ECONOMIC AND SOCIAL INDICATORS FOR THE SOUTH AUSTRALIAN SARDINE FISHERY 2021/22

A Report for the Department of Primary Industries and Regions

30 June 2023

Prepared by

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
AFMA	Australian Fisheries Management Authority
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CPUE	catch per unit of effort
CPI	Consumer Price Index
FRDC	Fisheries Research and Development Corporation
fte	full time equivalent
GOS	gross operating surplus
GRP	Gross Regional Product
GSP	Gross State Product
GVP	Gross Value of Production
NER	Net Economic Return
PIRSA	Department of Primary Industries and Regions
R&M	repairs and maintenance
RBA	Reserve Bank of Australia
SA	South Australia
SARDI	South Australian Research and Development Institute
SBT	Southern Bluefin Tuna
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TBCC	Total Boat Cash Costs
TBI	Total Boat Income

ACKNOWLEDGMENTS

In the preparation of economic indicators for the SA Sardine Fishery 2021/22, BDO EconSearch has relied heavily on the voluntary cooperation of fishing operators in providing data for the surveys. For the most recent (2021) survey we are particularly grateful for the time and cooperation generously provided by licence holders in responding to the rather lengthy questionnaire. BDO EconSearch is also indebted to various individuals and institutions for providing the necessary information for updating the indicators between survey years. Industry representatives, PIRSA and SARDI officers provided assistance, were supportive of the data collection and offered valuable advice.

DOCUMENT HISTORY AND STATUS

Doc Version	Doc Status	Issued To	Qty elec	Qty hard	Date	Reviewed	Approved
1	Draft	Steve Shanks Claire Webber	1 Word 1 PDF	-	2/06/2023	LMC	ADM
2	Final	Steve Shanks	1 Word 1 PDF	-	30/06/2023	LMC	ADM

Last Saved:	29/06/2023 5:14:00 PM
File Name:	I:\CLIENTS\PIRSA\ES2226_SA Fisheries & Aquaculture 2021-22\Economic Indicators\2021_22\Sardines\Reports\Sardine_Final_230630.docx
Project Manager:	Anders Magnusson
Principal Author/s:	Reuben Menashe, Abbie Dix and Lisa Carlin
Name of Client:	Department of Primary Industries and Regions
Name of Project:	Economic and Social Indicators for the South Australian Sardine Fishery 2021/22
Document Version:	2
Job Number:	ES2226

EXECUTIVE SUMMARY

The objective of this report is to present a set of economic and social performance indicators for the SA Sardine Fishery for 2021/22, as well as to develop a consistent time series of economic and social information to aid management of the fishery in future years. The economic and social indicators detailed in this report are summarised below.

Economic Performance Indicators

This report examines the performance of the fishery against the second goal of the management plan, *enable optimal utilisation and equitable distribution*, and the fourth goal, *Cost effective and consultative co-management of the fishery*. Specific performance indicators outlined in the management plan are detailed in Table ES-1. These performance indicators are presented against the reference points, also outlined in the management plan, and the change in each indicator between 2018/19 and 2021/22. A summary of key economic indicators is also presented in Table ES-2.

Table ES-1 SA Sardine Fishery performance indicators and trends

Performance indicator	Reference points	Change between 2018/19 and 2021/22
Economic Indicator reports	Economic indicators assessed in economic indicator reports	Annual report published for the last 20 years
Gross Value of Production (GVP)	GVP monitored regularly	Real GVP declined from $29.1m in 2018/19 to $25.5m in 2020/21 but increased to $29.1m in 2021/22
Gross operating surplus (GOS)	GOS monitored regularly	Real average GOS increased by 7% between 2018/19 ($1.0m per boat) and 2021/22 ($1.1m per boat)
Licence value	Licence value monitored regularly	Real value per licence increased by 7% from $6.3m in 2018/19 to $6.8m in 2021/22
Number of full time equivalent (fte) directly and indirectly employed		Direct employment increased from 77 fte in 2018/19 to 96 fte in 2021/22, however, indirect employment decreased slightly, from 112 fte to 110 fte
Licence fees as a percentage of GVP		Licence fees as a percentage of GVP decreased from 4.6% in 2018/19 to 3.4% in 2021/22

Table ES-2 Summary of key economic indicators, 2018/19 to 2021/22 [a]

Indicator	2018/19	2019/20	2020/21	2021/22
Catch	40,041t	39,889t	38,024t	46,935t
GVP	$29.1m	$29.2m	$25.5m	$29.1m
Fee/licence	$96,277	$77,214	$67,829	$71,618
Fee/GVP	4.6%	3.7%	3.7%	3.4%
Return on fishing gear and equip	22.4%	21.4%	17.7%	24.5%
Return on total capital	7.9%	7.5%	6.0%	8.0%
Licence Value	$6.3m	$6.3m	$6.5m	$6.8m
Gross operating surplus	$1.02m	$0.97m	$0.88m	$1.08m
Gross state product	$38.7m	$37.7m	$34.4m	$38.2m
Employment	189 fte	180 fte	199 fte	205 fte
Net Economic Return	$5.3m	$4.7m	$3.6m	$6.6m
Net Economic Return/GVP	18.1%	16.0%	14.0%	22.6%

[a] This table presents estimates in real 2021/22 dollars (excluding catch and employment).

Catch and Gross Value of Production

Total catch in the fishery followed an increasing trend, despite large fluctuations, between 2002/03 and 2021/22. Total catch increased significantly between 2020/21 (38,024 tonnes) and 2021/22[1] (46,935 tonnes).

The real value of the Sardine catch peaked in 2004/05, a 52 per cent increase on its 2002/03 value. GVP of the Sardine catch fell significantly in 2005/06, due to a 49 per cent reduction in TACC for the 2006 season. It fluctuated in subsequent years as a result of small changes in both the catch and price of Sardines but followed a slight increasing trend overall until 2021/22 ($29.1 million). GVP in 2021/22 was a 14 per cent increase from the previous year principally as a result of the large increase in catch.

The average nominal price for Sardines declined since peaking at $0.82/kg in 2002/03. It remained at around $0.60/kg thereafter with small fluctuations, and was estimated to be $0.62/kg in 2021/22. The average real price for Sardines has shown a declining trend since 2002/03, decreasing by 53 per cent between 2002/03 and 2021/22. The average nominal price for Sardines decreased by 24 per cent over the same period.

Based on licence holders' survey responses, an estimated 99.8 per cent of catch was sold as Tuna feed in 2020/21. The total volume of catch and price received for Sardines is therefore heavily dependent on Tuna farm production and price in South Australia. In 2021/22, the value of Tuna farm output increased by 21 per cent as a result of a 10 per cent increase in volume of farmed Tuna and an 11 per cent rise in price (BDO

[1] The economic indicators reports are based on financial years, while TACC is set for a calendar year. Some of the variation in catch recorded for financial years can be caused by this.

EconSearch 2023). Due to the increased volume of Tuna farm output more Sardines were required as Tuna feed and an increase in catch resulted.

Management Costs

Since 2002/03 there have been large fluctuations in aggregate licence fees due to the biennial research program and TACC setting process for the fishery and the associated costs. Licence fees as a percentage of GVP fluctuated between years but followed an increasing trend overall, from 2.4 per cent in 2002/03 to 3.4 per cent in 2021/22, although were as high at 6.3 per cent in 2005/06. Fees per licence increased, with fluctuations, from $49,376 (real 2021/22 dollars) in 2002/03 to $71,618 in 2021/22. The 2021/22 fee per licence was a 6 per cent increase from the previous year of $71,618 but 10 per cent lower than the average for the 20 year period ($79,256).

Financial Performance Indicators

Total recorded Sardine catch in South Australia increased by 23 per cent between 2020/21 and 2021/22. Gross receipts from the sale of Sardines rose by 21 per cent (in nominal terms) over the same period. The average gross income per surveyed licence in the fishery was estimated to be almost $2.1 million in 2021/22, up from $1.7 million in 2020/21.

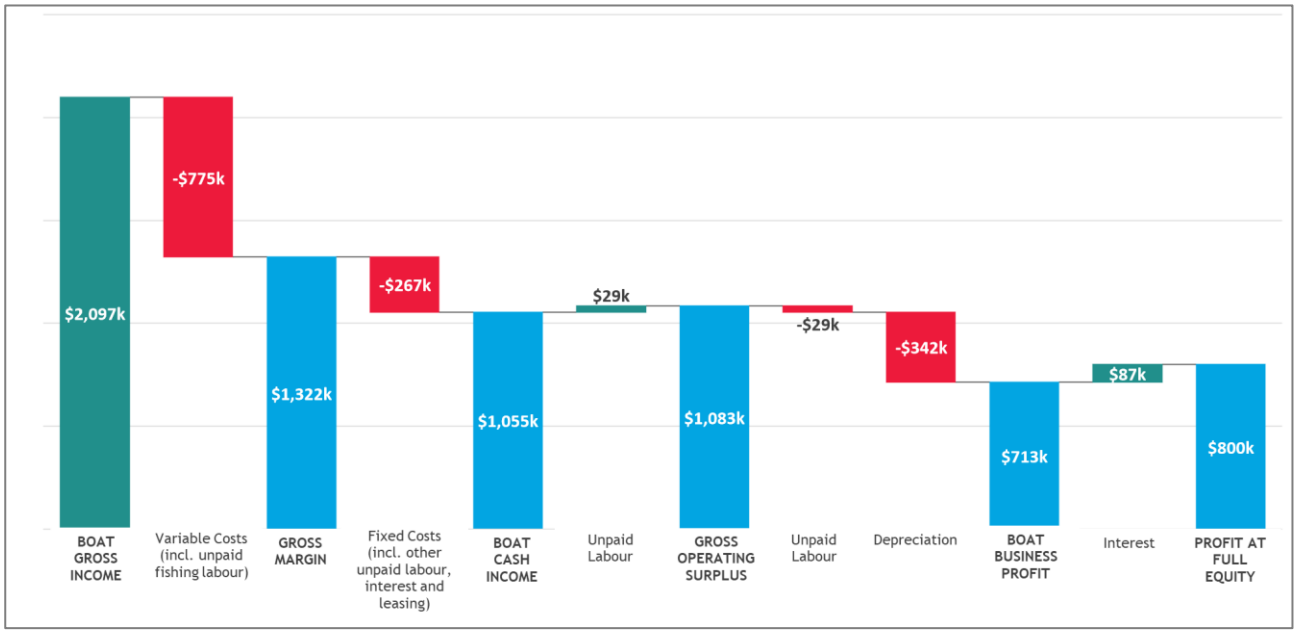
Variable costs (74 per cent of total boat cash costs in 2021/22) represented a significantly greater proportion of total cash costs than fixed costs (26 per cent). It was estimated that average total boat cash costs increased by approximately 12 per cent between 2020/21 and 2021/22. Variable costs increased by 14 per cent and fixed costs increased by 6 per cent. In 2021/22, for the fishery as a whole, 48 per cent of total boat cash costs were attributable to labour costs, by far the biggest cost item.

The increase in variable costs between 2020/21 and 2021/22 were a result of a 9 per cent rise in days fished which is most likely in response to increased demand for Tuna feed.

Between 2002/03 and 2021/22 the average price of Sardines decreased by approximately 53 per cent in real terms. The average cost of catching Sardines declined by 39 per cent in real terms over the same period. A declining average cost of catching Sardines, in real terms, reflects productivity improvements (principally in labour and repairs and maintenance) over the period.

Profitability followed an increasing trend between 2002/03 and 2004/05 before declining significantly in 2005/06 as a result of the reduction in TACC. Profitability has fluctuated since 2005/06 but generally followed an increasing trend. Between 2020/21 and 2021/22, profit at full equity rose 36 per cent due to gross income increasing by more (14 per cent) than total cash costs (5 per cent). This resulted in a rise in the gross margin, GOS and profit at full equity. Boat level financial performance in the SA Sardine Fishery is shown for 2021/22 in Figure ES-1.

Figure ES-1 Summary of boat level financial performance in the SA Sardine Fishery, 2021/22



The rate of return to boat capital (i.e. fishing gear and equipment) was estimated to be 24.5 per cent and the rate of return to total capital (including licence value) was estimated to average 8.0 per cent in 2021/22, up on the estimates for 2020/21.

Contribution to the South Australian Economy

The change in total value of output and gross state product (GSP) contributions are closely related to changes in catch. In 2021/22, the contribution to GSP was estimated to be $38.2 million, including flow-on effects. The total employment contribution of the fishery increased between 2002/03 and 2021/22, from approximately 189 to 205 fte jobs, primarily as a result of the increase in GVP and downstream impacts.

Net Economic Return

Net economic return (NER) is the return from a fishery after all costs have been met. It is equal to fishing revenue less fishing costs (cost of labour, capital including depreciation, materials and an allowance for "normal" profit). NER is maximised when economic efficiency is maximised. The NER generated by the fishery increased from almost $10.6m in 2002/03 to $16.2 million in 2004/05 (in real 2021/22 dollars). It fell to -$5.4m in 2007/08 as a result of a decrease in TACC and therefore fishery income. NER then increased until it reached $8.6m in 2015/16. NER has been lower in recent years and was $3.6m in 2020/21 but increased to $6.6m in 2021/22, primarily due to the notable rise in gross fishery income.

Licences have value because the owner receives current and expected flows of net economic return from the fishery. The return to the capital value of the fishery can be interpreted as the net economic return generated relative to the market value of licences. It follows that the rate of return varies when either the net economic return or the market valuation of licences varies. The return to the aggregate value of licences averaged 8.0 per cent between 2002/03 and 2004/05. The return on aggregate licence value was significantly lower between 2005/06 and 2007/08 but increased until 2015/16 where it peaked at 11.1 per cent. Since 2015/16, the return to the aggregate value of licences in the fishery has been lower and was 6.9 per cent in 2021/22.

Expectations about net economic return are different in the SA Sardine Fishery compared to other SA commercial fisheries. Being a forage-fish fishery, operators harvest a relatively low value commodity that is highly traded internationally, the expectation is that net economic return would be competed away to zero. Anecdotal evidence from licence holder surveys suggests that Tuna aquaculture operators in South Australia pay a premium for local sardines over imported product. This could be a result of frozen imported feed for tuna farms costing more when transported to SA. This cost point of difference between local and imported Sardines may explain, in part, the positive net economic return. Other contributing factors are the increasing efficiency of the fishery, as keeping costs down increases net economic return. Also contributing to this is likely to be that most of the Sardine catches are by licence holders who are also Tuna farmers and therefore have a lower-cost supply chain. This cost structure includes the possibly significant saving of using the same purse seiners to catch both Tuna and Sardines.

1. INTRODUCTION

Under the *Fisheries Management Act 2007* (the Act), 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 the Department of Primary Industries and Regions (PIRSA) to meet the obligations of Section 7 of the Act. The Management Plan for the South Australian Commercial Marine Scalefish Fishery Part B – Management arrangements for the taking of sardines (PIRSA 2014) was published in November 2014. A new management plan for the Sardine Fishery is currently in development and will be independent of the Marine Scalefish management plan.

This report is the twentieth annual economic indicators report for the South Australian Sardine Fishery. The objective of this report is to provide an update of the fishery's most recent economic performance based on the eighth licence holder survey undertaken in 2021.

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

- gross value of production (GVP) (catch and price)
- the cost of management of the fishery
- factors affecting costs in the fishery
- financial performance (income, costs, profit, and return on investment)
- economic contribution of the fishery, both local and state
- net economic return
- external factors that influence the economic condition of the fishery.

For purposes of comparison, summary economic indicators for all South Australian commercial fisheries, up to 2020/21, are presented in Appendix 2.

In 2014, the economic indicators surveys of commercial fisheries were extended to include the collection of social indicators. The results of the social indicators component for the 2021 survey are presented in BDO EconSearch (2022a).

2. METHOD OF ANALYSIS AND DEFINITION OF TERMS

2.1. Survey of Licence Holders, 2020/21

The questionnaire for the survey was based on the previous questionnaire, used in the 2018 survey. It was drafted in consultation with the fishery Executive Officer and the SA Sardine fishery management team at PIRSA. Development of the social indicator component of the questionnaire was based on a process recommended in the report *Managing the Social Dimensions of Fishing* (Triantafillos et al. 2014a, b).

Licence holders were sent an introductory letter from BDO EconSearch outlining the project and seeking their support. Telephone calls were then made by BDO EconSearch representatives to each licence holder seeking their participation in the survey. The survey was completed by the owners (or representatives) of nine of the fishery's fourteen licences, representing 64 per cent of the licences in the fishery. Five of these responses were complete, and four of these responses were partially complete. Four licence holders, covering five licences, did not wish to participate in the survey.

2.2. Updating the Indicators, 2021/22

The 2021/22 economic indicators for the SA Sardine Fishery were derived using a range of primary and secondary data, and survey-based 2020/21 indicators. The following information was used to adjust 2020/21 indicators to reflect fisheries' performance in 2021/22.

- SARDI data were used to reflect changes in catch and its value between 2020/21 and 2021/22. Catch and value data were used to estimate the average total boat income in the fisheries.
- Information on change in fishing effort (number of days fished) between 2020/21 and 2021/22 was used to adjust the cost of inputs that were assumed to vary with fishing effort. These inputs included fuel, repairs and maintenance, ice and provisions.
- The consumer price index (CPI) for Adelaide and components of the CPI were used to adjust the cost of inputs to reflect local levels of inflation (ABS 2022a).

2.3. Definition of Terms

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. Other 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 can be problematic in vertically integrated fisheries, as the majority of product, such as in the Sardine Fishery, is sold at a pre-agreed price to the tuna farms. Reported prices are therefore notional rather than actual.

Boat Business Profit: is defined as Gross Operating Surplus(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.

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.

Boat Cash Income: is defined as GOS less imputed wages for owner- operator and unpaid family labour.

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.

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).

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.

Gross Operating Surplus (GOS): is defined as Total Boat Income (TBI) less Total Boat Cash Costs (TBCC) 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 TBI. 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.

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.

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 for which involves imputing a labour cost based on the amount of time and equivalent wage rates. In the above calculations this labour cost can be included simply as another cost so that GOS 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).

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 debt 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.

Total Boat Cash Costs (TBCC): defined as Total Boat Variable Costs plus Total Boat 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)
- interest on loan repayments and overdraft
- leasing.

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, lines, etc.)
- repairs & maintenance.

3. ECONOMIC INDICATORS FOR THE SA SARDINE FISHERY

3.1. Economic Objectives of the SA Sardine Fishery

According to the current management plan for the Sardine fishery (PIRSA 2014), management of the fishery has four key goals:

1. Maintain harvest of Sardines at ecologically sustainable levels
2. Optimum utilisation and equitable distribution
3. Protect and conserve aquatic resources, habitats and ecosystems
4. Cost effective and consultative co-management of the fishery

In order to achieve these aims the management plan sets out specific biological, ecological, social and economic objectives for the fishery. The economic objectives of the Sardine fishery, as described in the management plan for the fishery, are summarised in Table 3-1.

Table 3-1 Economic Objectives of the SA Sardine Fishery

Goal	Objective	Management Strategies	Performance Indicator	Limit Reference Points
Goal 2: Optimum utilisation and equitable distribution	2a. Maximise value of the fishery to the community within ecologically sustainable limits	2a(i) Undertake economic review on a regular basis 2a(ii) Develop arrangements to improve the operational efficiency of the fishing fleet, while maximising flexibility (e.g. new fishing grounds if appropriate) 2a(iii) Develop arrangements that allow for value-adding strategies, where possible	Gross value of production Gross operating surplus Licence value Number of FTEs directly and indirectly employed	GVP monitored regularly GOS monitored regularly Licence value monitored regularly Economic indicators report conducted regularly
	2b. An economically efficient fleet	2b(i) Consider economic and financial impacts when implementing management arrangements 2b(ii) Undertake economic review on a regular basis 2b(iii) Where appropriate, and if possible, influence other processes that impact on infrastructure development	Gross value of production Gross operating surplus Licence value Economic indicators assessed in economic indicators report	
	2c. Ensure sufficient economic information is used to make informed management decisions	2c(i) Undertake economic surveys to assess the economic performance of the fishery	Economic indicators assessed in economic indicators report	The economic indicators report is published regularly

Goal	Objective	Management Strategies	Performance Indicator	Limit Reference Points
Goal 4: Cost effective and consultative co-management of the fishery	4a. Provide cost-effective and efficient management of the fishery, in line with government's cost recovery policy	4a(vi) Monitor licence fees as a percentage of GVP	Key economic indicators: licence fees as a percentage of gross value of production, gross operating surplus, licence value	

Indicators reported in Economic reports.

Source: PIRSA 2014

3.2. Catch and Gross Value of Production

The catch levels shown in Table 3-2 indicate that total catch in the SA Sardine Fishery has increased significantly since 2002/03. During 2002/03, 21,741 tonnes of Sardines were caught as the fishery was recovering from a significant Sardine mortality event occurring across the entire distribution of the Australian Sardine population during October 1998 to May 1999 (Gaut 1999). However, South Australian Sardine stocks quickly regenerated, resulting in a significant increase in catch in the following years, reaching almost 57,000 tonnes in 2004/05. This significant increase in catch and value of catch was the result of the stock recovery and subsequent increases in total allowable commercial catch (TACC) (Table 3-3) and investment into research surveys to estimate biomass.

