Economic Study of Recreational Fishing in Victoria

VRFish

20th November 2009

This project is funded by the Victorian Government using Recreational Fishing Licence fees.

Ernst & Young Building
8 Exhibition Street
Melbourne VIC 3000 Australia
GPO Box 67 Melbourne VIC 3001

Tel: +61 3 9288 8000
Fax: +61 3 8650 7777
www.ey.com/au

Mr Christopher Collins
Executive Officer
VRFish
24 York Street
South Melbourne VIC 3205

20th November 2009

Private and confidential

Dear Christopher

Subject: Economic Study of Recreational Fishing in Victoria

Ernst & Young Australia (EYA) are pleased to present VRFish with our economic study of recreational fishing sector in Victoria.

EYA were engaged by VRFish to undertake economic research to assess the economic contribution of recreational fishing in Victoria to the state's economy. The scope of the review agreed between VRFish and EYA in the engagement letter dated 26th November 2008 included, but was not limited to:

- a desk-based literature study on the economic contribution of recreational fishing in Victoria and other jurisdictions;
- developing and undertaking a survey of recreational fishing practices in Victoria;
- conducting a net benefits assessment of recreational fishing in Victoria; and
- determining the economic contribution of recreational fishing in Victoria.

The attached report provides the outcomes of this study. As agreed, the report has been prepared based on our ability to access and analyse the information which was accessible within a restricted timeframe. This economic contribution study has been undertaken for Victorian residents only. The study has not considered the value of recreational fishing tourism to the Victorian economy. Use of the report may result in VRFish identifying specific areas for further research. Completion of this additional research is outside the scope of this initial project.

Restrictions on the Report Use

The Report may be relied upon by the VRFish Team in the process of determining the contribution of economic benefits of recreational fishing in Victoria pursuant to the engagement letter dated 26th November 2008.

EYA disclaims all liability to any party other than VRFish for all costs, loss, damage and liability that the third party may suffer or incur arising from or relating to or in any way connected with the provision of the deliverables to a third party without our prior written consent.

You have agreed that you will not amend the Report or distribute the Report to outside parties without prior written approval from EYA. If others choose to rely on the Report in any way they do so entirely at their own risk.

Basis of Our Work

We have performed research and analysis using publicly available information drawn from a wide range of literature research, databases, surveys and on-line information services which were available to us within the timeframe specified for preparation of the report in order to provide you with the economic research.

We have not independently verified, or accept any responsibility or liability for independently verifying, any such information, nor do we make any representation as to the accuracy or completeness of the information.

We accept no liability for any loss or damage which may result from your reliance on any research, analyses or information so supplied.

The attached report provides the outcomes of this study.

Yours sincerely,

Dr David A Cochrane
Partner, Economics Advisory Group
Ernst & Young

Contents

Headline Results

Ernst & Young have performed economic research in order to determine the net benefit and economic contribution of recreational fishing to Victoria. The key outcomes required for this study were qualitative and quantitative answers to the following questions:

- What are the characteristics and level of recreational fishing participants in Victoria?
- What is the net benefit of recreational fishing on the Victorian economy? and
- What is the contribution of recreational fishing and activities associated with fishing to the Victorian state economy?

The results of this research reflect the value of recreational fishing completed in Victoria by Victorians. The additional impact of recreational fishing in Victoria by non-Victorian tourists is not included.

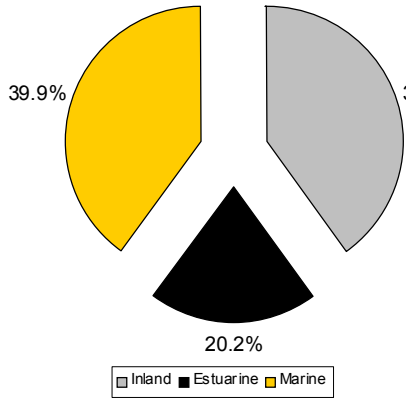
The major outcomes of this study include:

- it is estimated 721,000 Victorians participated in recreational fishing in 2008/09. This level is higher than the previous estimate made by the Department of Primary Industries (DPI) which estimated that participation was around 500,000 each year in Victoria;
- the number of fishing trips taken in Victoria is estimated at an average of 12 per year per fisher. with the total number of fishing trips undertaken per annum in Victoria by all fishers being estimated at 8.7 million;
- the average expenditure per trip per fisher is estimated to be $250 inclusive of variable costs (such as accommodation, bait, fuel etc) and fixed costs (such as equipment and capital);
- an average of 2.4 people accompanying a fisher on each Victorian fishing trip; and
- the average number of locations regularly fished in Victoria by each fisher was 2.8.

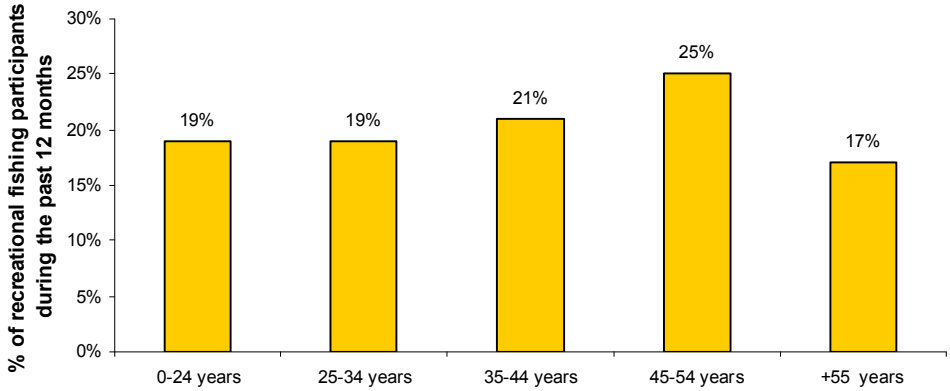
The major demographic characteristics of Victorian recreational fishers (from the survey) include:

- 67% of recreational fishers are male with 33% being female.
- 64% of recreational fishers reside in metropolitan Melbourne and 36% in regional Victoria.
- 75% of recreational fishing is undertaken in Summer and Spring.
- The majority of fishing takes place inland and in the marine environment with bait fishing being the most popular, followed by Lure fishing and Fly fishing.

Type of Fishing Participation	% of respondents
Bait Fishing	97%
Lure Fishing	65%
Fly Fishing	14%
Spear Fishing	6%
Other	3%

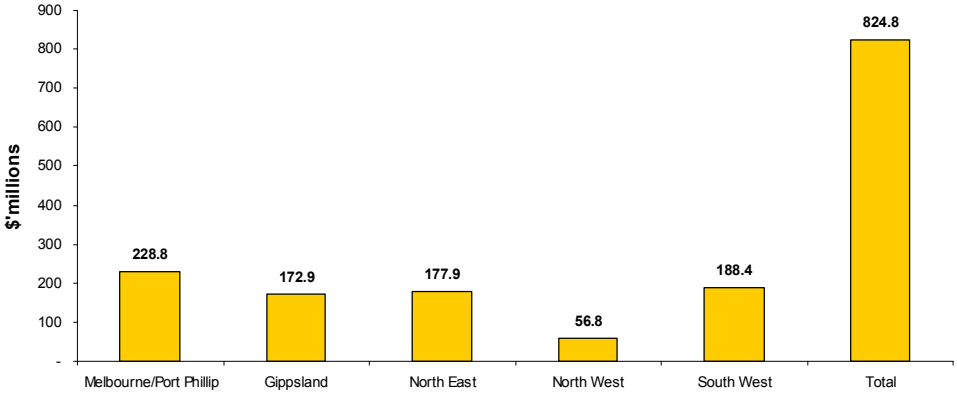


- The age group with which recreational fishing is most popular is the 45 – 54 years age bracket, however, the range is relatively evenly spread between all age groups.

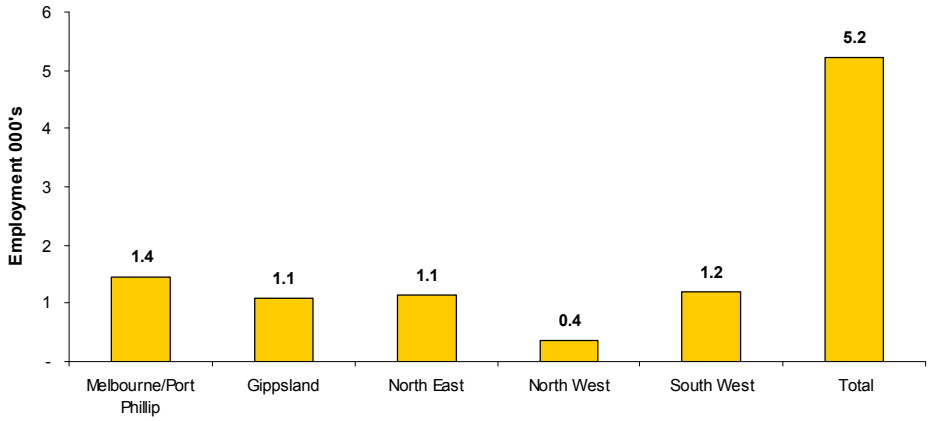


The results of the economic analysis include:

- The activity direct expenditure was valued at $2.3 billion in 2008-09 and is estimated to increase to $2.9 billion in 2028-29; and
- The industry produced an estimated total Gross State Product (GSP) of $825 million in 2008-09, representing 0.3% of the total Victorian GSP. The net present value of the recreational fishing industry over the next 20 years is estimated at $10.6 billion.
- The recreational fishing industry contributed 5,200 jobs in Victoria in 2008-09 (including flow on jobs).
- There is a significant regional component to the economic contribution of recreational fishing in Victoria as reflected in the following:
    - The Gross Regional Product (GRP) outcomes for 2008-09:



► The regional employment outcomes for 2008-09:



This report, from which the Headline Results have been sourced, required Ernst & Young to complete an independent evaluation of the economic contribution of recreational fishing in Victoria, has been commissioned by VRFish. However, it is important to note that a condition of Ernst & Young agreeing to its preparation was for it to have complete independence in the preparation and presentation of the results.

The report draws on inquiries into, and discussions with management and a range of public and private sector organisations and uses publicly available information, which where possible, has been verified. The results set out in the report have been limited in scope and time and a more detailed review with access to confidential or restricted information may reveal material issues that this review has not.

The report may not have considered issues relevant to any parties other than VRFIsh. Any use such other parties may choose to make of the report is entirely at their own risk. Ernst & Young will have no responsibility whatsoever in relation to any such use. This document may be distributed outside of VRFish only on the basis that Ernst & Young assumes no duty of care or responsibility or liability whatsoever to any recipient in respect of the contents of the document.

Executive summary

Introduction

Recreational fishing is typically defined as fishing for pleasure or competition. The obvious contrast is commercial fishing, which involves fishing for profit.

Inland Victoria sustains a range of freshwater recreational fisheries. The most popular are introduced species such as trout and redfin, although anglers are increasingly targeting native species such as golden perch, Murray cod and Australian bass. All of these fish species, other than redfin, are stocked regularly by Fisheries Victoria to enhance recreational fishing opportunities for anglers. Yabbies and spiny freshwater crayfish are also popular but are not stocked by Fisheries Victoria.

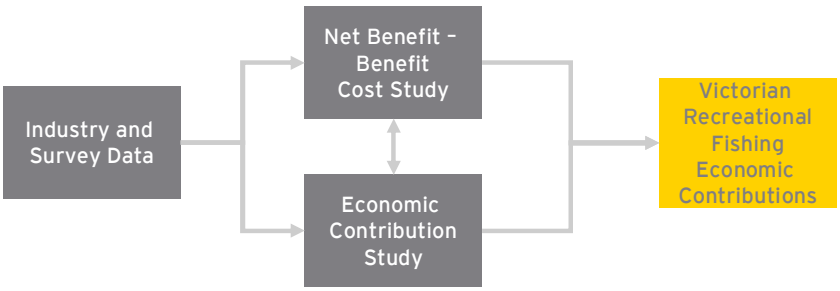
In addition, Victoria's bays, inlets and oceans provide some of the State's most productive recreational fisheries for species such as snapper, King George whiting, flathead, bream, calamari and Australian salmon. These species are most often caught by hook and line. Other popular species such as scallops, abalone and rock lobster are also taken by recreational divers.

Ernst & Young have performed this economic research in order to determine the net benefit and economic contribution of recreational fishing to Victoria. The key outcomes required of this study were qualitative and quantitative answers to the following questions:

- What are the characteristics and level of recreational fishing participants in Victoria?
- What is the net benefit of recreational fishing on the Victorian economy? and
- What is the contribution of recreational fishing and activities associated with fishing to the Victorian state economy?

The overarching methodology used to satisfy the three questions driving this study is highlighted in the figure below.

Table 1: Recreational fishing economic assessment project methodology



The different types of economic assessment use different modelling techniques and provide different information as outputs. The economic assessment techniques used in this study include:

- ***Net Benefits*** - valuations used in the net benefits assessment are generally considered the direct impacts of projects or operations and form the basis for quantifying the total economic contribution of an industry. Net benefit studies do not specifically consider flow on impacts.
- ***Economic Contribution*** - the economic contribution of a sector can be estimated by converting direct expenditures into 'value added' estimates.

The recreational fishing and the recreational fishing industry

Recreational fishing is one of the most popular recreational pursuits in Victoria. The Department of Primary Industries (DPI) estimate that more than 500,000 people participate in recreational fishing each year based on licensing information and previous industry surveys. The analysis in this report will produce an estimate of current and future participation in recreational fishing in Victoria.

There is a large variety in the type of fishing that occurs across Victoria, including:

- bait fishing;
- soft plastics / hard bodied lure fishing;
- spear fishing; and
- fly fishing.

There were a number of data sources that were used in calculating the outcomes of the study into the economic contribution of recreational fishing in Victoria. Some of the important data sources are shown below.

DPI Recreational Fishing License Data

The DPI maintains a database of all licences sold. The number of licences sold, by licence type, and their value, during 2007/08 are shown in the table below. In total, the data shows that there were 204,066 licenses sold in 2007/08.

Table 2: Licences sold during 2007/08

Licence type	Total number sold	Total costs for licences sold
2-day RFL	50,377	$302,262
28-day RFL	18,894	$226,728
One-year	121,744	$2,982,728
Three-year	13,051	$861,366
Total	**204,066**	**$4,373,084**

The total number of licences sold during 2007/08 will be less than the actual number of valid RFLs, given that holders of three-year licences purchased in 2005/06 or 2006/07 will hold valid licences, but are not recorded on this database as they did not pay for a licence during 2007/08.

Recreational fishing survey

A web-based survey was conducted on recreational fishing demand and expenditure. This survey was developed by Ernst & Young in conjunction with VRFish. Over 1,000 responses were received to the survey.

A selection of results from the survey are discussed below:

- Of the 1,037 respondents to the survey, 58% were male and 42% were female. Of the respondents, 68% resided in metropolitan areas in Victoria, with the remaining 32% residing in regional Victorian locations.
- The age bracket with the most number of respondents to the survey was the 55+ category which accounted for 32% of respondents, followed by the 25 – 44 year old category, which accounted for 19% of respondents. With only 12% of the survey population in the 18 – 24 year old category, this age category had the least number of respondents.

- Of the 1,037 Victorian survey respondents, 19% of respondents had participated in recreational fishing in the past 12 months. Of this 19% of recreational fishers, 67% of these participants were male, and 33% were female.

- The household income distribution of those who responded as fishers is distributed slightly higher than the general population, although the median household income band is $40,000 to $59,000 per annum.

- The respondents who fish are slightly more likely to be located regionally, than for the general population. Of the respondents, 64% resided in metropolitan areas in Victoria, with the remaining 36% residing in regional Victorian locations.

- Recreational fishers have a number of reasons for fishing. The most popular reason to fish was to be outdoors (84% of respondents considered it to be one of their reasons to fish), to relax (82%), to be with family and friends (73%), for the sport (45%) and for competition (25%), amongst other reasons.

  The reasons for recreational fishing are presented in the table below.

Table 3: Reasons for fishing

Reasons for fishing	% of respondents
To be outdoors	84%
To relax	82%
To be with friends / family	73%
For solitude	45%
To participate in a sport	45%
For food	44%
For competition	25%
Other	33%

- A large number of fishers also own boats for use in recreational fishing. Boat ownership increases the scope of access for a fisher. Based on the survey results, 21.1% of recreational fishers have boats which they purchased for their recreational fishing activities.

In general, the following facts where determined on fishing trips by Victorian recreational fishers:

- The average number of people accompanying the survey respondent on each Victorian fishing trip was 2.4 people.

- The average number of locations regularly fished in Victoria averaged 2.8 based on survey responses of fishers.

In addition, a number of open ended questions were asked as part of the survey process to ensure that respondents could appropriately detail their views. The main issues that were raised through written responses (but not all) included:

- Issues around fishing stocks and the need to restock rivers;

- Pest control and the removal of noxious species, such as European Carp;

- Improvements to boating and fishing related infrastructure such as ramps and jetties;

- Environmental concerns including clean waterways and pollution in general, climate change and the effects of drought on the waterways;
- Access to and accessibility of suitable fishing locations;
- Concerns regarding overfishing and bag limits, with particular concerns regarding commercial overfishing; and
- Request for better explanation and enforcement of licensing requirements.

Recreational fishing, trip levels and average catch

The major determinant of the overall level of expenditure and benefits derived from recreational fishing in Victorian is the level of participation in fishing as an activity.

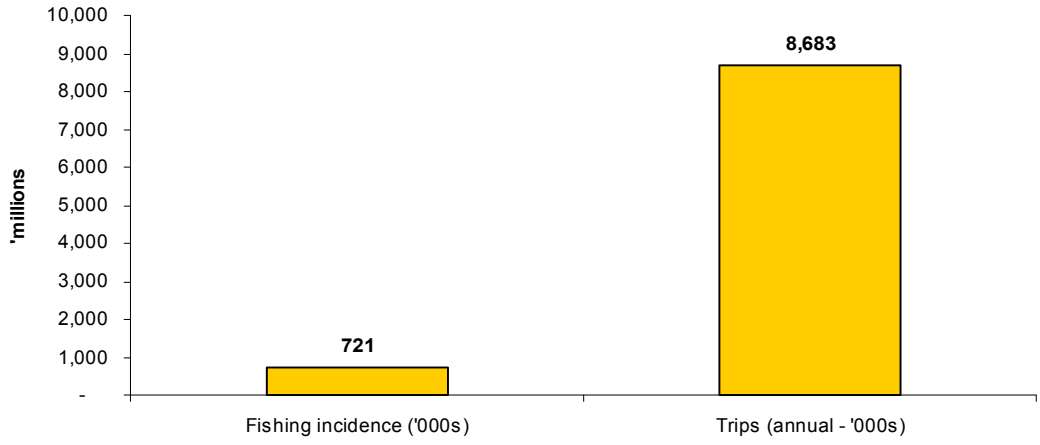
To determine the total participation of the Victorian population, the following information was sourced:

- participation rates for recreational fishing in Victoria;
- the current size of the Victorian population; and
- the average number of trips survey respondents undertook for purposes of recreationally fishing per annum.

The current population in Victoria is 5.4 million based on information sourced from the Australian Bureau of Statistics. The recreational fishing survey provided information on the average number of fishing trips undertaken by participants each year. The average number of fishing trips taken in Victoria by the survey sample was 12 per year.

Using this information, the current level of participation in recreational fishing in Victoria is estimated to be 721,000 participants. Using the average trip information, the number of fishing trips undertaken per annum in Victoria is 8.7 million. This information is shown in the figure below. These figures provide the basis for the 2008-09 net benefits analysis.

