

Economic Indicators
for the South Australian
Blue Crab Fishery
2006/07

A report prepared for
Primary Industries and Resources South Australia

Prepared by



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Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
CPI	consumer price index
FMC	Fishery Management Committee
FRDC	Fisheries Research and Development Corporation
fte	full time equivalent
GSP	gross state product
GVP	gross value of production
PIRSA	Primary Industries and Resources South Australia
R&M	repairs and maintenance
SA	South Australia
SARDI	South Australian Research and Development Institute
TACC	Total Allowable Commercial Catch

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1. Introduction

All the major fisheries in South Australia (SA) operate in accordance with fishery management plans that determine the primary management objectives of the fishery. Economic performance indicators are a feature of these plans and annual reports on them are required for the Minister for Agriculture, Food and Fisheries to meet the obligations of section 7 of the *Fisheries Management Act 2007*.

This report is the tenth annual economic indicators report for the South Australian Blue Crab fishery. The first report, prepared for 1997/98, entitled *Economic Indicators for the South Australian Blue Crab Fishery 1997/98*, (EconSearch 1999), reported on the results of an initial economic survey of the fishery. The second to seventh annual reports, prepared for the years 1998/99 to 2003/04, respectively, provided an update of the 1997/98 economic indicators (EconSearch 2000 to 2005a). The eighth report, prepared for 2004/05, provided an outline of the fishery's economic performance based on an additional survey of licence holders, conducted in March and April 2006¹ (EconSearch 2006). The ninth report, prepared for 2005/06, provided an update of the economic indicators, based on the second licence holder survey (EconSearch 2007a).

The objective of this report, *Economic Indicators for the South Australian Blue Crab Fishery 2006/07*, is to provide an update of the economic indicators based on the results of the second licence holder survey.

The aim of all the studies is to present a set of economic performance indicators for the fishery as well as to develop a consistent time series of economic information to aid management of the fishery in future years. The economic indicators detailed in this report include:

- gross value of production (catch and price);
- the cost of management of the fishery;
- a summary of factors that affect costs in the fishery;
- financial performance indicators (income, costs, profit, and return on investment);
- economic impact of the fishery;
- economic rent;
- external factors that influence the economic condition the fishery; and
- market prices for blue crabs in key domestic markets.

For purposes of comparison, summary economic indicators for all South Australian commercial fisheries, up to 2005/06, are presented in Appendix 2.

¹ Licence holder surveys were also conducted for 2000/01 and 2001/02. However, due to an insufficient number of responses received, these survey data were not used in the preparation of economic indicator reports.

2. Survey and Definition of Terms

2.1 Survey of Licence Holders in the Fishery, 2004/05

The questionnaire for the 2004/05 survey was based on the previous surveys conducted in 1997/98, 2000/01 and 2001/02². It was drafted by the consultants in consultation with the Industry Development Officer (Mr Justin Phillips).

In March 2006, all licence holders were sent an introductory letter encouraging them to participate in the survey. Licence holders were then contacted and face-to-face surveys were carried out over the period March – April 2006.

The completed responses from the pot sector represented approximately 52 per cent of the total quota units allocated to the sector. The responses from the marine scale sector represented approximately 51 per cent of the total quota units in the sector.³ Accordingly, the economic indicators for 2004/05 were survey based.

2.2 Updating the Indicators, 2006/07

The 2006/07 economic indicators for the South Australian blue crab fishery were derived using a range of primary and secondary data and survey-based 2004/05 indicators. The following information was used to adjust the 2005/06 indicators to reflect the fishery's performance in 2006/07:

- SARDI data were used to reflect changes in catch size and its value between 2005/06 and 2006/07. Catch and value data were used to determine the gross income in the fishery.
- Information on the change in fishing effort (number of days fished) between 2005/06 and 2006/07 was used to adjust the costs of inputs that were assumed to vary with fishing effort. These inputs included fuel and repairs and maintenance (R&M) costs.
- Price information from input suppliers was used to adjust prices that had changed, for example, fuel.
- The consumer price index (CPI) for Adelaide was used to adjust the cost of inputs to reflect local levels of inflation (ABS 2007).

² Surveys conducted in 1997/98, 2000/01 and 2001/02 are described in EconSearch (2005a).

³ As there is significant variation in the quantity of quota units held by each licence holder, the proportion of total quota units provides a more accurate indication of the response rate.

2.3 Definition of Terms⁴

Gross value of production (GVP) is the total year's catch for the whole fishery valued at the landed beach price.

Gross income (Total boat cash receipts) is the income received by the individual licence holder from the sale of blue crabs prior to any deductions for freight and selling charges.

Cash costs (Total boat fixed and variable costs) include the payments for hired labour and materials and services (including payments on capital items subject to leasing, rent, interest, licence fees and repairs and maintenance). If family or other labour were unpaid, an estimate of the cost of labour was made based on the time spent on fishing business related activity.

Cash operating surplus (Boat cash income) is the difference between gross income and total cash costs. It has been calculated with the imputed value of unpaid labour included in cash costs.

Depreciation is a non-cash cost representing the wear and tear on capital items during the year. It has been calculated using information on the age, current value and current replacement cost of each item. This was used to determine the depreciation rate for each item.⁵

Earnings before tax is defined as cash operating surplus less depreciation.

Earnings before interest and tax (Boat business profit) is defined as cash operating surplus less depreciation plus interest.

Capital is defined as the value placed on assets employed by the fishing business. It includes the total gross value of the boat, including the value of the hull, engine and other on-board and shore based plant, equipment and structures. Estimates are also reported for the value of licences.

Rate of return to fishing gear and equipment is calculated by expressing earnings before interest and tax as a percentage of the capital value of fishing gear and equipment. The rate of return to fishing gear and equipment provides an indication of the impact of management changes on the fishery.

Rate of return to total capital is calculated by expressing earnings before interest and tax as a percentage of total capital. This gives a measure of the economic performance of the fishery for those interested in investing in a boat and licence.

⁴ Where possible, definitions have been kept consistent with those used by Brown (1997) in ABARE's *Australian Fisheries Survey Report*.

⁵ An allowance for depreciation of a capital item was estimated using the formula $(R-C)/A$ where R = replacement cost of the item, C = current value of the item and A = age of the item in years

3. Economic Indicators for the SA Blue Crab Fishery

3.1 Gross Value of Production

The total catch of blue crab in South Australia increased from 434 tonnes in 1990/91 to 655 tonnes in 1995/96 before decreasing to 467 tonnes in 1999/00. The total blue crab catch has trended upward in subsequent years reaching 649 tonnes in 2005/06 before decreasing slightly to 637 tonnes in 2006/07. Comparison of the two end-years in Table 3.1 (1990/91 and 2006/07) illustrates how the value of the fishery has changed over the sixteen-year period. The total catch in 2006/07 (637 tonnes) was almost 47 per cent above that in 1990/91 (434 tonnes) while the value of the catch was approximately 243 per cent higher, increasing from \$1.6 million in 1990/91 to \$5.6 million in 2006/07. The blue crab catch peaked at 655 tonnes in the 1995/96 season with a value of almost \$2.5 million.

Table 3.1 SA Blue Crab catch and value of catch, 1990/91 to 2006/07

Year	Pot Sector		Marine Scale Sector ^a		South Australia	
	(tonnes)	(\$'000)	(tonnes)	(\$'000)	(tonnes)	(\$'000)
1990/91	354	1,337	80	303	434	1,640
1991/92	357	1,156	68	221	425	1,377
1992/93	403	1,256	108	337	511	1,593
1993/94	401	1,332	143	476	544	1,808
1994/95	465	1,683	143	518	608	2,201
1995/96	506	1,929	149	566	655	2,495
1996/97	410	1,816	54	241	464	2,057
1997/98	396	1,837	73	336	469	2,173
1998/99	429	1,913	72	321	501	2,234
1999/00	416	1,916	51	233	467	2,149
2000/01	469	2,588	87	479	556	3,067
2001/02	481	2,975	79	486	560	3,461
2002/03	515	3,157	68	417	583	3,574
2003/04	559	3,385	53	253	611	3,638
2004/05	584	3,322	47	269	632	3,591
2005/06 ^b	600	4,966	48	270	649	5,236
2006/07 ^b	595	5,328	42	301	637	5,629

^a Reported marine scale sector catch includes a small amount of crabs caught by marine scale fishers on the west coast. Catch by these fishers is not included in the Total Allowable Commercial Catch (TACC) for the fishery.

^b SARDI estimate of GVP for 2005/06 and 2006/07 have been re-valued to reflect price differentials between fishery sectors.

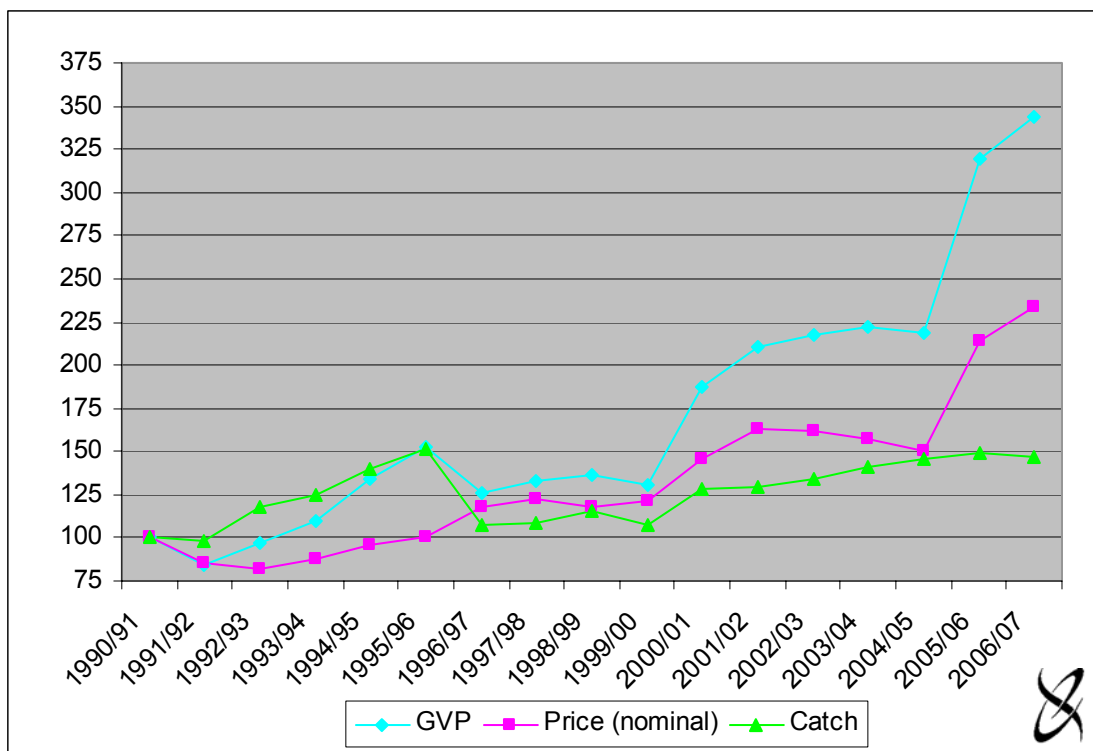
Source: SARDI Aquatic Sciences and EconSearch analysis.

SARDI estimates of GVP of blue crabs harvested by licence holders in the pot sector are underestimated as average values are based on wholesale prices received for marine scale sector catch. Survey information and information on average monthly prices from processors indicate that a proportion of pot sector catch is marketed either at the Sydney or Melbourne markets, where prices received are often higher than can be obtained in Adelaide. For the purpose of this study, SARDI's estimates of GVP for 2005/06 and 2006/07 have been re-valued using weighted average monthly prices for pot sector and marine scale sector catch from SARDI Aquatic Sciences (Angelo Tsolos, pers. comm.).

Further analysis of prices received for blue crabs in the Sydney and Melbourne markets is provided in Section 4.3 of this report.

Figure 3.1 illustrates how the value of the fishery has changed over the 16-year period 1990/91 to 2006/07. As noted above, the nominal value of the blue crab catch in 2006/07 was 243 per cent above that in 1990/91. This is the result of an increase in catch (47 per cent) and an increase in price (134 per cent in nominal terms).

