

Economic Indicators
for the
Lakes and Coorong Fishery
2005/06

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
fte	full time equivalent
GRP	Gross Regional Product
GSP	Gross State Product
GVP	Gross Value of Production
PIRSA	Primary Industries and Resources South Australia
RBA	Reserve Bank of Australia
R&M	Repairs and Maintenance
SA	South Australia
SARDI	South Australian Research and Development Institute
SASQAP	South Australian Shellfish Quality Assurance Program
SFA	Southern Fishermen's Association

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The estimates in this report are based on analysis undertaken for the Southern Fishermen's Association (SFA), and presented in the report *Lakes and Coorong Fishery: "Wild Fisheries with a Future", Current Economic Value and Value-Adding Opportunities, Final Report* (EconSearch 2004a), funded by the Commonwealth Department of Transport and Regional Services' Regional Assistance Program.

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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 by the Minister for Agriculture, Food and Fisheries to meet the obligations of section 20 of the *Fisheries Act 1982*.

This report, *Economic Indicators for the Lakes and Coorong Fishery, 2005/06*, is the fourth detailed economic indicators report prepared for the Lakes and Coorong Fishery, the first having been prepared for 2002/03 (EconSearch 2004b). The 2002/03 economic indicators were derived from a report prepared for the Southern Fishermen's Association (SFA), entitled *Lakes and Coorong Fishery: "Wild Fisheries with a Future", Current Economic Value and Value-Adding Opportunities, Final Report* (EconSearch 2004a), funded by the Commonwealth Department of Transport and Regional Services' Regional Assistance Program. The second and third reports, prepared for 2003/04 and 2004/05, respectively (EconSearch 2005a and 2006a), provided an update of the survey based indicators.

For earlier years, a limited number of economic indicators for the Lakes and Coorong Fishery have been prepared in conjunction with the River Murray commercial fishery. The first report, entitled *Economic Indicators for the SA Inland Waters Fisheries 1997/98*, summarised information obtained from SARDI Aquatic Sciences and PIRSA Fisheries (EconSearch 1999). The second to fifth annual reports, prepared for the years 1998/99 to 2001/02, respectively, provided an update of the 1997/98 economic indicators (EconSearch 2000, 2001, 2002 and 2003).

The objective of this report, *Economic Indicators for the Lakes and Coorong Fishery, 2005/06*, was to provide an update of the economic indicators based on a second survey of licence holders conducted in October 2006.

The aim of all the studies has been 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);
- the economic impact of the fishery, both local and state;
- economic rent;
- external factors that influence the economic condition of the fishery;
- prices in local and interstate markets;
- contribution to the community; and
- a range of demographic and other indicators.

For purposes of comparison, summary economic indicators for all South Australian commercial fisheries, up to 2004/05, are presented in Appendix 2.

2. Method of Analysis and Definition of Terms

2.1 Survey of Lakes and Coorong Licence Holders, 2005/06

The questionnaire for the survey of licence holders was based on the survey conducted in 2003. The questionnaire for the survey was drafted by the consultants and subsequently modified after consultation with members of the Southern Fishermen's Association (SFA). The sampling frame for the survey included all licence holders in the Lakes and Coorong Fishery (36 licences in total)¹. The time period for which information was sought was the 2005/06 financial year.

Licence holders were sent an introductory letter from the President of the SFA outlining the project and seeking their support. Telephone calls were then made by an EconSearch representative to each licence holder seeking their participation in the survey. Interview times were arranged with willing participants. A copy of the questionnaire and other relevant information was posted to each participating licence holder prior to the interview. EconSearch representatives visited licence holders to conduct face-to-face interviews over the period 12 to 20 October 2006.

A total of 24 usable responses were collected, twelve licence holders did not provide a response to the survey for the following reasons:

- not contactable (3);
- not interested in participating in the survey (3);
- too busy to participate in the survey (1);
- minimal fishing days during 2005/06 and was unable to provide financial records (2); and
- only purchased licence recently and was unable to provide financial records (3).

A total of 24 useable licence holders represented two-thirds of the licences in the fishery.

2.2 Definition of Terms²

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 fish prior to any deductions for freight and selling charges.

¹ There were 37 licences in the fishery in 2005/06 one of which was amalgamated during that year. According, the sample for the 2005/06 survey was 36 licences.

² Where possible definitions have been kept consistent with those used by Brown (1997) in the *Australian Fisheries Survey Report*.

Cash costs (Total boat variable and fixed 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 both with and without 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. Participants in the survey were asked for information on the age, current value and current replacement cost of each item. This was to be used to determine the depreciation rate of fishing equipment.³

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.

³ 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 Lakes and Coorong Fishery

3.1 Gross Value of Production and Catch

The principal information used to estimate the gross value of production (GVP) for the South Australian Lakes and Coorong Fishery is derived from the catch and effort database administered by SARDI Aquatic Sciences.

It is acknowledged that SARDI's estimates of the GVP of fish harvested from the Lakes and Coorong Fishery are underestimated because average values are based on wholesale prices received at the Adelaide market. Baker and Pierce (1998) believed this to be an unrealistic premise. They suggested that a significant proportion of some of the more financially important species are marketed either at the Sydney and Melbourne markets or locally, where prices received are considerably higher than can be obtained at the Adelaide market. Licence holders participating in the surveys in 2003 and 2006 confirmed that fish are marketed at a wide variety of locations, including the Sydney and Melbourne fish markets.

Baker and Pierce (1998) re-assessed 1996/97 SARDI catch data using prices from local and interstate markets, as well as individual estimates of local value-adding provided by the fishers to account for the higher prices received at alternative markets. For the purpose of this study, SARDI estimates of GVP for the period 1992/93 to 2001/02 have been re-valued using Baker and Pierce's (1998) method. However, as these readjustment factors were derived from 1996/97 data, SARDI estimates of GVP for 2002/03 to 2004/05 have been revised using updated readjustment factors derived from a weighted average of 2002/03 fish prices from the Adelaide, Sydney and Melbourne fish markets. The market weightings were derived from the EconSearch survey of licence holders in 2003. The SARDI estimates of GVP for 2005/06 have also been revised using readjustment factors based on weighted averages of 2005/06 Adelaide, Sydney and Melbourne market prices. Weightings were based on the 2006 survey of licence holders.

The reported catch levels of species caught by fishers in the Lakes and Coorong Fishery for the period 1992/93 to 2005/06 are shown in Table 3.1. The total catch of fish in 2005/06 was 2,352 tonnes, slightly more than the total weight of fish caught in 1992/93. Table 3.1 and Figures 3.1 and 3.2 demonstrate that catch levels have fluctuated significantly during the thirteen-year period from 1992/93 to 2005/06.

The estimated GVP of species caught by fishers in the Lakes and Coorong Fishery for the period 1992/93 to 2005/06 is shown in Table 3.2. The estimated GVP of the fishery increased by 39 per cent in nominal terms from \$5.5 million in 1992/93 to almost \$6.7 million in 2005/06. While the Lakes and Coorong Fishery's GVP over the thirteen-year period (1992/93 - 2005/06) trended upwards in nominal terms, the consumer price index for Adelaide also increased (by 42 per cent) over the same period (ABS 2006). This means that, in real terms (i.e. in 1992/93 dollars), the value of the catch in the Lakes and Coorong Fishery in 2005/06 was 33 per cent higher than in 1992/93.

Table 3.1 Reported catch of the Lakes and Coorong Fishery, 1992/93 to 2005/06 (tonnes) ^a

	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Australian Salmon	3	1	0	5	3	4	3	4	2	1	1	2	4	3
Black Bream	3	3	3	4	4	4	3	4	7	8	12	10	6	7
Bony Bream	612	695	838	706	688	757	609	429	474	298	212	225	286	264
Callop	100	104	207	173	137	151	98	57	71	36	38	82	103	123
European Carp	673	842	816	767	767	635	444	269	274	210	404	573	561	731
Goolwa Cockle	445	465	396	473	485	669	635	756	873	783	1,086	1,070	1,066	1,024
Flounder	27	10	4	30	15	11	28	40	19	26	6	6	9	7
Yellow-Eye Mullet	210	181	239	195	161	158	139	150	127	155	167	111	110	126
Mulloway	34	85	78	57	56	50	95	69	136	109	45	31	39	38
Redfin	36	64	43	22	30	22	44	24	25	10	6	n.a.	n.a.	n.a.
Other Species	9	3	2	3	8	4	4	5	5	4	2	10	14	29
Total	2,152	2,453	2,626	2,435	2,354	2,465	2,102	1,807	2,013	1,640	1,979	2,120	2,198	2,352

^a Catch by river fishery licence holders has not been included in the reported catch of the Lakes and Coorong Fishery. Although the River Fishery was closed from July 2003 a limited number of licences have access to the River. For confidentiality reasons production figures are unavailable for the River Fishery for 2004/05 and 2005/06 and have been imputed based on 2003/04 production.

Source: Knight et al. (2004) and SARDI Aquatic Sciences.

Table 3.2 Gross value of production of the Lakes and Coorong Fishery, 1992/93 to 2005/06 (\$'000) ^a

	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Australian Salmon	3	1	0	6	4	5	4	5	2	1	1	3	5	4
Black Bream	17	21	25	33	34	42	30	37	58	70	110	100	55	69
Bony Bream	479	497	694	566	553	661	542	479	512	564	227	234	286	264
Callop	571	644	1,738	1,640	1,638	1,691	1,190	851	892	271	583	1,176	1,464	1,904
European Carp	653	720	991	667	662	590	650	562	502	463	748	1,030	960	952
Goolwa Cockle	752	672	572	692	647	712	1,098	1,096	1,710	1,315	2,013	2,305	2,092	2,757
Flounder	106	45	18	137	74	62	132	219	113	183	53	49	78	62
Yellow-Eye Mullet	599	592	715	638	612	544	581	773	704	795	392	257	245	310
Mulloway	182	444	455	328	310	303	570	482	824	736	306	192	256	231
Redfin	178	290	259	154	200	137	295	166	193	80	25	n.a.	n.a.	n.a.
Other Species	9	5	4	4	13	9	13	18	14	24	7	35	54	127
Total (Nominal)	3,548	3,930	5,471	4,865	4,747	4,756	5,107	4,689	5,525	4,502	4,466	5,382	5,495	6,680
Total (Real) ^b	3,548	3,854	5,204	4,463	4,316	4,349	4,609	4,128	4,602	3,649	3,480	4,071	4,063	4,713

