Western Rock Lobster Council Inc.

W.R.L.C.

Improving the Economic Efficiency of the Western Rock Lobster Fishery-

Using the Input Control System

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Current State of the Industry

The Western Rock Lobster fishery is managed by an individually transferable effort management system (also called 'input controls'). The industry has recently been through an extensive review looking at alternative management systems (including quota options) for the fishery. The details of the review process are well documented and reference papers for the review process can be found on the Western Rock Lobster Council website, www.rocklobsterwa.com.

The results of the review process clearly demonstrated the industry preferred maintaining the input control system, rather than moving to a quota management system, although it was made clear that staying with input controls did not mean "no change" to the management system. The Minister has recently approved a continuation of the input control system.

Sustainability in the Fishery by Zone

The Western Rock Lobster fishery has traditionally been managed across three zones (A Zone, B Zone and C zone), which are described in Appendix A, along with information on the number of units in each zone.

Prior to the start of the 2005/06 season, the Department of Fisheries introduced a new management package for the fishery recognizing the need to manage each zone separately. Advice from the Department of Fisheries (Research Section) clearly indicated that because of the different levels of breeding stock within each zone of the fishery, there was a need to address sustainability concerns by zone.

The advice is summarised as follows:

- A Zone - the exploitation rate and breeding stock index were above the target levels.

- B Zone - the exploitation rate and breeding stock index were trending downwards. Research advice outlined that a 15% effort reduction was needed to address the declining trend in the breeding stock index.

- C Zone - the exploitation rate and breeding stock index were above the target levels, but given the poor recruitment occurring in the zone, this would be likely to have a negative impact on the breeding stock index in the following years. Their advice was industry should aim for a 5% reduction in effort to help off-set the impact of poor recruitment years on the breeding stock.

The consultation process leading to the changes in the management package are explained in Appendix 2.

Following the introduction of the 2005/06 management package, the Western Rock Lobster Council in partnership with the Department of Fisheries carried out an extensive review of alternative systems of management for the fishery. The review focused on whether a quota system would give better net economic returns to the State of WA than the existing input control system does.

In a poll of the industry, a clear preference for maintaining the input control was established, the results of the poll are included as Appendix 3; however, to maintain sustainability under an input control system, adjustments to the level of effort in the fishery will be required. During the review it was made clear that further effort reductions would have to be considered if there was a continuation of the input control system

Basis of Managing Biological Sustainability

Decision Rules Framework

In order to maintain the levels of breeding stock at or above sustainable levels, the annual breeding stock level is compared to a target level (being the level of breeding stock present in the early 1980's). Should the levels of breeding stock decrease to a point where the fishery is considered to be at risk, Government and industry will take action to reduce effort to allow the breeding stock to recover, this is called the decision rules framework. Within this framework, there are specific trigger levels, where depending on the extent of decline, either the industry or the Government has the ability to put in place measures to address the decline.

The aim of the decision rules framework is to monitor the breeding stock and keep it above the sustainable level, with industry consultation small changes are put in place to maintain the stock, and should those not be enough, the Government will implement stronger measures to prevent the fishery collapsing.

The Economics of the Industry

The Western Rock Lobster ('WRL') industry is feeling the impact of the ongoing cost-price squeeze, due to increasing costs and recent price changes. This, along with a series of poor recruitment years have resulted in below average catches, which are being felt most severely in the C Zone, and are predicted to continue until at least the 2009/10 season.

To limit the falling profitability in the industry, the fishery needs to seriously consider ways to reduce its costs and improve catch efficiency, while maintaining the biological sustainability of the fishery.

The main cost drivers in the fishery show little sign of easing, and there is a longer term trend towards increasing fuel costs. The industry is also facing challenges with its labour needs, in some parts of the fishery, most crew are engaged on the basis of sharing revenue and costs on the boat. This means that a downturn in profit margins makes the industry less competitive with the mining and tourism industries, making labour hard to come by and increasing the costs of keeping current crew.

The challenge for the industry now is to look at the current input control system and find ways to restructure it and reduce input costs, in an organized clearly planned process.

Links Between Economic and Biological Sustainability

Because there are very strong links between biological and economic sustainability, we do not want to put in place biological controls that make the fishery environmentally sustainable if it is not economically viable. On the other hand, it would not be acceptable for the WA Government to allow fishing that was economically viable in the short term but meant that the fishery was biologically unstable in the long term. The aim is for the industry and government in partnership to look for solutions that ensure that the fishery is both economically and biologically sustainable.

The Western Rock Lobster Council has proposed a project funded by the FRDC (Fisheries Research and Development Corporation), to look at ways to improve the economic returns of the industry by reviewing the current management package and making recommendations to the Rock Lobster Industry Advisory Committee (RLIAC). The process will also take into consideration the biological sustainability of the fishery.

Characteristics of Input Controlled Fisheries

The 'Race to Fish'

In an input control management system, out of the lobsters available on the fishing grounds, the number of lobsters caught each season gradually increases. This exploitation is due to intense competition between fishers (pots) to maximise their share of the catch.

High levels of competition are always created in input control fisheries, and this is referred to as the "race to fish". Competition encourages fishermen to fish **"harder"** (e.g. by fishing more days, travelling longer distances, using more bait, etc) and fish **"smarter"** (e.g. by using technology, more efficient boats, GPS and plotters, communications, colour sounders, computers, etc).

In the fully exploited Western Rock Lobster Fishery, the only way a fisherman can consistently catch more than those fishing around him, is to fish "harder" and "smarter" than the others do. Therefore, fishers invest a lot of money in more bait, larger and faster boats (which cost more to purchase and operate) and the latest technology, to try and maintain or increase their share of the catch.

Due to the competitive nature of the current input control management system, it is not easy for fishers to reduce their fishing costs and still maximise their share of the catch.

This on going drive to fish harder and smarter to maintain a share of the catch eventually leads to effort creep, so the measure of management in the fishery (a 'pot pull') is not the same from one year to the next. Over time the ability of the industry to catch lobster with a single pot pull increases and in an input controlled fishery, there is a need to adjust the level of effort in the fishery to offset that effort creep.

Historically, the Dept. of Fisheries has needed to regulate efficiency gains in the industry to ensure biological sustainability. Examples include limiting trap design. Previously, fishermen have experimented with a range of pot designs and developed a larger pot with a better catch rate during the 'whites' period of the fishery. To ensure sustainability, these new designs were banned and the dimensions/design of the pot became fixed under the Act.

Other examples include the boat replacement policy designed to limit the potential for ongoing efficiency gains in the industry.

Given the strong support by the industry for keeping the input control system and the need for the industry to improve its economic returns; it is important for the industry to manage effort creep and efficiency gains. The following diagram shows the process and options the industry will have to address to improve economic performance in the fishery and reduce or re-structure its input costs.

The diagram on the next page (Fig. 1) shows the choices and assessments which the industry has to work with, given the decision to maintain the input control system of management. Naturally, with the decision to keep the input control system is the need to adjust effort in the fishery as efficiency of the fleet improves.

How Management Decisions Have Evolved

The top section of the diagram (in red) shows the role of the Dept. of Fisheries in managing and assessing the rock lobster resource, with annual checks of the breeding stock and stock status. Each year, the industry improves its effective effort though advances in technology or internal transfers of units. This in turn means that each year the exploitation rate and breeding stock are impacted.

Currently, the researchers assess the need to reduce effort or modify the management package based on the assessment of breeding stock every year. If researchers advise that a reduction in effort is needed to ensure sustainability, there is a consultation process with industry on the best way to achieve the effort reduction.

Historically, this has occurred approximately every 10 years. In the 1986/87 season a pot reduction was used to reduce effort in the fishery. The next change was made in the 1993/94 season.

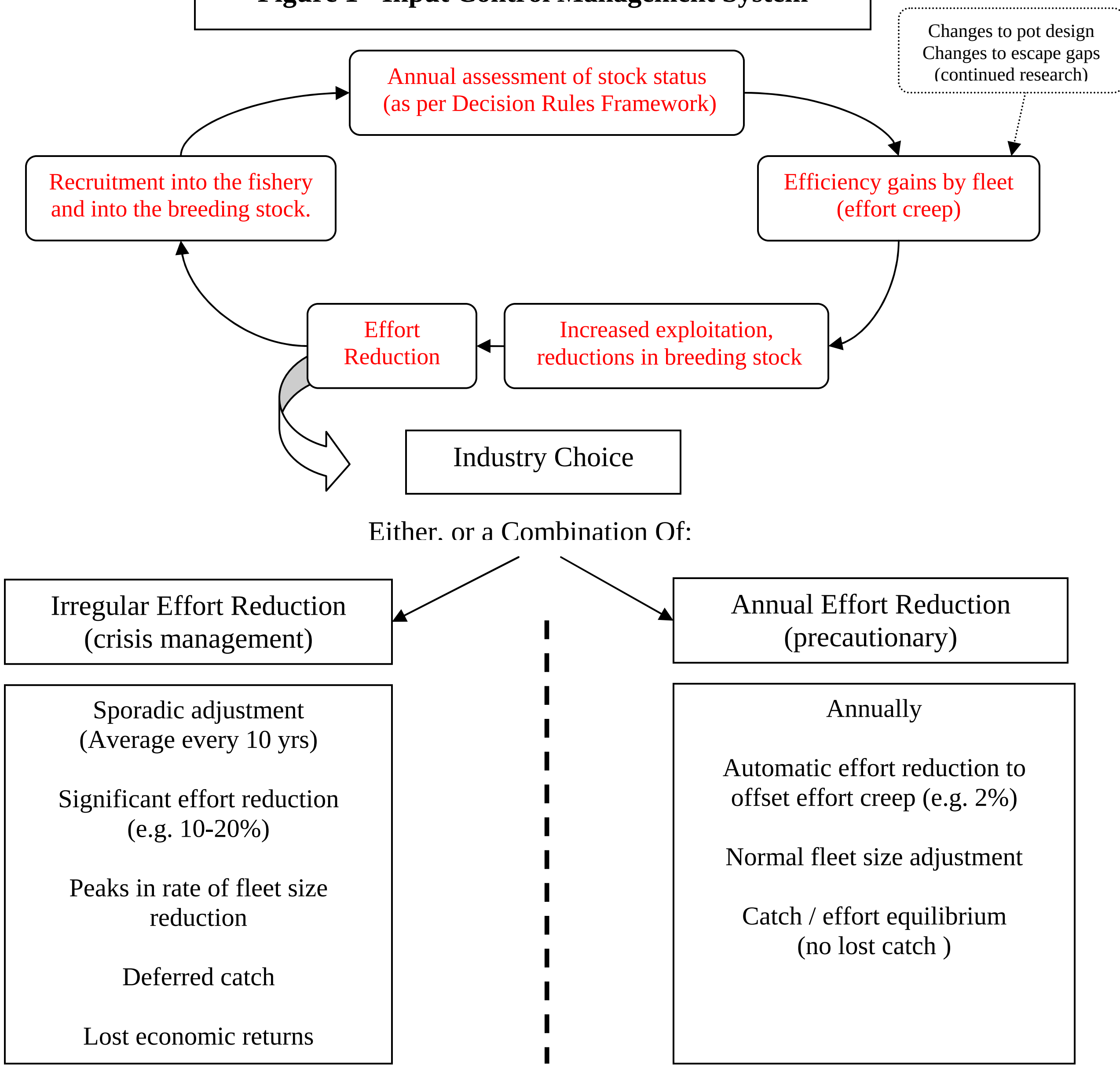
The 1993/94 management package had the desired effect on the breeding stock index within a relatively short period of time; however developing the package was very difficult and resulted in frustration within the industry. The result was a dramatic reduction in effort, an overall drop in catch for a period of time and a peak in the number of vessels leaving the industry. For many in the industry it was a difficult and uncertain period.