Figure 1: Estimated number of recreational fishers and trip levels – 2008-09



The survey also provided information on average catch levels. The average catch information was sourced from the recreational fishing survey and is provided in the table below. The results are produced across an average of participants, fishing type and fish type.

Table 4: Average catch per trip

Fish Type	Average catch
Trout	0.6
Redfin	0.7
Murray cod	0.2
Yellow belly	0.3
Bream	0.5
Mullet	0.3
Mulloway	0.1
Estuary Perch	0.1
Flathead	1.2
Whiting	0.9
Snapper	0.5
Calamari (squid)	0.3
Rock lobster	0.0
Abalone	0.0
Gummy shark	0.1
Tuna	0.0

Net benefits of recreational fishing

A net benefits assessment involves capturing all the direct costs and benefits associated with the operation of a project or an industry. In this study, an assessment of the net benefits of recreational fishing was undertaken. The net benefits being measured in this assessment included both the financial and economic benefits. Economic benefits can have a realisable financial element (or market element) or may be measured in terms of utility (or non market) impacts.

The net benefits study being undertaken for this study is not a typical benefit cost study. A typical benefit cost study will assess the benefits of a development or project against the existing base case. In this study, an assessment of the net benefit of the existing participation in recreational fishing is being undertaken. This analysis acts as a precursor and input into the economic contribution study.

The net benefits results for recreational fishing are presented for a single point in time (2008-09) and based on the forecast participation and expenditure levels over a 20 year evaluation period.

The overall net benefits for recreational fishing for 2008-09 are shown in the table below.

Table 5: Net benefits results – 2008-09

Net benefits outcomes	2008-09
Present value of costs ($m, 2008 dollars)	2,331
Present value of benefits ($m, 2008 dollars)	2,954
NPV ($m, 2008 dollars) i.e. 'Net Benefit'	623
BCR	1.27

The overall net benefits for recreational fishing over the 20 year evaluation period are shown in the table below.

Table 6: Net benefits results – 2008-09

	Discount Rate (%)		
	4%	7%	10%
Present value of costs ($m, 2008 dollars)	38,150	29,933	24,282
Present value of benefits ($m, 2008 dollars)	48,342	37,930	30,769
NPV ($m, 2008 dollars) i.e. 'Net Benefit'	10,192	7,997	6,487
BCR	1.27	1.27	1.27

The benefit-cost ratio (BCR) outcome may seem low compared to some other economic studies that have been produced, for example, the construction of a road in Victoria. The reason for the comparatively low BCR is a result of the analysis being a non traditional net benefits assessment rather than a traditional benefit-cost study. The analysis undertaken in this study is looking at the net benefits to recreational fishers. Based on this, the study shows, for every dollar that a fisher spends on recreational fishing, they receive $1.27 in benefits, or a net gain of $0.27. In this context the result is considered to be very positive.

Economic contribution of recreational fishing

The economic contribution of recreational fishing to the Victorian economy is undertaken using an input-output model and methodology. The major input into the economic contribution analysis is the direct expenditure data collated in the net benefits section of this report. However, for the economic contribution study, any direct expenditure which is undertaken on recreational fishing, but ultimately leaks out of the Victorian economy, is discounted as not having an economic contribution to Victoria.

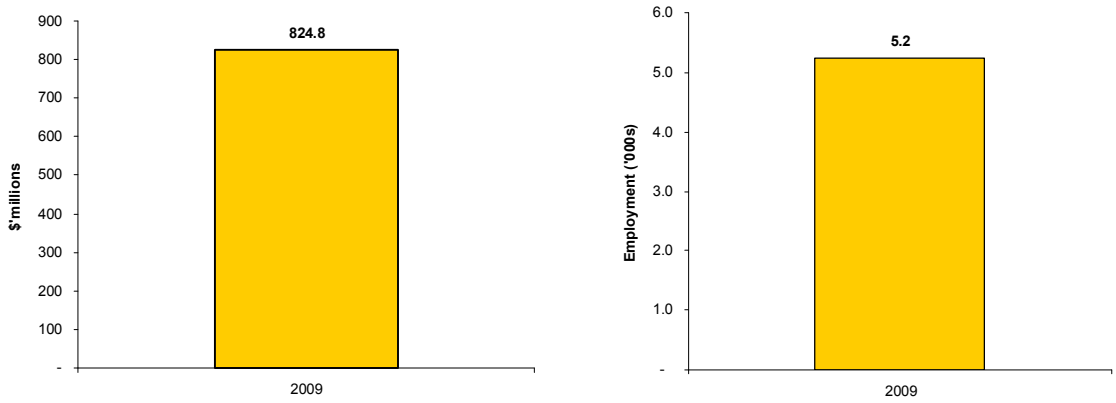
This direct expenditure is placed in an input –output model to determine the flow on impacts that the expenditure on recreational fishing activities has on the broader Victorian economy. This process then allows for the calculation of the total economic contribution of recreational fishing on the Victorian economy.

Recreational Fishing Economic Contributions – 2008-09

The economic contribution of the recreational fishing industry was calculating by applying input-output multipliers to the direct expenditure data. The result of this analysis is shown in the table below.

The industry produced a total GSP of $825 million in 2008-09. This value represents 0.3% of the total Victorian GSP.

Figure 2: Economic Contributions 2008-09 – Value Add (GSP $'millions) and employment



The employment impacts are shown for 2008-09 in the figure above. The recreational fishing industry contributed 5,200 jobs in Victoria when the industry and flow on jobs are considered.

Recreational Fishing Economic Contributions – Forecast

Based on the analysis undertaken in the net benefits section of this report, in particular in regards to the direct expenditure, forecast economic contribution outcomes have been produced for GSP and employment.

The forecast GSP and employment over the 20 year evaluation period is shown in the table below. Results include:

- the GSP contribution of the recreational fishing industry ranges from $837.1 million to $1,014.2 million per annum.
- the employment contribution of the recreational fishing industry ranges from 5,310 to 6,400 jobs in a particular year.

Table 7: Forecast recreational fishing economic contribution

Economic Variables	2009-10	2014-15	2019-20	2024-25	NPV/ Annual average
Value Add ($'m)	837.1	893.4	950.7	1,014.2	10,591
Employment ('000s)	5.31	5.67	6.03	6.44	5.98

The net present value of the recreational fishing industry over the 20 year evaluation period is $10.6 billion while average annual employment is 5,980.

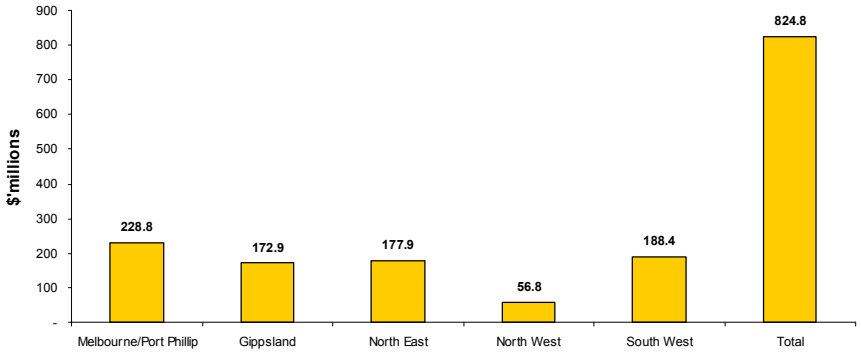
Regional Implications

The recreational fishing industry is an industry that has a large impact on regional Victorian communities. Much of the fishing activity that occurs within Victoria occurs outside of the metropolitan area.

Based on information on regional location of recreational fishing activity contained in the recreational fishing survey (discussed in Section 4), the economic contribution of the recreational fishing industry to regional locations is presented in the figure below. The Gross Regional Product (GRP) outcomes for 2008-09 include:

- $228.8 million (28%) in Melbourne/Port Phillip;
- $172.9 million (21%) in Gippsland;
- $177.9 million (22%) in the North East region;
- $56.8 million (7%) in the North West region; and
- $188.4 million (23%) in the South West region.

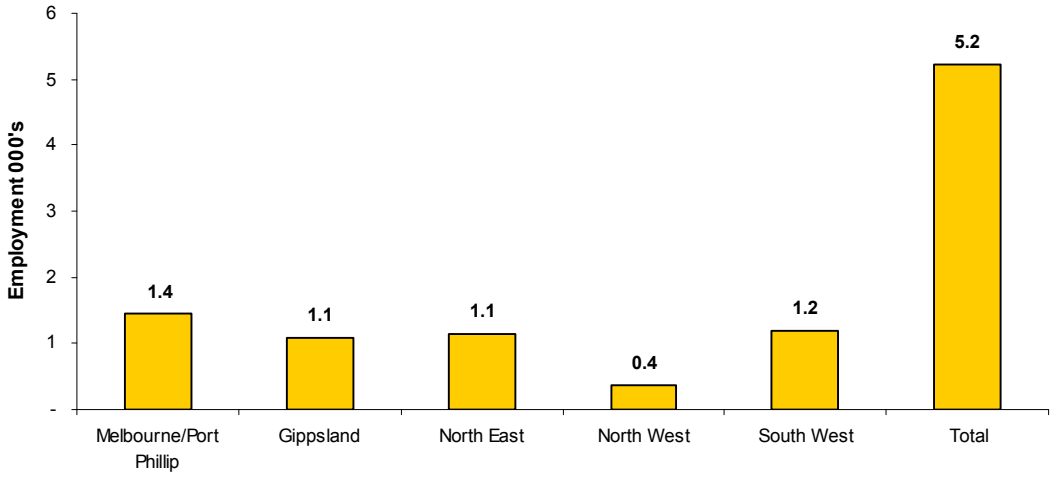
Figure 3: GSP Impacts ($'millions) by region 2008-09



The regional employment outcomes have also been produced for 2008-09. The regional employment outcomes for 2008-09, based on the direct and flow on contribution of the recreational fishing industry, include:

- 1,400 in Melbourne/Port Phillip;
- 1,100 in Gippsland;
- 1,100 in the North East region;
- 400 in the North West region; and
- 1,200 in the South West region.

Figure 4: Employment impacts by region 2008-09



1. Introduction

Ernst & Young Australia (EYA) were engaged by Victorian Recreational Fishing Peak Body (VRFish) to undertake an economic study of recreational fishing in Victoria.

The objective of this study was to provide comprehensive consideration and understanding of the impact and value of macro-economic, lifestyle and social factors of recreational fishing. In particular, it was considered a priority to quantify these impacts in order to determine the contribution of one of the most popular recreational pursuits in Victoria.

Therefore, this study has determined the impacts on the Victorian economy of recreational fishing, both currently and for the next 20 years.

1.1 Background

Recreational fishing is one of the most popular recreational pursuits in Victoria. The Department of Primary Industries (DPI) estimate that more than 500,000 people participate in recreational fishing each year.

Victoria's Recreational Fishing Peak Body, VRFish, is a not for profit organisation established in 1995 and is funded by Victorian Recreational Fishing Licence revenue. VRFish is the recognised peak body responsible for representing the interests of recreational fishers in Victoria.

VRFish commissioned Ernst & Young to undertake an economic study an economic study of Victoria's recreational fishing sector. VRFish have commissioned the study as there has been limited recent analysis on the size and economic contribution of the recreational fishing sector in Victoria. The last major study into the economic value of recreational fishing was undertaken in 2000 by the Commonwealth Department of Agriculture, Fisheries and Forestry in the National Recreational and Indigenous Fishing Survey (released in 2003).

1.1.1 Recreational fishing

Recreational fishing can be described as any fishing which is not undertaken for commercial purposes. There is a large variety in the type of recreational fishing that occurs across Victoria, including:

- Bait fishing;
- Soft plastics / hard bodied lure fishing;
- Spear fishing; and
- Fly fishing.

These types of recreational fishing occur in inland, estuarine and marine waters throughout the state.

Some of the most popular catches in Victoria, by type of water, are shown in Table 8 below.

Table 8: Most popular catches

Water type	Most popular catches
Inland waters	Trout Redfin Murray cod Yellow belly
Estuarine waters	Bream Mullet Mulloway Estuary Perch
Marine waters	Flathead Whiting Snapper Calamari (squid) Rock lobster Abalone Gummy shark Tuna

The Victorian Government recognises the importance of recreational fishing, both in terms of recreation, as well as its significant economic contribution to the state. This was formally recognised at the 2006 election, where the Brumby Government committed $42 million to improve the facilities and services for boaters and anglers, to ensure that recreational fishing continues to be a popular past-time for Victoria's population. Many of these initiatives have already been undertaken.

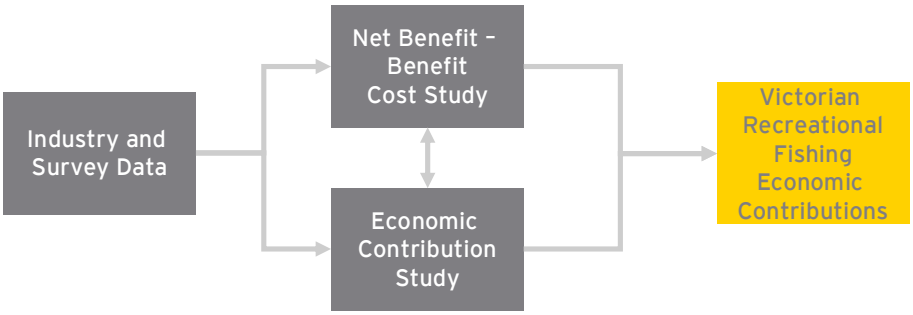
1.2 Scope of works

Broadly, Ernst & Young have performed this economic research in order to determine the net benefit and economic contribution recreational fishing to Victoria. The key outcomes required of this study were qualitative and quantitative answers to the following questions:

- What are the characteristics and level of recreational fishing participants in Victoria?
- What is the net benefit of recreational fishing on the Victorian economy? and
- What is the contribution of recreational fishing and activities associated with fishing to the Victorian state economy?

The overarching methodology used to satisfy the three questions driving this study is highlighted in the figure below.

Figure 5: Recreational Fishing Economic Assessment Project Methodology



1.3 Net benefits & economic contribution analysis

As presented in Figure 5 above, there are two forms of economic assessments being undertaken in this report. These two economic assessments use different modelling techniques and provide different information as outputs. These are discussed in 1.3.1 and 1.3.2 below.

1.3.1 Net benefits

Valuations used in the net benefits assessment are generally considered the direct impacts of projects or operations and form the basis for quantifying the total economic contribution. Net benefit studies do not specifically consider flow on impacts, but rather seek to properly evaluate all costs and benefits associated with an investment decision of activity.

1.3.2 Economic contribution

The economic contribution of a sector can be estimated by converting direct expenditures into 'value added' estimates. The industry value added provides a measure of the net contribution of the sector calculated as the value of total sales less the value of the inputs. Value added is used as a standard measure of economic contribution because it removes inadvertent double counting and provides a meaningful basis for comparison across industries (i.e., the sector's contribution to Gross State Product). Contribution analysis seeks to measure an industry or activities current effect on the economy and does not consider that the removal of the industry would result in expenditures being shifted to other industries. Contribution studies generally use (but not necessarily) input output modelling. It consists of both direct and indirect economic contribution.

1.3.2.1 Direct contribution

Direct contribution relates to activity, employment and income that is wholly or largely related to operations or usage of the services in the Fishing and Marine Industries

1.3.2.2 Indirect contribution

Indirect or flow-on contribution relates to activity, employment and income generated in the economy of the study area by the spending of incomes generated by the direct impacts.

1.4 Data sources

In undertaking the study, three main sources of data were used in assessing the economics of recreational fishing. These sources included a survey of recreational fishers, previous studies undertaken in relation to recreational fishing, as well as Australian Bureau of Statistics (ABS) data. These data sources are discussed in more detail below.

1.4.1 Survey data

As part of the data collection process, a web-based survey was conducted on recreational fishing demand and expenditure. This survey was developed by EYA in conjunction with VRFish and undertaken by StollzNow Research. Over 1,000 responses were received, with questions including, but not limited to:

- characteristics of recreational fishers and their fishing patterns;
- recreational fishers expenditure on fishing-related activities; and
- constraints restricting recreational fishers participating in recreational fishing more frequently.

Given the large number of respondents to the survey, the results were statistically significant from a population perspective.

The results to this survey are discussed throughout this report, with a copy of the survey provided in Appendix A.

1.4.2 Department of Primary Industries (DPI) data

The Victorian DPI provided data on licenses, including:

- 12 month;
- 1 year; and
- 3 years.

1.4.3 Previous studies

Previous studies undertaken on the demographics and economic impact of recreational fishing were sourced and analysed, and are quoted within this report. A full list of previous studies used in the economic assessment is provided in Appendix B.

1.4.4 Australian Bureau of Statistics (ABS) data

ABS data was used as inputs into the economic modelling to determine the economic net benefits and contribution of recreational fishing.

1.4.5 Other industry Data

Industry data was collected on recreational fishing via a number of sources. This industry data provided the basis for valuing a number of the industry operations. The industry sources were collected through stakeholder consultation and desk based research. Information sources include:

- IBIS World – Industry, Company and Business Research;
- VRFish information; and
- Access Economics Business monitor.

1.5 Project stakeholders

There are a number of project stakeholders that have an interest in the economic study of recreational fishing in Victoria. The main project stakeholders are discussed below.

1.5.1 VRFish

VRFish's role is to represent and advocate the interests of the Victorian recreational fishing community.

VRFish is a registered company managed by a Board of Directors and four staff. The VRFish membership comprises three categories, which are: affiliated members of a club or association representing at least 500 members or 10 fishing clubs; unaffiliated members; and the third category are kindred interest groups.

1.5.2 Department of Primary Industries (DPI)

Fisheries Victoria is a division of the Department of Primary Industries (DPI). DPI works with the fisheries industry so that they generate wealth and employment, and also take their environmental and social responsibilities seriously. Fisheries Victoria manages the fisheries resource by developing and implementing policies and projects and delivering a wide range of services.

DPI management of fisheries is focused on securing a high quality natural resource base for the long term, as well as generating economic and social benefits in our communities. Our aim is to secure, share and grow our fisheries resources in an ecologically sustainable way for now and the future.

Fisheries Victoria's external stakeholders include recreational users, aquaculturalists, commercial fishers, cultural users and the broader community. These stakeholders have different environmental, social and economic values and expectations.

1.5.3 Tourism Victoria

Tourism Victoria is a state government authority with responsibility for marketing Victoria as a tourism destination both domestically and internationally. By developing the tourism market within Victoria, Tourism Victoria and the government seek to maximise employment and economic opportunities associated with tourism.

Tourism Victoria's interest in this project is related to any changes in recreational fishing trends that could facilitate tourism growth through increases in usage, facilities and events.

1.6 Structure of the report

- Chapter 2 - provides an overview of the recreational fishing industry in Victoria and Australia;
- Chapter 3 - outlines previous economic studies undertaken relating to recreational fishing;
- Chapter 4 - discusses the recreational fishing survey undertaken;
- Chapter 5 - determines the net benefits of recreational fishing in Victoria;
- Chapter 6 - evaluates the economic contribution of recreational fishing to Victoria; and
- Chapter 7 - provides a conclusion.

2. About the recreational fishing

Recreational fishing is typically been defined as fishing for pleasure or competition. It involves not fishing for commercial gain. In 2008/09 there were over 200,000 fishing licenses purchased in Victoria. Recreational fishing can be undertaken in a number of water environments, including:

- marine;
- inland and rivers; and
- estuary.

A number of types of fishing are practiced in Victoria, including:

- bait fishing;
- lure fishing;
- spear fishing; and
- fly fishing.