Table 3-2 Catch and value of catch of the SA Sardine Fishery, 2002/03 to 2021/22

	Catch (tonnes)	Nominal Value of Catch ($'000)	Real Value of Catch (2020/21 $'000)
2002/03	21,741	17,827	26,718
2003/04	33,160	22,549	32,834
2004/05	56,952	28,476	40,562
2005/06	28,626	16,031	22,010
2006/07	30,355	18,517	24,986
2007/08	29,692	16,331	21,071
2008/09	27,850	17,546	22,297
2009/10	36,573	23,041	28,481
2010/11	33,220	19,268	22,927
2011/12	36,962	20,699	24,335
2012/13	35,065	21,039	24,227
2013/14	33,197	19,254	21,499
2014/15	36,020	21,612	23,838
2015/16	41,103	25,895	28,376
2016/17	39,745	23,847	25,725
2017/18	43,293	26,409	27,752
2018/19	40,041	26,427	27,380
2019/20	39,889	26,726	27,472
2020/21	38,024	23,955	23,955
2021/22	46,935	29,100	29,100

Source: SARDI Aquatic Sciences

The increase in catch was underpinned by the development of a harvest strategy for the fishery that has used the quantification of the Sardine spawning biomass to set the TACC. Since 2005/06, the TACC has constrained catch in the Sardine Fishery, and trends in total catch are closely linked to decisions about TACC. Being a forage-fish fishery, the TACC is constrained by sustainability implications for predator species as well as for Sardines themselves. In 2021, licences holders agreed not to increase the TACC due to market conditions, even though all stock indicators supported the increase as sustainable. In 2022 however, TACC increased to the largest allowable catch since 2005 (45,000t).

Table 3-3 TACC in the SA Sardine Fishery, 2002 to 2022 (calendar years) [a]

Year	Total Allowable Commercial Catch (t)
2002	17,750
2003	36,000
2004	40,000
2005	51,100
2006	26,000
2007	32,000
2008	30,000
2009	30,000
2010	34,000
2011	34,000
2012	36,000
2013	32,000
2014	34,000
2015	38,000
2016	38,000
2017	42,750
2018	42,750
2019	42,750
2020	42,750
2021	42,750
2022	45,000

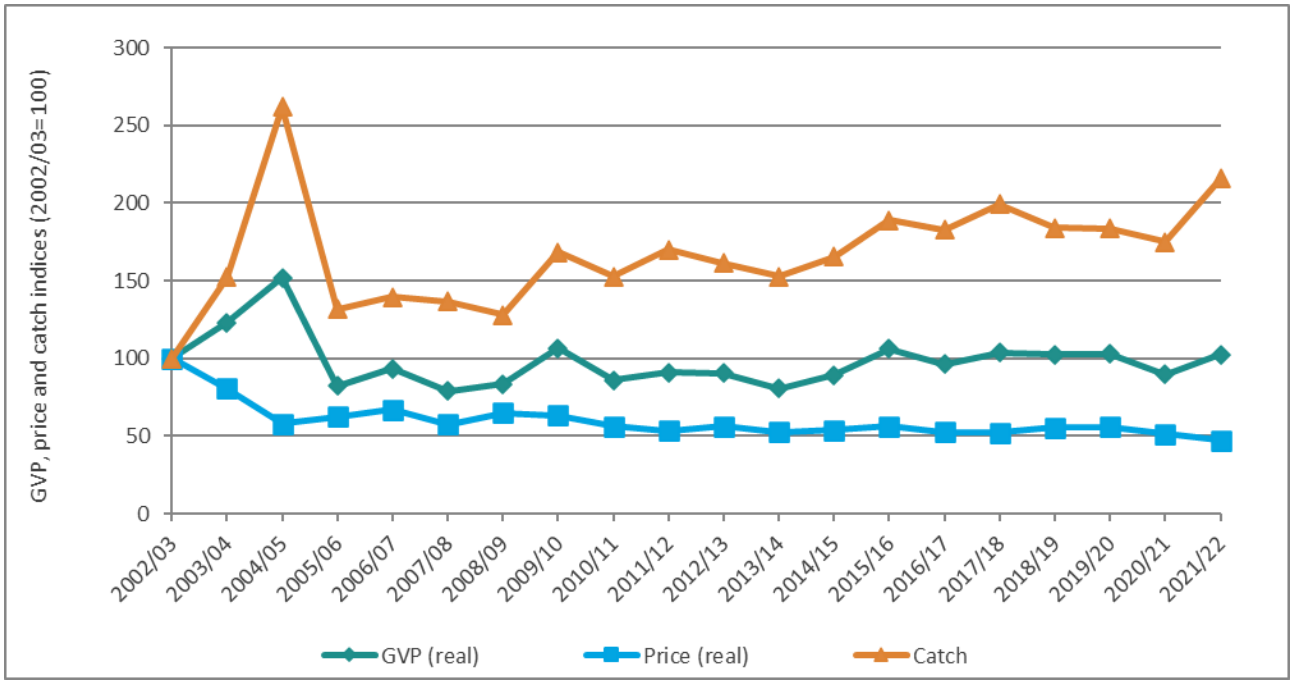
[a] Each year between 2010 and 2014 there was a 30,000t TACC plus 4,000t made available for capture outside the traditional fishing areas. In 2012, an additional 2,000t was advanced to the industry from the 2013 allocation due to a critical shortage in supply of Tuna feed. The advance from 2012 (2,000 t) was deducted from the allocation for 2013. TACC was increased further in 2015 and 2016 due to an increase in the estimated spawning biomass. In 2016 a daily egg production method survey was undertaken which has subsequently provided the opportunity to set a higher TACC in 2017 and maintain through to 2020 (42,750t).

Source: PIRSA Fisheries pers. Comm. And Grammer et al. (2021a).

Catch has been steadily increasing since 2005/06, with consistent increases in TACC. After remaining steady for the last five years, TACC increased slightly in 2022 (Table 3-3), resulting in a catch of nearly 47,000t – the largest overall catch since 2004/05 (almost 57,000t) (Table 3-2).

Figure 3-2 illustrates how the value of the fishery has changed over the 20 years, 2002/03 to 2021/22. The real value of the Sardine catch peaked in 2004/05, a 52 per cent increase on its 2002/03 value. Sardine Fishery GVP fell significantly in 2005/06, due to a 49 per cent reduction in TACC for the 2006 season. It has fluctuated in subsequent years as a result of small changes in both the catch and price of Sardines but followed a slight increasing trend overall. In 2021/22, GVP was estimated to be $29.1 million, a 14 per cent real increase from the previous year due to the large increase in catch.

Figure 3-2 GVP, price and catch indices for the SA Sardine Fishery [a]



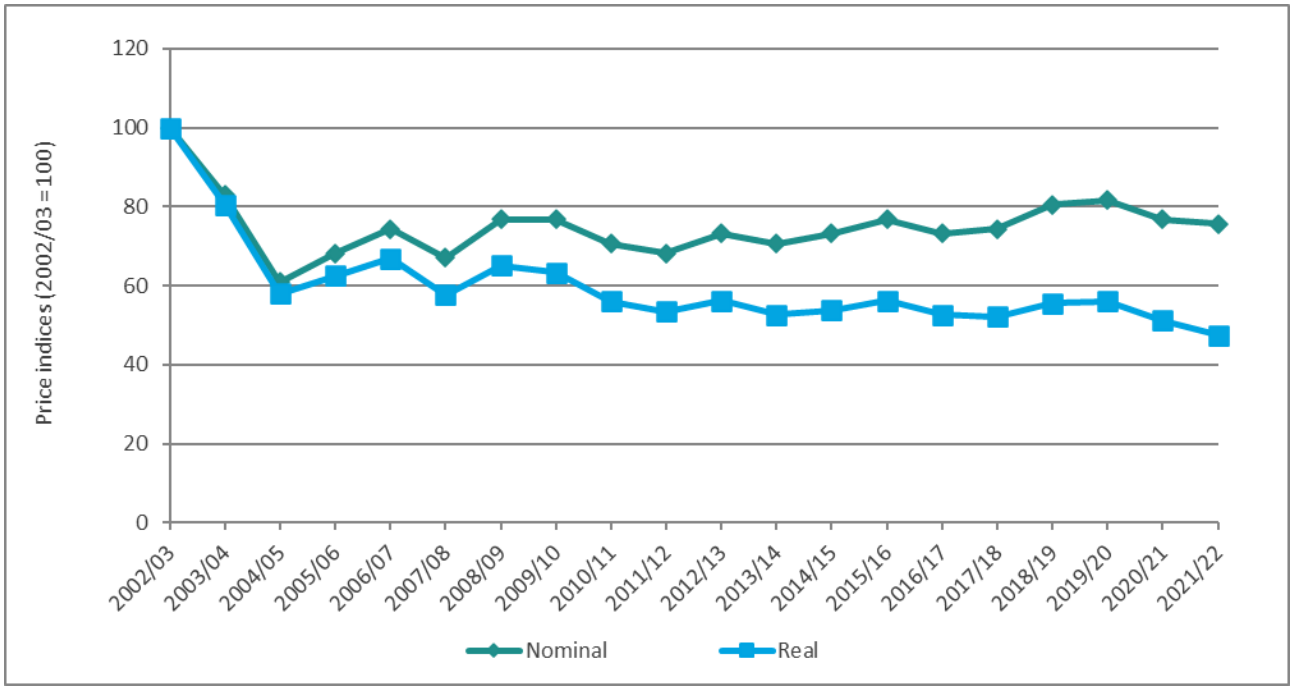
[a] 2002/03 is the reference year against which all other years are compared.

Source: SARDI Aquatic Sciences

The nominal price for Sardines declined, with some fluctuations, between 2002/03 and 2004/05 but has been relatively stable since. A stable nominal price together with continuing inflation has led to a steadily decreasing real price since 2004/05 (Figure 3-3). Note that in a market characterised by a high level of vertical integration, such as that for Sardines, the notional beach price may not accurately reflect the price that could be received in an open market.

Based on licence holders' survey responses, an estimated 99.8 per cent of catch was sold as Tuna feed in 2020/21. The total volume of catch and price received for Sardines is therefore heavily dependent on Tuna farm production and price in South Australia. In 2021/22, the value of Tuna farm output increased by 21 per cent as a result of a 10 per cent increase in volume of farmed Tuna and an 11 per cent rise in price (BDO EconSearch 2023). Due to the increased volume of Tuna farm output more Sardines were required as Tuna feed and an increase in catch resulted.

Figure 3-3 Price indices for the SA Sardine Fishery [a]



[a] Nominal price refers to the beach price in the current year's dollars. Real price is the nominal price adjusted for the purchasing power of money. The Adelaide CPI (consumer price index) has been used to make this adjustment (ABS 2022a). It enables meaningful comparisons of prices to be made between years.

Source: SARDI Aquatic Sciences

3.3. Factors Affecting Cost in the South Australian Sardine Fishery

The information in Table 3-4 was used to adjust the 2020/21 financial performance indicators to reflect the costs incurred in the fishery in 2021/22. The following data were used and adjustments made.

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

Table 3-4 Factors affecting costs in the SA Sardine Fishery, 2020/21 to 2021/22

	2020/21	2021/22	Change
Total Days Fished [a]	583	637	9.3%
Price of Fuel – Transportation Index [b]	105.7	119.7	13.2%
Interest charges (%/annum) [c]	6.51%	6.59%	1.4%
CPI Adelaide [d]	117.8	125.3	6.4%
Wage Price Index [e]	136.4	139.3	2.1%

[a] SARDI Aquatic Sciences
[b] Transportation index (component of CPI) for Adelaide (ABS 2022a)
[c] RBA indicator lending rate for small business (RBA 2022b)
[d] CPI for Adelaide (ABS 2022a)
[e] Wage price index for SA (ABS 2022b)

3.4. Cost of Management

Licence fees from SA Sardine Fishery licence holders are collected in accordance with the PIRSA Cost Recovery Policy and the Australian Government's Cost Recovery Guidelines (July 2014). Accordingly, licence fees are set to cover the cost of managing the SA Sardine Fishery. For 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 (PIRSA, pers. Comm.). However, this excludes some known small subsidies, such as federal government grants for research and stock status assessments.

Management services include:

- annual reports on biological and economic indicators
- policy and management services
- regulatory/legislation and licensing services
- compliance services
- directorate services
- observer services (specifically observer coverage)
- research services, including the Fisheries Research and Development Corporation (FRDC) levy.

Licence fee receipts for the SA Sardine fishery for the period 2002/03 to 2022/23 are shown in Table 3-5. Licence fee values shown are in real 2021/22 dollars.

Table 3-5 Costs of management in the SA Sardine Fishery, 2002/03 to 2022/23 (real 2021/22 dollars) [a]

	Licence Fee [b]	GVP	Fee/GVP	Catch	Fee/Catch	Licences	Fee/Licence [c]
	($'000)	($'000)	(%)	(tonnes)	($/kg)	(No.)	($/licence)
2002/03	691	28,419	2.4%	21,741	$0.03	14	$49,376
2003/04	1,456	34,924	4.2%	33,160	$0.04	14	$103,997
2004/05	1,501	43,144	3.5%	56,952	$0.03	14	$107,244
2005/06	1,468	23,411	6.3%	28,626	$0.05	14	$104,876
2006/07	1,154	26,577	4.3%	30,355	$0.04	14	$82,399
2007/08	948	22,413	4.2%	29,692	$0.03	14	$67,682
2008/09	1,167	23,716	4.9%	27,850	$0.04	14	$83,362
2009/10	863	30,294	2.8%	36,573	$0.02	14	$61,611
2010/11	1,255	24,387	5.1%	33,220	$0.04	14	$89,621
2011/12	761	25,884	2.9%	36,962	$0.02	14	$54,328
2012/13	1,041	25,769	4.0%	35,065	$0.03	14	$74,327
2013/14	1,034	22,868	4.5%	33,197	$0.03	14	$73,846
2014/15	1,247	25,356	4.9%	36,020	$0.03	14	$89,070
2015/16	1,239	30,183	4.1%	41,103	$0.03	14	$88,490
2016/17	850	27,363	3.1%	39,745	$0.02	14	$60,702
2017/18	1,138	29,519	3.9%	43,293	$0.03	14	$81,258
2018/19	1,348	29,123	4.6%	40,041	$0.03	14	$96,277
2019/20	1,081	29,221	3.7%	39,889	$0.03	14	$77,214
2020/21	950	25,480	3.7%	38,024	$0.02	14	$67,829
2021/22	1,003	29,100	3.4%	46,935	$0.02	14	$71,618
2022/23[d, e]	1,277	n.a.	-	n.a.	-	14	$91,199

[a] This table presents management costs in real 2021/22 dollars. Nominal management costs are presented in Appendix 4.

[b] Total fishery management costs.

[c] The fee per licence holder comprises the Sardine net fee and the Marine Scalefish base fee. It does not include the Marine Scalefish net fee.

[d] 2022/23 values have not been adjusted.

[e] Reported 2022/23 values include the cost of an additional DEPM survey ($517,874) that was paid out of pocket directly by licence holders to the South Australian Sardine Industry Association who paid PIRSA directly. This cost was not recorded by PIRSA as a licence fee due to the timing of the cost and the invoicing method.

Source: PIRSA Fisheries and SARDI Aquatic Sciences

Licence fees in the Sardine Fishery increased significantly between 2002/03 and 2003/04 reflecting the need for additional research into the impact of harvesting large quantities of Sardines, a low-order species in the ecosystem. This was associated with the significant increase in the fishery's TACC from 9,100 tonnes in 2000 to 40,000 tonnes in 2004 (PIRSA, pers. comm.). Since 2006/07 licence fees have fluctuated, within a limited range, due to the biennial research program and the TACC setting process for the fishery.

Between 2020/21 and 2021/22 the following changes can be observed:

- Licence fees as a percentage of GVP declined to 3.4 per cent as a result of the increase in GVP and despite the increase in aggregate licence fees.
- The licence fee cost per kilogram of Sardines remained at $0.02/kg.
- Fees per licence increased from $67,829 in 2020/21 to $71,618 in 2021/22. This increase is due to the change in annual research costs which relate to different biannual research tasks being undertaken in each year since 2006/07.

As mentioned earlier, between 2006/07 and 2021/22 licence fees in the fishery mostly followed a biennial pattern of increase and decrease. This was due to the cycling in the biennial research program and TACC setting process for the fishery and the associated costs. For example, Year 1 (e.g. 2006/07) is the more expensive of the two years as it included the daily egg production method survey reported in the *Spawning Biomass* report (Ward et al. 2020b), as well as fish sampling/aging. Year 2 (e.g. 2007/08) is cheaper as it only included the age-structured population model and fish sampling/aging, which is reported in the *Fishery Assessment* report (Grammer et al. 2021a).

3.5. Financial Performance Indicators

The major measures of the financial performance of the surveyed licences in the SA Sardine Fishery for the period 2019/20 to 2021/22 are shown in Table 3-6. Financial performance estimates for 2019/20 are based on the 2018 survey and estimates for 2020/21 and 2021/22 are based on the 2021 licence holder survey. For comparison, financial performance estimates for earlier years (2002/03 to 2018/19) are provided in Appendix 3.

Income

Total recorded Sardine catch in South Australia increased by 23 per cent between 2020/21 and 2021/22. Gross receipts from the sale of Sardines rose by 21 per cent (in nominal terms) over the same period (Table 3-2). The average gross income per surveyed licence in the fishery was estimated to be almost $2.1 million in 2021/22, up from $1.7 million in 2020/21(Table 3-6).

Costs

Table 3-6 shows total cash costs separated into variable and fixed costs. Variable costs (74 per cent of total boat cash costs in 2021/22) represented a significantly greater proportion of total cash costs than fixed costs (26 per cent).

It was estimated that average total boat cash costs increased by approximately 12 per cent between 2020/21 and 2021/22. Variable costs increased by 14 per cent and fixed costs increased by 6 per cent (Table 3-6). Variable costs increased due to the increase in the number of days fished between 2020/21 and 2021/22 (9 per cent).

In 2021/22, for the fishery as a whole, 48 per cent of total boat cash costs were attributable to labour costs, by far the biggest cost item. The labour costs reported in Table 3-6 are comprised of payments to licence owners, crew and others employed in the operation of Sardine fishing businesses, as well as imputed labour costs for unpaid labour. The other significant cash costs were repairs and maintenance (15 per cent), fuel (13 per cent), interest payments (8 per cent) and licence fees (7 per cent) (Table 3-6).

Table 3-6 Financial performance in the SA Sardine Fishery, 2019/20 to 2021/22 (average per licence) [a]

		2019/20		2020/21		2021/22	
		Average per licence	Share of TBCC[b]	Average per licence	Share of TBCC[b]	Average per licence	Share of TBCC[b]
(1)	**Total Boat Gross Income**	**$2,171,549**		**$1,726,433**		**$2,097,232**	
	Variable Costs						
	Fuel	$213,044	17%	$108,435	12%	$134,111	13%
	Repairs & Maintenance [c]	$144,396	11%	$130,409	14%	$151,560	15%
	Bait/Ice	$1,345	0%	$1,591	0%	$1,850	0%
	Provisions	$6,598	1%	$1,385	0%	$1,610	0%
	Labour - paid	$651,203	51%	$432,268	46%	$482,348	46%
(2)	Labour - unpaid [d]	$853	0%	$2,801	0%	$3,126	0%
	Other	$4,483	0%	$427	0%	$496	0%
(3)	**Total Variable Costs**	**$1,021,922**	**80%**	**$677,316**	**73%**	**$775,101**	**74%**
	Fixed Costs						
	Licence Fee	$84,951	7%	$68,666	7%	$77,118	7%
	Insurance	$33,994	3%	$39,123	4%	$41,613	4%
(4)	Interest	$64,577	5%	$86,292	9%	$87,469	8%
(5)	Labour - unpaid [d]	$491	0%	$24,916	3%	$25,446	2%
	Legal & Accounting	$7,412	1%	$5,872	1%	$6,246	1%
	Telephone etc.	$3,379	0%	$1,098	0%	$1,168	0%
	Slipping & Mooring	$14,341	1%	$7,704	1%	$8,194	1%
	Travel	$659	0%	$883	0%	$939	0%
	Office & Admin	$49,524	4%	$17,988	2%	$19,133	2%
(7)	**Total Fixed Costs**	**$259,328**	**20%**	**$252,542**	**27%**	**$267,327**	**26%**
(8)	**Total Boat Cash Costs (3+7)**	**$1,281,250**	**100%**	**$929,858**	**100%**	**$1,042,428**	**100%**
	Boat Gross Margin (1-3)	**$1,149,626**		**$1,049,117**		**$1,322,132**	
(9)	**Total Unpaid Labour (2+5)**	**$1,344**		**$27,717**		**$28,572**	
	Gross Operating Surplus (1-8+9)	**$891,642**		**$824,292**		**$1,083,376**	
(10)	**Boat Cash Income (1-8)**	**$890,299**		**$796,575**		**$1,054,804**	
(11)	**Depreciation**	**$288,264**		**$328,118**		**$341,829**	
(12)	**Boat Business Profit (10-11)**	**$602,035**		**$468,457**		**$712,975**	
(13)	**Profit at Full Equity (12+4+6)**	**$666,612**		**$554,748**		**$800,444**	
	Boat Capital						
(14)	Fishing Gear & Equip	$3,119,246		$3,132,734		$3,263,644	
	Licence Value	$5,789,089		$6,076,511		$6,778,144	
(15)	**Total Boat Capital**	**$8,908,334**		**$9,209,245**		**$10,041,788**	
	Rate of Return on Fishing Gear & Equip (13/14*100)	**21.4%**		**17.7%**		**24.5%**	
	Rate of Return on Total Boat Capital (13/15*100)	**7.5%**		**6.0%**		**8.0%**	

[a] Financial performance estimates for the years 2019/20 are based on the 2018 licence holder survey and estimates for 2020/21 and 2021/22 are based on the 2021 licence holder survey. All figures are in nominal terms.

[b] Total boat cash costs.

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

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

Source: BDO EconSearch analysis

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 of 26 per cent in boat gross margin in 2021/22 ($1.3m) compared to previous year ($1.0m), since total boat gross income increased by more than total variable costs.

