REPORT № 15

**DEPARTMENT OF
FISHERIES AND WILDLIFE
WESTERN AUSTRALIA**

The Western Rock Lobster Fishery 1972–1973

BY

G. R. MORGAN

AND

E. H. BARKER

PERTH
WESTERN AUSTRALIA

1974

Department of Fisheries and Wildlife

108 Adelaide Terrace

PERTH

R E P O R T
NO. 15

THE WESTERN ROCK LOBSTER FISHERY 1972-73

by

G.R. MORGAN

and

E.H. BARKER

1974

CONTENTS

FIGURES

TABLES

3

PLATES

(Centre Pages)

1. A modern bondwood Rock Lobster Boat.

2. An older type of carvel planked Rock Lobster Boat

3. Rock Lobster Boat showing large deck space and pot winch

4. A batten pot.

5. A wire beehive pot with bait basket.

6. A load of cane beehive pots.

I   INTRODUCTION

The fishery for the western rock lobster* is one of the most important single fisheries in Australia and an important export earner for the State.   The fishery is governed by a complex set of regulations which have been reviewed by Bowen (1971) and which are designed to limit the total effort to acceptable levels and to enforce a legal minimum size.   It is thus important to constantly monitor the state of the fishery both to ensure that the effort is remaining within the accepted limits and that the regulations are adequately performing their function of maintaining reasonably stable catches.   Inherent in this monitoring of the fishery is a careful examination of fishing practice, gear, etc., which may lead to increases in efficiency which may not be detectable through the usual calculated effort figures.

This paper is envisaged as the first of a series of annual reviews of the previous rock lobster season which will discuss fishing practice, catches, effort, mean size and various other factors, a knowledge of which will help toward a better understanding of the status of the fishery.

II   METHODS

Catch and effort data were extracted from figures supplied by the Commonwealth Bureau of Census and Statistics and also from research log book data, while mean size information was gathered from measurements made by Departmental Research staff aboard commercial vessels fishing from Dongara, Jurien Bay, Lancelin and Fremantle.   Information on trends in fishing practice was gathered principally from conversation with fishermen at various ports as well as from comments made in research log books.

---

*   Referred to as *Panulirus cygnus* George (Morgan, 1974), *P. longipes cygnus* George (Chittleborough and Thomas, 1969) and *P. longipes* (Milne-Edwards) (Dall, 1974)

III   RESULTS

A.   Catch and Effort Data

The fishing season extends from 15 November to 14 August
and may be subdivided into three distinct phases viz. (i)
the "whites" fishery (George, 1958) which begins suddenly
in late November (as pale-coloured newly-moulted rock
lobsters leave the shallow reef areas) and arbitrarily
finishes on 31 December, (ii) the "coastal red" fishery,
which begins on 1 January and ends on 14 August and (iii)
the Abrolhos Islands fishery which is open from 15 March
to 14 August.

In 1972 the "whites" run commenced on about 23 November in
both northern and southern areas which is about the average
time but a few days earlier than the previous season.
Catches and effort (in number of pot lifts) were as follows:

"Whites" catch	=	5,887,500 lbs.
"Whites" effort	=	2,535,600 pot lifts.
"Coastal Reds" catch	=	6,335,960 lbs.
"Coastal Reds" effort	=	5,271,195 pot lifts.
Abrolhos catch	=	2,755,773 lbs.
Abrolhos effort	=	1,329,145 pot lifts.
Total Catch	=	14,979,233 lbs.
Total Effort	=	9,135,940 pot lifts.

These figures include a small amount of fishing in extreme
northern and southern areas and hence differ slightly from
the figures shown in Tables 1 and 2.   Also, these figures do
not include "cash" sales (i.e. rock lobsters which are sold
for cash and are not recorded in the fisherman's monthly
returns of catches) totalling approx. 1,000,000 lbs., or
amateur catches for which estimates have so far not been
obtained.   Figure 1 shows comparative catch, effort and
catch per effort data from previous years.

Catch and effort data from various statistical blocks
(Figure 2) are shown in Table 1 with catches expressed in
pounds weight and effort as number of pot lifts.   Table 2
shows catch per pot data for the same statistical blocks.
Using the method of Gulland (1969) to calculate effective
fishing intensity with each month's effort in pot lifts being
weighted according to the relative catchability in that

6

month (Morgan, 1974), the total effective fishing intensity is 7,252,802 units of effort, which is about 3·8% less than the 1971/72 season.

B.   Mean Size

Samples of rock lobsters were measured aboard commercial vessels using standard pots with 54 mm escape gaps in four depth categories at various ports.   The samples would hence include all commercial size rock lobsters plus undersized which would have been reduced in number by selection by the escape gap (Bowen, 1963).   Mean carapace lengths of males and females in the various depth categories at Fremantle, Lancelin, Dongara and Jurien Bay throughout the fishing season have been compared in Table 3.   The many omissions in the table are due to either fishermen not fishing the area in question or to some circumstance (breakdowns, etc.) which prevented the data from being collected.   These figures will provide a basis for comparison in future years.

C.   Number of boats

The number of boats licenced to fish for rock lobsters is carefully controlled, though boat owners are able to nominate their choice of fishing area viz. north or south of 30°S.

Number of boats licenced in 1972-73   =   807
Number of boats fishing North of 30°S   =   409
Number of boats fishing South of 30°S   =   394

D.   Forecast of 1972/73 Recruitment

A forecast based on the unusually poor settlement of puerulus larvae from the spawning crop of 1968-69, of reduced catches in the 1973-74 commercial fishery, appears to have been anticipated by the relatively poor catches of the 1972-73 season.   (Chittleborough, pers. comm.)

E.   Introduction of New Legislation

1.   As from 8 November 1972, the rock lobster concession area was extended from between latitude 24°S and latitude 34°S to the area between Augusta and Tubridgi Point in Exmouth Gulf, i.e. between latitudes 21°44'S and 34°24'S.

