UNIVERSITY of TASMANIA

IMAS

Institute for Marine and Antarctic Studies

Tasmanian Fisheries and Aquaculture Industry 2020/21: Economic Contributions Technical Report

Steven Rust, Emily Ogier

December 2023

Acknowledgements:

Anders Magnusson (BDO), Jasmin Douglas (BDO), Oysters Tasmania (Duncan Spender), Tasmanian Abalone Growers Association (Nick Savva), Tasmania Rock Lobster Fishermens' Association (Rene Hidding, Karl Krause), Tasmanian Abalone Dive sector (John Franklin).

Institute for Marine and Antarctic Studies, University of Tasmania, Private Bag 49, Hobart TAS 7001

Enquires should be directed to:
Dr. Steven Rust
Institute for Marine and Antarctic Studies
University of Tasmania
Private Bag 49, Hobart, Tasmania 7001, Australia
Email: steven.rust@utas.edu.au
Ph. (03) 6226 8254

Executive Summary

This report presents economic contribution results for six (6) key fisheries and aquaculture production sectors for Tasmanian economy for the 2020/21 year (the Tasmanian Rock Lobster Fishery; the Tasmanian Abalone Fishery; the Tasmanian Scalefish Fishery; Tasmanian Salmonid Aquaculture; Tasmanian Pacific Oyster Aquaculture; and Tasmanian Abalone Aquaculture). It details estimates of economic contribution principally for Gross Value Added (GVA), employment, and household income generate by each sector to the Tasmanian economy for the 2020/21 financial year. Estimates are reported for direct contribution, flow-on (or indirect) contribution, and total contribution (the sum of direct and flow-on contributions).

The analysis in this report builds on the foundations set out by the *2017/18 National Fisheries and Aquaculture Industry Contributions Study* (FRDC 2017-210). It also represents a significant step forward in measuring and monitoring the contribution of Tasmania's commercial seafood production activities to the economic prosperity and wellbeing of the Tasmanian community.

This report aims to provide baseline information for key Tasmanian fishery and aquaculture production sectors from which changes can be monitored and measured over time, and which can provide data to support evidence-based decision-making. It represents one component of an overarching IMAS research programme to establish an ongoing fisheries and aquaculture assessment to fill key knowledge gaps for marine resources in Tasmania.

The analysis has been undertaken by the Institute for Marine and Antarctic Studies at the University of Tasmania in collaboration with BDO. The results in this report have undergone a quality assurance and benchmarking process, based on the comparison of key output metrics for the direct and total contribution of each sector to an extensive database of studies on similar seafood sectors from around Australia.

Contents

1 Introduction 1
2 Modelling approach, scope, and limitations 2
2.1 Scope 2
2.2 Comparisons to other sectors 3
2.3 Limitations 3
3 Definition of terms 3
4 Definition of direct, indirect, and total contribution 4
5 Economic profiles for fishing and aquaculture production 5
6 Data for economic profiles for fishing and aquaculture production 6
7 Process of conversion to basic prices 8
8 Economic contribution results 9
8.1 Tasmanian Rock Lobster Fishery 9
8.1.1 Tasmanian Rock Lobster Fishery – Direct Spending 9
8.1.2 Tasmanian Rock Lobster Fishery – Economic Contribution 10
8.2 Tasmanian Abalone Fishery 13
8.2.1 Tasmanian Abalone Fishery – Direct Spending 13
8.2.2 Tasmanian Abalone Fishery – Economic Contribution 14
8.3 Tasmanian Scalefish Fishery 17
8.3.1 Tasmanian Scalefish Fishery – Direct Spending 17
8.3.2 Tasmanian Scalefish Fishery – Economic Contribution 18
8.4 Tasmanian Salmonid Aquaculture 21
8.4.1 Tasmanian Salmonid Aquaculture – Direct Spending 21
8.4.2 Tasmanian Salmonid Aquaculture – Economic Contribution 22
8.5 Tasmanian Pacific Oyster Aquaculture 25
8.5.1 Tasmanian Pacific Oyster Aquaculture – Direct Spending 25
8.5.2 Tasmanian Pacific Oyster Aquaculture – Economic Contribution 26
8.6 Tasmanian Farmed Abalone Aquaculture 29
8.6.1 Tasmanian Farmed Abalone Aquaculture – Direct Spending 29
8.6.2 Tasmanian Farmed Abalone Aquaculture – Economic Contribution 30
9 Summary of data sources per fishery / aquaculture sector 33
9.1 Fishery economic and employment data sources 33
9.2 Additional data sources used in conversion to basic prices 36
10 A time series of economic contribution to Tasmania 37
10.1 Economic contribution (total, direct) to Tasmania over time for six sectors 37
11 References 38

1 Introduction

This report presents the economic contribution of six (6) key fisheries and aquaculture production sectors to the Tasmanian economy for the 2020/21 financial year:

- Tasmanian Rock Lobster Fishery;
- Tasmanian Abalone Fishery;
- Tasmanian Scalefish Fishery;
- Tasmanian Salmonid Aquaculture;
- Tasmanian Pacific Oyster Aquaculture; and
- Tasmanian Abalone Aquaculture.

It details each of the above production sectors' contribution to the Tasmanian economy for the 2020/21 financial year. The work was undertaken by the Institute for Marine and Antarctic Studies at the University of Tasmania in collaboration with BDO and builds on the foundations and approach set out in *2017/18 National Fisheries and Aquaculture Industry Contributions Study* (FRDC 2017-210). The estimates are based on the best available information at the time of writing and apply input-output modelling (developed by BDO[1]) that uses the economic profiles and conversion to basic prices as provided by IMAS. Results are shown for Gross Value Added (GVA), the contribution to Household Income, the number of persons employed and contribution to the total full-time equivalent (FTE) workforce. To generate these results, the framework recommended in *Australian Fisheries and Aquaculture Industry: Economic Contributions Estimates - Practitioner Guidelines 2019* (IMAS 2020) was applied. For the analysis in this report, the contribution of immediate processing[2] or farm gate retail activity is not included.

This report represents a significant step forward in measuring and monitoring the contribution of Tasmania's seafood production activities to the economic prosperity and wellbeing of Tasmanians. The report represents one component of an overarching programme aimed at establishing an ongoing fisheries and aquaculture assessment to fill key knowledge gaps for living marine resources in Tasmania. This information is important for the management of Tasmania's fisheries and aquaculture production. For example, fisheries in Tasmania are currently managed under the provisions of the *Living Marine Resources Management Act 1995* (the LMRMA). Among other things, the LMRMA requires managers to take account of the community's needs and interest in the State's living marine resources. To this end, the current report aims to provide baseline information for several key production sectors from which changes can be monitored and measured over time, and which provides data to support evidence-based decision-making. Other components of this research programme include the assessment of indicators for social and economic performance, such as employment and livelihood provision, public and private share of economic returns, quota market operation and performance, and the assessment of management costs relevant to Tasmanian sectors.

[1] An extended input-output model known as the RISE model (Regional Industry Structure and Employment) has been developed by BDO for this type of analysis. The model describes the interlinkages between different industries and different types of economic activity within a regional economy.

[2] 'Immediate processing' in this report refers to Tasmanian seafood processing activities that are integrated with primary production activities (for example, oyster-shucking/processing that occurs on-farm prior to the post-harvest sector).

This report relates to the fishing and aquaculture production and does not account for the direct and flow-on effects of immediate seafood processing (which may be supplied by production sectors). Where sectors involve large integrated value chains, such as salmonid and pacific oyster aquaculture, effort has been made in our analysis to separate the production components of the value chain from the post-production elements for the purposes of this estimation. Doing this ensures that all estimates for each of the six fishery and aquaculture sectors presented in this report have been undertaken on an equivalent basis.

Understanding the economic contribution of the seafood processing sector is a significant area for further research in advancing our knowledge of the economy broadly associated with fishing and aquaculture in Tasmania. **Because of data and time limitations, it was not possible to include the processing sector for the estimates in this report. However, we recognise the central role of this sector in ensuring sales and marketability, and in assisting to coordinate activities in the catching sector for some fisheries.** Increased data availability, and investment of time to consider the connection between multi-species processing activities and production across multiple fishing and aquaculture sectors would provide a basis for the inclusion of this sector in future assessments.

This report considers the economic contribution of key fishery and aquaculture industries in Tasmania. The information in this report is generalised to a 'whole-of-fleet' or 'whole-of-industry' level and does not consider the individual conditions faced by specific operators. **The estimates in this report were prepared after the outbreak of the *SARS-CoV-2* (COVID-19) virus, and the emergence of trade issues for certain sectors, and relate to a time during which many businesses were significantly impacted by these events.**

The results presented in this report have undergone a quality assurance and benchmarking process in collaboration with BDO, which has been based on the comparison of key output metrics for the direct and total contribution of each sector to a database of studies from similar seafood sectors from around Australia.

2 Modelling approach, scope, and limitations

2.1 Scope

The estimates reported include economic contributions of commercial fishing production activity and aquaculture production activity. The estimates are for economic contributions of these activities in Tasmania to the Tasmanian economy.

Commercial activities by Indigenous fishing and aquaculture businesses are included in commercial fishing and aquaculture.

Commercial charter fishing activity is excluded. Fishery and aquaculture sector management activity (other than where these costs are recovered through licence fees) is excluded. Seafood processing of either locally produced or imported seafood is excluded. The analysis relates to the primary production units only (i.e., the harvesting or farming activities).

The economic activity of sectors that supply goods and services to the commercial fishing and aquaculture industry are included in the analysis as flow-on effects from the expenditures by commercial fishing and aquaculture industries. This includes fishing support services and aquaculture support services.

The contributions of Tasmanian fisheries and aquaculture to the rest of Australia are outside the scope of this report.

2.2 Comparisons to other sectors

Consistent with the national project report for FRDC 2017-210, *2017/18 National Fisheries and Aquaculture Industry Contributions Study* (FRDC 2019), comparisons of the economic contribution of commercial fisheries and recreational fisheries (made as fishing-related expenditures generate direct and indirect economic impacts) need to be made cautiously. The two activities are fundamentally different and require different modelling approaches, and comparisons can only be made where estimates are comprehensive. For commercial fisheries this requires that estimates include backward and forward linked sectors (for example, boat building, as well as seafood retail sectors). For recreational fisheries this requires that only expenditures that are directly attributable to fishing are included in the estimate.

The use of estimates of economic contribution to predict the impact on a regional economy of changes in resource allocation between commercial and recreational fisheries can complement benefit cost analysis methodologies. However, it would require further knowledge to determine how inputs would be redeployed in the economy by other sectors where commercial fishing is no longer occurring, and how recreational fishers would spend their discretionary income on substitutable activities were they not able to recreationally catch fish.

2.3 Limitations

The main limitations are due to data gaps and issues with data quality for some sectors. Limited data was available to estimate the contributions of the processing sector, and as such the estimates for this sector have been omitted from the current report. Similarly, the estimates present an incomplete profile of economic contributions made along the seafood supply chain, as immediate and secondary processing and retail sectors are not included due to lack of data. Addressing this by collecting data on these sectors presents an opportunity to produce more comprehensive estimates in future.

