

Economic Indicators
for the South Australian
Blue Crab Fishery
2007/08

A report prepared for
Primary Industries and Resources South Australia

Prepared by



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EconSearch Pty Ltd
214 Kensington Road
Marryatville SA 5068
Tel: (08) 8431 5533
Fax: (08) 8431 7710
www.econsearch.com.au

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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 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 eleventh 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 and tenth reports, prepared for 2005/06 and 2006/07, provided updates of the economic indicators, based on the second licence holder survey (EconSearch 2007 and 2008a).

The objective of this report, *Economic Indicators for the South Australian Blue Crab Fishery 2007/08*, is to provide an update of the economic indicators based on the results of a third licence holder survey conducted in 2008.

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;
- 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 2006/07, 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, 2007/08

The questionnaire for the 2007/08 survey was based on the previous surveys conducted in 1997/98, 2000/01, 2001/02 and 2004/05². It was drafted by the consultants in consultation with the Executive Officer of the Blue Crab Pot Fishers Association (Mr Justin Phillips).

In November 2008, 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 November - December 2008.

The completed responses from licence holders in the fishery represented approximately 48 per cent of the total quota of the fishery³. Responses were received from licence holders in both the marine scale sector and the pot sector. Accordingly, the economic indicators for 2007/08 were survey based.

2.2 Definition of Terms⁴

Total Boat Income (TBI): refers to the cash receipts received by an individual firm and is expressed in dollar terms. Total boat income is calculated as catch (kg) multiplied by 'beach price' (\$/kg). Total boat income is the contribution of an individual licence holder to the GVP of a fishing sector or fishery.

Total Boat Variable Costs: are costs which are dependent upon the level of catch or, more commonly, the amount of time spent fishing. As catch or fishing time increases, variable costs also increase. Variable costs are measured in current dollar terms and include the following individual cost items:

- fuel, oil and grease for the boat (net of diesel fuel rebate)
- bait
- ice
- provisions
- crew payments
- fishing equipment, purchase and repairs (nets, pots, lines, etc)
- repairs & maintenance: ongoing (slipping, painting, overhaul motor)

Boat Gross Margin: is defined as *Total Boat Income* less *Total Boat Variable Costs*. This is a basic measure of profit which assumes that capital has no alternative use and that as fishing activity (days fished) varies there is no change in capital or fixed costs.

² Surveys conducted in 1997/98, 2000/01 and 2001/02 are described in EconSearch (2005a). The survey conducted in 2004/05 is described in EconSearch (2007).

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.

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

Total Boat Fixed Costs: are costs that remain fixed regardless of the level of catch or the amount of time spent fishing. As such these costs, measured in current dollar terms, are likely to remain relatively constant from one year to the next. Examples of fixed cost include:

- insurance
- licence and industry fees
- office & business administration (communication, stationery, accountancy fees)
- interest on loan repayments and overdraft
- leasing

Total Boat Cash Costs (TBCC): defined as *Total Boat Variable Costs* plus *Total Boat Fixed Costs*

Gross Operating Surplus: (GOS) is defined as *Total Boat Income* less *Total Boat Cash Costs* and is expressed in current dollar terms. GOS may be used interchangeably with the term Gross Boat Profit. A GOS value of zero represents a breakeven position for the business, where TBCC equals TBCR. If GOS is a negative value the firm is operating at a cash loss and if positive the firm is making a cash profit. GOS does not include a value for owner/operator wages, unpaid family work, or depreciation.

Owner-operator and Unpaid Family Labour: in many fishing businesses there is a component of labour that does not draw a direct wage or salary from the business. This will generally include owner/operator labour and often also include some unpaid family labour. The value of this labour needs to be accounted which involves imputing a labour cost based on the amount of time and equivalent wages rate. In the above calculations this labour cost can be included simply as another cost so that Gross Operating Surplus takes account of this cost. Alternatively, it can be deducted from GOS to give a separate indicator called Boat Cash Income. Owner-operator and unpaid family labour is separated into variable labour (fishing and repairs and maintenance) and overhead labour (management and administration).

Boat Cash Income: is defined as *Gross Operating Surplus* less *imputed wages for owner-operator and unpaid family labour*.

Boat Capital: includes capital items that are required by the licence holder to earn the boat income. It includes boat hull, engine, electronics and other permanent fixtures and tender boats. Other capital items such as motor vehicles, sheds, cold-rooms, and jetty/moorings can be included to the extent that they are used in the fishing business. The fishing licence/permit value is included in total boat capital.

Depreciation: Depreciation refers to the annual reduction in the value of boat capital due to general wear and tear or the reduction in value of an item over time.

Boat Business Profit: is defined as *GOS* less *Depreciation* less *Owner-operator and Unpaid Family Labour*. Boat Business Profit represents a more complete picture of the actual financial status of an individual firm, compared with GOS, which represents the cash in-cash out situation only.

Profit at Full Equity: is calculated as *Boat Business Profit* plus *rent, interest and lease payments*. Profit at Full Equity represents the profitability of an individual licence holder, assuming the licence holder has full equity in the operation, i.e. there is no outstanding associated with the investment in boat capital. Profit at Full Equity is a useful absolute measure of the economic performance of fishing firms.

Rate of Return to Capital: is calculated as *Profit at Full Equity* divided by *Boat Capital* multiplied by *100*. This measure is expressed in percentage terms and is calculated for an individual licence holder. It refers to the economic return to the total investment in capital items, and is a useful relative measure of the performance of individual firms. Rate of return to capital is useful to compare the performance of various licence holders, and to compare the performance of other types of operators, and with other industries.

Gross value of production (GVP): refers to the value of the total annual catch for individual fisheries, fishing sectors or the fishing industry as a whole, and is measured in dollar terms. GVP, generally reported on an annual basis, is the quantity of catch for the year multiplied by the average monthly landed beach prices.

Beach price: refers to the price received by commercial fishers at the "port level" for their catch, and is generally expressed in terms of \$/kg. Processing costs are not included in the beach price, as processing operations are assumed to occur further along the value chain. The use of beach prices also removes the effect of transfer pricing by the firm if it is vertically integrated into the value chain.

Cost of management services: in a commercial fishery management services will generally include biological monitoring and reporting; policy, regulation and legislation development; compliance and enforcement services; licensing services; and research. Where a commercial fishery operates under full cost recovery, licence fees will be set to cover the cost of managing the fishery or at least the commercial sector's share of the resource.

In fisheries where there is full cost recovery, it can be assumed that the cost of providing these management services to the commercial sector will be equal to the gross receipts from licence fees in the fishery. With information on licence fee receipts, GVP, catch and the number of commercial fishers in the fishery, the following indicators can be readily calculated:

- aggregate licence fee receipts for the fishery (\$)
- licence fee/GVP (%)
- licence fee/catch (\$/kg)
- licence fee/licence holder (\$/licence holder)

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 668 tonnes in 2007/08. Comparison of the two end-years in Table 3.1 (1990/91 and 2007/08) illustrates how the value of the fishery has changed over the seventeen-year period. The total catch in 2007/08 (668 tonnes) was almost 54 per cent above that in 1990/91 (434 tonnes) while the value of the catch was approximately 250 per cent higher, increasing from \$1.6 million in 1990/91 to \$5.7 million in 2007/08.

Table 3.1 SA Blue Crab catch and value of catch, 1990/91 to 2007/08

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	595	5,328	42	301	637	5,629
2007/08	618	5,423	50	314	668	5,737

^a Reported marine scale sector catch includes catch from the west coast, the Spencer Gulf and the Gulf St Vincent. The Total Allowable Commercial Catch (TACC) for the fishery applies only to the Spencer Gulf and Gulf St Vincent.

^b SARDI estimate of GVP for 2005/06 to 2007/08 have been re-valued to reflect price differentials between fishery sectors.