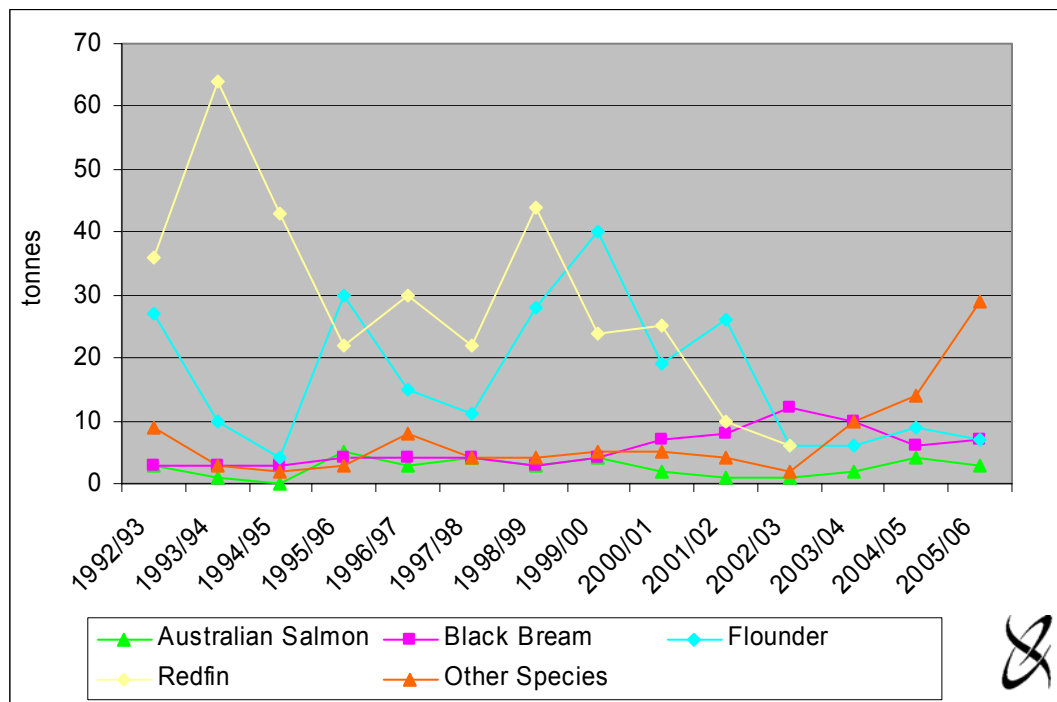
^a GVP estimates for 1992/93 to 2001/02 are based on re-estimated SARDI values using readjustment factors outlined in Baker and Pierce (1998). As these readjustment factors were derived from 1996/97 data, SARDI's GVP estimates for 2002/03 to 2004/05 have been revised using updated readjustment factors derived from a weighted average of 2002/03 fish prices from the Adelaide, Sydney and Melbourne fish markets. The market weightings were derived from the 2003 EconSearch survey of licence holders. SARDI's estimates of GVP for 2005/06 have been revised based on updated readjustments factors derived from 2005/06 market prices and market weightings from the 2006 licence holder survey. Information provided by licence holders in the 2006 survey suggests that re-valued estimates of GVP for some species may have been overstated in previous years.

^b In 1992/93 dollars.

Source: Knight et al. (2004), Baker and Pierce (1998), SARDI Aquatic Sciences and EconSearch analysis

The catch of lower volume species in the fishery over the period 1992/93 to 2005/06 is shown in Figure 3.1. Catch levels of flounder and redfin have fluctuated significantly from year to year. A long-term decline in the quantity of redfin caught is evident. Very small quantities of flounder, black bream and Australian salmon were caught in 2005/06, relative to other species.

Figure 3.1 Catch of lower volume species, Lakes and Coorong Fishery, 1992/93 to 2005/06 ^a



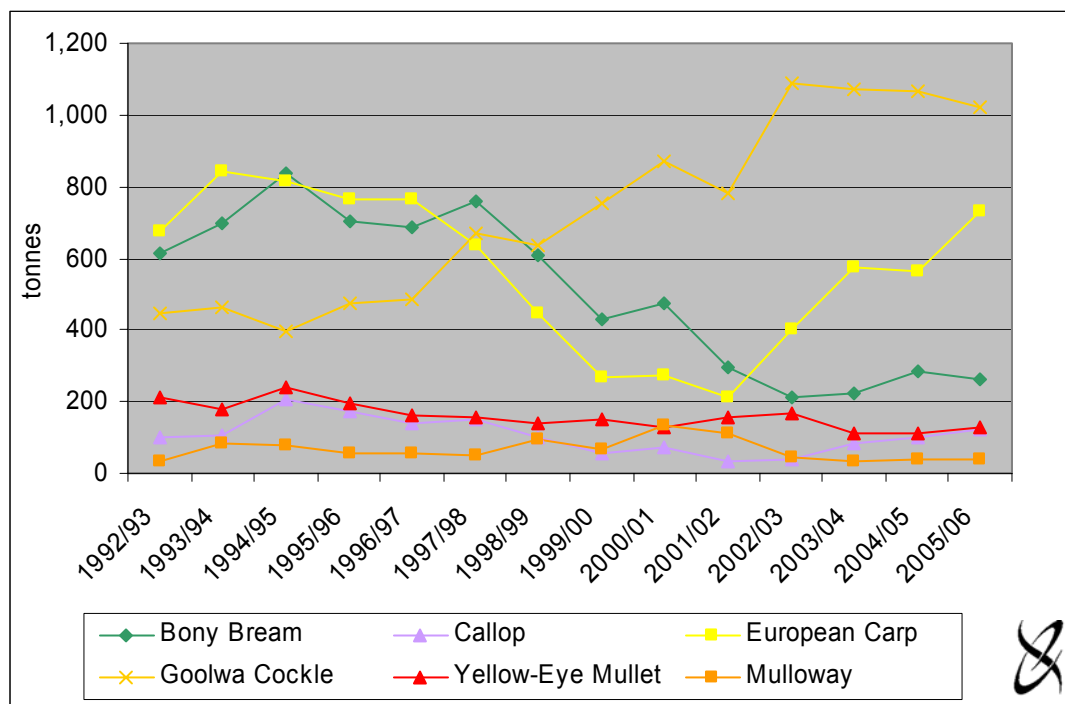
^a Note that Redfin catch was not published separately in 2003/04 to 2005/06 and has been included in the 'other species' category.

Source: Knight et al. (2004) and SARDI Aquatic Sciences.

Figure 3.2 outlines the catch of higher volume species over the period 1992/93 to 2005/06. Notable trends include the significant increase in the quantity of Goolwa cockles harvested (130 per cent) and the significant decline in the reported bony bream (57 per cent) catch⁴ during the thirteen-year period.

⁴ Survey respondents indicated that considerable quantities of European carp and bony bream caught cannot be sold and are thus discarded. As licence holders generally do not record these discarded fish in their monthly log book returns, SARDI catch estimates for these species, as reported in Table 3.1 and Figure 3.2, may be somewhat underestimated.

Figure 3.2 Catch of higher volume species, Lakes and Coorong Fishery, 1992/93 to 2005/06



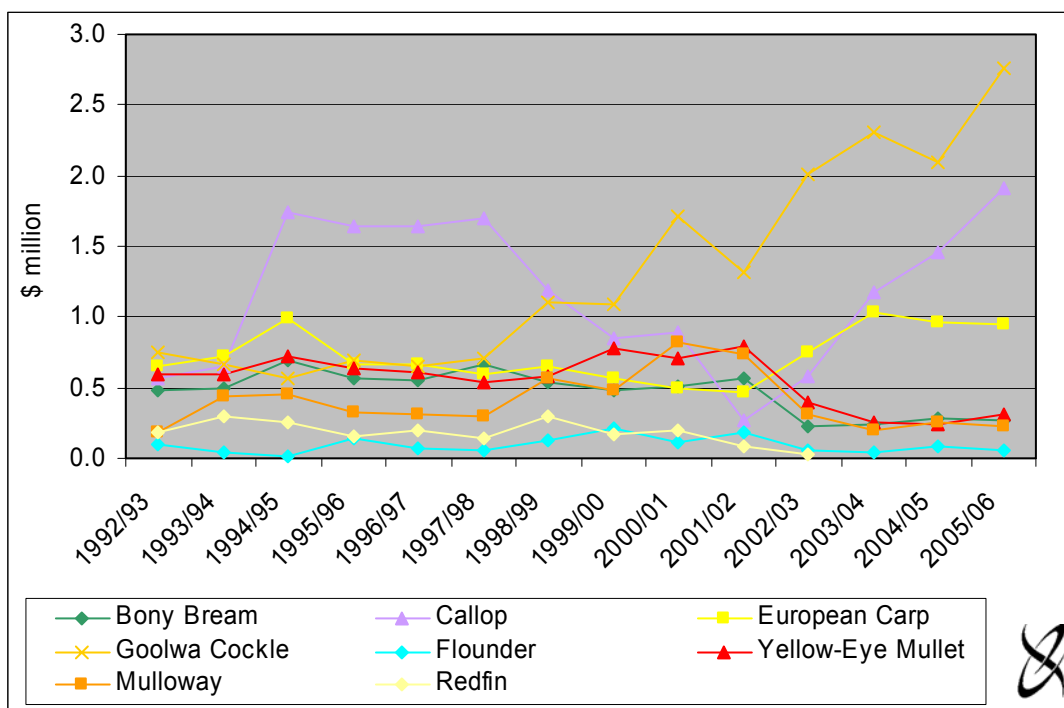
Source: Knight et al. (2004) and SARDI Aquatic Sciences.

Figure 3.3 outlines the gross value of production of the most significant species over the period 1992/93 to 2005/06. As with catch, GVP by species has fluctuated significantly⁵.

Figure 3.4 outlines the total catch and value of all species taken by licence holders in the Lakes and Coorong Fishery over the period 1992/93 to 2005/06. These data, together with the information shown in Table 3.1, are interesting as they demonstrate the high level of variability of catch for individual species and total catch over time. Figure 3.4 also shows that aggregate income has remained relatively steady over that time, which suggests that effort is switched from financially unviable species to more lucrative species in response to changing market and environmental conditions.

⁵ Other factors such as annual variations in 'catchability', effort targeting and market conditions (especially supply of competitive product) can also influence the variability shown in Figures 3.3 and 3.4.

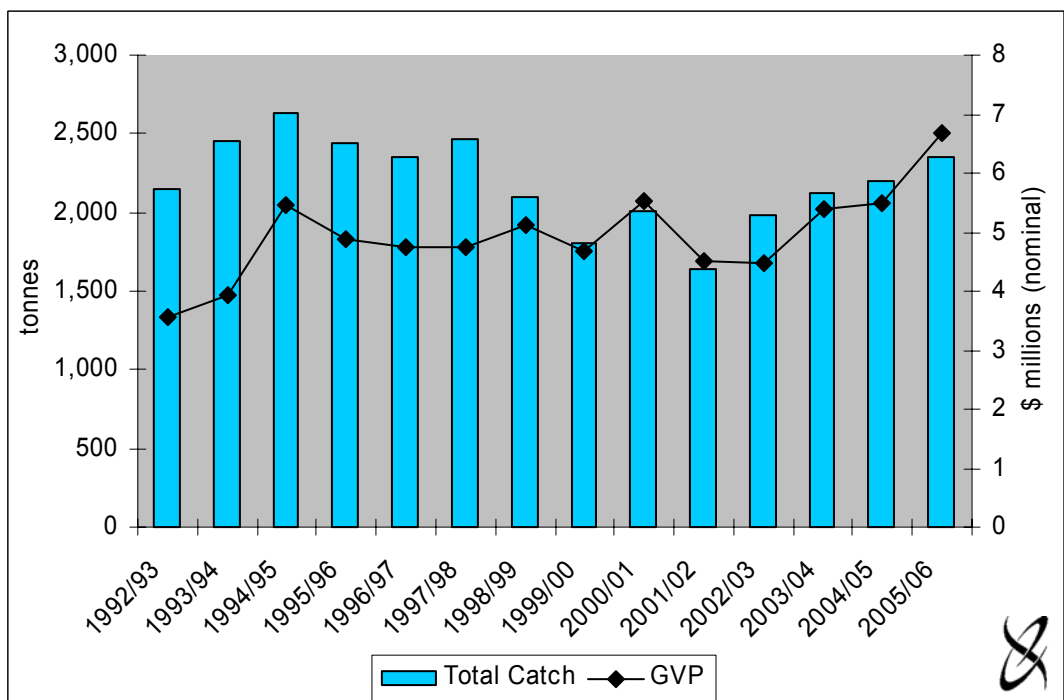
Figure 3.3 Gross value of production of major species, Lakes and Coorong Fishery, 1992/93 to 2005/06 ^a



^a Note that Redfin value of production was not published separately in 2003/04 to 2005/06 and has been included in the other species category (Figure 3.2).

