

The Business of Fishing: Queensland, Australia 1997-98

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Abstract: Commercial fishing in Queensland, Australia, involves a diversity of fishing activities such as trawl, line, net and crab. Due to a complex licensing arrangement (Licence Packages), most fishers are endorsed to operate in more than one fishery providing flexibility for commercial fishing operations. The aim of this paper is to document the economic performance of Queensland's fishing businesses based on a comprehensive survey. Business performance was analysed using the following economic indicators: receipts, costs, boat operating surplus, boat business profit, gross returns index, rate of return to capital and fishery rent. The analysis characterised fishing businesses based on scale of operation, type of fishery accessed, degree of specialisation and geographical location of fishing business base. Each group had differing levels of economic performance: at least half of the surveyed fleet were not covering all of their economic costs. Fishers were asked their view on a range of issues effecting their economic performance and were pessimistic about the viability of the fishing industry and their future.

Keywords: Australia, commercial fishing, diversification, economic indicators, economic performance, financial viability, multi-species fisheries, survey, economics.

INTRODUCTION

Approximately 1900 commercial fishers are licensed to harvest product from Queensland waters in a variety of fisheries. Marine fishery resources are shared between indigenous communities, commercial fishers, recreational fishers and other user groups. Managing the multiple-use of these fisheries resources requires an understanding of the socio-economic implications of management arrangements on the fishing business. Economic performance indicators such as: receipts, costs, boat operating surplus, boat business profit, gross returns index, rate of return to capital and fishery rent are the basis of this understanding.

This paper identifies and quantifies the economic indicators for a range of Queensland fishing business groups characterised by:

- scale of operation (boat length, investment and fishing intensity);
- type of fishery accessed (trawl, line, net, crab);
- degree of specialisation or reliance on numbers of fisheries accessed by the fishing business (diversification code);
- geographical location of fishing business (coastal region); and
- fisher views (outlook).

The paper provides a general economic background of Queensland fisheries and their management along with a brief description of the survey method used. The main economic indicators are described and calculated for the

entire Queensland fishery and analysed in terms of the main groups of fishing businesses active in Queensland. Feedback from fishers on the state of their fishing business and the industry is also given.

2 BACKGROUND

Queensland's State managed fishing waters include nearly 5,700km of coastline (ANCA 1996). These waters also contain the largest coral barrier reef in the world (Great Barrier Reef World Heritage Area) stretching some 2,500km between latitude 10⁰41' and 24⁰30'. Australia is a small fishing nation producing about 0.2% of the world fish production. Queensland has the second largest fishing sector based on Gross value of Production (GVP) in Australia.

Queensland's fisheries are managed through a complex limited entry licensing regime where each boat authorisation (Licence Package) has a number of Fishery Symbols attached, such as T1 (trawl), N1 (inshore netting), C1 (crab), and L2 (reef line). Each Fishery Symbol specifies area, gear, and location of fishing activity. The complex nature of this licensing regime is illustrated in Appendix A. However, not all of these symbols were used by fishers during 1997-98 as many fishers are specialists operating out of one fishery. An example of the degree of specialisation within the Queensland fleet is given in Appendix B.

Each main type of fishery (trawl, line, net and crab) is managed through a management advisory committee

(MAC) with stakeholder membership. Because a fishing business may rely on more than one fishery it is subject to the management regimes of more than one MAC. Given the narrow focus of each MAC to the species under its control the overall impacts of the MAC's decision making on economic performance has to date been ignored or at best accepted as unknown

For the purpose of this paper, the Queensland coastline has been divided into seven coastal regions where fishing businesses are located, not where the boats fish. These regions are used as the basis for identifying the economic contribution of these fishing businesses to coastal communities. The economic impact and flow on effects of fishing is not considered here.

