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Western rock lobster management for seasons 2001/2002 and 2002/2003 : a discussion paper

Kevin Donohue

WESTERN ROCK LOBSTER MANAGEMENT FOR SEASONS 2001/2002 AND 2002/2003

A DISCUSSION PAPER

by

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on behalf of the Rock Lobster Industry Advisory Committee

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EXECUTIVE SUMMARY

The RLIAC has produced this discussion paper primarily to provide a basis for discussion on management options for seasons 2001/2002 and 2002/2003 but also in response to rock lobster association suggestions made to the RLIAC. The release of this paper is an important step in the development of the RLIAC's management advice because it provides a framework for ongoing discussions.

In Part One of this paper the discussion is focused on the suggestion that the 2001/2002 catch be increased. In Part Two other suggestions, by associations, that are primarily concerned with other aspects of the management of the fishery are discussed.

The suggestion to increase the catch, primarily in Zone C, is based on consideration of catch predictions and estimates of egg production in relation to the targets set for the fishery.

Catches for the fishery are predicted to decline from around 14,000 tonnes for the current season to between 9,350 and 10,250 tonnes in 2001/2002 after which they are expected to increase to between 10,750 and 11,700 tonnes in 2002/2003. Egg production at the start of the 2002/2003 season is expected to be five per cent below the target in Zone A, 18 per cent above in Zone B and 28 per cent above in Zone C.

As the breeding stock is considered to be above the target level (particularly in Zone C) it has been proposed by some sections of the industry that there is an opportunity to take additional catch and the best time to do this is in 2001/2002 when there is a catch trough (in Zone C).

The following management changes have been generally suggested by industry as having the scope to increase the catch in 2001/2002:

- removing the maximum size rule;
- allowing setose females greater than 105 mm carapace length to be kept;
- increasing pot usage; and
- extending the length of the season by one month.

Removing the maximum size rule all season is expected to result in additional catches of about **290 tonnes in total; 40 tonnes (2 per cent increase) from Zone A, 90 tonnes (3 per cent increase) from Zone B and 160 tonnes (3 per cent increase) from Zone C**. Less would be caught if the change applied from 1 January onwards.

Allowing setose females greater than 105 mm carapace length to be kept all season is expected to result in additional catches of about **930 tonnes in total; 130 tonnes (8 per cent increase) from Zone A, 240 tonnes (8 per cent increase) from Zone B and 560 tonnes (13 per cent increase) from Zone C**. Less would be caught if the change applied from 1 January onwards.

Pot usages of about 87 per cent in Zone A (Abrolhos Islands), 87 per cent for Zone B and 85 per cent for Zone C are expected to give equivalent catch increases to removing the maximum size rule. Increasing pot usage to 94 per cent in Zone A (Abrolhos Islands), 94 per cent in Zone B and 93 per cent in Zone C are expected to give equivalent catch increases to allowing setose females greater than 105 mm carapace length to be kept. Pot usages for Zone A and Zone B have been made the same to keep a consistency in pot usage in the northern zone even though a higher pot usage in Zone A in some cases may be required to give the desired catch increases.

Extending the length of the season by one month in 2001/2002 is expected to result in additional catches of about **1010 tonnes in total; 90 tonnes (5 per cent increase) from**

Zone A, 280 tonnes (9 per cent increase) from Zone B and 640 (6.5 per cent increase) tonnes from Zone C.

Allowing the retention of additional mature females should have an immediate but short-term impact on egg production. In contrast increasing pot usage and extending the season should have less impact on egg production in the short term because new recruits of both sexes would mostly be taken. Increasing pot usage and extending the season should have a delayed impact on egg production. In comparison to the other options these two options should increase fishing costs.

It is possible for the northern and southern Zones to have different approaches to management for the 2001/2002 season.

Industry suggestions discussed in part two of the paper which may or may not impact on the catch are listed below and discussed in this paper:

- closing Zone B from 10 January to 9 February;
- introducing a nomination system that gives Zone A and B licensees the choice of fishing Zone B in January or July;
- increasing the maximum pot usage to 150;
- permitting pots to be hauled at night at Big Bank;
- removing separate management arrangements for the Big Bank zone;
- removing the 20 fathom line restriction on Zone A licensees; and
- removing the 77mm minimum size rule in Zone B.

A brief discussion of management arrangements for the 2002/2003 season is provided for the purposes of enabling the RLIAC to implement a three-year rolling plan for the fishery.

A period of around six weeks (July to August) is being allowed for submissions on this paper. After which, the RLIAC will discuss its revised proposal with industry on the coastal tour in October (9th to 13th). Following the coastal tour the RLIAC expects to be in a position to provide the Minister with its management advice for the 2001/2002 and 2002/2003 seasons.

DESCRIPTION OF MANAGEMENT OPTIONS

This section contains a brief description of the changes which would occur if the options discussed in this paper were implemented. These management issues are discussed in response to industry suggestions and although options are presented this should not be taken to mean that they are supported by the RLIAC.

Part One: Options for Increasing the Catch in 2001/2002

Maximum Size

1.1 Remove the maximum size rule at the start of the season.

If this change was made fishermen would retain non-setose females greater than 115 mm carapace length in Zone C and 105 mm carapace length in Zones A and B all season.

1.2 Remove the maximum size rule from the 1January.

If this change was made fishermen would retain non-setose females greater than 115 mm carapace length in Zone C and 105 mm carapace length in Zones A and B from 1 January onwards.

Setose Rule above 105 mm

2.1 Allow all female rock lobsters greater than 105 mm carapace length to be retained all season.

If this change was made, fishermen would retain all female (including setose females) lobsters they caught greater than 105 mm carapace length all season.

3.4 Allow all female rock lobsters greater than 105 mm carapace length to be retained from 1 January for the rest of the season.

If this change was made, fishermen would retain all female (including setose females) lobsters they caught greater than 105 mm carapace length from 1 January onwards.

Pot Usage

3.1 Increase the pot usage to give a catch increase equivalent to option 1.1 above.

If this change was made Zone A licensees would operate 87 per cent of their pots, Zone B licensees 87 per cent and Zone C licensees 85 per cent.

3.2 Increase the pot usage to give a catch increase equivalent to option 1.2 above.

If this change was made Zone A licensees would operate 87 per cent of their pots, Zone B licensees 87 per cent and Zone C licensees 85 per cent.

3.3 Increase the pot usage to give a catch increase equivalent to option 2.1 above.

If this change was made Zone A licensees would operate 94 per cent of their pots, Zone B licensees 94 per cent and Zone C licensees 93 per cent.

3.4 Increase the pot usage to give a catch increase equivalent to option 2.2 above.

If this change was made Zone A licensees would operate 92 per cent of their pots, Zone B licensees 92 per cent of their pots and Zone C licensees 91 per cent of their pots.

Extend the Season by one month

4.1 Extend the season by one month in 2001/2002.

If this change was made, fishing would continue in all zones up to the 31 July. Zone A licensees would fish Zone A, Zone B licenses and so on. The rules applying prior up to the 30 June would carry over to the July period.

Part Two: Options for Other Management Issues

Zone B Closure

5 Close Zone B from 10 January to 9 February.

If this change was made all Zone A and Zone B licensees would stop fishing from 10 January to 9 February.

Nomination Zone B

6 Introduce a nomination system that gives Zone A and B licensees the choice of fishing Zone B in January or July.

If this change was made Zone A and Zone B licensees would nominate to fish Zone B either in January or July, they could not fish both periods and Zone A would be closed as usual on the 30 June.

150 Pot Rule

7 Increase the maximum pot usage to 150

If this change was made, the maximum pot usage would increase to 150. A licensee therefore would need to hold 183 pots to reach the maximum pot usage of 150 if the pot usage was 82 per cent. However, if for example the pot usage were to increase to 90 per cent a licensee would only need to hold 166 pots to enable them to use the maximum number.

Night Hauling Big Bank

8 Permit pots to be hauled at night at Big Bank

If this change was made those fisherman fishing Big Bank could haul their pots at any time, they would no longer be restricted to daylight hours.

Big Bank

9 Remove separate management arrangements for the Big Bank zone

If this change was made Big Bank would no longer be treated any differently to the rest of Zone B. Zone B fisherman could fish the Big Bank area from the start of the season and Zone A licensees until the 14 March. As there would be no nomination system fishermen could come and go as they pleased.

20 Fathom line

10 Remove the 20 fathom line restriction on Zone A licensees

If this change was made Zone A licensees would no longer be restricted to fishing deeper than 20 fathoms from the 1 March until the opening of the Abrolhos Islands. Zone A licensees could therefore fish coastal Zone B waters right up to the 15 March.

OPTIONS SUMMARY TABLE

PART 1. OPTIONS FOR INCREASING THE CATCH IN 2001/2002

Regulation	No	Option	Additional Catch*			
		Zone	A	B	C	All
Maximum Size**	1.1	Remove - all season	40	90	160	290
	1.2	Remove - 1 January to 30 June	40	90	150	280
Setose	2.1	Take all females above 105 mm all season	130	240	560	930
	2.2	Take all females above 105 mm 1 Jan. to 30 Jun.	130	190	480	800
Pot Usage (%)***		Zone (Pot Usage %) A B C				
Option 1.1 =	3.1	87 87 85	40	90	160	290
Option 1.2 =	3.2	87 87 85	40	90	150	280
Option 2.1 =	3.3	94 94 93	130	240	560	930
Option 2.2 =	3.4	92 92 91	130	190	480	800
Fishing Period	4.1	Extend the season by one month in all Zones	90	280	640	1010

*** Tonnes rounded to reflect the precision of the estimates.**

**** Of the above changes the maximum size rule could be removed permanently, all other changes are for the 2001/2002 season only.**

***** Zone A pot usage made to be consistent with Zone B pot usage.**

PART 2. OPTIONS FOR OTHER MANAGEMENT ISSUES

Issue	No	Option
Zone B Closure	5	Close Zone B from 10 January to 9 February
Nomination Zone B	6	Allow Zone A and B licensees to nominate to fish Zone B either in January or July on a trial basis
150 Pot Rule	7	Increase the maximum pot usage to 150
Night Hauling	8	Permit pots to be hauled at night at Big Bank
Big Bank	9	Remove separate management arrangements for Big Bank
20 Fathom Line	10	Remove the 20 fathom line restriction on Zone A licensees

Submissions

Licensees can make a submission to the RLIAC using the enclosed form and return it in the self addressed envelope. Other interested persons and associations wishing to make a submission directly to the RLIAC should address their written submission to:

Executive Officer RLIAC
Fisheries WA
Locked Bag No 39
Cloisters Square Post Office
Perth WA 6850

The closing date for written submissions is Tuesday 29 August 2000

Inquiries

Inquires should be directed to:

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BACKGROUND

Introduction

The industry is arguably experiencing its best period since the introduction of the 1993/94 management package. The breeding stock is about or above the 1993/94 targets. The Marine Stewardship Council has certified the fishery and the Legislative Council of Western Australia Standing Committee on Ecological Sustainable Development (ESD) has concluded that the fishery is being managed along ESD principles (Report No. 6, Sharp 2000).

