

Economic Indicators for
the South Australian
Sardine Fishery
2006/07

A report prepared for
Primary Industries and Resources South Australia

Prepared by



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Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
CPI	consumer price index
FRDC	Fisheries Research and Development Corporation
fte	full time equivalent
GDP	gross domestic product
GRP	gross regional product
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

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1. Introduction

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

This report is the sixth annual economic indicators report for the South Australian Sardine Fishery.¹ The first report, *Economic Indicators for the South Australian Pilchard Fishery 2001/02* (Econsearch 2003), reported on the results of an economic survey of the fishery. The second to fourth reports, for the 2002/03, 2003/04 and 2004/05 financial years (EconSearch 2004, 2005a and 2006a) provided an update of the indicators based on the results of the initial licence holder survey. The fifth report, prepared for 2005/06, provided an outline of the fisheries economic performance based on a second survey of licence holders, conducted in September 2006.

The objective of this report, *Economic Indicators for the South Australian Sardine Fishery 2006/07*, was to provide an outline of the fishery's most recent economic performance based on the September 2006 survey and an update survey conducted in early 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;
- factors affecting costs in the fishery;
- financial performance indicators (income, costs, profit, and return on investment);
- economic impact of the fishery, both local and state;
- economic rent;
- external factors that influence the economic condition of the fishery; and
- price of sardines in domestic markets.

For purposes of comparison, summary economic indicators for all South Australian commercial fisheries, up to 2005/06, are presented in Appendix 3.

¹ In 2005/06 the name of the fishery officially changed from the South Australian Pilchard Fishery to the South Australian Sardine Fishery.

2. Method of Analysis and Definition of Terms

2.1 Survey of Licence Holders in the Fishery, 2005/06

The questionnaire for the survey was drafted by the consultants and subsequently modified after consultation with Christian Pyke (Executive Officer, SAMSSIA). In September 2006, all licence holders were sent an introductory letter and a copy of the questionnaire. All licence holders were then contacted by the consultants to confirm their participation in the study and to arrange a convenient time to conduct a face-to-face interview.

In September 2006, interviews were conducted with the owners (or representatives) of 10 of the fishery's 14 licences. Not all licence holders were available to complete the survey face-to-face, however completed returns were received for all 14 licences.

2.2 Survey of Licence Holders in the Fishery, 2006/07

A brief questionnaire for the survey was prepared by the consultants based on the September 2006 survey and consultation with Christian Pyke (Executive Officer, SAMSSIA). In January 2008, all licence holders were sent a copy the questionnaire. All licence holders were then contacted by the consultants to arrange for the survey to be completed over the phone or returned via mail.

The responses to the 2008 survey were used together with information gathered in the September 2006 survey to prepare the economic indicators for 2006/07.

2.3 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.

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.

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.

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

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

Coefficient of Variation is a relative measure of dispersion expressed as a percentage. It is calculated by dividing the standard deviation by the arithmetic mean.

Depreciation is a non-cash cost representing the wear and tear on capital items during the year. It has been calculated using information on the age, current value and current replacement cost of each item. This was to be used to determine the depreciation rate of fishing equipment³.

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.

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

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

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 SA Sardine Fishery

3.1 Gross Value of Production

The catch levels shown in Table 3.1 indicate that total catch in the SA Sardine Fishery has fluctuated significantly since the establishment of the fishery in 1990/91. Only 145 tonnes of sardines were caught during 1991/92, because very few licence holders took up sardine fishing on a full-time basis or purchased purpose built fishing gear (Mackie 1995).

In 1992/93 catch in the fishery increased to 1,230 tonnes. In 1993/94, management arrangements for the fishery were reviewed and a three-year experimental period for the fishery was introduced, coinciding with the advent of the tuna farming industry in Port Lincoln. Catch levels increased annually until 1995/96, reaching 3,708 tonnes. Although catch declined slightly in 1996/97, it increased significantly in the following year (1997/98) to over 6,000 tonnes. In 1998/99 and 1999/00, catch declined considerably as a result of a significant sardine mortality event occurring across the entire distribution of the Australian sardine population during October 1998 to May 1999 (Gaut 1999). Sardine stocks regenerated quickly, however, resulting in a significant increase in catch in 2000/01 to 2004/05 up to 56,000 tonnes. A reduction in the TACC for the 2006 season (Table 3.2) resulted in a significant decrease in the catch and value of catch in the fishery in 2005/06.

Table 3.1 Catch and value of catch, South Australian Sardine Fishery, 1990/91 to 2006/07 (financial years)

	Catch (tonnes)	Value of Catch (\$'000)
1990/91	n.a.	n.a.
1991/92	145	164
1992/93	1,230	757
1993/94	2,377	1,360
1994/95	2,803	1,630
1995/96	3,708	2,524
1996/97	3,428	2,197
1997/98	6,041	3,846
1998/99	4,465	2,500
1999/00	3,836	2,685
2000/01	7,368	5,157
2001/02	12,165	8,516
2002/03	21,741	17,827
2003/04	33,160	22,549
2004/05	56,952	28,476
2005/06 ^a	28,626	16,031
2006/07 ^a	30,355	18,517

^a Catch and value of catch estimates for 2006/07 are based on provisional SARDI data.

Source: SARDI Aquatic Sciences.

The significant increase in catch and value of catch between 2000/01 and 2004/05 has been a result of increases in total allowable commercial catch (TACC). The TACC for the fishery is derived from stock assessment and spawning biomass reports (Steve Shanks pers. comm.). In 2002 the TACC was 17,500 tonnes. This was reviewed and increased to 36,000 tonnes in 2003. The TACC was increased a further 4,000 tonnes to a total of 40,000 tonnes in 2004. In 2005 the TACC for the SA Sardine Fishery was 51,100 tonnes (Steve Shanks, pers. comm.). The TACC more than halved in the 2006 season, which is reflected in the significant decrease in catch in the fishery in 2005/06. The TACC for the fishery was set at 32,000 tonnes for 2007 and a baseline TACC for 30,000 tonnes was established for 2008 onwards (Tables 3.1 and 3.2).

Table 3.2 TACC in the South Australian Sardine Fishery, 1995 to 2008, (calendar years)

Year	Total Allowable Commercial Catch (tonnes)
1995 ^a	3,500
1996	3,500
1997	3,500
1998 ^a	9,000
1999	4,700
2000	3,800
2001	9,100
2002	17,750
2003	36,000
2004	40,000
2005	51,100
2006	25,462
2007	32,000
2008 ^b	30,000

^a Mass pilchard (sardine) mortality events occurred in 1995 and 1998.

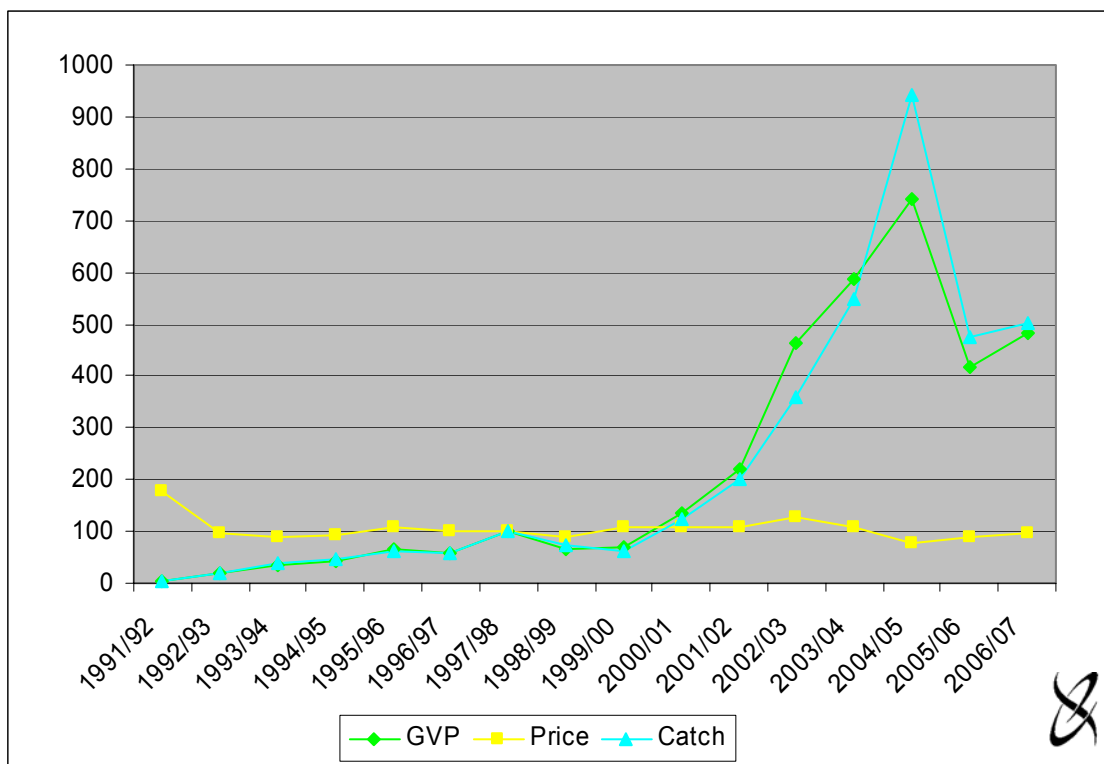
^b From 2008 onwards the baseline TACC in the Sardine fishery will be 30,000 tonnes.