A 12 year period of relatively stable management followed, when only minor changes were made to fishing effort and the management package. Consultation for the development of the

2005 package started in 2003 and was based on concerns for the overall sustainability of the fishery.

The result of the 2005 management package has been well received by the industry and most fishermen seem satisfied that the management measures have not been too disruptive to their businesses. However, the effects of the 2005 package on the sustainability indicators in the fishery are still unknown.

Figure 1 - Input Control Management System



How to reduce effort??

- Reduce number of pots
- Reduce the number of days fished
- Reduce the number of pot days (more flexible ITE system)*

* More flexible ITE system where units in the fishery have a number of pot lifts attached rather than a pot usage rate. For example, 100 units with 130 fishing days is equal to 13,000 pot lifts; the fisherman can then choose how those pot days are to be broken up within the season.

Decision Making in the Future

There is a high level of understanding within the industry about the management tools for reducing effort in the fishery; and in order to adjust effort as a result of effort creep, the industry is faced with a choice of how to go about it (either a combination of the above methods, or one or other method).

The industry can continue to make irregular management changes responding to declines in the breeding stock index as it has in the past; or the industry could decide to address effort creep and efficiency gains on an annual basis. If the industry accepts effort creep is somewhere between 1% and 3% per year, then on an annual basis there could be a 1-3% reduction in effort. This would remove the need for large 'one-off' or sporadic effort reductions.

There are a number of advantages to addressing effort creep on an annual basis. As effort is reduced in small parts, the impact on catch is lower. In other words, the industry could adjust more easily and maintain the same levels of catch.

Fleet size reductions would occur gradually there would not be peaks in the number of vessels leaving the fishery as occurred after the 1993 package. This allows fishermen to strategically plan for their future, taking into consideration the annual effort reductions. It would allow the industry to re-structure and reduce input costs in their businesses.

There will eventually be a time though, when the effort has been reduced to the point where the numbers of pots in the fishery are not capable of achieving the predicted catch.

How Do We Reduce Effort Fairly?

The important question is how do we fairly and equitably reduce effort in the fishery? It is widely accepted that the two main tools in the fishery for reducing effort are taking pots out of the water, or reducing the amount of time that the pots can be in the water (basically pot reductions or time off).

There was another option raised during the quota debate and that was a more flexible individual transferable effort (or ITE) system. The basis of the more flexible ITE system is that the unit of effort in the fishery is measured by a 'pot pull'.

If a fisherman has 100 units on their licence and on average works 150 days for the season, that fisherman effectively has 15,000 pot pulls.

With a more flexible ITE system the fisherman has the flexibility to decide how to use those 15,000 pot pulls. He may decide to use 100 pots for 150 days or 150 pots for 100 days or any other combination of usage that he decides would be the best for his business.

To reduce effort by 2% per year for example, in the first year the fisherman has 15,000 pot pulls to use. With the effort reduction, he will have 14,700 pot pulls in the second year and 14,406 pot pulls in the third year and so on. This system requires use of VMS in the fishery.

Process for This Project

The Western Rock Lobster Council has received funding from the FRDC under an agreement where the industry contribution to the project comes from the $2 per pot levy. The Council has developed the following process to ensure any effort reductions in the future are fair and equitable across the fishery and improve the overall economic returns from the fishery.

The most important part of the process will be the development of an economic model to look at all of the possible effort reduction options and management tools available to the industry.

The project will be structured in a very similar way to the quota debate, i.e. it will be done in four phases:

Phase 1	Collect baseline data on the economic performance of the fishery from primary sources. Use the baseline data to develop a model that can compare economic returns from the current management package against a series of possible variations to input controls management.
Phase 2	Stakeholder discussion on the advantages and disadvantages of possible variations to the management package.
Phase 3	Stakeholder views considered and advice prepared for Government. Industry poll conducted to assess industry preference- this will be considered in decision making.
Phase 4	Government decision made on future direction of the input control management system.

Table One: Proposed phases of project

Phase 1 – Baseline data collection

Accounting company RSM Bird Cameron collected primary data from fishing businesses to develop a baseline of economic performance of the fishery under the current management system. This baseline data will be used to develop an economic model for the fishery, possibly with some additional data collection.

Importantly, this model will deal mainly with the economic performance of the fishery. Outputs from the model can suggest possible management packages that would then be used in the new biological model for the lobster fishery. The Department of Fisheries Research Section is developing this model and will then provide advice to the industry on the biological and economic impacts of the proposed changes to the management system.

We aim to make the model simple enough for use on a standard computer, so fishermen in the industry will be able to see what changes to the management plan will affect the economics of the fishery at and industry level and also at an individual business level.

Phase 2 – Stakeholder discussion

The model will be used in a series of meetings and workshops with the industry to work out future management arrangements in the fishery. The meetings of small groups of fishermen will consider the information in the model and seek feedback or potential improvements to the proposed management packages based on the economics of the fishery. The Department will then assess the impacts of the proposals on sustainability.

Phase 3 – Industry poll

A poll of industry seeking there opinions on the proposals is planned, with the results of the poll used to develop the final advice to the Minister for Fisheries. This leads into Phase 4, the decision by the Minister for Fisheries for implementation November 2009. Altogether this process is similar to the one used in the quota debate, but will focus only on the current system and will use a simpler model than the first one.

Lessons learned from the ERA model

Going through the process of modeling the economics of the fishery during the quota discussion was an important lesson for the industry. The first model developed by a company called ERA was a very detailed and difficult model, with only a large report to the industry with high level technical information being presented. This limited our use of the model and the reports as it was hard to understand and assess the potential impact of the different management options.

There was no delivery of the actual model itself to the Department of Fisheries or the industry, so there was no ability for the industry to change and query the model as requested.

The industry held several workshops questioning the underlying assumptions of the model and the reports; and requested a number of changes to the assumptions and the outputs. This was very time consuming and increased the cost of the model. In addition, there were several items that could not be changed due to the complexity and structure of the model.

Most of the complexity in the model was due to use of the biology of the fishery and the type of model that it was (called an optimisation model). The model also had very large data sets which made it difficult to work with. Essentially, the model became a “black box” that only the creators of the model could understand and change to deliver outcomes.

This was unsatisfactory from the industry point of view, and as a result of that process we recognize the need to greatly simplify the model, with a trade-off between complexity and user-friendliness for industry consultation processes.

As a result, the new model will be limited to looking at input controls only, and use only economic information. Then, based on the outcomes of this economic model, the proposed changes to the management package will be put into a separate biological model to see how those changes will affect the sustainability of the fishery.

Timelines for the Project

The estimated timeframe for each phase of the project is shown in the table below, with this paper being the first of a series of information about the economics of the fishery. A second paper, using information collected by RSM Bird Cameron will explain where the industry is currently sitting in terms of a benchmark. This will be useful to show us what the current costs and profits are like in the industry, so we can find ways to improve them.

The Council hopes this project will be successful in getting the industry to understand the process, and we hope to achieve a greater involvement of fishermen and an increased understanding of the issues and how to improve the economics of the fishery.

Table Two: Timeline and associated milestone of each proposed project phase

Phase	Date	Output/ Milestone
Phase 1	Mid May 2007	Release RSM document
	End of May 2007	Contract developed (with specifications to be modified)
	End of Aug 2007	Delivery of draft model
	End of Sept 2007	Demonstration model available for Coastal Tour with a document on variables/options
	End of Oct 2007	Road test model at Coastal Tour
Phase 2	Jan-Apr 2008	Meetings/consultation with small groups (industry)
	July 2008	Formal presentation to RLIAC of with feedback from industry based on consultation
Phase 3	July 2008	RLIAC advice to Minister
	Nov 2008	Implement new management system in fishery. FRDC Final Report due.

Executive Summary

The Western Rock Lobster (‘WRL’) industry is experiencing the impact of the ongoing and intensifying cost-price squeeze flowing from ever increasing costs and recent price volatility. The long-term impact on the profitability of the fishery will be minimised by the ability of the industry to reduce its costs and improve catch efficiency while ensuring the biological sustainability of the fishery.

The main cost drivers show little sign of easing over either the short or longer term. There is a longer term trend towards increasing fuel costs. The industry is also facing challenges with its labour requirements. The historical method of sharing revenue and costs on the boat with a downturn in profit margins has resulted in the industry being less competitive with the mining and tourism industries. These industries are reducing the labour pool and further increasing the costs of labour.

There is even more evidence, supported by the results of this study, suggesting higher geared operators are facing an increasing level of financial stress. Combine this with the aging of the population of fisherman and the cost price squeeze, the trend in the shrinking of the fishing fleet and the processing sector is likely to continue. If net earnings are used as the basis for valuing pot entitlements, reducing profit margins will also reduce the capital value of pot entitlements.

In a recent poll of licence holders, the industry has expressed its preference for maintaining the input control system of management. The challenge for the industry is to assess the current input control system and look for mechanisms that in a systematic and planned way, allows it to restructure and reduce its input costs. In order to achieve this, a baseline of economic performance in the fishery is needed so informed decisions about future management arrangements can be made which enable industry stakeholders to increase their profitability.

To maintain or improve its current rate of return, the fishery must first find a mechanism that allows it to restructure input costs. Similarly, it needs to consider the prospects of improving its marketing and processing of product.

The objective of this report is to provide industry with a benchmark and baseline of economic performance of those within the fishery from which to monitor and make informed decisions about the future management of the fishery.

Objectives and Scope

The research project had four key objectives.

1. To work out the method and sampling techniques for benchmarking economic performance in the lobster fishery.

    - The methods must be able to adequately sample a range of business sizes from large operators through to small licences.
    - The methods must be able to sample across zones in the fishery.

2. To create a database of economic indicators to put into an economic model for assessing the economic effects of changes to the input control system in the Western Rock Lobster Fishery.

    - Increase the quantity and quality of baseline economic information on business structures, profitability and financial sustainability.

    - Assess the ability to service existing debt across a range of business sizes and fishing zones.

    - Benchmark existing value of licences in the fishery.

    - Better understand the number and rate of fishers leaving the industry and try to work out who will be buying the units.

    - Understand what will happen to obsolete boats and gear in the market.

3. Develop methods and tools for fishermen to individually benchmark their businesses against an industry sample.

Introduction

To make informed decisions on the future management of the fishery it is important to understand the current financial status of industry. This is not something fisheries researchers consider in their advice on management decisions. Their role is primarily about stock assessment and sustainability and not about the financial decision making at a business level.

In recent times there has been a change in attitude and the majority of industry now agree it is important to develop a partnership approach with Government and peak bodies. This will help to ensure the management packages addressing sustainability of the resource and can increase profitability in the individual fishing businesses.

Last year, economic modelling company ERA surveyed 21 fishing businesses and the information collected was used in the Quota discussion with fishermen focus groups. Additional information was provided by the Australian Bureau of Statistics and other groups.

This paper adds to the work completed by ERA, but is different because:

- It uses 49 fishing businesses instead of 21,
- It provides a snapshot of the current financial status of the industry
- It will identify the main cost drivers in the industry so we can monitor how they could change with different management controls.

One of the strengths of the industry is the diversity of business models used by individual fishing businesses. This paper does not attempt to identify what is an "average" or "representative" fishing business for Zone A, B or C. Instead it provides a snapshot of some individual business types with different capital and cost structures, family arrangements and circumstances.

Research Methods

Information for this report was collected from actual fishing businesses collected from the last 3 years financial records. The base financial information:

- included financial statements, fishing statements and reviews of asset registers
- was entered into specialised accounting software without adjustment
- a small sample was removed where fishers' personal situation had changed significantly (e.g. divorce)

Protecting the identity of the individual businesses was of the highest priority and data was presented so they remain anonymous.

We have concentrated mainly on working out the relevant cost drivers as an indicator of business performance. Cash inflows are determined by the number of kilos caught multiplied by the selling price. Because total cash inflows must exceed cash outflows, beach price is one of the most important factors for fishing businesses.