The 1993/94 management package has delivered not only a larger breeding stock but also provided:

- a better economic performance;
- a redistribution of the catch from 'whites' to 'reds'; and
- a greater certainty that the sustainability of the stock will be maintained in the long term.

With the industry being in such good shape there seems to be no compelling reason to change the fundamentals of the management of the fishery. This is a commonly held view by a lot of fishers which, to a large degree, the RLIAC shares. However, there may be opportunities to 'fine-tune' some of the management of the fishery and perhaps better utilize the stock.

Purpose

This paper has been produced to provide a forum for discussion on management issues and respond to fishermen's suggestions about management changes. In doing so this paper forms an important component of the annual planning process to develop management advice for a three year rolling plan endorsed by industry last year and is part of the deliberative process in the RLIAC fulfilling its function of providing the Minister with management advice for the fishery.

Specifically, the purposes of producing this RLIAC discussion paper are to:

- respond to industry submissions;
- inform industry of the management changes rock lobster associations have suggested;
- provide a basis for consultation with industry on rock lobster management issues;
- promote discussion within industry on rock lobster management issues; and
- provide an opportunity for industry to participate in the formulation of the RLIAC's management advice.

The paper is divided into two parts, the first part deals with the suggestion that the catch be increased in the 2001/2002 season while the second part is concerned with other aspects of management.

Each of the following management options suggested by industry as having the scope to increase the catch in 2001/2002 is discussed in detail in Part One:

- removing the maximum size rule;
- allowing setose females greater than 105 mm carapace length to be kept;
- increasing pot usage; and
- extending the length of the season by one month.

The management issues discussed in Part Two (listed below) are primarily concerned with aspects of management not as directly related to the sustainability of the fishery:

- closing Zone B from 10 January to 9 February;
- introducing a nomination system that gives Zone A and B licensees the choice of fishing Zone B in January or July;
- increasing the maximum pot usage to 150;
- permitting pots to be hauled at night at Big Bank;
- removing separate management arrangements for the Big Bank zone;
- removing the 20 fathom line restriction on Zone A licensees; and
- removing the 77mm minimum size rule in Zone B.

The suggestions by associations as they relate to management changes are referred to where possible in the discussion. Not all associations have made submissions and some have limited their comments to certain aspects of management and not others.

Three-Year Rolling Plan Concept

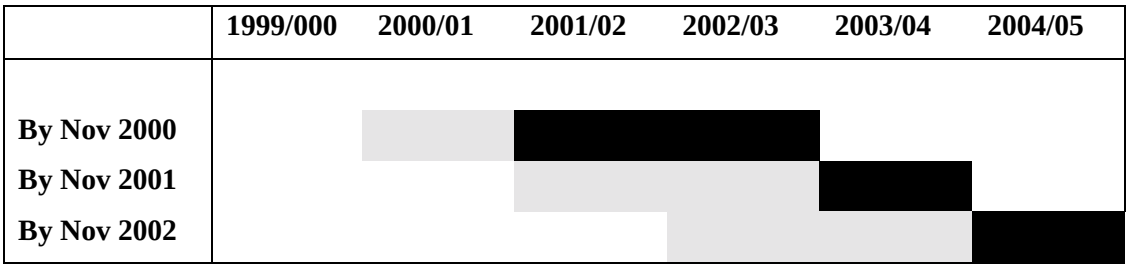
The RLIAC notified industry of its intention to introduce a three-year rolling plan for the fishery in November 1999. The plan was aimed at enabling the RLIAC to provide the Minister with much longer term management advice for the fishery.

The plan, as illustrated in the *Operational and Work Plans for the West Coast Rock Lobster Managed Fishery* brochure,(circulated to industry in 1999) showed the RLIAC's advice extending over four seasons, that is, three seasons beyond the **current season**. As explained at the RLIAC 1999 coastal tour, it is not feasible to provide advice that far forward because catch predictions for the fourth year out are not available at the time the advice is required. The plan has therefore been adjusted to provide management advice extending over three seasons (that is, two seasons ahead of the next season).

To establish the three-year rolling plan the RLIAC intended to advise the Minister of its recommendations for the 2000/2001 and 2001/2002 seasons in November 1999. The Minister approved the committee's recommendation to make no change to the management package introduced to rebuild the breeding stock for the 2000/2001 season. However, the committee, in November 1999, was not in a position to provide advice to the Minister for the 2001/2002 season. This was because it wanted to consider the arrangements for 2001/2002 season, a low predicted catch season, in the context of the 2002/2003 catch prediction which was not available at the time.

Accordingly, the RLIAC has revised its implementation timetable to establish a three-year rolling planning cycle for the fishery which is illustrated in Figure 1 below.

Figure 1 Three-year rolling plan



[redacted] Management advice for new seasons added

Under this implementation timetable advice for the 2001/2002 season and preliminary advice for the 2002/2003 season will need to be settled by November 2000, thereby installing management advice over three seasons by the end of 2000. Preliminary advice for the 2003/2004 season should then be discussed the in 2001 for finalisation by November 2001 and so on.

Year 2000 Planning Process

To give further certainty and structure to the development of its management advice and provide the greatest opportunity for input from industry into the development of the committee's advice for the 2001/2002 and 2002/2003 seasons the RLIAC has established the following process for 2000 (Figure 2).

Figure 2 Year 2000 planning process

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
RLIAC Meetings	●			●			●		●	
Drafting options paper	●	●	●	●	●					
Options paper discussed by RLIAC				●						
Options paper released and submissions invited						●	●			
Revised proposal/s discussed at Coastal tour									●	
Minister advised										●

The process provides at least three opportunities for industry to make submissions, that is:

- prior to and during the drafting phase of the options paper;
- a period following release of the options paper; and
- at the coastal tour.

Fishery Objectives

The management objectives for the fishery in order of importance are:

Primary

That the management arrangements adopted would ensure that the abundance of breeding lobsters is maintained at or above the levels in the late 1970s early 1980s, that is, about 20-25 per cent of the unfished parental biomass.

Secondary

That the management arrangements adopted would properly take into account market requirements, industry structure and 'whole of industry' operating costs, in order to maximize returns to the industry from an appropriate level of catch.

Assessment of the 1993/94 Management Package

The last major change to the management arrangements for the fishery occurred in 1993/94 as a result of concerns about the breeding stock. The specific objective for the fishery then was:

"that the management measures adopted would arrest the ongoing decline in breeding stock and seek to re-establish the number of breeding female rock lobsters to levels consistent with known historic safe levels in the fishery"

Specific targets for breeding stock increases were set depending upon the level of improvement required (see *Fisheries Management Papers Nos 54 and 55*). While mindful of the breeding stock targets, the committee sought to take advantage of the forthcoming above average and average recruitment years to push a pulse of females into the breeding stock. A secondary outcome was to reduce the catch of 'whites', enhance the catch of 'reds' and transfer about 1000 tonnes of catch to the following season.

Impact of the package on the breeding stock

The impact of the package on egg production, as derived from the model used to evaluate the management options for the 2001/2002 season, is presented in Table 1 and displayed in Figure 3.

The egg production is that which is expected at the beginning of season 2002/2003 if the current rules are maintained. The targets presented in Table 1 are expressed as a percentages of virgin egg production. These targets are what the 1993/94 management package was intended to achieve (that is, estimates of the egg production of the late 1970s and early 1980s).

Table 1 ***Estimated egg production by region as a percentage of virgin egg production at the beginning of the 2002/2003 fishing season***

Zone	Target	Mean	95% Confidence Limits	
			Lower	Upper
A	22%	20.8%	18.8%	26.9%
B	8%	9.4%	0.8%	22.8%
C	24%	30.8%	10.4%	60.1%

Table 1: 95 per cent confidence limits show the range of values that egg production is likely to fall within using the modelling methods developed by Fisheries WA Research Division.

Figure 3 Estimated egg production by Zone at the beginning of the 2002/2003 season

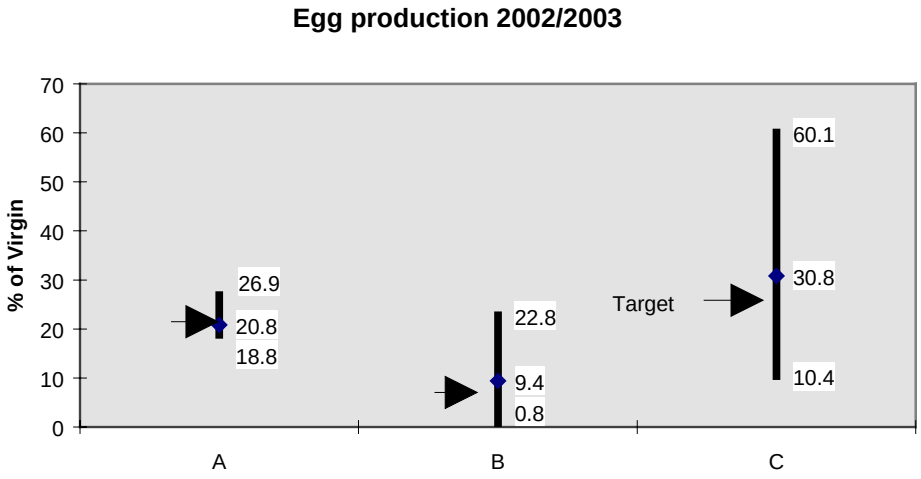


Figure 3. In the above figure the mean value of the egg production is shown with the range of values it is most likely to lie between i.e. for Zone A the mean is 20.8 per cent but it could be as low as 18.8 per cent or as high as 26.9 per cent. The arrow shows the target for each of the Zones.