Recreational fishing is practiced right across Victoria, with a high concentration in regional Victoria, including:

- Melbourne/Port Phillip;
- North West;
- North East;
- South West; and
- Gippsland

This chapter outlines the characteristics of the recreational fishing within Victoria.

2.1 Recreational fishing

Recreational fishing is typically defined as fishing for pleasure or competition. The obvious contrast is commercial fishing, which involves fishing for profit.

The recreational fishing industry is estimated to involve over 550,000 Victorians based on estimates developed in the Commonwealth Department of Agriculture, Fisheries and Forestry, 2003, "The National Recreational and Indigenous Fishing Survey".

Inland Victoria sustains a range of freshwater recreational fisheries. The most popular are introduced species such as trout and redfin, although anglers are increasingly targeting native species such as golden perch, Murray cod and Australian bass. All of these fish

species, other than redfin, are stocked regularly by Fisheries Victoria to enhance recreational fishing opportunities for anglers. Yabbies and spiny freshwater crayfish are also popular but are not stocked by Fisheries Victoria.

In addition, Victoria's bays, inlets and oceans provide some of the State's most productive recreational fisheries for species such as snapper, King George whiting, flathead, bream, calamari and Australian salmon. These species are most often caught by hook and line. Other popular species such as scallops, abalone and rock lobster are also taken by recreational divers.

In 2008, more than 830,000 native fish were stocked into 35 lakes and rivers across Victoria. Over the next year, fishing opportunities for Victorians will be boosted by 21 projects funded through $1.2 million of recreational fishing licence (RFL) revenue. Projects include new fishing platforms and access stairs, an economic study of recreational fishing in Victoria and a program to promote fishing among disadvantaged primary school children.

2.1.1 Key Catch Types

The following fish types are the major catch items for recreational fishers in Victoria.

- Trout
- Redfin
- Murray cod
- Yellow belly
- Bream
- Mullet
- Mulloway
- Estuary Perch
- Flathead
- Whiting
- Snapper
- Calamari (squid)
- Rock lobster
- Abalone
- Gummy shark
- Tuna

More detail on the volume and scale of catch by fish type will be in Section 5 of this report.

2.1.2 Recreational fishing industry or sector

For the purpose of this study the recreational fishing industry or sector includes the following groups:

- Fishers;
- tackle shops and tackle manufacturers;
- bait suppliers;
- charter-boat operators;
- recreational boat manufacturers and chandlery suppliers;
- marina operators;
- specialised angling media; and
- tourism operators.

In addition, the recreational fishing sector includes Victorian Government departments and agencies responsible for issues such as fish stock and waterways management, parklands and tourism.

2.2 Key recreational fishing locations

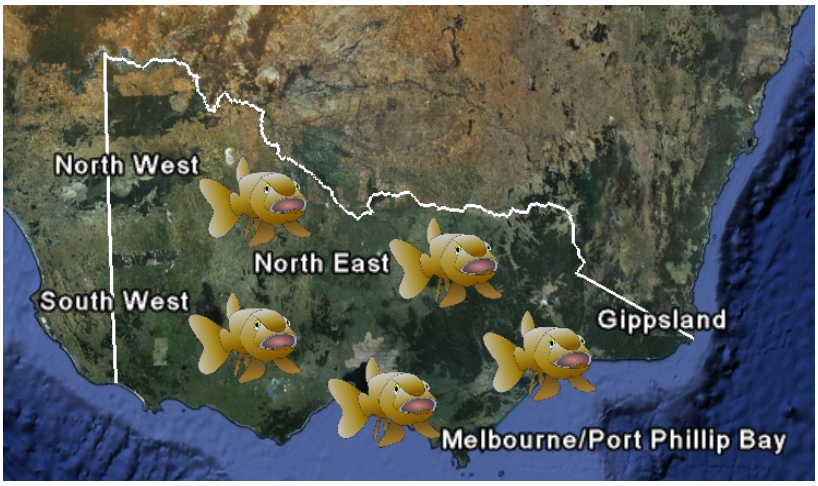
Victoria's waters range from fast, snow-fed streams in the mountains, to lazy rivers and creeks flowing down to the sea. They include inland lakes, river systems and water storages, estuarine and marine inshore waters and marine offshore waters out to the 3 nautical mile limit. By agreement with the Commonwealth, Victoria also manages some fisheries beyond this limit.

The recreation fishing locations, broadly, can be categorised into three location types:

- Inland
- Estuarine
- Marine

More specifically, the map below indicates the major areas within Victoria where recreation fishing activities take place.

Figure 6: Key recreational fishing locations within Victoria



2.3 Key infrastructure and equipment used for recreational fishing

There are a number of key pieces of infrastructure and equipment that are required for some types of recreational fishing, including:

- Boats
- Boat storage/ mooring
- Jetties and ramps
- Tackle and equipment
- Bait

- Clothing for fishing
- Camping gear
- Rods and reels

Specific information on the expenditure of recreational fishers on equipment is detailed in Section 5 of this study.

2.4 Licensing for recreational fishing

In order to regulate and protect Victoria's fishing industry, a Recreational Fishing Licence (RFL) is required for all forms of recreational fishing in Victoria's marine, estuarine and freshwaters. Fishing licensing began in Victoria in 1999.

2.4.1 Recreational Fishing Licences

A Recreational Fishing Licence (RFL) is required by law when taking, or attempting to take, any species of fish by any method including line fishing, bait collection, gathering shellfish, yabby fishing, prawning and spear fishing forms of recreational fishing in all of Victoria's marine, estuarine and freshwaters.

The only exception to this rule is if recreational fishers are:

- under 18 years of age;
- 70 years of age or over; or
- A holder of a:
    - Victorian Seniors Card or interstate equivalent;
    - Veterans' Affairs Pensioner Card;
    - Veterans' Affairs Repatriation Health Card coded (TPI); or
    - Commonwealth Pensioner Concession Card coded either (DSP), (DSP Blind), (AGE), (AGE Blind) or (CAR).

An RFL can be obtained from many DPI offices and more than 980 retail businesses throughout Victoria, including most retail fishing tackle stores.

2.4.2 Types of RFLs

Four types of RFLs are currently available, differing in terms of the length of their validity. The licences available, and their corresponding current charges, are shown in Table 9 below.

Table 9: Licence types

Licence type	Price
2-day RFL	$6.00
28-day RFL	$12.00
One-year	$24.50
Three-year	$66.00

2.4.3 Total number of RFLs

The DPI maintains a database of all licences sold. The number of licences sold, by licence type, and their value, during 2007/08 are shown in Table 10 below. The 2007/08 data was the latest that could be provided by DPI for use in this study.

Table 10: Licences sold during 2007/08

Licence type	Total number sold	Total costs for licences sold
2-day RFL	50,377	$302,262
28-day RFL	18,894	$226,728
One-year	121,744	$2,982,728
Three-year	13,051	$861,366
Total	**204,066**	**$4,373,084**

The total number of licences sold during 2007/08 will be less than the actual number of valid RFLs, given that holders of three-year licences purchased in 2005/06 or 2006/07 will hold valid licences, but are not recorded on this database as they did not pay for a licence during 2007/08.

DPI also records the age and location of purchasers of licences, which are presented in Figure 7 and Figure 8 below.

Figure 7: Age distribution based on license information

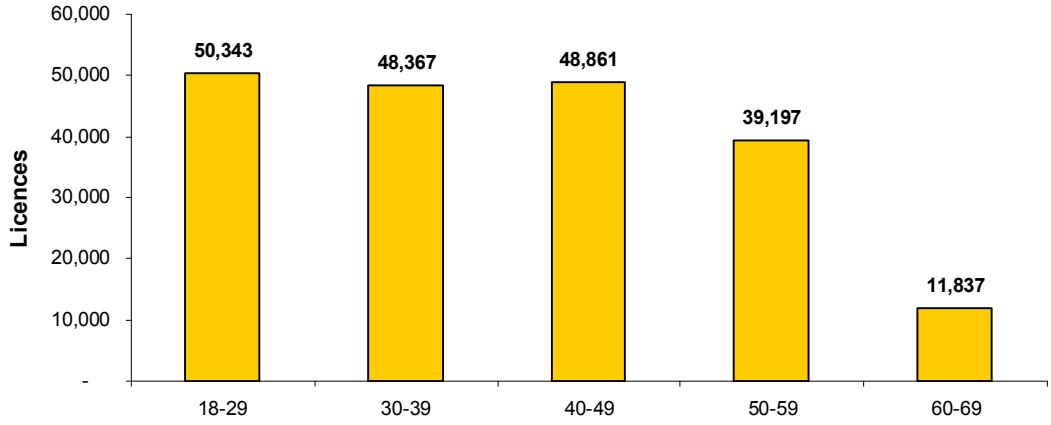
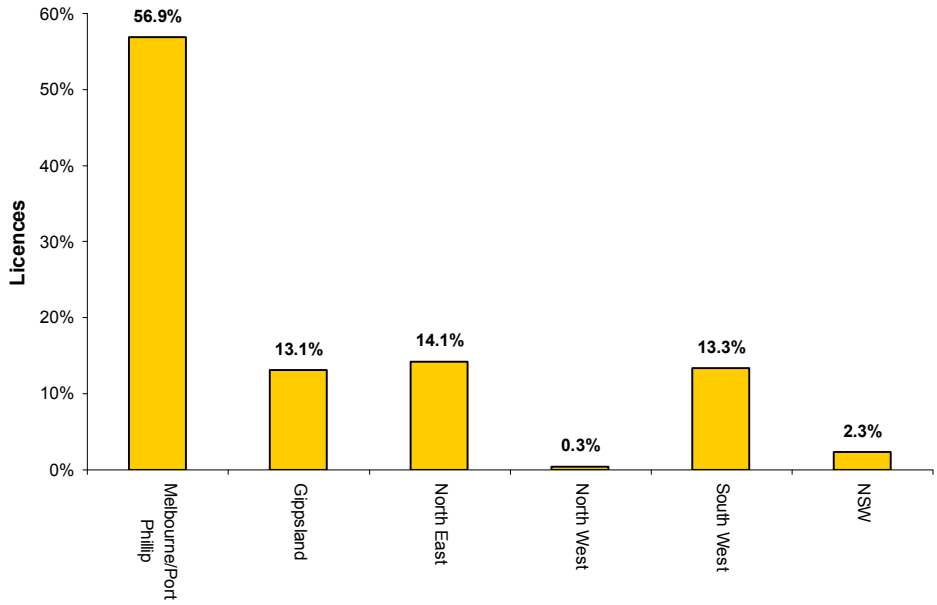


Figure 8: Location of licence purchasers



2.5 Policies for recreational fishing

There are a number of important government policies that are relevant to the recreational fishing industry. The following describes two of the main policies relating to recreational fishing in Victoria.

2.5.1 Fish stocking for recreational purposes - Policy Statement

Fisheries Victoria stocks about 1.1 million native and salmon fish per annum into public waters throughout Victoria for recreational fishing purposes. This policy provides guidance in the setting of priorities for stocking of Victorian waters.

It defines the principles and criteria used by Fisheries Victoria when prioritising waters in the recreational fish stocking program. Waters must first meet each of the conditions described in the principals. Each body of water then receives a numeric rating for each of the criteria listed in the policy. The combined total for each body of water determines its stocking priority.

The policy and table is intended to assist Fisheries Victoria to respond to changes in environmental conditions such as water quality and quantity, drought and bushfires, altered management practices by water and land managers, and changing stakeholder values and expectations.

2.5.2 Responding to the impacts of drought and its consequences on inland recreational fisheries - Policy Statement

The Victorian inland recreational fisheries face significant pressures due to ongoing drought conditions. This policy provides guidance for the Department of Primary Industries (DPI) in responding to the impacts of prolonged periods of drought such as significantly reduced water quantity, quality and flow.

Water resources have become the major issue across the State after a 10-year run of dry seasons with the last wet period ending September 1996. Victoria is presently experiencing the lowest stream flows in recorded history.

The DPI stocks some water bodies that are also used to supply town water (potable) and or for general domestic and stock use. There is concern that the increased risk of a fish death due to drought conditions could result in future limitations on stocking and angler access.

3. Previous economic studies

This section of the report details some of the studies that have been undertaken on the economic contribution of recreational fishing in Victoria and across Australia.

3.1 The Economic Significance of Recreational Fishing in Victoria (June 1997)

The Victorian Fisheries Division of the Department of Natural Resources & Environment commissioned the National Institute of Economic and Industry Research (NIEIR) to undertake a study to determine the economic significance of recreational fishing in Victoria.

The study was based upon 790 field surveys of persons fishing, conducted through on-site interviews of fishers from mid-January 1997 to the end of April 1997.

The expenditure data was allocated by their relationship to the given activity of fishing. All purchases of fishing equipment and related clothing, bait and tackle were allocated 100% to fishing expenditure, however expenditure which were made by persons fishing but not incurred solely for fishing, such as travel costs, boat fuel, food and drink, were allocated to fishing at a rate of 50%.

Based on this methodology, the key findings of the study relating to expenditure were:

- the total value of expenditure on recreational fishing in Victoria in 1996 was estimated at $1,037.1 million;
- the 1996 current expenditure was valued at $277.5 million; and
- the 1996 expenditures on annual and capital items were estimated to total $759.5 million.

The economic impact of recreational fishing in Victoria was then determined using an input-output methodology.

The results indicated that the estimated contribution of the recreational fishing industry to Victoria's GSP in 1996 was $1,265 million, and created approximately 27,000 jobs as well as contributing $830 million to household disposable income.

The Melbourne region generated the highest contribution to GSP, with over 60 per cent of the total state GSP contribution from recreational fishing generated in the area. The north-east region generated the second-highest contributions, generating approximately 14 per cent of the GSP from recreational fishing for the state. The north-west region made the lowest contribution, with only 6% of the recreational fishing GSP for Victoria attributable to the region.

The difference in outcomes in the June 1997 study compared to the outcomes from this study, which are produced in later sections of the report would seem to be based on the choice of indirect (or flow on) economic model. The NIEIR analysis uses an input-output model, as does this study, however the input-output model used in this study is based on a general equilibrium model, which traditionally, has more conservative multiplier outcomes.

3.2 National Recreational Fishing Survey – Economic Report (2005)

A national survey of recreational and indigenous fishing in Australia was conducted during 2000/01 by the Department of Agriculture, Fisheries and Forestry (DAFF), which was the first comprehensive national examination of the non-commercial components of Australian fisheries. The survey obtained estimates of the level of participation, fishing effort and catch by recreational and indigenous fishers, as well as economic activity associated with recreational fishing and the attitude of recreational and indigenous fishers at a national, state and regional level. A survey report was produced in 2003, which provided a detailed background to the survey and the methodology used to collect recreational fishing data and the process by which the data was expanded to the national population. In 2005 the Economic Report was published with outcomes based on the survey and expenditure data.

The survey monitored fishing and fishing-related expenditure activities between May 2000 and April 2001, and generated a statistically robust set of expenditure and catch data. The results indicated that from May 2000 to April 2001 Victoria:

- had the second highest total expenditure on recreational fishing in Australia ($396 million), behind NSW ($554 million);
- realised the highest level of per fisher expenditure on travel of any state or territory ($177);
- had an average expenditure of $721 per fisher, the highest of any state or territory in Australia;
- had 549,803 fishers, accounting for 16% of fishing participants in Australia, whilst having 25% of Australia's population;
- Melbourne accounted for 67% of the recreational fishing expenditure;
- Greatest expenditure on recreational fishing was realised for Victoria in December, February and August, and the least in May, June and July.

The incidence of recreational fishing in the general population of Victoria in the National Recreational Fishing Survey was 13%. Differences in participation, compared to the outcomes of this report, could be attributable to differences in survey technique, for example, a telephone survey rather than a web based survey used by Ernst & Young. One of the criticisms of telephone surveys are that the people that are at home when telephone surveys are undertaken may not be people who participate in recreational activities, such as fishing. In the National Survey, Victoria had a significantly lower recreational fishing incidence than the rest of Australia, being 4% lower than the next lowest, NSW, and 18% below the highest incidence found in the Northern Territory.

The National Recreational Fishing Survey – Economic Report provided information on expenditure levels. These expenditure levels are lower than the Ernst & Young report. It is believed that these expenditure levels differ on a per trip and annual capital spend level due to a broader interpretation of travel and accommodation expenditure, the inclusion of boat maintenance and a broader inclusion of annual equipment expenditure.

3.3 Goulburn River Trout Fishery: Estimates of Catch, Effort, Angler-Satisfaction and Expenditure (July 2007)

As part of the Fisheries Victoria Research Report Series, the Department of Primary Industries (DPI) undertook a survey to, amongst other things, determine anglers' expenditure on fishing on the mid-Goulburn River. Before subsequent calculations, each

estimate of costs incurred was reduced by an amount equivalent to capital costs depreciated over 5 years.

Data from questions on angler expenditure were summed and a mean and variance calculated for all interviews in each level of stratification. Total expenditure for each stratum was estimated by multiplying the mean expenditure by weighting factors. Estimates of the number of accommodation nights away from home were also made by calculating the average for each stratum and multiplying by the appropriate weighting factor.

The individual expenditure varied widely for the 338 people interviewed for the 2003/04 fishing season, from $0 to $2,660, resulting in total expenditure of anglers fishing of $418,320 (+/- $496), or an average of $1,390 per person.

3.4 Further Reports Reviewed

In addition to those listed above, a number of additional reports were reviewed, however did not have any information specifically related to recreational fishing expenditure.

These reports were:

- Australian Bureau of Agricultural and Resource Economics (ABARE): Economic Value of Charter and Recreational Fishing in Australia's Eastern Tuna and Billfish Fishery (July 2004);
- Fisheries Victoria Research Report Series: Lake Wendouree Fisheries Assessment (February 2004);
- Fisheries Victoria Research Report Series: Lake Modewarre Creek Survey (September 2008);
- Fisheries Victoria Research Report Series: Macalister River Creel Survey (February 2008);
- Fisheries Victoria Research Report Series: Merri and Hopkins Rivers Creel Surveys 2003/04 (October 2008);
- Marine and Freshwater Resources Institute Freshwater Fisheries Report No. 02/1: Lake Mokoan Fisheries Assessments (September 2002);
- Marsden Jacob Associates: Victorian Bay and Inlet Fisheries Resource Allocation Valuation Study (March 2006).

4. The recreational fishing survey

A survey was undertaken to determine the demographic and economic characteristics of Victorians who participate in recreational fishing. The survey consisted of 52 questions, developed by Ernst & Young.

In total, 1,037 responses to the survey were received, making the results statistically significant. The survey was conducted using a best practice industry approach to ensure that the sample was as random as possible and that results could be used to analyse expenditure outcomes of the general population within Victoria.

4.1 EY survey on recreational fishing

As discussed in Section 1.4.1, a survey was undertaken to determine the demographic and economic characteristics of Victorians who participate in recreational fishing. The survey consisted of 52 questions, developed by Ernst & Young. After the finalisation of the survey questions with VRFish, StollzNow research distributed the survey in the form of an online survey.

In total, 1,037 responses to the survey were received, making the results statistically significant for the Victorian population. The responses to the survey, for the most part, are considered to be stated preference because there are limited constraints to answers given with regard to decisions relating to participation in recreational fishing, for example income. This is not the case for all survey questions, as in some cases there are constrained questions within the survey.

4.2 Purpose of the survey

The purpose of the Ernst & Young survey was to gain insight into three main characteristics of Victorians who participate in recreational fishing. These aspects were:

- characteristics of recreational fishers and their fishing patterns;
- recreational fishers expenditure on fishing-related activities; and
- constraints restricting recreational fishers participating in recreational fishing more frequently.