Gross operating surplus (GOS) is calculated as income less total boat cash costs, excluding imputed wages for operator and family members as a cost item. The average GOS of all licences in 2021/22 was estimated to be almost $1.1 million, a 31 per cent increase on 2020/21 ($824,000) (Table 3-6).

Boat cash income is measured as gross operating surplus with imputed wages (unpaid labour) included as cash costs. In 2021/22, boat cash income was almost $1.1m, up 32 per cent on 2020/21 ($797,000) (Table 3-6).

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 2021/22, the average boat business profit was almost $713,000, up 52 per cent from the previous year ($468,000) (Table 3-6).

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 2021/22 ($800,000 per licence) was 44 per cent higher than the estimate for the previous year (around $555,000) as a result of increased income (Table 3-6).

Return on Investment

There are a number of interpretations of the concept of return on investment. For the purpose of this analysis[2] it is appropriate to consider the investment as the capital employed by an average licence holder. Capital includes boats, licence/quota units, fishing gear, sheds, vehicles and other capital items used as part of the fishing enterprise. It does not include working capital or capital associated with other businesses operated by the licence holder. 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 2021/22 was estimated to be $10 million per licence. This included the licence holders' estimate of the value of their licence (around $6.8 million) and estimated investment in boats and fishing gear (almost $3.3 million per licence).

The average return on investment for the fishery is reported in Table 3-6. The rate of return to boat capital (i.e. fishing gear and equipment) was estimated to be 24.5 per cent and the rate of return to total capital (including licence value) was estimated to average 8.0 per cent in 2021/22, up on the estimates for 2020/21 (17.7 per cent and 6.0 per cent, respectively).

[2] The analysis in this section relates exclusively to fishing activity and therefore only capital directly related to harvest (i.e. up to the point of landing) was included. The licence value is included because this represents return on investment in the context of a new private investor.

Licence values

The value of licences represents a significant part of the capital used by each licence holder in the fishery. Licence values capitalise flows of net economic return so they also provide a measure of the success of management in achieving allocative efficiency. Based on information provided by licence holders in the 2021 survey and updated information as described earlier, the value per licence in the fishery was estimated to be almost $6.8 million in 2021/22. A record of licence transfers from PIRSA Fisheries indicates that there were limited licence transfers in 2021/22. 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 3-7.

Table 3-7 Sensitivity of rate of return to changes in licence value, 2021/22 [a]

Estimated Licence Value	$3,389,072	$6,778,144	$10,167,216
Rate of Return to Total Capital (%)	12.0%	8.0%	6.0%

[a] Based on the licence value estimated for 2021/22 and values 50 per cent above and below this estimate.

Source: BDO EconSearch analysis

Based on the costs and returns shown for the year 2020/21 in Table 3-6, a licence value of $3.4 million (approximately 50 per cent below the licence value estimated for 2021/22) would mean an annual return to the total asset of 12.0 per cent, while a licence value of $10.2 million (approximately 50 per cent above the licence value estimated for 2021/22) would mean an annual return to the total asset of 6.0 per cent (Table 3-7).

3.6. State and Regional Economic Contribution

Estimates of the economic contribution of the SA Sardine fishing industry on the South Australian and regional (Eyre and Western[3]) economies in 2021/22 are outlined below.

3.6.1. Measuring direct and flow-on effects

Estimates of the direct economic contribution of the SA Sardine fishery are consistent with the method employed in PIRSA's Value-added ScoreCard, 2021/22.

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

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

[3] The Eyre and Western region is consistent with the SA Government Regions, as defined by the Department of Planning and Local Government.

Each of these activities generates flow-on effects to other sectors through purchase 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 contributions at regional and state levels.

Economic contributions at the state and regional levels were based on models for the state as a whole and for the Eyre and Western State Government region, prepared for the Department of Premier and Cabinet (BDO EconSearch 2021).

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 2021 survey and updated as described earlier. On an item-by-item basis, the expenditures were allocated between those occurring in the Eyre and 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, 2021/22) (PIRSA, pers. Comm.). Estimates of the net value of local transport margins and capital expenditure per licence holder were derived from the licence holder survey.

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

- value of output
- employment
- household income
- contribution to gross state or regional product.

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

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

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

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

3.6.2. Economic contributions at the state and regional levels

Estimates of the economic contribution generated in 2021/22 by the SA Sardine fishing industry in South Australia and the Eyre and Western Region are outlined in Table 3-8 and Table 3-9, respectively.

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

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

Table 3-8 The economic contribution of the SA Sardine fishing industry in South Australia, 2021/22

Sector	Output		Employment [a]		Household Income		Contribution to GSP	
	($m)	%	(fte jobs)	%	($m)	%	($m)	%
Direct effects								
Fishing	29.1	52%	82	40%	7.2	45%	23.0	60%
Processing	0.4	1%	1	0%	0.1	0%	0.1	0%
Transport	0.1	0%	0	0%	0.0	0%	0.0	0%
Retail	0.2	0%	2	1%	0.1	1%	0.1	0%
Food services	0.3	1%	3	2%	0.1	1%	0.2	0%
Capital expenditure [b]	1.4	3%	8	4%	0.5	3%	0.7	2%
Total Direct [c]	*31.5*	*56%*	*96*	*47%*	*8.0*	*50%*	*24.2*	*63%*
Flow-on effects								
Trade	2.9	5%	18	9%	1.2	7%	1.7	4%
Manufacturing	2.9	5%	7	3%	0.5	3%	0.9	2%
Business Services	3.5	6%	22	11%	1.7	11%	1.9	5%
Transport	1.4	2%	5	2%	0.4	2%	0.6	2%
Other Sectors	14.1	25%	58	28%	4.2	26%	8.9	23%
Total Flow-on [c]	*24.8*	*44%*	*110*	*53%*	*8.0*	*50%*	*14.0*	*37%*
Total [c]	**56.3**	**100%**	**205**	**100%**	**16.0**	**100%**	**38.2**	**100%**
Total/Direct	1.8	-	2.1	-	2.0	-	1.6	-
Total/Tonne	$1,100	-	0.00	-	$300	-	$800	-

[a] Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 47 full-time and 76 part-time jobs, that is, 123 jobs in aggregate, which was estimated to be equal to 82 fte jobs.

[b] 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).

[c] Totals may not sum due to rounding.

Source: BDO EconSearch analysis

Table 3-9 The economic contribution of the SA Sardine fishing industry in the Eyre and Western Region, 2021/22

Sector	Output		Employment [a]		Household Income		Contribution to GRP	
	($m)	%	(fte jobs)	%	($m)	%	($m)	%
Direct effects								
Fishing	29.1	67%	82	54%	7.2	61%	22.5	73%
Processing	0.4	1%	1	1%	0.1	0%	0.1	0%
Transport	0.1	0%	0	0%	0.0	0%	0.0	0%
Retail	0.2	0%	1	1%	0.1	1%	0.1	0%
Food services	0.0	0%	0	0%	0.0	0%	0.0	0%
Capital expenditure [b]	0.6	1%	4	3%	0.3	2%	0.3	1%
Total Direct [c]	*30.3*	70%	*89*	59%	*7.6*	65%	*23.1*	75%
Flow-on effects								
Trade	1.9	4%	12	8%	0.8	7%	1.1	4%
Manufacturing	0.5	1%	2	1%	0.1	1%	0.2	1%
Business Services	1.4	3%	8	6%	0.6	5%	0.7	2%
Transport	1.0	2%	3	2%	0.3	2%	0.5	2%
Other Sectors	8.3	19%	37	24%	2.4	20%	5.2	17%
Total Flow-on [c]	*13.1*	30%	*62*	41%	*4.2*	35%	*7.7*	25%
Total [c]	**43.5**	**100%**	**151**	**100%**	**11.7**	**100%**	**30.8**	**100%**
Total/Direct	1.4	-	1.7	-	1.5	-	1.3	-
Total/Tonne	$900	-	0.00	-	$200	-	$600	-

[a-c] See Table 3-8 footnotes

Source: BDO EconSearch analysis

Value of output

The value of output generated directly in South Australia and the Eyre and Western region by Sardine fishing enterprises summed to $29.1 million in 2021/22 (Table 3-8 and Table 3-9), while output generated in South Australia by associated downstream activities (processing, transport, retail/food services and capital expenditure) summed to $2.4 million ($1.2 million in the Eyre and Western region).

Flow-ons to other sectors of the state economy added another $24.8 million in output ($13.1 million in the regional economy). The sectors most affected were the manufacturing, trade, business services and transport sectors. The total output contribution in SA (direct plus indirect) was estimated to be $56.3 million in 2021/22 ($43.5 million in the regional economy).

Employment and household income

In 2021/22, the SA Sardine fishery was responsible for the direct employment of around 82 fte and downstream activities created employment of 14 fte jobs state-wide (7 fte jobs regionally). Flow-on business activity was estimated to generate a further 110 fte jobs state-wide (62 jobs regionally). These state-wide jobs were concentrated in the business services (22), trade (18), manufacturing (7) and transport (5) sectors. The total employment contribution in SA was estimated to be 205 fte jobs (151 fte jobs regionally).

Personal income of $7.2 million was earned in the fishing sector (wages of employees and estimated drawings by owner/operators) and $0.8 million in downstream activities in SA. An additional $8.0 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 contribution was $16.0 million in SA ($11.7 million in the Eyre and Western region).

Contribution to GSP and GRP

As noted above, contribution to GSP or GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. In 2021/22, total SA Sardine fishery related contribution to GSP in South Australia was $38.2 million ($30.8 million in the Eyre and Western region), $23.0 million generated by fishing directly, $1.2 million generated by downstream activities and $14.0 million generated in other sectors of the state economy.

Total contributions over time

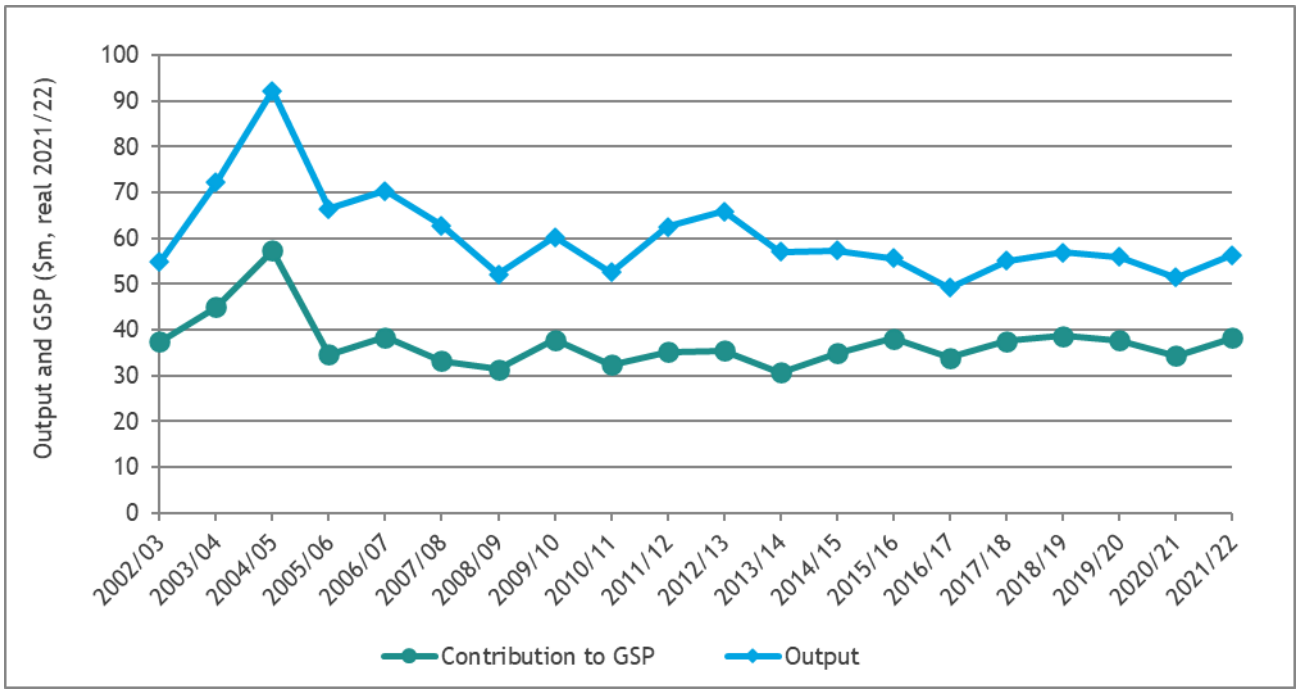
Figure 3-4 and Figure 3-5 illustrate the total economic contribution (direct plus flow-on effects) of the fishery on the SA economy for the years, 2002/03 to 2021/22. Estimates of economic contribution are expressed in real 2021/22 dollars. The Adelaide Consumer Price Index was used to adjust for inflation (ABS 2022a).

Estimates of economic contribution for 2002/03 do not include the contribution of local retail and food service trade, however these effects have been included in subsequent years. As economic contribution estimates for the years 2002/03 to 2021/22 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 contribution as it includes elements of double counting. Contribution to GSP is the preferred measure of net contribution to the SA economy.

The change in total output and GSP contributions are closely related to changes in the GVP for the fishery (Figure 3-4). All measures of economic contribution followed a sharply increasing trend between 2002/03 and 2004/05. Between 2004/05 and 2005/06 output, GSP and household income all fell significantly and employment fell slightly. All measures followed a slight decreasing trend over the period from 2005/06 to 2021/22 despite an increase in 2021/22 (Figure 3-4 and Figure 3-5).

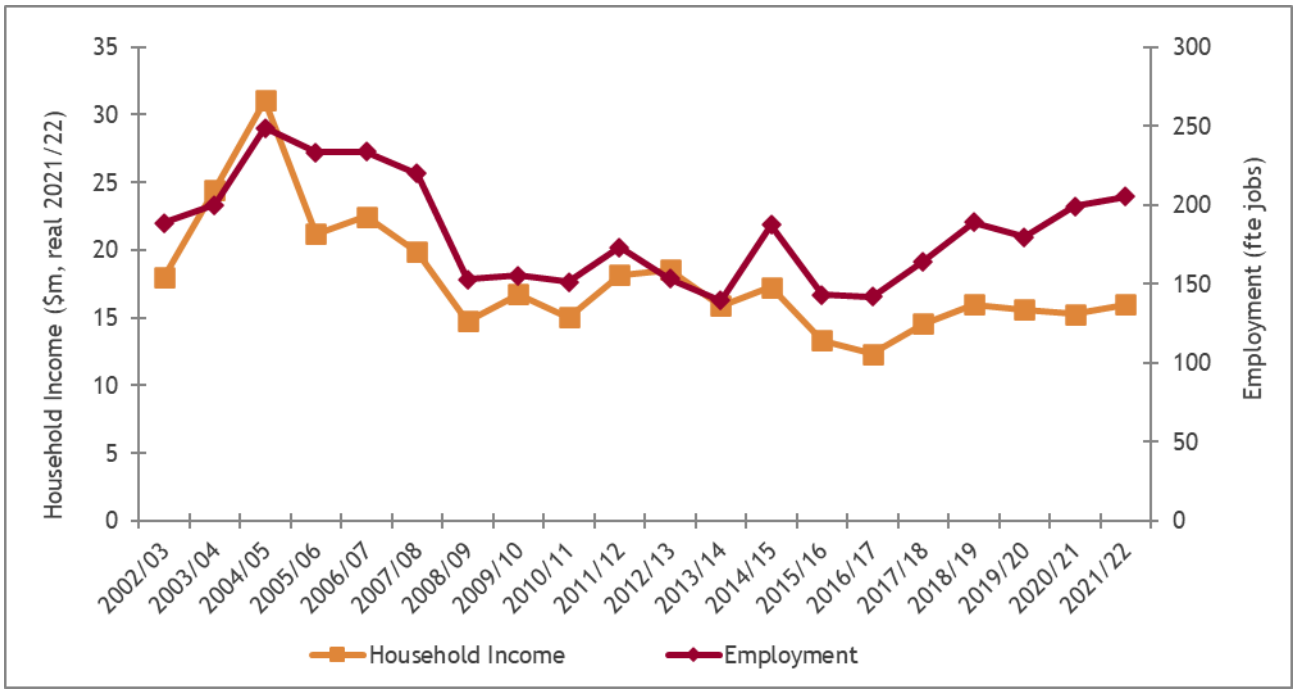
Figure 3-4 Total gross state product and output contribution of the SA Sardine Fishery on the South Australian economy, 2002/03 to 2021/22 [a]



[a] Monetary values have been converted to real 2021/22 dollars using the Adelaide CPI (ABS 2022a).

Source: BDO EconSearch (2022a) and BDO EconSearch analysis

Figure 3-5 Total employment and household income contribution of the SA Sardine Fishery on the South Australian economy, 2002/03 to 2021/22 [a,b]



[a] See footnote for Figure 3-4.

Source: BDO EconSearch (2022a) and BDO EconSearch analysis

3.7. Net Economic Return

Net economic return (NER) is the return from a fishery after all costs have been met. It is equal to fishing revenue less fishing costs (cost of labour, capital including depreciation, materials and an allowance for "normal" profit). NER is maximised when economic efficiency is maximised. NER[4] can also be 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), ice, 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. The inclusion of opportunity cost for labour and capital distinguishes net economic return from accounting profit. It means that net economic return of zero is expected in a perfectly competitive industry and a zero net economic return is sustainable.

Determining the opportunity cost of capital involves assessing 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.

Expectations about net economic return are different in the SA Sardine Fishery compared to other SA commercial fisheries. Being a forage fish fishery, operators harvest a relatively low value commodity that is highly traded internationally, the expectation is that, changes in catch would not affect price through supply/demand dynamics. Anecdotal evidence from licence holder surveys suggests that Tuna aquaculture operators in South Australia pay a premium for local sardines over imported product. This could be a result of frozen imported feed for tuna farms costing more when transported to SA. This cost point of difference between local and imported Sardines may explain, in part, the positive net economic return. Other contributing factors are the increasing efficiency of the fishery, as keeping costs down increases net economic return. Also contributing to this is likely to be that most of the Sardine catches are by licence holders who are also Tuna farmers and, therefore, have a lower-cost supply chain. This cost structure includes the possibly significant saving of using the same purse seiners to catch both Tuna and Sardines. This efficiency is demonstrated where, despite a significant increase in catch since 2002/03, the fishery managed a 4 per cent decrease in labour over the same period. The fishery catches on average 573t of Sardines per fte. Keeping costs down, such as a labour, is another contributing factor to a positive net economic return.

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[4] Net economic return or 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 net economic return, 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 NER.

What remains after the value of these inputs (labour, capital, materials and services) has been taken out is the value of the natural resource itself. The significant reduction in rent between 2004/05 and 2005/06 was driven by a decrease in total income in the fishery as a result of the reduction in TACC (Table 3-3) and the increase in investment in boats. Net economic return then followed an upward trend since 2005/06 (-$5.2m) and 2021/22 ($6.6m), as a result of decreasing costs (primarily opportunity cost of capital and labour costs) and increasing gross income. In 2021/22 the aggregate value of licences was estimated to be $95 million (14 licences with an average value of $6.8 million). A net economic return of $6.6 million represents a return of 6.9 per cent to the capital value of the fishery.

Table 3-10 Net economic return [a] in the SA Sardine Fishery, 2002/03 to 2021/22 ($'000 real 2021/22)

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	**Net Economic Return**
2002/03	35,111	12,362	5,482	3,432	3,261	**10,574**
2003/04	34,924	12,296	5,828	2,781	2,642	**11,379**
2004/05	43,144	15,190	7,000	2,434	2,312	**16,209**
2005/06	23,411	9,712	9,572	3,956	5,339	**-5,167**
2006/07	26,577	10,923	9,350	4,275	5,582	**-3,552**
2007/08	22,413	9,235	8,904	4,200	5,483	**-5,409**
2008/09	23,716	7,906	8,171	3,015	5,851	**-1,227**
2009/10	30,294	10,013	8,921	3,148	6,111	**2,101**
2010/11	24,387	8,388	7,684	3,253	6,313	**-1,251**
2011/12	25,884	7,737	8,735	3,255	3,376	**2,782**
2012/13	25,769	6,856	8,323	3,328	3,452	**3,810**
2013/14	22,868	6,409	7,928	3,238	3,359	**1,933**
2014/15	25,356	8,068	7,196	3,437	2,560	**4,094**
2015/16	30,183	8,249	7,622	3,290	2,451	**8,570**
2016/17	27,363	8,437	7,174	3,163	2,356	**6,233**
2017/18	26,776	7,134	5,949	5,089	4,859	**3,745**
2018/19	29,123	8,057	7,561	3,950	4,275	**5,280**
2019/20	29,221	8,870	7,591	3,879	4,197	**4,684**
2020/21	25,480	6,789	5,661	4,843	4,624	**3,564**
2021/22	29,100	7,089	6,161	4,743	4,528	**6,578**

[a] Adjusted for sample bias. This table presents net economic return in real 2021/22 dollars. Nominal net economic return is presented in Appendix 4.

Source: BDO EconSearch analysis

4. OTHER INDICATORS

4.1. Factors Influencing the Economic Condition of the SA Sardine Fishery

There were a number of factors in 2021/22 that impacted 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 in 1992 created a market for Sardines as feed for SBT ranched in these farms, which significantly increased demand. The cost of freight, time in transit and federal government biosecurity measures make importing baitfish for tuna feed difficult. This can depend on species, location and Australia's geopolitical relationship with the exporting country, for example FTA's.

Based on licence holders 2020/21 survey responses, an estimated 99.8 per cent of catch is used as Tuna feed. This compares with 99.5 per cent sold for Tuna feed in 2017/18, 100 per cent for Tuna feed in 2014/15, 100 per cent sold for Tuna feed in 2011/12, 93.7 sold as Tuna feed in 2008/09 and 97.6 per cent sold for Tuna feed in 2005/06. The balance of Sardine catch was used for either human consumption, canned for pet food or frozen as bait for recreational fishers (Table 4-2).

