



## **ECONOMIC AND SOCIAL INDICATORS FOR THE NSW SEA URCHIN AND TURBAN SHELL FISHERY IN 2019/20**

A Report for the Department of  
Primary Industries

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Prepared by

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## ABBREVIATIONS

ABARES	Australian Bureau of Agriculture and Resource Economics and Science
DPI	the Department of Primary Industries
fte	full-time equivalent
GOS	Gross Operating Surplus
GVP	Gross Value of Production
GSP	Gross State Product
GRP	Gross Regional Product
NSW	New South Wales
PWI	Personal Wellbeing Index

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## GLOSSARY

**Active Business:** refers to a fisher operating a fishing business which fished at least one day during the relevant period.

**Beach Price:** refers to the unimproved price received by commercial fishers when landing their catch at the beach, wharf or port (also referred to as wharf price and comparable to farm gate price), and is generally expressed in terms of \$/kg or \$/unit. Processing margins are not included in the beach price as processing operations are assumed to occur further along the value chain. The use of beach prices also removes the effect of transfer pricing by the firm if it is vertically integrated into the value chain.

**Boat Business Profit:** is defined as *Gross Operating Surplus 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 Gross Operating Surplus, which represents the cash in-cash out situation only.

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

**Boat Gross Margin:** is defined as *Gross 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:** 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. Approximated by licence fees in this report.

**Days Fished:** refers to the number of days fished by a fishing business throughout the relevant period.

**Depreciation:** Depreciation refers to the annual reduction in the value of working capital due to general wear and tear or the reduction in value of an item over time. Note this is a measure of economic depreciation not accounting depreciation<sup>1</sup>.

**Employment:** is a measure of the number of working proprietors, managers, directors and other employees, in terms of the number (total jobs) or full-time equivalent (fte) jobs. One fte is considered to be 37.5 hours for 42 week per year.

**Equity:** Commercial fishing businesses in New South Wales utilise valuable fishery shares, vessels or vehicles and other working capital. They may hold cash and may also hold debt to finance the business and other liabilities. The total assets held by a business less its total liabilities is the business' equity, which can be expressed in dollar terms or as a percentage of total asset value.

**Fishing Business:** for the purpose of this report is an economic entity rather than a legal entity and is defined by Fishing Business ID or Authorised Fisher ID.

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

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<sup>1</sup> Accounting depreciation allocates the cost of an asset over its useful life.

**Gross Regional Product (GRP) and Gross State Product (GSP):** 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).

**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 beach price.

**Household Income (economic contribution):** 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.

**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 includes 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 wages rate. In the above calculations this labour cost can be included simply as another cost so that *Gross Operating Surplus* takes account of this cost. Alternatively, it can be deducted from GOS to give a separate indicator called *Boat Cash Income* in this report. 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 *leasing of building, equipment & quota transfer* payments less *depreciation* associated with leased capital. Profit at Full Equity represents the profitability of an individual fishing business, assuming the business has full equity in the operation, i.e. there is no outstanding debt associated with the investment in working capital so equity is 100%. Profit at Full Equity is a useful absolute measure of the economic performance of fishing firms.

**Rate of Return on Capital:** is calculated as *Profit at Full Equity* divided by *Working Capital* multiplied by 100. In this calculation, the value of leased equipment or transferred quota is capitalised and added to *Working Capital* to represent a ‘full equity’ scenario. This measure is expressed in percentage terms and is calculated for an individual fishing business. 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 fishing businesses, 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
- administrative and industry fees
- office & business administration (communication, stationery, accountancy fees)
- interest on loan repayments and overdraft
- leasing.

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

**Total Variable Cost:** 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
- bait
- ice
- provisions
- crew payments
- unscheduled repairs & maintenance.

**Working Capital:** includes capital items that are required by the fishing business to earn the gross income<sup>2</sup>. 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 are included to the extent that they are used in the fishing business.

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<sup>2</sup> Working capital should not be confused with financial capital which is money provided by lenders for a price (interest).

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## SUMMARY

This report presents economic and social indicators for the Sea Urchin & Turban Shell fishery for 2019/20. BDO EconSearch was contracted by the Department of Primary Industries (DPI) to develop an independent economic and social indicator monitoring program to inform stakeholders with published financial, economic and social information about commercial fisheries in New South Wales (NSW). The objective is to inform discussions and decisions about fisheries management and to develop an understanding of the values supported by the industry. This report is complemented by a more detailed report ‘Economic and Social Indicators for NSW Commercial Fisheries for 2019/20’ (BDO 2021) that describes the monitoring program in detail and presents results for all NSW commercial fisheries.

A summary of key indicators is provided in Table S-1. In 2019/20, the Sea Urchin & Turban Shell fishery produced \$0.5m in gross value of production (at beach price) from a catch of 126t. The fishery generated -\$0.5m in net economic return. Including flow-on contributions to the broader economy, the fishery supported \$1.6m of gross state product and 18 fte jobs in NSW.

**Table S-1 Summary of key economic indicators for 2019/20**

Indicator	
Catch (t)	126t
Gross Value of Production (beach price) (\$m)	\$0.5m
Active Businesses	18 businesses
Fisheries fees/Gross Value of Production	5.1%
Rate of Return on Total Boat Capital	-10.1%
Active Endorsement Value per Active Business <sup>a</sup>	\$58,889
Gross State Product (direct + flow-on) (\$m)	\$1.6m
Employment (direct + flow-on)	18 fte jobs
Net Economic Return (\$m)	-\$0.5m
Net Economic Return/Gross Value of Production	-96.3%

<sup>a</sup> Active Endorsement Value refers to the value of endorsements held by active fishers.

Source: BDO EconSearch analysis

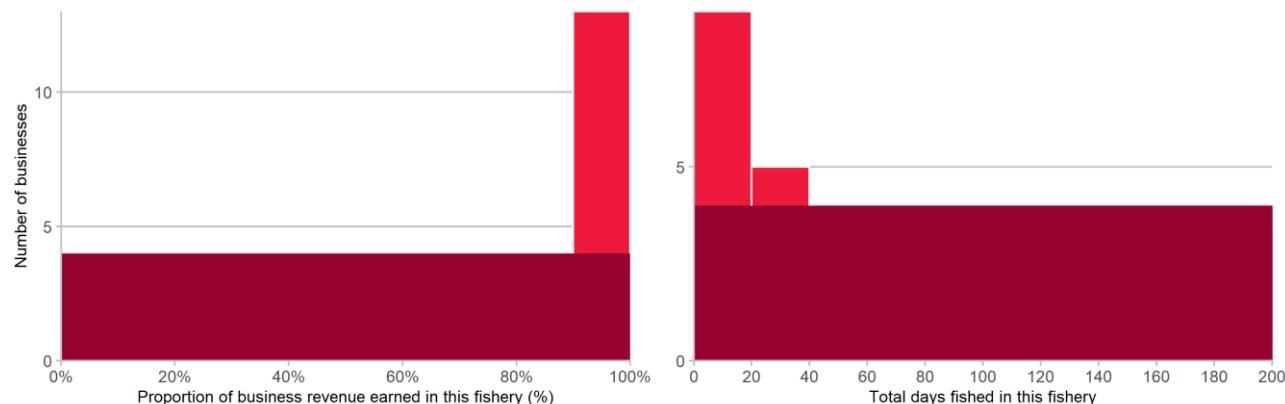
## 1. INTRODUCTION

This report presents economic and social indicators for the Sea Urchin & Turban Shell fishery for 2019/20. BDO EconSearch was contracted by the Department of Primary Industries (DPI) to develop an independent economic and social indicator monitoring program to inform stakeholders with published financial, economic and social information about commercial fisheries in New South Wales (NSW). The objective is to inform discussions and decisions about fisheries management and to develop an understanding of the values supported by the industry. This report is complemented by a more detailed report ‘Economic and Social Indicators for NSW Commercial Fisheries for 2019/20’ (BDO 2021) that describes the monitoring program in detail and presents results for all NSW commercial fisheries.

The Sea Urchin and Turban Shell fishery is a small restricted fishery within New South Wales. Generally, sea urchin and turban shells are hand gathered by divers. Fishing occurs throughout the year depending on target species and for sea urchins specifically when the roe is well developed. The red sea urchin has size limits and has catch capped by a total allowable commercial catch yearly limit. There are also catch limits depending on which of the 5 regions a fisher is operating in.

The variation in businesses in the Sea Urchin & Turban Shell fishery in terms of proportion of revenue earned within the Sea Urchin & Turban Shell fishery and total days fished is presented in Figure 1-1. Each visible bar represents at least 5 businesses for confidentiality reasons. The burgundy band along the horizontal axis covers the area between 0 and 4 businesses to ensure confidentiality. The limits of the horizontal axis are set to show non-confidential data only which means there may be businesses with greater days fished than the maximum axis values.