In summary, the mean egg production, assuming the current rules remain in place, is estimated at the start of the 2002/2003 season to be 28 per cent above the target for Zone C, 18 per cent above the target for Zone B, 5 per cent below the target for Zone A. In should be noted that the Zone A results reported are not as reliable as those for Zones B and C.

Impact of the package on the catch in each zone

In summary the impact on the catch of the package as detailed in the Commercial Fisheries Bulletin *The Effects of Five Years (1993/94 to 1997/98) of Stable Management in the Western Rock Lobster Fishery* and from a preliminary research assessment (FWA internal report) was:

- The catch from 1993/94 to 1997/98 in Zone A was 10 per cent greater than that expected from puerulus settlement. Higher than expected landings in Zone A were a result of improvements in the deeper water catches.

- The short term loss of catch in Zone B (the difference between actual and predicted catch) during 1993/94 was around 17 per cent. However, over the longer term the loss was of the order of 4 per cent after taking into account the change in effort.

- For Zone C the catches predicted from the puerulus settlement were almost identical to those actually landed. Based on the analysis, the management package appeared to have little impact on the Zone C catch.

Impact of the individual elements of the package

The importance of each individual element (setose rule, maximum size, 18 per cent pot usage and 77 mm size limit) are discussed below.

Maximum size

The weight of lobsters handled above the maximum size showed a 300 per cent increase over the period 1993/94 to 1998/99. However, there were relatively only small numbers of large female lobsters before the introduction of the maximum size and the build up was slow.

If used alone the prohibition on taking females lobsters above the maximum size was estimated to have increased the breeding stock from that measured in 1993/94 by 12 per cent, 36 per cent and 11 per cent in Zones A, B and C respectively.

Setose rule

The number of setose lobsters handled has shown a 50 per cent increase across the fishery over the period 1993/94 to 1997/98, with variable increases in each zone. Specifically, the weight of setose handled has increased by about 135 per cent, 14 per cent and 65 per cent in Zones A, B and C respectively (*Commercial Fisheries Research Bulletin 1998*). If used alone he setose rule was estimated to have increased egg production 26 per cent, 71 per cent, 44 per cent in Zones A, B, C respectively.

Pot reduction

By the end of 1997/98 pot lifts were about 4.5 per cent greater than in 1993/94, a similar number of pot lifts to the late 1970s/early 80s. However, the **effectiveness** of the effort in 1997/98 would have been greater than the late 1970s early 80s.

If used alone scientists have estimated the 18 per cent pot reduction would have increased egg production from that recorded in 1993/94 by 16 per cent, 42 per cent and 30 per cent, for Zones A, B, C respectively (Hall *et al* in prep.).

Minimum size (77mm)

When comparing actual catches from 1993/94 onwards to those predicted from puerulus settlement, an average shift in catch from ‘whites’ to ‘reds’ of about 10 per cent was estimated for B zone and about 6 per cent for C zone (*Commercial Fisheries Research Bulletin 1998).*

Tagging data indicated that the vast majority of 76 mm lobsters thrown back during the ‘whites’ fishery are recaptured in deeper waters adjacent to the nursery area from which they migrated (*Commercial Fisheries Research Bulletin 1998*). The minimum size increase to 77mm was estimated to have the least impact on the catch and breeding stock in Zone C and Zone B.

Conclusion

From the modelling assessment of the impact of the package over the period 1993 to 1999 the breeding stock has been estimated to have almost doubled in the south coastal fishery (Zone C), more than doubled in the north coastal fishery (Zone B), and increased by about 50 percent in Zone A. Egg production is now estimated to be at (Zones A & B) or slightly above (Zone C) the target levels of the late 1970s and early 1980s. This is also confirmed by the independent breeding stock surveys and is reflected in the numbers of setose females being handled.

There appears to have been no significant long-term loss of catch from that predicted from puerulus settlement since the introduction of the 1993/94 management package. In fact in one instance, Zone A, the catch was higher than that expected from puerulus settlement. Significantly, the breeding stock has been rebuilt without any major long-term loss of catch.

Generally, the setose and 18 per cent pot reduction appear to be the most effective regulations increasing egg production in each of the zones although the impact of each element varied between zones.

In summary, the management package introduced in 1993/94 has been very successful in rebuilding the breeding stock and in:

- lowering fishing costs and thereby improving the returns from the fishery;
- redistributing the catch from 'whites' to 'reds';
- decreasing congestion on fishing grounds; and
- providing a greater certainty that the sustainability of the stock will be maintained in the long term.

Catch Predictions

Catch predictions are given for the next three seasons in Table 2 and displayed in Figure 4. These predictions indicate that after the record catch for the 1999/2000 season catches are expected to decline to a low of between 9,350 to 10,250 tonnes in 2001/2002, after which the catch is predicted to increase to between 10,750 to 11,700 tonnes in 2002/2003.

Table 2 Catch predictions (t.) over the period 1999/2000 to 2002/2003

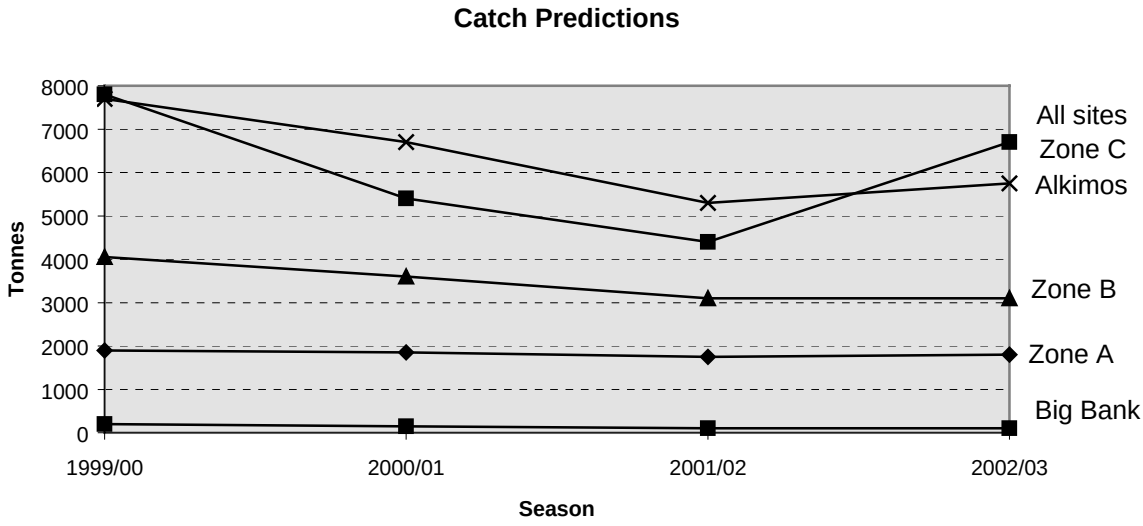
Season	Zone A	Big Bank	Zone B	Zone C	Total
1999/00	1900	200	4050	7700*	13 850
				7800**	13 950
2000/01	1850	150	3600	6700*	12 300
				5400**	11 000
2001/02	1750	100	3100	5300*	10 250
				4400**	9 350
2002/03	1800	100	3100	5750*	10 750
				6700**	11 700

Zone B excludes Big Bank

Zone C prediction using Alkimos* & all sites**

The 2002/2003 catch predictions are based on the current rules remaining in place until season 2002/2003. However, if the rules were to change then the catch prediction could be expected to change, the amount being dependent on what change was made.

Figure 4 Catch predictions 1999/2000 to 2002/2003



PART ONE - OPTIONS FOR INCREASING THE CATCH IN 2001/2002

Introduction

The management strategy for the 2001/2002 season under consideration at the suggestion of industry is to: **increase the catch by around 250 - 1000 tonnes.**

The rationale for this management strategy appears to be twofold:

- that there is additional stock that can be harvested without compromising the management objective for the fishery i.e. put the breeding stock at risk; and
- that it is preferable to take additional catch in low catch years (which happens to be 2001/2002 in Zone C) rather than high catch years.

Some of the factors to consider in evaluating this strategy are:

- the fishery objective;
- the objectives of the *Fish Resources Management Act 1994;*
- research advice on the status of the breeding stock;
- catch predictions;
- submissions from associations; and
- the assessment of the 1993/94 management package.

There are differing views on harvesting the breeding stock and for the sake of completeness these are presented below.

Some of the arguments against taking additional catch in 2001/2002.

- It is often argued by licensees that having suffered the 'pain' over a long period of time to rebuild the stock it would not prudent to put it at risk again.
- There is uncertainty about whether the breeding stock targets set in 1993/94 are the right ones for the fishery.
- The egg production estimates have a large degree of variability.
- The higher catches in recent years should have provided a financial buffer against a lower catch.

Some of the arguments in favour of taking additional catch in 2001/2002.

- Although there is variability about the level of egg production, the best estimates available are that egg production at the start of the 2002/2003 season will be about or above the mid-70s and early 80s.
- An accumulation of larger females may lower productivity by creating a scarcity in habitat for younger animals.

- Harvesting additional stock increases the return to the fishery in a low catch season.
- That the risk of lowering the breeding stock to an unacceptable level with a one off increase in exploitation in 2001/2002 is low.

