


Economic Value of Commercial Fishing
Operating out of Lakes Entrance
(Port of Gippsland Lakes)

A report to

Gippsland Ports

Prepared by

 *econsearch*

and



Roberts Evaluation

6 February 2014

EconSearch Pty Ltd
214 Kensington Road
Marryatville SA 5068
Tel: (08) 8431 5533
Fax: (08) 8431 7710

www.econsearch.com.au

CONTENTS

Contents	iii
Tables	iv
Figures	iv
Abbreviations	v
Document History and Status	v
Executive Summary	vi
1. Introduction	1
2. Method of Analysis	2
2.1 General Approach	2
2.2 Estimation of Economic Effects – Key Concepts	2
2.2.1 Economic activity	2
2.2.2 Indicators of economic activity defined	2
2.2.3 Categories of economic activity in the infrastructure supply chain	3
2.3 Economic Impact Model	4
3. Data and Assumptions	8
3.1 Commercial Fishing Trends	8
3.2 Data Collection and Assumptions	11
4. Profile of Economic Activity in East Gippsland	13
4.1 Employment	13
4.2 Total Value Added	14
4.3 Gross Regional Product	16
5. Economic Impact Results	17
5.1 Fishing Industry	17
5.2 Fish Processing Industry	19
5.3 Retail and Food Services Industries	20
5.4 Total Impact	22
6. Future Commercial Fishing Trends	24
6.1 Demand for Final Product	24
6.2 Sustainability of Current Catch Levels	26
6.3 Supply of Substitutes	27
6.4 Productivity Improvements	27
6.5 Exchange Rate	28
6.6 Cost of Fishing	29
6.7 Likely Future Trends in the Contribution to the Economy of the Lakes Entrance Fishing Industry	29
7. Industry Perspectives on Ocean Access	32
7.1 Overview	32

7.2	Changes to the Entrance Channel	32
7.3	Impacts of Improved Access	33
	References.....	35
	Appendix 1: Data Collection Sheet Example	36
	Appendix 2: Fishing Zones.....	39

TABLES

Table 3-1	Catch and GVP in selected Commonwealth Fisheries 2001/02 to 2011/12.....	9
Table 3-2	Catch and GVP in selected Victorian Fisheries 2001/02 to 2011/12.....	10
Table 3-3	Estimates of total catch by commercial fisheries operating out of Gippsland Lakes, 2012/13.....	12
Table 4-1	Employment and output, East Gippsland, 2011/12 ^a	13
Table 4-2	Household income, other value added and total value added, East Gippsland, 2011/12 ^a	15
Table 5-1	Economic impact of the Lakes Entrance fishing Industry ^a	18
Table 5-2	Economic impact of the Lakes Entrance seafood processing industry ^a	19
Table 5-3	Economic impact of the Lakes Entrance seafood trade and food services industries ^a	21
Table 5-4	Economic impact of the Lakes Entrance commercial fishing industries ^a	22
Table 6-1	Victorian per capita GDP and the price of Lakes Entrance landed catch	25
Table 6-2	Key Variables that Influence the economic impact of the Lakes Entrance fishing Industry.....	30

FIGURES

Figure 2-1	Map of the Lakes Entrance SA2 region.....	5
Figure 2-2	Map of the East Gippsland local government area	6
Figure 2-3	Map of Victoria	7
Figure 4-1	Employment, East Gippsland, 2011/12	14
Figure 4-2	Total value added, East Gippsland region, 2011/12.....	15

ABBREVIATIONS

AFMA	Australian Fisheries Management Authority
DEPI	Department of Environment and Primary Industries
fte	full-time equivalent
GRP	gross regional product
GSP	gross state product
LGA	Local Government Area
RISE	Regional Industry Structure and Employment
RBA	Reserve Bank of Australia
VIC	Victoria

DOCUMENT HISTORY AND STATUS

Doc Ver	Doc Status	Issued To	Qty elec	Qty hard	Date	Reviewed	Approved
1	Draft	Damian Snell	1 Word 1 PDF	-	12/12/13	JBM	JBM
2	Draft	Damian Snell	1 Word 1 PDF	-	6/02/14	JBM	JBM
3	Final	Damian Snell	1 Word 1 PDF	-	6/02/14	JBM	JBM

Printed: 11/06/2014 4:14:00 PM

Last Saved: 6/02/2014 3:51:00 PM

File Name: S:\1_Projects\Current\1343_Lakes Entrance Commercial Fishing\Reports\Lakes Entrance Fishing Economic Impacts_Final_140206.docx

Project Manager: Julian Morison

Principal Author/s: Lisa Rippin, Julian Morison, Patrick Gilmour and Stacey Paterson

Name of Client: Gippsland Ports

Name of Project: Economic Value of Commercial Fishing Operating out of Lakes Entrance (Port of Gippsland Lakes)

Document Version: 3

Job Number: 1343

EXECUTIVE SUMMARY

EconSearch in collaboration with Roberts Evaluation were contracted by Gippsland Ports to undertake an assessment of the value of the contribution of the commercial fishing conducted from the Port of Gippsland Lakes (Lakes Entrance) to the local and state economies.

This is an economic impact assessment. The estimates of economic impact presented are based on the use of an extension of the conventional input-output method. Over the past decade EconSearch has developed an extended input-output model known as the RISE model (Regional Industry Structure & Employment). The RISE model provides a comprehensive economic framework that is extremely useful in the resource planning process, particularly for regional economic impact applications.

The indicators used in impact analysis typically include output, employment, household income and gross state/regional product, and these four indicators are used in this report.

Almost 7,300 tonnes of seafood was landed in Lakes Entrance in 2012/13 with a value of approximately \$27.5 million. To put this in context, the total value of Victoria's state wild catch fisheries was \$54.7 million in 2011/12 (Skirtun, Sahlqvist and Vieira 2013). The Commonwealth Bass Strait Central Zone Scallop fishery had an estimated value of \$1.0 million, the Southern and Eastern Scalefish and Shark Fishery (SESSF) Gillnet, Hook and Trap Sector had a value of \$20.9 million and the SESSF Commonwealth Trawl Sector had a value of \$50.6 million in 2010/11.

Of the 7,400 tonnes of catch processed or handled in Lakes Entrance an estimated 3 per cent remains in the East Gippsland region, 86 per cent is sent to Melbourne and 11 per cent is sent interstate or overseas.

The economic impact (output, gross regional product, household income and jobs) of commercial fishing operating out of the Port of Gippsland Lakes (Lakes Entrance) is detailed in ES Table 1-1.

In the East Gippsland region the direct output generated from the commercial fishing industry and related processing and food service industries was estimated to be around \$35.0 million, \$27.5 million from fishing, \$6.7 million from seafood processing and \$0.8 million from retail and food services.

For Victoria, the direct output generated from the commercial fishing industry and related processing and food service industries was estimated to be around \$44.0 million, \$27.5 million from fishing, \$8.1 million from seafood processing and \$8.5 million from retail and food services.

ES Table 1-1 Economic impact of the Lakes Entrance commercial fishing industries, 2012/13^a

	East Gippsland	Victoria
Output (\$m) (direct only)		
Fishing	27.5	27.5
Seafood Processing	6.7	8.1
Trade & Food Services	0.8	8.5
<i>Total</i>	<i>35.0</i>	<i>44.0</i>
Gross Regional/State Product (\$m)		
Direct	20.0	24.5
Flow-on	9.3	23.9
<i>Total</i>	<i>29.3</i>	<i>48.4</i>
Household Income (\$m)		
Direct	11.2	14.0
Flow-on	5.5	13.5
<i>Total</i>	<i>16.7</i>	<i>27.5</i>
Employment (fte)		
Direct	168	216
Flow-on	110	178
<i>Total</i>	<i>278</i>	<i>394</i>

^a Output, GSP and household income estimates in 2013 dollars.

Source: EconSearch analysis

The direct and flow-on GRP in the East Gippsland region generated from commercial fishing and related processing and food service sectors was estimated to be around \$29.3 million, \$20.0 million generated directly and \$9.3 in flow-on activity. The GRP impact represents 15 per cent of total GRP in the Lakes Entrance SA2 region (\$188.3 million in 2011/12) and 2.0 per cent of total GRP in the East Gippsland region (\$1.48 billion in 2011/12). For Victoria, fishing industry activity based on commercial fishing out of Lakes Entrance is estimated to generate gross state product (GSP) of around \$48.4 million which represents 0.01 per cent of the state's total (\$328.6 billion in 2011/12).

The estimates presented in ES Table 1-1 show that total (direct plus flow-on) employment in the East Gippsland region as a result of the commercial fishing and related processing and food service sectors is estimated to be 278 fte jobs, 168 fte jobs generated directly by the fishing industry and 110 fte jobs through flow-on activity. The direct plus flow-on employment represents approximately 12 per cent of the estimated employment (fte) in the Lakes Entrance SA2 region¹ (2,233 fte in 2011/12) and 1.8 per cent of the estimated employment (fte) for the East Gippsland region (15,570 fte in 2011/12). For Victoria, direct and indirect employment is estimated to be 394 fte jobs. This represents 0.02 per cent of Victoria's total employment (approximately 2.4 million fte in 2011/12).

¹ It was deemed important to estimate the economic impacts at a smaller regional scale to show the importance of commercial fishing at the local level, i.e. the township of Lakes Entrance.

Total (direct plus flow-on) household income in the East Gippsland region as a result of the commercial fishing and related processing and food service sectors is estimated to be \$16.7 million, \$11.2 million generated directly by the fishing industry and \$5.5 million through flow-on activity. The direct plus flow-on household income represents 2.0 per cent of the estimated household income in the East Gippsland region for 2011/12 (\$854.9 million). For Victoria, direct and indirect household income is estimated to be \$27.5 million. This represents 0.01 per cent of Victoria's total household income (\$185.8 billion in 2011/12).

There has been a significant decline in the volume and value of catch landed in Lakes Entrance over the past decade or more and hence on the economic contribution the industry has been making both locally and at a broader level. However, on balance, taking account of the many factors affecting industry size and performance, it seems likely that the quantity of fish landed and the level of profitability of fishing operations will remain neutral over the next decade. Because of the direct relationship between profitability of fishing and the contribution to the economy, it is likely that the economic impact of the Lakes Entrance fishing industry will also remain steady over that period, with the opportunity to increase economic activity resting with an expansion in local processing operations.

The most likely negative influence on the market is a potentially significant increase in the global supply of seafood from aquaculture (i.e. seafood imports), which will place downward pressure on local fish prices. A potential positive influence on product price and local economic activity is strong and sustained growth in domestic demand, but this seems unlikely, at least in the short to medium term. All things considered, the factors identified as likely to have a positive influence on the value of commercial fishing in Lakes Entrance, domestic consumer demand and productivity improvements in fishing and processing operations, will result in relatively small positive shifts in market conditions which are unlikely to do any more than neutralise the negative consequences of projected increases in global seafood supply.

The ongoing contribution of fishing industry operations to the local, regional and state economies is dependent on continued ocean access to Lakes Entrance. Fishing industry views on the importance of ocean access indicate that safety, operational efficiency and other industry opportunity are all important and significant benefits over and above the measured contribution of the industry to the local, regional and state economies.

1. INTRODUCTION

The purpose of the project was to assess the economic impact (output, gross regional product and employment) of commercial fishing operating out of the Port of Gippsland Lakes (Lakes Entrance).

Gippsland Ports manage access to the Port of Gippsland Lakes at Lakes Entrance for Victoria's largest permanent commercial fishing fleet and substantial recreational boating activity. One of the factors for supporting continued ocean access to the Lakes is the presence of the commercial fishing industry operating out of Lakes Entrance.

EconSearch in collaboration with Roberts Evaluation were contracted by Gippsland Ports to undertake an assessment of the value of the contribution of the commercial fishing conducted from the Port of Gippsland Lakes (Lakes Entrance) to the local and state economies.

The following section (Section 2) provides an overview of the method of analysis and economic modelling approach used in preparing this paper.

Section 3 sets out historical catch and GVP trends in selected Commonwealth and state fisheries and describes the primary data collection process and related assumptions.

In Section 4 a set of economic indicators (employment and gross regional product) for the East Gippsland LGA region is presented to provide some context for the results of the analysis.

The results of the analysis are presented in Section 5 and future trends for the commercial fishing sector are discussed in Section 6.

The report concludes with Section 7 in which important perspectives from interviewees are presented on how dredging of the Lakes Entrance bar affects fishing operations and the safety and wellbeing of both recreational and commercial boat users

2. METHOD OF ANALYSIS

2.1 General Approach

This is an economic impact assessment. The estimates of economic impact presented are based on the use of an extension of the conventional input-output method. Over the past decade EconSearch has developed an extended input-output model known as the RISE model (Regional Industry Structure & Employment). The RISE model provides a comprehensive economic framework that is extremely useful in the resource planning process, particularly for regional economic impact applications.

The indicators used in impact analysis typically include output, employment and gross state/regional product and these two indicators are used in this report.

2.2 Estimation of Economic Effects – Key Concepts

2.2.1 Economic activity

Economic activity indicators: the primary focus in this report is on the concept of economic activity resulting from the fishing industry. The key economic activity indicators considered in this analysis are employment, output, gross regional product (GRP) and household income.