2.1 Gross Value of Production (GVP)

Gross Value of Production is an estimate of the contribution of the fishery to the economy, based on the fleet catch quantity and an average yearly price of individual species. The 1997-98 GVP of Queensland's fishing fleet was AUD228.6 million, of which 64% was attributed to trawlers (taking prawns and scallops) making up 40% of the fleet. About six percent of the licensed fleet did not fish (latent boats) during 1997-98 (Table 1). Note that all \$ are AUD in this paper.

Fishery	Number of boats	GVP \$'000	% of Qld GVP
Trawl	792	146,030	63.9
Line	412	38,580	16.9
Net	331	25,800	11.3
Spanner	151	9,430	4.1
Crab	147	8,780	3.8
Latent	116		
Total	1949	228,620	100

Table 1 Contribution of Major Fisheries to Queensland GVP

The fleet is made up of mostly small boats under ten metres (47%), medium sized boats 10-14m (28%) and large boats over 14m (35%). The maximum size is set at 20m under fisheries legislation. Most of the large boats are trawlers which produced 44% of Queensland's GVP during 1997-98.

The Far North region had the greatest number of boats that were mainly specialised trawlers generating about 25% of GVP. The south-eastern part of Queensland, Moreton and Brisbane regions combined contributed 30% of GVP by multi-species fisheries from generally smaller boats (Table 2).

Region	Number of boats	GVP \$'000
Far North	394	57,680
North	141	21,025
Mackay	155	19,630
Fitzroy	218	26,465
Wide Bay	286	37,165
Brisbane	331	29,275
Moreton	308	37,380
Total	1949	228,620

Table 2 Contribution of Fishing Businesses to Queensland Regional GVP

2.2 Diversification of the Queensland Fishing Business

The Queensland fleet was broken down into codes based on reliance on the number of various fisheries contributing to their cash receipts. The more specialised fishing businesses accessed only one fishery. The more fisheries accessed, the more diversified the fishing business. The trawl and line fleets are very specialised with greater diversification in the net and crab fisheries (Switala and Taylor-Moore 1999). For a breakdown of the fleet into these codes see Appendix B.

2.3 Income Distribution of Fishing Businesses

The spread of GVP across the fishing fleet is skewed (Figure 1). Two thirds of the fleet generated only 25% of GVP (Taylor-Moore 1998b).

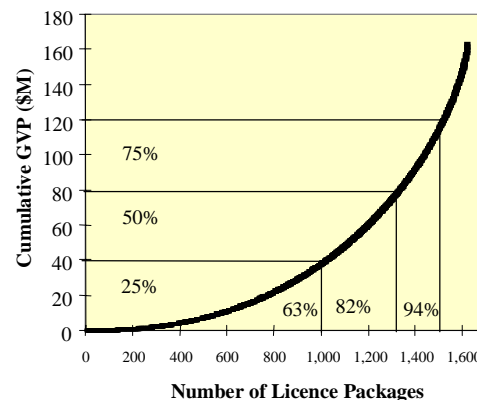


Figure 1 Income Distribution of the Fishing Fleet (1996-97)

From a fisheries adjustment perspective, it would be easy to assume that the boats in this category are the least efficient, less profitable and have the lowest returns to capital. Economic indicators described below provide a perspective on this assumption.

3 METHODS

During 1999, a census mail survey of all 1,949 known licensed Queensland commercial fishers was undertaken to gather financial data on their catching activities for the 1997-98 financial period. The mail survey was followed up by intensive personal and telephone contacts. A census, as opposed to a stratified sample, was chosen because of the complex multi-species licensing arrangements underpinning the management of Queensland's fisheries. Other data was sourced from the compulsory logbook and licensing database with permission from the fishers.

The number of responses to the survey was 775 (42% of active Licence Packages). However, only 481 fishing businesses were analysed due to many boats being ruled out of scope of the study. For example, boats licensed to fish in Queensland managed fisheries and licensed in other jurisdictions were excluded because of limited cost and expenditure data attributable to these other fisheries.