Submissions

The majority of associations have not expressed a view on increasing the catch in 2001/2002 (Table 3, details of submissions are provided in Appendix 1). Whilst recognizing that this is the case the RLIAC, in any event, is presenting the information relevant to increasing the catch noting that **maintaining the *status quo* is an acceptable alternative strategy.**

Table 3 Associations' views on increasing the catch in 2001/2002

FOR	AGAINST	UNKNOWN
Zone C	Ledge Point /Sea Bird	Federation^
	Central West Coast	Fremantle^
	Geraldton PFA	Mandurah^
	Dongara PFA	Two Rocks^
		Leeman*
		United Mid West PFA*
		Kalbarri*

^ No submission received

* Submission received suggesting changes to the current arrangements but does not specifically mention the association's position on increasing the catch in 2001/2002

There is an opportunity for associations and individuals to review their positions in the light of the information presented in this paper.

The rest of part one of this paper discusses the regulatory tools that could be used to increase the catch for 2001/2002 only.

Regulations which could be changed to increase the catch in 2001/2002

Maximum size rule

Options

1.1 Remove the maximum size rule at the start of the season

1.2 Remove the maximum size rule from 1 January

Background

A prohibition on the retention of female western rock lobsters with a carapace length greater than 115 mm was originally introduced to all zones of the fishery for the 1992/93 season.

This was seen as an effective method of increasing the survival of mature female rock lobsters and improving egg production in the fishery.

The rule after one year was assessed as effective and workable but made little contribution to the protection of breeding stock in Zones A and B and northern Zone C. As a consequence and for equity reasons the maximum size was lowered to 105 mm for Zones A and B for the 1993/94 season.

Submissions

Kalbarri PFA

The Kalbarri association has requested that the maximum size either be increased to 115mm in Zone B or removed altogether.

Zone C PFA

The Zone C PFA has requested that this be the first rule removed.

Discussion

The maximum size regulation is perhaps the simplest management measure to change. The main issue is how much does removal of the regulation increase the catch and when do the animals previously protected become available for capture. Scientists estimated that removal of the maximum size rule in the 2001/2002 season would increase the catch by about 200-300 tonnes.

The maximum size regulation was assessed as having the least impact on rebuilding the stock and because of this should have the lowest risk of lowering the breeding stock to an unacceptable level.

Essentially, removing the regulation would result in a one-off 'mining' exercise as the accumulated stock would be harvested mostly in the first season. The removal of the maximum size, in itself, is relatively low-risk because most of the larger-sized females are protected by the setose rule.

If the maximum size rule were removed, with retention of the setose rule most of the large-sized female animals would become available for capture when they are non-setose, that is, in March, April and May. Unfortunately, these periods are generally outside the preferred periods for sale of large lobster, which are:

- two weeks before the Chinese New Year (which occurs on the 12 February in 2002);
- from May to October.

However, the period of capture is less of an issue now that processors have the capacity to hold a large quantity of animals live for extended periods of time.

The impact of removing the maximum size but retaining the other elements of the package was expected to result in a small loss of egg production, with a small increase in catch.

Because there is little point in taking additional animals in the 'whites' phase of the fishery when the market for larger lobsters is poor and most females are 'setose' two options are presented: one for removal of the regulation all season and the other from the first of January onwards.

The estimated additional contribution to the catch from taking non-setose oversize females is expected to be relatively small (Table 4).

Table 4 Expected additional catch (t.) from removing the maximum size rule only in 2001/2002

	Zone			
	A	B	C	All
Remove all season	40	90	160	290
Remove from 1 January	40	90	150	280

The estimate for Zone A has been provided independently of those provided from the modelling exercise. The model results were not considered to be as reliable for Zone A because of the lack of long term monitoring and other data that could be input into the model. This situation is being addressed with increased commercial monitoring now taking place at the Abrolhos Islands.

A summary of the relative advantages and disadvantages of removing the prohibition on taking female lobsters greater than the maximum sizes are provided below.

Advantages	**Disadvantages**
• Small risk of lowering the breeding stock to an unacceptable level	• Breeding stock levels will be reduced
• Doesn't increase fishing costs	• Small increase in economic benefit
• Simplifies compliance as Fisheries Officers have less rules to check and fishermen one less gauge to use	• Unless there was a change in fishing practices the additional catch would not be equally accessible to inshore and offshore boats
• Specifically targeted at taking breeding stock	• The animals become available generally at non-preferred times
• Has potential to decrease congestion on inshore fishing grounds at certain times of the season	• Small increase in catch
	• Risk that the reduction in breeding stock may be greater than expected

Setose Rule

Options

2.1 Allow all female rock lobsters greater than 105 mm carapace length to be retained all season.

3.4 Allow all female rock lobsters greater than 105 mm carapace length to be retained from 1 January.

Background

The prohibition on the retention of setose and tar-spotted female rock lobsters was originally introduced over the period 15 November to 28 February inclusive for the 1992/93 season. The introduction of this rule and the maximum size regulation was intended to increase the survival of mature female rock lobster and improve egg production in the fishery (Fisheries Management Paper 54).

The return of setose/tar-spot animals to the water proved to be an effective and workable measure but overall the controls were estimated to be insufficient to meet the revised targets for safe levels of breeding stock.

The prohibition on taking setose and tar spot female rock lobster was extended to the full season throughout the fishery in 1993/1994 to provide additional protection for the breeding stock. This proposal was generally supported at the time it was introduced in submissions made to the RLIAC.

Submissions

Some associations have informed the RLIAC, at meetings, that they believe the prohibition on taking setose is the single most important conservation measure of the 1993/94 management package and the key to maintaining the breeding stock at an adequate level.

Kalbarri PFA

The Kalbarri PFA proposed that the setose rule be removed from the 15 March to 31 May as most large females are not in breeding condition then. It would reduce compliance costs and deck workload, without causing a significant stress on the breeding stock. All setose animals outside this period are in breeding condition and hence worthy of protection.

Zone C PFA

The association considers varying the setose rule is the simplest and most effective way to cull any excess breeding stock. The association suggested that firstly the quantity of setose that can be safely taken be estimated. Secondly, the maximum size is set to allow that quantity to be harvested throughout the year

Alternatively, the association has suggested that certain times during the season setose be permitted to be caught, but it is of the view that it would be more difficult to estimate the catch of setose lobsters when changing the rule at different times of the season, that is, Chinese New Year and May to June.

Discussion

It has been proposed that there be a uniform size for both zones above which setose females can be kept to avoid any difficulties that might occur in compliance with different zone rules. In the first instance it has been proposed that this size be 105 mm. However, if there is a large variation in the distribution of the catch there may be further 'fine-tuning' necessary.

In practice, implementation of a size above which setose animals could be retained would necessarily include the removal of the existing maximum size rule.

As there is likely to be less benefit flowing to the fishery from harvesting additional animals in the 'whites' two options are presented, one for keeping setose females above 105mm all season and the other from the 1 January onwards.

The predicted additional catch contribution from taking setose and tar-spot animals above 105 mm for 2001/2002 are given in Table 5.

Table 5 Expected additional catch (t.) from allowing setose females greater than 105 mm carapace length to be retained in 2001/2002

	Zone			
	A	B	C	All
Take setose above 105 mm all season	130	240	560	930
Take setose above 105 mm from 1 January	130	190	480	800

A summary of the relative advantages and disadvantages of introducing a size above which setose animals could be retained is provided below.

Advantages	**Disadvantages**
• Provides the flexibility to harvest a fixed quantity of breeding stock while maintaining the breeding stock at an acceptable level.	• Greater risk of lowering the breeding stock to an unacceptable level.
• Specifically, targets mature larger lobsters.	• Unless there was a change in fishing practices the additional catch would not be equally accessible to inshore and offshore boats
• Simplifies compliance with the one size limit in both zones.	• Having one size across zones results in a greater catch impact on the breeding stock in Zone C than in Zones A and B.
• Increases the economic return to the industry.	
• Potential to decrease congestion on inshore fishing grounds at certain times of the season.	

Pot usage

Options

3.1 Pot usage equivalent to removing the maximum size rule all season

3.2 Pot usage equivalent to removing the maximum size rule from 1 January

3.3 Pot usage equivalent to taking setose females greater than 105 mm carapace length all season

3.4 Pot usage equivalent to taking setose females greater than 105 mm carapace length from 1 January

Background

A 10 per cent temporary pot reduction was introduced from 15 November to 9 January for the 1992/93 season. The reduction was intended to increase the survival of migrating lobsters by allowing animals to disperse into the breeding stock areas. The mid-season closure (10 January to 9 February inclusive), combined with the 10 per cent pot reduction in the north, was estimated to contribute 35 tonnes of rock lobster to the breeding stock.

This temporary pot reduction was increased to 18 per cent for the 1993/94 season for all zones and the whole season to further reduce exploitation rates across all size-classes of rock lobster in order to meet the target breeding stock for each zone.

Submissions

United Mid West PFA

Pot usage be returned to 100 per cent. The temporary reduction is no longer necessary because the desired increase in breeding stock has been achieved.

Ledge Point/Seabird PFA

Prefer no change but if there was to be a change it should be an increase in pot usage.

Zone C PFA

This method was the least preferred but in the event that the other proposals were not implemented increasing pot usage should be considered. The increased exploitation was thought to give a modest increase in catch if there was no change in the setose rule with associated increased fishing costs.

Discussion

Increasing pot usage has some advantages in terms of taking additional catch for the 2001/2002 season on a one-off basis but with an increase in total industry costs. Increases in fishing efficiency may have eroded the impact of the 18 percent pot reduction and increasing the pot usage would therefore increase the exploitation rate.

The following equivalency in catches from pot usage is provided in Table 6 so a comparison can be made with the use of this measure and the other options discussed.

Table 6 Pot usages (percentage) giving catch increases equivalent to removing the maximum size rule and allowing setose to be taken in 2001/2002

	Zone		
	A*	B*	C
Remove maximum size all season	87	87	85
Remove maximum size from 1 Jan.	87	87	85
Take setose greater than 105 mm all season	94	94	93
Take setose greater than 105 mm from 1 Jan.	92	92	91

**Standardised between zones for ease of administration.*

A summary of the relative advantages and disadvantages of increasing the pot usage are provided below.