Source: Knight et al. (2004), Baker and Pierce (1998), SARDI Aquatic Sciences and EconSearch analysis.

Figure 3.4 Total catch and gross value of production, Lakes and Coorong Fishery, 1992/93 to 2005/06



Source: Knight et al. (2004), Baker and Pierce (1998) SARDI Aquatic Sciences and EconSearch analysis.

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 (FRDC) levy; and
- services of the various fishery management committees.

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

Table 3.3 shows the cost of management for the fishery for the period 1996/97 to 2005/06.

The following can be observed for the fishery for the period 1996/97 to 2005/06.

- Actual licence fee receipts increased 96 per cent from \$136,000 in 1996/97 to \$265,000 in 2005/06.
- Licence fees as a percentage of GVP increased from 2.9 per cent in 1996/97 to 4.0 per cent in 2005/06, reflecting a significant increase in licence fees (96 per cent) and an increase in GVP of 41 per cent over the same period.
- The management cost per kilogram of catch increased from \$0.06/kg in 1996/97 to \$0.11/kg in 2005/06, reflecting a slight fall in catch and an increase in licence fees.
- The management cost per licence holder increased from \$3,478 in 1996/97 to \$7,175 in 2005/06, reflecting a decrease in the number of licence holders (from 39 to 37) and an increase in total management costs⁶.

Average fee per licence holder increased by approximately 13 per cent between 2005/06 and 2006/07, from \$7,175 to \$8,093, reflecting an increase in total licence fees and a decrease in the number of licences.

⁶ Note that the average management cost per licence holder excludes the \$40,000 in drought relief funds received in 2003/04 and 2004/05. If this was included, the management cost per licence holder would have been \$6,396 in 2003/04 and \$7,643 in 2004/05.

Table 3.3 Cost of management in the Lakes and Coorong Fishery, 1996/97 to 2006/07 ^a

	Licence Fees ^b	Gross Value of Production	Fees/GVP	Catch	Fees/Catch	Licence Holders	Average Fees/Licence Holder
	(\$'000)	(\$'000)	(%)	('000kg)	(\$/kg)	(no.)	(\$/licence)
1996/97	136	4,747	2.9%	2,354	\$0.06	39	\$3,478
1997/98	171	4,756	3.6%	2,465	\$0.07	39	\$4,395
1998/99	150	5,107	2.9%	2,102	\$0.07	38	\$3,940
1999/00	173	4,689	3.7%	1,807	\$0.10	38	\$4,549
2000/01	179	5,525	3.2%	2,013	\$0.09	38	\$4,698
2001/02	175	4,502	3.9%	1,640	\$0.11	38	\$4,595
2002/03	185	4,466	4.1%	1,979	\$0.09	37	\$5,001
2003/04 ^c	197	5,382	3.7%	2,120	\$0.09	37	\$5,315
2004/05 ^c	243	5,495	4.4%	2,198	\$0.11	37	\$6,562
2005/06 ^{c,d}	265	6,680	4.0%	2,352	\$0.11	37	\$7,175
2006/07 ^c	293	n.a.	-	n.a.	-	36	\$8,135

^a In addition to licence fees collected, \$40,000 in drought relief funds were received in both 2003/04 and 2004/05 from the SA Government to assist in the management of the fishery (Alice Fistr PIRSA, pers comm.).

^b Comprised of base licence fees (\$218,505 in 2005/06) and marine scale net fee (\$29,579 in 2005/06).

^c Includes South Australian Shellfish Quality Assurance Program (SASQAP) fee incurred by Goolwa Cockle fishers (\$17,387 in 2005/06).

^d PIRSA licensing records for 2005/06 indicate that there were 37 licences in the fishery. Two of these licences were amalgamated in 2006, thus for the purposes of this report it is assumed that there are 36 licences in the fishery.

Source: PIRSA Fisheries, SARDI Aquatic Sciences.

3.3 Financial Performance Indicators

The major measures of the financial performance of licence holders in the Lakes and Coorong Fishery for the period 2002/03 to 2005/06 are shown in Table 3.4. Estimates of financial performance for 2002/03 to 2004/05 were derived from the 2003 survey of licence holders. Financial performance estimates for 2005/06 were based on a second licence holder survey conducted in 2006.

Income...

The average gross income per licence in the Lakes and Coorong Fishery in 2005/06 was approximately \$192,500 (Table 3.4), 18 per cent higher than 2004/05, reflecting increased catch (Table 3.1) and GVP (Table 3.2) in the fishery.

Table 3.4 Financial performance in the Lakes and Coorong Fishery, 2002/03 to 2005/06 (average per licence)

	2002/03		2003/04		2004/05		2005/06	
	Average per Licence	Share of TCC ^a	Average per Licence	Share of TCC ^a	Average per Licence	Share of TCC ^a	Average per Licence	Share of TCC ^a
Gross Income	\$132,648		\$159,852		\$163,222		\$192,547	
Costs								
Fuel	\$9,497	9%	\$9,850	9%	\$10,836	9%	\$13,949	10%
Repairs and Maintenance	\$7,134	7%	\$7,497	7%	\$8,112	7%	\$6,382	5%
Provisions	\$1,086	1%	\$1,141	1%	\$1,235	1%	\$231	0%
Labour ^b	\$58,575	54%	\$61,554	54%	\$66,599	55%	\$70,477	53%
Licence fee ^c	\$4,870	5%	\$5,175	5%	\$6,390	5%	\$8,660	6%
Insurance	\$1,227	1%	\$1,264	1%	\$1,306	1%	\$1,593	1%
Interest	\$4,177	4%	\$4,285	4%	\$4,394	4%	\$4,900	4%
Administration and Other	\$21,645	20%	\$22,322	20%	\$23,114	19%	\$27,202	20%
Total Cash Costs	\$108,212	100%	\$113,090	100%	\$121,985	100%	\$133,393	100%
Cash Operating Surplus	\$24,436		\$46,762		\$41,237		\$59,154	
Depreciation	\$14,968		\$15,420		\$19,303		\$18,084	
Earnings Before Tax	\$9,468		\$31,342		\$21,934		\$41,070	
Earnings Before Interest and Tax	\$13,644		\$35,628		\$26,328		\$45,970	
Capital								
Fishing Gear and Equipment ^d	\$90,014		\$92,727		\$116,080		\$121,908	
Licence Value ^e	\$112,931		\$136,092		\$138,961		\$177,500	
Total Capital	\$202,945		\$228,818		\$255,041		\$299,408	
Rate of Return to Fishing Gear and Equipment	15.2%		38.4%		22.7%		37.7%	
Rate of Return to Total Capital	6.7%		15.6%		10.3%		15.4%	

^a Total cash costs.

^b Labour costs include an imputed wage to operators and other family members who are not paid a wage directly by the business (\$45,165 per licence in 2005/06).

^c Licence fees for 2002/03 to 2004/05 have been calculated based on the cost indicated by licence holders in the 2003 survey and change in the average fees per licence holder in subsequent years. Licence fees reported for 2005/06 have been calculated based on the cost indicated by licence holders in the 2006 survey responses (Table 3.4).

^d There were 9 new boats purchased by licence holders in the fishery in 2005/06 ranging in size from 4 to 7 metres. This investment is reflected in the increase in the estimate of the value of fishing gear and equipment per licence holder between 2004/05 and 2005/06.

^e Estimates of the 2002/03 to 2004/05 licence values were derived from the licence holder's estimate of the value of their licence in the 2003 survey. Estimates of the 2005/06 licence value reflect licence holders estimates of the value of their licence in the 2006 survey.

Source: Licence holder survey and EconSearch analysis.

Cash Income and Profit...

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. Accordingly, cash operating surplus was calculated by including imputed wages as part of cash costs. The 2005/06 average cash operating surplus per licence was estimated to be just over \$59,000.

Cash operating surplus and earnings before tax (business profit) indicate the capacity of the operator to remain in the fishery in the short to medium term. In 2005/06, the average earnings before tax were just over \$41,000 per licence.

Return on Investment...

For the purpose of this analysis, 'investment' is considered to be the capital employed by a licence holder in the fishery. Capital includes boats, licence, 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 average total investment in fishing gear and licence in the Lakes and Coorong Fishery in 2005/06 was estimated to be over \$299,000 per fisher. This included the licence holder's estimate of the value of their licence (\$177,500)⁷ and estimated investment in boats and fishing gear (approximately \$121,900 per licence).

Licence holders indicated that, due to the inherent variability in the fishery, little money is spent on boats and gear in difficult years, as fishers try to keep costs to a minimum. In more profitable years, however, investment in boats and gear increases, with surplus supplies being purchased and stored for use in years when fishing incomes decline.

Qualitative information from the 2006 survey indicated that investment in boats and fishing equipment had been relatively low in recent years (and hence a relatively low level of depreciation – Table 3.5). There was, however, some investment in new boats in 2005/06, with PIRSA licensing records indicating that there were 9 new boats registered by licence holders in the fishery in 2005/06. Eight of these boat registrations were following licence transfers and one was a new boat entering the fishery. This is reflected in the increase in the estimate of value of fishing gear and equipment per licence holder between 2004/05 and 2005/06.

For the Lakes and Coorong Fishery as a whole, the average rate of return to fishing gear and equipment was estimated to be 37.7 per cent in 2005/06. Rate of return to total capital (gear and licence) was estimated to be 15.4 per cent⁸. The increase in the rates of return can be attributed to a large increase in gross income (18 per cent) relative to the increase in cash costs (10 per cent).

⁷ There were six licences traded in the Lakes and Coorong Fishery in 2005/06. For confidentiality reasons the value of these trades can not be reported, however the average of trades was approximately \$83,000 (excluding the value fishing gear and equipment transferred with the licence).

⁸ These estimates, as with those made elsewhere in this report, are sensitive to the accuracy of survey responses and assumptions made in calculating depreciation and labour costs.

