

Economic Indicators for  
the South Australian  
Sardine Fishery  
2008/09

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
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CPUE	catch per unit effort
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
SBT	Southern Bluefin Tuna
TACC	Total Allowable Commercial Catch

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## 1. Introduction

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

This report is the eighth annual economic indicators report for the South Australian Sardine Fishery.<sup>1</sup> 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, 2005 and 2006) provided an update of the indicators based on the results of the initial licence holder survey. The fifth report, prepared for 2005/06 (EconSearch 2007), provided an outline of the fisheries economic performance based on a second survey of licence holders, conducted in September 2006. The sixth and seventh reports, prepared for 2006/07 and 2007/08 (EconSearch 2008 and 2009a), provided an update of the fisheries economic performance based on the September 2006 survey and an additional survey conducted in early 2008.

The objective of this report, *Economic Indicators for the South Australian Sardine Fishery 2008/09*, was to provide an outline of the fishery's most recent economic performance based on the March 2010 survey.

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

- gross value of production (catch and price);
- the cost of management of the fishery;
- 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 2007/08, are presented in Appendix 3.

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<sup>1</sup> 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, 2008/09

The questionnaire for the survey was drafted by the consultants and subsequently modified after consultation with Christian Pyke (Executive Officer, South Australian Sardine Industry Association). In February 2010, 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 March 2010, interviews were conducted with the owners (or representatives) of 10 of the fishery's 14 licences. A total of 10 usable responses were collected, representing almost three-quarters of the licences in the fishery. Two licence holders, covering 4 licences, did not wish to participate in the survey.

### 2.2 Definition of Terms <sup>2</sup>

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

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

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

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

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

- insurance
- licence and industry fees
- office & business administration (communication, stationery, accountancy fees)

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

- interest on loan repayments and overdraft
- leasing

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### 3. Economic Indicators for the SA 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. Management arrangements for the fishery were reviewed in 1993/94 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. The increase in catch levels was underpinned by the introduction of research that measured the size of the spawning biomass of sardines in SA waters.

Table 3.1 Catch and value of catch, South Australian Sardine Fishery, 1990/91 to 2008/09 (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	28,626	16,031
2006/07	30,355	18,517
2007/08	29,692	16,331
2008/09 <sup>a</sup>	27,850	17,546

<sup>a</sup> Catch and value of catch estimates for 2008/09 are based on provisional SARDI data.

Source: SARDI Aquatic Sciences

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 resulting in a significant increase in catch in 2000/01 to 2004/05 up to almost 57,000 tonnes.

A reduction in the total allowable commercial catch (TACC) for the 2006 and subsequent seasons (Table 3.2) resulted in a significant decline in the catch and value of catch in the fishery.

The significant increase in catch and value of catch between 2000/01 and 2004/05 has been a result of increases in the TACC. The TACC for the fishery was derived from stock assessment and the spawning biomass assessment (Steve Shanks pers. comm.) and since 2008 has been based on the biannual spawning biomass surveys and the Harvest Strategy. In 2002 the TACC was 17,750 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, 2009 and 2010 (Tables 3.1 and 3.2). An additional 4,000 tonnes of quota (to be fished outside the traditional fishing areas) had been made available for the 2010 calendar year.

Table 3.2 TACC in the South Australian Sardine Fishery, 1995 to 2009, (calendar years)

Year	Total Allowable Commercial Catch
1995 <sup>a</sup>	3,500
1996	3,500
1997	3,500
1998 <sup>a</sup>	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 <sup>b</sup>	30,000
2009	30,000

<sup>a</sup> Mass pilchard (sardine) mortality events occurred in 1995 and 1998.

<sup>b</sup> From 2008 onwards the baseline TACC in the sardine fishery will be 30,000 tonnes.

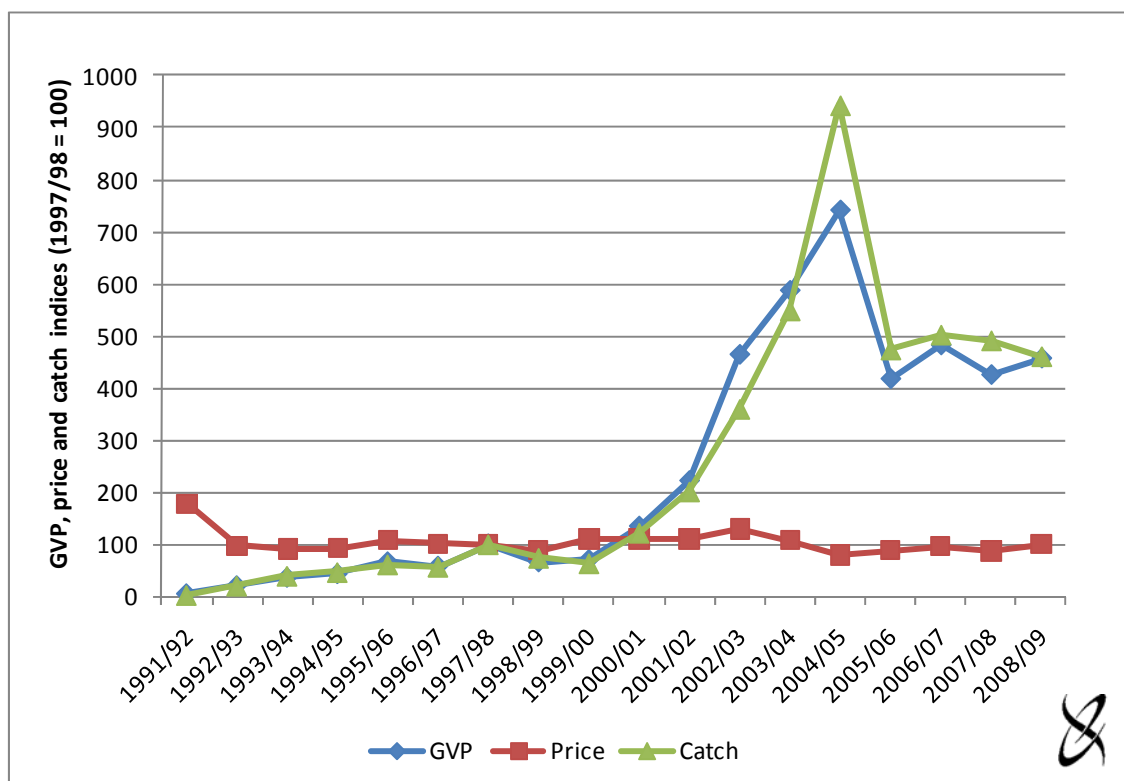
Source: Michelle Besley (PIRSA Fisheries pers. comm.), Steve Shanks (PIRSA Fisheries pers. comm.), Craig Noell (PIRSA Fisheries pers. comm.) and Ward et. al. (2007)

Fishing effort is generally concentrated between January and June each year. Survey data indicates that during 2008/09 some licence holders caught all of their annual catch within that 6 month period.

Figure 3.1 illustrates how the value of the fishery has changed over the 17 year period, 1991/92 to 2008/09. 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, before decreasing in 2007/08. Despite a decrease in catch, the nominal value of sardine catch increased in 2008/09 as a result of a 15 per cent increase in the nominal price of sardines.

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. The nominal price of sardines decreased to \$0.55/kg in 2007/08 before increasing to \$0.63/kg in 2008/09.

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

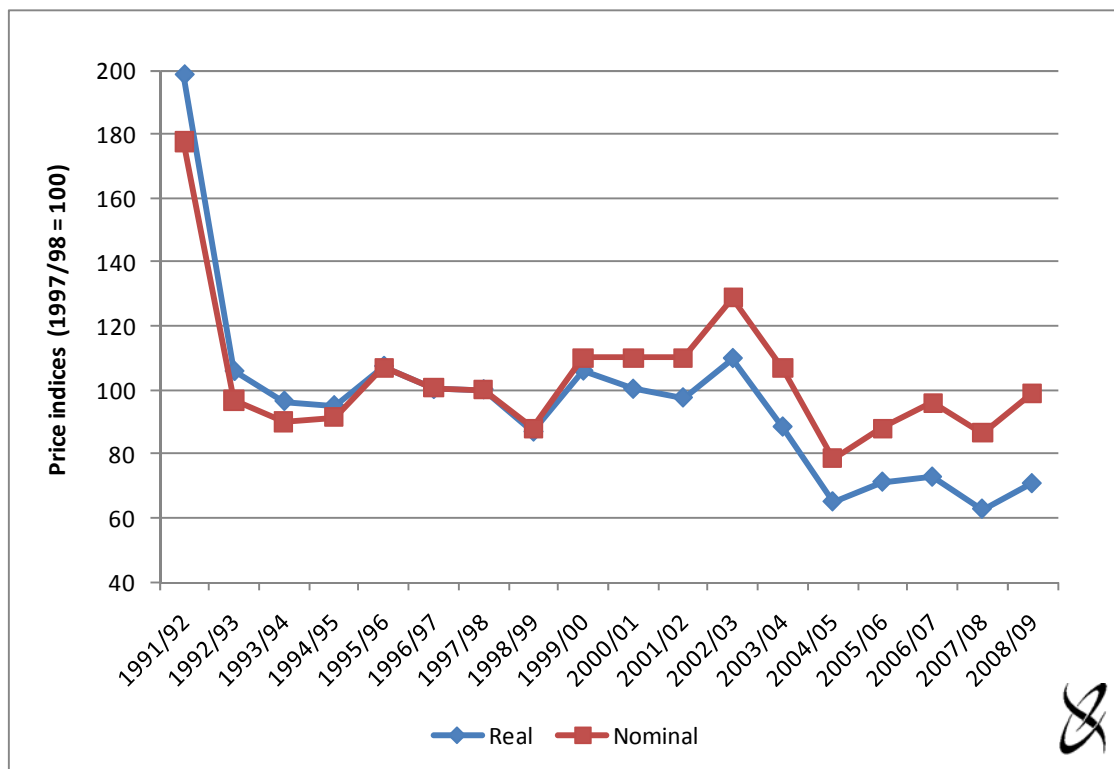


<sup>a</sup> 1997/98 is the reference year against which all other years are compared.

Source: SARDI Aquatic Sciences

Figure 3.2 shows that the 1 per cent decrease in the nominal beach price of sardines over the 11 year period from 1997/98 to 2008/09 was equivalent to a 29 per cent decline in the real price<sup>3</sup>. The price of sardines rose between 2007/08 and 2008/09, in both nominal and real terms (Figure 3.2).

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



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

Source: SARDI Aquatic Sciences and ABS (2009)

### 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;
- observer services; and
- research services (including the FRDC levy).

<sup>3</sup> 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 2009). It enables meaningful comparisons of prices to be made between years.

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 3.3 shows actual licence fee receipts for the SA Sardine Fishery for the period 2000/01 to 2009/10.

Table 3.3 Cost of management in the South Australian Sardine Fishery, 2000/01 to 2009/10

	Licence Fee (\$'000)	Gross Value of Production (\$'000)	Fee/GVP (%)	Catch (tonnes)	Fee/Catch (\$/kg)	Licence Holders (No.)	Fee/Licence Holder <sup>a</sup> (\$/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	16,331	4.2%	29,692	\$0.02	14	\$49,317
2008/09	863	17,546	4.9%	27,850	\$0.03	14	\$61,673
2009/10	656	n.a.	-	n.a.	-	14	\$46,860

<sup>a</sup> 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 2007/08 to 2008/09:

- licence fees as a percentage of GVP increased marginally from 4.2 per cent to 4.9 per cent as a result of an increase in aggregate licence fees;
- the cost per kilogram of sardines increased from \$0.02 to \$0.03 as result of an increase in licence fees and a decline in catch; and
- fees per licence increased from \$49,317 in 2007/08 to \$61,673 in 2008/09, an increase of 25 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 2003/04 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 in 2006/07 (20 per cent) and 2007/08 (14 per cent) before increasing to \$61,673 in 2008/09 (25 per cent).