The sample was analysed in terms of GVP and boat length categories for representativeness of the fleet. The sample was skewed towards higher categories of GVP.. The sample was regarded as being representative of the fleet for the boat length categories

This study provided base year data (1997-98) of the economic status of the Queensland fishery sector, and will aid in the assessment of potential impacts of policy and management options on Queensland's fishing industry and commercial fishers. Further, it is anticipated the results of this study will provide a benchmark for other studies of this nature. The study was also undertaken to provide better economic information to support policy and management measures such as adjustment (Taylor-Moore 1998a). For a more comprehensive analysis of the economic performance of the fleet see Taylor-Moore (2000).

4. RESULTS AND ANALYSIS

The results of the survey findings presented are:

- key economic indicators;
- economic performance of specific groups of fishing businesses; and
- views of respondents with respect to their financial viability and the future outlook for industry.

4.1 Key Economic Indicators

A summary of the economic status of the 481 fishing businesses selected for the 1997-98 financial year is presented for the average boat in Table 3.

Total Boat Cash Receipts (TBCR) for the average Queensland fishing business was \$151,753, with average Total Boat Cash Costs (TBCC) of \$107,474. The average fishing business has \$294,000 invested in the fishing operation (capital investment). Average Boat Business Profit (BBP) was \$5,300 and average BBP at full equity was \$10,1042, which appears marginally positive. The Rate of Return to Capital (RRC) is 4.7%, which also appears only marginally positive. Fishery Rent (FR) was 3.5% of GVP or Total Boat Cash Receipts. Gross Returns Index (GRI) for the sample was 141 (Table 3). Each of these indicators are described in detail below.

Key Economic Indicators	Average \$ per boat
<i>Receipts and Cost Indicators</i>	
Total Capital	294,012
Total Boat Cash Receipts (TBCR)	151,713
Total Boat Fixed Costs (TBFC)	16,367
Total Boat Variable Costs (TBVC)	90,781
Total Boat Cash Costs (TBCC)	107,474
Depreciation	14,949
Imputed Labour	26,849
<i>Economic Indicators</i>	
Boat Operating Surplus (BOS)	44,238
Boat Business Profit (BBP)	5,306
Profit at Full Equity (PFE)	10,142
Rate of Return to Capital (RRC)	4,7%
RRC at Full Equity (RRCFE)	3.4%
Fishery Rent as % of TBCR (FR)	3.5%
Gross Returns Index (GRI)	141

Table 3 Economic Indicators for the Queensland Commercial Fishing Fleet

Total Boat Cash Receipts (TBCR) refers to the income received by an individual Licence Package holder and catch (kg), taken from fisher logbooks, with their permission, multiplied by average yearly beach price (\$/kg). GVP was \$73M for the sample and \$229M for the whole fleet.

TBCR is the income of an individual Licence Package holder without taking into consideration costs associated with freight and selling charges. TBCR is the contribution of an individual Licence Package holder to the GVP of the Queensland commercial fishing industry.

Further analysis of the proportion of Queensland commercial fishers in various categories of TBCR is a

useful indicator of the scale of operation of the fishing business (Table 4).

Fourteen percent of the respondents obtained TBCR of less than \$25,000 with approximately 50% of fishers generating less than \$100,000. This indicates that most fishers are small scale operators. A very small proportion of fishers (2%) indicated their TBCR for the year was greater than \$500,000.

Total Boat Cash Receipts	% of Respondents
\$0-\$10,000	3%
\$10,001-\$25,000	11%
\$25,001-\$50,000	11%
\$50,001-\$100,000	24%
\$100,001-\$250,000	32%
\$250,001-\$500,000	17%
\$500,001+	2%
Total	100%

Table 4 Proportion of Fishers in Various Categories of TBCR

Further analysis of the types of fishers operating at various levels of TBCR indicates smaller boats are likely to achieve a lower TBCR than larger boats. This result is expected. Similarly, the average TBCR per day increases with boat size.

The major capital item of each business is the boat (average value is \$136,538) making up 46% of total investment followed by the licence value and other items such as onshore facilities (Table 5).