The question of what is a 'reasonable' average rate of return should be considered in light of the riskiness of the industry. Operating a fishing business is a relatively high-risk activity, with some of the major risks arising from market uncertainty (price risk), seasonal variability (environmental risk) and uncertainty regarding long-term resource security (institutional risk).

3.4 State and Regional Economic Impact

Estimates of the economic impact of the Lakes and Coorong fishing industry on the South Australian and regional (Murraylands⁹) economies in 2005/06 are outlined below.

3.4.1 Measuring direct and flow-on effects

Estimates of the direct economic impact of the Lakes and Coorong Fishery are consistent with the method employed in PIRSA's *Food for the Future* value-chain analysis, 2005/06¹⁰.

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) 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 practical method for measuring economic impacts at regional and state levels.

Economic impacts at the state and regional levels were based on models for the state as a whole and for the Murraylands region, respectively, 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 per boat were derived from data provided by operators in the fishery in the financial survey for 2005/06, described earlier. On an item-by-item basis, the expenditures were allocated between those occurring in the Murraylands region, those occurring in South Australia and those goods and services imported from outside the state.

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, 2004/05*) (Jack Langberg, PIRSA, pers. comm.). Estimates of the net value of local transport margins and capital expenditure per licence holder were derived from the 2006 survey of licence holders.

⁹ The Murraylands is comprised of the statistical division of the Murraylands, as defined by the ABS.

¹⁰ The relevant information was obtained from Jack Langberg (PIRSA, pers. comm.).

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

- value of output;
- employment;
- household income; and
- contribution to gross state or regional 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 Gross Regional Product (GRP) 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 or GRP is a measure of the net contribution of an activity to the state/regional economy. Contribution to GSP or GRP 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 or GRP 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 impacts at the state and regional levels

Estimates of the economic impact generated in 2005/06 by the Lakes and Coorong fishing industry in South Australia and the Murraylands region are outlined in Tables 3.5 and 3.6, respectively.

For each measure of economic activity, the impacts at the state level are greater than regional level impacts. This is to be expected, as the regional impact is simply a component, albeit a significant one, of the total state impact.

The direct impact measures fishing and downstream activities (i.e. 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 effects.

Value of output...

The value of output generated directly in South Australia and the Murraylands region by Lakes and Coorong fishing enterprises summed to \$6.7 million in 2005/06 (Tables 3.5 and 3.6), while output generated in South Australia by associated downstream activities (processing, transport, retail/food services and capital expenditure) summed to \$5.8 million (\$1.5 million in the Murraylands region, Table 3.6).

Flow-ons to other sectors of the state economy added another \$13.7 million in output (\$4.9 million in the regional economy). The sectors most affected were the manufacturing, trade, business services and transport sectors.

Table 3.5 The economic impact of the Lakes and Coorong fishing industry in South Australia, 2005/06

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	6.7	25.5%	74	37.5%	2.6	32.7%	4.5	33.5%
Processing	1.4	5.3%	4	2.2%	0.2	2.5%	0.3	2.4%
Transport	1.2	4.5%	5	2.8%	0.4	4.8%	0.6	4.2%
Retail	1.4	5.5%	21	10.8%	0.6	7.6%	0.7	5.4%
Food services	1.5	5.7%	13	6.4%	0.4	4.8%	0.6	4.3%
Capital expenditure ^b	0.3	1.3%	2	1.3%	0.1	1.1%	0.1	0.9%
Total Direct ^c	12.5	46.4%	120	59.7%	4.3	52.3%	6.8	49.8%
Flow-on effects								
Trade	2.2	8.3%	24	12.2%	0.8	10.2%	1.0	7.6%
Manufacturing	2.8	10.8%	9	4.5%	0.4	5.2%	0.7	4.9%
Business Services	1.8	6.8%	11	5.4%	0.7	8.2%	0.9	6.4%
Transport	0.7	2.5%	3	1.5%	0.2	2.7%	0.3	2.3%
Other Sectors	6.3	24.0%	30	15.4%	1.6	20.3%	3.8	28.0%
Total Flow-on ^c	13.7	52.3%	77	39.1%	3.7	46.6%	6.6	49.2%
Total ^c	26.2	100.0%	197	100.0%	8.0	100.0%	13.4	100.0%
Total/Direct	2.1	-	1.6	-	1.9	-	2.0	-
Total/Tonne	\$11,100	-	0.08	-	\$3,300	-	\$5,704	-

^a Full-time equivalent jobs. Direct employment in the fishing industry was comprised of 52 full-time jobs and 51 part-time jobs, that is, 103 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.

Employment and household income...

In 2005/06, the Lakes and Coorong Fishery was responsible for direct employment of around 74 full-time equivalents and downstream activities created employment of around 46 fte jobs state-wide. Flow-on business activity was estimated to generate a further 77 fte jobs state-wide (37 jobs regionally). These state-wide jobs were concentrated in the trade (24), business services (11) and manufacturing (9) sectors.

Personal income of \$2.6 million was earned in the fishing sector (wages of employees and estimated drawings by owner/operators) and \$1.7 million in downstream activities in SA. An additional \$3.7 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 \$8.0 million in SA (\$4.3 million in the Murraylands region).

Table 3.6 The economic impact of the Lakes and Coorong fishing industry in the Murraylands region, 2005/06

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	6.7	51.0%	74	61.5%	2.6	60.1%	4.5	59.1%
Processing	0.7	5.3%	2	1.8%	0.1	2.1%	0.2	2.5%
Transport	0.6	4.5%	4	3.2%	0.2	4.7%	0.3	3.7%
Retail	0.0	0.3%	1	0.6%	0.0	0.4%	0.0	0.3%
Food services	0.0	0.3%	0	0.4%	0.0	0.3%	0.0	0.2%
Capital expenditure ^b	0.2	1.3%	2	1.9%	0.1	1.5%	0.1	1.1%
Total Direct ^c	8.2	61.5%	83	67.6%	3.0	67.7%	5.1	65.8%
Flow-on effects								
Trade	1.1	8.6%	15	12.7%	0.4	9.7%	0.5	7.0%
Manufacturing	0.6	4.6%	2	1.6%	0.1	1.8%	0.2	2.1%
Business Services	0.4	3.2%	3	2.3%	0.1	3.3%	0.2	2.6%
Transport	0.2	1.4%	1	1.0%	0.1	1.5%	0.1	1.1%
Other Sectors	2.6	19.5%	16	12.9%	0.6	14.6%	1.5	20.3%
Total Flow-on ^c	4.9	37.2%	37	30.5%	1.3	30.8%	2.5	33.1%
Total ^c	13.1	100.0%	120	100.0%	4.3	100.0%	7.6	100.0%
Total/Direct	1.6	-	1.4	-	1.4	-	1.5	-
Total/Tonne	\$5,500	-	0.05	-	\$1,800	-	\$3,200	-

^a Full-time equivalent jobs. Direct employment in the fishing industry was comprised of 52 full-time jobs and 50 part-time jobs, that is, 103 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 and GRP...

As noted above, contribution to GSP or GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. In 2005/06, total Lakes and Coorong fishing industry related contribution to GSP in South Australia was \$13.4 million (\$7.6 million in the Murraylands region), \$4.5 million generated by fishing directly, \$2.3 million generated by downstream activities and \$6.6 million generated in other sectors of the state economy.

3.5 Economic Rent

Economic rent¹¹ is a measure of the economic efficiency with which a resource is utilised. If there are too many boats in a fishery, too much gear and too many people employed in a fishery, relative to the sustainable catch, business profits will be poor and economic rent will be correspondingly low or negative. With the prosperity of licence holders and legislative objectives in mind, a fishery should be managed in a manner that aims to maximise economic rent¹².

The long term costs all need to be covered if the licence holder is to remain in the fishery. These long-term 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 licence fees 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.

The economic rent for the years 2002/03 to 2005/06 for the Lakes and Coorong Fishery is outlined in Table 3.7. The economic rent generated in the Lakes and Coorong Fishery was estimated to be approximately \$1,172,000 in 2005/06 (Table 3.8), a 136 per cent increase compared to the previous year.

Table 3.7 Economic rent in the Lakes and Coorong Fishery, 2002/03 to 2005/06 ^a

	2002/03	2003/04	2004/05	2005/06
	(\$'000)	(\$'000)	(\$'000)	(\$'000)
Gross Income	4,466	5,382	5,495	6,680
Less Labour	1,972	2,072	2,242	2,445
Less Cash Costs (materials and services less labour and interest)	1,530	1,591	1,717	2,013
Less Depreciation	504	519	650	627
Less Opportunity Cost of Capital (@10%)	303	312	391	423
Economic Rent	156	887	496	1,172

^a Adjusted for bias.

Source: EconSearch analysis.

¹¹ Economic rent 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 Lakes and Coorong Fishery and the good produced is the landed fish.

¹² Where a fishery has limited entry and transferable licences (as with the Lakes and Coorong Fishery), the licences will carry a value that reflects the economic rents generated by the fishery. That is to say, the rents are capitalised into the licence values. As many licence holders view their licence as, at least, one component of their retirement or superannuation fund, it is important that the fishery is managed in a way that maximises the rents generated by the fishery.

4. Other Indicators

4.1 Factors Influencing the Economic Condition of the Lakes and Coorong Fishery

There are a number of factors in 2005/06 that have impacted on the economic performance of the fishery. Most of these are likely to continue to affect economic outcomes in the future.

4.1.1 Environmental/Climatic Conditions

In the survey of licence holders of November 2006, respondents highlighted drought as a factor that influences economic returns. Reduction in catch as a result of drought generally affects finfish species. Drought conditions can also have a negative influence on cockle recruitment. Rough weather periods and hot weather affects the oxygen levels and can influence the ability to catch some species.

Due to the individual needs of many native fish species in the Lakes and Coorong Fishery, the volume, timing, duration, frequency and quality of water released into the lower lakes and Coorong is critical to spawning and recruitment success, overall population health and productivity levels (Pierce and Doonan 1999). Reduced river flows from the River Murray also affect the migration of fish into some areas of the Coorong. Reduced flows and less frequent flooding have caused sand to build up in and around the Murray Mouth that impedes migration of marine species into the Lakes and Coorong and reduces water quality. Dredging operations have been undertaken to maintain the Murray Mouth since 2003.

Fish-ways have been introduced to barrages to allow fish movement between marine environments and freshwater systems. The introduction of pilot fish ways will be beneficial to the Lakes and Coorong Fishery in the medium to long term.

Crabs and stingrays are predators to some Lakes and Coorong species, thus an increase in their population can impact on the economic performance of the fishery.

4.1.2 Stock Assessment

A status report for all key species in the Lakes and Coorong Fishery is undertaken on an annual basis. In these reports fishery-dependent data are used to assess the performance of the Lakes and Coorong Fishery against the Performance Indicators prescribed in the Management Plan (Sloan 2005).

Further information about the condition of the stocks of key species can be found in the Management Plan for the South Australian Lakes and Coorong Fishery (Sloan 2005).

4.2 Licence Holder Comments

A number of licence holders, who participated in the November 2006 survey, raised several key issues that they felt affected the economic performance of their individual operations and the performance of the Lakes and Coorong Fishery as a whole.