Source: Steve Shanks (PIRSA Fisheries pers. comm.), Craig Noell (PIRSA Fisheries pers. comm.) and Ward et. al. (2007).

Fishing effort is generally concentrated between January and June each year. During 2006/07 some licence holders caught up to 80 per cent of their annual catch within that 6 month period.

Figure 3.1 illustrates how the value of the fishery has changed over the 15 year period 1991/92 to 2006/07. The nominal value of the sardine catch in 2004/05 was more than seven times its value in 1997/98, which in turn was three times the value recorded in 1993/94 when the fishery’s experimental period commenced. This significant increase in value corresponds closely with increased catches to meet the growing demand for feedstock from Port Lincoln’s tuna farming industry. The nominal value of the sardine catch fell significantly in 2005/06, due to the 50 per cent reduction in the TACC for the 2006 season. In 2006/07 the nominal value of the sardine catch increased slightly, compared to the previous year as a result of an increase in overall catch and average price. Figure 3.1 shows that the average price of sardines in the fishery has been relatively steady in nominal terms over the period 1992/93 to 2002/03 when it peaked at \$0.82/kg. Since its peak the nominal price of sardines fell 39 per cent to \$0.50/kg in 2004/05, the price recovered slightly in subsequent years reaching \$0.56/kg in 2005/06 and \$0.61/kg in 2006/07.

Figure 3.1 GVP, price and catch indices for the South Australian Sardine Fishery (1997/98=100)^a

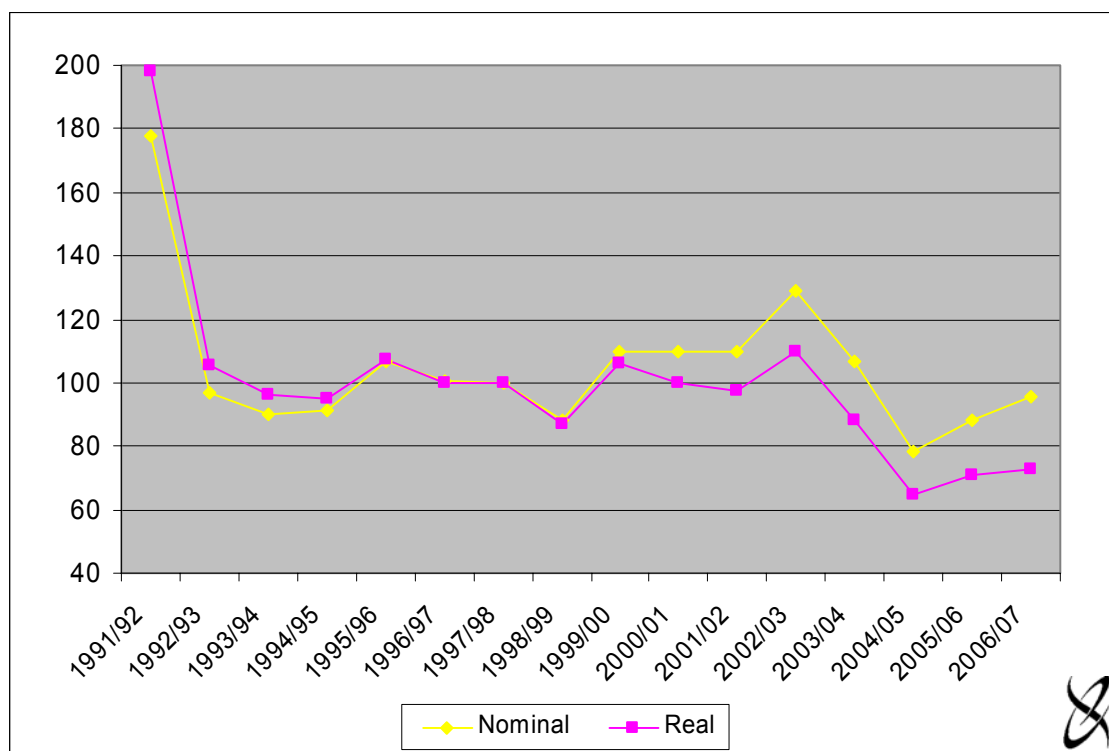


^a 1997/98 is the reference year against which all other years are compared.

Source: SARDI Aquatic Sciences.

Figure 3.2 shows that the 4 per cent decrease in the nominal beach price of sardines over the nine-year period from 1997/98 to 2006/07 was equivalent to a 27 per cent decline in the real price⁴. The price of sardines increased slightly between 2005/06 and 2006/07, in both nominal and real terms (Figure 3.2).

⁴ 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 2006). It enables meaningful comparisons of prices to be made between years.

Figure 3.2 Price indices for the South Australian Sardine Fishery (1997/98=100) ^a

^a 1997/98 is the reference year against which all other years are compared.

Source: SARDI Aquatic Sciences.

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 required to manage the fishery 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 FRDC 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 (Will Zacharin, pers. comm.).

Table 3.2 shows actual licence fee receipts for the SA Sardine Fishery for the period 2000/01 to 2007/08.

Table 3.3 Cost of management in the South Australian Sardine Fishery, 2000/01 to 2007/08

	Licence Fee (\$'000)	Gross Value of Production (\$'000)	Fee/GVP (%)	Catch (tonnes)	Fee/Catch (\$/kg)	Licence Holders (No.)	Fee/Licence Holder ^a (\$/licence)
2000/01	331	5,157	6.4%	7,368	\$0.04	14	\$23,633
2001/02	423	8,516	5.0%	12,165	\$0.03	14	\$30,224
2002/03	434	17,827	2.4%	21,741	\$0.02	14	\$30,974
2003/04	940	22,549	4.2%	33,160	\$0.03	14	\$67,145
2004/05	991	28,476	3.5%	56,952	\$0.02	14	\$70,783
2005/06	1,005	16,031	6.3%	28,626	\$0.04	14	\$71,814
2006/07	804	18,517	4.3%	30,355	\$0.03	14	\$57,410
2007/08	690	n.a.	-	n.a.	-	14	\$49,317

^a The fee per licence holder comprises the Sardine net fee and the Sardine base fee. It does not include the marine scalefish fishery net fee.

Source: PIRSA Fisheries and SARDI Aquatic Sciences

The following observations can be made for the period 2005/06 to 2006/07:

- licence fees as a percentage of GVP decreased from 6.3 per cent to 4.3 per cent as a result of an increase in GVP and a decrease in licence fees;
- the cost per kilogram of sardines decreased from \$0.04 to \$0.03 as result of an increase in catch and a decrease in licence fees; and
- the cost per licence decreased from \$71,814 in 2005/06 to \$57,410 in 2006/07, a decrease of 20 per cent.

The significant increase in fees between 2002/03 and 2003/04 reflected the need for additional research into the impact of harvesting large quantities of sardines, a low-order species, on higher-order species in the ecosystem which was, in turn, associated with the significant increase in the fishery's total allowable catch from 9,100 tonnes in 2000 to 40,000 tonnes in 2004 (Steve Shanks, pers. comm.). Between 2003/07 and 2005/06 aggregate licence fees were relatively steady, increasing by around 5 per cent in 2004/05 and 1 per cent in 2005/06. Fees per licence holder decreased by 20 per cent in 2006/07 to \$57,410 and decreased by a further 14 per cent to \$49,317 in 2007/08 (Table 3.3).

3.3 Summary of Factors Affecting Costs in the Fishery

The information in Table 3.4 was used, together with the 2008 survey responses, to adjust the financial performance indicators to reflect the costs incurred in the fishery in 2006/07.

Table 3.4 Factors affecting costs in the South Australian Sardine Fishery, 2006/07

	2005/06	2006/07	Change
Total Days Fished ^a	966	966	0.0%
Price of Fuel - Transportation Index ^b	158.8	160.9	5.0%
Interest charges (%/annum) ^c	8.2%	8.8%	2.5%
CPI Adelaide ^d	157.6	160.3	2.3%

^a SARDI Aquatic Sciences (Angelo Tsolos pers. comm.).

^b ABS transportation index for Adelaide (ABS 2008).

^c RBA indicator lending rate for small business (RBA 2008).

^d Consumer Price Index (CPI) for Adelaide (ABS 2008).

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

3.4 Financial Performance Indicators

The major measures of the financial performance of the surveyed licences in the SA Sardine Fishery for the period 2004/05 to 2006/07 are shown in Table 3.5. For comparison financial performance estimates for earlier years (2001/02 to 2003/04) are provided in Appendix 1.