SBT are managed by the Australian Fisheries Management Authority (AFMA) who through the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) are provided an annual allocation of SBT. In October 2009, the CCSBT agreed that a reduction in the global total allowable catch (TAC) was necessary in order to rebuild the stock of SBT. CCSBT agreed upon a reduction of 20 per cent in global catches, reducing Australia's quota to 4,015 tonnes. With the SBT stock recovery, Australia's national allocation was set at 5,665 tonnes per year across the period 2015 to 2017. Australia's national allocation increased to 6,165 over the period 2018 to 2020 (CCBST 2021), of which 250 tonnes per annum was set aside for the recreational sector. The increase in catch of SBT increased demand for Sardines. Although the CCSBT global quota for the 2021 to 2023 triennium remains at 17,647 tonnes, Australia's national allocation increased by 73.4 tonnes, to 6,238.4 tonnes in total (CCBST 2021), of which 5 per cent (312 tonnes) was allocated to the recreational sector. This increase in TAC could further increase demand for Sardines. However, an increasing share (22 per cent in 2021) of Australia's total TAC is being used for longlining on the East Coast, and not for farming.

4.1.2. Additional Sardine quota

An additional 4,000 tonnes of quota was made available for the 2010 to 2014 fishing seasons. A further additional 2,000 tonnes of quota was brought forward from the 2013 fishing season and used in the 2012 season to meet a shortage of feed for Tuna farms. Licence holders indicated that this flexibility from management was of significant help to both the Sardine industry and the Tuna industry. In 2015 and 2016 the quota was increased to a total of 38,000t, in 2017 to 2021 it was increased once again to 42,750t, and in 2022 it was increased to 45,000t, the highest level since 2005.

4.1.3. Stock assessment

Catch, effort and catch per unit of effort (CPUE) data are summarised in Table 4-1 below for the 2002/03 to 2021/22 seasons from the most recent stock assessment report (Grammer et al. 2021a). Catch increased by 116 per cent between 2002/03 and 2021/22. CPUE increased from 2002/03 to 2004/05, and it then fluctuated, but did not change significantly from 2005/06 to 2009/10. From 2009/10 to 2017/18 CPUE has increased, reaching 69t/trip in 2017/18, before increasing further in 2021/22 to reach a peak of 74t/trip (Table 4-1).

Table 4-1 Catch, effort and CPUE, SA Sardine Fishery, 2002/03 to 2021/22

	Catch (t)	Effort (trips)	CPUE (t/trip)
2002/03	21,741	601	36
2003/04	33,160	751	44
2004/05	56,952	966	59
2005/06	28,626	689	42
2006/07	30,355	679	45
2007/08	29,692	652	46
2008/09	27,850	656	42
2009/10	36,573	790	46
2010/11	33,220	679	49
2011/12	36,962	706	52
2012/13	35,065	618	57
2013/14	33,197	577	58
2014/15	36,020	605	60
2015/16	41,103	609	67
2016/17	39,745	608	65
2017/18	43,293	627	69
2018/19	40,041	615	65
2019/20	39,889	660	60
2020/21	38,024	583	65
2021/22	46,935	637	74

Source: Grammer et al. 2021a and BDO EconSearch analysis

4.2. Destination of SA Sardine Fishery Product

Licence holders indicated in the 2021 survey that product caught in the SA Sardine fishery is used as fresh and frozen Tuna feed. In previous surveys, licence holders also indicated that Sardines were sold frozen after value adding for human consumption. As the response rate for the 2021 survey was less than 100 per cent, it is likely that this form of Sardine is still being sold by some participants in the fishery. The proportion of total product sold by destination and weighted average price in 2020/21 are detailed in Table 4-2. The majority of Sardines used for Tuna feed were fresh (around 86 per cent) rather than frozen.

Table 4-2 Estimated proportion of Sardines sold by destination and weighted average price (nominal), survey years from 2005/06 to 2020/21

	Survey Year					
	2005/06	2008/09	2011/12	2014/15	2017/18	2020/21
Proportion of Volume Sold (%)						
Fresh Tuna Feed	55.2	85.7	74.1	83.9	90.2	85.7
Frozen Tuna Feed	42.4	8.0	25.9	16.1	9.3	14.2
Fresh Value Added	0.6	0.7	0.0	0.0	0.5	0.0
Frozen Value Added	1.8	5.5	0.0	0.0	0.0	0.2
Average Price ($/kg)						
Fresh Tuna Feed	$0.53	$0.67	$0.57	$0.54	$0.70	$0.59
Frozen Tuna Feed	$0.72	$0.78	$0.59	$0.36	$0.29	$0.69
Fresh Value Added	$0.80	$2.50	n.a.	n.a.	$0.75	$4.00
Frozen Value Added	$1.04	$2.50	n.a.	n.a.	n.a.	$3.50

Source: 2006, 2010, 2013, 2016, 2018 and 2021 licence holder surveys and BDO EconSearch analysis

4.3. Contribution to the Community

As a part of the 2021 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 BDO EconSearch (2022a).

4.4. Social Indicators

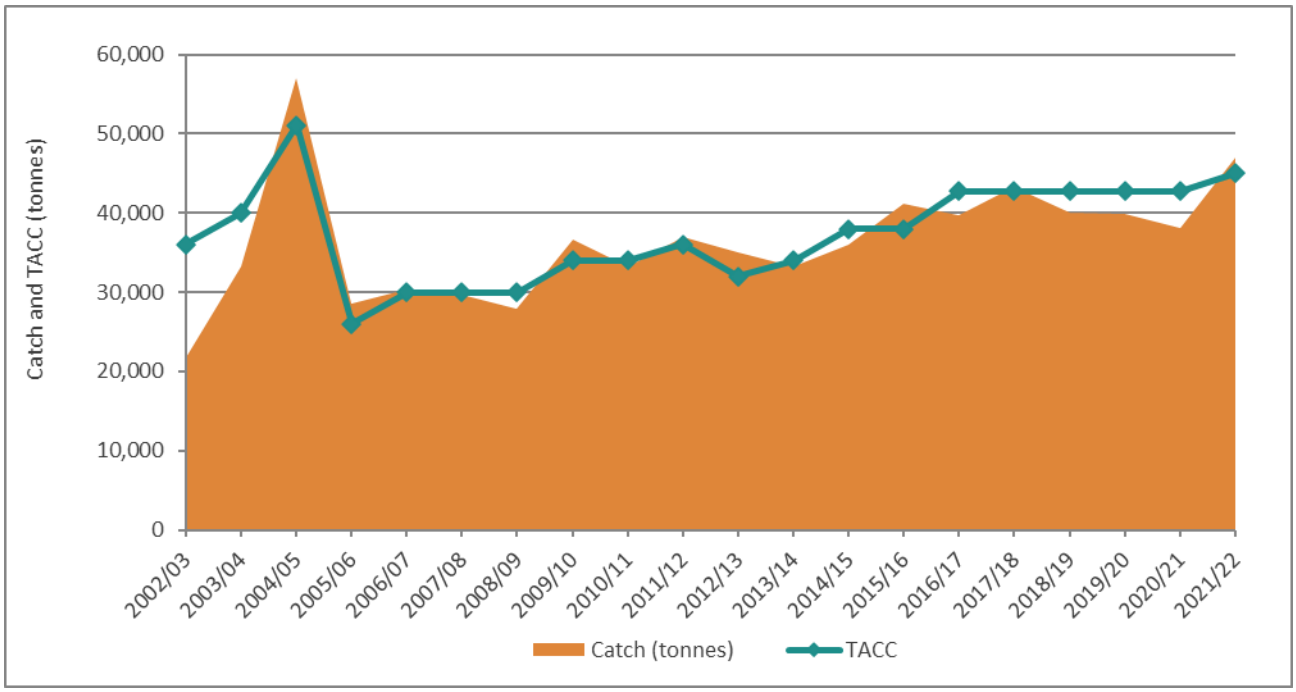
In 2014, 2018 and 2021, the economic indicators survey of commercial fisheries was extended to include the collection of social indicators. The results of the social indicators component of the survey are detailed in BDO EconSearch (2022a).

5. ECONOMIC TRENDS IN THE FISHERY

5.1. Catch and Gross Value of Production

The data shown in Figure 5-1 indicate that total catch in the fishery followed an increasing trend, mostly constrained by TACC over the period 2002/03 to 2021/22. The figure shows TACC by calendar year and catch by financial year. This can account for the years where catch is greater than TACC and vice versa. Prior to 2000, catch had declined considerably as a result of a significant Sardine mortality event occurring across the entire distribution of the Australian Sardine population from October 1998 to May 1999. Sardine stocks regenerated quickly, however, resulting in a significant increase in catch between 2002 and 2005 made possible by increases in the TACC. This significant increase in value corresponds with increased catches to meet the growing demand for feedstock from Port Lincoln's Tuna farming industry. There was a large reduction in TACC between 2005 and 2006, which resulted in a significant decrease in the catch and value of catch in the fishery. Since 2006, TACC has increased gradually which has allowed an overall increasing trend in catch and GVP.

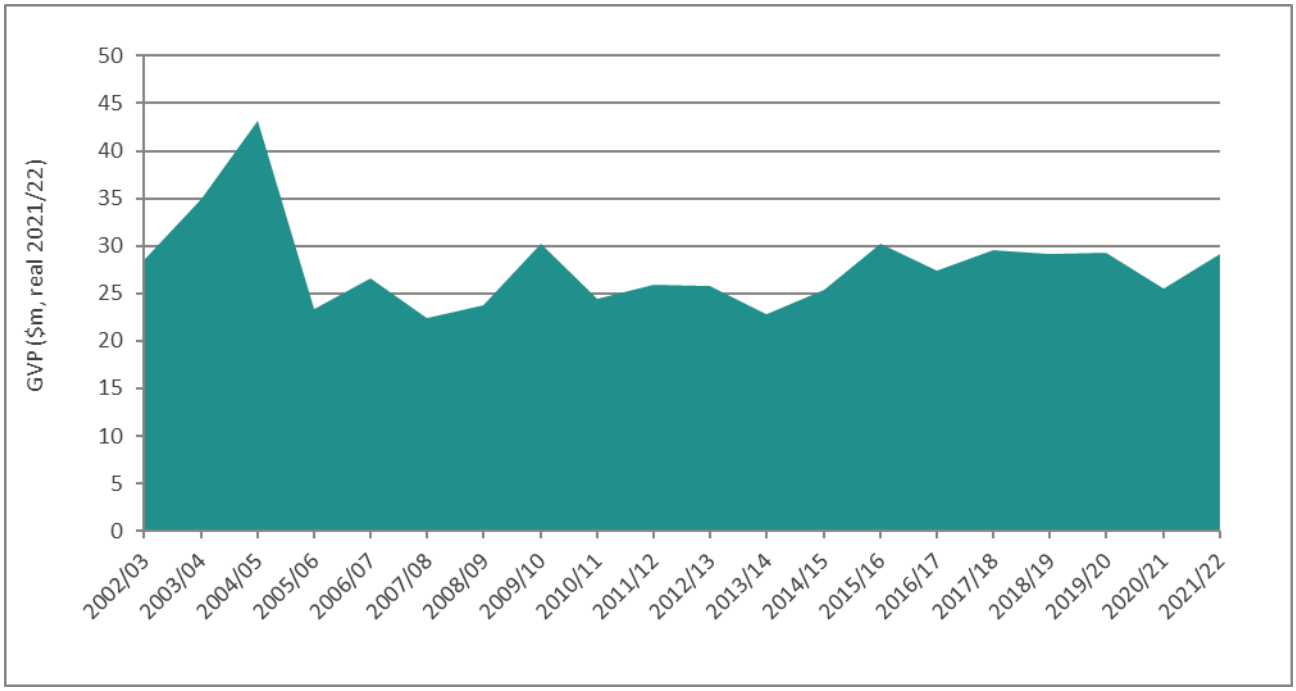
Figure 5-1 SA Sardine Fishery catch (financial year) and TACC (calandar year), 2002/03 to 2021/22



Source: Grammer et al. 2021a

The GVP for the Sardine fishery for the period 2002/03 to 2021/22 is illustrated in Figure 5-2. The real value of the Sardine catch increased significantly between 2002/03 and 2004/05 (Figure 5-2). The real value of the Sardine catch fell significantly in 2005/06, due to the 49 per cent reduction in TACC for the 2006 season. GVP fluctuated in subsequent years as a result of small changes in both the level of catch and the price of Sardines, but has followed a slight increasing trend since 2005/06. In 2021/22, GVP was estimated to be $29.1 million, a 14 per cent real increase from the previous year (Figure 5-2). This increase is attributable to a 23 per cent rise in catch and despite a 7 per cent decline in price.

Figure 5-2 SA Sardine Fishery GVP, 2002/03 to 2021/22 [a]



[a] Values have been converted to real 2021/22 dollars.

Source: Table 3-2

Catch, GVP and price indices for the fishery for 2002/03 to 2021/22 are illustrated in Figure 3-2. Change in GVP over time is strongly influenced by change in catch. Because changes in real price are slight compared to the dramatic shifts in catch, changes in real price have had a lesser impact on GVP. However, the decline in real price since 2002/03 has offset the increase in catch over that period leaving real GVP only slightly larger in 2021/22 than in 2002/03 (2 per cent).

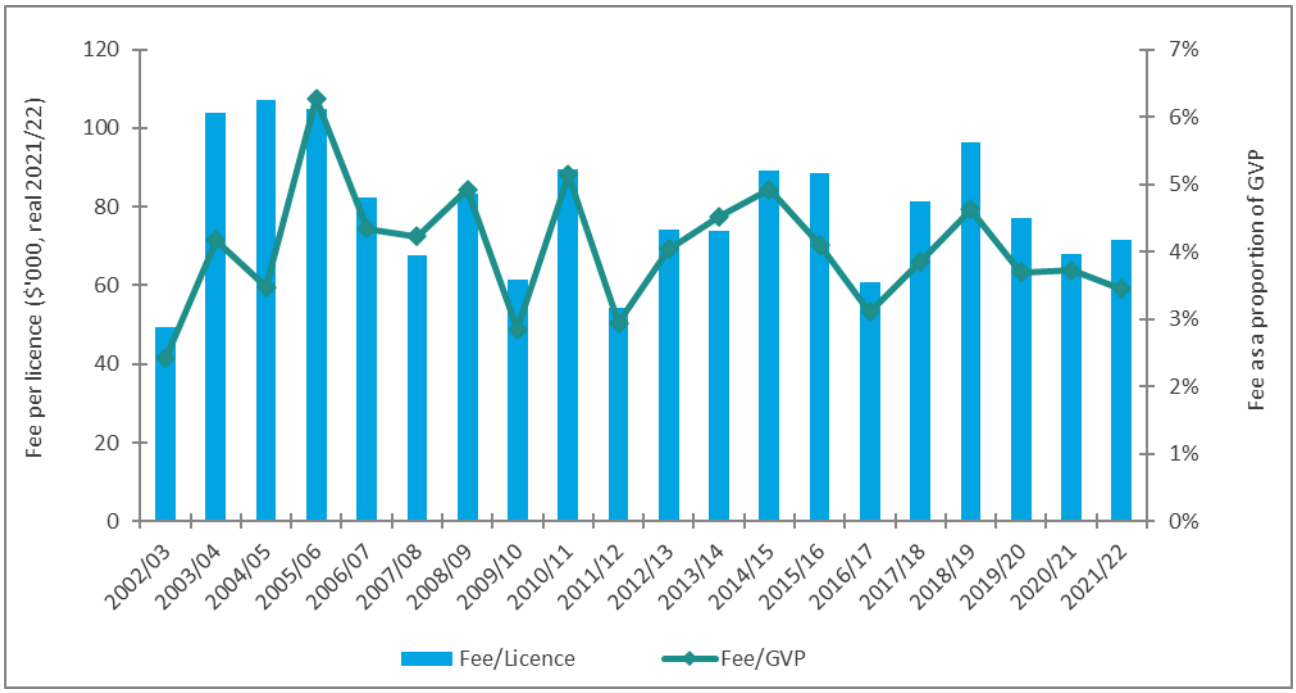
The trends in real and nominal price for Sardines over the last twenty years can be seen in Figure 3-3. The average real price for Sardines has shown a declining trend since 2002/03, decreasing by 53 per cent between 2002/03 and 2021/22. The average nominal price for Sardines decreased by 24 per cent over the same period (Figure 3-3).

5.2. Management Costs

The average management fee per licence and the licence fee as a proportion of GVP, for the period 2002/03 to 2021/22, are illustrated in Figure 5-3. Licence fees as a percentage of GVP fluctuated between years but increased overall from 2.4 per cent in 2002/03 to 3.4 per cent in 2021/22. This rise can be attributed to an increase in the cost of managing the fishery, despite an increase in real fishery GVP.

The average management cost per licence increased (in real terms) from around $49,000 in 2002/03 to $107,000 in 2004/05, reflecting an increase in total management costs. Since 2004/05, the average cost per licence has decreased with fluctuations due to changes in observer services, the cycling in the biennial research program and TACC setting process for the fishery and the associated costs. In 2021/22, the management fee per licence was almost $72,000 (Figure 5-3).

Figure 5-3 Management fee per licence and as a proportion of GVP, SA Sardine Fishery, 2002/03 to 2021/22 [a]



[a] Values have been converted to real 2021/22 dollars.

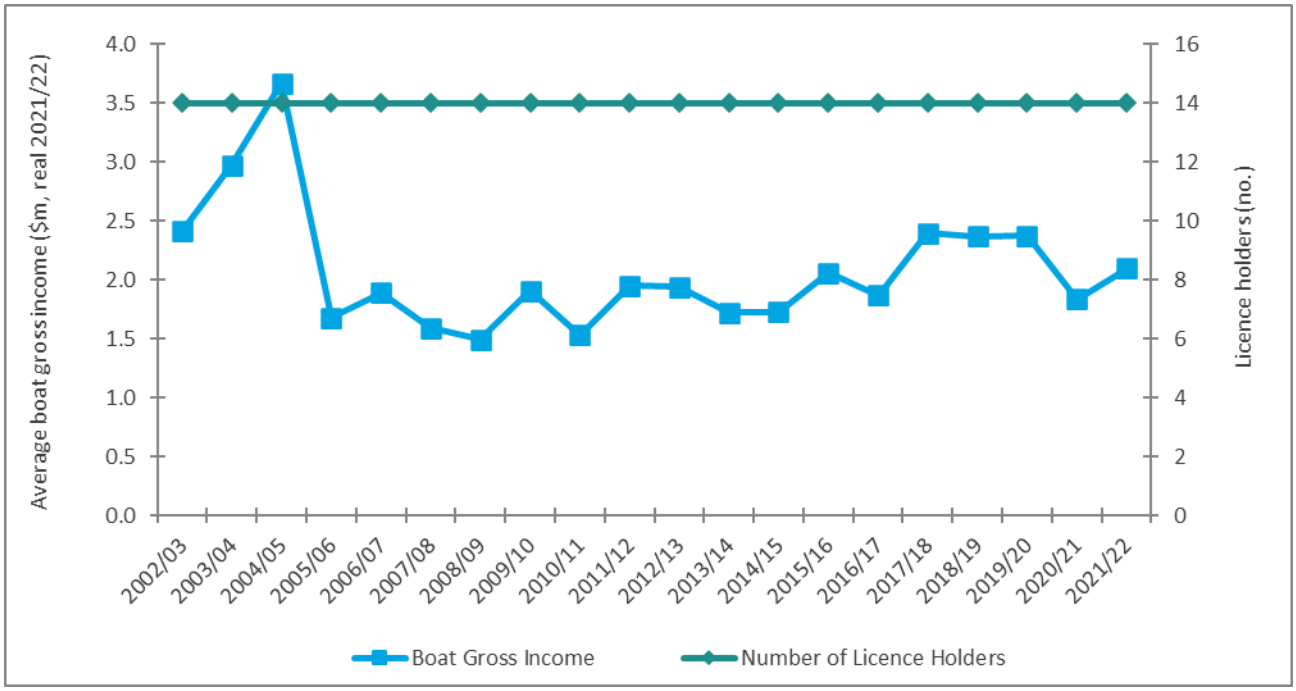
Source: Table 3-3

5.3. Financial Performance Indicators

Average income

Average income and total number of licences in the fishery for the period 2002/03 to 2021/22 are illustrated in Figure 5-4. The average income per licence (in real 2021/22 dollars) increased from $2.4 million in 2002/03 to almost $3.7 million in 2004/05 then declined significantly in 2005/06 (to $1.7 million) as a result of the reduction in TACC. In subsequent years, average income per licence has followed a slight increasing trend (Figure 5-4). The total number of licences in the fishery has not changed over the period of analysis. Accordingly, changes in the average income per licence directly relate to the total real GVP for the fishery.

Figure 5-4 Average income per licence in the SA Sardine Fishery, 2002/03 to 2021/22 [a]



[a] Estimates of average boat gross income are expressed in real 2021/22 dollars.

