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Tasmanian Fisheries and Aquaculture Industry 2018/19: Economic Contributions Technical Report

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Executive Summary

This report presents economic contribution results for six (6) key fisheries and aquaculture production sectors for Tasmanian economy for the 2018/19 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 generated by each sector to the Tasmanian economy for the 2018/19 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 against 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 EconSearch. 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 a database of studies on similar seafood sectors from around Australia.

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1 Introduction

This report presents the economic contribution of six (6) key fisheries and aquaculture production sectors to the Tasmanian economy for the 2018/19 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 2018/19 financial year. The work was undertaken by the Institute for Marine and Antarctic Studies at the University of Tasmania in collaboration with BDO EconSearch 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 EconSearch¹) 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 processing² 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 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 fisheries 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 against 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 operations 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 EconSearch 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 the 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 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 role of this sector in ensuring sales and marketability, and in assisting to coordinate activities of the catching sector in some fisheries. Increased data availability, and investment of time to understand 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 were prepared prior to the outbreak of the SARS-CoV-2 (COVID-19) virus, and the emergence of trade-related issues. The emergence of these factors has negatively impacted levels of seafood industry activity more recently. This report therefore provides a baseline with which to continue to understand changes in economic conditions for these industries. Future work will likely expand on this analysis to include other seafood and supply chain sectors.

The results presented in this report have undergone a quality assurance and benchmarking process in collaboration with BDO EconSearch, 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 in 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), we acknowledge that:

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.

A recreational fishing survey is currently underway as part of *National Social and Economic Survey of Recreational Fishers 2019* (FRDC 2018-161) and is expected to deliver information for recreational fishing in Australia at the national, state and territory level in 2022. Economic contributions for commercial industries are generally based on financial data held by businesses. However, in the case of recreational fisheries, where business records are unavailable, the estimation procedures often rely on broad-based activity surveys. Such surveys involve large numbers of participants and are conducted over longer periods of time.

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 (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 2018/19. 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 2018/19 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 DPIPWE. 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 DPIPWE 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 10.

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, to keep these two components of the economic profile on a consistent basis. A summary of the data sources used in the case of each fishery and aquaculture sector is provided in Section 10.

Catch/production: fishery catch and aquaculture production data by individual fishery and aquaculture sector was sourced from the DPIPWE 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 DPIPWE FILMS database or aquaculture data maintained by the department. In the case of the Tasmanian Scalefish Fishery and Tasmanian Salmonid Aquaculture, information on industry total revenue³ has been used in place of industry catch/production and price data. In the case of the Tasmanian Scalefish Fishery this was due to the diversity in catches landed in the fishery for the 2018/19 year; and in the case of Tasmanian Salmonid Aquaculture it was to maintain consistency with the estimate of production costs (which were based on published annual reports for the 2018/19 year).

³ In the case of the Tasmanian Scalefish Fishery, industry total revenue was obtained for the 2017/18 financial year from Steven et al. (2020), inflated from June 2018 to June 2019 using the *Fish and Other Seafood* expenditure classification for the Australia series in Table 9 of ABS Cat No 6401.0 (the Consumer Price Index).

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). The following costs items were *generally* included in case of the fishing industries:

Variable costs:

- fuel, oil and grease for the boat (net of diesel 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 DPIPWE 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 the same/similar fixed costs, and variable costs typically included:

- 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 DPIPWE 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 the 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 10.

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 within the input-output model (these are: the industry sectors, margin sectors, imports, taxes less subsidies, wages and salaries, or 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 relies on detailed feedback from industry contacts, review and consultation within the project team, as well as information and data from the published data sources as listed in Section 10.2. This stage of our analysis was validated in the benchmarking process carried out in collaboration with BDO Econsearch.

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 on 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 2018/19 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 2018/19 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').

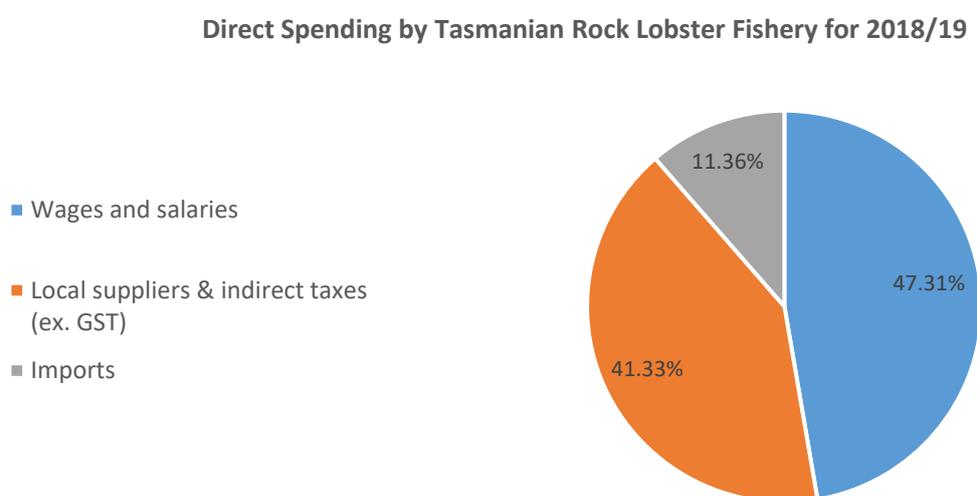


Figure 1: Breakdown of direct spending by the Tasmanian Rock Lobster fishery for the 2018/19 year. Spending is shown in three categories: wages and salaries paid to employees and drawn by business owners ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local 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 economy⁴. Figure 2 shows results for contribution to Gross Value Added (GVA) and Household Income⁵; 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 State⁶. 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.)*

Rock Lobster (GVA, Household Income)