Fees per licence holder fell from \$61,673 in 2008/09 to \$46,860 in 2009/10, a 24 per cent decline (Table 3.3). This is due to the cycling in the bi-annual research program and TACC setting process for the fishery and the associated costs. Year 1 (e.g. 2008/09) is the more expensive of the two years as it includes undertaking of egg sampling and the Daily Egg Production Model (DEPM) reported in the Spawning Biomass Report as well as fish sampling/aging, and year 2 (e.g. 2009/10) includes the fish sampling/aging which is reported in the Fishery Assessment Report.

### 3.3 Financial Performance Indicators

The major measures of the financial performance of the surveyed licences in the SA Sardine Fishery for the period 2006/07 to 2008/09 are shown in Table 3.4. Measures of financial performance are also provided on a quota year (calendar year) basis. Financial year (2008/09) and quota year (2009) estimates of financial performance are presented on a per licence basis in Table 3.5. Estimates of financial performance for 2006/07 and 2007/08 are based on the 2006 licence holder survey and an updated survey conducted in 2008. Financial performance estimates for 2008/09 are based on the 2010 licence holder survey. For comparison, financial performance estimates for earlier years (2001/02 to 2005/06) are provided in Appendix 1. Some of the differences between years are, therefore, attributable to sampling variability.

#### **Income...**

Total recorded sardine catch in South Australia decreased by 6 per cent between 2007/08 and 2008/09 while gross receipts from the sale of sardines increased by 7 per cent over the same period (Table 3.1). The average gross income per surveyed licence in the fishery was estimated to be just over \$1.1 million in 2008/09 down 5 per cent from 2007/08 (Table 3.4)<sup>4</sup>.

The 2006, 2008 and 2010 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. Some licence holders lease quota to or from others. This practice, along with market factors, accounts for the small variation in income per licence. The coefficient of variation of gross income was 26 per cent in 2008/09 and 8 per cent in 2009 (Table 3.5).

Comparison of the financial and quota year estimated income indicates that average gross income per licence was approximately 43 per cent higher in the latter half of the year because of a concentration of fishing effort during this period (Table 3.5).

#### **Costs...**

Table 3.4 shows total cash costs separated into variable and fixed costs. Variable costs (78 per cent of total boat cash costs in 2008/09) represented a significantly greater proportion of total cash costs than fixed costs (22 per cent).

It was estimated that average total boat cash costs decreased by approximately 24 per cent between 2007/08 and 2008/09. Notable changes in costs included increases in bait/ice costs and decreases in leasing, interest and fuel costs. Labour costs declined between 2007/08 and 2008/09 in line with the decrease in catch (Table 3.4).

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<sup>4</sup> Financial performance estimates for 2008/09 are based on different survey samples to earlier years. Some of the differences between years is, therefore, attributable to sampling variability.

Table 3.4 Financial performance in the South Australian Sardine Fishery, 2006/07 to 2008/09 (average per licence)<sup>a</sup>

	2006/07		2007/08		2008/09	
	Average per licence	Share of TBCC <sup>b</sup>	Average per licence	Share of TBCC <sup>b</sup>	Average per licence	Share of TBCC <sup>b</sup>
<b>(1) Total Boat Gross Income</b>	<b>\$1,315,921</b>		<b>\$1,160,572</b>		<b>\$1,103,668</b>	
Variable Costs						
Fuel	\$199,489	18%	\$200,662	19%	\$137,876	17%
Repairs & Maintenance <sup>c</sup>	\$98,819	9%	\$99,211	9%	\$97,835	12%
Bait/Ice	\$2,299	0%	\$2,308	0%	\$7,546	1%
Provisions	\$8,123	1%	\$8,155	1%	\$4,829	1%
Labour - paid	\$527,271	47%	\$465,025	44%	\$348,492	43%
<b>(2) - unpaid<sup>d</sup></b>	<b>\$3,303</b>	<b>0%</b>	<b>\$2,913</b>	<b>0%</b>	<b>\$6,305</b>	<b>1%</b>
Other	\$33,468	3%	\$34,992	3%	\$25,347	3%
<b>(3) Total Variable Costs</b>	<b>\$872,772</b>	<b>78%</b>	<b>\$813,267</b>	<b>77%</b>	<b>\$628,230</b>	<b>78%</b>
Fixed Costs						
Licence Fee <sup>e</sup>	\$56,375	5%	\$48,428	5%	\$44,788	6%
Insurance	\$30,624	3%	\$32,018	3%	\$32,344	4%
<b>(4) Interest</b>	<b>\$84,874</b>	<b>8%</b>	<b>\$97,704</b>	<b>9%</b>	<b>\$58,549</b>	<b>7%</b>
<b>(5) Labour - unpaid<sup>d</sup></b>	<b>\$10,248</b>	<b>1%</b>	<b>\$10,248</b>	<b>1%</b>	<b>\$13,135</b>	<b>2%</b>
<b>(6) Leasing</b>	<b>\$23,357</b>	<b>2%</b>	<b>\$21,060</b>	<b>2%</b>	<b>\$2,107</b>	<b>0%</b>
Legal & Accounting	\$7,828	1%	\$8,185	1%	\$5,371	1%
Telephone etc.	\$1,745	0%	\$1,825	0%	\$1,001	0%
Slipping & Mooring	\$17,013	2%	\$17,788	2%	\$12,918	2%
Travel	\$818	0%	\$856	0%	\$63	0%
Office & Admin	\$6,340	1%	\$6,629	1%	\$10,346	1%
<b>(7) Total Fixed Costs</b>	<b>\$239,223</b>	<b>22%</b>	<b>\$244,739</b>	<b>23%</b>	<b>\$180,620</b>	<b>22%</b>
<b>(8) Total Boat Cash Costs (3 + 7)</b>	<b>\$1,111,995</b>	<b>100%</b>	<b>\$1,058,006</b>	<b>100%</b>	<b>\$808,850</b>	<b>100%</b>
<b>Boat Gross Margin (1 - 3)</b>	<b>\$443,149</b>		<b>\$347,305</b>		<b>\$475,438</b>	
<b>(9) Total Unpaid Labour (2 + 5)</b>	<b>\$13,551</b>		<b>\$13,161</b>		<b>\$19,440</b>	
<b>Gross Operating Surplus (1 - 8 + 9)</b>	<b>\$217,477</b>		<b>\$115,727</b>		<b>\$314,258</b>	
<b>(10) Boat Cash Income (1 - 8)</b>	<b>\$203,925</b>		<b>\$102,565</b>		<b>\$294,818</b>	
<b>(11) Depreciation</b>	<b>\$211,685</b>		<b>\$217,477</b>		<b>\$140,284</b>	
<b>(12) Boat Business Profit (10 - 9)</b>	<b>-\$7,759</b>		<b>-\$114,911</b>		<b>\$154,534</b>	
<b>(13) Profit at Full Equity (12 + 4 + 6)</b>	<b>\$100,472</b>		<b>\$3,852</b>		<b>\$215,190</b>	
<b>Boat Capital</b>						
<b>(14) Fishing Gear &amp; Equip</b>	<b>\$2,763,603</b>		<b>\$2,839,221</b>		<b>\$2,722,706</b>	
Licence Value	\$3,318,705		\$2,926,919		\$3,386,223	
<b>(15) Total Boat Capital</b>	<b>\$6,082,308</b>		<b>\$5,766,140</b>		<b>\$6,108,928</b>	
<b>Rate of Return on Fishing Gear &amp; Equip (13 / 14 * 100)</b>	<b>3.64%</b>		<b>0.14%</b>		<b>7.90%</b>	
<b>Rate of Return on Total Boat Capital (13 / 15 * 100)</b>	<b>1.65%</b>		<b>0.07%</b>		<b>3.52%</b>	

<sup>a</sup> Estimates of financial performance for 2006/07 and 2007/08 are based on the 2006 licence holder survey and an updated survey conducted in 2008. Financial performance estimates for 2008/09 are based on the 2010 licence holder survey. Financial performance estimates for 2001/02 to 2005/06 are detailed in Appendix 1.

<sup>b</sup> Total boat cash costs.

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

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

<sup>e</sup> Licence fees for 2006/07 and 2007/08 are based on information provided by licence holders in the 2006 and 2008 surveys. Licence fees for 2008/09 are based on information provided by licence holders in the 2010 survey. Accordingly, licence fees reported in Table 3.4 differ slightly to the management costs reported in Table 3.3.

Source: EconSearch analysis

Table 3.5 Financial performance in the South Australian Sardine fishery, 2008/09 and 2009 (average per licence)

	2008/09			2009		
	Average per licence	Share of TBCC <sup>a</sup>	Coefficient of Variation <sup>b</sup>	Average per licence	Share of TBCC <sup>a</sup>	Coefficient of Variation <sup>b</sup>
(1) <b>Total Boat Gross Income</b>	<b>\$1,103,668</b>		26%	<b>\$1,583,463</b>		8%
Variable Costs						
Fuel	\$137,876	17%	25%	\$165,272	17%	24%
Repairs & Maintenance <sup>c</sup>	\$97,835	12%	7%	\$77,172	8%	5%
Bait/Ice	\$7,546	1%	30%	\$7,546	1%	30%
Provisions	\$4,829	1%	6%	\$6,293	1%	6%
Labour - paid	\$348,492	43%	28%	\$466,600	49%	25%
(2)     - unpaid <sup>d</sup>	\$6,305	1%	146%	\$6,110	1%	152%
Other	\$25,347	3%	138%	\$28,598	3%	130%
(3) <b>Total Variable Costs</b>	<b>\$628,230</b>	<b>78%</b>	23%	<b>\$757,592</b>	<b>79%</b>	19%
Fixed Costs						
Licence Fee <sup>e</sup>	\$44,788	6%	22%	\$44,788	5%	22%
Insurance	\$32,344	4%	47%	\$25,871	3%	52%
(4) Interest	\$58,549	7%	139%	\$76,558	8%	126%
(5) Labour - unpaid <sup>d</sup>	\$13,135	2%	146%	\$12,730	1%	152%
(6) Leasing	\$2,107	0%	198%	\$3,999	0%	211%
Legal & Accounting	\$5,371	1%	102%	\$5,547	1%	96%
Telephone etc.	\$1,001	0%	119%	\$1,272	0%	110%
Slipping & Mooring	\$12,918	2%	144%	\$13,378	1%	140%
Travel	\$63	0%	211%	\$125	0%	211%
Office & Admin	\$10,346	1%	86%	\$12,029	1%	77%
(7) <b>Total Fixed Costs</b>	<b>\$180,620</b>	<b>22%</b>	58%	<b>\$196,295</b>	<b>21%</b>	62%
(8) <b>Total Boat Cash Costs (3 + 7)</b>	<b>\$808,850</b>	<b>100%</b>	29%	<b>\$953,887</b>	<b>100%</b>	25%
<b>Boat Gross Margin (1 - 3)</b>	<b>\$475,438</b>			<b>\$825,871</b>		
(9) <b>Total Unpaid Labour (2 + 5)</b>	<b>\$19,440</b>			<b>\$18,840</b>		
<b>Gross Operating Surplus (1 - 8 + 9)</b>	<b>\$314,258</b>			<b>\$648,416</b>		
(10) <b>Boat Cash Income (1 - 8)</b>	<b>\$294,818</b>			<b>\$629,576</b>		
(11) <b>Depreciation</b>	<b>\$140,284</b>			<b>\$140,284</b>		
(12) <b>Boat Business Profit (10 - 9)</b>	<b>\$154,534</b>			<b>\$489,292</b>		
(13) <b>Profit at Full Equity (12 + 4 + 6)</b>	<b>\$215,190</b>			<b>\$569,849</b>		
Boat Capital						
(14) Fishing Gear & Equip	\$2,722,706		55%	\$2,722,706		55%
Licence Value	\$3,386,223		18%	\$3,386,223		18%
(15) <b>Total Boat Capital</b>	<b>\$6,108,928</b>		21%	<b>\$6,108,928</b>		21%
<b>Rate of Return on Fishing Gear &amp; Equip (13 / 14 * 100)</b>	<b>7.90%</b>			<b>20.93%</b>		
<b>Rate of Return on Total Boat Capital (13 / 15 * 100)</b>	<b>3.52%</b>			<b>9.33%</b>		

<sup>a</sup> Total boat cash costs.