3 Definition of terms

Employment is a measure of the number of working proprietors, managers, directors, and other employees, in terms of the number of jobs (employment – total) and the number of full-time equivalent (FTE) jobs (employment – FTE). For this study we consider 1 FTE as being equivalent to 37.5 hours of work per week.

Gross product represents the total dollar value of all 'final' goods and services consumed during a specific period and is considered a measure of the total size of the economy. At the national level, gross product is referred to as Gross Domestic Product (GDP); at the state level it is referred to as Gross State Product (GSP); and at a regional level it is called Gross Regional Product (GRP). Contribution to gross product is measured as the value of output less the cost of goods and services (including imports) used in producing that output. Gross product can be measured as household income plus gross operating surplus (business profit) and the total of all taxes, less subsidies paid to the government.

Gross Value Added (GVA): GVA represents the value of all goods and services produced in an industry, minus the cost of all inputs and raw materials used to produce those goods or services. It also represents the total household income (defined below) and gross operating surplus generated by the industry over a time-period. In this report GVA provides a basis for measuring the net contribution of a fishing or aquaculture industry to the Tasmanian economy.

GVA is easier to estimate than gross product (defined above) at the industry level because it *excludes* the value of net taxes (taxes minus subsidies). Net taxes are hard to estimate at this level because money that is levied on buying or selling specific products (e.g., fuel excise, stamp duties, luxury car tax, etc.) is difficult to allocate between the buyers and sellers of those products. For example, when a tax is levied on the seller of a product, that firm may increase the price of their production outputs and thereby 'pass through' a part of the tax to buyers. These proportions are difficult to estimate at small scales. The National Accounts report GVA, but do not report GDP, at the industry level (in part due to this difficulty).

Household income is a measure of wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour including overtime payments, employer's superannuation contributions and income tax, but excluding payroll tax. Household income provides a measure of the wages and salaries associated with the employment contribution of a fishing or aquaculture industry.

Output measures the gross revenue from goods and services produced by commercial organisations (e.g., landed value of rock lobster). Output must be used with care as it includes elements of double counting (for e.g., the value of pacific oysters produced in one year may include the output of spat from a previous year).

4 Definition of direct, indirect, and total contribution

Estimates of economic contribution for GVA, employment, and household income are presented in this report in terms of:

- direct contribution;
- flow-on (or indirect) contribution; and
- total contribution.

Direct contribution measures the initial effects (GVA, employment, and household income) that are generated by a fishery or aquaculture sector within the Tasmanian economy for 2020/21. This includes spending on wages (to employees, and business owners) and the purchase of fishing or production inputs. The total direct effect is the sum of all the initial effects of a fishing or aquaculture production activity on the Tasmanian economy for the 2020/21 year.

Flow-on (or indirect) contribution occurs due to the re-spending by households (consumption induced indirect effects) or re-spending of business (production induced indirect effects) following receipt of the direct spending of the industry. Production-induced effects are additional GVA, employment, and household income resulting from re-spending by firms (e.g., boat maintenance contractors, fish feed suppliers) that receive payments from goods or services provided to a fishing or aquaculture industry. Consumption-induced effects are additional GVA, employment, and household income that results from re-spending by households that receive income from employment in activities that are either directly or indirectly associated with an industry. The total indirect effect is the sum of the consumption and production induced components.

The total contribution is the sum of direct and flow-on (indirect) contribution for a fishery or aquaculture sector.

5 Economic profiles for fishing and aquaculture production

The measurement of economic contribution is based on economic profiles (receipts from fish sales, expenditures, and employment) identified for fishing and aquaculture production in Tasmania. These profiles represent the direct economic contribution of each industry (the 'initial round' effects, before considering the spending and re-spending of individuals and business in the economy). In this study, the direct industry output, GVA, number of employed persons, and household income are estimated from primary data collected from Tasmanian fishery and aquaculture industries and from records maintained by NRE Tas. Where primary data was not available for an industry, economic profiles were developed using published secondary sources and expert opinion. Published sources were combined with NRE Tas records for estimating FTE employment in the case of all fishery and aquaculture sectors. The data sources used for each sector are outlined in Section 9.

In all cases, direct GVA is the sum of direct household income plus gross operating surplus. Direct household income was estimated as wages and salaries paid in-cash and in-kind, drawings by owner operators and other payments to labour including overtime payments, employer's superannuation contributions and income tax, but excluding payroll tax. Gross operating surplus was estimated as the value of output less the cost of goods and services (including imports) used in producing the output (the cost of production).

The reported results relate to the catching or primary production sectors (excluding immediate processing, and farm gate retail operations), and do not account for the direct and flow-on benefits of seafood processing (which may also be supplied by the catching or production sectors). ***Understanding the economic contribution of seafood processing is an important area for further research in understanding the total of all economic activity that is broadly associated with Tasmania's fishing and aquaculture industries.***

Management costs in this study have been limited to those recovered through licence fees. In a fully cost–recovered fishery or aquaculture sector, licence fees would reflect the total management cost associated with each sector and are used as a measure of management costs. For most seafood industries, however, the cost of management is not fully recovered in licence fees, and this is a limitation of our results that may mean that the contributions reported in this study *slightly* under-estimate the direct GVA and flow-on effects for each sector (i.e., by potentially excluding some relevant government activity).

6 Data for economic profiles for fishing and aquaculture production

This section broadly describes the data that are used to estimate the economic profile for each fishery and aquaculture sector. This data was collected from primary sources (databases and surveys) and published sources, where appropriate, for the individual fisheries and aquaculture sectors. The data includes wild catch/farm production, product prices, cost of production, licence fees, and employment (i.e., total persons and FTE). Wherever possible, the same data sources have been used in estimating an industry's total revenue as used in estimating its total production costs, so that both components of each economic profile will be on a consistent basis. A summary of the data sources used in the case of each fishery and aquaculture sector is provided in Section 9.

Catch/production: fishery catch and aquaculture production data by individual fishery and aquaculture sector was sourced from the NRE Tas Fisheries Licensing and Monitoring System (FILMS) database and aquaculture data maintained by the department in Tasmania.

Price: price data for fishery catch and aquaculture production was sourced from IMAS surveys of industry, the NRE Tas FILMS database or aquaculture data maintained by the department.

Costs of production: the costs of production represent the business costs of an average firm in each fishing or aquaculture industry. The cost of production data is used to establish the direct and indirect contributions to GVA (i.e., it is used to calculate profit and wages of businesses and their patterns of expenditure into the Tasmanian economy). The specific cost items vary from industry to industry with changes in the production technology and business structure of the average firm (e.g., different business structures vary in terms of regulatory requirements, rates of taxation, and the treatment of business profit in terms of proprietor income versus income that accrues to an incorporated entity). In general, the following cost items were included in case of the fishing industries:

Variable costs:

- fuel, oil, and grease for the boat (net of fuel rebate)
- bait
- ice
- provisions
- crew payments
- Imputed owner/operator and unpaid family labour (variable component)

Fixed costs:

- imputed owner/operator and unpaid family labour (fixed component)
- repairs & maintenance: ongoing (slipping, painting, motor)
- fishing equipment purchase and repairs (nets, pots, lines, etc.)
- insurance
- industry fees (including membership and association expenses collected by NRE Tas and disbursed directly to industry bodies).
- office & business administration (communication, stationery, accountancy fees)
- interest on loan repayments and overdraft
- leasing costs

Aquaculture cost of production included similar fixed costs, and common variable costs were as per below:

- feed
- fry/fingerlings/spat
- electricity
- fuel & oil
- repairs & maintenance
- paid labour
- other (e.g., security, packaging)

Employment (FTE & number of persons): employment data (total number of persons) for individual fishery and aquaculture sectors was sourced from the NRE Tas FILMS database and aquaculture data maintained by the department. Total employment describes the number of people directly involved in the fishery or aquaculture production sector. In all cases, the estimate of FTE employment has been derived from secondary sources in combination with primary data for total number of employed persons.

Licence fees: information on licence fees was obtained from the same source as cost of production data for each fishery and aquaculture sector in this study. Further information on data sources is presented in Section 9.

7 Process of conversion to basic prices

Once constructed, the expenditures in each economic profile on the various fixed and variable costs for the financial year must be allocated to the defined destinations in the input-output model (these are industry sectors, margin sectors, imports, taxes less subsidies, wages and salaries, and other value added). This process is known as conversion from purchasers' prices to basic prices and requires information on the supply chains for goods and services purchased by each fishery and aquaculture sector. This stage of our analysis has relied on detailed feedback from key industry contacts, review, and consultation with BDO, as well as information and data from the published sources as listed in Section 9.2. This stage of our analysis was reviewed and validated by BDO.

8 Economic contribution results

The Tasmanian community achieves a multiplier on direct spending by its local industries, including its fishery and aquaculture sectors. Direct spending by these sectors creates flow-on benefits to the Tasmanian economy through business and household re-spending, including from the flow of new credit for housing development that is sustained by regular employment in the State. The following subsections present a breakdown of direct spending and economic contribution for the fishery and aquaculture sectors reported in this study. Total direct spending in each case represents the total costs incurred by businesses in the sector, excluding quota rental payments and transfer payments that occur between participants (e.g., the abalone dive fee). From each sector, the total direct spending represents a flow of money immediately engaged in the Tasmanian economy for the 2020/21 year.

8.1 Tasmanian Rock Lobster Fishery

8.1.1 Tasmanian Rock Lobster Fishery – Direct Spending

The following figure shows a breakdown of direct spending by the Tasmanian Rock Lobster fishery for the 2020/21 year. These estimates are based on the best available information at the time of writing and show spending into three categories: wages and salaries paid to households ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports').

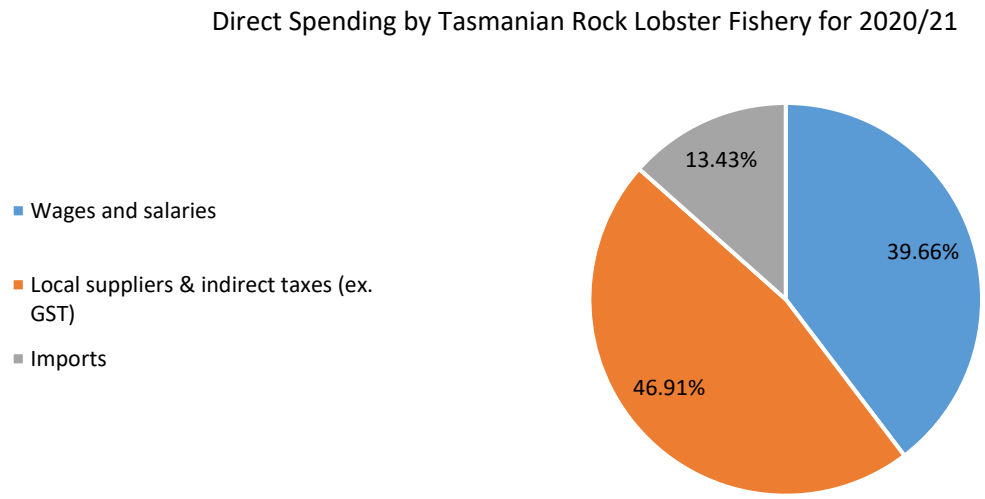

Figure 1: Breakdown of direct spending by the Tasmanian Rock Lobster fishery for the 2020/21 year. Spending is shown in three categories: wages and salaries paid to employees and drawn by business owners ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports'). This pie chart shows a breakdown in percentages of the total spending (total cost) by firms in the sector. Quota rental costs are a component of the gross operating surplus (profit) generated by the sector, and therefore do not appear in this chart.

