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Information on
Quota Management
of Rock Lobster Fisheries
in South Australia,
Tasmania and New Zealand

By Kevin Donohue and Eric Barker

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EXECUTIVE SUMMARY

This report provides an update on the information available to Western Australians on the quota management of Australasian rock lobster fisheries. The report keeps Government and industry abreast of developments in alternative management systems and, if necessary, reviews the WA management system.

The last major evaluation of quota management was undertaken in Western Australia in 1994 (see reports by Bowen, Lindner, Marec Pty Ltd and McLaughlin 1994). The information in this report was collected over a three week period in March 1999 from the various stakeholders in South Australia, Tasmania and New Zealand.

In this report, the extent to which broad comparisons can be made between the various regions and trends identified on introduction of quota management systems is limited because of the lack of consistency in the data available from the various regions. The focus has therefore been on the presentation of the data available, rather than attempting to make interpretations from inconsistent information. Nonetheless, there are some key points that could be drawn from the information gathered, which are outlined below.

History of Quota

- In South Australia, Individual Transferable Quotas (ITQs) were introduced in the southern fishery in 1994/95. The northern fishery is managed by input controls. ITQs were introduced into the Tasmanian fishery in 1998, while the New Zealand fishery has been managed by ITQs since 1990. The Victorian Government has made the decision to implement an ITQ regime for its rock lobster fishery in the year 2000.
- In general, quota management systems were introduced at a time when stocks were either declining and/or expected to decline in the future. Generally, scientists were recommending that action be taken to avoid the risks of further growth and/or recruitment over-fishing of rock lobster.
- There have been adjustments (including increases) in the Total Allowable Commercial Catch (TACC) of New Zealand rock lobster fisheries zones since 1990 (Table 7). There has been no significant change in the TACC for the South Australian rock lobster fisheries since introduction. The Tasmanian Fishery is expected to retain the same TACC for the first three years.
- It is not obvious that the sole use of quota management regimes has led to a significant recovery of stocks. However, in New Zealand and Australia, stock monitoring indicators suggest that limitations on commercial landings have been successful in stopping further stock declines.

Allocation of Quota

- Allocation of entitlements in quota managed fisheries has proved, and still continues to be, the most contentious issue for fishermen and fisheries managers. This is because some fishermen's catch share under the allocation methods used (e.g. per pot in Australia) did not necessarily correspond to their historical catch share. Those who felt most aggrieved were those fishermen who had caught more than the average per pot.

- In Australia, the method used to deal with this problem (which has been tested in the courts) has been to initially allocate some fishermen additional quota according to their catch history. However, the additional allocation is being gradually phased out so that all the TACC is eventually allocated as an equal amount per pot. Given the experience of other states with the judicial system, this is probably the most likely method to succeed in terms of resolving disputes about which is the fairest way of allocating entitlements.
- Because of the contentious nature of the allocation method and ability for aggrieved persons to challenge allocation through the judicial and political systems, allocation will be problematic unless there is strong support from Government for the quota management scheme.
- Allocation of ITQ in New Zealand was simplified because the incumbent fishermen had effectively been 'locked into' the fishery over many years, with no transferability permits and/or vessel licences allowed. Allocation of provisional ITQs solely on the basis of individual catch history was therefore an acceptable option.

Management and Enforcement

- Quota Monitoring Systems (QMS) are based on paper audit trails and/or electronic reporting. The Tasmanian system, which uses a combination of both, is perhaps the most effective. The New Zealand experience is that reporting of catch against quota can be simplified by using electronic data transfer.
- Due to the lack of available information from the relevant enforcement agencies, it is not possible to provide estimates of compliance with quotas. Everyone consulted in the preparation of this report acknowledged that some slippage does occur through deliberate mis-reporting by fishermen and processors. In New Zealand, penalties for breaches of reporting rules encourage high levels of compliance by the majority of commercial operators in rock lobster fisheries.
- The most definitive example of the additional cost of introducing a QMS was available from Tasmania, where additional management costs to run the quota system were estimated to be \$675,000. Most Australian fishermen doubt that the QMSs introduced are cost effective, and have consequently sought greater accountability and transparency from compliance staff.

Deregulation and Changes in Ownership Under Quota

- Australian state fisheries using ITQs have not deregulated as potentially expected under an output control regime (i.e. existing input controls have been retained). In New Zealand, a suite of input controls in rock lobster fisheries supported by fishermen and quota holders is used to manage the fishery.
- The most notable structural change evident in quota managed fisheries has been to ownership of entitlements in New Zealand, where up to 50 per cent of the TACC for rock lobster quota is now owned by corporate interests, including processors.
- There have been some changes to fishing patterns by the introduction of quota, e.g. a shift to greater fishing effort at times of the year when prices are highest. However, where

grounds are limited, there is still competition between fishermen to harvest their ITQs when catch rates and/or beach prices are greatest.

Economics of Fishing

- An input and output system operates concurrently in South Australia and shows that there is no significant difference in profitability under the two management schemes.
- Values of entitlements have increased under quota management in South Australia but this was confounded to some extent by prices paid for rock lobster. Most of the increase in the value of entitlements was prior to the change over to quota management. Values of entitlements have increased markedly in New Zealand in some areas, but not others.
- Quota trade values have fluctuated over time in New Zealand in response to changing export market demand and/or the status of stocks within each of the nine rock lobster quota management areas.

Resource Sharing

- Resource sharing is a concern for all fisheries, particularly in New Zealand where the available yield from rock lobster fisheries is shared between a number of stakeholders, i.e. commercial, recreational and Maori. The New Zealand commercial rock lobster fishermen have initiated discussions with non-commercial fishers with a view to obtaining agreement on explicit proportional shares to be incorporated into the annual TAC setting process. Progress on this issue is slow due to a lack of reliable recreational catch information and properly mandated recreational fishing groups in all areas.

Conclusions

- Having gone through the process of implementation of a quota management system, fishermen have generally come to accept the change and are therefore not lobbying Government to revert to pre-quota management systems.
- To a large degree, these findings are similar to those of Bowen 1994, with allocation, enforcement and cost of compliance being the dominant issues.
- Interestingly, although QMSs have been favoured by economists, there is lack of data available to assess whether the expected economic benefits of quota management have been realized. A more analytical study is perhaps required to determine what the economic benefits, if any, have been. However, given the reasons for introducing the quotas in the first place, i.e. to improve the stock status, in the short-term, quotas seem to have been beneficial.

1.0 INTRODUCTION

The purpose of this study is to provide current information on the experience with quota management in rock lobster fisheries from South Australia, Tasmania and New Zealand. This information is intended to build on information provided by Bowen *et al* in 1993/94, and facilitate any ongoing discussions that may take place on alternative management systems.

The information in this report comes from interviews and documents provided by key Government and industry members over a three week period from 15 March to 31 March 1999. A list of the people contacted in each location is provided in Appendix 1.

For each sub-section, an attempt has been made to provide consistent information from each location, although this was not always possible due to the availability of information. In particular, as Tasmania has only recently introduced quota management, it was not possible to discuss changes that have occurred under quota management.

2.0 FISHERY DESCRIPTION

A brief overview of each of the fisheries compared with Western Australia is provided in Table 1.

Table 1 Summary of Key Commercial Fishery Information (1997/98)

	Sth	SA Nth	TAS	NZ	WA
Catch/TAC (t)	1,720*	942	1,500*	2,848*	10,478
Pots	11,923	3,950	10,507	-	69,288
Effort (millions pot lifts)	1.8	0.7	1.8	-	10.7
CPUE (kg/pot)	0.95	1.29	0.95	0.86-1.21	0.98
Licences	184	73	314	487	603
Seasons	Oct-Apr	Nov-May	#Feb-Mar	Apr-Mar	Nov-Jun

Note: those catches indicated with a * are Total Allowable Catches (TACs), i.e. fishers are restricted to a maximum catch. In the season indicated with a #, there is a closure from September to November, but in May to September fishing is allowed for male lobsters only.

02.1 South Australia

The South Australian southern rock lobster fishery is the State's most valuable commercial fishery. The fishery is based on a single species of rock (spiny) lobster, *Jasus edwardsii*. The commercial fishery is managed in two separate zones - the southern zone is managed by quota, while the northern zone is managed by input controls.

Although the northern zone is much larger, it contains less suitable habitat than the southern zone and accounts for approximately one-third of the state's annual catch. This report provides information predominantly from the Southern Zone.

The majority of the boats fish from one of seven designated landing ports.

The fishery is primarily a day fishery with vessels returning from the fishing grounds to unload at varying times during the day. In the southern part of the southern zone, there is a high density of fishable bottom from the low water mark to the continental shelf. Combined with the close proximity to the shelf, this means it is unnecessary for fishermen to travel far from home ports. However, as the shelf widens further north and the reef is more scattered, greater distances are travelled from home ports.

The fleet of 184 boats range in size up to about 20 metres. The majority of boats have planing hulls allowing quicker travel to and from fishing grounds. The average value of fishing gear and equipment per vessel is around \$240,000, and a maximum of 80 pots may be operated at any one time.

Beehive pots of wire mesh on steel frames or 50 × 75 mm weldmesh with moulded plastic or cane necks are used in the fishery. The size of pots and dimensions of escape gaps are regulated, and pots must have a single entrance at the top. A variety of baits are used including fish, cattle hocks and hides. Pots are usually set overnight and hauled at first light.

Total production is around 2,500 tonnes, with the Southern zone accounting for around 65 per cent of production. Ninety five per cent of the catch is exported to Japan, China and other Asian markets, and live lobsters make up 95 per cent of the export trade. In 1996/97, prices ranged between \$25 and \$33.

12.2 Tasmania

The Tasmanian rock lobster fishery targets the southern rock lobster (*Jasus edwardsii*) in the waters adjacent to Tasmania. Within Tasmania, the southern rock lobster is found among rocky reefs from the intertidal to depths of 200 metres around the entire coastline of Tasmania.

There are 38 specified wharves and jetties in Tasmania and four ports in Victoria where lobster unloading can occur. The fishery is divided into five regions for the purposes of regional catch rate analysis, and eight regions for the purposes of stock assessment modelling.

The length of trip depends on the location fished and the size of the vessel. In general, the larger vessels fish more remote locations, spending up to 10 days at sea, whereas smaller vessels fishing inshore waters return to port daily.