The design and operation of the survey reflected the requirements of the survey presented above. It was therefore important that the survey of the general population was statistically random and that the sample size was statistically significant. The survey operation, which was web based, had a series of checks and balances to ensure that the survey process was not contaminated.

The findings of this survey, together with data collected from a variety of additional sources, such as the Victorian DPI and the ABS, have been used to determine the net benefit and economic contribution of recreational fishing in Victoria.

4.3 Survey design, operation and parameters

The survey was designed as a random sample general population survey to provide results that could be used on analysis across the population of Victoria. The recreational fishing survey was undertaken using an internet based response approach.

In terms of design, a sample size of 1,000 respondents was targeted. The breakdown of targetted responses was:

- 500 general population responses; and
- 500 fishers responses.

This would give an appropriate understanding of population response in relation to recreational fishing outcomes. The sample size of 1,000 respondents (and the breakdown of respondent types) would provide a confidence level of ±3.08% at a 95% confidence level. The estimated proportion based on this sample for individuals is p%. The 95% confidence interval for this estimate is p% ± 3.08%. This means that if this survey were completed 100 times, for 95 of these times the results would be within (p% + 3.08%, p% - 3.08%). The number of surveys proposed for this study (1,000+) will provide a statistically significant result which means that the outcomes can be transposed onto the general Victorian population.

Once the population, activity and expenditure profiles are constructed, and based on the statistically significant response levels, it allows an estimate of the following to be undertaken:

- the size of the recreational fishing sector in Victoria in terms of its direct expenditures; and
- the importance of recreational fishing as a source of expenditure in regional economies.

The parameters or information that was being sought though the survey in general terms include:

- The percentage of Victorians who are recreational fishers by:
  - residence (i.e., by region);
  - age and gender; and
  - ethnicity.
- Activity profile of recreational fishers (for the previous 12 months):
  - number of days fished;
  - number of fishing trips;
  - type of fish targeted;
  - volume and type of fish caught;
  - location of fishing and distances travelled;
  - type of fishing technique adopted (e.g. fly fishing, deep sea fishing etc);

- motivations for recreational fishing; and
- boat ownership.

- Expenditure profile of recreational fishers (for the previous 12 months) including:
  - tackle and equipment;
  - bait;
  - food and accommodation;
  - fuel and transport;
  - additional capital costs (for example, boats);
  - fishing club fees; and
  - licensing costs;
- Issues being faced in the industry.

In addition, the survey was issued to members of VRFish as a means of providing verification of the expenditure levels determined through the survey. The survey was completed by 207 members of VRFish. The survey information provided by VRFish members was not reflected in the general population outcomes of the expenditure analysis.

The results of the survey are provided in the following sections of the report.

4.4 Recreational fishing survey outcomes

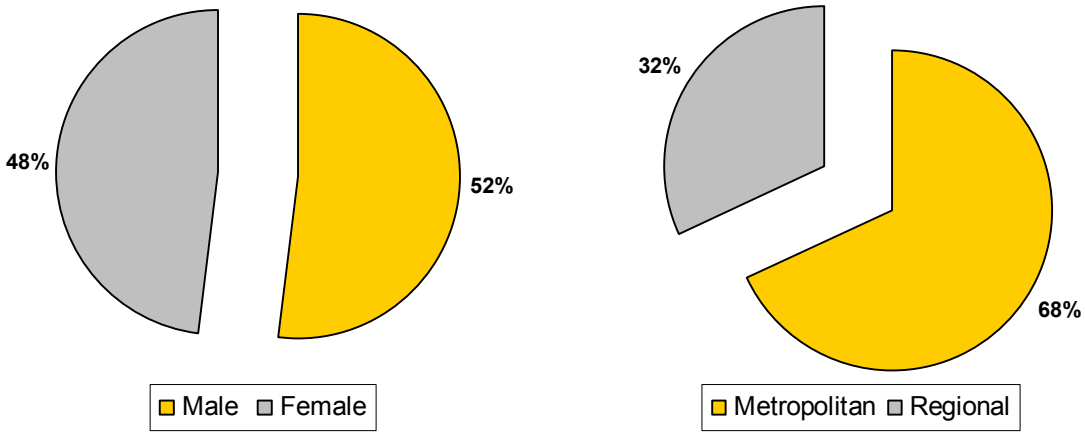
The broad results to the EYA survey are discussed below, with more detailed results discussed later in the report.

4.4.1 Demographic results

Of the 1,037 respondents to the survey, 52% were male and 48% were female. Of the respondents, 68% resided in metropolitan areas in Victoria, with the remaining 32% residing in regional Victorian locations.

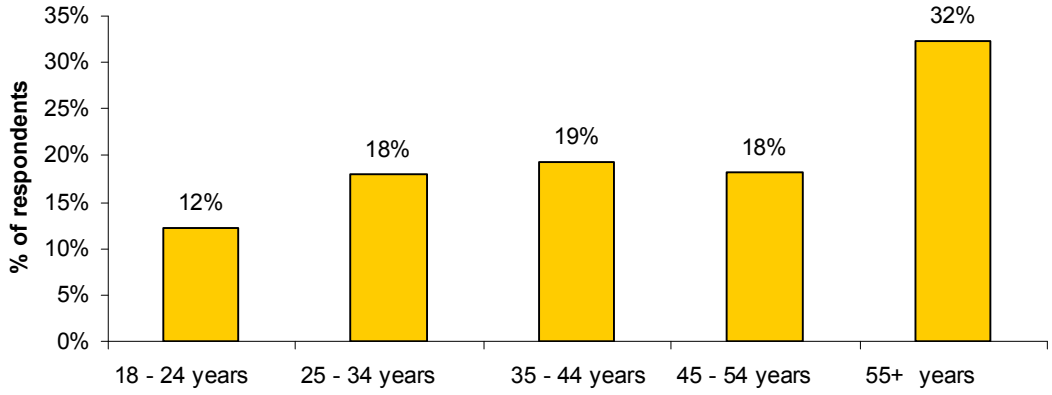
The following diagrams present this data graphically.

Figure 9: General survey demographics



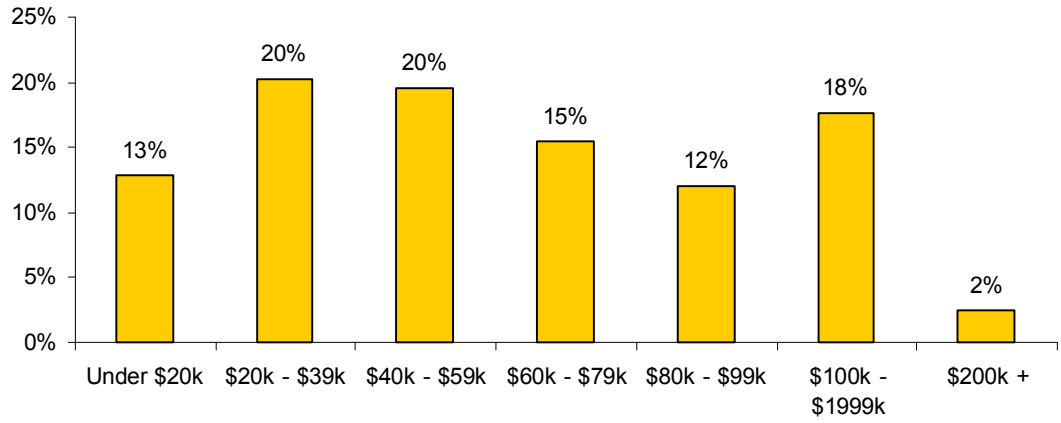
The age profile of the survey respondents is presented in the figure below. As can be seen in Figure 10, the age bracket with the most number of respondents to the survey was the 55+ category which accounted for 32% of respondents, followed by the 25 – 44 year old category, which accounted for 19% of respondents. With only 12% of the survey population in the 18 – 24 year old category, this age category had the least number of respondents.

Figure 10: Age profile of respondents



The figure below shows the household incomes for survey respondents. As can be seen, the median income is in the $40,000 - $59,000 category. The response levels are consistent with ABS data, where the average household income was estimated to be $40,011 (adjusted 2006 figures).

Figure 11: Respondents household income distribution

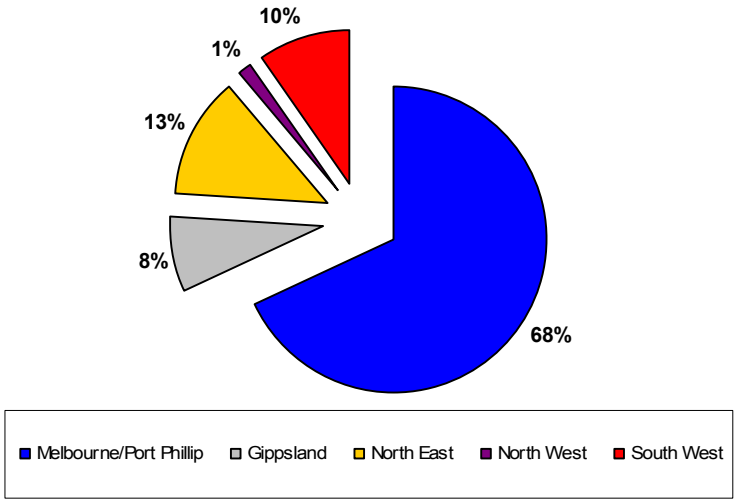


In order to get an appropriate distribution of responses, the survey sample targetted a broad range of locations across Victoria. The distribution of respondents across Victoria is produced in the figure below. The location of respondents has been classified by the same means that VRFish classifies the regions of Victoria. The regions include:

- Melbourne/Port Phillip;
- Gippsland;
- North East;
- North West; and
- South West.

The location of respondents is shown in the figure below.

Figure 12: Location of respondents

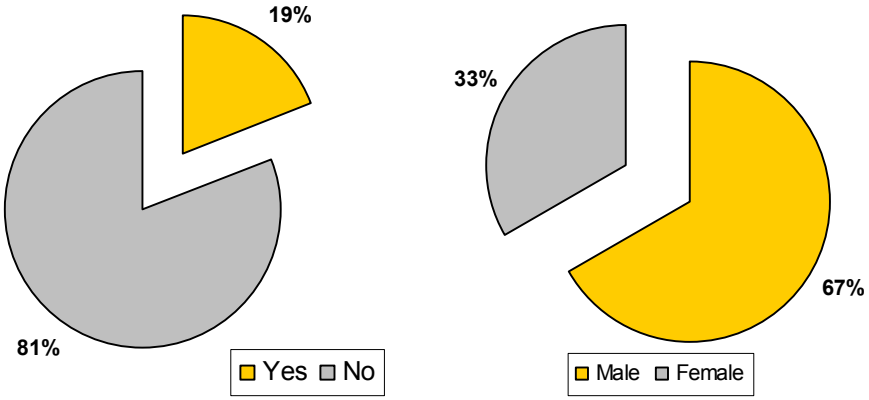


4.4.2 Characteristics of recreational fishers

The remainder of the information provided in this section of the report is concerned with the responses of recreational fishers in Victoria.

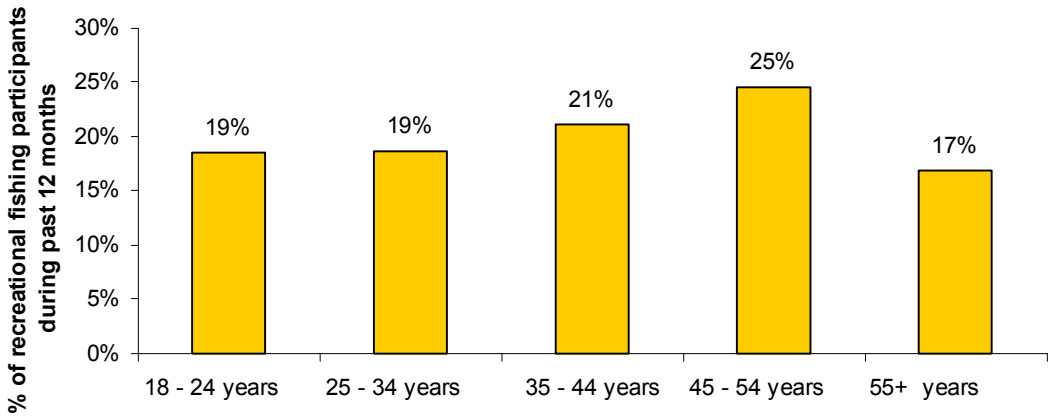
Of the 1,037 Victorian survey respondents, 19% of respondents had participated in recreational fishing in the past 12 months. Of this 19% of recreational fishers, 67% of these participants were male, and 33% were female.

Figure 13: Fishers ratio's – by proportion of population and gender



The age distributions of respondents who have participated in recreational fishing over the past 12 months are shown in Figure 14 below.

Figure 14: Breakdown by age of persons who have participated in recreational fishing in past 12 months



As can be seen, the age group with which recreational fishing is most popular is the 45 – 54 years age bracket, however, the range is relatively evenly spread between all age groups.

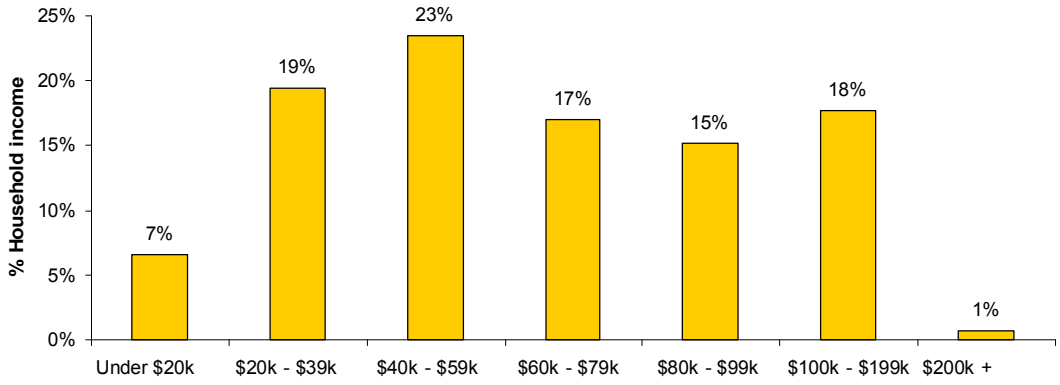
For the 19% of Victorians surveyed who have participated in recreational fishing during the past 12 months, the breakdown of time spent on recreational fishing per season is presented in below. Not surprisingly, summer is the season where the highest proportion of fishing is undertaken.

Table 11: Participation in recreation fishing by season

Season	% of total recreational fishing time
Spring	28.9%
Summer	46.1%
Autumn	16.5%
Winter	8.5%

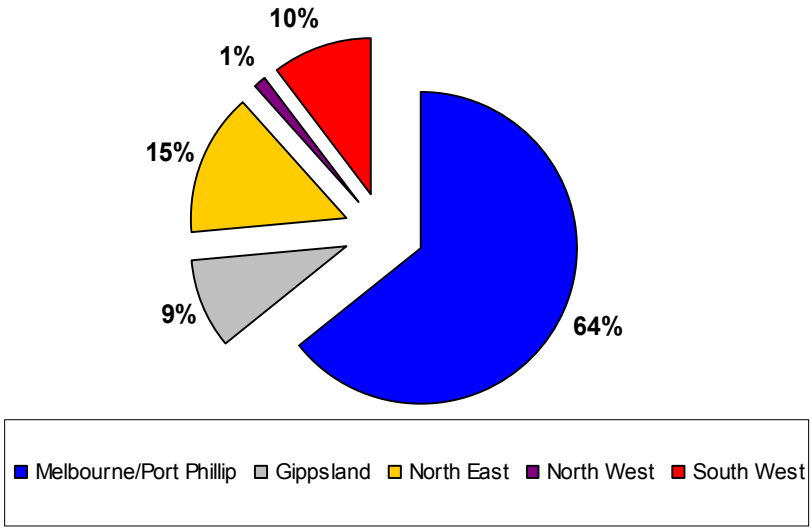
The household income distribution of those who responded as fishers is shown in the figure below. The distribution of those who responded as fishers is distributed slightly higher than the general population, although the median household income band is $40,000 to $59,000 per annum.

Figure 15: Fishing respondent's household income distribution



The respondents who fish are slightly more likely to be located regionally, than for the general population. Of the respondents, 64% resided in metropolitan areas in Victoria, with the remaining 36% residing in regional Victorian locations.

The regional location of respondents who responded as being fishers is presented in the figure below.



4.4.3 Victorian recreational fishing participants results

This section of the report presents the outcomes of the survey based on individuals who have fished in Victoria within the last 12 months. This section concentrates on the physical and operational aspects of recreational fishing. The financial and economic implications of fishing activities will be covered in the net benefits and economic contribution sections of this report.

The table below shows the frequency of recreational fishing in Victoria based on survey responses.

Table 12: Frequency of recreational fishing in Victoria

Frequency	% of respondents
Weekly	9%
Every two weeks	15%
Monthly	24%
Every two months	20%
Every four months	9%
Every six months	10%
About once a year	13%
Total	100%

The type of fishing that survey respondents undertook is shown in the figure below. The most common form of fishing is bait fishing (97%) followed by lure fishing (65%) and then fly fishing (14%).

Table 13: Types of fishing

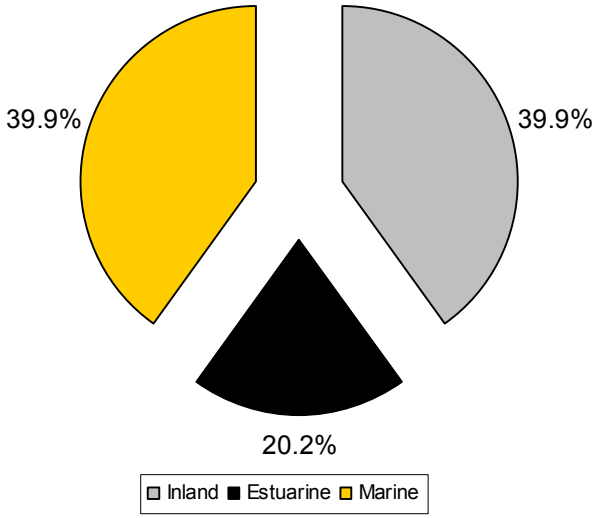
Type of Fishing Participation	% of respondents
Bait Fishing	97%
Lure Fishing	65%
Fly Fishing	14%
Spear Fishing	6%
Other	3%

The survey asked respondents which types of water bodies that they fished on. The distribution was based on the following water sources:

- Inland;
- Marine; and
- Estuaries.

The figure below shows the percentage split by water type. The incidence of water type fished is reasonably evenly split, especially between inland and marine fishing.

Figure 16: Water type fished



A summary of the main types of fish that are target at each of these locations are shown in the table below.

Table 14: Summary of Fish types targeted by water type

Inland		Estuarine		Marine	
Fish Type	Targetted	Fish Type	Targetted	Fish Type	Targetted
Trout	76%	Bream	84%	Flathead	81%
Redfin	50%	Mullet	36%	Snapper	76%
Murray cod	44%	Estuary Perch	22%	Whiting	76%
Yellow belly	43%	Mulloway	21%	Gummy Shark	29%

The survey respondents were asked the top three locations that they have fished within the last 12 months, by region. The location results are shown in the table below for the three location preferences.

The table shows the importance of regional locations (i.e. outside of Melbourne metropolitan areas) to the recreational fishing industry.