**Figure 1-1 Revenue share and days fished of businesses in the Sea Urchin & Turban Shell fishery in 2019/20**



Source: 2021 business survey

### Data

The indicators are based on a confidential survey of fishing businesses undertaken in 2021 and administrative data provided by Department of Primary Industries (DPI). Survey data are confidential and BDO will not provide individual data to DPI in any form that is not also appropriate to be published publicly, such as by aggregating responses into groups of at least 5 for any statistic (see BDO 2021 for details). All results in this report are calculated from a representative model of the fishery developed from survey data. At a high level, the data collected include:

- Survey data:
  - Itemised costs of fishing, business administration and associated processing
  - Species prices and market destinations

- Share values
  - Quota values
  - Working capital values (e.g. vessel, vehicles, buildings and equipment)
  - Perceptions of management, lifestyle and wellbeing.
- Department of Primary Industries data:
    - Fisher level fishing activity such as catch by species and effort, including spatial and temporal dimensions
    - Share ownership and trading
    - Licence fees
    - Disposal details
    - Species prices provided by Sydney Fish Market (as a contingency for gaps in survey based prices only).

### **Method**

Indicators were produced through a number of techniques including:

- Business level statistical matching and imputation
- Regional economic contribution analysis (using an input-output model approach)
- Established financial reporting techniques
- Data visualisation.

A description of the methods used to produce these indicators is presented in ‘Economic and Social Indicators for NSW Commercial Fisheries for 2019/20’ (BDO 2021).

### **Indicators**

This report presents indicators in the following categories:

- Economic indicators
  - Business financial indicators
  - Economic contribution indicators
  - Fishery economic indicators
- Social indicators
  - Perceptions of management
  - Lifestyle and satisfaction
  - Personal wellbeing
  - Community contribution.

### **Regions**

Indicators for the Sea Urchin & Turban Shell fishery are reported at the state level only due to the small number of active fishers.

## 2. SURVEY

The survey captured responses from 38.9% of fishing businesses that were active in 2019/20 (Table 2-1). A business is considered active if it fished at least one day during 2019/20.

Table 2-1 Survey sample from 2021 in the Sea Urchin & Turban Shell fishery

Fishing Region	Active Businesses	Sample Size	%
<b>Whole Fishery</b>	<b>18</b>	<b>7</b>	<b>38.9%</b>

Source: BDO EconSearch analysis

### 3. CATCH, VALUE, PRICES AND MARKETS

Catch, price, value and market destinations are shown in Table 3-1 for the species where the survey provided at least 5 observations (to maintain confidentiality), these prices were used to calculate indicators. The price shown for other species is not a specific price but an average price of all the species included within the other species grouping. The Sea Urchin & Turban Shell fishery produced 126t of catch and \$0.5m in GVP (at beach price). Market destinations by catch include NSW (100.0%). The proportion of catch exported overseas is likely to be lower due to the impact of COVID-19 and associated border restrictions and closures.

Table 3-1 Catch, GVP and markets for Sea Urchin & Turban Shell fishery in 2019/20

Species	Catch	Price	Unit	GVP (\$m)	NSW	Market Destination (%)		
						Interstate	Direct overseas	Total overseas <sup>a</sup>
Other species	126,444	\$4.01	Kg	0.5	100.0%	0.0%	0.0%	0.0%
<b>Fishery Total</b>	<b>126,444</b>	<b>\$4.01</b>	<b>Kg</b>	<b>0.5</b>	<b>100.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

<sup>a</sup> This estimate is made by fishing businesses. It is their understanding of total exports by all businesses (e.g. themselves and seafood processors).

Source: BDO EconSearch analysis

## 4. FINANCIAL INDICATORS

This section presents a series of tables that describe the average financial performance of businesses in the Sea Urchin & Turban Shell fishery in 2019/20. The average business refers to the average activity within the Sea Urchin & Turban Shell fishery of businesses that access the fishery, which means that a ‘business’ as represented in the financial indicators table may actually be just the proportion of the business attributable to the Sea Urchin & Turban Shell fishery. For example, a business that is active in both the Sea Urchin & Turban Shell fishery and another fishery will have their business activity (employment, expenditure, capital values, etc.) proportionally split between the financial indicators tables of the two fisheries.

Following the financial indicators tables, the value of assets, liabilities and equity of fishing businesses that accessed the Sea Urchin & Turban Shell fishery in 2019/20 is summarised.

### 4.1. Financial Performance

Financial indicators are presented in Table 4-1 to Table 4-4 that follow using various groupings:

- **Whole fishery:** provides an understanding of the average performance across the whole fishery.
- **Profitability quartiles:** provides an understanding of the performance of the average business in each profitability quartile (defined by return on investment). This allows comparison of business characteristics at different levels of profitability.
- **Activity level quartiles:** provides an understanding of the performance of the average businesses in each activity level quartile (by days fished). This allows comparison of the business characteristics of businesses with different levels of activity.
- **Specialisation:** provides an understanding of the performance of businesses that are specialised in this fishery compared to those that earn more of their revenue in other fisheries. This allows comparison of the business characteristics of businesses with different levels of specialisation.

#### Fishing activity

The average business that accessed the Sea Urchin & Turban Shell fishery in 2019/20 employed 0.4 fte jobs and fished on 23 days of the year (Table 4-1).

#### Revenue and costs

Average gross income was \$28,194 and average total variable costs was \$27,644, producing an average boat gross margin of \$550. Average total fixed cost was \$13,935 which produces an average gross operating surplus of -\$4,421 (Table 4-1).

#### Profitability

Average boat business profit, which accounts for depreciation and unpaid labour, was -\$18,003. Average profit at full equity, which excludes any leasing and interest costs, was -\$16,848. Dividing profit at full equity by the value of capital produces a return on investment of -15.6% including the capital value of fishing gear and equipment only, or -10.1% when also including the capital value of fishery shares or licences (Table 4-1).

**Table 4-1 Financial performance of the average business in the Sea Urchin & Turban Shell fishery in 2019/20**

Indicator	Whole Fishery Value per active business	%
<b>Fishing Businesses</b>		
Active Businesses	18	
Sample Size	7	
<b>Fishing Activity</b>		
Days Fished	23	
Catch (kg)	7,025	
Prop. of Revenue Earned in this Fishery	77.3%	
<b>Employment</b>		
Total Jobs	1.7	
FTE Jobs	0.4	
<b>(1) Gross Income</b>	\$28,194	
<b>Variable Costs</b>		
Bait/Ice	\$821	2%
Fuel	\$7,334	18%
Labour - paid	\$5,955	14%
(2) Labour - unpaid	\$6,477	16%
Other	\$490	1%
Provisions	\$165	0%
Repairs & Maintenance	\$6,402	15%
<b>(3) Total Variable Cost</b>	\$27,644	66%
<b>Fixed Costs</b>		
Insurance	\$2,697	6%
(4) Interest	\$672	2%
(5) Labour - unpaid	\$2,487	6%
(6) Leasing of building, equipment & quota transfers	\$0	
Legal & Accounting	\$1,110	3%
Licence fee	\$1,475	4%
Office & Admin	\$1,173	3%
Other	\$0	0%
Other licence fees	\$1,106	
Slipping & Mooring	\$814	2%
Telephone etc.	\$2,285	5%
Travel	\$116	0%
<b>(7) Total Fixed Cost</b>	\$13,935	34%
<b>(8) Total Boat Cash Costs (3+7)</b>	\$41,580	100%
<b>Profitability</b>		
Boat Gross Margin (1-3)	\$550	
(9) Total Unpaid Labour (2+5)	\$8,964	
Gross Operating Surplus (1-8+9)	-\$4,421	
(10) Boat Cash Income (1-8)	-\$13,386	
(11) Depreciation	\$4,618	
(12) Boat Business Profit (10-11)	-\$18,003	
(13) Profit at Full Equity (12+4+6)	-\$16,848	
<b>Boat Capital</b>		
(14) Fishing Gear and Equipment	\$98,116	
Licence Value	\$58,889	
<b>(15) Total Working Capital</b>	\$157,005	
<b>Rate of Return</b>		
Rate of Return on Fishing Gear and Equipment (13/14*100)	-15.6%	
Rate of Return on Total Working Capital (13/15*100)	-10.1%	

Source: BDO EconSearch analysis

**Table 4-2 Financial performance in the Sea Urchin & Turban Shell fishery in 2019/20, average business in each profitability quartile**