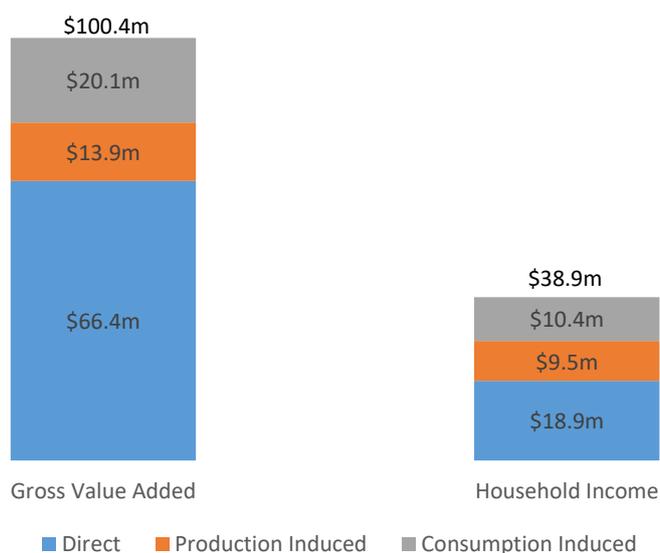


Figure 2: Contribution of the Rock Lobster fishery to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

⁴ The input-output modelling was provided by BDO EconSearch (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared prior to the outbreak of the SARS-CoV-2 (COVID-19) virus and the emergence of trade disruptions.

⁵ 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.

⁶ 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.

Rock Lobster (Employment)

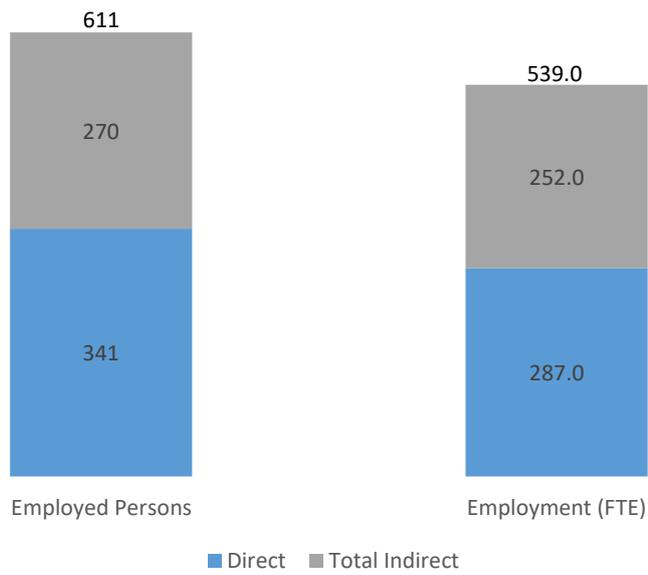


Figure 3: Contribution of the Rock Lobster fishery to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 1: Economic contribution of the Tasmanian Rock Lobster Fishery to Tasmania, 2018/19

Sector	Output (\$m)	GVA (\$m)	Household Income (\$m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Fishing	87.4	66.4	18.9	287	341
Flow-on effects					
By component					
<i>Production induced</i>		13.9	9.5	102	101
<i>Consumption induced</i>		20.1	10.4	150	169
By top 10 sectors					
<i>Ownership of Dwellings</i>		3.8	0.0	0	0
<i>Public Admin & Regltry Serv</i>		3.0	2.6	27	28
<i>Other Machinery & Equipment</i>		2.8	2.4	25	21
<i>Retail Trade</i>		2.5	1.8	31	39
<i>Finance</i>		2.3	0.4	5	4
<i>Wholesale Trade</i>		1.5	1.2	8	7
<i>Health & Community Serv</i>		1.6	1.5	20	23
<i>Insurance & Other Fin Serv</i>		1.4	0.9	9	8
<i>Road Transport</i>		1.1	0.7	9	8
<i>Transport Support & Storage</i>		1.2	0.4	5	5
<i>Other Sectors</i>		12.7	8.1	115	125
Total Flow-on		34.0	20.0	252	270
Total		100.4	38.9	539	611
Total/Direct		1.5	2.1	1.9	1.8

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 2018/19 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').

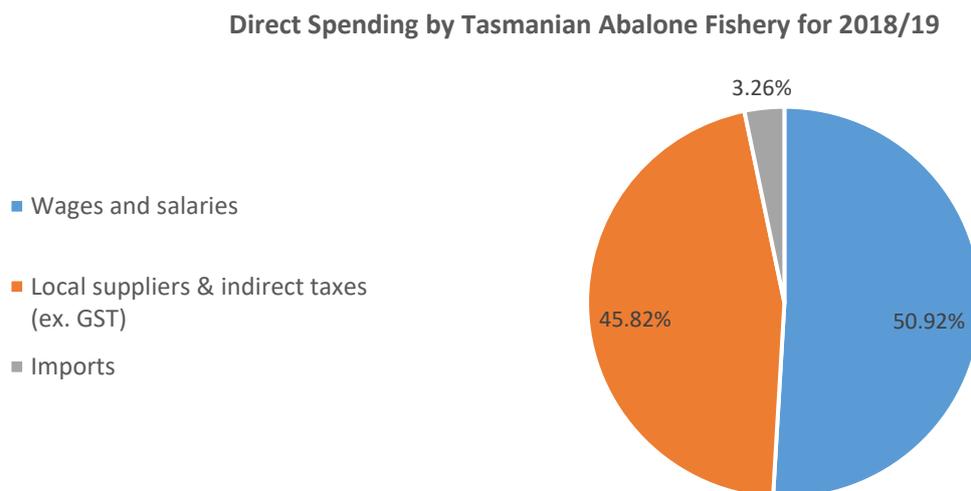


Figure 4: Breakdown of direct spending by the Tasmanian Abalone fishery for the 2018/19 year. Spending is shown in three categories: wages and salaries paid to employees and drawn by business owners ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local 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 does not explicitly report transfer payments (diver fees) that happen between participants in the fishery. These fees are mostly included within wages and salaries (i.e., drawn by business owners).