Advantages	**Disadvantages**
• Can be targeted to increase the catch to a predetermined level	• Increases fishing effort and the exploitation rate
• Applies equally to everyone	• Increases congestion and competition on fishing grounds
• Gives credence to the temporary nature of the 1993/94 pot reduction	• Increases fishing costs
• For those leasing pots it may lower the cost in the short term	• May decrease individual pot values and decrease returns to licensees • May increase the risk of a significant depletion of the breeding stock

Extending the Season - All Zones

Option

4.1 Extend the season by one month in 2001/2002

Background

Extending the season has been discussed extensively in the past (see *Fisheries Management paper 113*). When last proposed many fishermen were strongly opposed to the proposal because:

- there was no cost benefit analysis of the proposal;
- they were unconvinced that they would benefit;
- they were not prepared to adjust their live style to try off-season fishing;
- they were concerned about inequities of proposed schemes;
- a satisfactory resolution to the mechanism to trade off catches from one period to another could not be found.

There was also resistance from the processing sector to extend the fishing period resulting from perceived logistical and equity problems.

Originally, it was proposed that animals could be made available by altering the rules to bring forward some of the next season's catch or delay harvesting some of the current season's catch. Faced with these difficulties, a trial was proposed as the way forward to gather information and try a mechanism for implementation. However although the trial was to be externally funded, this was not supported and the project proposal was cancelled.

Submissions

The Leeman PFA and United Mid West PFA have contemplated extending the season by proposing a nomination system to fish July .

Discussion

Notwithstanding previous objections, for the 2001/2002 season there is an opportunity to again trial extending the season. This is primarily because the management strategy for 2001/2002 under consideration is aimed at increasing the catch. Accordingly, extending the season for the purposes of taking additional catch becomes an option on an one-off basis for the 2001/2002 season.

An estimate of the catch predicted to be taken by extending the season by one month may be derived from an examination of the catches taken in June. The catch in June from 1995 to 1999 is shown in Figure 5 and the catch in June as a percentage of the total catch in Figure 6.

Figure 5 Catch in June by Zone from 1995 to 1999

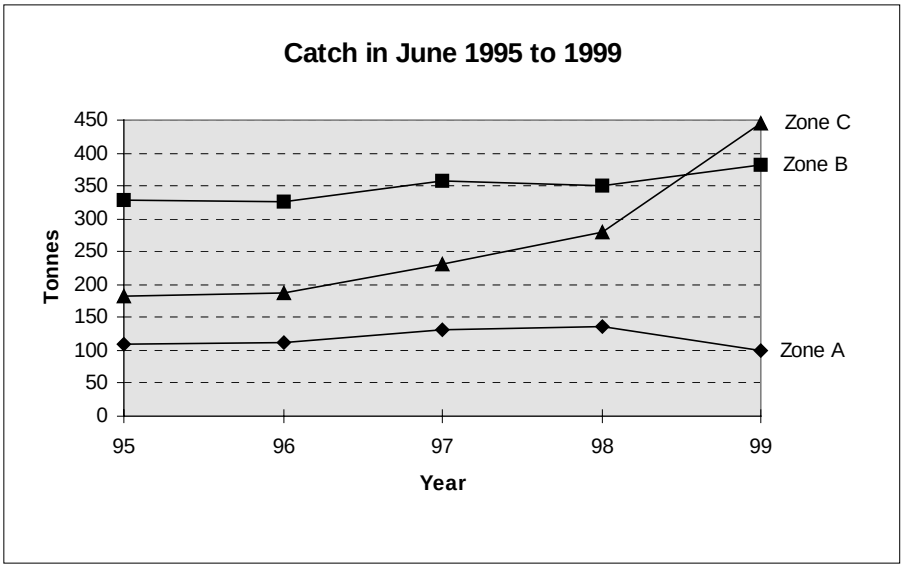
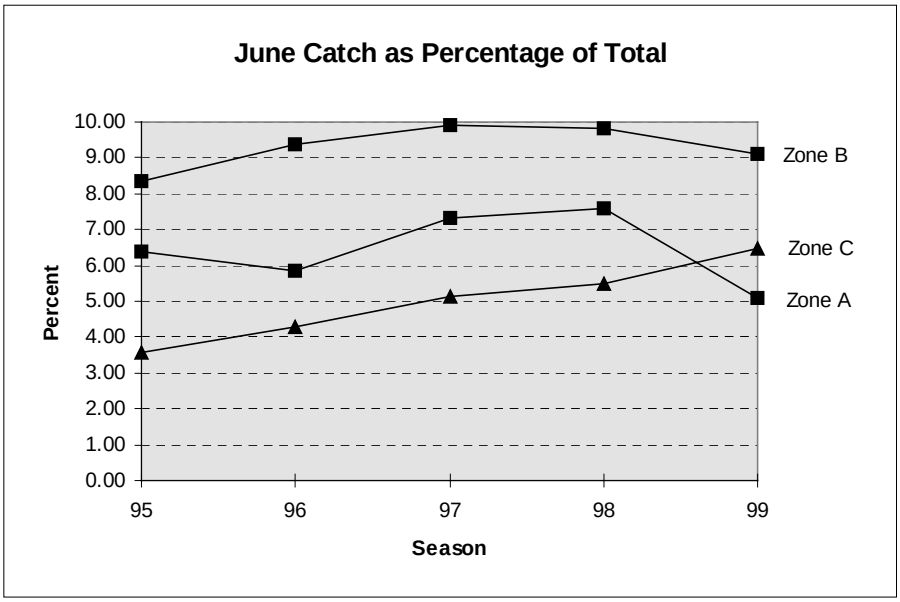


Figure 6 Catch in June as a percentage of the total catch by zone from 1995 to 1999



The estimates of additional catch taken in July 2002 (Table 7) are based on the catch predictions by zone and the assumption that the catch in July 2002 will be the same percentage of the 2001/2002 catch as the catch in June 1999 was of the 1998/99 catch.

Table 7 Additional catch (tonnes) expected to be caught as a result of extending the season for one month in 2001/2002

Zone			
A	B	C	All
90	280	640	1010

A summary of the advantages and disadvantages of extending the season by one month on a trial basis are contained below.

Advantages	**Disadvantages**
• May increase the economic return to the industry	• Increases fishing effort and exploitation rate
• Applies equally to everyone	• The increase in fishing costs and operating costs of processors may not exceed any increase in total catch value
• Provides economic and biological information that can be used for future evaluation	• There are social costs to those fishing in terms of extended periods at sea
	• Compliance costs would increase

General Discussion

The rationale for increasing the catch in 2001/2002 are that there is additional catch that can be taken without putting the breeding stock at risk and that the 2001/2002 season is the preferred season as there is a catch trough.

This management strategy is considered by some sections of industry to be relatively low risk in the short term as remedial action could be taken if there was an unexpected impact on the breeding stock. Past experience has been that under the existing package the breeding stock doubled in size over a six-year period.

In terms of the breeding stock the information provided by scientists indicate that the stock has exceeded the target in Zone C by about 28 per cent but this is not the case for Zone A which is 5 per cent below and although egg production is 18 per cent above the target in Zone B, egg production from Zone B is much lower than the other two Zones (Figure 3).

Therefore the view that there is additional breeding stock that could be harvested is only supported from the information available for Zone C.

In terms of the catch being lower in season 2001/2002, this is only the case for Zone C. For the other two Zones the catch declines slightly but there is no sign that it is on the increase the following season (Figure 4).

Based on the above discussion, the idea of increasing the catch may have greater merit in Zone C where catches are more variable. It is therefore primarily in the context of increasing the catch in 2001/2002 in Zone C that the options are compared and discussed.

Three of the four options discussed above are elements of the 1993/94 management package, the maximum size rule, the setose rule and pot usage, the other option extending the season is a new adjustment to the 1993/1994 management package.

In terms of impact on catches removing the maximum size rule or increasing pot usage to give equivalent catches is likely to increase the catch by the smallest amount, less than 300 tonnes. Allowing setose females to be taken greater than 105 mm carapace length or increasing pot usage to give equivalent catches are expected to increase the catch by 800 to 1000 tonnes.

Extending the season is expected to give catches of around 1010 tonnes (370 tonnes in the north and 640 tonnes in the south).

The setose and maximum size regulations protect mature females only whereas the 18 per cent pot reduction protects males as well as females. In addition, while the setose and maximum size rules protect mature females, after they reach size at maturity, the pot reduction and minimum size increase the survival rate to maturity.

The removal of the maximum size rule has the least risk of lowering the breeding stock to an unacceptable level. The increase in catch is estimated to be small and not at the preferred times, that is, before the Chinese New Year (12 February 2002) and May and June. However, this is probably not that important given that processors have the capacity to hold a substantial quantity of animals alive for extended periods of time.

Varying the size above which setose can be taken is a flexible method of lowering the breeding stock to a predetermined level. Used in combination with a time period it can be specifically tailored to supply a market when demand is greatest. Implementation of this management change is inconsistent with retention of the maximum size regulation and therefore by necessity would imply the abandonment of the maximum size regulation.

Pot usage can be used to increase the catch but at a greater economic cost. The use of pots to increase the catch is non-specific to the breeding stock and a greater range of size classes (mainly A & B) would be taken compared to the other two methods. It is likely that the equivalent catch from increasing pot usage could be taken with less impact on the breeding stock than the stock specific measures (maximum size and setose regulations). As most of the additional catch would come from new recruits size of A and B lobsters.

It has been argued that there would be merit in increasing pot usage to give credence to the temporary nature of the 1993/94 pot reduction.

Extending the season in some ways would have a similar impact to increasing pot usage in that both males and females would be taken and the impact on egg production would not be as pronounced in the short term but last longer. Extending the season would be equitable in the sense that everyone could have the opportunity to fish.

The impact of increasing the catch in 2001/2002 there can be expected to flow on to the following season. The impact (decrease in catch) being dependent on the change made if any.