In January 1997, the fleet comprised 321 vessels, ranging in length from 8-26 metres. The vessels are a mixture of wooden and steel hulls, as well as some fibreglass. The majority of the fleet has displacement hulls with a small number of planing hulls.

Half the fleet is multi-purpose, holding endorsements to other fisheries. The average age of the fleet exceeds 15 years, with very few new vessels operating. The market value of vessels participating in the fishery varies from a low of \$15,000 to more than \$750,000.

Each vessel has a rock lobster pot allocation based on the length or tonnage of the vessel. The allocation varies between 15 and 50 pots. A maximum of 50 pots can be used on vessels 18 metres and over, or those which have measured tonnages of 30 tonnes or greater. The majority of vessels are owner operated, but there is a trend toward the leasing of vessels and licences.

Commercial fishers generally use pots made of steel and mesh netting or wooden 'sticks', and steel mesh of a maximum size specified in the management plan. Pots are usually baited with fish - mainly jack mackerel or Australian salmon - and are set overnight or during the day. Colour sounders, radar and GPS are installed on most boats.

All rock lobster are landed live from the catching vessel and generally purchased by the processor at the point of landing.

Ownership of licences is given in Table 2.

Table 2 Tasmanian Breakdown of Licence Holder Group

Licence holder Group	Number of licences	Percentage (%)
Tasmanian individuals	230	71.6
Tasmanian companies	39	12.1
Interstate individuals	32	10.0
Interstate companies	20	6.2

In 1997, about 112 licence holders had an entitlement to use 40 pots, while the remainder of the fleet held between 15 and 40 pots.

The beach price usually starts at about \$20-23 per kilogram in November when the season commences, and increases to \$40-\$50 per kilogram in July/August. Australian Bureau of Statistics figures show that about 46 per cent of the processed catch is exported to Hong Kong, Taiwan, Japan, USA and Singapore as live fresh cooked and frozen product. Most of the remaining 54 per cent of the catch is sold interstate.

22.3 New Zealand

The New Zealand fishery is based on the red/southern rock lobster (*Jasus edwardsii*) although about one per cent of the catch comprises what is commonly known as the pack horse rock lobster (*Jasus verreauxi*). The red lobster is caught around the mainland of New Zealand, Stewart Island, and at the Chatham Islands. The pack horse lobster is taken in the northern part of the North Island.

The fishery is divided into 10 Quota Management Areas (QMAs), labeled CRA1 to CRA10, and each has individual Total Allowable Catches (TACs) within which Total Allowable Commercial Catches (TACCs) are set. Historically, the three stocks were recognized for stock assessment purposes: North and South Island red lobster (NSI); Chatham Islands red rock lobster; and the pack horse rock lobster stock (PCH). The NSI stock has subsequently been

divided into three sub-stocks: northern (NSN), east central (NSC) and southern (NSS). The quota year starts on 1 April and finishes on 31 March the following year.

Fishing occurs mostly on a daily basis between the shore and 120 fathoms, and generally on hard or foul ground.

Around 500 commercial vessels operate in the rock lobster fishery, with both planing and displacement hulls in the six metre to 20 metre size range. Most are multi-purpose because of the relatively short duration of the lobster season. In some areas, vessels are still moved on trailers to enable access to fishing grounds due to lack of port facilities.

There are no limits on the number of pots that can be used and regulations on trap design are limited to specifying escape gaps. Some vessels fish large numbers of pots (up to 400 each day), although most use 50 per day.

In 1997, rock lobster became New Zealand's second most valuable fish export species. Live exports make up 96 per cent of the trade. Asia is the main market with Hong Kong and Japan taking 36 per cent and 26 per cent of export volume respectively.

3.0 REASONS FOR MOVING TO QUOTA

33.1 South Australia

The primary aim of the Quota Monitoring System (QMS) in South Australia was to ensure that catches did not exceed the sustainable harvest level for the fishery. Historically, pot reductions and a buy-back scheme had been used to control fishing effort.

As the need arose to consider what additional regulations would be required to control exploitation in the fishery, quota management was presented to industry along with six other options. Although many fishermen were unsure whether quota management was appropriate for the fishery, once it was introduced there was little support for the other options.

43.2 Tasmania

Quotas were introduced into Tasmania to stop a stock decline. In the mid 1980s, it was identified that action had to be taken to stop the decline in rock lobster biomass - particularly spawning biomass. Egg production and biomass had significantly declined in all regions, effort was increasing and catch rates were down. The catch peaked in 1985 and given the pessimistic stock assessment, industry wanted something done to conserve the fishery.

53.3 New Zealand

A QMS was introduced on 1 April 1990 as a mechanism to ensure that stocks were not further depleted. Prior to the QMS, rock lobster catches were unrestricted, except for minimum size regulations, prohibition on taking berried females and soft shelled lobsters, and some local area closures.

The number of licence holders was limited, along with the type, size and number of vessels used. Management under this type of regime proved to be ineffective as catches were not restrained, and strong incentives existed for fishers to develop new ways to circumvent management controls to increase harvest levels. This management regime promoted neither sustainable nor efficient harvesting.

4.0 ESTABLISHING AND ALLOCATING ENTITLEMENTS

64.1 Methods

04.1.1 South Australia

For the first year of quota management, individual quotas were allocated according to the so called 'adjusted preferred' or 'Presser model'. This method was used to select each fisherman's greatest relative share of the total catch by equating it to either their pot holding or catch history.

The method used to determine catch history 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 season.

All fishermen's allocations were then reduced by 10 per cent to ensure that the TAC was not exceeded or did not exceed the sustainable limit (see Zacharin 1997b for further details).

Following a review of the initial allocation method, the management committee recommended that it be changed so that the TACC would be allocated on the basis of an equal value per pot by the end of a three year phase-in period. This was known as the APACHE Model. Following further consultation, the Minister agreed to extend the implementation period to four years to allow licence holders who had a higher catch history an extra season to adapt to the changes.

14.1.2 Tasmania

In 1991, a working group comprising industry and government was formed to investigate management options to address concerns that the increasing catch could not be sustained. In 1993, an interim report was produced and various options examined, i.e. buy-back scheme, pot reduction, closures, TAC, etc.

In March 1993, with the release of the draft report, a 15 per cent pot reduction was introduced over three years. The season was also progressively shortened over the period 1993 to 1997. Industry was then asked to consider either a further 15 per cent pot reduction or TAC to constrain the catch. When the two options were put to industry, only 100 out of 326 voted, and of these, 53 per cent were in favour of a TAC.

A second vote conducted by the Minister provided six options on a ballot paper, and 280 out of 326 fishermen voted. In January 1994, another working group was formed to advise the Minister on quota, although no decision was made.

By the end of 1995, the Minister retired and in 1996 a parliamentary election was held with a new Minister appointed. The new Minister favoured quotas, and although keen to make a decision, was under considerable pressure not to as industry was divided on the issue.

In August 1996, Cabinet decided to introduce quotas and the advisory committee (September 1996) produced a draft plan for public consultation.

In November 1996, a Legislative Council select committee was formed to investigate the future of the rock lobster fishery. The committee received 150 submissions and held several hearings. The Government also made a submission supporting the introduction of a QMS for the rock lobster fishery (Department of Primary Industry and Fisheries 1997). The committee's report was compiled by a private consultant.

In June 1997, a draft management plan was prepared by the agency and discussed at 11 port meetings to the end of September 1997. Industry was extremely divided at these meetings. Due to the number of concerns about the impact of changes on regional communities, a comprehensive study on the socio-economic profile of the industry was commissioned (see Williamson *et al* 1998 for the results)

It was proposed that a quota of 1,500 tonnes be divided among 10,507 pots at 143 kg/pot and introduced by an Act of Parliament. This was done following Crown Law advice plus advice from an independent solicitor with expertise in Constitutional Law. This provided the best protection for government and avoided the prospect of the proposed changes being disallowed in the Upper House.

The plan was tabled in both Houses of Parliament and the Bill was finally passed (10 to eight) in the Lower House after lengthy debate and incorporated some amendments made by an independent member.

By early November 1997, the management plan was gazetted for implementation in March 1998 (Consolidated Legislation Fisheries Rock Lobster Rules 1997). Subsequently, a review of the management plan in 1998 determined that a number of amendments were required to correct drafting errors and other matters.

24.1.3 New Zealand

In New Zealand, allocation was calculated on an average of the best four of six years of catch history (1 June 1982 to 31 May 1988). The choice of extended catch history years reduced the impact of the race for catch history immediately prior to introduction of the QMS in 1990.

Fishermen holding Controlled Fishery Licences for rock lobster received Provisional Maximum Transferable Term Quotas (PMTTQ) based on average catch history. The term was initially set at 25 years because of uncertainty about the outcome of indigenous fisheries claims.

An appeals process was available to fishermen who could demonstrate legitimate discrepancies between their reported landings over time and the records held by the management agency.

The Ministry for Fisheries then reduced the PMTTQ to the level of the TACC for each QMA. The TACCs were then allocated to fishermen as Guaranteed Minimum Transferable Term Quota (GMTTQ).

Notices of GMTTQ allocations for each QMA were published in newspapers and an industry magazine. The GMTTQ was allocated on 1 April 1990 and from that date, all rock lobster catch had to be recorded against quota.

Compensation was paid in two stages for the reduction in catch history and the subsequent reductions in TACCs in rock lobster fisheries. Between the period 1989 and 1994, compensation was set at \$6,300 /tonne up to a maximum of 500 tonnes in all QMAs, although the actual TACC reductions did exceed the 500 tonne limit and the final price per tonne payments was reduced.

Following resolution of outstanding issues in relation to indigenous fisheries rights (Treaty of Waitangi Fisheries Claims), transferable term quotas were converted to Individual Transferable Quotas (ITQs) in October 1996.

74.2 Key Difficulties in Allocation and How They Were Overcome

34.2.1 South Australia

One of the key difficulties in allocation in South Australia was that about 25 per cent of fishermen had a lower allocation under the APACHE model than they did under the Presser model.

As a consequence, one of these licensees with a lower allocation under the APACHE model challenged the regulation in the Supreme Court of South Australia. The licensee won the case and the fishery reverted to a competitive TACC for the remainder of the 1994/95 season. Although the court ruled against the APACHE model, fishermen at all ports voted to abide by the APACHE model.

However, an appeal by South Australia Fisheries to the Full Supreme Court of South Australia to overturn the Supreme Court of South Australia ruling was upheld and the APACHE

allocation method was reinstated. By 1997/98, all pots were allocated a standard proportion of the TAC.