Indicator	Return on Investment Quartile			
	Q1	Q2	Q3	Q4
<b>Fishing Businesses</b>				
Active Businesses	5	4	4	5
Sample Size		1	3	3
<b>Fishing Activity</b>				
Days Fished	4	23	25	39
Catch (kg)	834	8,175	4,888	14,004
Prop. of Revenue Earned in this Fishery	100.0%	100.0%	60.1%	50.0%
<b>Employment</b>				
Total Jobs	2.5	2.5	0.8	1.0
FTE Jobs	0.5	0.5	0.2	0.2
<b>(1) Gross Income</b>	\$5,434	\$27,059	\$26,502	\$53,217
<b>Variable Costs</b>				
Bait/Ice	\$930	\$215	\$748	\$1,254
Fuel	\$4,081	\$11,213	\$8,205	\$6,788
Labour - paid	\$2,014	\$11,586	\$6,208	\$5,188
<b>(2) Labour - unpaid</b>	\$11,346	\$7,984	\$2,662	\$3,455
Other	\$327	\$286	\$658	\$681
Provisions	\$159	\$202	\$107	\$188
Repairs & Maintenance	\$8,812	\$9,578	\$3,977	\$3,392
<b>(3) Total Variable Cost</b>	\$27,669	\$41,065	\$22,566	\$20,946
<b>Fixed Costs</b>				
Insurance	\$3,096	\$4,134	\$2,111	\$1,617
<b>(4) Interest</b>	\$0	\$1,233	\$340	\$1,160
<b>(5) Labour - unpaid</b>	\$5,000	\$2,765	\$501	\$1,342
Leasing of building, equipment & quota transfers	\$0	\$0	\$0	\$0
Legal & Accounting	\$1,197	\$1,392	\$705	\$1,121
Licence fee	\$1,213	\$1,500	\$1,476	\$1,718
Office & Admin	\$550	\$1,615	\$1,575	\$1,122
Other	\$0	\$0	\$0	\$0
Other licence fees	\$1,098	\$969	\$938	\$1,357
Slipping & Mooring	\$1,782	\$1,131	\$52	\$200
Telephone etc.	\$3,424	\$2,920	\$1,152	\$1,545
Travel	\$0	\$315	\$68	\$113
<b>(7) Total Fixed Cost</b>	\$17,360	\$17,973	\$8,917	\$11,295
<b>(8) Total Boat Cash Costs (3+7)</b>	\$45,029	\$59,039	\$31,484	\$32,241
<b>Profitability</b>				
Boat Gross Margin (1-3)	-\$22,235	-\$14,007	\$3,935	\$32,271
<b>(9) Total Unpaid Labour (2+5)</b>	\$16,346	\$10,748	\$3,163	\$4,797
Gross Operating Surplus (1-8+9)	-\$23,249	-\$21,232	-\$1,819	\$25,773
<b>(10) Boat Cash Income (1-8)</b>	-\$39,595	-\$31,980	-\$4,982	\$20,976
(11) Depreciation	\$6,475	\$5,786	\$2,565	\$3,468
<b>(12) Boat Business Profit (10-11)</b>	-\$46,070	-\$37,766	-\$7,547	\$17,508
<b>(13) Profit at Full Equity (12+4+6)</b>	-\$45,826	-\$35,901	-\$6,470	\$19,069
<b>Boat Capital</b>				
<b>(14) Fishing Gear and Equipment</b>	\$119,305	\$125,882	\$72,418	\$75,272
Licence Value	\$44,732	\$59,085	\$72,500	\$62,000
<b>(15) Total Working Capital</b>	\$164,038	\$184,966	\$144,918	\$137,272
<b>Rate of Return</b>				
Rate of Return on Fishing Gear and Equipment (13/14*100)	-36.9%	-25.9%	-7.4%	22.9%
Rate of Return on Total Working Capital (13/15*100)	-27.1%	-18.2%	-4.1%	13.1%

Source: BDO EconSearch analysis

**Table 4-3 Financial performance in the Sea Urchin & Turban Shell fishery in 2019/20, average business in each days fished quartile**

Indicator	Days Fished Quartile			
	Q1	Q2	Q3	Q4
<b>Fishing Businesses</b>				
Active Businesses	6	3	4	5
Sample Size	2	1	1	3
<b>Fishing Activity</b>				
Days Fished	3	8	30	49
Catch (kg)	1,191	1,518	15,621	10,452
Prop. of Revenue Earned in this Fishery	69.0%	75.7%	100.0%	69.9%
<b>Employment</b>				
Total Jobs	1.7	1.6	1.7	1.8
FTE Jobs	0.4	0.4	0.3	0.3
<b>(1) Gross Income</b>	\$4,296	\$8,415	\$47,687	\$53,146
<b>Variable Costs</b>				
Bait/Ice	\$403	\$1,118	\$499	\$1,402
Fuel	\$1,640	\$8,069	\$11,203	\$10,630
Labour - paid	\$1,496	\$3,356	\$15,112	\$5,538
(2) Labour - unpaid	\$4,128	\$15,004	\$4,175	\$6,022
Other	\$118	\$422	\$717	\$795
Provisions	\$132	\$0	\$147	\$318
Repairs & Maintenance	\$5,131	\$7,563	\$8,679	\$5,410
<b>(3) Total Variable Cost</b>	\$13,048	\$35,532	\$40,533	\$30,117
<b>Fixed Costs</b>				
Insurance	\$2,298	\$2,151	\$3,811	\$2,612
(4) Interest	\$0	\$0	\$638	\$1,908
(5) Labour - unpaid	\$3,392	\$3,025	\$1,423	\$1,930
(6) Leasing of building, equipment & quota transfers	\$0	\$0	\$0	\$0
Legal & Accounting	\$826	\$908	\$1,351	\$1,379
Licence fee	\$822	\$1,670	\$1,558	\$2,077
Office & Admin	\$424	\$871	\$2,308	\$1,347
Other	\$0	\$0	\$0	\$0
Other licence fees	\$772	\$1,389	\$1,126	\$1,320
Slipping & Mooring	\$1,225	\$1,023	\$821	\$188
Telephone etc.	\$2,300	\$2,315	\$2,414	\$2,146
Travel	\$0	\$0	\$132	\$313
<b>(7) Total Fixed Cost</b>	\$12,059	\$13,352	\$15,582	\$15,220
<b>(8) Total Boat Cash Costs (3+7)</b>	\$25,107	\$48,884	\$56,114	\$45,337
<b>Profitability</b>				
Boat Gross Margin (1-3)	-\$8,752	-\$27,117	\$7,154	\$23,029
(9) Total Unpaid Labour (2+5)	\$7,520	\$18,029	\$5,598	\$7,952
Gross Operating Surplus (1-8+9)	-\$13,292	-\$22,440	-\$2,830	\$15,761
(10) Boat Cash Income (1-8)	-\$20,811	-\$40,469	-\$8,428	\$7,809
(11) Depreciation	\$4,429	\$4,292	\$4,667	\$5,000
(12) Boat Business Profit (10-11)	-\$25,240	-\$44,761	-\$13,095	\$2,809
(13) Profit at Full Equity (12+4+6)	-\$25,052	-\$44,355	-\$11,390	\$5,134
<b>Boat Capital</b>				
(14) Fishing Gear and Equipment	\$84,426	\$106,411	\$117,698	\$93,901
Licence Value	\$42,277	\$73,333	\$59,085	\$70,000
<b>(15) Total Working Capital</b>	\$126,703	\$179,745	\$176,783	\$163,901
<b>Rate of Return</b>				
Rate of Return on Fishing Gear and Equipment (13/14*100)	-28.4%	-38.7%	-8.2%	5.0%
Rate of Return on Total Working Capital (13/15*100)	-19.2%	-23.6%	-5.7%	3.0%

Source: BDO EconSearch analysis

**Table 4-4 Financial performance in the Sea Urchin & Turban Shell fishery in 2019/20, average business in each specialisation group**

Indicator	Share of Revenue earned in Fishery	
	High Revenue Share	Low Revenue Share
<b>Fishing Businesses</b>		
Active Businesses	13	5
Sample Size	2	5
<b>Fishing Activity</b>		
Days Fished	23	22
Catch (kg)	7,744	5,153
Prop. of Revenue Earned in this Fishery	100.0%	18.1%
<b>Employment</b>		
Total Jobs	2.2	0.4
FTE Jobs	0.5	0.1
<b>(1) Gross Income</b>	\$30,582	\$21,986
<b>Variable Costs</b>		
Bait/Ice	\$962	\$454
Fuel	\$9,310	\$2,196
Labour - paid	\$7,891	\$920
<b>(2) Labour - unpaid</b>	\$8,407	\$1,461
Other	\$613	\$170
Provisions	\$212	\$44
Repairs & Maintenance	\$8,595	\$701
<b>(3) Total Variable Cost</b>	\$35,990	\$5,946
<b>Fixed Costs</b>		
Insurance	\$3,564	\$443
<b>(4) Interest</b>	\$713	\$564
<b>(5) Labour - unpaid</b>	\$3,258	\$482
Leasing of building, equipment & quota transfers	\$0	\$0
Legal & Accounting	\$1,368	\$438
Licence fee	\$1,402	\$1,667
Office & Admin	\$1,481	\$374
Other	\$0	\$0
Other licence fees	\$1,216	\$819
Slipping & Mooring	\$1,086	\$106
Telephone etc.	\$2,893	\$706
Travel	\$140	\$55
<b>(7) Total Fixed Cost</b>	\$17,120	\$5,655
<b>(8) Total Boat Cash Costs (3+7)</b>	\$53,110	\$11,600
<b>Profitability</b>		
Boat Gross Margin (1-3)	-\$5,408	\$16,040
<b>(9) Total Unpaid Labour (2+5)</b>	\$11,665	\$1,943
Gross Operating Surplus (1-8+9)	-\$10,863	\$12,328
<b>(10) Boat Cash Income (1-8)</b>	-\$22,528	\$10,386
(11) Depreciation	\$5,782	\$1,590
<b>(12) Boat Business Profit (10-11)</b>	-\$28,311	\$8,796
<b>(13) Profit at Full Equity (12+4+6)</b>	-\$26,960	\$9,441
<b>Boat Capital</b>		
<b>(14) Fishing Gear and Equipment</b>	\$124,934	\$28,388
Licence Value	\$55,385	\$68,000
<b>(15) Total Working Capital</b>	\$180,319	\$96,388
<b>Rate of Return</b>		
Rate of Return on Fishing Gear and Equipment (13/14*100)	-19.6%	31.5%
Rate of Return on Total Working Capital (13/15*100)	-14.0%	9.6%

Source: BDO EconSearch analysis

## 4.2. Assets, Liabilities and Equity

Commercial fishing businesses in New South Wales utilise valuable fishery shares, vessels or vehicles and other working capital. They may hold cash and may also hold debt to finance the business and other liabilities. The total assets held by a business less its total liabilities is the business' equity, which can be expressed in dollar terms or as a percentage of total asset value. Table 4-5 presents a simple average of the equity of all surveyed businesses that access the Sea Urchin & Turban Shell fishery. The average is of whole businesses and includes the share values for all fisheries that they access, unlike the financial indicator tables above which present averages of proportions of businesses that access the fishery.