Capital Item	Average per Boat	Average % of Total Capital
Primary Boat Hull	\$136,538	46%
Electronics	\$22,448	8%
Licence Package	\$75,948	26%

Table 5 Major Capital Items

Total Boat Cash Costs (TBCC) is the sum of TBFC and TBVC, and represents the total cash expenditure incurred by individual licence holders in 1997/98. Average TBCC was \$110,253.

Total Boat Fixed Costs (TBFC) are defined as costs that do not change with the level of production or output of the individual licence holder. TBFC are independent of the level of production, and remain relatively constant

from one year to the next. Main fixed costs are interest (47%) and insurance (41%) (Table 6).

Key Fixed Cost Item	Average \$ per Boat	Average % of TBFC
Overdraft Interest	\$7,725	47%
Insurance	\$6,656	41%
Leasing Costs	\$4,746	29%
Licence and Industry Fees	\$2,174	13%

Table 6 Major Fixed Costs

Total Boat Variable Costs (TBVC) are dependent upon the level of fishing activity. As activity increases, TBVC also increases. Average TBVC was \$90,781. Labour, fuel and repairs and maintenance averaged 58%, 22% and 21% of total boat variable costs respectively (Table 7). Note that labour costs are actual and do not include either imputed owner-operator wages or contribution of family members.

Key Variable Cost Item	Average per Boat	Average % of TBVC
Labour Costs (crew)	\$52,817	58%
Repairs and Maintenance (Boat)	\$18,979	21%
Fuel Oil and Grease (Boat)	\$19,912	22%

Table 7 Major Variable Cost Items

Boat Operating Surplus (BOS) is defined as the difference between TBCR and TBCC and may be used interchangeably with the terms *Boat Cash Income* or *Gross Boat Profit*.

A BOS value of zero represents a cash breakeven position where TBCC equals TBCR. If BOS is a negative value the boat is operating at a cash loss and if positive the boat is making a cash profit. BOS does not include a value for owner/operator wages, unpaid family work, or depreciation, as these are not cash items.

Categories of BOS are given in Table 8. Twenty one percent of Queensland commercial fishers responding to the survey operated at a negative BOS in the 1997-98 financial year. The majority of respondents (46%) achieved a BOS within the range of \$1 to \$50,000, with only 13% of respondents achieving a BOS greater than \$100,000.

Boat Operating Surplus (\$)	% of respondents
Less than -50,000	4
-50,000 to 0	17
1 to 25,000	26
25,001 to 50,000	20
50,001 to 100,000	20
100,001 to 150,000	7
150,001 to 200,000	3
Greater than 200,000	3
Total	100

Table 8 Proportion of Queensland Commercial Fishers in Various Categories of BOS

The large proportion of fishers operating at a negative BOS in 1997-98 (21%) may be partially explained by the need for fishers to expend significant funds in particular years on major, high-cost refits. Furthermore, catch and receipts are likely to fall below average as a result of time lost during refits. Repairs and maintenance make up 21% of the TBVC of the average fisher. Other explanations include unfavourable fishing conditions and lifestyle decisions where fishers are motivated by factors other than economic gain.

Boat Business Profit (BBP) is defined as BOS less depreciation and imputed owner-operated and family labour costs. BBP is the main economic indicator that provides a more complete picture of the economic performance of each individual Licence Package holder.

The imputed wages of owner-operated fishing businesses were based on boat skipper wages provided in the economic survey. An imputed value of family contribution to the fishing business was based upon other industries and their similarities to the fishing sector.

The average BBP was \$5,300 and 56% of respondents had a negative boat business profit (Table 9). No evidence relating to this matter was available at the time of the survey.