7

2.   As from 15 November 1972, the escape gap size was
      increased from 2 inches (51 mm) to 54 mm and the
      escape gap had to also comply with specifications
      regarding construction.

3.   As from 1 February 1973, the taking of rock lobsters
      by multi-necked pots was prohibited.   This regulation
      was introduced in response to the increasing usage
      of large, multi-necked pots which were found to catch
      more efficiently than the commonly used pots.

4.   As from 1 January 1973, the mile closure regulation,
      which prohibited fishing within one mile of the shore
      after 1 January each year, was rescinded.   It had
      been agreed that, with the introduction of the larger
      escape gap, this regulation, which was originally
      introduced to protect the undersize rock lobsters in
      shallow waters, was no longer appropriate.

5.   As from 4 May 1973, the taking of rock lobsters by
      any person (amateur or professional) by means of
      spearguns, harpoons, Hawaiin slings, gidgies and all
      other pointed instruments was prohibited.   This was
      introduced in order to limit the effectiveness of the
      increasing number of amateur fishermen who were taking
      rock lobsters.
                              SEVEN MILE BEACH
6.   Two areas, one at ~~Cliff Head~~ and one at Jurien Bay,
      were closed to the taking of rock lobsters as they
      were areas in which the CSIRO research team was con-
      ducting research upon juvenile rock lobsters.

Information regarding these changes to the legislation govern-
ing the rock lobster fishery, as well as the Department of
Fisheries and Wildlife's policies on various issues, may be
found in the following volumes of the Fishing Industry News
Service (F.I.N.S.):- Vol. 4 (1971) pp. 3, 29, 48, 66, 70.
Vol. 5 (1972) pp. 2, 3, 20, 30, 31, 46, 47, 64, 66, 71.

      F.   Effects of New Legislation

During the year, the two major changes in the legislation
governing the fishery made were:

1.   the abolition of the "mile limit" (E.4 above) and

2.   the increase in escape gap size (E.2 above)

8

From an examination of Table 3, it seems apparent that the mean sizes inside and outside the old mile limit are not significantly different and hence the regulation does not seem to have produced an accumulation of large animals in the closed area.   In addition, the catch per pot (in numbers) for all areas for all months was similar both inside and outside the mile limit (1.6 and 1.5 respectively).

The effect of the increase in escape gap size may be examined by comparing the catch per pot of undersize rock lobsters in January and February (when most undersize animals are caught) for the 1971/72 and 1972/73 seasons.   This is shown in Table 4, together with catch per pot data for legal size animals.   The tendency was for the numbers of undersize rock lobsters taken by pots to be lower in all areas in 1972/73 when compared with 1971/72.   This may be attributed mainly to the sorting effect of the escape gap (Bowen, 1963) but also to the slightly smaller numbers of juvenile, undersize rock lobsters present on the reefs (see item D. above).   Hence, the larger escape gap seems to be a more effective means of protecting the undersize rock lobsters than the rescinded mile limit regulation which, besides not protecting all of the juvenile rock lobster habitat, was difficult to enforce.

G.   Innovations to Boats and Gear

A replacement trend towards fibre glass boats with motors of greater horsepower continued, enabling the boats to fish more distant grounds and to travel more quickly to the grounds and back.   Deck tanks, for holding legal size rock lobsters while working the gear and returning from the grounds, began to be more widely used.

Following the introduction of new legislation (see E. above) multi-necked pots were no longer used.   Due to handling difficulties and doubts over their efficiency, large single-necked pots were rarely used except in areas or times of high density (e.g. the "whites") or in situations where the gear was not able to be pulled each day.   Under these conditions, the greater holding capacity of the larger pot seemed to offer some advantages although under normal conditions it was less efficient than the commonly used beehive or batten pots.   There appeared to be a slight trend towards increased usage of batten pots in the southern areas.

H.   Bait

The most popular combination of bait was herring (*Arripis*

georgianus) and cattle hocks, or herring and cattle hides.
Salmon (*Arripis trutta*) heads declined in popularity due to
the increasing price and lowered availability.   However,
salmon heads and hocks or salmon heads and cattle hide were
still popular bait.   Other whole fish such as Bony herring
(*Fluvialosa vlaminghi*), mullet (*Mugil cephalus*), mulies
(*Sardinops neopilchardus*), etc. were also used in bait
baskets.   Pieces of cattle hide became increasingly popular
due mainly to the low price, ready availability and good
lasting qualities.

I.   Distribution of Fishing

The distribution of fishing is shown in Table 1.   This
demonstrates how, as usual, the majority of early season
fishing (November - December) was concentrated in shallow
water (Blocks 2814, 2914, 3014, 3015, 3115) and how, probably
as a result of poor weather conditions, fishing effort de-
clined considerably after May in all areas.

J.   Average Number of Days Worked per boat per Month

Month	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug
Days worked	11.5	24.7	15.6	16.1	19.4	19.7	15.6	13.3	13.6	6.6

The average number of days worked per month for the 1972/73
season was 16.2.   The bad weather during the winter months
was a contributing factor to the relatively low level of
effort during June, July and August.

K.   Price of Rock Lobsters

Price to fishermen $1.00 - $1.20 per lb. (whole weight)

Wholesale New York price $A3.03 - $A3.37 per lb. (tail weight)

L.   Market Trends and Economic Factors

Again the majority (99%) of frozen rock lobster tails were
exported to the U.S.A.   The demand for whole rock lobster
increased substantially (by 157%) over the previous year with
the majority being exported to France (48%) and Japan (30%).
Holdings of frozen rock lobster tails in the U.S.A. decreased
slightly.

10

Two revaluations of the Australian dollar and one deval-
uation of the American dollar had the effect of reducing
the price of rock lobsters sold to the United States by
22½%.   This reduced the profitability of rock lobster
boats considerably.

M.   Average Value per Pot on Boat Transfer

About $230 - $250.