Source: Table 3-6, Table 3-7 and Appendix 3

Operating cost trends

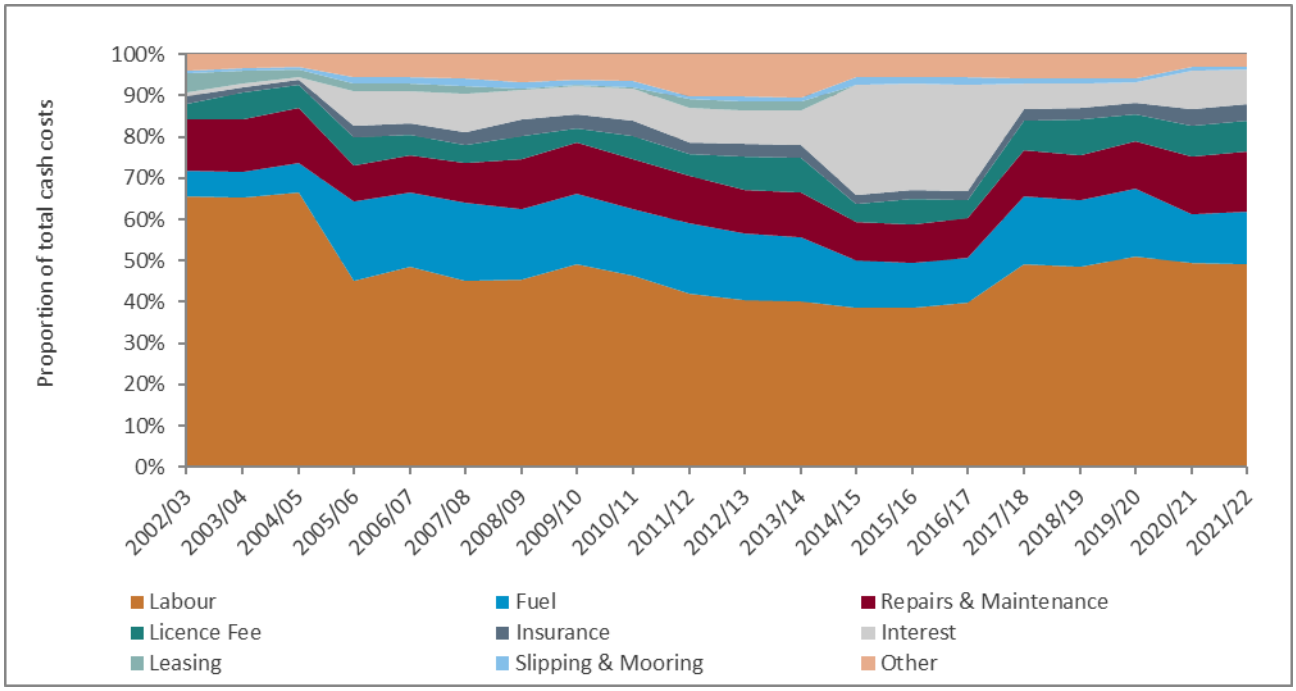
A breakdown of major cost items as a proportion of total cash costs, for the period 2002/03 to 2021/22, is illustrated in Figure 5-5. Since 2002/03, labour costs have accounted for a large but decreasing (with some fluctuations) share of total cash costs. The labour costs are comprised of payments to licence owners and crew, as well as an imputed wage to those licence owners and other family members who contribute to the business, but who are not paid a wage directly by the business.

Interest costs became a notable feature of total cash costs over the same period, increasing from 1 per cent of total cash costs in 2002/03 to 27 per cent in 2014/15. Interest costs declined between 2017/18 and 2019/20 and then increased back to 8 per cent of total cash costs in 2021/22. This variance in interest payments could be due to sampling variability as economic contribution estimates for the years 2002/03 to 2021/22 are based on different survey samples and techniques, some of the differences between years is, therefore, attributable to sampling variability.

Other significant cash costs were repairs and maintenance, fuel and licence fees (Figure 5-5). The proportion of fuel in respect to all cash costs decreased between 2005/06 to 2016/17, reflecting the fishery's improving efficiency and green credentials of their product. From 2017/18 to 2021/22 there was a slight rise in fuel costs. However, this could be caused, in part, by a sampling variation between surveys.

The cash costs detailed in Figure 5-5 can be categorised as either variable or fixed costs and are illustrated on this basis in Figure 5-6 on an average per boat basis. Total variable costs increased between 2002/03 and 2004/05, as catch increased, and have fluctuated in subsequent years but generally followed a slight decreasing trend. In 2021/22 variable costs increased by 8 per cent from 2020/21 due to an increase in the number of days fished (9 per cent rise). As would be expected, total fixed costs have fluctuated much less from year to year but followed an increasing trend over the entire period of analysis (Figure 5-6).

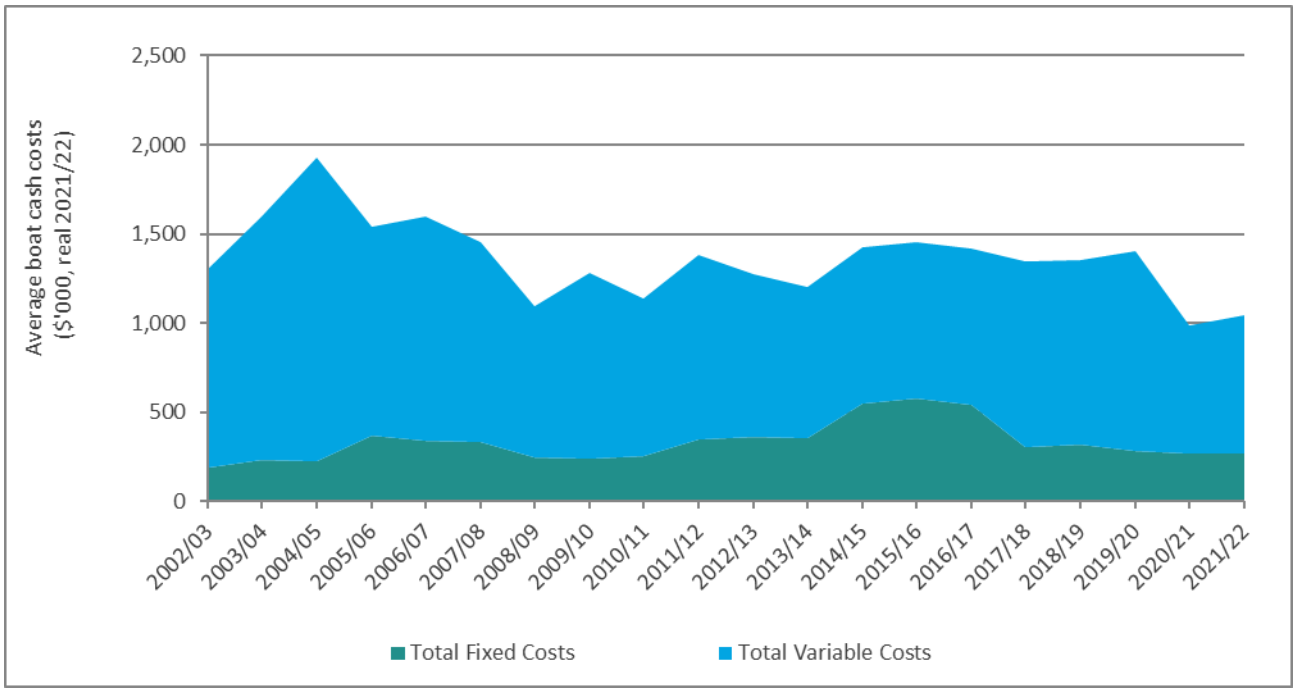
Figure 5-5 Cost shares in the SA Sardine Fishery, 2002/03 to 2021/22 [a]



[a] Financial performance estimates were based on different survey samples and techniques. Some of the difference between years is, therefore, attributable to sampling variability.

Source: Table 3-6 and Appendix 3

Figure 5-6 Average total costs in the SA Sardine Fishery 2002/03 to 2021/22 [a]



[a] Estimates of average costs are expressed in real 2021/22 dollars.

Source: Table 3-6 and Appendix 3

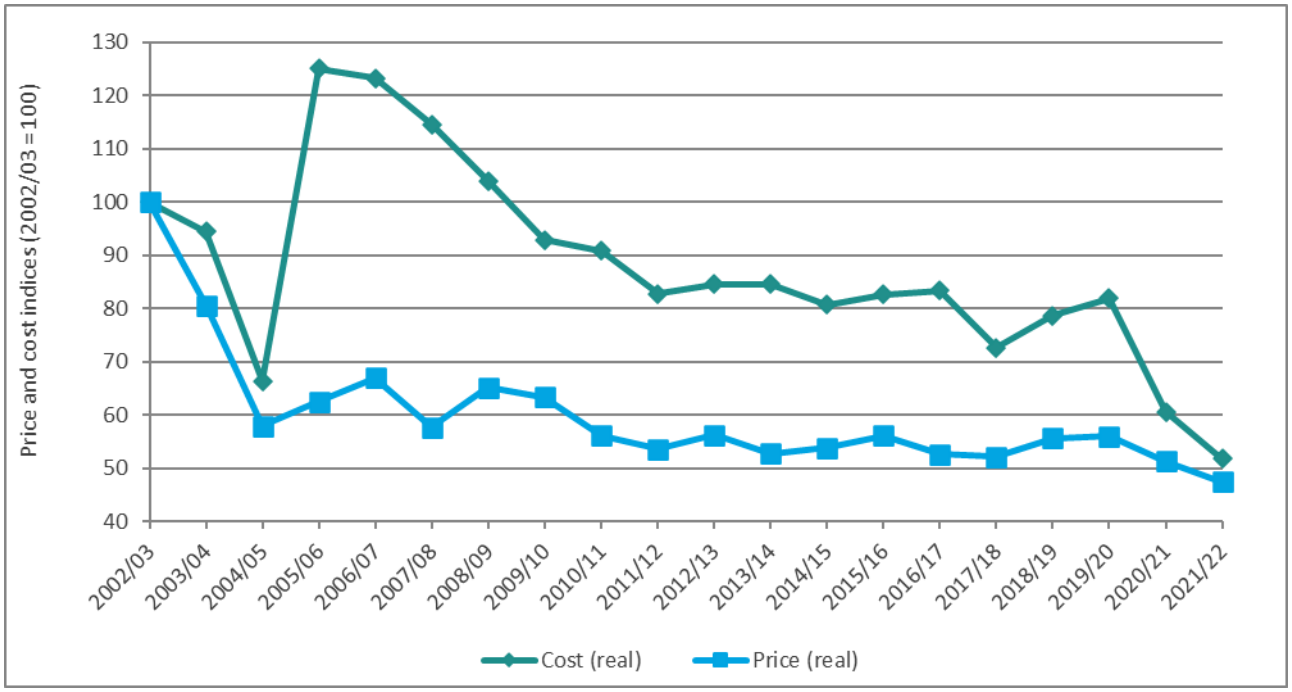
Cost Price Squeeze

Price and cost indices for the South Australian Sardine Fishery for the years 2002/03 to 2021/22 are summarised in Figure 5-7. These indicators are derived from the average price and average cost per kilogram of catch.

Between 2002/03 and 2021/22 the average price of Sardines decreased by approximately 53 per cent in real terms. The average cost of catching Sardines declined by 48 per cent in real terms over the same period. A declining average cost of catching Sardines, in real terms, reflects productivity improvements (principally in labour and repairs and maintenance) over the period.

Between 2002/03 and 2004/05 both the average price for Sardines and the average cost per kg of catch decreased significantly as catch increased spreading the fixed costs across a larger catch. Since 2004/05 the real price for Sardines has decreased slightly (with some minor fluctuations). The cost of catching Sardines rose dramatically in 2005/06, the year when catch fell dramatically and has been declining gradually since as catch has increased. As the quantity demanded of Sardine catch increased, fishers increased the number of days fished (9 per cent) and overall catch by (23 per cent) in 2021/22, increasing total variable costs of fishers between years.

Figure 5-7 Price and cost indices for the SA Sardine Fishery, 2002/03 to 2021/22

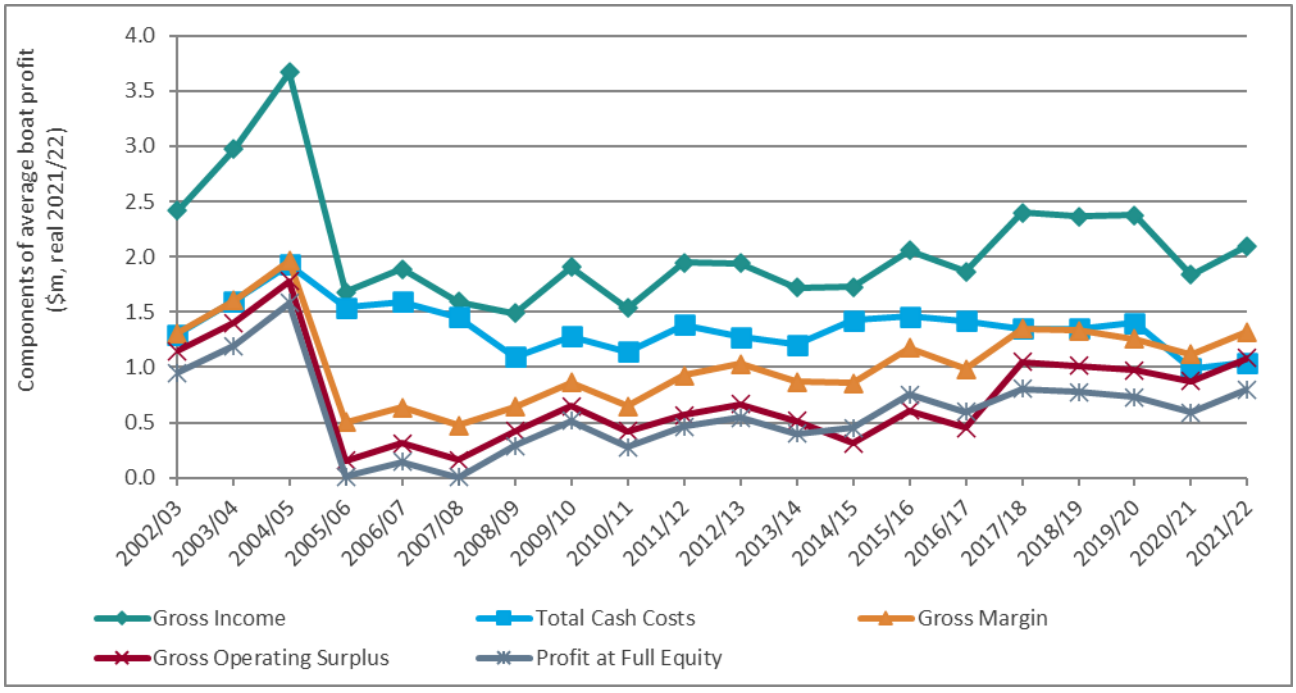


Source: Figure 3-2, Table 3-6 and Appendix 3

Profitability

Selected measures of profitability for the South Australian Sardine Fishery are summarised in Figure 5-8 for the years 2002/03 to 2021/22. Changes in each of the profitability measures for the fishery were closely related to the average income earned. Profitability followed an increasing trend between 2002/03 and 2004/05 before declining significantly in 2005/06 as a result of the reduction in TACC. Profitability has fluctuated since 2005/06 but generally followed a slight increasing trend. In 2021/22, profit at full equity rose 36 per cent due to gross income increasing by more (14 per cent) than total cash costs (5 per cent). This resulted in a rise in the gross margin, GOS and profit at full equity.

Figure 5-8 Average financial performance indicators per boat in the SA Sardine Fishery, 2002/03 to 2021/22[a]



[a] Estimates of income and profitability measures are expressed in in real 2021/22 dollars.

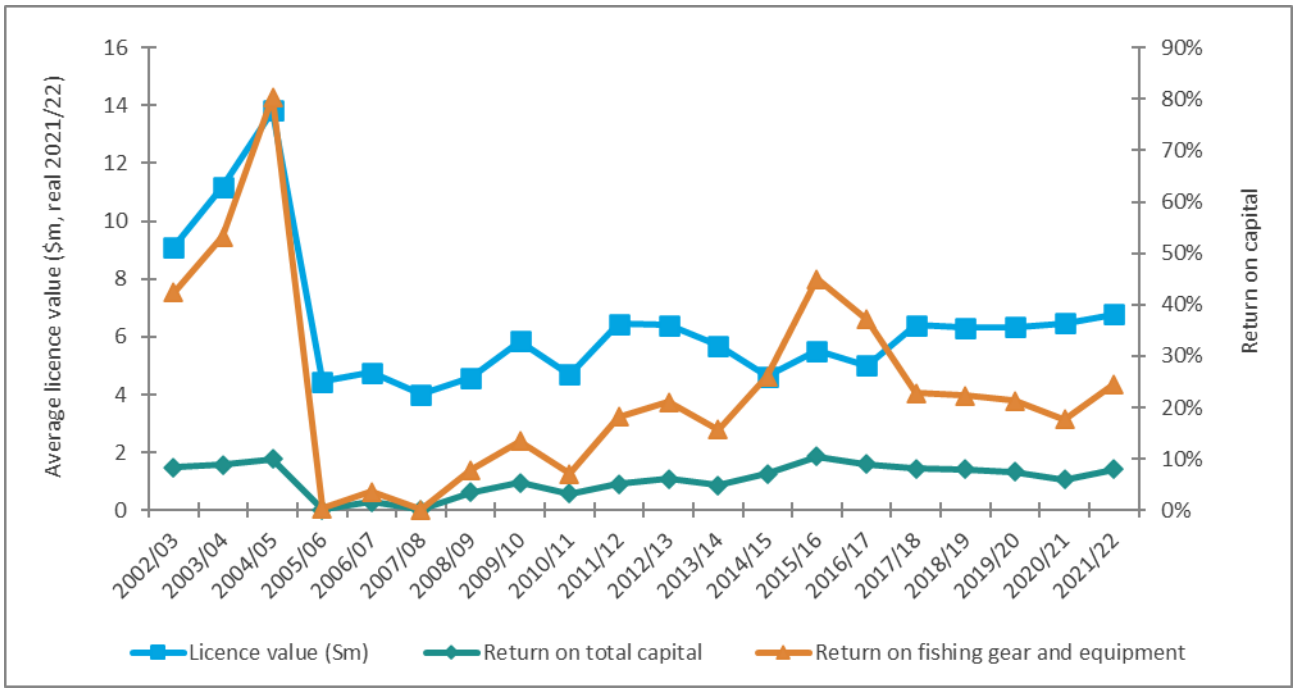
Source: Table 3-6 and Appendix 3

Return on Investment

Estimates of the average licence value and the rate of return to capital are illustrated in Figure 5-9. Total capital includes boats, licence/quota, fishing gear, sheds, vehicles and other capital items used as part of the fishing enterprise. Return on investment is calculated to be profit at full equity as a percentage of both total capital employed and total capital excluding licence/quota.

Between 2002/03 and 2004/05 the estimated rate of return on total capital increased from 8 per cent to 10 per cent then fell significantly in 2005/06 (to 0.1 per cent). This measure followed an increasing trend since 2005/06 and was estimated to be 8.0 per cent in 2021/22. Since the average licence value comprises most of the average total capital value (Table 3-6), its movements are closely linked to changes in the estimated profitability of the fishery (Figure 5-9).

Figure 5-9 Return on capital in the SA Sardine Fishery, 2002/03 to 2021/22



Source: Table 3-6 and Appendix 3

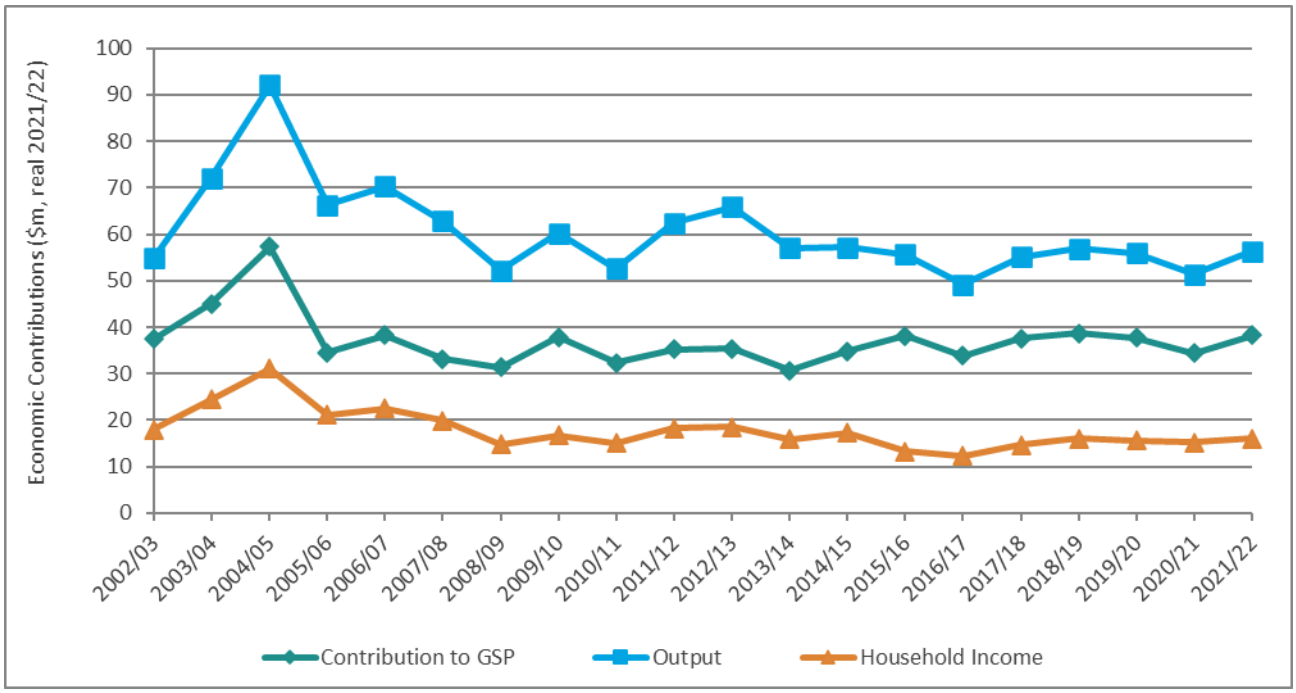
5.4. Contribution to the South Australian Economy

Figure 5-10 and Figure 5-11 illustrate the total economic contribution of the fishery to the SA economy for the period 2002/03 to 2021/22.