Economic impact: changes in economic activity are referred to as economic impacts. Generally changes in the economic activity indicators result from some stimulus or external shock imposed on the system. In this analysis the concept of economic impact includes the contribution that an existing industry, i.e. the fishing industry, makes to the economy. This *economic impact* is measured in terms of the *economic activity indicators*.

2.2.2 Indicators of economic activity defined

Employment units: A further important distinction is the units in which employment numbers are reported. They are usually reported in either full time equivalent (FTE) units, or job units defined as follows:

- *FTE:* is a way to measure a worker's involvement in a project. An FTE of 1.0 means that the person is equivalent to a full-time worker, while an FTE of 0.5 signals that the worker is only half-time. Typically, different scales are used to calibrate this number, depending on the type of industry and scope of the analysis but the basic calculation is the total hours worked divided by average annual hours worked in full-time jobs.
- *Jobs:* is used to refer to the number of workers employed in an industry or on a project at any point in time. It typically refers to either:
 - the *maximum* number of workers required any point over the analytical period or the duration of the project; or

- the *average* number of workers required over the analytical period/duration of the project. This can be calculated on a daily, weekly, monthly or annual basis.

In this report employment has been reported in terms of FTE units on a per annum basis.

Output (Value of): is a measure of the gross revenue of goods and services produced by commercial organisations (e.g. farm-gate value of production) and gross expenditure by government agencies. Total output needs to be used with care as it can include elements of double counting when the output of integrated industries is added together (e.g. the value of winery output includes the farm-gate value of grapes). In this report the term *value of output* is used interchangeably with *gross value of production*.

Gross regional product (GRP): is a measure of the contribution of an activity to the regional economy. GRP is measured as value of gross output (business revenue) less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as the sum of household income, 'gross operating surplus and gross mixed income net of payments to owner managers' and 'taxes less subsidies on products and production'. It represents payments to the primary inputs of production (labour, capital and land). Using GRP as a measure of economic impact avoids the problem of double counting that may arise from using value of output for this purpose.

Household income: is a component of GRP and 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.

2.2.3 Categories of economic activity in the infrastructure supply chain

A useful way to think about economic activity and economic impact (as measured by employment, GRP, etc.) is using the concept of a 'supply chain'. The supply chain, in the context of the commercial fishing industry includes fishing, processing, wholesaling, retailing and food services. It also includes coordination and collaboration with suppliers, intermediaries and third-party service providers.

Broadly speaking there are four categories of economic impact along the fishing supply chain.

1. *Direct economic impact* – this is economic activity (as measured by contribution to GRP, employment, household income, etc.) in those firms, businesses and organisations that are directly engaged in the fishing supply chain. Typically these will include:
 - a. fishing businesses,
 - b. fish processors, and
 - c. wholesale, retail and food service businesses.
2. *First round economic impact* - refers to employment in firms that supply inputs and services to the 'direct impact' businesses, i.e. those categorised under #1 above.
 - a. energy (e.g. fuel)

- b. raw materials (e.g. ice, bait)
 - c. logistics (e.g. transport)
 - d. business support services (e.g. accounting, legal)
 - e. other inputs
3. *Industrial-support economic impact* - is the term applied to 'second and subsequent round' economic impacts as successive waves of output increases occur in the economy to provide industrial support, as a response to the original fishing industry supply chain expenditure. The category *excludes* any economic activity associated with household consumption.
 4. *Consumption-induced economic impact* - is the term applied to the economic activity induced by increased household income associated with the original fishing industry supply chain expenditure. The expenditure of household income associated with all above three categories of economic impact (direct, first round and industrial-support) will generate additional economic activity that can be estimated separately in terms of GRP, jobs and household income.

Flow-on (or indirect) economic impact is the sum of categories 2, 3 and 4. In this analysis *direct* and *flow-on* employment, GRP and household income generated by the fishing industry supply chain have been reported. To avoid double counting, the supply chain *value of output* is reported only in terms of the direct impact.

2.3 Economic Impact Model

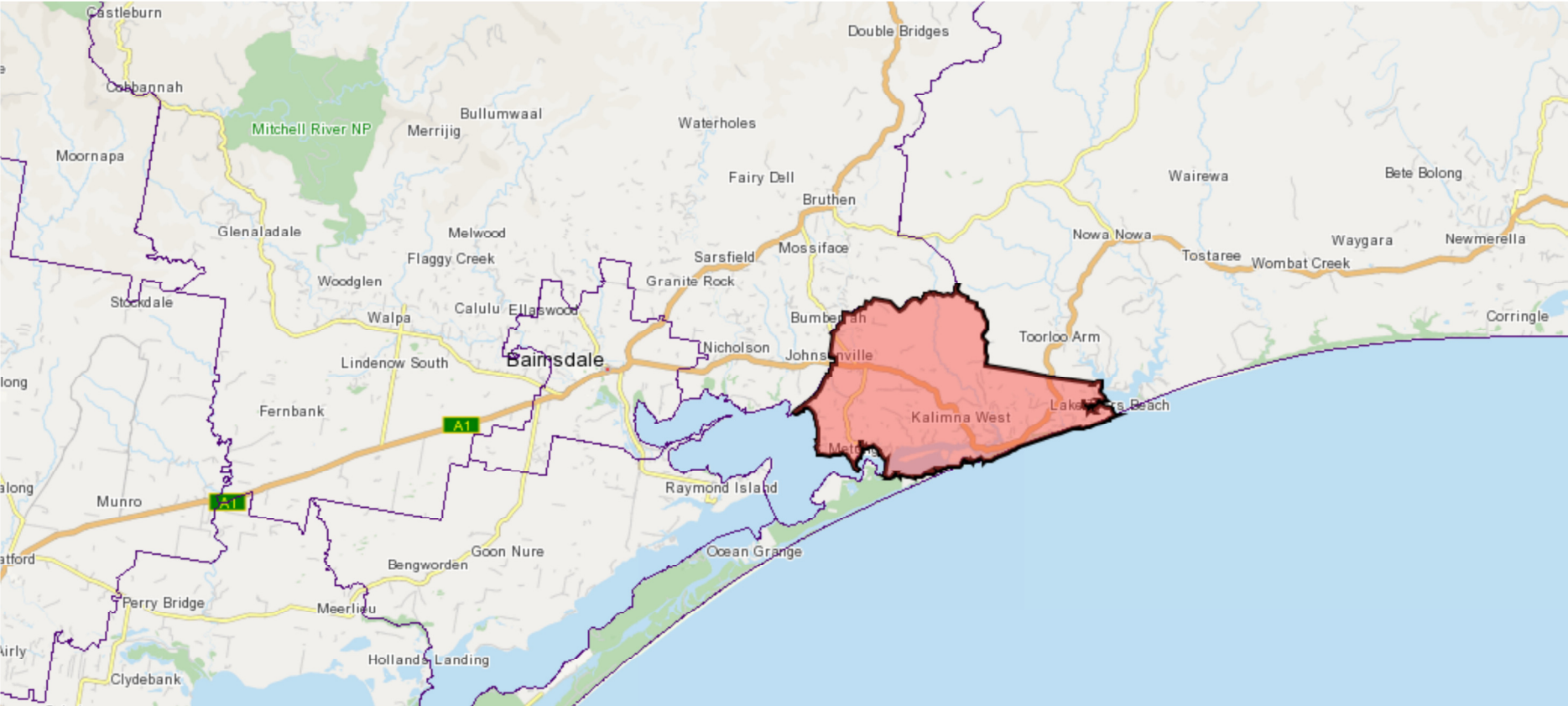
Input-output (I-O) models are widely used to assess the economic impact of existing or changing levels of economic activity², such as that associated with fishing supply chains. I-O models are available at the national, state and regional levels. The RISE I-O models of the Victorian and regional economies, constructed by EconSearch, are widely used by the Victorian Government and, as noted above, models for the East Gippsland region and Victorian economies have been used in this assessment.

Estimates of employment and GRP for the Lakes Entrance SA2 region were based on the East Gippsland IO model and 4 digit ANZSIC employment data for the Lakes Entrance SA2 from the *2011 ABS Census of Population and housing*. A map of the Lakes Entrance region is shown in Figure 2-1 with the East Gippsland region shown in Figure 2-2 and Victoria shown in Figure 2-3.

A RISE model provides industry sector multipliers (in terms of employment, GRP and household income), which are applied directly to output and spending estimates to formulate impact estimates. This approach makes implicit assumptions about the operation of the economy. It has the benefit of being relatively simple and transparent.

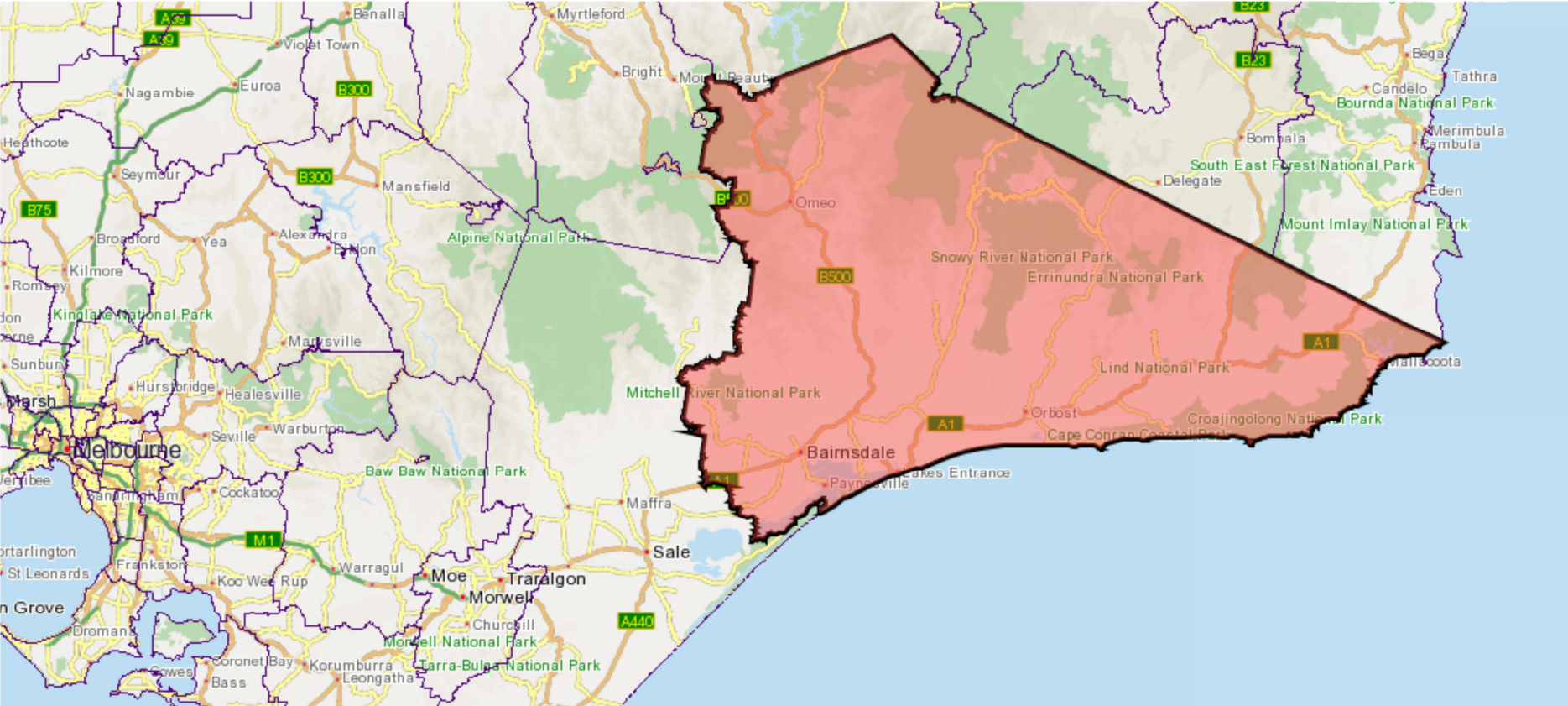
² Called an 'exogenous shock' in economic modelling terminology.