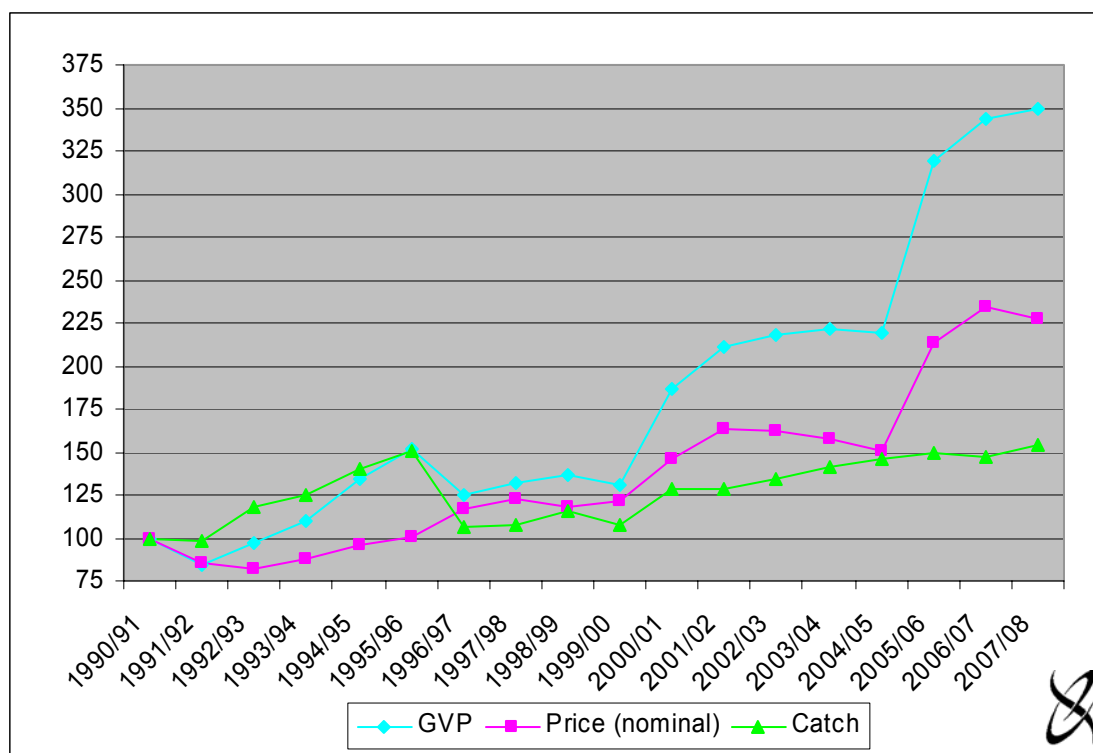
Source: SARDI Aquatic Sciences and EconSearch analysis.

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 to 2007/08 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 17-year period 1990/91 to 2007/08. As noted above, the nominal value of the blue crab catch in 2007/08 was 250 per cent above that in 1990/91. This is the result of an increase in catch (54 per cent) and an increase in price (127 per cent in nominal terms).

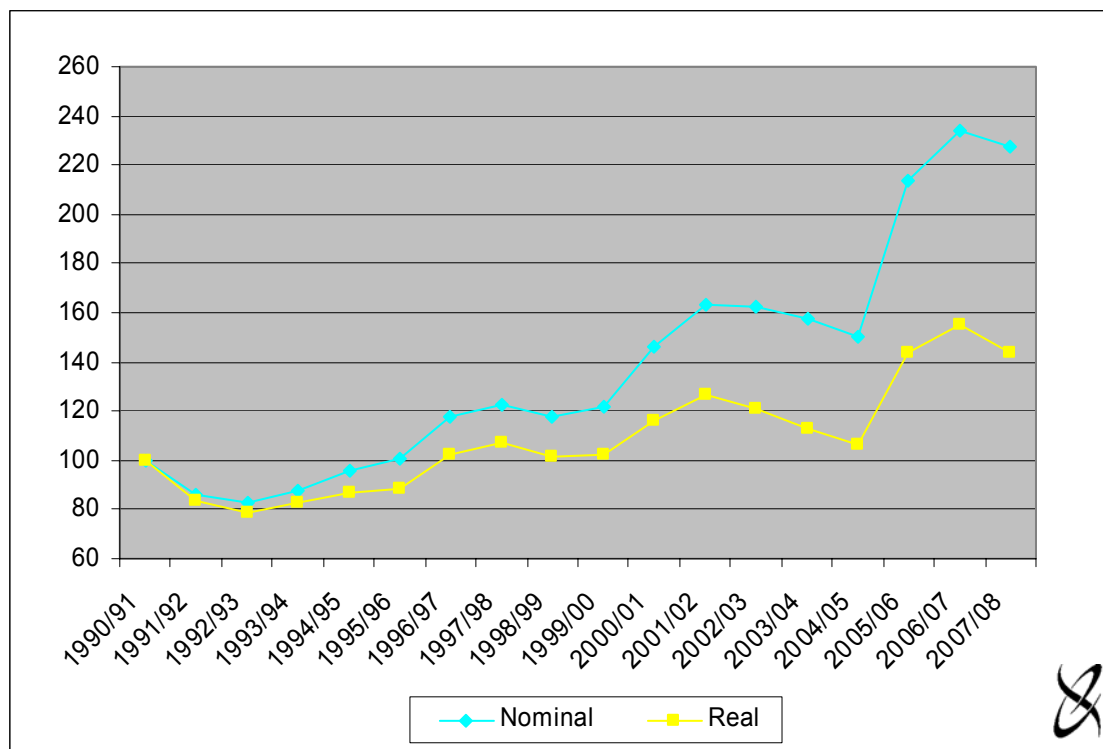
Figure 3.1 GVP, price and catch indices for the SA Blue Crab fishery (1990/91=100)^a



^a SARDI estimate of GVP for 2005/06 to 2007/08 have been re-valued to reflect price differentials between fishery sectors.

Source: SARDI Aquatic Sciences.

Figure 3.2 shows that the 127 per cent increase in nominal price over the period 1990/91 to 2007/08 has been equivalent to 44 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 2008). It enables meaningful comparisons of prices to be made between years.

^b SARDI estimate of GVP for 2005/06 to 2007/08 have been re-valued to reflect price differentials between fishery sectors.

Source: SARDI Aquatic Sciences and ABS (2008).

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 2008/09 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. Total licence fees decreased in 2007/08 and GVP increased. Accordingly, fees as a percentage of GVP decreased to 4.2 per cent.
- 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. Licence fees as a percentage of GVP were 3.4 per cent in 2007/08, a significant decrease from previous years, reflecting an increase in GVP and a considerable reduction 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 has subsequently increased, however, and was \$0.45/kg in 2006/07. It did fall to \$0.37 in 2007/08 as a result of a reduction total management cost and an increase in catch.
- 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 but has declined in subsequent years and was calculated to be \$0.21/kg in 2007/08.
- For the pot sector, average fees per licence holder peaked at \$34,600 in 1997/98 and then fell significantly to \$18,782 in 2002/03. Fees per licence holder have increased in subsequent years, reaching \$33,325 in 2006/07. In 2007/08, fees per licence holder were \$28,490 a drop of 15 per cent compared to the previous year.
- 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 a reduction 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 have fallen in subsequent years and were \$2,126 in 2007/08 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 11 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 there were only 5 in 2007/08.

A new pot sector licence was created in 2008/09. Accordingly, the number of licence holders in the pot sector increased from 8 to 9 and the number in the marine scale sector decreased from 5 to 4. Between 2007/08 and 2008/09 average fees per licence fall by 3 per cent (from \$28,490 to \$27,736) in the pot sector and by 56 per cent in the marine scale sector (from \$2,126 to \$947)

Table 3.2 Cost of management in the SA Blue Crab fishery, 1996/97 to 2008/09

	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	5,423	4.2%	618	\$0.37	8	\$28,490
2008/09	250	n.a.	-	n.a.	-	9	\$27,736
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	314	3.4%	50	\$0.21	5	\$2,126
2008/09	4	n.a.	-	n.a.	-	4	\$947
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	5,737	4.2%	668	\$0.36	13	\$18,350
2008/09	253	n.a.	-	n.a.	-	13	\$19,493

^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 entered the fishery between 1996/97 and 2003/04 and another was created in 2008/09. 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 2008/09 is illustrated in Table 3.3. The proportion of units held by the marine scale sector has fallen from approximately 13 per cent in 2000/01 to just 5 per cent in 2007/08. The proportion of quota held by marine scale licence holders decreased further in 2008/09 to just over 1 per cent of the total quota in the fishery. The proportion of quota units held by the pot sector has risen over the period, from approximately 87 per cent in 2000/01 to 95 per cent in 2007/08 and to almost 99 per cent in 2008/09 (Table 3.3).

Table 3.3 Allocation of quota units in the SA Blue Crab fishery, 2000/01 to 2008/09

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	10,360	494	10,854
2008/09	10,698	156	10,854

Source: PIRSA Fisheries.

3.3 Financial Performance Indicators

The major measures of the financial performance of the surveyed boats in the SA Blue Crab fishery for the period 2005/06 to 2007/08 are shown in Tables 3.4 and 3.5. 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 the fishery and as an average per quota unit⁵.

⁵ To allow for comparison between years, the estimates of financial performance for the years 1997/98 to 2004/05, previously presented on an average per boat basis, have been presented on a whole of fishery and per quota unit basis in Appendix 3 of this report.

Income...

Total recorded blue crab catch increased by almost 5 per cent from 2006/07 to 2007/08, comprised of a 4 per cent increase in catch by pot sector licence holders and a 19 per cent increase in the marine scale sector catch. Gross receipts from the sale of blue crabs increased by approximately 2 per cent over the same period for the fishery as a whole, an increase of approximately 2 per cent in the pot sector and 4 per cent in the marine scale sector (Table 3.1). The total gross income for the fishery as a whole was estimated, based on the survey responses, to be \$5.6 million a fall of approximately 1 per cent compared to the previous year (Table 3.4).⁶ In 2007/08, the total income per pot was estimated to be approximately \$513 (Table 3.5).

Note that financial performance estimates for 2007/08 were based on different survey samples to earlier years. It would appear that some of the difference between years is attributable to sampling variability.

Costs...

Tables 3.4 and 3.5 show total cash costs separated into variable and fixed costs. Variable costs (71 per cent of total boat cash costs in 2007/08) represented a significantly greater proportion of total cash costs than fixed costs (29 per cent).