8.1.2 Tasmanian Rock Lobster Fishery – Economic Contribution

This section presents an estimate for the economic contribution of Rock Lobster fishery to the Tasmanian economy[3]. Figure 2 shows results for contribution to Gross Value Added (GVA) and Household Income[4]; and Figure 3 shows the contribution to number of persons employed in Tasmanian and the estimated contribution to the total full-time equivalent (FTE) workforce in the State[5]. In the case of GVA and Household Income, the results are shown for 'Direct', 'Production Induced' and 'Consumption Induced' components. For Employed Persons and Employment (FTE), results are shown for 'Direct' and 'Total Indirect'. In the standard input-output model, the so-called 'direct effects' arise from the initial spending of an industry into the other sectors of the economy. This includes the spending on wages (paid to employees) and the purchase of inputs. The 'indirect effects' arise from re-spending by households in the economy (the 'consumption induced' indirect effects) and by businesses (the 'production induced' indirect effects). The 'total indirect effect' is the sum of the consumption and production induced components. *(note: the results in this section do not include activities within the seafood processing sector.).*

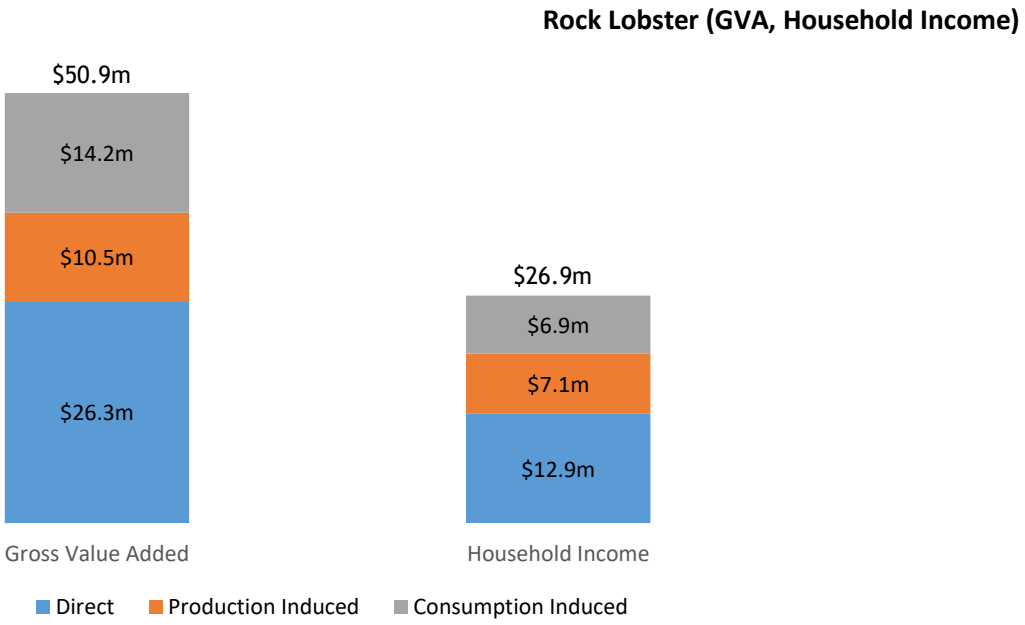

Figure 2: Contribution of the Rock Lobster fishery to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

[3] The input-output modelling was provided by BDO Services Pty Ltd (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared after the outbreak of the *SARS-CoV-2* (COVID-19) virus and the emergence of trade disruptions.

[4] GVA represents the value of all goods and services produced in an industry, minus the cost of all inputs and raw materials consumed to produce those products, and provides a measure of the net contribution of an activity to the economy (excluding net taxes). Household income represents wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour.

[5] This estimate for FTE employment should be treated with caution. It has been derived using a range of secondary sources in combination with some primary data extracted from the FILMS database. The number of persons employed was obtained directly from the FILMS database, and is considered robust.

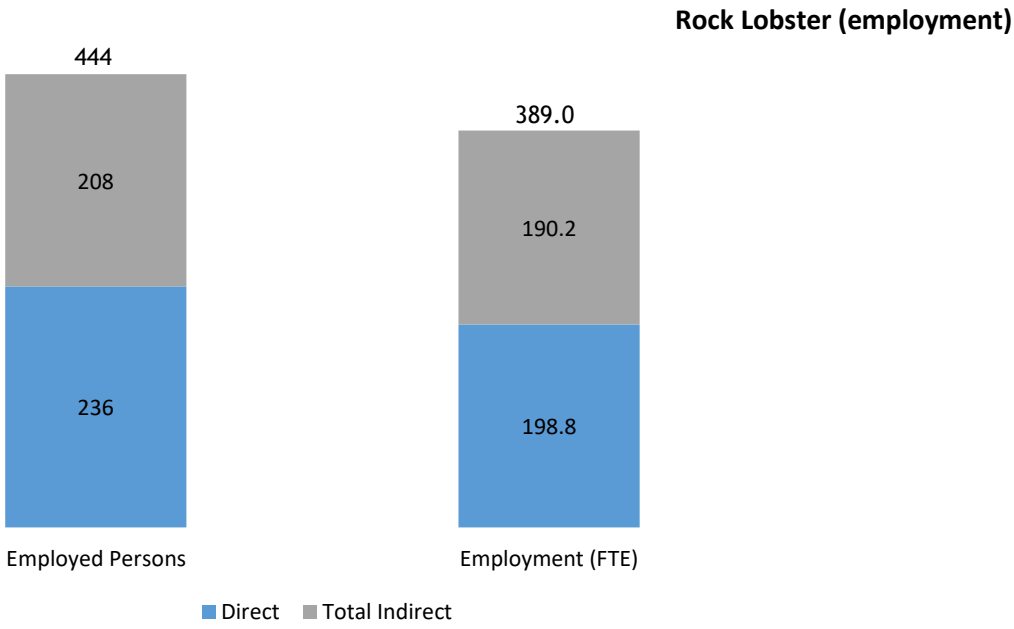

Figure 3: Contribution of the Rock Lobster fishery to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 1: Economic contribution of the Tasmanian Rock Lobster Fishery to Tasmania, 2020/21

Sector	Output ($m)	GVA ($m)	Household Income ($m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Fishing	45.8	26.3	12.9	199	236
Flow-on effects					
By component					
Production induced		*10.5*	*7.1*	*87*	*89*
Consumption induced		*14.2*	*6.9*	*103*	*119*
By top 10 sectors					
Ownership of Dwellings		*3.7*	*0.0*	*0*	*0*
Public Admin & Regltry Serv		*2.8*	*2.3*	*22*	*23*
Other Machinery & Equipment		*1.9*	*1.5*	*17*	*16*
Finance		*1.6*	*0.3*	*4*	*4*
Retail Trade		*1.4*	*1.0*	*19*	*25*
Wholesale Trade		*1.3*	*0.9*	*10*	*9*
Health & Community Serv		*1.3*	*1.3*	*11*	*13*
Insurance & Other Fin Serv		*1.0*	*0.7*	*8*	*8*
Prof Scientific Tech Serv		*0.9*	*0.9*	*12*	*12*
Fishing, Hunting & Trapping		*0.7*	*0.1*	*3*	*3*
Other Sectors		*8.0*	*5.0*	*84*	*94*
Total Flow-on		24.6	14.0	190	208
Total		**50.9**	**26.9**	**389**	**444**
Total/Direct		*1.9*	*2.1*	*2.0*	*1.9*

8.2 Tasmanian Abalone Fishery

8.2.1 Tasmanian Abalone Fishery – Direct Spending

The following figure shows a breakdown of direct spending by the Tasmanian Abalone fishery for the 2020/21 year. These estimates are based on the best available information at the time of writing and show spending into three categories: wages and salaries paid to households ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports').

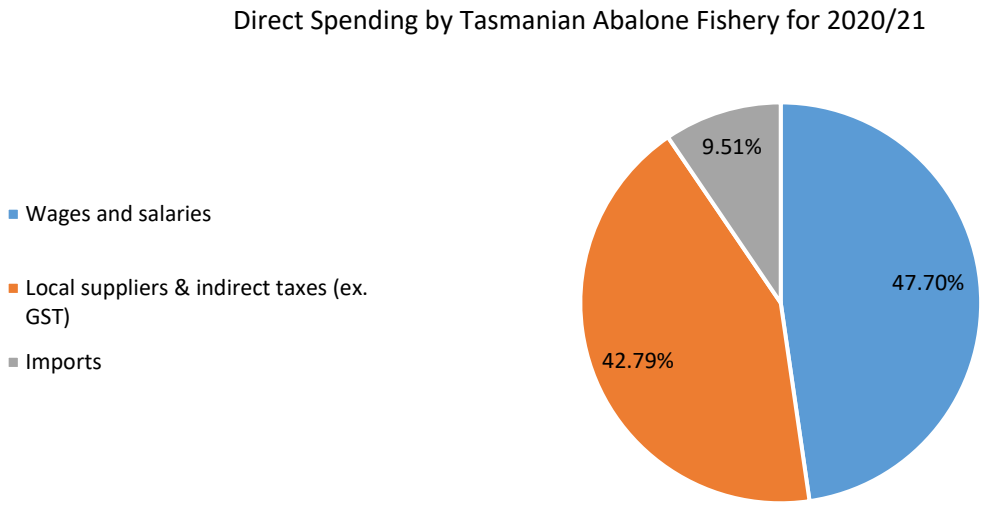

Figure 4: Breakdown of direct spending by the Tasmanian Abalone fishery for the 2020/21 year. Spending is shown in three categories: wages and salaries paid to employees and drawn by business owners ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports'). This pie chart shows a breakdown in percentages of the total spending (total cost) by firms in the sector. Quota rental costs are a component of the gross operating surplus (profit) generated by the sector, and therefore do not appear in this chart. The chart also excludes transfer payments (diver fees) that happen between participants in the fishery.