Figure 2-1 Map of the Lakes Entrance SA2 region



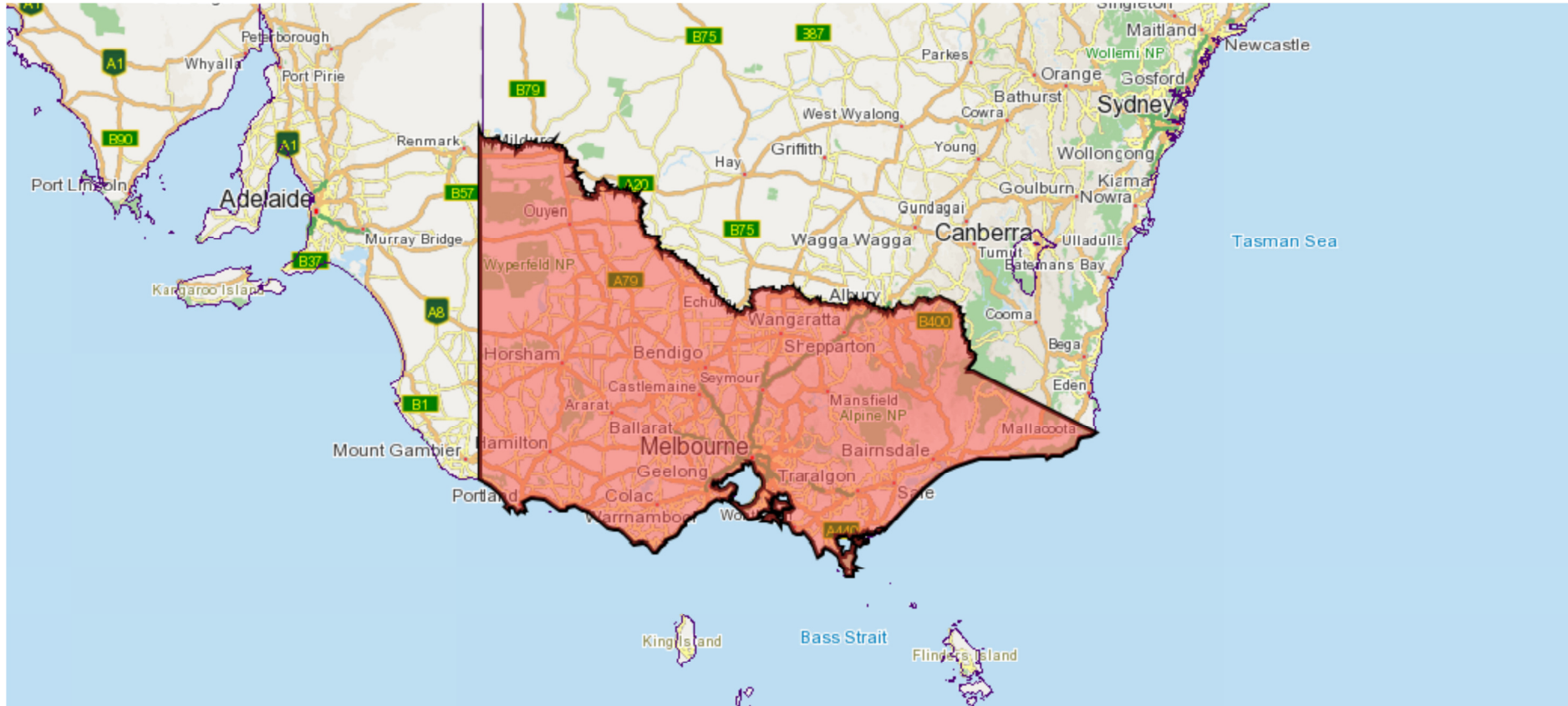
Source: ABS TableBuilder

Figure 2-2 Map of the East Gippsland local government area



Source: ABS TableBuilder

Figure 2-3 Map of Victoria



Source: ABS TableBuilder

3. DATA AND ASSUMPTIONS

3.1 Commercial Fishing Trends

This section of the report sets out historical catch and GVP trends in selected Commonwealth and state fisheries. Fisheries included in the tables below are those fisheries which were included in the fishing and processing data collection described in Section 3.2. Catch and GVP in the tables below are for the whole fisheries. Trends in catch and GVP for each fishery may differ from the trends in catch and value that passes through Lakes Entrance in each of these fisheries.

Catch and GVP in selected Commonwealth Fisheries 2001/02 to 2011/12 are detailed in Table 3-1. Both the Gillnet Hook and Trap sector and the Trawl sector of the Southern and Eastern Scalefish and Shark Commonwealth fishery have shown a significant decline in catch and real GVP in the last ten years. This may have contributed to a reduction in the catch and value of catch that has been landed in Lakes Entrance by each of these fisheries over the same period.

While catch in these fisheries has substantially reduced over the last 10 years³ this is consistent with experience elsewhere in south-eastern Australia following the introduction in 2006 of measures to improve the economic and biological condition of major fisheries. These measures included a government funded buy-back of fishing concessions and a reduction in catch levels. Comparatively the reduction in value of the catch is moderate given corresponding increases in fish prices. Note that the greatest impact of the buy-back of fishing concessions in Victoria was expected in Lakes Entrance hence the establishment of the Commonwealth Gippsland Lakes Community Grants initiative (DTPLI pers. comm.).

The Bass Strait Scallop fishery catch has fluctuated significantly over the last ten years. In 2011/12 catch was similar to catch in 2002/03.

Catch and GVP in selected Victorian Fisheries 2001/02 to 2011/12 are detailed in Table 3-2. The Gippsland Lake and Lake Tyers fishery has shown a significant decline in catch over the last ten years. Catch from this fishery does not pass through Lakes Entrance port, but a significant portion of it is processed using facilities in Gippsland Lake. The Eastern Zone Southern Rock Lobster fishery's catch has remained relatively constant. Rock Lobster makes up a relatively minor component of catch passing through Lakes Entrance. The Victorian Scallop fishery has not recorded any catch in the last two years, although this is principally because the vessels chose to fish in the Commercial fishery in Tasmanian.

³ According to the Australian Bureau of Agricultural and Resource Economics and Sciences (Skirtun, Sahlqvist and Vieira (2013)), there was a 13 per cent fall in the volume of Australian fisheries production in 2005-06, and a 16 per cent decline in the value of Commonwealth fisheries production to \$278 million.

Table 3-1 Catch and GVP in selected Commonwealth Fisheries 2001/02 to 2011/12

Year	SESSF Gillnet, Hook and Trap Sector		SESSF- Commonwealth Trawl Sector		Bass Strait Scallop	
	Catch (t)	GVP ('000)	Catch (t)	GVP ('000)	Catch (t)	GVP ('000)
2001/02	28,280	\$70,047	n.a.	n.a.	0	\$0
2002/03	30,558	\$65,732	4,665	\$21,587	421	\$694
2003/04	28,089	\$54,547	4,926	\$23,499	1,113	\$1,475
2004/05	25,055	\$58,926	5,041	\$24,591	339	\$387
2005/06	19,937	\$43,627	4,502	\$21,540	171	\$191
2006/07	16,328	\$54,539	4,250	\$23,784	n.a.	n.a.
2007/08	15,211	\$46,398	4,785	\$27,544	0	\$0
2008/09	15,449	\$55,940	4,509	\$30,570	594	\$1,163
2009/10	14,023	\$55,673	4,116	\$24,550	2,091	\$3,744
2010/11	14,603	\$48,579	4,055	\$23,830	2,032	\$2,946
2011/12	14,749	\$50,644	3,631	\$20,860	484	\$1,027

n.a. data not available.

Source: Skirtun, Sahlqvist and Vieira (2013)

Table 3-2 Catch and GVP in selected Victorian Fisheries 2001/02 to 2011/12

Year	Gippsland Lake and Lake Tyers		Southern Rock Lobster- Eastern Zone		Victorian Scallop	
	Catch (t)	GVP ('000)	Catch (t)	GVP ('000)	Catch (t)	GVP ('000)
2001/02	826	\$2,245	59	\$2,595	n.a.	n.a.
2002/03	772	\$2,296	50	\$1,974	n.a.	n.a.
2003/04	698	\$1,784	54	\$1,574	n.a.	n.a.
2004/05	694	\$1,627	54	\$1,662	n.a.	n.a.
2005/06	494	\$1,483	55	\$1,921	n.a.	n.a.
2006/07	364	\$1,682	51	\$2,061	n.a.	n.a.
2007/08	356	\$1,737	50	\$1,962	916	\$1,882
2008/09	259	\$1,013	41	\$2,075	403	\$1,026
2009/10	218	\$1,138	44	\$2,300	n.a.	n.a.
2010/11	291	n.p	65	\$3,522	0	\$0
2011/12	267	n.p	65	\$3,908	0	\$0

n.p. data not published, n.a. data not available.

Source: DEPI (2013)

3.2 Data Collection and Assumptions

Where possible, for each commercial fishery sector (State and Commonwealth) data was collected on the current and historic catch and effort, prices, boat and licence numbers, processor numbers, cost of management and geographic spread. Due to project time constraints, rather than conduct a survey of licence holders within each sector, a preliminary profile of representative boats/businesses was prepared from previous analyses undertaken by EconSearch in Victorian fisheries and discussed with one or two licence holders in each fishery/sector.

Roberts Evaluation collaborated with EconSearch to design interview questions based on the data needed for the economic modelling. Input was then sought from Gippsland Ports on contact details of licence holders, processors and other value chain businesses to approach, i.e. those broadly representative of the segments within each sector and those likely to be willing participants. Roberts Evaluation conducted face-to-face interviews with 11 key contacts in the Lakes Entrance region. A further five phone interviews were done to capture data from respondents unavailable for face-to-face interviews and to follow-up on issues that arose during the data collection process.

Interviews were structured around data tables containing initial estimates by EconSearch of the typical turnover, expenditure and employment by particular segments within the commercial industry (i.e. processors, trawl fishing businesses, Danish seine businesses, scallop fishing businesses, etc.). Expenditure was broken down into fixed and variable costs and allocated to a variety of standard categories, including wages, fuel, equipment and repairs, administration and so on (see example of a data collection sheet in Appendix 1). Interviews sought to confirm or update preliminary estimates. Interviews also focused on identifying the location of expenditure for each category (in East Gippsland, in the Gippsland Region, in Victoria or interstate/overseas). In addition to this economic data, interviews also provided the opportunity to explore the complexities and nuances of the Lakes Entrance fishing industry and commercial fishers' perspectives on the current dredging program.

Estimates of the economic impact of commercial fishing operating out of Lakes Entrance were based on an existing set of models that specify the expenditure for the representative boats/businesses within each of the sectors. These models were updated for the expenditure data collected during the consultation. For each of the sectors the expenditure models were used to develop an aggregate profile of expenditure for the Lakes Entrance region. An existing regional economic model (RISE model) for the East Gippsland LGA was used to estimate the economic contribution to the region and, similarly, a RISE model for Victoria was used to estimate the economic contribution to the state.

Total catch by commercial fishers operating out of Gippsland Lakes in 2012/13 is summarised in Table 3-3. Approximately 7,263 tonnes of seafood was landed in Lakes Entrance in 2012/13 with a value of around \$27.5 million. To put this in context the total value of Victoria's state wild catch fisheries was \$54.7 million in 2011/12 (Skirtun, Sahlqvist and Vieira 2013). The Commonwealth Bass Strait Central Zone Scallop fishery had an estimated value of \$1.0 million, the Southern and Eastern Scalefish and Shark Fishery (SESSF) Gillnet, Hook and Trap Sector had

a value of \$20.9 million and the SESSF Commonwealth Trawl Sector had a value of \$50.6 million in 2010/11.

Table 3-3 Estimates of total catch by commercial fisheries operating out of Gippsland Lakes, 2012/13

	Catch (t)	GVP ('000)
Shark Gillnet	525	\$6,222
Otter Trawl	1,530	\$6,678
Danish Seine	1,600	\$9,588
Scallop	630	\$1,040
Bays and Inlets ^a	-	-
Other ^b	2,978	\$3,973
Total	7,263	\$27,500

^a Bays and Inlets fishery was excluded from the total catch but 210t of catch from this fishery was processed locally and included in the analysis.

^b Other includes: longline, other trawl, rock lobster purse seine.

Source: Roberts Evaluation data collection and EconSearch analysis

Approximately 7,447 tonnes of catch (7,263 tonnes landed in Lakes Entrance plus 210 tonnes of Bays and Inlets catch less 1 tonne of Rock Lobster and 25 tonnes of prawns sold with no processing or handling) is processed of which around 99 per cent (approximately 7,398 tonnes) is processed or handled by local processing businesses. The remainder, predominantly Scallops, is sent directly to Melbourne and Sydney for processing.

Of the 7,447 tonnes of catch processed or handled by processing businesses in Lakes Entrance:

- 3 per cent remained in the East Gippsland region;
- 86 per cent was sent to Melbourne; and
- 11 per cent was sent interstate or overseas.

Of the processed catch that remained in East Gippsland:

- 61 per cent was distributed to local retailers; and
- 39 per cent was distributed to local restaurants.

Of the processed catch that was sent to Melbourne:

- 80 per cent was distributed to the Melbourne Fish Market;
- 10 per cent was distributed to retailers; and
- 10 per cent was distributed to restaurants.

4. PROFILE OF ECONOMIC ACTIVITY IN EAST GIPPSLAND

In order to set the context for the estimates of local economic contribution and impact of the commercial fishing industry (which follows), a brief profile of economic activity in East Gippsland region in 2011/12 is provided below. These data were derived from the I-O database utilised by the consultants for this project. Estimates of employment and output by sector are detailed in Table 4-1 and gross regional product (GRP) and its components in Table 4-2.