Boat Business Profit (\$)	Proportion of respondents
Less than -50,000	16
-50,000 to 0	40
1 to 25,000	17
25,001 to 50,000	19
50,001 to 100,000	11
100,001 to 150,000	4
Greater than 150,000	3
Total	100

Table 9 Proportion of Queensland Commercial Fishers in Various Categories of BBP

Fishery Rent (FR) is the net economic contribution of the fishing industry to the Queensland economy. Industry BBP is known as fishery rent. Fishery rent as a percentage of GVP is a useful comparative indicator. For the 481 surveyed boats fishery rent for 1997-98 was \$2.55M or 3.5% of their GVP. The estimate of fishery rent for the entire fishing fleet is \$6.4M based on the survey data.

Profit at Full Equity (PFE) is the profitability of the fishing business assuming the licence holder has full equity in the operation: all resources used by the business are owned by the business. PFE is calculated as BBP plus rent, interest and leasing costs. PFE is a useful absolute measure of the economic performance of licence package holders. Industry average profit at full equity was \$10,142 (Table 3).

Rate of Return to Capital (RRC) refers to the return to capital owned by the fishing business and is a useful relative measure of the performance of individual licence holders. The rate of return to capital is expressed in percentage terms and is calculated for an individual Licence Package holder as Profit at Full Equity divided by Total Capital (excluding licence value) multiplied by 100. Rate of return to capital is useful to compare the economic performance of various groups of fishing operations. RRC was 4.7% for 1997-98.

Rate of Return to Capital at Full Equity (RRFE) is calculated as PFE as a percentage of total capital (including value of licence) as if all fishing assets were wholly owned by the owner. This is a useful indicator, for potential investors in the business, of the economic performance of the fishing businesses. RRFE was 3.4% for 1997-98.

The *Gross Returns Index* (GRI) is calculated as TBCR divided by TBCC multiplied by 100. This index provides a relative measure of the relationship between cash receipts gained for each \$100 of cash expenditure. GRI less than 100 indicates a cash operating loss. GRI for 1997-98 was 141, meaning \$141 cash was generated from each \$100 spent by the fishing business.

4.2 Economic Performance of Specific Groups of Fishing Businesses

Further analysis of the economic performance of various sub-sectors of the Queensland commercial fishing fleet was undertaken. Results indicate the similarities and differences between various categories of Queensland fishing businesses. Within this section, cross-tabulation analysis was undertaken to provide additional detailed analysis of the economic performance of the main Queensland commercial fishing fleets.

The Queensland fishing sector can be categorised by various characteristics. Key characteristics of fishers used to analyse the results of the economic survey include:

- scale of operation (boat length, investment and fishing intensity);
- type of fishery (trawl, line, net, crab);
- degree of specialisation or reliance on numbers of fisheries accessed by the fishing business (diversification code); and
- geographical location of fishing business base (coastal regions).

Tree diagrams of these characteristics for each fishing port of Queensland was created by Switala and Taylor-Moore (1999) as part of the needs analysis for the FRDC project upon which this paper was based. However, these tree diagrams were limited in their coverage of the economics of coastal regions because economic performance data was not available. An example of a tree diagram for the economic performance of the surveyed fleet and of the fishing port of Mooloolaba in south-eastern Queensland, is given in Appendix B.

4.2.1 Scale of Operation

The economic performance of the fishing business varies considerably for the boat length categories used (Table 10). The average profitability of large boats (>14.1m) is significantly greater than that of smaller boats (<14.0m). However, the small boats have the greatest RRC because of lower costs related to capital. Smaller boats had higher cash returns from cash outlays than larger boats. For example 55% of small boats made an economic loss and were 45% of all boats making an economic loss. Businesses with cash receipts less than \$50,000 had 78% of the small boats.