8.2.2 Tasmanian Abalone Fishery – Economic Contribution

This section presents an estimate for the economic contribution of Abalone fishery to the Tasmanian economy[6]. Figure 5 shows results for contribution to Gross Value Added (GVA) and Household Income[7]; and Figure 6 shows the contribution to number of persons employed in Tasmanian and the estimated contribution to the total full-time equivalent (FTE) workforce in the State[8]. In the case of GVA and Household Income, the results are shown for 'Direct', 'Production Induced' and 'Consumption Induced' components. For Employed Persons and Employment (FTE), results are shown for 'Direct' and 'Total Indirect'. In the standard input-output model, the so-called 'direct effects' arise from the initial spending of an industry into the other sectors of the economy. This includes the spending on wages (paid to employees) and the purchase of inputs. The 'indirect effects' arise from re-spending by households in the economy (the 'consumption induced' indirect effects) and by businesses (the 'production induced' indirect effects). The 'total indirect effect' is the sum of the consumption and production induced components. *(note: the results in this section do not include activities within the seafood processing sector. The imputed wage for a small amount of quota holders' time related to admin tasks for quota is also unaccounted for in the Tasmanian Abalone Fishery).*

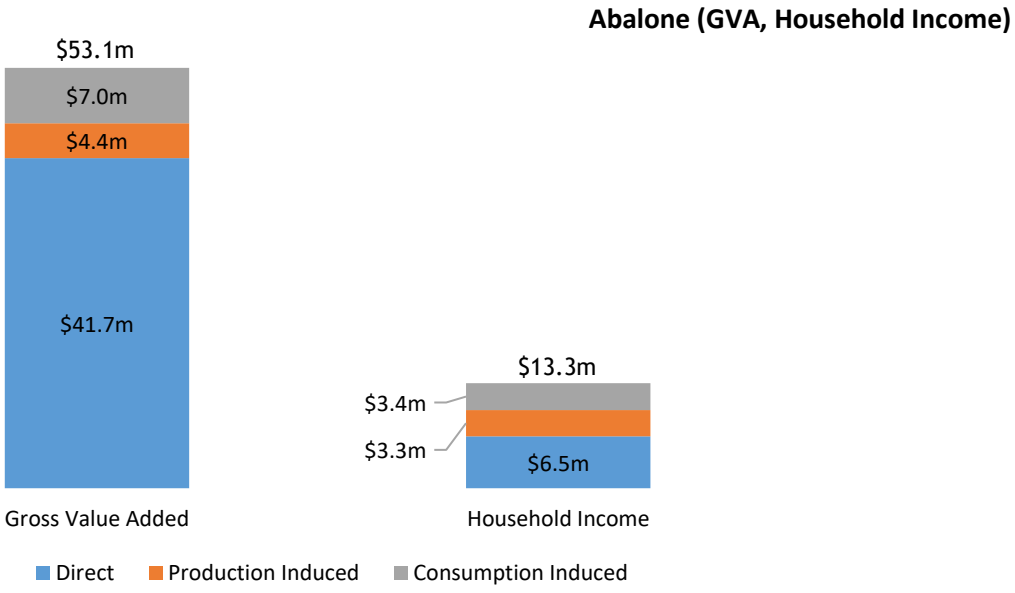

Figure 5: Contribution of the Abalone fishery to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

[6] The input-output modelling was provided by BDO Services Pty Ltd (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared after the outbreak of the *SARS-CoV-2* (COVID-19) virus and the emergence of trade disruptions.

[7] GVA represents the value of all goods and services produced in an industry, minus the cost of all inputs and raw materials consumed to produce those products, and provides a measure of the net contribution of an activity to the economy (excluding net taxes). Household income represents wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour.

[8] This estimate for FTE employment should be treated with caution. It has been derived using a range of secondary sources in combination with some primary data extracted from the FILMS database. The number of persons employed was obtained directly from the FILMS database, and is considered robust.

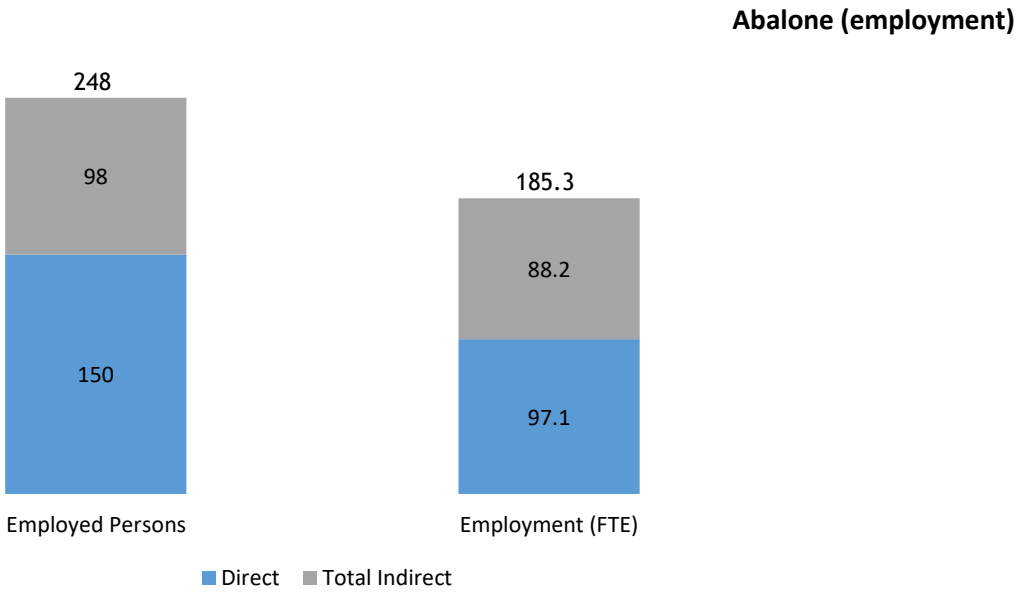

Figure 6: Contribution of the Abalone fishery to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 2: Economic contribution of the Tasmanian Abalone Fishery to Tasmania, 2020/21

Sector	Output ($m)	GVA ($m)	Household Income ($m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Fishing	48.8	41.7	6.5	97	150
Flow-on effects					
By component					
Production induced		*4.4*	*3.3*	*38*	*40*
Consumption induced		*7.0*	*3.4*	*51*	*59*
By top 10 sectors					
Public Admin & Regltry Serv		*2.6*	*2.1*	*20*	*21*
Ownership of Dwellings		*1.8*	*0.0*	*0*	*0*
Retail Trade		*0.7*	*0.5*	*10*	*12*
Finance		*0.7*	*0.1*	*2*	*2*
Health & Community Serv		*0.6*	*0.6*	*6*	*7*
Prof Scientific Tech Serv		*0.4*	*0.4*	*6*	*6*
Wholesale Trade		*0.4*	*0.3*	*3*	*3*
Communication Services		*0.3*	*0.1*	*1*	*1*
Insurance & Other Fin Serv		*0.3*	*0.2*	*2*	*3*
Education & Training		*0.3*	*0.3*	*4*	*5*
Other Sectors		*3.1*	*2.0*	*35*	*39*
Total Flow-on		11.4	6.7	88	98
Total		**53.1**	**13.3**	**185**	**248**
Total/Direct		*1.3*	*2.0*	*1.9*	*1.7*

8.3 Tasmanian Scalefish Fishery

8.3.1 Tasmanian Scalefish Fishery – Direct Spending

The following figure shows a breakdown of direct spending by the Tasmanian Scalefish fishery for the 2020/21 year. These estimates are based on the best available information at the time of writing and show spending into three categories: wages and salaries paid to households ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports').

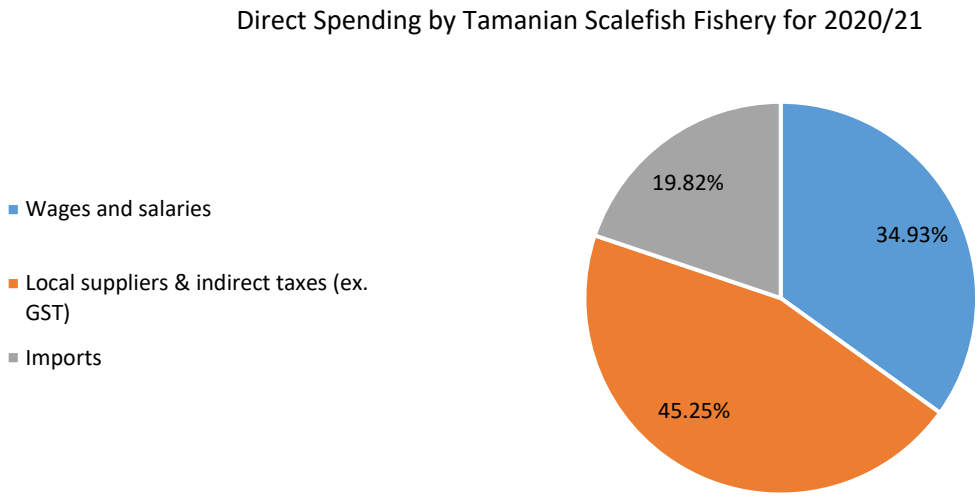

Figure 7: Breakdown of direct spending by the Tasmanian Scalefish fishery for the 2020/21 year. Spending is shown in three categories: wages and salaries paid to employees and drawn by business owners ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports'). This pie chart shows a breakdown in percentages of the total spending (total cost) by firms in the sector. Quota rental costs are a component of the gross operating surplus (profit) generated by the sector, and therefore do not appear in this chart.

8.3.2 Tasmanian Scalefish Fishery – Economic Contribution

This section presents an estimate for the economic contribution of Scalefish fishery to the Tasmanian economy[9]. Figure 8 shows results for contribution to Gross Value Added (GVA) and Household Income[10]; and Figure 9 shows the contribution to number of persons employed in Tasmanian and the estimated contribution to the total full-time equivalent (FTE) workforce in the State[11]. In the case of GVA and Household Income, the results are shown for 'Direct', 'Production Induced' and 'Consumption Induced' components. For Employed Persons and Employment (FTE), results are shown for 'Direct' and 'Total Indirect'. In the standard input-output model, the so-called 'direct effects' arise from the initial spending of an industry into the other sectors of the economy. This includes the spending on wages (paid to employees) and the purchase of inputs. The 'indirect effects' arise from re-spending by households in the economy (the 'consumption induced' indirect effects) and by businesses (the 'production induced' indirect effects). The 'total indirect effect' is the sum of the consumption and production induced components. *(note: the results in this section do not include activities within the seafood processing sector.).*

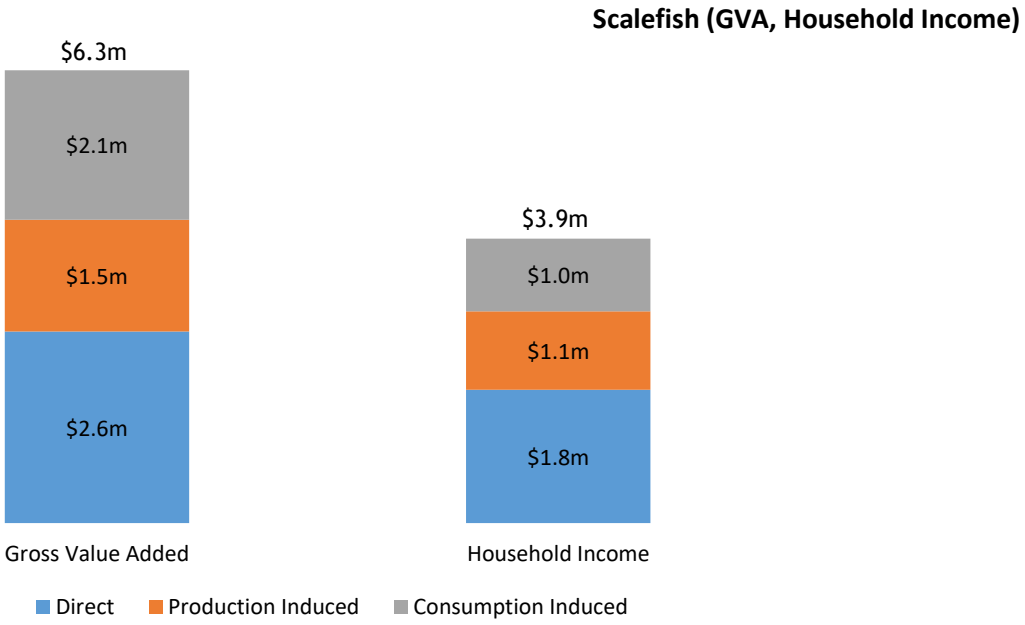

Figure 8: Contribution of the Scalefish fishery to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

[9] The input-output modelling was provided by BDO Services Pty Ltd (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared after the outbreak of the *SARS-CoV-2* (COVID-19) virus and the emergence of trade disruptions.