Figure 3.1 GVP, price and catch indices for the SA Blue Crab fishery (1990/91=100)^a

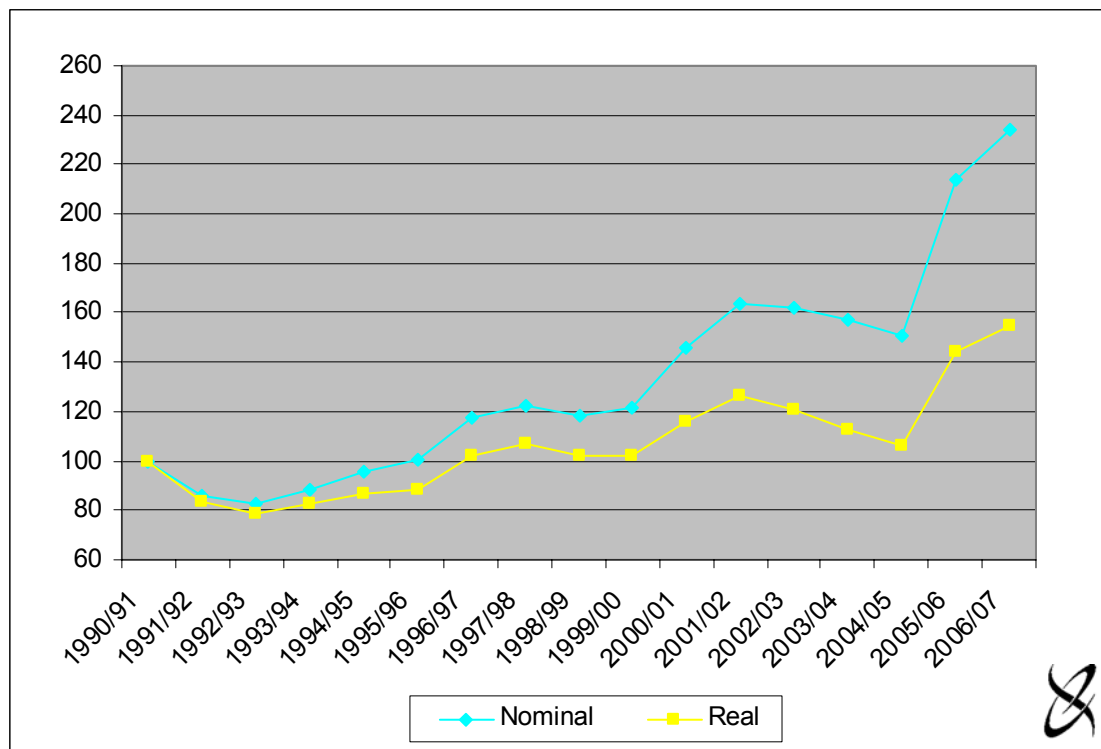


^a SARDI estimate of GVP for 2005/06 and 2006/07 have been re-valued to reflect price differentials between fishery sectors.

Source: SARDI Aquatic Sciences.

Figure 3.2 shows that the 134 per cent increase in nominal price over the period 1990/91 to 2006/07 has been equivalent to 55 per cent increase in the real price (that is the nominal price adjusted for inflation).

Figure 3.2 Price indices for the SA Blue Crab fishery (1990/91=100) ^{a b}



^a Nominal price refers to the beach price in the current year's dollars. Real price is the nominal price adjusted for the purchasing power of money. The CPI (consumer price index) has been used to make this adjustment (ABS 2007). It enables meaningful comparisons of prices to be made between years.

^b SARDI estimate of GVP for 2005/06 and 2006/07 have been re-valued to reflect price differentials between fishery sectors.

Source: SARDI Aquatic Sciences and ABS (2007).

3.2 Cost of Management

South Australian commercial fisheries operate under full cost recovery. Accordingly, licence fees are set to cover the cost of managing the fishery. Management services include:

- annual reports on biological and economic indicators;
- policy and management services;
- regulatory/legislation and licensing services;
- compliance services;
- directorate services;
- extension services;
- research services (including the Fisheries Research and Development Corporation levy); and
- the services of various committees.

For the purpose of this analysis, the cost of providing these management services has been assumed to be equal to the gross receipts from licence fees in the fishery.

Table 3.2 shows actual licence fee receipts for the period 1996/97 to 2007/08 for both sectors and the fishery as a whole.

Since 1996/97 the following trends have emerged.

- For the pot sector, licence fees as a percentage of GVP peaked at 11.3 per cent in 1997/98, before falling to 4.2 per cent in 2002/03 and have increased since, reaching 6.2 per cent in 2004/05. Despite a small increase in GVP, fees as a percentage of GVP in the pot sector increased from 4.8 per cent in 2005/06 to 5.0 per cent in 2006/07, due to the increase in licence fees.
- For the marine scale sector, licence fees as a percentage of GVP peaked at 49.1 per cent in 1999/00 and have fluctuated in subsequent years. The licence fees as a percentage of GVP were 8.2 per cent in 2006/07, a significant decrease from 2005/06 (20.4 per cent), reflecting a slight increase in GVP and a considerable decrease in aggregate licence fees.
- For the pot sector, the cost of management per kilogram of crabs peaked at \$0.52 in 1997/98, trending downward in subsequent years to a low of \$0.26 in 2002/03. The cost per kilogram has subsequently increased, however, and was \$0.45/kg in 2006/07.
- For the marine scale sector, the cost of management per kilogram of crabs increased from \$0.53 in 1996/97 to \$2.24 in 1999/00 and has declined in subsequent years and was calculated to be \$0.59/kg in 2006/07.
- For the pot sector, average fees per licence holder peaked at \$34,600 in 1997/98 and then decreased significantly to \$18,782 in 2002/03. Fees per licence holder have increased in subsequent years, reaching \$33,325 in 2006/07.
- For the marine scale sector, fees per licence holder increased, from \$847 in 1996/97 to \$6,775 in 2003/04, as a result of an increase in aggregate fees and/or a decrease in the overall number of licence holders in the fishery. Fees per licence holder were significantly less in 2004/05 (\$3,479) compared to the previous year. Average fees were \$5,004 in 2005/06, approximately 43 per cent more than in 2004/05. Fees per licence holder in 2006/07 decreased by 18 per cent from the previous year to \$4,125 reflecting the lower aggregate licence fees for the marine scale sector.
- The number of marine scale licence holders with blue crab quota has decreased over the 10-years since 1996/97. In 1996/97, there were 34 licence holders in the blue crab marine scale sector. The number of licence holders decreased steadily and was only 6 in 2006/07.

Between 2006/07 and 2007/08 fees per licence holder decreased by approximately 5 per cent for the fishery as a whole (from \$20,811 to \$19,879), comprised of a 15 per cent decrease for the blue crab pot sector and a 36 per cent decrease for the marine scale sector.

Table 3.2 Cost of management in the SA Blue Crab fishery, 1996/97 to 2007/08

	Licence Fees	Gross Value of Production	Fees/GVP	Catch	Fee/Catch	Licence Holders	Fee/Licence Holder
	(\$'000)	(\$'000)	(%)	(tonnes)	(\$/kg)	(no)	(\$/licence)
Pot							
1996/97	170	1,816	9.4%	410	\$0.42	6	\$28,400
1997/98	208	1,837	11.3%	396	\$0.52	6	\$34,600
1998/99	181	1,913	9.4%	429	\$0.42	6	\$30,090
1999/00	164	1,916	8.6%	416	\$0.39	6	\$27,315
2000/01	140	2,588	5.4%	469	\$0.30	6	\$23,352
2001/02	166	2,975	5.6%	481	\$0.35	6	\$27,746
2002/03	131	3,157	4.2%	515	\$0.26	7	\$18,782
2003/04	205	3,385	6.0%	559	\$0.37	8	\$25,589
2004/05	206	3,322	6.2%	584	\$0.35	8	\$25,695
2005/06	240	4,966	4.8%	600	\$0.40	8	\$29,965
2006/07	267	5,328	5.0%	595	\$0.45	8	\$33,325
2007/08	228	n.a.	-	n.a.	-	8	\$28,490
Marine Scale^a							
1996/97	29	241	11.9%	54	\$0.53	34	\$847
1997/98	100	336	29.6%	73	\$1.36	34	\$2,928
1998/99	117	321	36.4%	72	\$1.62	32	\$3,647
1999/00	114	233	49.1%	51	\$2.24	27	\$4,238
2000/01	85	479	17.7%	87	\$0.98	21	\$4,044
2001/02	102	486	21.0%	79	\$1.29	17	\$6,002
2002/03	83	417	19.9%	68	\$1.22	15	\$5,545
2003/04	95	253	37.5%	53	\$1.79	14	\$6,775
2004/05	49	269	18.1%	47	\$1.03	14	\$3,479
2005/06	55	270	20.4%	48	\$1.15	11	\$5,004
2006/07	25	301	8.2%	42	\$0.59	6	\$4,125
2007/08	11	n.a.	-	n.a.	-	4	\$2,657
Total Fishery							
1996/97	199	2,057	9.7%	464	\$0.43	40	\$4,980
1997/98	307	2,173	14.1%	469	\$0.65	40	\$7,679
1998/99	297	2,234	13.3%	501	\$0.59	38	\$7,823
1999/00	278	2,149	13.0%	467	\$0.60	33	\$8,434
2000/01	225	3,067	7.3%	556	\$0.40	27	\$8,334
2001/02	269	3,461	7.8%	560	\$0.48	23	\$11,675
2002/03	215	3,574	6.0%	583	\$0.37	22	\$9,757
2003/04	300	3,638	8.2%	612	\$0.49	22	\$13,616
2004/05	254	3,591	7.1%	632	\$0.40	22	\$11,558
2005/06	295	5,236	5.6%	648	\$0.45	19	\$15,514
2006/07	291	5,629	5.2%	637	\$0.46	14	\$20,811
2007/08	239	n.a.	-	n.a.	-	12	\$19,879

^a Management costs and the number of licence holders in the marine scale sector for the period 2000/01 to 2004/05 have been revised from those presented in EconSearch (2005a).

Source: PIRSA Fisheries, SARDI Aquatic Sciences.

Since the introduction of total allowable commercial catch (TACC) to the SA Blue Crab fishery (in 1996/97) there has been a transfer of commercial effort from the marine scale sector to the pot sector. Two additional pot sector licence holders have entered the fishery since 1996/97, while the number of marine scale sector licence holders has decreased significantly (Table 3.2).

The allocation of quota units is a key determinant of catch level in each of the sectors of the fishery. The allocation of units between sectors for the period 2000/01 to 2007/08 is illustrated in Table 3.3. Over this period, the proportion of units held by the marine scale sector has fallen from approximately 13 per cent (2000/01) to just over 1 per cent (2007/08). The proportion of quota units held by the pot sector has risen over the period, from approximately 87 per cent in 2000/01 to almost 99 per cent in 2007/08.

Table 3.3 Allocation of quota units in the SA Blue Crab fishery, 2000/01 to 2007/08

Year	Pot Sector (Units)	Marine Scale Sector (Units)	South Australia (Units)
2000/01	9,404	1,450	10,854
2001/02	8,810	2,044	10,854
2002/03	9,404	1,450	10,854
2003/04	9,517	1,337	10,854
2004/05	10,086	768	10,854
2005/06	10,136	718	10,854
2006/07	10,442	412	10,854
2007/08	10,698	156	10,854

Source: PIRSA Fisheries.

3.3 Summary of Factors Affecting Costs in the Fishery

The information in Table 3.4 (and similar data for previous years) was used to adjust the 2005/06 financial performance indicators to reflect the costs incurred in the fishery in 2006/07.

- Information from SARDI on the change in fishing effort (total days fished) was used to adjust costs that vary depending on the amount of time spent fishing. These costs include the cost of fuel, repairs and maintenance, bait and provisions.
- The ABS transportation index for Adelaide was used to adjust the cost of fuel.
- Interest charges were adjusted in accordance with the Reserve Bank of Australia indicator lending rate, (i.e. weighted average interest rate for small businesses with outstanding credit).
- The CPI for Adelaide was used to adjust other costs. Other costs associated with operating in the fishery include, legal and accounting costs, office and administration, telephone expenses and other incidental costs.

Table 3.4 Factors affecting costs in the SA Blue Crab fishery, 2005/06 and 2006/07

	2005/06	2006/07	Change
Total days fished - pot sector ^a	1,751	1,495	-14.6%
Total days fished - marine scale sector ^a	107	107	0.0%
Price of fuel - transportation index ^b	158.8	160.9	1.3%
Interest charges (% per annum) ^c	8.2%	8.8%	7.3%
CPI Adelaide ^d	157.6	160.3	1.7%

^a SARDI Aquatic Sciences (Angelo Tsolos pers. comm.), adjusted to reflect changes in number of licence holders (Table 3.2).

^b ABS transportation index for Adelaide (ABS 2007).

^c RBA indicator lending rate for small business (RBA 2007).

^d Consumer price index for Adelaide (ABS 2007).

3.4 Financial Performance Indicators

The major measures of the financial performance of the surveyed boats in the SA Blue Crab fishery for the period 2002/03 to 2006/07 are shown in Tables 3.5 to 3.8. As the number of quota units held by each licence holder in the fishery varies significantly, the estimates of financial performance have been presented as a total for each of the sectors and as an average per quota unit⁶.

Income...

Total recorded blue crab catch decreased by almost 2 per cent from 2005/06 to 2006/07, comprised of a 1 per cent decrease in catch by pot sector licence holders and a 13 per cent decrease in the marine scale sector catch. Gross receipts from the sale of blue crabs increased by approximately 8 per cent over the same period for the fishery as a whole, an increase of approximately 7 per cent in the pot sector and 11 per cent in the marine scale sector (Table 3.1). Total gross income in the pot sector was approximately \$5.3 million in 2006/07 (Table 3.5). In the marine scale sector total gross income was \$301,000 (Table 3.7). The average gross income per quota unit was \$510 in the pot sector (Table 3.6) and \$730 in the marine scale sector (Table 3.8).