Total economic contribution refers to the direct fishing industry contributions (fishing, processing, etc.) and the indirect contributions on other sectors of the economy. The change in total output and GSP contributions are closely related to changes in price and fishery GVP (Figure 5-10). GSP and output were slightly higher in 2021/22 than in 2002/03. Conversely household income was slightly lower over the same period. Like fishery GVP, these measures increased between 2002/03 and 2004/05 before falling in 2005/06 with a reduction in TACC.

Employment (direct and indirect) increased between 2002/03 and 2004/05 before falling sharply until 2008/09. Total employment has followed an increasing trend since 2008/09 (Figure 5-11). Direct employment was 98 fte in 2002/03 and despite fluctuations over the 20 years, was 96 fte in 2021/22. Indirect employment has increased over the same period, from 91 fte in 2002/03 to 110 fte in 2021/22.

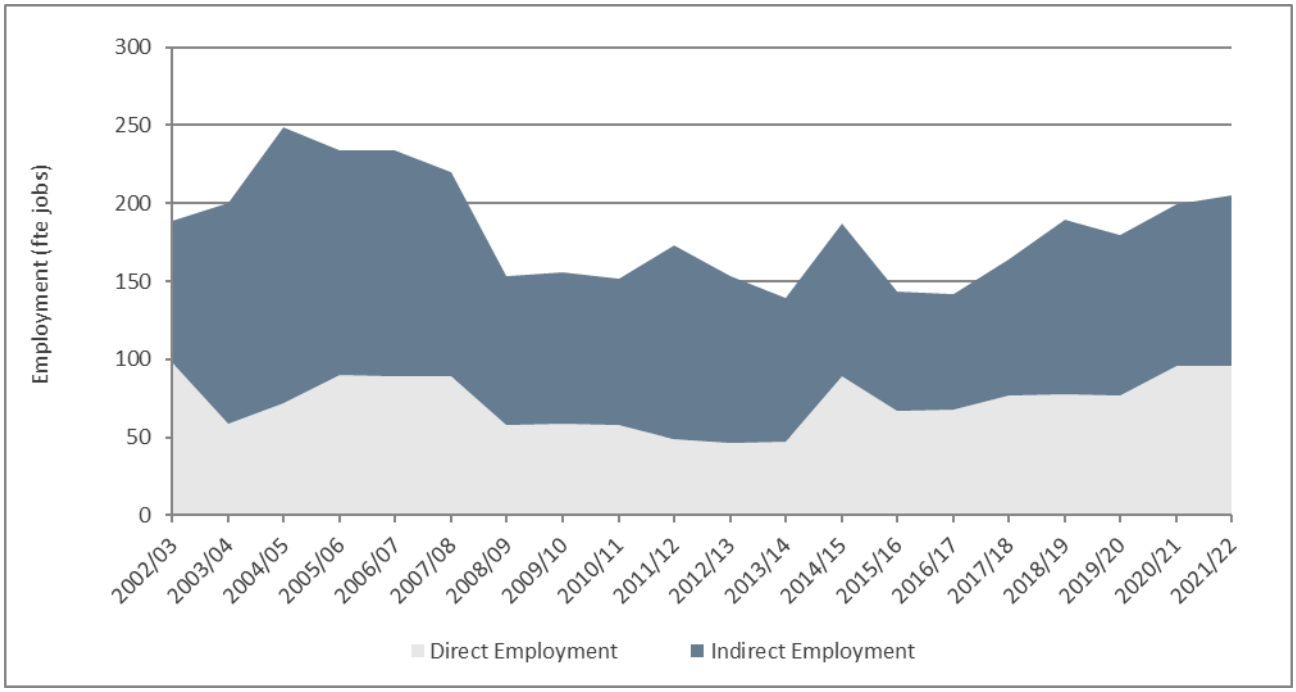
Figure 5-10 Total gross state product, output and household income contribution of the SA Sardine Fishery on the SA economy, 2002/03 to 2021/22 [a]



[a] Estimates of output, GSP and household income are expressed in real 2021/22 dollars.

Source: Table 3-8

Figure 5-11 Total direct and indirect employment contribution of the SA Sardine Fishery on the SA economy, 2002/03 to 2021/22



Source: Table 3-8

5.5. Net Economic Return

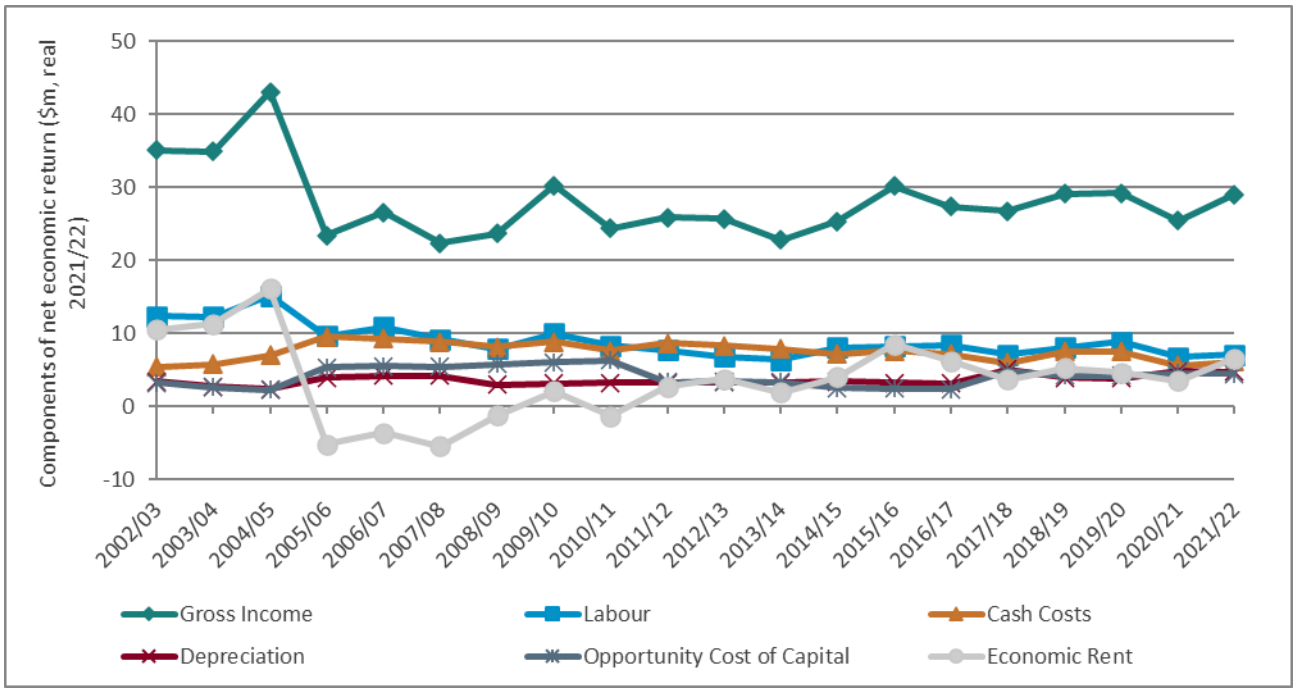
Net economic return (NER) is the return from a fishery after all costs have been met. It is equal to fishing revenue less fishing costs (cost of labour, capital including depreciation, materials and an allowance for "normal" profit). NER is maximised when economic efficiency is maximised. Estimates of the NER generated in the Sardine fishery are summarised in Figure 5-12 for the period 2002/03 to 2021/22.

Real NER increased from almost $10.6 million in 2002/03 to $16.2 million in 2004/05, but fell dramatically in 2005/06 to -$5.2 million. NER decreased to its lowest level of -$5.4 million in 2007/08. Since 2007/08 net economic return followed an increasing trend reaching $6.6 million in 2021/22(Figure 5-12).

NER expressed as a percentage of GVP is a useful indicator for analysing a fishery over time and for comparing different fisheries. This indicator is illustrated in Figure 5-13 and shows an overall decrease between 2002/03 and 2005/06. Since 2005/06 net economic return as a percentage of GVP followed an increasing trend (Figure 5-13).

NER represents a return to the value of licences in the fishery. The aggregate value of licences in the Sardine fishery and the return to the aggregate value of licences in the fishery are illustrated in Figure 5-14. The return to the aggregate value of licences follows a similar trend to NER as a percentage of GVP. Decreasing between 2002/03 and 2005/06, then an increasing trend since reaching 6.9 per cent in 2021/22 (Figure 5-14).

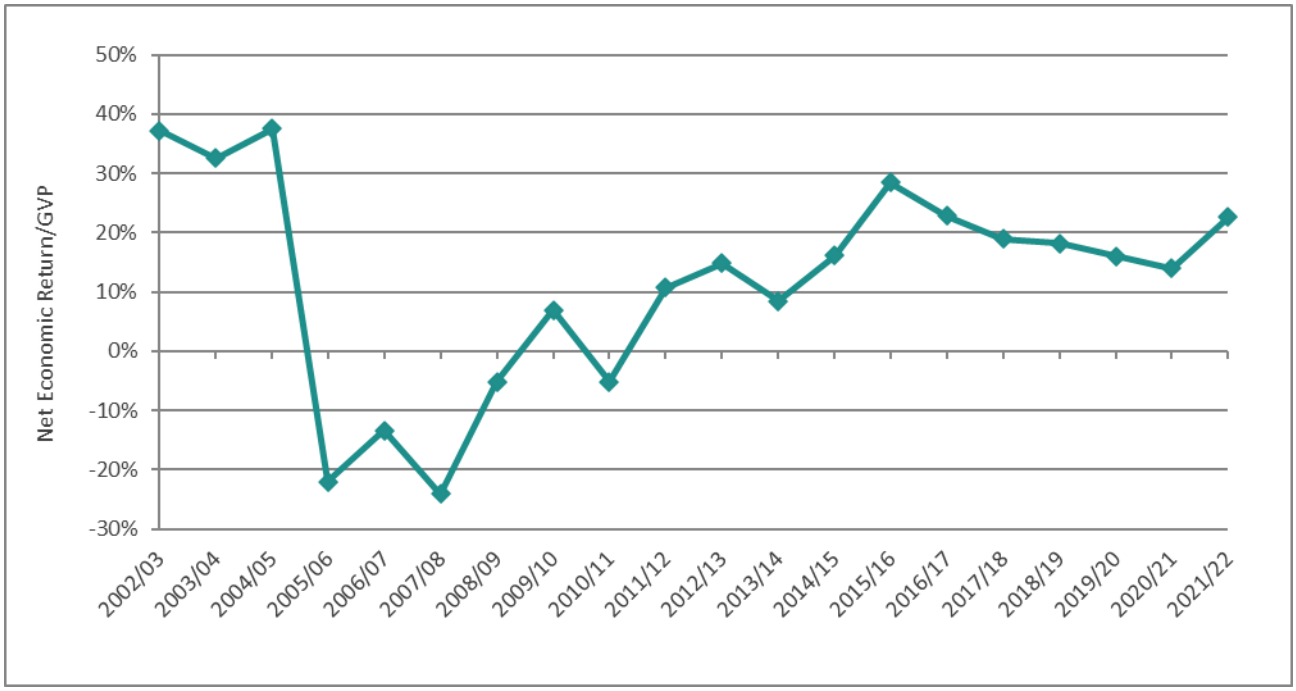
Figure 5-12 Net economic return in the SA Sardine Fishery, 2002/03 to 2021/22 ($'000) [a]



[a] All indicators are expressed in real 2021/22 dollars.

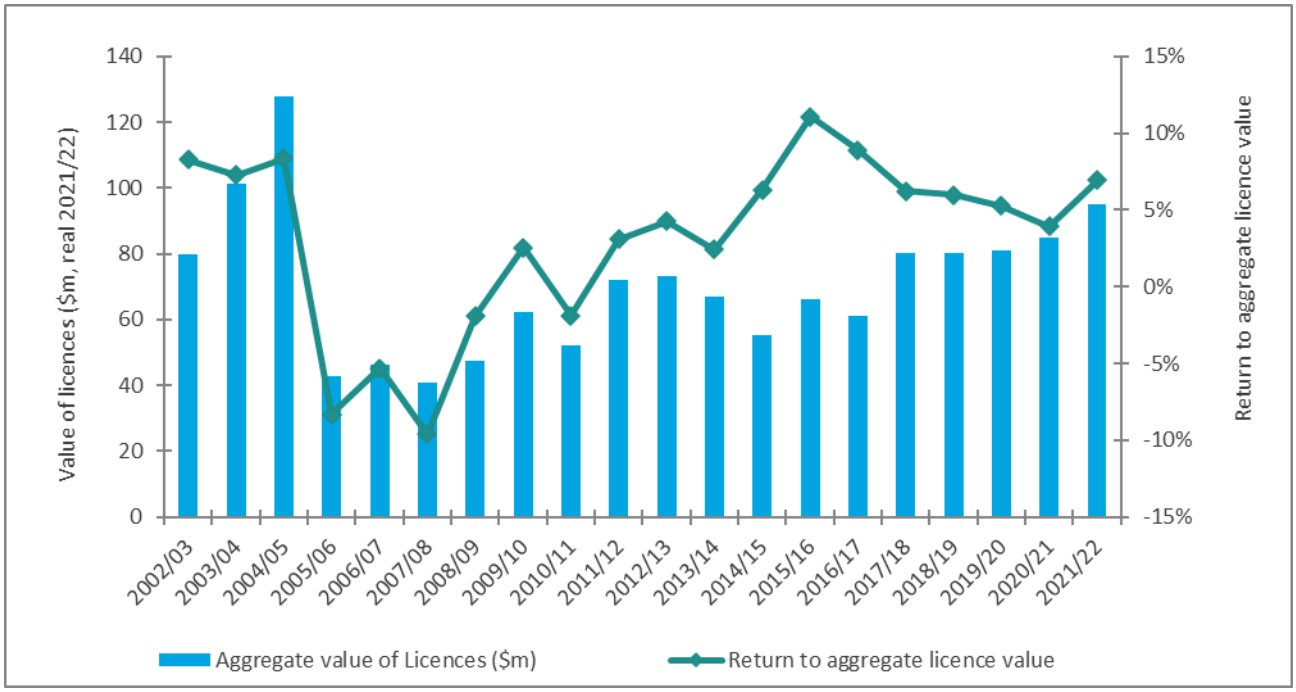
Source: Table 3-10

Figure 5-13 Net economic return as a proportion of GVP in the SA Sardine Fishery, 2002/03 to 2021/22



Source: Table 3-2 and Table 3-10 and Appendix 3

Figure 5-14 Aggregate value of licences and return to aggregate licence value in the SA Sardine Fishery, 2002/03 to 2021/22 [a]



[a] The value of licences represents licence holders' estimates of the value of their fishing licence derived from survey responses. Estimates were based on different survey samples and techniques. Some of the difference between years is, therefore, attributable to sampling variability.

Source: Table 3-6, Table 3-10 and Appendix 3

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Disclaimer

The assignment is a consulting engagement as outlined in the 'Framework for Assurance Engagements', issued by the Auditing and Assurances Standards Board, Section 17. Consulting engagements employ an assurance practitioner's technical skills, education, observations, experiences and knowledge of the consulting process. The consulting process is an analytical process that typically involves some combination of activities relating to: objective-setting, fact-finding, definition of problems or opportunities, evaluation of alternatives, development of recommendations including actions, communication of results, and sometimes implementation and follow-up.

The nature and scope of work has been determined by agreement between BDO and the Client. This consulting engagement does not meet the definition of an assurance engagement as defined in the 'Framework for Assurance Engagements', issued by the Auditing and Assurances Standards Board, Section 10.

Except as otherwise noted in this report, we have not performed any testing on the information provided to confirm its completeness and accuracy. Accordingly, we do not express such an audit opinion and readers of the report should draw their own conclusions from the results of the review, based on the scope, agreed-upon procedures carried out and findings.

APPENDIX 1 Economic Contribution of the SA Sardine Fishery, 2020/21

Appendix Table 1-1 The economic contribution of the SA Sardine fishing industry in South Australia, 2020/21 [d]

Sector	Output		Employment [a]		Household Income		Contribution to GSP	
	($m)	%	(fte jobs)	%	($m)	%	($m)	%
Direct effects								
Fishing	24.0	50%	82	41%	6.4	45%	18.7	58%
Processing	0.3	1%	1	0%	0.0	0%	0.1	0%
Transport	0.1	0%	0	0%	0.0	0%	0.0	0%
Retail	0.2	0%	1	1%	0.1	1%	0.1	0%
Food services	0.3	1%	3	1%	0.1	1%	0.2	0%
Capital expenditure [b]	1.4	3%	8	4%	0.5	4%	0.7	2%
Total Direct [c]	*26.2*	*54%*	*95*	*48%*	*7.2*	*50%*	*19.8*	*61%*
Flow-on effects								
Trade	2.6	5%	17	9%	1.0	7%	1.5	5%
Manufacturing	2.6	5%	7	3%	0.4	3%	0.8	2%
Business Services	3.2	7%	21	10%	1.6	11%	1.8	5%
Transport	1.2	3%	5	2%	0.3	2%	0.5	2%
Other Sectors	12.5	26%	55	28%	3.8	26%	8.0	25%
Total Flow-on [c]	*22.1*	*46%*	*104*	*52%*	*7.2*	*50%*	*12.5*	*39%*
Total [c]	**48.3**	**100%**	**199**	**100%**	**14.3**	**100%**	**32.3**	**100%**
Total/Direct	1.8	-	2.1	-	2.0	-	1.6	-
Total/Tonne	$1,200	-	0.01	-	$300	-	$800	-

[a] Full-time equivalent jobs. Direct employment in the fishing sector was comprised of 47 full-time and 76 part-time jobs, that is, 123 jobs in aggregate, which was estimated to be equal to 82 fte jobs.

[b] 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).

[c] Totals may not sum due to rounding.

[d] Employment impacts have been revised using updated information received in 2021/22.

Source: BDO EconSearch analysis

Appendix Table 1-2 The economic contribution of the SA Sardine fishing industry in the Eyre and Western Region, 2020/21 [d]

Sector	Output		Employment [a]		Household Income		Contribution to GRP	
	($m)	%	(fte jobs)	%	($m)	%	($m)	%
Direct effects								
Fishing	24.0	65%	82	55%	6.4	61%	18.2	71%
Processing	0.3	1%	1	1%	0.0	0%	0.1	0%
Transport	0.1	0%	0	0%	0.0	0%	0.0	0%
Retail	0.1	0%	1	1%	0.1	1%	0.1	0%
Food services	0.0	0%	0	0%	0.0	0%	0.0	0%
Capital expenditure [b]	0.6	2%	5	3%	0.3	3%	0.3	1%
Total Direct [c]	*25.1*	68%	*89*	60%	*6.8*	65%	*18.8*	73%
Flow-on effects								
Trade	1.7	5%	11	8%	0.7	6%	1.0	4%
Manufacturing	0.5	1%	2	1%	0.1	1%	0.1	1%
Business Services	1.2	3%	8	5%	0.6	5%	0.7	3%
Transport	0.9	2%	3	2%	0.2	2%	0.4	2%
Other Sectors	7.4	20%	35	23%	2.1	20%	4.7	18%
Total Flow-on [c]	*11.7*	32%	*59*	40%	*3.7*	35%	*6.9*	27%
Total [c]	**36.8**	**100%**	**148**	**100%**	**10.5**	**100%**	**25.7**	**100%**
Total/Direct	1.5	-	1.7	-	1.5	-	1.4	-
Total/Tonne	$900	-	0.00	-	$200	-	$600	-

[a-d] See footnotes from Appendix Table 1-1

Source: BDO EconSearch analysis

APPENDIX 2 Summary Economic Indicators for SA Commercial Fisheries

Appendix Table 2-1 Commercial fisheries catch, South Australia, 2001/02 to 2020/21 (tonnes)

Year	Abalone	GSV Prawns [a]	SGWC Prawns [a]	Sth'n Zone Rock Lobster [a]	Nth'n Zone Rock Lobster [a]	Blue Crabs	Lakes and Coorong [b]	Sardines	Marine Scalefish	Misc [c]	Total SA Fisheries [d]
2001/02	850	322	2,309	1,717	675	481	1,640	12,165	4,801	-	24,960
2002/03	890	232	1,508	1,766	595	515	1,979	21,741	4,243	-	33,469
2003/04	879	172	1,958	1,896	504	559	2,180	33,160	4,221	-	45,529
2004/05	902	213	1,960	1,897	446	584	2,277	56,952	3,857	-	69,089
2005/06	896	175	1,891	1,889	476	600	2,440	28,626	3,234	-	40,227
2006/07	883	209	2,024	1,895	492	617	2,443	30,355	2,855	-	41,773
2007/08	889	229	2,088	1,850	459	625	2,146	29,692	2,925	28	40,931
2008/09	837	273	1,915	1,407	403	604	2,023	27,850	2,998	28	38,338
2009/10	855	250	2,445	1,243	310	539	1,916	36,573	3,330	24	47,485
2010/11	815	178	2,115	1,244	313	591	1,681	33,220	3,068	24	43,249
2011/12	822	125	1,840	1,242	307	611	1,641	36,962	3,208	25	46,783
2012/13	875	0	1,881	1,234	325	511	1,811	35,065	2,603	28	44,333
2013/14	661	0	1,805	1,247	331	571	1,852	33,197	2,302	22	41,988
2014/15	744	249	1,848	1,238	321	576	1,598	36,020	2,582	22	45,198
2015/16	625	218	2,357	1,244	347	625	1,646	41,103	2,550	21	50,736
2016/17	743	225	2,205	1,238	320	627	1,847	39,745	2,519	22	49,491
2017/18	700	237	2,197	1,246	308	603	1,873	43,293	2,303	22	52,782
2018/19	658	212	2,121	1,245	294	616	1,861	40,041	2,099	22	49,169
2019/20	509	133	1,743	1,203	226	620	1,978	39,889	2,130	17	48,448
2020/21	493	110	1,837	1,275	251	592	1,926	38,024	1,689	18	46,215

[a] Excludes retained by-catch of Octopus and Southern Calamari.

