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The western rock lobster fishery 1993/94 to 1994/95

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Fisheries Western Australia

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FISHERIES
WESTERN AUSTRALIA

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Fisheries research in Western Australia
The Fisheries Research Division of Fisheries Western Australia is based at the Western Australian Marine Research Laboratories, P.O. Box 20, North Beach (Perth), Western Australia, 6020. The Marine Research Laboratories serve as the centre for fisheries research in the State of Western Australia.

Research programs conducted by the Fisheries Research Division and laboratories investigate basic fish biology, stock identity and levels, population dynamics, environmental factors, and other factors related to commercial fisheries, recreational fisheries and aquaculture. The Fisheries Research Division also maintains the State data base of catch and effort fisheries statistics.

The primary function of the Fisheries Research Division is to provide scientific advice to government in the formulation of management policies for developing and sustaining Western Australian fisheries.

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The western rock lobster fishery 1993/94 to 1994/95

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Abstract

This report is the latest in a series covering the West Coast Rock Lobster Managed Fishery (formerly the West Coast Rock Lobster Limited Entry Fishery), Western Australia's largest and most valuable fishery. These reports form an historical record of fishery data and information documented season by season for use by industry and research personnel now and in the future. The reports provide information on catch, fishing effort and biology; value of the product and licences; input costs (fuel, bait, etc.); changes in fishing practices, gear, technology and boats and management/legislative changes. By necessity, the information contained herein is summarised from the extensive and detailed data bases maintained by Fisheries WA. Commercial Fisheries Production Bulletins issued periodically, summarising the status of the fishery in each season, are included as an appendix to this report.

The 1993/94 and 1994/95 seasons produced landings of 11,000 and 10,800 tonnes respectively, valued at approximately $300 million in each season. These average to slightly above average catches were landed by 639 vessels in 1993/94 and 621 boats in 1994/95 with stable nominal fishing effort of 10.4 million pot lifts during each of the seasons. Similar catch rates of 1.06 and 1.04 kg of rock lobster per pot lift were recorded for both seasons.

New management arrangements were introduced in 1993/94 to rebuild the breeding stock which had fallen to a low level. Over the course of the two seasons opposition to the management package dissipated and the fishery enjoyed a period of stability and profitability.

1.0 Introduction

The fishery for the western rock lobster, *Panulirus cygnus*, is the most important single species fishery in Australia and an important source of export income for Western Australia. During the period covered by this report, Western Australia produced annual rock lobster catches of between 10,800 and 11,000 tonnes. The fishery is governed by a complex set of regulations designed to limit the total fishing effort to acceptable levels and to enforce regulations such as a legal minimum size (Bowen 1971, Hancock 1981, Bowen and Hancock 1989, Phillips and Brown 1989). Thus, it is important to monitor the state of the fishery constantly, both to ensure that the fishing effort remains within acceptable limits and that the regulations are adequately performing their function of maintaining sustainable catches. Inherent in this monitoring of the fishery, is careful examination of changes in fishing practice, gear modifications and so on, as these innovations lead to increases in efficiency which may not be detectable through the usual calculations of fishing effort (Brown, Caputi and Barker 1995).

This paper is the eighteenth in a series of reviews of the rock lobster seasons which discuss fishing practice, catches, fishing effort, mean size and various other factors which affect the impact of fishing on the stock. This knowledge will provide a good record and understanding of the status of the fishery. Each review follows a standardised format to allow season to season comparisons

and examination of long term trends. This particular report covers the two seasons 1993/94 and 1994/95 and is the third of several reports intended to bring the series up to date. It includes, as an appendix, the Commercial Fisheries Production Bulletins issued for these two seasons.

2.0 Methods

Catch and effort data were extracted from figures obtained from fishermen's monthly returns supplied from the Fisheries WA catch and effort statistical system (CAESS) and from voluntary rock lobster research log books. Catch composition and mean size information was gathered from measurements made by Fisheries WA's Research Staff aboard commercial vessels fishing from Dongara, Jurien, Lancelin and Fremantle. Information on trends in fishing practice was gathered principally from interviews with fishermen at various ports as well as from comments made in research log books.

The percentage of rock lobster fishers who submitted rock lobster research records voluntarily during 1993/94 and 1994/95 was as follows:

Season	Percentage
1993/94	29.9
1994/95	28.8

3.0 Results

3.1 Catch and effort data

The fishing season extends from 15 November to 30 June following and may be subdivided into three distinct components:

i. the "whites" fishery (George 1958) begins in late November, as pale-coloured newly-moulted rock lobsters migrate offshore from the shallow reef areas, and finishes arbitrarily on 31 December;

ii. the "coastal reds" fishery begins on 1 January and ends on 30 June; and

iii. the Abrolhos Islands fishery, which is restricted to the period 15 March to 30 June.

In fishing seasons prior to 1977/78, both the coastal and the Abrolhos Islands fisheries ended on 14 August. The season was shortened by six weeks in 1977/78 as a conservation measure (Hancock 1981). During the period covered by this report, the "whites" run commenced (initial large increases in catches of "whites") in the Fremantle, Jurien and Geraldton areas approximately at the following times:

Season	Fremantle	Jurien	Geraldton
1993/94	26 November	27 November	15 November
1994/95	30 November	28 November	24 November

Total catches (kg) and fishing effort (number of pot lifts), recorded by fishermen in their monthly returns, were as follows (Figure 1):

Catch and effort	1993/94	1994/95
"Whites" catch (15 Nov-31 Dec)	3,433,649	3,413,384
"Whites" effort 15 Nov-31 Dec)	2,393,532	2,387,472
"Coastal Reds" catch (1 Jan-30 June)	5,987,295	5,684,983
"Coastal Reds" effort (1 Jan-30 June)	6,797,719	6,843,912
Abrolhos catch (15 March-30 June)	1,618,885	1,704,069
Abrolhos effort (15 March-30 June)	1,182,574	1,141,737
Total catch	11,039,829	10,802,436
Total effort	10,373,825	10,373,121

Abrolhos catch figures are derived from statistical blocks 27131, 28130, 28131, 28141, 29131, 29141 and 97011 to 97015 (See Figures 2a, b and c).

Catch figures are corrected, for any unreported catches or missing records in the monthly returns, so that the table of catches agrees with processors monthly production figures. However, since season 1992/93 (Chubb and Barker 1998) the difference between the two figures varied by less than 0.2% and therefore is considered negligible.

Not included in the above production figures are the estimated annual recreational catches listed below:

Season	Annual recreational catch (kg)
1993/94	647,000
1994/95	526,000

Figure 1 shows comparative commercial catch (excluding the recreational component), fishing effort (*i.e.* the number of pot lifts [pulls]) and catch per pot lift data from 1944/45 to 1994/95. Fishing effort is measured as the number of pot lifts recorded by fishermen in their monthly returns. In the annual reports prior to 1977/78 fishing effort was calculated as effective fishing effort by the method of Gulland (1969). Catch and effort data from various statistical blocks (Figures 2a, b and c), are shown in Tables 1 and 2 with catches expressed by weight in kilograms and fishing effort as number of pot lifts. Tables 3 and 4 show catch per pot lift data for the same statistical blocks. The total levels of fishing effort recorded for each of the 1993/94 and 1994/95 seasons were as follows:

Season	Total fishing effort	Variation on previous season
1993/94	10,373,825	11.6% down
1994/95	10,373,121	0% difference

3.2 Exports and grade categories

This section is based on data provided by selected processing establishments from Fremantle to Geraldton. Over the years the export of rock lobster products has changed from predominantly frozen raw tails to a mixture of live, whole cooked, whole raw and tails. Thus to compare the grade composition of the catch over the years, all product lines have been changed to the equivalent in numbers of cartons of tails (11.34 kg) in each grade. The following table represents each season's total production for all grades with all product lines expressed as percentages of the total equivalent number of cartons of tails by grade.

Grade	Percentage of each grade packed 1993/94 (%)	1994/95 (%)
A (140-179 gm)	45.3	37.5
B (180-239 gm)	33.1	33.9
C (240-279 gm)	11.4	12.9
D (280-359 gm)	4.8	8.2
E (360-479 gm)	2.5	3.7
F (480-599 gm)	1.3	1.5
G (600-667 gm)	1.0	1.3
H (> 667 gm)	0.6	1.0

3.3 Mean size

Samples of rock lobsters were measured aboard commercial vessels (from Fremantle, Lancelin, Jurien and Dongara) which used standard pots (each with 54 mm escape gaps) in four depth categories. The sample included all commercial size rock lobsters, plus some undersize which would have been reduced in number due to the escape gap selection (Bowen 1963; Brown and Caputi 1986), breeding females and females above a maximum size limit. Mean carapace lengths of males and females taken throughout the fishing season from the various depth categories at the four sites and the Abrolhos Islands in March, are compared in Tables 5 and 6. The omissions in the tables are due either to fishermen not fishing the area in question or to some circumstance which prevented the data from being collected (vessel breakdown, etc.).

3.4 Number of boats and pots

The number of boats licensed to fish for rock lobster in the various zones is carefully controlled. Provided certain conditions are met, boat/licence owners are able to transfer their pot entitlement between fishing zones (A, B or C zones). The zones are defined as follows:

Zone A - see Figures 2a, b and c;
Zone B - coastal fishery from 21°44´S to 30°S excluding the A zone;
Zone C - from 30°S to the intersection of a line (115° east longitude) drawn in a southerly direction from the Cape Leeuwin lighthouse to 34°24´ south longitude;
Big Bank - see Figure 2d.

The number of boats licensed to fish in the various zones was as follows:

Zone	Number of licensed boats 1993/94 (as at 01/07/94)	1994/95 (as at 18/6/95)
A	153	149
B	164	158
C	322	314
Total	639	621

Listed below are the number of licensed pots by the various zones for the seasons 1993/94 to 1994/95:

Zone	Number of licensed pots 1993/94 (as at 01/07/94)	1994/95 (as at 20/07/94)
A	16,249	16,212
B	17,227	17,336
C	35,831	35,750
Total	69,307	69,298

Note: Under the management arrangements only 82% of these pots were allowed to be fished.

3.5 Forecast of recruitment

The settlement of puerulus on collectors of artificial seaweed along the coast is monitored continually.

Annual indices of puerulus settlement to predict future recruitment were based on the mean of the number of puerulus settling per collector at Seven Mile Beach and Jurien Bay (Figure 3).

Research indicates that puerulus settlement three years prior to the catch year provide a significant proportion of new recruits late in the reds catch for that year, while the puerulus settling four years prior to the catch year provides the whites catch (Caputi, Brown and Chubb 1995).

1993/94
Puerulus settlements in 1989/90 (191) and 1990/91 (89) produced the slightly above average commercial catch of 11.0 million kg in 1993/94 compared with the predicted catch for that season of 11.8 million kg.

1994/95
Puerulus settlements in 1990/91 (89) and 1991/92 (79) produced an average commercial catch of 10.8 million kg in 1994/95 compared with the predicted catch for that season of 10.6 million kg.

3.6 Introduction of new legislation

Note: While these reports detail the legislative changes applicable to the WRL fishery, it has been past policy to include legislative changes related to all rock lobster fisheries in WA for information. This policy is continued herein.

1993/94 season
As a result of recommendations to the Minister from the Rock Lobster Industry Advisory Committee, the Minister adopted the following conservation rules for the 1993/94 season, which were published as Notice No 620 (Government Gazette, 2/11/1993):

- That full protection be given to setose and tar spotted females for the duration of the season.
- That a temporary 18% pot reduction be applied to all boats in all zones.
- That the minimum legal size be increased from 76 mm to 77 mm for the period 15 November to 31 January and that for the remainder of the season 1 February to 30 June, 76 mm apply.

- That the taking of female rock lobsters with a carapace length greater than 105 mm be prohibited between 21°44´ south latitude and 30°48´ south latitude (approximately Wedge Island) and that the taking of female rock lobsters greater than 115 mm be banned between Wedge Island and 34°24´ south latitude.
- That no boat shall have on board whilst at anchor or moored between 21°44´ and 30°48´ any female rock lobsters greater than 105 mm.
- That containers of rock lobsters consigned from between 21°44´ and 30°48´ have labels stating place of landing of rock lobsters and the zone from which the lobsters were taken.
- That fishers intending to fish in the Big Bank area nominate by 10.00 a.m. on 10 February and shall not fish in the above area prior to the above date.
- That those boats nominated to fish in the Big Bank area, not be allowed to fish outside the above area until after the end of February.
- That a maximum of three boats at any one time be permitted to fish north of Cape Inscription in the period 15 March to 30 June, and that fishers must apply and seek nomination through the Geraldton Fisheries Department prior to 4.30 p.m. on 14 March.
- That there be night restrictions on the pulling of pots with different periods and times. The fishing times restrictions are as follows:

Winter:	1 April to 30 June	6.00 p.m. - 6.00 a.m.
Summer:	15 November to 31 March	7.30 p.m. - 4.30 a.m.

The controls regulating the times for permitting pulling of pots during the day, the prohibition on the taking of setose and tar-spotted females, the new minimum legal size of 77 mm during the period 15 November to 31 January, and the new maximum sizes of 105 mm (north of Wedge Island) and 115 mm (south of Wedge Island), were also extended to all recreational rock lobster fishing methods, including diving. However, the 18% temporary pot reduction did not apply to recreational fishers.

Recreational fishers, whether using rock lobster pots, diving from a boat or from the shore, were required to tail clip or tail punch within 5 minutes of capture, any legal animals (keepers) being brought to the boat or landed ashore.

Notice No 657, Rock Lobster Pot (West Coast) Amendment Notice and Notice No 658, Rock Lobster Pot (South Coast). Amendment Notice (Government Gazette, 5/11/1993) brought about administrative changes and allowed the use of pressed steel or aluminium escape gaps in rock lobster pots.

Notices No 624, 625 and 626 (Government Gazette, 5/11/1993) replaced Notices No 621, 622 and 623 (Government Gazette 2/11/1993) thereby correcting errors in the latter notices.

Southern rock lobster fishery

Notice No 611 (Government Gazette, 15/10/1993) removed the requirement for an A class licensee in the Esperance Rock Lobster Limited Entry Fishery who wanted to transfer his licence having to offer it first to a B Class licensee.

During the 1993/94 season, the following scale of Fisheries licence fees and charges were introduced:

Rock lobster (limited entry fisheries)	
West Coast	$34.00 per pot
Windy Harbour/Augusta	$3.00 per pot
Esperance	$4.60 per pot
Rock lobster pot licence (for areas outside the existing limited entry rock lobster fisheries)	$27.00 per pot
Fishing boats	
Not exceeding 7.5 metres	$27.00
Over 7.5 metres but under 10.5 metres	$34.00
Over 10.5 metres but under 16.5 metres	$50.00
Over 16.5 metres	$88.00
Carrier boats	
Not exceeding 7.5 metres	$13.00
Over 7.5 metres but under 10.5 metres	$16.50
Over 10.5 metres but under 16.5 metres	$24.00
Over 16.5 metres	$42.50
Professional fisherman's licence	$19.00
Recreational fishing licence (rock lobster)	$20.00
Processors' licences (land based establishments)	
Rock lobster or prawns only	$495.00
Rock lobster and prawns only	$990.00
Rock lobster, prawns and wetfish	$1230.00
Rock lobster or prawns and wetfish only	$735.00
Wetfish only	$240.00
Seagoing processing establishment	$240.00
Transfer of processor's licence	$25.00
Removal of processor's licence	$25.00

1994/95 season

Regulation 14AA was amended to allow recreational rock lobster divers to use non-piercing instruments, viz. snare or crook to take rock lobsters.

Regulation 14G was amended to allow recreational rock lobster pot fishers to carry four rock lobster pots on a boat in any one day. Previously they were only allowed to carry two pots in any one day.

Clause 16 was amended so that the calculations of the maximum length of a replacement boat used the number of pots divided by seven to give the length to the nearest one tenth of a metre. Previously, clause 16(5) made the calculations to the nearest metre. This amendment was made to correct a previous mistake in the notice.

Clause 15 was amended to correct a previous anomaly which allowed more pots to be owned than ten times the boat length and only limited pot usage (with the 18% temporary pot reduction)

to ten times the boat length. This amendment limited the number of pots held on a licence to ten times the boat length.

Licensing conditions on rock lobster professional fishermen's licences were altered to prohibit the mutilation of lobsters in such a way that it was not possible to determine whether or not a rock lobster was setose.

The same conditions (as above) also were applied to fishing boat licences.

The management package, aimed at the restoration of breeding stock levels, viz. full protection for setose and tar-spotted females, 18% pot reduction for all boats in all zones, increase in the minimum legal size from 76 mm to 77 mm for the period 15 November to 31 January and a prohibition on the taking of female rock lobsters greater than 115 mm south of Wedge Island, together with a prohibition on the taking of female rock lobsters greater than 105 mm north of Wedge Island, was continued for the duration of the 1994/95 season (see 3.7 Effects of new legislation, for effects).