However, a break down of these costs is still important for determining the relative profitability of individual businesses.

We assume that the main objective of a fishing business is to maximize profit. We have also assumed that profit is defined as the difference between the cash inflows and outflows.

Primary Sources

The data collection targeted fishing businesses equally across all zones using a spread of business sizes and structures. The sample sizes per zone were approximately equal with 16 (A zone), 14 (B zone), 19 (C zone).

Primary data was collected from fishermen with the assistance from other professionals including accountants and banks. Many fishermen were concerned and decided not to provide data possibly due to the competitive nature of the industry and the view that they had already done several surveys.

Additional Sources of Data

The following additional sources of information and data were used in this report:

- detailed discussions with fishers and their family members, processors and research scientists;
- scientific papers (including ERA's report);
- Department of Fisheries' papers and publicly available statistics; and
- discussions with financial institutions, brokers and other industry participants.

Current Industry Structure

Catching sector

The rock lobster industry currently has 495 fishing vessels and 69,178 units. The units are distributed throughout the fleet with the majority of vessels being owner operated, but there is an increasing trend toward the leasing of licences and units.

There are significant fluctuations in the cost of leasing units depending on the market demand, fishing zone and beach price per kilo of lobster.

The market value of vessels in the fishery varies from less than $100,000 to more than $1,000,000. In 2005-06, the market value of units ranged between $20,000–25,000, placing the total asset value of the access rights in the whole fishery at between $1.383 and $1.729 billion.

To participate in the fishery the vessel must have a Fishing Boat Licence (FBL) and needs a minimum of 63 units in the fishery to hold an active Managed Fishery Licence (MFL) and can then exercise the right to fish.

Rock lobster fishing has traditionally been seen as a lucrative business when compared to some other forms of agriculture and fishing with significant capital value tied up in the value of unit (pot) entitlements.

Recently the cost of fishing has been increasing while the real value of rock lobsters has been decreasing, resulting in a cost-price squeeze. These recent trends may be one of the reasons the price of rock lobster units has decreased by about 27% in the last two years.

Boat numbers in the Western Rock Lobster Fishery have also been decreasing as fishers have moved to larger boats with larger licence sizes allowing them to take advantage of economies of scale.

In recent years, economic pressures have increased to a point where economies of scale can no longer offset the shrinking profit margins in the fishery.

The challenge facing the industry is to determine the appropriate measures under an input control system that will allow fishers to survive the ongoing cost-price squeeze.

There is a concern that the current management system is not flexible and has limited the ability of fishers to reduce their costs effectively.

Rock Lobster Market and Prices

While WA is the largest spiny lobster producer, it represents less than 10 per cent of world total lobster supply and fluctuations in local supply have an impact on prices received within a given season. Annual fluctuations (season to season) also have some impact.

If monthly prices are averaged over 10 years, there is about a $2/kg variation from the low price month of December to the high priced month of June. Annual beach prices over the last ten years have ranged between $20/kg and $36/kg (CPI adjusted).

The downward trend in rock lobster prices is even more pronounced if they are adjusted to eliminate fluctuations in exchange rate. More than 95% of rock lobsters caught in WA are exported to major markets in the United States, Japan and South-East Asia. This means the WA export market is very dependent on the fluctuations in the Australian dollar against the US dollar.

Because most South-East Asian countries currencies are linked to the US dollar, trading in South-East Asia is in essentially trading in US dollars. As the $AU strengthens or weaken against the US dollar, this has an impact on trade in Asia.

The important point is that the favourable exchange rate movements (declines in $AU against the $US) in 1999 and 2000 have provided a buffer against a decline in the world price for rock lobsters.

The major concern now is the Australian dollar could remain strong and if this occurs, prices are likely to remain low in Australian dollar terms.

At the time of writing this paper, the Australian dollar was valued at $US0.83 and the outlook for a strengthening or weakening dollar was mixed.

Biological Factors and environmental conditions

The ability of researchers to predict future catches in the lobster fishery is quite unique. Future catches in the fishery are a factor of environmental conditions with the strength of the Leeuwin current and related weather patterns being the main drivers.

Over the long-term, there are unlikely to be any significant changes to future catch levels averaging 11,500 tonnes per year.

Over the years there has been a shift from fishing being a lifestyle choice when low catch times were not fished, to the point where all non fishing days need to be legislated. This is due to the increased value of capital; increased pressure to make a profit; as well as increased regulation and social changes.

The predicted reductions in catch over the next two years will have a major impact on the fishers' bottom line (and crew wages), as it is likely to coincide with increased cost-price pressures.

Additionally, recent adjustments to the current management package as well as the predicted reduction in catch will also affect fishers' profit margins because any corresponding efficiency gains are occurring at a much slower rate.

The Cost Drivers and Fishing strategies

The profitability of rock lobster fishing is mainly affected by variations in price and volume of catch and total costs. These costs include:

- fuel costs,
- bait costs,
- labour costs,
- capital costs (e.g. the cost of boats, debt servicing and the cost of replacing or upgrading fishing equipment), and
- administration and other sundry on-costs (e.g. accounting fees).

These costs are driven upwards by fishers competing against each other to achieve a greater percentage of the catch. As a result there is an increase in the level of investment in vessels and technology. It can be through having faster vessels or the latest electronic fish finding equipment for example.

However there are still a range of fishing strategies in the industry, the majority of which are somewhere between the following examples:

- highly mobile and travel vast distances in the fishery to maximise the catch per pot. These fishers will generally have a "high cost-high turnover" fishing strategy.

- Others in the fishery are not as mobile and tend to remain in an area where they know they will achieve a certain level of catch and therefore have lower costs and lower turnover.

Research Outcomes

Part of the fishery snapshot presented in this paper includes information about participation in the fishery and a profile of the fishermen survey including their average age, amount of time remaining the fishery etc.

Age of fishers and leaving the industry

With the average age of rock lobster fishers in the survey being 47 years, there are obviously a significant number of older fishers possibly considering retirement and either liquidating their fishing assets, becoming a non active fisher; or handing control of their fishing assets to other family members.

The decision about which management controls they prefer may be strongly influenced by whether they are considering leaving the fishery (i.e. they may simply want to maximize the value of assets prior to exiting the industry).

Of the surveyed fishers, 79.41% of fishers or their families intend to stay in the industry and as a consequence are likely to choose management controls that will maximize their share of the resource. There are some fishers who will want to stay in the industry because it offers a unique lifestyle.

However the research has shown a large number of fishers are feeling increased levels of financial pressure from debt generated through having to buy back pots. This trend is a significant weakness of the current management package.

Boat Replacement

Of those surveyed, 30% don't expect to replace their boat in the next 15 years because most have already done so recently. The number of boats purchased over the last 20-30 years are shown in the table below, with most boats being bought in 2001-2005. This graph does NOT show how many new boats were built, but simply whether a fisherman had bought a boat or not.

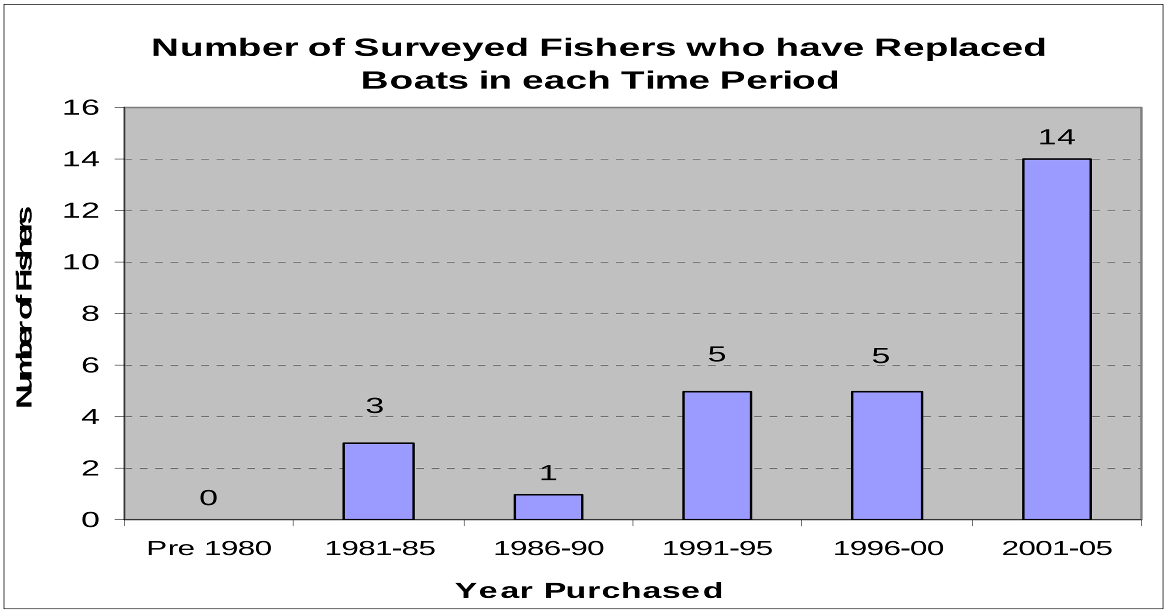


Figure 2: Number of surveyed fishers who have replaced boats

This graph suggests that fishermen are actively seeking to improve their own economic efficiency, but any change in the management package could have a negative effect on those investment decisions.

The high number of recent boat purchases may also be due to the removal of the 150 pot rule (in 2003) and good catch years.

There is also a large amount of recycling of boats within the industry, with fewer new boats being built, suggesting that the potential for a vessel to carry additional pots is not currently a limiting factor in the fishery.

Recycling vessels back into the fleet also means the real rate of boat depreciation is very low. 40% of those surveyed valued their boats to be higher than the purchase price. This is supported by evidence from boat brokers that the:

- Average purchase price of a boat is $475,298. This is the average purchase of price of a replacement boat, not necessarily a new boat. This is price paid when the fisherman purchased it.
- Average estimated market value of each boat is $437,037. This is what they expect to be able to sell it for at the time of collecting these data.

Ownership of pots in the fishery

Most investment in the fishery is through Active Fishing Individual/ Trustee/ Company and Superfund methods and suggests low outside investment and a strong family business setup.

However, these findings may partly be due to the sampling method, where only active fishers were asked to participate in the data collection. The graph below shows the ownership structure of the surveyed fishermen.

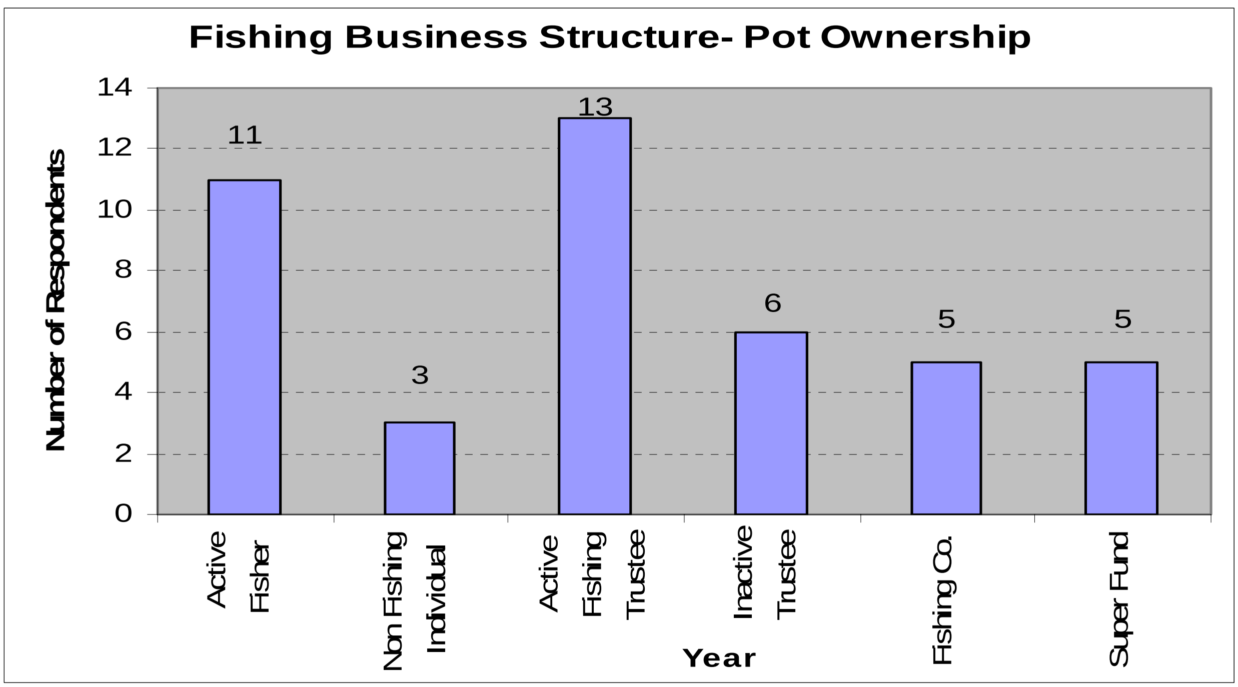


Figure 3: Fishing business structure – pot ownership

Pot Buying

The surveyed fishermen were also asked when they had bought pots. These purchases may have been a whole licence, a top-up of a licence, or simply for superannuation.