44.2.2 Tasmania

The key difficulty in introducing the TACC in Tasmania was that the industry was divided on whether a TACC should be introduced at all. Consequently, the allocation became a very divisive issue. Even though there was considerable consultation over a long period, the Government eventually had to resort to an Act of Parliament in the lower house (where it had the numbers) to enable passage of the legislation.

54.2.3 New Zealand

For many years prior to the announcement that rock lobster would be added to the QMS, the lobster industry had been campaigning for effort controls and transferability. Pot limits and transferable vessel licences were the preferred options for industry, but these were not supported by Government. Industry made strong protests about the intended TACC, which, if implemented, meant a reduction to some individual historical catches in excess of 52 per cent.

The TACC set in 1990 represented an average 32 per cent reduction to historical landings. Claims for compensation for reductions to catch history and subsequent TACC reductions were settled by a one-off payment to industry of \$6 million.

The allocation process was less contentious in New Zealand because rock lobster fishermen had been locked into a non-transferable licence regime from 1977 until the implementation of the quota managed fishery in 1990. Industry accepted catch history as the basis for allocation and sufficient provision was made in that process to take account of normal fluctuations in fishing activity.

84.3 Quota Units

64.3.1 South Australia

Quota is allocated on a per pot basis which in 1998/99 was 144.26 Kg/pot.

74.3.2 Tasmania

The TACC for the rock lobster fishery was set at 1,502.5 tonnes for the first year of the management plan (1 March 1998 - 28 February 1999). This was allocated on a per pot basis equating to 130kg per pot in the first year (10,507 pots @ 130kg = 1,366 tonnes) and the remaining 136 tonnes was allocated on past catch histories. A licensee who qualified for an additional allocation under the catch history criteria was allocated two types of quota units, *rock lobster quota units* and *rock lobster catch history units*. The catch history allocation is being phased

out over a three year period so that by March 2001, every licensee will get the same per pot allocation of the TACC, i.e. $1/10,507^{\text{th}}$ of the TACC.

Catch history units for a particular licensee were calculated from the sum of the licensee's best three years of catch for the nine year period commencing 1 November 1988. A licensee's catch history was the sum of the difference between their catches and the base figure of 130kg per pot. This catch history was then used to calculate the value of a single rock lobster catch history unit allocated to a licensee in the fishery. A licensee's allocation was equal to the licensee's catch history, divided by the sum of all catch histories, multiplied by the portion of the TAC for allocation by catch history fishery (136 tonnes in 1998/99).

Rock lobster quota units = 130 kg/pot (91 per cent of the TAC) increasing to 143 kg/pot by March 2001.

Rock lobster catch history units = 9 per cent of the TAC (136 Tonnes) decreasing to zero by March 2001

84.3.3 New Zealand

In terms of statute, ITQs are a proportional share of the TACC, which is a proportional share of the TAC determined by the Minister for Fisheries each year.

Quota entitlements are specified in tonnes. Three tonnes by ownership and/or lease is the minimum holding required to obtain a rock lobster fishing permit. However, a grandfather clause provision in the *Fisheries Act* allows a permit to be issued when a TACC decision has reduced the amount of quota owned by an individual fisherman to less than the three tonne minimum. The grandfather clause does not apply to leased quota.

Rock lobster quota can be traded and leased in minimum parcels of 100kg. Legislation provides for a limit on the amount of quota that can be owned by any person and/or company. This aggregation limit is currently set at 10 per cent of the TACC for the area, but exemptions can be applied for and are routinely given.

94.4 Resolution of Disputes During Quota Allocation

94.4.1 South Australia

Licensees had the right to appeal their allocation to an independent appeals court. An internal appeals mechanism provided the opportunity for licensees to show cause (based on catch returns) as to why they should be entitled to an extra allocation. The appeals process was conducted over six months and resulted in an extra 20 tonnes of quota being allocated.

104.4.2 Tasmania

Hearings of disputes over catch history involved two stages. Firstly, the licensees put their case before the Secretary (Fisheries Department), and if unsuccessful had the right to access the appeals tribunal. There were a total of 22 disputes and half were successful in obtaining additional entitlements. The state appeals tribunal for fisheries comprises three people - a chairperson, who is a lawyer, and at least one other member who must have fishing experience.

Licensees were entitled to have their allocations reviewed and to make a subsequent appeal of the determination of their catch history. A minimum period was allowed for appeals to be dealt with before the catch histories were used to determine the allocation of catch history units. No appeal was allowed against the final allocation of catch history units.

114.4.3 New Zealand

Fishermen had three months to appeal the proposed allocation of PMTTQ to the Quota Appeal Authority (QAA). Appeals were restricted to claims in relation to reported catch history. A decision by the QAA to increase a fisherman's PMTTQ was also deemed to temporarily increase the TACC. For most of the quota management areas, provisional quota granted in the appeals process led to a proportional reduction in all ITQs.

5.0 STOCK ASSESSMENT AND RESEARCH

105.1 Techniques Used to Estimate Stock Status

125.1.1 South Australia

The approach in South Australia has been to calculate the biological reference points specified in the management plan. The status of the fishery is then evaluated against these biological reference points. For more technical detail on the methods used to estimate these biological reference points, see Prescott *et al* 1998. When one or more of the reference points is reached or exceeded, the management committee is obliged to take action to investigate and report to the Minister and industry.

A fishery management model has been built to assist managers and fishermen to explore the impact on the stock of various management strategies. The model is deterministic and therefore does not provide the likelihood of particular stock sizes over time under different management scenarios. (The model can be downloaded from the South Australian Research and Development Institute [SARDI] rock lobster research web page, address: <http://www.sardi.sa.gov.au/aquatic/aquatic/programs/rocklobs.htm>).

The five reference points indicators with values for 1997 are given in Table 3 (Prescott *et al* 1998).

Table 3 South Australian Performance Indicator Values - 1997

Indicator	1997
1. Exploitation Rate	0.54
2. Egg production (%)	13
3. Pre-recruit abundance (% of 1992)	117
4. Catch rates (kg/pot lift)	0.95
5. Mean Weight (kg)	0.79

These indicators for 1997/98 were consistent with stable or increasing biomass of lobsters in the southern zone.

The population model used by researchers suggests that both egg production and long-term sustainable catch rates could increase by decreasing exploitation rates. Similar analyses show that egg production could be increased by increasing the current size limit.

Research

The SARDI is the Government's preferred research provider and conducts most research and monitoring programs for the rock lobster fishery. Research needs and management priorities are determined by the Rock Lobster Research Sub-committee, and a five year strategic plan has been developed for the fishery.

Monitoring programs include collecting commercial fisheries data, pot-catch data, length frequency data, larval settlement indices and temperature records. The research focus is on monitoring through a catch sampling program, collection of yield per recruit data, egg recruit analysis, production and modeling information.

The SARDI currently provides annual stock assessment reports on the southern zone fishery to the management committee by 31 May each year.

135.1.2 Tasmania

In Tasmania, the performance of the management plan in meeting the objectives of maintaining the biomass and recruitment is measured through a combination of performance indicators concerning the sustainability of the resource, similar to South Australia. These performance indicators are assessed relative to the situation that existed in 1993, 1994 and 1995.

The management plan aims to keep the performance indicators at or above the estimated levels for the three reference years. Performance indicators (DPIF, Tasmania 1997) are outlined below, but the assessment may include consideration of other issues as well:

- Catch per Unit Effort (CPUE);
- biomass;
- egg production;
- relative abundance of undersized rock lobster;
- total annual catch;

- the size of the rock lobster fleet; and
- the recreational catch.

Trigger points are specified for each performance indicator (DPIF, Tasmania 1997). When one or more of the trigger points are reached, the Minister reviews the management of the rock lobster fishery.

A population model developed in conjunction with the indicators is used extensively for stock assessment (Frusher 1997a, 1997b). The model represents a major advance in the quality of stock assessment advice for the Tasmanian rock lobster fishery. It is based on fitting a population dynamics model for each of the eight statistical zones around Tasmania. The eight areas are assessed separately because of the significant variation in growth rates, size at maturity and catch rates between regions.

The values for the parameters of the model (monthly catchabilities of lobsters, juvenile recruitment and initial fishing mortality) are obtained by fitting the model to most of the currently available data. Once fitted, the model provided estimates of historical changes in the fishery from 1970 to 1995. The model fits the observed data extremely well, and further enhancements are being incorporated.

145.1.3 New Zealand

Annual stock assessments are linked to 'decision rules' which contain specified actions if assessments indicate significant decreases in population size from one year to the next (see Starr *et al* for an evaluation of a decision rule). Not all sub-stocks and QMAs are necessarily assessed each year. Where possible, assessments are undertaken to determine whether under recent catches the stocks will move towards a size that will support maximum sustainable yield (MSY).

Specifically, stock assessments are carried out using length-based models to represent the sub-stocks. The model results provide estimates of the current position of the fisheries compared with reference positions. These models are dynamic and fitted to standardized Catch per Unit Effort (CPUE) indices and to length frequency data (*Annala and Sullivan 1998*). Growth is represented through a transition matrix, which specifies the probability of animals in every size class moving to the same length or larger in the next time step.

The initial population of 1945 was assumed to be in equilibrium under average recruitment and no fishing mortality. Each year, the number of male and female lobster within each size class is updated as a result of recruitment, mortality, vulnerability (selectivity curve), growth and mortality. Estimates of vulnerable biomass are made for the beginning of each assessment year.

115.2 Accuracy of Stock Estimates

155.2.1 South Australia

Although errors are provided for in the model parameters and CPUE (Prescott *et al* 1998), the fishery model used for stock predictions under different management scenarios does not have the capability to provide estimates of the uncertainty surrounding stock predictions.

165.2.2 Tasmania

A risk assessment of future harvest levels is provided in stock assessment reports. A series of alternative sequences of future TACCs are evaluated in terms of the probability that the biomass of sized lobsters will drop below the level that existed at the start of 1995. These TACC scenarios are also evaluated in terms of the probability that egg production will fall below the level which occurred during 1995.

The probability of the biomass falling below that recorded in January 1995, with a 1,500 tonne TACC for the life of the current management plan (year 2000), has been estimated to be close to zero. However, the 1,500 TACC it is not expected to have a significant impact on egg production over the life of the current management plan, and additional measures will need to be considered to increase egg production.