During the 1994/95 season, the following scale of fisheries licence fees and charges were introduced:

Rock lobster (limited entry fisheries)	
West Coast	$70.00 per pot
Windy Harbour/Augusta	$3.80 per pot
Esperance	$7.00 per pot
Rock lobster pot licence (for areas outside the existing limited entry rock lobster fisheries)	$55.00 per pot
Fishing boats	
Not exceeding 7.5 metres	$27.00
Over 7.5 metres but under 10.5 metres	$34.00
Over 10.5 metres but under 16.5 metres	$50.00
Over 16.5 metres	$88.00
Carrier boats	
Not exceeding 7.5 metres	$13.50
Over 7.5 metres but under 10.5 metres	$17.00
Over 10.5 metres but under 16.5 metres	$25.00
Over 16.5 metres	$44.00
Professional fisherman's licence	$19.00
Recreational fishing licence (rock lobster)	$20.00
Processors' licences (land based establishments)	
Rock lobster or prawns only	$555.00
Rock lobster and prawns only	$1100.00
Rock lobster, prawns and wetfish	$1380.00
Rock lobster or prawns and wetfish only	$825.00
Wetfish only	$270.00
Seagoing processing establishment	$270.00
Transfer of processors licence	$25.00
Renewal of processors licence	$25.00

3.7 Effects of new legislation

1993/94

The new package contained a number of elements aimed at rebuilding a declining breeding stock by a variety of mechanisms.

A temporary 18% pot reduction was applied to all boats in all zones to reduce the overall rate of exploitation on the rock lobster stock thereby allowing more lobsters to survive from one season to another.

Full protection for setose and tar-spotted females for the duration of the season promoted the survival of breeding females by reducing the exploitation rate on them.

The minimum legal size was increased from 76 mm to 77 mm carapace length for the period 15 November to 31 January after which it reverted to 76 mm. This measure was implemented to allow greater numbers of sub-adults (whites) to reach the offshore breeding grounds and subsequently enhance egg production when they matured. Further protection for these maturing lobsters was afforded by the effects of the pot reduction.

A maximum size of 105 mm carapace length applied in all regions except south of 30°48´S (approx. Wedge Island) to 34°24´S where a 115 mm maximum size applied. The effect of this measure was to totally protect large breeding females and to boost the limited numbers of these highly-fecund animals.

Legislation was introduced to prevent more than three vessels at any one time fishing in the region north of Cape Inscription. This region was believed to contain relatively small numbers of breeding animals which would be contributing to the overall egg production. While it was unlikely that catch rates would be economical, the view was taken that these lobsters should be protected, but that limited exploratory fishing would provide some information on a previously very-lightly fished area. Interest in fishing this area proved negligible in both seasons covered by this report.

Due to the possibility of increasing the exploitation rate of migratory white lobsters coast-wide by pulling pots more than once in a 24-hour period, the regulation banning the setting and pulling of pots at night was introduced. This regulation simply re-enforced the existing practice of fishers on the coast. However, it had very little effect on the vessels operating in the difficult to police Big Bank region, where continuous pot pulling throughout the night was conducted opportunistically by a number of vessels.

With the exception of the 18% pot reduction and Cape Inscription rules, all of the above measures equally applied to both recreational and commercial fishers. However, recreational fishers were required to tail punch or clip legally retainable lobsters prior to landing them to distinguish recreational catches, from commercial catches thereby assisting in the policing of illegal recreational sales.

1994/95

The management package introduced in 1993/94 continued in 1994/95. Similar effects to those described in 1993/94 were seen in 1994/95.

Regulations were introduced to update and streamline the operations of the recreational pot and dive fishery. This now meant that two licensed fishers could carry four regulation pots (previously two) on one boat and allowed divers to use non piercing instruments such as crooks and loops to take their catch.

The 18% pot reduction introduced in 1993/94, combined with the 150 pot maximum holding on licences, allowed some fishers, but not others to buy additional pots to partially restore pot numbers. This was seen as inequitable by fishers with large pot entitlements. So in 1994/95 a regulation was introduced to set the maximum pot entitlement of a licence at 10 times the boat length (in metres). Effectively, if a 12 metre vessel already had an entitlement of 120 pots, following the 18% temporary reduction to 98 pots, no more pots could be added to the license to offset the reduction. More pots could have been added in 1993/94.

3.8 Innovations to boats and gear (including costs)

Data supplied by the Department of Transport showed that during the years 1993 to 1995 the following number of new boats were constructed each fiscal year (1 July to 30 June).

Year	Area	Construction material			Size range (m)	Average size (m)	% Change on previous season
		Wood	Fibre-glass	Aluminium			
93/94	North 30° south	-	5	6	10.97-19.99	15.40	
	South 30° south	3	16	11	13.72-19.85	16.34	
	Total	3	21	17			24.2% up
94/95	North 30° south	2	15	12	10.93-21.40	17.11	
	South 30° south	1	20	19	10.70-18.30	15.03	
	Total	3	35	31			68.3% up

Listed below are the approximate costs of new aluminium or fibre-glass vessels (approximate size 16 to 17 metres) designed specifically for rock lobster fishing. Also listed are the costs of navigational and fish finding equipment, viz. GPS, auto-pilot, radio, radar, colour and black and white echo-sounders, etc., which must be added onto the basic vessel costs. The cost of a new vessel varies greatly, depending on design, type and number of motors, and the type and amount of equipment installed. The prices were supplied by a major builder of vessels for the rock lobster industry:

Season	Cost of vessel ($)	Approx. average size	Cost of navigational & fish finding equipment ($)
1993/94	400,000-470,000	16 metres	40,000
1994/95	450,000	17 metres	50,000

The approximate price paid by fishermen for boat fuel (distillate) during the two seasons is listed below. The price paid by fishermen varies greatly, depending on location (cartage) and distributor. The prices were provided by a major distributor in the northern sector of the fishery. Fishermen are entitled to claim a diesel fuel rebate which also is listed and has not been deducted from the basic fuel price:

Season	Fuel price range (¢/litre)	Approx. average price (¢/litre)	Fuel rebate price range (¢/litre)	Approx average rebate price (¢/litre)
1993/94	58.26-62.88	60.03	27.90-30.36	29.40
1994/95	58.75-61.43	59.88	31.42-32.39	32.01

Data from research log books showed the following usage of the various types of rock lobster pots by fishermen north and south of 30° S:

Season	Area	Type of pot				
		Stick & Cane Beehive	Batten	Steel Beehive	Plastic Beehive	Steel Bottom Beehive
1993/94	North 30° south	-	100%	-	-	-
	South 30° south	15%	86%	1%	-	1%
1994/95	North 30° south	-	100%	-	-	-
	South 30° south	17%	84%	6%	-	-

Note: Total percentage greater than 100% is due to boats using a combination of pot types.

1993/94

The various types of pots in use throughout the fishery remained similar to the previous season. In the northern sector, steel framed batten pots with removable panels of chiefly pine battens, and to a lesser extent karri and jarrah, gained in popularity. Small numbers of batten pots equipped with plastic finger necks were used in the northern sector. This is not to be confused with the imported plastic pot-neck with fine fingers which restricts the egress of rock lobsters from the pot. This type of pot-neck is illegal.

1994/95

Pot usage during this season was very similar to 1993/94. In the northern sector steel framed batten pots with removable panels continued to be used, however, the battens used on this type of pot were mainly pine and, to a lesser extent, karri.

A very small number of batten pots equipped with plastic finger necks (see 1993/94 above) were used in the northern sector.

There was an increase in the use of beehive pots in the southern area as a result of the success of this type of pot when targeting large mature animals in the "middle" grounds.

	Price of pots ($)			
	1993/94		1994/95	
	North 30°S	South 30°S	North 30°S	South 30°S
Batten[1]				
Steel Bottom	116.00	118.00-120.00	119.00	121.00-124.00
Wood Bottom	115.00	118.00-120.00	117.80	-
Steel Framed Batten[2]				
Steel Bottom	130.00	-	135.00	-
Wood Bottom	-	-	135.00	-
Stick and Cane Beehive[3]	-	65.00-68.00	-	67.00-70.00

1. Batten pots are either constructed with a steel or wooden bottom and come complete with two built-in bait baskets, plastic or wood finger neck, escape gaps, ballast and an anode in steel bottom pots.
2. Steel framed batten pots are constructed with a removable top and side panels comprised of jarrah, karri or pine battens, depending on personal preference.
3. The price quoted for stick and cane beehive pots does not include ballast or a skid board, which was approximately $5.50 to $6.00 per pot for the skid board.

The above prices were supplied by selected pot manufacturers, however, pot prices vary between manufacturers.

Listed below are the prices charged by a major distributor of commercial fishing gear in the southern sector of the fishery for 10 mm pot rope and 200 mm pot floats. Once again prices varied depending on the distributor and in the case of rope, the country of origin.

Season	Pot rope ($) (220 m coil)	Country of origin	Pot float ($) (each)
1993/94	72.80	Thailand	2.30
1994/95	65.00-72.00	Thailand	2.55-2.70

3.9 Bait

Data from research log books showed the following usage of bullock hocks and pieces of cattle hide as a holding and/or catching bait north and south of 30° S:

Season	Area	Hocks	Hide
1993/94	North 30°S	10%	90%
	South 30°S	10%	90%
1994/95	North 30°S	4%	96%
	South 30°S	13%	88%

Fishermen were able to choose from a wide range of both local and imported fish baits. These fish baits were generally used in combination with either pieces of cattle hide or, to a lesser extent, cattle hocks. During the 1993/94 and 1994/95 seasons the following baits, listed in order of popularity, were the most commonly used:

Herring, comprising North Sea herring and the unrelated Australian herring (*Clupea* spp and *Arripis georgianus*); imported mackerel and mackerel heads (*Scomber* spp.); Australian salmon and New Zealand Kahawai heads and meat (*Arripis truttaceus* and *Arripis trutta)*; scaly mackerel *(Sardinella lemura*); tuna heads (*Thunnus* spp.); pilchards (*Sardinops neopilchardus*); mullet (*Mugil cephalus*); orange roughy heads (*Hoplostetnus atlanticus*); and rabbit heads (*Oryctolagus* spp.).

Listed below are some of the baits used during the two seasons. The numbers indicate the order of popularity, with 1 being the most popular bait.

Common names	1993/94		1994/95	
	North 30°S	South 30°S	North 30°S	South 30°S
North Sea herring and Australian herring	1	4	4	1
Imported mackerel	2	2	1	2
Australian salmon and New Zealand Kahawai	3	1	2	4
Scaly mackerel	4	6	6	3
Tuna heads	5	-	-	5
Pilchards	6	3	3	6
Mullet	7	-	7	7
Orange roughy heads	-	5	5	8
Rabbit heads	-	-	-	9

Listed below are the retail prices paid by fishermen both north and south of 30° S for a variety of rock lobster baits. Prices quoted here are from selected processing establishments and do vary between suppliers:

Type of Bait	1993/94 Retail price ($)		1994/95 Retail price ($)	
	North 30°S	South 30°S	North 30°S	South 30°S
Hocks per bag	17.50	16.80	19.50	18.30
Hides per bag	17.50	16.80	17.50	16.80
Australian salmon per kg	1.00-1.30	1.30	1.05-1.30	1.30
New Zealand salmon per kg	1.35-1.40	1.50	1.35-1.40	1.50
Australian herring per kg	-	1.15	1.10	1.15
Yelloweye mullet per kg	0.95	-	1.00	-
Mullet per kg	-	0.95	0.95	0.95
Scaly mackerel per kg	0.95	1.25	0.95	1.10
Bonito per kg	-	-	-	-
Perth or bony herring per kg	0.95	-	0.95	-
Imported mackerel per kg	1.05-1.20	1.20	1.05-1.25	1.20
Tuna heads per kg	0.90	0.95	0.95	0.95
Kangaroo per kg	0.80	0.85	0.80	-
Pilchards per kg	-	1.00	-	1.00
North Sea herring per kg	1.05	1.00	1.05	1.00

3.10 Distribution of fishing

The distribution of fishing, indicated by catch and effort records in fishermen's returns, is shown in Tables 1 and 2. The pattern of fishing does not vary greatly from season to season and is dependent on the density of rock lobsters in the various depths. Throughout a season, the usual pattern is concentrated fishing in the shallows during November and early December; followed by a move to deeper water fishing during the latter part of December and early January as the "whites" migration is followed; then back to the shallows, with some fishing in the middle grounds, during February, March and April; and finally fishing in mixed depths (mainly shallower), depending on weather and density of rock lobsters, throughout the remainder of the season.

During the period covered by this report, vessels fished for rock lobsters in the extreme northern and southern areas of the fishery, viz. in the area around South Passage in Shark Bay in the north and Augusta in the south. Most of the rock lobsters caught in the Augusta area (statistical blocks 3414, 3415, 3416 and 3517) were outside the West Coast Rock Lobster Managed (Limited Entry) Fishery concession area. However, because of the boundary at 34°24´S, blocks 3414 and 3415 include catches from both the West Coast Rock Lobster and Windy Harbour-Augusta Rock Lobster Managed (Limited Entry) fisheries.

Prior to the 1986/87 season, a small number of vessels fished for rock lobsters in deep water north-west of Kalbarri in an area known as Big Bank (Figure 2d). From 1986/87 through to 1994/95 up to 120 vessels fished in the above area during January and February of each season, taking large numbers of migratory rock lobsters in very deep water (70 to 100 fathoms) (Chubb, Barker and Dibden 1994). Regulations controlling the timing of the commencement of fishing there have been in force since 1991.

3.11 Average number of days worked per boat per month

Listed below are the average total number of days worked per boat each month for both north and south of 30°S latitude and a total for the combined areas:

Month	North 30°S		South 30°S		Total	
	1993/94	1994/95	1993/94	1994/95	1993/94	1994/95
November	15.5	15.4	13.9	13.2	14.7	14.3
December	27.1	27.6	27.1	27.7	27.1	27.7
January	16.1	17.9	20.4	20.9	18.3	19.4
February	23.5	24.2	25.5	25.5	24.5	24.9
March	25.3	25.5	29.0	28.8	27.2	27.2
April	28.5	28.6	23.1	24.3	25.8	26.4
May	26.2	25.8	21.8	21.4	24.0	23.6
June	22.0	21.1	18.9	17.6	20.4	19.3

3.12 Price of rock lobsters (per kg)

The prices gained by exporters for the sale of rock lobsters are governed by a complex set of factors, *eg*. demand, size of lobster, product type, exchange rate, etc. Thus this section deals only with the average price paid to fishermen selling their catch directly to licensed rock lobster processors.

1993/94

In the northern sector of the fishery the average price that fishermen received for their catches was approximately $28.00 per kg.

In the southern sector the beach price was approximately $26.00 per kg and the pool price was approximately $27.00 per kg, with an average price of approximately $26.50. The prices that fishermen received varied considerably throughout the season.

1994/95

In the northern sector of the fishery the average price that fishermen received for their catches was approximately $29.00 per kg.

In the southern sector the price was approximately $26.00 per kg.

In both areas and seasons, a moderate number of fishermen elected to be paid under the pool system. Those fishermen who fished under the pool system received a slightly higher price per kg for their catches.

3.13 Marketing

Each season, depending on market demand, rock lobsters were processed into various product types , viz. frozen tails, whole cooked (boiled), whole raw (frozen) and live. The processed rock lobsters, with the exception of a small quantity destined for the local market, were exported chiefly to Japan, Taiwan and USA, with a very small quantity marketed in France. Whole cooked, whole raw and live were marketed in Japan and Taiwan, whilst the frozen tails were exported to the USA.

Average wholesale New York price for Australian rock lobster tails:

Grade	$US per kg	
	1993/94	1994/95
5-6 oz (113-170 gm)	52.51	61.49
6-8 oz (170-226 gm)	49.63	59.05
8-10 oz (226-283 gm)	46.42	58.61
10-12 oz (283-340 gm)	44.77	56.65
Over 12 oz (over 340 gm)	51.55	56.25

Note: Grades (weights) stated here are different from Western Australian grades shown in Section 3.2.

Listed below are the percentages of each product type for the seasons 1993/94 to 1994/95 converted to landed live weight equivalents.

The production figures have been separated into three fishing/processing sectors, viz. Augusta to Wedge Island, Green Islets to Green Head, Leeman to Denham, together with a total for the whole coast. It must be noted however, that due to transportation of some product between centres for processing, the figures are a combination of what was caught and what was processed in each area:

Area	Season	Product type (%)			
		Tails	Cooked	Raw	Live
South	1993/94	14.8	45.4	5.6	34.2
(Augusta to Wedge Island)	1994/95	25.0	30.3	5.3	39.4
Central	1993/94	17.8	49.0	3.3	29.8
(Green Islets to Green Head)	1994/95	17.6	33.6	6.1	42.6
North	1993/94	16.2	52.9	8.2	22.7
(Leeman to Denham)	1994/95	19.8	49.2	9.7	21.3
Total	1993/94	15.7	49.2	6.6	28.4
	1994/95	21.9	40.1	7.6	30.4

3.14 Average value per pot on pot redistribution

(*i.e.* market price paid for a licensed pot)

1993/94

Zones A and B from approximately $20,000 to approximately $25,000.
Zone C from approximately $13,000 to approximately $20,000.

1994/95

Zones A and B from approximately $22,000 to approximately $25,000.
Zone C from approximately $18,000 to approximately $20,000.