N.   Sea Water Temperatures and Salinities

These have relevance to the behaviour and catch rates of
rock lobsters (Morgan, 1974).

The average sea water temperature during the rock lobster
season (i.e. 15 November to 14 August) at Waterman (aquarium
intake temperature) was 20.5°C, with a maximum of 25.4°C on
21 January 1973 and a minimum of 15.6°C on 5 August, 1973.

The average salinity during the season at Waterman (aquarium)
was 35.826 $^{\circ}$/oo, with a maximum of 36.624 $^{\circ}$/oo on 5 March
1973 and a minimum of 35.225 $^{\circ}$/oo on 30 July 1973.

Bottom temperatures and surface salinities in waters of
various depths in the Fremantle, Lancelin, Jurien Bay and
Dongara areas were collected as part of the monitoring of
rock lobster catches (item B.) and are shown in Table 5.
These records will form the basis of comparisons between
areas and between years.   Other records are maintained by
CSIRO.

O.   Spawning Rock Lobsters

While most of the breeding females are found in the 20-30
fathom depth range, no variation was observed in size at
first breeding from one depth category to another.   Hence
the data from all depths may be pooled to indicate the size
frequency of breeding (i.e. "berried" and mated) females
and this has been done in Figure 3.   This shows that the
mean size of breeding females was greater at Fremantle and
Lancelin than at either Dongara or Jurien Bay with the mean
sizes being 95.4 mm for Dongara, 85.6 mm for Jurien Bay,
100.7 mm for Lancelin and 108.5 mm for Fremantle.   By com-
parison,the mean sizes at first breeding (i.e. the smallest
carapace length at which 50 per cent have been mated) was
found by Chittleborough (pers. comm.) to be 82 mm at Dongara,

11

80 mm at Jurien Bay, 96 mm at Lancelin and 95 mm at Fremantle. Sufficient data on the proportion of breeding females to total females above the mean size at first breeding was not available for the 1972/73 season, but will be collected in future years.

P. Sex Ratios

The sex ratio of rock lobsters taken by commercial pots was calculated from the information gathered from the catch monitoring programme and is shown in Table 6.   There was usually, but not always, an increase in the percentage of females with depth, particularly in the Dongara area.

IV   DISCUSSION

Bowen and Chittleborough (1966) calculated the sustainable level of catch for the western rock lobster fishery to be 16,000,000 $\pm$ 2,000,000 lbs. per year, assuming that recruitment can be stabilized and that the regulations introduced in 1963 were effective in reducing and maintaining the effort at an acceptable level.   During the year 1972/73 the total catch was within this range although it was taken by an effort which was some 50% higher than the 1964/65 level of effort.   However, the effort in 1972/73 showed some decrease from the previous year and it may be that, under the present regulations and economic conditions, maximum effort is now being expended by the fleet.

The trend towards increased efficiency of the fishing fleet continued in 1972/73, although a return to average weather conditions after the extremely mild season in 1971/72 resulted in the average number of boat days worked per month falling slightly.   Also, the effective 22½% reduction in price, due to the devaluations and revaluations of the American and Australian dollar, probably contributed to this fall in days worked per month as many boats would find it uneconomical to work during periods of low catch rate.

The 1972/73 season was thus a little below the average of recent years so far as total catch is concerned (Figure 1) with the cause probably being a combination of lowered recruitment and the continued application of greater than optimal effort.

PLATES 1–6
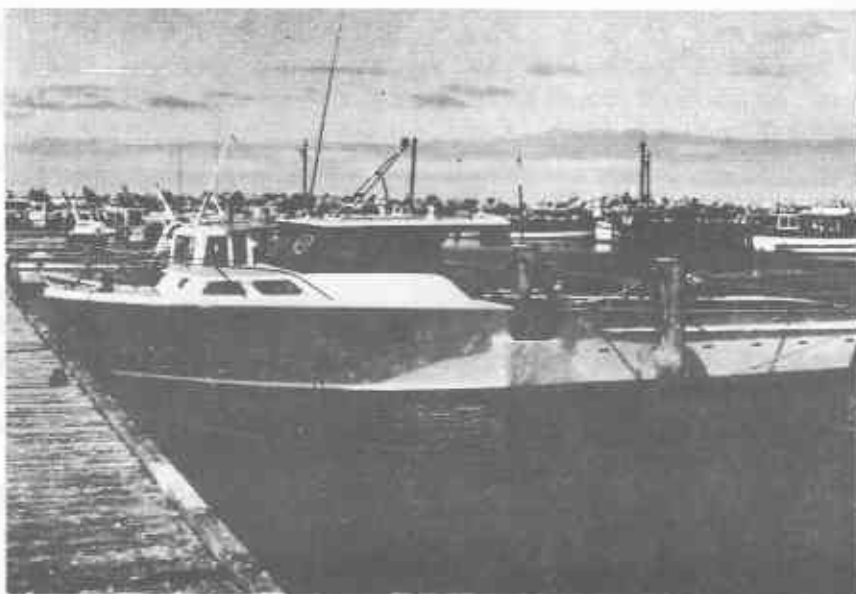
Plate 1.   A modern bondwood Rock Lobster Boat