<sup>b</sup> 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. For example, the mean gross income for 2008/09 was reported as \$1,103,668, and the standard deviation was calculated to be \$291,278, this gives a coefficient of variation of 26 per cent (i.e. \$291,278/\$1,103,668).

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

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

<sup>e</sup> Licence fees for 2008/09 and 2009 are based on information provided by licence holders in the 2010 survey. Accordingly, licence fees reported in Table 3.5 differ slightly to the management costs reported in Table 3.3.

Source: EconSearch analysis.

In 2008/09, for the fishery as a whole, approximately 45 per cent of total boat cash costs were attributable to labour costs, by far the biggest cost item. The labour costs reported in Table 3.4 are comprised of payments to licence owners and crew as well as an imputed wage to those licence owners and other family members who are not paid a wage directly by the business. Imputed unpaid labour (just over \$8,400 for 2008/09) was divided into variable (fishing and repairs and maintenance (\$6,305)) and fixed (management and administration (\$13,135)) with components based on the 2010 licence holder survey.

The other significant cash costs were fuel (17 per cent), repairs and maintenance (12 per cent), interest (7 per cent) and licence fees (6 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. There was a significant decline in quota leasing costs between 2007/08 and 2008/09. PIRSA licensing data suggests this is due to sampling variation rather than a decline in the level of quota trade. The coefficient of variation of quota leasing costs was 198 per cent in 2008/09 and 211 per cent in 2009, indicating a high level of variation in quota leasing costs per licence (Table 3.5).

The lower capital value of fishing gear and equipment and capital depreciation costs in 2008/09 indicates less investment in new vessels compared to earlier years. This is also reflected in the lower interest costs for 2008/09 (Table 3.4 and Appendix Table 1.1).

Comparison of the financial and quota year estimated total cash costs indicate that costs were approximately 18 per cent higher in the latter half of the year. The most significant increases were in the costs of fuel, labour and leasing because of the concentration of fishing effort in the latter half of the year (Table 3.5).

### ***Cash Income and Profit...***

The separation of variable and fixed costs from total cash costs enables the calculation of boat gross margin (total boat income less total boat variable costs) as a basic measure of profit (assuming that capital has no alternative use and that as fishing activity varies there is no change in capital or fixed costs). There was an increase in boat gross margin in 2008/09 (\$475,000) compared to previous years due to the decline total variable costs.

Gross operating surplus (GOS) was calculated excluding imputed wages for operator and family members as a cost item. The average GOS of all licences in 2008/09 was estimated to be approximately \$314,000, 172 per cent higher than in 2007/08 (Table 3.4).

Boat cash income is measured as gross operating surplus with imputed wages (unpaid labour) included as cash costs. The estimated average boat cash income in 2008/09 was almost \$295,000 per licence (Table 3.4).

Gross operating surplus and boat business profit give an indication of the capacity of the operator to remain in the fishery in the short to medium term. In 2008/09, the average boat business profit was approximately \$154,000, significantly greater than the previous year (-\$115,000) (Table 3.4).

Profit at full equity is a measure of the profitability of an individual licence holder, assuming the licence holder has full equity in the operation. It is a useful absolute measure of the economic performance of fishing firms. Profit at full equity in 2008/09 (approximately \$215,000 per licence) was significantly greater than the estimate for the previous year (almost \$4,000) (Table 3.4).

### **Return on Investment...**

There are a number of interpretations of the concept of return on investment. For the purpose of this analysis it is appropriate to consider the investment as the capital employed by an average licence holder. 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<sup>5</sup> operated by the licence holder. Additionally, it does not include any capital associated with onshore processing facilities owned and 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 total investment in fishing gear and licence in the sardine fishery in 2008/09 was estimated to be almost \$6.1 million per licence. This included the licence holder's estimate of the value of their licence (almost \$3.4 million) and estimated investment in boats and fishing gear (just over \$2.7 million per licence). There was significant variation across the fishery in the licence holders' estimates of the value of fishing gear and equipment.

The average return on investment for the fisheries is reported in Table 3.4. The rate of return to boat capital (i.e. fishing gear and equipment) was estimated to be 7.9 per cent and the rate of return to total capital was estimated to average 3.5 per cent in 2008/09. The rates of return for 2008/09 were higher than those reported for previous years (Table 3.4 and Appendix Table 1.1).

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 the 2010 survey, the value per licence in the fishery is almost \$3.4 million. A record of licence transfers from PIRSA Fisheries indicates that there was no licence transfers in 2008/09.

Since there have been limited transfers of licences in recent years and the current market value of licences is uncertain, a sensitivity analysis was undertaken to estimate the rate of return to capital for a range of licence values. The results are presented in Table 3.6.

Table 3.6 Sensitivity of rate of return to changes in licence value, 2008/09 <sup>a</sup>

Licence Value	\$1,693,111	\$3,386,223	\$5,079,334
Rate of Return to Total Capital (%)	4.87%	3.52%	2.76%

<sup>a</sup> Based on the licence value estimated for 2008/09 and values 50 per cent above and below this estimate.

Source: EconSearch analysis.

<sup>5</sup> It also excludes capital used by the licence holder in other fisheries.

Based on the costs and returns shown for the year 2008/09 in Table 3.4, a licence value of \$1.7 million (approximately 50 per cent below the licence value estimated for 2008/09) would mean an annual return to the total asset of 4.9 per cent, while a licence value of \$5.1 million (approximately 50 per cent above the licence value estimated for 2008/09) would mean an annual return to the total asset of 2.8 per cent (Table 3.6).

### 3.4 State and Regional Economic Impact

Estimates of the economic impact of the SA Sardine Fishery on the South Australian and regional (Eyre/Western<sup>6</sup>) economies in 2008/09 are outlined below.

#### 3.4.1 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 *Value-added ScoreCard, 2006/07*<sup>7</sup>.

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<sup>8</sup>.

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/Western State Government region, prepared for the Department of Trade and Economic Development (EconSearch 2009c).

In order to compile a representative cost structure for the fishing sector, costs per licence were derived from data provided by operators in the fishery in the financial survey for 2008/09, described earlier. On an item-by-item basis, the expenditures were allocated between those occurring in the Eyre/Western 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 *value-added ScoreCard (Seafood Scorecard, 2006/07)* (Rob Esvelt, PIRSA, pers. comm.).

<sup>6</sup> The Eyre and Western region is consistent with the SA Government Region, as defined by the Department of Planning and Local Government.

<sup>7</sup> The relevant information was obtained from Rob Esvelt (PIRSA, pers. comm.).

<sup>8</sup> 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.

Estimates of the net value of local transport margins and capital expenditure<sup>9</sup> per licence holder were derived from the survey of licence holders.

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

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

### 3.4.2 Economic impacts at state and regional levels

Estimates of the economic impact generated in 2008/09 by the SA Sardine Fishery in South Australia and the Eyre/Western region are outlined in Tables 3.7 and 3.8, 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.

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<sup>9</sup> 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.

**Value of output...**

The value of output generated directly in South Australia and the Eyre/Western region by sardine fishing enterprises summed to \$17.5 million in 2008/09 (Table 3.7), while output generated in South Australia by associated downstream activities (processing, transport, retail/food services and capital expenditure) summed to \$3.8 million (\$2.4 million in the Eyre/Western region, Table 3.8).

Flow-ons to other sectors of the state economy added another \$22.7 million in output (\$9.7 million in the regional economy). The sectors most affected were the manufacturing, trade, business services and transport sectors.

**Table 3.7 The economic impact of the South Australian Sardine Fishery in South Australia, 2008/09**

Sector	Output		Employment <sup>a</sup>		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
<b>Direct effects</b>								
Fishing	17.5	39.9%	48	26.2%	5.2	41.6%	12.1	48.7%
Processing	1.9	4.3%	7	3.7%	0.4	3.4%	0.6	2.4%
Transport	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Retail	1.1	2.5%	12	6.8%	0.4	3.3%	0.6	2.3%
Food services	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Capital expenditure <sup>b</sup>	0.8	1.8%	6	3.1%	0.2	1.8%	0.3	1.3%
<b>Total Direct <sup>c</sup></b>	<b>21.3</b>	<b>46.7%</b>	<b>73</b>	<b>36.7%</b>	<b>6.2</b>	<b>48.3%</b>	<b>13.6</b>	<b>53.5%</b>
<b>Flow-on effects</b>								
Trade	3.7	8.4%	32	17.4%	1.2	9.9%	1.8	7.0%
Manufacturing	5.3	12.1%	19	10.5%	1.2	9.6%	1.7	6.9%
Business Services	2.7	6.1%	12	6.6%	0.9	7.6%	1.3	5.1%
Transport	1.3	3.0%	5	2.8%	0.3	2.5%	0.6	2.3%
Other Sectors	9.6	21.9%	42	22.9%	2.5	20.3%	6.0	23.9%
<b>Total Flow-on <sup>c</sup></b>	<b>22.7</b>	<b>51.5%</b>	<b>110</b>	<b>60.2%</b>	<b>6.2</b>	<b>49.9%</b>	<b>11.3</b>	<b>45.3%</b>
<b>Total <sup>c</sup></b>	<b>44.0</b>	<b>100.0%</b>	<b>182</b>	<b>100.0%</b>	<b>12.4</b>	<b>100.0%</b>	<b>24.9</b>	<b>100.0%</b>
Total/Direct	2.1	-	2.5	-	2.0	-	1.8	-
Total/Tonne	\$1,500	-	0.01	-	\$400	-	\$894	-

<sup>a</sup> Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 13 full-time jobs and 67 part-time jobs, that is, 80 jobs in aggregate, which was estimated to be 48 ftes.

<sup>b</sup> 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).

<sup>c</sup> Totals may not sum due to rounding.