[10] GVA represents the value of all goods and services produced in an industry, minus the cost of all inputs and raw materials consumed to produce those products, and provides a measure of the net contribution of an activity to the economy (excluding net taxes). Household income represents wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour.

[11] This estimate for FTE employment should be treated with caution. It has been derived using a range of secondary sources in combination with some primary data extracted from the FILMS database. The number of persons employed was obtained directly from the FILMS database, and is considered robust.

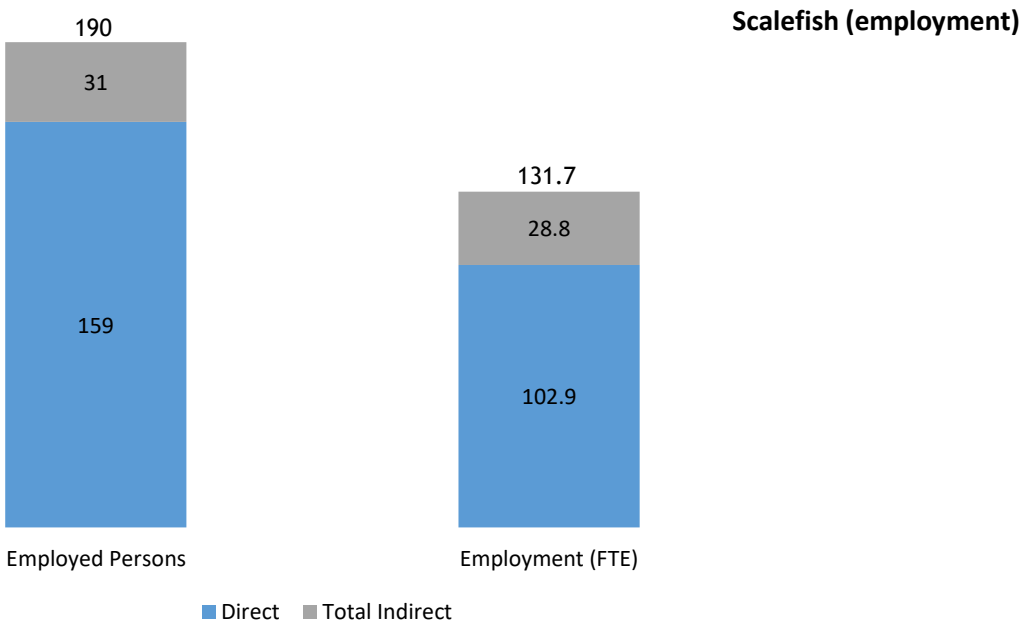

Figure 9: Contribution of the Scalefish fishery to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania. Direct employment in this fishery also includes part-time operators, who work primarily in other fisheries but take occasional catches from Scalefish stocks.

Table 3: Economic contribution of the Tasmanian Scalefish Fishery to Tasmania, 2020/21

Sector	Output ($m)	GVA ($m)	Household Income ($m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Fishing	6.0	2.6	1.8	103	159
Flow-on effects					
By component					
Production induced		*1.5*	*1.1*	*13.7*	*14*
Consumption induced		*2.1*	*1.0*	*15.0*	*17*
By top 10 sectors					
Ownership of Dwellings		*0.5*	*0.0*	*0*	*0*
Other Machinery & Equipment		*0.4*	*0.3*	*4*	*3*
Finance		*0.3*	*0.0*	*1*	*1*
Public Admin & Regltry Serv		*0.2*	*0.2*	*2*	*2*
Retail Trade		*0.2*	*0.2*	*3*	*4*
Wholesale Trade		*0.2*	*0.1*	*2*	*1*
Health & Community Serv		*0.2*	*0.2*	*2*	*2*
Prof Scientific Tech Serv		*0.2*	*0.2*	*2*	*2*
Transport Support & Storage		*0.1*	*0.1*	*1*	*1*
Insurance & Other Fin Serv		*0.1*	*0.1*	*1*	*1*
Other Sectors		*1.1*	*0.7*	*12*	*14*
Total Flow-on		3.6	2.1	29	31
Total		**6.3**	**3.9**	**132**	**190**
Total/Direct		*2.4*	*2.1*	*1.3*	*1.2*

8.4 Tasmanian Salmonid Aquaculture

8.4.1 Tasmanian Salmonid Aquaculture – Direct Spending

The following figure shows a breakdown of direct spending by the Tasmanian Salmonid Aquaculture sector for the 2020/21 year (*note: this spending does not include processing, marketing, or post-production activities undertaken by the sector, which may also be of significance to the economy*). These estimates are based on the best available information at the time of writing and show spending into three categories: wages and salaries paid to households ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports'). *(note: estimates for salmonid aquaculture rely on secondary data and data matching methods).*

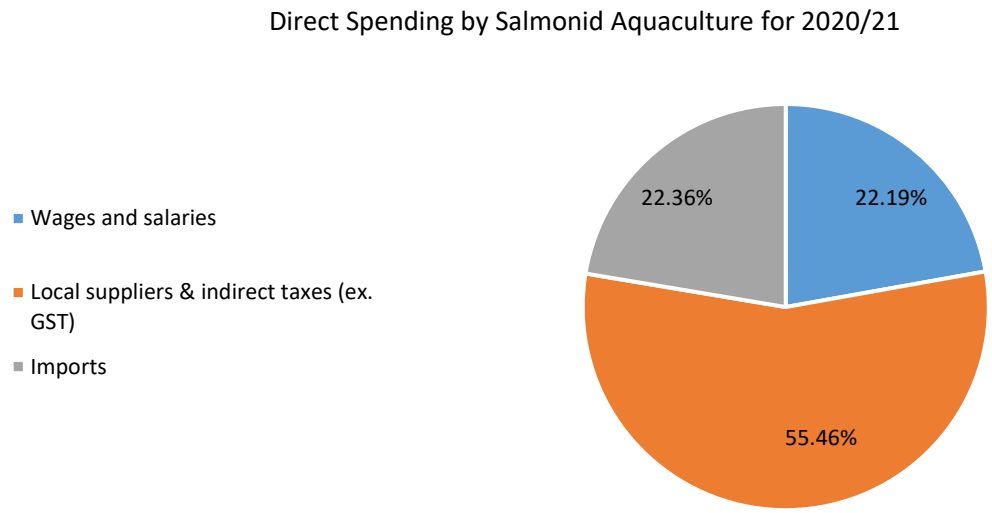

Figure 10: Breakdown of direct spending by the Tasmanian Salmonid Aquaculture sector for the 2020/21 year. Spending is shown in three categories: wages and salaries paid to employees ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports'). (note: this spending does not include processing, marketing, or post-production activities undertaken by the sector, which may also be of significance to the economy). This pie chart shows a breakdown in percentages of the total spending (total cost) by firms in this sector.

8.4.2 Tasmanian Salmonid Aquaculture – Economic Contribution

This section presents an estimate for the economic contribution of Salmonid Aquaculture to the Tasmanian economy[12]. Figure 11 shows results for contribution to Gross Value Added (GVA) and Household Income[13]; and Figure 12 shows the contribution to number of persons employed in Tasmanian and the estimated contribution to the total full-time equivalent (FTE) workforce in the State[14]. In the case of GVA and Household Income, the results are shown for 'Direct', 'Production Induced' and 'Consumption Induced' components. For Employed Persons and Employment (FTE), results are shown for 'Direct' and 'Total Indirect'. In the standard input-output model, the so-called 'direct effects' arise from the initial spending of an industry into the other sectors of the economy. This includes the spending on wages (paid to employees) and the purchase of inputs. The 'indirect effects' arise from re-spending by households in the economy (the 'consumption induced' indirect effects) and by businesses (the 'production induced' indirect effects). The 'total indirect effect' is the sum of the consumption and production induced components. *(note: the results in this section do not include activities within the seafood processing sector.).*

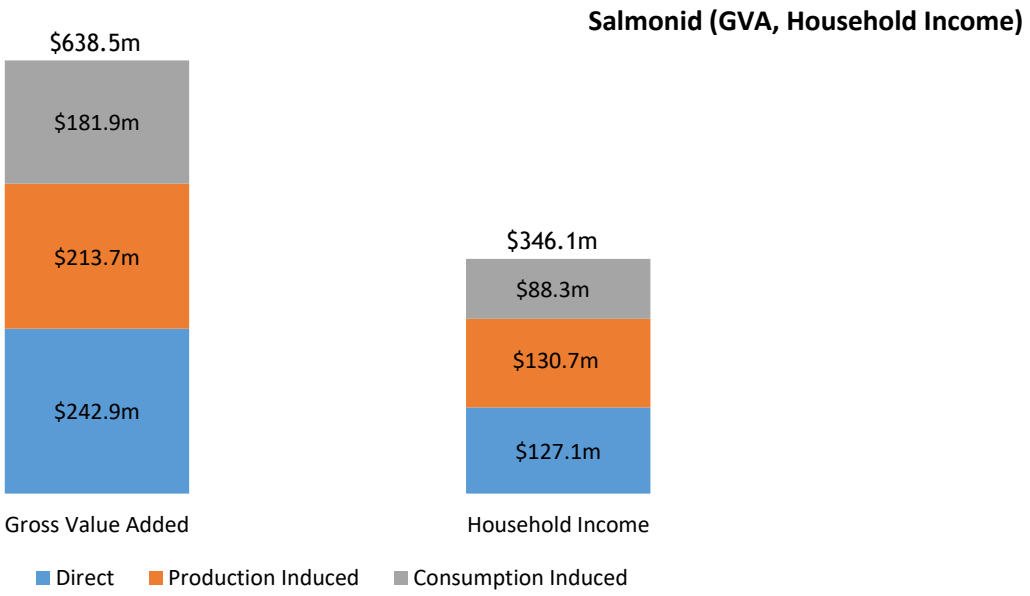

Figure 11: Contribution of Salmonid Aquaculture to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

[12] The input-output modelling was provided by BDO Services Pty Ltd (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared after the outbreak of the *SARS-CoV-2* (COVID-19) virus and the emergence of trade disruptions.