4.1 Employment

Table 4-1 Employment and output, East Gippsland, 2011/12 ^a

Sector	Total employment		Employment		Value of output	
	no. of jobs	%	fte	%	\$m	%
Agric, Forestry & Fishing	1,822	11.0%	2,158	13.9%	436	15.6%
Mining	62	0.4%	87	0.6%	31	1.1%
Manufacturing	1,504	9.1%	1,499	9.6%	326	11.7%
Electricity, gas, water and waste services	197	1.2%	201	1.3%	60	2.1%
Construction	1,409	8.5%	1,491	9.6%	352	12.6%
Wholesale Trade	546	3.3%	517	3.3%	90	3.2%
Retail Trade	2,098	12.7%	1,786	11.5%	187	6.7%
Accommodation and food services	1,527	9.2%	1,225	7.9%	164	5.9%
Transport, postal and warehousing	642	3.9%	688	4.4%	132	4.7%
Information media and telecommunications	90	0.5%	65	0.4%	20	0.7%
Financial and insurance services	177	1.1%	174	1.1%	83	3.0%
Ownership of Dwellings ^b	0	0.0%	0	0.0%	195	7.0%
Rental, hiring and real estate services	208	1.3%	196	1.3%	77	2.8%
Professional, scientific and technical services	543	3.3%	510	3.3%	108	3.9%
Administrative and support services	345	2.1%	277	1.8%	52	1.8%
Public administration and safety	844	5.1%	881	5.7%	108	3.9%
Education and training	1,568	9.5%	1,398	9.0%	127	4.5%
Health care and social assistance	2,196	13.3%	1,732	11.1%	174	6.2%
Arts and recreation services	182	1.1%	153	1.0%	18	0.6%
Other services	576	3.5%	532	3.4%	51	1.8%
Total	16,536	100.0%	15,570	100.0%	2,792	100.0%

^a Estimates of employment are based on ABS *2011 Census of Population and Housing* and updated for changes between the August quarter 2011 (time of census) and the four quarter average ABS *Labour Force* estimates for 2011/12.

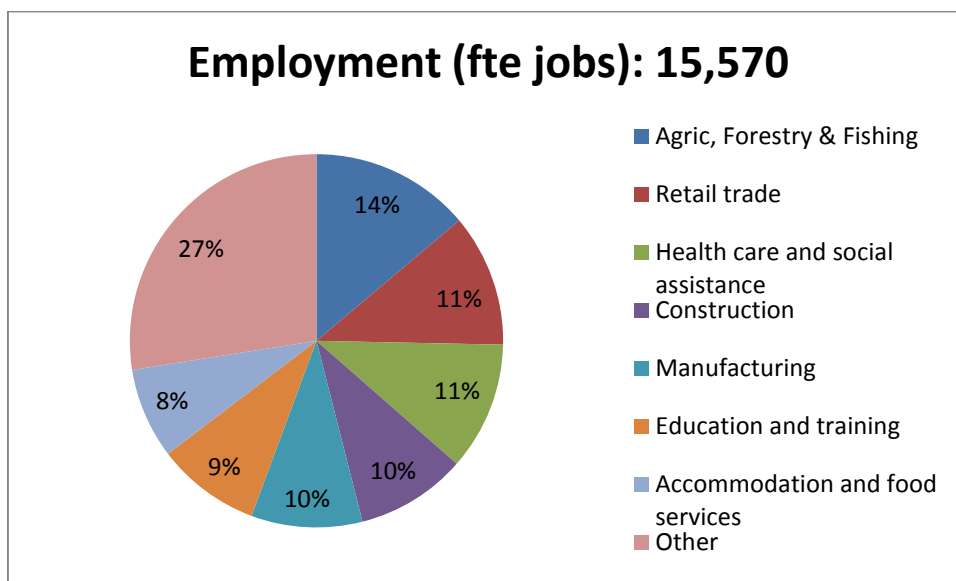
^b The ownership of dwellings sector is a notional sector designed to impute a return to the region's housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

Source: EconSearch (2013a)

It was estimated that there were around 15,570 fte jobs (approximately 16,500 total jobs) in the East Gippsland region in 2011/12 (Table 4-1). The top five contributors to total jobs in the region in 2011/12 were:

- Agriculture, forestry and fishing (14 per cent);
- Retail trade (11 per cent);
- Health care and social assistance (11 per cent);
- Construction (10 per cent); and
- Manufacturing (10 per cent).

Figure 4-1 Employment, East Gippsland, 2011/12



Source: EconSearch analysis.

In 2011/12 employment in Victoria was around 2.4 million (fte jobs) which means the East Gippsland region accounts for around 0.7 per cent of the total state employment.

4.2 Total Value Added

Total value added in the East Gippsland region in 2011/12 was estimated to be approximately \$1.36 billion (Table 4-2). The contribution of an individual industry to total value added is calculated as the sum of household income, gross operating surplus and gross mixed income. The top five contributors to total value added were:

- Agriculture, forestry and fishing (14 per cent);
- Ownership of Dwellings (11 per cent);
- Health care and social assistance (9 per cent);
- Retail trade (8 per cent); and
- Construction (8 per cent).

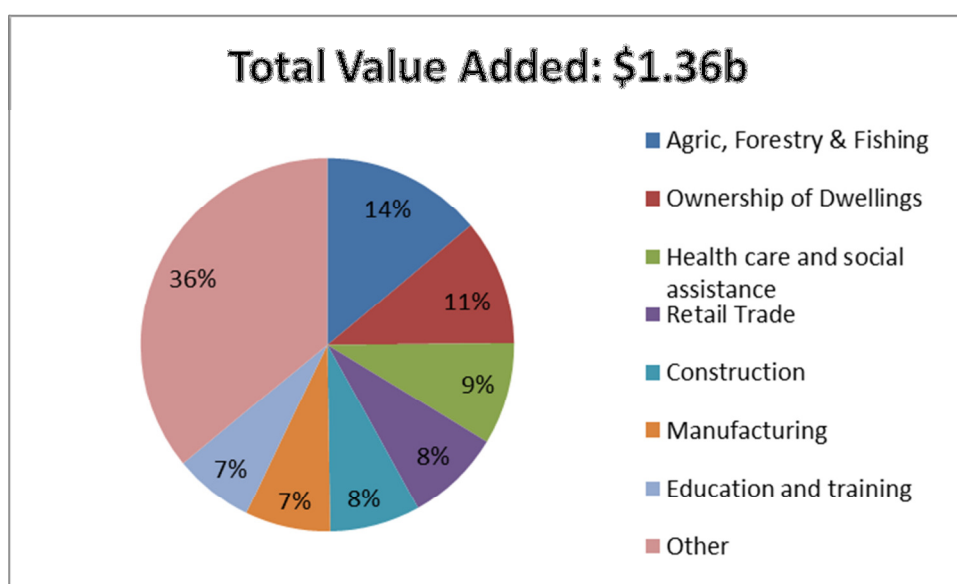
Table 4-2 Household income, other value added and total value added, East Gippsland, 2011/12 ^a

Sector	Household income		Other value added		Total value added	
	\$m	%	\$m	%	\$m	%
Agric, Forestry & Fishing	108	12.7%	81	16.1%	189	13.9%
Mining	9	1.0%	4	0.8%	13	0.9%
Manufacturing	70	8.2%	30	6.1%	101	7.4%
Electricity, gas, water and waste services	14	1.7%	15	3.0%	29	2.2%
Construction	86	10.0%	21	4.1%	106	7.8%
Wholesale Trade	28	3.3%	16	3.2%	44	3.2%
Retail Trade	82	9.6%	30	5.9%	112	8.2%
Accommodation and food services	48	5.7%	27	5.4%	76	5.6%
Transport, postal and warehousing	35	4.1%	26	5.1%	61	4.5%
Information media and telecommunications	4	0.5%	6	1.3%	11	0.8%
Financial and insurance services	28	3.3%	32	6.3%	60	4.4%
Ownership of Dwellings	0	0.0%	148	29.4%	148	10.9%
Rental, hiring and real estate services	15	1.8%	14	2.8%	29	2.2%
Professional, scientific and technical services	31	3.6%	16	3.2%	47	3.4%
Administrative and support services	24	2.8%	1	0.3%	25	1.9%
Public administration and safety	50	5.8%	11	2.1%	61	4.5%
Education and training	87	10.2%	7	1.4%	94	6.9%
Health care and social assistance	109	12.7%	12	2.3%	120	8.9%
Arts and recreation services	6	0.7%	2	0.3%	8	0.6%
Other services	21	2.5%	4	0.8%	25	1.9%
Total	855	100.0%	504	100.0%	1,359	100.0%

^a Household income and other value added are the two components of total value added. Using the income method to derive total value added enables its estimation on a sector-by-sector basis.

Source: EconSearch (2013a)

Figure 4-2 Total value added, East Gippsland region, 2011/12



Source: EconSearch analysis.

In 2011/12 Victoria's total value added was \$306.88 billion which means that the East Gippsland region accounts for 0.4 per cent of the state economy. Economic activity in East Gippsland is based around a diverse range of agriculture, construction and manufacturing industries along with a significant housing stock with associated service industries (health, retail trade and education).

4.3 Gross Regional Product

Gross regional product (GRP) is a measure of the net contribution of an activity to the regional economy. GRP is measured as value of output less the cost of goods and services (including imports) used in producing the output. In other words, GRP is total value added plus net taxes (i.e. taxes less subsidies on products and production) paid by households and other components of final demand.

GRP in the East Gippsland region in 2011/12 was estimated to be \$1.48 billion comprised of \$1.36 billion in total value added and \$0.12 billion in net taxes. In 2011/12 Victoria's gross state product was \$328.6 billion which means that East Gippsland accounts for almost 0.5 per cent of the state economy.

5. ECONOMIC IMPACT RESULTS

The data described in Section 3.2 were used to compile a series of economic impacts in terms of output, GRP/GSP and employment (and associated household income) for the local region and the State using the 2011/12 RISE models for the East Gippsland region and Victoria. The estimated impacts are reported in the following sections: fishing industry impacts in Section 5.1, seafood processing industry impacts in Section 5.2 and the retail and food services industry impacts in Section 5.3, with a summary of all three industry sectors in Section 5.4.

5.1 Fishing Industry

As described in Section 3.3, almost 7,300 tonnes of seafood was landed in Lakes Entrance in 2012/13 with a value of approximately \$27.5 million. In total the commercial fishing industry directly employs 122 fte. Along with the household income and gross operating surplus generated directly by the commercial fishing sector estimates of economic impact were based on an aggregate profile of expenditure across all the fisheries.

Output...

Output is a measure of the gross revenue of goods and services produced by commercial organisations (e.g. farm-gate value of production) and gross expenditure by government agencies. Total output needs to be used with care as it can include elements of double counting when the output of integrated industries is added together (e.g. the value of processor output includes the beach value of the fish). Estimates of direct output for the fishing sector are provided in Table 5-1. The direct output generated from the fishing sector was estimated to be around \$27.5 million in the East Gippsland region and in Victoria as a whole.

Gross regional product (GRP)/ Gross state product (GSP)...

GRP/GSP is a measure of the net contribution of an activity or industry to the regional economy. It represents payments to the primary inputs of production (labour, capital and land) and is a regional/state level equivalent of gross domestic product. The direct and flow-on GRP in the East Gippsland region generated by the commercial fishing industry was estimated to be around \$24.6 million, \$17.5 million generated directly and \$7.1 in flow-on activity.

In the Lakes Entrance SA2 region the GRP was estimated to be \$188.3 million in 2011/12. On this basis, the estimated GRP total impact represents 13 per cent of the region's total. In Section 3.3 it was reported that in 2011/12 the GRP in the East Gippsland region was approximately \$1.48 billion. On this basis, the estimated GRP total impact represents 1.7 per cent of the region's total.

For Victoria, the industry is estimated to generate GSP of around \$31.6 million. In the context of Victoria's GSP in 2011/12 (\$328.60 billion) (ABS 2012), the estimated GSP total impact represents 0.01 per cent of the state's total.

Table 5-1 Economic impact of the Lakes Entrance fishing Industry ^a

	East Gippsland	Victoria
Output (\$m) (direct only)		
Fishing	27.5	27.5
Gross Regional Product (\$m)		
Direct	17.5	17.5
Flow-on	7.1	14.1
<i>Total</i>	24.6	31.6
Household Income (\$m)		
Direct	8.9	8.9
Flow-on	4.3	8.2
<i>Total</i>	13.2	17.1
Employment (fte)		
Direct	122	122
Flow-on	86	110
<i>Total</i>	209	233

^a GSP estimates in 2013 dollars.

Source: EconSearch analysis

Employment (fte)...

Employment is an important indicator of both regional economic activity and the welfare of regional households. The estimates presented in Table 5-1 show that total (direct plus flow-on) employment in the East Gippsland region as a result of the commercial fishing industry is estimated to be 209 fte jobs, 122 fte jobs generated directly by the fishing industry and 86 fte jobs through flow-on activity.

In the Lakes Entrance SA2 region⁴ total fte employment was estimated to be 2,233 in 2011/12. On this basis, the estimated employment total impact represents 9 per cent of the region's total. The direct plus flow-on employment comprises 1.3 per cent of the estimated employment (fte) for the East Gippsland region for 2011/12 (15,570 fte).