The graph below shows when ANY pots were bought, it may have been 1 or 100 pots; it might also have been the same one fisherman who bought pots on 8 separate occasions in time between 1986-1990 for example.

Of those fishermen surveyed, most pot buying events had occurred before 1980. The graph also shows a slight peak in pot buying events in 1991-1995. It does show that between 8-10 pot buying events occurred every 5 or so years. Remember, this is about the pot buying activity, not the number of pots purchased.

The higher number of pot buying events in 1991-1995 is most likely to be the result of pot reductions. This graph shows us actual figures of what we believe has happened previously, suggesting when pot reductions are bought in, the fishermen buy pots to replace those they lost.

Those that can't buy them will lease more pots, or are forced to fish with less.

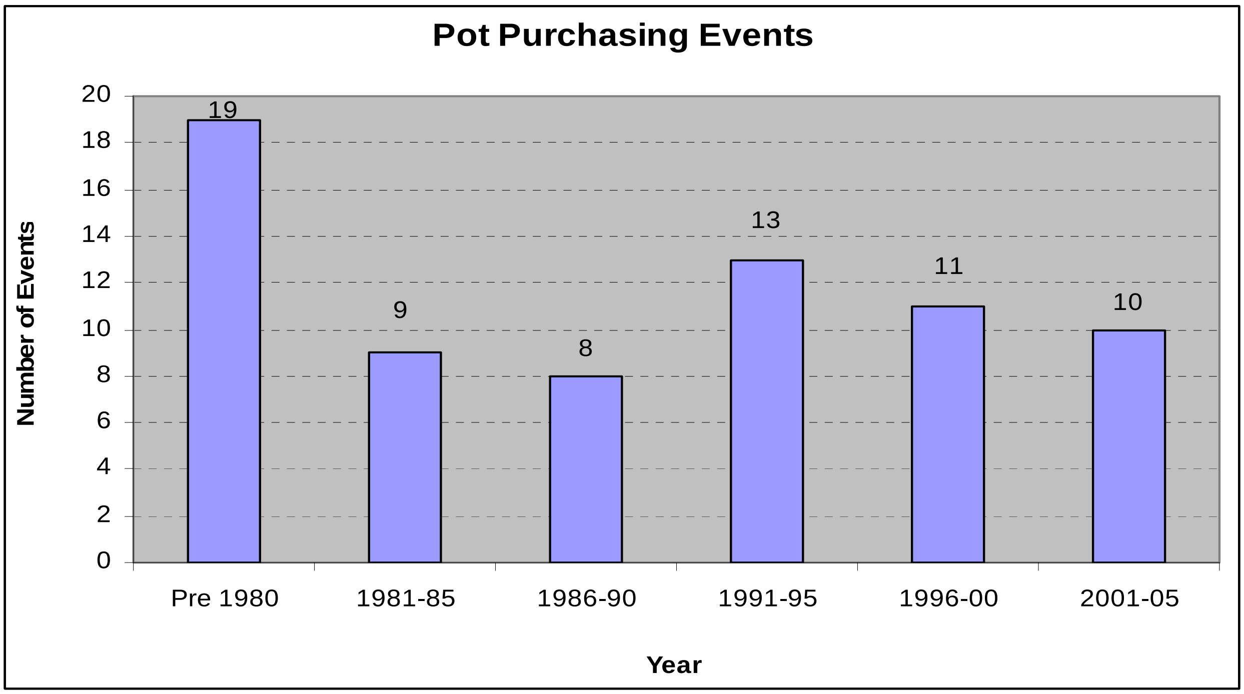


Figure 4: Number of pot purchasing events by surveyed fishermen

Trends in Fleet Size

Boat numbers have decreased from 836 in 1963, when limited entry was introduced, to 495 in December 2005, and this is shown in the graph below. This was partly due to

- the removal of the "7 and 10" rule (1979);
- pot reductions (1986 and 1993);
- the removal of the 150 pot rule (2003).

We have found no evidence the fleet reduction is slowing. Things which could add to the decline in boat numbers are:

- the cost-price squeeze on the industry;
- further pot reductions
- shortages of skilled labour;
- future catch predictions;
- a sudden increase in the value of pots encouraging fishers to realise their asset value and exit the industry; (although its unlikely to happen, and it also depends on what factors drive the increase such as beach price etc)
- a down turn in beach prices causing those with high debt levels to again reduce their operations further; and
- changes to lifestyle structure with fishers wanting to spend more time at home.

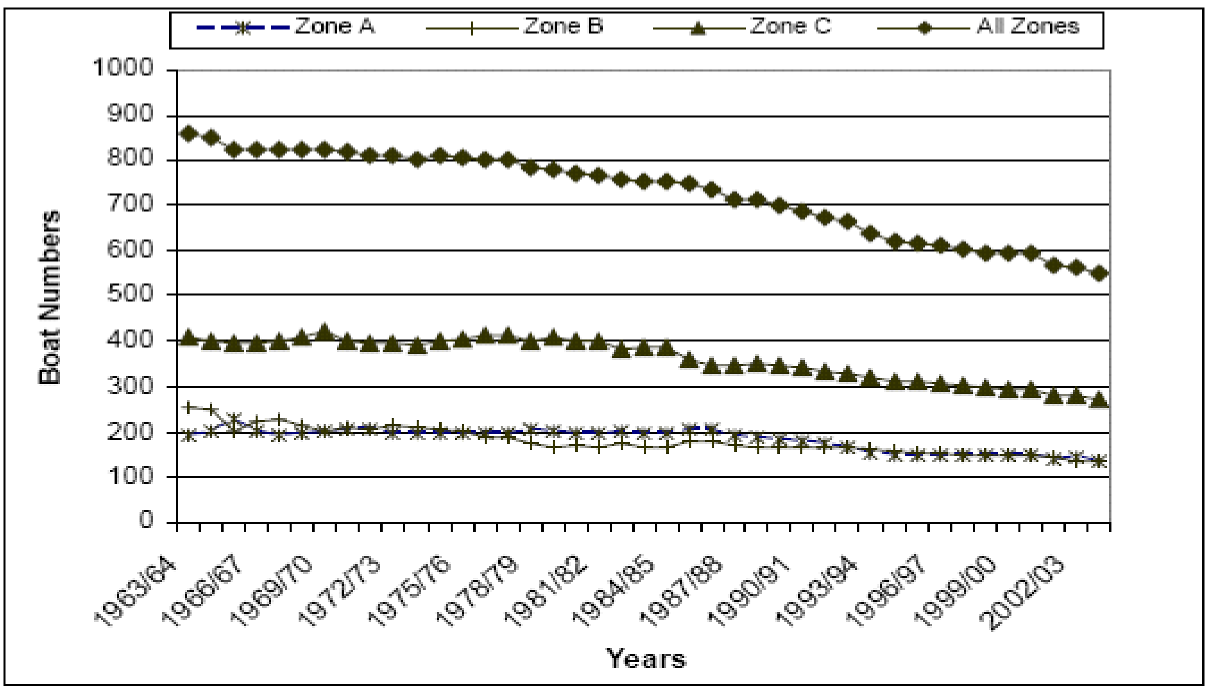


Figure 5: Lobster Boats with Attached Lobster Entitlements 1963-64 to 2003-04

Leasing of Pots

The steady increase in the number of boats choosing to lease pots supports the idea that within individual businesses there were advantages in the economies of scale. This works up to a point, beyond which it is no longer efficient to keep increasing licence size, as catch per pot flattens off.

Leasing pots was identified by many fishermen as one of the strategies to increase the efficiency of their fishing operations.

The trend towards more pots per boat, bigger boats and increased leasing of pots is an industry response to the cost-price squeeze. The number of people in the survey who lease pots is shown in the graph below.

There is a steady increase among survey participants in the leasing of pots over the last four seasons from approximately 78% to 84%.

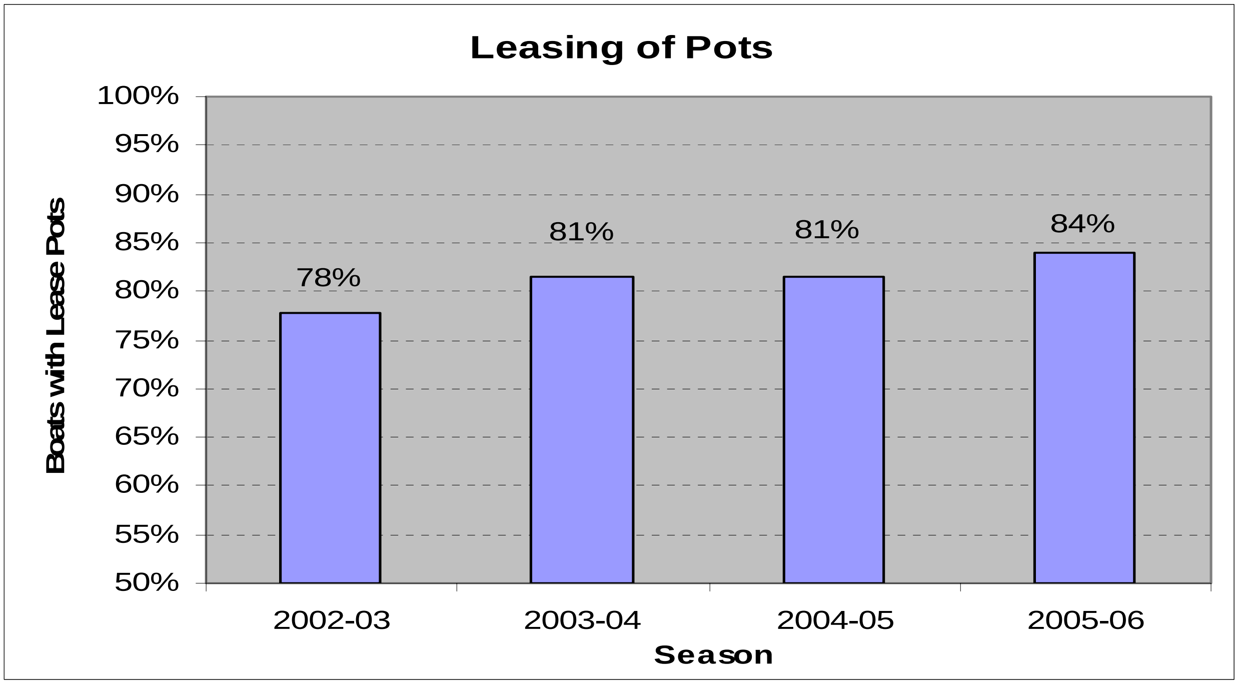


Figure 6: Leasing of pots by surveyed fishers

The next graph below shows how many pots are leased per boat by participants in the survey. There was an increase from approximately 34 pots leased per boat, to more than 40 pots leased per boat between 2002-03 and 2003-04. This is most likely due to the removal of the 150 pot limit. There is also a slight trend for fewer pots to be leased per boat from 2003-04 onwards.