Table 3.5 Financial performance in the South Australian Sardine Fishery, 2004/05 to 2006/07 (average per licence)

	2004/05		2005/06		2006/07	
	All Licences	Share of TCC ^a	All Licences	Share of TCC ^a	All Licences	Share of TCC ^a
Gross Income	\$2,422,103		\$1,149,494		\$1,315,921	
Costs						
Fuel	\$88,821	7%	\$201,916	19%	\$199,489	18%
R&M	\$171,619	13%	\$92,054	9%	\$98,819	9%
Provisions	\$6,714	1%	\$8,601	1%	\$8,123	1%
Labour	\$861,420	67%	\$476,843	45%	\$540,823	49%
Licence fee ^b	\$70,600	5%	\$71,634	7%	\$56,375	5%
Quota leasing cost ^c	\$21,774	2%	\$20,221	2%	\$23,357	2%
Insurance	\$14,897	1%	\$30,477	3%	\$30,624	3%
Interest	\$10,093	1%	\$88,312	8%	\$84,874	8%
Admin and Other	\$40,318	3%	\$65,296	6%	\$69,512	6%
Total Cash Costs	\$1,286,256	100%	\$1,055,354	100%	\$1,111,995	100%
Cash Operating Surplus	\$1,135,847		\$94,139		\$203,925	
Depreciation	\$143,443		\$194,240		\$211,685	
Earnings Before Tax	\$992,404		-\$100,101		-\$7,759	
Earnings Before Interest & Tax	\$1,002,496		-\$11,789		\$77,115	
Capital						
Fishing Gear & Equip	\$1,362,796		\$2,621,394		\$2,763,603	
Licence Value ^d	\$9,123,861		\$3,042,857		\$3,318,705	
Total Capital	\$10,486,657		\$5,664,251		\$6,082,308	
Rate of Return to Fishing Gear & Equip	75.2%		0.3%		3.6%	
Rate of Return to Total Capital	9.8%		0.1%		1.7%	

^a Total cash costs.

^b Licence fees for 2005/06 and 2006/07 are based on information provided by licence holders in the 2006 and 2008 surveys. Accordingly, licence fees reported in Table 3.5 differ slightly to the management costs reported in Table 3.3.

^c Quota leasing costs are those costs incurred as a result of leasing available quota from another party. The costs associated with quota leasing have been excluded from the calculation of the rate of return to gear and equipment and total capital for 2005/06 and 2006/07. The estimated rates of return for 2001/02 to 2004/05 have been revised from previous reports to account for this change in methodology.

^d Licence values for 2005/06 and 2006/07 are based on estimates of the value of a licence provided by licence holders. Licence value for 2001/02 to 2004/05 has been calculated based on the average value indicated by licence holders in the 2002 survey and updated changes in gross income per licence holder between 2001/02 and 2004/05. As there have been limited licence transfers in recent years it is difficult to ascertain the market value of licences.

Source: EconSearch analysis.

Income...

Total recorded sardine catch in South Australia increased by 6 per cent between 2005/06 and 2006/07 while gross receipts from the sale of sardines increased by 16 per cent over the same period (Table 3.1). The average gross income per licence in the fishery was estimated to be just over \$1.3 million in 2006/07 up 14 per cent from 2005/06 (Table 3.5). The increase in average gross income is attributable to the increase in catch in response to a rise in the TACC for the fishery in the 2006 and 2007 seasons (Table 3.2). The average gross income per licence in for the 2007 quota year was estimated to be \$1.0 million (Table 3.6).

The 2006 and 2008 survey responses highlighted that there is minimal variation in the average gross income per licence held (some licence holders own more than one licence). This consistency across the fishery is due to the management arrangements of the fishery, where the total quota is allocated equally across each of the 14 licences.

Costs...

For the fishery as a whole, about 49 per cent of total cash costs⁵ were attributable to labour costs in 2006/07, by far the largest individual cost item. The other significant cash costs were fuel (18 per cent), repairs and maintenance (9 per cent), interest (8 per cent) and licence fees (5 per cent).

Some licence holders may have insufficient quota to ensure viable operations throughout the year. Accordingly they may lease quota from other licence holders, if it is available, which increases the costs of operating in the fishery. In 2006/07 quota leasing costs accounted for an estimated 2 per cent of the total cash costs.

The higher fuel costs, lower repairs and maintenance expenditure and more significant interest payments in 2005/06 and 2006/07 compared to earlier indicate that there has most likely been some investment in larger vessels in recent years. This is also reflected in the higher capital value of fishing gear and equipment and capital depreciation costs (Table 3.5).

Survey responses indicate that there is some variation in the costs incurred among licence holders, this is to be expected given the differences in the scale of operations in the fishery (i.e. some businesses hold multiple licences while others hold only a single licence). The variations worth noting include quota leasing costs and interest.

Cash Income and Profit...

The labour costs reported in Table 3.5 are comprised of payments to skippers and crew, as well as an imputed wage to operators and other family members who are not paid a wage directly by the business. Accordingly, cash operating surplus was calculated by including imputed wages as part of cash costs. The 2006/07 cash operating surplus per licence was estimated to be approximately \$204,000 (approximately \$94 per tonne) a 117 per cent increase on 2005/06 (Table 3.5).

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 2006/07, the average earnings before tax was approximately -\$8,000 per licence (Table 3.5).

⁵ Fixed and variable costs have not been differentiated; therefore Boat Gross Margin has not been calculated. Boat Gross Margin is available upon request.

There was some variation in the income and profit reported among the licence holders with some reporting a significant negative cash income and earnings before tax and some reporting a marginal profit.

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 investment as the capital employed by an average licence holder in the fishery. Capital includes boats, licence/quota, fishing gear, sheds, vehicles and other capital items used as part of the fishing enterprise. It does not include working capital or capital associated with other businesses operated by the licence holder. The return on investment has been calculated as the net profit after depreciation as a percentage of the total capital employed.

The average return on investment for the fishery is reported in Table 3.5. The rate of return to boat capital (i.e. fishing gear and equipment) for 2006/07 was 3.6 per cent based on a capital investment of almost \$2.8 million.

There have been a number of new boats registered in the fishery since the 2002 survey. Licence holders also indicated that they had made significant investment in upgrading existing vessels.

There was significant variation across the fishery in the licence holders' estimates of the value of their fishing gear and equipment.

Comparison of the 2006 and 2008 survey results with the previous survey (2001/02) confirms that there has been significant capital investment in the fishery in recent years. The increase in capital investment is consistent with the dramatic increase in the average interest paid and capital depreciation per licence (Table 3.5).

The rate of return to total capital (i.e. fishing gear, equipment and licence) in 2006/07 was estimated to be 1.7 per cent, based on a total capital value of almost \$6.1 million per licence holder (Table 3.5).

The value of licences represents a significant part of the capital used by each licence holder in the fishery. Based on information provided by licence holders in recent surveys, the value per licence in the fishery is approximately \$3.3 million. This is a significant decrease compared to previous years. The reported licence value of \$9.1 million for 2004/05 in Table 3.5 was estimated by adjusting the 2001/02 licence value to reflect changes in the average gross income per licence holder between 2001/02 and 2004/05. It is likely that this estimate is overstated. As there have been limited sales of licences in recent years it is difficult to provide an estimate of the actual market value of a licence during that period.

The variation in the business profit calculated for each licence holder and their survey based estimates of the value of fishing gear and equipment meant that the rates of return (to fishing gear and equipment and total capital) varied significantly across the fishery.

3.5 State and Regional Economic Impact

Estimates of the economic impact of the SA Sardine Fishery on the South Australian and regional (Eyre⁶) economies in 2006/07 are outlined below.

3.5.1 Measuring direct and flow-on effects

Estimates of the direct economic impact of the SA Sardine 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.

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 Eyre 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 2006/07, described earlier. On an item-by-item basis, the expenditures were allocated between those occurring in the Eyre 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 expenditure⁹ per licence holder were derived from the survey of licence holders.

⁶ The Eyre region is comprised of the Statistical Division of the Eyre as defined by the ABS.

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 (excluding Lakes and Coorong) for the period 1997/98 to 2002/03 do not include the impact of local retail and food service trade this has been included in subsequent years.

⁹ Due to the level of integration between sardine fishing and processing activities, the value of capital equipment used in sardine processing (sheds, buildings, freezers, vehicles etc) has been included in the calculation of economic impacts in the fishery.

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 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.

3.5.2 Economic impacts at state and regional levels

Estimates of the economic impact generated in 2006/07 by the SA Sardine Fishery in South Australia and the Eyre region are outlined in Tables 3.6 and 3.7, 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.