Note that financial performance estimates for 2004/05 to 2006/07 were based on different survey samples to earlier years. It would appear that much of the variability between these and earlier years is attributable to sampling variability.

⁶ To allow for comparison between years, the estimates of financial performance for the years 1997/98 to 2003/04, previously presented on an average per boat basis, have been presented on a whole of sector and per quota unit basis.

Table 3.5 Financial performance in the SA Blue Crab fishery, pot sector, 2002/03 to 2006/07 (total sector)^a

	2002/03		2003/04		2004/05		2005/06		2006/07	
	Total Pot Sector	Share of TCC ^b	Total Pot Sector	Share of TCC ^b	Total Pot Sector	Share of TCC ^b	Total Pot Sector	Share of TCC ^b	Total Pot Sector	Share of TCC ^b
Gross Income	\$3,157,000		\$3,385,000		\$4,164,746		\$4,965,840		\$5,327,767	
Costs										
Fuel	\$262,601	12%	\$267,199	10%	\$607,798	18%	\$643,257	18%	\$556,560	15%
R&M	\$196,048	9%	\$202,059	8%	\$538,029	16%	\$554,784	15%	\$481,788	13%
Provisions	\$72,481	3%	\$74,704	3%	\$71,795	2%	\$74,030	2%	\$64,290	2%
Labour	\$1,445,453	65%	\$1,771,250	67%	\$1,042,277	31%	\$1,242,761	34%	\$1,333,337	37%
Licence fee ^c	\$131,473	6%	\$204,709	8%	\$205,560	6%	\$239,717	7%	\$266,600	7%
Insurance	\$29,590	1%	\$34,824	1%	\$62,058	2%	\$64,430	2%	\$65,533	2%
Interest	\$6,904	0%	\$8,095	0%	\$607,150	18%	\$630,348	17%	\$641,147	18%
Admin and Other	\$73,413	3%	\$86,401	3%	\$206,192	6%	\$214,071	6%	\$217,738	6%
Total Cash Costs	\$2,217,963	100%	\$2,649,241	100%	\$3,340,859	100%	\$3,663,397	100%	\$3,626,994	100%
Cash Operating Surplus	\$939,037		\$735,759		\$823,887		\$1,302,443		\$1,700,773	
Depreciation	\$136,615		\$160,784		\$337,038		\$334,322		\$325,412	
Earnings Before Tax	\$802,422		\$574,975		\$486,850		\$968,121		\$1,375,361	
Earnings Before Interest & Tax	\$809,326		\$583,070		\$1,093,999		\$1,598,468		\$2,016,508	
Capital										
Fishing Gear & Equipment	\$1,208,854		\$1,422,717		\$3,373,659		\$3,346,480		\$3,257,288	
Licence Value	\$4,460,187		\$5,465,490		\$21,394,610		\$25,509,890		\$27,369,135	
Total Capital	\$5,669,041		\$6,888,206		\$24,768,269		\$28,856,371		\$30,626,424	
Rate of Return to Fishing Gear & Equipment	66.9%		41.0%		32.4%		47.8%		61.9%	
Rate of Return to Total Capital	14.3%		8.5%		4.4%		5.5%		6.6%	

^a Estimates of financial performance for 2004/05 to 2006/07 are based on the 2006 survey of licence holders. Estimates of financial performance per boat, as reported in EconSearch (2005a) for the period 2000/01 to 2003/04, have been adjusted to reflect a total for the sector. Estimates of financial performance for 1997/98 to 2001/02 are provided in Appendix 3 of this report.

^b Total cash costs.

^c Licence fees reported in EconSearch (2005a) for the period 2001/02 to 2003/04 and the period 2004/05 to 2006/07 estimates have been adjusted to reflect the actual costs of managing the fishery (Table 3.2).

Source: EconSearch analysis.

Table 3.6 Financial performance in the SA Blue Crab fishery, pot sector, 2002/03 to 2006/07 (average per quota unit)^a

	Average per Unit				
	2002/03	2003/04	2004/05	2005/06	2006/07
Gross Income	\$335.71	\$355.68	\$412.92	\$492.35	\$510.22
Costs					
Fuel	\$27.92	\$28.08	\$60.26	\$63.78	\$53.30
R&M	\$20.85	\$21.23	\$53.34	\$55.01	\$46.14
Provisions	\$7.71	\$7.85	\$7.12	\$7.34	\$6.16
Labour	\$153.71	\$186.11	\$103.34	\$123.22	\$127.69
Licence fee	\$13.98	\$21.51	\$20.38	\$23.77	\$25.53
Insurance	\$3.15	\$3.66	\$6.15	\$6.39	\$6.28
Interest	\$0.73	\$0.85	\$60.20	\$62.50	\$61.40
Admin and Other	\$7.81	\$9.08	\$20.44	\$21.22	\$20.85
Total Cash Costs	\$235.85	\$278.37	\$331.24	\$363.22	\$347.35
Cash Operating Surplus	\$99.86	\$77.31	\$81.69	\$129.13	\$162.88
Depreciation	\$14.53	\$16.89	\$33.42	\$33.15	\$31.16
Earnings Before Tax	\$85.33	\$60.42	\$48.27	\$95.99	\$131.71
Earnings Before Interest & Tax	\$86.06	\$61.27	\$108.47	\$158.48	\$193.12
Capital					
Fishing Gear & Equipment	\$128.55	\$149.49	\$334.49	\$331.79	\$311.94
Licence Value	\$474.29	\$574.29	\$2,121.22	\$2,529.24	\$2,621.06
Total Capital	\$602.83	\$723.78	\$2,455.71	\$2,861.03	\$2,933.00
Rate of Return to Fishing Gear & Equipment	66.9%	41.0%	32.4%	47.8%	61.9%
Rate of Return to Total Capital	14.3%	8.5%	4.4%	5.5%	6.6%

^a Calculated using sector total (Table 3.5) and total number of quota units in the sector (Table 3.3). One quota unit was equivalent to 57.75 kg of catch.

Source: EconSearch analysis.

Table 3.7 Financial performance in the SA Blue Crab fishery, marine scale sector, 2002/03 to 2006/07 (total sector) ^a

	2002/03		2003/04		2004/05		2005/06		2006/07	
	Total MSF Sector	Share of TCC ^b	Total MSF Sector	Share of TCC ^b	Total MSF Sector	Share of TCC ^b	Total MSF Sector	Share of TCC ^b	Total MSF Sector	Share of TCC ^b
Gross Income	\$417,000		\$253,000		\$248,560		\$270,000		\$301,000	
Costs										
Fuel	\$64,916	21%	\$49,204	17%	\$41,970	16%	\$29,947	12%	\$44,142	16%
R&M	\$14,535	5%	\$11,163	4%	\$50,065	19%	\$34,805	14%	\$51,492	19%
Provisions	\$8,781	3%	\$6,744	2%	\$13,387	5%	\$9,306	4%	\$13,768	5%
Labour	\$108,849	35%	\$83,598	30%	\$84,904	32%	\$92,227	36%	\$102,817	38%
Licence fee ^c	\$83,173	26%	\$94,848	34%	\$48,708	18%	\$55,046	22%	\$24,752	9%
Insurance	\$7,441	2%	\$7,665	3%	\$9,344	3%	\$9,701	4%	\$9,867	4%
Interest	\$7,036	2%	\$7,218	3%	\$8,451	3%	\$8,774	3%	\$8,924	3%
Admin and Other	\$20,615	7%	\$21,089	7%	\$12,686	5%	\$13,171	5%	\$13,397	5%
Total Cash Costs	\$315,344	100%	\$281,530	100%	\$269,515	100%	\$252,977	100%	\$269,159	100%
Cash Operating Surplus	\$101,656		-\$28,530		-\$20,955		\$17,023		\$31,841	
Depreciation	\$42,665		\$43,936		\$48,326		\$38,863		\$22,662	
Earnings Before Tax	\$58,992		-\$72,466		-\$69,281		-\$21,840		\$9,179	
Earnings Before Interest & Tax	\$66,027		-\$65,247		-\$60,830		-\$13,067		\$18,103	
Capital										
Fishing Gear & Equipment	\$260,378		\$268,137		\$407,405		\$327,635		\$191,047	
Licence Value	\$524,517		\$318,232		\$1,180,450		\$1,282,274		\$1,429,498	
Total Capital	\$784,894		\$586,368		\$1,587,855		\$1,609,909		\$1,620,546	
Rate of Return to Fishing Gear & Equipment	25.4%		-24.3%		-14.9%		-4.0%		9.5%	
Rate of Return to Total Capital	8.4%		-11.1%		-3.8%		-0.8%		1.1%	

^a Estimates of financial performance for 2004/05 to 2006/07 are based on the 2006 survey of licence holders. Estimates of financial performance per boat, as reported in EconSearch (2005a) for the period 2001/02 to 2003/04, have been adjusted to reflect a total for the sector. Estimates of financial performance for 1997/98 to 2001/02 are provided in Appendix 3 of this report.

^b Total cash costs.

^c Licence fees reported in EconSearch (2005a) for the period 2001/02 to 2003/04 and the 2004/05 to 2006/07 estimates have been adjusted to reflect the actual costs of managing the fishery (Table 3.2).

Source: EconSearch analysis.

Table 3.8 Financial performance in the SA Blue Crab fishery, marine scale sector, 2002/03 to 2006/07 (average per quota unit)^a

	Average per Unit				
	2002/03	2003/04	2004/05	2005/06	2006/07
Gross Income	\$287.59	\$189.23	\$323.65	\$376.04	\$730.58
Costs					
Fuel	\$44.77	\$36.80	\$54.65	\$41.71	\$107.14
R&M	\$10.02	\$8.35	\$65.19	\$48.47	\$124.98
Provisions	\$6.06	\$5.04	\$17.43	\$12.96	\$33.42
Labour	\$75.07	\$62.53	\$110.55	\$128.45	\$249.55
Licence fee	\$57.36	\$70.94	\$63.42	\$76.67	\$60.08
Insurance	\$5.13	\$5.73	\$12.17	\$13.51	\$23.95
Interest	\$4.85	\$5.40	\$11.00	\$12.22	\$21.66
Admin and Other	\$14.22	\$15.77	\$16.52	\$18.34	\$32.52
Total Cash Costs	\$217.48	\$210.57	\$350.93	\$352.34	\$653.30
Cash Operating Surplus	\$70.11	-\$21.34	-\$27.29	\$23.71	\$77.28
Depreciation	\$29.42	\$32.86	\$62.92	\$54.13	\$55.00
Earnings Before Tax	\$40.68	-\$54.20	-\$90.21	-\$30.42	\$22.28
Earnings Before Interest & Tax	\$45.54	-\$48.80	-\$79.21	-\$18.20	\$43.94
Capital					
Fishing Gear & Equipment	\$179.57	\$200.55	\$530.47	\$456.32	\$463.71
Licence Value	\$361.74	\$238.02	\$1,537.04	\$1,785.90	\$3,469.66
Total Capital	\$541.31	\$438.57	\$2,067.52	\$2,242.21	\$3,933.36
Rate of Return to Fishing Gear & Equipment	25.4%	-24.3%	-14.9%	-4.0%	9.5%
Rate of Return to Total Capital	8.4%	-11.1%	-3.8%	-0.8%	1.1%

^a Calculated using sector total (Table 3.6) and total number of quota units in the sector (Table 3.3). One quota unit was equivalent to 57.75kg of catch.

Source: EconSearch analysis.

Costs...

Labour costs were by far the largest individual cost item comprising approximately 37 per cent of total cash costs⁷ in the pot sector and approximately 38 per cent in the marine scale sector in 2006/07. As a proportion of total cash costs, licence fees were slightly higher in the marine scale sector (9 per cent) than the pot sector (7 per cent). The other significant cash costs were fuel (15 per cent for the pot sector and 16 per cent for the marine scale sector) and repairs and maintenance (13 per cent and 19 per cent, respectively). Interest on borrowings (18 per cent) was also a significant cost in the pot sector.

Average gross income per quota unit for the marine scale sector was approximately 43 per cent above that of the pot sector and average total cash costs per unit were 88 per cent higher. The cost items where the largest differences occurred between sectors were labour (95 per cent higher per quota unit in the marine scale sector), repairs and maintenance (171 per cent higher) and fuel (101 per cent). Interest costs, however, were 183 per cent greater per quota unit in the pot sector compared to the marine scale sector.

Overall, total cash costs in the pot sector decreased by approximately 4 per cent, from \$3.7 million in 2005/06 to approximately \$3.5 million in 2006/07. The main drivers of the decrease have been the decrease in fuel (16 per cent) and repairs and maintenance (16 per cent) costs due to the decrease in fishing effort in the fishery (Table 3.5). For the marine scale sector, total cash costs increased by approximately 6 per cent, from almost \$253,000 in 2005/06 to almost \$270,000 in 2006/07. The main drivers of the increase have been the increase in fuel and repairs and maintenance costs.

Cash Income and Profit...