Table 15: Region within Victoria fished

Region fished (% of respondents)	Location 1	Location 2	Location 3
Melbourne/Port Phillip	33.3	20.8	15.4
Gippsland	20.5	20.9	24.1
North East	19.3	25.7	22.6
North West	6.7	7.0	7.9
South West	20.3	25.7	30.0
Total	100.0	100.0	100.0

For preferred location 1, the regional areas provide 66.7% of the locations that recreational fishers use for the activity of fishing. In location 2 and 3, the importance of the regional locations increases to 79.2% and 84.6%, respectively.

The impact of fishing on regional locations is further explored in the net benefits and economic contribution sections of this report.

Recreational fishers have a number of reasons for fishing. A number of these reasons were explored within the survey. A respondent could attribute a number of reasons to their fishing activities. The most popular reason to fish was to be outdoors (84% of respondents considered it to be one of their reasons to fish), to relax (82%), to be with family and friends (73%), for the sport (45%) and for competition (25%), amongst other reasons.

The reasons for recreational fishing are presented in the table below.

Table 16: Reasons for fishing

Reasons for fishing	% of respondents
To be outdoors	84%
To relax	82%
To be with friends / family	73%
For solitude	45%
To participate in a sport	45%
For food	44%
For competition	25%
Other	33%

In Victoria, for most groups of people, a fishing licence is required for recreational fishing. A Recreational Fishing Licence (RFL) covers all forms of recreational fishing in all of Victoria's marine, estuarine and freshwaters. A licence is required when taking, or attempting to take, any species of fish by any method including line fishing, bait collection, gathering shellfish, yabby fishing, prawning and spear fishing.

The exemptions to licences in Victoria include

- under 18 years of age;
- 70 years of age or over;

or a holder of a :

- Victorian Seniors Card or interstate equivalent;
- Veterans' Affairs Pensioner Card;
- Veterans' Affairs Repatriation Health Card coded (TPI); and
- Commonwealth Pensioner Concession Card coded either (DSP), (DSP Blind), (AGE), (AGE Blind) or (CAR).

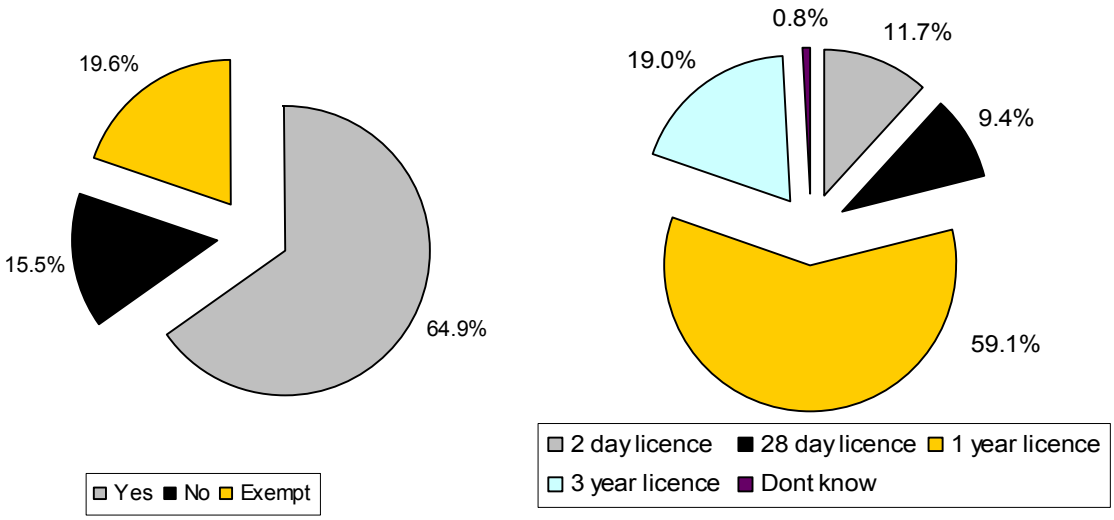
Fishing licences can be purchased for different periods of time, ranging from a two day licence to a three year licence.

The figures below show the incidence of licence purchase by recreational fishers. Of those respondents that indicated they fished, 64.9% have purchased a fishing licence within the

last 12 months. The remainder of respondents either did not purchase a licence (15.5%) or were exempt (19.6%).

The most common licence type, based on respondent information, is a 1 year licence (59.1%), followed by a 3 year licence (19.0%). The two day licence (11.7%) is slightly more popular than the 28 day licence (9.4%).

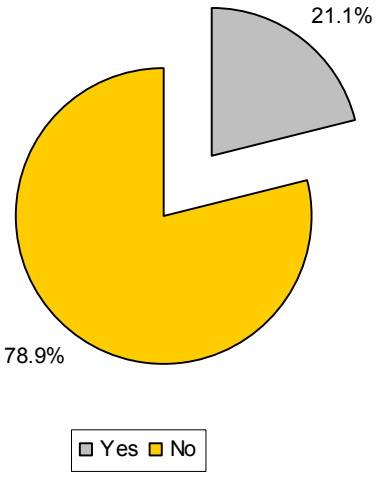
Figure 17: Fishing licence purchased in the last 12 months and the type of licence



A large number of fishers also own boats for use in recreational fishing. Boat ownership increases the scope of access for a fisher. Based on the survey results, 21.1% of recreational fishers have boats which they purchased for their recreational fishing activities.

This will be important to this study when determining the level of capital expenditure undertaken within the recreational fishing industry.

Figure 18: Boat ownership for fishing



The major type of boat owned for fishing purposes is a motor boat (97% of respondents who have a boat for fishing have a motor boat). The length of boats owned and used for fishing

based on respondent information is presented in the table below. The dominant craft owned and operated for fishing purposes is less than 4 metres (34%), followed by 4-6 metres (29%) and 6-8 metres (24%).

Table 17: Length of boat owned by fishers

Boat Length Owned	% respondents
Less than 4m	34%
4m	29%
6m	24%
8m	11%
10m	2%

In general, the following facts where determined on fishing trips by Victorian recreational fishers:

- The average number of people accompanying the survey respondent on each Victorian fishing trip was 2.4 people.
- The average number of locations regularly fished in Victoria averaged 2.8 based on survey responses of fishers.

Expenditure data captured within the survey will be presented in later sections of the report as part of the net benefits and net contribution analysis.

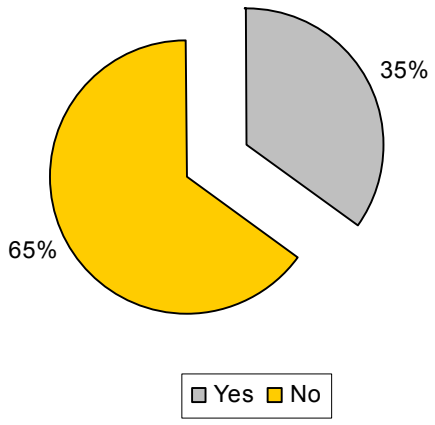
4.4.4 Interstate and international fishing participation by Victorians

One of the issues that VRFish and the broader industry was interested in capturing information on through the survey was the leakage of recreational fishing out of Victoria to interstate and international locations.

This leakage has implications for the economic contribution of the industry.

Of all respondents that indicated they had fished within the last 12 months, 35% had fished outside of Victoria.

Figure 19: Percentage of respondents who fished outside of Victoria



The locations where individuals travel to outside of Victoria are shown in the table below.

Table 18: Percentage interstate and international locations where Victorians fished within the last 12 months

Location outside of Victoria	% Respondent
NSW	61%
Queensland	21%
WA	4%
SA	18%
ACT	0%
Northern Territory	5%
Tasmania	10%
New Zealand	2%
Overseas (other than New Zealand)	5%

The impact on expenditure of interstate and international fishing by Victorians will be shown in the net benefits and economic contribution sections of this report.

4.4.5 Recreational fishing issues identified through the survey

There were a number of reasons identified that stopped individuals from fishing more within Victoria. The main reason sighted was a lack of time, followed by the requirement to travel to a suitable fishing location. The reasons for not fishing as much as desired are shown in the figure below.

Table 19: Issues restricting time spent recreationally fishing

Issues	% respondent
Lack of time	59%
Lack of facilities	8%
Too expensive	16%
Too far from a suitable fishing location	24%
Nothing, I fish as much as I want to	24%
Other	8%

In addition, a number of open ended questions were asked as part of the survey process to ensure that respondents could appropriately detail their views. The main issues that were raised through written responses (but not all) included:

- Issues around fishing stocks and the need to restock rivers;
- Pest control and the removal of noxious species, such as European Carp;
- Improvements to boating and fishing related infrastructure such as ramps and jetties;
- Environmental concerns including clean waterways and pollution in general, climate change and the effects of drought on the waterways;
- Access to and accessibility of suitable fishing locations;
- Concerns regarding overfishing and bag limits, with particular concerns regarding commercial overfishing; and
- Request for better explanation and enforcement of licensing requirements.

From the survey, the relevant importance of issues was identified. The table below shows which issues, having been resolved, would lead people to fish more within Victoria.

Improved facilities, such as jetties and boat ramps, and enhanced stocking would have the largest impact on individual's decisions to fish.

Table 20: Improvements to enhance time spent fishing

Increase time spent fishing	% Respondents
Enhanced stocking	42%
Improved access	33%
Improved facilities e.g. jetties/piers, boat ramps etc	44%
Improved research & development	17%
Improved habitat	37%
Other	10%
None of these	23%

5. The net benefits of recreational fishing

A net benefits study of the recreational fishing industry in Victoria was undertaken. A net benefits assessment involves capturing the direct costs and benefits associated with the recreational fishing industry in particular those to recreational fishers. The net benefits being measured in this assessment include both the financial and economic benefits but do not directly consider the effects to Government. There were number of key findings that were determined through the net benefits assessment:

- The current level of participation in recreational fishing in Victoria is estimated to be 721,000 participants, using the survey responses. Using the average trip information, the number of fishing trips undertaken per annum in Victoria is 8.7 million.
- In total, the per trip expenditure levels were estimated to average $208 dollars.
- The annual expenditure levels, which are in addition to the per trip expenditure are estimated to be $503.4 per annum on average.
- The market value of the recreational fishing catch ranges from $690 million in 2008-09 to $896 million in 2028-29, using current price across the evaluation period.
- The non market value benefits of recreational fishing ranges from $2.3 billion in 2008-09 to $2.9 billion in 2028-29.
- A NPV or net benefit estimated to be $623 million with a BCR of 1.27 in 2008/09

In this section of the report an analysis of the net benefits of the recreational fishing industry was undertaken. A net benefit study generally considers the direct impacts of projects or operations and forms the basis for quantifying the total economic impact. Net benefit studies do not specifically consider flow on impacts, but rather seek to properly evaluate all costs and benefits associated with an investment decision or activity.

The net impacts of a project typically weigh the benefits and costs to society to determine the total benefits of undertaking a project or activity. In the case of this study, the evaluation has been limited to the effects on recreational fishers and the recreational fishing industry. The evaluation does not consider direct Government expenditure on recreational fishing.

5.1 Recreational fishing data collection and use

Data for the calculation of the economic contribution of recreational fishing on the Victorian economy was sourced from three main sources, which were:

- the Ernst & Young Recreational Fishing Survey;
- Government and other agencies; and
- previous recreational fishing studies.

5.1.1 Recreational fishing survey

The process and outcomes of the recreational fishing survey have been described earlier in this report. In summary, a survey was undertaken to determine the incidence of recreational fishing in Victoria from a representative sample of the Victorian population. In addition to assessing the level of participation in recreational fishing, a number of questions focused on the activity and capital cost of recreational fishing and fishers. The survey identified and valued the following cost items:

- Tackle and equipment
- Bait
- Food and accommodation
- Fuel and transport
- Boat hire
- Fuel for boat
- Boat maintenance
- Clothing for fishing
- Fishing club fees
- Licensing costs
- Boating registration
- Camping gear
- Rods and reels
- Boat storage/ mooring
- Capital expenditure on boats
- Any other areas of expense.

5.1.2 Government and Other Agencies

In addition to the recreational fishing user services, state government, other agencies and fishing representation bodies have collected data over time on participation and expenditure of recreational fishers. The use of this additional information allows for a broad sense check to be undertaken on the data collected within the survey. The sources used for additional user analysis included:

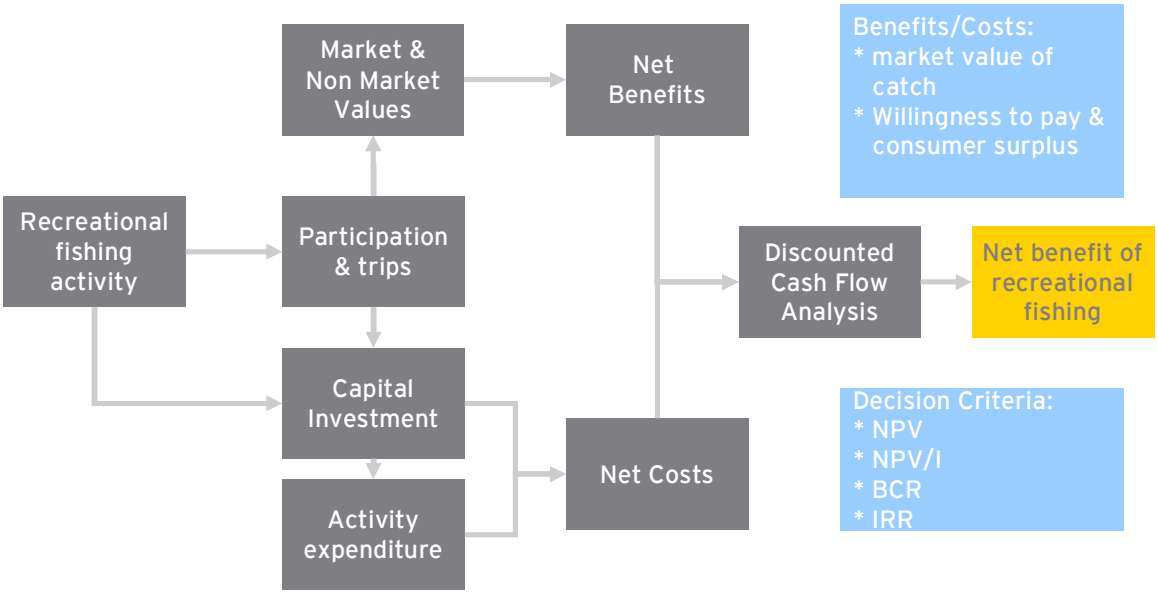
- DPI; and
- VRFish.

5.2 Net benefits methodology

As has been mentioned, a net benefits assessment involved capturing all the direct costs and benefits associated with the operation of a project or an industry. In this study, an assessment of the net benefits of recreational fishing to recreational fishers was undertaken. The net benefits being measured in this assessment included both the financial and economic benefits. Economic benefits can have a realisable financial element (or market element) or may be measured in terms of a utility (or non market) impacts.

The net benefits study being undertaken for this study is not a typical benefit cost study. A typical benefit cost study will assess the benefits of a development or project against the existing base case. In this study, an assessment of the net benefit of the existing participation in recreational fishing is being undertaken. The net benefits contained in this analysis do not directly consider the effects of Government expenditure within the recreational fishing industry. This analysis acts as a precursor and input into the economic contribution study to ensure that the net effect of industry expenditure is used within the analysis rather than total expenditure.

Figure 20: Net benefits methodology



The analysis in this study has been undertaken over two periods. At a single point in time and over a 20 year period based on forecast participation levels. More details on the evaluation period are provided in the following sections.

The decision criteria used in this study include:

- Net Present Value (NPV) – the discounted present value stream of benefits and costs over time.
- Benefit-Cost Ratio (BCR) - ratio of the present value of the economic benefits to the present value of the economic costs of a proposed initiative or activity. It is an indicator of economic merit and can be used to compare options against one another.

The NPV/I and the Internal Rate of Return (IRR) have not been used as the study does not consider the implication of large scale capital investments at the Government level, but focuses on user investment in fishing activity specific equipment.

5.3 General Project Assumptions

There are a number of general assumptions that have been used when calculating the net benefits of the recreational fishing industry and to recreational fishers. The general assumptions are presented below.

Evaluation period

There are two appraisal periods produced for the net benefits study. The analysis is undertaken for a single point in time and over a 20 year evaluation period. The single point evaluation date and the 20 year evaluation start were assumed to be 2008-09.

Discount Rate

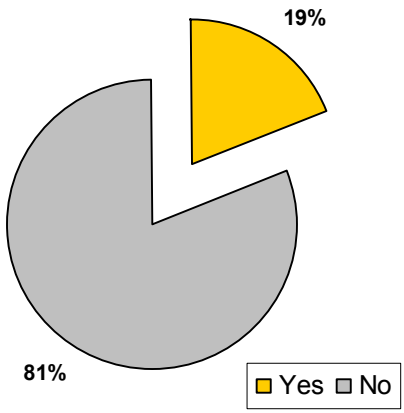
The discount rate used in the evaluation is 7%. Sensitivities have been run on 4% and 10%.

5.4 Participation in recreational fishing in Victoria

The major determinant of the overall level of expenditure and benefits derived from recreational fishing in Victorian is the level of participation in recreational fishing as an activity.

As detailed in Section 4 of this study, Ernst & Young undertook a survey to determine the level of participation in recreational fishing in Victoria. The study found that 19% of respondents had recreationally fished within the last 12 months.

Figure 21: Estimation of recreational fishing participation



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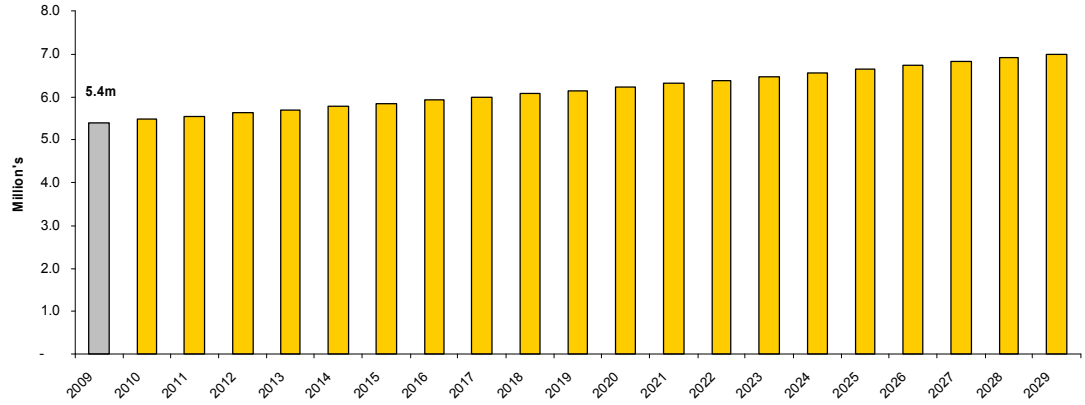
The sample size for this survey is considered statistically significant and, as such, the outcomes of the survey can be applied to the population of Victoria to determine total levels of participation.

To determine the total participation of the Victorian population, the following information was sourced

- the current size of the Victorian population;
- the average number of trips survey respondents undertook for purposes of recreationally fishing per annum.

The current population in Victoria is 5.4 million based on information sourced from the Australian Bureau of Statistics. In addition to the current population levels, forecast population growth has been used as the basis for forecasting participation in recreational fishing in Victoria. Population forecasts were sourced from Access economics investment and business outlook, 2009. The forecasts population levels for Victoria are shown in the figure below.