Source: EconSearch analysis

### **Employment and household income...**

In 2008/09, the SA Sardine Fishery was responsible for the direct employment of around 48 full-time equivalents (fte) and downstream activities created employment of around 25 fte jobs state-wide. Flow-on business activity was estimated to generate a further 110 fte jobs state-wide (50 jobs regionally). These state-wide jobs were concentrated in the trade (32), manufacturing (19), business services (12) and transport (5) sectors.

Personal income of \$5.2 million was earned in the fishing sector (wages of employees and estimated drawings by owner/operators) and \$1.1 million in downstream activities in SA. An additional \$6.2 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 \$12.4 million in SA (\$8.3 million in the Eyre/Western region).

**Table 3.8 The economic impact of the South Australian Sardine Fishery in the Eyre region, 2008/09**

Sector	Output		Employment <sup>a</sup>		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
<b>Direct effects</b>								
Fishing	17.5	59.0%	48	44.3%	5.2	62.3%	12.1	67.5%
Processing	1.9	6.3%	5	5.0%	0.4	5.0%	0.6	3.3%
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 <sup>b</sup>	0.6	1.9%	5	4.6%	0.2	2.1%	0.2	1.4%
<b>Total Direct <sup>c</sup></b>	<b>20.0</b>	<b>65.3%</b>	<b>58</b>	<b>49.3%</b>	<b>5.7</b>	<b>67.3%</b>	<b>13.0</b>	<b>70.8%</b>
<b>Flow-on effects</b>								
Trade	2.2	5.1%	21	11.3%	0.8	6.1%	1.1	4.3%
Manufacturing	2.1	4.7%	6	3.3%	0.5	3.7%	0.6	2.6%
Business Services	0.9	1.9%	4	2.2%	0.3	2.2%	0.4	1.6%
Transport	0.7	1.5%	3	1.5%	0.2	1.3%	0.3	1.2%
Other Sectors	3.9	8.9%	17	9.1%	0.9	7.2%	2.6	10.4%
<b>Total Flow-on <sup>c</sup></b>	<b>9.7</b>	<b>22.2%</b>	<b>50</b>	<b>27.3%</b>	<b>2.5</b>	<b>20.5%</b>	<b>5.0</b>	<b>20.1%</b>
<b>Total <sup>c</sup></b>	<b>29.7</b>	<b>89.4%</b>	<b>108</b>	<b>81.1%</b>	<b>8.3</b>	<b>89.8%</b>	<b>18.0</b>	<b>92.2%</b>
Total/Direct	1.5	-	1.9	-	1.4	-	1.4	-
Total/Tonne	\$1,000	-	0.00	-	\$200	-	\$600	-

<sup>a</sup> Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 13 full-time jobs and 67 part-time jobs, that is, 80 jobs in aggregate, which was estimated to be 48 ftes.

<sup>b</sup> 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).

<sup>c</sup> Totals may not sum due to rounding.

Source: EconSearch analysis

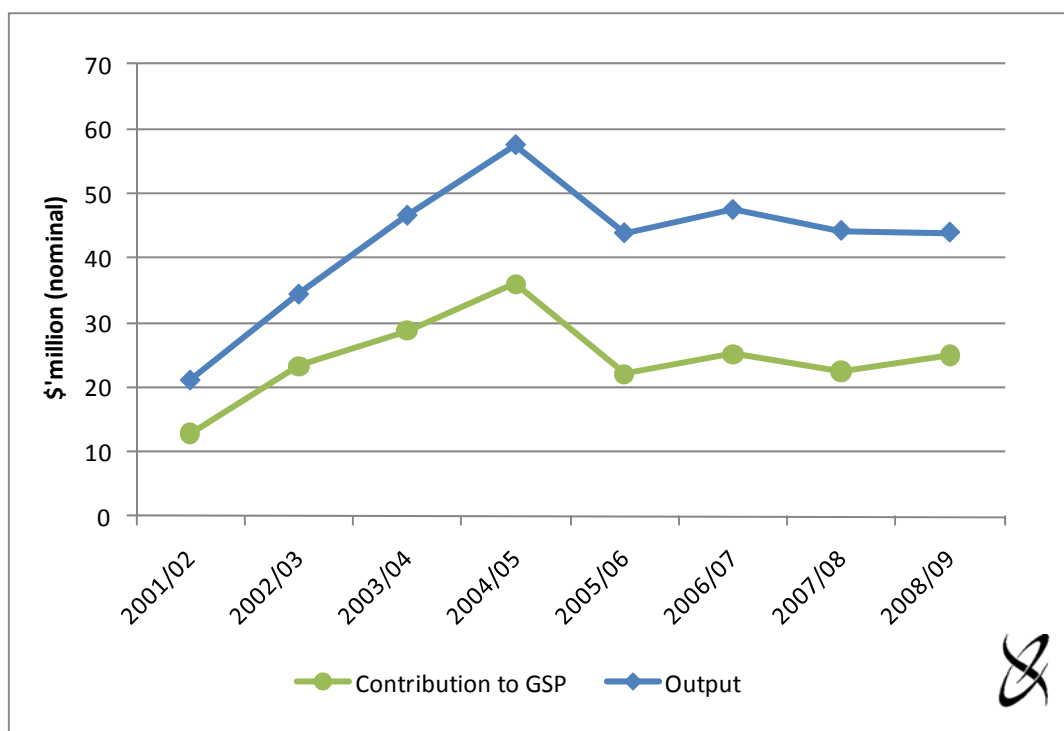
**Contribution to GSP and GRP...**

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 2008/09, total SA Sardine Fishery related contribution to GSP in South Australia was \$24.9 million (\$18.0 million in the Eyre/Western region), \$12.1 million generated by fishing directly, \$1.5 million generated by downstream activities and \$11.3 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 eight-year period, 2001/02 to 2007/08. Estimates of economic impact are expressed in nominal terms which means that no adjustment has been made for inflation.

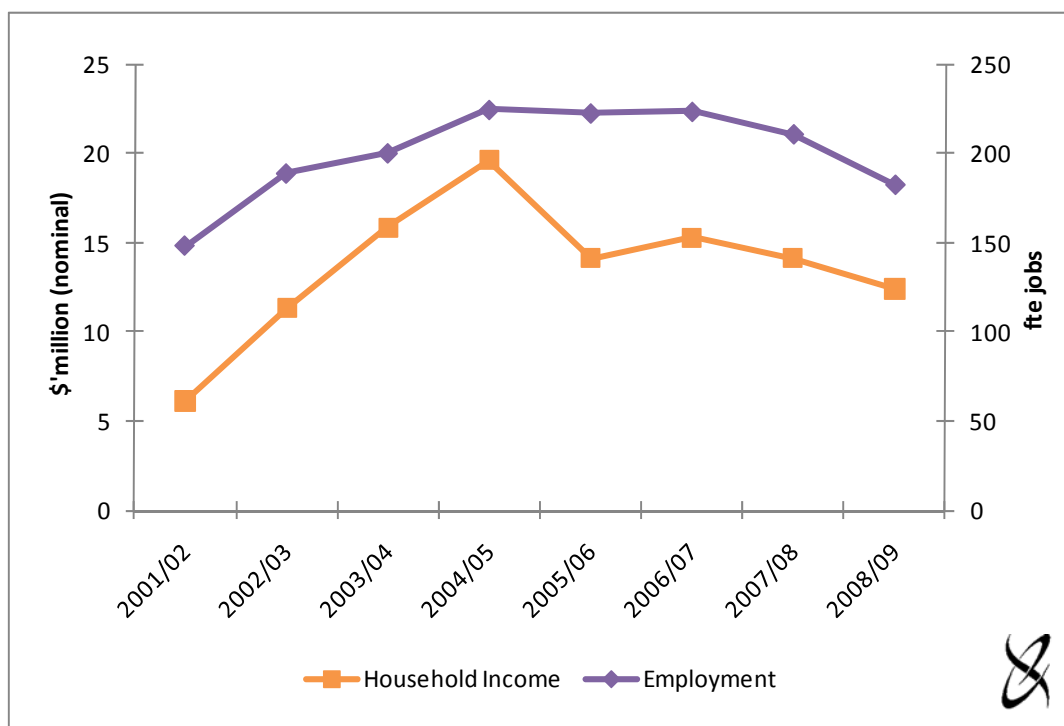
Figure 3.3 Total gross state product and output impact of the South Australian Sardine Fishery on the SA economy, 2001/02 to 2008/09 <sup>a</sup>



<sup>a</sup> 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 (2009a) 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 2008/09 <sup>a</sup>



<sup>a</sup> See note for Figure 3.3.

Source: EconSearch (2009a) and EconSearch analysis

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 2008/09 are based on different survey samples and techniques, some of the differences 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.

### 3.5 Economic Rent

Economic rent<sup>10</sup> 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 -\$0.9 million in 2008/09 (Table 3.9).

This significant change in rent between 2004/05 and 2005/06 is driven by a decrease in total income in the fishery as a result of the reduction in the TACC and the increase in investment in boats (Table 3.2). Labour costs decreased significantly, as a result of a decrease in gross income, however other cash costs such as fuel, repairs and maintenance and interest have increased. Reflecting the increase in investment depreciation and the opportunity cost of capital both increased as a result of significant investment in capital equipment (e.g. bigger boats) 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 \$47.4 million (14 licences with an average value of \$3.4 million). An annual economic rent of -\$0.9 million represents a return of -1.9 per cent to the capital value of the fishery.

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<sup>10</sup> 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.

Table 3.9 Economic rent in the South Australian Sardine Fishery, 2001/02 to 2008/09 (\$'000) <sup>a</sup>

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	<b>Economic Rent</b>
2001/02	8,516	3,029	2,263	1,101	1,046	<b>1,078</b>
2002/03	22,025	7,754	3,439	2,629	2,497	<b>5,706</b>
2003/04	22,549	7,939	3,763	2,192	2,082	<b>6,574</b>
2004/05	28,476	10,026	4,620	1,961	1,863	<b>10,006</b>
2005/06	16,031	6,650	6,554	2,709	3,656	<b>-3,538</b>
2006/07	18,517	7,610	6,514	2,979	3,889	<b>-2,475</b>
2007/08	16,331	6,729	6,488	3,060	3,995	<b>-3,941</b>
2008/09	17,546	5,849	6,045	2,230	4,329	<b>-907</b>

<sup>a</sup> 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

## 4. Other Indicators

### 4.1 External Factors Influencing the Economic Condition of the Fishery

There are a number of factors in 2008/09 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 Demand for product

Prior to 1993, the majority of the 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. Based on licence holders 2008/09 survey responses, an estimated 93.7 per cent of catch is used as tuna fodder with the balance used for either human consumption or as bait for recreational fishers (Table 4.3). This compares with 97.6 per cent sold for tuna fodder in 2005/06.

SBT are managed under the Commission for the Conservation of Southern Bluefin Tuna (CCSBT). In October 2009, the CCSBT agreed that a reduction in the global TAC was necessary in order to rebuild the stock of SBT. CCSBT agreed upon a reduction of 20 per cent in global catches. Australia's national allocation for the next two years, has been set at 4,015 tonnes per year.

Since the majority of sardine catch in SA is used as tuna fodder licence holders were asked during the 2010 survey whether they thought a reduction in SBT quota will influence the demand for sardines caught in SA. A few licence holders indicated that demand for SA caught sardines is likely remain stable or increase slightly because SA sardines are cheaper and better quality than imported sardines. Also, SA sardines can often be fed fresh to tuna reducing holding costs for tuna farmers.