[13] GVA represents the value of all goods and services produced in an industry, minus the cost of all inputs and raw materials consumed to produce those products, and provides a measure of the net contribution of an activity to the economy (excluding net taxes). Household income represents wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour.

[14] This estimate for FTE employment should be treated with caution. It has been derived using a range of secondary sources in combination with some primary data from NRE Tas Marine Farming Branch Licensing Data. The number of persons employed was obtained directly from the NRE Tas Marine Farming Branch Licensing Data and is considered robust.

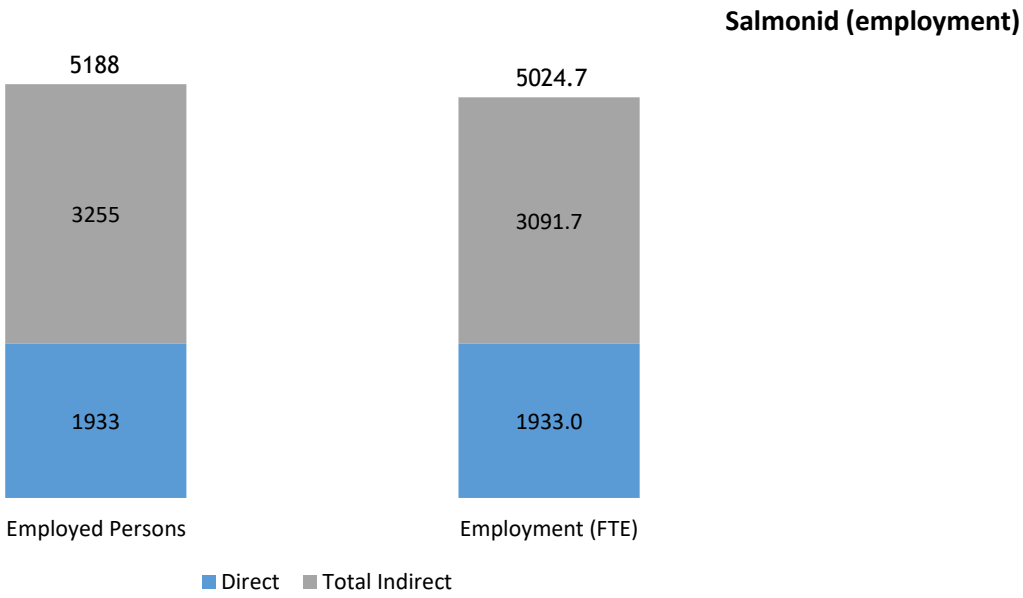

Figure 12: Contribution of Salmonid Aquaculture to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 4: Economic contribution of Tasmanian Salmonid Aquaculture to Tasmania, 2020/21

Sector	Output ($m)	GVA ($m)	Household Income ($m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Production	667.6	242.9	127.1	1,933	1,933
Flow-on effects					
By component					
Production induced		*213.7*	*130.7*	*1,770*	*1,729*
Consumption induced		*181.9*	*88.3*	*1,322*	*1,526*
By top 10 sectors					
Ownership of Dwellings		*50.6*	*21.6*	*308*	*261*
Electricity Supply		*47.7*	*0.0*	*0*	*0*
Finance		*31.2*	*27.4*	*413*	*383*
Retail Trade		*23.9*	*4.2*	*61*	*66*
Wholesale Trade		*23.9*	*16.1*	*181*	*169*
Health & Community Serv		*21.9*	*21.5*	*302*	*312*
Insurance & Other Fin Serv		*19.3*	*7.7*	*83*	*76*
Electricity Generation		*18.4*	*13.3*	*250*	*318*
Other Food Products		*16.1*	*16.1*	*138*	*164*
Prof Scientific Tech Serv		*15.6*	*12.9*	*121*	*129*
Other Sectors		*126.9*	*78.2*	*1,236*	*1,376*
Total Flow-on		395.6	219.0	3,092	3,255
Total		**638.5**	**346.1**	**5,025**	**5,188**
Total/Direct		*2.6*	*2.7*	*2.6*	*2.7*

8.5 Tasmanian Pacific Oyster Aquaculture

8.5.1 Tasmanian Pacific Oyster Aquaculture – Direct Spending

The following figure shows a breakdown of direct spending by the Tasmanian Pacific Oyster Aquaculture sector for the 2020/21 year (*note: this spending does not include processing, marketing, or post-production activities undertaken by the sector, which may also be of significance to the economy*). These estimates are based on the best available information at the time of writing and show spending into three categories: wages and salaries paid to households ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports').

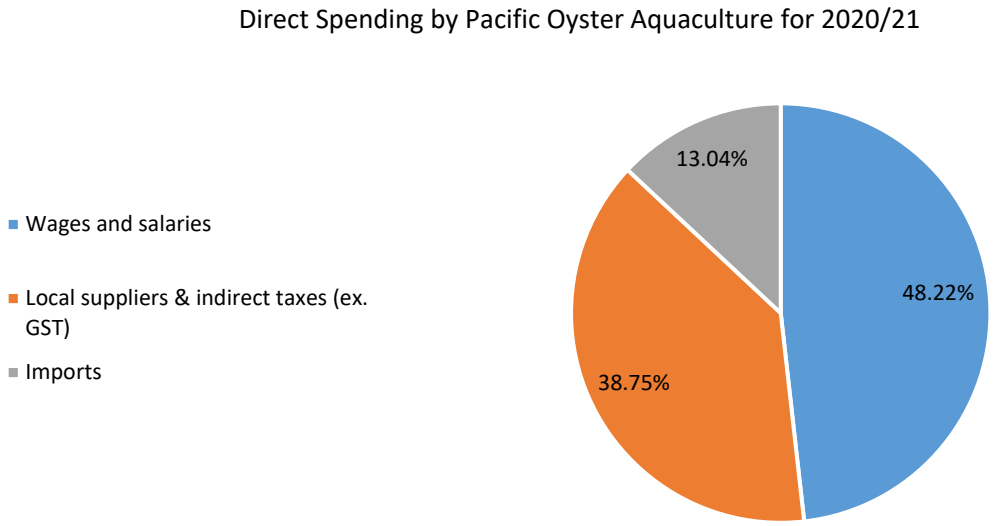

Figure 13: Breakdown of direct spending by the Tasmanian Pacific Oyster Aquaculture sector for the 2020/21 year. Spending is shown in three categories: wages and salaries paid to employees ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports'). (note: this spending does not include processing, marketing, or post-production activities undertaken by the sector, which may also be of significance to the economy). This pie chart shows a breakdown in percentages of the total spending (total cost) by firms in the sector.

8.5.2 Tasmanian Pacific Oyster Aquaculture – Economic Contribution

This section presents an estimate for the economic contribution of Pacific Oyster Aquaculture to the Tasmanian economy[15]. Figure 14 shows results for contribution to Gross Value Added (GVA) and Household Income[16]; and Figure 15 shows the contribution to number of persons employed in Tasmanian and the estimated contribution to the total full-time equivalent (FTE) workforce in the State[17]. In the case of GVA and Household Income, the results are shown for 'Direct', 'Production Induced' and 'Consumption Induced' components. For Employed Persons and Employment (FTE), results are shown for 'Direct' and 'Total Indirect'. In the standard input-output model, the so-called 'direct effects' arise from the initial spending of an industry into the other sectors of the economy. This includes the spending on wages (paid to employees) and the purchase of inputs. The 'indirect effects' arise from re-spending by households in the economy (the 'consumption induced' indirect effects) and by businesses (the 'production induced' indirect effects). The 'total indirect effect' is the sum of the consumption and production induced components. *(note: the results in this section do not include activities within the seafood processing sector.).*

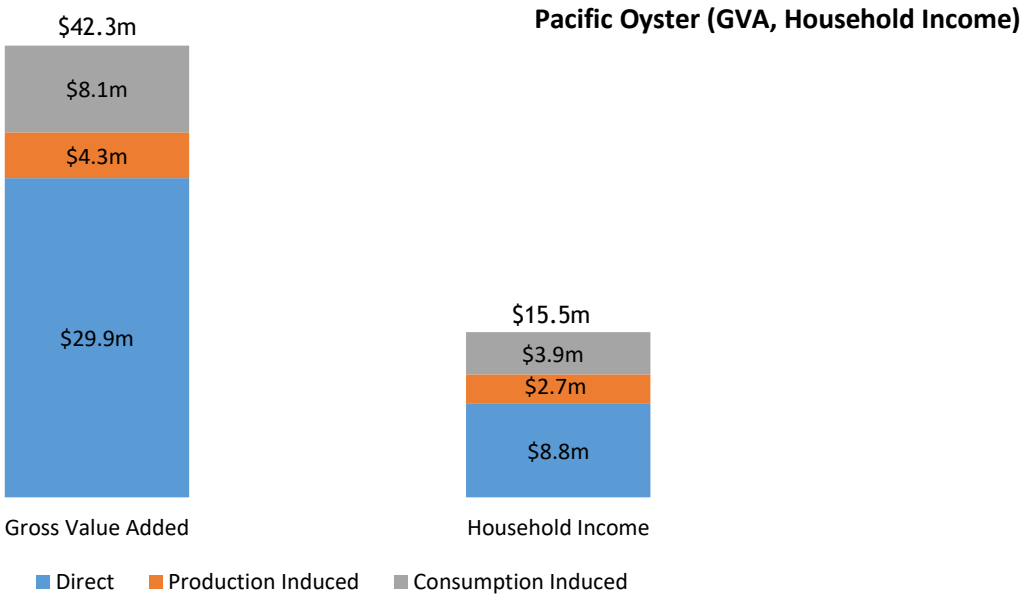

Figure 14: Contribution of Pacific Oyster Aquaculture to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

[15] The input-output modelling was provided by BDO Services Pty Ltd (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared after the outbreak of the *SARS-CoV-2* (COVID-19) virus and the emergence of trade disruptions.

[16] GVA represents the value of all goods and services produced in an industry, minus the cost of all inputs and raw materials consumed to produce those products, and provides a measure of the net contribution of an activity to the economy (excluding net taxes). Household income represents wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour.

[17] This estimate for FTE employment should be treated with caution. It has been derived using a range of secondary sources in combination with some primary data from NRE Tas Marine Farming Branch Licensing Data. The number of persons employed was obtained directly from the NRE Tas Marine Farming Branch Licensing Data and is considered robust.