8.2.2 Tasmanian Abalone Fishery – Economic Contribution

This section presents an estimate for the economic contribution of Abalone fishery to the Tasmanian economy⁷. Figure 5 shows results for contribution to Gross Value Added (GVA) and Household Income⁸; 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 State⁹. 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).*

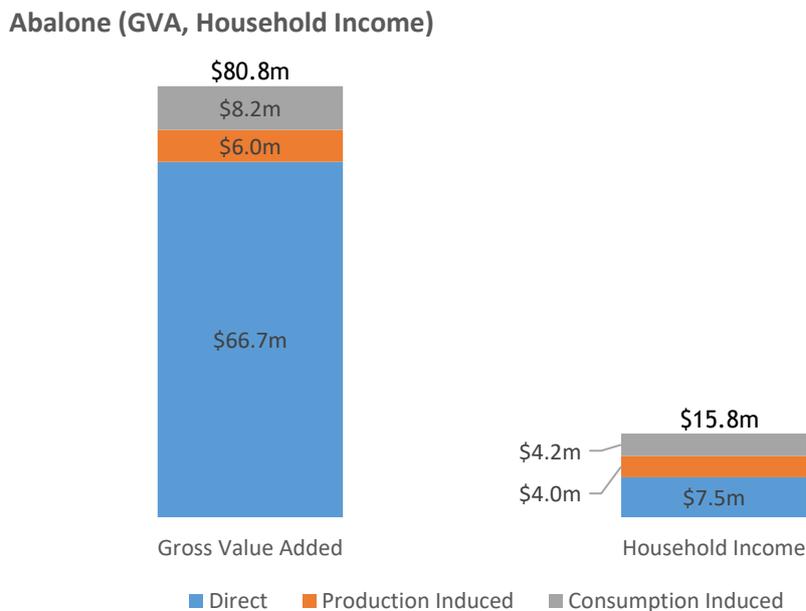


Figure 5: Contribution of the Abalone fishery to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

⁷ The input-output modelling was provided by BDO EconSearch (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared prior to the outbreak of the SARS-CoV-2 (COVID-19) virus and the emergence of trade disruptions.

⁸ 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.

⁹ 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.

Abalone (Employment)



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, 2018/19

Sector	Output (\$m)	GVA (\$m)	Household Income (\$m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Fishing	73.9	66.7	7.5	85	132
Flow-on effects					
By component					
<i>Production induced</i>		6.0	4.0	45	47
<i>Consumption induced</i>		8.2	4.2	61	69
By top 10 sectors					
<i>Public Admin & Regltry Serv</i>		2.9	2.4	25	27
<i>Ownership of Dwellings</i>		1.5	0.0	0	0
<i>Transport Support & Storage</i>		1.2	0.4	5	6
<i>Retail Trade</i>		1.0	0.7	13	16
<i>Finance</i>		0.8	0.1	2	2
<i>Rental Hiring Real Estate</i>		0.7	0.2	3	3
<i>Health & Community Serv</i>		0.6	0.6	8	10
<i>Education & Training</i>		0.4	0.4	5	5
<i>Prof Scientific Tech Serv</i>		0.4	0.4	5	5
<i>Wholesale Trade</i>		0.4	0.3	2	2
<i>Other Sectors</i>		4.2	2.6	38	42
Total Flow-on		14.2	8.3	106	116
Total		80.8	15.8	191	248
Total/Direct		1.2	2.1	2.2	1.9

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 2018/19 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').

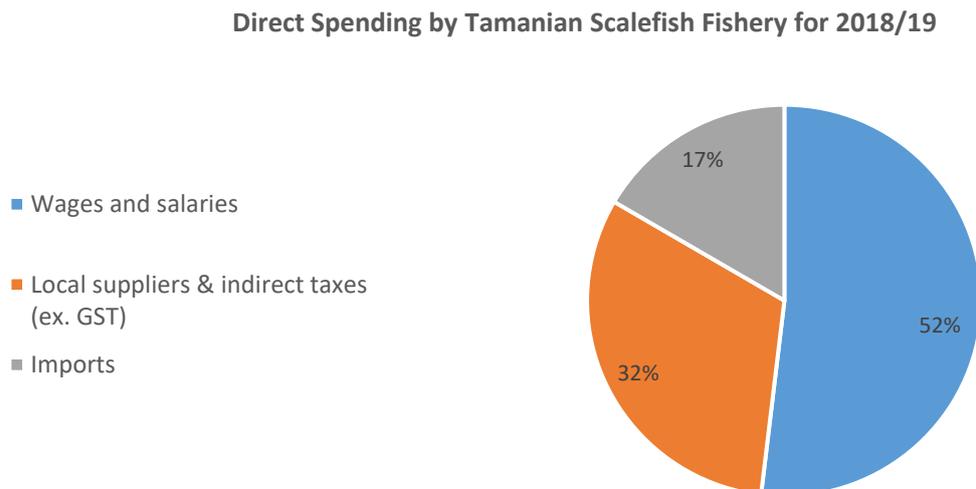


Figure 7: Breakdown of direct spending by the Tasmanian Scalefish fishery for the 2018/19 year. Spending is shown in three categories: wages and salaries paid to employees and drawn by business owners ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local 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 economy¹⁰. Figure 8 shows results for contribution to Gross Value Added (GVA) and Household Income¹¹; 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 State¹². 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.)*

Scalefish (GVA, Household Income)