Some licence holders indicated there may be an immediate reduction in demand as overseas bait orders have already been placed for the next season. If the Australian dollar remains strong tuna farms can buy feed cheaper from overseas and this will reduce demand for SA sardines.

#### 4.1.2 Additional sardine quota

An additional 4,000 tonnes of quota has been made available to the sardine fishery for 2010 fishing season. Some licence holders indicated this will not affect the price of sardines because there is a stable wharf price and stable demand from tuna farms for the product.

Some licence holders felt that the additional quota will make it harder to sell sardines to tuna farms as the farms that hold sardine licences can catch more of their own feed. Others indicated that the additional quota and consequently higher catch might place downward pressure on the price of sardines. The industry is currently looking to new markets to take up the additional supply of sardines.

### 4.1.3 Stock assessment

Mortality events, in 1995 and 1998, impeded the early growth of the sardine catch. Since the fishery's 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 2008/09 seasons.

Table 4.1 Catch, effort and CPUE, South Australian Sardine Fishery, 2001/02 to 2008/09

Indicator	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Catch (t)	12,165	21,741	33,160	56,952	28,626	30,355	29,692	27,850
Effort (days fished)	502	601	751	966	689	679	652	656
CPUE (t/day)	24	36	44	59	42	45	46	42

Source: SARDI Aquatic Sciences

Total catch and effort increased significantly over the period 2001/02 to 2004/05. There was also an increase in the CPUE, which more than doubled over the three year period. CPUE has not changed significantly between 2005/06 and 2008/09 (Table 4.1).

## 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<sup>11</sup> is estimated on the basis of information provided by processors in South Australia. However, 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 2008/09 was \$3.40/kg<sup>12</sup>, significantly above the estimate average beach price in South Australia of \$0.63/kg in 2008/09 (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 both local and interstate markets.

<sup>11</sup> Information sourced from SARDI Aquatic Sciences.

<sup>12</sup> This estimate is a weighted average price for all Sardines from all sources sold in the Melbourne Fish Market during 2008/09 (Tim Rieniets, Melbourne Wholesale Fish Markets, pers. comm.).

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 SA remained relatively stable during 2008/09 ranging from \$0.45/kg in September 2008 to \$0.69/kg in May 2009. Prices for sardines sold in the Melbourne markets varied, from \$2.69/kg to \$4.91/kg.

Table 4.2 Average monthly prices for sardines, beach prices in South Australia and Sydney and Melbourne Fish Markets, 2006/07 to 2008/09<sup>a</sup>

Month	Average Monthly Price (\$/kg)								
	Adelaide			Melbourne <sup>b</sup>			Sydney <sup>b, c</sup>		
	2006/07	2007/08	2008/09	2006/07	2007/08	2008/09	2006/07	2007/08	2008/09
July	\$0.46	\$0.61	\$0.51	\$4.91	\$2.50	\$4.91	\$4.41	\$4.84	n.a.
August	\$0.40	\$0.54	\$0.47	\$3.54	\$2.99	\$3.54	\$3.56	\$3.33	n.a.
September	\$0.40	\$0.49	\$0.45	\$3.79	\$3.68	\$3.79	\$3.92	\$5.39	n.a.
October	\$0.42	\$0.48	\$0.46	\$3.72	\$3.09	\$3.72	\$3.71	\$4.17	n.a.
November	\$0.41	\$0.41	\$0.58	\$3.35	\$4.28	\$3.35	\$3.96	\$4.22	n.a.
December	\$0.49	\$0.49	\$0.54	\$3.77	\$4.04	\$3.77	\$3.78	\$3.37	n.a.
January	\$0.61	\$0.48	\$0.61	\$3.38	\$3.63	\$3.38	\$2.59	n.a.	n.a.
February	\$0.61	\$0.50	\$0.63	\$3.63	\$4.10	\$3.63	\$3.77	n.a.	n.a.
March	\$0.63	\$0.66	\$0.60	\$2.88	\$3.97	\$2.88	\$3.64	n.a.	n.a.
April	\$0.64	\$0.56	\$0.68	\$2.81	\$2.89	\$2.81	\$3.37	n.a.	n.a.
May	\$0.63	\$0.49	\$0.69	\$2.69	\$3.12	\$2.69	\$3.35	n.a.	n.a.
June	\$0.60	\$0.54	\$0.67	\$3.13	\$3.83	\$3.13	\$3.94	n.a.	n.a.
Average Annual Price	\$0.60	\$0.55	\$0.63	\$3.47	\$3.60	\$3.40	\$3.67	\$4.22	n.a.

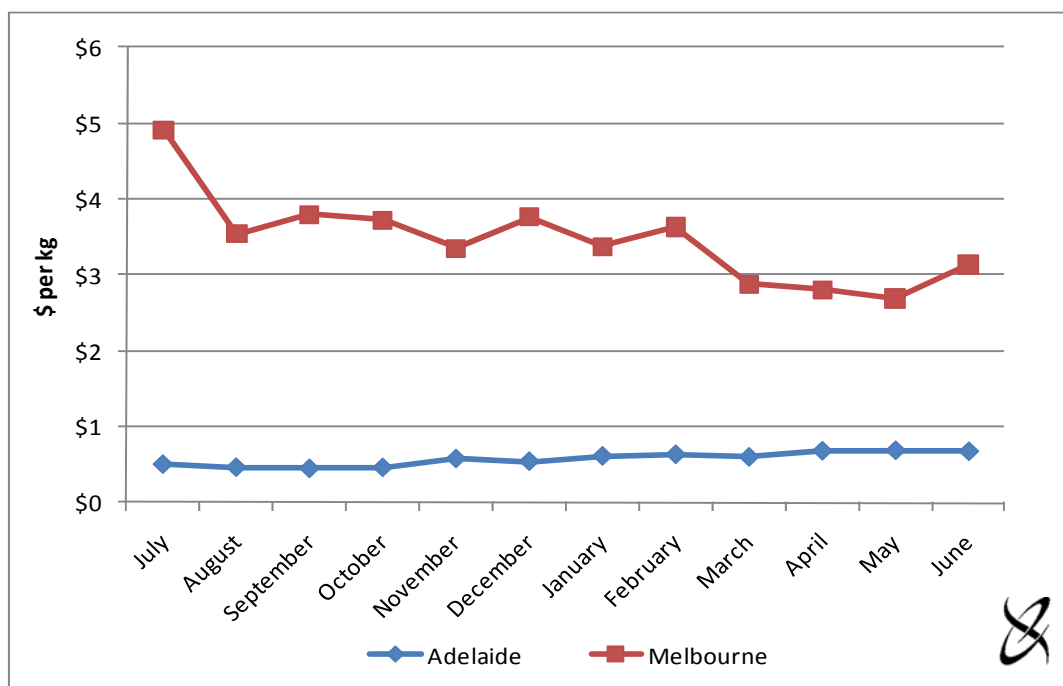
<sup>a</sup> Nominal prices

<sup>b</sup> 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.

<sup>c</sup> Sydney market prices were not available for 2008 and 2009.

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 Melbourne Fish Markets, 2008/09<sup>a</sup>



<sup>a</sup> Sydney market prices were not available for 2008 and 2009.

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 March 2010 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. Products for human consumption (fresh, filleted and frozen) are sold in Adelaide and interstate markets.

The proportion of total product sold by destination and weighted average price in 2008/09 are detailed in Table 4.3.

Fresh and frozen tuna fodder account for the majority of the volume of sales of sardines. It is estimated that almost 86 per cent of the total volume of fish sold in 2008/09 was fresh tuna fodder, while 8 per cent was frozen tuna fodder. The remaining volume was sold for human consumption as either a fresh (0.7 per cent) or frozen (5.5 per cent) product.

Table 4.3 Estimated proportion of sardines sold by destination and weighted average price, 2008/09

Market Destination	2005/06		2008/09	
	Proportion of Total Volume Sold	Average Price	Proportion of Total Volume Sold	Average Price
	(%)	(\$/kg)	(%)	(\$/kg)
Fresh Tuna Fodder	55.2	0.53	85.7	0.67
Frozen Tuna Fodder	42.4	0.72	8.0	0.78
Fresh Value Added	0.6	0.80	0.7	2.50
Frozen Value Added	1.8	1.04	5.5	2.50

Source: 2006 and 2010 survey responses and EconSearch analysis

Comparison of the 2006 and 2010 survey results indicates that a greater proportion of the sardine catch was sold for fresh tuna fodder in 2008/09. There was also a greater proportion sold as value added for human consumption in 2008/09 (Table 4.3).

#### 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 2010 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 2008/09 is summarised in Table 4.4.

On average, each licence holder (including family members and employees) spent at more than 7 days (57.9 hours) per month on community-support activities. The majority of this time, around 33 hours per month, was spent volunteering for community services.

SA Sardine Fishery licence holders, as a whole, spent a minimum of 465 hours per month on community-support activities.

Assuming the value of time foregone is approximately \$23 per hour<sup>13</sup>, the average value of each licence holder's time spent on community-support activities was approximately \$1,300 per month or almost \$16,000 for the full year (2008/09). On a whole of fishery basis, the aggregate value of time spent on community-support activities was at least \$10,000 per month or around \$128,000 for the full year.

Table 4.4 Estimated time per month spent on community-support and other activities, 2008/09

Activity	Hours per month	
	Average per Licence Holder	All Licence Holders
Conservation activities	16.0	192
Marine rescue and recovery	2.1	13
Attending meetings, seminars and workshops	2.5	25
Compiling fishing related information for research purposes	3.7	34
Provision of technical advice to committees, panels	1.1	7
Volunteering for community services	32.5	195
<b>Total</b>	<b>57.9</b>	<b>465</b>

Source: 2010 survey responses

#### 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 37 children (under the age of 16) who were members of fishing families and fishing families' employees in 2008/09. Of these 37 children, the majority attended local schools. Three children assisted with fishing operations.

<sup>13</sup> 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 \$23 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 \$20.85/hr to \$24.32/hr in 2009 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 farmers	Port Lincoln	Supply fish
Labour hire companies	Port Lincoln	Hire Labour
Equipment suppliers	Port Lincoln	Hire/purchase boats and equipment
Sardine processors/Tuna farmers	Port Lincoln	Freezing, value adding, packaging and storage
Freight carriers	Port Lincoln	Transport fish locally and interstate
Mechanics	Port Lincoln	Vehicle, boat and equipment maintenance
Recreational fishers	Port Lincoln	Supply fish for bait
Fuel suppliers	Port Lincoln	Purchase fuel for boats and vehicles
Marine supplier dealers	Port Lincoln	Purchase fishing gear

Source: 2010 survey responses

## 4.5 Other Indicators

In addition to financial information, a range of other information was collected from licence holders during the 2010 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 2 to 20 years, with an average length of ownership of 9 years. The corresponding average length of ownership by licence holders reported in the 2006 survey was 10 years.

### 4.5.2 Age of licence holders

The majority of licence holders were aged over 35 years at the time of the 2010 survey, with the highest number of licence holders in the over 60 year age bracket (57 per cent). In 2005/06 the greatest proportion of licence holders was in the 41-50 year age bracket.

The average age of licence holders in the SA Sardine Fishery is slightly higher than that of licence holders in other fisheries. In 2008/09, 32 per cent of licence holders in the SA Lakes and Coorong Fishery were in the 41-45 year age bracket (EconSearch 2010).

The average age of SA Sardine Fishery licence holders is higher than that for South Australian owner/managers of broad acre and livestock properties. In 2007/08, the average age of farm owner/managers was 54 years (ABARE 2009).