As noted elsewhere, the labour costs reported in Tables 3.5 to 3.8 are comprised of payments to skippers and crew as well as an imputed wage to operators and other family members who are not paid a wage directly by the business. Cash operating surplus was calculated by including the imputed wages for operator and family members as part of cash costs.

The average cash operating surplus for all boats in the pot sector was estimated to be almost \$1.7 million in 2006/07 and for all boats in the marine scale sector it was estimated to be \$32,000. Cash operating surplus and earnings before tax (business profit) give an indication of the capacity of the operator to remain in the fishery in the short to medium term.

On a per quota unit basis the cash operating surplus in the pot sector (\$163/unit) was more than that in the marine scale sector (\$77/unit) in 2006/07.

⁷ Fixed and variable costs have not been differentiated; therefore Boat Gross Margin has not been calculated. Boat Gross Margin is available upon request.

Return on Investment...

There are a number of interpretations of the concept of return on investment. For the purpose of this analysis it is appropriate to consider the investment as the capital employed by an average licence holder in the fishery. Capital includes boats, licence/quota, fishing gear, sheds, vehicles and other capital items used as part of the fishing enterprise. It does not include working capital or capital associated with other businesses operated by the licence holder. For those licence holders who are operating in other fisheries (i.e. outside the blue crab fishery), capital invested, depreciation costs and other overheads were apportioned on the basis of income earned in the blue crab fishery as a proportion of total fishing income. The return on investment was calculated as the earnings before interest and tax (EBIT) as a percentage of total capital employed.

The average return on investment for each sector in the fishery is reported in Tables 3.5 to 3.8. While the rate of return to boat capital in the pot sector (i.e. fishing gear and equipment) is relatively high (61.9 per cent in 2006/07), the rate of return to total capital was estimated to be significantly lower at 6.6 per cent. The rate of return to capital for 2005/06 and 2006/07 was significantly less than in earlier years. This is partly due to the significant increase in the estimated value of licences in the fishery. It is likely that the value of licences was underestimated in earlier years. For the marine scale sector the rate of return to boat capital was estimated to be 9.3 per cent and the rate of return to total capital 1.1 per cent in 2006/07. This was an increase on the 2005/06 estimated returns of -4.0 per cent to boat capital and -0.8 per cent to total capital (Table 3.7).

The licence value for the 1997/98 analysis was based on the then market rate of around \$7,000 per tonne of quota or around \$5,600 per pot. Since that time there has been considerable interest in 'marginal' units of quota, particularly in the marine scale sector, which has given rise to a substantial increase in the cost of traded quota. Licence values for the period 1999/00 to 2003/04 (reported in Appendix 3 and Tables 3.6 and 3.8) were calculated on the basis of the 1997/98 survey values and adjusted in line with changes in GVP in the fishery, to reflect changes in the profitability of holding a licence. It is understood that the demand for quota and subsequent increase in the price of quota has resulted from operators in other fishing sectors looking to better utilise their existing investments in vessel, gear and available labour. Because the opportunity cost of this 'off-season' capital and labour is low, it enables the operator to offer a higher price for quota than would otherwise be the case⁸.

This situation has created an interesting effect. While changes in the profitability of the total fishery may have warranted only relatively small changes in the value of licences, opportunities identified by individual operators have pushed up the price of quota significantly. This is reflected in the licence values reported for 2006/07 calculated on the basis of the March - April 2006 licence holder survey and changes in fishery GVP. Since there have been limited transfers of full licences in recent years and the current market value of licences is uncertain, a sensitivity analysis was undertaken to estimate the rate of return to capital for a range of licence values in the fishery. The results of the licence value sensitivity analysis are presented in Tables 3.9 for the pot sector and 3.10 for the marine scale sector.

⁸ Opportunity cost refers to the cost of passing up the next best choice when making a decision.

Table 3.9 Sensitivity of rate of return to changes in licence value, pot sector, 2006/07

Licence Value per Quota Unit	\$1,311 ^a	\$2,621 ^b	\$3,932 ^c
Rate of Return to Total Capital	11.9%	6.6%	4.6%

^a Approximately 50 per cent below the licence value estimated for 2006/07.

^b The licence value estimated for 2006/07.

^c Approximately 50 per cent above the licence value estimated for 2006/07.

Source: EconSearch analysis.

Table 3.10 Sensitivity of rate of return to changes in licence value, marine scale sector, 2006/07

Licence Value per Quota Unit	\$1,735 ^a	\$3,470 ^b	\$5,204 ^c
Rate of Return to Total Capital	2.0%	1.1%	0.8%

^a Approximately 50 per cent below the licence value estimated for 2006/07.

^b The licence value estimated 2006/07.

^c Approximately 50 per cent above the licence value estimated for 2006/07.

Source: EconSearch analysis.

Based on the costs and returns shown for the year 2006/07 in Table 3.5, licence value in the pot sector of \$3,932 per quota unit would mean an annual return to the total asset of 4.6 per cent, while a licence value of \$1,311 per unit would equate to an annual return to the total asset of 11.9 per cent (Table 3.9). For the marine scale sector, a total licence value of \$5,204 per quota unit would mean an annual return to the total asset of 0.8 per cent, while a licence value of \$1,735 per quota unit would equate to an annual return to the total asset of 2.0 per cent (Table 3.10).

3.5 Economic Impact of the Fishery

Estimates of the economic impact of the blue crab fishing industry (i.e. pot and marine scale sectors) on the South Australian economy in 2006/07 are outlined below.

3.5.1 Measuring flow-on effects

Estimates of the direct economic impact of the SA Blue Crab fishery are consistent with the method employed in PIRSA's *Food for the Future* value-chain analysis, 2004/05⁹.

⁹ The relevant information was obtained from Jack Langberg (PIRSA, pers. comm.).

The following stages in the marketing chain have, therefore, been included in the quantifiable economic impact:

- the landed beach value of production; and
- downstream impacts, including the:
 - net value of local (state and regional) processing;
 - value of local transport services at all stages of the marketing chain; and
 - net value of local retail and food service (e.g. hotels & restaurants) trade¹⁰.

Each of these activities generates flow-on effects to other sectors through purchases of inputs and the employment of labour. These flow-on effects have been estimated using input-output analysis. Input-output analysis is widely used in economic impact analysis and is a practicable method for measuring economic impacts at regional and state levels.

A single input-output model was used for this study. As operators in the blue crab fishery are spread all over the state, economic impacts were based on a model for South Australia prepared for the Regional Communities Consultative Council, Local Government Association of South Australia and Regional Development SA (EconSearch 2005b).

In order to compile a representative cost structure for the fishing sector, costs were derived from data provided by operators in the fishery in a financial survey for 2004/05 and updated to 2006/07, as described earlier. On an item-by-item basis, the expenditures were allocated between those occurring in South Australia and those goods and services imported from outside the state.

These data were then incorporated into the state input-output model to estimate the flow-on or indirect economic impacts of the blue crab fishery in South Australia in 2006/07.

Estimates of the net value of local (i.e. regional and state) processing margins and retail and food service trade margins were derived from PIRSA's *Food for the Future* value-chain analysis (*Seafood Scorecard, 2005/06*) (Jack Langberg, PIRSA, pers. comm.). Estimates of the net value of local transport margins and capital expenditure were derived from the March – April 2006 survey of licence holders.

Economic impacts have been specified in terms of the following economic indicators:

- value of output;
- employment;
- household income; and
- contribution to gross state product.

Value of output is a measure of the gross revenue of goods and services produced by commercial organisations plus gross expenditure by government agencies. This indicator needs to be used with care as it includes elements of double counting.

Employment is a measure of the number of working proprietors, managers, directors and other employees, in terms of the number of full-time equivalent (fte) jobs.

¹⁰ Estimates of economic impact prepared for this and other commercial fisheries in South Australia (except Lakes and Coorong) for the period 1997/98 to 2002/03 do not include the impact of local retail and food service trade.

Household income is a component of Gross State Product (GSP) and is a measure of wages and salaries, drawings by owner operators and other payments to labour including overtime payments and income tax, but excluding payroll tax.

Contribution to GSP is a measure of the net contribution of an activity to the state economy. Contribution to GSP is measured as value of output less the cost of goods and services (including imports) used in producing the output. It can also be measured as household income plus other value added (gross operating surplus and all taxes, less subsidies). It represents payments to the primary inputs of production (labour, capital and land). Using contribution to GSP as a measure of economic impact avoids the problem of double counting that may arise from using value of output for this purpose.

3.5.2 Economic impact

Estimates of the economic impact generated in 2006/07 by the blue crab fishing industry in South Australia are outlined in Table 3.11.

The direct impact measures fishing and downstream activities (fish processing, transport, retail/food services and capital expenditure). The flow-on impact measures the economic effects in other sectors of the economy (trade, manufacturing, etc.) generated by the fishing industry activities, that is, the multiplier effect.

Value of output...

The value of output generated directly in South Australia by blue crab fishing enterprises summed to \$5.6 million in 2006/07 (Table 3.11), while output generated in South Australia by associated downstream activities (processing, transport, retail/food services and capital expenditure) summed to \$3.1 million.

Flow-ons to other sectors of the state economy added another \$8.9 million in output. The sectors most affected were the manufacturing (\$2.2 million), trade (\$1.3 million) and business services sectors (\$1.0 million).

Employment and household income...

In 2006/07, the SA Blue Crab fishery was responsible for the direct employment of around 29 full-time equivalents (fte) and downstream activities created employment of 17 fte jobs state-wide. Flow-on business activity was estimated to generate a further 48 fte jobs state-wide. These state-wide jobs were concentrated in the trade (14), manufacturing (7) and business services sectors (6).

Personal income of \$1.5 million was earned in the fishing sector (wages of employees and estimated drawings by owner/operators) and \$0.7 million in downstream activities in SA. An additional \$2.3 million was earned by wage earners in other businesses in the state as a result of fishing and associated downstream activities. The total household income impact was \$4.5 million in South Australia.

Table 3.11 Economic impact of the blue crab fishing industry on the South Australian economy, 2006/07

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	5.6	31.9%	29	31.1%	1.5	32.5%	3.7	41.2%
Processing	1.5	8.5%	5	5.0%	0.2	4.8%	0.3	3.9%
Transport	0.7	3.8%	3	3.3%	0.2	4.8%	0.3	3.6%
Retail	0.2	1.2%	3	3.2%	0.1	1.9%	0.1	1.2%
Food services	0.6	3.1%	5	4.9%	0.1	3.1%	0.2	2.4%
Capital expenditure ^b	0.2	0.9%	1	1.5%	0.0	1.0%	0.1	0.7%
Total Direct ^c	8.7	49.4%	46	47.5%	2.2	47.2%	4.7	52.3%
Flow-on effects								
Trade	1.3	7.4%	14	14.8%	0.5	10.7%	0.6	6.8%
Manufacturing	2.2	12.4%	7	7.3%	0.3	7.1%	0.5	5.8%
Business Services	1.0	5.7%	6	6.3%	0.4	8.1%	0.5	5.4%
Transport	0.5	2.8%	2	2.5%	0.2	3.6%	0.2	2.7%
Other Sectors	3.9	22.3%	19	20.2%	1.0	22.3%	2.3	26.3%
Total Flow-on ^c	8.9	50.6%	48	51.0%	2.3	51.8%	4.2	47.0%
Total ^c	17.6	100.1%	93	100.0%	4.5	100.0%	8.9	100.0%
Total/Direct	2.0	-	2.0	-	2.1	-	1.9	-
Total/Tonne	\$27,600	-	0.15	-	\$7,100	-	\$13,900	-

^a Full-time equivalent jobs. Direct employment in the fishery was comprised of 11 full-time jobs (11 in the pot sector, none in the marine scale sector) and 33 part-time jobs (17 in the pot sector and 16 in the marine scale sector), that is, 44 jobs in aggregate.

^b Capital expenditure includes expenditure on boats, fishing gear and equipment, sheds and buildings, motor vehicles and other equipment.

^c Totals may not sum due to rounding.

Source: EconSearch analysis.

Contribution to GSP...