3.15 Sea water temperatures and salinities

These environmental variables have relevance to the behaviour and catch rates of rock lobsters (Morgan 1974). The average sea water temperatures (°C) and salinities (parts per thousand) together with maximum and minimum sea water temperatures and salinities during the following rock lobster seasons (*i.e.* 1993/94 to 1994/95, 15 November to 30 June) at the Western Australian Marine Research Laboratories (aquarium header tank) were:

Season	Max. temp (°C)	Week starting	Min temp (°C)	Week starting	Avg temp (°C) (season)	Max salinity	Week starting	Min salinity	Week starting	Avg salinity (season)
1993/94	23.5	28/3/94	17.6	4/7/94	21.0	36.751	7/3/94	35.070	4/7/94	35.898
1994/95	24.0	17/1/95	16.7	20/6/95	21.2	36.994	07/2/95	35.077	20/6/95	36.103

Bottom temperatures and surface salinities in waters of various depths in the Fremantle, Lancelin, Jurien and Dongara areas were collected as part of the monitoring of rock lobster catches (see section 2.0) and are shown in Tables 7 and 8. Limited information is available for the Abrolhos Islands in March. Other records are maintained by CSIRO.

3.16 Spawning rock lobsters

Monitoring on board commercial vessels provides a detailed description of the lobsters caught in commercial pots, particularly with respect to the breeding stock and undersize animals. The sex ratios between males and females in different depth categories are given in Tables 9 and 10.

Most of the breeding females are found in the 20-50 fathom range with no variation in the size of first breeding observed from one depth category to another . Hence the data for December, January and February from all depths may be pooled to indicate the size frequency of breeding (*i.e.* "berried" and mated) females (Figures 4a and b). The mean sizes of breeding females from monitoring data collected during the period 1993/94 to 1994/95 were as follows:

Season	Carapace length (mm)			
	Fremantle	Lancelin	Jurien	Dongara
1993/94	102.3	96.5	86.6	93.3
1994/95	101.9	98.0	88.1	90.8

By comparison the mean sizes at first breeding (*i.e.* the smallest carapace length at which 50% are "berried" and mated) were found to be:

Season	Carapace length (mm)			
	Fremantle	Lancelin	Jurien	Dongara
1993/94	100.6	97.9	93.2	93.7
1994/95	104.1	95.2	92.1	89.8

4.0 Discussion

The western rock lobster catches in the 1993/94 and 1994/95 seasons were the result of lower abundances of lobsters due to the declining levels of puerulus settling in 1989/90 and the early 1990s. The catch of 11,000 tonnes in 1993/94 was 10.6% lower than the previous season whilst a smaller reduction led to the average landings of 10,800 tonnes in 1994/95.

A change in Government in 1992/93 brought about different management arrangements to deal with heightened concern about the very low and declining levels of egg production in the fishery. The 1993/94 season saw the introduction of an 18% temporary pot reduction, an increase in the legal minimum size to 77 mm carapace length (from 76 mm) from 15 November to 31 January, total protection for all breeding female rock lobsters (*i.e.* setose, tar-spotted and berried) and a maximum size for females. This had the effect of reducing the number of pot lifts by 11.6% in 1993/94 compared with the previous season and promoted the survival of migrating white lobsters and the breeding stock at a time when abundance was forecast to be declining. The nominal fishing effort levels in 1994/95 were identical to those in 1993/94.

As the 1993/94 season progressed, opposition to the new management package waned and confidence in the fishery grew as fishers realised the benefits that accrued to them in both the short and long term. Significantly, management arrangements were in place for at least two years

and possibly longer, so a sense of stability returned to the fishery allowing fishers to effectively assess and plan their investment in the industry. Thus the two seasons covered by this report were a period of restructuring in the fishery and continued development of the markets in Asia, principally Japan and Taiwan. The potential of these markets was being realised with high prices paid for live and whole cooked product.

As the Asian markets were developed, demand for product increased as supply (catch) was declining. It is significant that the volume of live lobsters exported in 1993/94 increased 18% by weight over the 1992/93 exports. Exports in 1994/95 showed a minimal increase (< 1%) over 1993/94, so that live lobsters accounted for approximately 30% of the total exports of rock lobster, compared with 22% in 1992/93. This change in product mix, coupled with favourable exchange rates between the Yen and the US and Australian dollars, saw average prices paid to fishers in both 1993/94 and 1994/95 of about $27.50 per kg, a 50% increase in the price paid in 1992/93. Fuel, bait, rope and float prices, major components of fishers' costs, essentially remained unchanged over the period, whilst the price of the various types of pots rose by between 3% and 8% from 1992/93 to 1994/95. While catches declined over 1993/94 and 1994/95, costs increased only marginally and thus high product prices ensured the strong economic performance of the fishery. This is evidenced by the number of new vessels entering the fishery. Compared with 1992/93 when new vessels comprised 5% of the fleet, 41 new vessels (6.4%) entered the fleet in 1993/94 and 69 vessels, or 11.1% of the fleet, were replaced with new ones in 1994/95.

Under the conditions of stability, a buoyant market place and a general acceptance that the breeding stock was improving, the new arrangements led to a restructuring of the fleet. For most of the fleet, the exception being those vessels affected by the 150 pot rule, the temporary pot reduction caused fishers to buy additional pots to replace those not able to be used. This had two effects. Firstly the demand for pots saw prices leap from about $12,500 per pot in 1992/93 to $22,500 in 1993/94 and to $23,500 in 1994/95 in the north of the fishery. Similarly, from $10,750 in 1992/93 to $16,500 in 1993/94 and $19,000 in 1994/95 in the southern regions of the fishery. Over the two seasons, the price per pot increased 88% in the north and 77% in the south compared with values in 1992/93. The second effect flowed from these pot prices which saw a number of fishers totally redistribute all their pots and retire from the fishery altogether. By law, limited entry licences were extinguished on total redistribution of pots and accordingly the fleet size declined from 665 vessels in 1992/93 to 639 in 1993/94 and to 621 in 1994/95.

In summary, virtually all opposition to the new management arrangements had dissipated by 1994/95 as fishers understood the economic benefits the arrangements conferred and the contribution they were making to rebuilding the breeding stock and the significant improvement of egg production in the fishery. Confidence was restored in the consultative process of management and since the management package in force was being viewed as a three- to five-year plan, industry was looking forward to a period of stability and prosperity despite the prospect of below average catches in the following seasons.

5.0 Acknowledgments

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7.0 Tables

Table 1 Catch (in kg weight) and fishing effort (in pot lifts) for the 1993/94 rock lobster season in various statistical blocks.

Block		Date								
		9311	9312	9401	9402	9403	9404	9405	9406	Total
24120	Catch	-	-	-	7131	-	-	-	-	7131
	Effort	-	-	-	2979	-	-	-	-	2979
25120	Catch	-	-	-	39257	-	4673	11241	4268	59439
	Effort	-	-	-	14458	-	2352	9192	4210	30212
26120	Catch	-	-	218	186797	15670	5963	3823	-	212471
	Effort	-	-	738	72032	8339	2550	2244	-	85903
26131	Catch	-	-	12116	19234	31483	42388	21012	3838	130071
	Effort	-	-	13147	11543	14129	21282	16063	4420	80584
27120	Catch	-	-	-	12756	3507	-	-	-	16263
	Effort	-	-	-	4515	1530	-	-	-	6045
27132	Catch	1360	19096	13494	127120	94548	90873	24251	8284	379026
	Effort	1717	14741	22791	75977	50381	52973	25871	12449	256900
27140	Catch	11004	57113	17616	19247	33585	29995	27165	15459	211184
	Effort	13028	47654	31312	21103	20838	19870	28003	20507	202315
28130	Catch	-	-	-	-	14819	31832	16058	4461	67170
	Effort	-	-	-	-	5622	21013	17051	10578	54264
28132	Catch	-	-	1334	-	-	-	-	-	1334
	Effort	-	-	1260	-	-	-	-	-	1260
28142	Catch	157504	233268	46276	149659	161632	86840	81527	83537	1000243
	Effort	154851	228528	137532	193800	139614	92214	113691	118822	1179052
29132	Catch	2627	3550	1427	88	-	-	-	-	7692
	Effort	1845	3321	2484	168	-	-	-	-	7818
29140	Catch	-	-	-	-	8999	-	-	-	8999
	Effort	-	-	-	-	5435	-	-	-	5435
29142	Catch	255160	590492	80280	161435	271488	196947	139943	128003	1823748
	Effort	254683	451748	224620	234331	238778	199554	179891	185299	1968904
30140	Catch	117446	607369	137484	112434	278063	194753	102780	87075	1637404
	Effort	139370	249844	138967	180386	253131	205758	170238	151239	1488933
30150	Catch	28291	119966	32327	47069	74305	43494	22394	23348	391194
	Effort	36067	49464	37533	59985	71029	54138	44556	32145	384917
31140	Catch	874	59911	20438	13286	19354	13400	5506	6108	138877
	Effort	2159	24498	14063	23133	20933	18144	12508	11925	127363
31150	Catch	140804	720975	279915	247005	375788	218253	151590	155544	2289874
	Effort	195131	342362	258898	330811	367997	273303	268455	234619	2271576
32140	Catch	450	9213	38067	17071	15012	9504	4595	3576	97488
	Effort	979	4382	22019	17803	14692	11570	8909	7226	87580
32150	Catch	19555	275277	165123	90087	118111	89368	80165	85189	922875
	Effort	35264	121044	115451	122803	118682	102780	108541	101054	825619
33140	Catch	-	-	3220	5214	4418	2374	12185	8592	36003
	Effort	-	-	5423	6797	5117	2523	11063	9193	40116
33150	Catch	-	-	5977	2379	-	1386	8311	2826	20879
	Effort	-	-	2472	2606	-	1800	8542	2972	18392
34141	Catch	-	-	-	803	702	2335	373	-	4213
	Effort	-	-	-	1865	1500	2990	575	-	6930
34151	Catch	-	-	-	335	-	71	-	-	406
	Effort	-	-	-	1265	-	230	-	-	1495
34152	Catch	211	1989	5129	4358	4413	3712	2129	2045	23986
	Effort	5470	13326	18702	16252	18305	17422	11325	8065	108867
35150	Catch	19	125	-	-	-	-	-	-	144
	Effort	700	1356	-	-	-	-	-	-	2056
97011	Catch	-	-	-	-	23592	25410	14055	5115	68172
	Effort	-	-	-	-	10116	18272	14737	7894	51019
97012	Catch	-	-	-	-	266226	231494	114371	57051	669142
	Effort	-	-	-	-	86019	152589	140720	100528	479856
97013	Catch	-	-	-	-	220007	146018	72584	34360	472969
	Effort	-	-	-	-	71275	97855	97932	65496	332558
97014	Catch	-	-	-	-	99319	98253	39656	22912	260140
	Effort	-	-	-	-	40858	68974	50734	38577	199143
97015	Catch	-	-	-	-	19252	44863	10594	6583	81292
	Effort	-	-	-	-	8492	30085	14462	12695	65734
Total	Catch	735305	2698344	860441	1262765	2154293	1614199	966308	748174	11039829
	Effort	841264	1552268	1047412	1394612	1572812	1470241	1355303	1139913	10373825

Table 2 Catch (in kg weight) and fishing effort (in pot lifts) for the 1994/95 rock lobster season in various statistical blocks.

Block		Date								
		9411	9412	9501	9502	9503	9504	9505	9506	Total
24131	Catch	-	-	-	1308	-	-	-	-	1308
	Effort	-	-	-	837	-	-	-	-	837
25120	Catch	-	-	-	4736	-	11467	4027	-	20230
	Effort	-	-	-	4262	-	8441	4365	-	17068
26120	Catch	-	-	89	71329	8102	10590	956	-	91066
	Effort	-	-	355	43812	3927	6840	1125	-	56059
26131	Catch	-	-	4990	11555	9241	44145	9638	2438	82006
	Effort	-	-	6622	10601	5533	25984	9081	3008	60829
27120	Catch	-	-	-	5130	-	-	-	-	5130
	Effort	-	-	-	1996	-	-	-	-	1996
27132	Catch	1947	22626	6789	227522	68045	71299	22753	12422	433403
	Effort	2788	14760	12441	126252	45993	46385	21772	16251	286642
27140	Catch	15370	80082	14799	23929	51425	42519	25792	22341	276257
	Effort	16671	53948	33398	22735	33138	30567	24819	26922	242198
28132	Catch	1018	2271	1653	1407	1358	-	-	-	7707
	Effort	1185	2291	4447	2054	1168	-	-	-	11145
28142	Catch	111701	289776	72922	163356	177079	89888	78160	67559	1050440
	Effort	147695	223496	186120	222120	152034	93290	111070	93151	1228976
29132	Catch	-	7616	3826	5756	2857	2199	1513	1261	25028
	Effort	-	5621	3129	6000	3813	3690	3813	3690	29756
29142	Catch	225850	634588	125847	177676	290757	188255	168926	131707	1943606
	Effort	257432	465635	235638	213046	255123	187929	200403	200367	2015573
30140	Catch	74937	655230	208512	137345	280550	186761	113091	90983	1747409
	Effort	129954	278367	166010	194016	293064	232243	178776	165671	1638101
30150	Catch	16324	98709	31126	35121	60354	40033	22988	13773	318429
	Effort	32142	44421	35007	48783	68072	54097	38703	29079	350304
31140	Catch	2932	40620	29661	14711	8591	15377	7738	4595	124226
	Effort	5499	16094	20204	20805	10449	15991	12947	10935	112924
31150	Catch	122154	688803	278011	230869	257474	197890	145205	102677	2023084
	Effort	171403	331858	260013	344679	335630	273505	250740	217850	2185678
32140	Catch	751	21944	17393	9178	9191	11358	5445	2208	77469
	Effort	1302	9832	13923	12756	14199	10526	6305	3764	72607
32150	Catch	35149	261363	113994	78586	81238	89832	68417	47635	776214
	Effort	42429	122222	105308	113195	115030	99773	99125	69981	767063
33140	Catch	-	38	3771	4949	238	14935	11435	1939	37305
	Effort	-	150	2723	4590	392	10830	11567	3468	33720
33150	Catch	724	-	1056	2383	-	6368	25493	9776	45800
	Effort	600	-	1211	3645	-	7108	25370	11969	49903
34141	Catch	-	-	364	554	234	1544	-	-	2696
	Effort	-	-	2415	1465	375	700	-	-	4955
34142	Catch	-	-	1	-	-	-	-	-	1
	Effort	-	-	900	-	-	-	-	-	900
34151	Catch	-	-	59	-	-	87	-	-	146
	Effort	-	-	345	-	-	105	-	-	450
34152	Catch	141	717	1114	1667	1656	1879	876	897	8948
	Effort	2127	7550	9282	10912	9834	9293	6365	4928	60291
35150	Catch	-	-	135	55	-	220	47	-	458
	Effort	-	-	1130	1104	-	590	585	-	3409
97011	Catch	-	-	-	-	26186	43955	10014	2555	82709
	Effort	-	-	-	-	9367	22773	11128	3997	47265
97012	Catch	-	-	-	-	285907	229053	116494	49573	681026
	Effort	-	-	-	-	90840	151641	138428	88774	469683
97013	Catch	-	-	-	-	214460	164067	73523	31789	483838
	Effort	-	-	-	-	68133	102658	100990	69081	340862
97014	Catch	-	-	-	-	130165	150354	56001	19814	356334
	Effort	-	-	-	-	41437	82070	59433	35597	218537
97015	Catch	-	-	-	-	21679	56215	17174	5095	100162
	Effort	-	-	-	-	7599	29960	18170	9661	65390
Total	Catch	609000	2804384	916114	1209122	1986787	1670289	985704	621037	10802436
	Effort	811227	1576245	1100621	1409665	1565150	1506989	1335080	1068144	10373121

Table 3 Catch (kg) per unit of fishing effort (*i.e.* kilograms of rock lobster per pot lift) data for the 1993/94 season in various statistical blocks (see Figures 2a, b and c).

Block	Date								
	9311	9312	9401	9402	9403	9404	9405	9406	Total
24120	-	-	-	2.394	-	-	-	-	2.394
25120	-	-	-	2.715	-	1.987	1.223	1.014	1.967
26120	-	-	0.295	2.593	1.879	2.338	1.704	-	2.473
26131	-	-	0.922	1.666	2.228	1.992	1.308	0.868	1.614
27120	-	-	-	2.825	2.292	-	-	-	2.690
27132	0.792	1.295	0.592	1.673	1.877	1.715	0.937	0.665	1.475
27140	0.845	1.198	0.563	0.912	1.612	1.510	0.97	0.754	1.044
28130	-	-	-	-	2.636	1.515	0.942	0.422	1.238
28132	-	-	1.059	-	-	-	-	-	1.059
28142	1.017	1.021	0.336	0.772	1.158	0.942	0.717	0.703	0.848
29132	1.424	1.069	0.574	0.524	-	-	-	-	0.984
29140	-	-	-	-	1.656	-	-	-	1.656
29142	1.002	1.307	0.357	0.689	1.137	0.987	0.778	0.691	0.926
30140	0.843	2.431	0.989	0.623	1.098	0.947	0.604	0.576	1.100
30150	0.784	2.425	0.861	0.785	1.046	0.803	0.503	0.726	1.016
31140	0.405	2.446	1.453	0.574	0.925	0.739	0.44	0.512	1.090
31150	0.722	2.106	1.081	0.747	1.021	0.799	0.565	0.663	1.008
32140	0.460	2.102	1.729	0.959	1.022	0.821	0.516	0.495	1.113
32150	0.555	2.274	1.430	0.734	0.995	0.870	0.739	0.843	1.118
33140	-	-	0.594	0.767	0.863	0.941	1.101	0.935	0.897
33150	-	-	2.418	0.913	-	0.770	0.973	0.951	1.135
34141	-	-	-	0.431	0.468	0.781	0.649	-	0.608
34151	-	-	-	0.265	-	0.309	-	-	0.272
34152	0.039	0.149	0.274	0.268	0.241	0.213	0.188	0.254	0.220
35150	0.027	0.092	-	-	-	-	-	-	0.070
97011	-	-	-	-	2.332	1.391	0.954	0.648	1.336
97012	-	-	-	-	3.095	1.517	0.813	0.568	1.394
97013	-	-	-	-	3.087	1.492	0.741	0.525	1.422
97014	-	-	-	-	2.431	1.424	0.782	0.594	1.306
97015	-	-	-	-	2.267	1.491	0.733	0.519	1.237
Total	0.874	1.738	0.821	0.905	1.370	1.098	0.713	0.656	1.064

Total catch = 11,039,829 kg
Total effort = 10,373,825 pot lifts

Table 4 Catch (kg) per unit of fishing effort (*i.e.* kilograms of rock lobster per pot lift) data for the 1994/95 season in various statistical blocks (see Figures 2a, b and c).