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## Appendix 1 Financial Performance Indicators, 2001/02 to 2005/06

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

	2001/02		2002/03		2003/04	
	Average per licence	Share of TBCC <sup>b</sup>	Average per licence	Share of TBCC <sup>b</sup>	Average per licence	Share of TBCC <sup>b</sup>
<b>(1) Total Boat Gross Income</b>	<b>\$845,076</b>		<b>\$1,516,323</b>		<b>\$1,917,966</b>	
Variable Costs						
Fuel	\$49,054	9%	\$51,766	6%	\$65,763	6%
Repairs & Maintenance <sup>c</sup>	\$94,882	17%	\$101,307	12%	\$130,406	13%
Bait/ice	\$5,512	1%	\$5,885	1%	\$7,575	1%
Provisions	\$3,712	1%	\$3,963	0%	\$5,101	0%
Labour - paid	\$287,811	51%	\$516,421	63%	\$653,210	63%
(2)      - unpaid <sup>d</sup>	\$5,907	1%	\$10,599	1%	\$13,407	1%
Other	\$5,854	1%	\$6,088	1%	\$6,272	1%
<b>(3) Total Variable Costs</b>	<b>\$452,731</b>	<b>80%</b>	<b>\$696,028</b>	<b>85%</b>	<b>\$881,733</b>	<b>85%</b>
Fixed Costs						
Licence Fee	\$30,146	5%	\$30,893	4%	\$66,972	6%
Insurance	\$13,589	2%	\$14,134	2%	\$14,560	1%
(4) Interest	\$9,719	2%	\$9,594	1%	\$9,844	1%
(5) Labour - unpaid <sup>d</sup>	\$6,833	1%	\$6,833	1%	\$6,833	1%
(6) Leasing	\$30,486	5%	\$35,708	4%	\$29,613	3%
Legal & Accounting	\$4,269	1%	\$4,440	1%	\$4,573	0%
Telephone etc.	\$2,642	0%	\$2,748	0%	\$2,831	0%
Slipping & Mooring	\$6,988	1%	\$7,268	1%	\$7,487	1%
Travel	\$4,035	1%	\$4,197	1%	\$4,323	0%
Office & Admin	\$3,898	1%	\$4,054	0%	\$4,177	0%
<b>(7) Total Fixed Costs</b>	<b>\$112,604</b>	<b>20%</b>	<b>\$119,870</b>	<b>15%</b>	<b>\$151,212</b>	<b>15%</b>
<b>(8) Total Boat Cash Costs (3 + 7)</b>	<b>\$565,335</b>	<b>100%</b>	<b>\$815,898</b>	<b>100%</b>	<b>\$1,032,946</b>	<b>100%</b>
<b>Boat Gross Margin (1 - 3)</b>	<b>\$392,345</b>		<b>\$820,295</b>		<b>\$1,036,232</b>	
<b>(9) Total Unpaid Labour (2 + 5)</b>	<b>\$12,740</b>		<b>\$17,432</b>		<b>\$20,240</b>	
<b>Gross Operating Surplus (1 - 8 + 9)</b>	<b>\$292,481</b>		<b>\$717,857</b>		<b>\$905,260</b>	
<b>(10) Boat Cash Income (1 - 8)</b>	<b>\$279,741</b>		<b>\$700,425</b>		<b>\$885,020</b>	
<b>(11) Depreciation</b>	<b>\$109,228</b>		<b>\$180,964</b>		<b>\$186,417</b>	
<b>(12) Boat Business Profit (10 - 9)</b>	<b>\$170,513</b>		<b>\$519,461</b>		<b>\$698,603</b>	
<b>(13) Profit at Full Equity (12 + 4 + 6)</b>	<b>\$210,718</b>		<b>\$564,764</b>		<b>\$738,060</b>	
<b>Boat Capital</b>						
(14) Fishing Gear & Equip	\$1,037,731		\$1,719,264		\$1,771,071	
Licence Value	\$3,183,333		\$5,711,865		\$7,224,819	
<b>(15) Total Boat Capital</b>	<b>\$4,221,064</b>		<b>\$7,431,129</b>		<b>\$8,995,890</b>	
<b>Rate of Return on Fishing Gear &amp; Equip (13 / 14 * 100)</b>	<b>20.3%</b>		<b>32.8%</b>		<b>41.7%</b>	
<b>Rate of Return on Total Boat Capital (13 / 15 * 100)</b>	<b>5.0%</b>		<b>7.6%</b>		<b>8.2%</b>	

<sup>a</sup> Estimates of financial performance for the years 2001/02 to 2004/05 are based on the 2002 survey of licence holders.

<sup>b</sup> Total boat cash costs.

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

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

Source: EconSearch analysis

Appendix Table 1.2 Financial performance in the South Australian Sardine Fishery, 2004/05 to 2005/06 (average per licence) <sup>a</sup>

	2004/05		2005/06	
	Average per licence	Share of TBCC <sup>b</sup>	Average per licence	Share of TBCC <sup>b</sup>
(1) <b>Total Boat Gross Income</b>	<b>\$2,422,103</b>		<b>\$1,149,494</b>	
Variable Costs				
Fuel	\$88,821	7%	\$201,916	19%
Repairs & Maintenance <sup>c</sup>	\$171,619	13%	\$92,054	9%
Bait/Ice	\$9,969	1%	\$2,302	0%
Provisions	\$6,714	1%	\$8,601	1%
Labour - paid	\$824,906	65%	\$463,052	44%
(2)       - unpaid <sup>d</sup>	\$16,931	1%	\$3,749	0%
Other	\$6,417	1%	\$31,547	3%
(3) <b>Total Variable Costs</b>	<b>\$1,125,376</b>	<b>88%</b>	<b>\$803,220</b>	<b>76%</b>
Fixed Costs				
Licence Fee	\$70,600	6%	\$71,634	7%
Insurance	\$14,897	1%	\$30,477	3%
(4) Interest	\$10,093	1%	\$88,312	8%
(5) Labour - unpaid <sup>d</sup>	\$6,833	1%	\$10,042	1%
(6) Leasing	\$21,774	2%	\$20,221	2%
Legal & Accounting	\$4,679	0%	\$8,259	1%
Telephone etc.	\$2,897	0%	\$1,979	0%
Slipping & Mooring	\$7,660	1%	\$16,895	2%
Travel	\$4,423	0%	\$761	0%
Office & Admin	\$4,273	0%	\$3,554	0%
(7) <b>Total Fixed Costs</b>	<b>\$148,128</b>	<b>12%</b>	<b>\$252,135</b>	<b>24%</b>
(8) <b>Total Boat Cash Costs (3 + 7)</b>	<b>\$1,273,505</b>	<b>100%</b>	<b>\$1,055,354</b>	<b>100%</b>
<b>Boat Gross Margin (1 - 3)</b>	<b>\$1,296,726</b>		<b>\$346,274</b>	
(9) <b>Total Unpaid Labour (2 + 5)</b>	<b>\$23,764</b>		<b>\$13,791</b>	
<b>Gross Operating Surplus (1 - 8 + 9)</b>	<b>\$1,172,361</b>		<b>\$107,931</b>	
(10) <b>Boat Cash Income (1 - 8)</b>	<b>\$1,148,598</b>		<b>\$94,139</b>	
(11) <b>Depreciation</b>	<b>\$166,795</b>		<b>\$194,240</b>	
(12) <b>Boat Business Profit (10 - 9)</b>	<b>\$981,803</b>		<b>-\$100,101</b>	
(13) <b>Profit at Full Equity (12 + 4 + 6)</b>	<b>\$1,013,669</b>		<b>\$8,433</b>	
<b>Boat Capital</b>				
(14) Fishing Gear & Equip	\$1,584,654		\$2,621,394	
Licence Value	\$9,123,861		\$3,042,857	
(15) <b>Total Boat Capital</b>	<b>\$10,708,515</b>		<b>\$5,664,251</b>	
<b>Rate of Return on Fishing Gear &amp; Equip (13 / 14 * 100)</b>	<b>64.0%</b>		<b>0.32%</b>	
<b>Rate of Return on Total Boat Capital (13 / 15 * 100)</b>	<b>9.5%</b>		<b>0.15%</b>	

<sup>a</sup> Estimates of financial performance for the years 2001/02 to 2004/05 are based on the 2002 survey of licence holders. Estimates of financial performance for 2005/06 are based on the 2006 licence holder survey.

<sup>b</sup> Total boat cash costs.

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

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

Source: EconSearch analysis

## Appendix 2 Economic Impact of the SA Sardine Fishery, 2007/08<sup>14</sup>

Appendix Table 2.11 Economic impact of the SA Sardine Fishery in South Australia, 2007/08

Sector	Output		Employment <sup>a</sup>		Household Income		Contribution to GSP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
<b>Direct effects</b>								
Fishing	16.3	36.9%	63	30.1%	6.7	47.5%	9.3	41.6%
Processing <sup>b</sup>	0.0	0.0%	0	0.0%	0.0	0.0%	0.0	0.0%
Transport <sup>b</sup>	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 <sup>c</sup>	3.5	7.8%	20	9.6%	1.0	7.4%	1.5	6.9%
<b>Total Direct <sup>d</sup></b>	<b>19.8</b>	<b>36.9%</b>	<b>84</b>	<b>30.1%</b>	<b>7.7</b>	<b>47.5%</b>	<b>10.9</b>	<b>41.6%</b>
<b>Flow-on effects</b>								
Trade	3.8	8.5%	39	18.7%	1.4	10.0%	1.8	7.8%
Manufacturing	5.9	13.4%	18	8.4%	0.9	6.1%	1.4	6.2%
Business Services	2.4	5.4%	13	6.4%	0.9	6.2%	1.1	5.1%
Transport	1.4	3.2%	6	3.0%	0.5	3.3%	0.7	3.0%
Other Sectors	11.0	24.8%	50	23.8%	2.8	19.6%	6.6	29.5%
<b>Total Flow-on <sup>d</sup></b>	<b>24.4</b>	<b>55.3%</b>	<b>127</b>	<b>60.3%</b>	<b>6.4</b>	<b>45.1%</b>	<b>11.6</b>	<b>51.5%</b>
<b>Total <sup>d</sup></b>	<b>44.2</b>	<b>100.0%</b>	<b>211</b>	<b>100.0%</b>	<b>14.1</b>	<b>100.0%</b>	<b>22.5</b>	<b>100.0%</b>
Total/Direct	2.2	-	2.5	-	1.8	-	2.1	-
Total/Tonne	\$1,400	-	0.01	-	\$400	-	\$740	-

<sup>a</sup> 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.

<sup>b</sup> 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.

<sup>c</sup> 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).

<sup>d</sup> Totals may not sum due to rounding.