The choice of these options really comes down to what is an acceptable risk that egg production will fall below the target and the extent to which expected economic benefits are realised. Although there is no level of risk specified for the fishery, the risk is higher in Zones A and B than Zone C that the stock will fall below the target if the current rules are changed. For Zone C allowing the maximum size females to be taken has the least risk but this increases if all females above 105 mm are allowed to be taken.

In the final analysis it will be up to the RLIAC in consultation with industry to advise the Minister on which management changes, if any, should occur in 2001/2002 and 2002/ 2003. An important factor to take into account in formulation of this advice will be the risk that each option has, if implemented, of egg production falling below the targets for the fishery and the likelihood that the related economic benefits are realised.

PART TWO – OPTIONS FOR OTHER MANAGEMENT ISSUES

Zone B Closure

Option

5 Close Zone B from 10 January to 9 February

Background

A closure from 10 January to 9 February inclusive was introduced for Zone B in the 1992/93 season. The closure was abandoned the following season (1993/94).

The closure was put in place at a time when catches were traditionally poor and did little to reduce the exploitation rate on the fishable stock. When the closure was lifted on the 10 February catch rates were slightly higher than average but soon returned to 'normal' levels indicating much of the stock had been caught regardless of the closure (Chubb and Barker 1998). There was no significant contribution to improvements in egg production from the measure used in isolation. However, it does provide a mechanism for reducing costs during a period of low catch rate in Zone B.

At that time (1992/93) the Zone A and B processors were opposed to the summer closure because it decreased the availability of live lobster to supply markets. It was expected that this shortage in supply of live lobster would provide an opportunity for competitors to gain inroads into their markets . The other concern raised was that access to air freight space could be lost as suppliers of other products took over the freight space making it more difficult to recover it for live lobster export after the summer closure (*Fisheries Management Paper 55*).

Submissions

Kalbarri PFA

The Kalbarri PFA supports a closure from 9 January to the beginning of Big Bank. Generally, low-retained catch during this time makes operations economically marginal, at best. High illegal catch (setose, spawners, 76 mm animals) means repetitive handling of animals. If the animals were left undisturbed during this high egg production period, it could offset some increased take of females as is being proposed by others. Slightly reduced overall catch for fishers would be offset by reduced costs and increased catch once the fishery re-opens.

United Mid West PFA

Supported a summer closure on the basis of its conservation value and considered it had some effect as had all other measures in place over the years.

Dongara PFA

Suggested that closing the last two weeks of January would be an option for preventing the storage of 76 mm animals prior to the gauge change on the 1 February.

Discussion

Catching sector issues

Traditionally, because of low catch rates in January, ranging between 0.52 and 0.35 kg per pot over the last five seasons (Figure 7), many Zone A and B fishermen choose not to fish. Accordingly, fishing effort is about half that of December, ranging between 391,000 and 482,000 pot lifts over the last five seasons (Figure 8). The low catch rates and lower fishing effort results in a very low catch for January, ranging between 140 and 230 tonnes (that is, four to six per cent of the total Zone B catch) over the last five seasons (Figure 9).

Figure 7 Catch rates in Zone B by month from 1994/95 to 1998/99

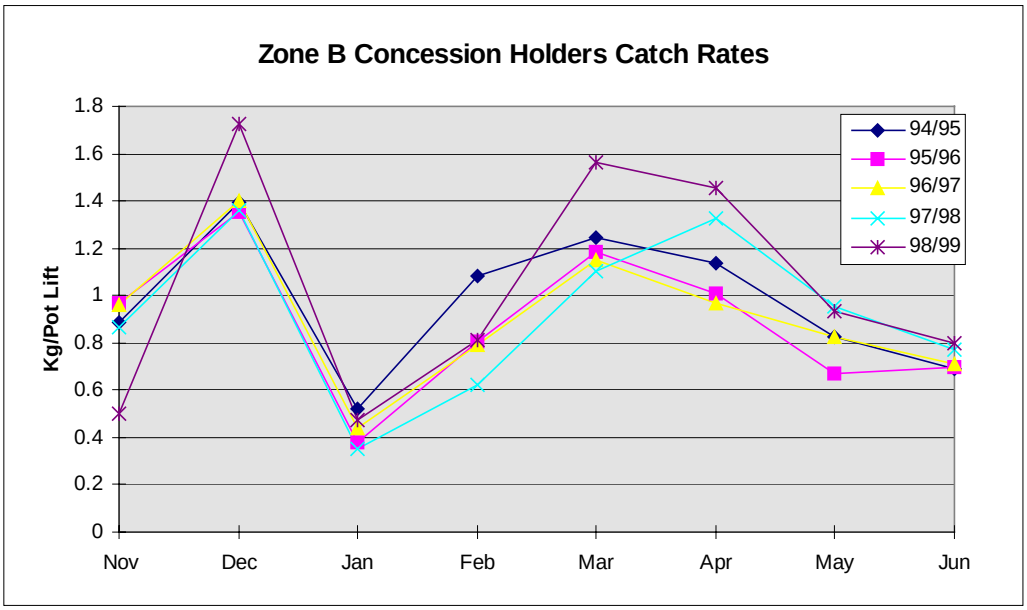


Figure 8 Days fished in Zone B by month from 1994/95 to 1998/99

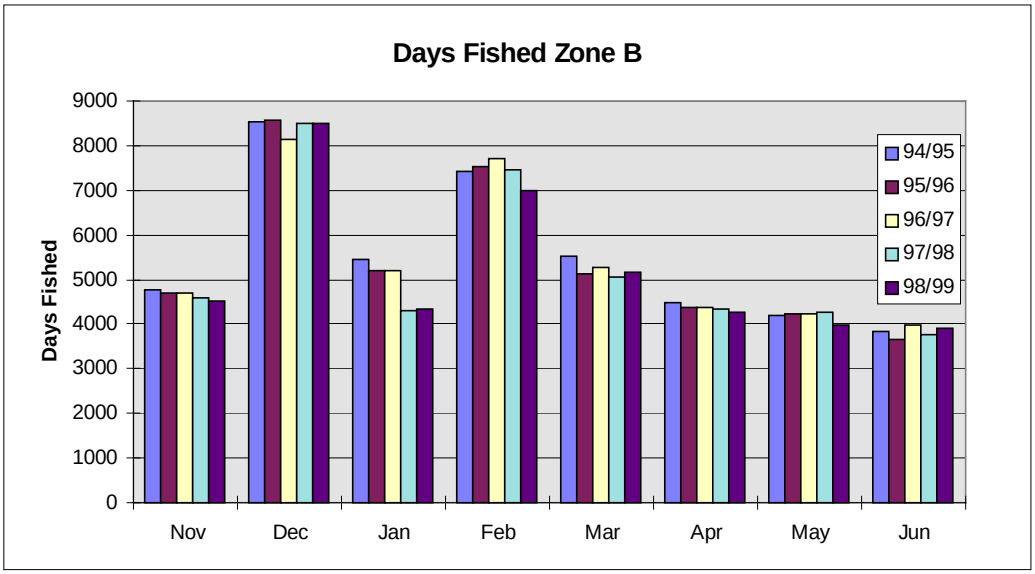
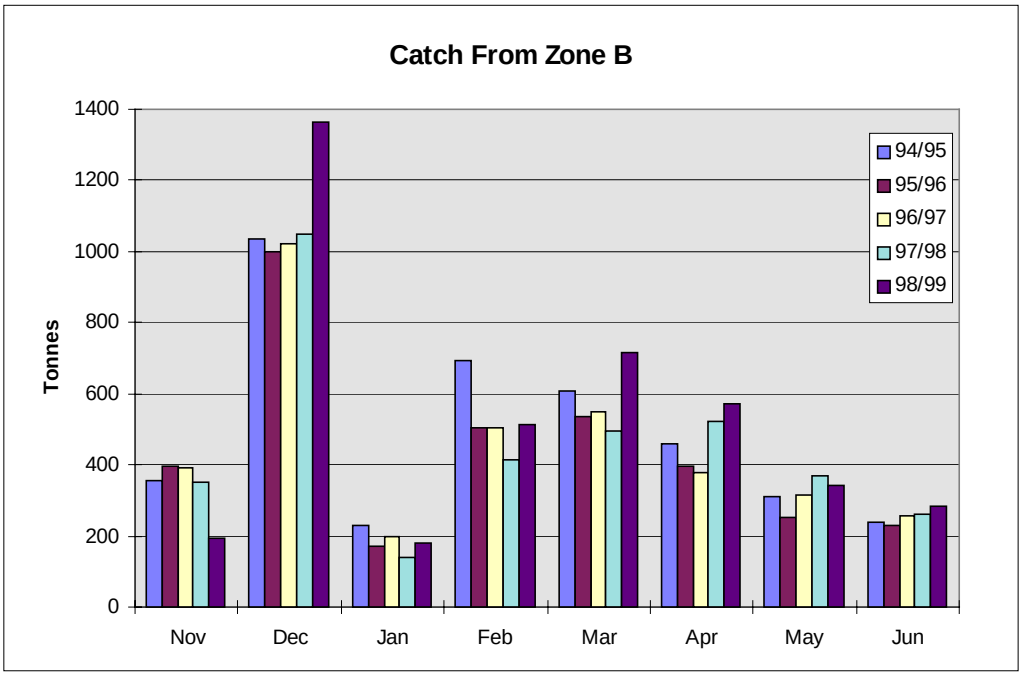


Figure 9 Catch from Zone B by month from 1994/95 to 1998/99



This season's (1999/2000) January catch of 337 tonnes was unusual in that it was well above the last five-year average catch of 183 tonnes. Whether this trend continues in the long term is unknown but the high abundance of lobsters last season and this season may have contributed to the unusually high catch. Accordingly, there is an expectation that the catch will revert to around the five-year average as the catch declines over the next three seasons.

Economically, at these low catch rates many fishermen especially those who have high variable costs, would be better off not fishing. Others continue to fish because they; may have lower costs, are able to catch more on average than the rest of the fleet or are not so economically minded.

The cost of fishing in January based on 290 vessels fishing (From Monthly Returns, January 1999) and assuming average fishing costs per vessel of $3,876 (Value Optimisation Model report, in prep.) is $1.1 million. Potentially, this represents an increase in profits of $1.1 million from a January closure if there is no decline in overall catch for the season.