Table 4-5 Assets, liabilities and equity in the Sea Urchin & Turban Shell fishery in 2019/20

	Value
<b>Assets</b>	
Share value	\$825,550
Working capital	\$464,760
Other assets	\$69,000
Total assets	\$1,359,310
<b>Liabilities</b>	
Total liabilities	\$55,000
<b>Equity</b>	
Total equity	\$1,304,310
Equity / Total assets	96.0%

Source: BDO EconSearch analysis

## 5. ECONOMIC CONTRIBUTION

Estimates of the economic contribution of the Sea Urchin & Turban Shell fishery to the NSW economy in 2019/20 are outlined in this section.

Economic contribution analysis is a descriptive analysis that traces the gross economic activity of the fishery as dollars of expenditure cycle through the regional and state economies. The analysis utilised the detailed industry specific data reported above in combination with other regional/state data that describe the linkages that exist within the regional economies.

### Contribution or impact?

An *economic contribution analysis* (presented in this report) can be thought of as a *footprint* or *snapshot* analysis of economic activity. It is distinctly different to an *economic impact analysis*, which can be thought of as an analysis of a *change* in economic activity (not the subject of this report). An *economic impact analysis* is an appropriate approach for evaluating a *change* where an industry is generating new revenues that would otherwise not occur, keeping revenues in the region that would otherwise be lost, or being subject to changes that result in existing revenues being lost.

### Direct and flow-on effects

The following types of activity are presented in this report as *direct* economic contribution:

- the landed beach value of production
- the sustaining capital expenditure of fishing businesses
- the margin value of local seafood processing.

Each of these activities generates flow-on effects to other sectors through purchases of inputs and the employment of labour. These effects have been estimated using input-output analysis (BDO 2021).

### Economic contribution indicators

Economic contributions have been specified in terms of the following indicators.

- Value of output (direct only and equivalent to gross value of production or GVP)
- Employment (fte and total jobs)
- Household income
- Gross regional state product.

### 5.1. Economic Contribution to New South Wales

The estimated economic contribution of the Sea Urchin & Turban Shell fishery to New South Wales in 2019/20 is presented in Table 5-1.

Direct contribution measures fishing and downstream activities (i.e. processing and capital expenditure). Flow-on contribution measures the economic effects in other sectors of the economy (retail and wholesale trade, manufacturing, etc.) generated by fishing and processing activities, that is, the multiplier effects. Flow-on effects are disaggregated by industry with the top 10 industries shown separately in the table. Capital expenditures are assumed to be the same as depreciation (i.e. sustaining the capital stock) which may or may not be the case in a given year but is a reasonable assumption in the long-run. Economic contribution of capital expenditure should, therefore, be interpreted as a long-run average.

**Table 5-1 Economic contribution to New South Wales of the Sea Urchin & Turban Shell fishery in 2019/20**

Sector	Output (\$m)	Gross State Product (\$m)	Household Income (\$m)	Employment (fte)	Employment (total)
<b>Direct</b>					
Fishing	0.5	0.1	0.3	6	31
CAPEX	<0.1	<0.1	<0.1	<1	<1
Processing	0.9	0.2	0.1	2	1
Total Direct	1.5	0.4	0.4	8	32
<b>Flow-on</b>					
Personal & Other Services		<0.1	<0.1	1	1
Retail Trade		<0.1	<0.1	1	1
Professional, Scientific & Technical Services		<0.1	<0.1	<1	<1
Aquaculture		<0.1	<0.1	<1	<1
Wholesale Trade		<0.1	<0.1	<1	<1
Admin Support Services		<0.1	<0.1	<1	<1
Food & Beverage Services		<0.1	<0.1	<1	<1
Health & Community Services		<0.1	<0.1	<1	<1
Education & Training		<0.1	<0.1	<1	<1
Road Transport		<0.1	<0.1	<1	<1
Other Sectors	0.6	0.2	0.2	3	3
Total Flow-ons	1.2	0.7	0.7	10	10
<b>Total Contribution</b>	<b>1.6</b>	<b>1.1</b>	<b>1.1</b>	<b>18</b>	<b>42</b>

Source: BDO EconSearch analysis

### Value of Output

The value of output at beach price (also known as GVP) generated directly in the Sea Urchin & Turban Shell fishery in 2019/20 was \$0.5m (Table 5-1).

### Employment

The Sea Urchin & Turban Shell fishery directly contributed an estimated 6 fte jobs in 2019/20 while associated seafood processing of catch and capital expenditure by fishing businesses supported additional employment of around 2 fte jobs (Table 5-1).

Flow-on business activity was estimated to support a further 10 fte jobs in 2019/20 state-wide. These jobs were concentrated in the Personal & Other Services, Retail Trade, and Professional, Scientific & Technical Services sectors. The total employment contribution to New South Wales was estimated to be 18 fte jobs in 2019/20 (Table 5-1).

### Household Income

Estimated household income of \$0.3m was earned in 2019/20 in the Sea Urchin & Turban Shell fishery (wages of employees and estimated drawings by owner/operators) while associated seafood processing of catch and capital expenditure by fishing businesses generated an estimated additional \$0.1m in household income. Flow-on business activity was estimated to support a further \$0.7m of household income in 2019/20 state-

wide. The estimated total household income contribution in New South Wales was \$1.1m in 2019/20 (Table 5-1).

### **Contribution to GSP**

Contribution to GSP is measured as value of output less the cost of goods and services (including imports but excluding wages) used in producing the output. Estimated GSP of \$0.1m was produced in 2019/20 by the Sea Urchin & Turban Shell fishery while associated seafood processing of catch and capital expenditure by fishing businesses generated an estimated additional \$0.2m in GSP. Flow-on business activity was estimated to support a further \$1.2m of GSP in 2019/20 state-wide. The estimated total GSP contribution in New South Wales was \$1.6m in 2019/20 (Table 5-1).

## 6. NET ECONOMIC RETURN

Net economic return is the long-run profit from a fishery after all costs have been met, including fuel, crew costs, repairs, the opportunity cost of family and owner labour, fishery management costs, depreciation and the opportunity cost of capital (excluding endorsement) (Bath et al. 2018). These unit costs or long-term costs all need to be covered if the fishing business is to remain viable in the fishery. The cost of fisheries management is included as a cash cost to fishing businesses through licence fees, though this likely underestimates the cost of fisheries management as this cost is not fully recovered from businesses. The opportunity cost of capital is equivalent to what the fisher's investment could have earned in the next most similar alternative use considering risk and skills required. What remains after the value of these inputs (labour, capital, materials and services) has been netted out is the net economic return.

Commercial fishing operations in Australia are not risk free. Returns can be impacted both positively and negatively by factors such as natural events, changes in market conditions, disease, and management regulations. Determining the opportunity cost of capital involves an assessment of the degree of financial risk involved in the activity. For a risk-free operation, an appropriate opportunity cost of capital might be the long-term real rate of return on government bonds. The greater the risks involved, the greater is the necessary return on capital to justify the investment in that particular activity. For this analysis an opportunity cost of capital of 10 per cent has been used with sensitivity analysis at 7 and 15 per cent. The lower-bound is consistent with ABARES Australian fisheries economic indicator reporting for commonwealth managed fisheries (Bath et al. 2018). Commonwealth managed fisheries are generally larger and characterised by larger businesses with less overall variation than state managed inshore fisheries. This is why the 7 per cent used by ABARES is used as a lower-bound in this analysis. The upper-bound of 15 per cent represents a reasonable estimate for what an investor might expect when buying into a commercial fishery in New South Wales, given the variability and risk involved in this type of fishing business.

The net economic return results are presented in Table 6-1. Assuming an opportunity cost of capital of 10 per cent, net economic return generated in the Sea Urchin & Turban Shell fishery was estimated to be \$-0.49m in 2019/20.