It was estimated that average total boat cash costs increased by approximately 4 per cent between 2006/07 and 2007/08. Notable changes in costs included increases in fuel, repairs and maintenance and insurance. There was a significant reduction in some overhead costs such as interest, legal and accounting and office expenses (Table 3.4).

In 2007/08, for the fishery as a whole, approximately 36 per cent of total boat cash costs were attributable to labour costs, by far the biggest cost item. The labour costs reported in Table 3.4 are comprised of payments to licence owners and crew as well as an imputed wage to those licence owners and other family members who are not paid a wage directly by the business. Imputed unpaid labour (almost \$193,000 for 2007/08) was divided into variable (fishing and repairs and maintenance) and fixed (management and administration) components based on the 2008 licence holder survey.

The other significant cash costs were fuel (18 per cent), interest (15 per cent), repairs and maintenance (15 per cent) and licence fees (7 per cent) (Table 3.4).

Cash Income and Profit...

The separation of variable and fixed costs from total cash costs enables the calculation of boat gross margin (total boat income less total boat variable costs) as a basic measure of profit (assuming that capital has no alternative use and that as fishing activity varies there is no change in capital or fixed costs). There was a slight decrease in boat gross margin in 2007/08 (\$2.6 million) compared to the previous year mainly due to the decline in boat gross income and an increase in variable costs (particularly fuel and repairs and maintenance) in 2007/08.

⁶ Estimates of total gross income for 2006/07 and 2007/08 were based on different survey results. This accounts for the small reduction in gross income between these years (Table 3.4) when the SARDI data indicated a small increase (Table 3.2)..

Table 3.4 Financial performance in the SA Blue Crab fishery, 2005/06 to 2007/08 (total fishery)^a

	2005/06		2006/07		2007/08	
	Fishery Total	Share of TBCC ^b	Fishery Total	Share of TBCC ^b	Fishery Total	Share of TBCC ^b
(1) Total Boat Gross Income	\$5,235,840		\$5,628,767		\$5,563,643	
Variable Costs						
Fuel	\$673,203	17%	\$600,702	15%	\$734,680	18%
Repairs & Maintenance ^c	\$595,077	15%	\$538,245	13%	\$610,241	15%
Bait/Ice	\$71,183	2%	\$67,556	2%	\$75,196	2%
Provisions	\$12,930	0%	\$11,228	0%	\$0	0%
Labour - paid	\$1,147,096	29%	\$1,280,277	32%	\$1,299,682	31%
(2) - unpaid ^d	\$187,531	5%	\$211,641	5%	\$124,583	3%
Other	\$18,401	0%	\$18,717	0%	\$132,766	3%
(3) Total Variable Costs	\$2,705,421	68%	\$2,728,366	68%	\$2,977,149	71%
Fixed Costs						
Licence Fee	\$294,763	7%	\$291,352	7%	\$279,665	7%
Insurance	\$74,821	2%	\$76,103	2%	\$105,287	3%
(4) Interest	\$645,071	16%	\$656,122	16%	\$629,053	15%
(5) Labour - unpaid ^d	\$42,767	1%	\$44,440	1%	\$68,197	2%
Legal & Accounting	\$43,421	1%	\$44,165	1%	\$23,507	1%
Telephone etc.	\$21,925	1%	\$22,300	1%	\$29,350	1%
Slipping & Mooring	\$31,909	1%	\$32,456	1%	\$0	0%
Travel	\$27,824	1%	\$28,301	1%	\$16,691	0%
Office & Admin	\$85,877	2%	\$87,349	2%	\$45,117	1%
(6) Total Fixed Costs	\$1,268,378	32%	\$1,282,587	32%	\$1,196,868	29%
(7) Total Boat Cash Costs (3 + 6)	\$3,973,799	100%	\$4,010,953	100%	\$4,174,016	100%
Boat Gross Margin (1 - 3)	\$2,530,419		\$2,900,401		\$2,586,494	
(8) Total Unpaid Labour (2 + 5)	\$230,298		\$256,081		\$192,780	
Gross Operating Surplus (1 - 7 + 8)	\$1,492,340		\$1,873,895		\$1,582,407	
(9) Boat Cash Income (1 - 7)	\$1,262,041		\$1,617,814		\$1,389,627	
(10) Depreciation	\$375,824		\$349,703		\$551,976	
(11) Boat Business Profit (9 - 10)	\$886,217		\$1,268,111		\$837,650	
(12) Profit at Full Equity (11 + 4)	\$1,531,288		\$1,924,234		\$1,466,704	
Boat Capital						
(13) Fishing Gear & Equip	\$3,702,469		\$3,472,408		\$2,907,618	
Licence Value	\$26,792,164		\$28,798,634		\$24,255,246	
(14) Total Boat Capital	\$30,494,633		\$32,271,042		\$27,162,863	
Rate of Return on Fishing Gear & Equip (12 / 13 * 100)	41.4%		55.4%		50.4%	
Rate of Return on Total Boat Capital (12 / 14 * 100)	5.0%		6.0%		5.4%	

^a Estimates of financial performance for 2007/08 are based on the 2009 survey of licence holders. Estimates of financial performance for 2005/06 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 2004/05 are provided in Appendix 3 of this report.

^b Total boat cash costs.

^c Repairs and maintenance costs have been classified as a variable cost although it is noted that some of these costs may be fixed (e.g. regulated maintenance).

^d Unpaid labour was divided between variable (time spent fishing and on repairs and maintenance) and fixed (management and administrative duties) based on survey responses.

Source: EconSearch analysis.

Table 3.5 Financial performance in the SA Blue Crab fishery, 2005/06 to 2007/08
(average per quota unit)^a

	2005/06		2006/07		2007/08	
	Fishery Total	Share of TBCC ^b	Fishery Total	Share of TBCC ^b	Fishery Total	Share of TBCC ^b
(1) Total Boat Gross Income	\$482.39		\$518.59		\$512.59	
Variable Costs						
Fuel	\$62.02	17%	\$55.34	15%	\$67.69	18%
Repairs & Maintenance ^c	\$54.83	15%	\$49.59	13%	\$56.22	15%
Bait/Ice	\$6.56	2%	\$6.22	2%	\$6.93	2%
Provisions	\$1.19	0%	\$1.03	0%	\$0.00	0%
Labour - paid	\$105.68	29%	\$117.95	32%	\$119.74	31%
(2) - unpaid^d	\$17.28	5%	\$19.50	5%	\$11.48	3%
Other	\$1.70	0%	\$1.72	0%	\$12.23	3%
(3) Total Variable Costs	\$249.26	68%	\$251.37	68%	\$274.29	71%
Fixed Costs						
Licence Fee	\$27.16	7%	\$26.84	7%	\$25.77	7%
Insurance	\$6.89	2%	\$7.01	2%	\$9.70	3%
(4) Interest	\$59.43	16%	\$60.45	16%	\$57.96	15%
(5) Labour - unpaid^d	\$3.94	1%	\$4.09	1%	\$6.28	2%
Legal & Accounting	\$4.00	1%	\$4.07	1%	\$2.17	1%
Telephone etc.	\$2.02	1%	\$2.05	1%	\$2.70	1%
Slipping & Mooring	\$2.94	1%	\$2.99	1%	\$0.00	0%
Travel	\$2.56	1%	\$2.61	1%	\$1.54	0%
Office & Admin	\$7.91	2%	\$8.05	2%	\$4.16	1%
(6) Total Fixed Costs	\$116.86	32%	\$118.17	32%	\$110.27	29%
(7) Total Boat Cash Costs (3 + 6)	\$366.11	100%	\$369.54	100%	\$384.56	100%
Boat Gross Margin (1 - 3)	\$233.13		\$267.22		\$238.30	
(8) Total Unpaid Labour (2 + 5)	\$21.22		\$23.59		\$17.76	
Gross Operating Surplus (1 - 7 + 8)	\$137.49		\$172.65		\$145.79	
(9) Boat Cash Income (1 - 7)	\$116.27		\$149.05		\$128.03	
(10) Depreciation	\$34.63		\$32.22		\$50.85	
(11) Boat Business Profit (9 - 10)	\$81.65		\$116.83		\$77.17	
(12) Profit at Full Equity (11 + 4)	\$141.08		\$177.28		\$135.13	
Boat Capital						
(13) Fishing Gear & Equip	\$341.12		\$319.92		\$267.88	
Licence Value	\$2,468.41		\$2,653.27		\$2,234.68	
(14) Total Boat Capital	\$2,809.53		\$2,973.19		\$2,502.57	
Rate of Return on Fishing Gear & Equip (12 / 13 * 100)	41.4%		55.4%		50.4%	
Rate of Return on Total Boat Capital (12 / 14 * 100)	5.0%		6.0%		5.4%	

^a Calculated using sector total (Table 3.4) and total number of quota units in the fishery (Table 3.3). One quota unit was equivalent to 57.75 kg of catch.

^b Total boat cash costs.

^c Repairs and maintenance costs have been classified as a variable cost although it is noted that some of these costs may be fixed (e.g. regulated maintenance).