Block	Date								
	9411	9412	9501	9502	9503	9504	9505	9506	Total
24131	-	-	-	1.562	-	-	-	-	1.562
25120	-	-	-	1.111	-	1.358	0.923	-	1.185
26120	-	-	0.251	1.628	2.063	1.548	0.850	-	1.624
26131	-	-	0.754	1.090	1.670	1.699	1.061	0.810	1.348
27120	-	-	-	2.570	-	-	-	-	2.570
27132	0.698	1.533	0.546	1.802	1.479	1.537	1.045	0.764	1.512
27140	0.922	1.484	0.443	1.053	1.552	1.391	1.039	0.830	1.141
28132	0.859	0.991	0.372	0.685	1.162	-	-	-	0.692
28142	0.756	1.297	0.392	0.735	1.165	0.964	0.704	0.725	0.855
29132	-	1.355	1.223	0.959	0.749	0.596	0.397	0.342	0.841
29142	0.877	1.363	0.534	0.834	1.140	1.002	0.843	0.657	0.964
30140	0.577	2.354	1.256	0.708	0.957	0.804	0.633	0.549	1.067
30150	0.508	2.222	0.889	0.720	0.887	0.740	0.594	0.474	0.909
31140	0.533	2.524	1.468	0.707	0.822	0.962	0.598	0.420	1.100
31150	0.713	2.076	1.069	0.670	0.767	0.724	0.579	0.471	0.926
32140	0.577	2.232	1.249	0.720	0.647	1.079	0.864	0.587	1.067
32150	0.828	2.138	1.082	0.694	0.706	0.900	0.690	0.681	1.012
33140	-	0.254	1.385	1.078	0.608	1.379	0.989	0.559	1.106
33150	1.207	-	0.872	0.654	-	0.896	1.005	0.817	0.918
34141	-	-	0.151	0.378	0.625	2.206	-	-	0.544
34142	-	-	0.001	-	-	-	-	-	0.001
34151	-	-	0.171	-	-	0.830	-	-	0.325
34152	0.066	0.095	0.120	0.153	0.168	0.202	0.138	0.182	0.148
35150	-	-	0.120	0.050	-	0.374	0.081	-	0.134
97011	-	-	-	-	2.796	1.930	0.900	0.639	1.750
97012	-	-	-	-	3.147	1.510	0.842	0.558	1.450
97013	-	-	-	-	3.148	1.598	0.728	0.460	1.419
97014	-	-	-	-	3.141	1.832	0.942	0.557	1.631
97015	-	-	-	-	2.853	1.876	0.945	0.527	1.532
Total	0.751	1.779	0.832	0.858	1.269	1.108	0.738	0.581	1.041

Total catch = 10,802,436 kg
Total effort = 10,373,121 pot lifts

Table 5 Mean carapace lengths (mm) of male and female rock lobsters in various depth categories at Fremantle, Lancelin, Jurien and Dongara throughout the 1993/94 fishing season.

Location	Month	0-10 fathoms		10-20 fathoms		20-30 fathoms		30+ fathoms	
		Male	Female	Male	Female	Male	Female	Male	Female
Abrolhos	Mar	79	76	81	76	80	76	84	79
Dongara	Nov	75	73	77	76	-	-	-	-
	Dec	74	73	76	75	78	77	85	79
	Jan	73	73	75	75	83	78	78	75
	Feb	78	75	73	71	-	-	-	-
	Mar	76	75	78	76	-	-	-	-
	Apr	77	75	75	74	83	82	85	80
	May	76	75	74	74	87	80	-	-
	Jun	79	76	75	73	87	80	89	78
Jurien	Nov	76	74	76	75	-	-	-	-
	Dec	77	74	77	74	79	76	79	76
	Jan	76	74	76	75	80	77	82	77
	Feb	76	74	78	77	81	78	-	-
	Mar	78	75	78	75	82	80	83	81
	Apr	76	74	76	74	84	80	85	82
	May	77	74	78	75	84	79	-	-
	Jun	78	75	81	76	92	79	-	-
Lancelin	Nov	77	75	-	-	-	-	-	-
	Dec	75	73	79	76	81	77	86	80
	Jan	75	74	78	75	86	80	88	80
	Feb	77	74	85	78	87	77	-	-
	Mar	76	75	84	79	92	87	-	-
	Apr	76	74	-	-	91	85	-	-
	May	74	74	92	84	94	84	-	76
	Jun	76	75	92	85	92	83	-	-
Fremantle	Nov	78	76	80	77	-	-	-	-
	Dec	79	77	81	78	87	82	88	82
	Jan	79	77	80	76	99	89	92	84
	Feb	78	75	81	79	87	81	97	90
	Mar	80	77	82	79	99	90	-	-
	Apr	80	77	83	80	92	85	-	-
	May	79	76	84	80	97	85	99	85
	Jun	81	78	-	-	102	90	-	-

Table 6 Mean carapace lengths (mm) of male and female rock lobsters in various depth categories at Fremantle, Lancelin, Jurien, Dongara and Abrolhos Islands throughout the 1994/95 fishing season.

Location	Month	0-10 fathoms		10-20 fathoms		20-30 fathoms		30+ fathoms	
		Male	Female	Male	Female	Male	Female	Male	Female
Abrolhos	Mar	80	76	81	76	81	77	84	79
Dongara	Nov	78	76	77	76	-	-	-	-
	Dec	76	75	80	77	81	78	87	82
	Jan	73	72	69	70	94	88	75	74
	Feb	73	72	77	74	-	-	-	-
	Mar	75	74	79	77	84	82	83	83
	Apr	72	73	77	76	88	83	90	83
	May	73	73	76	74	87	82	81	82
	Jun	75	73	75	74	91	82	-	-
Jurien	Nov	77	75	78	75	-	-	-	-
	Dec	81	77	80	76	81	76	81	78
	Jan	77	74	76	74	84	81	82	77
	Feb	77	75	79	77	84	79	-	-
	Mar	77	74	80	77	84	81	86	85
	Apr	76	74	79	75	88	82	87	82
	May	76	74	82	78	89	82	-	-
	Jun	77	74	83	77	93	81	-	-
Lancelin	Nov	78	76	-	-	-	-	-	-
	Dec	79	76	88	80	93	86	96	89
	Jan	77	75	89	86	94	92	-	-
	Feb	76	74	86	81	99	95	94	84
	Mar	77	75	85	85	98	91	97	87
	Apr	76	74	84	80	98	91	99	93
	May	78	76	92	83	97	88	-	-
	Jun	77	75	94	84	98	88	-	-
Fremantle	Nov	81	78	-	-	-	-	-	-
	Dec	83	78	85	81	88	83	90	84
	Jan	79	76	-	-	98	98	95	90
	Feb	80	77	88	81	91	88	-	-
	Mar	83	78	87	81	101	92	-	-
	Apr	82	78	-	-	108	94	-	92
	May	86	81	97	87	117	92	-	-
	Jun	88	81	95	88	108	89	-	-

Table 7 Bottom temperature (°C) and surface salinity (parts per thousand) in various depth categories in waters out from Fremantle, Lancelin, Jurien, Dongara and Abrolhos Islands throughout the 1993/94 fishing season.

Location	Depth	November		December		January		February		March		April		May		June	
	(fathoms)	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal
Abrolhos	0-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	20-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	30+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dongara	0-10	20.6	-	-	-	21.3	-	22.2	-	-	-	22.2	-	-	-	20.5	-
	10-20	20.4	-	21.4	-	-	-	22.3	-	23.3	-	21.7	-	-	-	20.6	-
	20-30	-	-	20.3	36.82	20.6	36.92	-	-	-	-	22.7	-	23.2	-	22.2	-
	30+	-	-	20.2	36.74	20.0	36.73	-	-	-	-	22.7	-	-	-	22.5	-
Jurien	0-10	-	-	19.8	-	20.4	-	22.5	-	24.0	-	22.5	-	-	-	20.2	-
	10-20	20.6	-	-	-	-	-	21.8	-	23.1	-	-	-	-	-	20.9	-
	20-30	-	-	20.1	36.97	19.1	36.61	21.7	-	22.8	-	23.4	-	21.5	-	21.0	-
	30+	-	-	-	-	20.2	36.42	-	-	23.3	-	-	-	-	-	-	-
Lancelin	0-10	21.0	-	21.2	36.70	22.9	-	22.4	-	23.2	-	21.5	-	21.2	-	19.4	-
	10-20	-	-	19.3	-	21.7	-	21.9	-	22.2	-	-	-	21.8	-	-	-
	20-30	-	-	19.9	36.82	20.5	-	21.1	-	21.9	-	22.4	-	22.5	-	20.4	-
	30+	-	-	19.7	36.55	-	-	-	-	-	-	-	-	-	-	-	-
Fremantle	0-10	20.1	-	-	-	-	-	21.7	-	22.7	-	21.6	-	20.5	-	18.5	-
	10-20	-	-	20.2	36.04	-	-	-	-	23.3	-	21.8	-	21.4	-	-	-
	20-30	-	-	18.2	-	20.8	-	-	-	23.8	-	21.9	-	22.4	-	19.7	-
	30+	-	-	19.1	36.86	19.9	-	-	-	-	-	-	-	22.4	-	-	-

Temperatures were taken using a protected reversing thermometer and surface water samples were taken and later analysed to determine salinity.

Table 8 Bottom temperature (°C) and surface salinity (parts per thousand) in various depth categories in waters out from Fremantle, Lancelin, Jurien, Dongara and Abrolhos Islands throughout the 1994/95 fishing season.

Location	Depth	November		December		January		February		March		April		May		June	
	(fathoms)	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal	Temp	Sal
Abrolhos	0-10	-	-	-	-	-	-	-	-	24.2	35.87	-	-	-	-	-	-
	10-20	-	-	-	-	-	-	-	-	23.7	35.86	-	-	-	-	-	-
	20-30	-	-	-	-	-	-	-	-	23.4	35.80	-	-	-	-	-	-
	30+	-	-	-	-	-	-	-	-	23.5	35.78	-	-	-	-	-	-
Dongara	0-10	20.8	36.80	21.4	36.36	23.3	36.52	23.6	-	22.3	36.28	-	-	20.8	-	19.9	35.92
	10-20	21.3	36.90	21.4	36.15	-	-	23.2	36.32	22.8	36.22	24.5	36.35	20.6	-	19.9	35.81
	20-30	-	-	21.0	35.98	22.3	36.09	-	-	22.5	36.12	24.2	35.69	20.9	-	19.6	35.69
	30+	-	-	20.9	36.01	21.4	35.94	-	-	22.2	36.07	24.1	35.62	-	-	-	-
Jurien	0-10	21.4	37.00	21.9	36.41	22.1	-	23.4	36.52	23.7	36.17	22.3	36.44	20.6	-	20.6	35.81
	10-20	20.8	36.90	21.5	36.24	-	-	-	-	23.0	36.18	-	-	20.7	-	19.9	35.61
	20-30	-	-	20.8	36.02	21.5	36.02	21.9	36.01	23.3	35.87	24.2	35.67	21.6	-	20.4	35.61
	30+	-	-	20.7	35.87	-	-	-	-	22.9	35.88	22.3	35.58	-	-	-	-
Lancelin	0-10	21.0	36.90	21.6	36.26	23.8	36.83	22.3	36.61	23.4	36.67	21.1	36.20	21.1	-	17.6	35.71
	10-20	-	-	20.9	36.09	21.5	36.01	22.1	36.18	23.0	36.02	-	-	20.9	-	19.3	35.69
	20-30	-	-	20.4	36.00	21.7	36.13	21.5	36.05	22.8	36.01	22.4	35.96	22.8	-	19.1	35.72
	30+	-	-	20.8	35.88	-	-	21.4	36.03	23.3	35.94	22.6	35.92	-	-	-	-
Fremantle	0-10	20.1	36.60	20.5	36.32	23.6	36.77	22.6	36.62	21.5	36.67	-	36.50	19.0	-	17.4	35.69
	10-20	-	-	20.4	36.09	-	-	22.2	36.23	21.7	36.17	-	-	20.2	-	18.6	35.75
	20-30	-	-	20.2	35.99	21.3	36.13	22.1	36.24	22.4	35.98	22.5	35.96	20.6	-	19.5	35.65
	30+	-	-	20.2	35.93	20.9	36.02	-	-	-	-	-	-	-	-	-	-

Temperatures were taken using a protected reversing thermometer and surface water samples were taken and later analysed to determine salinity.

Table 9 1993/94 sex ratio by location, depth category and month. Figures are the percentage of female rock lobsters in the total sampled catch.

Location	Depth (fathoms)	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Abrolhos	0-10	-	-	-	-	47	-	-	-
	10-20	-	-	-	-	58	-	-	-
	20-30	-	-	-	-	55	-	-	-
	30+	-	-	-	-	54	-	-	-
Dongara	0-10	52	61	60	55	59	59	56	56
	10-20	56	55	47	60	67	55	47	55
	20-30	-	56	64	-	-	66	73	44
	30+	-	61	90	-	-	76	-	50
Jurien	0-10	54	50	53	50	56	56	55	53
	10-20	55	48	52	52	55	62	63	48
	20-30	-	59	54	62	61	67	67	50
	30+	-	65	76	-	69	67	-	-
Lancelin	0-10	61	51	56	53	67	67	63	66
	10-20	-	64	59	53	61	-	65	56
	20-30	-	70	64	64	65	65	48	42
	30+	-	77	65	-	-	-	-	-
Fremantle	0-10	60	47	48	53	56	61	56	48
	10-20	65	56	52	81	55	59	50	-
	20-30	-	61	64	51	52	58	49	43
	30+	-	64	60	50	-	-	53	-

Table 10 1994/95 sex ratio by location, depth category and month. Figures are the percentage of female rock lobsters in the total sampled catch.

Location	Depth (fathoms)	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Abrolhos	0-10	-	-	-	-	50	-	-	-
	10-20	-	-	-	-	61	-	-	-
	20-30	-	-	-	-	53	-	-	-
	30+	-	-	-	-	54	-	-	-
Dongara	0-10	56	56	54	51	62	53	57	60
	10-20	63	65	47	64	68	59	60	64
	20-30	-	69	60	-	75	73	65	54
	30+	-	58	80	-	80	70	83	-
Jurien	0-10	57	57	48	56	56	57	54	59
	10-20	57	49	45	59	59	63	50	60
	20-30	-	59	56	57	68	63	56	46
	30+	-	72	78	-	75	66	-	-
Lancelin	0-10	57	59	56	59	59	60	62	65
	10-20	-	63	80	59	70	71	61	46
	20-30	-	60	73	66	72	66	59	43
	30+	-	50	-	68	75	82	-	-
Fremantle	0-10	64	61	53	57	51	52	54	52
	10-20	-	61	-	34	51	-	50	51
	20-30	-	57	54	33	66	66	18	29
	30+	-	59	63	-	-	-	-	-

8.0 Figures

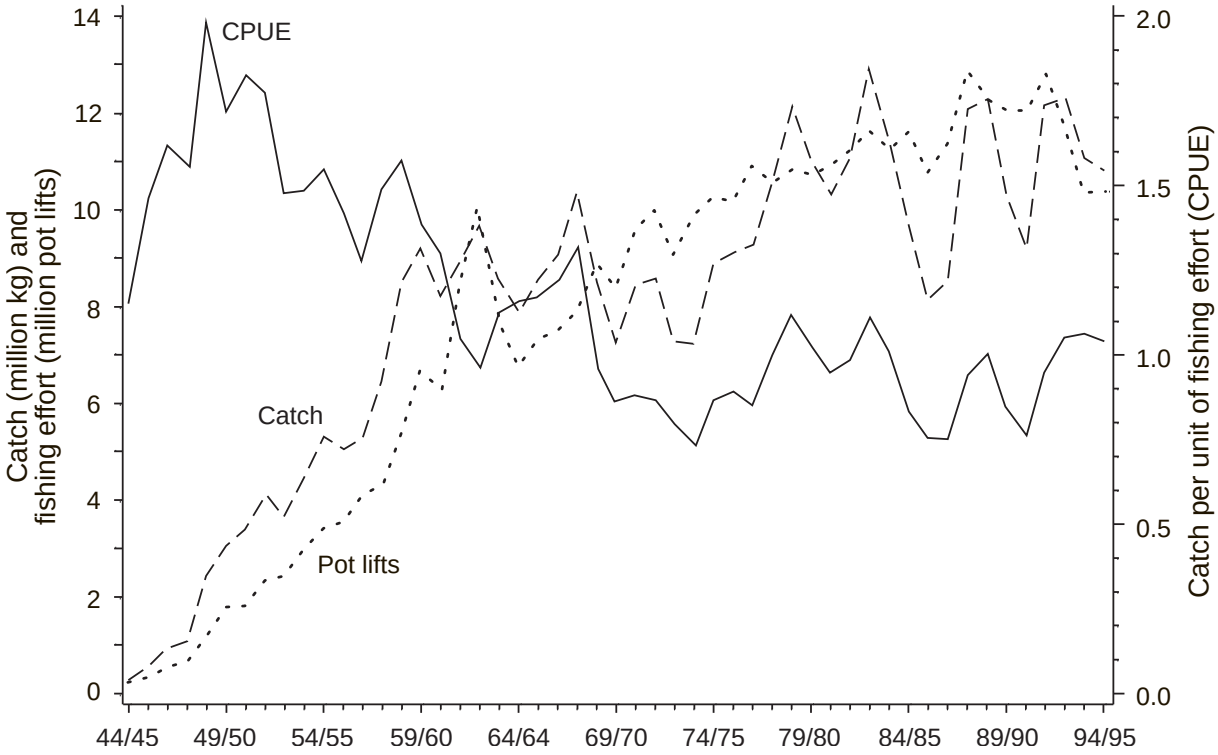


Figure 1 Rock lobster catch (kg), fishing effort (pot lifts) and catch per unit of fishing effort (kg/pot lift) data.