Figure 22: Victorian Population forecasts

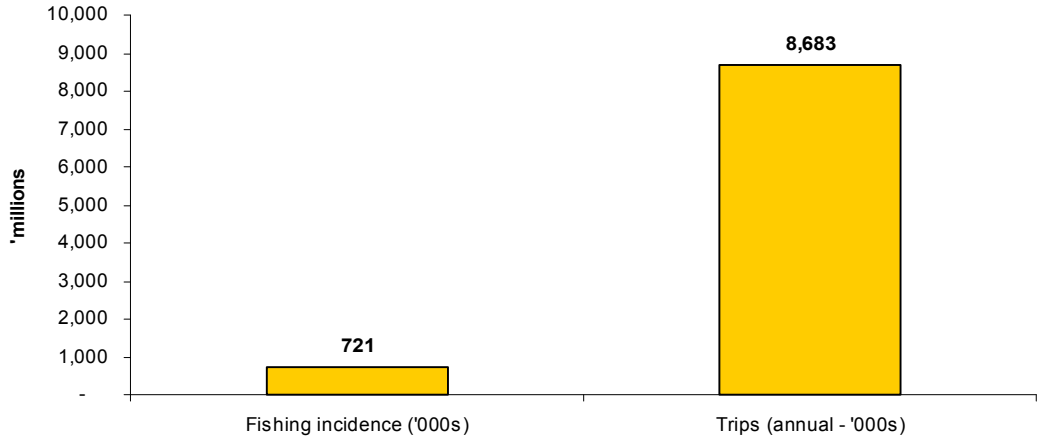


Access economics investment and business outlook, 2009

The recreational fishing survey provided information on the average number of fishing trips undertaken by participants each year. The average number of fishing trips taken in Victoria by the survey sample was 12 per year.

Using this information, the current level of participation in recreational fishing in Victoria is estimated to be 721,000 participants. Using the average trip information, the number of fishing trips undertaken per annum in Victoria is 8.7 million. This information is shown in the figure below. These figures provide the basis for the 2008-09 net benefits analysis.

Figure 23: Estimated number of recreational fishers and trip levels – 2008-09

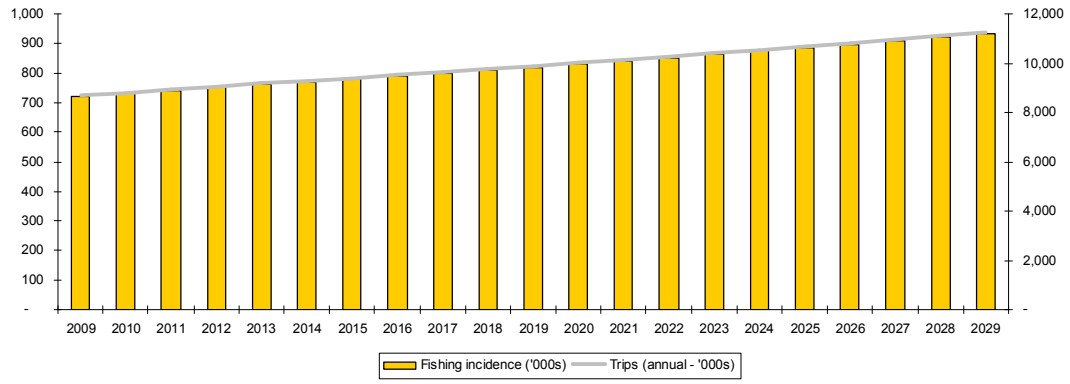


Using the forecast population levels for Victoria and the existing average trip levels, the forecast participation and number of fishing trips have been calculated for Victoria. The results are presented in the figure below.

The forecasts include:

- fishing incidence or participation increasing from 721,000 to 933,000 by 2028-29; and
- fishing trip levels increasing from 8.7 million to 11.2 million by 2028-29.

Figure 24: **Forecast fishers and fishing trips**



5.5 Direct recreational fishing expenditure

The direct expenditure on recreational fishing within Victoria was captured through the recreational fishing survey. Survey participants were asked about their expenditure levels over the past year on recreational fishing activities. The expenditure levels that were captured included both a per trip component and an annual expenditure component for more capital intensive items, such as rods and reels.

The results of the survey expenditure outputs are presented below.

In total, the per trip expenditure levels were estimated to average $208 dollars. This expenditure does not include the annual expenditure on capital items, which is presented in Table 22 below. The major components of this expenditure include:

- Food and accommodation estimated to be $81 per trip; and
- Fuel and transport estimated to be $52.5 per trip.

Table 21: Per trip expenditure estimates

Expenditure Item	$/trip
Tackle and equipment	15.6
Bait	14.8
Food and accommodation	81.0
Fuel and transport	52.5
Boat hire	12.6
Fuel for boat	12.0
Any other areas of expense	19.8
Total trip expenditure	**208.3**

The annual expenditure levels, which are in addition to the per trip expenditure are shown in the table below and are estimated to be $503.4 per annum on average. The major expenditure items include:

- Rods and reels estimated to be $95.80 per annum;
- Boat maintenance estimated to be $59.80 per annum; and
- Camping gear estimated to be $45.30 per annum.

Table 22: Annual expenditure estimates

Expenditure Item	Additional $/Annum
Boat maintenance	59.8
Clothing for fishing	31.1
Fishing club fees	4.4
Licensing costs	28.8
Boating registration	21.5
Camping gear	45.3
Rods and reels	95.8
Boat storage/ mooring	12.8
Any other areas of expense	203.9
Total per year expenditure	**503.4**

When annual capital expenditure is expressed as a per trip measure, it equates to $42 per trip. In total, the variable and fixed per trip expenditure is estimated to be $250 based on survey responses.

In addition to the direct recreational fishing activity expenditure data, survey participants were asked whether they had purchased a boat for the purpose of undertaking recreational fishing. In addition, the survey participants were asked what the capital cost of the boat was and how often they replaced their boat. Using this information and information on second hand sales an annualised capital expenditure for boats was developed that could be linked directly to recreational fishing. The outcomes of the boating expenditure, directly linked to fishing, analysis is shown in the table below.

Table 23: Boating expenditure directly linked to fishing

Boat capital direct expenditure	
Value of boat purchased ($)	9,570
Average Replacement(years)	7.6
Boat ownership for fishing	21%
Direct boat expenditure 2008-09 ($'millions)	80.0

Based on the information provided in the survey:

- the average capital value of a boat purchased for recreational fishing is $9,570;
- replacement occurs on average every 7.6 years; and
- the value of boat capital expenditure is estimated to be $80 million in 2008-09.

5.5.1 Direct expenditure outcomes

The direct expenditure has been calculated for two time periods:

- for a single point in time, being 2008-09;
- over a 20 year evaluation from 2008-09 to 2028-29.

The results of this expenditure analysis are shown in the table below.

Table 24: Direct expenditure recreational fishing

Direct expenditure ($'millions)	2008-09	20014-15	2019-20	2024-25	2028-29
Activity cost	2,251	2,439	2,562	2,768	2,915
Boating cost	80	86	91	98	103
Total Direct expenditure	2,331	2,525	2,653	2,866	3,018

The outputs of the direct expenditure analysis include:

- the activity direct expenditure is $2.3 billion in 2008-09 and is estimated to increase to $2.9 billion in 2028-29; and
- the boating direct expenditure is $80 million in 2008-09 and is estimated to increase to $103 million by 2028-29.

5.6 Benefits of recreational fishing

The direct benefits of recreational fishing in Victoria are calculated using two measures, which attribute a value to the fishing participant:

- the market value to recreational fishers of their catch; and
- the non market benefits to recreational fishers associated with consumer surplus gained from undertaking fishing activities.

The two measures of recreational fishing benefits are explained in the following sections.

5.6.1 Market values

The market value of the fish caught by recreational fishers provides a quantifiable and measurable means of valuing the benefits of recreational fishing to the participant. For example, the catching of a fish for consumption means that the individual does not have to purchase that fish. Even if the fisher is practicing catch and release, the value of that catch remains quantifiable. The value of the catch remains quantifiable because it is the intrinsic market value of the catch and represents a component of the consumer surplus that the fisher gains from participating in recreation fishing.

The market value of the catch to recreational fishers in Victoria is captured using two pieces of information:

- average catch per trip information; and
- market price and average weight of fish caught.

The average catch information was sourced from the recreational fishing survey and is provided in the table below. The results are produced across an average of participants, fishing type and fish type.

Table 25: Average catch per trip

Fish Type	Average catch
Trout	0.6
Redfin	0.7
Murray cod	0.2
Yellow belly	0.3
Bream	0.5
Mullet	0.3
Mulloway	0.1
Estuary Perch	0.1
Flathead	1.2
Whiting	0.9
Snapper	0.5
Calamari (squid)	0.3
Rock lobster	0.0
Abalone	0.0
Gummy shark	0.1
Tuna	0.0

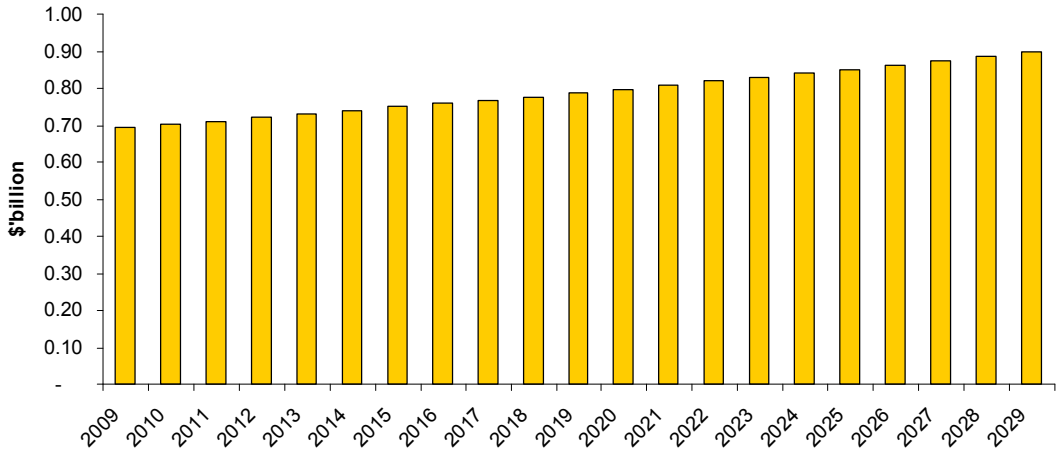
The market price and weight information was sourced from the Melbourne Wholesale Fish Markets. The results of this analysis are shown in the table below.

Table 26: Average fish weights and prices

Fish Type	Average Price per kg ($)	Average kg	Total Average Price ($)
Trout	6.4	1	6.4
Redfin	6.5	1.5	9.8
Murray cod	19	5	95.0
Yellow belly	6	2.5	15.0
Bream	6.5	1.25	8.1
Mullet	3	0.5	1.5
Mulloway	4.5	1.5	6.8
Estuary Perch	11	0.8	8.8
Flathead	2.8	2.5	7.0
Whiting	11	0.5	5.5
Snapper	6.5	4	26.0
Calamari (squid)	4.5	0.5	2.3
Rock lobster	26	0.5	13.0
Abalone	15	0.2	3.0
Gummy shark	9.5	5	47.5
Tuna	8.5	14	119.0

By combining the catch information and the market price values, the total market value of the recreational fishing catch in Victoria can be valued. The market value of the recreational fishing catch is shown in the figure below.

Figure 25: Market value to recreational fishers



The market value of the recreational fishing catch ranges from $690 million in 2008-09 to $896 million in 2028-29, using current price across the evaluation period.

5.6.2 Non market values – Consumer surplus

In addition to capturing the market value of recreational fishing, an assessment of the non market values that fishers place on the opportunity to fish was undertaken. Non market benefits attempt to identify external benefits that arise from undertaking an activity which are not actually captured through the pricing mechanism. Non market benefit valuation attempts to capture the users consumer surplus.

Consumer surplus measures the additional value that is derived from undertaking fishing activities, over and above what has to be paid for that fishing activity. It is the difference between what users are willing to pay to undertake an activity and what they are actually required to pay.

Willingness to pay measures attempt to capture the social and amenity (non-market) benefits associated with recreational fishing. Approaches to capturing willingness to pay in previous studies include:

- Revealed preference – assesses things like travel costs and license fees to determine what anglers are willing to spend to undertaking fishing activities;
- Stated previous, such as contingent valuation – which uses survey techniques to ask anglers how much they would be willing to pay; and
- Market based methods – which uses actual market data to determine how anglers react to price changes.

It should be noted that no new research on willingness to pay for recreational fishing activities has been undertaken for this study, rather that a benefit transfer approach has been taken. A benefit transfer approach is used to estimate economic values by transferring available information from studies already completed in another location and/or context. For example, values for recreational fishing in a particular state may be estimated by applying measures of recreational fishing values from a study conducted in another state.

The basic goal of benefit transfer is to estimate benefits for one context by adapting an estimate of benefits from some other context. Benefit transfer is often used when it is too expensive and/or there is too little time available to conduct an original valuation study, yet some measure of benefits is needed. It is important to note that benefit transfers can only

be as accurate as the initial study. For these reasons it is necessary to be aware of the limitations of the benefit transfer approach including the potential for margins of error in valuation and around the suitability of benefits captured in one location to a separate location.

Using a benefit transfer methodology, a range of sources of information need to be collected and then used to capture the per trip non market benefit in order to minimise the potential limitations to the methodology. Part of the process of using a benefit transfer methodology is to ensure that the studies undertaken are appropriate and consistent with the approach being taken within this study. This per trip was then able to be applied to the trip estimation numbers developed through the recreational fishing survey. Based on the analysis of previous studies, it was determined that the consumer surplus of recreational fishing ranged from $193 and $440 per trip. The average, based on the analysis of a range of Queensland values, rather than from International studies, was determined to be $360 per trip (in 2008/09 dollars), which was subsequently used to calculate the non market benefits to Victorian recreational fishers within this study. (While this approach, therefore, is predominantly based on freshwater reports the outcome is similar to that which would arise from the incorporation of the international marine studies.)

The range of values used as the basis for determining the per trip benefit to recreational fishers in Victoria are shown in the table below.

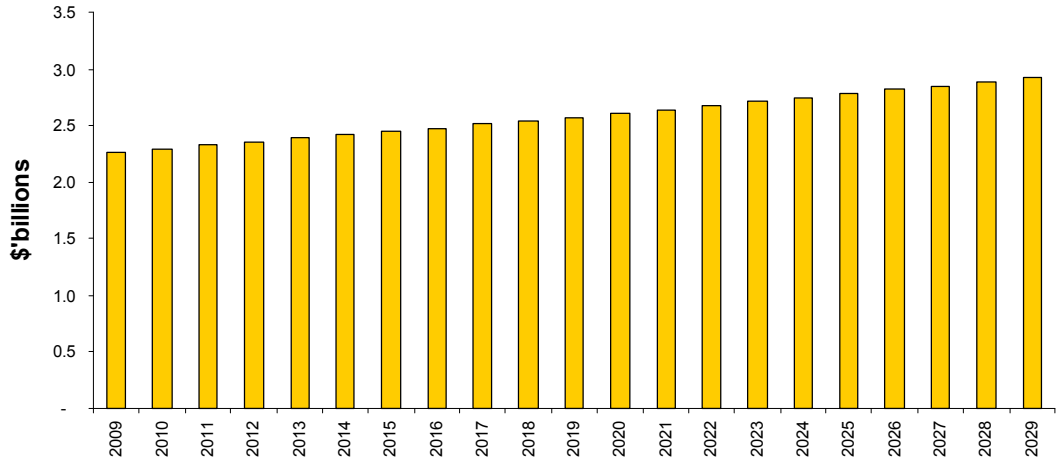
Table 27: Range of benefit values per trip to recreational fishers

Study	Valuation method	Value per trip ($)
Estimating values for recreational fishing at freshwater dams in Queensland, John Rolfe and Prabha Prayaga (2005)	Contingent valuation	220
Estimating values for recreational fishing at freshwater dams in Queensland, John Rolfe and Prabha Prayaga (2005)	Contingent valuation	359
Estimating values for recreational fishing at freshwater dams in Queensland, John Rolfe and Prabha Prayaga (2005)	Contingent valuation	440
The economic value of marine recreational fishing, Haab, Hicks and Whitehead (2006)	Willingness to pay	235
The economic value of marine recreational fishing, Haab, Hicks and Whitehead (2006)	Willingness to pay	355
The economic value of marine recreational fishing, Haab and Jeong (2004)	Willingness to pay	193
The economic value of marine recreational fishing, Haab and Jeong (2004)	Willingness to pay	383

Based on an analysis of the methodologies used in the studies listed above, it was determined that it was appropriate for the values of consumer surplus (willingness to pay) to be used within the Victorian study.

The non market benefits calculated through the consumer surplus approach include the market value of recreational fishing, so it is important that these are subtracted from the total non market value calculation, in order to avoid double counting. The outcomes of the non market benefit valuation are shown in the figure below.

Figure 26: Non market benefits of recreational fishing in Victoria



The non market value benefits of recreational fishing ranges from $2.3 billion in 2008-09 to $2.9 billion in 2028-29.

5.6.3 Benefits of recreational fishing in Victoria

The total benefit of recreational fishing in Victoria is calculated by bringing the market and non market benefit values together.

Table 28: Market and non market benefits of recreational fishing in Victoria

Market and non market benefits ($'millions)	2008-09	20014-15	2019-20	2024-25	2028-29
Market value benefits	692	750	798	851	896
Non market value benefits	2,262	2,450	2,607	2,781	2,929
Total benefits	2,954	3,200	3,405	3,632	3,825

The outputs of the direct benefits analysis include:

- the market value of benefits is $692 million in 2008-09 and is estimated to increase to $896 billion in 2028-09; and
- the non market value of benefits is $2.3 billion in 2008-09 and is estimated to increase to $2.9 billion by 2028-29.

5.7 Net benefits of recreational fishing

The net benefits results for recreational fishing are presented for a single point in time (2008-09) and based on the forecast participation and expenditure levels over a 20 year evaluation period.

The results of the net benefits analysis in 2008/09 include:

- a present value of costs valued at $2.3 billion;
- a present value of benefits valued at $3.0 billion;
- a net benefit to recreational fishers of $623 million; and

- a benefit-cost ratio of 1.27.

The overall net benefits for recreational fishing for 2008-09 are shown in the table below.

Table 29: Net benefits results – 2008-09

Net benefits outcomes	2008-09
Present value of costs ($m, 2008 dollars)	2,331
Present value of benefits ($m, 2008 dollars)	2,954
NPV ($m, 2008 dollars) i.e. 'Net Benefit'	623
BCR	1.27

The overall net benefits for recreational fishing over the 20 year evaluation period are shown in the table below.

Table 30: Net benefits results – 2008-09

	Discount Rate (%)		
	4%	7%	10%
Present value of costs	38,150	29,933	24,282
Present value of benefits	48,342	37,930	30,769
NPV ($m, 2008 dollars) i.e. 'Net Benefit'	10,192	7,997	6,487
BCR	1.27	1.27	1.27

The benefit-cost ratio (BCR) outcome may seem low compared to some other economic studies that have been produced, for example, the construction of a road in Victoria. The reason for the comparatively low BCR is a result of the analysis being a non traditional net benefits assessment rather than a traditional benefit-cost study. The analysis undertaken in this study is looking at the net benefits to recreational fishers. Based on this, the study shows, for every dollar that a fisher spends on recreational fishing, they receive $1.27 in benefits, or a net gain of $0.27. In this context the result is considered to be very positive.

6. The economic contribution of recreational fishing

An assessment of the economic contribution of recreational fishing to the Victorian economy is undertaken based on the expenditure information obtained through the survey of recreational fishers and using an input-output methodology to calculate the indirect or flow on effects associated with recreational fishing.