For Victoria, direct and indirect employment is estimated to be 233 fte jobs. This represents 0.01 per cent of Victoria's total employment in 2011/12 (2.4 million fte).

Household Income...

Household income is a component of GRP/GSP and is a measure of wages and salaries paid in cash and in-kind, drawings by owner operators and other payments to labour. The estimates presented in Table 5-1 show that total (direct plus flow-on) household income in the East Gippsland region as a result of the commercial fishing industry is estimated to be \$13.2 million, \$8.9 million generated directly by the fishing industry and \$4.3 million through flow-on activity. The direct plus flow-on household income represents 1.5 per cent of the estimated

⁴ It was deemed important to estimate the economic impacts at a smaller regional scale to show the importance of commercial fishing on a small town (e.g. the township of Lakes Entrance).

household for the East Gippsland region for 2011/12 (\$854.9 million). For Victoria, direct and indirect household income is estimated to be \$17.1 million. This represents 0.01 per cent of Victoria's total household income (\$185.8 billion in 2011/12).

5.2 Fish Processing Industry

As described in Section 3.2, approximately 7,447 tonnes of catch (7,263 tonnes landed in Lakes Entrance plus 210 tonnes of Bays and Inlets catch less 1 tonne of Rock Lobster and 25 tonnes of prawns sold with no processing or handling) is processed of which around 99 per cent (approximately 7,398 tonnes) is processed or handled by local processing businesses. In total the seafood processing and handling industry directly employs 39 fte. Along with the household income and gross operating surplus generated directly by these businesses estimates of economic impact were based on an aggregate profile of expenditure.

Output...

Estimates of direct output for the processing sector are provided in Table 5-2. The direct output generated from the processing sector was estimated to be around \$6.7 million in the East Gippsland region and \$8.1 million in Victoria as a whole.

Table 5-2 Economic impact of the Lakes Entrance seafood processing industry ^a

	East Gippsland	Victoria
Output (\$m) (direct only)		
Seafood Processing	6.7	8.1
Gross Regional Product (\$m)		
Direct	2.1	2.8
Flow-on	2.0	4.8
<i>Total</i>	4.1	7.6
Household Income (\$m)		
Direct	1.9	2.2
Flow-on	1.2	2.7
<i>Total</i>	3.1	4.9
Employment (fte)		
Direct	39	49
Flow-on	22	34
<i>Total</i>	60	83

^a GSP estimates in 2013 dollars.

Source: EconSearch analysis

Gross regional product (GRP)/ Gross state product (GSP)...

The direct and flow-on GRP in the East Gippsland region generated by the seafood processing industry was estimated to be around \$4.1 million, \$2.1 million generated directly and \$2.0 in flow-on activity. In the Lakes Entrance SA2 region the GRP was estimated to be \$188.3 million in 2011/12. On this basis, the estimated GRP total impact comprises almost 2.2 per cent of the region's total. In Section 3.3 it was reported that in 2011/12 the GRP in the East Gippsland region was approximately \$1.48 billion. On this basis, the estimated GRP total impact represents 0.3 per cent of the region's total.

For Victoria, the industry is estimated to generate GSP of around \$4.9 million. In the context of Victoria's GSP in 2011/12 (\$328.60 billion) (ABS 2012), the estimated GSP total impact comprises just 0.002 per cent of the state's total.

Employment (fte)...

The estimates presented in Table 5-1 show that total (direct plus flow-on) employment in the East Gippsland region as a result of the seafood processing industry is estimated to be 60 fte jobs, 39 fte jobs generated directly by the fishing industry and 22 fte jobs through flow-on activity. In the Lakes Entrance SA2 region total fte employment was estimated to be 2,233 in 2011/12. On this basis, the estimated employment total impact represents 2.7 per cent of the region's total. The direct plus flow-on employment comprises 0.4 per cent of the estimated employment (fte) for the East Gippsland region for 2011/12 (15,570 fte).

For Victoria, direct and indirect employment is estimated to be 83 fte jobs. This represents 0.003 per cent of Victoria's total employment (2.4 million fte in 2011/12).

Household Income...

The estimates presented in Table 5-2 show that total (direct plus flow-on) household income in the East Gippsland region as a result of the processing industry is estimated to be \$3.1 million, \$1.9 million generated directly by the processing industry and \$1.2 million through flow-on activity. The direct plus flow-on household income comprises 0.4 per cent of the estimated household for the East Gippsland region for 2011/12 (\$854.9 million). For Victoria, direct and indirect household income is estimated to be \$4.9 million. This represents 0.003 per cent of Victoria's total household income (\$185.8 billion in 2011/12).

5.3 Retail and Food Services Industries

Of the 7,447 tonnes of catch processed or handled in Lakes Entrance; 3 per cent remains in the East Gippsland region, 86 per cent is sent to Melbourne and 11 per cent is sent interstate or overseas. The value chain assumptions detailed in Section 3.3 were used with margins to estimate a profile of final demand for the wholesale trade, retail trade and food and beverage service sectors.

Output...

Estimates of direct output for the trade and food service sector are provided in Table 5-3. In the East Gippsland region the direct output generated from the trade and food service industries was estimated to be around \$0.8 million. Whilst for Victoria, the direct output generated from the trade and food service industries was estimated to be around \$8.5 million

Table 5-3 Economic impact of the Lakes Entrance seafood trade and food services industries ^a

	East Gippsland	Victoria
Output (\$m) (direct only)		
Trade & Food Services	0.8	8.5
Gross Regional Product (\$m)		
Direct	0.4	4.2
Flow-on	0.2	5.0
<i>Total</i>	<i>0.6</i>	<i>9.2</i>
Household Income (\$m)		
Direct	0.3	2.9
Flow-on	0.1	2.6
<i>Total</i>	<i>0.4</i>	<i>5.5</i>
Employment (fte)		
Direct	7	45
Flow-on	2	33
<i>Total</i>	<i>9</i>	<i>78</i>

^a GSP estimates in 2013 dollars.

Source: EconSearch analysis

Gross regional product (GRP)/ Gross state product (GSP)...

The direct and flow-on GRP in the East Gippsland region generated by the seafood retail and food services industry was estimated to be around \$0.6 million, \$0.4 million generated directly and \$0.2 in flow-on activity. In the Lakes Entrance SA2 region the GRP was estimated to be \$188.3 million in 2011/12. On this basis, the estimated GRP total impact represents 0.3 per cent of the region's total. In Section 3.3 it was reported that in 2011/12 the GRP in the East Gippsland region was approximately \$1.48 billion. On this basis, the estimated GRP total impact comprises 0.04 per cent of the region's total.

For Victoria, the industry is estimated to generate GSP of around \$9.2 million. In the context of Victoria's GSP in 2011/12 (\$328.60 billion) (ABS 2012), the estimated GSP total impact represents 0.003 per cent of the state's total.

Employment (fte)...

The estimates presented in Table 5-3 show that total (direct plus flow-on) employment in the East Gippsland region as a result of the trade and food service industry is estimated to be 9 fte jobs, 7 fte jobs generated directly and 2 fte jobs through flow-on activity. In the Lakes Entrance SA2 region total fte employment was estimated to be 2,233 in 2011/12. On this basis, the estimated employment total impact represents 0.4 per cent of the region's total. The direct plus flow-on employment comprises 0.06 per cent of the estimated employment (fte) for the East Gippsland region for 2011/12 (15,570 fte).

For Victoria, direct and indirect employment is estimated to be 78 fte jobs. This represents 0.003 per cent of Victoria's total employment (2.4 million fte in 2011/12).

Household Income...

The estimates presented in Table 5-3 show that total (direct plus flow-on) household income in the East Gippsland region as a result of the trade and food service is estimated to be \$0.4 million, \$0.3 million generated directly by the trade and food service industry and \$0.1 million through flow-on activity. The direct plus flow-on household income comprises 0.05 per cent of the estimated household for the East Gippsland region for 2011/12 (\$854.9 million). For Victoria, direct and indirect household income is estimated to be \$5.5 million. This represents 0.003 per cent of Victoria's total household income (\$185.8 billion in 2011/12).

5.4 Total Impact

Output...

Estimates of direct output generated from commercial fishing and related processing and food service sectors are provided in Table 5-4. In the East Gippsland region the direct output generated from the commercial fishing industry and related processing and food service industries was estimated to be around \$35.0 million, \$27.5 million from fishing, \$6.7 million from seafood processing and \$0.8 million from retail and food services.

For Victoria, the direct output generated from the commercial fishing industry and related processing and food service industries was estimated to be around \$44.0 million, \$27.5 million from fishing, \$8.1 million from seafood processing and \$8.5 million from retail and food services.

Table 5-4 Economic impact of the Lakes Entrance commercial fishing industries ^a

	East Gippsland	Victoria
Output (\$m) (direct only)		
Fishing	27.5	27.5
Seafood Processing	6.7	8.1
Trade & Food Services	0.8	8.5
<i>Total</i>	<i>35.0</i>	<i>44.0</i>
Gross Regional/State Product (\$m)		
Direct	20.0	24.5
Flow-on	9.3	23.9
<i>Total</i>	<i>29.3</i>	<i>48.4</i>
Household Income (\$m)		
Direct	11.2	14.0
Flow-on	5.5	13.5
<i>Total</i>	<i>16.7</i>	<i>27.5</i>
Employment (fte)		
Direct	168	216
Flow-on	110	178
<i>Total</i>	<i>278</i>	<i>394</i>

^a GSP estimates in 2013 dollars.

Source: EconSearch analysis

Gross regional product (GRP)/ Gross state product (GSP)...

The direct and flow-on GRP in the East Gippsland region generated from commercial fishing and related processing and food service sectors was estimated to be around \$29.3 million, \$20.0 million generated directly and \$9.3 in flow-on activity. In the Lakes Entrance SA2 region the GRP was estimated to be \$188.3 million in 2011/12. On this basis, the estimated GRP total impact comprises 15 per cent of the region's total. In Section 3.1 it was reported that in 2011/12 the GRP in the East Gippsland region was approximately \$1.48 billion. On this basis, the estimated GRP total impact represents 2.0 per cent of the region's total.

For Victoria, the industry is estimated to generate GSP of around \$48.4 million. In the context of Victoria's GSP in 2011/12 (\$328.60 billion) (ABS 2012), the estimated GSP total impact comprises 0.01 per cent of the state's total.

Employment (fte)...

The estimates presented in Table 5-4 show that total (direct plus flow-on) employment in the East Gippsland region as a result of the commercial fishing and related processing and food service sectors is estimated to be 278 fte jobs, 168 fte jobs generated directly by the fishing industry and 110 fte jobs through flow-on activity. In the Lakes Entrance SA2 region total fte employment was estimated to be 2,233 in 2011/12. On this basis, the estimated employment total impact comprises around 12 per cent of the region's total. The direct plus flow-on employment represents 1.8 per cent of the estimated employment (fte) for the East Gippsland region for 2011/12 (15,570 fte).

For Victoria, direct and indirect employment is estimated to be 394 fte jobs. This represents 0.02 per cent of Victoria's total employment in 2011/12 (2.4 million fte).

Household Income

The estimates presented in Table 5-4 show that total (direct plus flow-on) household income in the East Gippsland region as a result of the commercial fishing and related processing and food service sectors is estimated to be \$16.7 million, \$11.2 million generated directly by fishing industry and \$5.5 million through flow-on activity. The direct plus flow-on household income represents 2.0 per cent of the estimated household for the East Gippsland region for 2011/12 (\$854.9 million). For Victoria, direct and indirect household income is estimated to be \$27.5 million. This represents 0.01 per cent of Victoria's total household income (\$185.8 billion in 2011/12).

6. FUTURE COMMERCIAL FISHING TRENDS

This section of the report sets out the likely trends in the commercial fishing sector operating out of Lakes Entrance. The approach taken has been to:

- identify the main variables that are likely to affect commercial fishing operations;
- examine recent trends in these variables (where data are available);
- consider in what way (positive or negative) these variables could affect the value of the fishery; and
- consider to what extent these variables may change in the short to medium term.

Following these considerations it is then possible to assess, with varying degrees of confidence, the extent to which the variables may affect commercial fishing businesses operating out of Lakes Entrance and therefore the impact that these operations are likely to have on the local and broader economies.

In any commercial fishery there are many variables that can affect the expected value of the fishery, the value of access rights to the fishery and the impact the operation of the fishery will have on the local and broader economies. The uncertainty of these variables makes the determination of future values very difficult. Some of the key variables that influence the future value of fishing industries include:

- demand for final product;
- sustainability of current catch levels;
- supply of substitutes;
- productivity of fishing operations;
- relevant exchange rates; and
- costs of fishing.

These factors will, to a greater or lesser extent, affect the price of fish and the cost of fishing operations. Because product price and production cost directly affect profitability, they are key determinants of the value of the fishery and the impact the fishery will have on the local and broader economies. Recent trends and the outlook for these factors are discussed, in turn, below.