**Table 6-1 Net Economic Return of the Sea Urchin & Turban Shell fishery in 2019/20**

	Value (\$m)
Gross Value of Production	0.51
Less Labour Costs	0.27
Less Materials & Services	0.47
Less Depreciation	0.08
Less Opportunity Cost of Capital (10%)	0.18
<b>Net Economic Return</b>	<b>-0.49</b>

Source: BDO EconSearch analysis

The sensitivity analysis in Table 6-2 shows that, with the varying assumptions about opportunity cost of capital, net economic return was likely in the range of \$-0.58m to \$-0.44m.

**Table 6-2 Sensitivity of Net Economic Return**

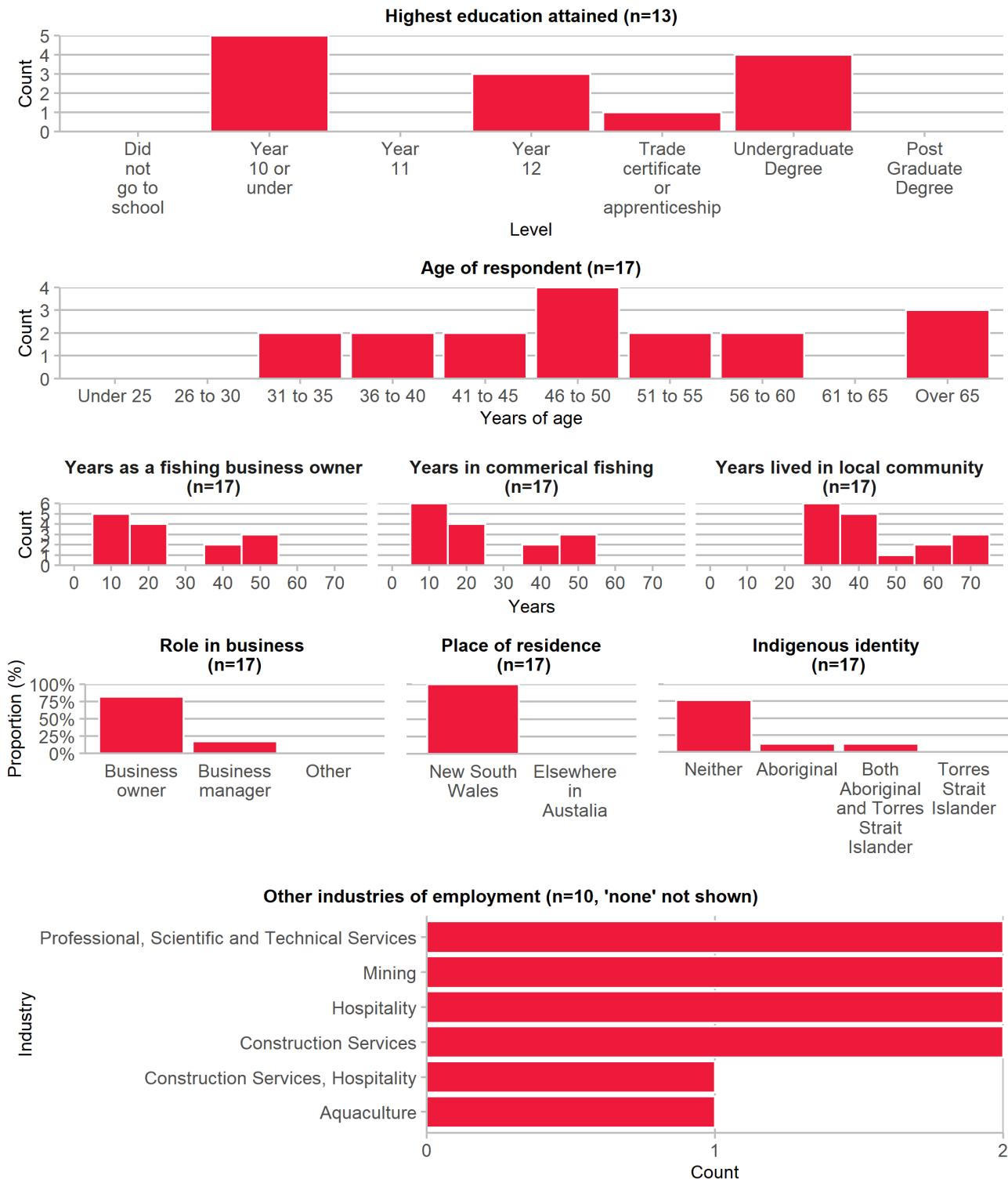
Opportunity Cost of Capital (%)	7%	10%	15%
Less Opportunity Cost of Capital (\$m)	0.12	0.18	0.26
<b>Net Economic Return (\$m)</b>	<b>-0.44</b>	<b>-0.49</b>	<b>-0.58</b>

Source: BDO EconSearch analysis

## 7. DEMOGRAPHICS

Figure 7-1 present a demographic profile of fishers who accessed the Sea Urchin & Turban Shell fishery in New South Wales in 2019/20.

**Figure 7-1 Demographic profile of the Sea Urchin & Turban Shell fishery in 2019/20**



Source: 2021 business survey

## 8. SOCIAL INDICATORS

Fishers may derive non-financial benefits or costs from the Sea Urchin & Turban Shell fishery and may contribute to the community in different ways. This section presents a series of social indicators including:

- Perceptions of management
- Lifestyle and satisfaction
- Personal wellbeing
- Community contribution.

### 8.1. Management

Figure 8-1 to Figure 8-3 presents fishers' perceptions of different aspects of fishery management and participation in management.

Fishers who access the Sea Urchin and Turban Shell fishery were unanimous in agreement that they had a good understanding of the fishing rules and regulations that apply to their fishing activities. There was also near unanimous agreement that most commercial fishers comply with fishing rules and regulations and that it was easy for their business to comply with them. Although most fishers who access the Sea Urchin and Turban Shell fishery indicated that they were inclined to report other people for doing the wrong thing, some disagreed that they would do this. Overall, these results indicate a high level of stewardship amongst fishers who access the Sea Urchin and Turban Shell fishery which is associated with lower costs of management and compliance activities, and a greater ability to achieve ecological sustainability.

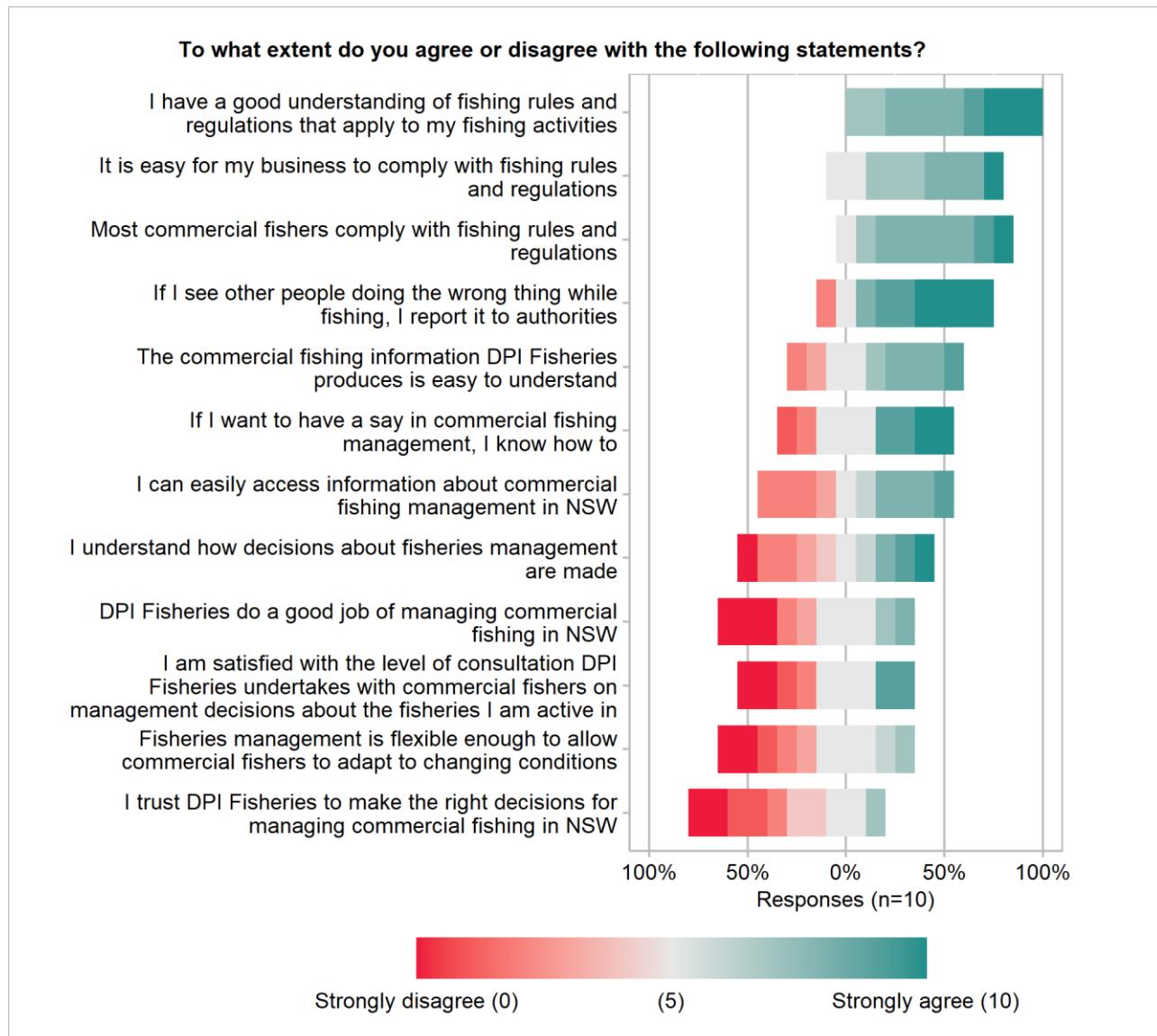
Importantly, a significant majority of fishers who access the Sea Urchin and Turban Shell fishery do not trust DPI Fisheries to make the right decisions for managing commercial fishing in NSW. This indicates that there may be problems in terms of management achieving desired social outcomes. Fishers are more likely to trust fisheries management if they feel the processes used to make decisions are transparent. Over half of fishers who access the Sea Urchin and Turban Shell fishery indicated that they think the information DPI Fisheries produces is easy to understand and that it was easy to access information about commercial fishing management in NSW. However, just over half indicated that they do not understand how fisheries management decisions are made. A significant majority of fishers who access the Sea Urchin and Turban Shell fishery also indicated that they did not feel that consultation processes are satisfactory or that fisheries management is flexible enough. Over half of fishers who access the Sea Urchin and Turban Shell fishery indicated that they know how to have a say in fishery management.