Some fishermen have argued a benefit from closing January would result from less handling of setose and tar-spot animals. If the 77 mm size limit remained in place a January closure would address the Dongara PFA concern about hoarding 76 mm sized animals prior to 1 February , and should have a secondary benefit of allowing more of the 76mm lobsters to undergo the February moult before capture.

Marketing Issues

Currently, January is usually the period during which stocks of live lobsters are built up to supply the Chinese New Year market (traditionally, prices are higher at this time). Stocks are required about seven to ten days prior to this. Processors have the holding-tank capacity to hold stock over the closure period but this increases holding costs. For the 2002 Chinese New Year it would require storing live lobsters for about a month as the Chinese New Year falls on the 12 February in 2002. Continuity of supply (even though a relatively small

amount) is regarded by processors as vital to their marketing strategy. A shortfall in supply, albeit a relatively minor one, could lead to marketing problems.

Essentially, any shortfall in supply of live lobsters by northern processors could be met by southern processors but this would not be very palatable to the northern processors if it resulted in them losing clients or receiving reduced seasonal revenue. The capacity to hold large volumes of live lobsters over the closure could be expected to reduce the risk of a shortfall in supply from northern processors occurring but at increased costs.

It could be expected that some processors could experience staffing problems as a result of the closure, but this would probably be less of a problem for the catching sector. On the other hand under the current rules, costs per kilogram of rock lobster processed will be higher as the factors of production are not being fully employed (staff and other infrastructure). These higher costs per kilogram processed would need to be offset against improved prices to make sure that there was not downward pressure on the beach price.

Conclusion

The case for a closure in Zone B from 10 January to 9 February comes down to weighing up the relative costs and benefits. The benefits of a closure in Zone B arise primarily because it is expected to increase returns to the fishery, that is, the closure is expected to decrease fishing costs while generally being revenue neutral. Some biological benefit may result from a January closure via a reduction in handling of undersize, setose and tar-spot animals. Also, introduction of a closure from 10 January to 9 February would provide a way of addressing hoarding 76mm animals.

The costs are not directly measurable, indeed it may not be possible to estimate the costs at all. Some northern processors are concerned that the closure would impact on their ability to provide a continuous supply of product to buyers in January (albeit at a much lower level but at a higher expected price). Their concerns could be understood to imply (if it is a cost to the fishery) that there is a risk that the disruption to their supply of product could be reflected indirectly in a lowering of the beach price (maybe to northern fishers). However, there is no way of quantifying the risk of this occurring or amounts involved.

Notwithstanding the concerns of some processors, the introduction of a January closure in Zone B is consistent with the objects of the *Fish Resources Management Act 1994* in terms of maximizing net economic benefits and with the secondary fishery objective (given previously).

Nominating to Fish January or July - Zone B

Option

6 Allow Zone A and B licensees to nominate to fish Zone B either in January or July on a trial basis.

Submissions

A variation to closing January in Zone B has been proposed by the United Midwest and Leeman PFAs. The Leeman PFA has proposed consideration be given to the possibility of B zone fishermen opting to forfeit fishing January in return for the opportunity to fish July. The United Mid West PFA has suggested that the summer closure and extension of the season could be accommodated into the management plan for the fishery by permitting fishermen to nominate fishing times in 30 day blocks.

Specifically, the Leeman PFA has suggested that fishermen choosing to fish July would be required to submit their nomination to fish July no later than 15 November and would have to remove their pots from the water no later than 31 December. The Association believes that there may be a small increase in overall catch in the first year as the July catch consists of the following year's 'whites'. A number of benefits of the proposal are outlined, see Appendix 1.

Discussion

The RLIAC has identified previously (*Fisheries Management Paper 113*) that the fishery is likely to benefit from increasing the length of the season. Originally, extending the season was packaged with other management changes primarily aimed at 'smoothing' the catch. However, fishing the off season did have other market advantages in that it extended the period live lobsters could be supplied to markets.

The main issue for the RLIAC in dealing with this matter has been what mechanism to use to implement an extension to the fishing period and associated smoothing of the catch without increasing the overall catch.

The RLIAC has focused on methods of transferring catch between fishing periods to make enough animals available for capture in the off season to warrant fishing then. The schemes presented were based either on making bringing the catch forward or delaying the catch to make additional animals available at the end of the season. Importantly, the RLIAC was aiming at introducing a scheme that would result in little net change in the overall catch in the long term.

A scheme based on transferring fishing effort from one period to another (forgoing January fishing for fishing July) raises some additional problems because the catchability of lobsters and/or abundance varies over time. For example if animals are more abundant and/or catchable in July a greater quantity will be caught per unit of effort in July.

Furthermore, forgoing January for July in Zone B has the potential to activate latent January effort in July if it is more worthwhile to fish July. For example, fishermen who currently choose not to fish in January or fishes very little in January could trade this entitlement under the nomination scheme for fishing the whole of July.

The management of the Northern Zone of the South Australian rock lobster fishery deals with the problems associated with nominating effort by offering fishermen choices of fishing periods that are not equivalent in length. In summary the South Australian scheme allows fishermen to fish a maximum of 200 days out of a total 220 possible fishing days. Licensees have to nominate periods that they will not fish.

The RLIAC acknowledges that the South Australian scheme may be able to be applied to the Western Rock Lobster Managed fishers. However, until a study is undertaken to explore the relative advantages and disadvantages of such a scheme there will be an absence of analysis of the proposals presented by the Leeman and United Mid West PFAs.

Conclusion

Although there is no analysis of a cost and benefits of a reallocation of fishing time, there is the opportunity to trial a nomination system. However, if it was agreed to trial the nomination system on a one off basis it would have to be considered in the context of any other management changes being made at the same time. Because of the complexity involved in developing a nomination system and lack of analysis the most practical approach in the first instance would be to trial the system proposed by the Leeman PFA, that is, nominate to fish

July. The United Mid West 30-day nomination proposal could be fully explored at a later date.

The nomination system would apply to fish in Zone B only as the right to fish in Zone B is being foregone in one period for another period.

In summary, fishing July 2002 by nomination on a trial basis has some merit and could be explored further if it had widespread support from industry. It would allow an alternative management system to be tried while at the same time gaining valuable biological, market and ancillary information.

150 Pot Rule

Option

7 Increase the maximum pot usage to 150

Background

The upper limit on the number of pots permitted to be operated in the fishery has been on the RLIAC agenda for the last ten years. The RLIAC last discussed options for changing the 150 pot rule with industry on its February 1999 mini-tour. On that tour four options were presented:

- retention of the 150 pot holding rule;
- a 150 pot usage rule;
- a 183 pot holding rule; and
- removal of the upper limits in pot holding and pot usage.

At that time (February 1999) there was little industry support for changing the rule.

A subsequent National Competition Policy (NCP) review of Fisheries Legislation carried out by Fisheries WA identified that maximum and minimum pot holdings were anti-competitive restrictions which should be addressed.

Submission

Geraldton PFA

The Geraldton PFA has proposed that the 150 pots maximum on a licence be changed to usage.

Many small pot holders after the 18 per cent pot reduction could buy back up to their pot holding before the 18 per cent pot reduction was introduced. Whereas those who were close to or on the maximum did not have the opportunity to buy up to their original pot holding.

Discussion

Practically, the simplest way to implement a 150 maximum pot usage would be to remove the 150 pot maximum holding (but it may be increased to an arbitrary amount, say 200) and specify that a licensee is entitled to use 82 per cent of their pots up to a maximum of 150 (although this could be less). This way the pot usage is not linked to a maximum holding. In practice there would not be a benefit in holding more pots on a licence than needed for the

maximum usage. As the usage changed licensees wanting to use the maximum would either transfer pots to and from their licence accordingly.

Conclusion

Notwithstanding how a change to the 150 pot rule would be implemented in practice, the committee has resolved to await the outcome of the Governments consideration of the NCP Review of Fisheries Legislation prior to considering the issue further.

Night Hauling Big Bank

Option

8 Remove the restriction on hauling pots at night at Big Bank

Background

The ability to haul pots more than once in a 24-hour period was effectively curtailed by the introduction of the restriction of pot lifting to day light hours in 1992/93. The measure also applied to the recreational sector. The restriction introduced in the 1992/93 season was varied in 1993/94 to permit a longer fishing period in summer mainly for recreational fishers: The times allowed for hauling pots in 1993/94were:

Summer	Winter
15 Nov to 31 Mar	1 Apr to 30 Jun
4.30am to7.30pm	6.00am to 6.00pm

Following a review in 1998/99 of hauling times, the times were amended to allow pots to be hauled by boats fishing deeper water earlier in the later half of the season. This change allowed commercial boats to return to port earlier than was possible under the previous legislation while still minimizing the potential for commercial and recreational fishers hauling each other's pots in shallow waters.

The new times permitted for hauling pots were:

Summer	Winter	
15 Nov to 31 Mar	1 Apr to 30 Jun	
	< 20 Fathoms	> 20 Fathoms
4.30am to 7.30pm	6.00am to 6.00pm	4.30am to 7.30pm

There was limited ability to police the measure in the Big Bank region of the fishery at times when large catches of migrating lobsters were being taken (Chubb and Barker 1998). Comments from fishermen confirm that it continues to be common practice to haul at night at

Big Bank (but with a reduced number of pots), because of the need to relocate pots to keep up with the movement of lobsters on the fishing grounds.

Submission

Geraldton PFA

Supported the removal of the prohibition on night hauling but did not state the reasons for their position.

Discussion

Although the rule is perhaps most difficult and expensive to enforce in remote locations such as Big Bank, for the majority of the fishery it has been assessed as being effective and supported by industry members (*Fisheries Management Paper 55*).

The night hauling restriction at Big Bank limits the capacity of the fleet to track the population as it moves quickly across the grounds as well as hampering fishing operations when at sea 24 hours a day. Provided there are no major concerns about the sustainability of the stock then permitting hauling at night would allow a greater degree of flexibility in fishing operations for those fishing Big Bank.