Economic Indicator	Boat Length (m)			
	<10	10.1- 14	14.1-18	18.1+
BOS (\$)	31,191	38,663	56,432	79,962
BBP (\$)	680	702	5,180	15,175
Profit FE (\$)	2,626	4,877	14,960	28,026
RRC (%)	9.3	-0.2	3.7	-1.1
RRCFE (%)	6.3	-0.1	2.9	-0.8
GRI	183	130	128	115
(n=)	224	131	95	31

Table 10 Main Economic Indicators: Business Average by Boat Length

Another indicator of scale of operation is fishing intensity. Forty nine percent of business operated with high fishing intensity (>150 days fished per annum) with 22% fishing over 200 days per year. The small boats (<10m) made up 70% of the low fishing intensity (less than 50 days per year) category compared with large boats (>14m) with 10%. Small boats made up 35% of

high fishing intensity category compared with the large boats which had 41% of the high fishing intensity category.

GRI is highest for the small boat category: all other boat categories are below industry average of 141.

4.2.2 Type of Fishery

The economic performance of businesses operating in various fisheries is presented in Table 11.

There is little difference between the average BOS for the crab, line, net and spanner fisheries. However, for trawl fishers, the average Boat Operating Surplus is significantly greater.

Average BBP figures vary across the types of fisheries. Line fishers appears to be operating at a marginally profitable level, as are crab fishers. Spanner fishers appear to be reasonably profitable.

	Type of Fishery				
	Crab	Line	Net	Spanner	Trawl
BOS \$	32,319	31,133	35,539	31,464	60,071
BBP \$	890	312	5,999	3,691	8,912
PFE \$	2,944	4,022	7,951	6,309	16,555
RRC %	3.1	2.5	4.2	6.0	5.0
RRFE %	1.9	1.8	4.2	4.2	3.8
FR%	1.4	0.3	7.1	4.0	3.8
GRI	197	138	173	151	136
(n=)	31	120	93	35	202

Table 11 Main Economic Indicators: Business Average by Type of Fishery

The rate of return to capital is highest for the spanner crab fishery, fishery rent as a percentage of TBCR is highest for the net fishery and the GRI is highest for the crab fishery. Overall, the trawl fishery, net fishery and the spanner crab fisheries are performing above the industry average

4.2.3 Degree of Specialisation

Across all types of businesses and regions (Table 12), the specialised fishers (diversification codes a and b) have, on average, a higher level of profitability than diversified fishers (diversification codes c to f).

The Boat Operating Surplus and the Boat Business Profit of specialised fishing businesses are double that of the diversified ones. Depreciation and the imputed cost of labour (non-cash costs) significantly impact heavily upon the profitability of both categories.

There appears little difference between the proportion of specialised and diversified boats in each of the nominated

Boat Business Profit categories. Across all diversification codes, it appears the Boat Business Profit for 57% of boats was negative for 1997-98. Despite this, the average BBP is positive at \$5,306 per boat per annum (Table 3) with the specialised fishers being slightly better off (Table 12). The GRI is higher for the diversified category indicating greater cash returns to cash costs which is based on the lower cost structure of the diversified group.

Economic Indicator	Specialised Fishers	Diversified Fishers
BOS (\$)	46,370	36,115
BBP (\$)	5,928	2,935
Profit FE (\$)	11,538	4,823
RRC (%)	4.7	4.0
RRFE (%)	3.6	2.7
% FR of TBCR	3.5	3.5
GRI	138	177
(n=)	381	100

Table 12 Main Economic Indicators: Business Average by Degree of Specialisation

4.2.4 Geographical Location

There are major differences between the economic indicators of businesses based in the various coastal regions of Queensland. The Far North, Northern and Moreton regions are the most profitable according to all economic indicators. Fitzroy and Wide Bay and Mackay regions had negative BBP. Fitzroy and Wide Bay all had negative key performance indicators and a GRI that was below industry average (Table 13).