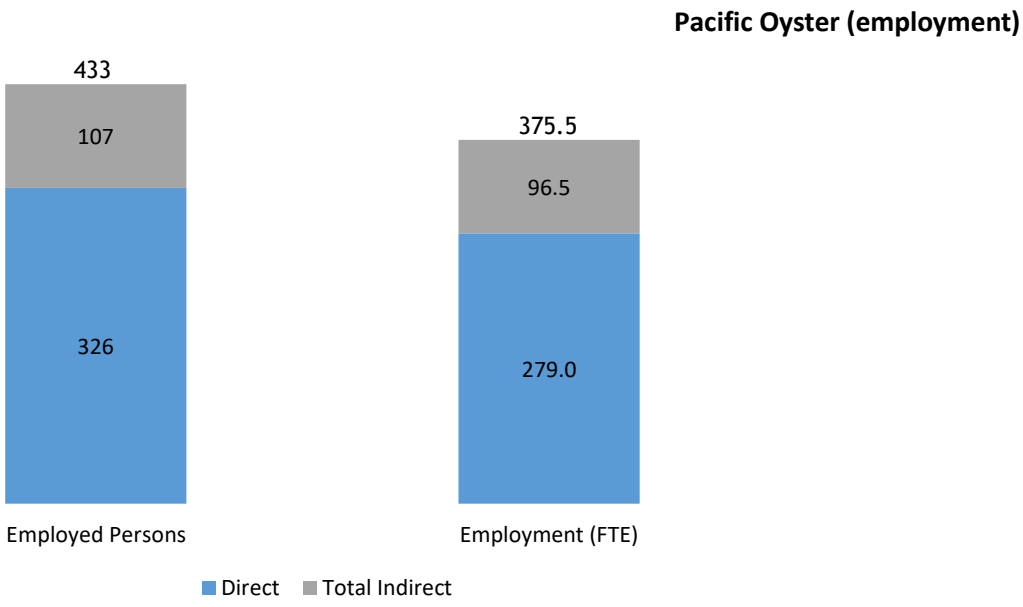

Figure 15: Contribution of Pacific Oyster Aquaculture to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 5: Economic contribution of Tasmanian Pacific Oyster Aquaculture to Tasmania, 2020/21

Sector	Output ($m)	GVA ($m)	Household Income ($m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Production	38.2	29.9	8.8	279	326
Flow-on effects					
By component					
Production induced		*4.3*	*2.7*	*37.5*	*39*
Consumption induced		*8.1*	*3.9*	*59.0*	*68*
By top 10 sectors					
Ownership of Dwellings		*2.1*	*0.0*	*0*	*0*
Finance		*0.9*	*0.2*	*2*	*2*
Retail Trade		*0.8*	*0.6*	*11*	*14*
Insurance & Other Fin Serv		*0.7*	*0.5*	*5*	*6*
Health & Community Serv		*0.7*	*0.7*	*6*	*7*
Prof Scientific Tech Serv		*0.6*	*0.6*	*8*	*9*
Wholesale Trade		*0.6*	*0.4*	*4*	*4*
Public Admin & Regltry Serv		*0.5*	*0.5*	*4*	*5*
Education & Training		*0.5*	*0.5*	*6*	*7*
Road Transport		*0.5*	*0.4*	*6*	*6*
Other Sectors		*6.6*	*2.4*	*42*	*48*
Total Flow-on		12.4	6.7	97	107
Total		**42.3**	**15.5**	**375**	**433**
Total/Direct		*1.4*	*1.8*	*1.3*	*1.3*

8.6 Tasmanian Farmed Abalone Aquaculture

8.6.1 Tasmanian Farmed Abalone Aquaculture – Direct Spending

The following figure shows a breakdown of direct spending by the Tasmanian Farmed Abalone Aquaculture sector for the 2020/21 year (*note: this spending does not include processing, marketing, or post-production activities undertaken by the sector, which may also be of significance to the economy*). These estimates are based on the best available information at the time of writing and show spending into three categories: wages and salaries paid to households ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports').

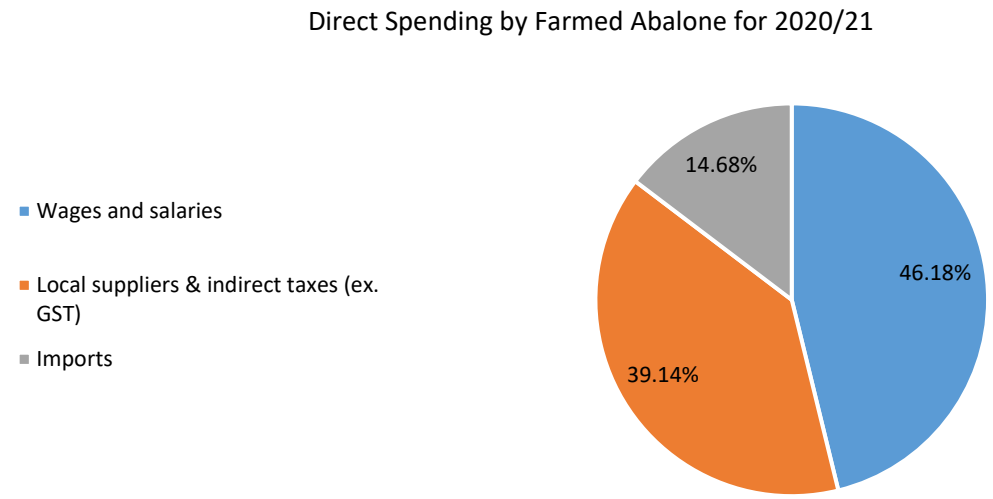

Figure 16: Breakdown of direct spending by the Tasmanian Farmed Abalone Aquaculture sector for the 2020/21 year. Spending is shown in three categories: wages and salaries paid to employees ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & indirect taxes (ex. GST)'), and payments to interstate or overseas suppliers ('Imports'). (note: this spending does not include processing, marketing, or post-production activities undertaken by the sector, which may also be of significance to the economy). This pie chart shows a breakdown in percentages of the total spending (total cost) by firms in the sector.

8.6.2 Tasmanian Farmed Abalone Aquaculture – Economic Contribution

This section presents an estimate for the economic contribution of Farmed Abalone Aquaculture to the Tasmanian economy[18]. Figure 17 shows results for contribution to Gross Value Added (GVA) and Household Income[19]; and Figure 18 shows the contribution to number of persons employed in Tasmanian and the estimated contribution to the total full-time equivalent (FTE) workforce in the State[20]. In the case of GVA and Household Income, the results are shown for 'Direct', 'Production Induced' and 'Consumption Induced' components. For Employed Persons and Employment (FTE), results are shown for 'Direct' and 'Total Indirect'. In the standard input-output model, the so-called 'direct effects' arise from the initial spending of an industry into the other sectors of the economy. This includes the spending on wages (paid to employees) and the purchase of inputs. The 'indirect effects' arise from re-spending by households in the economy (the 'consumption induced' indirect effects) and by businesses (the 'production induced' indirect effects). The 'total indirect effect' is the sum of the consumption and production induced components. *(note: the results in this section do not include activities within the seafood processing sector.).*

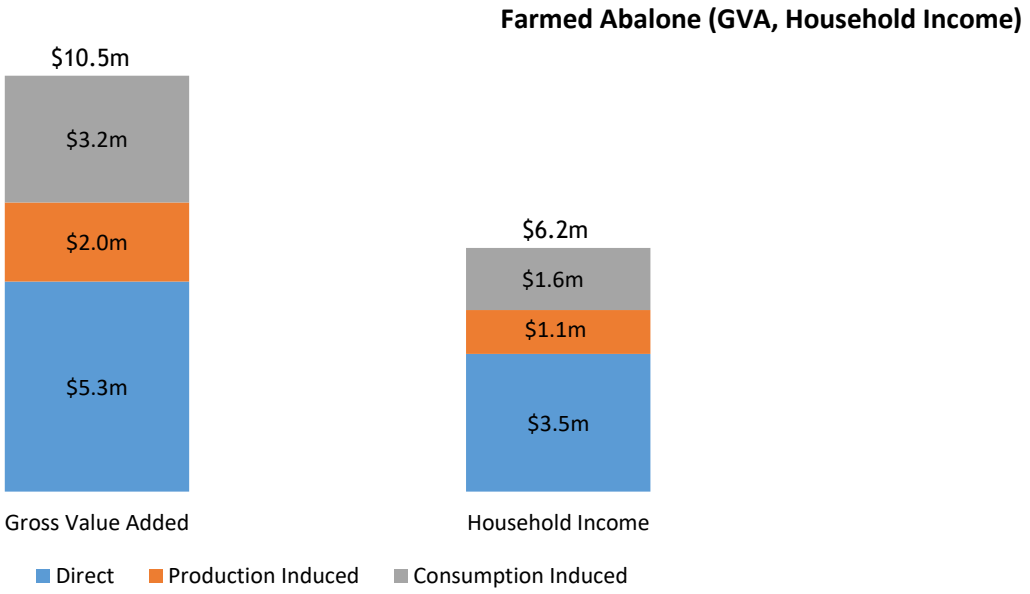

Figure 17: Contribution of Farmed Abalone Aquaculture to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

[18] The input-output modelling was provided by BDO Services Pty Ltd (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared after the outbreak of the *SARS-CoV-2* (COVID-19) virus and the emergence of trade disruptions.

[19] GVA represents the value of all goods and services produced in an industry, minus the cost of all inputs and raw materials consumed to produce those products, and provides a measure of the net contribution of an activity to the economy (excluding net taxes). Household income represents wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour.

[20] This estimate for FTE employment should be treated with caution. It has been derived using a range of secondary sources in combination with some primary data from NRE Tas Marine Farming Branch Licensing Data. The number of persons employed was obtained directly from the NRE Tas Marine Farming Branch Licensing Data and is considered robust.