6.1 Demand for Final Product

Demand for fish caught by Lakes Entrance fishers is derived from the demand for seafood products at the retail level. The vast majority of the fish that are landed in Lakes Entrance are sent to the Melbourne Fish Market where they are sold to retailers or restaurants or for

further processing. So it is the demand by Victorian consumers that is the relevant final demand. In this regard it is worth noting the concept of ‘derived demand’, a term used by economists to describe the demand for inputs that are used to produce final products. The demand for an input is said to be a derived demand because the intensity of demand, i.e. the height of the demand curve and the relationship between input price and demand, are determined by the demand for the final product. The concept of derived demand is used to describe relationships between different functions in the market. In the context of the Lakes Entrance fisheries, demand for fish is related to the demand for the final consumer product, retail of food services of fresh seafood.

Economic theory indicates that real income (nominal income adjusted for inflation) will have a positive relationship with demand for goods such as fresh seafood (i.e. normal goods). In Australia seafood is a luxury item which can be expected to experience an increase in demand as real income rises; both aggregate and per capita income. Recent trends in these factors and the price paid for fish from Lakes Entrance fisheries are illustrated in the table below.

Table 6-1 Victorian per capita GDP and the price of Lakes Entrance landed catch

Year	GSP Victoria (\$m)	Population Victoria	Real per Capita GSP	Fish Price Index ^a
2003/04	212,789	4,927,149	43,187	100
2004/05	221,589	4,989,246	44,413	115
2005/06	222,905	5,061,266	44,041	108
2006/07	234,515	5,153,522	45,506	152
2007/08	243,508	5,256,375	46,326	139
2008/09	246,775	5,371,934	45,938	159
2009/10	251,031	5,461,101	45,967	152
2010/11	256,385	5,537,817	46,297	131
2011/12	265,832	5,630,855	47,210	138
2012/13 ^b	267,429	5,712,982	46,811	n.a.

^a Average price of fish from the fisheries that land in Lakes Entrance.

^b Latest published population estimate is for the March quarter 2013.

Source: ABS (2013 a, b), Skirtun, Sahlqvist and Vieira (2013), DEPI (2013)

Visual inspection of real per capita income and the price of landed fish suggests a positive correlation over time (Table 6-1). The coefficient of correlation⁵ between the two factors over the period 2003/04 to 2012/13, indicates a strong positive relationship ($\rho = +0.76$) consistent with economic theory.

It could be expected that the growth in real GSP in Victoria and the rest of Australia over the next decade will be equal to or greater than that which has occurred over the past 10 years (average annual growth of 2.3% from 2003/04– 2012/13), given the structural adjustment that has occurred in the economy during that period. In the short-term, the RBA increased its

⁵ The strength of a relationship between two variables can be measured by the coefficient of correlation (ρ), whose value ranges from -1.0 for perfect negative correlation up to $+1.0$ for perfect positive correlation.

growth forecast for this year to 2.5 per cent, but lowered its projections for the next two years by 0.5 percentage points. It expects the economy to grow by 2 per cent to 3 per cent in 2014. In 2015, it forecasts growth of between 2.25 per cent to 3.25 per cent (RBA 2013).

6.2 Sustainability of Current Catch Levels

From the *Status of Key Australian Fish Stocks report 2012* (FRDC 2012), the status of the following species from Commonwealth fisheries landed in Lakes Entrance was as follows:

- Scallops – undefined
- Gould’s Squid – sustainable
- Dusky Shark – sustainable
- School Shark – overfished
- Tiger Flathead – sustainable
- Blue Grenadier – sustainable
- Swordfish – sustainable
- Eastern School Whiting – sustainable

Of the Commonwealth fisheries species landed in Lakes Entrance all were listed as sustainable apart from Scallops where insufficient data has meant the status of the stock was undefined.

The status of the following species from Victorian fisheries landed in Lakes Entrance was as follows:

- Scallops – undefined
- Southern Rock Lobster – sustainable
- Southern Calamari – undefined
- Gummy Shark – sustainable
- School Shark – overfished
- Australian Salmon – sustainable
- Australian Sardine – sustainable
- Dusky Flathead – sustainable
- Tiger Flathead – sustainable
- Snapper – sustainable
- King George Whiting – sustainable
- Eastern School Whiting – sustainable

Of the Victorian fisheries species landed in Lakes Entrance all were listed as sustainable apart from Scallops and Southern Calamari where insufficient data has meant the status of the stock was undefined and School Shark which was listed as overfished.

6.3 Supply of Substitutes

As there are many species landed through Lakes Entrance there are also be numerous substitutes, from both other fisheries in Australia and form overseas. Therefore, the supply of these substitutes, including imports, will have an impact on the price of Lakes Entrance product and the value of the fisheries operating out of Lakes entrance. However, in general, there is uncertainty in the scientific community about the outlook for substitute fisheries.

6.4 Productivity Improvements

Improvements in productivity, in terms of the inputs used to yield a certain catch level, would be expected to have a positive effect on the value of the fishery but the effect of the fishery on the local and broader economies is less clear. If more fish can be caught by an individual boat then the profitability of the boat would be expected to rise (as long as the cost of achieving the gains are less than the value of the gains). The picture is less clear for the effect on the local and broader economies. When the productivity gains are in the form of less crew or, indeed, less boats in the fishery, there can well be a reduction in aggregate expenditure and employment in the industry and therefore a lower impact on the economy.

By contrast, innovation in processing that might make an improvement in the profitability of local processing could see an increase in the quantity processed before it leaves the region and therefore an increase in the economic impact of the fishery. During the data collection process the Lakes Entrance Fishermen's Co-Operative Society Limited (the co-op) stated they are currently looking at expanding their processing operations, including purchasing a filleting machine, so that they can start exporting. They have secured some support from the state government to help fund this expansion. The additional volume of catch that will be processed is unsure but it will be enough to support 10 more employees. The co-op also discussed the potential for further value-adding through better marketing and branding, particularly as the sustainability and source of seafood becomes increasingly important.

Other productivity improvements are likely to result from on-going research and development in commercial fisheries particularly that funded through the programmes of the Fisheries Research and Development Corporation (FRDC). The following are examples of the areas targeted in current research programmes.

- *2010-306-DLD - Empowering Industry through Improved Understanding of Stock Assessments and Harvest Strategies*. A series of PowerPoint presentations and short videos were produced that used case studies from various Australian fisheries with simple language and graphics to explain fundamental concepts used in fisheries biology, population dynamics, stock assessment and harvest strategies. - See more at: <http://frdc.com.au/research/final-reports/Pages/2010-306-DLD.aspx#sthash.Ro52rViY.1ziLVlBj.dpuf>

- *2009-069-DLD - A collaborative approach to novel by-catch research for rapid development, extension and adoption into a commercial trawl.* The primary outcome of this project was the voluntary adoption of by-catch reduction technology which was achieved through a collaborative research approach among key stakeholders that enabled rapid development and extension of a novel trawl gear combination. See more at: <http://frdc.com.au/research/final-reports/Pages/2009-069-DLD.aspx#sthash.8GwulMrY.vxGEJkYb.dpuf>
- *2010-044 - Quantitatively defining proxies for biological and economic reference points in data poor and data limited fisheries.* The outputs from this project will guide fishery management agencies in their development of policies and management rules. See more at: <http://frdc.com.au/research/final-reports/Pages/2010-044-DLD.aspx#sthash.3x3GOH6T.dpuf>
- *Final report - 2011/402 - 2011 Trans-Tasman 7th Rock Lobster Congress.* Australian and New Zealand rock lobster fisheries operating sustainably in a secure and profitable manner by ensuring the productivity of their respective lobster stocks; the efficiency and effectiveness of their commercial harvest and marketing strategies; within cost effective and efficient science and compliance services partnerships with their relevant Government agencies. See more at: <http://frdc.com.au/research/final-reports/Pages/2011-402-DLD.aspx#sthash.i1fYriI3.dpuf>
- *2002-028-DLD - Trophic dynamics of the eastern shelf and slope of the south east fishery: impacts of and on the fishery.* The overall objective of this study was to develop trophic models that describe the past and present structure and dynamics of the food web of the south-east Australian shelf around Eastern Bass Strait (EBS). - See more at: <http://frdc.com.au/research/final-reports/Pages/2002-028-DLD.aspx#sthash.nDu1js2D.dpuf>

6.5 Exchange Rate

Currently, only a small proportion of the catch is exported from Victoria and the majority of that catch ends up interstate in Sydney. However, for fisheries where a large proportion of the catch is exported (e.g. rock lobster) the value of the Australian dollar can have a significant impact on the economic performance of the fishery and its impact on the local and broader economy. The value of the Australian dollar influences the price of Australian exports overseas. Significant changes in the value of the Australian dollar have the potential to influence the demand for Australian seafood exports. The Australian dollar generally remained high in 2011/12, typically valued above or very close to parity with the US Dollar.

Although exchange rates can be volatile at times, fluctuating over a large range in a short period of time, the impact of exchange rate risk can be reduced through the use of hedging and forward selling.

6.6 Cost of Fishing

A number of studies undertaken by EconSearch⁶ have involved the collation of cost and return data for fishing operators. It is clear from the analyses that three of the major operating costs for a fishing operator are labour, fuel and repairs and maintenance. The single biggest expense is labour which is comprised of payments to licence owners and crew as well as an imputed wage to those licence owners and other family members who are not paid a wage directly by the business. As with labour, the cost of other high quantity inputs (fuel and repairs and maintenance) have not experienced increases significantly different from general price increases reflected in the CPI.

6.7 Likely Future Trends in the Contribution to the Economy of the Lakes Entrance Fishing Industry

The market factors discussed above are summarised in Table 6-2. The difficulties in forecasting future economic outcomes are clear from the uncertainties described in the table below. However, by considering each of the above factors in turn, it is possible to make some general inferences about the future value of the Lakes Entrance fishing industry given the relative uncertainties associated with each of the factors.

Growth in real per capita GDP in Australia over the next decade is likely to be positive and at least equal to that experienced in the previous decade. However a mature, developed economy such as Australia's is unlikely to experience more than moderate growth over the period. While this factor is likely to have a positive impact on demand for fish and fish prices (and therefore the contribution of the commercial fishing industry to the economy), the impact is likely to be moderate at best.

Productivity improvements in fishing are likely to have an incremental positive influence on the economic impact of the Lakes Entrance fishing industry. The industry has a well-funded research program into fishing and in recent years has demonstrated a steady improvement in production technology. However, if other primary industries are a guide, then as the fishing industry matures, the improvements in productivity are unlikely to do anything significantly more than offset the impacts of increasing real costs (i.e. overcoming the cost-price squeeze).

It is perhaps in the processing sector where the greatest opportunities lie for productivity-led increases in economic activity. As noted earlier, investment in equipment upgrades (e.g. purchasing a filleting machine) have the potential to expand local processing operations and facilitate a push into export markets.

⁶ For example EconSearch (2013b).

Table 6-2 Key Variables that Influence the economic impact of the Lakes Entrance fishing Industry

Market Factor	How factor impacts on GRP	Impact on GRP (positive/negative)	Expected change over next 10 years	Expected influence on GRP
Demand for final product	Through price of final product	Positive – increase demand and price goes up	Increase	Positive – however the industry is almost totally dependent on the domestic market. Any major economic collapse in Australia would create a significant problem for the fishing industry.
Sustainability of current catch levels	Through supply of fish	Positive	Steady	Most likely neutral over next 10 years but significant scientific uncertainty.
Supply of substitutes	Through price of fish	Negative	Increase	Negative – supply of domestic substitutes is numerous and the supply of cheap imports is likely to increase.
Productivity improvements	Increase production	Positive	Increase	Positive if confined to Australia but negative if adoption is worldwide.
	Reduced cost/unit of production	Positive - as cost declines profits will increase	Decrease	Positive – opportunities exist for cost cutting & improved efficiencies – backed by strong R&D.
Exchange rate	Through AUD price of exports	Negative – as US/AUD increases, AUD price of fish declines	Unknown	Unknown – but short-medium term protection through hedging is available for relevant fisheries.
Cost of fishing	Direct impact on business profits	Negative – as costs go up profits will decline	Steady/increase	Neutral/negative

The main factor identified as likely to have a negative impact on the contribution of the Lakes Entrance fishing industry to the economy is the supply of substitute product, particularly through imported product. The growth in farming of seafood, particularly in South-East Asian countries, does have the potential to substantially increase world supply. The effect would be a likely dampening, in real terms, of fish prices, reduced profitability for fishing business and a diminished level of local economic activity as a result.

The other factors likely to influence Lakes Entrance fishing market conditions over the next 10 years are subject to a high degree of uncertainty. The sustainability of the fisheries is uncertain, mainly due to a lack of necessary data for scientific assessment. However, from the

Status of key Australian Fish Stocks Reports 2012 (FRDC 2012), most species landed through Lakes Entrance are listed as sustainable with only one species listed as over fished (School shark).

The US/Australian dollar exchange rate potentially has an influence on the economic impact of the Lakes Entrance fishing industry. However, given the small amount of catch that is currently exported and the uncertainty about the quantity of fish that will be exported over the next 10 years, the exchange rate is unlikely to have a large impact on the economic contribution of the Lakes Entrance fishing industry. It may become a more significant factor if the co-op is successful in its push into export markets.