^d Unpaid labour was divided between variable (time spent fishing and on repairs and maintenance) and fixed (management and administrative duties) based on survey responses.

Source: EconSearch analysis.

Gross operating surplus (GOS) was calculated by excluding imputed wages for operator and family members as a cost item. The aggregate GOS of all boats in 2007/08 was estimated to be approximately \$1.6 million, 16 per cent lower than in 2006/07 (Table 3.4).

Boat cash income is measured as gross operating surplus with imputed wages (unpaid labour) included as cash costs. The average boat cash income for the fishery as a whole in 2007/08 was approximately \$1.4 million.

Gross operating surplus and boat business profit give an indication of the capacity of the operator to remain in the fishery in the short to medium term. In 2007/08, the total boat business profit was almost \$838,000, 34 per cent lower than 2006/07.

Profit at full equity is a measure of the profitability of licence holders in the fishery, assuming that licence holders have full equity in the operation. It is a useful absolute measure of the economic performance of fishing firms. Profit at full equity in 2007/08 (\$1.5 million) was less than the previous year (\$1.9 million), a fall of around 24 per cent.

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 licence holders 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. The return on investment has been calculated as the profit at full equity as a percentage of the total capital employed.

The total investment in fishing gear and licence in the Blue Crab Fishery in 2007/08 was estimated to be approximately \$27.2 million. This includes the licence holder's estimate of the value of fishing licences (\$24.3 million) and estimated investment in boats and fishing gear (approximately \$2.9 million).

The average return on investment for the fishery for the period 2005/06 to 2007/08 is reported in Table 3.4. While the rate of return to boat capital (i.e. fishing gear and equipment) is high (50.4 per cent in 2007/08), the rate of return to total capital was estimated to be 5.4 per cent, similar to the estimates for 2005/06 and 2006/07.

The licence value for the 1997/98 analysis (reported in Appendix 3) 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 1997/98 to 2003/04 (reported in Appendix 3) 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 the 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 case.

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 2004/05 to 2006/07 calculated on the basis of the March - April 2006 licence holder survey and changes in fishery GVP and for licence values in 2007/08 based on the most recent licence holder survey. 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 Table 3.6.

Table 3.6 Sensitivity of rate of return to changes in licence value, 2007/08

Licence Value per Quota Unit	\$1,117 ^a	\$2,235 ^b	\$3,352 ^c
Rate of Return to Total Capital	9.8%	5.4%	3.7%

^a Approximately 50 per cent below the licence value estimated for 2007/08.

^b The licence value estimated for 2007/08.

^c Approximately 50 per cent above the licence value estimated for 2007/08.

Source: EconSearch analysis.

Based on the costs and returns shown for the year 2007/08 in Table 3.4, a licence value in the fishery of \$3,352 per quota unit would mean an annual return to the total asset of 3.7 per cent, while a licence value of \$1,117 per unit would equate to an annual return to the total asset of 9.8 per cent (Table 3.6).

3.4 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 2007/08 are outlined below.

3.4.1 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, 2004/05⁷.

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) trade⁸.

⁷ The relevant information was obtained from Jack Langberg (PIRSA, pers. comm.).

⁸ 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.

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 2007/08, 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 2007/08.

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 November – December 2008 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.

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.

3.4.2 Economic impact

Estimates of the economic impact generated in 2007/08 by the blue crab fishing industry in South Australia are outlined in Table 3.7.

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 \$5.7 million in 2007/08 (Table 3.7), while output generated in South Australia by associated downstream activities (processing, transport, retail/food services and capital expenditure) summed to \$3.3 million.

Flow-ons to other sectors of the state economy added another \$9.3 million in output. The sectors most affected were the manufacturing (\$2.4 million), trade (\$1.4 million) and business services sectors (\$1.0 million).

Employment and household income...

In 2007/08, the SA Blue Crab fishery was responsible for the direct employment of around 28 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 \$0.8 million in downstream activities in SA. An additional \$2.4 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 \$4.7 million in South Australia in 2007/08.

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 2007/08, total blue crab fishing industry related contribution to GSP in South Australia was \$9.2 million, \$3.7 million generated by fishing directly, \$1.1 million generated by downstream activities and \$4.4 million generated in other sectors of the state economy.

Table 3.7 Economic impact of the blue crab fishing industry on the South Australian economy, 2007/08

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	5.7	31.2%	28	30.2%	1.5	31.8%	3.7	40.1%
Processing	1.6	8.5%	5	5.0%	0.2	4.9%	0.4	4.0%
Transport	0.7	3.8%	3	3.3%	0.2	4.9%	0.3	3.7%
Retail	0.2	1.2%	3	3.3%	0.1	1.9%	0.1	1.2%
Food services	0.6	3.1%	5	4.9%	0.1	3.2%	0.2	2.5%
Capital expenditure ^b	0.3	1.4%	2	2.1%	0.1	1.5%	0.1	1.0%
Total Direct ^c	9.1	49.3%	45	46.7%	2.3	46.6%	4.8	51.4%
Flow-on effects								
Trade	1.4	7.5%	14	15.1%	0.5	11.0%	0.6	7.0%
Manufacturing	2.4	12.8%	7	7.6%	0.3	7.4%	0.6	6.0%
Business Services	1.0	5.7%	6	6.3%	0.4	8.1%	0.5	5.4%
Transport	0.5	2.7%	2	2.3%	0.2	3.5%	0.2	2.6%
Other Sectors	4.0	22.0%	18	19.8%	1.0	22.0%	2.4	26.5%
Total Flow-on ^c	9.3	50.7%	48	51.1%	2.4	51.9%	4.4	47.6%
Total ^c	18.4	100.0%	93	100.0%	4.7	100.0%	9.2	100.0%
Total/Direct	2.0	-	2.0	-	2.1	-	1.9	-
Total/Tonne	\$27,500	-	0.14	-	\$7,000	-	\$13,700	-

^a Full-time equivalent jobs. Direct employment in the fishery was comprised of 16 full-time jobs and 30 part-time jobs, that is, 46 jobs in aggregate and 28 fte jobs.

^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.

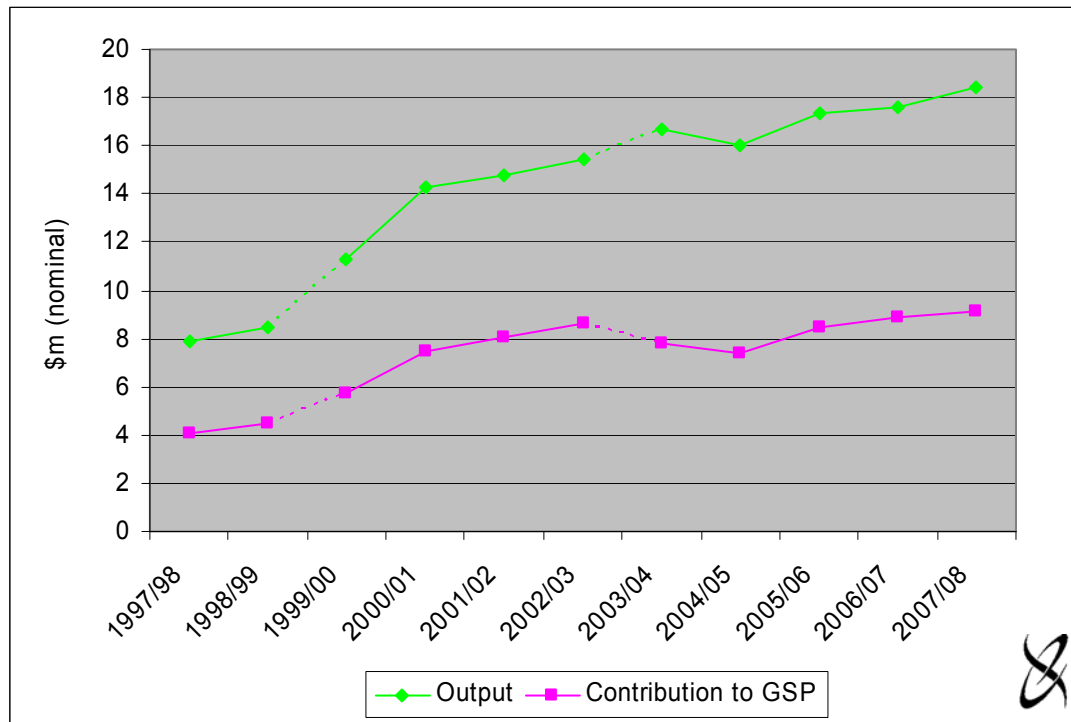
Source: EconSearch analysis.

Total impacts over time...

Figures 3.3 and 3.4 illustrate the total economic impact of the fishery on the SA economy for the ten-year period, 1997/98 to 2007/08. Estimates of economic impact are expressed in nominal terms, which means that 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 survey of licence holders conducted in March – April 2006. Estimates of economic impact are based on the most recent survey of licence holders undertaken in November – December 2008.

Figure 3.3 Total gross state product and output impact of the blue crab fishing industry in SA, 1997/98 to 2007/08 ^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.