Note: Prior to the 1977/78 season, fishing effort was calculated as effective fishing effort by the method of Gulland (1969).

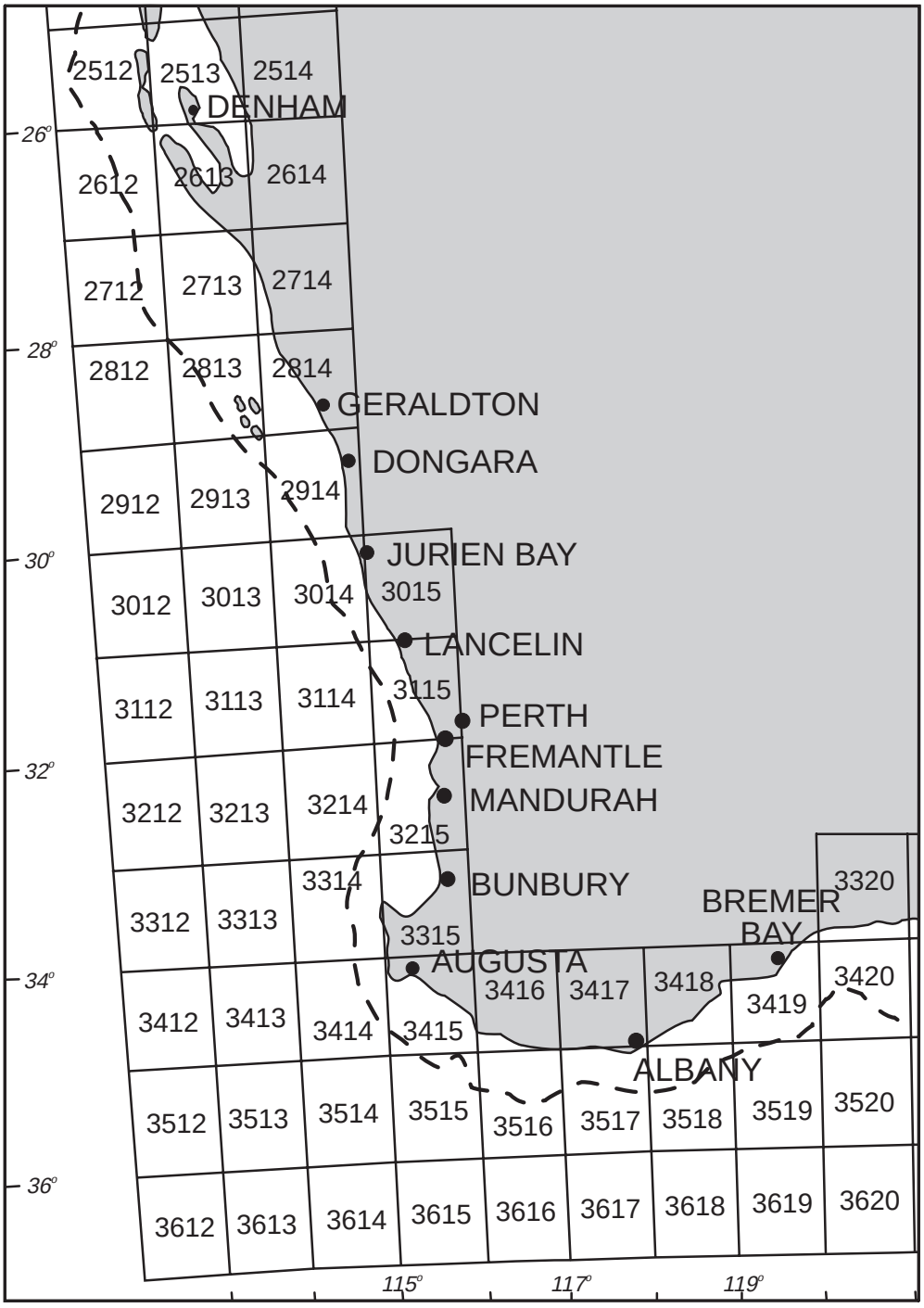


Figure 2a Rock lobster fishing areas.

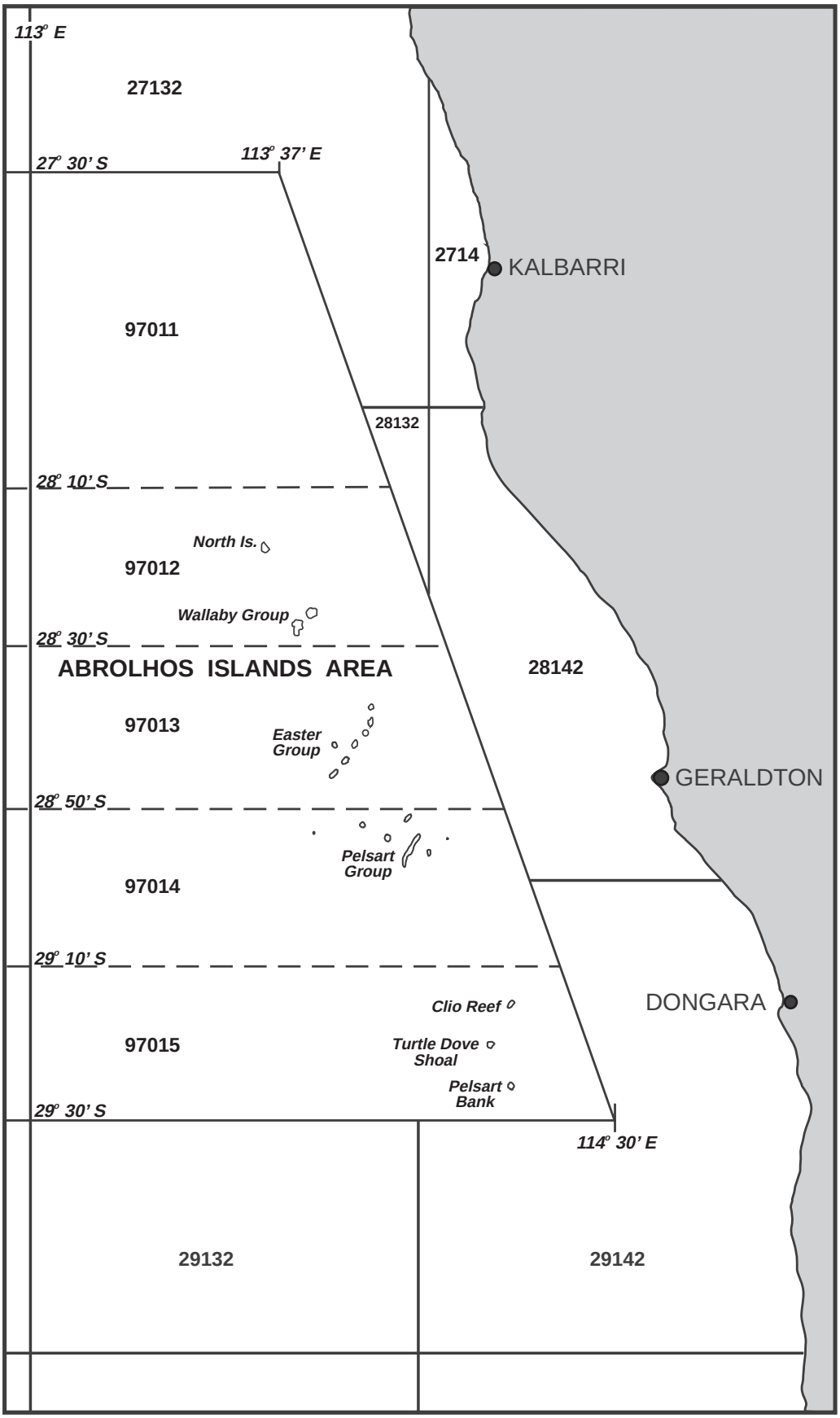


Figure 2b Rock lobster fishing areas.

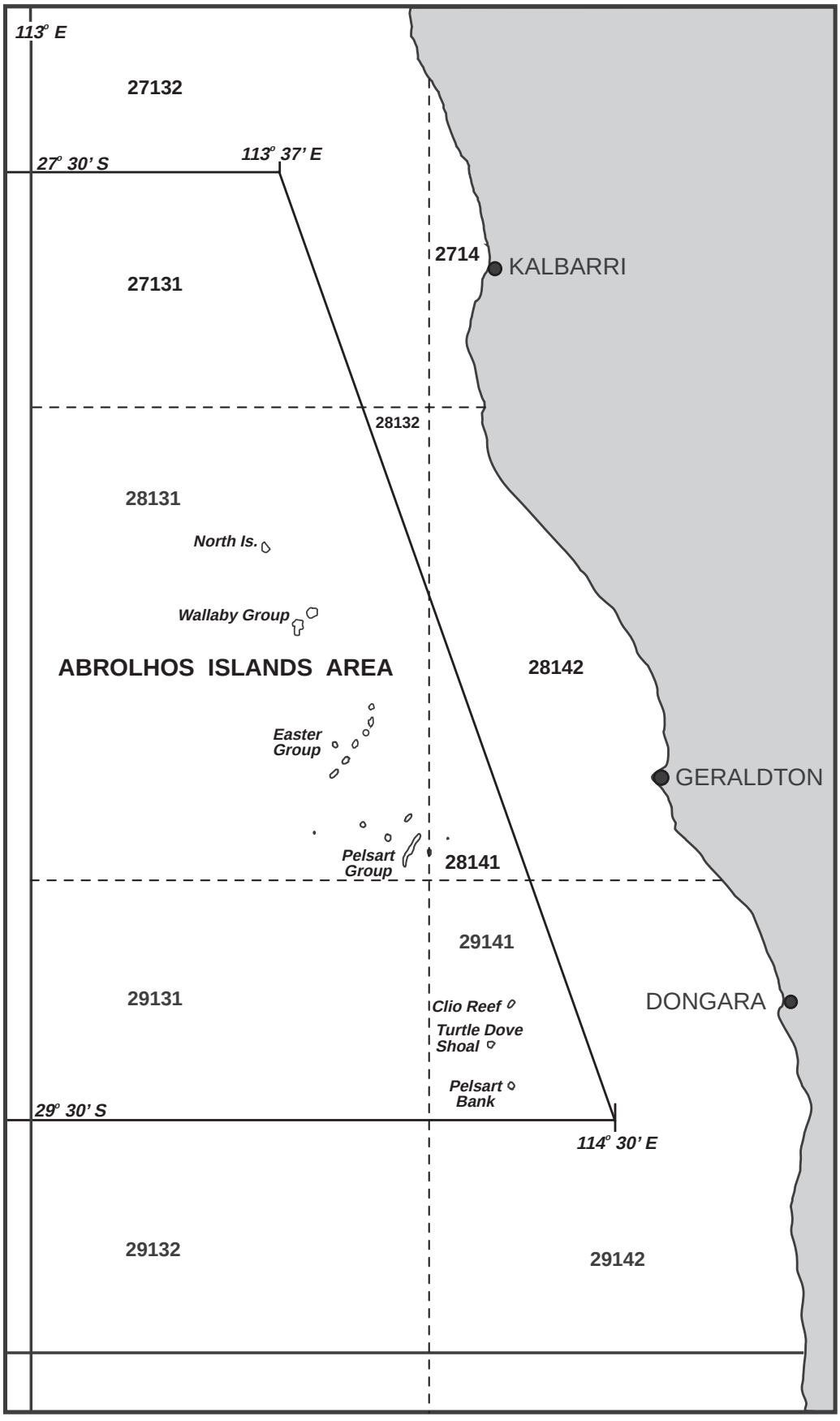


Figure 2c Rock lobster fishing areas.

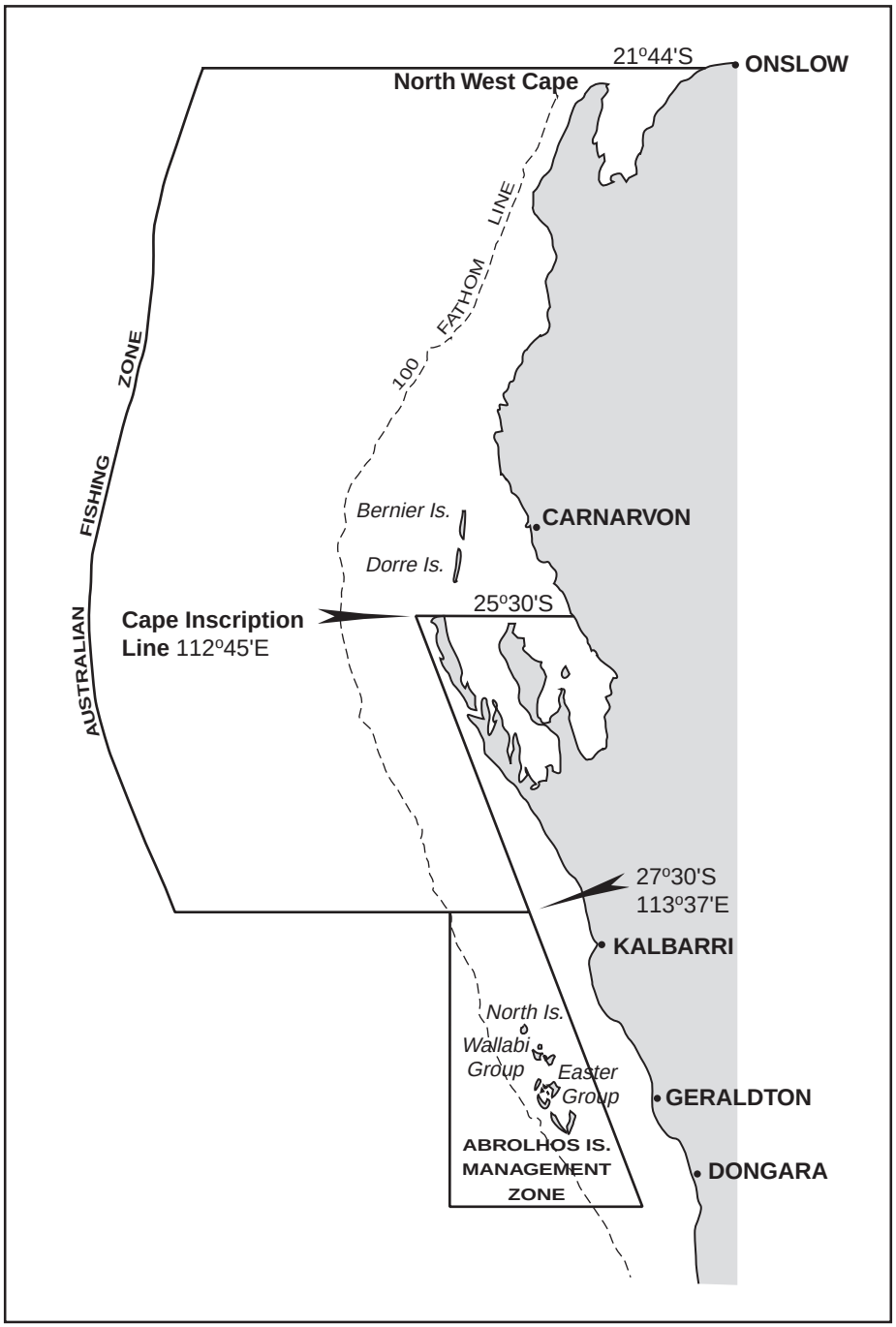


Figure 2d Big Bank fishing area (adapted from Chubb *et al.* 1994).