On balance, taking account of the factors about which there is relatively less uncertainty, it seems likely that the quantity of fish landed and the level of profitability of fishing operations will remain relatively unchanged over the next decade. Because of the direct relationship between profitability of fishing and the contribution to the economy, it is likely that the economic impact of the Lakes Entrance fishing industry will also remain steady over that period. Opportunities exist to increase economic activity with an expansion in local processing operations. The most likely negative influence on the market is a potentially significant increase in the global supply of seafood from aquaculture, i.e. seafood imports, which will place downward pressure on local fish prices. A potential positive influence on product price and local economic activity is strong and sustained growth in domestic demand, but this seems unlikely, at least in the short to medium term. All things considered, the factors identified as likely to have a positive influence on the value of commercial fishing in Lakes Entrance, domestic consumer demand and productivity improvements in fishing and processing operations, will result in relatively small positive shifts in market conditions which are unlikely to do any more than neutralise the negative consequences of projected increases in global seafood supply.

Needless to say, the ongoing contribution of fishing industry operations to the local, regional and state economies is dependent upon continued ocean access to Lakes Entrance. Industry views on the importance of ocean access, perspectives on safety, efficiency and other industry opportunities, are taken up in the final section of this report.

7. INDUSTRY PERSPECTIVES ON OCEAN ACCESS

7.1 Overview

Interviews with industry stakeholders focused on understanding the economic impacts of the commercial fishing industry in Lakes Entrance. However, these interviews also revealed important perspectives on how dredging of the Lakes Entrance bar affects their operations and the safety and wellbeing of both recreational and commercial boat users.

In most cases, these perspectives were offered unsolicited, before the interviewee was asked any specific questions about dredging of the bar. This salience reinforces the substantial difference that the new dredging methods have made to boat operators' day-to-day lives. This emphasises how the dredging works do not just provide "ocean access", but also how they contribute to a safe and predictable work environment.

7.2 Changes to the Entrance Channel

All of the interviewees noted that access to the Lakes Entrance port has radically improved since dredging operations were changed in 2008. Vessel operators noted that prior to this:

- For most commercial fishing vessels, the bar would only be able to be crossed on certain tidal conditions.
- The bar would occasionally be un-crossable for days or weeks at a time.
- The channel through the bar was unpredictable, with the navigable route changing between the time a vessel left to fish and the time it returned with its catch.
- The channel was shallow, frequently causing minor damage to boats as they collided with the bottom.
- Major groundings of vessels occurred several times per year, severely damaging vessels and threatening the safety of crew.

Several of the interviewees noted that while there were alternative ports where they could land their catch, these were less desirable because:

- they were further away from key fishing grounds that they fished close to Lakes Entrance
- other ports nearby had dangerous and difficult-to-navigate entrances.

Interviewees noted that all of these issues have all been resolved with the new dredging schedule. For example, interviewees said:

We were always hitting the bottom - but now, since the dredge has come, not at all. (Commercial fisher).

*It's been such a radical improvement way past anyone's wildest imaginings.
(Commercial fisher).*

The new dredge has just been the best thing to happen. It's just great. We instantly see the difference once it's been. The previous one [dredge] created its own problems, but this one - there's been no trouble since it started. Without the dredge, this place would be finished. Can't say enough good things about the Pelican (Trailing Suction Hopper Dredge), it's the best thing ever. (Commercial fisher).

7.3 Impacts of Improved Access

The improved access noted above has, in turn, led to a range of key benefits to commercial fishers and other port users.

Safety and welfare

Despite interviews focusing on fishery economic activity, more than half of the interviewees made an unsolicited and explicit point of highlighting that the improved dredging has dramatically improved safety. They noted that the bar and channel depth is now more predictable, meaning that crossing the bar and entering the port is a far less hazardous task. One interviewee described the change:

*Most importantly, it was dangerous. You always had your heart in your mouth when you were coming through there. Now, it's like a different port.
(Commercial fisher).*

Others noted how groundings had been relatively frequent events but, since the change to the dredging schedule:

There's been no groundings since it happened. And that's had all sorts of flow on effects - the amount of stress that it used to cause. You used to get families lining up on the hill there watching as the boats make their runs in ... that just doesn't happen now. (Commercial fisher).

The stress and worry surrounding the bar was also emphasised by another interviewee, who noted:

Stress is probably the biggest thing - the stress of crossing the bar ground me down at the end [of my career]. There used to be seven commercial groundings a year and lots of accidents for recreationalists too, but none in the last five years (Commercial fisher).

Efficiency and flexibility of fishing

The second key point that interviewees noted was that the more reliable navigability through bar and channel means that the port is now accessible in all tidal and weather conditions. Interviewees suggested that in addition to the safety aspects above, this has substantially improved the flexibility of their operations. Previously the location and duration of fishing trips was strongly influenced by timing access to the port (i.e. on high tide). This meant that fishing trips were often cut short or time would be wasted waiting for the right conditions. As one

interviewee noted, “you’d waste a lot of time locked out and unable to come in” (Commercial fisher). With improved access this is now no longer a consideration:

The channel also helps improve the economics of the fishing operations because the accessibility means that fishing can become more flexible again, it doesn't have to rely on catching the tide and wind just right.
(Commercial fisher).

Another interviewee noted:

I started commercial fishing at 20 and my whole career all the coming and going has revolved around the bar. It shortens trips - from the moment you cross the bar you're on the clock ... since they've fixed the bar boats can come and go at any state of the tide.

Other vessels and industries

The third key point that interviewees raised was that the above noted improvements do not just apply to the commercial fishing fleet, but to recreational and other commercial vessels as well. Several respondents noted that they had observed increased recreational use of the port. This included large cruisers and sailing vessels making their way along the southeast coast, but also larger “day-tripper” recreational vessels that would have previously been confined to the Gippsland Lakes.

Other commonwealth commercial fishing vessels were also noted to have started to increasingly use the port as a means of broadening their base of operations. For example, several interviewees noted that South Australian vessels had started to infrequently pass through the port in order to access Bass Strait fishing grounds.

Importantly, improved access was also noted to have given processors in the area greater confidence in the supply of fish. This has, in turn, led to them exploring the potential for greater value-adding processes based in Lakes Entrance. This includes developing a processing and export facility and improved branding related to regional provenance and sustainability. The planned expansion has already secured support from the State government and was suggested to have the potential to provide employment for a further ten or more employees.

REFERENCES

ABS 2012, *2011/12 Australian National Accounts, State Accounts*, ABS Cat No. 5220.0, Canberra.

ABS 2013a, *2012/13, Australian National Accounts, State Accounts*, ABS Cat No. 5220.0, Canberra.

ABS 2013b, *Australian Demographic Statistics*, ABS Cat No. 3101.0, Canberra.

Department of Environment and Primary Industries (DEPI) 2013, *Fishery Production Data*, accessed via <http://www.dpi.vic.gov.au/fisheries/commercial-fishing/fisheries-victoria-commercial-fish-production-2012>

EconSearch 2013a, *Local Input-Output Modelling of Victorian Primary Industries – Update: Technical Report*, report prepared for the Department of Environment and Primary Industries (Victoria), June.

EconSearch 2013b, *Economic Indicators for the Commercial Fisheries of South Australia*, reports prepared for Primary Industries and Resources South Australia, October.

Fisheries Research and Development Corporation (FRDC) 2012, *Status of key Australian Fish Stocks Reports 2012*, Canberra.

RBA 2013, *Statement on Monetary Policy*, November 2013.

Skirtun, M., Sahlqvist, P. and Vieira, S., 2013, *Australian fisheries statistics 2012*, FRDC project 2010/208. ABARES, Canberra, November.

Disclaimer

We have prepared the above report exclusively for the use and benefit of our client. Neither the firm nor any employee of the firm undertakes responsibility in any way whatsoever to any person (other than to the above mentioned client) in respect of the report including any errors or omissions therein however caused.

APPENDIX 1: DATA COLLECTION SHEET EXAMPLE

Appendix Table 1-1 Fishing data collection sheet example

	EconSearch preliminary estimate	Industry Estimate	Location of Expenditure				
			% East Gippsland	% other RDV region	% Other Victoria	% Interstate or overseas	Total
Gross Income	\$245,000						
Estimated Catch	98,000						
Variable Costs							
Fuel	\$28,000						100%
Repairs & Maintenance	\$29,000						100%
Ice & Bait	\$1,000						100%
Provisions	\$3,000						100%
Labour - paid	\$32,000						100%
- unpaid	\$29,000						100%
Leasing	\$8,000						100%
Other	\$130,000						100%
Total Variable Costs							
Fixed Costs							
Licence Fee	\$5,000						100%
Insurance	\$7,000						100%
Interest	\$8,000						100%
Labour - unpaid ^d	\$9,000						100%
Legal & Accounting	\$4,000						100%
Telephone etc.	\$2,000						100%
Slipping & Mooring	\$8,000						100%
Travel	\$2,000						100%
Office & Admin	\$1,000						100%
Total Fixed Costs	\$46,000						100%
Total Costs	\$176,000						100%
Unpaid Labour							
Fishing (days)		88					
R&M (days)		60					
Mgmt & Admin (days)		34					
Employment, paid and unpaid (FTE)							

Appendix Table 2-2 Sale Destination of fish example

percentage sold in			
% East Gippsland	% other RDV region	% Other Victoria	% Interstate or overseas

Appendix Table 3-3 Fish Processing data collection sheet example

Name of Processing Business: _____

Location of Processing Business: _____

Total Volume processed (2012/13): _____

Total Income from Sale of processed fish (2012/13) : _____

	EconSearch preliminary estimate	Industry Estimate	Location of Expenditure				Total
			% East Gippsland	% other RDV region	% Other Victoria	% Interstate or overseas	
Purchases from Commercial Fishing	32%						100%
Purchases from Aquaculture	10%						100%
Packaging Materials	7%						100%
Specialised and Other Machinery and Equipment	1%						100%
Electricity	1%						100%
Transport	4%						100%
Storage	1%						100%
Finance	1%						100%
Insurance	1%						100%
Accounting & Business Services	3%						100%
Repair and Maintenance	3%						100%
Other Inputs	20%						100%
Wages & Salaries	7%						100%
Operating Surplus and Taxes	9%						100%
Total	100%	100%					

Profile Based on allocation from 5209.0.55.001

Australian National Accounts: Input-Output Tables -

Total employment by the business in 2012/13 (total jobs): _____

Total employment by the business in 2012/13 (FTE): _____

Appendix Table 4-4 Product Chain example

Table One: Value Chain for Seafood Processed in East Gippsland

Final Sale Destination	East Gippsland Shire	Other Gippsland	Other Victoria	Exports	Total
Proportion of catch sold to restaurants	50%	20%	10%	0%	80%
Proportion of catch sold to retailers	5%	0%	0%	0%	5%
Proportion of catch sold to distributors/ other	5%	0%	10%	0%	15%
Total	60%	20%	20%	0%	100%

Table Two: Value Chain for Seafood Processed in Other Gippsland

Final Sale Destination	East Gippsland Shire	Other Gippsland	Other Victoria	Exports	Total
Proportion of catch sold to restaurants		50%	0%	0%	50%
Proportion of catch sold to retailers		0%	0%	0%	0%
Proportion of catch sold to distributors/ other		50%	0%	0%	50%
Total	0%	100%	0%	0%	100%

Table Three: Value Chain for Seafood Processed in Other Victoria

Final Sale Destination	East Gippsland Shire	Other Gippsland	Other Victoria	Exports	Total
Proportion of catch sold to restaurants			5%	0%	5%
Proportion of catch sold to retailers			0%	0%	0%
Proportion of catch sold to distributors/ other			50%	45%	95%
Total	0%	0%	55%	45%	100%

Table Four: Total Value of Processed Seafood

Processed in	Value	% of total value
East Gippsland Shire		
Other Gippsland		
Other Victoria		
Outside Victoria		
TOTAL		0%