Coastal Region	BOS (\$000)	BBP (\$000)	PFE (\$000)	RRC (%)	RRFE (%)	GRI
Far North	45.3	7.1	13.8	5.5	4.3	134
Northern	60.7	23.3	26.2	12.2	8.6	146
Mackay	37.1	-0.2	4.5	2.4	1.7	133
Fitzroy	22.0	-16.8	-12.5	-6.2	-4.5	121
Wide Bay	35.9	-6.8	-2.2	-0.8	-0.6	131
Moreton	51.0	11.0	17.5	8.0	5.8	145
Brisbane	40.5	4.2	7.1	4.7	3.3	154
All	44.2	5.3	10.1	4.7	3.4	141

Table 13 Main Economic Indicators: Business Average by Coastal Regions (n=481)

4.3 Fisher Views

Fishers were asked what their views were on the outlook of the fishing industry as part of the economic survey. Figure 2 shows that fifty two percent of the respondents were either very fearful or fearful and therefore pessimistic about the future of commercial fishing. The findings of the economic performance of the fleet support these views.

The main reasons given for the commercial fishers' pessimism were fisheries management (46%), environmental impacts (18%) and recreational fishing (14%) (Figure 3). Forty three percent of fishers who stated they will leave the fishery within ten years which may be a reflection of their pessimism or a function of their age (48% of respondents were over 50 years old)

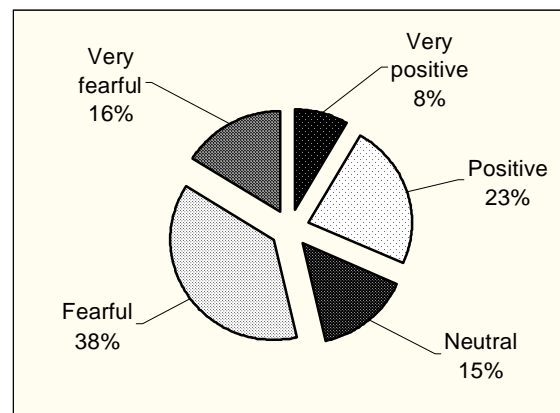


Figure 2 Fisher View on the Future of Commercial Fishing

However, when asked what factors could increase the earning potential of their business, 40% of fishers stated higher beach prices, with 20% suggesting a voluntary buy-back scheme. Fifty five percent of respondents stated they would offer their licences to such a scheme.

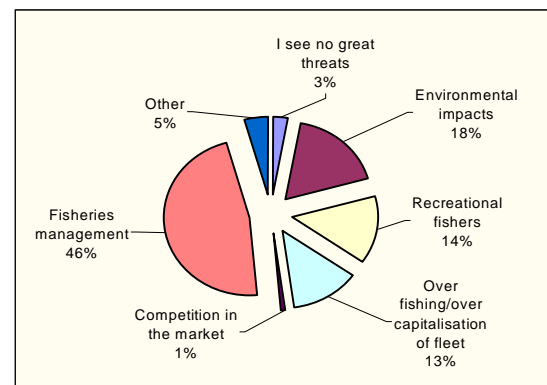


Figure 3 Fisher Views on Threats to Staying in Commercial fishing

5 KEY FINDINGS

The survey of Queensland commercial fishers indicated the industry is complex and diversified in scale of operation, type of fishery, degree of specialisation and geographical location. Consequently it is difficult to apply a detailed analysis to particular groups within the industry. See Appendix B for an overview of this complexity.

Caution should be exercised when making or interpreting comments of a generalised nature about a particular group in the industry, as there was a high level of variation around the economic indicators.

Specifically, survey findings for Queensland fishing businesses are:

- 21% of fishing businesses surveyed had a negative Boat Operating Surplus;
- 57% had a negative Boat Business Profit;
- trawl fishing businesses appear to be the most profitable with above industry average economic performance;
- Trawl, net and spanner crab fisheries had the highest level of economic performance;
- specialised fishers appear to operate at a higher level of profitability than diversified but diversified fishers had better cash returns on cash outlays;
- fishers based in the Far North, Northern and Moreton Bay regions operate most profitably, while fishers based in the Wide Bay, Fitzroy and Mackay regions operate at a lower level of profitability;
- larger boats (>14.0m) have higher levels of boat business profit than smaller boats (<14.0m);
- smaller boats have both a higher rate of return to capital and higher cash returns from cash outlays than larger boats;
- 55% of small boats made an economic loss
- small boats were 45% of all boats making an economic loss;
- of the businesses with cash receipts less than \$50,000, 78% had small boats; less than 10m; and
- fishers were fairly pessimistic about their future with 55% of respondents indicating they would probably

leave the fishery if a voluntary buy-back scheme was available.