4.2.1 Licence Fees

Many licence holders felt that licence fees were too high given their earning capacity in the fishery. There were also some equity issues raised by a few licence holders relating to the amount of licence fees charged. Some licence holders with a 25 net licence indicated that they are charged the same fee as those with a 50, 75 or 100 net licence, despite their lower earning potential.

Licence holders indicated that they could not afford any further increase in licence fees.

In a meeting held in February 2007, the Fisheries Management Committee committed to a review of the licence fees and gear entitlements to take place during 2007/08.

4.2.2 Markets for products

Some licence holders indicated that they found it difficult to catch adequate quantities to supply the Sydney Fish Market and indicated that demand for product from the Melbourne market was limited.

The majority of licence holders in the fishery indicated that there was a need to find an alternative market for European Carp and Bony Bream. Currently, Carp and Bony Bream are sold to Rock Lobster fishermen for bait. In the winter months the Rock Lobster fishery is closed and, due to a lack of an alternative market, tonnes of bait fish caught are discarded. Some suggestions were made for alternative low value uses including pet food and fertiliser. Developing and marketing new products requires significant capital investment. This acts as a barrier for many licence holders who are otherwise interested in exploring new markets.

4.2.3 Stock Assessments

Some licence holders indicated that, in their view, the stock assessment system failed to capture the multi-species and multi-zone nature of the fishery, as the assessments focus on individual species targeted in the fishery. These licence holders felt that it would be more beneficial to focus on the fishery as a whole.

When stocks of one particular species are low, licence holders indicated that they focus their efforts on catching an alternative species, this practice is typical of a multi-species fishery. Some licence holders suggested that, in their view, an overall assessment of all species in the fishery would provide a more accurate indication of the health of the fishery as a whole.

A small number of licence holders indicated that, in their view, catch per unit of effort (CPUE), used in the assessment of the stock abundance of particular species, fails to take into account changes in harvest strategies and techniques. This comment was generally made in relation to Goolwa Cockles. These, licence holders believed that the trend of declining CPUE for Goolwa cockles in recent years was in response to changes in the market destination of product caught rather than an indicator of the stock abundance of the species. Many Lakes and Coorong Fishery licence holders now target cockles that are suitable for the human consumption market rather than for bait, which requires a greater amount of fishing effort, resulting in a lower CPUE. The uncertainty in CPUE for Goolwa cockles is being addressed with revised logbooks and additional data collection.

Refining the stock assessment process has been a subject of recent discussions by the Fisheries Management Committee.

4.2.4 Value adding in the fishery

Several licence holders recognised the need for increased value adding of product caught in the fishery. Licence holders understood that there was potential to obtain a higher financial return through value adding. Exploring alternative value adding opportunities and developing a market for products requires significant capital investment. There would need to be a significant increase in economic rent in the fishery to fund innovation and development in the fishery.

A few licence holders expressed interest in investing in value-adding opportunities but were concerned regarding the security of access to the fishery resource.

Significant investment has already been made in equipment and market development for Goolwa Cockles for human consumption. Some licence holders have been able to market cockles for human consumption. Cockles have traditionally been sold for bait only. Cockles for human consumption are sold for between \$3.00 and \$5.00 per kilogram, while bait cockles sell for around \$1.60/kg.

Limited value-adding of European Carp are currently being explored. Given the abundance and low value of the species, successful value-adding has the potential to significantly increase financial returns in the fishery.

4.2.5 Management

Many licence holders felt that the focus of management should be on the whole of the fishery rather than individual species. Fishermen adapt to changes in conditions and stock structures by targeting alternative species or fishing in different regions. Licence holders felt that fisheries management should seek advice from fishermen to assist them in decision making.

Several licence holders felt that a greater proportion of funds collected through licence fees should be directed towards fisheries research and development. They also felt that there needed to be more transparency and accountability in the cost recovery process to ensure that all sectors (recreational and commercial) share the cost of fisheries management.

The majority of licence holders who provided comments indicated that they found it difficult to plan for the future due to uncertainty relating to long term access to the fishery. Many licence holders indicated that they would invest further in the fishery if they could be given some assurances.

4.2.6 Environmental issues

Licence holders, particularly those who had been fishing for several years, noted several environmental issues in the Lakes and Coorong system. Several licence holders indicated that the increasing scarcity of birdlife in the Coorong could partially be attributed to fishing activity but more significantly to increased tourism and recreational activity in the area.

A lack of flows into the Coorong from the Murray Mouth was also raised as a serious issue. The lack of fresh water flows has led to poor water quality in the Coorong, particularly in the Southern Lagoon. Management strategies employed for the River Murray can have serious implications for the fishery. Licence holders indicated that only one significant flood was enough to ensure good fishing for 6 or 7 years.

Some licence holders raised concerns regarding the significant residential development that has occurred on Hindmarsh Island in recent years. There were concerns that the development could have negative effects on water quality in the River Murray.

4.2.7 Other factors

There were several other comments made by licence holders regarding the fishery:

- Some licence holders indicated that it was difficult to find suitable employees to assist in the fishing business.
- Rising fuel prices was raised as an issue by many licence holders.
- Licence holders indicated that outboards ran on petrol fuel, therefore they pay road taxes on fuel used in fishing vessels. Diesel fuel used in boats and other off-road equipment is eligible for a rebate of these taxes, however, petrol fuel is not. Boat fuel was one of the most significant costs of fishing in 2005/06 (Table 3.4).

4.3 Prices for Lakes and Coorong Fishery Product

4.3.1 Wholesale prices for Lakes and Coorong Fishery species in South Australia

An outline of wholesale prices for fish species in South Australia for the period 1992/93 to 2005/06 is provided in Table 4.1. Wholesale prices in SA have trended upwards during this period for most species.

Table 4.1 Average annual wholesale price for Lakes and Coorong Fishery species, South Australia, 1992/93 to 2005/06 (\$/kg)

	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Australian Salmon	\$1.00	\$1.00	-	\$1.20	\$1.33	\$1.25	\$1.33	\$1.25	\$1.00	\$1.00	\$1.00	\$1.50	\$1.25	\$1.33
Black Bream	\$5.67	\$7.00	\$8.33	\$8.25	\$8.50	\$10.50	\$10.00	\$9.25	\$8.29	\$8.75	\$9.17	\$10.00	\$9.17	\$9.86
Bony Bream	\$0.78	\$0.71	\$0.83	\$0.80	\$0.80	\$0.87	\$0.89	\$1.12	\$1.08	\$1.89	\$1.07	\$1.04	\$1.00	\$1.00
Callop	\$5.71	\$6.19	\$8.40	\$9.48	\$11.96	\$11.20	\$12.15	\$14.93	\$12.56	\$7.53	\$15.35	\$14.34	\$14.21	\$15.48
European Carp	\$0.97	\$0.85	\$1.21	\$0.87	\$0.86	\$0.93	\$1.46	\$2.09	\$1.83	\$2.20	\$1.85	\$1.80	\$1.71	\$1.30
Goolwa Cockle	\$1.69	\$1.44	\$1.45	\$1.46	\$1.33	\$1.06	\$1.73	\$1.45	\$1.96	\$1.68	\$1.85	\$2.15	\$1.96	\$3.61
Flounder	\$3.93	\$4.50	\$4.50	\$4.57	\$4.93	\$5.64	\$4.71	\$5.48	\$5.95	\$7.04	\$8.83	\$8.17	\$8.67	\$8.86
Yellow-Eye Mullet	\$2.85	\$3.27	\$2.99	\$3.27	\$3.80	\$3.44	\$4.18	\$5.15	\$5.55	\$5.13	\$2.35	\$2.32	\$2.23	\$2.46
Mulloway	\$5.35	\$5.22	\$5.83	\$5.75	\$5.54	\$6.06	\$6.00	\$6.99	\$6.06	\$6.75	\$6.81	\$6.20	\$6.58	\$6.09
Redfin	\$4.95	\$4.54	\$6.01	\$6.98	\$6.67	\$6.21	\$6.71	\$6.91	\$7.71	\$8.05	\$4.17	n.a.	n.a.	n.a.
Other Species	\$1.00	\$1.67	\$2.00	\$1.33	\$1.63	\$2.25	\$3.25	\$3.60	\$2.80	\$6.00	\$3.50	\$3.50	\$3.86	\$4.38
Total	\$1.65	\$1.60	\$2.08	\$2.00	\$2.02	\$1.93	\$2.43	\$2.59	\$2.74	\$2.75	\$2.26	\$2.54	\$2.50	\$3.24

Source: Derived from Knight et al. (2004) and SARDI Aquatic Sciences.

4.3.2 Prices for Lakes and Coorong Fishery product in other domestic markets

As stated in Section 3.1, the gross value of catch data sourced from SARDI Aquatic Sciences are estimated on the basis of information provided by processors in South Australia.

The differential between wholesale prices in Adelaide and in the Sydney and Melbourne fish markets is illustrated in Table 4.2 for the three years 2003/04 to 2005/06 and in Figure 4.1 for 2005/06. Even allowing for freight and commission, it is likely that the gross value of production estimates for the Lakes and Coorong Fishery, as estimated by SARDI Aquatic Sciences (Knight et al. 2004), have been underestimated.

The lower prices obtained in Adelaide for some species can be attributed to two interrelated factors. One is that the average quality of fish sold in Adelaide is not as high as that being marketed interstate. The second factor is that consumer numbers in specialist markets (e.g. Asian and Jewish) are much lower in Adelaide than interstate and, therefore, there is not the demand to support prices for the high quality product sought in these markets.

In years where the catch of some species is low Adelaide prices reach a similar level to Melbourne and Sydney. Catch of Black Bream dropped to 7 tonnes in 2005/06 (Table 3.1), accordingly, there was only a small difference in price between Adelaide, Sydney and Melbourne.