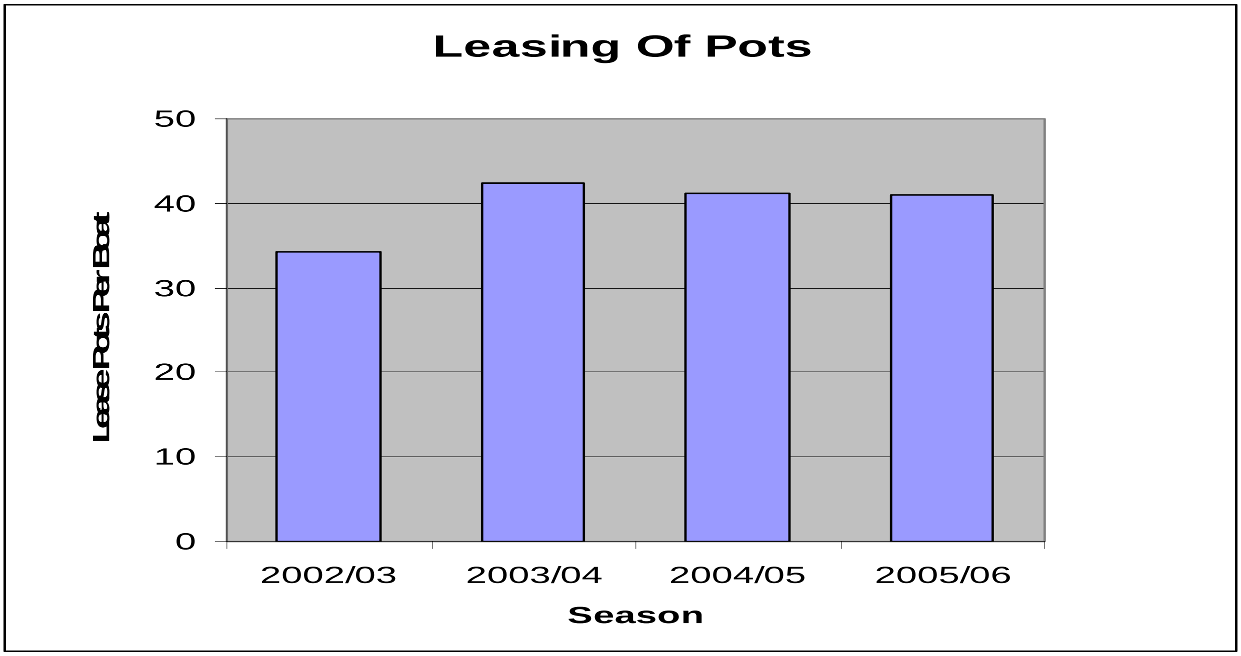


Figure 7: Number of pots leased by surveyed fishers

Profit From Fishing

Profit from fishing is defined simply as:

Profit = (Cash inflows from fishing) – (Cash outflows from fishing)

To determine the cash inflows and outflows we reviewed the Profit and Loss reports from the fishermen and removed any items that were not strictly related to fishing activities. The expenses that were looked at included:

- Harbour fees and Licences (which includes $134 per pot fee, and mooring and pen fees)
- Wages
- Superannuation
- Bank Fees & Sundries & Interest
- Depreciation
- Personal Expenditure
- Bait
- Fuel & Oil
- General Boat Expenses
- Repairs & Maintenance
- Other Expenses

(Note- A Zone cartage fees from the islands were not included in these costs). Please see table three explaining what they are, and how they were used in the analyses.

The baseline cash flow from fishing operations of survey participants within each zone on a per pot basis is shown below and was based on the 2005 figures as they were the most recent and most accurately reflect current catch and expense trends.

Table Three: Income and outflow per pot according to fishers surveyed

CASH INFLOWS (PER POT)	A Zone	B Zone	C Zone
Gross income	4,301.56	3,819.27	4,889.94
Rebates (diesel fuel rebate)	113.11	185.70	161.28
Total Cash Inflows	**4,434.67**	**4,004.97**	**5,051.22**
CASH OUTFLOWS (PER POT)			
Bait	294.34	292.21	294.00
Fuel & Oil	490.80	575.22	558.88
General Boat Expenses	18.23	41.19	78.76
Harbour Fees and Licences	388.96	290.11	251.61
Repairs & Maintenance	163.42	163.41	163.42
Wages	1,376.50	1,162.16	1,468.43
Superannuation	123.89	104.59	132.16
Total Cash Outflows	**2,856.14**	**2,628.89**	**2,947.26**
Total Profit From Fishing per pot	**1,578.54**	**1,376.08**	**2,103.96**

The data we have collected shows that it was more profitable per pot, to be fishing in C zone in 2005 than A zone or B zone. It also shows that while B zone had the lowest income of all three zones, this particular zone also had the lowest costs.

If we had more data, this information could be broken up further in to licence sizes, or fishing location, or boat size for example.

Variable Costs

Variable costs are also referred to as operational costs. These make up over 60 % of the total fishing costs of 'an average' rock lobster fisher. A break down of these costs across each zone is shown below:

Table Four: Percentage breakdown of operational (variable) costs

	A Zone*	**B Zone**	**C Zone**
Bait	10.3%	11.1%	10.0%
Fuel & Oil	17.2%	21.9%	19.0%
General Boat Expenses	0.6%	1.6%	2.7%
Harbour Fees and Licences	13.6%	11.0%	8.5%
Repairs & Maintenance	5.7%	6.2%	5.5%
Wages	48.2%	44.2%	49.8%
Superannuation	4.4%	4.0%	4.5%
Total Variable Costs	**100.0%**	**100.0%**	**100.0%**

* Cartage from the islands is not included in these costs.

The table shows that in general, wages are approximately 50% of the operational costs of the fishing business, with bait being about 10%, and fuel approximately 20% in 2005. The table also shows that while A zone fishers had higher harbour and licence fees, they had lower general boat expenses.

While the B zone fishers surveyed had the highest bait, fuel and oil, and repairs, they also had the lowest wages and superannuation expenses.

C zone fishers surveyed had the highest wages, but the lowest bait and repairs expenses.

These figures are similar to the findings of last year's ERA study and some points that are raised by this information are:

- long-term reductions in costs can only gained through managing variable costs;
- fishers have attempted to minimise costs and maximise catch; but are somewhat limited by the current management package.
- the decision to lease pots only impacts variable labour costs if the number of additional pots leased requires more crew
- changes in pot design could improve cost efficiencies but requires further research
- any reduction in maintenance costs on boat or gear are short term and may reduce profitability due to reduced fishing time
- the shortage of crew will result in the variable cost of labour continuing to rise.

Impact of Fuel Usage on Gross Income Per Pot

The graph below shows relationship between gross receipts (income) per pot and fuel used per pot in 2005 for C zone boats which participated in the survey.

In general, the trend shows fishing harder (or using more fuel) generates higher catches but does not improve the fuel to income ratio. For example, is catching an extra 10kg of lobster worth an additional $250 income offset the cost of an extra $190 of fuel used?

The bulk of fuel used in the industry is for travelling to and from fishing areas. Fishers are likely to increase the number of pots per boat to reduce their fuel per pot usage (economies of scale).

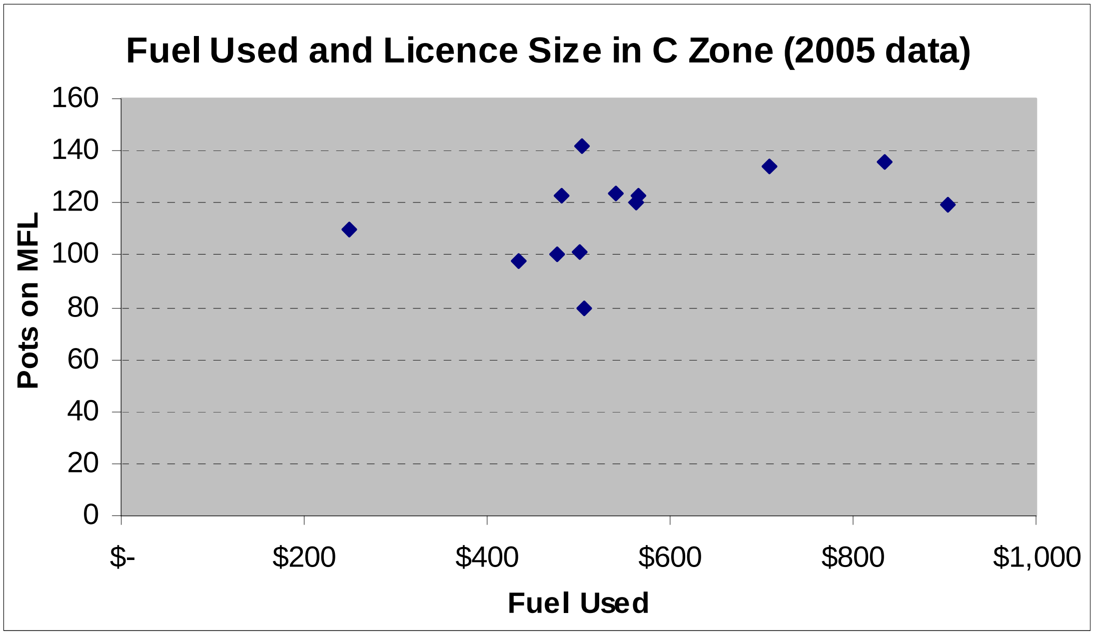


Figure 8: Cost of fuel per pot against size of MFL held by surveyed fishers in C zone

The graph above shows a large variation in the amount of fuel used per pot by participants in the survey.

For example, boats using 120 pots are using between $450 and $ 900 fuel per pot. It also shows that small licences can also use more fuel than large licences and vice versa.

Impact of Labour Costs on Gross Income Per Pot

Recent evidence shows that crew earnings are falling below competing sectors (e.g. mining) and there is an increasing trend for fishers to pay deckhands wages for 52 weeks of the year and adjust for good years by adding a bonus.

Under the current revenue sharing arrangements, paying crew a percentage of the catch provides a buffer for the owner if the catch is poor (because crew payments will be low) but provides a good outcome for crew if the catch is good (because crew payments will be higher).

One solution to the crew shortage may be to pay crew a greater proportion of the value of the catch (either as a fixed payment or under a revenue sharing arrangement) which would have a considerable impact on the profit margin.

However, this could be offset by the decreasing costs or improving catch efficiencies. In addition, a high turnover of crew will also increase costs due to reduced efficiency while training up new crew.

The table below shows the impact of increasing crew earnings on the fishing business using the starting pay level of 8% per crew on costs per pot fished. If the average wage is set at

$47,879.10 to start with; this equates to $346.95 per pot over 138 pots (average number of pots per boat in 2006) for each crew member, or an average of $693.90 per pot fished with two crew.

For example, an increase in the crew's total wages (not his % catch share) by 3%, would take his total income to $49,315.68 (equivalent to 8.24% of the catch share), you would then need to pay them an additional $1,436.58 each (which works out to total crew costs of $714.72 per pot).

The total cost of the crew per pot in the right hand column assumes two crew per vessel. If you wanted to keep up with the average annual wage increase in W.A. of 6.5%, you would need to pay your two crew an additional $3,113.28 each per year, this works out to be $739.02 per pot total crew costs.