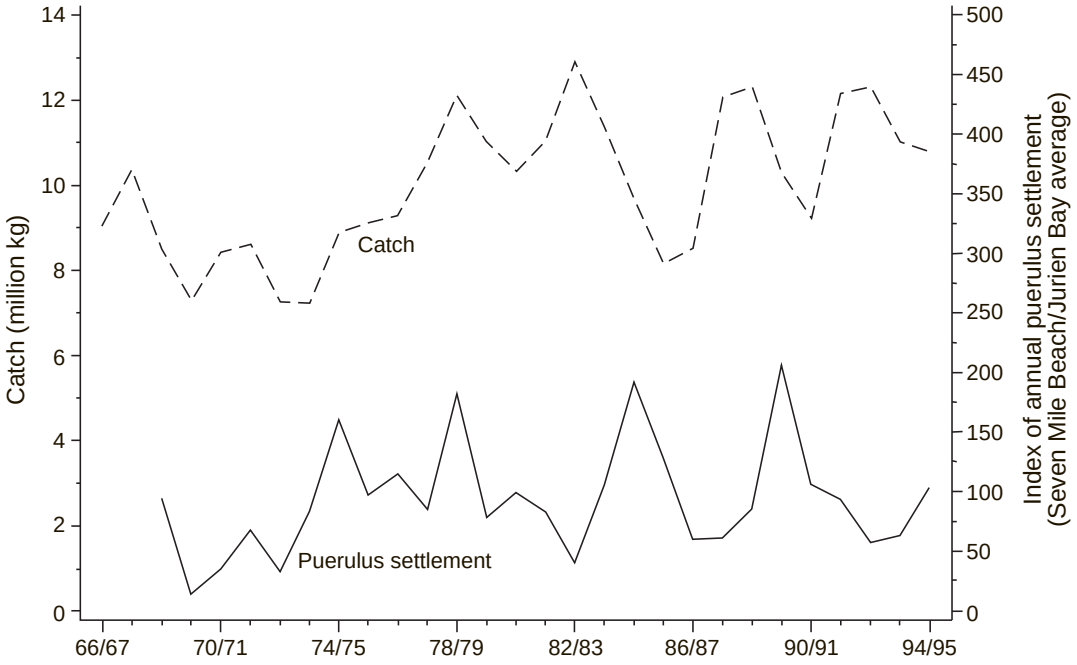


Figure 3 Rock lobster catch and index of annual puerulus settlement (puerulus take approximately four years to grow to legal size).

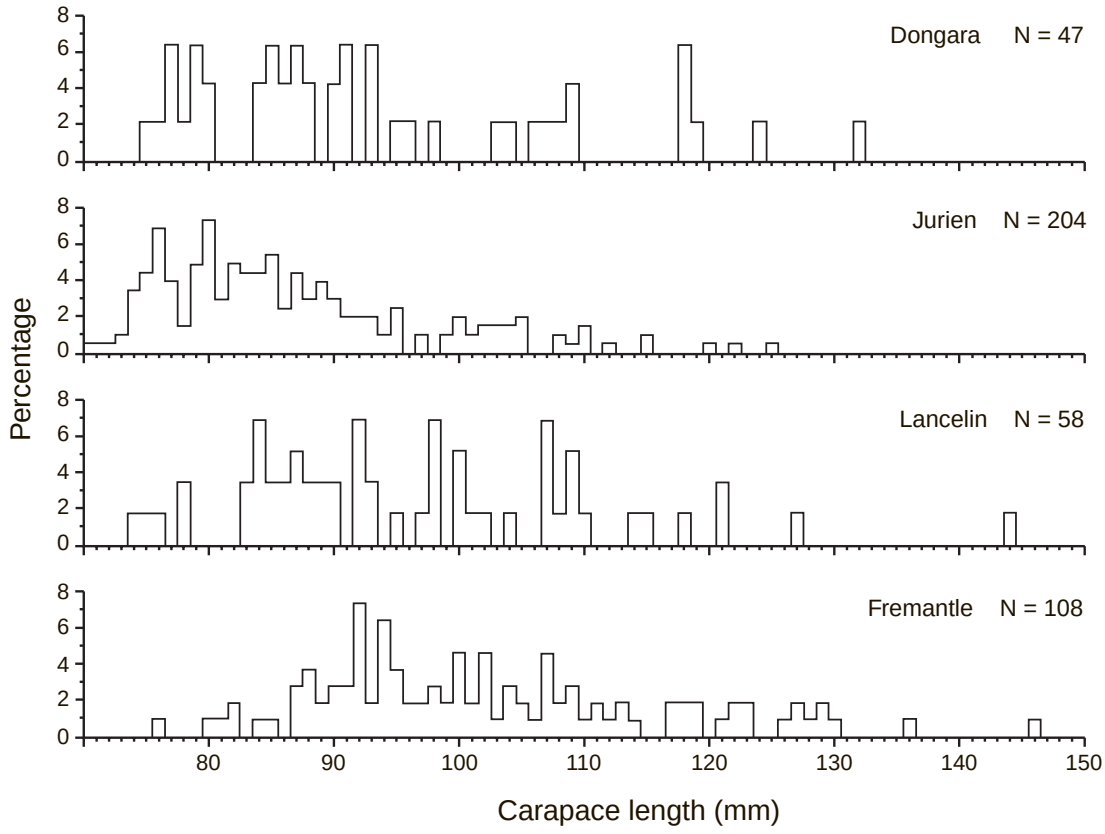


Figure 4a Length frequency of breeding female rock lobsters taken from December 1993 to February 1994.

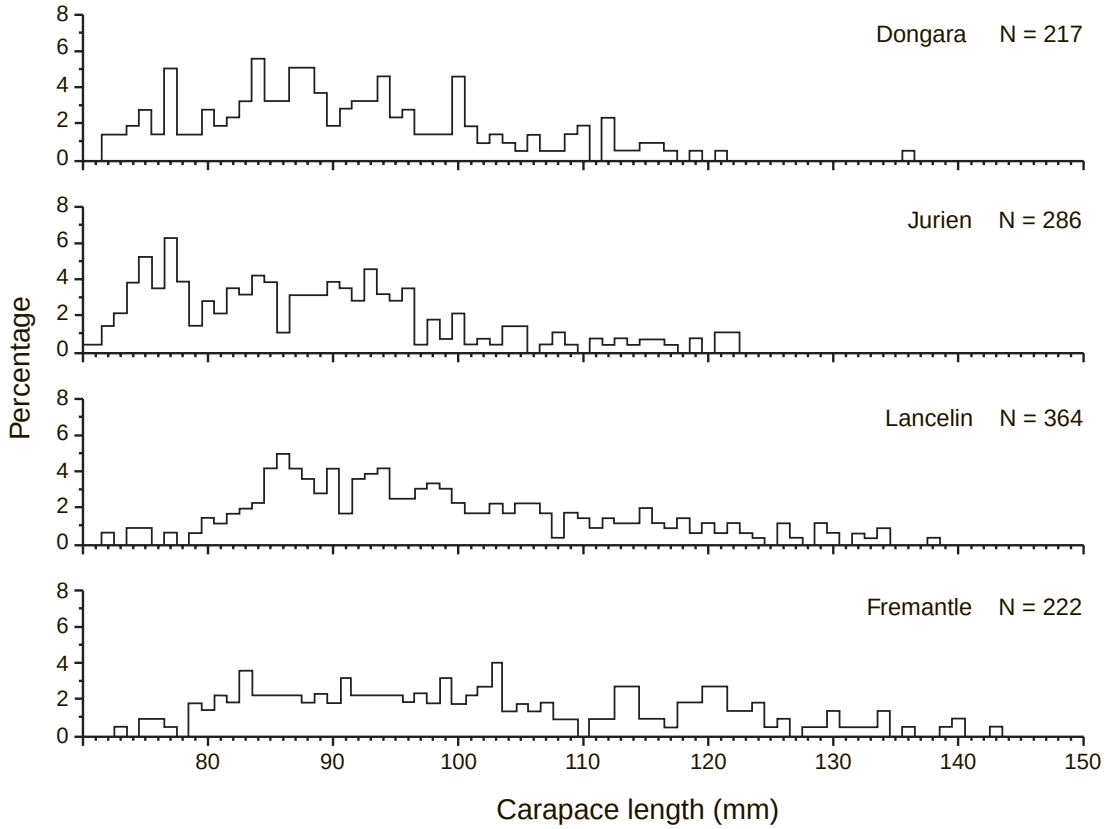


Figure 4b Length frequency of breeding female rock lobsters taken from December 1994 to February 1995.

MEDIA RELEASE 18 MAY 1994

COMMERCIAL FISHERIES PRODUCTION BULLETIN

ROCK LOBSTER FISHERY

1993/94 SEASON

MAY 1994

PRODUCTION FIGURES

The rock lobster catch to the end of April 1994 of 9,145 tonnes is 13.1% below the 10,521 tonnes caught in the same period in 1992/93 and 1.2% below the average (9,253 tonnes) over the last 10 years. Catches to the end of April 1994 in the Fremantle, Jurien and Geraldton regions were 17.6%, 21.3% and 6.2% respectively below last season's catches. Assuming the continuance of the current rate of catch reduction of 13% on the previous season, then compared to 1992/93 total catch of 12,300 tonnes, the 1993/94 total catch is expected to be about 10,700 tonnes, approximately equal to the average catch over the last 10 years. The lower catches in C Zone relative to A and B Zones this season are in line with the regional forecasts from the puerulus to catch predictive system, and the expected impact of the 1993/94 management arrangements.

Production (kg) to end of April 1994

Fremantle	Jurien	Geraldton	Total
3 322 443	1 363 651	4 458 915	9 145 009

Production (kg) to end of April 1993

Fremantle	Jurien	Geraldton	Total
4 033 209	1 732 522	4 755 495	10 521 226

Difference (kg) and percentage difference

Fremantle	Jurien	Geraldton	Total
710 766	368 871	296 580	1 376 217
-17.6%	-21.3%	-6.2%	-13.1%

10 year cumulative average to end of April=9 253 000kg
Production to end of April 1994=9 145 009kg
Difference=107 991kg or -1.2%

VALUE

Approximate average beach prices for the 1992/93 and current seasons are $18 per kg and $25 per kg respectively. The value of this season's catch to the end of April was about $230 million compared to $190 million to the end of April 1993.

BIG BANK FISHERY

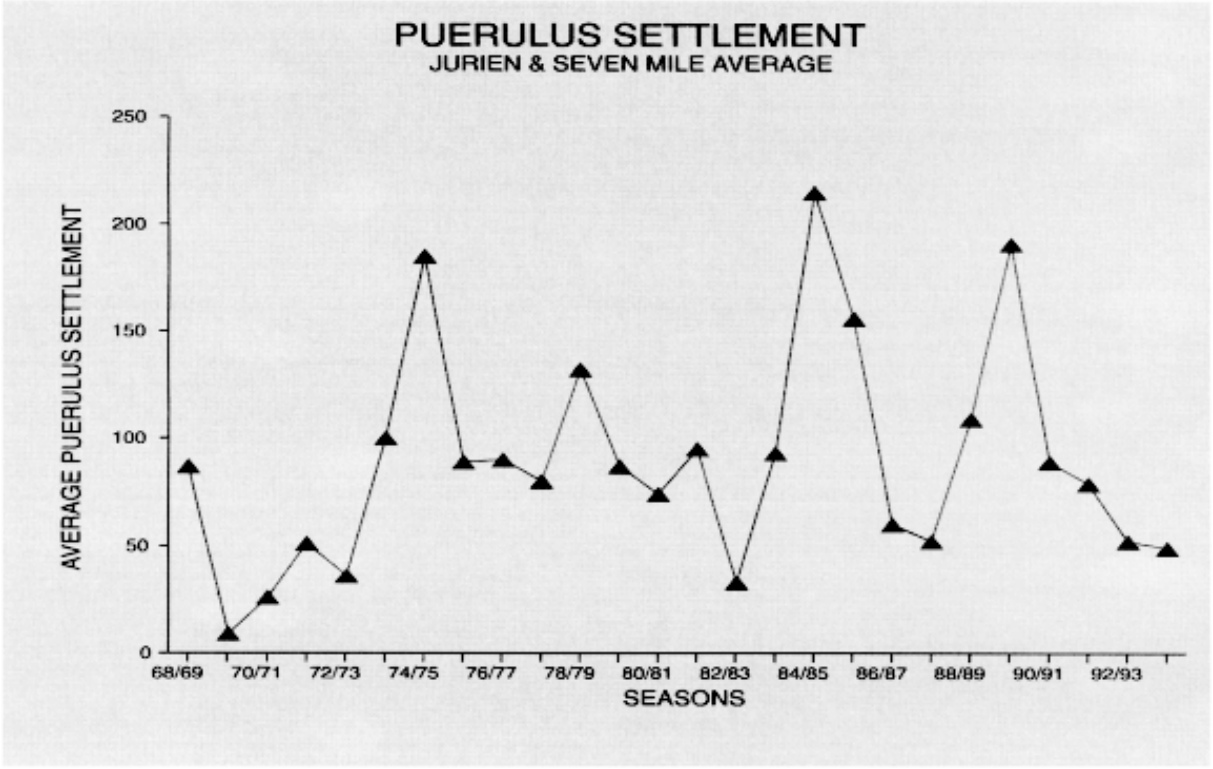
Large Big Bank catches occurred throughout the region from the A zone line to west of Shark Bay in very deep water (90 to 100 fm) from 11 to 18 February. Some fishing continued into early March. Approximately 359 tonnes of lobsters, valued at $9 million, were caught by 120 boats. By comparison, 336 tonnes were caught by 82 boats in February and early March 1993. The rock lobsters caught were in very good condition and predominantly B grade white lobsters, together with some A and a few C and D grade animals.

ABROLHOS FISHERY

Catches at the Abrolhos were slightly above average over the opening two week period and due to the 18% pot reduction, catches have remained at relatively high levels for a longer period than in previous seasons. The carrier boat landings for the current season to 3 May are 2.5% up on the same period last year. The overall catch from the Abrolhos, therefore, is expected to be similar to the 1992/93 catch of 1,699 tonnes.

PUERULUS SETTLEMENT

The preliminary 1993/94 puerulus settlement figures indicate recruitment of puerulus is well below average (37 to 94%) at all sites except for South Passage, Shark Bay, where settlement is only 3% below the average over the last eight years. In C zone the reduction is more severe than in A and B zones, particularly in the southern sector of C zone where settlement at Warnbro is 94% below average and at Cape Mentelle where no settlement has been recorded since August 1991. The preliminary annual index (average of Jurien Bay and Seven-mile Beach) of 49 is 6% below last year's value of 52 and 46% below the 25 year average of 90. A season of average puerulus settlement (1990/91) followed by three consecutive seasons of below average settlement indicate declining catches in the next three seasons (see over)



IMPACT OF MANAGEMENT PACKAGE

It is not possible to assess the impacts of individual parts of the management package because all of the data will not available until the end of the season. However, the catch to the end of January 1994 (the whites catch) was 11.6% below the last 10 year average. Given a good whites catch was predicted, this confirms that the pot reduction and larger minimum size components of the package had the desired effect of reducing the exploitation rate and leaving more white rock lobsters in the water. An expected catch of about 10,700 tonnes for the current season (compared to the predicted 11,800 tonnes) indicates the package is likely to achieve its principal objective of leaving uncaught an estimated 1,000 tonnes of rock lobsters. The achievement of this significant reduction in exploitation rate will enable a greater flow through of lobsters to the breeding stock in the coming years. A complete and detailed assessment will be undertaken at the end of the season when all research and industry data will be available. The results of these analyses will be presented on the Rock Lobster Industry Advisory Committee seminar tour in early September

OVERSEAS MARKET TRENDS*

Live - a strong demand has continued through the month of April, however, processors were unable to meet the demand in part due to the sizes of lobsters available.

Tails - there is a steadily increasing demand for this product with the highest prices ever witnessed primarily due to lesser volumes exported to the United States market.

Whole Cooked (Boiled) - a strong demand for whole cooked continued throughout April with extremely good price levels being achieved. Concern was expressed that prices were peaking, however, consumption appears to have offset this concern for the time being.

Whole Frozen Raw - a steady demand for this product continued through April.

BEACH PRICES*

Higher prices paid for product in April were reflected in a $2 per kilogramme increase in the beach price paid to fishers, which currently stands at $27 per kg plus bonuses for the proportion of the catch that can be used for live export. The beach price in the previous months was $25+ per kg.

* This information was provided by the Rock Lobster and Prawning Association of Western Australia (Inc.), Suite 6, 41 Walters Drive, Osborne Park WA 6017. Chairman Tony Gibson ph: 244 2933 fax: 244 2934.

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MEDIA RELEASE 14 JULY 1994

COMMERCIAL FISHERIES PRODUCTION BULLETIN

ROCK LOBSTER FISHERY

1993/94 SEASON

JULY 1994

PRODUCTION FIGURES

The preliminary rock lobster landings for the 1993/94 season were 10,990 tonnes, 10.4% below the corresponding 1992/93 preliminary catch of 12,264 tonnes, and 3.5% above the average (10,619 tonnes) over the last 10 years. Regional catches were 13.4%, 17.8% and 5.5% below last season's catches in the Fremantle, Jurien and Geraldton regions respectively. The lower catches in C Zone relative to A and B Zones this season are in line with the regional forecasts from the puerulus to catch predictive system, and the expected impact of the 1993/94 management arrangements. The reduction in landings from the central west coast (Jurien region) can partially be attributed to a number of vessels from the region opportunistically taking advantage of the higher catch rates in the southern sector of C Zone. Vessels from the Fremantle region also moved to take advantage of the higher catches to the south but the areas fished fall within the Fremantle region's "boundaries".