175.2.3 New Zealand

The *Fisheries Act 1996* requires decision makers to consider the following information principles:

- Decisions should be based on the best available information.
- Decision makers should consider any uncertainty in information available.
- Decision makers should act with caution when information is uncertain, unreliable or inadequate.
- The absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

The Fisheries Assessment Working Group uses a number of performance indicators as measures of the status and risk of each sub-stock/QMA assessed (Annala and Sullivan 1998). The performance indicators are to be calculated for each management scenario investigated.

Maximum sustainable yield estimates and five to 95 per cent confidence limits are provided for sub-stocks and QMAs.

125.3 Changes in Stock Status

185.3.1 South Australia

The status of stocks is assessed against a series of reference points, and these reference points and trends over time are given in Table 4.

Table 4 South Australian Reference Points 1992-1997

Reference Point	1992	1993	1994	1995	1996	1997
Exploitation Rate (%)	0.48	0.52	0.48	0.51	0.56	0.54
Egg production (% of virgin)	14	13	14	13	12	13
Pre-recruit abundance (% of 1992)	100	99	121	113	96	117
Catch rates (kg/potlift)	1.00	1.01	1.14	1.06	0.94	0.95
Mean Weight (kg)	0.78	0.82	0.81	0.80	0.80	0.79

Relative stock biomass estimates suggest the biomass is greater in recent seasons than it was for most of the 1980s.

195.3.2 Tasmania

As the quota has only been in place for a year, it is too early to assess the changes in the stock status under the QMS.

205.3.3 New Zealand

Assuming CPUE is a reasonable indicator of stock abundance, then rock lobster stocks have increased in abundance in most areas since 1993 (see Table 5). Exceptions are CRA 6 (CHI) and more recently CRA 7 and CRA 8 (NSS).

Table 5 contains reported commercial landings (to August 1998) and CPUE (kg per pot lift) for *Jasus edwardsii* NSI and CHI stocks, and NSN, NSC and NSS sub-stocks, for the 1979/80 to 1997/98 fishing years.

Table 5 New Zealand Commercial Landings and CPUE 1979/80 to 1997/98

NSI Sub-stocks

Year	Landing	NSN CPUE	Landing	NSC CPUE	Landing	NSS CPUE	Landing	NSI CPUE	Landing	CHI CPUE
1979/80	408	0.57	1385	0.85	2258	1.66	4141	1.09	401	2.32
1980/81	632	0.72	1718	0.88	1841	1.54	4288	1.04	356	2.18
1981/82	575	0.65	1665	0.85	1692	1.50	4012	0.99	465	2.19
1982/83	550	0.59	2213	0.91	1688	1.39	4510	0.97	472	1.77
1983/84	506	0.55	2303	0.85	1659	1.11	4539	0.87	548	1.73
1984/85	482	0.51	2294	0.76	1757	1.10	4614	0.82	492	1.36
1985/86	556	0.54	2227	0.71	2197	1.22	5061	0.83	604	1.41
1986/87	479	0.47	2113	0.72	1975	1.11	4658	0.80	572	1.65
1987/88	445	0.44	1794	0.57	1974	1.12	4305	0.71	451	1.48
1988/89	401	0.47	1399	0.51	1262	0.79	3087	0.58	450	1.40
1989/90	427	0.57	1457	0.54	1352	0.87	3262	0.66	318	1.35
1990/91	369	0.58	1156	0.49	968	0.87	2538	0.61	371	1.37
1991/92	358	0.51	1087	0.43	1142	1.00	2634	0.61	389	1.30
1992/93	301	0.46	946	0.41	1008	0.75	2301	0.54	329	1.14
1993/94	342	0.56	983	0.50	1034	0.99	2404	0.67	342	1.09
1994/95	343	0.69	946	0.63	976	0.91	2310	0.75	312	1.07
1995/96	339	0.80	943	0.78	907	0.89	2234	0.83	309	1.07
1996/97	343	0.87	993	0.94	924	0.81	2307	0.88	368	1.01
1997/98	363	0.88	1014	1.21	814	0.73	2238	0.93	298	0.86

135.4 Annual Variation in TAC

215.4.1 South Australia

Since 1993/94, the catch has been controlled by a TACC, which has essentially remained the same since introduction, but in most seasons has not been taken (Table 6).

Table 6 South Australian Variations in TACC 1993/94 to 1998/99

Year	TACC (t)	Catch (t)
1993/94	1718	-
1994/95	1740	1720
1995/96	1720	1684
1996/97	1720	1642
1997/98	1720	1685
1998/99	1720	1713

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235.4.2 Tasmania

The TACC has been set at 1,500 tonnes for the first three years of quota management.

245.4.3 New Zealand

Changes to TACCs for QMAs since rock lobster was introduced into the QMS are outlined in Table 7.

Table 7 New Zealand TACCs for the Fishing Years 1990/91 to 1999/00

Fish Stock	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
CRA1	160	157	138	130	130	130	130	130	130	130
CRA 2	250	241	217	215	215	215	215	236	236	236
CRA 3	437	412	331	164	164	164	205	225	327	327
CRA 4	576	546	507	496	496	496	496	496	496	576
CRA 5	465	434	338	304	304	304	304	304	304	350
CRA 6	518	531	540	531	531	531	531	400	360	360
CRA7	179	167	155	139	139	139	139	139	139	11
CRA8	1152	1077	994	888	888	888	888	888	888	711
CRA9	55	52	47	47	47	47	47	47	47	47
CRA 10	0	0	0	0	0	0	0	0	0	0
TOTALS	3792	3617	3267	2914	2914	2914	2955	2865	2927	2848

The sum of the TACCs for the New Zealand rock lobster fisheries was set at 3,792t for the year commencing 1 April 1990 (including increases in individual ITQs resulting from appeals by fishers over catch histories). This was steadily reduced year by year and on an area by area basis until 1997/98 to reach 2865t but increased to be 2848.6t in 1999/2000, following increases in TACC for CRA2, CRA3, CRA4, and CRA5.

CRA 10 comprises the Kermadec Islands, and has a TACC of 0.1t.

The TACC for pack horse lobster (PHC) increased from 27t in 1990 to 40.3t (the current TACC) at the beginning of the 1993/94 fishing year after appeals.

Following passage of the *Fisheries Act 1996*, TACs were set for the first time in 1997. Subsequently, TACs have been set for CRA2 (452.6t), CRA3 (453t) CRA4 (771t) CRA5 (467t) CRA6 (370t) CRA7 (131t) and CRA 8 (798t).

6.0 DETERMINING THE ANNUAL QUOTA

146.1 South Australia

Assessment reports (biological and economic) are mandated for release by April each year (Prescott *et al* 1998, Econ Search Pty Ltd 1999a&b). The annual report for the fishery has to be completed by June each year. The Fisheries Management Committee (FMC) then has the opportunity to meet twice to consider the annual report and formulate advice to the Minister.

The FMC is a statutory body with an independent chairman (appointed for a two year period), with seven voting, four non-voting and two advisers attending meetings. The FMC considers the issues raised in the reports in consultation with industry and makes recommendations to the Minister on the TACC prior to the commencement of the next season. After consideration of the FMC advice, the Minister determines the TACC and the industry is advised accordingly.

156.2 Tasmania

A stock assessment report, which includes *inter alia* a review of biomass trends, egg production trends, a risk assessment of future harvest levels and assessment of trigger points, provides the basis for discussions on annual quota (see Frusher 1997a&b). In Tasmania, the quota has been set at 1,500 tonnes for the first three years.

The annual management cycle is given below:

March	Quota year commences
July	The first draft stock assessment report is provided to the Fisheries Assessment Working Group (FAWG).
August to November	FAWG consults with the agency and representative bodies Minister is provided with advice by the agency and/or MAC
December	TACC is set for the following season

However, a review of the management plan can occur at any time. The steps in this process are:

1. The agency conducts a review with the MAC and/or relevant body.
2. The agency makes a recommendation and seeks comments from industry which may be in the form of an options paper.
3. The agency then seeks approval from the Minister to draft amendments to the management arrangements.

166.3 New Zealand

The *Fisheries Act 1996* (1996 Act) contains a framework for the TAC decision making process. When considering the setting or altering of a TAC under the 1996 Act, the Minister is required to consider the issues outlined below. A practical application of this framework is contained in the National Rock Lobster Management Group (NRLMG) annual report (*Review of Rock Lobster Sustainability Measures for the 1999-00 Fishing Year*, Page 50).

256.3.1 Purposes and Principles of the Act

The purpose of the 1996 Act is to provide for utilisation of the resource while ensuring sustainability of the stock. In providing for utilisation, the 1996 Act requires that the adverse effects of fishing on the aquatic environment are avoided, remedied, or mitigated. In considering management changes, the Minister should consider what impact the existing fishery is having on the aquatic environment.

It is a requirement of the 1996 Act to maintain the potential of fisheries resources to meet the reasonably foreseeable needs of future generations. In a fish stock context, it is considered reasonable to assume that the 'reasonably foreseeable needs' of the next generation are provided by having access to the fish stock at or above a level that can produce the Maximum Sustainable Yield Biomass (B_{MSY}).

In considering management changes, the Minister should consider whether the fish stock is likely to be able to provide for future generations, i.e. the stock's current position in relation to B_{MSY} and its rate of rebuild toward that level (if it is below B_{MSY}).

266.3.2 Information Principles

The precautionary approach contained in the information principles section of the 1996 Act provides that decision makers should consider any uncertainty in the information available in any case and should be cautious when information is uncertain, unreliable, or inadequate. The absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act.

The degree of caution to be exercised is related to the level of risk associated with the proposed action, i.e. the seriousness or significance of the threat. Deciding on the degree of caution necessary requires a balance between not taking appropriate management measures to achieve sustainability and restrictions being placed on fishing activities.

276.3.3 Environmental Principles

The Minister is required to take into account three environmental principles which specify an obligation to:

1. maintain the long term viability of associated or dependent species;
2. maintain biological diversity; and
3. protect habitat of particular significance for fisheries management.

286.3.4 Sustainability Measures

The Minister is also required to take into account any effects of fishing on any stock and the aquatic environment, the natural variability of the stock concerned, and any existing controls under the 1996 Act that currently apply to the stock or area concerned.