Table 3.6 The economic impact of the South Australian Sardine Fishery in South Australia, 2006/07

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	18.5	39.0%	63	28.4%	7.6	49.6%	11.4	45.5%
Processing ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^c	3.3	7.0%	20	9.0%	1.0	6.5%	1.5	5.9%
Total Direct ^d	21.8	39.0%	84	28.4%	8.6	49.6%	12.9	45.5%
Flow-on effects								
Trade	3.9	8.3%	43	19.4%	1.5	9.7%	1.8	7.3%
Manufacturing	6.1	12.8%	19	8.6%	0.9	5.8%	1.4	5.7%
Business Services	2.5	5.2%	15	6.5%	0.9	5.9%	1.2	4.7%
Transport	1.4	3.0%	7	3.0%	0.5	3.1%	0.7	2.7%
Other Sectors	11.7	24.7%	56	25.2%	3.0	19.4%	7.1	28.2%
Total Flow-on ^d	25.6	54.0%	140	62.6%	6.7	43.9%	12.2	48.6%
Total ^d	47.5	100.0%	223	100.0%	15.3	100.0%	25.1	100.0%
Total/Direct	2.2	-	2.7	-	1.8	-	1.9	-
Total/Tonne	\$1,500	-	0.01	-	\$500	-	\$827	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 10 full-time jobs and 111 part-time jobs, that is, 121 jobs in aggregate.

^b It was assumed that all landed sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of sardines are sold for human consumption and recreational fishing bait, the flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

^c Capital expenditure includes fishing related expenditure (boats, fishing gear and equipment, sheds and buildings, motor vehicles and other equipment) and processing relating expenditure (sheds, buildings and freezers).

^d Totals may not sum due to rounding.

Source: EconSearch analysis.

Table 3.7 The economic impact of the South Australian Sardine Fishery in the Eyre region, 2006/07

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	18.5	58.1%	63	40.1%	7.6	66.6%	11.4	62.5%
Processing	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^b	2.7	8.4%	20	12.9%	0.9	7.6%	1.3	7.3%
Total Direct ^c	21.2	58.1%	84	40.1%	8.4	66.6%	12.8	62.5%
Flow-on effects								
Trade	2.4	7.4%	30	19.2%	0.9	7.7%	1.1	6.1%
Manufacturing	1.6	5.0%	7	4.7%	0.3	2.6%	0.4	2.4%
Business Services	0.7	2.1%	5	2.9%	0.2	2.1%	0.3	1.8%
Transport	0.6	1.9%	3	2.2%	0.2	1.8%	0.3	1.6%
Other Sectors	5.5	17.1%	29	18.0%	1.3	11.6%	3.3	18.2%
Total Flow-on ^c	10.7	33.5%	74	47.0%	2.9	25.8%	5.5	30.2%
Total ^c	31.9	100.0%	158	100.0%	11.4	100.0%	18.3	100.0%
Total/Direct	1.5	-	1.9	-	1.3	-	1.4	-
Total/Tonne	\$1,000	-	0.01	-	\$300	-	\$600	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 10 full-time jobs and 111 part-time jobs, that is, 121 jobs in aggregate.

^b It was assumed that all landed sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of sardines are sold for human consumption and recreational fishing bait, the flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

^c Capital expenditure includes fishing related expenditure (boats, fishing gear and equipment, sheds and buildings, motor vehicles and other equipment) and processing relating expenditure (sheds, buildings and freezers).

^d Totals may not sum due to rounding.

Source: EconSearch analysis.

Value of output...

The value of output generated directly in South Australia and the Eyre region by sardine fishing enterprises summed to \$18.5 million in 2006/07 (Table 3.6), while output generated in South Australia by associated downstream activities (processing, transport, retail/food services and capital expenditure) summed to \$3.3 million (\$2.7 million in the Eyre region, Table 3.7).

Flow-ons to other sectors of the state economy added another \$25.6 million in output (\$10.7 million in the regional economy). The sectors most affected were the manufacturing, trade, business services and transport sectors.

Employment and household income...

In 2006/07, the South Australian Sardine Fishery was responsible for the direct employment of around 63 full-time equivalents (fte) and downstream activities created employment of around 20 fte jobs state-wide. Flow-on business activity was estimated to generate a further 140 fte jobs state-wide (74 jobs regionally). These state-wide jobs were concentrated in the trade (43), manufacturing (19), business services (15) and transport (7) sectors.

Personal income of \$7.6 million was earned in the fishing sector (wages of employees and estimated drawings by owner/operators) and \$1.0 million in downstream activities in SA. An additional \$6.7 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 \$15.3 million in SA (\$11.4 million in the Eyre region).

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 2006/07, total SA Sardine Fishery related contribution to GSP in South Australia was \$25.1 million (\$18.3 million in the Eyre region), \$11.4 million generated by fishing directly, \$1.5 million generated by downstream activities and \$12.2 million generated in other sectors of the state economy.

Total impacts over time...

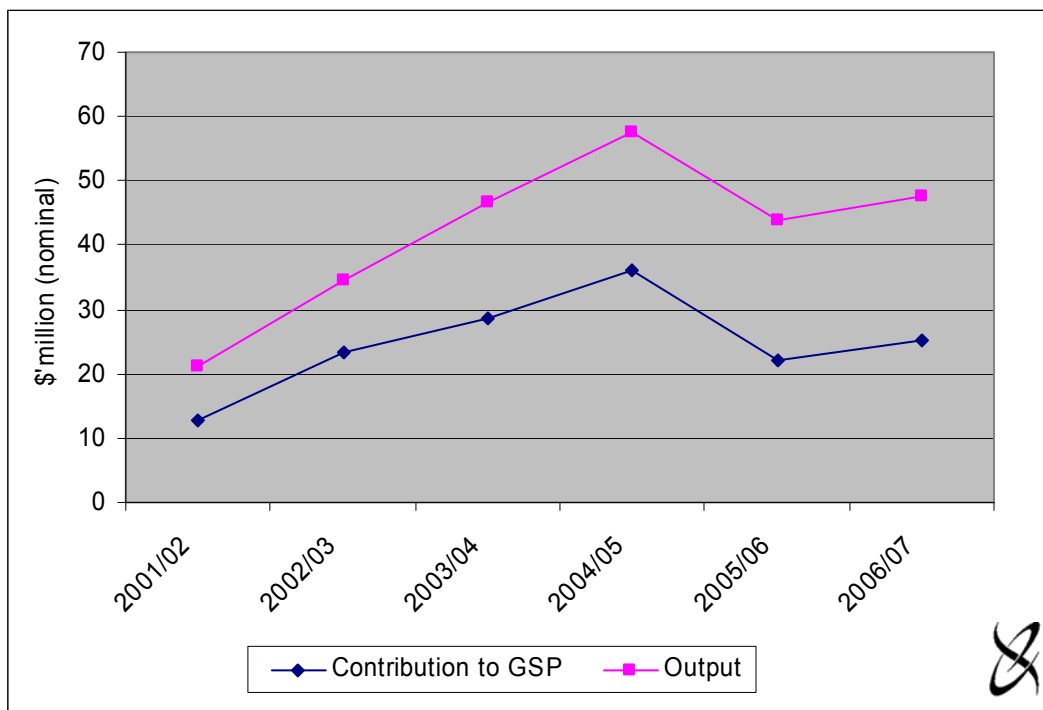
Figures 3.3 and 3.4 illustrate the total economic impact (direct plus flow-on effects) of the fishery on the SA economy for the five-year period, 2001/02 to 2006/07. Estimates of economic impact are expressed in nominal terms, accordingly no adjustment has been made to reflect inflation.

Estimates of economic impact for 2001/02 and 2002/03 do not include the impact of local retail and food service trade, these effects have been included in subsequent years.

As economic impact estimates for the years 2001/02 to 2006/07 are based on different survey samples and techniques, some of the variability between years is, therefore, attributable to sampling variability.

Care should be taken when using value of output as a measure of economic impact as it includes elements of double counting. Using contribution to GSP is the preferred measure of net contribution to the SA economy.

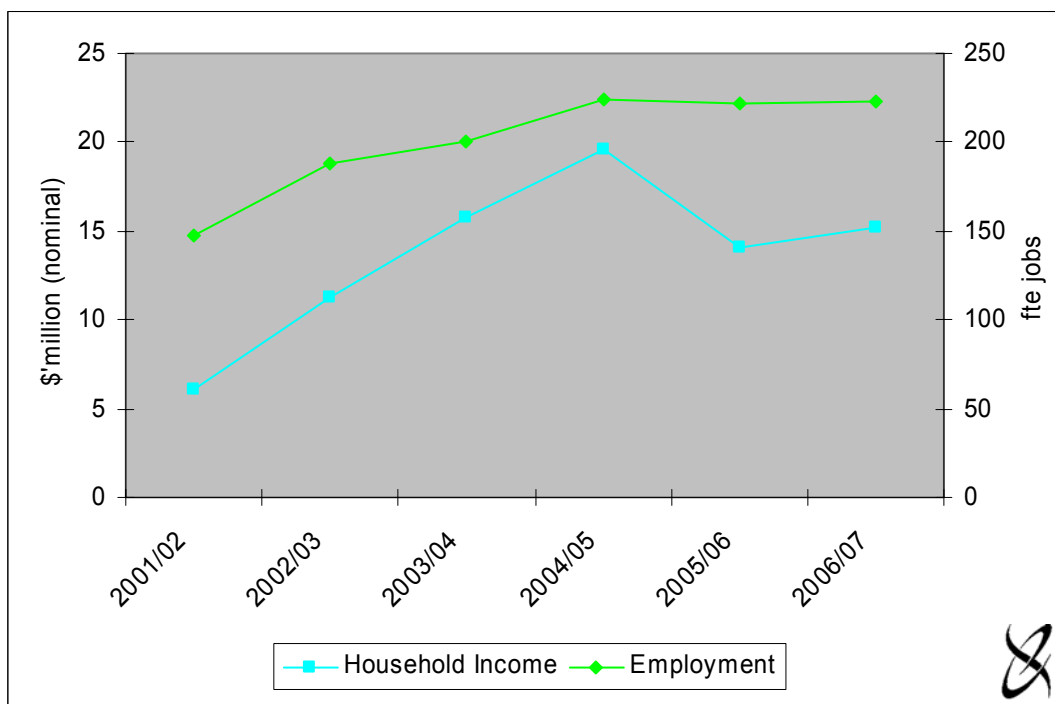
Figure 3.3 Total gross state product and output impact of the South Australian Sardine Fishery on the SA economy, 2001/02 to 2006/07 ^a



^a Estimates of economic impact for the period 2001/02 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 (2007b) and EconSearch analysis.