These perceptions suggest that transparency may be affecting trust in fisheries management. However, fishers who access the Sea Urchin and Turban Shell fishery show a better ability to access and understand the information produced by DPI Fisheries than most NSW fisheries.

Most fishers who access the Sea Urchin and Turban Shell fishery indicated that they felt fairly treated by fisheries managers in relation to allocation of catch and gear restrictions, though more than half indicated that they felt unfairly treated in relation to access to fishing areas. About half of fishers who access the Sea Urchin and Turban Shell fishery indicated that they felt unfairly treated in relation to decision making in fisheries management.

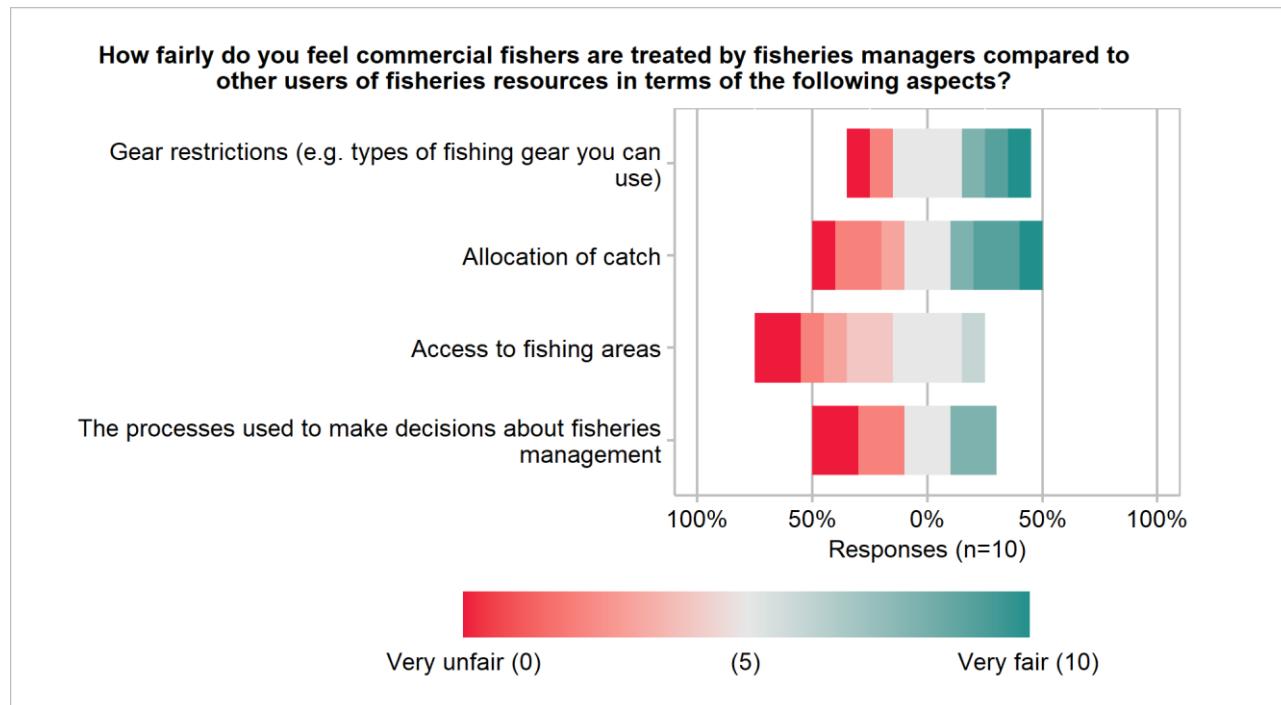
Fishers who access the Sea Urchin and Turban Shell fishery indicated general satisfaction relating to infrastructure access across all facilities.

Figure 8-1 Perceptions of fishery management in the Sea Urchin & Turban Shell fishery (2021 survey)



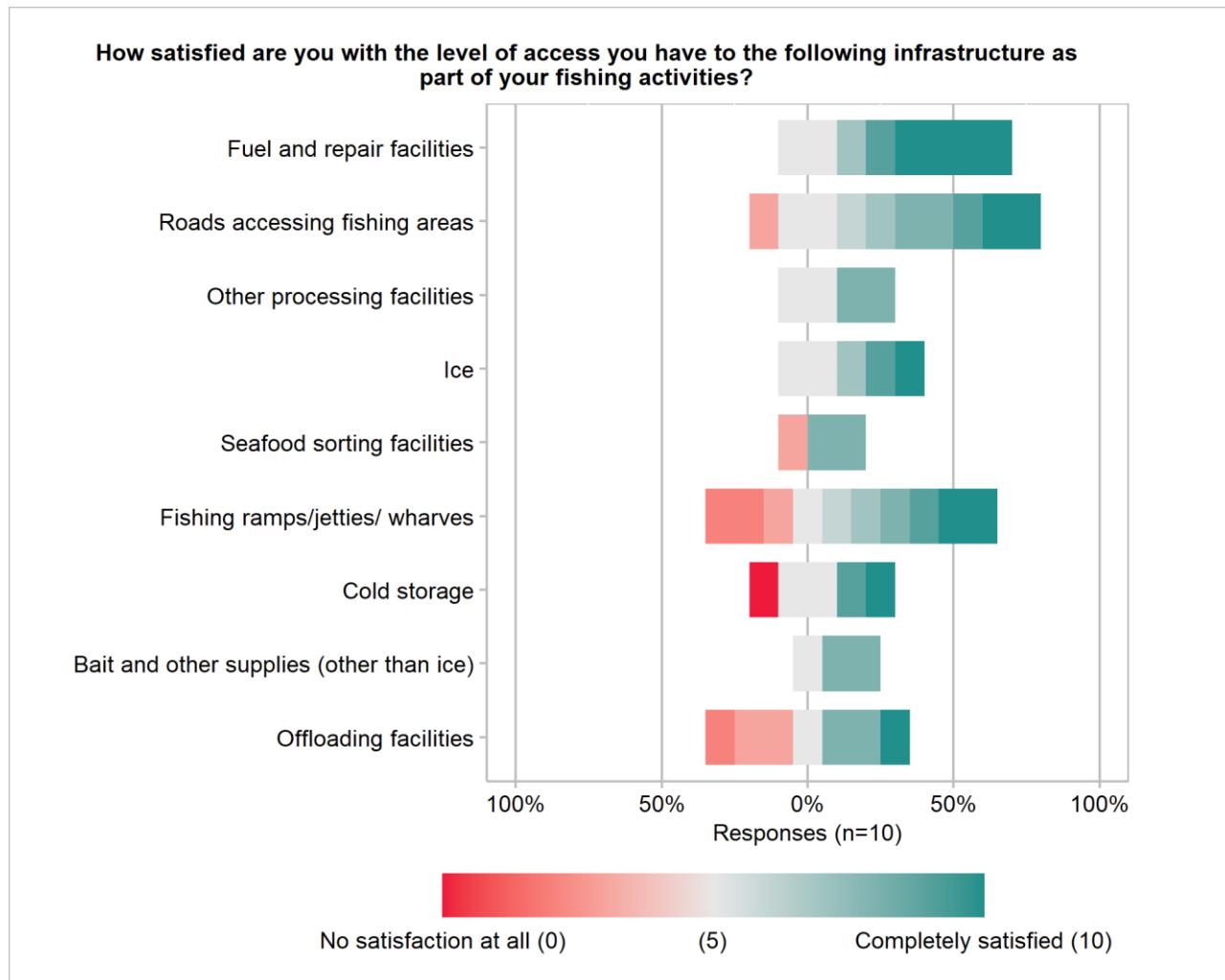
Source: 2021 business survey

Figure 8-2 Perceptions of management fairness in the Sea Urchin & Turban Shell fishery (2021 survey)