6.3.5 TAC Setting Considerations

The Minister is required to set a TAC:

- that maintains the stock at or above a level that can produce MSY having regard to the interdependence of stocks; or
- enables, within a period appropriate to the stock and its biological characteristics, the level of any stock whose current level is below that which can produce the MSY to be altered in a way and at a rate that will result in the stock being restored to or above MSY, having regard to the interdependence of stocks and any environmental conditions affecting stock;
- enables the level of any stock whose current level is above MSY to be altered in a way and at a rate that will result in the stock moving towards or above B_{MSY} , having regard to the interdependence of stocks; and
- in considering the way and rate at which the stock moves toward or above MSY, the Minister shall have regard to such social, cultural and economic factors he considers relevant.

296.3.6 Decision Making Process

Decision rules are in place for some rock lobster fisheries to provide some certainty to fishers about future management decisions and ensure legislative obligations are met (*Review of Rock Lobster Sustainability Measures for the 1999-00 Fishing Year*, page 13).

Fish stocks are reviewed by the Fishery Assessment Working Group (FAWG) if the decision rule in the relevant area has been triggered. The FAWG models various levels of total removals on the basis of recommendations by sector groups or the Ministry to determine impact on the stock in relation to B_{MSY} . The FAWG then produces a Plenary report which contains the results of modeling and stock assessment of those fisheries under review.

The National Rock Lobster Management Group (NRLMG) then considers the results of the stock assessment and makes recommendations on the level of TAC and TACC to the Minister for Fisheries.

The Minister then consults with persons or groups he considers representative of those with an interest in the fishery, and there is also a statutory requirement for the Minister to provide for the input and participation of Maori commercial interests in the fishery.

The NRLMG Annual Report (*Review of Rock Lobster Sustainability Measures for the 1999-00 Fishing Year*) forms the basis of public consultation. The Minister outlines his initial views on the matters raised by the NRLMG, and any other additional matters he would like to raise with stakeholders. The statutory consultation period is usually four weeks.

The NRLMG then meets to consider submissions from stakeholders. (For an example of a submission, see the CRA8 1998 Management Committee submission).

MFish and the NRLMG prepare and submit final advice to the Minister summarizing submissions and responding to any issues that may have been raised by stakeholders. The Minister meets with the NRLMG to outline his decisions.

Stakeholders are notified of the Minister's decision by a letter outlining the decisions and rationale, along with a press release.

A notice of TAC/TACC changes is published in an official Government publication.

7.0 QUOTA MONITORING SYSTEM

177.1 South Australia

The quota system is monitored through a paper audit trail from the time lobster are landed to the point of sale.

Both fishermen and processors must complete records and submit these records to Primary Industry Research South Australia (PIRSA). (Detailed compliance protocols are given in Zachrin 1997b.) Integral to this process is the requirement for fishermen to weigh their catch at one of eight registered weighing stations. The electronic balances at the weighing stations are checked on a weekly basis. The system relies on detecting discrepancies between what fishermen record on their form and what is delivered to processors

7.1.1 Procedure

Prior to landing, fishermen are required to complete a form with a record of the number of lobsters taken, an estimate of the catch weight and the port where they intend to land. The catch must be landed at one of the eight ports with certified weight scales.

On landing, the catch must be weighed and the exact weight recorded on the Catch Disposal Receipt (CDR) form.

The CDR form is lodged in a locked box at the scales (the forms are collected every 24 hours and delivered to a compliance officer).

The CDR is added to a database and individual catches recorded against allocated pot quotas.

The audit continues with further paper work completed by processors upon purchase and sale of rock lobster.

The agency has undertaken to review an alternative electronic system involving the reporting of catches by telephone using a swipe card, pin number and licence number. The agency would also like prior reporting included in a new system.

Although the agency has the view that the electronic system would be tighter and provide savings to industry, the industry has a preference for a paper system.

187.2 Tasmania

In summary, the Tasmanian QMS relies on a combination of real time information via a paging service and written documentation. The system is designed around a number of 'control points' between catch and market at which quota landings can be verified in a cost effective manner. The Marine Police and DPIF can randomly check at any or each of the 'control points' to explore mis-reporting in the chain. This provides a meaningful audit trail to maintain the integrity of the quota system.

Requirements of commercial fishermen are as follows.

1. Complete daily log sheets recording details of fishing operation.
2. Contact the paging service:
 - prior to leaving port (minimum two hours) if holding lobster from a previous trip;
 - prior to unloading rock lobster (minimum two hours);
 - prior to unloading rock lobster into a cauf (minimum two hours); and
 - after an emergency landing.
3. Complete rock lobster quota dockets when unloading lobsters.
4. Tag rock lobster pots.
5. Install vessel monitoring transponder in some circumstances, i.e. when holding dual state licences etc.
6. Unless authorised, fishermen must not sell more than five rock lobsters to a fish processor or fish handler.
7. Issue and keep copies of receipts for all sales of five or less rock lobsters to non-licensed people.
8. Tail clip dead lobsters up to the allowance of three per trip.
9. Only land at designated ports/jetties (42 allowable).
10. Tag (horn tag) all rock lobsters sold to domestic Tasmanian retail market.

Requirements for processors (approximately 60 licensed, 30 operating) and handlers are as follows.

1. Hold a licence to purchase more than five lobsters directly from fishermen.
2. Contact the paging service:
 - prior to transporting lobsters from the wharf (where the premises is more than one kilometre from the place of unloading);
 - within 15 minutes of receiving rock lobster (where the premises is more than one kilometre from the place of unloading); and
 - prior to receiving lobster from a non-quota holder.
3. Complete quota dockets when unloading rock lobster.
4. Complete daily transfer dockets for all lobster handled.
5. Make records available for an annual audit.
6. Clearly mark all vehicles used.

A new computer system with a total budget for all ITQ fisheries of \$400,000 was to be introduced in three phases. Stage two will link fishermen's and processors pager information to documentation. To date, the system has cost \$500,000 and currently no commitment has been undertaken to complete phase three.

197.3 New Zealand

The commercial catch must be sold to a Licenced Fish Receiver (LFR) and the fisherman must report the weight of target catch and any incidental bycatch to MFish within 15 days of the end of the month in which the catch was taken. Fishermen must also report daily catch, effort and landing information to MFish each month.

The catch must be recorded within two hours of landing. LFRs have to report catch purchased from commercial fishermen on a monthly basis.

The system is explained in detail in *The Fishermen's Guide to the Quota Management System* (Boyle 1993).

8.0 ENFORCEMENT

208.1 South Australia

There are six compliance officers and one data entry operator employed to manage the QMS.

218.2 Tasmania

To manage the quota system, 11 additional staff were employed, including:

- four marine police;
- three accountants;
- one person to operate the Vessel Monitoring System (VMS);
- one data analyst; and
- two researchers.

228.3 New Zealand

There is no readily available information on staff employed to manage the QMS for the rock lobster fishery, given that the QMS is the core system for the majority of New Zealand's fisheries.

It was reported that emphasis is on identifying anomalies by comparing the information supplied from the various sources of information. However, enforcement officers do occasionally board vessels in port to check paper work. Enforcement officers undertake covert operations where large scale 'quota busting' offences are suspected. Fish thieving and blackmarket operations outside the commercial industry are the greatest enforcement problem in New Zealand.

238.4 Levels of Compliance

308.4.1 South Australia

There have been four prosecutions over the last two years.

Compliance performance indicators for the fisheries are:

- reduction in illegal activity determined by the 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.

318.4.2. Tasmania

Although it is early days, agency staff consider that compliance is very good. There has been one case of a fishermen failing to make an entry. Twenty per cent of unloadings are inspected.

328.4.3 New Zealand

Illegal removals have been estimated at about 400 tonnes (approximately 13 per cent of the TACC), but the bulk of that estimate comprises fish thieving and black-market activity by illegal fishermen. Commercial compliance in rock lobster fisheries is generally high and few prosecutions result from investigations into alleged 'quota busting'.

248.5 Compliance Problems

338.5.1 South Australia

Non-declaration of catch is acknowledged as the major shortcoming of the QMS. Some fishermen have suggested a greater effort should be directed towards checking the catch as it comes ashore rather than after it is landed. Difficulties in reporting and auditing have been observed in the South Australia system.

Two types of quota avoidance are known to occur:

- weights are either not declared or wrongly declared; and
- fraud by converting and changing documentation.

Although no one really knows the level of non-compliance, some persons contacted suggested that 10 per cent of the total catch was undeclared. Some fishermen were concerned that the estimate of the quantity of catch under-reported was being exaggerated for the purposes of justifying greater resourcing of compliance activities.

348.5.2 Tasmania

Upon introduction of the QMS, there were incidents of incorrect documentation. However, it was reported that the standard was improving as fishermen gained more experience with the system. It is too early to judge the level of deliberate non-compliance.

358.5.3 New Zealand

The level of illegal removals concerns the NRLMG, although the greatest concern is over the activities of fish thieves and black-market operators working outside the QMS. There have been calls for more government funding of compliance to minimize illegal removals. Risk assessments are being undertaken to provide a foundation for dedicated compliance activities. The New Zealand Rock Lobster Industry Council is encouraging the devolution of routine monitoring activities to regional stakeholder groups in an effort to enable more effective criminal compliance activity to be undertaken by the Ministry of Fisheries compliance officers.

9.0 OTHER MANAGEMENT CONTROLS USED

259.1 Biological Constraints

369.1.1 South Australia

Animals below a carapace length 98.5 mm are not permitted to be taken and it is prohibited to take berried females. There are a number of sanctuary areas that add to the protection of the stock, and a prohibition on fishing for five months over the period May to September inclusive also exists.

379.1.2 Tasmania

Female animals below 105 mm (4-5 years old) carapace length and males below 110 mm (30-40 years old) carapace length are not permitted to be taken. Similar to South Australia, taking berried females is prohibited. Fishing for three months over the period September to November inclusive is prohibited, as is taking females for five months from May to September. Effectively, females are protected for a total of eight months.

389.1.3 New Zealand

A minimum size also applies in New Zealand, but it is based on tail width (TW) (measured between the spine tips of the second abdominal segment). The most frequently used TW is 54 mm for males and 58 mm for females, but there are minimum legal size differentials established as components of the regional rock lobster fishery plans. The 54/60 TW applies to recreational catch in all management areas. The commercial and recreational minimum legal size for pack horse lobster measured as tail length is 216 mm for both sexes.

Harvesting soft shelled, berried or damaged lobsters is prohibited. Seasonal and/or area closures are implemented as components of regional fishery plans.