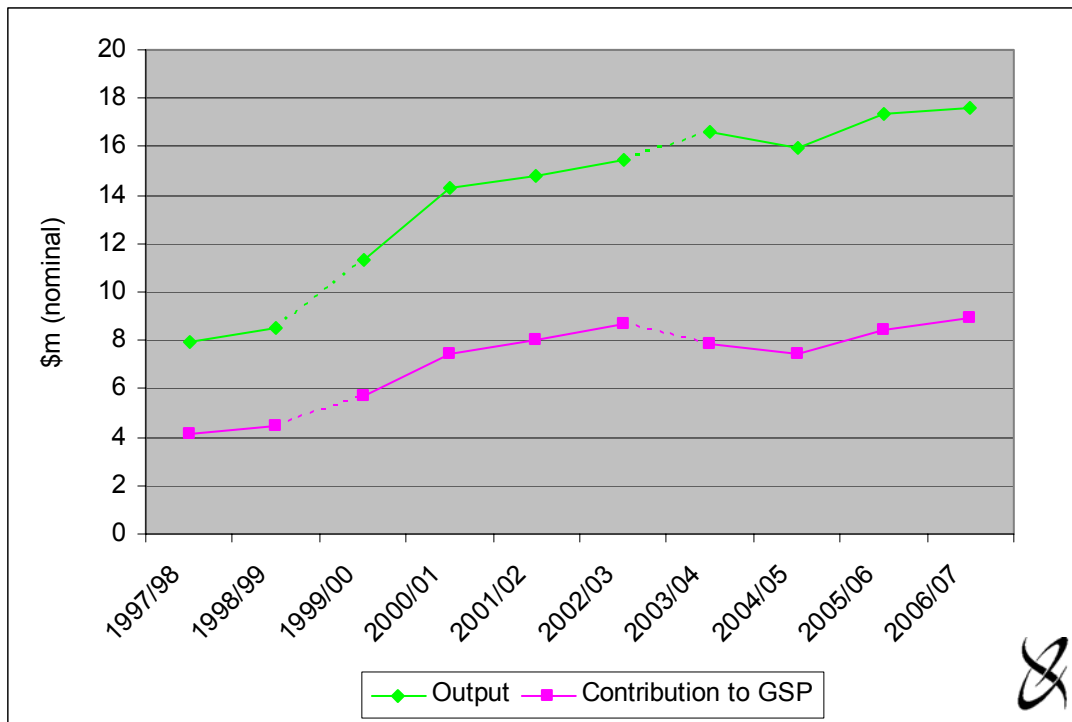
As noted above, contribution to GSP is measured as value of output less the cost of goods and services (including imports) used in producing the output. In 2006/07, total blue crab fishing industry related contribution to GSP in South Australia was \$8.9 million, \$3.7 million generated by fishing directly, \$1.1 million generated by downstream activities and \$4.2 million generated in other sectors of the state economy

Total impacts over time...

Figures 3.3 and 3.4 illustrate the total economic impact of the fishery on the SA economy for the eight-year period, 1997/98 to 2006/07. Estimates of economic impact are expressed in nominal terms, accordingly no adjustment has been made to reflect inflation.

Estimates of economic impact for 1997/98 to 2003/04 are based on the October 1998 survey of licence holders. Estimates for 2004/05 and 2006/07 are based on the recent survey of licence holders conducted in March – April 2006.

Figure 3.3 Total gross state product and output impact of the blue crab fishing industry in SA, 1997/98 to 2006/07 ^a



^a The economic impact of the SA Blue Crab fishery in 1997/98 and 1998/99 does not include the direct and flow-on effects of estimated capital expenditure by licensees; these effects have been included in subsequent years. Estimates of economic impact for the period 1997/98 to 2002/03 do not include the impact of local retail and food service trade; these effects have been included in subsequent years.

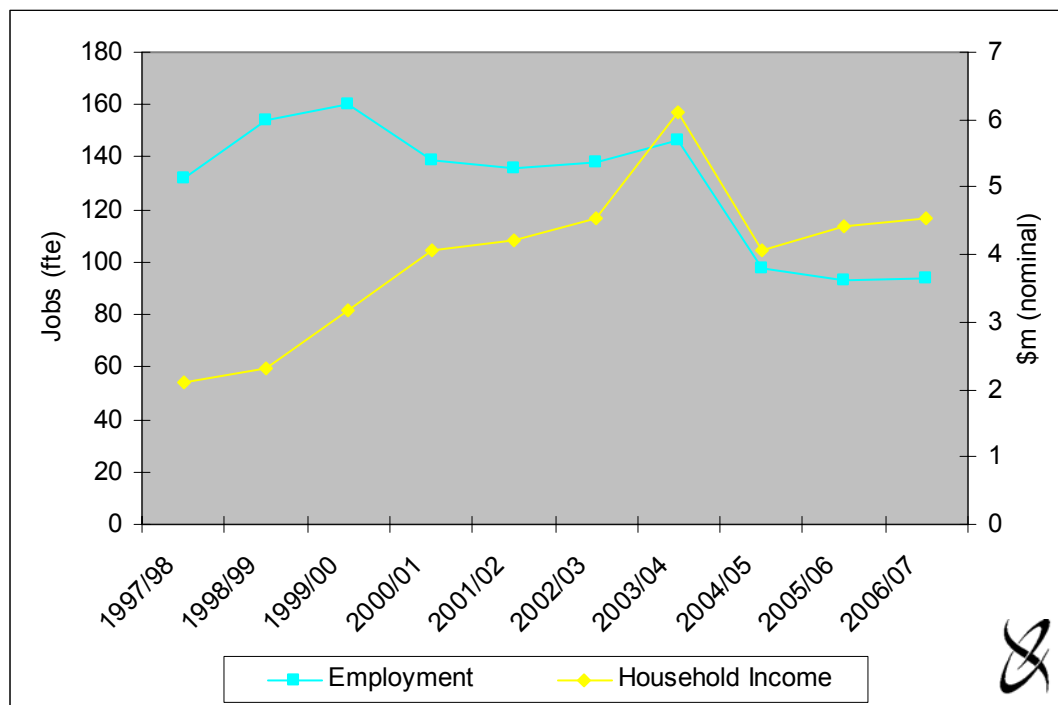
Source: EconSearch (2006a) and EconSearch analysis.

As economic impact estimates for the years 1997/98 to 2006/07 are based on different survey samples and techniques, some of the variability between years, is therefore, attributable to sampling variability.

There has been an increase in the total output and GSP impact of the fishery over the nine year period, as illustrated in Figure 3.3. This increase can be attributed to the significant increase in catch and value of catch over the period (Table 3.1).

The total employment impact increased between 1997/98 and 1999/00, but has declined significantly since. This decrease can be attributed to a considerable reduction in the total number of licence holders in the marine scale sector (direct employment) and productivity improvements across all related industries.

Figure 3.4 Total employment and household income impact for the blue crab fishing industry in SA, 1997/98 to 2006/07 ^a



^a See note for Figure 3.3.

Source EconSearch (2006a) and EconSearch analysis.

3.6 Economic Rent

Economic rent¹¹ is defined as the difference between the price of a good produced using a natural resource and the unit costs of turning that natural resource into the good. In this case the natural resource is the blue crab fishery and the good produced is the landed blue crab.

The unit costs all need to be covered if the licence holder is to remain in the fishery. These costs include direct operating costs such as fuel, labour (including the opportunity cost of a self employed fisher's own labour), bait, overheads such as administration and licences and the cost of capital invested in the boat and gear (excluding licence). Capital cost includes depreciation and the opportunity cost of the capital applied to the fishery. The opportunity cost is equivalent to what the fisher's investment could have earned in the next best alternative use.

¹¹ Economic rent is comprised of three types of rent: entrepreneurial rent, quasi-rent and resource rent. As in any business some operators are more skilful than others and will therefore earn more profit. These profits, which are one component of economic rent, are *entrepreneurial rents*. In the short-term fishers may earn large surpluses over costs, which may provide prima facie evidence of substantial resource rents. However, there are some circumstances where such surpluses can occur but they are not true rents. These are referred to as *quasi-rents*. One example is where a fishery is developing or recovering and there may be under-investment in the fishery. Another example is where there is a short-term but unsustainable increase in price due to, for example, exchange rate fluctuations. However, some profits will be obtained because the natural resource being used (i.e. the fishery) has a value. These profits are described as *resource rents* and are also a component of economic rent.

Determining the opportunity cost of capital involves an assessment of the degree of financial risk involved in the activity. For a risk-free operation, an appropriate opportunity cost of capital might be the long-term real rate of return on government bonds. The greater the risks involved, the greater is the necessary return on capital to justify the investment in that particular activity. For this analysis, the long-term (10 year) real rate of return on government (treasury) bonds of 5 per cent has been used and a risk premium of 5 per cent has been applied.

What remains after the value of these inputs (labour, capital, materials, services) has been netted out is the value of the natural resource itself. The economic rent generated in the SA Blue Crab fishery over the period 1997/98 to 2006/07, for the component sectors and the fishery as a whole is outlined in Tables 3.12 to 3.14. Economic rent for the fishery as a whole was \$1.69 million in 2006/07 (Table 3.14), approximately 39 per cent higher than the estimate for 2005/06. All of the economic rent was generated in the pot sector.

Table 3.12 Economic rent in the SA Blue Crab fishery, pot sector, 1997/98 to 2006/07 (\$'000) ^a

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	Economic Rent
1997/98	1,837	841	670	116	103	106
1998/99	1,913	876	663	118	104	152
1999/00	1,916	877	672	121	107	139
2000/01	2,588	1,185	732	128	113	431
2001/02	2,975	1,362	741	131	116	624
2002/03	3,157	1,445	766	137	121	688
2003/04	3,385	1,771	870	161	142	441
2004/05	4,165	1,042	1,691	337	337	757
2005/06	4,966	1,243	1,790	334	335	1,264
2006/07	5,328	1,333	1,653	325	326	1,691

^a Economic rents for the pot sector for the period 1997/98 to 2003/04 have been revised from that reported in EconSearch (2005a).

Source: EconSearch analysis.

Table 3.13 Economic rent in the SA Blue Crab fishery, marine scale sector, 1997/98 to 2006/07 (\$'000) ^a

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	Economic Rent
1997/98	336	112	202	36	22	-36
1998/99	321	107	196	37	22	-41
1999/00	233	78	201	38	23	-106
2000/01	479	141	231	40	24	43
2001/02	486	141	245	41	25	34
2002/03	417	109	199	43	26	40
2003/04	253	84	191	44	27	-92
2004/05	249	85	176	48	41	-102
2005/06	270	92	152	39	33	-46
2006/07	301	103	157	23	19	-1

^a Economic rents for the marine scale sector for the period 1997/98 to 2003/04 have been revised from that reported in EconSearch (2005a).

Source: EconSearch analysis.

Table 3.14 Economic rent in the SA Blue Crab fishery, total fishery, 1997/98 to 2006/07 (\$'000) ^a

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	Economic Rent
1997/98	2,173	953	872	153	125	70
1998/99	2,234	983	859	155	127	111
1999/00	2,149	955	873	159	130	32
2000/01	3,067	1,326	962	168	137	473
2001/02	3,461	1,503	986	172	141	659
2002/03	3,574	1,554	965	179	147	728
2003/04	3,638	1,855	1,061	205	169	349
2004/05	4,413	1,127	1,868	385	378	655
2005/06	5,236	1,335	1,942	373	367	1,218
2006/07	5,629	1,436	1,810	348	345	1,690

^a Economic rents for the blue crab fishery for the period 1997/98 to 2003/04 have been revised from that reported in EconSearch (2005a).

Source: EconSearch analysis.

When an economic rent is generated in a fishery and there are transferable licences, the rent represents a return to the value of the licences. The aggregate value of licences in 2006/07 was estimated to be \$28.8 million. An annual economic rent of \$1.7 million represents a return of 5.9 per cent to the capital value of the SA Blue Crab fishery in aggregate.

4. Other Indicators

4.1 External Factors Influencing the Economic Condition of the Fishery

There are a number of factors in 2006/07 that have impacted on the economic performance of the fishery. Most of these are likely to continue to affect economic outcomes in the future.

Stock Assessment

The status of the SA Blue Crab fishery is measured against performance indicators set out by the draft Management Plan. These indicators relate to:

- catch;
- exploitation rate;
- pre-recruitment; and
- ratio of males and females.

The draft Management Plan specifies targets and limits for each of the performance indicators to ensure the sustainability of the fishery.

The most recent stock assessment information available relates to the 2005/06 season. According to that report, evidence available suggests that blue crab stocks in both Spencer Gulf and Gulf St Vincent are being harvested within sustainable limits.

The target catch determined by the draft Management Plan is between 80 and 100 per cent of the total allowable commercial catch (TACC). During the 2005/06 season, almost 99 per cent of the TACC was landed (Currie, Hooper and Ward 2007).

Exploitation rate targets are expressed in terms of a percentage of a base year. In the Spencer Gulf region of the fishery, the target exploitation rate is 40 per cent of the base year (1994), and the limit is 80 per cent. In the Gulf St Vincent region, the target exploitation rate is 50 per cent of the base year (1994) and the limit is 100 per cent. There has not been adequate sampling to generate an exploitation rate for the 2005/06 season (Currie, Hooper and Ward 2007).

The pre-recruitment targets for the SA Blue Crab fishery are measured as the percentage of undersize crabs caught in the months of June and July. In Gulf St Vincent, the target reference is 10 per cent and the minimum or limit is 5 per cent. The reference values for Spencer Gulf are slightly higher; 30 per cent target and 15 per cent limit, respectively. In 2005/06 the pre-recruitment rates were within or above the target levels set by the management plan. The percentages of undersize crabs caught were 17.7 per cent in Gulf St Vincent and 5.3 per cent for Spencer Gulf (Currie, Hooper and Ward 2007).

The target range for the abundance of female crabs compared to males is between 15 and 30 per cent. In the Gulf St Vincent region the proportion of females in 2005/06 was 32 per cent and in Spencer Gulf, 20 per cent. These values are above the target rate set by the Management Plan (Currie, Hooper and Ward 2007).