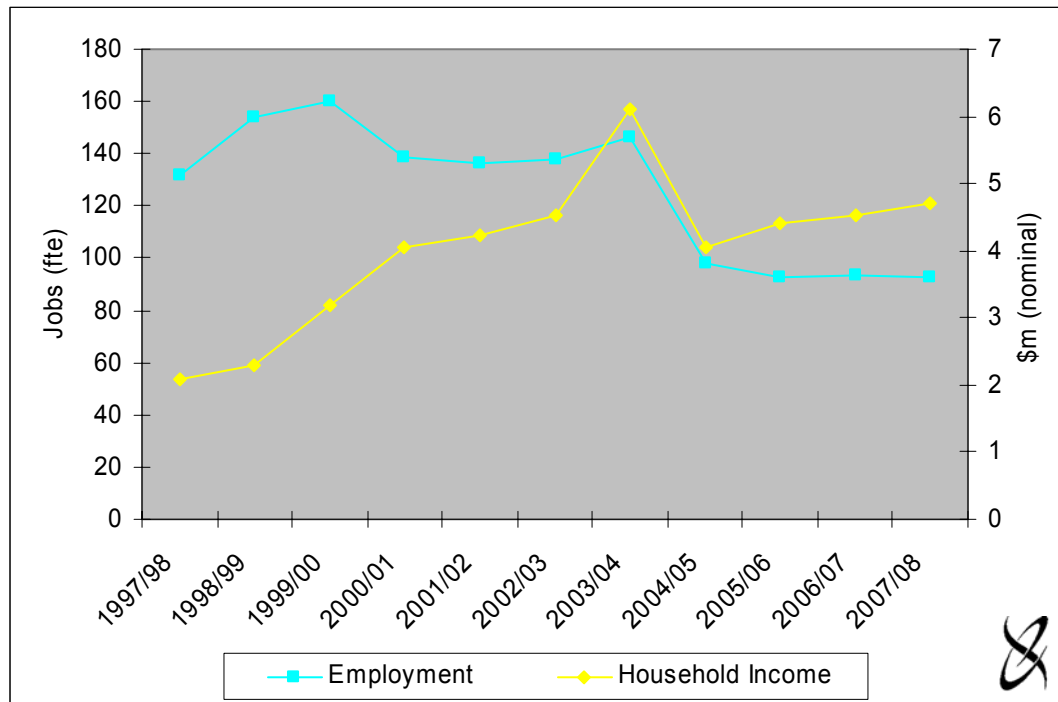
Source: EconSearch (2006) and EconSearch analysis.

As economic impact estimates for the years 1997/98 to 2007/08 are based on different survey samples and techniques, some of the differences between years are attributable to sampling variability.

There has been an increase in the total output and GSP impact of the fishery over the ten 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 (Figure 3.4). This fall 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 2007/08 ^a



^a See note for Figure 3.3.

Source EconSearch (2006) and EconSearch analysis.

3.5 Economic Rent

Economic rent⁹ 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.

⁹ 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 2007/08 is outlined in Table 3.8. Economic rent for the fishery as a whole was \$1.2 million in 2007/08 (Table 3.14), approximately 25 per cent lower than the estimate for 2006/07.

When 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 2007/08 was estimated to be \$24.3 million. An annual economic rent of \$1.2 million represents a return of 4.8 per cent to the capital value of the SA Blue Crab fishery in aggregate.

Table 3.8 Economic rent in the SA Blue Crab fishery, total fishery, 1997/98 to 2007/08 (\$'000) ^a

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	Economic Rent
1997/98	2,173	953	821	153	125	121
1998/99	2,234	1,012	809	155	127	131
1999/00	2,149	1,012	828	159	130	21
2000/01	3,067	1,453	922	168	137	387
2001/02	3,461	1,696	939	172	141	512
2002/03	3,574	1,829	913	179	147	506
2003/04	3,638	1,891	981	205	169	392
2004/05	4,413	1,098	1,890	385	378	662
2005/06	5,236	1,377	1,951	376	370	1,161
2006/07	5,629	1,536	1,818	350	347	1,577
2007/08	5,564	1,492	2,053	552	291	1,176

^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.

4. Other Indicators

4.1 External Factors Influencing the Economic Condition of the Fishery

There are a number of factors in 2007/08 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. PIRSA Fisheries is currently developing a new management plan under the *Fisheries Management Act 2007*, performance indicators in the existing draft management plan are likely to change under the new plan.

The most recent stock assessment information available relates to the 2006/07 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 2006/07 season, almost 98 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. The exploitation rate for 2006/07 could not be calculated from the available data (Dixon et al. 2008).

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 2006/07 the pre-recruitment rates exceeded the target levels set by the management plan. The percentages of undersize crabs caught comprised 42.0 per cent of the commercial survey and 43.5 per cent of the fishery-independent survey in the Spencer Gulf. In the Gulf St Vincent the proportion of undersize comprised 17.3 and 33.1 per cent of the commercial and fishery-independent survey catch (Dixon et al. 2008).

The target range for the abundance of female crabs compared to males is between 15 and 30 per cent. The percentage of female crabs exceeded the target reference points in all surveys except for the fishery-independent survey in the Spencer Gulf which was just below the target (Dixon et al. 2008).

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

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. Licence holders were optimistic about the price of product in future years despite a slight decline in 2007/08.

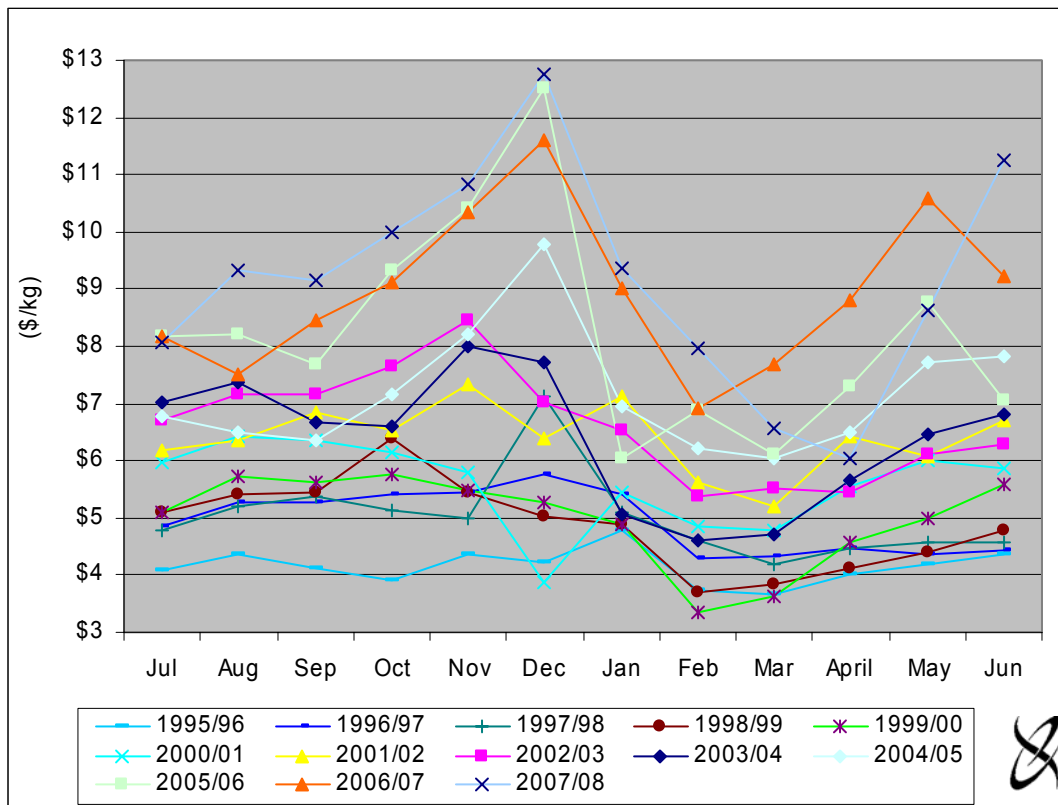
4.3 Prices for Blue Crabs in Domestic Markets

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 2007/08 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 2007/08^a



^a Nominal prices.

Source: SARDI Aquatic Sciences.

Table 4.1 Average monthly beach prices for blue crabs, South Australia, 1995/96 to 2007/08 ^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	2007/08
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	\$8.06
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	\$9.33
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	\$9.17
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	\$10.00
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	\$10.83
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	\$12.75
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	\$9.38
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	\$7.96
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	\$6.57
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	\$6.03
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	\$8.64
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	\$11.25
Weighted Average Annual Price	\$3.81	\$4.43	\$4.63	\$4.46	\$4.60	\$5.52	\$6.18	\$6.13	\$5.95	\$5.68	\$8.08	\$8.84	\$8.80

^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 2007/08 was \$8.28/kg¹⁰ and at the Sydney wholesale fish market, \$8.79/kg¹¹, the estimated average beach price in South Australia was \$8.80/kg in 2007/08 (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 2007/08) 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.