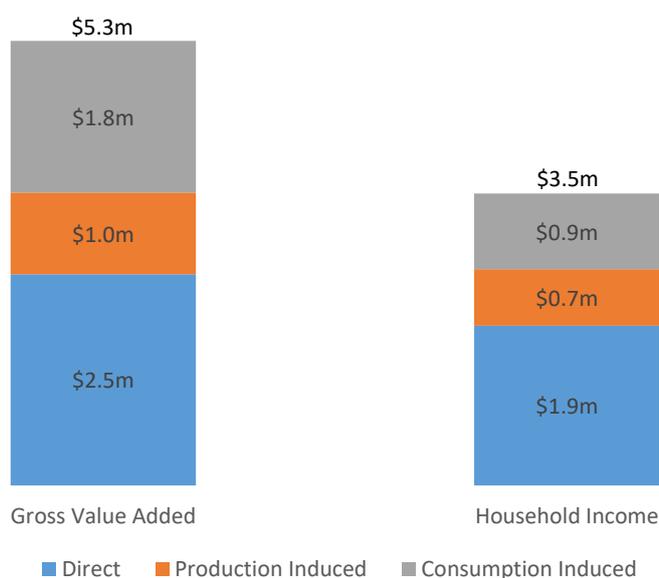


Figure 8: Contribution of the Scalefish fishery to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

¹⁰ The input-output modelling was provided by BDO EconSearch (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared prior to the outbreak of the SARS-CoV-2 (COVID-19) virus and the emergence of trade disruptions.

¹¹ 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.

¹² 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.

Scalefish (Employment)



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. Further work is being undertaken to better understand employment in this fishery.

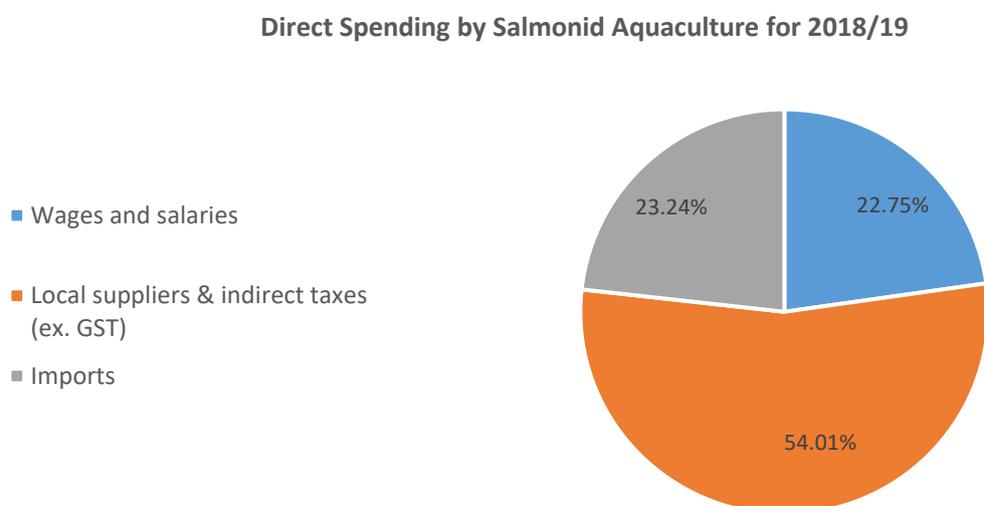
Table 3: Economic contribution of the Tasmanian Scalefish Fishery to Tasmania, 2018/19

Sector	Output (\$m)	GVA (\$m)	Household Income (\$m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Fishing	4.3	2.5	1.9	98	171
Flow-on effects					
By component					
<i>Production induced</i>		1.0	0.7	7	7
<i>Consumption induced</i>		1.8	0.9	14	15
By top 10 sectors					
<i>Ownership of Dwellings</i>		0.3	0.0	0	0
<i>Finance</i>		0.2	0.0	0	0
<i>Retail Trade</i>		0.2	0.2	3	4
<i>Other Machinery & Equipment</i>		0.2	0.2	2	2
<i>Public Admin & Regltry Serv</i>		0.2	0.1	1	2
<i>Wholesale Trade</i>		0.1	0.1	1	1
<i>Health & Community Serv</i>		0.1	0.1	2	2
<i>Road Transport</i>		0.1	0.1	1	1
<i>Prof Scientific Tech Serv</i>		0.1	0.1	1	1
<i>Education & Training</i>		0.1	0.1	1	1
<i>Other Sectors</i>		1.0	0.6	9	9
Total Flow-on		2.8	1.6	21	22
Total		5.3	3.5	119	193
Total/Direct		2.1	1.8	1.2	1.1

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 2018/19 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: these estimates rely on secondary data and data matching methods and as such should be treated with caution. Provision of primary data from industry would improve the accuracy of these estimates.*)



*Figure 10: Breakdown of direct spending by the Tasmanian Salmonid Aquaculture sector for the 2018/19 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 economy¹³. Figure 11 shows results for contribution to Gross Value Added (GVA) and Household Income¹⁴; 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 State¹⁵. 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.*)

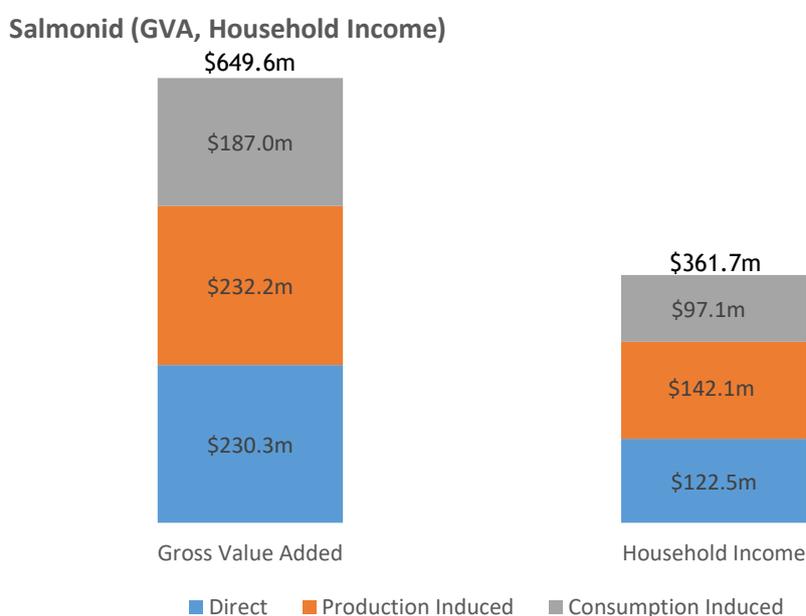


Figure 11: Contribution of Salmonid Aquaculture to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

¹³ The input-output modelling was provided by BDO EconSearch (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared prior to the outbreak of the SARS-CoV-2 (COVID-19) virus and the emergence of trade disruptions.