Table 4.2 Prices for Lakes and Coorong Fishery species; wholesale prices in South Australia and the Melbourne and Sydney fish markets, 2003/04 to 2005/06^a

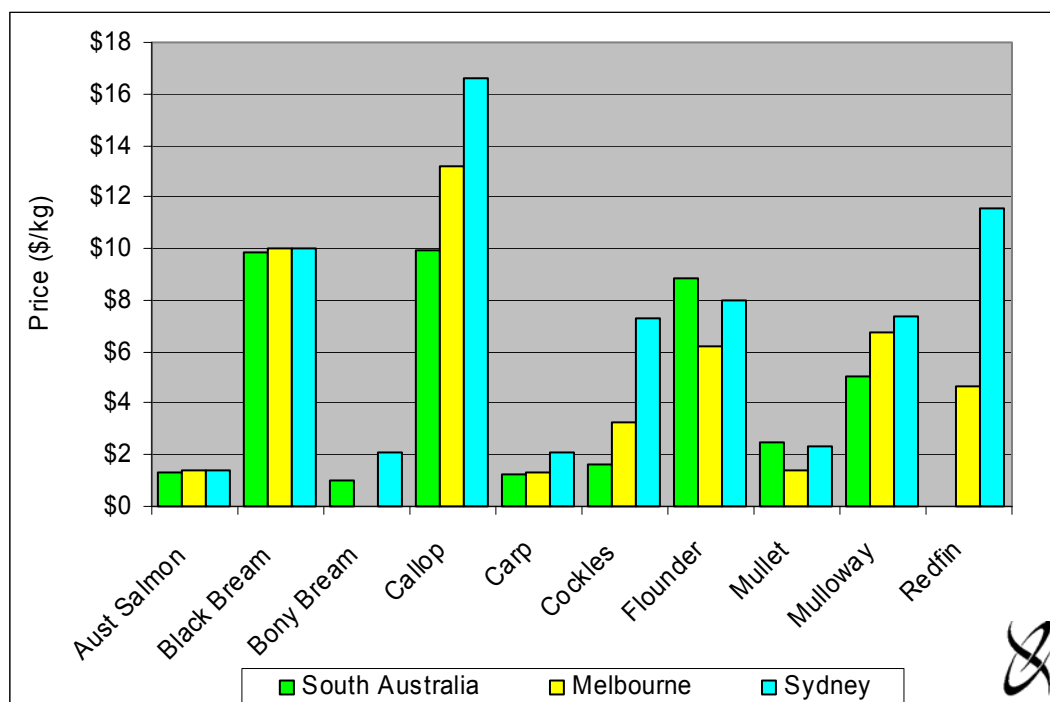
Major Species	Adelaide			Melbourne ^b			Sydney ^b		
	2003/04	2004/05	2005/06	2003/04	2004/05	2005/06	2003/04	2004/05	2005/06
Australian Salmon	\$1.50	\$1.25	\$1.33	\$0.74	\$1.03	\$1.36	-	\$1.24	\$1.38
Black Bream	\$10.00	\$9.17	\$9.86	\$10.17	\$9.29	\$10.02	\$12.19	-	\$10.04
Bony Bream	\$1.04	\$1.00	\$1.00	-	-	-	\$1.61	\$1.89	\$2.13
Callop	\$10.18	\$10.09	\$9.93	\$12.94	\$13.40	\$13.21	\$17.59	\$16.87	\$16.63
European Carp	\$0.69	\$0.66	\$1.24	\$1.20	\$1.30	\$1.30	\$2.11	\$2.05	\$2.10
Goolwa Cockle	\$1.34	\$1.22	\$1.61	\$2.44	\$7.60	\$3.26	\$3.60	\$4.77	\$7.32
Flounder	\$8.17	\$8.67	\$8.86	\$7.54	\$7.50	\$6.19	-	-	\$8.02
Yellow-Eye Mullet	\$2.32	\$2.23	\$2.46	\$1.18	\$1.85	\$1.36	-	-	\$2.36
Mulloway	\$5.23	\$5.54	\$5.08	\$5.90	\$4.38	\$6.76	-	\$7.39	\$7.36
Redfin	-	-	-	\$1.50	\$2.72	\$4.62	\$11.88	\$12.07	\$11.55

^a Weighted average nominal prices.

^b All prices reported from Sydney and Melbourne Fish Markets are wholesale, that is, before commission is taken into account. Currently, Sydney Fish Markets charges 9 per cent commission plus an environmental levy of 0.025 per cent. Melbourne Fish Market charges 11 per cent commission. Sydney market prices for 2003/04 are for product sourced from South Australia only. Melbourne market prices for all years and Sydney prices for 2004/05 and 2005/06 are for product from all sources within Australia.

Source: SARDI Aquatic Sciences, Tim Rieniets (Melbourne Wholesale Fish Markets, pers. comm.) and Samantha Dawes (DPI – NSW Fisheries, pers. comm.)

Figure 4.1 Prices for Lakes and Coorong Fishery species in South Australia, Melbourne and Sydney, 2005/06 ^a



^a Where data has been omitted it was either unavailable or no product was sold in that market.

Source: SARDI Aquatic Sciences, Tim Rieniets (Melbourne Wholesale Fish Markets, pers. comm.) and Samantha Dawes (DPI – NSW Fisheries, pers. comm.).

4.4 Contribution to the Community

In addition to the economic contribution made to the regional and state economies (Section 3.5), the Lakes and Coorong Fishery also contributes to the social, environmental and heritage values of the region, through involvement in community-support activities and contribution to the provision, maintenance and expansion of local and regional services and businesses.

4.4.1 Community-support activities

The estimated time spent on community-support activities by licence holders (including licence holder's family members and employees) in 2005/06 is summarised in Table 4.3.

On average, each licence holder (including family members and employees) spent at almost 3 days (21 hours) per month on community-support activities. Almost 6 hours per month were spent on attending fishing and Lakes and Coorong region related meetings, etc.

Table 4.3 Estimated time per month spent on community-support activities, 2005/06

Community Activity	Hours per month	
	Average Per Licence Holder	All Licence Holders ^a
Conservation activities (e.g. bird watch, water watch)	1.1	41
Marine rescue and recovery	3.2	116
Attending meetings, seminars, workshops	5.9	211
Compiling fishing-related information for research purposes	3.0	107
Provision of technical advice to committees, panels	3.4	123
Volunteering for community services (e.g. CFS, SES)	3.3	119
Other	0.6	22
Total^b	20.5	737

^a Calculation based on scaling up average hours per month per licence holder for all 37 licence holders.

^b Totals may not sum due to rounding.

Source: 2006 survey response.

Lakes and Coorong Fishery licence holders, as a whole, spent a minimum of almost 740 hours per month on community-support activities.

Assuming the value of time foregone is approximately \$20 per hour¹³, the average value of each licence holder's time spent on community-support activities was at least \$410 per month or \$4,915 for the full year (2005/06). On a whole of fishery basis, the aggregate value of time spent on community-support activities was at least \$14,750 per month or around \$177,000 for the full year.

In addition to the above mentioned community-support activities, licence holders indicated that there are a number of other ways that the Lakes and Coorong Fishery contributes to social, environmental and heritage values of the local community including:

- assisting local sporting clubs (e.g. coaching, fundraising, social events);
- removal of introduced pest species of fish (i.e. carp, redfin);
- removal of rubbish from water, lake banks etc.;
- donating fish to community groups for fundraising, school camps etc.;
- caring for the elderly (e.g. cooking, donating fish, Meals on Wheels);
- reporting illegal fishing activities to PIRSA, police and National Parks and Wildlife Service;

¹³ Valuation of time is a difficult concept. The key question is whether one should use the value of time in work to value time spent on leisure or other non-work related activities. The use of \$20 per hour is an approximation of the opportunity cost of time in work for the average person (i.e. an approximation of the average wage rate). The Australian Bureau of Statistics used 3 methods to value volunteers' time and produced a range of estimates from \$19.29/hr to \$22.51/hr in 2006 dollars (inflated from 1997 estimates (Ironmonger 2002, p. 3)).

- assisting local schools (i.e. taking on work experience students, assisting with reading programs, donating fish for camps, supervising school camps, taking students on tours of the Coorong), etc.;
- assisting government agencies and university students undertaking research into the fishery;
- identifying aboriginal sites;
- office bearer/member of local associations (i.e. Town Hall, sporting clubs, Local Council, Parents and Friends Committee); and
- passing on valuable knowledge and information regarding the Lakes and Coorong environment and the fishing industry to local residents from outside the fishing community, tourists and recreational fishers.

4.4.2 Local and regional services/businesses

The operation of the Lakes and Coorong Fishery (and the employment the fishery generates and the households it maintains) has either directly or indirectly contributed to the provision, maintenance and expansion of a number of local and regional services and businesses. A summary of the Lakes and Coorong Fishery's contribution to various services and businesses is provided in Table 4.4.

Note that some of the fishery's contribution to the community is quantified in section 3.6, but the need for services (e.g. schools, police etc.) and the contributions to various organisations (e.g. hospitals) means the fishery contributes to the community in more ways than just generating income and the direct purchase of goods and services.

While it was difficult to quantify the contribution the fishery makes to local and regional services and businesses, an estimate was made of the number of children from fishing families and fishing families' employees that attended local schools.

Of those who participated in the survey there were 66 children (under the age of 18) who were members of fishing families and fishing families' employees in 2005/06. Thirty-one children belonged to licence holder families and 35 were children of employees. Of these 66 children, 60 of them attended local schools. Twenty-five children assisted with fishing operations.

Table 4.4 Fishery contribution to local and regional services/businesses, 2005/06

Service/Business	Location	Fishery Contribution
School	Goolwa, Meningie, Milang, Victor Harbour	Children attend, donate fish, cooking classes
Schools/Universities	Adelaide, Goolwa, Meningie, Murray Bridge, Victor Harbour	Work experience for students, provide advice
Hospitality/food service industry	Clayton, Goolwa, Meningie	Supply fish
Sporting Clubs/Community Groups/Fundraisers	Goolwa, Meningie	Supply fish
Animal Welfare League	Goolwa	Supply fish
Fishing Club	Meningie	Donate cockles for bait
Fish buyers	Adelaide, Meningie	Supply fish
Fish processing	Meningie, Murray Bridge	Supply fish
Marine supplies dealers	Goolwa, Meningie	Purchase nets, tackle etc.
Fuel suppliers	Goolwa, Meningie	Purchase fuel for boats and vehicles
Hospital	Meningie	Donate fish for meals
Fish retailers (e.g. supermarkets, butchers, fish shops)	Meningie, Murray Bridge	Supply fish
Freight carriers	Adelaide, Goolwa, Meningie, Murray Bridge	Transport fish to markets
Ice suppliers	Meningie, Murray Bridge, Victor Harbour	Purchase ice
Cockle processors/exporters	Goolwa	Supply cockles
Mechanics	Goolwa, Meningie	Vehicle and boat maintenance
Boat makers	Goolwa	Purchase boats and motors
SZ rock lobster licence holders	Kangaroo Island, Kingston SE	Supply bait

Source: 2006 survey response.

4.5 Other Indicators

In addition to financial information, a range of other information was collected from licence holders during the survey regarding their fishing operations.

4.5.1 Time in fishery

The number of years that licence holders in the Lakes and Coorong Fishery had owned fishing licences ranged from 1 year to 42 years, with an average length of ownership by individual licence holders of 15 years.

Several fishing families have held licences for a number of generations. On average, each family had held a licence for 17 years, however, this timeframe ranged from 1 year to 56 years.

4.5.2 Age of licence holders

The majority of licence holders were aged between 36 and 50 years at the time of the survey, with the highest number of licence holders in the 36-40 year and 46-50 year age bracket (25 per cent in each) (Table 4.5).

The average age of Lakes and Coorong Fishery licence holders is considerably lower than that for South Australian owner/managers of broad acre and livestock properties. In 2004/05, the average age of farm owner/managers was 53 years (ABARE 2006).

Table 4.5 Age of Lakes and Coorong Fishery licence holders, 2005/06

Age Bracket (years)	Number from Survey Sample	Proportion
< 25	0	0%
26-30	0	0%
31-35	1	4%
36-40	6	25%
41-45	4	17%
46-50	6	25%
51-55	2	8%
55-60	1	4%
> 60	4	17%
Total	24	100%

Source: 2006 survey response.