[b] The River fishery was closed from July 2003. There are 6 River fishery licences with access to non-native species and their production is included in this table.

[c] Prior to 2007/08 catch from the Miscellaneous Fishery was included in the Marine Scalefish Fishery.

[d] Excludes retained by-catch of Octopus, Southern Calamari and Bugs (49t of Octopus, 45t of Southern Calamari and 4t of Bugs in 2020/21) from the Rock Lobster and Prawn Fisheries. Excludes catch from Charter Boat Fishery, aquaculture and south east non-trawl and deep water trawl Commonwealth Fisheries.

Source: BDO EconSearch (2022b)

Appendix Table 2-2 Commercial fisheries gross value of production, South Australia, 2001/02 to 2020/21 ($m)

Year	Abalone	GSV Prawns [a]	SGWC Prawns [a]	Sth'n Zone Rock Lobster [a]	Nth'n Zone Rock Lobster [a]	Blue Crabs	Lakes and Coorong [b]	Sardines	Marine Scalefish	Misc [c]	Charter Boat	Total SA Fisheries [d]
2001/02	54	9	62	98	41	5	7	13	30	-	-	319
2002/03	54	6	41	96	28	5	7	27	31	-	-	296
2003/04	46	5	58	72	18	5	8	33	33	-	-	277
2004/05	46	5	45	77	17	5	8	41	30	-	-	274
2005/06	46	4	46	90	21	7	8	22	24	-	6	275
2006/07	42	4	53	106	24	7	10	25	26	-	6	305
2007/08	40	4	41	98	21	7	10	21	26	1	5	274
2008/09	41	4	38	108	25	7	11	22	27	1	5	290
2009/10	35	3	34	87	19	5	8	28	28	1	6	254
2010/11	33	3	36	80	17	6	8	23	26	1	5	238
2011/12	34	2	29	93	20	6	9	24	27	1	6	252
2012/13	34	0	32	82	18	6	11	24	28	1	6	241
2013/14	25	0	31	99	22	7	11	21	24	1	5	246
2014/15	28	5	32	112	25	7	9	24	26	1	4	272
2015/16	24	4	42	124	27	8	9	28	24	2	4	297
2016/17	30	5	42	108	22	9	10	26	25	2	4	281
2017/18	29	5	46	103	26	9	12	28	24	2	4	287
2018/19	30	4	43	115	26	9	14	27	21	2	3	295
2019/20	22	2	23	106	19	9	13	27	20	2	2	247
2020/21	18	2	36	71	12	8	14	24	19	1	3	209

[a] Excludes retained by-catch of Octopus and Southern Calamari.

[b] The River fishery was closed from July 2003. There are 6 River fishery licences with access to non-native species and their production is included in this table.

[c] Prior to 2007/08 catch from the Miscellaneous Fishery was included in the Marine Scalefish Fishery.

[d] Excludes retained by-catch of Octopus, Southern Calamari and Bugs ($433,000 of Octopus, $791,000 of Southern Calamari and $66,000 of Bugs in 2020/21) from the Rock Lobster and Prawn Fisheries. Excludes catch of aquaculture and south east non-trawl, tuna, deep water trawl Commonwealth Fisheries. All values are expressed in real 2020/21 dollars.

Source: BDO EconSearch (2022b)

Appendix Table 2-3 Cost of management in South Australian commercial fisheries, 2020/21

	Licence Fees	GVP	Fees/ GVP	Catch [a]	Fees/ Catch	Licence Holders	Fees/ Licence
	($'000)	($'000)	(%)	(t)	($/kg)	(no.)	($/licence)
Abalone	2,431	18,337	13.3%	493	$4.93	34	$71,505
Charter Boats [b]	180	2,907	6.2%	12,077	$14.87	82	$2,191
GSV Prawns	410	2,093	19.6%	110	$3.73	10	$40,991
SG Prawns [c]	1,055	35,653	3.0%	1,837	$0.57	39	$27,049
Sth'n Zone Rock Lobster	3,444	71,299	4.8%	1,275	$2.70	180	$19,131
Nth'n Zone Rock Lobster	1,601	11,643	13.8%	251	$6.38	63	$25,414
Blue Crabs	320	8,410	3.8%	592	$0.54	9	$35,565
Lakes and Coorong	704	13,721	5.1%	1,926	$0.37	36	$19,562
Marine Scalefish [d]	1,973	19,103	10.3%	1,689	$1.17	305	$6,469
Miscellaneous	119	1,484	8.0%	18	$6.60	15	$7,916
Sardines	893	23,955	3.7%	38,024	$0.02	14	$63,769
Total SA	**13,129**	**208,604**	**6.3%**	**46,215**	**$0.28**	**787**	**$16,683**

[a] Total catch for the Charter Boat Fishery is the total number of clients rather than total volume of catch and has therefore been excluded from the total catch for all SA commercial fisheries.

[b] Management costs for the Charter Boat Fishery are reported per client rather than per kg of catch.

[c] Excludes West Coast Prawn Fishery.

[d] 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: BDO EconSearch (2022b)

Appendix Table 2-4 Financial performance in South Australian commercial fisheries, 2020/21, (average per boat) [a]

		Abalone	Charter Boats	GSV Prawns	SG Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs [a]	Marine Scalefish	Sardine	Lakes and Coorong
(1)	**Total Boat Gross Income**	**585,788**	**95,682**	**418,600**	**858,836**	**440,222**	**250,721**	**8,409,508**	**122,224**	**1,726,433**	**517,480**
	Variable Costs										
	Fuel	15,214	16,015	60,732	80,931	24,940	24,264	530,977	13,025	108,435	16,878
	Repairs &	24,130	17,007	41,471	97,439	35,796	17,104	438,956	8,151	130,409	12,430
	Bait/Ice	527	3,525	0	5,001	14,584	13,170	134,934	2,411	1,591	1,542
	Provisions	3,806	854	2,477	4,605	1,067	6,159	29,862	980	1,385	610
	Labour - paid	185,740	6,185	212,626	361,846	158,999	113,626	2,462,702	12,639	432,268	66,979
(2)	Labour - unpaid	1,342	13,126	9,867	2,001	7,280	15,902	9,604	18,510	2,801	14,746
	Other	3,593	2,967	37,985	367	1,312	3,581	1,781	1,568	427	1,123
(3)	**Total Variable Costs**	**234,353**	**59,679**	**365,158**	**552,190**	**243,978**	**193,805**	**3,608,815**	**57,283**	**677,316**	**114,309**
	Fixed Costs										
	Licence Fee	72,620	4,185	81,983	27,634	23,122	26,786	343,300	5,769	68,666	16,136
	Insurance	8,283	4,179	9,796	20,831	8,734	7,461	198,233	3,036	39,123	5,302
(4)	Interest	18,080	1,141	4,154	38,018	12,378	3,411	388,980	4,239	86,292	4,012
(5)	Labour - unpaid	13,418	17,493	23,796	3,419	10,693	3,971	127,993	5,041	24,916	9,522
(6)	Leasing	0	0	0	5,365	4,452	42,432	320,184	0	0	7,111
	Legal & Accounting	9,191	2,030	6,579	4,872	6,764	4,206	26,823	2,292	5,872	4,537
	Telephone etc.	2,451	1,296	1,805	2,995	2,518	1,032	5,696	1,266	1,098	1,911
	Slipping & Mooring	1,271	2,193	20,061	21,804	6,383	5,825	70,083	1,629	7,704	276
	Travel	5,482	659	0	570	1,363	1,598	3,561	594	883	927
	Office & Admin	6,229	7,027	3,869	30,556	6,869	11,429	144,778	7,369	17,988	8,919
(7)	**Total Fixed Costs**	**137,025**	**40,203**	**152,042**	**156,062**	**83,275**	**108,151**	**1,629,632**	**31,234**	**252,542**	**58,654**
(8)	**Total Boat Cash Costs (3 + 7)**	**371,377**	**99,882**	**517,201**	**708,252**	**327,254**	**301,957**	**5,238,447**	**88,517**	**929,858**	**172,962**
	Boat Gross Margin (1 - 3)	**351,435**	**36,003**	**53,442**	**306,646**	**196,243**	**56,916**	**4,800,692**	**64,941**	**1,049,117**	**403,171**
(9)	**Total Unpaid Labour (2 + 5)**	**14,760**	**30,618**	**33,662**	**5,420**	**17,973**	**19,872**	**137,597**	**23,550**	**27,717**	**24,268**
	Gross Operating Surplus (1- 8+ 9)	**229,170**	**26,418**	**-64,938**	**156,004**	**130,942**	**-31,363**	**3,308,657**	**57,258**	**824,292**	**368,786**
(10)	**Boat Cash Income (1 - 8)**	**214,411**	**-4,200**	**-98,601**	**150,584**	**112,968**	**-51,235**	**3,171,061**	**33,707**	**796,575**	**344,518**
(11)	**Depreciation**	**53,300**	**22,687**	**73,852**	**110,310**	**41,973**	**47,587**	**740,508**	**19,848**	**328,118**	**54,278**
(12)	**Boat Business Profit (10 - 11)**	**161,111**	**-26,887**	**-172,453**	**40,274**	**70,995**	**-98,823**	**2,430,552**	**13,859**	**468,457**	**290,239**
(13)	**Profit at Full Equity (12 + 4 + 6)**	**179,191**	**-25,746**	**-168,299**	**83,656**	**87,825**	**-52,980**	**3,139,717**	**18,097**	**554,748**	**301,363**
	Boat Capital										
(14)	Fishing Gear &	**369,703**	**273,514**	**1,136,412**	**1,435,546**	**512,056**	**514,497**	**8,036,811**	**150,058**	**3,132,734**	**432,446**
	Licence Value	**6,326,294**	**7,750**	**2,000,000**	**4,198,095**	**5,257,050**	**2,296,864**	**47,285,237**	**226,097**	**6,076,511**	**1,469,734**
(15)	**Total Boat Capital**	**6,695,997**	**281,264**	**3,136,412**	**5,633,641**	**5,769,107**	**2,811,360**	**55,322,048**	**376,155**	**9,209,245**	**1,902,180**
	Rate of Return on Fishing Gear & Equip (13 / 14 * 100)	**48.5%**	**-9.4%**	**-14.8%**	**6%**	**17%**	**-10.3%**	**39.1%**	**12.1%**	**17.7%**	**69.7%**
	Rate of Return on Total Boat Capital (13 / 15 * 100)	**2.7%**	**-9.2%**	**-5.4%**	**1.5%**	**1.5%**	**-1.9%**	**5.7%**	**4.8%**	**6.0%**	**15.8%**

[a] Excludes aquaculture and Commonwealth fisheries including; the Southern Eastern Scalefish and Shark fishery, Southern Bluefin Tuna fishery, Great Australian Bight fishery, Western Skipjack fishery, the Western Tuna and Billfish fishery

[b] Estimates of financial performance for the blue crab fishery have been presented on a whole of fishery basis.

Source: BDO EconSearch (2022b)

Appendix Table 2-5 Costs as a percentage of total cash costs in South Australian commercial fisheries, 2020/21 [a]

	Abalone	Charter Boats	Gulf St Vincent Prawns	Spencer Gulf Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish	Sardines	Lakes and Coorong
Variable Costs										
Fuel	4%	16%	12%	11%	8%	8%	10%	15%	12%	10%
R&M	6%	17%	8%	14%	11%	6%	8%	9%	14%	7%
Bait/Ice	0%	4%	0%	1%	4%	4%	3%	3%	0%	1%
Provisions	1%	1%	0%	1%	0%	2%	1%	1%	0%	0%
Labour - paid	50%	6%	41%	51%	49%	38%	47%	14%	46%	39%
Labour - unpaid	0%	13%	2%	0%	2%	5%	0%	21%	0%	9%
Other	1%	3%	7%	0%	0%	1%	0%	2%	0%	1%
Fixed Costs										
Licence Fee	20%	4%	16%	4%	7%	9%	7%	7%	7%	9%
Insurance	2%	4%	2%	3%	3%	2%	4%	3%	4%	3%
Interest	5%	1%	1%	5%	4%	1%	7%	5%	9%	2%
Labour - unpaid	4%	18%	5%	0%	3%	1%	2%	6%	3%	6%
Leasing	0%	2%	0%	1%	1%	14%	6%	0%	0%	4%
Legal & Accounting	2%	1%	1%	1%	2%	1%	1%	3%	1%	3%
Telephone etc.	1%	2%	0%	0%	1%	0%	0%	1%	0%	1%
Slipping & Mooring	0%	1%	4%	3%	2%	2%	1%	2%	1%	0%
Travel	1%	7%	0%	0%	0%	1%	0%	1%	0%	1%
Office & Admin	2%	40%	1%	4%	2%	4%	3%	8%	2%	5%
Total Variable Costs	**63%**	**60%**	**71%**	**78%**	**75%**	**64%**	**69%**	**65%**	**73%**	**66%**
Total Fixed Costs	**37%**	**40%**	**29%**	**22%**	**25%**	**36%**	**31%**	**35%**	**27%**	**34%**
Total Cash Costs	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

[a] Excludes aquaculture and Commonwealth fisheries including; the Southern Eastern Scalefish and Shark fishery, Southern Bluefin Tuna fishery, Great Australian Bight fishery, Western Skipjack fishery, the Western Tuna and Billfish fishery.

Source: Derived from BDO EconSearch (2022b)

Appendix Table 2-6 Economic contributions of South Australian commercial fisheries, 2020/21 [a,b]

	Abalone	Charter Boats	Gulf St Vincent Prawn	SG Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish	Sardines	Lakes and Coorong	All Fisheries
Output ($m)											
Direct											
Fishing	18.3	2.9	2.1	35.7	71.7	11.7	8.4	19.1	24.0	13.7	207.6
Downstream	15.2	5.7	2.2	35.9	29.8	6.1	7.5	8.7	2.2	6.6	119.9
All other sectors	56.9	14.4	7.3	91.4	125.3	29.5	18.4	57.3	22.1	19.5	442.3
Total	**90.5**	**23.0**	**11.6**	**163.0**	**226.8**	**47.3**	**34.4**	**85.1**	**48.3**	**39.8**	**769.8**
Total/Direct	2.7	2.7	2.7	2.3	2.2	2.7	2.2	3.1	1.8	2.0	2.4
Total/Tonne ($)	$183,500	$1,900	$105,600	$88,700	$172,300	$182,500	$58,000	$50,300	$1,200	$24,900	$16,000
Contribution to GSP ($m)											
Direct											
Fishing	13.9	1.2	0.9	24.3	51.1	3.8	6.5	7.9	18.7	11.3	139.6
Downstream	13.8	2.8	1.3	20.6	14.8	3.0	3.8	4.2	1.1	3.2	68.6
All other sectors	18.1	8.1	4.1	50.9	71.5	16.8	10.4	32.8	12.5	11.1	236.4
Total	**45.9**	**12.1**	**6.3**	**95.9**	**137.4**	**23.7**	**20.8**	**44.8**	**32.3**	**25.5**	**444.6**
Total/Direct	1.7	3.1	2.9	2.1	2.1	3.5	2.0	3.7	1.6	11.1	2.1
Total/Tonne ($)	$93,000	$1,000	$56,900	$52,100	$104,400	$91,300	$35,000	$26,500	$800	$26	$9,200
Employment (fte jobs)											
Direct											
Fishing	51	32	18	116	327	89	29	211	82	109	1,064
Downstream	125	29	19	305	194	39	58	55	13	40	876
All other sectors	148	68	33	413	584	139	82	274	104	88	1,934
Total	**323**	**128**	**70**	**834**	**1,105**	**268**	**169**	**540**	**199**	**238**	**3,874**
Total/Direct	1.8	2.1	1.9	2.0	2.1	2.1	2.0	2.0	2.1	1.6	2.0
Total/Tonne	0.7	0.0	0.6	0.5	0.8	1.0	0.3	0.3	0.0	0.1	0.1
Household Income ($m)											
Direct											
Fishing	6.8	0.6	1.2	14.3	28.0	6.2	2.6	8.7	6.4	3.3	78.2
Downstream	6.6	1.6	0.9	15.1	11.0	2.2	2.7	3.0	0.8	2.3	46.1
All other sectors	10.4	4.9	2.4	28.5	41.2	9.8	5.9	19.8	7.2	6.5	136.4
Total	**23.8**	**7.1**	**4.5**	**57.9**	**80.1**	**18.3**	**11.2**	**31.5**	**14.3**	**12.0**	**260.7**
Total/Direct	1.8	3.2	2.1	2.0	2.1	2.2	2.1	2.7	2.0	2.2	2.1
Total/Tonne ($)	$48,200	$500	$41,100	$31,500	$60,800	$70,400	$18,800	$18,600	$300	$7,500	$5,400

[a] Excludes aquaculture and Commonwealth fisheries including; the Southern Eastern Scalefish and Shark fishery, Southern Bluefin Tuna fishery, Great Australian Bight fishery, Western Skipjack fishery, the Western Tuna and Billfish fishery.

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

Source: BDO EconSearch (2022b)

Appendix Table 2-7 Net economic return (NER) in South Australian commercial fisheries, 2020/21 ($m)

	Abalone	GSV Prawns	SGWC Prawns	Sth'n Zone Rock Lob	Nth'n Zone Rock Lob	Blue Crabs	Marine Scalefish	Sardines	Lakes and Coorong	**All Fisheries**[a]
Gross Income	18.3	2.1	35.7	71.7	11.7	8.4	19.1	24.0	13.7	204.6
Less Labour	6.3	1.2	15.0	28.8	6.2	2.6	5.7	6.4	2.4	74.6
Less Materials & Services	4.8	1.3	12.1	21.7	5.7	1.9	9.0	5.3	2.1	64.0
Less Depreciation	1.7	0.4	4.5	6.8	2.2	0.7	3.1	4.6	1.4	25.4
Less Opportunity Cost of Capital (@10%)	1.2	0.6	5.8	8.3	2.4	0.8	2.3	4.3	1.1	27.0
NER	**4**	**-1**	**-2**	**6**	**-5**	**2**	**-1**	**3**	**7**	**14**
NER/GVP	24%	-64%	-5%	8%	-42%	28%	-5%	14%	49%	5%

[a] Excludes aquaculture and Commonwealth fisheries including; the Southern Eastern Scalefish and Shark fishery, Southern Bluefin Tuna fishery, Great Australian Bight fishery, Western Skipjack fishery, the Western Tuna and Billfish fishery.

Source: BDO EconSearch (2022b)

APPENDIX 3 Financial Performance, 2002/03 – 2018/19

Appendix Table 3-1 Financial performance in the SA Sardine Fishery, 2002/03 to 2004/05 (average per boat) [a]

		2002/03		2003/04		2004/05	
		Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]
(1)	**Total Boat Gross Income**	**$1,516,323**		**$1,917,966**		**$2,422,103**	
	Variable Costs						
	Fuel	$51,766	6%	$65,763	6%	$88,821	7%
	Repairs & Maintenance [c]	$101,307	12%	$130,406	13%	$171,619	13%
	Bait/Ice	$5,885	1%	$7,575	1%	$9,969	1%
	Provisions	$3,963	0%	$5,101	0%	$6,714	1%
	Labour - paid	$516,421	63%	$653,210	63%	$824,906	65%
(2)	Labour - unpaid [d]	$10,599	1%	$13,407	1%	$16,931	1%
	Other	$6,088	1%	$6,272	1%	$6,417	1%
(3)	**Total Variable Costs**	**$696,028**	**85%**	**$881,733**	**85%**	**$1,125,376**	**88%**
	Fixed Costs						
	Licence Fee	$30,893	4%	$66,972	6%	$70,600	6%
	Insurance	$14,134	2%	$14,560	1%	$14,897	1%
(4)	Interest	$9,594	1%	$9,844	1%	$10,093	1%
(5)	Labour - unpaid [d]	$6,833	1%	$6,833	1%	$6,833	1%
(6)	Leasing	$35,708	4%	$29,613	3%	$21,774	2%
	Legal & Accounting	$4,440	1%	$4,573	0%	$4,679	0%
	Telephone etc.	$2,748	0%	$2,831	0%	$2,897	0%
	Slipping & Mooring	$7,268	1%	$7,487	1%	$7,660	1%
	Travel	$4,197	1%	$4,323	0%	$4,423	0%
	Office & Admin	$4,054	0%	$4,177	0%	$4,273	0%
(7)	**Total Fixed Costs**	**$119,870**	**15%**	**$151,212**	**15%**	**$148,128**	**12%**
(8)	**Total Boat Cash Costs (3+7)**	**$815,898**	**100%**	**$1,032,946**	**100%**	**$1,273,505**	**100%**
	Boat Gross Margin (1-3)	**$820,295**		**$1,036,232**		**$1,296,726**	
(9)	**Total Unpaid Labour (2+5)**	**$17,432**		**$20,240**		**$23,764**	
	Gross Operating Surplus (1-8+9)	**$717,857**		**$905,260**		**$1,172,361**	
(10)	**Boat Cash Income (1-8)**	**$700,425**		**$885,020**		**$1,148,598**	
(11)	**Depreciation**	**$148,236**		**$152,703**		**$136,630**	
(12)	**Boat Business Profit (10-11)**	**$552,189**		**$732,317**		**$1,011,968**	
(13)	**Profit at Full Equity (12+4+6)**	**$597,491**		**$771,773**		**$1,043,834**	
	Boat Capital						
(14)	Fishing Gear & Equip	$1,408,333		$1,450,771		$1,298,068	
	Licence Value	$5,711,865		$7,224,819		$9,123,861	
(15)	**Total Boat Capital**	**$7,120,198**		**$8,675,590**		**$10,421,929**	
	Rate of Return on Fishing Gear & Equip (13/14*100)	**42.4%**		**53.2%**		**80.4%**	
	Rate of Return on Total Boat Capital (13/15*100)	**8.4%**		**8.9%**		**10.0%**	

[a] Estimates of financial performance for the years 2002/03 and 2003/04 are based on the 2001 licence holder and estimates for 2004/05 are based on the 2006 licence holder survey. All figures are presented in nominal terms.