¹⁴ 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.

¹⁵ 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 DPIPWE Marine Farming Branch Licensing Data. The number of persons employed was obtained directly from the DPIPWE Marine Farming Branch Licensing Data and is considered robust.

Salmonid (Employment)



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, 2018/19

Sector	Output (\$m)	GVA (\$m)	Household Income (\$m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Production	646.3	230.3	122.5	1,812	1,812
Flow-on effects					
By component					
<i>Production induced</i>		232.2	142.1	1,691	1,619
<i>Consumption induced</i>		187.0	97.1	1,393	1,572
By top 10 sectors					
<i>Other Construction</i>		44.0	23.5	430	375
<i>Electricity Supply</i>		34.8	15.2	73	65
<i>Road Transport</i>		38.8	24.9	293	269
<i>Ownership of Dwellings</i>		35.3	0.0	0	0
<i>Wholesale Trade</i>		24.7	18.6	123	116
<i>Retail Trade</i>		23.9	16.9	292	364
<i>Finance</i>		23.1	4.1	45	45
<i>Prof Scientific Tech Serv</i>		22.2	22.2	275	287
<i>Public Admin & Regltry Serv</i>		15.2	12.8	134	142
<i>Health & Community Serv</i>		14.4	13.5	186	215
<i>Other Sectors</i>		142.9	87.5	1,234	1,313
Total Flow-on		419.2	239.2	3,083	3,191
Total		649.6	361.7	4,895	5,003
Total/Direct		2.8	3.0	2.7	2.8

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 2018/19 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').

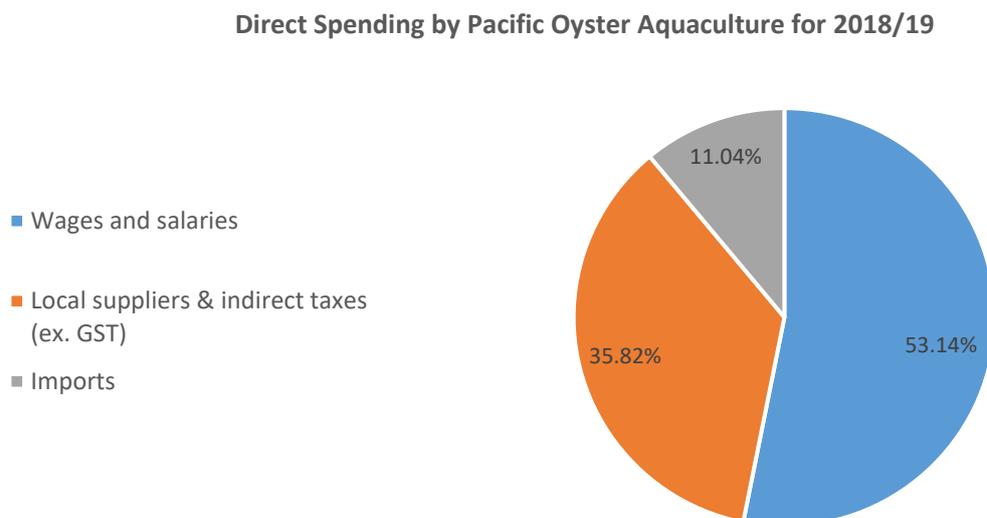


Figure 13: Breakdown of direct spending by the Tasmanian Pacific Oyster Aquaculture sector for the 2018/19 year. Spending is shown in three categories: wages and salaries paid to employees ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & 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 economy¹⁶. Figure 14 shows results for contribution to Gross Value Added (GVA) and Household Income¹⁷; 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 State¹⁸. 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.)*

Pacific Oyster (GVA, Household Income)

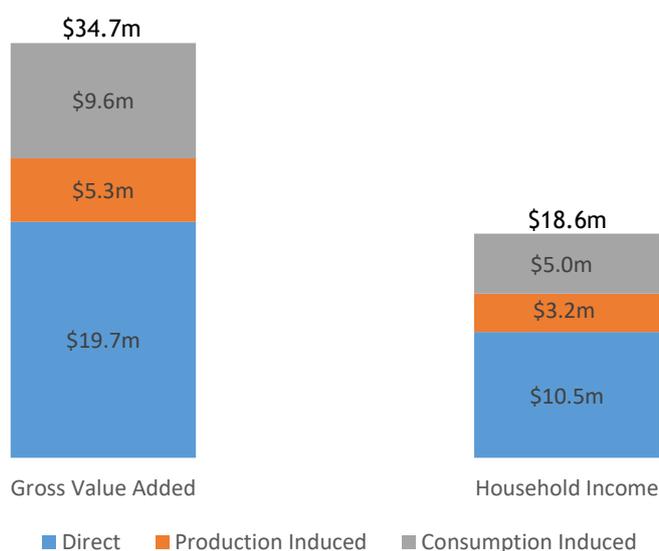


Figure 14: Contribution of Pacific Oyster Aquaculture to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

¹⁶ The input-output modelling was provided by BDO EconSearch (ABN 74 161 378 892) using industry cost profiles and conversion to basic prices as provided by IMAS. These estimates were prepared prior to the outbreak of the SARS-CoV-2 (COVID-19) virus and the emergence of trade disruptions.

¹⁷ 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.

¹⁸ 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 DPIPWE Marine Farming Branch Licensing Data. The number of persons employed was obtained directly from the DPIPWE Marine Farming Branch Licensing Data and is considered robust.