A new management plan for the Blue Crab Fishery will be developed by PIRSA Fisheries under the new *Fisheries Management Act 2007*.

Environmental Factors

Productivity of blue crab stock is ambiguous due to extreme variation in biological characteristics of the species. Biological factors, and accordingly the rate of recruitment of the species, can be influenced by environmental factors. Fluctuations in the abundance of the species and low recruitment rates are often linked to changes in temperature and salinity levels (DEH 2004).

Sustainability

In 2004 the Department for Environment, Water, Heritage and the Arts (DEWHA) conducted an assessment of the sustainability of the blue crab fishery. The assessment covered both the marine scale sector and the pot sector of the fishery in both the Spencer Gulf and Gulf St Vincent. The 2004 assessment found that the fishery is operating in accordance with management practices and is unlikely to have an unsustainable impact on the environment or the fishery's resource in the short to medium term (DEH 2004).

DEWHA is required by the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act* (1999) to assess the fishery's management framework to determine whether to exempt the fishery from export controls and protected species permit requirements for individual licence holders. In 2004 the Blue Crab Fishery was accredited to be exempt from the *EPBC Act* for a period of five years.

4.2 Licence Holder Comments

Several licence holders who participated in the 2006 survey indicated that the significant amount of time spent on paperwork and management impedes their ability to develop the fishery. Some suggested that the licence fees at their current level were too high when compared with other commercial fisheries. Others, however, felt that the level of fees was appropriate but more of the funds raised should be directed towards promotion and marketing of the fishery.

Some licence holders felt that their quota allocation was too low making their business unviable. Rising licence fees and other expenses and low prices for catch were also placing pressure on the viability of business. Some licence holders felt that there should be an increase in the TACC for the fishery, having indicated that the stocks were strong and could sustain an increase. There were mixed views about this with a number of licence holders opposed to any increase in TACC.

The majority of licence holders who participated in the survey indicated that the fishery's stock was healthy and the long-term outlook for the fishery was positive.

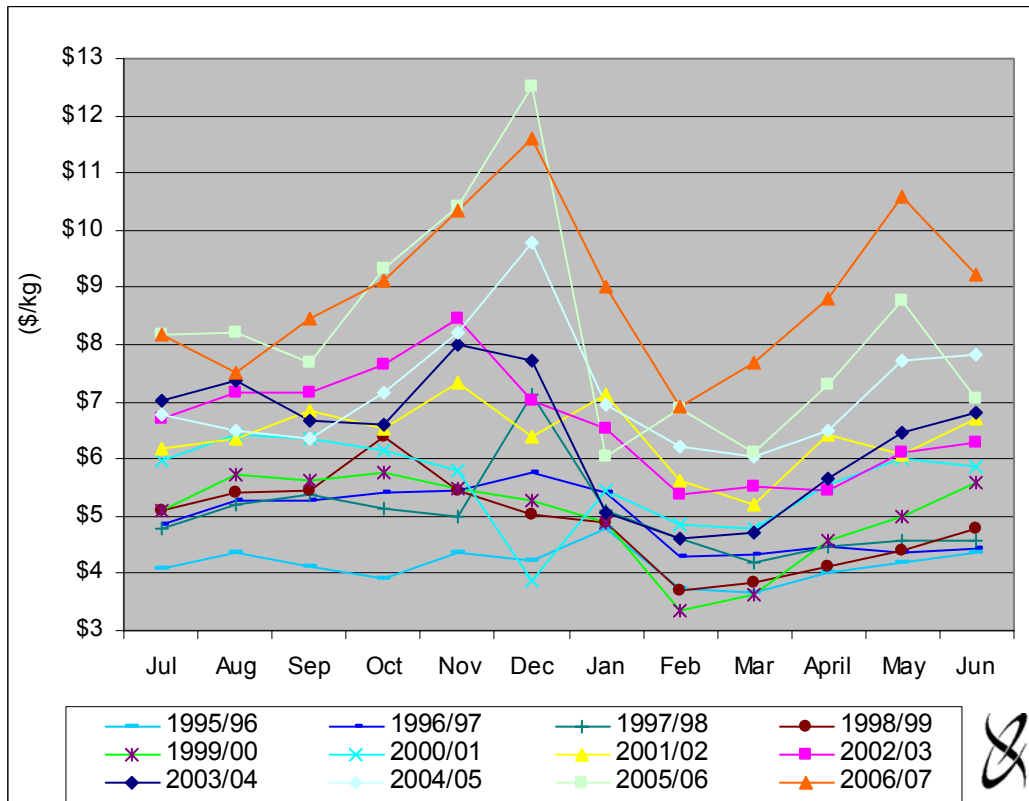
4.3 Prices for Blue Crabs in Domestic Markets

This section of the report provides further analysis of prices for blue crabs in the Adelaide, Sydney and Melbourne domestic markets. It provides some indication of the seasonality of prices and price differentials between Adelaide, Sydney and Melbourne.

4.3.1 Average monthly beach prices for blue crabs in South Australia

An outline of the seasonality of blue crab prices in SA (by month) for the period 1995/96 to 2006/07 is provided in Table 4.1 and Figure 4.1. Within each financial year, beach prices in SA tend to peak from October to December and trough in February and March, corresponding with a period of peak supply.

Figure 4.1 Average monthly beach prices for blue crabs, South Australia, 1995/96 to 2006/07^a



^a Nominal prices.

Source: SARDI Aquatic Sciences.

Table 4.1 Average monthly beach prices for blue crabs, South Australia, 1995/96 to 2006/07^a

Month	Average Monthly Price (\$/kg)											
	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
July	\$4.09	\$4.87	\$4.77	\$5.09	\$5.09	\$5.98	\$6.19	\$6.69	\$7.03	\$6.76	\$8.18	\$8.19
August	\$4.36	\$5.27	\$5.20	\$5.43	\$5.71	\$6.43	\$6.37	\$7.17	\$7.36	\$6.48	\$8.20	\$7.51
September	\$4.13	\$5.28	\$5.38	\$5.44	\$5.62	\$6.35	\$6.85	\$7.17	\$6.69	\$6.37	\$7.68	\$8.46
October	\$3.92	\$5.42	\$5.14	\$6.38	\$5.75	\$6.13	\$6.53	\$7.65	\$6.62	\$7.15	\$9.32	\$9.12
November	\$4.35	\$5.46	\$5.00	\$5.46	\$5.50	\$5.78	\$7.35	\$8.44	\$8.00	\$8.21	\$10.41	\$10.33
December	\$4.23	\$5.75	\$7.14	\$5.02	\$5.26	\$3.87	\$6.38	\$7.02	\$7.72	\$9.79	\$12.50	\$11.59
January	\$4.78	\$5.43	\$5.10	\$4.89	\$4.89	\$5.44	\$7.12	\$6.53	\$5.07	\$6.96	\$6.03	\$9.01
February	\$3.73	\$4.28	\$4.60	\$3.69	\$3.36	\$4.85	\$5.61	\$5.37	\$4.62	\$6.20	\$6.87	\$6.90
March	\$3.67	\$4.34	\$4.20	\$3.84	\$3.64	\$4.80	\$5.21	\$5.53	\$4.70	\$6.04	\$6.11	\$7.68
April	\$4.00	\$4.48	\$4.48	\$4.11	\$4.58	\$5.56	\$6.41	\$5.46	\$5.67	\$6.49	\$7.30	\$8.81
May	\$4.18	\$4.35	\$4.56	\$4.39	\$5.01	\$6.02	\$6.09	\$6.12	\$6.46	\$7.72	\$8.76	\$10.59
June	\$4.36	\$4.45	\$4.57	\$4.79	\$5.59	\$5.85	\$6.72	\$6.27	\$6.82	\$7.83	\$7.05	\$9.22
Weighted Average Annual Price	\$3.81	\$4.43	\$4.63	\$4.46	\$4.60	\$5.52	\$6.18	\$6.13	\$6.04	\$5.68	\$8.08	\$8.84

^a Nominal prices.

Source: SARDI Aquatic Sciences.

4.3.2 Prices for blue crabs in South Australia and other domestic markets

As stated in Section 3.1, the value of blue crab catch data sourced from SARDI Aquatic Sciences are estimated on the basis of information provided by processors in South Australia. In recent times a significant proportion of the State's blue crabs have been sold in the Melbourne and Sydney markets. The average price at the Melbourne wholesale fish market for blue crabs during 2006/07 was \$9.52/kg¹² and at the Sydney wholesale fish market, \$8.98/kg¹³, the estimated average beach price in South Australia was \$8.84/kg in 2006/07 (Table 4.2).

This price differential between the beach price in SA and wholesale market prices in Sydney and Melbourne is illustrated on a monthly basis (for 2006/07) in Table 4.2 and Figure 4.2. Fluctuations in price are similar in all states with prices peaking in October to December and reaching a low point in February and March.

The value of production estimates for 2005/06 and 2006/07 were revalued as described in Section 3.1, however, it is likely that the estimates for previous and subsequent years, as shown in Table 3.1, have been underestimated.

Table 4.2 Average monthly prices for blue crabs, beach prices in South Australia and Sydney and Melbourne Fish Markets, 2006/07^a

Month	Average Monthly Price \$/kg		
	Beach Price, SA	Sydney Fish Market	Melbourne Fish Market
July	\$8.19	\$9.44	\$9.66
August	\$7.51	\$8.83	\$8.27
September	\$8.46	\$9.71	\$6.11
October	\$9.12	\$10.93	\$10.49
November	\$10.33	\$12.10	\$11.07
December	\$11.59	\$13.43	\$11.82
January	\$9.01	\$10.86	\$12.61
February	\$6.90	\$6.28	\$9.14
March	\$7.68	\$4.97	\$10.00
April	\$8.81	\$6.80	\$9.88
May	\$10.59	\$7.83	\$9.96
June	\$9.22	\$6.62	na
Weighted Average Annual Price	\$8.84	\$8.98	\$9.52

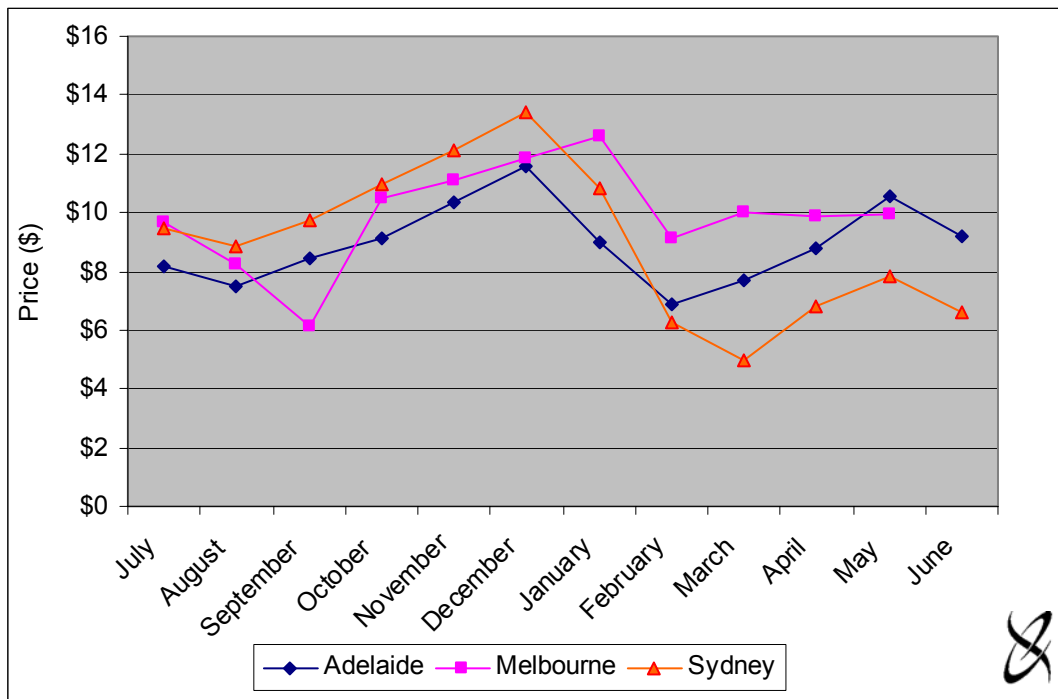
^a Nominal prices.

Source: SARDI Aquatic Sciences, NSW Department of Primary Industries (Samantha Dawes, pers. comm.), and Melbourne Wholesale Fish Market (Tim Rieniets, pers. comm.).

¹² This estimate is a weighted average price for all Blue Crabs from all sources sold in the Melbourne Fish Market during 2006/07 (Tim Rieniets, Melbourne Wholesale Fish Market, pers. comm.).

¹³ This estimate is a weighted average price for all Blue Crabs from all sources sold in the Sydney Fish Market during 2006/07 (Samantha Dawes, NSW Department of Primary Industries pers. comm.).

Figure 4.2 Average monthly prices for blue crabs, beach prices in South Australia and Sydney and Melbourne Fish Markets, 2006/07



Source: SARDI Aquatic Sciences, NSW Department of Primary Industries (Samantha Dawes, pers. comm.), and Melbourne Wholesale Fish Market (Tim Rieniets, pers. comm.).