Plate 2.   An older type of carvel planked
Rock Lobster Boat

Plate 3.   Rock Lobster Boat showing large deck space and pot winch

Plate 4.   A batten pot
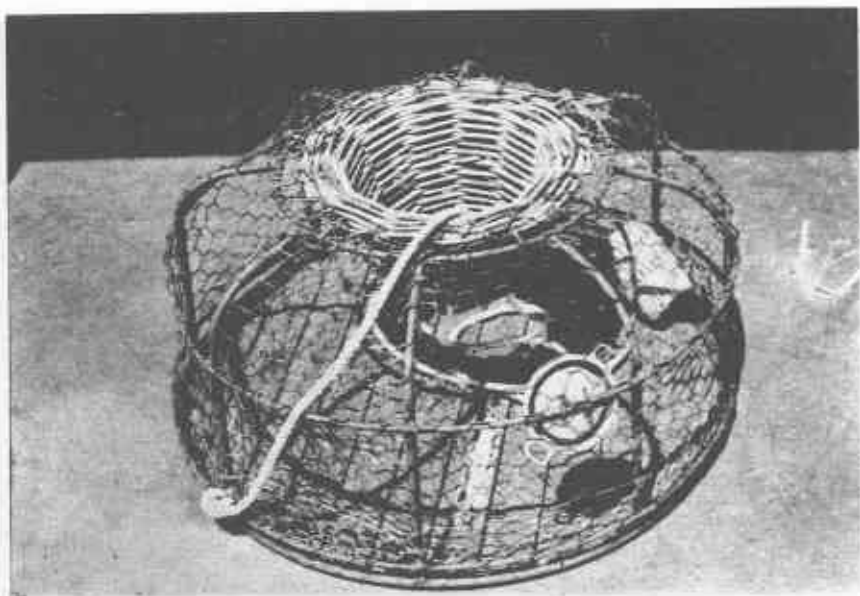
Plate 5.   A wire beehive pot with bait basket

Plate 6.   A load of cane beehive pots

V   ACKNOWLEDGEMENTS

VI   REFERENCES

Bowen, B.K.   (1963).   -   Preliminary report on the effectiveness of escape-gaps in crayfish-pots.
Fisheries Dept. Western Australia, Rep. No. 2.

Bowen, B.K., and Chittleborough, R.G.   (1966).   -   Preliminary assessments of stocks of the Western Australian crayfish, *Panulirus cygnus* George.
Aust. J. mar. Freshw. Res. 17, 93-121.

Bowen, B.K.   (1971).   -   Management of the western rock lobster (*Panulirus longipes cygnus*, George)
Proc. 14th Sess. Indo-Pacif. Fish. Coun., Bangkok, 139-154.

Chittleborough, R.G. and Thomas, L.R.   (1969).   -   Larval ecology of the Western Australian marine crayfish, with notes upon other panulirid larvae from the eastern Indian Ocean.
Aust. J. mar. Freshw. Res. 20, 199-223.

Dall, W.   (1974).   -   Osmotic and ionic regulation in the western rock lobster, *Panulirus longipes* (Milne-Edwards).
J. exp. mar. Biol. Ecol. 15, 97-125.

George, R.W.   (1958).   -   The status of the "white" crayfish in Western Australia.
Aust. J. mar. Freshw. Res., 9, 537-545.

Gulland, J.A.   (1969).   -   Manual of methods for fish stock assessment.
FAO Man. in Fish. Sci. 4 FAO, Rome, Italy.

Morgan, G.R.   (1974).   -   Aspects of the population dynamics of the western rock lobster, *Panulirus cygnus* George II Seasonal changes in the catchability coefficient.
Aust. J. mar. Freshw. Res. 25, 249-59.

FIGURE 1. Rock Lobster Catch, Effort and Catch per unit of Effort Data.

FIGURE 2. Rock Lobster Fishing Areas

FIGURE 3. Length Frequency of Breeding Female Rock Lobsters.

Table 1

Catch (in pounds weight) and effort (in pot lifts) for the 1972/73 Rock Lobster season in Various Statistical Blocks