Figure 3.4 Total employment and household income impact of the South Australian Sardine Fishery on the SA economy, 2001/02 to 2006/07 ^a



^a See note for Figure 3.3.

Source: EconSearch (2007b) and EconSearch analysis.

3.6 Economic Rent

Economic rent¹⁰ 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 SA Sardine Fishery and the good produced is the landed sardine.

The unit costs or 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) and 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.

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 given the relatively high-risk nature of the industry.

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 Sardine Fishery was estimated to be approximately -\$2.5 million in 2006/07 (Table 3.8).

Table 3.8 Economic rent in the South Australian Sardine Fishery, 2001/02 to 2006/07 (\$'000)^a

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	Economic Rent
2001/02	8,516	3,029	2,263	1,101	1,046	1,078
2002/03	21,147	7,521	3,302	2,170	2,062	6,092
2003/04	22,549	8,020	3,763	1,885	1,791	7,091
2004/05	28,476	10,127	4,620	1,686	1,602	10,440
2005/06	16,031	6,650	6,554	2,709	3,656	-3,538
2006/07	18,517	7,610	6,514	2,979	3,889	-2,475

^a Estimates of economic rent for the period 2001/02 to 2004/05 have been revised from those presented in EconSearch 2006 to account for a change in methodology adopted for the 2005/06 indicators.

Source: EconSearch analysis.

¹⁰ 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.

This significant change is driven by a decrease in total income in the fishery as a result of the reduction in the TACC (Table 3.2). Labour costs decreased significantly in 2005/06, as a result of a decrease in gross income, however other cash costs such as fuel, repairs and maintenance and interest have increased. Depreciation and the opportunity cost of capital both increased as a result of significant investment in capital equipment in recent years.

When an economic rent is generated in a fishery and there are transferable licences, the rent represents a return to the value of the licences. The aggregate value of licences was estimated to be \$46.5 million (14 licences with an average value of \$3.3 million). An annual economic rent of -\$2.5 million represents a return of -5.3 per cent to the capital value of the fishery.

4. Other Indicators

4.1 External Factors Influencing the Economic Condition of the 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.

Demand for Product

Prior to 1993, the majority of Sardine catch was taken by the Southern Bluefin Tuna (SBT) Fishery for use as live bait. The development of commercial tuna farms in Port Lincoln has significantly increased the demand for sardines as food for the farmed tuna. Tuna farms are the primary source of demand for the sardines caught in the SA Sardine Fishery. In 2005/06 an estimated 98 per cent of catch was used as tuna fodder with the balance used for either human consumption or as bait for recreational fishers (Table 4.3).

Stock Assessment

Mortality events, in 1995 and 1998, impeded the early growth of the sardine catch. Since the fisheries recovery from the 1998 event catch has increased significantly. In 1999/00 (the season following the second mortality event) 3,836 tonnes of sardines were caught. The total catch increased rapidly from approximately 7,400 tonnes in 2000/01 to almost 57,000 tonnes in 2004/05. The amount of time spent fishing has also increased. In 2000/01 effort was just under 500 fishing days compared with 966 days in 2004/05. Total sardine catch decreased to approximately 28,600 tonnes and effort decreased to 689 days in 2005/06 in response to a reduction in the TACC for the fishery. Catch, effort and catch per unit of effort (CPUE) data are summarised in Table 4.1 below for the 2001/02 to 2006/07 seasons.

Table 4.1 Catch, effort and CPUE, South Australian Sardine Fishery, 2001/02 to 2006/07

Indicator	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Catch (t)	12,165	21,741	33,160	56,952	28,626	30,355
Effort (days fished)	502	601	751	966	689	679
CPUE (t/day)	24	36	44	59	42	45

Source: SARDI Aquatic Sciences

Total catch and effort has increased significantly over the period 2001/02 to 2004/05. There has also been an increase in the CPUE, which has more than doubled over the three year period.

Sardine fishing tends to be localised in areas within close proximity to Port Lincoln and the tuna farms. Research is currently being undertaken to assess the impact and sustainability of this concentration of fishing effort (DEH 2004).

4.2 Price of Sardines in Domestic Markets

This section of the report provides further economic analysis of prices for Sardines in the Adelaide, Sydney and Melbourne domestic markets. It provides some indication of:

- the seasonality of prices; and
- price differentiation between Adelaide, Melbourne and Sydney.

The value of the Sardine catch sourced from SARDI Aquatic Sciences is estimated on the basis of information provided by processors in South Australia. A proportion of the state's Sardine catch has been sold in the Melbourne and Sydney fish markets. The average price at the Melbourne wholesale fish market in 2006/07 was \$3.61/kg¹¹ and at the Sydney wholesale fish market, \$3.67/kg¹², both significantly above the estimate average beach price in South Australia of \$0.60/kg in 2006/07 (SARDI Aquatic Sciences).

Only a small proportion of the Sardine catch is marketed as bait and/or for human consumption. Although a small quantity, this product is sold in both in local and interstate markets.

This price differential between the beach price in SA and wholesale market prices in Sydney and Melbourne is illustrated on a monthly basis in Table 4.2 and Figure 4.1.

Prices in South Australian remained relatively stable during 2006/07 ranging from \$0.40/kg in August and September 2006 to \$0.64/kg in March 2007. Prices for Sardines sold in the Melbourne markets varied, from \$2.18 to \$4.60. Prices for Sardines sold in the Sydney Fish Market varied, from \$2.59 to \$4.41.

¹¹ This estimate is a weighted average price for all Sardines from all sources sold in the Melbourne Fish Market during 2006/07 (Tim Rieniets, Melbourne Wholesale Fish Markets, pers. comm.).

¹² This estimate is an average price for all Sardines from all sources sold in the Sydney Fish Market during 2006/07 (Samantha Dawes, DPI – NSW Fisheries, pers. comm.).

Table 4.2 Average monthly prices for sardines, beach prices in South Australia and Sydney and Melbourne Fish Markets, 2004/05 to 2006/07^a