APPENDIX 2: FISHING ZONES

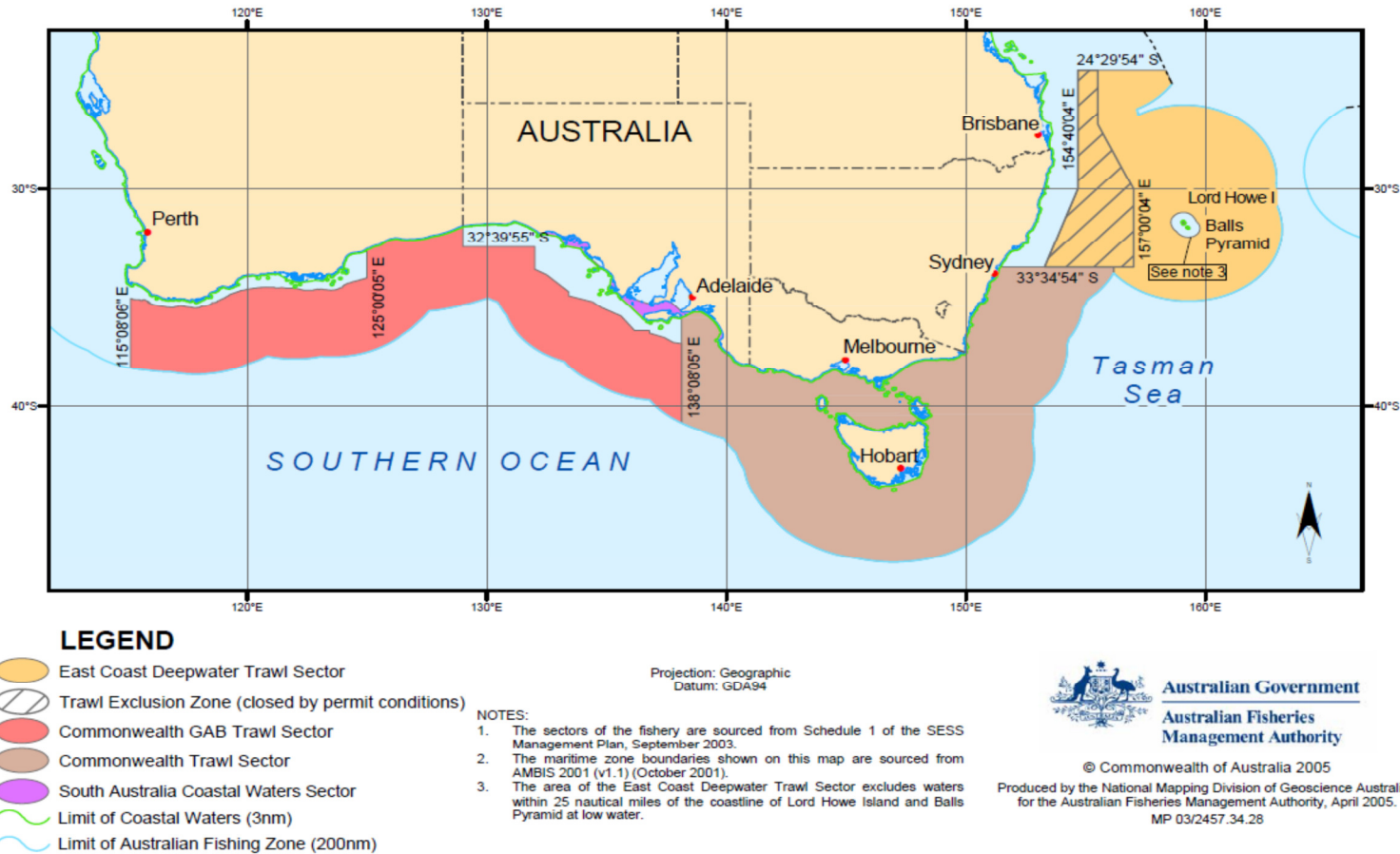
Appendix Figure 2-1 SESSF Gillnet, Hook and Trawl Sector

Southern and Eastern Scalefish and Shark Fishery Commonwealth Hook Sectors and Gillnet Sector

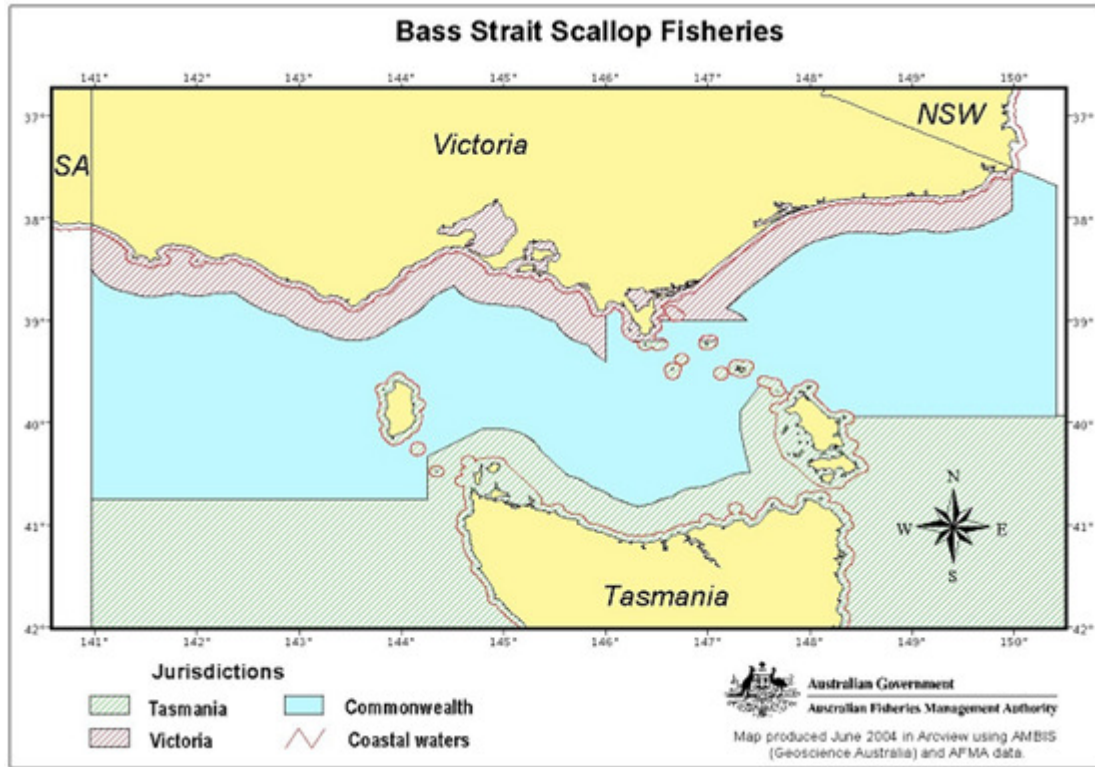


Appendix Figure 2-2 SESSF Commonwealth Trawl Sector

Southern and Eastern Scalefish and Shark Fishery Commonwealth Trawl Sectors and South Australian Coastal Waters Sector

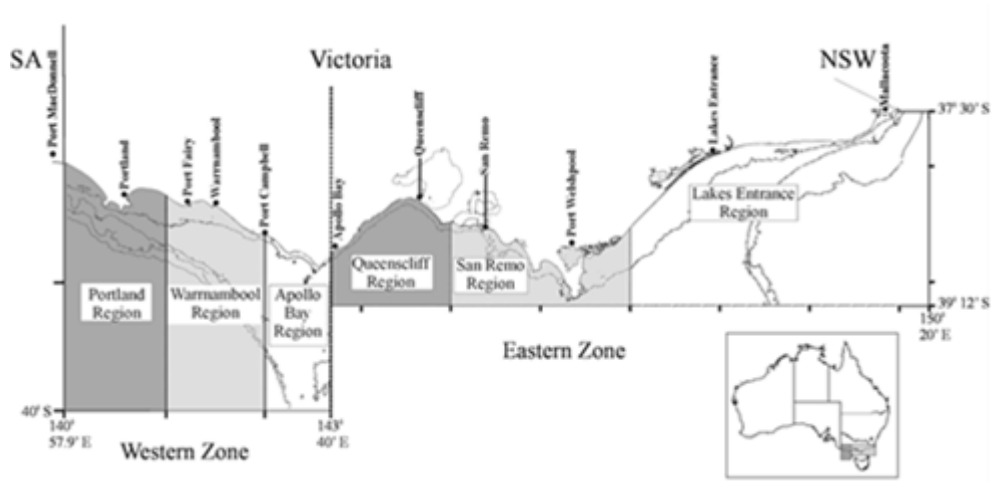


Appendix Figure 2-3 Bass Strait Scallop Fisheries, Victorian, Tasmanian and Commonwealth Zones



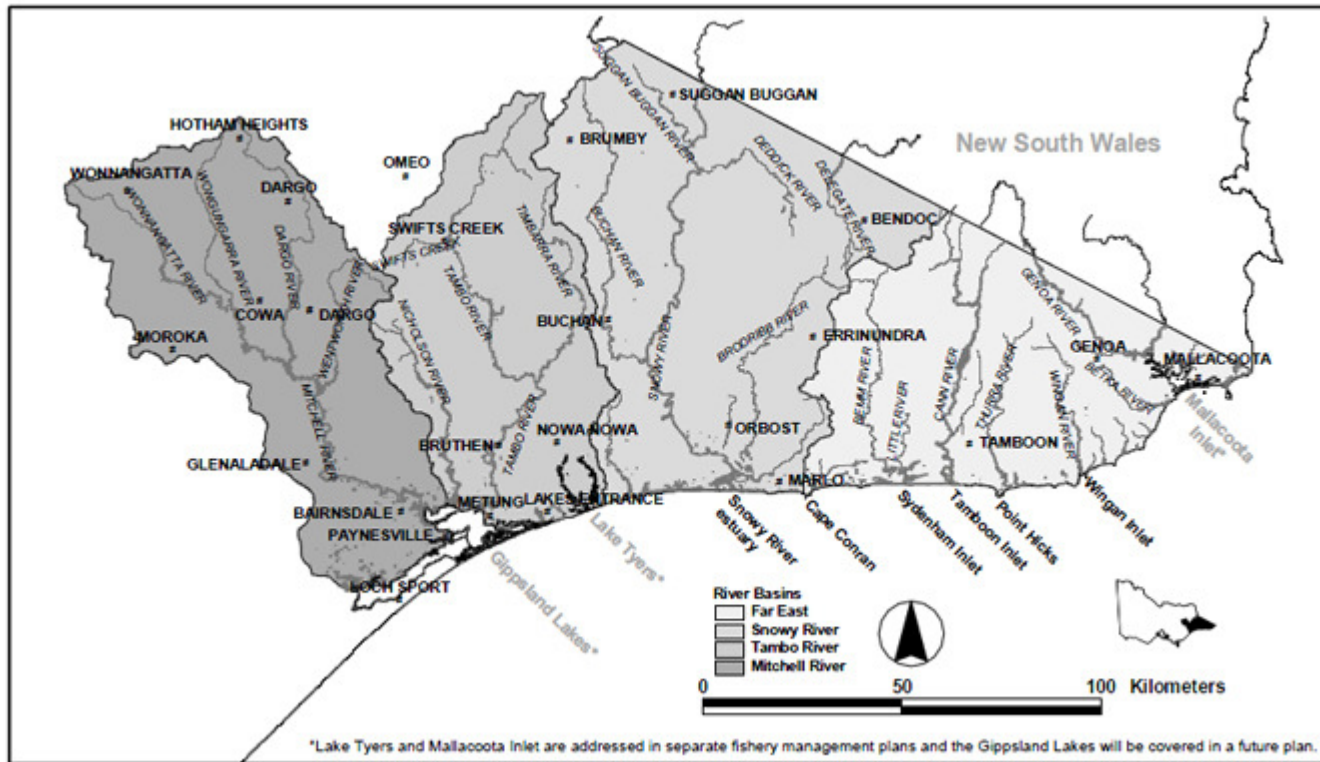
Source: Victorian Department of Environment and Primary Industries: <http://www.depi.vic.gov.au/fishing-and-hunting/commercial-fishing/scallop/fishery-overview>

Appendix Figure 2-4 Victorian Southern Rock Lobster Fisheries



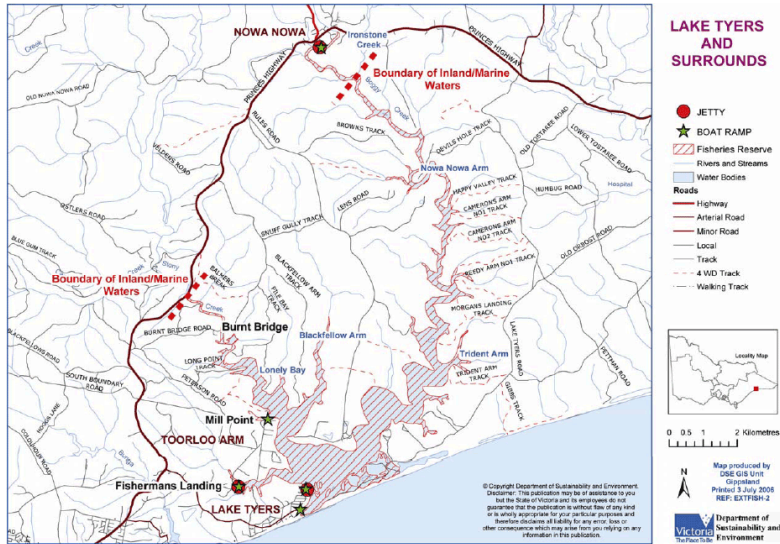
Source: Victorian Department of Environment and Primary Industries: <http://www.depi.vic.gov.au/fishing-and-hunting/commercial-fishing/scallop/fishery-overview>

Appendix Figure 2-5 East Gippsland Fishery Management Plan area



Source: Victorian Department of Environment and Primary Industries: <http://www.dpi.vic.gov.au/fisheries/about-fisheries/managing-fisheries/draft-east-gippsland-fishery-management-plan>

Appendix Figure 2-6 Lake Tyers Fisheries Reserve Management Plan Area



Source: Victorian Department of Environment and Primary Industries: <http://www.dpi.vic.gov.au/fisheries/about-fisheries/managing-fisheries/lake-tyers-fisheries-reserve-management-plan/lake-tyers-fisheries-reserve-management-plan>