[b-d] See Table 3-3 footnotes.

Source: EconSearch (2022a)

Appendix Table 3-2 Financial performance in the SA Sardine Fishery, 2005/06 to 2007/08 (average per boat) [a]

		2005/06		2006/07		2007/08	
		Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]
(1)	**Total Boat Gross Income**	**$1,149,494**		**$1,315,921**		**$1,160,572**	
	Variable Costs						
	Fuel	$201,916	19%	$199,489	18%	$200,662	19%
	Repairs & Maintenance [c]	$92,054	9%	$98,819	9%	$99,211	9%
	Bait/Ice	$2,302	0%	$2,299	0%	$2,308	0%
	Provisions	$8,601	1%	$8,123	1%	$8,155	1%
	Labour - paid	$463,052	44%	$527,271	47%	$465,025	44%
(2)	Labour - unpaid [d]	$3,749	0%	$3,303	0%	$2,913	0%
	Other	$31,547	3%	$33,468	3%	$34,992	3%
(3)	**Total Variable Costs**	**$803,220**	**76%**	**$872,772**	**78%**	**$813,267**	**77%**
	Fixed Costs						
	Licence Fee	$71,634	7%	$56,375	5%	$48,428	5%
	Insurance	$30,477	3%	$30,624	3%	$32,018	3%
(4)	Interest	$88,312	8%	$84,874	8%	$97,704	9%
(5)	Labour - unpaid [d]	$10,042	1%	$10,248	1%	$10,248	1%
(6)	Leasing	$20,221	2%	$23,357	2%	$21,060	2%
	Legal & Accounting	$8,259	1%	$7,828	1%	$8,185	1%
	Telephone etc.	$1,979	0%	$1,745	0%	$1,825	0%
	Slipping & Mooring	$16,895	2%	$17,013	2%	$17,788	2%
	Travel	$761	0%	$818	0%	$856	0%
	Office & Admin	$3,554	0%	$6,340	1%	$6,629	1%
(7)	**Total Fixed Costs**	**$252,135**	**24%**	**$239,223**	**22%**	**$244,739**	**23%**
(8)	**Total Boat Cash Costs (3+7)**	**$1,055,354**	**100%**	**$1,111,995**	**100%**	**$1,058,006**	**100%**
	Boat Gross Margin (1-3)	**$346,274**		**$443,149**		**$347,305**	
(9)	**Total Unpaid Labour (2+5)**	**$13,791**		**$13,551**		**$13,161**	
	Gross Operating Surplus (1-8+9)	**$107,931**		**$217,477**		**$115,727**	
(10)	**Boat Cash Income (1-8)**	**$94,139**		**$203,925**		**$102,565**	
(11)	**Depreciation**	**$194,240**		**$211,685**		**$217,477**	
(12)	**Boat Business Profit (10-11)**	**-$100,101**		**-$7,759**		**-$114,911**	
(13)	**Profit at Full Equity (12+4+6)**	**$8,433**		**$100,472**		**$3,852**	
	Boat Capital						
(14)	Fishing Gear & Equip	$2,621,394		$2,763,603		$2,839,221	
	Licence Value	$3,042,857		$3,318,705		$2,926,919	
(15)	**Total Boat Capital**	**$5,664,251**		**$6,082,308**		**$5,766,140**	
	Rate of Return on Fishing Gear & Equip (13/14*100)	**0.32%**		**3.64%**		**0.14%**	
	Rate of Return on Total Boat Capital (13/15*100)	**0.15%**		**1.65%**		**0.07%**	

[a] Estimates of financial performance for the years 2005/06 and 2006/07 are based on the 2006 licence holder survey and those estimates for 2007/08 are based on the 2009 licence holder survey. All figures are presented in nominal terms.

[b-d] See Table 3-3 footnotes.

Source: EconSearch (2022a)

Appendix Table 3-3 Financial performance in the SA Sardine Fishery, 2008/09 to 2010/11 (average per boat) [a]

		2008/09		2009/10		2010/11	
		Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]
(1)	**Total Boat Gross Income**	**$1,103,668**		**$1,449,312**		**$1,211,985**	
	Variable Costs						
	Fuel	$137,876	17%	$166,588	17%	$145,961	16%
	Repairs & Maintenance [c]	$97,835	12%	$121,071	12%	$108,104	12%
	Bait/Ice	$7,546	1%	$9,338	1%	$8,338	1%
	Provisions	$4,829	1%	$5,976	1%	$5,336	1%
	Labour - paid	$348,492	43%	$457,631	47%	$396,095	44%
(2)	Labour – unpaid [d]	$6,305	1%	$8,279	1%	$7,166	1%
	Other	$25,347	3%	$26,046	3%	$27,058	3%
(3)	**Total Variable Costs**	**$628,230**	**78%**	**$794,930**	**81%**	**$698,058**	**77%**
	Fixed Costs						
	Licence Fee	$44,788	6%	$34,030	3%	$51,423	6%
	Insurance	$32,344	4%	$33,236	3%	$34,528	4%
(4)	Interest	$58,549	7%	$67,580	7%	$69,760	8%
(5)	Labour - unpaid [d]	$13,135	2%	$13,135	1%	$13,595	2%
(6)	Leasing	$2,107	0%	$2,106	0%	$1,939	0%
	Legal & Accounting	$5,371	1%	$5,519	1%	$5,734	1%
	Telephone etc.	$1,001	0%	$1,029	0%	$1,069	0%
	Slipping & Mooring	$12,918	2%	$13,274	1%	$13,790	2%
	Travel	$63	0%	$64	0%	$67	0%
	Office & Admin	$10,346	1%	$10,631	1%	$11,044	1%
(7)	**Total Fixed Costs**	**$180,620**	**22%**	**$180,606**	**19%**	**$202,949**	**23%**
(8)	**Total Boat Cash Costs (3+7)**	**$808,850**	**100%**	**$975,536**	**100%**	**$901,007**	**100%**
	Boat Gross Margin (1-3)	**$475,438**		**$654,381**		**$513,926**	
(9)	**Total Unpaid Labour (2+5)**	**$19,440**		**$21,415**		**$20,761**	
	Gross Operating Surplus (1-8+9)	**$314,258**		**$495,190**		**$331,739**	
(10)	**Boat Cash Income (1-8)**	**$294,818**		**$473,776**		**$310,977**	
(11)	**Depreciation**	**$140,284**		**$150,626**		**$161,651**	
(12)	**Boat Business Profit (10-11)**	**$154,534**		**$323,150**		**$149,326**	
(13)	**Profit at Full Equity (12+4+6)**	**$215,190**		**$392,836**		**$221,026**	
	Boat Capital						
(14)	Fishing Gear & Equip	$2,722,706		$2,923,431		$3,137,407	
	Licence Value	$3,386,223		$4,446,709		$3,718,553	
(15)	**Total Boat Capital**	**$6,108,928**		**$7,370,140**		**$6,855,960**	
	Rate of Return on Fishing Gear & Equip (13/14*100)	**7.9%**		**13.4%**		**7.0%**	
	Rate of Return on Total Boat Capital (13/15*100)	**3.5%**		**5.3%**		**3.2%**	

[a] Estimates of financial performance for the years 2008/09 and 2009/10 are based on the 2008 licence holder survey and those estimates for 2010/11 are based on the 2012 licence holder survey. All figures are presented in nominal terms.

[b-d] See Table 3-3 footnotes.

Source: EconSearch (2022a)

Appendix Table 3-4 Financial performance in the SA Sardine Fishery, 2011/12 to 2013/14 (average per boat) [a]

		2011/12		2012/13		2013/14	
		Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]
(1)	**Total Boat Gross Income**	**$1,557,426**		**$1,583,008**		**$1,448,702**	
	Variable Costs						
	Fuel	$188,110	18%	$165,157	16%	$159,735	16%
	Repairs & Maintenance [c]	$124,962	12%	$112,333	11%	$107,531	11%
	Bait/Ice	$462	0%	$415	0%	$398	0%
	Provisions	$26,836	2%	$24,124	2%	$23,093	2%
	Labour - paid	$465,501	41%	$421,184	41%	$406,039	40%
(2)	Labour - unpaid [d]	$0	0%	$0	0%	$0	0%
	Other	$23,805	2%	$19,151	2%	$18,334	2%
(3)	**Total Variable Costs**	**$829,676**	**75%**	**$742,365**	**71%**	**$715,128**	**71%**
	Fixed Costs						
	Licence Fee	$59,340	5%	$82,886	8%	$84,926	8%
	Insurance	$32,171	3%	$33,038	3%	$33,872	3%
(4)	Interest	$90,618	8%	$81,820	8%	$83,440	8%
(5)	Labour - unpaid [d]	$0	0%	$0	0%	$0	0%
(6)	Leasing	$23,807	2%	$24,198	2%	$22,145	2%
	Legal & Accounting	$21,243	2%	$21,815	2%	$22,366	2%
	Telephone etc.	$1,900	0%	$1,951	0%	$2,000	0%
	Slipping & Mooring	$7,682	1%	$10,452	1%	$10,716	1%
	Travel	$3,120	0%	$3,205	0%	$3,285	0%
	Office & Admin	$35,925	3%	$36,738	4%	$36,018	4%
(7)	**Total Fixed Costs**	**$275,806**	**25%**	**$296,103**	**29%**	**$298,770**	**29%**
(8)	**Total Boat Cash Costs (3+7)**	**$1,105,482**	**100%**	**$1,038,468**	**100%**	**$1,013,898**	**100%**
	Boat Gross Margin (1-3)	**$742,753**		**$840,643**		**$733,574**	
(9)	**Total Unpaid Labour (2+5)**	**$0**		**$0**		**$0**	
	Gross Operating Surplus (1-8+9)	**$451,945**		**$544,541**		**$434,804**	
(10)	**Boat Cash Income (1-8)**	**$451,945**		**$544,541**		**$434,804**	
(11)	**Depreciation**	**$195,855**		**$204,444**		**$205,138**	
(12)	**Boat Business Profit (10-11)**	**$256,090**		**$340,097**		**$229,666**	
(13)	**Profit at Full Equity (12+4+6)**	**$370,515**		**$446,115**		**$335,252**	
	Boat Capital						
(14)	Fishing Gear & Equip	$2,031,533		$2,120,621		$2,127,820	
	Licence Value	$5,150,000		$5,234,593		$4,790,478	
(15)	**Total Boat Capital**	**$7,181,533**		**$7,355,214**		**$6,918,298**	
	Rate of Return on Fishing Gear & Equip (13/14*100)	**18.2%**		**21.0%**		**15.8%**	
	Rate of Return on Total Boat Capital (13/15*100)	**5.2%**		**6.1%**		**4.8%**	

[a] Estimates of financial performance for 2011/12 are based on the 2012 licence holder survey and estimates for the years 2012/13 and 2013/14 are based on the 2015 licence holder survey. All figures are presented in nominal terms.

[b-d] See Table 3-3 footnotes.

Source: EconSearch (2022a)

Appendix Table 3-5 Financial performance in the SA Sardine Fishery, 2014/15 to 2016/17 (average per boat) [a]

		2014/15		2015/16		2016/17	
		Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]
(1)	**Total Boat Gross Income**	**$1,474,219**		**$1,766,375**		**$1,626,675**	
	Variable Costs						
	Fuel	$137,362	11%	$136,260	11%	$136,308	11%
	Repairs & Maintenance [c]	$114,602	9%	$116,115	9%	$117,758	10%
	Bait/Ice	$1,110	0%	$1,125	0%	$1,141	0%
	Provisions	$11,026	1%	$11,172	1%	$11,330	1%
	Labour - paid	$465,797	38%	$479,391	38%	$489,101	39%
(2)	Labour - unpaid [d]	$465	0%	$478	0%	$488	0%
	Other	$12,343	1%	$12,506	1%	$12,683	1%
(3)	**Total Variable Costs**	**$742,704**	**61%**	**$757,047**	**61%**	**$768,809**	**62%**
	Fixed Costs						
	Licence Fee	$49,896	4%	$76,272	6%	$53,148	4%
	Insurance	$27,415	2%	$27,595	2%	$28,031	2%
(4)	Interest	$325,153	27%	$321,458	26%	$319,611	26%
(5)	Labour - unpaid [d]	$2,816	0%	$2,879	0%	$2,942	0%
(6)	Leasing	$0	0%	$0	0%	$0	0%
	Legal & Accounting	$2,771	0%	$2,789	0%	$2,833	0%
	Telephone etc.	$1,800	0%	$1,812	0%	$1,840	0%
	Slipping & Mooring	$21,023	2%	$21,161	2%	$21,496	2%
	Travel	$2,925	0%	$2,944	0%	$2,991	0%
	Office & Admin	$36,102	3%	$36,338	3%	$36,913	3%
(7)	**Total Fixed Costs**	**$469,901**	**39%**	**$493,248**	**39%**	**$469,805**	**38%**
(8)	**Total Boat Cash Costs (3+7)**	**$1,212,605**	**100%**	**$1,250,295**	**100%**	**$1,238,614**	**100%**
	Boat Gross Margin (1-3)	**$731,514**		**$1,009,328**		**$857,866**	
(9)	**Total Unpaid Labour (2+5)**	**$3,281**		**$3,357**		**$3,430**	
	Gross Operating Surplus (1-8+9)	**$264,894**		**$519,437**		**$391,491**	
(10)	**Boat Cash Income (1-8)**	**$261,613**		**$516,080**		**$388,061**	
(11)	**Depreciation**	**$199,858**		**$192,558**		**$188,032**	
(12)	**Boat Business Profit (10-11)**	**$61,755**		**$323,521**		**$200,029**	
(13)	**Profit at Full Equity (12+4+6)**	**$386,908**		**$644,980**		**$519,640**	
	Boat Capital						
(14)	Fishing Gear & Equip	$1,488,600		$1,434,229		$1,400,513	
	Licence Value	$3,953,520		$4,737,016		$4,362,372	
(15)	**Total Boat Capital**	**$5,442,120**		**$6,171,245**		**$5,762,886**	
	Rate of Return on Fishing Gear & Equip (13/14*100)	**26.0%**		**45.0%**		**37.1%**	
	Rate of Return on Total Boat Capital (13/15*100)	**7.1%**		**10.5%**		**9.0%**	

[a] Estimates of financial performance for the years 2014/15 and 2015/16 are based on the 2015 licence holders survey and estimates for 2016/17 are based on the 2018 licence holder survey. All figures are presented in nominal terms.

[b-d] See Table 3-3 footnotes.

Source: EconSearch (2022a)

Appendix Table 3-6 Financial performance in the SA Sardine Fishery, 2017/18 and 2018/19 (average per boat) [a]

		2017/18		2018/19	
		Average per licence	Share of TBCC [b]	Average per licence	Share of TBCC [b]
(1)	**Total Boat Gross Income**	**$2,145,792**		**$2,147,254**	
	Variable Costs				
	Fuel	$197,881	16%	$198,937	16%
	Repairs & Maintenance [c]	$134,183	11%	$133,494	11%
	Bait/Ice	$1,250	0%	$1,244	0%
	Provisions	$6,132	1%	$6,100	0%
	Labour - paid	$591,465	49%	$592,796	48%
(2)	Labour - unpaid [d]	$774	0%	$776	0%
	Other	$4,166	0%	$4,144	0%
(3)	**Total Variable Costs**	**$935,851**	**78%**	**$937,492**	**76%**
	Fixed Costs				
	Licence Fee	$87,450	7%	$105,092	9%
	Insurance	$33,253	3%	$33,727	3%
(4)	Interest	$75,833	6%	$74,957	6%
(5)	Labour - unpaid [d]	$469	0%	$480	0%
(6)	Leasing	$0	0%		
	Legal & Accounting	$7,250	1%	$7,353	1%
	Telephone etc.	$3,305	0%	$3,353	0%
	Slipping & Mooring	$14,028	1%	$14,228	1%
	Travel	$645	0%	$654	0%
	Office & Admin	$48,444	4%	$49,135	4%
(7)	**Total Fixed Costs**	**$270,677**	**22%**	**$288,979**	**24%**
(8)	**Total Boat Cash Costs (3+7)**	**$1,206,528**	**100%**	**$1,226,471**	**100%**
	Boat Gross Margin (1-3)	**$1,209,940**		**$1,209,762**	
(9)	**Total Unpaid Labour (2+5)**	**$1,244**		**$1,256**	
	Gross Operating Surplus (1-8+9)	**$940,508**		**$922,039**	
(10)	**Boat Cash Income (1-8)**	**$939,264**		**$920,783**	
(11)	**Depreciation**	**$292,884**		**$291,264**	
(12)	**Boat Business Profit (10-11)**	**$646,380**		**$629,519**	
(13)	**Profit at Full Equity (12+4+6)**	**$722,214**		**$704,476**	
	Boat Capital				
(14)	Fishing Gear & Equip	$3,169,230		$3,151,707	
	Licence Value	$5,720,424		$5,724,323	
(15)	**Total Boat Capital**	**$8,889,653**		**$8,876,029**	
	Rate of Return on Fishing Gear & Equip (13/14*100)	**22.8%**		**22.4%**	
	Rate of Return on Total Boat Capital (13/15*100)	**8.1%**		**7.9%**	

[a] Estimates of financial performance for the years 2017/18 and 2018/19 are based on the 2018 licence holders survey. All figures are presented in nominal terms.

[b-d] See Table 3-3 footnotes.

Source: EconSearch (2022a)

APPENDIX 4 Nominal Licence Fees and Net Economic Return

Appendix Table 4-1 Costs of management in the SA Sardine Fishery, 2002/03 to 2022/23 [a]

	Licence Fee	Gross Value of Production	Fee/GVP	Catch	Fee/Catch	Licences	Fee/Licence
	($'000)	($'000)	(%)	(tonnes)	($/kg)	(No.)	($/licence)
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	23,041	2.8%	36,573	$0.02	14	$46,860
2010/11	991	19,268	5.1%	33,220	$0.03	14	$70,810
2011/12	608	20,699	2.9%	36,962	$0.02	14	$43,445
2012/13	850	21,039	4.0%	35,065	$0.02	14	$60,684
2013/14	870	19,254	4.5%	33,197	$0.03	14	$62,177
2014/15	1,063	21,612	4.9%	36,020	$0.03	14	$75,919
2015/16	1,063	25,895	4.1%	41,103	$0.03	14	$75,919
2016/17	741	23,847	3.1%	39,745	$0.02	14	$52,903
2017/18	1,018	26,409	3.9%	43,293	$0.02	14	$72,697
2018/19	1,223	26,427	4.6%	40,041	$0.03	14	$87,363
2019/20	989	26,726	3.7%	39,889	$0.02	14	$70,620
2020/21	893	23,955	3.7%	38,024	$0.02	14	$63,769
2021/22	1,003	29,100	3.4%	46,935	$0.02	14	$71,618
2022/23[b]	1,277	n.a.	-	n.a.	-	14	$91,199

[a] Values are in nominal terms.

[b] Reported 2022/23 values include the cost of an additional DEPM survey ($517,874) that was paid out of pocket directly by licence holders to the South Australian Sardine Industry Association who paid PIRSA directly. This cost was not recorded by PIRSA as a licence fee due to the timing of the cost and the invoicing method.

Source: PIRSA Fisheries and SARDI Aquatic Sciences

Appendix Table 4-2 Net economic return in the SA Sardine Fishery, 2002/03 to 2021/22 [a]

	Gross Income	Less Labour	Less Cash Costs	Less Depreciation	Less Opportunity Cost of Capital (@10%)	Net Economic Return
2002/03	22,025	7,754	3,439	2,153	2,046	**6,633**
2003/04	22,549	7,939	3,763	1,795	1,706	**7,347**
2004/05	28,476	10,026	4,620	1,606	1,526	**10,698**
2005/06	16,031	6,650	6,554	2,709	3,656	**-3,538**
2006/07	18,517	7,610	6,514	2,979	3,889	**-2,475**
2007/08	16,331	6,729	6,488	3,060	3,995	**-3,941**
2008/09	17,546	5,849	6,045	2,230	4,329	**-907**
2009/10	23,041	7,616	6,785	2,395	4,648	**1,598**
2010/11	19,268	6,627	6,072	2,570	4,988	**-988**
2011/12	20,699	6,187	6,985	2,603	2,700	**2,224**
2012/13	21,039	5,598	6,795	2,717	2,818	**3,111**
2013/14	19,254	5,396	6,675	2,726	2,828	**1,628**
2014/15	21,612	6,877	6,133	2,930	2,182	**3,490**
2015/16	25,895	7,077	6,540	2,823	2,103	**7,353**
2016/17	23,847	7,353	6,252	2,757	2,053	**5,432**
2017/18	26,409	7,295	6,621	3,605	3,900	**4,988**
2018/19	26,427	7,311	6,861	3,585	3,879	**4,791**
2019/20	26,726	8,112	6,943	3,548	3,839	**4,284**
2020/21	23,955	6,382	5,322	4,553	4,347	**3,351**
2021/22	29,100	7,089	6,161	4,743	4,528	**6,578**

[a] Adjusted for sample bias. Values are in nominal terms.

Source: BDO EconSearch analysis

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