269.2 Fishing Input Controls

399.2.1 South Australia

Pots are the only permitted commercial method of taking lobsters. The dimensions of pots, including mesh size and escape gaps, are regulated. Beehive pots of wire mesh on steel frames or 50 × 75 millimetres weld mesh with plastic or cane necks are used.

Licensees can hold between 40 and 100 pots per licence, although a maximum of 80 pots may only be used at any one time (if at least 80 are held against the licence).

409.2.2 Tasmania

Pots are the only permitted commercial method of taking lobsters. Pot sizes are limited to a maximum size 1250mm × 1250mm × 750mm, with a single neck entrance of at least 200mm diameter. Pots must have either one escape gap (57mm × 400mm) or two escape gaps (57mm × 200mm).

The maximum quota holding permitted is 100 pots (of 143 kg/pot) per licence. The maximum total holding of pots per person (or company or beneficial owner) on up to seven licences is 200 pots.

The maximum number of pots that can be fished is 50 and the minimum holding is five pots. However, 15 pots need to be attached to a licence before it can be fished.

Pots must have a pot tag.

419.2.3 New Zealand

Except for a limited number of dive permits in CRA 7, potting is the only method that commercial fishermen are allowed to use. Each rock lobster pot is required to have escape gaps and the mesh size is regulated. All pots and floats must be clearly marked to identify the owner.

Fishing must only take place from a registered fishing vessel. Rock lobster can only be caught and landed in the area where fishermen holds quota.

10.0 STRUCTURAL CHANGES THAT HAVE OCCURRED UNDER QUOTA MANAGEMENT

For an overview of the first 10 years of the New Zealand QMS, see *Batstone and Sharp 1999*.

2710.1 Number of Licences

4210.1.1 South Australia

The number of licences has reduced slightly from 187 to 183, and under legislation, the number of licences cannot increase.

4310.1.2 Tasmania

Although it is early days, the number of licences has only decreased by one.

4410.1.3 New Zealand

Prior to the introduction of quotas, 900 boats fished for rock lobster. There are now 487 holders of permits to fish.

2810.2 Owner Operator

4510.2.1 South Australia

About 80 per cent of licences are owner operated, and there are few lessees for the following two reasons.

- Leasing is not formally recognized. The lessor has to transfer pot entitlements to the lessee's name. Licensees may temporarily transfer all their pots from their licence within a season. However, they are not permitted to fish with less than 40 pots attached to the licence. Temporarily transferred pots are returned to the original licence at the end of the season.
- Licence holders are not permitted to hold multiple licences, so there are few licences available for lease.

4610.2.2 Tasmania

Ninety fishermen are leasing licences, which is about one-third of the total number of licences.

4710.2.3 New Zealand

Corporations/fish processors own about 50 per cent of the TACC. There is strong lease dependence by a significant number of rock lobster fishermen in most of the management areas. Corporate quota owners have begun to institute contract harvest arrangements whereby fishermen are paid a flat fee for landing rock lobster under the authority of company quota.

2910.3 Size of Fleet

4810.3.1 South Australia

In South Australia, the number of boats corresponds to the number of licences (quota holders). There are slightly fewer boats fishing resulting from aggregation of entitlements.

4910.3.2 Tasmania

In 1999, there were 285 out of a possible 310 vessels fishing (quota holders). The reduction in numbers of vessels fishing on introduction of the QMS was brought about by aggregation of entitlements to make up efficient fishing operations.

5010.3.3 New Zealand

About 433 boats fish for rock lobster in New Zealand. The number of vessels fishing does not translate to the number of quota holders (approximately 780) because there is no link between the managed fishing licences and fishing boat licences. It is not uncommon for fishing boats to fish for several quota holders.

3010.4 Boats

5110.4.1 South Australia

There has been a recent shift away from traditional slow displacement hulls to faster planing hulls, enabling fishing over greater areas adjacent to home ports. These new vessels are up to 20 metres in length and capable of cruising at speeds of 20 knots. Not all improvements are designed to increase efficiency but reflect to some degree a fishermen's desire for increased comfort at sea.

The quality of electronic equipment is also increasing particularly in the use of Global Positioning Systems (GPS), giving greater precision in fishing activities. This has been most beneficial in the northern zone where suitable lobster habitat is scattered over a large area, with good catches coming from isolated reefs.

5210.4.2 Tasmania

It has been reported that there has been no change in the size of vessels, but the QMS has only been in place for a season. There is widespread use of GPS and other fish finding equipment in the fishery.

5310.4.3 New Zealand

Some areas are using bigger and faster vessels that travel further to get their catch. Generally, because of weather conditions, displacement hulls are preferred to planing hulls, especially in South Island.

3110.5 Ownership of Entitlements

5410.5.1 South Australia

Very few transfers of ITQs have taken place since their introduction.

5510.5.2 Tasmania

A number of people have sold their licences mainly to investors. There has been some rationalization of ownership of entitlements as those licensees whose historical average catch was lowered on allocation sought to acquire more quota to increase their catch back to historical levels.

5610.5.3 New Zealand

Early experience in New Zealand was that soon after the initial allocation of quota was made in 1990, many small quota holders sold out because they had been locked into the fishery for over 10 years. By 1993, 30 per cent of quota had been sold - most of it to processors and other corporate buyers. Since then, there has been further concentration of ownership to processors reaching an estimated 50 per cent of the quota. Processors contracting out the right to fish for their quota has led to concerns that contract fishermen are less likely to show custodianship than fishermen owning the ongoing right to fish.

Processors are able to exert leverage over fishermen who have the vessel and potting capacity to catch more than their own ITQ. Processors can lease their quota to fishermen. In doing so, they expect fishermen to supply them with the catch taken under both theirs and the fisherman's quota at a price set by the processor.

3210.6 Geographical Distribution of the Fleet

5710.6.1 South Australia

The fishing fleet is exhibiting greater mobility across fishing grounds. It is becoming increasingly common for vessels to fish grounds previously not fished. As a result of concentration of fishing activities, some fishing grounds have become heavily fished. This has led to some conflict in some areas particularly where congestion is greatest.

5810.6.2 Tasmania

It has been reported that the only short term change in fleet distribution has been less vessels landing catch taken in Tasmanian waters at Victorian ports. The use of VMS is mandatory for these vessels so that their activities can be monitored.

5910.6.3 New Zealand

No changes in the geographical distribution were reported from New Zealand.

3310.7 Fishing Patterns

6010.7.1 South Australia

No obvious changes in fishing patterns have been attributed to the introduction of the QMS.

6110.7.2 Tasmania

There has been a shift towards more winter fishing when the price is higher. There has been little change in the number of unloadings.

6210.7.3 New Zealand

With the security provided by ITQ, fishers have been able to manage fishing operations to maximise returns from the fishery, which has resulted in a shift to winter fishing.

11.0 MANAGEMENT COSTS

3411.1 South Australia

All management cost are recovered from licensees. These costs are given for the northern and southern zones in Table 8.

Table 8 Cost of Management in the South Australia Rock Lobster Fisheries 1997/98

Zone	Licence Fees (\$'000)	Fee per pot (\$)	GVP (\$'000)	Fees/ GVP (%)	Catch ('000kg)	Fees/ Catch (\$/kg)	Licence Holders (No.)	Fees/ Licence Holder (\$/licence)
Southern	2,610	219	50,872	5.1	1680	1.55	184	14,186
Northern	1,216	308	27,683	4.4	942	1.29	75	16,208

The breakdown by project is given in Table 9.

Table 9 South Australian 1998/99 Management Services and Budget

Proj.	Category	Function/s	South		Total
			North	Total	
			\$	\$	\$
1	Research Biological	Catch/effort, stock assessment and pot sampling	421,955	180,838	602,793
2	Research Economic	Economic survey and analysis	8,400	3,600	12,000
3	Policy and Management	Fisheries Management Policy, advice and implementation	62,569	26,280	88,849
4	Licensing	Renewals and administration	87,189	37,536	124,725
5	Compliance	All activities	973,861	280,585	1,254,446
6	Directorate	Director of Fisheries	27,630	27,630	55,260
7a	FMC Budget	Operating budget covering chairman, travel, meeting costs	34,000	45,000	79,000
7b	FMC Budget	Extension Officer, travel and admin costs	98,000	42,000	140,000
8	Cost Recovery Comm	Overseeing service delivery fee process	6,112	2,620	8,732
9	Whole of Industry serv.		69,035	27,387	96,422
10	FRDC Research levy	0.25% of Gross Value of Production for Research	116,788	61,395	178,183
11	Community Awareness	Industry profiling - newsletter, events, fact sheets, sponsorship	102,200	42,950	145,150
12	Research Puerulus	Puerulus collector servicing	57,896	15,759	73,655
13	Environment	Assessment of pot impacts on the ocean floor	13,650	5,850	19,500
14	Industry training		18,400	7,400	25,800
15	FRAB	Contribution to South Australia Fisheries Research Advisory Board admin	4,900	2,100	7,000
ALL			2,102,585	808,930	2,911,515

3511.2 Tasmania

The costs of managing the Tasmanian fishery are given in Table 10.

Table 10 Tasmanian Management Costs 1996/97

Item	Direct (\$)	Indirect (\$)	Cost (\$)
Research and Assessment	297,313	444,711	742,024
Wild Fisheries Management	67,352	22,957	90,309
Licensing	7,683	6,927	14,610
Statistics	52,503	20,101	72,604
Policing	1,539,600	249,000	1,788,600
Total	1,964,451	743,696	2,708,147

(The licence fee per pot is given in Table 11).

Table 11 Tasmanian Licence Fees Per Pot

Year	1997/98	1998/99	1999/2000
Fee/pot	\$125	\$150	\$175
% of total costs recovered	40%	48%	55%

Compliance Cost

Three years ago, the rock lobster industry was paying \$500,000 for compliance. The new system has cost a further \$700,000 which is funded from consolidated revenue. The total cost for all fisheries is \$3.4 million. A examination of compliance activities is being undertaken to determine how much of the \$3.4 million compliance budget can be attributed to the rock lobster fishery. At the end of the current management plan (2001), the rock lobster fishery will move to 55 per cent cost recovery.

3611.3 New Zealand

Cost recovery was introduced into New Zealand Fisheries in 1995. Prior to 1995, a resource rent applied. (For detailed documentation of the nature and extent of fisheries services provided for the 1999/2000 financial year see the Ministry of Fisheries Proposed Nature and Extent of Fisheries Services for the 1999/2000 financial year).