The key results include:

- the industry produced a total GSP of $825 million in 2008-09.
- the recreational fishing industry is estimated to contribute 5,200 jobs in Victoria when the industry and flow on jobs are considered.

The Gross Regional Product (GRP) outcomes for 2008-09 include:

- $228.8 million in Melbourne/Port Phillip;
- $172.9 million in Gippsland;
- $177.9 million in the North East region;
- $56.8 million in the North West region; and
- $188.4 million in the South West region.

In Section 6 of this report an assessment of the economic contribution of recreational fishing to the Victorian economy is undertaken based on the expenditure information obtained through the survey of recreational fishers.

Given that this section of the report is associated with economic contribution, an input-output analysis has been used to calculate the indirect or flow on effects associated with recreational fishing. More details of the modelling process and the outcomes of the assessment are included within the methodology discussions.

6.1 Data collection

Data for the calculation of the economic contribution of recreational fishing on the Victorian economy is sourced from the net benefits analysis undertaken in Section 4 of this report. The data sources are as detailed in 5.1.

6.2 Economic contribution methodology

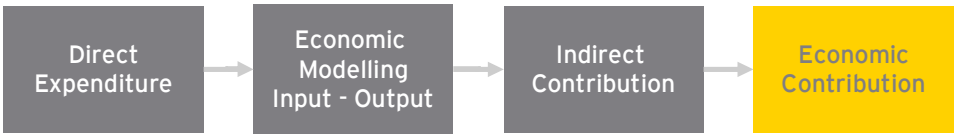
The economic contribution if recreational fishing to the Victorian economy is undertaken using an input-output model and methodology. The major input into the economic contribution analysis is the direct expenditure data collated in the net benefits section of this report. However, for the economic contribution study, any direct expenditure which is undertaken on recreational fishing, but ultimately leaks out of the Victorian economy, is discounted as not having an economic contribution to Victoria.

This direct expenditure is placed in an input –output model to determine the flow on impacts that the expenditure on recreational fishing activities has on the broader Victorian

economy. This process then allows for the calculation of the total economic contribution of recreational fishing on the Victorian economy.

An illustration of the methodology used in this assessment to capture the economic contribution of the recreational fishing industry is presented in the figure below.

Figure 27: Economic contribution methodology



As in the case of the net benefits study, the economic contribution analysis has been undertaken for two periods of time:

- for a single point in time, being 2008-09;
- over a 20 year evaluation from 2008-09 to 2028-29.

This allows an assessment to be made of the current economic contribution of recreational fishing to the Victorian economy and the potential future contribution of recreational fishing out to 2028-29.

6.3 Direct economic expenditure

The direct expenditure on recreational fishing was detailed in Section 5.5.1 of this report. This expenditure data, which was based on information contained in the survey on participation and expenditure, provides the basis for the inputs into the economic contribution analysis.

The direct expenditure data has been organised for modelling based on expenditure items and established in a database. Unlike in the case of the net benefits analysis, in examining the net economic contribution of recreational fishing, and to ensure not to over estimate the economic impact, it is necessary to consider:

- **displacement impacts of economic activity** – whereby economic activity is simply relocated from one area to another; and
- **substitution expenditure** – where demand for one industry's output is switched to another, therefore providing little net stimulus to an economy.

The end result requires adjusting data for any leakage out of the Victorian economy (such as imports), double counting, imports or any cross industry substitution.

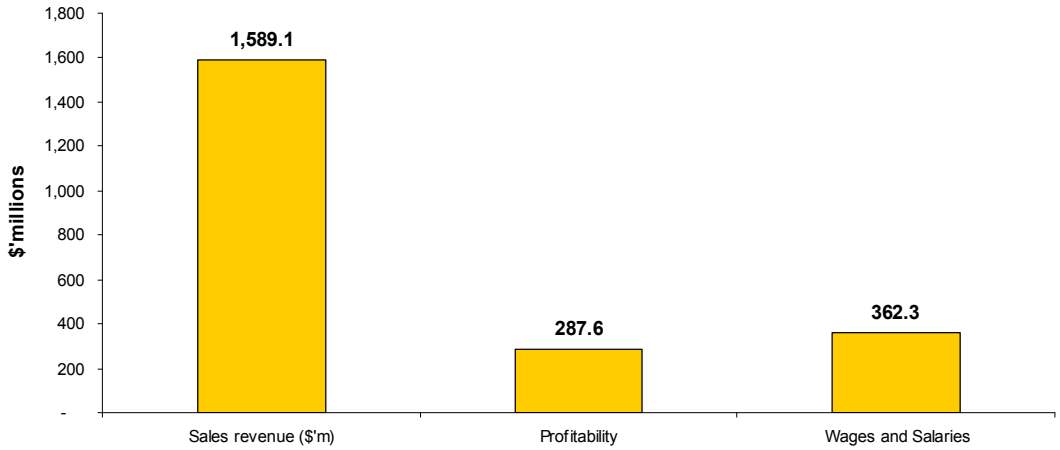
The direct expenditure represents the transaction levels within the Victorian economy. It can be considered the level of sales turnover within the Victorian economy derived through the recreational fishing industry. IBIS world industry financial benchmark data has been used to develop industry profitability and determine the level of wages and salaries within the recreational fishing industry.

The direct expenditure attributable to recreational fishing in Victoria in 2008-09, adjusted for leakages out of the Victorian economy, is produced in the figure below. The direct expenditure results include:

- sales revenue of $1.6 billion;
- industry profitability of $288 million; and

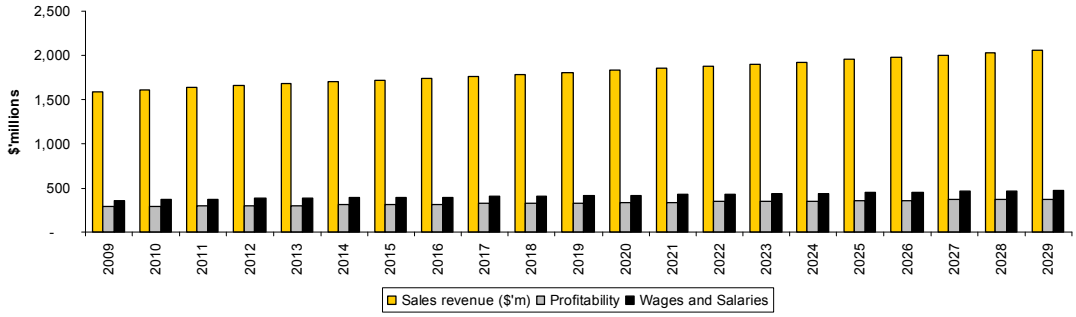
► industry wages and salaries of $362 million.

Figure 28: Direct expenditure recreational fishing – 2008-09



The direct expenditure across the 20 year evaluation is shown in the figure below. The direct expenditure undertaken within the recreational fishing industry has been estimated to range from $1.6 billion to $2.1 billion.

Figure 29: Forecast direct expenditure recreational fishing



The direct expenditure components of the recreational fishing industry are then placed into the input-output model to determine the economy wide contribution of the industry in Victoria.

6.4 Input-output (I-O) approach

To estimate the economic contribution of recreational fishing in Victoria to the Victorian economy, an input-output (I-O) methodology has been chosen as the appropriate method for calculating flow-on impacts of users on the economy. These methods were developed so that the transactions among industries could be studied, referred to as inter-industry transactions, in addition to the transactions where industries sell their goods and services to final users (e.g. consumers, exports, government and capital formation). The calculation of these transactional impact involves working 'backwards' from the sale to final users to examine the various contributions to the creation of that final product. This works through the supply (or value) chain for that product or service and identifies all of the trades that take place between contributing businesses.

6.5 Recreational fishing and the I-O model

The operation of Victorian recreational fishing participants and the range of activities associated with these operations highlight the complex way the modern economy operates. It involves the use and hence provision of infrastructure, a variety of administrative and regulatory functions of government and a variety of services provided by operators that are supported by a vast array of specialist support services.

The implication of the above is the need to conceptualise the project carefully to ensure completeness and to avoid double counting of impacts. This project involves estimating the economic contribution of recreational fishing in Victoria to the Victorian economy.

Impact studies of particular industries or user groups are normally best carried out through the construction of specific sectors to be included in the I-O table. This is because the sector specification used in the tables involves the aggregation of a number of related activities to make them manageable. Thus, the industry may not be appropriately represented by the aggregated sector as not all of the industries in a sector are homogeneous in terms of products produced, markets served, technologies used or source of inputs used.

The compilation of specific sectors that are superior to the sector in the I-O table is a considerable task and requires access to detailed information on the cost structure of the industries. Further, if the industry to be studied comprises a dominant part of the relevant sector in the input output table, then that sector will tend to reflect the characteristics of the dominant sector. This is likely to be the case for airline operations in the air transport sector. For some sectors, there is likely to be little variation in its characteristics from region to region, such as the retail sector. For this study, the recreational fishing industry has been constructed from the following industry segments:

- Parks;
- Recreation;
- Accommodation; and
- Manufacturing.

The base I-O multipliers used for this study have been developed by the Centre of Policy Studies (CoPS) from Monash University and are derived from their general equilibrium model. Given that the multipliers are derived from a general equilibrium model, the outcomes should not be overstated and will be more defensible than standard I-O multipliers. The I-O multipliers are developed with price and labour constraints inbuilt and provide a more realistic output when calculating economic contribution.

6.6 Recreational fishing industry economic contribution measures

Economic contribution outcomes can be measured using a range of variables. The usual measures calculated in economic contribution studies are:

- **Gross output or turnover** – this is a guide to business operation impacts that business operators can readily relate to. However, it involves double counting of intermediate inputs at each stage of the supply chain and so is not the preferred economic measure;
- **Value added** – this is a measure that nets out the use of intermediate inputs in the supply chain and approximates the measurement of GNP, or as in the case of a State based analysis GSP, used by the ABS to measure the value of output;

- **Employment** – this is a socio-economic measure used as an indicator of performance. Employment may be measured in terms of the number of jobs or in terms of jobs adjusted to FTEs; and

- **Household income** – this is a measure of the contribution that these activities make to the income (before tax) of households.

Typically an emphasis is placed on the outcomes of the value added and employment outcomes as being the most useful. For the purpose of this study, we will be concentrating on the value added and employment outcomes.

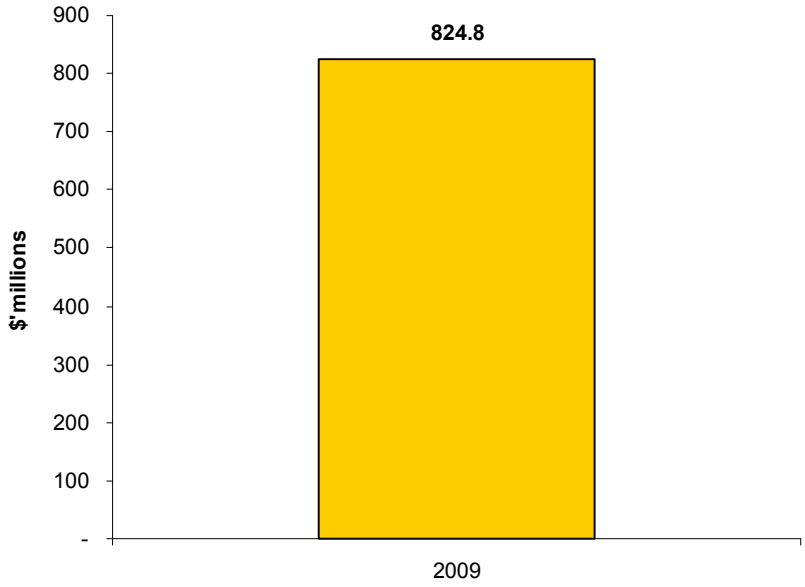
Results for employment need to be interpreted carefully. The employment outcomes are increasingly complicated by the growing flexibility in employment arrangements. As a result, there are a variety of employment arrangements to meet these needs that make common measures of number employed and FTEs difficult to achieve. It is also difficult to put the FTE estimates into a perspective of other measures calculated in a similar way.

6.6.1 Recreational Fishing Economic Contributions – 2008-09

The economic contribution of the recreational fishing industry was calculating by applying input-output multipliers to the direct expenditure data. The result of this analysis is shown in the table below.

The industry produced a total GSP of $825 million in 2008-09. This value represents 0.3% of the total Victorian GSP.

Figure 30: Economic Contributions 2008-09 – Value Add (GSP $'millions)



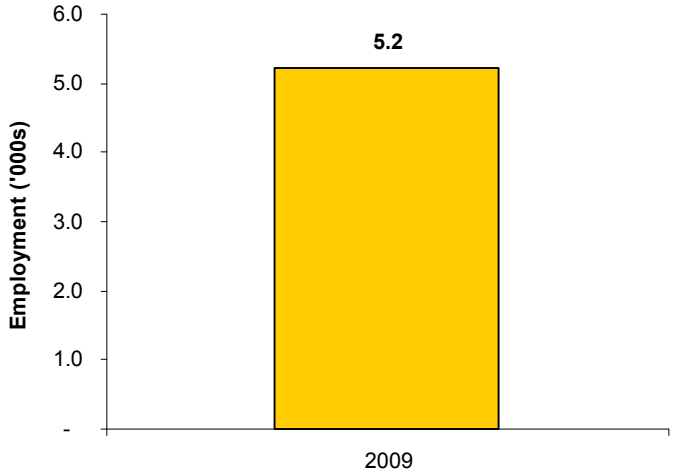
The contribution to the Victorian GSP on an industry basis for 2008-09 is presented in the table below.

Table 31: Economic Contributions 2008-09 – Value Add (GSP $'millions) by Industry

Industry ($'m)	2008-09
Agriculture, forestry and fishing	26.3
Mining	18.5
Manufacturing	16.5
Electricity, gas and water	24.1
Construction	55.1
Wholesale trade	52.7
Retail trade	48.4
Accommodation, cafes and restaurants	14.1
Transport and storage	35.8
Communication services	24.2
Finance and insurance	78.2
Property and business services	118.7
Government administration and defence	22.6
Education	43.9
Health and community services	53.4
Cultural and recreational services	14.6
Personal and other services	16.6
Ownership of dwellings	72.9
All Industries (excluding Recreational Fishing)	736.4
Recreational fishing industry	88.3
Total GSP by Industry	824.8

The employment impacts are shown for 2008-09 in the figure. The recreational fishing industry contributed 5,200 jobs in Victoria when the industry and flow on jobs are considered.

Figure 31: Economic Contributions 2008-09 – Employment



The distribution of these jobs across industries is shown in the table below for 2008-09.

Table 32: Economic Contributions 2008-09 – Employment by Industry

Industry Employment ('000s)	2008-09
Agriculture, forestry and fishing	0.2
Mining	0.1
Manufacturing	0.1
Electricity, gas and water	0.2
Construction	0.3
Wholesale trade	0.3
Retail trade	0.3
Accommodation, cafes and restaurants	0.1
Transport and storage	0.2
Communication services	0.2
Finance and insurance	0.5
Property and business services	0.8
Government administration and defence	0.1
Education	0.3
Health and community services	0.3
Cultural and recreational services	0.1
Personal and other services	0.1
Ownership of dwellings	0.5
All Industries (excluding Recreational Fishing)	4.7
Recreational fishing industry	0.6
Total GSP by Industry	5.2

6.6.2 Recreational Fishing Economic Contributions – Forecast

Based on the analysis undertaken in the net benefits section of this report, in particular in regards to the direct expenditure, forecast economic contribution outcomes have been produced for GSP and employment.

The forecast GSP and employment over the 20 year evaluation period is shown in the table below. Results include:

- the GSP contribution of the recreational fishing industry ranges from $837.1 million to $1,014.2 million per annum.
- the employment contribution of the recreational fishing industry ranges from 5,310 to 6,400 jobs in a particular year.

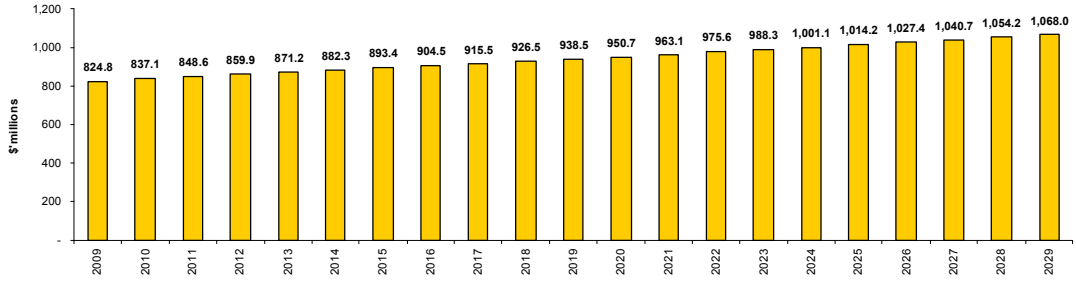
Table 33: Forecast recreational fishing economic contribution

Economic Variables	2009-10	2014-15	2019-20	2024-25	NPV/ Annual average
Value Add ($'m)	837.1	893.4	950.7	1,014.2	10,591
Employment ('000s)	5.31	5.67	6.03	6.44	5.98

The net present value of the recreational fishing industry over the 20 year evaluation period is $10.6 billion while average annual employment is 5,980.

The year on year direct and indirect contribution of the recreational fishing industry to Victorian GSP is shown in the figure below.

Figure 32: Forecast Economic Contributions – Value Add (GSP $'millions)



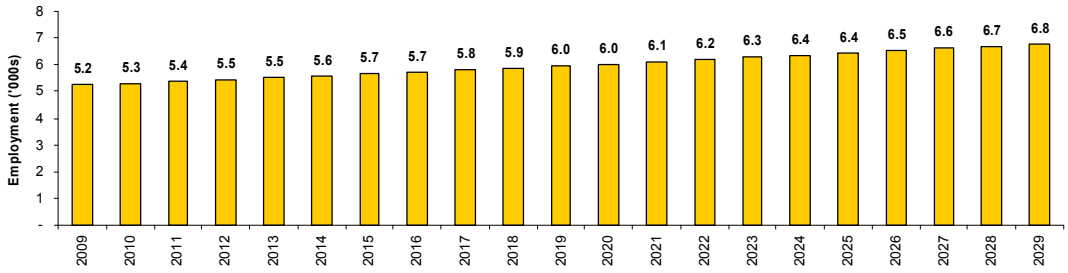
At an industry sector level, the estimated impact on value added forecasts has been calculated for the Victorian economy. The results are presented in the table below.

Table 34: Forecast Economic Contributions – Value Add (GSP $'millions) by Industry

Industry ($'millions)	2009-10	2014-15	2019-20	2024-25
Agriculture, forestry and fishing	26.7	28.5	30.3	32.3
Mining	18.8	20.0	21.3	0.1
Manufacturing	16.7	17.9	19.0	0.1
Electricity, gas and water	24.5	26.1	27.8	0.2
Construction	55.9	59.6	63.5	0.4
Wholesale trade	53.4	57.0	60.7	0.4
Retail trade	49.1	52.4	55.8	0.4
Accommodation, cafes and restaurants	14.3	15.2	16.2	0.1
Transport and storage	36.3	38.8	41.2	0.3
Communication services	24.6	26.2	27.9	0.2
Finance and insurance	79.3	84.7	90.1	0.6
Property and business services	120.5	128.6	136.9	0.9
Government administration and defence	22.9	24.4	26.0	0.2
Education	44.6	47.6	50.6	0.3
Health and community services	54.2	57.8	61.5	0.4
Cultural and recreational services	14.9	15.9	16.9	0.1
Personal and other services	16.8	18.0	19.1	0.1
Ownership of dwellings	74.0	79.0	84.1	0.6
All Industries (excluding Recreational Fishing)	747.4	797.7	848.9	904.1
Recreational fishing industry	89.7	95.7	101.8	0.7
Total GSP by Industry	837.1	893.4	950.7	904.8

The year on year direct and indirect contribution of the recreational fishing industry to Victorian employment is shown in the figure below.