Pacific Oyster (Employment)

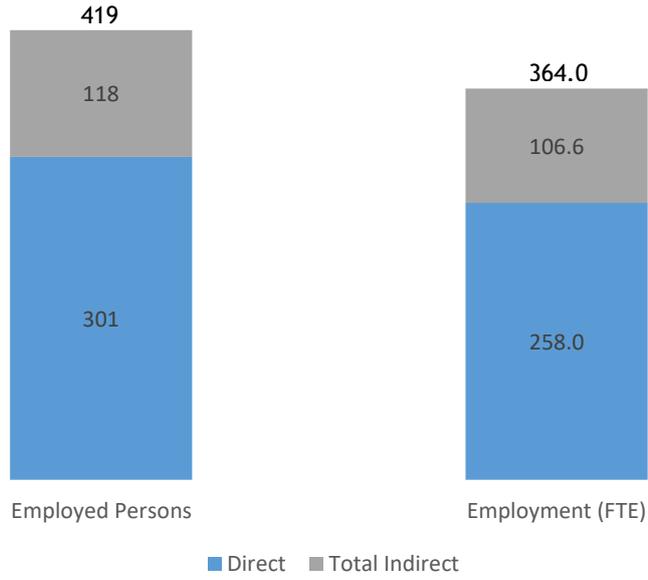


Figure 15: Contribution of Pacific Oyster Aquaculture to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 5: Economic contribution of Tasmanian Pacific Oyster Aquaculture to Tasmania, 2018/19

Sector	Output (\$m)	GVA (\$m)	Household Income (\$m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Production	29.0	19.7	10.5	258	301
Flow-on effects					
By component					
<i>Production induced</i>		5.3	3.2	34.8	37.1
<i>Consumption induced</i>		9.6	5.0	71.8	81.0
By top 10 sectors					
<i>Ownership of Dwellings</i>		1.8	2.0	0	0
<i>Retail Trade</i>		1.2	1.3	15	19
<i>Finance</i>		1.1	1.1	2	2
<i>Road Transport</i>		0.9	1.0	7	6
<i>Insurance & Other Fin Serv</i>		0.8	0.9	5	5
<i>Health & Community Serv</i>		0.7	0.8	10	11
<i>Electricity Supply</i>		0.6	0.7	1	1
<i>Prof Scientific Tech Serv</i>		0.6	0.6	8	8
<i>Public Admin & Regltry Serv</i>		0.6	0.6	5	6
<i>Education & Training</i>		0.6	0.6	6	7
<i>Other Sectors</i>		7.8	0.6	48	54
Total Flow-on		15.0	8.2	107	118
Total		34.7	18.6	364	419
Total/Direct		1.8	1.8	1.4	1.4

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 2018/19 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').

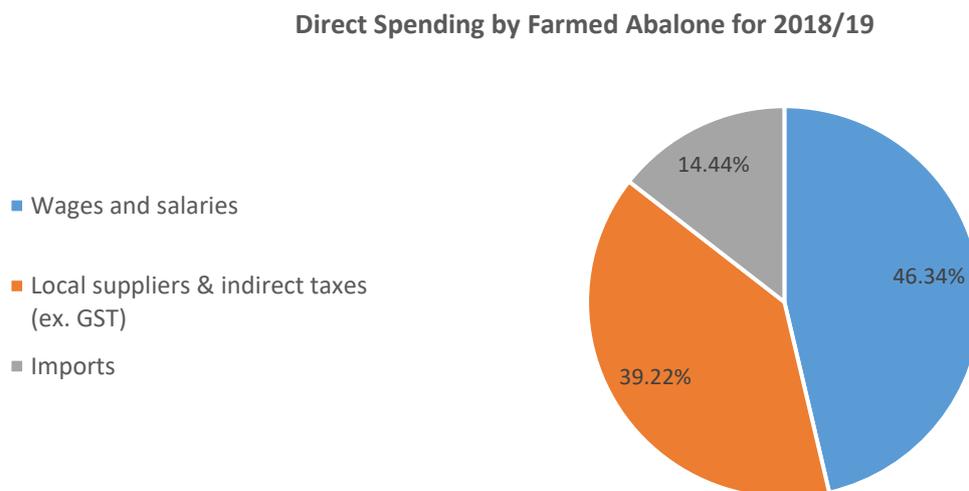


Figure 16: Breakdown of direct spending by the Tasmanian Farmed Abalone Aquaculture sector for the 2018/19 year. Spending is shown in three categories: wages and salaries paid to employees ('wages and salaries'), gross payments to local suppliers excluding the Goods and Services Tax ('Local suppliers & 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 economy¹⁹. Figure 17 shows results for contribution to Gross Value Added (GVA) and Household Income²⁰; 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 State²¹. 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.*)

Farmed Abalone (GVA, Household Income)

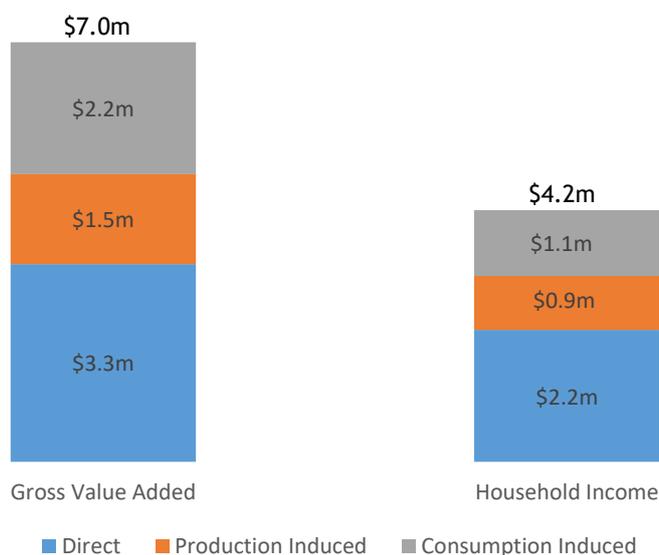


Figure 17: Contribution of Farmed Abalone Aquaculture to Gross Value Added (GVA) and Household Income in the Tasmanian economy.