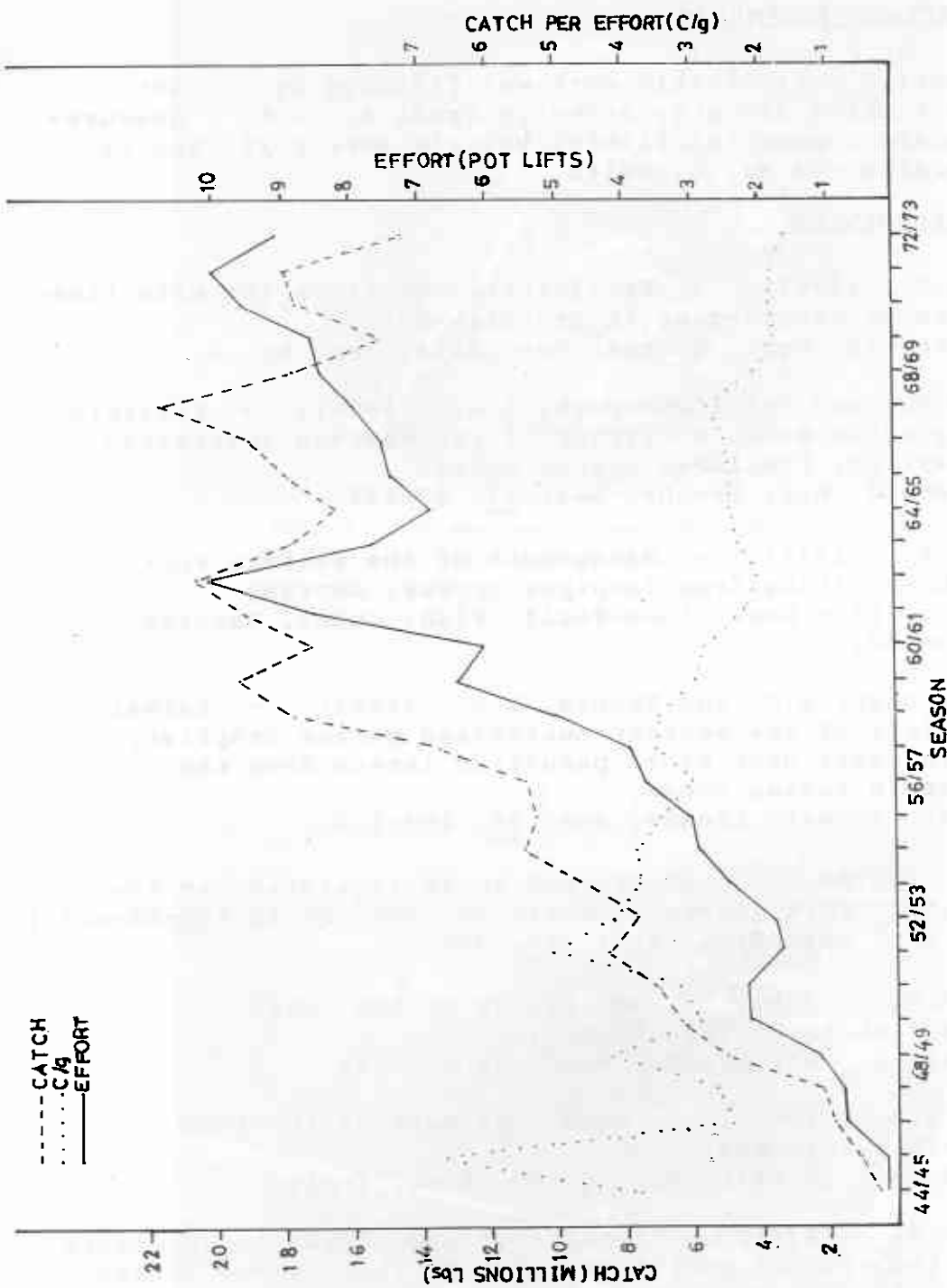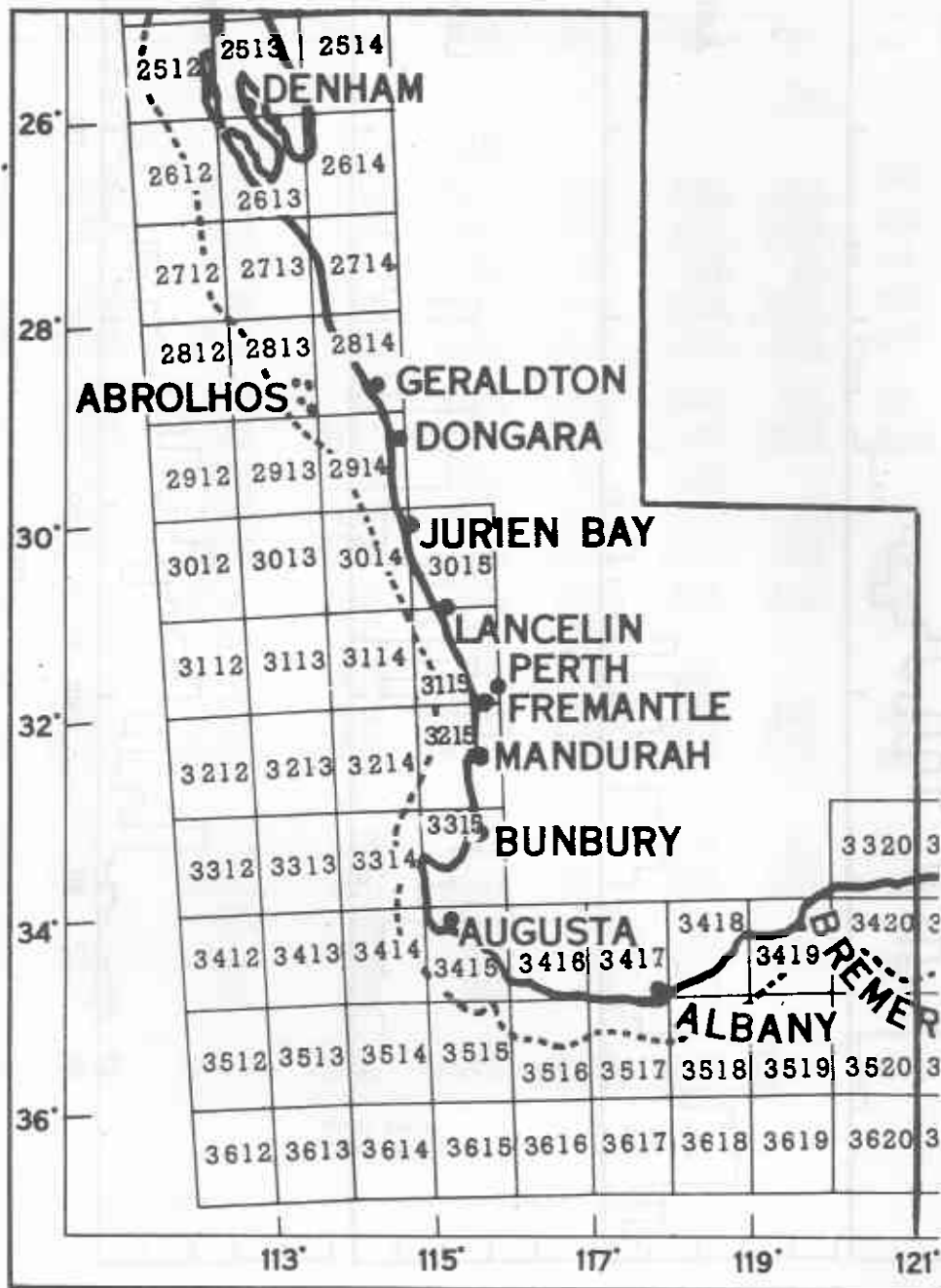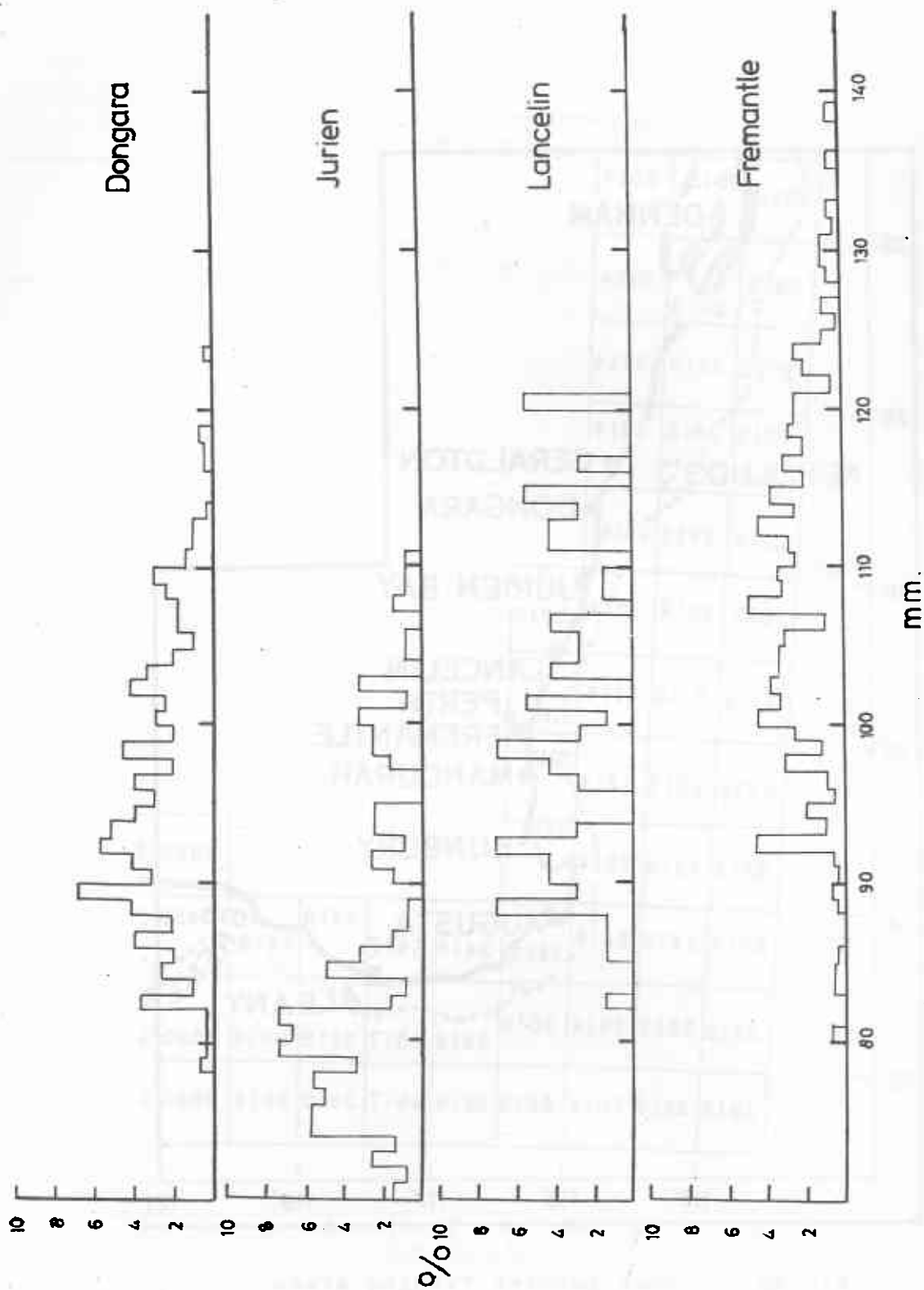| BLOCK	Nov	Dec	Jan	Feb	March	April	May	June	July	August	Total
2612	-	-	-	-	-	-	-	-	-	-	-
2613	-	-	-	-	-	-	-	3063 (2352)	-	-	3063 (2352)
2712	-	-	-	-	1916 (1586)	-	-	-	-	-	1916 (1586)
2713	10263 (8997)	32484 (20612)	38426 (28840)	32975 (27384)	49181 (26610)	40574 (20379)	53956 (21688)	46475 (20895)	46952 (23714)	15569 (9561)	366855 (208680)
2714	4353 (6067)	20691 (13159)	26540 (16247)	10324 (10867)	15603 (12884)	31212 (15726)	25821 (11337)	32901 (11721)	34813 (14500)	22739 (9282)	224997 (121790)
2812	-	-	-	-	4061 (1589)	4436 (2786)	2593 (2300)	656 (642)	1734 (1861)	286 (255)	13766 (9433)
2813	5131 (3858)	2032 (1741)	332 (576)	1292 (2270)	873575 (260976)	1056133 (432771)	468136 (305327)	119877 (128166)	161201 (161651)	68064 (65342)	2755773 (1362678)
2814	211623 (148347)	498005 (269886)	109531 (123244)	79634 (99064)	132282 (93209)	133135 (82433)	122110 (87462)	79911 (67592)	75779 (64655)	23269 (21520)	1465279 (1057412)
2912	-	-	-	-	-	-	-	-	-	-	-
2913	-	19720 (10290)	2747 (2775)	1104 (980)	30906 (11561)	41693 (15220)	16245 (11674)	2663 (2733)	7795 (4634)	2257 (1544)	125130 (61411)
2914	433526 (260326)	1057965 (510267)	246702 (242852)	226737 (227110)	289577 (225969)	228747 (152529)	165969 (149472)	136527 (135669)	134814 (135195)	41998 (43249)	2962562 (2082638)
3012	1069 (702)	11783 (2807)	4865 (1755)	2280 (1404)	2403 (2456)	2347 (1052)	1200 (1169)	-	-	-	25947 (11345)
3013	2398 (1641)	43568 (13655)	11363 (7008)	3600 (4078)	3424 (2879)	7259 (5342)	-	287 (340)	-	-	71899 (35443)