4.5.3 Fishing location

Survey respondents fished in three locations: the lakes (i.e. Lakes Alexandrina and Albert), the Coorong and the Southern Ocean (near the River Murray mouth). The majority of licence holders (approximately 60 per cent) indicated that they fished in more than one of these locations during the 2005/06 season. In 2005/06, the lakes were the most popular location fished. Eighty-three per cent of survey respondents (20 licence holders) indicated that they fished in the lakes, 67 per cent (16 licence holders) fished in the Coorong and 46 per cent fished in the ocean (11 licence holders). This highlights the importance of the lakes and Coorong to the commercial sustainability of the whole fishery with its existing number of licence holders. The ability of licence holders to shift effort between environments and between species clearly contributes to the long-term viability and sustainability of the resource.

4.5.4 Value of catch and effort data

Catch and effort data, recorded and submitted monthly to SARDI by Lakes and Coorong Fishery licence holders, are used in stock assessment and stock status reports. These data may also be used for other research, for example, these data are of particular interest to recreational fishers and for researchers monitoring the impact of changes in river management (i.e. changes in salinity, flow rates, river height etc.) on the health of the Lakes and Coorong ecosystem.

It was estimated from the 2006 survey of licence holders that, in total, licence holders spent approximately 107 hours per month compiling catch and effort data in 2005/06, which equated to 1,280 hours for the year. The value of licence holder's time spent on the collection of catch and effort data was almost \$26,000¹⁴ in total in 2005/06.

¹⁴ Assuming the value of licence holder's time foregone is approximately \$20/hour (section 4.3.1).

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Appendix 1 Economic Impact of the Lakes and Coorong Fishery, 2002/03 to 2004/05

Appendix Table 1.1 The economic impact of the Lakes and Coorong fishing industry in South Australia, 2002/03

Sector	Output		Value Added		Employment		Household Income	
	(\$m)	%	(\$m)	%	(jobs)	%	(\$m)	%
Direct effects								
Fishing	4.9	27.5%	3.4	35.8%	73	49.9%	2.2	42.8%
Processing	1.4	7.9%	0.4	4.0%	5	3.2%	0.2	4.6%
Transport	0.9	5.3%	0.5	5.0%	4	3.0%	0.2	4.7%
Retail	0.5	2.9%	0.3	2.7%	5	3.7%	0.2	3.2%
Food services	0.9	4.9%	0.4	4.3%	9	6.3%	0.2	4.1%
<i>Total Direct</i> ^a	8.7	48.6%	4.9	51.8%	97	66.1%	3.0	59.4%
Flow-on effects								
Trade	1.3	7.4%	0.6	6.8%	14	9.4%	0.4	8.1%
Manufacturing	2.3	12.7%	0.6	6.4%	8	5.2%	0.4	7.4%
Business Services	1.5	8.2%	0.7	7.0%	8	5.2%	0.4	7.2%
Transport	0.6	3.6%	0.3	3.4%	3	2.0%	0.2	3.2%
Other Sectors	3.5	19.6%	2.3	24.5%	18	12.2%	0.7	14.7%
<i>Total Flow-on</i> ^a	9.2	51.4%	4.5	48.2%	50	33.9%	2.1	40.6%
Total ^a	17.8	100.0%	9.4	100.0%	146	100.0%	5.1	100.0%
Total/Direct	2.29		2.10		1.67		1.81	

^a Totals may not sum due to rounding.

Source: EconSearch (2004b).

Appendix Table 1.2 The economic impact of the Lakes and Coorong fishing industry in the Lower Murray region, 2002/03

Sector	Output		Value Added		Employment		Household Income	
	(\$m)	%	(\$m)	%	(jobs)	%	(\$m)	%
Direct effects								
Fishing	4.9	49.8%	3.4	59.8%	73	61.4%	2.2	65.7%
Processing	0.6	5.8%	0.1	1.8%	2	1.4%	0.1	1.7%
Transport	0.5	4.8%	0.2	3.9%	5	4.4%	0.1	4.0%
Retail	0.0	0.2%	0.0	0.1%	0	0.2%	0.0	0.2%
Food services	0.0	0.3%	0.0	0.2%	0	0.3%	0.0	0.2%
<i>Total Direct</i> ^a	6.0	60.8%	3.7	65.8%	80	67.7%	2.4	71.8%
Flow-on effects								
Trade	0.9	9.4%	0.5	8.2%	16	13.5%	0.3	10.2%
Manufacturing	0.8	8.3%	0.2	3.4%	5	3.8%	0.1	3.5%
Business Services	0.3	3.3%	0.1	2.2%	2	1.9%	0.1	2.6%
Transport	0.2	2.4%	0.1	1.9%	3	2.1%	0.1	2.0%
Other Sectors	1.6	15.9%	1.0	18.6%	13	11.0%	0.3	9.9%
<i>Total Flow-on</i> ^a	3.9	39.2%	1.9	34.2%	38	32.3%	0.9	28.2%
Total ^a	9.8	100.0%	5.6	100.0%	119	100.0%	3.3	100.0%
Total/Direct	1.65		1.53		1.48		1.40	

^a Totals may not sum due to rounding.

Source: EconSearch (2004b).

Appendix Table 1.3 The economic impact of the Lakes and Coorong fishing industry in South Australia, 2003/04

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	5.4	24.5%	73	38.6%	2.3	33.4%	3.6	32.4%
Processing	1.3	5.7%	4	2.3%	0.2	2.7%	0.3	2.6%
Transport	0.8	3.5%	4	2.1%	0.2	3.7%	0.4	3.3%
Retail	1.3	5.9%	21	11.2%	0.5	8.0%	0.7	5.9%
Food services	1.3	6.1%	13	6.6%	0.3	5.0%	0.5	4.7%
Capital expenditure ^b	0.3	1.3%	2	1.3%	0.1	1.1%	0.1	0.9%
Total Direct ^c	10.3	45.6%	118	60.7%	3.7	52.8%	5.5	48.8%
Flow-on effects								
Trade	1.9	8.5%	23	12.0%	0.7	10.3%	0.9	7.8%
Manufacturing	2.5	11.2%	9	4.5%	0.4	5.3%	0.6	5.2%
Business Services	1.5	6.9%	10	5.3%	0.6	8.1%	0.7	6.5%
Transport	0.5	2.5%	3	1.5%	0.2	2.6%	0.3	2.3%
Other Sectors	5.3	24.0%	28	14.8%	1.4	19.9%	3.2	28.4%
Total Flow-on ^c	11.7	53.1%	72	38.0%	3.1	46.2%	5.6	50.3%
Total ^c	22.0	100.0%	190	100.0%	6.8	100.0%	11.1	100.0%
Total/Direct	2.1	-	1.6	-	1.9	-	2.0	-
Total/Tonne	\$10,300	-	0.09	-	\$3,200	-	\$5,251	-

^a Full-time equivalent jobs. Direct employment in the fishing industry was comprised of 36 full-time jobs and 75 part-time jobs, that is, 111 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 (2005a).

Appendix Table 1.4 The economic impact of the Lakes and Coorong fishing industry in the Murraylands region, 2003/04

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	5.4	49.7%	73	62.8%	2.3	61.2%	3.6	57.8%
Processing	0.6	5.8%	2	1.9%	0.1	2.2%	0.2	2.7%
Transport	0.4	3.5%	3	2.4%	0.1	3.6%	0.2	2.9%
Retail	0.0	0.4%	1	0.6%	0.0	0.4%	0.0	0.3%
Food services	0.0	0.4%	0	0.4%	0.0	0.3%	0.0	0.3%
Capital expenditure ^b	0.1	1.2%	2	1.1%	0.0	0.7%	0.1	0.6%
Total Direct ^c	6.6	59.7%	82	68.1%	2.6	67.7%	4.1	64.0%
Flow-on effects								
Trade	1.0	9.0%	15	12.5%	0.4	9.8%	0.5	7.4%
Manufacturing	0.6	5.2%	2	1.7%	0.1	2.0%	0.2	2.5%
Business Services	0.3	3.2%	3	2.1%	0.1	3.2%	0.2	2.7%
Transport	0.2	1.4%	1	0.9%	0.1	1.4%	0.1	1.2%
Other Sectors	2.2	20.3%	15	12.8%	0.5	14.5%	1.3	21.3%
Total Flow-on ^c	4.2	39.1%	35	30.1%	1.2	30.9%	2.2	35.0%
Total ^c	10.8	100.0%	117	99.3%	3.7	99.4%	6.2	99.6%
Total/Direct	1.6	-	1.4	-	1.4	-	1.5	-
Total/Tonne	\$5,100	-	0.06	-	\$1,700	-	\$2,900	-

^a Full-time equivalent jobs. Direct employment in the fishing industry was comprised of 36 full-time jobs and 75 part-time jobs, that is, 111 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 (2005a).

Appendix Table 1.5 The economic impact of the Lakes and Coorong fishing industry in South Australia, 2004/05

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	5.5	23.9%	73	38.2%	2.5	34.0%	3.6	31.1%
Processing	1.3	5.6%	4	2.3%	0.2	2.6%	0.3	2.6%
Transport	0.8	3.4%	4	2.1%	0.3	3.6%	0.4	3.3%
Retail	1.4	5.9%	21	11.1%	0.6	7.8%	0.7	5.9%
Food services	1.4	6.0%	13	6.5%	0.4	4.9%	0.5	4.7%
Capital expenditure ^b	0.3	1.3%	2	1.2%	0.1	1.1%	0.1	0.9%
Total Direct ^c	10.6	44.9%	118	60.1%	3.9	52.9%	5.6	47.6%
Flow-on effects								
Trade	2.0	8.6%	23	12.2%	0.7	10.2%	0.9	8.0%
Manufacturing	2.6	11.3%	9	4.6%	0.4	5.3%	0.6	5.3%
Business Services	1.6	6.9%	10	5.3%	0.6	8.1%	0.8	6.6%
Transport	0.6	2.5%	3	1.5%	0.2	2.6%	0.3	2.4%
Other Sectors	5.6	24.4%	29	15.1%	1.4	19.9%	3.4	29.2%
Total Flow-on ^c	12.4	53.8%	74	38.6%	3.3	46.0%	5.9	51.5%
Total ^c	23.0	100.0%	192	100.0%	7.2	100.0%	11.5	100.0%
Total/Direct	2.2	-	1.6	-	1.9	-	2.1	-
Total/Tonne	\$10,400	-	0.09	-	\$3,200	-	\$5,238	-

^a Full-time equivalent jobs. Direct employment in the fishing industry was comprised of 36 full-time jobs and 75 part-time jobs, that is, 111 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 (2006a).