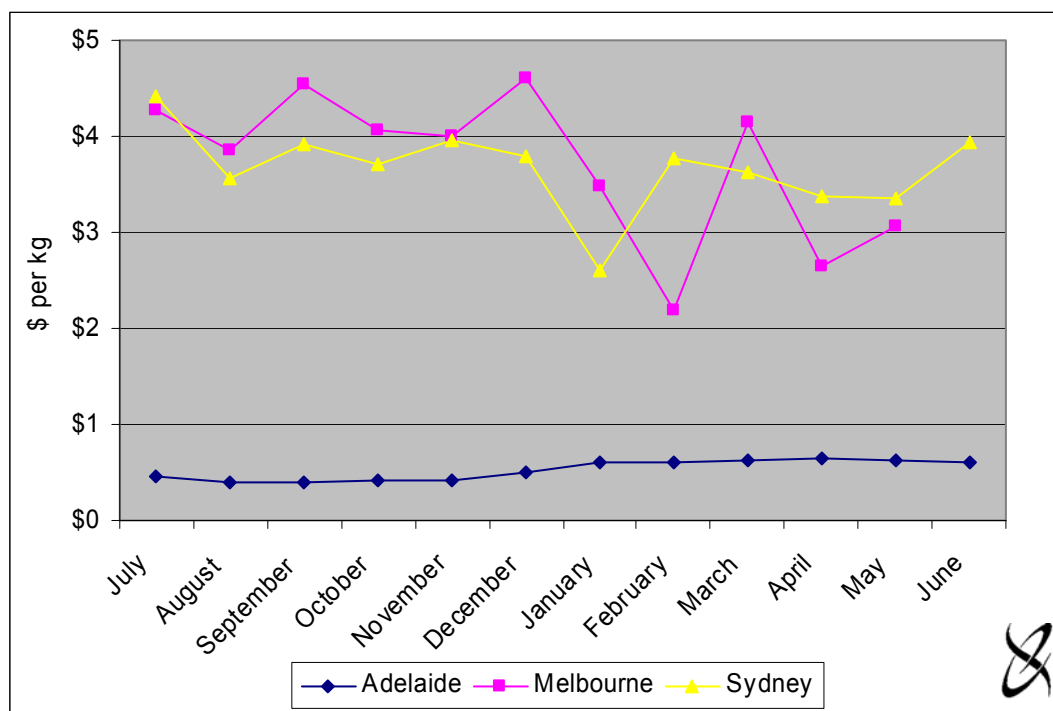
Month	Average Monthly Price (\$/kg)								
	Adelaide			Melbourne ^b			Sydney ^b		
	2004/05	2005/06	2006/07	2004/05	2005/06	2006/07	2004/05	2005/06	2006/07
July	\$0.53	\$0.46	\$0.46	\$4.77	\$3.00	\$4.27	\$5.10	\$3.87	\$4.41
August	\$0.54	\$0.52	\$0.40	\$3.53	\$2.72	\$3.85	\$3.52	\$3.13	\$3.56
September	\$0.50	\$0.47	\$0.40	\$4.21	\$3.35	\$4.55	\$3.40	\$3.22	\$3.92
October	\$0.43	\$0.42	\$0.42	\$4.03	\$3.59	\$4.07	\$3.68	\$3.06	\$3.71
November	\$0.40	\$0.41	\$0.41	\$3.61	\$4.00	\$4.00	\$3.61	\$4.78	\$3.96
December	\$0.42	\$0.42	\$0.49	\$3.25	\$4.89	\$4.60	\$3.88	\$4.44	\$3.78
January	\$0.48	\$0.53	\$0.61	\$2.86	\$4.16	\$3.47	\$3.01	\$4.43	\$2.59
February	\$0.55	\$0.41	\$0.61	\$3.90	\$3.79	\$2.18	\$4.48	\$3.78	\$3.77
March	\$0.54	\$0.64	\$0.63	\$3.66	\$3.84	\$4.15	\$4.11	\$3.61	\$3.64
April	\$0.48	\$0.59	\$0.64	\$3.75	\$2.66	\$2.66	\$2.78	\$4.05	\$3.37
May	\$0.49	\$0.58	\$0.63	\$3.00	\$3.90	\$3.07	\$4.15	\$2.80	\$3.35
June	\$0.49	\$0.56	\$0.60	\$3.00	\$3.98	n.a.	\$5.00	\$4.23	\$3.94
Average Annual Price	\$0.50	\$0.56	\$0.60	\$3.78	\$3.65	\$3.72	\$3.89	\$3.78	\$3.67

^a 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.

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

Figure 4.1 Average monthly prices for sardines, beach prices in South Australia and Sydney and Melbourne Fish Markets, 2006/07^a



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

4.3 Destination of SA Sardine Fishery Product

Licence holders indicated in the January 2007 survey that product caught in the SA Sardine Fishery are sold in a number of forms:

- fresh tuna fodder;
- frozen tuna fodder;
- fresh value added for human consumption; and
- frozen value added for human consumption.

Sardines for tuna fodder (fresh and frozen) are sold to the tuna farmers in Port Lincoln. Product for human consumption (fresh and frozen) is sold in Adelaide and interstate markets.

The proportion of total product sold by destination and weighted average price are detailed in Table 4.3.

Table 4.3 Estimated proportion of sardines sold by destination and weighted average price, 2006/07

Market Destination	Proportion of Total Volume Sold (%)	Average Price (\$/kg)
Fresh Tuna Fodder	55.2	0.53
Frozen Tuna Fodder	42.4	0.72
Fresh Value Added	0.6	0.80
Frozen Value Added	1.8	1.04

Source: Licence holder survey responses and EconSearch analysis

Fresh and frozen tuna fodder account for the majority of the volume of sales of sardines. It is estimated that approximately 55 per cent of the total volume of fish sold in 2006/07 was fresh tuna fodder, while 42 per cent was frozen tuna fodder. The remaining volume was sold for human consumption as either a fresh (0.6 per cent) or frozen (1.8 per cent) product.

4.4 Contribution to the Community

In addition to the economic contribution made to the regional and state economies (Section 3.4), the SA Sardine 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.

As a part of the 2007 survey, licence holders were asked to provide information relating to the ways in which they contribute to their local community. Their responses are summarised in the following sections.

4.4.1 Community-support activities

The estimated time spent on community-support activities by licence holders (including licence holders' family members and employees) in 2005/06 is summarised in Table 4.4.

On average, each licence holder (including family members and employees) spent at more than 3 days (29.5 hours) per month on community-support activities. The majority of this time, around twenty hours per month, was spent attending fishing related meetings, seminars and workshops.

Table 4.4 Estimated time per month spent on community-support activities, 2005/06

Community activity	Hours per month	
	Average per Licence Holder	All Licence Holders
Conservation activities	0.0	0
Marine rescue and recovery	0.4	4
Attending meetings, seminars and workshops	19.6	216
Compiling fishing related information for research purposes	3.9	43
Provision of technical advice to committees, panels	5.7	40
Volunteering for community services	0.0	0
Total	29.5	302

Source: Survey responses

SA Sardine Fishery licence holders, as a whole, spent a minimum of 302 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 \$590 per month or \$7,080 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 \$6,040 per month or around \$72,480 for the full year.

4.4.2 Local and regional services/businesses

The operation of the SA Sardine 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 SA Sardine fishery's contribution to various services and businesses is provided in Table 4.5.

There were approximately 50 children (under the age of 16) who were members of fishing families and fishing families' employees in 2005/06. Of these 50 children, the majority attended local schools. Nine children assisted with fishing operations.

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 \$17.47/hr to \$20.38/hr in 2003 dollars (inflated from 1997 estimates (Ironmonger 2002, p. 3)).

Table 4.5 Fishery contribution to local and regional services/businesses

Service/Business	Location	Fishery Contribution
Schools	Port Lincoln	Children attend
Tuna Farmer	Port Lincoln	Supply fish
Labour Hire Companies	Port Lincoln	Hire Labour
Equipment Supplier	Port Lincoln	Hire/purchase boats and equipment
Sardine Processors/Tuna Farmers	Port Lincoln	Freezing, packaging and storage
Freight carriers	Port Lincoln	Transport fish locally and interstate
Mechanics	Port Lincoln	Vehicle, boat and equipment maintenance
Recreational fishermen	Port Lincoln	Supply fish for bait
Fuel suppliers	Port Lincoln	Purchase fuel for boats and vehicles
Marine suppliers dealer	Port Lincoln	Purchase fishing gear

Source: Survey responses

4.5 Other Indicators

In addition to financial information, a range of other information was collected from licence holders during the 2007 survey regarding their fishing operations.

4.5.1 Time in fishery

The number of years that licence holders in the SA Sardine Fishery had owned fishing licences ranged from 3 to 15 years, with an average length of ownership of 10 years.

4.5.2 Age of licence holders

The majority of licence holders were aged between 35 and 60 years at the time of the survey, with the highest number of licence holders in the 41-50 year age bracket (57 per cent).

The average age of SA Sardine Fishery licence holders is 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).

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Disclaimer

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Appendix 1 Financial Performance Indicators, 2001/02 to 2003/04

Appendix Table 1.1 Financial performance in the South Australian Sardine Fishery, 2001/02 to 2003/04 (average per licence)

	2001/02		2002/03		2003/04	
	All Licences	Share of TCC ^a	All Licences	Share of TCC ^a	All Licences	Share of TCC ^a
Gross Income	\$845,076		\$1,516,323		\$1,917,966	
Costs						
Fuel	\$49,054	9%	\$51,766	6%	\$65,763	6%
R&M	\$94,882	17%	\$101,307	12%	\$130,406	13%
Provisions	\$3,712	1%	\$3,963	0%	\$5,101	0%
Labour	\$300,551	53%	\$539,280	66%	\$682,124	65%
Licence fee	\$30,146	5%	\$30,893	4%	\$66,972	6%
Quota leasing cost ^b	\$30,486	5%	\$35,708	4%	\$29,613	3%
Insurance	\$13,589	2%	\$14,134	2%	\$14,560	1%
Interest	\$9,719	2%	\$9,594	1%	\$9,844	1%
Admin and Other	\$33,197	6%	\$34,680	4%	\$37,238	4%
Total Cash Costs	\$565,335	100%	\$821,326	100%	\$1,041,621	100%
Cash Operating Surplus	\$279,741		\$694,998		\$876,345	
Depreciation	\$109,228		\$155,628		\$160,318	
Earnings Before Tax	\$170,513		\$539,369		\$716,027	
Earnings Before Interest & Tax	\$180,232		\$548,964		\$725,871	
Capital						
Fishing Gear & Equip	\$1,037,731		\$1,478,560		\$1,523,114	
Licence Value ^c	\$3,183,333		\$5,711,865		\$7,224,819	
Total Capital	\$4,221,064		\$7,190,425		\$8,747,933	
Rate of Return to Fishing Gear & Equip	20.3%		39.5%		49.6%	
Rate of Return to Total Capital	5.0%		8.1%		8.6%	

^a Total cash costs.