Cost recovery contributions are determined according to a price/weighted index, e.g. for rock lobster, one tonne of quota is estimated to be worth around \$30,000. Contributions are then estimated as a proportion of the value of the TACC, \$3.378 million was collected from rock lobster quota owners in 1998/99. Contributions are outlined in Table 12.

In addition to the cost recovery levy, another statutory levy on landings is payable to the New Zealand Seafood Industry Council (SeaFIC). One component of this levy funds the SeaFIC operations, while the other is allocated to the regional commercial rock lobster organizations

(CRAMACs). These organisations fund their own administration and research activities and contribute to the cost of maintaining staff and resources of the NZRLIC.

Table 12 New Zealand Costs Attributed to the Rock Lobster Fisheries for the 1998-99 Fishing Year (\$NZ)

Stock	TACC	Enforcement		Research		Management		Total	
		\$ per tonne	\$ by Fishery	\$ per tonne	\$ by Fishery	\$ per tonne	\$ by Fishery	\$ per tonne	\$ by Fishery
CRA 1	130.463	732.64	95,582.43	158.14	20,630.88	246.38	32,143.18	1137.15	148,356.48
CRA 2	236.083	732.64	172,963.88	115.87	27,356.08	238.33	56,265.96	1086.85	256,585.92
CRA 3	327.000	732.64	239,573.32	238.23	77,901.04	261.63	85,552.19	1232.50	403,026.55
CRA 4	495.689	732.64	363,161.65	196.02	97,163.07	253.59	125,701.83	1182.25	586,026.55
CRA 5	303.743	732.64	222,534.31	213.73	64,919.16	256.96	78,050.69	1203.33	365,504.16
CRA 6	360.000	732.64	263,750.44	104.38	37,576.86	236.14	85,011.36	1073.16	386,338.67
CRA 7	138.925	732.64	101,782.03	142.51	19,798.15	243.40	33,814.69	1118.55	155,394.87
CRA 8	888.092	732.64	650,651.83	150.80	133,924.27	244.98	217,565.65	1128.42	1,002,141.75
CRA 9	47.008	732.64	34,439.95	136.44	6,413.64	242.25	11,387.51	1111.32	52,241.10
PHC 1	40.300	439.58	17715.24	1.75	70.70	124.95	5,035.36	566.29	22,821.30
TOTAL	2967.303		2,162,155.06		485,753.84		730,528.44		3,378,437.34

*Note: columns of numbers may not add up exactly to totals, due to the rounding up of figures.

12.0 ECONOMICS

A summary of key economic indicators compared with Western Australia are given in Table 13.

Table 13 Summary of Key Economic Performance Indicators 1997/98 (\$AUD)

	SA		TAS	NZ	WA
	Sth	Nth			
Catch (t)	1,685	942	1,500	2,927	10,478
Catch value (\$ Millions)	50	28	51	143	210
Av. Price (\$)	29	30	34	49	20
Pot values (\$ '000s)	21	26	15	-	20
\$/Kg	146	109	105	59-280	132

3712.1 Trends in Profitability

6312.1.1 South Australia

The nominal value of the southern zone catch in 1997/98 was 90 per cent above that of 1990/91 (Econ Search Pty Ltd 1999a). This is the result of a relatively small increase in catch (seven per cent) and a substantial increase in price. The average price of lobster in the southern zone has increased by 77 per cent in nominal terms between 1990/91 and 1998/99, which is the same for the input controlled northern zone. The value of the southern zone catch was 67

per cent higher in real terms than it was in 1990/91 (90 per cent higher in nominal terms). In contrast the value of the northern zone in 1997/98 was 33 per cent higher in real terms than it was in 1990/91 (52 per cent higher in nominal terms).

Rates of return to capital (fishing gear and equipment and licence value) are similar but low for the southern and northern fisheries, i.e. 4.4 per cent and 4.5 per cent respectively (Econ Search Pty Ltd 1999a&b).

Economic performance indicators for the South Australia fishery are:

- gross value of production (GVP);
- cost of management programs compared with GVP;
- return on investment; and
- determination of major operating cost increases (e.g. possible future loss of fuel rebate).

6412.1.2 Tasmania

It is too early to assess the trends in profitability as the QMS has only been in place for one year.

65 12.1.3 New Zealand

There are no definitive economic surveys done for the New Zealand rock lobster fisheries, and no reliable comparisons of industry profitability pre and post-ITQs. However, anecdotal reports suggest that in the catching sector there has been no increase in profitability since quotas were introduced. There may have been a decline due to:

- high domestic costs - including quota lease prices and Government cost recovery levies;
- fluctuating export market prices; and
- unfavorable exchange rates.

12.2 Changes in Values of Entitlements

6612.2.1 South Australia

Changes in pot values over the period 1986 to 1998 are given in Table 14.

Table 14 South Australian Pot Prices 1986 to 1998 for Northern and Southern Zones

Year	ZONE	
	South (\$)	North (\$)
1986	2450	-
1987	2542	4016
1988	-	5562
1989	4600	5475
1990	4144	7568
1991	4860	13824
1992	-	12781
1993	10216	14642
1994	17838	18967
1995	21961	26667
1996	22015	25286
1997	22750	25800
1998	20525	26371

67

6812.2.2 Tasmania

Immediately prior to quota management legislation being passed by the Tasmanian Parliament, rock lobster pots were selling for about \$13,500. By January 1998, immediately after the decision was made to introduce a QMS on 1 March, 1998, the price of pots had increased to \$15,000.

Recent price increases are the result of existing licence holders competing for pots and the ability and willingness of some licensees to pay more for additional pots. At \$15,000 a pot, total market value in licences is \$157 million, which compares with \$50 million three years ago.

6912.2.3 New Zealand

Quota prices have in most cases increased significantly since 1990, although there is considerable variation between QMAs is evident in Table 15.

Table 15 New Zealand Average Trade Prices Per Tonne (\$NZ)

QMA	Oct 1990-Sep 1991	Oct 1997-Sep 1998
CRA 1	\$41,032	\$172,143
CRA 2	\$23,706	\$215,444
CRA 3	\$31,540	\$171,275
CRA 4	\$25,041	\$203,667
CRA 5	\$23,265	\$222,500
CRA 6	\$19,500	\$77,646
CRA 7	\$29,624	\$47,002
CRA 8	\$25,192	\$82,120
CRA 9	\$38,372	\$165,000

Table 16 New Zealand Average Lease Prices Per Tonne (\$NZ)

QMA	Oct 1990-Sep 1991	Oct 1997-Sep 1998
CRA 1	\$5,979	\$15,988
CRA 2	\$6,465	\$17,487
CRA 3	\$4,333	\$16,793
CRA 4	\$6,499	\$18,082
CRA 5	\$3,186	\$12,325
CRA 6	\$2,813	\$4,562
CRA 7	\$7,160	\$3,873
CRA 8	\$3,992	\$6,562
CRA 9	\$3,985	\$16,564

13.0 LEGISLATIVE FRAMEWORK

3813.1 Nature of Access Rights

7013.1.1 South Australia

Licences are renewable annually and confer the right to use the pot entitlement specified on the licence. The licence is renewed unless convictions are recorded against the licence that prevent it from being renewed. Entitlements are specified per individual and transferable within the limits of 40 to 100 pots per licence.

7113.1.2 Tasmania

Licences are renewable annually in perpetuity, i.e. a licence must be renewed if the fee is paid and no offences are recorded against the licence that prevent it from being renewed. Entitlements are individually specified and transferable within the ranges specified in legislation.

7213.1.3 New Zealand

The commercial fishery is the only sector provided with specific individual property rights in the form of ITQ. However, under the terms of the Treaty Settlement Act, the indigenous people (Maori) have explicit property rights to sea fisheries, which include management rights to determine when, where, by whom and by what methods customary non-commercial catch can be harvested.

The ITQ rights to harvest within the QMS are defined as a proportion of the annual TACC. The ITQs are issued in perpetuity, transferable and secure. The ITQ entitles fishers to harvest rock lobster up to the level of the entitlement. The property right is not absolute, i.e. it is subject to change in accordance with the sustainability of the fishery. Also, total removals are subject to re-allocation between sector groups.

3913.2 Transfers of Quota

7313.2.1. South Australia

Transfers are administered as temporary (within season) or permanent transfers.

7413.2.2 Tasmania

Rock lobster quota is transferable only to persons who hold a rock lobster fishing licence. Rock lobster units are either permanently transferred or on a seasonal basis, with automatic issue to the holder of the quota each year.

Transfers are subject to the rules in the management plan. Within the season, uncaught quota cannot be transferred.

Licence holders are able to separate the pots from quota units by transferring quota units without pots on a seasonal transfer basis, allowing the licence holder who transferred away quota units to use more pots than they hold quota for. Transferring quota units without the pots does not entitle the person who transfers such quota units onto a licence to use any additional pots.

7513.2.3 *New Zealand*

Quota may be traded or leased for any length of time between one day and 1000 years.

4013.3 Overruns and Underruns

Overruns and underruns refer to quota holders catching either more or less than their entitlement.

7613.3.1 *South Australia*

In South Australia, licensees catching more than their entitlement have their followings year's quota adjusted according to that specified in Table 17.

Table 17 Overrun Adjustment - South Australia

Overrun	Adjustment
≤ 20 kg	1 for 1 deduction off following seasons quota
20 to 50 kg	2 for 1 deduction off following seasons quota
> 50 kg	Prosecution

No adjustments are made to entitlements where less than the entitlement specified on the licence is caught.

7713.3.2 *Tasmania*

A similar arrangement applies in Tasmania where a quota holder catches more than their entitlement, as shown in Table 18.

Table 18 Overrun Adjustment - Tasmania

Overrun	Adjustment
0 - <20 kg	1 for 1 deduction
20 -< 45 kg	1.5 for 1 deduction
45 -< 70 kg	2 for 1 deduction
> 70 kg	Prosecution

No adjustments are made where the catch is less than a licensee's quota, although some adjustment is being considered for the future.

7813.3.3 New Zealand

Under the *Fisheries Act 1983* rock lobster quota, holders whose catch had exceeded their quota had a choice from the following four options:

- Surrender ownership of the fish to the Crown.
- Obtain additional uncaught quota from another quota holder.
- Count against another's quota.
- Pay a deemed value within 20 days of receiving the invoice. Having paid the deemed value a quota holder is eligible for a refund if they purchased or leased uncaught quota, or made arrangements to count against another uncaught quota.