Table Five: Impact of crew wage increase on cost of labour per pot

Crew Percentage	Annual Pay Increase for Crew $	Total Wage $	Overall Wage Increase	Cost of Labour Per Pot $ for 2 Crew
8.00%	0	47,879.10	0	693.90
8.24%	1,436.58	49,315.68	3%	714.72
8.48%	2,394.30	50,752.26	5%	728.60
8.72%	3,113.28	52,188.84	6.5%	739.02
8.96%	3,830.88	53,625.42	8%	749.42
9.20%	4,788.60	55,062.00	9%	763.30
9.44%	5,506.20	56,498.58	10%	818.82

If you wanted to increase the crew's total wages by 5% to reach $50,000 per year (average wage in Australia), without a similar increase in fishing revenue, annual profits would decline by about $4,000 (assuming the boat was crewed by two deckhands).

This table shows that it will be more difficult to keep crew unless wages are increased, and this will decrease profit margins as shown for a 138 pot vessel with two crew members.

Fixed Costs

Fixed costs must be paid regardless of activity and the only way to reduce fixed costs per pot is to spread them over more pots. However there is a physical limit to the number of pots which can be fished per boat. Fixed costs are:

- Difficult to reduce and are unlikely to affect profitability
- Difficult to establish a baseline for as they are different for each fisherman.

Cost – Volume – Profit Analysis

Variable Breakeven Analysis

The key point in bench marking the industry as it currently stands is to work out where you are in relation to other fishers to see how you can improve individual businesses. Using the break even point of the surveyed fishers as an industry standard, we are able to determine the amount of lobster (kg) that need to be caught given a particular beach price ($ / kg).

This is different for each zone, and is graphed below using the costs of fuel, bait etc in the 2005 season. This graph shows that for the surveyed fishermen in A and B zone, at $26/kg they need to catch 100kg per pot, or they are effectively losing money. C zone needs to catch more (approx 115- 120kg to break even at the same beach price).

If the price goes down to $22 per kilo for example, then the catch is approximately125kg to break even for A and B zones while again C zone is higher. This calculation assumes the vessel has over 100 pots, two crew members and a skipper paid on % of gross receipts, with superannuation paid at the required 9%.

It is important to note that this break even point is an average for this sample of fishermen surveyed, and that each fisherman would have a different break even point for their boat.

These calculations only include the costs to fish (variable costs) and allow estimates of the fishing activity needed to pay for these costs. Any additional income the fisher needs to cover fixed costs and returns to the owner are on top of this break even estimate.

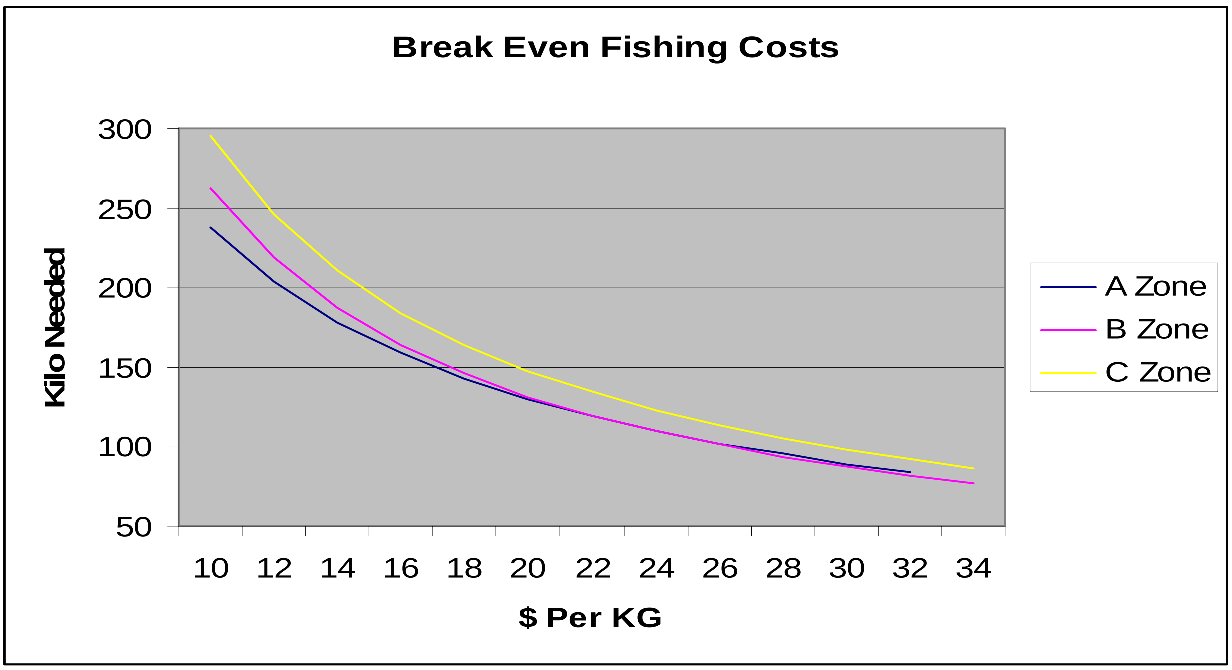


Figure 9: Breakeven for Fishing Operation per Zone based on data provided

Marginal Efficiency of Leased pots

This section is to assist fishers with a licence of 100 or more pots who are considering leasing additional pots. The break even point for fishermen leasing pots is obviously going to be higher and can be calculated using the variable costs for fishing businesses.

The table below shows what the additional variable (or operational) costs would be for an additional 10 leased pots.

Crew wages are assumed to remain the same as for the licence without lease pots (unless you need to hire more crew to handle the extra costs). The skipper's wage is also assumed to remain the same.

Table Six: Additional operational costs for lease pots

Item	Cost per Pot	Explanation
Fuel	$80	Fuel used when fishing that extra pot (does not include fuel used travelling to and from fishing grounds)
Bait	$294	This is additional costs for the 10 lease pots (does not include your normal bait costs)
Lease	$1,200	This cost only applies to each of the 10 lease pots
Repairs & Maint.	$100	This is the same cost for a lease pot as a normal pot
Licence Fee	$134	This is the same cost for a lease pot as a normal pot
Transfer	$620	This is a once off cost- not a cost per pot. It is $310 each way.
Gear	$100	This is the same cost for a lease pot as a normal pot

These costs for the break even point have been calculated based on the average of variable costs across the three zones. The actual numbers can change according to fishing businesses.

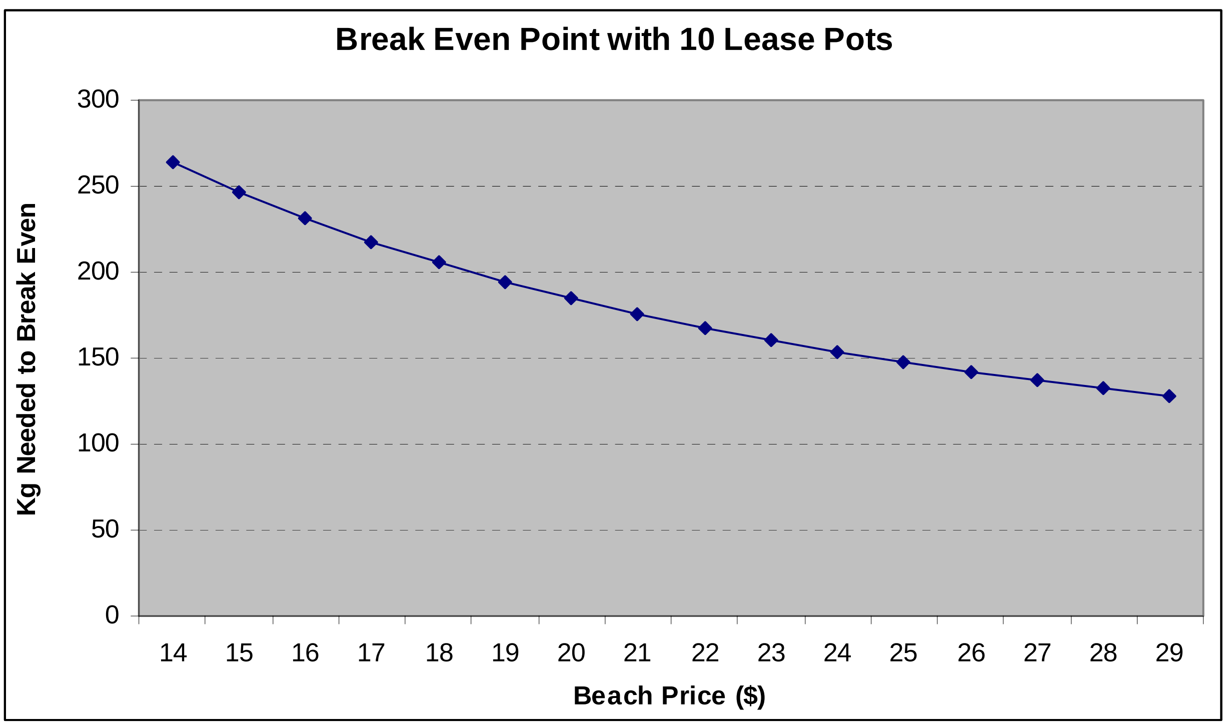


Figure 10: Hypothetical break even point for surveyed fishers with ten lease pots

Impact of Pot Transfer Costs

The cost to transfer pots onto your licence is $310 each time, which equals $620 per season. There is an economy of scale in leasing pots, you either spread the $620 fee across one leased pot (when it is $620 per pot leased) or across 10 pots (where it is $62 per pot).

The cost of this transfer results in low cost ‘efficiency’ for small numbers of leased pots, the more pots leased the greater the cost ‘efficiency’ of each pot. This will have a significant impact on the break even point for decisions around leasing pots.

Economies of Scale

The graph below shows the different profits for different licence sizes for the people surveyed. Because there is no particular trend, this suggests that the fishermen participating in the survey have found the most efficient pot number for their licence size. The graph shows that small licences can have high profits, as can larger licence sizes.

The graph also shows that some fishers with 100 or so pots can collect anywhere between $1700 and $2500 profit per pot, for example. This is based on variable costs only.

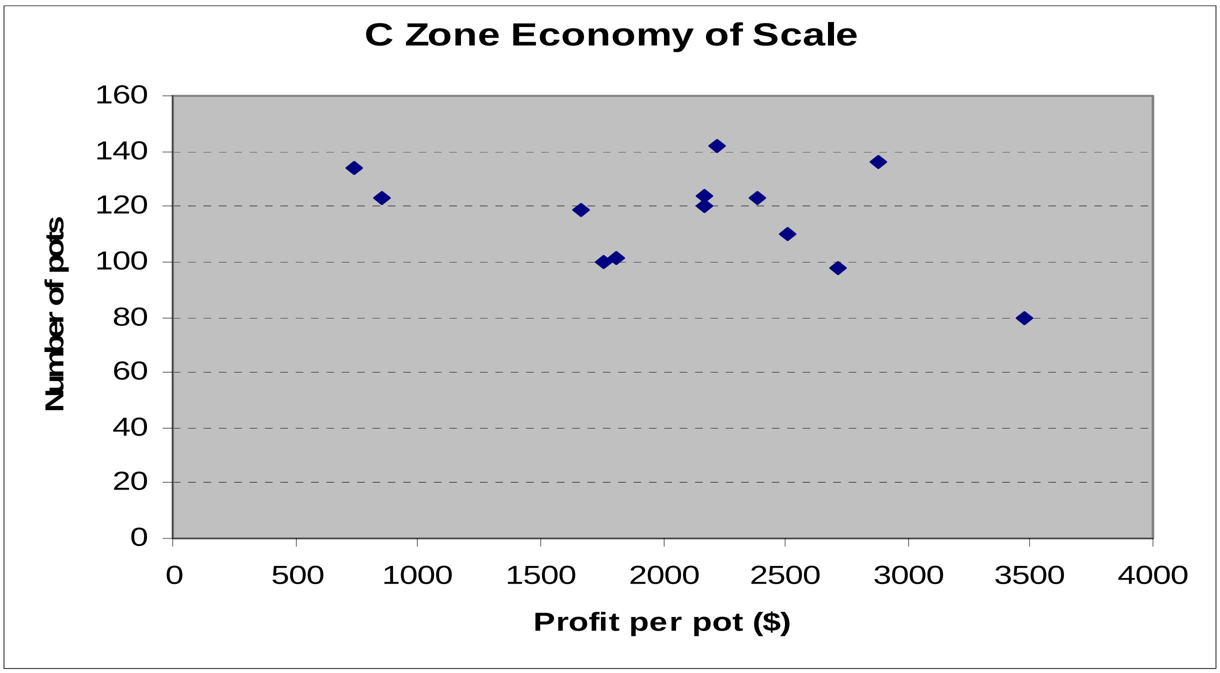


Figure 11: Profit per pot of surveyed fishers in C zone

The second graph (below) shows the costs of bait and fuel for the different licence sizes, relative to their profits (yellow bars), and shows the variation in fuel use, bait use and profit for licence sizes.