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

²⁰ 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.

²¹ 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 DPIPWE Marine Farming Branch Licensing Data. The number of persons employed was obtained directly from the DPIPWE Marine Farming Branch Licensing Data and is considered robust.

Farmed Abalone (Employment)

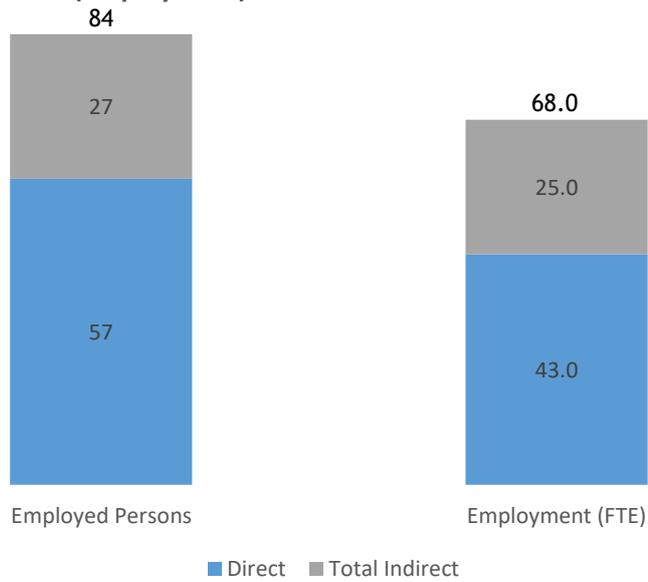


Figure 18: Contribution of Farmed Abalone Aquaculture to the total number of Employed Persons and full-time equivalent (FTE) workforce (Employment (FTE)) in Tasmania.

Table 6: Economic contribution of Tasmanian Farmed Abalone Aquaculture to Tasmania, 2018/19

Sector	Output (\$m)	GVA (\$m)	Household Income (\$m)	Employment (fte)	Employment (total)
Direct effects					
Total Direct Production	5.9	3.3	2.2	43	57
Flow-on effects					
By component					
<i>Production induced</i>		1.5	0.9	9	9
<i>Consumption induced</i>		2.2	1.1	16	18
By top 10 sectors					
<i>Electricity Supply</i>		0.0	0.2	1	1
<i>Ownership of Dwellings</i>		0.0	0.0	0	0
<i>Retail Trade</i>		0.0	0.2	3	4
<i>Finance</i>		0.0	0.0	0	0
<i>Road Transport</i>		0.0	0.1	1	1
<i>Insurance & Other Fin Serv</i>		0.0	0.1	1	1
<i>Wholesale Trade</i>		0.0	0.1	1	1
<i>Health & Community Serv</i>		0.0	0.2	2	2
<i>Other Food Products</i>		0.0	0.1	2	2
<i>Electricity Generation</i>		0.0	0.1	1	1
<i>Other Sectors</i>		3.7	0.8	12	13
Total Flow-on		3.7	2.0	25	27
Total		7.0	4.2	68	84
Total/Direct		2.1	1.9	1.6	1.5

9 Exports

A summary of official overseas export data for the six key sectors in this report is shown in Table 7. This analysis was based on a customised report from the Australian Bureau of Statistics (ABS) for International Merchandise Trade, 2018-19 (ABS 2020)²². The value of exports (export revenue) from Tasmania is a contributor to the standard of living in the State, and we therefore include this section within our description of economic contribution. The two measures used in this study to describe exports are: export quantity, and the value of exports. Export quantity is generally reported as gross weight, which refers to the shipping weight of the goods (in the packaged state) and excludes the weight of the shipping containers. The value of exports is measured using the free on board (FOB) cost. The FOB includes all costs incurred up to the point at which the goods are loaded onto an international carrier. It includes the value of outside packaging, but not the cost of international freight insurance and related on-costs such as shipping containers. The average value per kilogram for each seafood category is shown in the leftmost column of the table below, and this is the average FOB price per kilogram of exported fish during the 2018/19 year (as measured from the ABS dataset).

Table 7: Tasmanian overseas seafood exports for key sectors by value, 2018/19 (Sources: ABS 2020).

Seafood category	Export quantity		Export value ^A		Average value
	(Tonnes)	(%)	(\$m)	(%)	(\$/kg)
Atlantic & Pacific Salmon (<i>salmonid</i>)	8,653	84.3%	107.2	51.7%	12.4
Farmed and Wildcatch Abalone ^E	770	7.5%	72.4	34.9%	94.0
Rock Lobster ^E	128	1.2%	14.1	6.8%	110.7
Filleted and Whole Fish ^B	330	3.2%	2.4	1.2%	7.4
Trout (<i>salmonid</i>)	85	0.8%	1.2	0.6%	14.3
Oysters	7	0.1%	0.1	0.1%	17.8
Other ^C	291	2.8%	9.8	4.7%	33.6
Total ^{CD}	10,265	100.0%	207.3	100.0%	20.2

^A Export values are in terms of Free on Board (FOB) values. FOB values exclude the cost of freight and merchandise insurance involved in shipping the goods beyond the place of export up to the customs frontier of the importing country.

^B A portion of this category may capture some product harvested from the Tasmanian Scalefish Fishery.

^C "Other" includes Ornamental fish, of which export quantity is measured by number of specimens. The reported export quantity and export price figures exclude Ornamental fish due to differences in units of measurement.

^D Totals may not sum due to rounding.

^E The export value of rock lobster and abalone only includes direct international exports from Tasmania and does not include product which is consolidated interstate prior to export. Most harvested abalone and rock lobster were ultimately exported overseas for the 2018/19 year.

²² A request was made to the ABS specifying the Australian Harmonised Export Commodity Classification Codes (AHECC) for seafood products. The data requested per code, included: reference period (2018/19), state of origin, port of loading Australia, country of final destination, overseas port of discharge, gross weight, quantity, value (FOB).