Conclusion

Apart from Big Bank the night hauling restriction is justifiable in other parts of the fishery on sustainability grounds (restricts fishing effort) and socially because it minimizes the potential for conflict between the commercial and recreational sectors.

Big Bank

Option

9 Remove separate management arrangements for Big Bank Zone

Background

A detailed summary of the Big Bank fishery management changes up to 1994 can be found in *Fisheries Research Report 101* and these are summarised below.

Big Bank Management Changes

1990/91	Abrolhos Islands closed area was extended to 30 nautical miles northwards from 1 January to the 10 February 1991. However, the area was reopened mid season on the 26 January 1991 because it was found to be ineffectual in dealing with the compliance problems.
1991/92	Fishing was prohibited in waters on the western side of a line extending north westerly from the north eastern boundary of the Abrolhos Islands from 15 November to 10 February.
1992/93	The Big Bank area was extended to include all the waters north of Cape Inscription. Boats had to nominate to fish in the Big Bank region of the fishery. Nominations had to be received by midday 10 February. Once there, vessels were required to fish only in that region from 10 February to 9 March, effectively restricting the movement of vessels back to the coast

	during that period.
1993/94	The period which Big Bank boats were not permitted to fish outside Big Bank was shortened from 10 February to 9 March to 10 February to the end of February. This was to coincide with the date which Zone A fishers had to shift their pots outside the 20 fathom isobath or outside nine nautical miles from the coast.

Management measures were first introduced in the 1990/91 season to address the enforcement difficulties in policing the closed area of the Abrolhos Islands. The problem arose from the congestion brought about by fishers competing with one another to catch lobsters migrating northwards out of the Abrolhos Islands. The closure of the area until 10 February encouraged a greater geographical spread of the fleet via increasing the opportunity for animals to disperse in the zone prior to it being fished.

In 1993 the committee reviewed the 1992/93 Big Bank arrangements. The assessment of fishing activities was that although the vessels remaining in the area after the initial run caught breeding stock, this was counterbalanced to some extent by Big Bank nominees not being able to return to Zone B and fish the breeding stock in those waters.

Given there was little overall benefit identified for the breeding stock from a Big Bank closure, the committee initially in 1993 favoured reverting to the simpler Big Bank fishing arrangements applying for the 1991/92 season. That is vessels fishing Big Bank could come and go as they pleased. However, the RLIAC changed its position following representations from northern zone fishermen to retain the rules. The RLIAC resolved to recommend that Big Bank nominees could not fish outside the area until after the end of February.

The issue was one of catch share between boats and did not have any major breeding stock implications (*Fisheries Management Paper 55*). The committee sought to offer some protection to the inshore Kalbarri fleet. Increasing numbers of boats fishing Big Bank prior to the nomination system had led to greater competition on inshore fishing grounds between these boats and the boats based at Kalbarri. This additional fishing pressure resulted in the catch and catch rates of smaller inshore Kalbarri fleet being impacted for the remainder of the season.

Submission

Geraldton PFA

The Association supported the following previous motions on the Big Bank area:

a) *fishers should not have to nominate to go to Big Bank;*

b) *there should be no restriction on night pulling of pots;*

c) *fishers should be able to enter and leave when they wanted to; and*

d) *Big Bank should not be treated like a separate zone.*

Conclusion

The retention of the boundary is perhaps justifiable on compliance grounds. A removal would presumably mean a return to the past problems of compliance and congestion associated with the northern Abrolhos Islands boundary. This situation would be exacerbated to some extent by the greater mobility of the fleet. There is no indication in the Geraldton

PFA submission of an alternative approach to resolving the congestion and compliance problems that led to the management changes being made in the early 1990s.

The 20 Fathom Line

Option

10 Remove the 20 fathom line restriction on Zone A licensees

Background

The 20 fathom was introduced in 1981 to prevent Zone A fishermen from fishing in any waters shallower than 20 fathoms that are within 9 nautical miles of the mainland over the period 1 to 14 March. Essentially, the 20 fathom line was introduced as a resource sharing measure to protect the B Zone boats from competition in coastal waters.

As explained in the 1994 coastal tour document, increasing numbers of Zone A boats, which had historically tended to stop fishing a few weeks before the start of the Abrolhos, were fishing right up to the start of the season. This happened for two reasons:

- there was less need for boats to stop fishing to enable carrier boats to cart their pots to the Islands as more boats had the capability to carry their own pots; and
- as effort controls increased Zone A boats tended to compensate by fishing longer in Zone B.

In 1993 the RLIAC after considering the removal of the line accepted that there was no support to change. The removal of the line was again discussed in July 1994 as a means of redressing the drift of pots from A Zone to B Zone by making A Zone licences more attractive to buyers. Consequently, a discussion of the rule was included on the 1994 coastal tour.

Arguments in support of removing the line were:

- practical difficulties in enforcing;
- it prevents small jet boats from fishing 1 to 14 March; and
- it would help stop the flow of pots from Zone A to B.

In January 1995, following the coastal tour, the RLIAC resolved to not advise the Minister to change the rule.

Submissions

There have been no specific submissions from associations to have the 20 fathom line removed although this issue has recently been brought to the attention of the RLIAC at industry meetings.

Conclusion

Notwithstanding the difficulties with enforcement the issue is essentially one to do with catch share between Zone A and Zone B licensees and comes down to whether maintaining the status quo is justified.

The 77 mm Minimum Size

Background

The increase in minimum size from 15 November to 31 January was introduced as a variation to the 1992/93 package because of the greater contribution it was expected to make to the breeding stock in the centre and north of the fishery. This was expected to balance to an extent the large number of lobsters above the maximum size being caught in the south.

The 77 mm rule reduces the exploitation in the 'whites' phase thereby allowing for a greater spread of animals across the fishery. By increasing the minimum size predominately in the 'whites' period of the fishery in combination with the pot reduction a substantial quantity of lobsters would be moved into the 'reds' period of the season and then into the breeding stock.

Submissions

Kalbarri PFA

The minimum size rule has a greater impact in B zone than elsewhere, therefore the shift in catch is inequitable. It is thought that the inshore 'whites' migrate quickly to the Abrolhos Islands and Big Bank waters which are largely not fished by Kalbarri fishermen. An alternative was suggested by changing from 77 mm to 76 mm at the commencement of the Big Bank fishery.

United Mid West PFA

The united Mid West PFA's belief is that as there were no data available that demonstrates the 77 mm size limit increased breeding stocks or had any conservation value it should not be retained.

Dongara PFA

The association was concerned that 77 mm animals were being stored prior to the 1 February. The association suggested that the season be closed the last two weeks of January to prevent the practice.

Discussion

As the 77 mm size limit is mainly concerned with transferring animals within the season it has not been presented in part one of this paper as a rule that could be altered to increase the catch in 2001/2002.

The 77 mm minimum size from 15 November to 31 January, although assessed as not contributing much to the rebuilding of the breeding stock by itself, in combination with the setose rule, has an indirect impact on breeding stock and provides some protection to males. It has also provided other benefits, for example it has allowed the ratio of 'reds' to 'whites' caught to increase, thereby decreasing the peak in supply of 'white' lobsters early in the season.

The main issue brought to the attention of the RLIAC concerning this regulation has been the hoarding of 76 mm animals immediately prior to the 1 February. There has been observed a noticeable decrease in the quality of the lobsters in some catches landed immediately after the 31 January. The practice is apparently more widespread than previously thought and difficult to detect, although it only affects the last week out of 11 weeks.

The retention of the regulation for the purposes of reducing the peak in the 'whites' catch is important for the overall fishery. The 77 mm minimum may increase the overall yield and hence value from the fishery. The 77 mm rule is more effective in Zone B than Zone C giving a greater spread of animals across the fishery.

Although the conservation value of the 77 mm minimum size is not as high as other elements of the 1993/94 package there are benefits in retaining it for the reasons mentioned above. Indeed, there is the view that extending the period that the 77 mm rule applies to the end or middle of February in Zone B (that is until after the summer moult) would have two advantages:

- reduce the damage to 76 mm animals, as they would be less likely to be in pots prior to moulting, and
- increase the yield from the fishery as the uncaught 76 mm animals increase their weight by 15 to 20 per cent after moulting.

As extending the period the 77 mm rule applies would limit the access of Zone A licensees to the stock in Zone B an extension to the period the 77 mm rule applies could be packaged with removing the 20 fathom line to increase the access of Zone A licensees to the Zone B stock.

A summary of the relative advantages and disadvantages of **retaining** the 77 mm minimum size regulation are provided below.

Advantages	**Disadvantages**
• Reduces peak in 'whites' catch	• Reduces the supply of 76 mm lobsters in the early part of the season in Zone B
• Increases proportion of 'reds' to 'whites'	• Difficult to enforce in the last week
• Combines with setose rule to protect the breeding stock.	• Additional handling of 76 mm animals
• Reduces exploitation in the 'whites' may increase yield and possibly value of the catch	

Conclusion

The benefits of shifting animals within season are considered to outweigh any associated costs to such an extent that it does not warrant presenting an option to remove the rule. Indeed, as discussed above there may be benefits in extending the period the 77 mm minimum applies in Zone B.

2002/2003 Management Arrangements

Any management changes made in 2001/2002 either to increase the catch or for other reasons would no longer apply in 2002/2003 unless, the change made in 2001/2002, if maintained, was not likely to significantly increase the risk that the breeding stock would fall to an unacceptable level. At this stage the changes that might fall into this category (could be maintained) are:

- removing the maximum size rule;
- January closure in Zone B;
- increase in the maximum pot usage to 150;
- removing the prohibition on hauling pots at night at Big Bank;
- removing separate management arrangements for the Big Bank Zone; and
- removing the 20 fathom line restriction on Zone A licensees.

The impact of removing the maximum size and taking setose females above 105 mm in 2001/2002 would not be expected to have a significant effect on the catch in 2002/2003. However, increasing pot usage and extending the season would have some impact on the 2002/2003 catch.

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APPENDIX 1 - Rock Lobster Association Submissions