3014	218151 (120220)	957998 (302869)	259218 (184047)	170973 (163221)	226112 (202186)	193238 (168483)	61953 (79171)	48679 (60621)	48772 (60446)	18084 (20731)	2203178 (1361995)
3015	50437 (30441)	258553 (84304)	108671 (72246)	56442 (51298)	62806 (53876)	52935 (42691)	9729 (9744)	5620 (8690)	5111 (7057)	2222 (3050)	612526 (363397)
3112	10011 (3102)	12196 (3807)	7040 (2820)	2320 (2115)	3821 (2679)	4131 (2679)	-	-	-	-	39519 (17202)
3113	2271 (976)	-	9424 (5265)	4760 (4455)	3590 (3134)	-	192 (240)	-	-	-	20237 (14070)
3114	20097 (14358)	137089 (46911)	78454 (46774)	46079 (36975)	44275 (39452)	38340 (29079)	6464 (7235)	3545 (4561)	1060 (724)	620 (900)	376023 (226969)
3115	309764 (167779)	1273728 (372386)	421692 (238036)	308686 (236621)	319665 (275668)	206387 (196719)	72241 (88557)	55956 (69088)	51546 (55185)	18577 (18566)	3038242 (1718605)
3212	-	-	-	-	-	-	-	-	-	-	-
3213	-	-	-	-	-	-	-	-	-	-	-
3214	1110 (1394)	-	2177 (1190)	799 (1020)	4108 (2400)	-	410 (1232)	345 (1002)	48 (95)	253 (52)	9250 (8385)
3215	11582 (9735)	213649 (79655)	120920 (60072)	53069 (43421)	52365 (47219)	53217 (50136)	20269 (28372)	35063 (24740)	16509 (11989)	10767 (5376)	587410 (360715)
3314	30 (91)	-	1600 (1500)	1631 (1260)	1158 (1260)	1000 (1300)	-	-	-	-	5419 (5411)
3315	319 (741)	12581 (5560)	10027 (6268)	11743 (7683)	8094 (8369)	7488 (5380)	3718 (3523)	4323 (4409)	3984 (3312)	2490 (2390)	64767 (47635)
3414	-	50 (1260)	1673 (3600)	1649 (3840)	1843 (2434)	260 (359)	-	-	-	-	5475 (11493)
TOTAL	1292135 (778775)	4552092 (1739169)	1461402 (1045115)	1016097 (925066)	2130765 (1278396)	2102532 (1225064)	1031006 (808503)	575891 (543721)	590118 (545018)	227195 (201818)	

```
Total Catch  =  14 979 233  lbs
Total Effort =   9 090 645  pot lifts
```