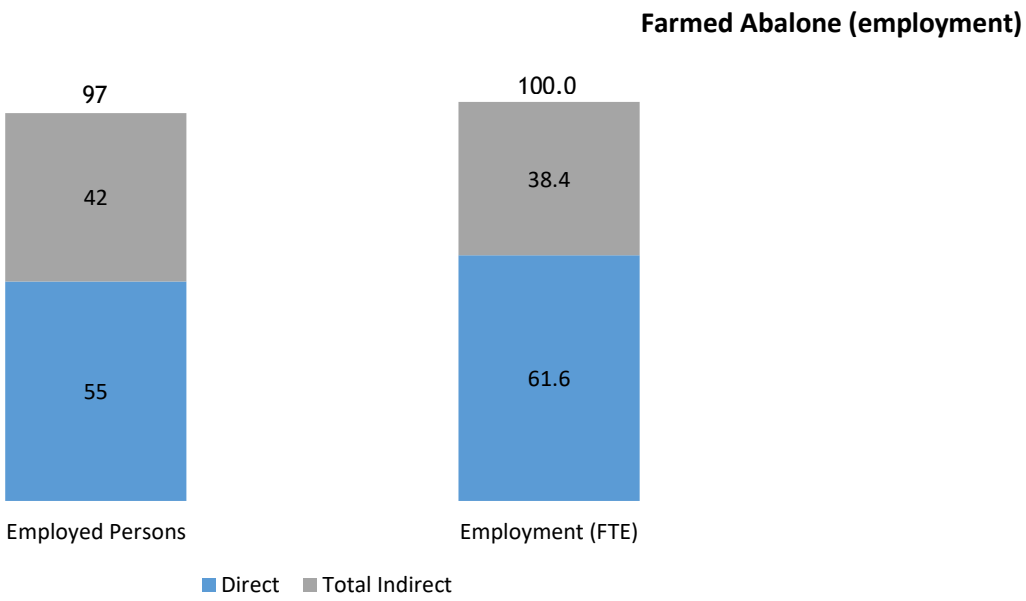

Figure 18: Contribution of Farmed Abalone Aquaculture to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 6: Economic contribution of Tasmanian Farmed Abalone Aquaculture to Tasmania, 2020/21

Sector	Output ($m)	GVA ($m)	Household Income ($m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Production	9.3	5.3	3.5	62	55
Flow-on effects					
By component					
Production induced		*2.0*	*1.1*	*15*	*15*
Consumption induced		*3.2*	*1.6*	*24*	*27*
By top 10 sectors					
Ownership of Dwellings		*0.8*	*0.0*	*0*	*0*
Electricity Supply		*0.5*	*0.2*	*2*	*2*
Finance		*0.3*	*0.1*	*1*	*1*
Retail Trade		*0.3*	*0.2*	*4*	*6*
Wholesale Trade		*0.3*	*0.2*	*2*	*2*
Health & Community Serv		*0.3*	*0.3*	*2*	*3*
Insurance & Other Fin Serv		*0.2*	*0.2*	*2*	*2*
Electricity Generation		*0.3*	*0.1*	*1*	*1*
Other Food Products		*0.2*	*0.2*	*3*	*3*
Prof Scientific Tech Serv		*0.2*	*0.2*	*2*	*2*
Other Sectors		*1.8*	*1.2*	*19*	*21*
Total Flow-on		5.2	2.7	38	42
Total		**10.5**	**6.2**	**100**	**97**
Total/Direct		*2.0*	*1.8*	*1.6*	*1.8*

9 Summary of data sources per fishery / aquaculture sector

9.1 Fishery economic and employment data sources

Fishery / Aquaculture sector	**Economic profile data sources[#]**	**Number of persons data sources**	**FTE (*estimate)* data sources**
Tasmanian Rock Lobster Fishery	*2018/19 Social-Economic survey of Tasmanian commercial rock lobster fishers* NRE Tas FILMS database	NRE Tas FILMS database	Tasmanian Seafood Industry Council (2017). *Seafood Industry Workforce Profile*. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania NRE Tas FILMS database
Tasmanian Abalone Fishery	Knuckey, I. and Sen, S. (2017). *Review of Tasmanian abalone dive rates*. Report prepared for Department of Primary Industries, Parks, Water and Environment. Fishwell Consulting, 51 pp. CC BY 3.0 NRE Tas FILMS database	NRE Tas FILMS database	Tasmanian Seafood Industry Council (2017). *Seafood Industry Workforce Profile*. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania NRE Tas FILMS database
Tasmanian Scalefish Fishery	*2018/19 Socio-economic characterisation of the Tasmanian Scalefish Fishery: Opportunities to improve viability and profitability* NRE Tas FILMS database	NRE Tas FILMS database	Tasmanian Seafood Industry Council (2017). *Seafood Industry Workforce Profile*. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania NRE Tas FILMS database
Tasmanian Salmonid Aquaculture	Evans, O (2019). “Prawns offer potential to deliver higher margins than salmon”, *Salmon Business*, https://salmonbusiness.com/prawns-offer-potenial-to-deliver-higher-margins-than-salmon/1/2MarkRyan	NRE Tas Marine Farming Branch Licensing Data	Tasmanian Seafood Industry Council (2017). *Seafood Industry Workforce Profile*. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania

Fishery / Aquaculture sector	Economic profile data sources[#]	Number of persons data sources	FTE (*estimate)* data sources
	Huon Aquaculture Group (2021). *Annual Report 2021*. Huon Aquaculture Group, Dover, Tasmania KPMG (2015). *Economic Impact Assessment: Tasmanian Aquaculture Industry*. Report prepared for the Tasmanian Salmonid Growers Association, May 2015. Sydney, New South Wales Lynch, J (2015). "Tassal buys De Costi Seafoods in cash and share deal", *Sydney Morning Herald*, https://www.smh.com.au/business/companies/tassal-buys-de-costi-seafoods-in-cash-and-share-deal-20150701-gi29ld.html Tassal Group Limited (2021). *2021 Annual Report*. Tassal Group Limited, Hobart, Tasmania Petuna Aquaculture (2021). *Annual financial report 30 September 2021*. Petuna Aquaculture Pty Ltd, Devonport, Tasmania		NRE Tas Marine Farming Branch Licensing Data
Tasmanian Pacific Oyster Aquaculture	*2019/20 IMAS baseline economic assessment: Tasmanian Oyster Industry* NRE Tas Marine Farming Branch Licensing Data	NRE Tas Marine Farming Branch Licensing Data	Tasmanian Seafood Industry Council (2017). *Seafood Industry Workforce Profile*. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania NRE Tas Marine Farming Branch Licensing Data

Fishery / Aquaculture sector	**Economic profile data sources[#]**	**Number of persons data sources**	**FTE (*estimate)* data sources**
Tasmanian Abalone Aquaculture	N Savva, *Tasmanian Abalone Growers Association,* 2020, per. comm., received 18 November 2020 NRE Tas Marine Farming Branch Licensing Data	NRE Tas Marine Farming Branch Licensing Data	Tasmanian Seafood Industry Council (2017). *Seafood Industry Workforce Profile*. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania NRE Tas Marine Farming Branch Licensing Data

Notes:
[#] Unless otherwise stated, all price indexation done using ABS All Groups CPI - Hobart (ABS Cat No. 6401.0).

9.2 Additional data sources used in conversion to basic prices

In addition to consultation with key industry stakeholders, the following specific data sources were also used to inform the allocation of direct expenditure to the destinations (the industry sectors, margin sectors, imports, taxes less subsidies, wages and salaries, or other value added) within the BDO RISE input-output model:

2018/19 Social-Economic survey of Tasmanian commercial rock lobster fishers

2018/19 Socio-economic characterisation of the Tasmanian Scalefish Fishery: Opportunities to improve viability and profitability

ABS (2006). *Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006.* ABS Cat. No. 1292.0 *Australian Bureau of Statistics*, Belconnen, Canberra

ABS (2006). *Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 (Revision 1.0).* ABS Cat. No. 1292.0 *Australian Bureau of Statistics*, Belconnen, Canberra

ABS (2013). *Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006 (Revision 2.0).* ABS Cat. No. 1292.0 *Australian Bureau of Statistics*, Belconnen, Canberra

Australia and New Zealand Banking Group Limited (2019). *The Company: 2019 Financial Report, 30 September 2019*. Australia and New Zealand Banking Group Limited, Melbourne, Victoria

Australian Institute of Petroleum (2021). *Facts about Petrol Prices & the Australian Fuel Market*. https://aip.com.au/resources/facts-about-petrol-prices-and-australian-fuel-market, accessed on 20 January 2021.

Bapcor (2019). *Bapcor Annual Report 2019*. Bapcor Limited, Melbourne, Victoria

NRE Tas (2020). *Commercial Fishing Application Fees – 01 July 2020 to 30 June 2021*. Tasmanian Department of Natural Resources and the Environment, Hobart, Tasmania

Department of State Growth (2023). *Transport Services: Registration fees*. https://www.transport.tas.gov.au/registration/registration_fees, accessed on 20 October 2023

Macquarie Group Limited (2016). *Pursuing Sustainable Growth: 2016 Insurance Broking Benchmarking Results*. Macquarie Group Limited, Sydney, Australia

OTTER (2023). *Electricity Pricing Explained.* https://www.economicregulator.tas.gov.au/electricity/pricing/retail/electricity-pricing-explained, accessed on 20 October 2023.

Taxation Determination TD 2020/5: *Income tax: what are the reasonable travel and overtime meal allowance expense amounts for the 2020–21 income year?*

10 A time series of economic contribution to Tasmania

10.1 Economic contribution (total, direct) to Tasmania over time for six sectors

Sector	Total		Direct	
	2020/21	2018/19	2020/21	2018/19
Tasmanian Rock Lobster Fishery				
Output ($m)	-	-	45.8	87.4
GVA ($m)	50.9	100.4	26.3	66.4
Household Income ($m)	26.9	38.9	12.9	18.9
Employment (fte)	389	539	199	287
Employment (total)	444	611	236	341
Tasmanian Abalone Fishery				
Output ($m)	-	-	48.8	73.9
GVA ($m)	53.1	80.8	41.7	66.7
Household Income ($m)	13.3	15.8	6.5	7.5
Employment (fte)	185	191	97	85
Employment (total)	348	248	150	132
Tasmanian Scalefish Fishery[1]				
Output ($m)	-	-	6.0	4.3
GVA ($m)	6.3	5.3	2.6	2.5
Household Income ($m)	3.9	3.5	1.8	1.9
Employment (fte)	132	119	103	98
Employment (total)	190	193	159	171
Tasmanian Salmonid Aquaculture[2]				
Output ($m)	-	-	667.6	646.3
GVA ($m)	638.5	649.6	242.9	230.3
Household Income ($m)	346.1	361.7	127.1	122.5
Employment (fte)	5,025	4,895	1,933	1,812
Employment (total)	5,188	5,003	1,933	1,812
Tasmanian Pacific Oyster Aquaculture				
Output ($m)	-	-	38.2	29.0
GVA ($m)	42.3	34.7	29.9	19.7
Household Income ($m)	15.5	18.6	8.8	10.5
Employment (fte)	375	364	279	258
Employment (total)	433	419	326	301
Tasmanian Abalone Aquaculture				
Output ($m)	-	-	9.3	5.9
GVA ($m)	10.5	7.0	5.3	3.3
Household Income ($m)	6.2	4.2	3.5	2.2
Employment (fte)[3]	100	68	62	43
Employment (total)	97	84	55	57

Notes:

[1] The definition of the Tasmanian Scalefish fishery for this report was expanded in 2020/21 to also include commercial octopus production.

[2] All indicators for Salmonid Aquaculture increase between 2018/19 and 2020/21 except GVA. This is due to a decrease in gross operating surplus related to higher supply chain costs and inventoried production due to the outbreak of the *SARS-CoV-2* (COVID-19) virus.

[3] Employment FTE for Tasmanian Abalone Aquaculture in 2020/21 exceeded total persons. This situation is consistent with a rapid expansion in output (2018/19 to 2020/21) and may normalise over time.

11 References

FRDC 2019. *Tasmanian Fisheries and Aquaculture Industry 2017/18: Economic Contributions Summary.* Fisheries Research and Development Corporation, Deakin, Australian Capital Territory.

IMAS 2020. *Australian Fisheries and Aquaculture Industry: Economic Contributions Estimates - Practitioner Guidelines 2019*. FRDC project 2017-210. Institute for Marine and Antarctic Studies at the University of Tasmania, Taroona, Tasmania.