10 Summary of data sources per fishery / aquaculture sector

10.1 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	<p>2018/19 <i>Social-Economic survey of Tasmanian commercial rock lobster fishers</i></p> <p>DPIPWE FILMS database</p>	DPIPWE FILMS database	<p>Tasmanian Seafood Industry Council (2017). <i>Seafood Industry Workforce Profile</i>. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania</p> <p>DPIPWE FILMS database</p>
Tasmanian Abalone Fishery	<p>Knuckey, I. and Sen, S. (2017). <i>Review of Tasmanian abalone dive rates</i>. Report prepared for Department of Primary Industries, Parks, Water and Environment. Fishwell Consulting, 51 pp. CC BY 3.0</p> <p>DPIPWE FILMS database</p>	DPIPWE FILMS database	<p>Tasmanian Seafood Industry Council (2017). <i>Seafood Industry Workforce Profile</i>. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania</p> <p>DPIPWE FILMS database</p>
Tasmanian Scalefish Fishery	<p>2018/19 <i>Socio-economic characterisation of the Tasmanian Scalefish Fishery: Opportunities to improve viability and profitability</i></p> <p>Steven, AH, Mobsby, D and Curtotti, R 2020. <i>Australian fisheries and aquaculture statistics 2018</i>, Fisheries Research and Development Corporation project 2019-093, ABARES, Canberra, April. CC BY 4.0. https://doi.org/10.25814/5de0959d55bab</p> <p>ABS Cat. No. 6401.0, Table 9</p>	DPIPWE FILMS database	<p>Tasmanian Seafood Industry Council (2017). <i>Seafood Industry Workforce Profile</i>. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania</p> <p>DPIPWE FILMS database</p>

Fishery / Aquaculture sector	Economic profile data sources [#]	Number of persons data sources	FTE (<i>estimate</i>) data sources
Tasmanian Salmonid Aquaculture	<p>Evans, O (2019). "Prawns offer potential to deliver higher margins than salmon", <i>Salmon Business</i>, https://salmonbusiness.com/prawns-offer-potential-to-deliver-higher-margins-than-salmon/1/2MarkRyan</p> <p>Huon Aquaculture Group (2019). <i>Annual Report 2019</i>. Huon Aquaculture Group, Dover, Tasmania</p> <p>Huon Aquaculture Group (2018). <i>Annual Report 2018</i>. Huon Aquaculture Group, Dover, Tasmania</p> <p>IBISWorld Pty Ltd (2020). <i>IBISWorld Company Report: Petuna Aquaculture Pty Ltd. Profile Report, Balance Date: June 2019</i>. IBISWorld Pty Ltd, Melbourne, Victoria</p> <p>KPMG (2015). <i>Economic Impact Assessment: Tasmanian Aquaculture Industry</i>. Report prepared for the Tasmanian Salmonid Growers Association, May 2015. Sydney, New South Wales</p> <p>Lynch, J (2015). "Tassal buys De Costi Seafoods in cash and share deal", <i>Sydney Morning Herald</i>, https://www.smh.com.au/business/companies/tassal-buys-de-costi-seafoods-in-cash-and-share-deal-20150701-gi29ld.html</p> <p>Tassal Group Limited 2019. <i>2019 Annual Report</i>. Tassal Group Limited, Hobart, Tasmania</p> <p>Tassal Group Limited 2018. <i>Annual Financial Report for the year ended 30 June 2018</i>. Tassal Group Limited, Hobart, Tasmania</p>	DPIPWE Marine Farming Branch Licensing Data	<p>Tasmanian Seafood Industry Council (2017). <i>Seafood Industry Workforce Profile</i>. Tasmanian Seafood Industry Council, Sandy Bay, Tasmania</p> <p>DPIPWE Marine Farming Branch Licensing Data</p>

Fishery / Aquaculture sector	Economic profile data sources [#]	Number of persons data sources	FTE (<i>estimate</i>) data sources
Tasmanian Pacific Oyster Aquaculture	2019/20 IMAS baseline economic assessment: <i>Tasmanian Oyster Industry</i>	DPIPWE Marine Farming Branch Licensing Data	Tasmanian Seafood Industry Council (2017). <i>Seafood Industry Workforce Profile</i> . Tasmanian Seafood Industry Council, Sandy Bay, Tasmania DPIPWE Marine Farming Branch Licensing Data
Tasmanian Abalone Aquaculture	N Savva, <i>Tasmanian Abalone Growers Association</i> , 2020, per. comm., received 18 November 2020 DPIPWE Marine Farming Branch Licensing Data	DPIPWE Marine Farming Branch Licensing Data	Tasmanian Seafood Industry Council (2017). <i>Seafood Industry Workforce Profile</i> . Tasmanian Seafood Industry Council, Sandy Bay, Tasmania DPIPWE Marine Farming Branch Licensing Data

Notes:

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

10.2 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

DPIPWE (2020). *Commercial Fishing Application Fees – 01 July 2020 to 30 June 2021*. Tasmanian Department of Primary Industries, Parks, Water and the Environment, Hobart, Tasmania

DPIPWE (2021). *Transport Services: Registration fees*. https://www.transport.tas.gov.au/registration/registration_fees, accessed on 20 January 2021

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

OTTER (2021). *Electricity Pricing Explained*. <https://www.economicregulator.tas.gov.au/electricity/pricing/retail/electricity-pricing-explained>, accessed on 20 January 2021.

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

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- DPIPWE 2018. *Tasmanian Rock Lobster Fishery: East Coast Stock Rebuilding Strategy 2013-2023*. Department of Primary Industries, Parks, Water and the Environment, Hobart, Tasmania.
- 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.
- Steven, AH, Mobsby, D and Curtotti, R 2020. *Australian fisheries and aquaculture statistics 2018*, Fisheries Research and Development Corporation project 2019-093, ABARES, Canberra, April. CC BY 4.0. <https://doi.org/10.25814/5de0959d55bab>