Effort figures are shown in parenthesis and catch figures are underlined.

17

Table 2

Catch/Effort Data for 1972/73 Season in Various Statistical Blocks

BLOCK	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Total
2612	–	–	–	–	–	–	–	–	–	–	–
2613	–	–	–	–	–	–	–	1.30	–	–	1.30
2712	–	–	–	–	1.21	–	–	–	–	–	1.21
2713	1.14	1.58	1.33	1.20	1.85	1.99	2.49	2.22	1.98	1.63	1.76
2714	0.72	1.57	1.63	0.95	1.21	1.98	2.28	2.81	2.40	2.45	1.85
2812	–	–	–	–	2.56	1.59	1.12	1.02	.93	1.12	1.46
2813	1.32	1.17	0.58	0.57	3.35	2.44	1.53	0.94	1.00	1.04	2.02
2814	1.43	1.84	0.89	0.80	1.42	1.62	1.40	1.18	1.17	1.08	1.39
2912	–	–	–	–	–	–	–	–	–	–	–
2913	–	1.92	1.00	1.13	2.67	2.74	1.39	0.97	1.68	1.46	2.04
2914	1.67	2.07	1.02	1.00	1.28	1.50	1.11	1.01	1.00	.97	1.42
3012	1.52	4.20	2.77	1.62	0.98	2.23	1.03	–	–	–	2.29
3013	1.46	3.19	1.62	0.88	1.19	1.36	–	0.34	–	–	2.03
3014	1.81	3.16	1.41	1.05	1.12	1.15	0.78	0.80	.81	.87	1.62
3015	1.66	3.07	1.50	1.10	1.17	1.24	1.00	0.65	.72	.73	1.69
3112	3.23	3.20	2.50	1.10	1.43	1.54	–	–	–	–	2.30
3113	2.33	–	1.79	1.07	1.15	–	0.80	–	–	–	1.44
3114	1.40	2.92	1.68	1.25	1.12	1.32	0.89	0.78	1.46	.69	1.66
3115	1.85	3.42	1.77	1.30	1.16	1.05	0.82	0.81	.93	1.00	1.77
3212	–	–	–	–	–	–	–	–	–	–	–
3213	–	–	–	–	–	–	–	–	–	–	–
3214	0.80	–	1.83	0.78	1.71	–	0.33	0.34	.51	4.87	1.10
3215	1.19	2.68	2.01	1.22	1.11	1.06	0.71	1.42	1.38	2.00	1.63
3314	0.33	–	1.07	1.29	0.92	0.77	–	–	–	–	1.00
3315	0.43	2.26	1.60	1.53	0.97	1.39	1.06	0.98	1.20	1.04	1.36
3414	–	0.04	0.46	0.43	0.76	0.72	–	–	–	–	0.48
Total	1.66	2.62	1.40	1.10	1.67	1.72	1.28	1.06	1.08	1.13	

Total Catch   14,979,233 lbs.

Total Effort   9,090,645 pot lifts.

18

Table 3

Mean Carapace lengths (mm) of Male and Female Rock Lobsters in Various Depth Categories at Fremantle, Lancelin, Jurien Bay and Dongara throughout the Fishing Season.