Source: EconSearch 2009a

<sup>14</sup> 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 2.12 Economic impact of the SA Sardine Fishery in the Eyre region, 2007/08

Sector	Output		Employment <sup>a</sup>		Household Income		Contribution to GRP	
	(\$m)	%	(fte jobs)	%	(\$m)	%	(\$m)	%
Direct effects								
Fishing	16.3	55.8%	63	42.0%	6.7	64.5%	9.3	58.6%
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 <sup>b</sup>	2.8	9.6%	20	13.5%	0.9	8.7%	1.4	8.8%
<b>Total Direct <sup>c</sup></b>	<b>19.1</b>	<b>55.8%</b>	<b>84</b>	<b>42.0%</b>	<b>7.6</b>	<b>64.5%</b>	<b>10.7</b>	<b>58.6%</b>
Flow-on effects								
Trade	2.3	7.7%	28	18.3%	0.8	8.1%	1.1	6.7%
Manufacturing	1.6	5.4%	7	4.6%	0.3	2.8%	0.4	2.8%
Business Services	0.7	2.3%	4	2.9%	0.2	2.3%	0.3	2.0%
Transport	0.6	2.0%	3	2.1%	0.2	1.9%	0.3	1.9%
Other Sectors	5.0	17.2%	25	16.7%	1.2	11.7%	3.1	19.3%
<b>Total Flow-on <sup>c</sup></b>	<b>10.1</b>	<b>34.6%</b>	<b>67</b>	<b>44.6%</b>	<b>2.8</b>	<b>26.8%</b>	<b>5.2</b>	<b>32.6%</b>
<b>Total <sup>c</sup></b>	<b>29.3</b>	<b>100.0%</b>	<b>151</b>	<b>100.0%</b>	<b>10.4</b>	<b>100.0%</b>	<b>15.9</b>	<b>100.0%</b>
Total/Direct	1.5	-	1.8	-	1.4	-	1.5	-
Total/Tonne	\$900	-	0.00	-	\$300	-	\$500	-

<sup>a</sup> 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.

<sup>b</sup> 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.

<sup>c</sup> 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).

<sup>d</sup> Totals may not sum due to rounding.

Source: EconSearch 2009a

## Appendix 3 Summary Economic Indicators for South Australian Commercial Fisheries

Appendix Table 3.1 Commercial fisheries catch, South Australia, 1990/91 to 2007/08 (tonnes)

Year	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lobster	Nth'n Zone Rock Lobster	Blue Swimmer Crabs	Lakes and Coorong <sup>a</sup>	Sardines	Other Marine Species	Total SA Fisheries <sup>b</sup>
1990/91	863	134	1,951	1,562	1,104	434	2,442	n.a.	7,108	15,598
1991/92	885	0	2,155	1,940	1,222	425	3,143	145	7,750	17,665
1992/93	869	0	1,645	1,754	1,064	511	2,640	1,230	7,499	17,212
1993/94	802	226	1,693	1,669	930	544	2,992	2,377	6,719	17,952
1994/95	851	148	1,911	1,720	891	608	2,884	2,803	9,744	21,560
1995/96	902	258	2,013	1,684	903	655	2,720	3,708	6,301	19,144
1996/97	903	211	1,813	1,635	893	464	2,657	3,428	6,507	18,511
1997/98	812	267	2,492	1,680	942	469	2,595	6,041	5,526	20,824
1998/99	933	336	2,425	1,713	1,016	501	2,355	4,465	4,964	18,708
1999/00	889	400	2,016	1,717	1,001	549	1,995	3,836	4,840	17,243
2000/01	867	384	2,603	1,716	846	556	2,293	7,368	5,132	21,765
2001/02	850	322	2,288	1,717	675	559	1,875	12,165	4,644	25,095
2002/03	890	232	1,508	1,766	595	583	2,030	21,741	4,048	33,393
2003/04	879	172	1,958	1,896	504	611	2,120	33,160	3,712	45,012
2004/05	902	213	1,960	1,897	446	632	2,198	56,952	3,810	69,010
2005/06	896	179	1,891	1,889	476	648	2,352	28,626	3,186	40,143
2006/07	883	209	2,024	1,894	492	637	2,443	30,355	2,978	41,915
2007/08	889	229	2,088	1,850	459	668	2,146	29,692	3,002	41,023

<sup>a</sup> Excludes the River fishery for the years 2003/04 to 2007/08.

<sup>b</sup> Excludes aquaculture, south east non-trawl, tuna, deep water trawl.

Source: EconSearch 2009b

Appendix Table 3.2 Commercial fisheries gross value of production, South Australia, 1990/91 – 2007/08 (\$m)

Year	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lobster	Nth'n Zone Rock Lobster	Blue Swimmer Crabs <sup>a</sup>	Inland Waters <sup>b</sup>	Sardines	Other Marine Species <sup>c</sup>	Total SA Fisheries <sup>d</sup>
1990/91	14.0	1.7	20.0	26.7	18.2	1.6	2.3	na	17.8	102.4
1991/92	15.1	0.0	19.7	36.3	21.4	1.4	2.6	0.2	21.3	117.9
1992/93	23.7	0.0	19.7	34.8	20.5	1.6	5.3	0.8	20.3	126.7
1993/94	27.2	3.3	20.9	43.2	23.4	1.8	5.6	1.4	19.2	146.0
1994/95	22.8	1.9	22.6	48.6	25.5	2.2	6.3	1.6	24.5	156.1
1995/96	22.5	3.5	22.9	44.6	23.8	2.5	6.0	2.5	21.8	150.1
1996/97	25.2	2.9	22.2	47.0	24.4	2.1	6.3	2.2	20.6	152.9
1997/98	26.9	4.1	29.2	50.9	27.7	2.2	5.5	3.8	16.7	166.9
1998/99	27.2	5.0	34.6	47.2	26.7	2.2	6.3	2.5	18.0	169.7
1999/00	32.4	7.6	36.1	51.2	29.8	2.5	7.5	2.7	19.2	189.1
2000/01	40.0	6.7	46.0	55.1	28.0	3.1	7.8	5.2	20.2	212.0
2001/02	34.8	5.9	41.5	65.7	26.2	3.5	6.0	8.5	18.5	210.5
2002/03	36.3	4.2	28.2	63.8	18.8	3.6	5.1	17.8	20.4	198.3
2003/04	31.6	3.1	40.4	49.3	12.0	3.6	5.4	22.5	21.9	189.9
2004/05	33.8	3.8	32.0	54.4	11.6	3.6	5.5	28.5	20.9	194.1
2005/06	33.9	2.9	34.0	65.7	15.4	5.2	5.9	16.0	17.4	196.6
2006/07	31.5	3.3	39.4	78.8	18.0	5.6	7.1	18.5	19.8	222.1
2007/08	31.0	2.9	33.0	75.7	15.9	5.7	5.9	16.3	20.9	207.5

<sup>a</sup> SARDI estimates for the years 1990/91 to 2004/05, revalued SARDI estimates using average monthly processor prices for 2007/08.

<sup>b</sup> 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 2007/08 Excludes the River fishery for the years 2003/04 to 2007/08

<sup>c</sup> SARDI estimates for the years 1990/91 to 2002/03, revalued SARDI estimates for 2003/04 to 2007/08 using weighted average prices from Sydney and Melbourne fish markets and price data obtained from fishers.

<sup>d</sup> Excludes aquaculture, south east non-trawl, tuna, deep water trawl.

Source: EconSearch 2009b

Appendix Table 3.3 Cost of management in South Australian commercial fisheries, 2007/08

	Licence Fees (\$'000)	GVP (\$'000)	Fees/ GVP (%)	Catch ('000kg)	Fees/ Catch (\$/kg)	Licence Holders (no.)	Fees/ Licence (\$/licence)
Abalone	2,530	31,044	8.1%	889	\$2.85	35	\$72,286
GSV Prawns	302	2,924	10.3%	229	\$1.32	10	\$30,204
SG & WC Prawns	1,022	32,950	3.1%	2,088	\$0.49	42	\$24,334
Sth'n Zone Rock Lobster	2,628	75,731	3.5%	1,850	\$1.42	181	\$14,518
Nth'n Zone Rock Lobster	1,175	15,935	7.4%	459	\$2.56	68	\$17,287
Blue Crabs - Pots	228	5,423	4.2%	618	\$0.37	8	\$28,490
Blue Crabs – Marine Scale	11	314	3.4%	50	\$0.21	5	\$2,126
Lakes and Coorong <sup>a</sup>	282	7,544	3.7%	2,146	\$0.13	37	\$7,614
Marine Scalefish	2,010	20,917	12.3%	3,002	\$0.86	343	\$5,968
Sardines	690	16,331	4.2%	29,692	\$0.02	14	\$49,317
Total SA	10,879	209,113	5.2%	41,023	\$0.27	743	\$14,641

<sup>a</sup> Excludes the River fishery.

<sup>b</sup> Licence fees include access/entitlement fees paid by rock lobster and lakes and Coorong licence holders. Number of licence holders and average fee per licence holder relates only to marine scalefish licence holders and excludes access/entitlement holders from other fisheries.

Source: EconSearch 2009b

Appendix Table 3.4 Financial performance in South Australian commercial fisheries, 2007/08, (\$'000) (average per boat)