References

- Australian Bureau of Statistics (ABS) 2007, *Consumer Price Index, Australia*, Cat. No. 6401.0.
- Baker, D. and Pierce, B. 1998, *Reassessment of the Gross Economic Value of the South Australian Inland Fisheries Harvest*, SARDI Aquatic Sciences
- Brown, D. 1997, *Australian Fisheries Surveys Report: Physical and financial performance in selected Australian Fisheries 1994-95 to 1996-97*, ABARE Report, Canberra.
- Currie, D. and Hooper, G. 2006, *Blue Swimmer Crab Fishery*, Fishery assessment report to PIRSA for the Blue Crab Fishery Management Committee, South Australian Research and Development Institute (Aquatic Sciences), March.
- Currie, D. Hooper, G. and Ward, T. 2007, *Blue Swimmer Crab Fishery*, Fishery assessment report to PIRSA for the Blue Crab Fishery Management Committee, South Australian Research and Development Institute (Aquatic Sciences), April.
- Department of Environment and Heritage (DEH), 2004, *Assessment of the Blue Crab Fishery*, ACT, November.
- EconSearch Pty Ltd 1999, *Economic Indicators for the South Australian Blue Crab Fishery 1997/98*, report prepared for Primary Industries and Resources South Australia, May.
- EconSearch Pty Ltd 2000, *Economic Indicators for the South Australian Blue Crab Fishery 1998/99*, report prepared for Primary Industries and Resources South Australia, April.
- EconSearch Pty Ltd 2001, *Economic Indicators for the South Australian Blue Crab Fishery 1999/00*, report prepared for Primary Industries and Resources South Australia, May.
- EconSearch Pty Ltd 2002, *Economic Indicators for the South Australian Blue Crab Fishery 2000/01*, report prepared for Primary Industries and Resources South Australia, September.
- EconSearch Pty Ltd 2003, *Economic Indicators for the South Australian Blue Crab Fishery 2001/02*, report prepared for Primary Industries and Resources South Australia, July.
- EconSearch 2004, *Economic Indicators for the South Australian Blue Crab Fishery 2002/03*, report prepared for Primary Industries and Resources South Australia, May.
- EconSearch 2005a, *Economic Indicators for the South Australian Blue Crab Fishery 2003/04*, report prepared for Primary Industries and Resources South Australia, August.
- EconSearch 2005b, *Quantifying the Economic Contribution of Regional South Australia*, report prepared for Regional Communities Consultative Council, Local Government Association of SA and Regional Development SA, May.
- EconSearch 2006, *Economic Indicators for the South Australian Blue Crab Fishery 2004/05*, report prepared for Primary Industries and Resources South Australia, June.

EconSearch 2007a, *Economic Indicators for the South Australian Blue Crab Fishery 2005/06*, report prepared for Primary Industries and Resources South Australia, Adelaide, May.

EconSearch 2007b, *Economic Indicators for the Commercial Fisheries of South Australia, Summary Report, 2005/06*, report prepared for Primary Industries and Resources South Australia, Adelaide, May.

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Appendix 1 Economic Impact of the South Australian Blue Crab Fishery, 2005/06

Appendix Table 1.1 Economic Impact of the South Australian Blue Crab fishery, 2005/06

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	5.2	30.2%	27	28.8%	1.3	30.2%	3.2	37.6%
Processing	1.5	8.8%	5	5.2%	0.2	5.0%	0.4	4.2%
Transport	0.7	3.9%	3	3.4%	0.2	5.0%	0.3	3.9%
Retail	0.2	1.2%	3	3.4%	0.1	2.0%	0.1	1.3%
Food services	0.6	3.2%	5	5.1%	0.1	3.3%	0.2	2.6%
Capital expenditure ^b	0.2	0.9%	1	1.4%	0.0	1.0%	0.1	0.7%
Total Direct ^c	8.4	48.2%	44	45.9%	2.1	45.5%	4.2	49.6%
Flow-on effects								
Trade	1.3	7.7%	14	15.4%	0.5	11.2%	0.6	7.3%
Manufacturing	2.3	13.0%	7	7.7%	0.3	7.5%	0.5	6.2%
Business Services	1.0	5.8%	6	6.5%	0.4	8.4%	0.5	5.7%
Transport	0.5	2.9%	2	2.6%	0.2	3.8%	0.2	2.9%
Other Sectors	3.9	22.4%	19	20.6%	1.0	22.6%	2.3	27.5%
Total Flow-on ^c	9.0	51.8%	49	52.7%	2.4	53.5%	4.2	49.7%
Total ^c	17.4	100.0%	93	100.0%	4.4	100.0%	8.4	100.0%
Total/Direct	2.1	-	2.1	-	2.1	-	2.0	-
Total/Tonne	\$26,700	-	0.14	-	\$6,800	-	\$13,000	-

^a Full-time equivalent jobs. Direct employment in the fishery was comprised of 11 full-time jobs (11 in the pot sector, none in the marine scale sector) and 33 part-time jobs (17 in the pot sector and 16 in the marine scale sector), that is, 44 jobs in aggregate.

^b Capital expenditure includes expenditure on boats, fishing gear and equipment, sheds and buildings, motor vehicles and other equipment.

^c Totals may not sum due to rounding.

Source: EconSearch (2007a).

Appendix 2 Summary Economic Indicators for South Australian Commercial Fisheries

Appendix Table 2.1 Commercial fisheries catch, South Australia, 1990/91 – 2005/06 (tonnes)

Year	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lobster	Nth'n Zone Rock Lobster	Blue Swimmer Crabs	Lakes and Coorong ^a	Sardines	Other Marine Species	Total SA Fisheries ^b
1990/91	863	134	1,951	1,562	1,104	434	2,442	n.a.	7,108	15,598
1991/92	885	0	2,155	1,940	1,222	425	3,143	145	7,750	17,665
1992/93	869	0	1,645	1,754	1,064	511	2,640	1,230	7,499	17,212
1993/94	802	226	1,693	1,669	930	544	2,992	2,377	6,719	17,952
1994/95	851	148	1,911	1,720	891	608	2,884	2,803	9,744	21,560
1995/96	902	258	2,013	1,684	903	655	2,720	3,708	6,301	19,144
1996/97	903	211	1,813	1,635	893	464	2,657	3,428	6,507	18,511
1997/98	812	267	2,492	1,680	942	469	2,595	6,041	5,526	20,824
1998/99	933	336	2,425	1,713	1,016	501	2,355	4,465	4,964	18,708
1999/00	889	400	2,016	1,717	1,001	549	1,995	3,836	4,840	17,243
2000/01	867	384	2,603	1,716	846	556	2,293	7,368	5,132	21,765
2001/02	850	322	2,288	1,717	675	559	1,875	12,165	4,644	25,095
2002/03	890	232	1,508	1,766	595	583	2,030	21,741	4,048	33,393
2003/04	879	172	1,958	1,896	504	611	2,120	33,160	3,712	45,012
2004/05	902	213	1,960	1,897	446	632	2,198	56,952	3,810	69,010
2005/06	896	179	1,891	1,889	476	648	2,352	28,626	3,186	40,143

^a Excludes the River fishery for the years 2003/04 and 2004/05.

^b Excludes aquaculture, south east non-trawl, tuna, deep water trawl.

Source: EconSearch (2007b).

Appendix Table 2.2 Commercial fisheries gross value of production, South Australia, 1990/91 – 2005/06 (\$m)

Year	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lobster	Nth'n Zone Rock Lobster	Blue Swimmer Crabs ^a	Inland Waters ^b	Sardines	Other Marine Species ^c	Total SA Fisheries ^d
1990/91	14.0	1.7	20.0	26.7	18.2	1.6	2.3	na	17.8	102.4
1991/92	15.1	0.0	19.7	36.3	21.4	1.4	2.6	0.2	21.3	117.9
1992/93	23.7	0.0	19.7	34.8	20.5	1.6	5.3	0.8	20.3	126.7
1993/94	27.2	3.3	20.9	43.2	23.4	1.8	5.6	1.4	19.2	146.0
1994/95	22.8	1.9	22.6	48.6	25.5	2.2	6.3	1.6	24.5	156.1
1995/96	22.5	3.5	22.9	44.6	23.8	2.5	6.0	2.5	21.8	150.1
1996/97	25.2	2.9	22.2	47.0	24.4	2.1	6.3	2.2	20.6	152.9
1997/98	26.9	4.1	29.2	50.9	27.7	2.2	5.5	3.8	16.7	166.9
1998/99	27.2	5.0	34.6	47.2	26.7	2.2	6.3	2.5	18.0	169.7
1999/00	32.4	7.6	36.1	51.2	29.8	2.5	7.5	2.7	19.2	189.1
2000/01	40.0	6.7	46.0	55.1	28.0	3.1	7.8	5.2	20.2	212.0
2001/02	34.8	5.9	41.5	65.7	26.2	3.5	6.0	8.5	18.5	210.5
2002/03	36.3	4.2	28.2	63.8	18.8	3.6	5.1	17.8	20.4	198.3
2003/04	31.6	3.1	40.4	49.3	12.0	3.6	5.4	22.5	21.9	189.9
2004/05	33.8	3.8	32.0	54.4	11.6	3.6	5.5	28.5	20.9	194.1
2005/06	33.9	2.9	34.0	65.7	15.4	5.2	5.9	16.0	17.4	196.6

^a SARDI estimates for the years 1990/91 and 1991/92, revalued SARDI estimates using Baker and Pierce (1998) for the years 1992/93 to 2001/02 and survey based readjustment factors for 2002/03 and 2003/04.

^b Excludes south east non-trawl, tuna, deep water trawl. SARDI estimates for the years 1990/91 to 2002/03, revalued SARDI estimates for 2003/04 using weighted average prices from Sydney and Melbourne fish markets and price data obtained from fishers.

^c Excludes aquaculture, south east non-trawl, tuna, deep water trawl.

Source: EconSearch (2007b).

Appendix Table 2.3 Cost of management in South Australian commercial fisheries, 2005/06

	Licence Fees (\$'000)	GVP (\$'000)	Fees/ GVP (%)	Catch ('000kg)	Fees/ Catch (\$/kg)	Licence Holders (no.)	Fees/ Licence (\$/licence)
Abalone	2,323	33,859	6.9%	896	\$2.59	35	\$66,359
GSV Prawns	270	2,941	9.2%	179	\$1.51	10	\$27,023
SG & WC Prawns	834	33,968	2.5%	1,891	\$0.44	42	\$19,855
Sth'n Zone Rock Lobster	2,508	65,737	3.8%	1,889	\$1.33	180	\$13,932
Nth'n Zone Rock Lobster	1,088	15,433	7.0%	476	\$2.29	69	\$15,766
Blue Crabs - Pots	240	4,966	4.8%	600	\$0.40	8	\$29,965
Blue Crabs – Marine Scale	55	270	20.4%	48	\$1.15	11	\$5,004
Lakes and Coorong ^a	265	5,924	4.5%	2,352	\$0.11	37	\$7,175
Marine Scalefish	1,547	17,446	8.9%	3,186	\$0.49	384	\$4,028
Sardines	1,005	16,031	6.3%	28,626	\$0.04	14	\$71,814
Total SA	10,135	196,575	5.2%	40,143	\$0.25	790	\$12,829

^a Excludes the River fishery.

Source: EconSearch (2007b).

Appendix Table 2.4 Financial performance in South Australian commercial fisheries, 2005/06, (\$'000) (average per boat)

	Abalone	GSV Prawns	SG & WC Prawns	Stn'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs Pot Sector ^a	Blue Crabs MS Sector ^a	Marine Scalefish ^b	Sardines	Lakes and Coorong
Gross Income	1,016.8	289.5	750.6	379.7	294.7	4,965.8	270.0	47.1	1,149.5	192.5
Costs										
Fuel	15.3	26.3	56.9	21.6	45.4	643.3	29.9	6.2	201.9	13.9
R&M	37.2	14.8	47.5	19.2	17.1	554.8	34.8	5.6	92.1	6.4
Labour	259.7	108.7	251.7	105.1	126.7	1,242.8	92.2	29.5	476.8	70.5
Licence fee	65.4	28.3	22.7	15.8	19.6	239.7	55.0	4.0	71.6	8.7
Insurance	6.9	19.0	19.9	6.4	8.8	64.4	9.7	1.9	30.5	1.6
Interest	5.0	28.5	41.8	22.0	31.9	630.3	8.8	0.3	88.3	4.9
Admin & Other	52.5	24.9	55.1	21.6	50.9	288.1	22.5	10.1	94.1	27.4
Total Cash Costs	442.0	250.4	495.6	211.7	300.4	3,663.4	253.0	57.7	1,055.4	133.4
Cash Operating Surplus	574.8	39.1	255.0	168.0	-5.7	1,302.4	17.0	-10.5	94.1	59.2
Depreciation	66.0	133.5	142.9	45.0	58.0	334.3	38.9	8.8	194.2	59.2
Earnings Before Tax	508.9	-94.5	112.1	123.0	-63.7	968.1	-21.8	-19.4	-100.1	0.0
EBIT^c	513.9	-66.0	153.9	145.0	-31.8	1,598.5	-13.1	-19.1	-11.8	4.9
Capital										
Fishing Gear & Equipment	331.0	988.2	1,295.4	330.3	451.2	3,346.5	327.6	87.9	2,621.4	121.9
Licence Value	8,534.6	2,424.1	4,283.7	2,874.0	1,472.3	25,509.9	1,282.3	146.6	3,042.9	177.5
Total Capital	8,865.6	3,412.3	5,579.0	3,204.3	1,923.5	28,856.4	1,609.9	234.4	5,664.3	299.4
Rate of Return to Gear/Equip	155.3%	-6.7%	11.9%	43.9%	-7.1%	47.8%	-4.0%	-21.7%	0.3%	4.0%
Rate of Return to Capital	5.8%	-1.9%	2.8%	4.5%	-1.7%	5.5%	-0.8%	-8.1%	0.1%	1.6%

^a Estimates of financial performance for the blue crab fishery have been presented on a whole of sector basis. The survey estimate of gross income for the blue crab – pot sector is higher than the SARDI estimate of \$3.32 million for 2004/05 presented in Appendix Table 3.2. The reason for the difference is likely to be that the SARDI estimate is based on Adelaide prices only, whereas licence holders are selling to the higher priced Sydney and Melbourne markets as well.