YEAR	AREA	MONTH	Inside 1 mile		Outside 1 mile		10-20 fms		20-30 fms		30+ fms	
			Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
72/73	Fremantle	Nov			79	76	87	82	93	84	94	85
		Dec							101	112		
		Jan	80	77	76	75	84	82	108	105		
		Feb	78	73	82	78	93	86	92	93		
		March			76	72	85	82	92	85		
		April			85	81	94	88				
		May			87	84	99	89	99	104	93	88
		June										
		July										
		Aug										
72/73	Lancelin	Nov	83	77	83	78			87	82	93	86
		Dec	76	75	79	76						
		Jan	82	77	81	78					100	92
		Feb	75	74	84	79						
		March					83	80	92	93		
		April										
		May			78	75			101	95		
		June	77	75	74	73						
		July	72	71								
		Aug			78	76						
72/73	Dongara	Nov	72	67	74	74	74	73	89	85	85	90
		Dec	66	64	76	75	78	75			88	95
		Jan	72	67	66	63	74	73				
		Feb			74	73			97	93		
		March			79	75	78	76	110	91		
		April			75	74	75	74	98	89		
		May	77	74	78	72	79	77	80	80	101	85
		June			76	74			101	92		
		July	76	75	77	75						
		Aug	72	67								
72/73	Jurien	Nov	78	76	80	75	84	78	85	80	88	84
		Dec			80	75			89	90		
		Jan			77	72			96	90		
		Feb	78	77	76	74			97	89		
		March			76	73			100	90		
		April			77	74	79	76			103	98
		May	75	74			96	94				
		June										
		July	78	74	76	73						
		Aug	75	72	76	74						

19

Table 4

Catch per Pot (in numbers) of legal Size and Undersize Rock Lobsters for January and February in various depth categories at Fremantle, Lancelin, Jurien Bay and Dongara for the 1971/72 and 1972/73 Seasons.

Area	Year	0-10 fathoms		10-20 fathoms		20-30 fms		30+ fms	
		Size	U/s	Size	U/s	Size	U/s	Size	U/s
Fremantle	1971/72	1.0	1.1	–	–	1.8	0.04	–	–
	1972/73	0.8	0.7	–	–	1.1	0.02	–	–
Lancelin*	1971/72	–	–	–	–	–	–	–	–
	1972/73	0.9	1.6	–	–	–	–	1.0	0
Jurien Bay	1971/72	1.6	3.1	1.3	3.8	1.1	0.5	2.8	0.5
	1972/73	0.8	0.7	–	–	0.7	0.02	–	–
Dongara	1971/72	0.9	3.5	0.9	4.4	1.6	0.3	1.1	0.2
	1972/73	0.6	3.2	0.2	1.4	2.5	0.2	0.7	0.03

* Measurements were not carried out in this area during the 1971/72 season

Table 5

Bottom temperature (°C), and surface Salinity in parts per thousand for Fremantle, Lancelin, Jurien and Dongara of waters between various depth contours for the 1972/73 season.

Area	Depth	November Temp	Sal	December Temp	Sal	January Temp	Sal	February Temp	Sal	March Temp	Sal	April Temp	Sal	May Temp	Sal	June Temp	Sal	July Temp	Sal	August Temp	Sal
Fremantle	0-10	21.4	35.709			23.8*	36.322	22.8*	36.613			22.6	36.377								
	10-20			20.6	35.732			22.0	36.511												
	20-30			20.6	35.780	24.8	35.865					21.6	35.842			17.4	35.598				
	30+											21.6	35.922								
Lancelin	0-10			22.0	35.867	23.9*	36.443	23.8	36.419							17.0*	35.482			18.5	35.397
	10-20			22.5*	35.823	25.0	36.264									18.9	35.506				
	20-30			21.8	35.823							21.6	35.843								
	30+			21.6	35.570																
Jurien	0-10	21.3	36.235			21.8	35.742			21.8	36.322			19.8*	35.727			17.6*	35.392		
	10-20									21.2	35.865			20.0	35.727			19.0	35.382		
	20-30																				
	30+																				
Dongara	0-10					24.6*	36.176			21.8	35.866			20.0*	36.220			17.4*	35.552		
	10-20					24.0	36.033			21.0	35.826			21.4	35.735			18.2	35.550		
	20-30					23.2	35.784			21.0	35.786			21.4	35.638			18.4	35.538		
	30+					21.8	35.630							22.2	35.589						
						21.9	35.662														

Temperatures and salinities marked * are from within the old one mile limit. Temperatures were taken using an unprotected reversing thermometer and surface water samples were taken and later analysed to determine salinity.

Table 6

1972-73 Sex Ratio by month and depth category
Figures given are % of females in the total

Dongara

Depth Range Fath.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August
0-10 fath inside mile	48%	-	50%	52%	-	-	53%	-	61%	36%
0-10 Fath. outside mile	59%	54%	56%	46%	54%	64%	53%	47%	57%	-
10-20 fath	49%	56%	64%	-	59%	64%	-	49%	-	-
20-30 fath	-	63%	84%	-	80%	49%	72%	52%	56%	-
30+ fath	-	-	90%	60%	-	-	74%	-	-	-

Jurien Bay

Depth Range Fath.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August
0-10 fath inside mile	53%	-	-	43%	36%	-	51%	-	43%	-
0-10 fath outside mile	53%	-	53%	60%	58%	61%	56%	-	55%	61%
10-20 fath	-	62%	-	-	62%	52%	-	-	-	-
20-30 fath	-	55%	76%	55%	68%	67%	-	-	-	-
30 + fath	-	47%	-	-	-	47%	-	-	-	-

Lancelin

Depth Range Fath.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August
0-10 fath inside mile	-	55%	49%	61%	60%	-	-	52%	54%	-
0-10 fath outside mile	-	58%	56%	64%	46%	-	54%	61%	-	54%
10-20 fath	-	-	-	-	43%	-	-	-	-	-
20-30 fath	-	64%	-	-	30%	-	56%	-	-	-
30 + fath	-	68%	-	50%	-	-	-	-	-	-

Fremantle

Depth Range Fath.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August
0-10 fath inside mile	49%	-	48%	52%	-	-	-	-	-	-
0-10 fath outside mile	58%	-	-	53%	51%	54%	35%	45%	-	-
10-20 fath	-	54%	58%	73%	40%	59%	44%	51%	53%	-
20-30 fath	-	52%	-	-	43%	60%	-	-	51%	-
30 + fath	57%	-	-	-	-	-	-	-	83%	-

22