Although it was a one-year study, the survey findings provide a basic understanding of the economic indicators used to evaluate the economic performance of the Queensland fishing business.

6 ACKNOWLEDGEMENTS

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Appendix A Licence Package Symbol Matrix (November 1998)

This matrix is an overview of the licensing arrangements of Queensland fisheries which highlights the interactions of the Fishery Symbols within specific fisheries.

Note: C indicates crab fisheries
 N & K indicates net fisheries
 L indicates line fisheries
 T indicates trawl fisheries

	C1	C2-3	L1	L2	L3	L4-9	N1	N2	N3	K	T1	T2	T5-9
C1	930	485	864	126	754	96	651	214	104	36	166	1	128
C2-3	485	486	455	63	415	42	351	111	31	18	68	1	71
L1	864	455	1661	219	1348	115	743	194	103	60	672	6	148
L2	126	63	219	241	-	16	117	54	3	1	25	1	21
L3	754	415	1348	-	1472	91	655	180	82	53	671	4	132
L4-9	96	42	115	16	91	168	49	11	52	1	8	-	5
N1	651	351	743	117	655	49	815	217	25	61	139	1	136
N2	214	111	194	54	180	11	217	235	-	-	23	-	60
N3	104	31	103	3	82	52	25	-	106	-	-	-	-
K	36	18	60	1	53	1	61	-	-	62	1	-	11
N6	930	486	1660	241	1471	147	811	235	106	62	745	6	161
T1	166	68	672	25	671	8	139	23	-	1	775	5	16
T2-4	1	1	6	1	4	-	1	-	-	-	5	40	-
T5-9	128	71	148	21	132	5	136	60	-	11	16	-	162

The diagonal of the matrix is the total number of each type of Fishery Symbol. Each Fishery Symbol relates to a fishery and specifies species that can be taken, gear used and area fished. Each column represents the number of the various Fishery Symbols that are attached to the vessels (Licence Packages) operating under that specific Fishery Symbol.

For example the East Coast Otter Trawl Fishery (T1) has 775 licensed vessels (Licence Packages). Of this group of T1 type of Licence Package:

- 166 has access to the mud crab and blue swimmer crab pot fishery (C1);
- 672 have access to the east coast line fishery (L1) outside of the Great Barrier Reef Marine Park,
- 139 have access to the east coast inshore net fishery (N1), and
- 16 have access to the small estuarine and riverine beam trawl fishery (T5-9).

In other words, the matrix describes the important linkage of Licence Packages and Fishery Symbols that make up a general picture of the Queensland fishery. There were 1949 Licence Packages for 1997/98.

Appendix B Economic Performance Trees of Economic Survey Results

Economic Indicator	Results for Mooloolaba	Results of all Survey
Gross Value of Production	\$8.9M	\$73M
Average Boat Operating Surplus	\$50,600 (se = \$24,500)	\$44,238 (se = \$4,400)
Average Boat Business Profit	\$9,300 (se = \$23,600)	\$5,300 (se = \$4,300)
Rate of Return to Capital	3.7%	4.7%
Fishery Rent as % of GVP	5.1%	3.5%
Gross Returns Index	139	141

Note for Tree Diagram: T, C, S, N, L mean major fishery of business based on highest percentage of TBCR.
Specialisation: a = reliance on 100% from one fishery, b = reliance on one fishery greater than 10% of TBCR.
Diversification: c = reliance on two fisheries greater than 10% of TBCR, d = reliance on three fisheries greater than 10% of TBCR, and f = reliance on four fisheries greater than 10% of TBCR. For example, Ta means a specialist trawl fishing business and Nc means a diversified net fishing business.