Remember this is profit per pot, not overall income per pot, so the fisherman with 134 pots has approximately $700-800 bait and fuel costs, but makes roughly $700-800 of PROFIT PER POT in the water, while the fisher with 80 pots has bait and fuel costs under $1000, and has a PROFIT PER POT in the water of nearly $3500 (based on variable costs).

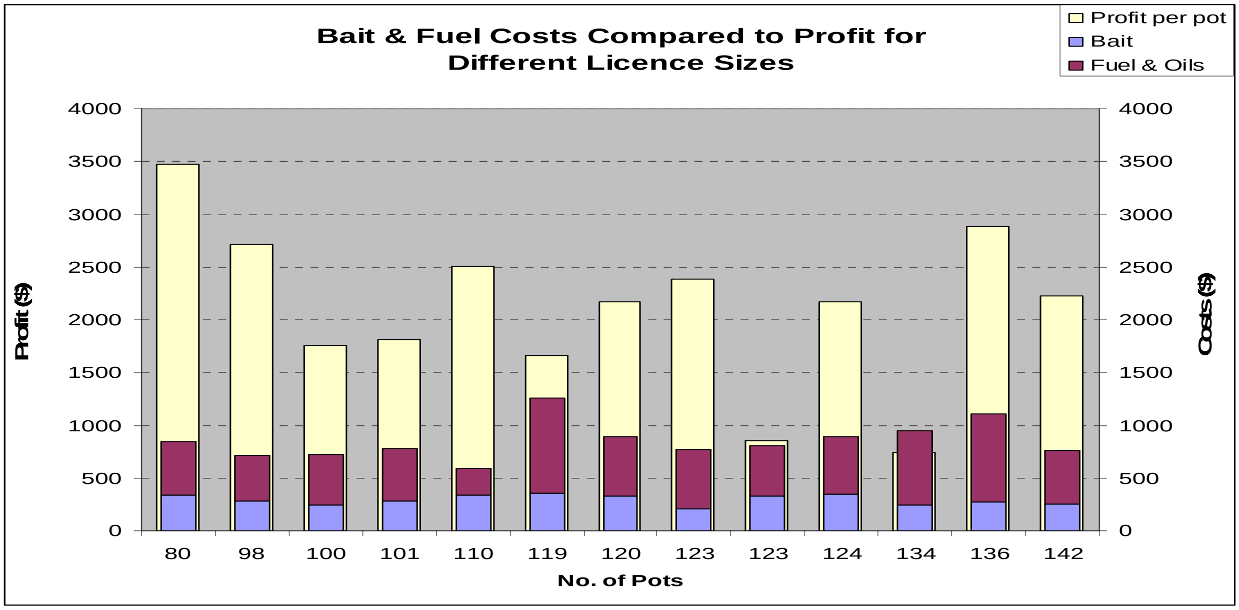


Figure 12: Profit, cost of bait and fuel per pot for various sizes of MFL

Differences in the efficiency of pots will depend on non-market factors including

- Fisherman's attitude (may have days off, not want to work very long hours)
- Skill of Fisherman
- Area and zone they fish
- Quality of season
- Seasonal factors

Financial Analysis

Comparing one business with another provides the most valuable indication about the financial health of a business; this is done by benchmarking the financial performance of the business against a representative sample (a standard). Some of the more common benchmarks used in financial analysis are explained below.

Asset to Liability Ratio

This is a test of the ability of a business to meet short term debts. This compares the liquid assets of a business to the liabilities due in the short term (the next 12 months), and is also called a quick ratio.

So the quick ratio = ASSETS: LIABILITIES

A Quick Ratio of 1:1 is generally felt to be acceptable and you can cover your debts (i.e. you have equal amounts of assets as you do debts).

The data from the study shows the industry sample has a range of quick ratio outcomes. A couple of businesses appear at each end of the scale showing extremely high and low ratios (i.e. some owe a lot more than is coming in (high ratio), while others have money left over after paying bills).

The ratio number (as in a high or a low number) can be found by dividing the assets by the liabilities.

For example, 1:4 assets to liabilities = ¼ or 0.25 which is a LOW ratio. Or, you could have a HIGH ratio, with 5:1 assets to liabilities = 5/1 or a ratio of 5. So in short:

More Liabilities = low Quick Ratio
More Assets = high Quick Ratio

The average quick ratio from those people sampled is 2.58:1 (i.e. they have more than twice as many assets than they have debts), suggesting most are financially sound.

There is no noticeable trend among businesses fishing a similar number of pots (i.e. bigger licences don't necessarily have a greater ability to pay their debts or vice-versa). The table below sets out the results of the quick ratios for our study:

Table Seven: Quick ratio of surveyed fishers

Assets : Liabilities	Number	Ratio	People surveyed	Outcome
1 : 2 or more	1/2	< 0.5	25%	Low ratio or large amount of liabilities
1 : 2 or 1 : 1	1/2 or 1/1	0.5 - 1	7%	Low to equal ratio
1 : 1 or 1.5 : 1	1/1 or 1.5/1	1 - 1.5	18%	Equal to high ratio
1.5 : 1 or more	1.5/1	>1.5	50%	High ratio or large amounts of assets

The information above shows that 68% of the surveyed people have either an even quick ratio or greater, and can therefore service their debts while 25% of those surveyed have excessive debts.

Quick Ratios are useful to showing good to bad liability ratios. There is another ratio which is basically opposite to this, which looks at your debt to your equity; or your 'bad' to your 'good' money.

So while a HIGH quick ratio is considered a good thing, a high DEBT TO EQUITY ratio is NOT a good thing, because this means that you basically have MORE DEBT than equity. This is explained below.

Debt to Equity Ratio

This ratio measures the amount of finance being provided by creditors (e.g. banks) compared to the amount of funds from the owners or beneficiaries (i.e. your own money).

Essentially this compares just how much the bank has contributed to your business, compared to how much you have contributed. The Debt to Equity ratio clearly shows businesses that are more funded by borrowings compared to those who are self funding.

Creditors prefer a relatively low Debt: Equity ratio (i.e. they like you to put more of you own money in). Business owners (fishermen) generally prefer to use creditor's funds (i.e. borrow more) and have a high ratio- remember this is opposite to the Assets: Liability or quick ratio above.

So in short:

More of your money	=	low Debt to Equity Ratio
More of bank's money	=	high Debt to Equity Ratio

Many industries have developed their own preferred ratio levels. The table below sets out our findings:

Table Eight: Debt to equity ratio of surveyed fishers

Ratio Results	Respondents %	Explanation
< 0.5 (Low)	32	These fishers have a lot more equity than debt.
0.5 – 1	18	These fishers have a little more equity than debt
1:1.5	14	These fishers have equal or more debt
>1.5 (High)	36	These fishers have a lot more debt than equity

For example, there are 32% of fishers surveyed who have at least twice the debt than they have equity (i.e. they own a third or less of their business, with the rest supported by loans).

18% of fishers surveyed own between a third and half of their business (range between twice as much debt to equity and equal levels of debt to equity) while 36% of fishermen surveyed owned more than they had borrowed, with a ratio of 3:2 or better. So in short, roughly a third of those surveyed are heavily mortgaged, a third are partially mortgaged, while a third are basically financially self-sufficient.

This information suggests, that those with a high Debt to Equity ratio would be unlikely to be able to get further funds from loans should a change in the industry require it. Consequently they may not have the financial ability to move through a period of change.

Note: This data should be treated with caution as surveyed fishers may have other assets not described in the survey.

There is also anecdotal evidence suggesting that some fishermen use their equity in the business to get pots. Rather than keeping their current ratio of debt to equity and putting up the cash, they instead re-finance and use the equity and increase further their debt to equity ratio. Some people selling up will withdraw their equity for retirement or other business pursuits.

If the industry does not generate sufficient returns to repay debt, the interest payable on debt becomes a fixed cost (which is then more difficult to remove). This high debt will cause financial stress in fishing businesses during times of low prices and/or increasing costs.

Value of Units (pots)

Any attempt to predict changes in the value of pots under various management controls should be based on the idea pot owners are rational investors and will maximise return on investment.

Any valuation process is highly subjective because it is difficult to fully understand the factors that drive prices. Generally, the market for pots is small and it is likely to be those fishermen with an existing interest in the industry, which means either a scarcity or surplus of pots can affect the market value of these pots.

Where a fisher has a profitable business unit, the motivation to get more pots is likely to be biased towards getting a return on investment. Decisions to invest in pots are influenced by a number of factors:

- Some fishers are investing to increase their pot holdings to reduce the impact of their fixed costs across a greater number of pots.

- Others may be making investment decisions to “future proof” themselves against changes in the management package.

For example in the lead up to and after the 18% pot reduction in 1993, some fishers wanted to buy pots to get back to their original entitlement in the water for economic reasons. Prices for pots varied before and after the 18% pot reduction based on demand.

What is Value?

The value of a pot is different for everyone. For this study, value is worked out on “maintainable earnings”. Maintainable earnings means that a fisherman could either lease a pot out for $1200 per year, fish with it for a profit (expect $1400 per pot in the A zone- see Table Three), or could sell it for $18,000-$25,000. The person buying it could use then lease it out, or could go fishing with it; and get a return on their investment.

If the return on investment (e.g. a 5-6% return on investment) is less than what could be made by fishing with it, or leasing it out, a buyer would not want to pay a high price for it. (Note - Maintainable earnings are not the same as the capital value of a pot (the $18,000-$25,000 they could sell it for, because this is a once off income, that is not ‘maintained’ earnings).

The value of pots is driven by the seller's expectation of future profit (e.g. $1200 per year lease income or $1400 from fishing it in A zone), discounted by a rate of return on investment acceptable to the buyer (e.g. 5% return on investment). This means the potential profit made by a pot needs to be worth a rate of return on investment by a buyer in order for that pot to have value.

The value of the pot that you can sell it for is basically worked out as follows:

$$\text{Value} = \frac{\text{Maintainable Earnings (e.g. \$1200 lease fee, or \$1400 A zone profit)}}{\text{\% Rate of Return on Investment}}$$

This means that although a pot may be able to earn you $1200 a year from a lease payment there may not be anyone willing to pay $1200/5% (= $24000 based on value calculation below) for a pot, so the value is not actually $24,000 on the market, because most people want a greater return on investment than 5%.

Or if you were going to fish that pot and not lease it out, expecting a $1400 profit (fishing in A zone) with a 5% return on investment; you would not want to pay more than $28,000 for that pot.

So, if you wanted a 6.5% return on investment, you would not want to pay more than $18,400 each for your pots (because 1200/6.5% = $18,400).

This suggests, for the same pot price (e.g. $24,000) you would make a higher return on investment (5.8%) fishing in A zone than you would leasing your pot out at $1200, and getting a 5.0% return on investment. However for a $20,000 pot, you could get a 6% return if you leased it or a 7% return if you fished it.