^b Quota leasing costs are those costs incurred as a result of leasing available quota from another party. The costs associated with quota leasing have been excluded from the calculation of the rate of return to gear and equipment and total capital for 2005/06 and 2006/07. The estimated rates of return for 2001/02 to 2003/04 have been revised from previous reports to account for this change in methodology.

^c Licence value for 2001/02 to 2003/04 has been calculated based on the average value indicated by licence holders in the 2002 survey and updated changes in gross income per licence holder between 2001/02 and 2003/04.

Source: EconSearch analysis.

Appendix 2 Economic Impact of the SA Sardine Fishery, 2001/02 to 2005/06¹⁴

Appendix Table 2.1 Economic impact of the SA Sardine Fishery on the South Australian economy, 2001/02^a

Sector	Turnover (\$m)		Employment (No. of jobs)		Household Income (\$m)		Value Added (\$m)	
	Local ^b	SA	Local	SA	Local	SA	Local	SA
Fishing (direct)	10.1	10.1	84 ^c	84 ^c	3.6	3.6	7.5	7.5
All other sectors ^{de} (indirect)	5.9	11.0	58	64	1.4	2.5	2.8	5.4
Total	16.0	21.1	142	148	5.0	6.1	10.3	12.8
Total/Direct	1.6	2.1	1.7	1.8	1.4	1.7	1.4	1.7
Total/Tonne	\$1,228	\$1,616	0.011 jobs	0.011 jobs	\$384	\$468	\$789	\$982

^a Based on 2001/02 estimated landed catch of 13,065 tonnes as indicated by licence holders in the survey.

^b 'Local' refers to the regional economy where the fishery is located, in this case the Eyre Peninsula.

^c Comprised of approximately 20 full-time and 64 part-time jobs, that is 44 full-time equivalent jobs.

^d 'All other sectors' refers to the other industry sectors in the regional and state economies such as fish processing and handling, other manufacturing, trade, business and property services, transport and finance.

^e It was assumed that all landed Sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of SA Sardines are sold for human consumption and recreational fishing bait, however, this proportion was unknown at the time of conducting this study. The flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, conservative.

Source: EconSearch 2003.

¹⁴ 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 and retail food service trade.

Appendix Table 2.2 Economic impact of the SA Sardine Fishery on the regional and state economies, 2002/03 ^a

Sector	Turnover (\$m)		Employment ^c (No. of jobs)		Household Income (\$m)		Value Added (\$m)	
	Local ^b	SA	Local	SA	Local	SA	Local	SA
	Fishing (direct)	17.8	17.8	98	98	7.5	7.5	14.9
All other sectors (indirect) ^{d, e}	9.0	16.6	83	91	2.1	3.7	4.5	8.4
Total	26.9	34.4	181	189	9.7	11.3	19.4	23.3
Total/Direct	1.5	1.9	1.8	1.9	1.3	1.5	1.3	1.6
Total/Tonne	\$1,200	\$1,500	0.01	0.01	\$400	\$500	\$800	\$1,000

^a Based on 2002/03 estimated landed catch of 21,741 tonnes (Table 3.1).

^b 'Local' refers to the regional economy where the fishery is located, in this case the Eyre Peninsula.

^c Direct employment was comprised of approximately 24 full-time and 74 part-time jobs, that is 61 full-time equivalent jobs.

^d 'All other sectors' refers to the other industry sectors in the regional and state economies such as fish processing and handling, other manufacturing, trade, business and property services, transport and finance.

^e It was assumed that all landed Sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of SA Sardines are sold for human consumption and recreational fishing bait, however, this proportion was unknown at the time of conducting this study. The flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

Source: EconSearch 2004.

Appendix Table 2.3 Economic impact of the SA Sardine Fishery in South Australia, 2003/04

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	22.5	48.4%	52	25.9%	9.5	60.4%	17.1	59.6%
Processing ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^c	0.7	1.6%	7	3.3%	0.2	1.3%	0.3	1.0%
Total Direct ^d	23.3	48.4%	58	25.9%	9.8	60.4%	17.4	59.6%
Flow-on effects								
Trade	3.4	7.3%	42	21.2%	1.3	8.1%	1.6	5.5%
Manufacturing	5.2	11.1%	18	9.0%	0.8	4.8%	1.2	4.2%
Business Services	2.1	4.5%	14	6.9%	0.8	4.8%	1.0	3.5%
Transport	1.0	2.1%	5	2.5%	0.3	2.0%	0.5	1.6%
Other Sectors	11.7	25.1%	63	31.3%	2.9	18.6%	7.1	24.6%
Total Flow-on ^d	23.3	50.0%	142	70.8%	6.1	38.3%	11.3	39.4%
Total ^d	46.6	100.0%	200	100.0%	15.8	100.0%	28.7	100.0%
Total/Direct	2.0	-	3.4	-	1.6	-	1.7	-
Total/Tonne	\$1,400	-	0.01	-	\$400	-	\$866	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 23 full-time jobs and 75 part-time jobs, that is, 98 jobs in aggregate.

^b It was assumed that all landed Sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of SA Sardines are sold for human consumption and recreational fishing bait, however, this proportion was unknown at the time of conducting this study. The flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

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

^d Totals may not sum due to rounding.

Source: EconSearch 2005a.

Appendix Table 2.4 Economic impact of the SA Sardine Fishery in the Eyre region, 2003/04

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	22.5	67.3%	52	37.6%	9.5	76.3%	17.1	75.2%
Processing	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^b	0.4	1.3%	6	4.5%	0.2	1.3%	0.2	1.0%
Total Direct ^c	23.0	67.3%	58	37.6%	9.7	76.3%	17.3	75.2%
Flow-on effects								
Trade	2.0	6.0%	30	21.7%	0.8	6.1%	1.0	4.3%
Manufacturing	1.8	5.3%	9	6.7%	0.3	2.6%	0.5	2.2%
Business Services	0.6	1.8%	4	3.2%	0.2	1.7%	0.3	1.2%
Transport	0.4	1.3%	3	2.0%	0.1	1.2%	0.2	1.0%
Other Sectors	5.7	17.0%	33	24.2%	1.4	10.8%	3.5	15.2%
Total Flow-on ^c	10.5	31.4%	80	57.9%	2.8	22.4%	5.4	23.9%
Total ^c	33.5	100.0%	137	100.0%	12.5	100.0%	22.8	100.0%
Total/Direct	1.5	-	2.4	-	1.3	-	1.3	-
Total/Tonne	\$1,000	-	0.00	-	\$300	-	\$600	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 23 full-time jobs and 75 part-time jobs, that is, 98 jobs in aggregate.

^b It was assumed that all landed Sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of SA Sardines are sold for human consumption and recreational fishing bait, however, this proportion was unknown at the time of conducting this study. The flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

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

^d Totals may not sum due to rounding.

Source: EconSearch 2005a.

Appendix Table 2.5 Economic impact of the SA Sardine Fishery in South Australia, 2004/05

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	28.5	49.5%	52	23.1%	12.1	61.5%	22.1	61.3%
Processing ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^c	0.8	1.3%	7	2.9%	0.2	1.1%	0.3	0.8%
Total Direct ^d	29.2	49.5%	58	23.1%	12.3	61.5%	22.4	61.3%
Flow-on effects								
Trade	4.2	7.3%	51	22.7%	1.6	8.1%	2.0	5.5%
Manufacturing	6.5	11.3%	22	9.8%	1.0	4.9%	1.5	4.2%
Business Services	2.5	4.3%	16	7.1%	0.9	4.6%	1.2	3.3%
Transport	1.2	2.1%	6	2.6%	0.4	2.0%	0.6	1.6%
Other Sectors	13.8	24.1%	71	31.8%	3.5	17.8%	8.4	23.3%
Total Flow-on ^d	28.2	49.1%	166	74.0%	7.3	37.4%	13.6	37.9%
Total ^d	57.5	100.0%	224	100.0%	19.6	100.0%	36.0	100.0%
Total/Direct	2.0	-	3.8	-	1.6	-	1.6	-
Total/Tonne	\$1,000	-	0.00	-	\$300	-	\$632	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 23 full-time jobs and 75 part-time jobs, that is, 98 jobs in aggregate.

^b It was assumed that all landed sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of SA sardines are sold for human consumption and recreational fishing bait, however, this proportion was unknown at the time of conducting this study. The flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

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

^d Totals may not sum due to rounding.

Source: EconSearch 2006.