Production (kg) for 1993/94 Season

Fremantle	Jurien	Geraldton	Total
3 972 609	1 601 844	5 415 106	10 989 559

Production (kg) for 1992/93 Season

Fremantle	Jurien	Geraldton	Total
4 585 643	1 947 581	5 730 610	12 263 834

n.b. The final catch for 1992/93 after all data was received and validated was 12 303 423 kg

Difference (kg) and percentage difference

Fremantle	Jurien	Geraldton	Total
613 034	345 737	315 504	1 274 275
-13.4%	-17.8%	-5.5%	-10.4%

10 year cumulative average = 10 619 000kg
Production for 1993/94 = 10 989 559kg
Difference = 370 559kg or +3.5%

VALUE

Approximate average beach prices for the 1992/93 and 1993/94 seasons are $18.50 per kg and $25 per kg respectively. Thus the preliminary value of the landed catch this season was about $275 million compared to $230 million for 1992/93.

ABROLHOS FISHERY

Catches at the Abrolhos were slightly above average over the opening two week period and due to the 18% pot reduction, catches remained at relatively high levels for a longer period than in previous seasons. The carrier boat landings for the 1993/94 season are 1.5% below those for 1992/93 when 1,615 tonnes were landed. A small proportion of A Zone concession holders operate from and land their catch on the mainland. An additional small number of fishers resident at the Abrolhos also transport their catch to the mainland. However, the number of vessels involved is low and has been relatively constant. Thus, the carrier boat landings provide a good preliminary indication of the success of the season.

PUERULUS SETTLEMENT

The puerulus settlement figures for 1993/94 indicate recruitment of puerulus was well below average (37 to 94%) at all sites except for South Passage, Shark Bay, where settlement was only 3% below the average over the last eight years. In C zone the reduction was more severe than in A and B zones, particularly in the southern sector of C zone where settlement at Warnbro was 94% below average and at Cape Mentelle where no settlement has been recorded since August 1991. The preliminary 1993/94 annual index (average of Jurien Bay and Seven Mile Beach) of 49 is 6% below last year's value of 52 and 46% below the 25 year average of 90. A season of average puerulus settlement (1990/91) followed by three consecutive seasons of below average settlement indicate declining catches in the next three seasons.

The 1993/94 puerulus settlement was at least 25% below the 1992/93 recruitment at all sites north of Lancelin except at Seven Mile Beach where settlement was 10% better than last year, but still well below average (see above). The settlement from Lancelin

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south was between 30 and 56% below that seen in 1992/93.

IMPACT OF MANAGEMENT PACKAGE

A formal assessment of the impacts of the management package on the rock lobster stock will be presented at the Rock Lobster Industry Advisory Committee's seminar series along the coast in early September. Compulsory monthly catch returns and voluntary research log book data, required for the research assessment, are still being received. Outstanding returns, particularly the compulsory monthly returns, are delaying the assessment process. However, preliminary analysis of factory receival data provides the following information:

1. The landings to the end of January 1994 (the whites catch) of about 4,400 tonnes were 6% below the last 10 year average and 25% below the predicted 1993/94 whites catch of about 5,900 tonnes, in line with the anticipated effect of the management package.
2. The February to June landings (the reds catch) of 6,600 tonnes were 12% greater than the average over the last 10 years of 5,900 tonnes which also was the predicted 1993/94 reds catch (not adjusted for the effects of the management package). This increase was expected as a result of the new regulations.
3. The preliminary total landings of about 11,000 tonnes for 1993/94 were 3.5% above the 10 year average but 7% below the predicted 11,800 tonnes (which did not include the anticipated effects of the management package). This reduction in landings was forecast as an impact of the new regulations.

These statistics indicate that the management package as a whole achieved its prime objective of significantly reducing the overall exploitation rate and leaving uncaught an estimated 800 tonnes of rock lobsters (target 1,000 tonnes). This will allow a greater flow through of lobsters to the breeding stock in the coming years. Another objective of the management package was to shift a significant portion of the whites catch through to the reds catch to provide a more even distribution of catch throughout the season and potentially a higher overall price for the product. The available figures for the fishery as a whole indicate this also was achieved.

OVERSEAS MARKET TRENDS*

Live - the market for live lobster finished the year quite strongly. Overall it appeared to accommodate the increased production without too many problems with quite reasonable price levels being achieved.

Whole Cooked (Boiled) - the Japanese market showed some further increases and a strengthening of prices on the back of speculative demand for the Autumn requirements. Prices received in June were the highest on record. Taiwan, faced with a short supply, markedly increased prices on offer. This was welcomed since Taiwanese prices had lagged for a large portion of the season.

Tails - limited supply of tails resulted in a very firm market and strong prices.

Whole Frozen Raw - very limited supply of this product resulted in a firm market and good prices.

OUTLOOK FOR 1994/95 SEASON*

Initial buyer resistance is anticipated to be encountered when Australian suppliers/packers commence business expecting to achieve the end of the 1993/94 season's price levels. The market may well have a differing approach. It promises to be a very interesting year.

* This information was provided by the Rock Lobster and Prawning Association of Western Australia (Inc.), Suite 6, 41 Walters Drive, Osborne Park WA 6017. Chairman Tony Gibson ph: 244 2933 fax: 244 2934.

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Bulletin No 3 November 1994

Commercial Fisheries Production Bulletin

WESTERN ROCK LOBSTER FISHERY
1994/95 SEASON

SUMMARY OF 1993/94 SEASON

Fishers participating in the western rock lobster fishery during the 1993/94 season landed a total catch of 11,000 tonnes valued at an estimated $300 million. The crews on board the 643 licensed vessels lifted their pots about 10.4 million times over the seven and a half month season from November 15 to June 30. This represents a 12% reduction in fishing effort compared to 1992/93 and is 19% lower than the very high effort level in 1991/92.

The principal aim of the 1993/94 management package was to leave rock lobsters in the water to allow greater survival and flow through to the depleted breeding stock. The total catch was predicted to be about 11,800 tonnes before the effect of the package was taken into account, thus with an 11,000 tonne catch it appeared that about 800 tonnes of lobsters were returned to the sea or not caught. Following a full assessment of the effects of the management package from research and industry data for the 1993/94 season, it was estimated that in real terms about 1,500 tonnes of catch was left in the ocean. Only a proportion of this saving will contribute to this season's catch since some natural mortality will occur and many females will be protected by the setose rule for much of the season.

Another success of the package was the objective of shifting a proportion of the very large whites catch through to the reds fishery; that is, trying to spread catches more evenly throughout the season. This, as predicted, was most effective in the central and northern parts of the fishery where a higher percentage of smaller whites are found. The levelling of the catch across the season aided the processors to better handle product and was, at least in part, instrumental in achieving higher prices. Thus, the principal management objective of enhancing the flow of rock lobsters to the breeding stock was achieved with an increase in the average income for the fishers.

PREDICTION FOR THE 1994/95 SEASON

The catch for the 1994/95 season is expected to decline as a result of lower puerulus settlements three and four years ago. As a consequence of the management package for the 1994/95 season, there also will be catch foregone, at a level similar to the previous season. However, lobsters surviving from last season will be available for capture at a larger size. A total catch of about 9,900 tonnes (range 9,000 to 10,800 tonnes) is predicted for the 1994/95 season.

Small declines are expected across all zones, particularly the south coastal, and over both the whites and reds periods of the fishery. If the current regulations are continued in 1995/96, a further decline to a catch of about 9,500 tonnes would be expected.

Table 1. Regional catch predictions for the 1994/95 and 1995/96 seasons before and after the impacts of the current management regulations are taken into account.

	1994/95 Predicted Catch (t)		1995/96 Predicted Catch (t)	
Region	Without Regs	With Regs	Without Regs	With Regs
Abrolhos Islands	1,600	1,500	1,500	1,500
North Coastal	4,200	3,900	4,000	3,800
South Coastal	4,800	4,500	4,500	4,200
TOTAL	10,600	9,900	10,000	9,500

PUERULUS SETTLEMENT

The 1994/95 puerulus settlement season is under way and to the end of November, all sites along the coast, except Cape Mentelle, have had some settlement. At this time puerulus settlement appears to be higher than the very low values experienced in the past two seasons. The early pattern of recruitment at both Jurien Bay and Seven-mile Beach followed the long term average, however, poor settlement in the last month or two has seen total settlement to date fall to below average levels.

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The mean annual index of settlement at Seven-mile Beach and Jurien is anticipated to be slightly below the 25 year average.

Puerulus settlement along the Western Australian coast has declined continually in recent years so it is pleasing to report positive improvement in some locations during 1994. Puerulus settlement at the Alkimos site has been exceptional and the level will be one of the highest recorded since collections started in 1982/83. In addition, settlement at the Abrolhos Islands has improved with levels above the average over the last ten years but lower than those obtained in the 1970s. Lancelin has had good settlement and puerulus numbers at South Passage (Shark Bay) are above average.

The improvement in the settlement, although patchy, appears to be a result of the stronger Leeuwin Current experienced earlier this year. However, the earlier trend in improving environmental conditions seems to have reversed, as evidenced by changes in the Fremantle sea level, and a return to ENSO conditions is likely. What impact this will have on puerulus settlement for the rest of the season (or the following one) has yet to be seen. A better assessment will be available early in the New Year when the bulk of puerulus will have settled.

MARKETING*

During the off season Cuban lobster sales into Taiwan at very low prices (up to $15 per kg less than last W.A. selling prices) have caused some initial buyer resistance to W.A. product. Similarly Japan has not been overly receptive to the suggested levels of product on offer by Western Australian processors.

South Australia has problems with low Taiwan prices and the bulk of their catch is being shipped to Japan.

The beach price has commenced at the $30 per kg level, however, it is too early to speculate what price the markets will sustain. Prices for cooked small grades will impact directly on live prices. Small sized pink/red lobster will hold their price whilst larger sizes will be difficult to place.

The 1994/95 season will be very interesting based on the entry of new suppliers, particularly into Taiwan with the resultant pressure to perform, therefore, being placed on the Japanese market.

*** This information was provided by the Rock Lobster and Prawning Association of Western Australia (Inc.), Suite 6, 41 Walters Drive, Osborne Park WA 6017. Chairman Tony Gibson ph: 244 2933 fax: 244 2934.**

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Bulletin No 4 February 1995

Commercial Fisheries Production Bulletin

WESTERN ROCK LOBSTER FISHERY

1994/95 SEASON

THE 1994/95 WHITES SEASON (Nov 15 - Jan 31)

The 622 commercial vessels licenced to operate in the western rock lobster fishery landed 4,314 tonnes of lobster during the whites segment of the 1994/95 rock lobster season. This is 5.0% below the average (4,539t) over the previous ten years but marginally better (0.8%) than the 4,281 tonnes caught over the same period last year. Table 1 shows the northern, central and southern regions of the coast had catches that were respectively 5.5% up, 6.1% up and 5.0% down compared to last year.

Table 1. Rock lobster production figures.

Production (kg) to end of January 1995

Fremantle	Jurien	Geraldton	Total
1 890 361	882 890	1 540 366	4 313 617

Production (kg) to end of January 1994

Fremantle	Jurien	Geraldton	Total
1 989 038	832 301	1 459 416	4 280 755

Difference (kg) and percentage difference

Fremantle	Jurien	Geraldton	Total
-98 677	50 589	80 950	32 862
-5.0%	+6.1%	+5.5%	+0.8%

10 yr cumulative ave. (to end Jan 94) = 4 539 000kg
Production to end of January 1995 = 4 313 617kg
Difference = 225 383kg or -5.0%

To date catches have been patchy throughout the fishery but more particularly in deep water. This probably is indicative of the lower densities of juveniles migrating across the fishing grounds to deeper waters Some very good individual catches were taken during the whites period, however, these were exceptions rather than the rule.

On first inspection, the figures to the end of January do not appear to support the prediction for a lower catch in the 1994/95 season compared to 1993/94. However, while the weight of catch landed so far was equivalent to last season's over the same period, fewer lobsters have been caught but with a larger average size. This is evidenced by the shift in grade categories between the seasons from the smaller A and B grades to larger-sized products (Figure 1). This effect was more noticeable in the southern region of the fishery (Figure 2).

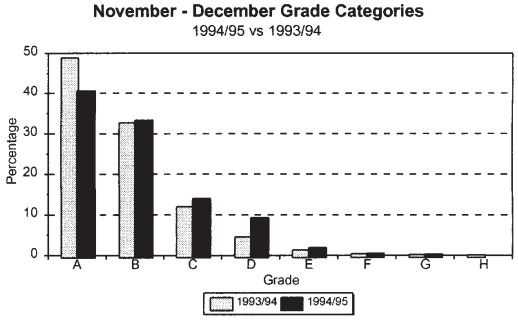

Figure 1

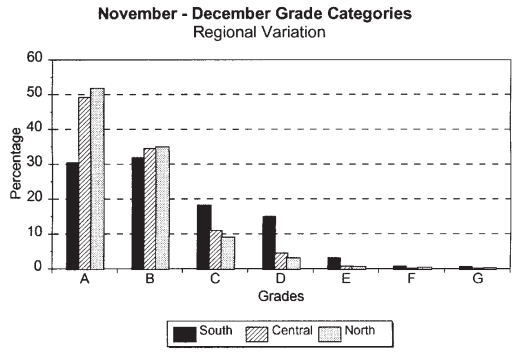

Figure 2

The phenomenon of larger lobsters results from a number of factors.There has been a carry-over, to this season, of lobsters left uncaught last season. Since these animals have moulted at least once, they are available for capture at a larger size and weight. Over the past four years, lower levels of puerulus settlement have meant reduced competition for food and shelter for successive age classes of juveniles thus permitting better growth and survival. Lower puerulus settlements contributing to this season's catch also would result in relatively lower proportions of the smaller size categories, irrespective of growth.

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Since last June, water temperatures have been about 0.5°C higher than average (Alan Pearce, CSIRO, pers. comm.). This not only would promote growth but also increases the catchability of rock lobsters leading to slightly higher catches.

PUERULUS SETTLEMENT

With the 1994/95 puerulus settlement season almost at an end, the mean annual index of settlement at Seven-Mile Beach and Jurien is expected to return to near average levels. This positive improvement follows the very low puerulus settlement experienced in the past two seasons (Figure 3).

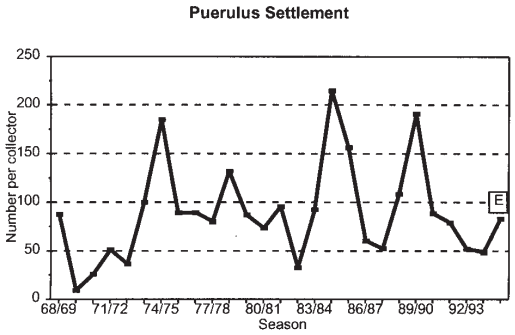

Figure 3 (E - expected value)

The pattern of recruitment varied along the coast. Above average settlement was recorded for South Passage (Shark Bay) and Alkimos in the south. In fact, extraordinary settlement throughout the season at Alkimos is suggesting a close to record recruitment of puerulus at this site. Uncharacteristically high numbers of puerulus settling at the Abrolhos in December have seen the index of settlement rise to a level expected to be only slightly below that recorded in the 1970s, *ie* well above the average over the past decade.

Seven-Mile Beach has had average settlement following uncharacteristically high settlement in December and January. Jurien Bay also received strong settlement in the same months, however, it failed to compensate for the early poorer level of recruitment and is likely to remain below average. Good puerulus numbers were noted for Lancelin.

While reasonable to very good puerulus settlement has occurred in the fishery north of Rottnest, more southern regions fared poorly. Warnbro settlement was well below average and there has not been any settlement on the collectors at Cape Mentelle this season.

The long running ENSO event is continuing, however, there was a brief return to normal conditions earlier in 1994 which led to a stronger Leeuwin Current than experienced the year before. At present there is no indication of a return to normal conditions.

IMPACTS OF THE MANAGEMENT PACKAGE

Rock lobster fishers have indicated that larger than usual numbers of breeding females have been seen in the fishery. In addition there has been an improvement in puerulus settlement. While there is a temptation to suggest all these events have occurred as a result of the management package, in truth this is not the case.

Certainly the return of setose and tar-spotted lobsters would have increased this season's egg production by a small amount, however, the higher numbers of breeding females seen may simply be a result of higher catchability due to warmer water temperatures. At least five years of data will be necessary to determine the real trend in egg production resulting from the package.

Similarly the improvement in puerulus is related to better environmental conditions and not the direct effect of slightly increased egg production.

MARKETING*

At the opening of the season markets generally were devoid of product and demand was high. Western Australian sellers moved in at high price levels and made early sales. While processors' beach price expectations were between $25-27 per kilogramme, the season's beach price opened at $30 per kg.

Recently introduced Cuban lobster has continued strongly in the Taiwanese market. Cuba is now providing larger quantities of higher quality, better handled product to Taiwan at 50 to 75% less than the Australian asking price. At this time of the year shipments to Japan and Taiwan are usually on a par. The December shipment (last three ships from Fremantle) saw 14 containers destined for Japan but only three to Taiwan.

It is important to note that other countries in the lobster market not only are "replicating" Australian standards and marketing techniques but also have the benefit of lower cost structures. Australia still has the best quality product but, with other products now on offer in the market place at over half the Australian price, quality is not the only factor influencing the buyers.

The United States market, on the other hand, has seen a resurgence since inventories were low and demand high. Accordingly, some factories moved to produce frozen green tails. A high price for lobster heads in Japan made the price for tailing more attractive. As is usual with the US market, there is uncertainty about the length of time this arrangement will continue.

The impact of the recent, tragic Kobe disaster on lobster sales to Japan is uncertain. Most producers believe there will be some impact as time progresses, however, the established benefits of long-term trading relationships should assist Western Australian products.