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs <sup>a</sup>	Marine Scalefish <sup>b</sup>	Sardines	Lakes and Coorong
<b>(1) Total Boat Gross Income</b>	<b>877.6</b>	<b>342.3</b>	<b>744.2</b>	<b>486.7</b>	<b>276.8</b>	<b>5,563.6</b>	<b>103.1</b>	<b>1,160.6</b>	<b>228.5</b>
Variable Costs									
Fuel	14.5	42.0	93.6	39.5	42.9	734.7	11.8	200.7	14.8
Repairs & Maintenance <sup>b</sup>	20.6	13.9	35.0	26.9	23.6	610.2	9.1	99.2	6.8
Bait/Ice	0.1	0.0	0.0	18.8	14.0	75.2	2.9	2.3	1.4
Provisions	8.3	0.7	7.7	0.7	11.4	0.0	0.0	8.2	0.2
Labour - paid	243.3	115.7	265.5	108.1	70.3	1,299.7	13.8	465.0	33.2
(2) - unpaid <sup>c</sup>	0.9	8.6	1.9	22.1	21.4	124.6	28.3	2.9	41.7
Other	4.8	0.5	16.3	0.7	1.0	132.8	0.0	35.0	16.9
<b>(3) Total Variable Costs</b>	<b>292.5</b>	<b>181.4</b>	<b>420.0</b>	<b>216.7</b>	<b>184.4</b>	<b>2,977.1</b>	<b>65.9</b>	<b>813.3</b>	<b>115.0</b>
Fixed Costs									
Licence Fee	70.4	30.1	24.2	19.3	20.8	279.7	7.1	48.4	9.2
Insurance	4.2	19.6	18.6	6.5	7.4	105.3	1.9	32.0	1.7
(4) Interest	17.1	18.0	41.6	26.1	42.7	629.1	5.1	97.7	5.9
(5) Labour - unpaid <sup>c</sup>	19.5	12.4	8.2	7.5	8.5	68.2	4.9	10.2	7.3
(6) Leasing	0.0	0.0	0.0	6.2	13.4	0.0	0.0	21.1	0.0
Legal & Accounting	8.4	6.6	9.9	3.8	4.1	23.5	1.3	8.2	2.1
Telephone etc.	2.9	2.6	3.5	1.8	3.1	29.3	1.4	1.8	2.3
Slipping & Mooring	2.0	4.0	2.7	2.8	1.7	0.0	0.8	17.8	0.1
Travel	8.1	0.4	1.4	2.2	3.7	16.7	0.5	0.9	1.0
Office & Admin	8.7	4.0	6.1	4.0	4.3	45.1	5.1	6.6	5.2
<b>(7) Total Fixed Costs</b>	<b>141.3</b>	<b>97.6</b>	<b>116.2</b>	<b>80.2</b>	<b>109.8</b>	<b>1,196.9</b>	<b>28.2</b>	<b>244.7</b>	<b>34.7</b>
<b>(8) Total Boat Cash Costs (3 + 7)</b>	<b>433.8</b>	<b>279.0</b>	<b>536.2</b>	<b>296.9</b>	<b>294.2</b>	<b>4,174.0</b>	<b>94.1</b>	<b>1,058.0</b>	<b>149.8</b>
<b>Boat Gross Margin (1 - 3)</b>	<b>585.0</b>	<b>160.9</b>	<b>324.2</b>	<b>270.0</b>	<b>92.3</b>	<b>2,586.5</b>	<b>37.2</b>	<b>347.3</b>	<b>113.5</b>
<b>(9) Total Unpaid Labour (2 + 5)</b>	<b>20.4</b>	<b>21.0</b>	<b>10.1</b>	<b>29.6</b>	<b>29.8</b>	<b>192.8</b>	<b>33.2</b>	<b>13.2</b>	<b>49.1</b>
<b>Gross Operating Surplus</b>	<b>464.1</b>	<b>84.3</b>	<b>218.1</b>	<b>219.4</b>	<b>12.4</b>	<b>1,582.4</b>	<b>42.2</b>	<b>115.7</b>	<b>127.8</b>
<b>(10) Boat Cash Income (1 - 8)</b>	<b>443.7</b>	<b>63.3</b>	<b>208.0</b>	<b>189.8</b>	<b>-17.4</b>	<b>1,389.6</b>	<b>9.0</b>	<b>102.6</b>	<b>78.7</b>
<b>(11) Depreciation</b>	<b>38.8</b>	<b>95.9</b>	<b>141.5</b>	<b>42.4</b>	<b>46.3</b>	<b>552.0</b>	<b>18.1</b>	<b>217.5</b>	<b>24.8</b>
<b>(12) Boat Business Profit (10 - 11)</b>	<b>404.9</b>	<b>-32.6</b>	<b>66.5</b>	<b>147.4</b>	<b>-63.8</b>	<b>837.7</b>	<b>-9.2</b>	<b>-114.9</b>	<b>53.9</b>
<b>(13) Profit at Full Equity (12 + 4 + 6)</b>	<b>422.0</b>	<b>-14.6</b>	<b>108.1</b>	<b>179.7</b>	<b>-7.6</b>	<b>1,466.7</b>	<b>-4.1</b>	<b>3.9</b>	<b>59.8</b>
<b>Boat Capital</b>									
(14) Fishing Gear & Equip	275.8	1,339.6	1,765.6	418.6	464.7	2,907.6	129.0	2,839.2	167.3
Licence Value	7,958.3	2,425.0	3,690.6	3,272.1	1,252.7	24,255.2	196.3	2,926.9	226.0
<b>(15) Total Boat Capital</b>	<b>8,234.1</b>	<b>3,764.6</b>	<b>5,456.3</b>	<b>3,690.7</b>	<b>1,717.4</b>	<b>27,162.9</b>	<b>325.3</b>	<b>5,766.1</b>	<b>393.3</b>
<b>Rate of Return on Fishing Gear &amp; Equip (13 / 14 * 100)</b>	<b>153.0%</b>	<b>-1.1%</b>	<b>6.1%</b>	<b>42.9%</b>	<b>-1.6%</b>	<b>50.4%</b>	<b>-3.2%</b>	<b>0.1%</b>	<b>35.8%</b>
<b>Rate of Return on Total Boat Capital (13 / 15 * 100)</b>	<b>5.1%</b>	<b>-0.4%</b>	<b>2.0%</b>	<b>4.9%</b>	<b>-0.4%</b>	<b>5.4%</b>	<b>-1.3%</b>	<b>0.1%</b>	<b>15.2%</b>

<sup>a</sup> Estimates of financial performance for the blue crab fishery have been presented on a whole of fishery basis.

<sup>b</sup> Excludes the Commonwealth managed fisheries: south east non-trawl, tuna, deep water trawl.

<sup>c</sup> Earnings before interest and tax.

Source: EconSearch 2009b

Appendix Table 3.5 Costs as a percentage of total cash costs in South Australian commercial fisheries, 2007/08

	Abalone	GSV Prawns	SG & WC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish <sup>a</sup>	Sardines	Lakes and Coorong
<b>Variable Costs</b>									
Fuel	3%	15%	17%	13%	15%	18%	13%	19%	10%
Repairs & Maintenance	5%	5%	7%	9%	8%	15%	10%	9%	5%
Bait/Ice	0%	0%	0%	6%	5%	2%	3%	0%	1%
Provisions	2%	0%	1%	0%	4%	0%	0%	1%	0%
Labour - paid	56%	41%	50%	36%	24%	31%	15%	44%	22%
- unpaid	0%	3%	0%	7%	7%	3%	30%	0%	28%
Other	1%	0%	3%	0%	0%	3%	0%	3%	11%
<b>Fixed Costs</b>									
Licence Fee	16%	11%	5%	7%	7%	7%	8%	5%	6%
Insurance	1%	7%	3%	2%	3%	3%	2%	3%	1%
Interest	4%	6%	8%	9%	15%	15%	5%	9%	4%
Labour - unpaid	4%	4%	2%	3%	3%	2%	5%	1%	5%
Leasing	0%	0%	0%	2%	5%	0%	0%	2%	0%
Legal & Accounting	2%	2%	2%	1%	1%	1%	1%	1%	1%
Telephone etc.	1%	1%	1%	1%	1%	1%	1%	0%	2%
Slipping & Mooring	0%	1%	1%	1%	1%	0%	1%	2%	0%
Travel	2%	0%	0%	1%	1%	0%	1%	0%	1%
Office & Admin	2%	1%	1%	1%	1%	1%	5%	1%	3%
<b>Total Variable Costs</b>	<b>67%</b>	<b>65%</b>	<b>78%</b>	<b>73%</b>	<b>63%</b>	<b>71%</b>	<b>70%</b>	<b>77%</b>	<b>77%</b>
<b>Total Fixed Costs</b>	<b>33%</b>	<b>35%</b>	<b>22%</b>	<b>27%</b>	<b>37%</b>	<b>29%</b>	<b>30%</b>	<b>23%</b>	<b>23%</b>
<b>Total Cash Costs</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

<sup>a</sup> Excludes Commonwealth managed fisheries: south east non-trawl, tuna, deep water trawl.

Source: EconSearch 2009b

Appendix Table 3.6 Economic impacts of South Australian commercial fisheries, 2007/08

	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 <sup>a</sup>
<b>Output (\$m)</b>										
Direct										
Fishing	31.0	2.9	32.0	75.7	15.9	5.7	20.9	16.3	7.5	208.2
Downstream <sup>b</sup>	16.4	2.0	16.5	23.5	6.0	3.3	9.6	3.5	5.4	86.3
All other sectors (indirect)	41.9	6.3	50.6	92.1	15.9	9.3	45.5	24.4	14.0	300.2
<b>Total</b>	<b>89.4</b>	<b>11.3</b>	<b>99.1</b>	<b>191.3</b>	<b>37.9</b>	<b>18.4</b>	<b>76.1</b>	<b>44.2</b>	<b>26.9</b>	<b>594.6</b>
Total/Direct	1.9	2.3	2.0	1.9	2.3	2.0	2.5	2.2	2.1	2.0
Total/Tonne (\$)	\$100,500	\$49,100	\$50,500	\$103,400	\$109,800	\$27,500	\$25,300	\$1,400	\$12,500	\$13,210
<b>Contribution to GSP (\$m)</b>										
Direct										
Fishing	25.6	1.6	22.5	54.0	6.7	3.7	5.9	9.3	5.2	134.6
Downstream	4.6	0.8	6.9	9.4	2.4	1.1	3.5	1.5	2.1	32.4
All other sectors (indirect)	20.1	3.1	24.3	44.1	13.5	4.4	21.3	11.6	6.8	149.1
<b>Total</b>	<b>50.2</b>	<b>5.6</b>	<b>53.6</b>	<b>107.5</b>	<b>22.6</b>	<b>9.2</b>	<b>30.8</b>	<b>22.5</b>	<b>14.1</b>	<b>316.1</b>
Total/Direct	1.7	2.3	1.8	1.7	2.5	1.9	3.3	2.1	1.9	1.9
Total/Tonne (\$)	\$56,500	\$24,294	\$27,300	\$58,000	\$49,200	\$13,700	\$10,244	\$740	\$6,578	\$7,022
<b>Employment (fte jobs) <sup>c</sup></b>										
Direct										
Fishing	90	28	185	414	155	28	531	63	74	1,569
Downstream	56	18	149	130	34	17	70	20	40	535
All other sectors (indirect)	217	33	265	480	150	48	234	127	74	1,628
<b>Total</b>	<b>364</b>	<b>80</b>	<b>598</b>	<b>1,025</b>	<b>339</b>	<b>93</b>	<b>835</b>	<b>211</b>	<b>188</b>	<b>3,732</b>
Total/Direct	2.5	1.7	1.8	1.9	1.8	2.0	1.4	2.5	1.6	1.8
Total/Tonne	0.41	0.35	0.31	0.55	0.74	0.14	0.28	0.01	0.09	0.08
<b>Household Income (\$m)</b>										
Direct										
Fishing	9.2	1.4	11.6	21.4	4.0	1.5	5.9	6.7	3.0	64.8
Downstream	2.9	0.6	4.9	6.5	1.7	0.8	2.6	1.0	1.5	22.5
All other sectors (indirect)	11.2	1.7	13.5	24.2	7.5	2.4	12.0	6.4	3.8	82.7
<b>Total</b>	<b>23.4</b>	<b>3.7</b>	<b>30.0</b>	<b>52.1</b>	<b>13.3</b>	<b>4.7</b>	<b>20.5</b>	<b>14.1</b>	<b>8.4</b>	<b>170.0</b>
Total/Direct	1.9	1.9	1.8	1.9	2.3	2.1	2.4	1.8	1.8	1.9
Total/Tonne (\$)	\$26,300	\$16,000	\$15,200	\$28,100	\$28,800	\$7,000	\$6,800	\$400	\$3,800	\$3,777

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

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

<sup>c</sup> Full time equivalent jobs. Direct employment in the fishing sector was comprised of 625 full-time and 1,161 part-time, that is, 1,786 jobs in total.

Source: EconSearch 2009b

Appendix Table 3.7 Economic rent in South Australian commercial fisheries, 2007/08 (\$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 <sup>a</sup>
Gross Income	30.7	2.9	33.0	75.7	15.9	5.6	20.9	16.3	7.5	208.6
Less Labour	9.2	1.2	12.2	21.3	5.8	1.5	9.5	6.7	2.7	70.2
Less Materials & Services	5.4	1.1	9.7	20.7	8.7	2.1	8.7	6.5	2.0	64.8
Less Depreciation	1.4	0.8	6.3	6.6	2.7	0.6	3.7	3.1	0.8	25.8
Less Opportunity Cost of Capital (@10%)	1.0	1.1	7.8	6.5	2.7	0.3	2.6	4.0	0.6	26.6
<b>Economic Rent</b>	<b>13.8</b>	<b>-1.3</b>	<b>-3.0</b>	<b>20.6</b>	<b>-3.9</b>	<b>1.2</b>	<b>-3.6</b>	<b>-3.9</b>	<b>1.4</b>	<b>21.3</b>

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

Source: EconSearch 2009b