Source: 2021 business survey

Figure 8-3 Perceptions of infrastructure access in the Sea Urchin & Turban Shell fishery (2021 survey)



Source: 2021 business survey

## 8.2. Lifestyle and Satisfaction

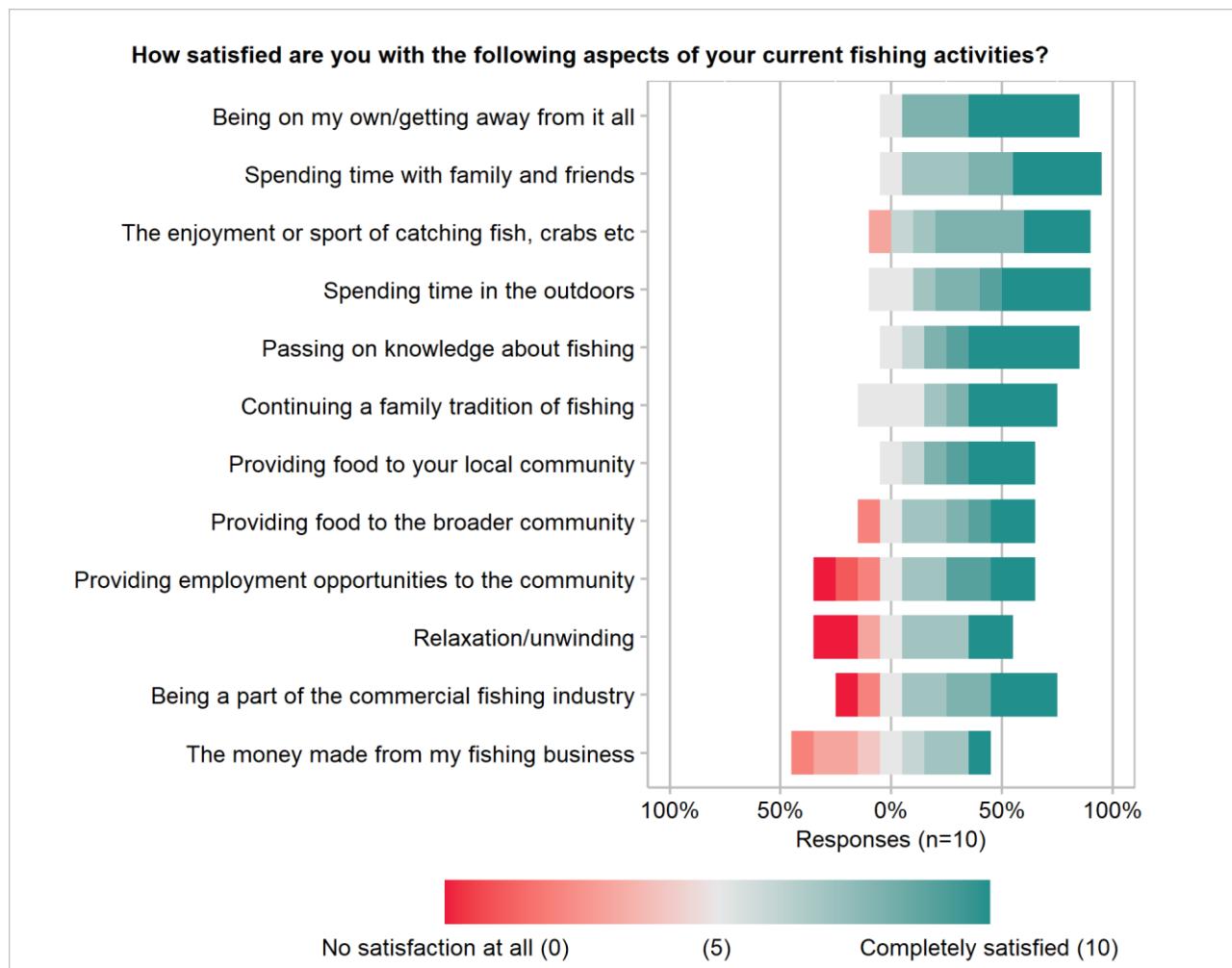
Figure 8-4 and Figure 8-5 present indicators of continuity, importance and satisfaction with different aspects of fisher's activity in the Sea Urchin & Turban Shell fishery.

Fishers who access Sea Urchin and Turban Shell fishery were unanimous in agreement that fishing is a very important aspect of their lives. A significant majority indicated that they intend to continue fishing for as long as possible. However, respondents were evenly split in their responses regarding their satisfaction with their commercial fishing activities over the last 12 months, with half indicating that they were satisfied, or completely satisfied and half indicating that they had little or no satisfaction at all. A significant majority of fishers who access the Sea Urchin and Turban Shell fishery were satisfied with most aspects of their current fishing activities, though some indicated that they had less satisfaction with the money made from their business, relaxation and unwinding and providing employment opportunities to their community.

Fishers who access the Sea Urchin and Turban Shell fishery indicated that they had very high levels of personal wellbeing across all PWI domains. However, a significant number of fishers who access the Sea Urchin and Turban Shell fishery indicated that they were dissatisfied their future security. This mirrors the overall pattern across NSW commercial fisheries.

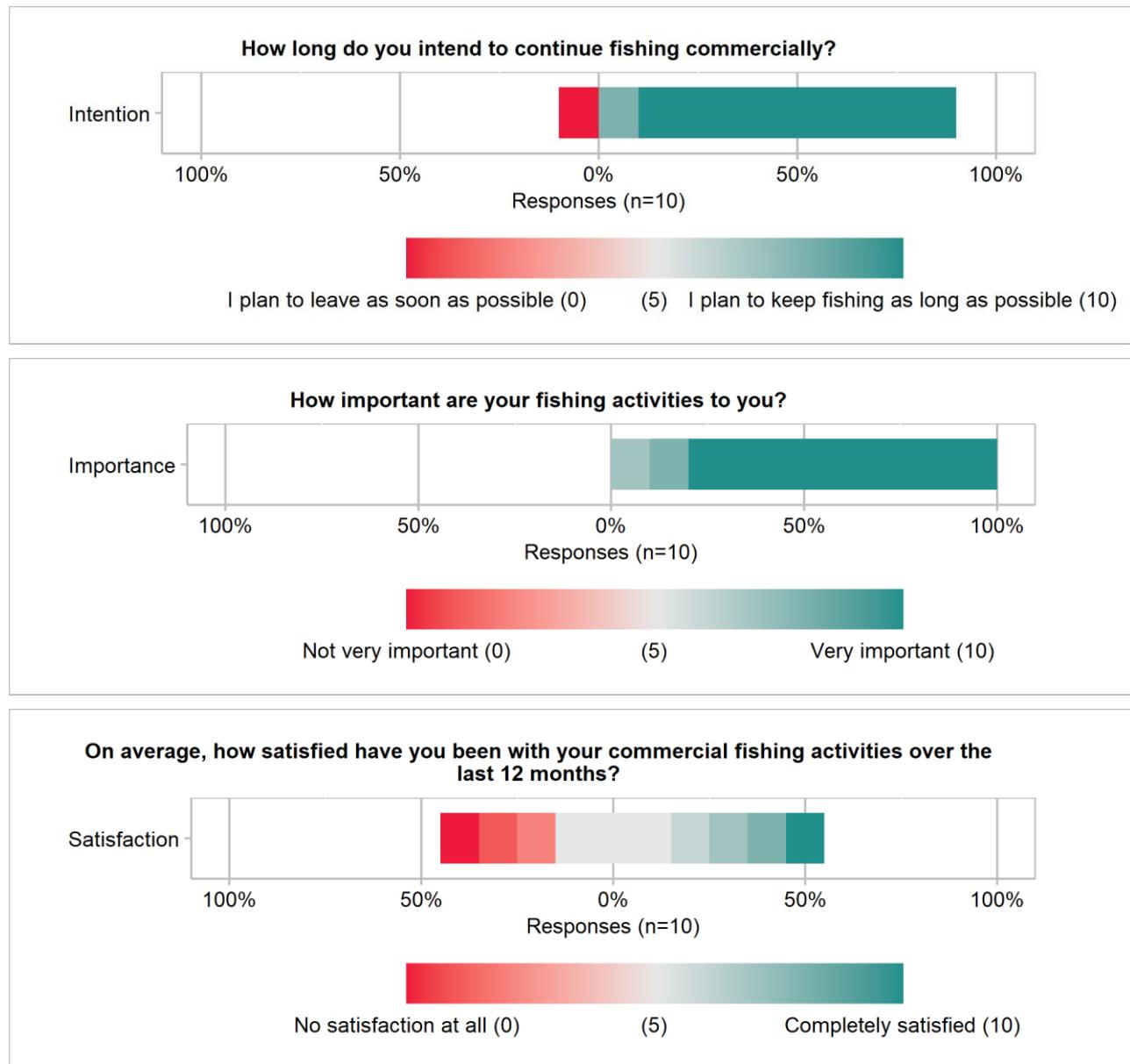
Overall, these results indicate that fishing activities are making a significant, positive contribution to the overall satisfaction and personal wellbeing of fishers who access the Sea Urchin and Turban Shell fishery.