^b Excludes the Commonwealth managed fisheries: south east non-trawl, tuna, deep water trawl.

^c Earnings before interest and tax.

Source: EconSearch (2007b).

Appendix Table 2.5 Costs as a percentage of total cash costs in South Australian commercial fisheries, 2005/06

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs Pot Sector	Blue Crabs MS Sector	Marine Scalefish ^a	Sardines	Lakes & Coorong
Fuel	3%	10%	11%	10%	15%	18%	12%	11%	19%	10%
R&M	8%	6%	10%	9%	6%	15%	14%	10%	9%	5%
Labour	59%	43%	51%	50%	42%	34%	36%	51%	45%	53%
Licence fee	15%	11%	5%	7%	7%	7%	22%	7%	7%	6%
Insurance	2%	8%	4%	3%	3%	2%	4%	3%	3%	1%
Interest	1%	11%	8%	10%	11%	17%	3%	0%	8%	4%
Admin & Other	12%	10%	11%	10%	17%	8%	9%	18%	9%	21%
Total Cash Costs	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

^a Excludes Commonwealth managed fisheries: south east non-trawl, tuna, deep water trawl.

Source: EconSearch (2007b).

Appendix Table 2.6 Economic impacts of South Australian commercial fisheries, 2005/06

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish	Sardines	Lakes and Coorong	All Fisheries ^a
Output (\$m)										
Direct										
Fishing	33.9	2.9	34.0	65.7	15.4	5.2	17.4	16.0	5.9	196.6
Downstream ^b	5.1	1.8	16.5	24.5	6.6	3.1	9.5	3.3	5.8	76.2
All other sectors (indirect)	29.6	5.6	48.6	80.1	32.6	9.0	39.2	24.6	13.7	283.1
Total	68.6	10.4	99.0	170.3	54.7	17.4	66.1	43.9	25.5	555.8
Total/Direct	1.8	2.2	2.0	1.9	2.5	2.1	2.5	2.3	2.2	2.0
Total/Tonne (\$)	\$76,500	\$57,900	\$52,300	\$90,100	\$114,800	\$26,700	\$20,700	\$1,500	\$10,800	\$12,348
Contribution to GSP (\$m)										
Direct										
Fishing	27.6	1.8	25.1	49.7	5.2	3.2	6.7	8.9	3.7	131.9
Downstream	1.8	0.7	6.8	9.7	2.6	1.1	3.4	1.5	2.3	29.9
All other sectors (indirect)	14.4	2.8	23.3	38.6	15.6	4.2	18.5	11.7	6.6	135.8
Total	43.8	5.3	55.2	98.0	23.5	8.4	28.6	22.0	12.7	297.6
Total/Direct	1.5	2.1	1.7	1.7	3.0	2.0	2.8	2.1	2.1	1.8
Total/Tonne (\$)	\$48,900	\$29,351	\$29,200	\$51,800	\$49,300	\$13,000	\$8,986	\$769	\$5,382	\$6,612
Employment (fte jobs)^c										
Direct										
Fishing	123	37	217	421	185	27	354	63	74	1,501
Downstream	23	18	160	141	41	17	74	21	46	542
All other sectors (indirect)	164	31	272	442	182	49	216	139	77	1,572
Total	310	86	649	1,005	408	93	644	222	197	3,615
Total/Direct	2.1	1.6	1.7	1.8	1.8	2.1	1.5	2.7	1.6	1.8
Total/Tonne	0.35	0.48	0.34	0.53	0.86	0.14	0.20	0.01	0.08	0.08
Household Income (\$m)										
Direct										
Fishing	9.1	1.1	10.6	18.9	5.8	1.3	6.7	6.7	2.6	62.8
Downstream	1.2	0.5	4.9	6.7	1.8	0.7	2.5	1.0	1.7	21.0
All other sectors (indirect)	8.0	1.5	13.0	21.1	8.6	2.4	10.4	6.4	3.7	75.1
Total	18.3	3.2	28.4	46.7	16.3	4.4	19.5	14.1	8.0	158.9
Total/Direct	1.8	1.9	1.8	1.8	2.1	2.1	2.1	1.8	1.9	1.9
Total/Tonne (\$)	\$20,400	\$17,600	\$15,000	\$24,700	\$34,200	\$6,800	\$6,100	\$400	\$3,300	\$3,530

^a Excludes the River fishery and the Commonwealth managed fisheries: south-east non-trawl, tuna and deep water trawl.

^b Downstream activities include net value of processing, transport services and retail/food services trade.

^c Full time equivalent jobs. Direct employment in the fishing sector was comprised of 655 full-time and 1,399 part-time, that is, 2,054 jobs in total.

Source: EconSearch (2007b).

Appendix Table 2.7 Economic rent in South Australian commercial fisheries, 2005/06 (\$m)

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish	Sardines	Lakes and Coorong	All Fisheries ^a
Gross Income	35.6	2.9	34.0	65.7	15.4	5.2	17.4	16.0	5.9	198.3
Less Labour	9.1	1.1	11.4	18.2	6.6	1.3	10.9	6.7	2.2	67.5
Less Materials & Services	6.2	1.2	9.1	14.6	7.4	1.9	10.3	6.6	1.8	59.2
Less Depreciation	2.3	1.4	6.5	7.8	3.0	0.4	3.3	2.7	0.6	27.9
Less Opportunity Cost of Capital (@10%)	1.2	1.0	5.9	5.7	2.4	0.4	3.3	3.7	0.4	23.8
Economic Rent	16.8	-1.7	1.1	19.4	-4.0	1.2	-10.3	-3.5	1.0	20.0

^a Excludes the River fishery and the Commonwealth managed fisheries: south east non-trawl, tuna, deep water trawl.

Source: EconSearch (2007b).

Appendix 3 Financial Performance Indicators, 1997/98 to 2001/02

Appendix Table 3.1 Financial performance in the SA Blue Crab fishery, pot sector, 1997/98 to 2001/02 (total sector) ^a

	1997/98		1998/99		1999/00		2000/01		2001/02	
	All Boats	Share of TCC	All Boats	Share of TCC	All Boats	Share of TCC	All Boats	Share of TCC	Total Pot Sector	Share of TCC ^b
Gross Income	\$1,837,000		\$1,913,000		\$1,916,000		\$2,588,000		\$2,975,000	
Costs										
Fuel	\$161,300	11%	\$162,200	10%	\$211,283	14%	\$251,581	13%	\$236,480	11%
R&M	\$156,038	10%	\$168,898	11%	\$150,327	10%	\$177,749	9%	\$174,492	8%
Provisions	\$57,689	4%	\$62,444	4%	\$55,578	4%	\$65,716	3%	\$64,512	3%
Labour	\$841,082	55%	\$875,879	57%	\$877,253	56%	\$1,184,933	62%	\$1,362,123	65%
Licence fee ^b	\$207,600	14%	\$180,541	12%	\$163,890	11%	\$140,113	7%	\$166,475	8%
Insurance	\$25,214	2%	\$25,546	2%	\$26,189	2%	\$27,682	1%	\$28,449	1%
Interest	\$8,159	1%	\$7,532	0%	\$8,338	1%	\$7,442	0%	\$6,994	0%
Admin and Other	\$62,558	4%	\$63,381	4%	\$64,976	4%	\$68,680	4%	\$70,583	3%
Total Cash Costs	\$1,519,641	100%	\$1,546,420	100%	\$1,557,834	100%	\$1,923,895	100%	\$2,110,109	100%
Cash Operating Surplus	\$317,359		\$366,580		\$358,166		\$664,105		\$864,891	
Depreciation	\$116,415		\$117,946		\$120,914		\$127,807		\$131,349	
Earnings Before Tax	\$200,944		\$248,634		\$237,252		\$536,297		\$733,542	
Earnings Before Interest & Tax	\$209,103		\$256,165		\$245,590		\$543,739		\$740,536	
Capital										
Fishing Gear & Equipment	\$1,030,110		\$1,043,664		\$1,069,925		\$1,130,918		\$1,162,262	
Licence Value	\$2,595,300		\$2,702,673		\$2,706,911		\$3,656,308		\$4,203,058	
Total Capital	\$3,625,410		\$3,746,337		\$3,776,836		\$4,787,226		\$5,365,321	
Rate of Return to Fishing Gear & Equipment	20.3%		24.5%		23.0%		48.1%		63.7%	
Rate of Return to Total Capital	5.8%		6.8%		6.5%		11.4%		13.8%	

^a Financial performance estimates for 1997/98 to 2001/02 are based on the 1998 survey of licence holders.

^b Licence fees reported in EconSearch (2005a) for the period 1997/98 to 2001/02 have been adjusted to reflect actual costs of managing the fishery (Table 3.2).

Source: EconSearch (1999, 2000, 2001, 2002 and 2003).

Appendix Table 3.2 Financial performance of the SA Blue Crab fishery, marine scale sector, 1997/98 to 2001/02 (total sector) ^a

	1997/98		1998/99		1999/00		2000/01		2001/02	
	All Boats	Share of TCC	All Boats	Share of TCC	All Boats	Share of TCC	All Boats	Share of TCC	Total MSF Sector	Share of TCC ^b
Gross Income	\$336,000		\$321,000		\$233,000		\$479,000		\$486,000	
Costs										
Fuel	\$53,407	17%	\$36,602	12%	\$45,994	16%	\$89,038	23%	\$85,133	22%
R&M	\$15,495	5%	\$11,430	4%	\$9,815	3%	\$18,867	5%	\$18,840	5%
Provisions	\$9,361	3%	\$6,905	2%	\$5,929	2%	\$11,398	3%	\$11,381	3%
Labour	\$112,033	35%	\$107,032	34%	\$77,690	27%	\$141,290	37%	\$141,088	36%
Licence fee ^b	\$99,550	31%	\$116,719	38%	\$114,439	40%	\$84,914	22%	\$102,040	26%
Insurance	\$6,340	2%	\$6,424	2%	\$6,585	2%	\$6,961	2%	\$7,154	2%
Interest	\$8,315	3%	\$7,675	2%	\$8,498	3%	\$7,584	2%	\$7,127	2%
Admin and Other	\$17,687	5%	\$17,755	6%	\$18,128	6%	\$19,489	5%	\$20,008	5%
Total Cash Costs	\$322,188	100%	\$310,542	100%	\$287,078	100%	\$379,540	100%	\$392,771	100%
Cash Operating Surplus	\$13,812		\$10,458		-\$54,078		\$99,460		\$93,229	
Depreciation	\$36,356		\$36,835		\$37,762		\$39,914		\$41,020	
Earnings Before Tax	-\$22,545		-\$26,377		-\$91,839		\$59,546		\$52,209	
Earnings Before Interest & Tax	-\$14,230		-\$18,701		-\$83,342		\$67,130		\$59,336	
Capital										
Fishing Gear & Equipment	\$221,877		\$224,797		\$230,453		\$243,591		\$250,342	
Licence Value	\$422,632		\$403,765		\$293,075		\$602,502		\$611,307	
Total Capital	\$644,510		\$628,561		\$523,529		\$846,093		\$861,649	
Rate of Return to Fishing Gear & Equipment	-6.4%		-8.3%		-36.2%		27.6%		23.7%	
Rate of Return to Total Capital	-2.2%		-3.0%		-15.9%		7.9%		6.9%	

^a Financial performance estimates for 1997/98 to 2001/02 are based on the 1998 survey of licence holders.

^b Licence fees reported in EconSearch (2005a) for the period 1997/98 to 2001/02 have been adjusted to reflect actual costs of managing the fishery (Table 3.2).

Source: EconSearch (1999, 2000, 2001, 2002 and 2003).