No adjustments are made to entitlements where less than entitlement specified is caught.

4113.4 Maximum and Minimum Holdings

7913.4.1 South Australia

The minimum and maximum number of pots that can be held on a licence are 40 and 100 respectively. However, no more than 80 pots are permitted to be operated at any one time from a boat.

8013.4.2 Tasmania

There is a maximum quota holding of 100 pots of quota per licence, with a maximum of 200 pots of quota per person (or company or beneficial owner) on up to seven licences.

The minimum holding is five pots of quota, although 15 quota units need to be attached to a licence before it can be fished. The number of pots that can be used attached to a licence has increased from 40 to 50.

8113.4.3 New Zealand

Permit holders (including associated persons) are precluded from holding more than 10 per cent of quota in any one QMA. Permit holders must hold a minimum of three tonnes by ownership and/or lease to hold a permit to go fishing for rock lobster. Where a reduction has occurred in the TACC that moves an individual's quota ownership below the three tonnes, that quota owner is grandfathered the right to continue to hold a permit to fish.

14.0 RESOURCE SHARING

4214.1 South Australia

Estimates of the recreational catch range between 90 and 130 tonnes per year, which is about two per cent of the total pot fishery for the state. Recreational fisheries have access to the fishery by diving, drop netting and a limited number have access to the use of pots. Pot use requires the person to register with PIRSA, while divers and drop netters are not required to register.

Drop nets are considered to be the most efficient capture method, although it requires good skills and calm weather to fish with drop nets. While the overall catch is relatively small, there are some localised areas where the recreational catch may exceed the commercial catch.

4314.2 Tasmania

It has been estimated that recreational fishers took five per cent of the commercial catch over the period November 1995 to June 1996. About 64 per cent of the recreational catch was taken using pots.

Divers take about 30 per cent of the recreational catch, with free diving being the most popular diving method. Licences cost \$35 with additional licences costing \$5. There are about 8,000 people holding recreational rock lobster licences - about 85 per cent of pot and 78 per cent of dive licences are used.

4414.3 New Zealand

The information on recreational fishing is limited to telephone and diary surveys. The catch estimates from the last National Telephone and Diary Survey of Recreational fishing conducted in 1996 are given in Table 19.

Table 19 New Zealand - estimates of the Recreational Rock Lobster Harvest (t) from the 1996 National Telephone and Diary Survey

	Estimate (t)
CRA1	51
CRA2	138
CRA3	-
CRA4	73
CRA5	35
CRA6	-
CRA7	-
CRA8	16
CRA9	-
Total	313

The 313 tonne estimated recreational catch is about 10 per cent of the TACC. A new diary survey designed to provide a current estimate of the recreational catch of rock lobster is being introduced.

4514.4 Allocation of Rights Between Stakeholders Under Quota Management

8214.4.1 South Australia

A maximum of 6,000 recreational pot licences are issued, i.e. 12,000 pots at two pots per registered person. About 6,000 of these pots have been allocated for life to those individuals who historically held licences, while the remaining 6,000 pots are allocated by ballot.

8314.4.2 Tasmania

There is no limit to the number of licences that can be issued although daily catch and possession limits apply.

8414.4.3 New Zealand

Under the current arrangements, 'allowances' are made for the following removals when setting the TACs:

- Maori customary fishing;
- recreational fishing;
- other fishing related mortalities (illegal fishing); and
- commercial fishing.

Customary fishing rights are recognized and traditional institutional structures are evolving to govern the exercise of traditional rights. Recreational fishers' rights to harvest fish are provided through regulations specifying daily bag limits. There is no upper bound on the total customary or recreational harvest. In some CRAs, negotiations take place between stakeholders to establish explicit catch shares for recreational fishers.

The Minister considers the issue of allocation between stakeholders when setting the TAC. There is no explicit priority provided to any stakeholder group under the *Fisheries Act 1996*. The customary regulations do not provide for a cap on the level of customary harvest except that it must remain within the TAC. Accordingly, because the level of customary harvest is provided for as an allowance within the TAC, a 'default' priority exists for customary harvest.

Following the making of the provisions for customary harvest, the Minister considers allocations for the commercial and recreational sectors. The current fisheries management regime aims to achieve sustainable utilisation by controlling total removals to levels that allow stocks to move towards a level that will support the MSY. The Minister is required to set a TAC for each stock (section 13 of the *Fisheries Act 1996*).

From a legal perspective, there is no obligation to undertake a proportional reduction between recreational and commercial interests where the TAC or an individual stakeholder allocation is reduced for conservation/sustainability purposes. However, the Minister is required to act reasonably to ensure that TAC reductions for conservation purposes are not undermined by a failure to consider corresponding controls on recreational and commercial stakeholders.

The *Fisheries Act* assigns no priority between commercial and recreational interests. The Act permits the preference of one sector to the disadvantage of another - for example, providing greater allowance for recreational interests in proportion to the commercial allocation. In determining the respective allocation to be afforded to commercial and recreational interests in a stock, the Minister is required to undertake a balancing exercise on a case by case basis.

The Minister should take into account social, economic and cultural factors when considering allocation between sectors.

Other factors that are relevant to the allocation of the TAC between stakeholders include:

- population trends;
- existing allocations (including popularity and importance of the resource); and
- current fishing practices (including overfishing, voluntary shelving, or closures by a stakeholder).

After the TAC is apportioned to respective fishing interests in a fishery, other mechanisms under the Act are used to ensure that recreational and commercial fishers are restrained within their respective allowances. Recreational catch is primarily controlled by the setting of an appropriate daily bag limit.

Overfishing of a TAC may result in the subsequent reduction of that TAC. The consistent overfishing of the TACC or an allowance which results in the reduction of the TAC, as a general principle ought to be attributed to the stakeholder group responsible for the overfishing.

In allocating the TAC, the Minister must allow for other sources of mortality to the stock caused by fishing, including handling mortality and illegal take.

In some instances, tonnage is specified. Modelling may factor as an element of other mortality, but this is a separate exercise to recognizing other mortality as a portion of total removals able to be taken from fishery.

4614.5 Management of the Recreational Sector

8514.5.1 South Australia

A person holding a pot registration is entitled to use a maximum of two pots. A total of 14,000 pots are available for allocation to the recreational sector, with a bag limit of four lobsters per person per day and a boat limit of eight per day.

8614.5.2 Tasmania

The recreational daily catch and possession limits for people who hold either a fishing licence (recreational rock lobster pot) or a fishing licence (recreational rock lobster dive) are five per day and 10 per day respectively. The possession limit for those who do not hold these licences is five unless they have a receipt proving the lobster were purchased.

The tail fan of a recreational caught rock lobster must be clipped.

8714.5.3 New Zealand

A bag limit of six legal lobster per person per day applies. A limit on the number of pots per vessel applies in some QMAs. Recreational fishers are not licensed, and most of the recreational catch is taken by divers.

15.0 PROCESSING SECTOR

4715.1 South Australia

Processors operate in Tasmania, Victoria and South Australian, and there is no limit to the number of processing licences granted. At times, this has led to 60 processing licences being issued over a 12 month period, although less than half the licensees seek to process rock lobster. Recently, there have been about 20 active processors: 9-10 in the northern zone and 10-11 in the southern zone. These numbers are expected to increase in the long term.

There are no cooperatives, but some fishermen are interested in pursuing the establishment of cooperative arrangements with existing processors. The general view is that the larger the number, the more advantageous it is to fishermen, as there is pressure on processors to pay higher prices to secure supply from producers. Generally, it would suit processors if there were fewer numbers to lessen the competition for supply.

The main markets are Taiwan, Hong Kong/China and Japan. Volume is considered to be an important determinate of price. Processors believe that to sell more lobsters, they would need to lower the price.

4815.2 Tasmania

There were 60 licensed processors in December 1996, and of these, only 37 reported processing any rock lobster. These processors typically purchase between 70 and 80 per cent of the catch. The remainder of the catch is sold either: directly by fishers to the public; or sold to retail outlets (which are not required to be licensed); or landed outside Tasmania; or sold directly to interstate buyers. Table 20 shows the number of processors processing different quantities of lobsters.

Table 20 Number of Processors and Quantity of Lobsters Processed - Tasmania

Quantity of Lobster Processed	Number of Processors
> 40 tonnes	8
20-30 tonnes	5
10-20 tonnes	4
1-10 tonnes	13
< 1 tonne	7
Total	37

Although there are no restrictions on foreign ownership, there is no foreign ownership of processor or commercial fishing licences and there are no cooperatives. The Tasmanian Department of Industry and Fisheries does not regulate processing standards, hygiene etc. The low overheads means that there are small processors who come and go.

4915.3 New Zealand

The commercial catch must be sold to a licensed fish receiver and catches are landed at a port nominated by the fishermen at the beginning of the season. There are 32 registered fish receivers - some process, but do not export, while others export, but do not process.

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18.0 GLOSSARY OF ACRONYMS

APACHE	Adjusted Preferred Allocation Catch History Entitlement
B_{msy}	Maximum Sustainable Yield Biomass
CDR	Catch Disposal Receipt (form)
CHI	Chatham Island rock lobster stock
CPUE	Catch per unit effort
CRA	Quota Management Area - New Zealand
DPIF	Department of Primary Industry and Fisheries, Tasmania
FAWG	Fisheries Assessment Working Group
GMTTQ	Guaranteed Minimum Transferable Term Quota
GPS	Global Positioning System
ITQ	Individual Transferable Quota
LFR	Licensed Fish Receiver
MSY	Maximum sustainable yield
NSC	East central rock lobster sub-stock - New Zealand
NSI	North and South Island rock lobster stock - New Zealand
NSN	Northern rock lobster sub-stock - New Zealand
NSS	Southern rock lobster sub-stock - New Zealand
NRLMG	National Rock Lobster Management Working Group
PCH	Pack horse rock lobster stock - New Zealand
PMTTQ	Provisional Maximum Transferable Term Quotas
SARDI	South Australian Research and Development Institute
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TW	Tail Width
VMS	Vessel Monitoring System
QAA	Quota Appeal Authority
QMA	Quota Management Areas
QMS	Quota Management System

19.0 APPENDIX 1 CONTACTS: SOUTH AUSTRALIA, TASMANIA AND NEW ZEALAND

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