**Figure 8-4 Satisfaction with aspects of the Sea Urchin & Turban Shell fishery (2021 survey)**



Source: 2021 business survey

Figure 8-5 Satisfaction in the Sea Urchin & Turban Shell fishery (2021 survey)



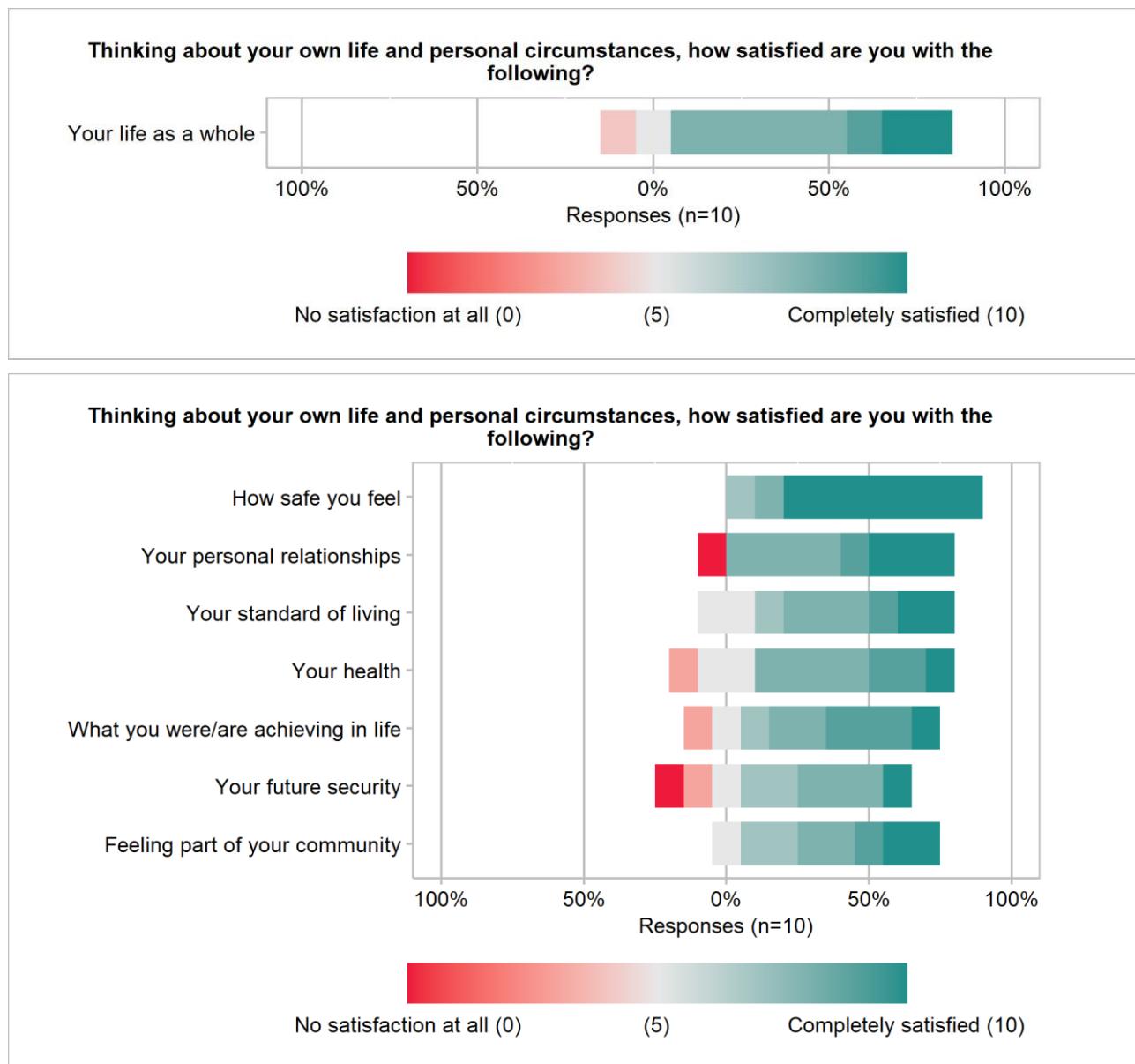
Source: 2021 business survey

### 8.3. Personal Wellbeing

The Personal Wellbeing Index (PWI) is a validated measure of wellbeing with established benchmarks that are useful for comparing between groups. A higher PWI means higher subjective wellbeing. It is calculated from the data presented in Figure 8-6 though the charts themselves also provide useful information about the levels of different domains of wellbeing for fishers that access the Sea Urchin & Turban Shell fishery. The PWI for the Sea Urchin & Turban Shell fishery is compared against the average for Australia, New South Wales and regional New South Wales, as reported in the Regional Wellbeing Survey (UC 2020), below:

- Australia: 70.4
- New South Wales: 71.4
- Regional New South Wales: 72.9
- Sea Urchin & Turban Shell fishery: 78.9.

**Figure 8-6 Personal wellbeing in the Sea Urchin & Turban Shell fishery (2021 survey)**



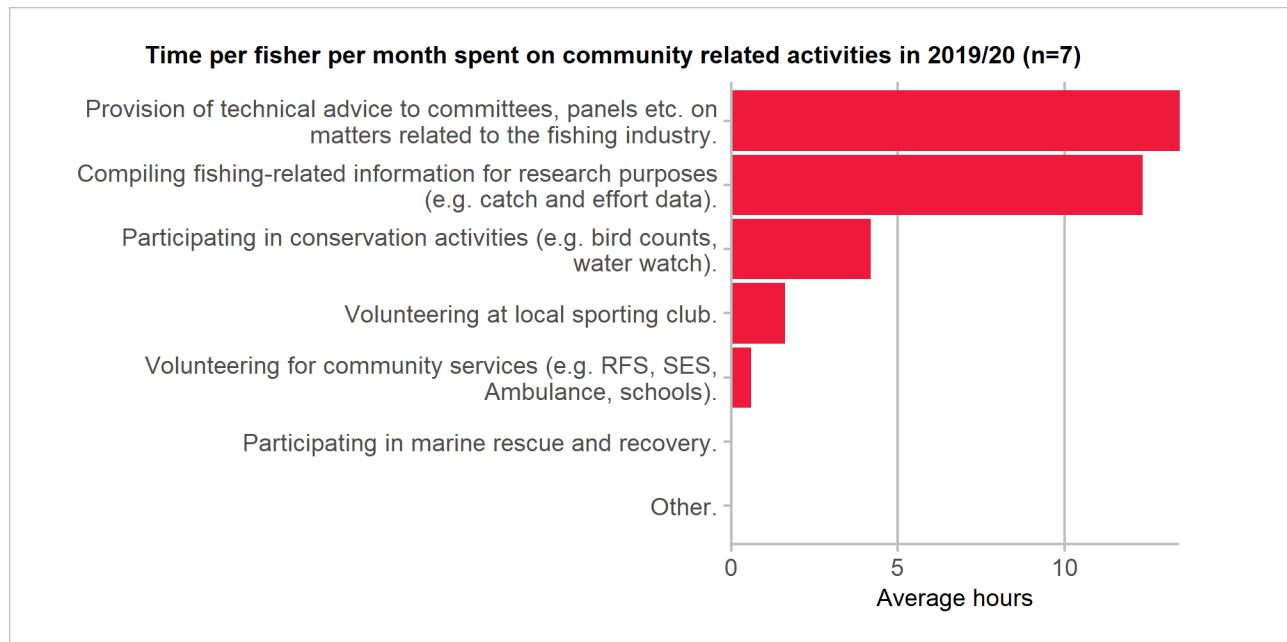
Source: 2021 business survey

## 8.4. Community Contribution

Fishers that access the Sea Urchin & Turban Shell fishery spend some of their time contributing to the community through various activities. The average number of hours contributed per month is presented in Figure 8-7.

Fishers who access the Sea Urchin and Turban Shell fishery indicated that they make a significant contribution to the community. This was particularly in the form of time spent contributing to providing technical advice related to the fishing industry, participating in marine rescue and recovery and compiling fishing related information for research.

**Figure 8-7 Community contribution in the Sea Urchin & Turban Shell fishery (2021 survey)**



Source: 2021 business survey

## REFERENCES

- Bath, A. Mobsby, D. and Koduah, A. 2018, *Australian fisheries economic indicators report 2017: financial and economic performance of the Southern and Eastern Scalefish and Shark Fishery*, ABARES, Canberra, April.
- BDO 2021, *Economic and Social Indicators for NSW Commercial Fisheries in 2019/20*, report prepared for the Department for Primary Industries, Adelaide, December.
- University of Canberra (UC) 2020, *Regional Wellbeing Survey*.

### 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.

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