*** This information was provided by the Rock Lobster and Prawning Association of Western Australia (Inc.), Suite 6, 41 Walters Drive, Osborne Park WA 6017. Chairman Mr Tony Gibson ph: 244 2933 fax: 244 2934.**

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Bulletin No 5 April 1995

Commercial Fisheries Production Bulletin

WESTERN ROCK LOBSTER FISHERY

1994/95 SEASON

THE COASTAL FISHERY TO DATE

The 622 commercial vessels licenced to operate in the western rock lobster fishery landed 7,500 tonnes of lobster from November 15, 1994 to March 31, 1995. This is 2.2% below the 7,700 tonnes caught over the same period during the 1993/94 season and marginally below (0.9%) the average (7,570t) caught over the previous ten years. Table 1 indicates that when compared to the same time last season, catches from the northern and central regions of the coast were 1.9% and 1.8% higher respectively, while the southern region catch was 8.4% down.

During February, following the whites migration, the fleet was largely concentrated in shallow inshore waters. At the same time a general moult marking the end of the breeding season was taking place in the middle ground. Large numbers of setose females were reported from the breeding grounds throughout the fishery. Once some of these lobsters had moulted into a non-setose condition, they, together with large males contributed to the good catches experienced in the middle grounds throughout the fishery in March and April.

The presence of significant numbers of breeding females is a good sign that the management package is having the desired effect of boosting the breeding stock. However, water temperatures have been a little higher than normal, thus increasing the lobster's catchability. In addition, individual breeding lobsters have been handled repetitively by fishers, giving the impression of higher absolute numbers. While the gains to the breeding stock have been positive, caution must be exercised in assessing the magnitude of such gains based on a single season's data.

THE ABROLHOS ISLANDS SEASON

Calm weather and a low swell allowed boats to operate in the shallows at the commencement of the Abrolhos season on March 15. In spite of the full moon, opening day catches were exceptional with the carrier boat landings approximately 12% higher than last year. At the end of the first week, however, catches had dropped to 8% below the previous season but by mid April carrier boat landings again had risen to be approximately 6% higher than at mid April 1994.

Initially catches consisted of all grades (*ie* A to G) with a predominance of red A and B lobsters. However, since about the second or third week of the season, considerable numbers of large males and non-setose females have been received in the factories as fishers redirected some of their fishing effort to deeper waters.

THE BIG BANK SEASON

The Big Bank season opened on February 10 with 119 boats nominating to fish the area compared to last year's total of 120. While boats could move back to other areas of B Zone from March 1, some stayed and fished the shallower grounds of the Big Bank region for the first week of March.

The catch of 330 tonnes was about 21% below last season's landings from the region of 419 tonnes (Figure 1). It would appear that the catches were more widespread than in 1994. The average catch per boat of 2.8 tonnes was slightly lower than last season's 3.5 tonnes per boat (Figure 1).

The reduction in catch reflects the drop in puerulus settlement from high to average levels seen in 1990/91 (Figure 2).

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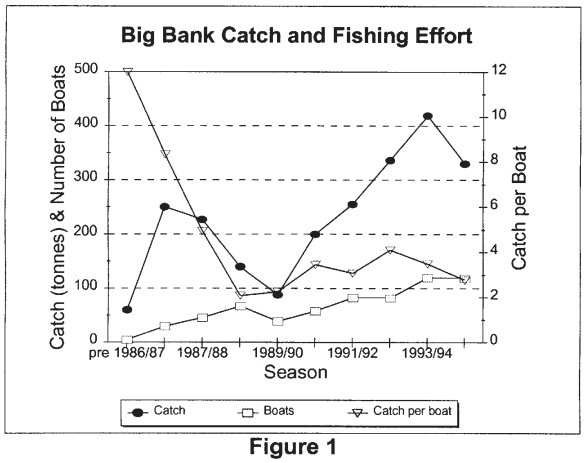

Figure 1

PUERULUS SETTLEMENT

A single collection is all that remains of the 1994/95 puerulus settlement season. Preliminary figures indicate that the mean of Jurien Bay And Seven-Mile Beach puerulus settlement has returned to long-term average levels of about 90 puerulus per collector (Figure 2).

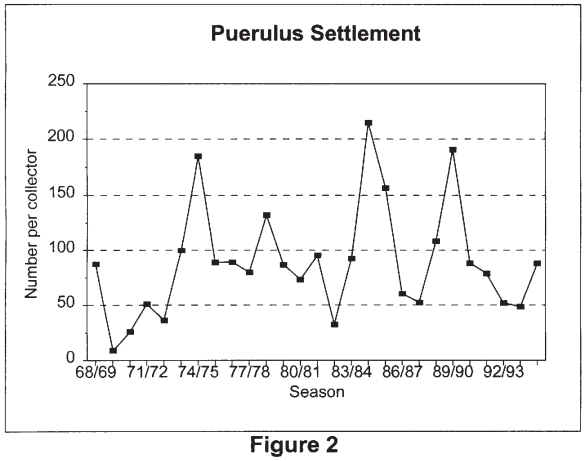

Figure 2

The general index returned to average levels, however, the pattern of recruitment varied along the coast. While the settlement season commenced with average or below average numbers of puerulus settling at most locations along the coast north of Rottnest Island, settlement was generally high from Lancelin north during December, January and February. The exception was Alkimos where very high settlement was recorded throughout the season. The preliminary 1994/95 value for Alkimos falls slightly below the highest values recorded for this location.

Above average settlement was recorded for South Passage (Shark Bay). The pattern of settlement at the Abrolhos followed the recent trend of lower recruitment in the first half of the settlement period. From December large numbers of settling puerulus boosted the index to the levels seen in the 1970s.

Puerulus settlement at Seven-Mile Beach was slightly above long term (25 yrs) average levels while Jurien Bay settlement was below average. Lancelin had good settlement. South of Rottnest Island puerulus settlement remained poor with levels at Warnbro Sound well below average and at Cape Mentelle puerulus have not settled on the collectors since August 1991.

An increase in the Fremantle sea level during March 1995 (A Pearce, CSIRO, pers. comm.) signified the probable end of the long running El Nino-Southern Oscillation (ENSO) event. As a result the Leeuwin Current is now flowing steadily along the coast and possibly may have contributed to the higher puerulus settlement seen this year, but should provide good settlement next year.

MARKETING*

The market in February was slow, however demand for product increased in March and has been maintained, particularly for A and B grade lobsters. The Japanese market is preferring A lobsters while Taiwan is taking predominantly B and C grades.

Although market demand is firm, it is difficult to determine whether it is being driven by a genuine demand for lobster or the exchange rate. The movement in the Yen is intriguing. While it has assisted with sales, an increase in prices has not been a direct result.

Competition from Cuban lobster abated temporarily. However, Cuba is expected to re-enter the market soon with quantities of new season Cuban lobsters expected on the market in August or September.

The lobster tail market (USA) continued to be strong for February and March and exports were up nearly 50% on last year. Big Bank lobsters featured in this upswing.

This season's catch is about average and only a little below the 1993/94 landings. However, the size composition is causing some concern with an apparent increase in larger sized animals compared to previous years. If this trend continues it will pose problems particularly with competing countries' catches on offer at lower prices. (*Research Note: larger grades are a result of the management package causing a carry-over of lobsters to the next season where, having grown, they are available for capture at a larger size and weight, and poorer puerulus settlements contributing relatively lower proportions of the smaller size categories*).

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MEDIA RELEASE 28 JULY 1995

COMMERCIAL FISHERIES PRODUCTION BULLETIN

ROCK LOBSTER FISHERY

1994/95 SEASON

PRODUCTION FIGURES

THE COASTAL FISHERY

Preliminary production figures (for the 1994/95 season to the end of June) show that a total of about 10,800 t had been caught by the 621 licenced fishing vessels during the period 15 November 1994 to 30 June 1995. This figure is 2.0% down on the 11 000 t caught the previous season, however, marginally up on the 10 year average catch of 10,575 t. Catches on a regional basis (see Table 1) were, southern area 8.2% down, central area 1.8% up and northern area 1.3% up on the 1993/94 season.

Table 1. Rock lobster production figures.

Production (t) to end of June 1995

Fremantle	Jurien	Geraldton	Total
3,648	1,631	5,485	10,764

Production (t) to end of June 1994

Fremantle	Jurien	Geraldton	Total
3,973	1,602	5,415	10,990

Difference (t) and percentage difference

Fremantle	Jurien	Geraldton	Total
-325	+29	+70	-226
-8.2%	+1.8%	+1.3%	-2.1%

10 yr cumulative ave. to end of June 1994	= 10,575
Production to end of June 1995	= 10,764
Difference	= *+189*
% Difference	= *+1.8%*

During May and June the fleet was distributed essentially in the inshore and middle grounds. Generally speaking, in the southern sector, the catches taken in the shallows were very average, whereas, in the northern sector, particularly during May, some excellent catches were taken. In the southern area of the fishery the middle grounds produced good quantities of very big animals, particularly males, with large numbers of setose lobsters being returned to the water particularly at the end of the season.

Analysis of processors grade category data supports the general fishermen's observations of an increased proportion of large animals during the past season. The higher than expected catch this year can be partially attributed to increased water temperatures this season due to a relatively stronger Leeuwin Current and due to the growth of the rock lobsters carried over from the previous season as a result of the current management package.

VALUE OF 1994/95 CATCH

The average beach price during the past season was about $26 - 29 per kg. This places a value on this years catch of approximately $300 million to fishermen.

ABROLHOS ISLANDS SEASON

Carrier boat transport figures (numbers of baskets consigned) indicate that the total number of baskets from the Islands area was approximately 7% up on the 1993/94 seasons catch of 1.6 million kg. Therefore, the Islands catch for the 1994/95 season is likely to be approximately 1.7 million kg. Final production figures for the Abrolhos catch will not be known until all the fishermen's monthly returns have been received.

PUERULUS SETTLEMENT

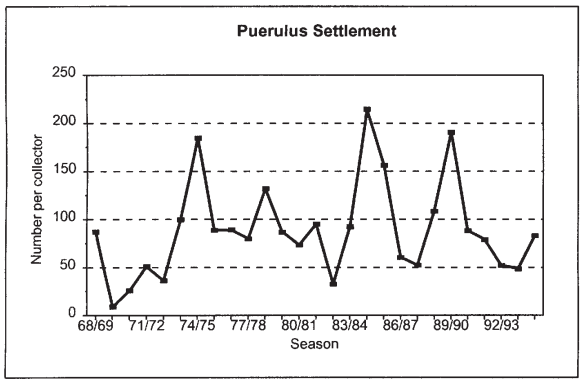
The mean of Jurien Bay and Seven-Mile Beach puerulus settlement for 1994/95 (89 puerulus per collector) which will be used to predict the 1997/98 and 1998/99 catches has now returned to long-term average levels. (Figure 1). Puerulus settlement at Seven-Mile Beach was slightly above long term (25 years) average levels while Jurien Bay settlement was slightly below average. Above average settlement was also recorded for South Passage (Shark Bay). However, the pattern of

This Bulletin is produced by the Research Division of the Western Australian Fisheries Department

recruitment has not been consistent along the coast. Settlement was generally high at all sites from Lancelin northwards during December, January and February. The exception was the Alkimos site where very high settlement was recorded throughout the season. The 1994/95 season total for Alkimos (45 puerulus per collector) falls slightly below the highest value previously recorded for this location in 1988/89. South of Rottnest Island puerulus settlement remained poor with levels at Warnbro Sound well below average and at Cape Mentelle puerulus have not settled on the collectors since August 1991.

The settlement at the Abrolhos followed the recent trend of lower recruitment in the first half of the settlement period, however from December onwards large numbers of settling puerulus boosted the Abrolhos index to its highest value in 9 years reaching the typical levels seen in the 1970's.

An increase in the Fremantle sea level during March - June 1995 (A Pearce, CSIRO, pers. comm.) indicates a stronger Leeuwin Current this year. The Southern Oscillation Index which is an indicator of El Nino - Southern Oscillation (ENSO) event is indicating a probable end to the long running ENSO event. The stronger Leeuwin current should result in good settlement in the 1995/96 year.



OVERSEAS MARKET TRENDS*

U.S.A

Following a very low production of lobster tails during the 1993/1994 season. Prices in the U.S.A. reached levels ranging from US $28.30 to US$ 32.00 per lb during the month of November.
Due to these prices, processors speculated on the production of tails during the months of November, December and January. This resulted in an increase in production of approximately 270,000 kg on the previous corresponding period and a drastic drop in price in the U.S.A. The selling price continued to drop throughout the year to current levels ranging from US$ 22.00 to US$ 25.50 per lb with further drops expected during the forthcoming months. Most packers expected prices to settle around March, however with production increasing by approximately 1/3, and stiffer competition being faced by other origin lobster tails, brokers in the United States are now expecting levels to settle at around US$ 18.00 to US$ 19.00 per lb.

(OUTLOOK FOR 1995/96)
We expect production of lobster tails next season to drop dramatically with packers possibly taking their chances on the whole frozen market.

JAPAN

(WHOLE BOILED/RAW)
During the months of October/November 1994, some processors sold a small volume of boiled pink lobsters at artificially high prices which in turn resulted in high opening beach prices. Although these selling prices were not a true reflection of this market, other processors were forced to obtain similar or higher levels in order to remain competitive. Some processors achieved these levels and some other packers were also forced to renegotiate contracts when it became evident that some Japanese importers managed to obtain product at cheaper levels. This resulted in the market becoming very unstable and importers taking a "wait and see" attitude. As a result of this, selling for pink lobsters which started at US$ 29.00 in November, very quickly dropped to around US$ 25.00/26.00 per kilo by early December. Prices for red colour lobsters were more steady with prices ranging from US$ 30.00 per kg in November and remaining quite stable until March/April when prices started to increase and then in May/June when final offers were made at around US$ 32.50 per kg. Prices for 'B' size lobsters in Japan were steady at US$ 25.50 per kg to US$ 27.00 per kg for pink coloured lobsters and US$ 27.00 to US$ 28.50 per kg for red coloured lobsters.

(LIVE LOBSTERS)
Unlike Taiwan, Hong Kong and China, shipments of live lobsters to Japan increased only slightly on last season. In our opinion, this was a direct result of the economy in Japan and the earthquake in Kobe. Unlike previous years, prices for live lobsters did not fluctuate wildly and ranged from around JPY 3200-JPY 3400 per kg. Again, this reflected economic conditions in Japan, however the weaker Australian dollar against a strengthening yen meant that processors were obtaining a higher return without the need to increase prices.

(OUTLOOK FOR 1995/96)
As far as frozen lobsters are concerned, we are facing stronger competition from other origin lobsters and importers have been warning us for the past 2 seasons that unless our selling prices drop, more end users will remove W.A. lobsters from their menus and replace them with cheaper product from other countries. In regard to live lobsters, next season should see Japan importing approximately the same volume as this past season. However Cuba is starting to improve their live lobster handling and already they have appointed an

exclusive importer in Japan who will provide Cuba with a distribution channel.

TAIWAN

(WHOLE BOILED/RAW)
Taiwanese importers knowing that with high catches during the 'whites' packers would be facing financial pressures which would soon force them to sell at low prices, sat back and refused to order product at prices which would reflect the beach price. As usual this tactic worked and some processors were forced to sell product at prices as low as US$ 22.00 for 'B' size and US$ 20.00 for 'C' size lobsters. After the 'whites' run when importers realised that production of whole boiled lobsters was down considerably on the previous year prices started firming up with prices finishing up at US$ 29.00 for pink 'A' US$ 27.00/27.50 for 'B' and US$ 23.50/24.00 for 'C'.

(LIVE LOBSTERS)
Although prices for live lobsters in this market were relatively low for most of the year volumes exported were much higher than previous years. The preferred sizes were 'C' and 'D', however when these sized were not available buyers accepted some larger sizes. At different times there was also a high demand for 'A' and 'B' size lobsters and the demand for these smaller sizes is expected to increase next season. Prices ranged from as low as US$ 27.00 per kg to US$ 36.00 per kg in June for sizes 'C' up and larger. Prices for 'A' and 'B' peaked at around US$ 43.00 per kg.

(OUTLOOK FOR 1995/96)
Demand for whole boiled lobsters size 'A' and 'B' is expected to remain high with prices staying at the same levels as this season(1994/95). Demand for larger sizes is expected to diminish unless prices are very low as these sizes have to compete with the cheaper Cuban imports. Fortunately, demand for live lobsters is expected to continue to increase, however volumes exported will be influenced by the number of 'Lucky Days' on the lunar calendar and to a greater degree by the volume of air space available.

HONG KONG/CHINA

This market is still mainly a live lobster market and this past season, a record volume of product has been shipped directly into China with very good arrival conditions. The bulk of live lobsters received by China is still sent via Hong Kong, however unlike previous years exports of W.A. lobsters have been steady from the start of the season whereas in the past significant sales would only be made from around March onwards. Prices fluctuated throughout the season with sales being made at levels as low as A $32.00 per kg and closing at around A $49.00 per kg. Fortunately this market takes mainly larger lobsters which would normally be processed as lobsters tails, thus making the low selling prices viable.

(OUTLOOK 1995/96)
Unless the Chinese Government decides in it's wisdom that the consumption of lobsters in not desirable exports of live lobsters to these markets should continue to increase and prices should improve. However this market should be looked upon as a "long term investment' rather than a market which will provide packers with quick profits.

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