Appendix Table 1.6 The economic impact of the Lakes and Coorong fishing industry in the Murraylands region, 2004/05

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	5.5	48.8%	73	62.2%	2.5	61.7%	3.6	56.2%
Processing	0.6	5.8%	2	1.9%	0.1	2.1%	0.2	2.7%
Transport	0.4	3.5%	3	2.4%	0.1	3.5%	0.2	3.0%
Retail	0.0	0.4%	1	0.6%	0.0	0.4%	0.0	0.3%
Food services	0.0	0.4%	0	0.4%	0.0	0.3%	0.0	0.3%
Capital expenditure ^b	0.1	1.2%	2	1.8%	0.1	1.3%	0.1	1.0%
Total Direct ^c	6.8	58.8%	82	67.5%	2.8	68.0%	4.0	62.5%
Flow-on effects								
Trade	1.0	9.2%	15	12.8%	0.4	9.8%	0.5	7.7%
Manufacturing	0.6	5.4%	2	1.7%	0.1	2.0%	0.2	2.6%
Business Services	0.4	3.2%	3	2.2%	0.1	3.1%	0.2	2.7%
Transport	0.2	1.4%	1	1.0%	0.1	1.4%	0.1	1.2%
Other Sectors	2.3	20.8%	15	13.0%	0.6	14.4%	1.4	22.2%
Total Flow-on ^c	4.5	40.1%	36	30.7%	1.2	30.7%	2.3	36.5%
Total ^c	11.3	100.0%	118	100.0%	4.0	100.0%	6.4	100.0%
Total/Direct	1.7	-	1.4	-	1.4	-	1.6	-
Total/Tonne	\$5,100	-	0.05	-	\$1,800	-	\$2,800	-

^a Full-time equivalent jobs. Direct employment in the fishing industry was comprised of 36 full-time jobs and 75 part-time jobs, that is, 111 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 (2006a).

Appendix 2 Summary Economic Indicators for South Australian Commercial Fisheries

Appendix Table 2.1 Commercial fisheries catch, South Australia, 1990/91 – 2004/05 (tonnes)

Year	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lobster	Nth'n Zone Rock Lobster	Blue Swimmer Crabs	Inland Waters ^a	Pilchards	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

^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 (2006b)

Appendix Table 2.2 Commercial fisheries gross value of production, South Australia, 1990/91 – 2004/05 (\$m)

Year	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lobster	Nth'n Zone Rock Lobster	Blue Swimmer Crabs	Inland Waters ^a	Pilchards	Other Marine Species ^b	Total SA Fisheries ^c
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

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

^b SARDI estimates for the years 1990/91 to 2002/03, revalued SARDI estimates for 2003/04 and 2004/05 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 (2006b).

Appendix Table 2.3 Cost of management in South Australian commercial fisheries, 2004/05

	Licence Fees (\$'000)	GVP (\$'000)	Fees/ GVP (%)	Catch ('000kg)	Fees/ Catch (\$/kg)	Licence Holders (no.)	Fees/ Licence (\$/licence)
Abalone	2,335	33,821	6.9%	902	\$2.59	35	\$66,715
GSV Prawns	259	3,761	6.9%	213	\$1.22	10	\$25,936
SG & WC Prawns	763	32,043	2.4%	1,960	\$0.39	42	\$18,158
Sth'n Zone Rock Lobster	2,497	54,397	4.6%	1,897	\$1.32	180	\$13,870
Nth'n Zone Rock Lobster	1,076	11,643	9.2%	446	\$2.41	69	\$15,600
Blue Crabs - Pots	206	3,322	6.2%	584	\$0.35	8	\$25,695
Blue Crabs – Marine Scale	49	269	18.1%	47	\$1.03	14	\$3,479
Lakes and Coorong ^a	243	5,495	4.4%	2,198	\$0.11	37	\$6,562
Marine Scalefish	1,469	20,878	7.0%	3,810	\$0.39	394	\$3,728
Pilchards	991	28,476	3.5%	56,952	\$0.02	14	\$70,783
Total SA	9,887	194,105	5.1%	69,010	\$0.14	803	\$12,312

^a Excludes the River fishery.

Source: EconSearch (2006b).

Appendix Table 2.4 Financial performance in South Australian commercial fisheries, 2004/05, (\$'000) (average per boat)

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs Pot Sector ^a	Blue Crabs MS Sector ^a	Marine Scalefish ^b	Pilchards	Lakes and Coorong
Gross Income	1,015.7	370.2	708.1	314.2	222.3	4,164.7	248.6	55.0	2,422.1	163.2
Costs										
Fuel	14.4	35.9	62.4	18.2	45.4	607.8	42.0	6.4	88.8	10.8
R&M	35.9	20.7	53.5	16.6	17.5	538.0	50.1	5.9	173.2	8.1
Labour	259.5	139.0	237.4	87.0	95.5	1,042.3	84.9	31.2	861.4	66.6
Licence fee	65.1	27.1	20.8	15.8	19.4	205.6	48.7	4.3	70.6	6.4
Insurance	6.6	18.3	19.2	6.2	8.4	62.1	9.3	1.8	38.0	1.3
Interest	4.9	28.6	41.3	21.7	31.5	607.1	8.5	0.3	33.4	4.4
Admin & Other	50.5	24.4	53.7	20.2	50.5	278.0	26.1	10.0	80.1	24.3
Total Cash Costs	436.8	294.0	488.3	185.6	268.3	3,340.9	269.5	60.1	1,345.5	122.0
Cash Operating Surplus	578.9	76.1	219.8	128.6	-46.0	823.9	-21.0	-5.1	1,076.6	41.2
Depreciation	54.3	154.4	160.6	48.0	55.4	337.0	48.3	8.9	146.2	19.3
Earnings Before Tax	524.6	-78.3	59.2	80.6	-101.4	486.8	-69.3	-14.0	930.4	21.9
EBIT^c	529.5	-49.7	100.5	102.3	-69.9	1,094.0	-60.8	-13.7	963.8	26.3
Capital										
Fishing Gear & Equipment	272.2	1,142.6	1,455.9	351.8	431.1	3,373.7	407.4	88.2	1,389.1	116.1
Licence Value	8,525.0	3,100.0	4,040.9	2,682.4	1,374.2	21,394.6	1,180.5	94.0	9,123.9	139.0
Total Capital	8,797.2	4,242.6	5,496.9	3,034.2	1,805.2	24,768.3	1,587.9	182.2	10,513.0	255.0
Rate of Return to Gear/Equip	194.5%	-4.3%	6.9%	29.1%	-16.2%	32.4%	-14.9%	-15.5%	69.4%	22.7%
Rate of Return to Capital	6.0%	-1.2%	1.8%	3.4%	-3.9%	4.4%	-3.8%	-7.5%	9.2%	10.3%

^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 2.2. 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 (2006b).

Appendix Table 2.5 Costs as a percentage of total cash costs in South Australian commercial fisheries, 2004/05

	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	Pilchards	Lakes & Coorong
Fuel	3%	12%	13%	10%	17%	18%	16%	11%	7%	9%
R&M	8%	7%	11%	9%	7%	16%	19%	10%	13%	7%
Labour	59%	47%	49%	47%	36%	31%	32%	52%	64%	55%
Licence fee	15%	9%	4%	8%	7%	6%	18%	7%	5%	5%
Insurance	2%	6%	4%	3%	3%	2%	3%	3%	3%	1%
Interest	1%	10%	8%	12%	12%	18%	3%	0%	2%	4%
Admin & Other	12%	8%	11%	11%	19%	8%	10%	17%	6%	20%
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 (2006b).

Appendix Table 2.6 Economic impacts of South Australian commercial fisheries, 2004/05

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish	Pilchards	Lakes and Coorong	All Fisheries ^a
Output (\$m)										
Direct										
Fishing	33.8	3.8	32.0	54.4	11.6	4.4	20.9	28.5	5.5	194.9
Downstream ^b	4.7	2.0	16.9	24.4	6.2	3.1	11.1	0.8	5.1	74.3
All other sectors (indirect)	28.8	6.5	48.8	73.6	29.9	8.5	45.7	28.2	12.4	282.4
Total	67.4	12.3	97.8	152.4	47.7	16.0	77.7	57.5	23.0	551.6
Total/Direct	1.7	2.1	2.0	1.9	2.7	2.1	2.4	2.0	2.2	2.0
Total/Tonne (\$)	\$74,600	\$57,700	\$49,800	\$80,300	\$107,000	\$25,300	\$20,300	\$1,000	\$10,400	\$12,255
Contribution to GSP (\$m)										
Direct										
Fishing	27.8	2.4	22.9	39.8	2.7	2.4	9.5	22.1	3.6	133.2
Downstream	1.6	0.8	7.0	9.7	2.5	1.0	3.9	0.3	2.0	28.8
All other sectors (indirect)	14.0	3.2	23.3	35.5	14.3	4.0	21.7	13.6	5.9	135.5
Total	43.4	6.4	53.2	84.9	19.5	7.4	35.2	36.0	11.5	297.6
Total/Direct	1.5	2.0	1.8	1.7	3.8	2.1	2.6	1.6	2.1	1.8
Total/Tonne (\$)	\$48,158	\$30,254	\$27,135	\$44,700	\$43,769	\$11,740	\$9,236	\$632	\$5,238	\$6,611
Employment (fte jobs)^c										
Direct										
Fishing	123	37	217	421	185	30	363	52	73	1,501
Downstream	20	21	174	147	41	18	89	7	45	560
All other sectors (indirect)	168	37	288	425	175	50	263	166	74	1,647
Total	313	95	679	994	400	98	715	224	192	3,708
Total/Direct	2.2	1.6	1.7	1.7	1.8	2.0	1.6	3.8	1.6	1.8
Total/Tonne	0.35	0.45	0.35	0.52	0.90	0.15	0.19	0.00	0.09	0.08
Household Income (\$m)										
Direct										
Fishing	9.1	1.4	10.0	15.7	5.7	1.1	9.5	12.1	2.5	67.0
Downstream	1.1	0.6	5.0	6.7	1.7	0.7	2.9	0.2	1.4	20.3
All other sectors (indirect)	7.8	1.7	13.0	19.4	7.9	2.2	12.1	7.3	3.3	74.9
Total	18.0	3.7	28.0	41.8	15.3	4.1	24.5	19.6	7.2	162.2
Total/Direct	1.8	1.9	1.9	1.9	2.1	2.2	2.0	1.6	1.9	1.9
Total/Tonne (\$)	\$19,900	\$17,600	\$14,200	\$22,000	\$34,400	\$6,400	\$6,400	\$300	\$3,200	\$3,605

^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 (2006b).

Appendix Table 2.7 Economic rent in South Australian commercial fisheries,
2004/05 (\$m)

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish	Pilchards	Lakes and Coorong	All Fisheries ^a
Gross Income	35.5	3.8	32.0	54.4	11.6	4.4	20.9	28.5	5.5	196.7
Less Labour	9.1	1.4	10.7	15.1	5.0	1.1	11.9	10.1	2.2	66.6
Less Materials & Services	6.0	1.3	9.5	13.3	7.4	1.9	10.9	5.3	1.7	57.2
Less Depreciation	1.9	1.6	7.3	8.3	2.9	0.4	3.4	1.7	0.6	28.1
Less Opportunity Cost of Capital (@10%)	1.0	1.2	6.6	6.1	2.3	0.4	3.4	1.6	0.4	22.8
Economic Rent	17.6	-1.7	-2.0	11.6	-5.9	0.7	-8.5	9.7	0.5	21.9

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

Source: EconSearch (2006b).