The relationship between value and the required rate of return on investment is an inverse relationship. This means that the higher the % rate of return on investment that is required, the lower the value of the maintainable cash flows.

Historical Trends in the Value of Pots

The market value of rock lobster pots has increased considerably over the last 20 years, with a noticeable spike in prices after the 1993 pot reduction.

While there have been seasons where the value of pots has decreased, the general trend has always been upward. During periods of decline in pot prices, short-term decreases in beach price have been identified as the main driver for this pot price decline. See Figure 13 below.

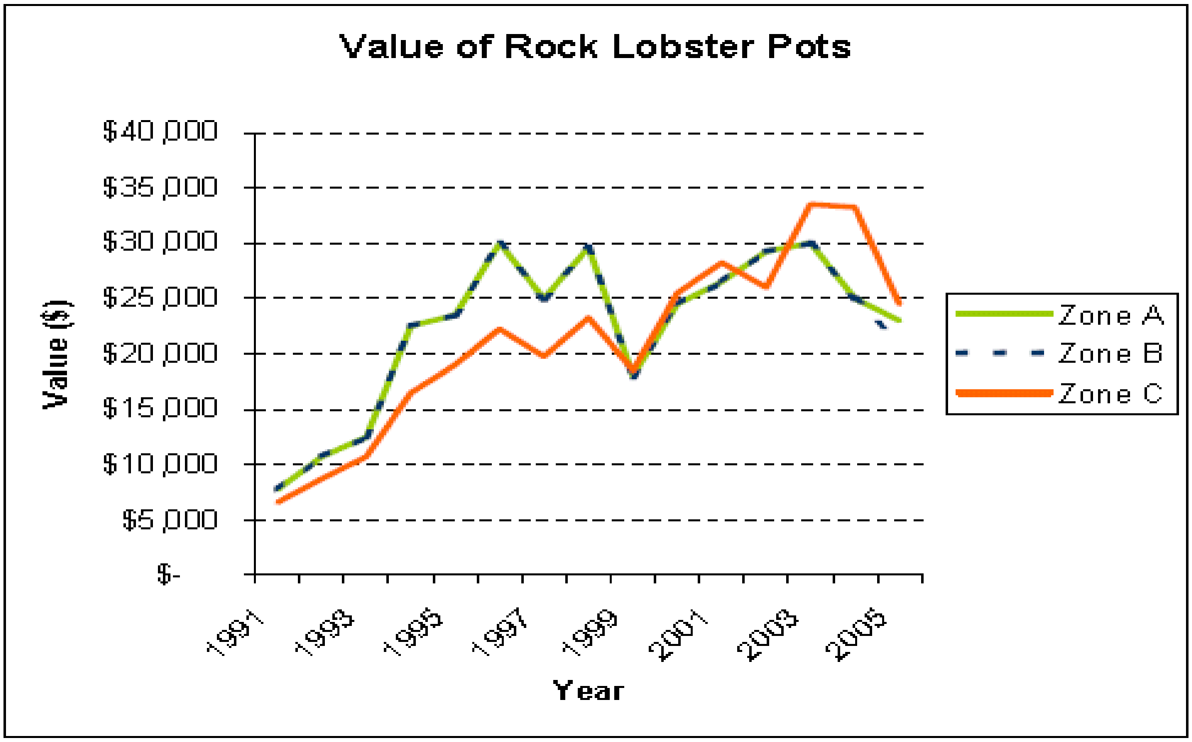


Figure 13: Value of rocklobster pots (units) over time

Our findings also support the view that demand for pots increases whenever there is a pot reduction. This appears to be a short term response by fishers to maintain their current cash flows, in spite of the fact that the level of debt in their fishing businesses has increased.

However, there is some evidence of fishermen getting additional pots after a pot reduction to spread the fixed costs across a greater number of pots, and the optimal number of pots for your vessel is what you had previously. (This is about spreading COSTS, not about making up for lost catch).

Recent and proposed sales data (for both boats and licences) suggests this strategy has not been effective for all fishers who tried it. Given the level of debt known in the industry, a small increase in bank interest rates could mean a significant additional cost per boat per year.

If this impact is added to the general rise in costs (mainly labour and fuel costs), the cash flows of most of fishing businesses would most likely decline.

Value of Pots under Different Management Controls

If our definition of value (i.e. based on maintainable earnings) stays true, changes to the management controls that increase the operating cash flows of the industry are likely to result in an increase in the value of pots.

The willingness of fishers to pay higher prices for pots should reflect the expectation of future earnings. However we must still think about things such as:

- speculation by both fishers and investors (i.e. buying pots on the chance that they might increase in price); or

- 'emotional' purchases by fishers prepared to "buy themselves or family members a job".

The first step in predicting future pot values is estimating the future maintainable cash flows under each of the management controls. The management controls which are likely to generate the highest maintainable earnings are also likely to result in the highest value of each pot.

The second step is the use of the appropriate discount rate of return for the buyer. It is highly unlikely all potential pot buyers will use the same discount rate (because some fishermen catch well per pot and others less so). However a range of rates may be identifiable. One proxy for the expected rate of return on pots is the current pot leasing rate (i.e. you can use the current lease price to estimate the expected rate of return).

The table below sets out the known net lease values achieved for the 2006/2007 season for A Zone. The base rate of $23,500 has been used as an average of the most recent pot sale price.

Table Nine: Lease value per pot of surveyed fishers in A zone

Lease Value Per Pot	**Base Value of A Zone Pots**	**% Return on investment**
1,100	23,500	4.7
1,150	23,500	4.9
1,200	23,500	5.1
1,250	23,500	5.3
1,300	23,500	5.5

This exercise does not consider the value of pots to fishers but rather measures the likely rate of return to investors. We assume:

- these investors are external to the industry and are rational. Consequently they are not impacted by family, succession or personal preferences which may influence the decision making process of some fishers;
- fishers also act rationally and do not lease pots unless they can generate their required rate of return;
- we know from the review of the financial performance of fishing businesses who lease 100% of pots fished, they can only expect to earn roughly the same as they would if they were skippering a boat;
- the rate of return on investment used in valuing pots can be estimated to be in the range of 4.5% to 6% before any capital gain;
- there is no allowance for changes in pot values.

This approach is sufficient for the purposes of comparing management controls because the profitability of the industry is the key issue of concern. Capital gains in pots will logically follow if profits can be improved through changes to the management package.

Calculating Maintainable Earnings

The table below sets out the values of pots for fishermen after income statements have been normalised and are calculated based on a 5% return on investment and again for a 10% return to show what happens to pot value with changing rates of return. The data has been grouped to protect fishermen's identity, and the profits etc have been averaged for that group of licence sizes. This is for A and B zone fishers.

Table Ten: Normalised value of pots according to size of MFL

Pots	Overall Profit from Fishing	Profit Per pot	Value of Pots to that fishermen using 5% return	Value of Pots to that fisherman using 10% return
63-99	200,915	2,210	44,195	22,097
100-109	166,986	1,651	33,021	16,510
110-119	146,819	1,308	26,162	13,081
120-129	119,010	982	19,648	9,824
150-160	224,716	1,469	29,375	14,687
160+	198,532	1,196	23,920	11,960

For example, for fishers with 63-99 pots, average profits for the business were $200, 915 per year, or $2,210 per pot. This means, to get a 5% return on investment, these pots in this licence group are worth approximately $44,000.

Whereas a fisherman with 120-129 pots and a profit of $119,010 their pots are worth $19,648 to them based on a 5% rate of return. Higher returns on investment (e.g. 10%) reduce the value of pots by roughly half.

The data displayed in the table above suggests boats fishing a smaller number of pots have generated a higher rate of return. This suggests pots are worth more to small fishing enterprises than larger fishing enterprises.

When fishers receive approximately the same net value (income) for their catch, this is called a 'pricing equilibrium'. Where there is pricing equilibrium between all fishers, it appears large investors would find investments in pots unattractive due to the low rate of return.

However, the idea described above may not hold true where vertical integration has occurred and investors have significant control over the processing sector. This is because processors are likely to get pots to lease to fishermen and have control over supply of lobster and can then distort any price equilibrium which existed.

Capital Investment Decisions

The rock lobster fishing industry infrastructure includes, but is not limited to:

- Fishing boats;
- Island camps and jetties
- Industrial land used as storage; and
- Processing land and plant.

Fishing Boats

The rock lobster fishing fleet has been steadily declining since the 1960s and by December 2004, there were 549 boats, down from a peak of 836 in 1963. The trend of declining boat numbers is likely to continue as the average number of pots per boat increases.

Boat numbers have further declined since 2004 and it is reasonable to think this decline will continue in the future, given the ongoing challenges of the continuing cost-price squeeze. When a fisherman leaves the industry, the trend is for the licence to be split up amongst the other fishermen, rather than being sold to another person entering the industry. This decline in boat numbers is likely to be accelerated if further pot reductions are introduced.

Under an input control system we expect the decline in boat numbers would slow before finally stopping. The fleet will then reach a point where there are a maximum number of pots that can be worked or carried on respective vessels. With the high cost of building boats seriously limiting the economic viability of new larger boats being built, there is a limit to the number of pots that can be carried on each vessel.

There is often a desired number of pots that a fisherman wants to fish that is lower than this top limit, and in a period of stability this would be the most they would have. With the current uncertain environment, our evidence suggests fishermen are either holding and fishing or leasing out extra pots as a way of securing their investment against future pot reductions.

There generally has been a strong demand for boats (both older and new boats) after 1990, but the number traded was mostly through recycling used boats as fishers upgraded; with each fisherman seeking a larger, faster boat than the one they currently own.

The boats which are no longer commercially viable are mostly sent to the recreational market. An investment of more than $1.2 million to build and commission a new 65 foot boat is risky give the current economic situation in the rock lobster industry.

Our data suggests the effective rate of depreciation for fishing boats has been historically very low. The market value of boats is subject to supply and demand not only within the rock lobster industry but also from other fisheries and recreational fishers. Any surge in the supply of new boats is unlikely to cause a long-term sustained decline in value. The reason being the cost of new boats is now and likely to remain very high and rock lobster boats are versatile in their application.

Other Infrastructure

In the past, industry has had no security of tenure at the islands. As a result, investment in infrastructure in camps and jetties at the islands has been limited. However, the industry is now working with Government to establish 21 yr lease agreements for the inhabited areas of the islands for the rock lobster industry and aquaculture sector.

We would expect some investment by fishers for upgrading of island infrastructure if the individual's businesses in the A zone fishery have a long term view.

Currently there is market for camps selling to fishers who are either expanding their island operations or new fishers electing to become A zone island operators. There has been no obsolete investment identified in this sector.

Industrial land and sheds are used to store gear during and after the season. Not all fishers own industrial sheds with some storing their equipment in facilities near their homes. The properties have increased significantly in value and provide equity for the fishing business. There has been no obsolete investment identified in this sector.

Conclusions

In economic terms, the Western Rock Lobster Fishery is facing challenging times as a result of the ongoing cost-price squeeze. Unless the industry can improve its efficiency or value of its product, this is likely to have a considerable long-term impact on the profitability of the fishery. Failure to do so is likely to harm profit margins and also the capital value of pots.

The main cost drivers don't seem to be easing over the short or longer term, and the outlook for rock lobster prices is not optimistic. Even if prices do rise, the industry is likely to see lower profits than in the last few seasons due to increasing costs. We also don't believe the industry can rely on its good fortune in the late 90s and early 2000s, when the Australian dollar was favourable for exporters.

The industry is facing further challenges with its labour arrangements. The historical method of sharing revenue with crew is placing fishing labour in a worsening position while mining and tourism flourish in the key fishing areas, decreasing the labour pool for the rock lobster industry.

If the industry wishes to maintain or improve its current rate of return, we need to find a management package to allow us to re-structure input costs, and this will be the aim of the upcoming consultation phase, and we look forward to your input and help with this.