Table 4.2 Average monthly prices for blue crabs, beach prices in South Australia and Sydney and Melbourne Fish Markets, 2007/08^a

Month	Average Monthly Price \$/kg		
	Beach Price, SA	Sydney Fish Market ^b	Melbourne Fish Market
July	\$8.06	\$8.73	\$9.58
August	\$9.33	\$8.32	\$9.42
September	\$9.17	\$8.41	\$9.68
October	\$10.00	\$9.16	\$11.46
November	\$10.83	\$7.76	\$11.85
December	\$12.75	\$10.37	\$11.67
January	\$9.38	n.a.	\$12.41
February	\$7.96	n.a.	\$8.43
March	\$6.57	n.a.	\$7.00
April	\$6.03	n.a.	\$7.30
May	\$8.64	n.a.	\$7.61
June	\$11.25	n.a.	\$8.36
Weighted Average Annual Price	\$8.80	\$8.79	\$8.28

^a Nominal prices.

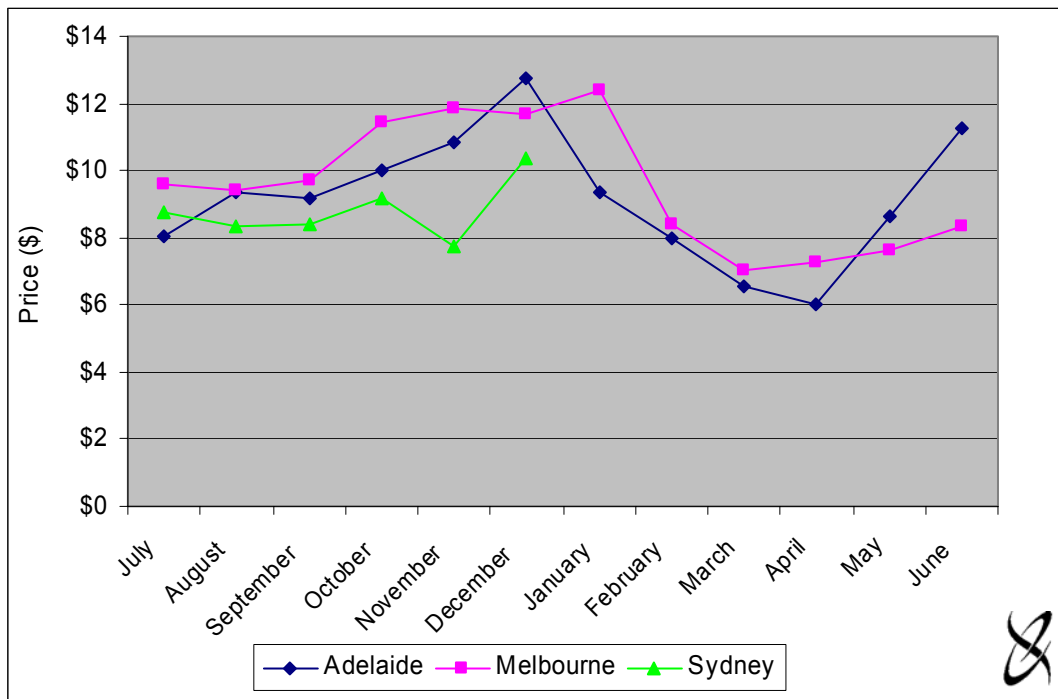
^b Sydney Fish Market prices were not available for 2008.

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

¹⁰ This estimate is a weighted average price for all Blue Crabs from all sources sold in the Melbourne Fish Market during 2007/08 (Tim Rieniets, Melbourne Wholesale Fish Market, pers. comm.).

¹¹ This estimate is a weighted average price for all Blue Crabs from all sources sold in the Sydney Fish Market during 2007 (Samantha Dawes, NSW Department of Primary Industries pers. comm.). Prices for fish sold in the Sydney Fish Market were not available for 2008.

Figure 4.2 Average monthly prices for blue crabs, beach prices in South Australia and Sydney and Melbourne Fish Markets, 2007/08



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

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Appendix 1 Economic Impact of the South Australian Blue Crab Fishery, 2006/07

Appendix Table 1.1 Economic Impact of the South Australian Blue Crab fishery, 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 (2008a).

Appendix 2 Summary Economic Indicators for South Australian Commercial Fisheries

Appendix Table 2.1 Commercial fisheries catch, South Australia, 1990/91 to 2006/07 (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
2006/07	883	209	2,024	1,894	492	637	2,443	30,355	2,978	41,915

^a Excludes the River fishery for the years 2003/04 to 2006/07.

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

Source: EconSearch (2008b)

Appendix Table 2.2 Commercial fisheries gross value of production, South Australia, 1990/91 to 2006/07 (\$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
2006/07	31.5	3.3	39.4	78.8	18.0	5.6	7.3	18.5	19.8	222.3

^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 to 2005/06. Excludes the River fishery for the years 2003/04 to 2006/07.

^b SARDI estimates for the years 1990/91 to 2002/03, revalued SARDI estimates for 2003/04 to 2006/07 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 (2008b).

Appendix Table 2.3 Cost of management in South Australian commercial fisheries, 2006/07

	Licence Fees (\$'000)	GVP (\$'000)	Fees/ GVP (%)	Catch ('000kg)	Fees/ Catch (\$/kg)	Licence Holders (no.)	Fees/ Licence (\$/licence)
Abalone	2,392	31,529	7.6%	883	\$2.71	35	\$68,339
GSV Prawns	257	3,270	7.9%	209	\$1.23	10	\$25,715
SG & WC Prawns	914	39,386	2.3%	2,024	\$0.45	42	\$21,761
Sth'n Zone Rock Lobster	2,976	78,791	3.8%	1,894	\$1.57	181	\$16,442
Nth'n Zone Rock Lobster	1,164	17,954	6.5%	492	\$2.37	68	\$17,112
Blue Crabs - Pots	267	5,328	5.0%	595	\$0.45	8	\$33,325
Blue Crabs – Marine Scale	25	301	8.2%	42	\$0.59	6	\$4,125
Lakes and Coorong ^a	263	7,143	3.7%	2,443	\$0.11	37	\$7,102
Marine Scalefish ^b	2,014	19,847	10.1%	2,978	\$0.68	349	\$4,184
Sardines	804	18,517	4.3%	30,355	\$0.03	14	\$57,410
Total SA	11,075	222,066	5.0%	41,915	\$0.26	750	\$14,766

^a Excludes the River fishery.

Source: EconSearch (2008b).

Appendix Table 2.4 Financial performance in South Australian commercial fisheries, 2006/07, (\$'000) (average per boat)

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs ^a	Marine Scalefish ^b	Sardines	Lakes and Coorong
(1) Total Boat Gross Income	946.9	321.8	870.3	452.6	347.8	5,628.8	95.1	1,315.9	216.3
Variable Costs									
Fuel	15.8	24.8	57.9	23.9	44.9	600.7	11.2	199.5	14.8
Repairs & Maintenance	38.7	14.0	48.5	21.4	16.9	533.3	8.7	98.8	6.8
Bait/Ice	0.3	0.0	0.0	10.9	14.8	66.9	2.3	2.3	1.4
Provisions	9.5	0.8	3.5	0.4	4.4	11.1	0.0	8.1	0.2
Labour - paid	263.6	96.9	296.0	91.7	107.0	1,280.3	12.2	527.3	33.2
(2) - unpaid	4.3	8.0	7.7	32.4	32.2	211.6	25.1	3.3	41.8
Other	10.7	9.6	21.8	0.7	5.3	18.5	0.0	33.5	16.2
(3) Total Variable Costs	342.9	154.2	435.4	181.5	225.5	2,722.5	59.3	872.8	114.5
Fixed Costs									
Licence Fee	67.4	26.9	24.9	18.7	21.3	291.4	5.0	56.4	9.8
Insurance	7.0	19.3	20.3	6.5	8.9	75.4	1.9	30.6	1.6
(4) Interest	5.3	31.1	44.8	23.6	34.2	650.1	4.5	84.9	5.3
(5) Labour - unpaid	18.9	18.3	8.9	7.6	14.1	44.4	4.7	10.2	7.0
(6) Leasing	0.0	0.0	0.0	1.9	12.5	0.0	0.0	23.4	0.0
Legal & Accounting	15.0	7.7	8.0	2.6	2.9	43.8	1.2	7.8	2.0
Telephone etc.	3.7	1.6	6.0	1.7	2.6	22.1	1.3	1.7	2.2
Slipping & Mooring	0.8	4.8	6.4	1.7	2.5	32.2	0.8	17.0	0.1
Travel	4.4	0.2	2.8	0.8	1.1	28.0	0.5	0.8	1.0
Office & Admin	9.2	0.5	7.5	2.7	3.8	86.5	4.8	6.3	4.9
(7) Total Fixed Costs	131.7	110.5	129.7	67.8	103.9	1,273.9	24.9	239.2	33.8
(8) Total Boat Cash Costs (3 + 7)	474.6	264.6	565.2	249.3	329.4	3,996.4	84.2	1,112.0	148.3
Boat Gross Margin (1 - 3)	603.9	167.7	434.9	271.1	122.3	2,906.3	35.7	443.1	101.8
(9) Total Unpaid Labour (2 + 5)	23.2	26.3	16.6	40.0	46.3	256.1	29.8	13.6	48.8
Gross Operating Surplus	495.4	83.5	321.8	243.4	64.7	1,888.5	40.7	217.5	116.9
(10) Boat Cash Income (1 - 8)	472.2	57.2	305.2	203.3	18.4	1,632.4	10.9	203.9	68.0
(11) Depreciation	66.3	129.8	142.2	47.9	63.0	349.3	18.3	211.7	22.0
(12) Boat Business Profit (10 - 11)	405.9	-72.6	163.0	155.4	-44.6	1,283.1	-7.4	-7.8	46.1
(13) Profit at Full Equity (12 + 4 + 6)	411.3	-41.6	207.8	180.9	2.1	1,933.1	-2.9	100.5	51.3
Boat Capital									
(14) Fishing Gear & Equip	332.7	960.9	1,289.6	351.5	490.4	3,468.5	130.1	2,763.6	148.1
Licence Value	7,947.3	2,695.3	4,966.9	3,079.3	1,577.5	28,798.6	184.2	3,318.7	214.0
(15) Total Boat Capital	8,280.0	3,656.2	6,256.5	3,430.8	2,067.9	32,267.1	314.3	6,082.3	362.1
Rate of Return on Fishing Gear & Equip (13 / 14 * 100)	123.6%	-4.3%	16.1%	51.5%	0.4%	55.7%	-2.2%	3.6%	34.7%
Rate of Return on Total Boat Capital (13 / 15 * 100)	5.0%	-1.1%	3.3%	5.3%	0.1%	6.0%	-0.9%	1.7%	14.2%