Appendix Table 2.6 Economic impact of the SA Sardine Fishery in the Eyre region, 2004/05

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	28.5	68.1%	52	33.9%	12.1	76.9%	22.1	76.3%
Processing	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^b	0.4	1.1%	6	4.1%	0.2	1.1%	0.2	0.8%
<i>Total Direct</i> ^c	28.9	68.1%	58	33.9%	12.2	76.9%	22.3	76.3%
Flow-on effects								
Trade	2.6	6.1%	36	23.9%	1.0	6.1%	1.2	4.2%
Manufacturing	2.3	5.6%	12	7.6%	0.4	2.7%	0.7	2.3%
Business Services	0.7	1.6%	5	3.3%	0.2	1.6%	0.3	1.1%
Transport	0.5	1.2%	3	2.1%	0.2	1.1%	0.3	0.9%
Other Sectors	6.8	16.3%	39	25.2%	1.6	10.4%	4.2	14.4%
<i>Total Flow-on</i> ^c	12.9	30.8%	95	62.1%	3.4	22.0%	6.6	23.0%
Total ^c	41.8	100.0%	153	100.0%	15.7	100.0%	28.9	100.0%
Total/Direct	1.4	-	2.6	-	1.3	-	1.3	-
Total/Tonne	\$700	-	0.00	-	\$200	-	\$500	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 23 full-time jobs and 75 part-time jobs, that is, 98 jobs in aggregate.

^b It was assumed that all landed sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of SA sardines are sold for human consumption and recreational fishing bait, however, this proportion was unknown at the time of conducting this study. The flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

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

^d Totals may not sum due to rounding.

Source: EconSearch 2006.

Appendix Table 2.7 Economic impact of the SA Sardine Fishery in South Australia, 2005/06

Sector	Output		Employment ^a		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	16.0	36.5%	63	28.5%	6.7	47.4%	8.9	40.3%
Processing ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport ^b	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^c	3.3	7.4%	21	9.2%	1.0	6.9%	1.5	6.6%
Total Direct ^d	19.3	36.5%	84	28.5%	7.7	47.4%	10.3	40.3%
Flow-on effects								
Trade	3.7	8.5%	42	19.0%	1.4	9.9%	1.7	7.9%
Manufacturing	5.8	13.2%	19	8.5%	0.8	6.0%	1.4	6.2%
Business Services	2.4	5.4%	14	6.5%	0.9	6.1%	1.1	5.1%
Transport	1.4	3.2%	7	3.0%	0.5	3.2%	0.7	3.1%
Other Sectors	11.3	25.7%	56	25.3%	2.9	20.4%	6.8	30.9%
Total Flow-on ^d	24.6	56.0%	139	62.3%	6.4	45.7%	11.7	53.1%
Total ^d	43.9	100.0%	222	100.0%	14.1	100.0%	22.0	100.0%
Total/Direct	2.3	-	2.7	-	1.8	-	2.1	-
Total/Tonne	\$1,500	-	0.01	-	\$400	-	\$769	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 10 full-time jobs and 111 part-time jobs, that is, 121 jobs in aggregate.

^b It was assumed that all landed sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of sardines are sold for human consumption and recreational fishing bait, the flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

^c Capital expenditure includes fishing related expenditure (boats, fishing gear and equipment, sheds and buildings, motor vehicles and other equipment) and processing relating expenditure (sheds, buildings and freezers).

^d Totals may not sum due to rounding.

Source: EconSearch 2007a.

Appendix Table 2.8 Economic impact of the SA Sardine Fishery in the Eyre region, 2005/06

Sector	Output		Employment ^a		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	16.0	55.9%	63	40.5%	6.7	64.9%	8.9	57.8%
Processing	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure ^b	2.6	9.2%	21	13.3%	0.8	8.2%	1.3	8.6%
Total Direct ^c	18.7	55.9%	84	40.5%	7.5	64.9%	10.2	57.8%
Flow-on effects								
Trade	2.2	7.7%	29	18.8%	0.8	8.0%	1.0	6.8%
Manufacturing	1.5	5.2%	7	4.6%	0.3	2.7%	0.4	2.7%
Business Services	0.6	2.3%	5	2.9%	0.2	2.3%	0.3	2.0%
Transport	0.6	2.0%	3	2.2%	0.2	1.9%	0.3	1.9%
Other Sectors	5.1	17.7%	28	17.7%	1.2	12.0%	3.1	20.1%
Total Flow-on ^c	10.0	34.8%	72	46.2%	2.8	26.8%	5.1	33.6%
Total ^c	28.7	100.0%	156	100.0%	10.3	100.0%	15.3	100.0%
Total/Direct	1.5	-	1.9	-	1.4	-	1.5	-
Total/Tonne	\$1,000	-	0.01	-	\$300	-	\$500	-

^a Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 10 full-time jobs and 111 part-time jobs, that is, 121 jobs in aggregate.

^b It was assumed that all landed sardines were sold as feedstock for tuna farms in Port Lincoln. A small proportion of sardines are sold for human consumption and recreational fishing bait, the flow-on effects estimated for the transport and fish processing and handling sectors are, therefore, probably conservative.

^c Capital expenditure includes fishing related expenditure (boats, fishing gear and equipment, sheds and buildings, motor vehicles and other equipment) and processing relating expenditure (sheds, buildings and freezers).

^d Totals may not sum due to rounding.

Source: EconSearch 2007a.

Appendix 3 Summary Economic Indicators for South Australian Commercial Fisheries

Appendix Table 3.1 Commercial fisheries catch, South Australia, 1990/91 to 2005/06 (tonnes)

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

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

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

Source: EconSearch 2007b

Appendix Table 3.2 Commercial fisheries gross value of production, South Australia, 1990/91 to 2005/06 (\$m)

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

^a SARDI estimates for the years 1990/91 and 1991/92, revalued SARDI estimates using Baker and Pierce (1998) for the years 1992/93 to 2001/02 and survey based readjustment factors for 2002/03 to 2005/06. Excludes the River fishery for the years 2003/04 to 2005/06.

^b SARDI estimates for the years 1990/91 to 2002/03, revalued SARDI estimates for 2003/04 to 2005/06 using weighted average prices from Sydney and Melbourne fish markets and price data obtained from fishers.

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

Source: EconSearch 2007b.

Appendix Table 3.3 Cost of management in South Australian commercial fisheries, 2005/06

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

^a Excludes the River fishery.

Source: EconSearch 2007b.

Appendix Table 3.4 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	Sardines	Lakes and Coorong
Gross Income	1,016.8	289.5	750.6	379.7	294.7	4,965.8	270.0	47.1	1,149.5	192.5
Costs										
Fuel	15.3	26.3	56.9	21.6	45.4	643.3	29.9	6.2	201.9	13.9
R&M	37.2	14.8	47.5	19.2	17.1	554.8	34.8	5.6	92.1	6.4
Labour	259.7	108.7	251.7	105.1	126.7	1,242.8	92.2	29.5	476.8	70.5
Licence fee	65.4	28.3	22.7	15.8	19.6	239.7	55.0	4.0	71.6	8.7
Insurance	6.9	19.0	19.9	6.4	8.8	64.4	9.7	1.9	30.5	1.6
Interest	5.0	28.5	41.8	22.0	31.9	630.3	8.8	0.3	88.3	4.9
Admin & Other	52.5	24.9	55.1	21.6	50.9	288.1	22.5	10.1	94.1	27.4
Total Cash Costs	442.0	250.4	495.6	211.7	300.4	3,663.4	253.0	57.7	1,055.4	133.4
Cash Operating Surplus	574.8	39.1	255.0	168.0	-5.7	1,302.4	17.0	-10.5	94.1	59.2
Depreciation	66.0	133.5	142.9	45.0	58.0	334.3	38.9	8.8	194.2	59.2
Earnings Before Tax	508.9	-94.5	112.1	123.0	-63.7	968.1	-21.8	-19.4	-100.1	0.0
EBIT^c	513.9	-66.0	153.9	145.0	-31.8	1,598.5	-13.1	-19.1	-11.8	4.9
Capital										
Fishing Gear & Equipment	331.0	988.2	1,295.4	330.3	451.2	3,346.5	327.6	87.9	2,621.4	121.9
Licence Value	8,534.6	2,424.1	4,283.7	2,874.0	1,472.3	25,509.9	1,282.3	146.6	3,042.9	177.5
Total Capital	8,865.6	3,412.3	5,579.0	3,204.3	1,923.5	28,856.4	1,609.9	234.4	5,664.3	299.4
Rate of Return to Gear/Equip	155.3%	-6.7%	11.9%	43.9%	-7.1%	47.8%	-4.0%	-21.7%	0.3%	4.0%
Rate of Return to Capital	5.8%	-1.9%	2.8%	4.5%	-1.7%	5.5%	-0.8%	-8.1%	0.1%	1.6%

^a Financial performance for blue crab are on a whole sector basis. Survey estimate of income for the pot sector are higher than SARDI estimates (Appendix Table 2.2). The reason for the difference is that SARDI estimates are based on Adelaide prices, whereas licence holders are also selling to the higher priced Sydney & Melbourne markets.

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

^c Earnings before interest and tax.

Source: EconSearch 2007b.

Appendix Table 3.5 Costs as a percentage of total cash costs in South Australian commercial fisheries, 2005/06

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

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

Source: EconSearch 2007b.

Appendix Table 3.6 Economic impacts of South Australian commercial fisheries, 2005/06

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

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

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

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

Source: EconSearch 2007b.

Appendix Table 3.7 Economic rent in South Australian commercial fisheries, 2005/06 (\$m)

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

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

Source: EconSearch 2007b.