^a Financial performance for blue crab are on a whole fishery basis.

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

^c Earnings before interest and tax.

Source: EconSearch (2008b).

Appendix Table 2.5 Costs as a percentage of total cash costs in South Australian commercial fisheries, 2006/07

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish ^a	Sardines	Lakes and Coorong
Variable Costs									
Fuel	3%	9%	10%	10%	14%	15%	13%	18%	10%
Repairs & Maintenance	8%	5%	9%	9%	5%	13%	10%	9%	5%
Bait/Ice	0%	0%	0%	4%	5%	2%	3%	0%	1%
Provisions	2%	0%	1%	0%	1%	0%	0%	1%	0%
Labour - paid	56%	37%	52%	37%	32%	32%	14%	47%	22%
- unpaid	1%	3%	1%	13%	10%	5%	30%	0%	28%
Other	2%	4%	4%	0%	2%	0%	0%	3%	11%
Fixed Costs									
Licence Fee	14%	10%	4%	7%	6%	7%	6%	5%	7%
Insurance	1%	7%	4%	3%	3%	2%	2%	3%	1%
Interest	1%	12%	8%	9%	10%	16%	5%	8%	4%
Labour - unpaid	4%	7%	2%	3%	4%	1%	6%	1%	5%
Leasing	0%	0%	0%	1%	4%	0%	0%	2%	0%
Legal & Accounting	3%	3%	1%	1%	1%	1%	1%	1%	1%
Telephone etc.	1%	1%	1%	1%	1%	1%	2%	0%	2%
Slipping & Mooring	0%	2%	1%	1%	1%	1%	1%	2%	0%
Travel	1%	0%	0%	0%	0%	1%	1%	0%	1%
Office & Admin	2%	0%	1%	1%	1%	2%	6%	1%	3%
Total Variable Costs	72%	58%	77%	73%	68%	68%	70%	78%	77%
Total Fixed Costs	28%	42%	23%	27%	32%	32%	30%	22%	23%
Total Cash Costs	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

Source: EconSearch (2008b).

Appendix Table 2.6 Economic impacts of South Australian commercial fisheries, 2006/07

	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	31.5	3.3	39.4	78.8	18.0	5.6	19.8	18.5	7.3	222.3
Downstream ^b	5.1	2.0	17.5	24.6	6.8	3.1	9.5	3.3	5.9	77.7
All other sectors (indirect)	29.8	6.0	52.4	88.3	18.0	8.9	43.4	24.6	14.8	286.2
Total	66.4	11.3	109.3	191.6	42.7	17.6	72.8	46.4	28.1	586.2
Total/Direct	1.8	2.1	1.9	1.9	2.4	2.0	2.5	2.1	2.1	2.0
Total/Tonne (\$)	\$75,100	\$54,100	\$54,000	\$101,100	\$119,200	\$27,600	\$24,400	\$1,500	\$11,700	\$13,023
Contribution to GSP (\$m)										
Direct										
Fishing	25.2	2.1	30.3	61.1	7.8	3.7	6.1	11.4	5.0	152.6
Downstream	1.8	0.8	7.2	9.7	2.7	1.1	3.5	1.5	2.3	30.6
All other sectors (indirect)	14.5	2.9	25.2	42.6	16.3	4.2	20.4	11.7	7.1	145.0
Total	41.5	5.9	62.8	113.4	26.9	8.9	30.0	24.5	14.5	328.3
Total/Direct	1.5	2.0	1.7	1.6	2.5	1.9	3.1	1.9	2.0	1.8
Total/Tonne (\$)	\$46,900	\$28,200	\$31,000	\$59,800	\$54,500	\$13,900	\$10,066	\$807	\$6,096	\$7,293
Employment (fte jobs) ^c										
Direct										
Fishing	123	37	217	424	185	29	540	63	74	1,692
Downstream	23	20	167	140	41	17	73	20	46	547
All other sectors (indirect)	163	33	289	479	186	48	235	134	82	1,647
Total	308	89	673	1,043	412	93	848	217	201	3,885
Total/Direct	2.1	1.6	1.8	1.8	1.8	2.0	1.4	2.6	1.7	1.7
Total/Tonne	0.35	0.43	0.33	0.55	0.84	0.15	0.28	0.01	0.08	0.09
Household Income (\$m)										
Direct										
Fishing	9.1	1.2	12.3	22.7	6.7	1.5	6.1	6.7	3.2	69.5
Downstream	1.2	0.6	5.2	6.7	1.9	0.7	2.5	1.0	1.7	21.5
All other sectors (indirect)	8.0	1.6	14.0	23.2	9.0	2.3	11.4	6.4	4.0	80.1
Total	18.4	3.4	31.4	52.6	17.6	4.5	20.1	14.1	8.9	171.1
Total/Direct	1.8	1.9	1.8	1.8	2.0	2.1	2.3	1.8	1.8	1.9
Total/Tonne (\$)	\$20,700	\$16,500	\$15,500	\$27,700	\$35,800	\$7,100	\$6,700	\$400	\$3,700	\$3,801

^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 642 full-time and 1,375 part-time, that is, 2,017 jobs in total.

Source: EconSearch (2008b).

Appendix Table 2.7 Economic rent in South Australian commercial fisheries, 2006/07 (\$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	33.1	3.3	39.4	78.8	18.0	5.6	19.8	18.5	7.1	223.7
Less Labour	8.5	1.2	13.2	21.8	7.7	1.4	8.8	7.6	2.8	73.0
Less Materials & Services	6.4	1.1	9.5	16.2	7.3	1.8	9.1	6.5	2.0	60.0
Less Depreciation	2.3	1.3	6.4	8.0	3.1	0.3	3.8	3.0	0.7	29.1
Less Opportunity Cost of Capital (@10%)	1.2	1.0	5.8	5.9	2.4	0.3	2.7	3.9	0.5	23.7
Economic Rent	14.8	-1.4	4.5	26.9	-2.6	1.7	-4.5	-2.5	1.1	37.9

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

Source: EconSearch (2008b).

Appendix 3 Financial Performance Indicators, 1997/98 to 2004/05

Appendix Table 3.1 Financial performance in the SA Blue Crab fishery, 1997/98 to 1999/00 (total fishery) ^a

	1997/98		1998/99		1999/00	
	Fishery Total	Share of TBCC	Fishery Total	Share of TBCC	Fishery Total	Share of TBCC
(1) Total Boat Gross Income	\$2,173,000		\$2,234,000		\$2,149,000	
Variable Costs						
Fuel	\$214,707	12%	\$198,801	11%	\$257,277	14%
Repairs & Maintenance ^c	\$171,533	10%	\$180,328	10%	\$160,141	9%
Bait/Ice	\$67,050	4%	\$69,349	4%	\$61,507	3%
Provisions	\$598	0%	\$441	0%	\$379	0%
Labour - paid	\$704,248	39%	\$752,093	41%	\$763,171	41%
(2) - unpaid ^d	\$209,129	12%	\$218,466	12%	\$206,272	11%
Other	\$13,196	1%	\$8,356	0%	\$8,566	0%
(3) Total Variable Costs	\$1,380,462	77%	\$1,427,835	78%	\$1,457,313	79%
Fixed Costs						
Licence Fee	\$256,019	14%	\$252,794	14%	\$237,964	13%
Insurance	\$31,555	2%	\$31,970	2%	\$32,774	2%
(4) Interest	\$16,474	1%	\$15,207	1%	\$16,836	1%
(5) Labour - unpaid ^d	\$39,738	2%	\$40,950	2%	\$42,113	2%
Legal & Accounting	\$10,892	1%	\$11,011	1%	\$11,288	1%
Telephone etc.	\$26,932	2%	\$27,286	1%	\$27,973	2%
Slipping & Mooring	\$1,375	0%	\$1,393	0%	\$1,428	0%
Travel	\$5,461	0%	\$5,533	0%	\$5,672	0%
Office & Admin	\$21,815	1%	\$22,102	1%	\$22,658	1%
(6) Total Fixed Costs	\$410,261	23%	\$408,245	22%	\$398,706	21%
(7) Total Boat Cash Costs (3 + 6)	\$1,790,723	100%	\$1,836,080	100%	\$1,856,019	100%
Boat Gross Margin (1 - 3)	\$792,538		\$806,165		\$691,687	
(8) Total Unpaid Labour (2 + 5)	\$248,867		\$259,416		\$248,385	
Gross Operating Surplus (1 - 7 + 8)	\$631,144		\$657,336		\$541,365	
(9) Boat Cash Income (1 - 7)	\$382,277		\$397,920		\$292,981	
(10) Depreciation	\$152,771		\$154,781		\$158,676	
(11) Boat Business Profit (9 - 10)	\$229,506		\$243,139		\$134,305	
(12) Profit at Full Equity (11 + 4)	\$245,980		\$258,345		\$151,141	
Boat Capital						
(13) Fishing Gear & Equip	\$1,251,987		\$1,268,461		\$1,300,378	
Licence Value	\$3,017,932		\$3,106,437		\$2,999,986	
(14) Total Boat Capital	\$4,269,920		\$4,374,898		\$4,300,364	
Rate of Return on Fishing Gear & Equip (12 / 13 * 100)	19.6%		20.4%		11.6%	
Rate of Return on Total Boat Capital (12 / 14 * 100)	5.8%		5.9%		3.5%	

^a Financial performance estimates for 1997/98 to 1999/00 are based on the 1998 survey of licence holders.

^b Total boat cash costs.

^c Repairs and maintenance costs have been classified as a variable cost although it is noted that some of these costs may be fixed (e.g. regulated maintenance).

^d Unpaid labour was divided between variable (time spent fishing and on repairs and maintenance) and fixed (management and administrative duties) based on survey responses.

Source: EconSearch analysis.

Appendix Table 3.2 Financial performance of the SA Blue Crab fishery sector, 2000/01 to 2002/03 (total fishery) ^a

	2000/01		2001/02		2002/03	
	Fishery Total	Share of TBCC	Fishery Total	Share of TBCC	Fishery Total	Share of TBCC
(1) Total Boat Gross Income	\$3,067,000		\$3,461,000		\$3,574,000	
Variable Costs						
Fuel	\$340,619	14%	\$321,614	12%	\$327,517	12%
Repairs & Maintenance ^c	\$196,615	8%	\$193,332	7%	\$210,582	8%
Bait/Ice	\$77,114	3%	\$75,893	3%	\$81,262	3%
Provisions	\$728	0%	\$727	0%	\$561	0%
Labour - paid	\$1,086,080	45%	\$1,281,289	48%	\$1,398,264	51%
(2) - unpaid ^d	\$323,524	14%	\$369,733	14%	\$384,407	14%
Other	\$9,054	0%	\$9,305	0%	\$9,678	0%
(3) Total Variable Costs	\$2,033,734	85%	\$2,251,893	85%	\$2,412,272	88%
Fixed Costs						
Licence Fee	\$190,518	8%	\$227,513	9%	\$168,109	6%
Insurance	\$34,643	1%	\$35,603	1%	\$37,030	1%
(4) Interest	\$15,026	1%	\$14,121	1%	\$13,940	1%
(5) Labour - unpaid ^d	\$43,470	2%	\$44,924	2%	\$46,668	2%
Legal & Accounting	\$11,932	0%	\$12,262	0%	\$12,754	0%
Telephone etc.	\$29,568	1%	\$30,387	1%	\$31,605	1%
Slipping & Mooring	\$1,509	0%	\$1,551	0%	\$1,613	0%
Travel	\$5,996	0%	\$6,162	0%	\$6,409	0%
Office & Admin	\$23,950	1%	\$24,613	1%	\$25,600	1%
(6) Total Fixed Costs	\$356,610	15%	\$397,136	15%	\$343,728	12%
(7) Total Boat Cash Costs (3 + 6)	\$2,390,344	100%	\$2,649,029	100%	\$2,756,000	100%
Boat Gross Margin (1 - 3)	\$1,033,266		\$1,209,107		\$1,161,728	
(8) Total Unpaid Labour (2 + 5)	\$366,994		\$414,657		\$431,076	
Gross Operating Surplus (1 - 7 + 8)	\$1,043,649		\$1,226,628		\$1,249,075	
(9) Boat Cash Income (1 - 7)	\$676,656		\$811,971		\$818,000	
(10) Depreciation	\$167,721		\$172,370		\$179,280	
(11) Boat Business Profit (9 - 10)	\$508,934		\$639,601		\$638,720	
(12) Profit at Full Equity (11 + 4)	\$523,960		\$653,721		\$652,660	
Boat Capital						
(13) Fishing Gear & Equip	\$1,374,509		\$1,412,604		\$1,469,232	
Licence Value	\$4,258,810		\$4,814,366		\$4,984,703	
(14) Total Boat Capital	\$5,633,319		\$6,226,970		\$6,453,935	
Rate of Return on Fishing Gear & Equip (12 / 13 * 100)	38.1%		46.3%		44.4%	
Rate of Return on Total Boat Capital (12 / 14 * 100)	9.3%		10.5%		10.1%	

^a Financial performance estimates for 1997/98 to 2002/03 are based on the 1998 survey of licence holders.

^b Total boat cash costs.

^c Repairs and maintenance costs have been classified as a variable cost although it is noted that some of these costs may be fixed (e.g. regulated maintenance).

^d Unpaid labour was divided between variable (time spent fishing and on repairs and maintenance) and fixed (management and administrative duties) based on survey responses.

Source: EconSearch analysis.

Appendix Table 3.3 Financial performance of the SA Blue Crab fishery sector, 2003/04 to 2004/05 (total fishery) ^a

	2003/04		2004/05	
	Fishery Total	Share of TBCC	Fishery Total	Share of TBCC
(1) Total Boat Gross Income	\$3,638,000		\$4,413,305	
Variable Costs				
Fuel	\$316,403	11%	\$649,768	18%
Repairs & Maintenance ^c	\$213,222	7%	\$588,094	16%
Bait/Ice	\$81,448	3%	\$72,758	2%
Provisions	\$431	0%	\$12,424	0%
Labour - paid	\$1,471,305	51%	\$932,163	26%
(2) - unpaid ^d	\$366,592	13%	\$124,378	3%
Other	\$9,970	0%	\$17,561	0%
(3) Total Variable Costs	\$2,459,370	85%	\$2,397,145	67%
Fixed Costs				
Licence Fee	\$227,097	8%	\$276,632	8%
Insurance	\$42,489	1%	\$71,403	2%
(4) Interest	\$15,314	1%	\$615,601	17%
(5) Labour - unpaid ^d	\$52,719	2%	\$41,460	1%
Legal & Accounting	\$14,696	1%	\$41,437	1%
Telephone etc.	\$36,760	1%	\$20,923	1%
Slipping & Mooring	\$1,898	0%	\$30,451	1%
Travel	\$7,543	0%	\$26,553	1%
Office & Admin	\$29,357	1%	\$81,954	2%
(6) Total Fixed Costs	\$427,873	15%	\$1,206,413	33%
(7) Total Boat Cash Costs (3 + 6)	\$2,887,243	100%	\$3,603,558	100%
Boat Gross Margin (1 - 3)	\$1,178,630		\$2,016,161	
(8) Total Unpaid Labour (2 + 5)	\$419,311		\$165,838	
Gross Operating Surplus (1 - 7 + 8)	\$1,170,068		\$975,586	
(9) Boat Cash Income (1 - 7)	\$750,757		\$809,747	
(10) Depreciation	\$204,720		\$385,363	
(11) Boat Business Profit (9 - 10)	\$546,037		\$424,384	
(12) Profit at Full Equity (11 + 4)	\$561,350		\$1,039,985	
Boat Capital				
(13) Fishing Gear & Equip	\$1,690,853		\$3,781,064	
Licence Value	\$5,783,722		\$22,575,060	
(14) Total Boat Capital	\$7,474,575		\$26,356,124	
Rate of Return on Fishing Gear & Equip (12 / 13 * 100)	33.2%		27.5%	
Rate of Return on Total Boat Capital (12 / 14 * 100)	7.5%		3.9%	

^a Financial performance estimates for 2003/04 are based on the 1998 survey of licence holders. Estimates for 2004/05 are based on the 2006 survey of licence holders.

^b Total boat cash costs.

^c Repairs and maintenance costs have been classified as a variable cost although it is noted that some of these costs may be fixed (e.g. regulated maintenance).

^d Unpaid labour was divided between variable (time spent fishing and on repairs and maintenance) and fixed (management and administrative duties) based on survey responses.

Source: EconSearch analysis.