Figure 33: Forecast Economic Contributions – Employment



The industry break down of forecast direct and indirect employment is shown in the table below.

Table 35: Forecast Economic Contributions – Employment by Industry

Industry (FTE's)	2009-10	2014-15	2019-20	2024-25
Agriculture, forestry and fishing	0.2	0.2	0.2	0.2
Mining	0.1	0.1	0.1	0.1
Manufacturing	0.1	0.1	0.1	0.1
Electricity, gas and water	0.2	0.2	0.2	0.2
Construction	0.4	0.4	0.4	0.4
Wholesale trade	0.3	0.4	0.4	0.4
Retail trade	0.3	0.3	0.4	0.4
Accommodation, cafes and restaurants	0.1	0.1	0.1	0.1
Transport and storage	0.2	0.2	0.3	0.3
Communication services	0.2	0.2	0.2	0.2
Finance and insurance	0.5	0.5	0.6	0.6
Property and business services	0.8	0.8	0.9	0.9
Government administration and defence	0.1	0.2	0.2	0.2
Education	0.3	0.3	0.3	0.3
Health and community services	0.3	0.4	0.4	0.4
Cultural and recreational services	0.1	0.1	0.1	0.1
Personal and other services	0.1	0.1	0.1	0.1
Ownership of dwellings	0.5	0.5	0.5	0.6
All Industries (excluding Recreational Fishing)	4.7	5.1	5.4	5.7
Recreational fishing industry	0.6	0.6	0.6	0.7
Total GSP by Industry	5.3	5.7	6.0	6.4

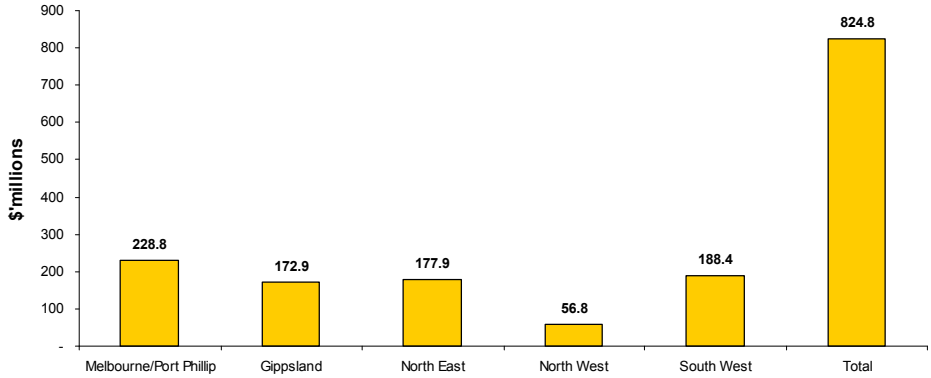
6.6.3 Regional Implications

The recreational fishing industry is an industry that has a large impact on regional Victorian communities. Much of the fishing activity that occurs within Victoria occurs outside of the metropolitan area.

Based on information on regional location of recreational fishing activity contained in the recreational fishing survey (discussed in Section 4), the economic contribution of the recreational fishing industry to regional locations is presented in the figure below. The Gross Regional Product (GRP) outcomes for 2008-09 include:

- $228.8 million (28%) in Melbourne/Port Phillip;
- $172.9 million (21%) in Gippsland;
- $177.9 million (22%) in the North East region;
- $56.8 million (7%) in the North West region; and
- $188.4 million (23%) in the South West region.

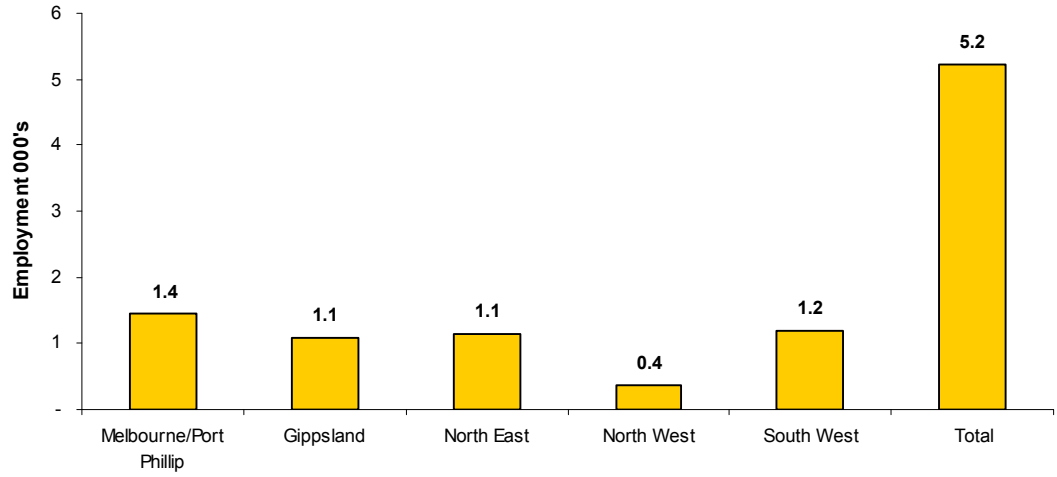
Figure 34: GSP Impacts ($'millions) by region 2008-09



The regional employment outcomes have also been produced for 2008-09. The regional employment outcomes for 2008-09, based on the direct and flow on contribution of the recreational fishing industry, include:

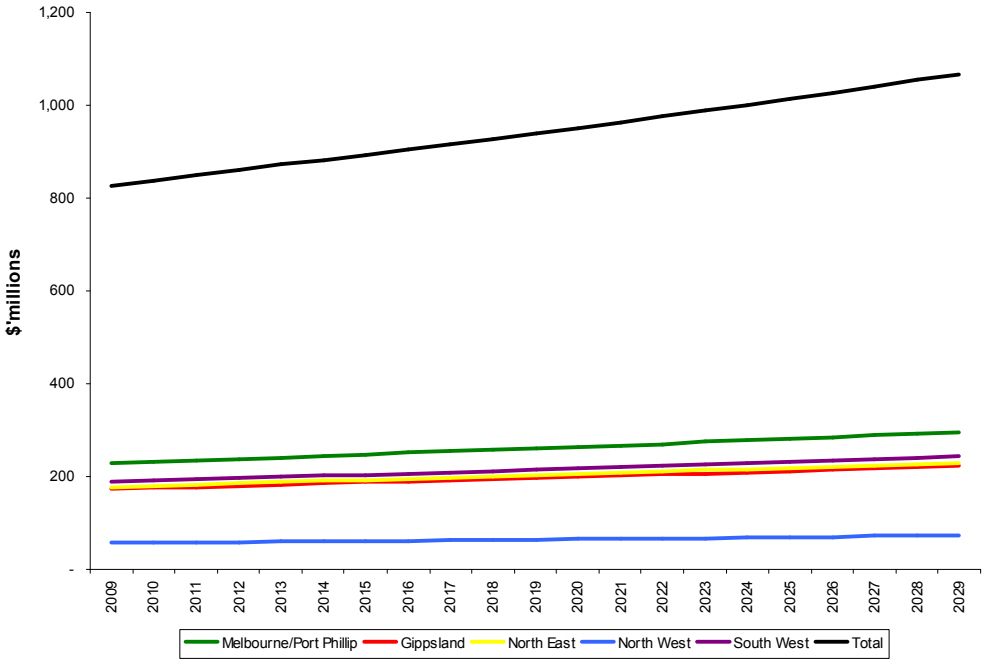
- 1,400 in Melbourne/Port Phillip;
- 1,100 in Gippsland;
- 1,100 in the North East region;
- 400 in the North West region; and
- 1,200 in the South West region.

Figure 35: Employment impacts by region 2008-09



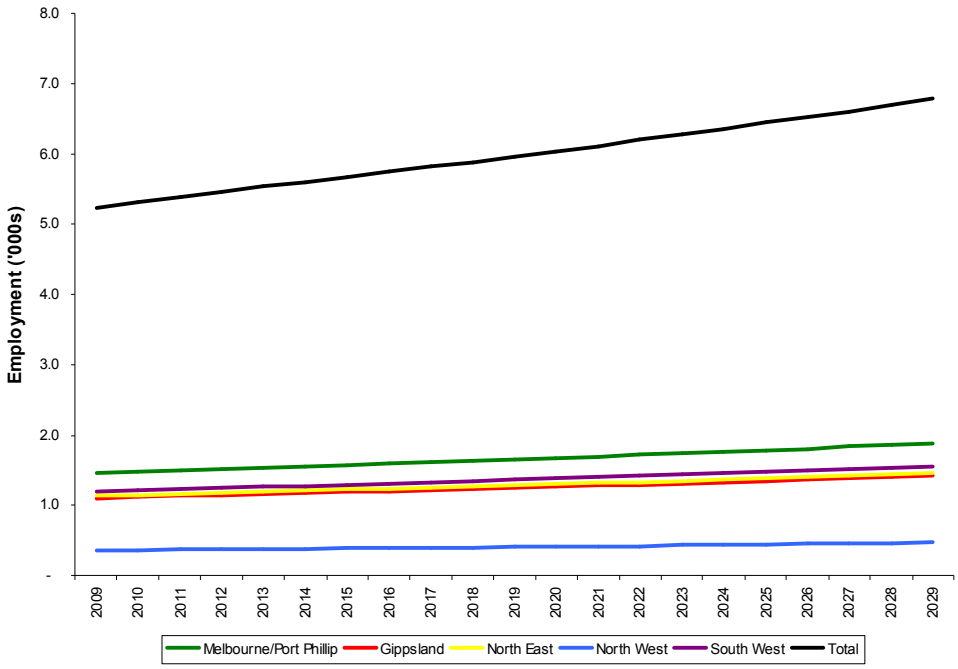
The forecast GRP for the Victorian regions are presented in the figure below. These forecasts are based on the forecast direct expenditure, which is driven by population growth.

Figure 36: Forecast GRP due to the recreational fishing industries



The forecast employment for the Victorian regions based on the direct and flow on contribution of the recreational fishing industry are presented in the figure below.

Figure 37: Forecast employment due to the recreational fishing industries



7. Conclusions

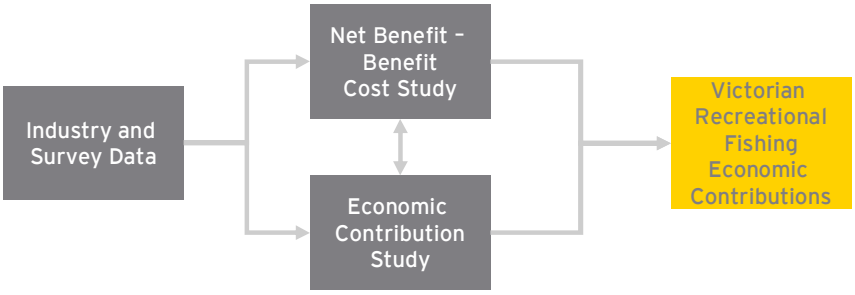
7.1 Study overview

Ernst & Young have performed this economic research in order to determine the net benefit and economic contribution of recreational fishing to Victoria. The key outcomes required of this study were qualitative and quantitative answers to the following questions:

- What are the characteristics and level of recreational fishing participants in Victoria?
- What is the net benefit of recreational fishing on the Victorian economy? and
- What is the contribution of recreational fishing and activities associated with fishing to the Victorian state economy?

The overarching methodology used to satisfy the three questions driving this study is highlighted in the figure below.

Table 36: Recreational fishing economic assessment project methodology



The different types of economic assessment use different modelling techniques and provide different information as outputs. The economic assessment techniques used in this study include:

- ***Net Benefits*** - valuations used in the net benefits assessment are generally considered the direct impacts of projects or operations and form the basis for quantifying the total economic contribution of an industry. Net benefit studies do not specifically consider flow on impacts.
- ***Economic Contribution*** - the economic contribution of a sector can be estimated by converting direct expenditures into 'value added' estimates.

7.2 Net benefits of recreational fishing

A net benefits assessment involves capturing all the direct costs and benefits associated with the operation of a project or an industry. In this study, an assessment of the net benefits of recreational fishing was undertaken. The net benefits being measured in this assessment included both the financial and economic benefits. Economic benefits can have a realisable financial element (or market element) or may be measured in terms of a utility (or non market) impacts.

The net benefits study being undertaken for this study is not a typical benefit cost study. A typical benefit cost study will assess the benefits of a development or project against the existing base case. In this study, an assessment of the net benefit of the existing participation in recreational fishing is being undertaken. This analysis acts as a precursor and input into the economic contribution study.

The analysis in this study has been undertaken over two periods. At a single point in time and over a 20 year period based on forecast participation levels. More details on the evaluation period are provided in the following sections.

The net benefits results for recreational fishing are presented for a single point in time (2008-09) and based on the forecast participation and expenditure levels over a 20 year evaluation period.

The results of the net benefits analysis in 2008/09 include:

- a present value of costs valued at $2.3 billion;
- a present value of benefits valued at $3.0 billion;
- a net benefit to recreational fishers of $623 million; and
- a benefit-cost ratio of 1.27.

The overall net benefits for recreational fishing for 2008-09 are shown in the table below.

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Net benefits outcomes	2008-09
Present value of costs	2,331
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NPV ($m, 2008 dollars) i.e. 'Net Benefit'	623
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	Discount Rate (%)		
	4%	7%	10%
Present value of costs	38,150	29,933	24,282
Present value of benefits	48,342	37,930	30,769
BCR	10,192	7,997	6,487
NPV ($m, 2008 dollars) i.e. 'Net Benefit'	1.27	1.27	1.27

The benefit-cost ratio (BCR) outcome may seem low compared to some other economic studies that have been produced, for example, the construction of a road in Victoria. The reason for the comparatively low BCR is a result of the analysis being a non traditional net benefits assessment rather than a traditional benefit-cost study. The analysis undertaken in this study is looking at the net benefits to recreational fishers. Based on this, the study shows, for every dollar that a fisher spends on recreational fishing, they receive $1.27 in benefits, or a net gain of $0.27. In this context the result is considered to be very positive.

7.3 Economic contribution of recreational fishing

The economic contribution if recreational fishing to the Victorian economy is undertaken using an input-output model and methodology. The major input into the economic contribution analysis is the direct expenditure data collated in the net benefits section of this report. However, for the economic contribution study, any direct expenditure which is undertaken on recreational fishing, but ultimately leaks out of the Victorian economy, is discounted as not having an economic contribution to Victoria.

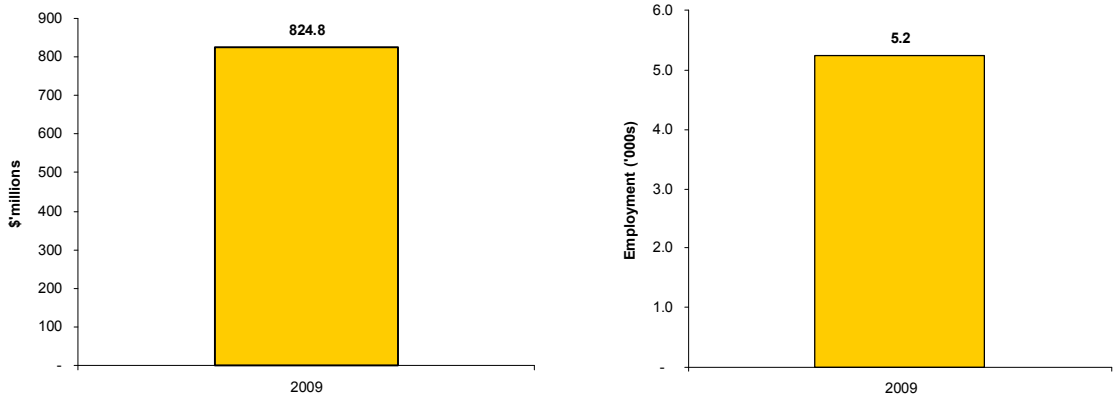
This direct expenditure is placed in an input –output model to determine the flow on impacts that the expenditure on recreational fishing activities has on the broader Victorian economy. This process then allows for the calculation of the total economic contribution of recreational fishing on the Victorian economy.

7.3.1 Recreational Fishing Economic Contributions – 2008-09

The economic contribution of the recreational fishing industry was calculating by applying input-output multipliers to the direct expenditure data. The result of this analysis is shown in the table below.

The industry produced a total GSP of $825 million in 2008-09. This value represents 0.3% of the total Victorian GSP.

Figure 38: Economic Contributions 2008-09 – Value Add (GSP $'millions) and employment



The employment impacts are shown for 2008-09 in the figure above. The recreational fishing industry contributed 5,200 jobs in Victoria when the industry and flow on jobs are considered.

Recreational Fishing Economic Contributions – Forecast

Based on the analysis undertaken in the net benefits section of this report, in particular in regards to the direct expenditure, forecast economic contribution outcomes have been produced for GSP and employment.

The forecast GSP and employment over the 20 year evaluation period is shown in the table below. Results include:

- the GSP contribution of the recreational fishing industry ranges from $837.1 million to $1,014.2 million per annum.
- the employment contribution of the recreational fishing industry ranges from 5,310 to 6,400 jobs in a particular year.

Table 39: Forecast recreational fishing economic contribution

Economic Variables	2009-10	2014-15	2019-20	2024-25	NPV/ Annual average
Value Add ($'m)	837.1	893.4	950.7	1,014.2	10,591
Employment ('000s)	5.31	5.67	6.03	6.44	5.98

The net present value of the recreational fishing industry over the 20 year evaluation period is $10.6 billion while average annual employment is 5,980.

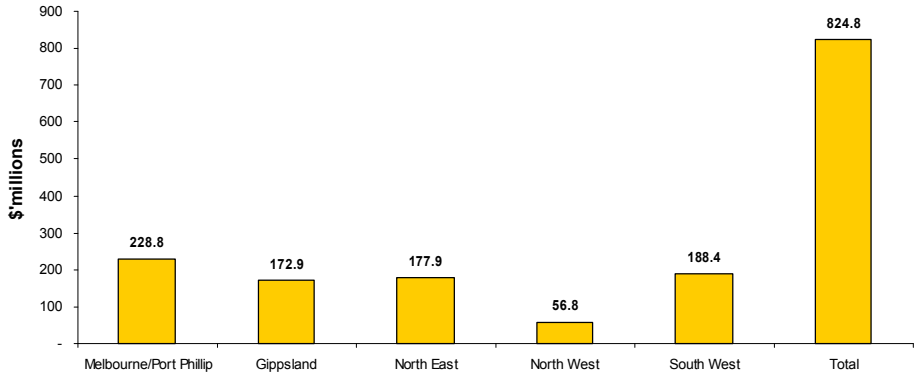
7.3.2 Regional Implications

The recreational fishing industry is an industry that has a large impact on regional Victorian communities. Much of the fishing activity that occurs within Victoria occurs outside of the metropolitan area.

Based on information on regional location of recreational fishing activity contained in the recreational fishing survey (discussed in Section 4), the economic contribution of the recreational fishing industry to regional locations is presented in the figure below. The Gross Regional Product (GRP) outcomes for 2008-09 include:

- $228.8 million (28%) in Melbourne/Port Phillip;
- $172.9 million (21%) in Gippsland;
- $177.9 million (22%) in the North East region;
- $56.8 million (7%) in the North West region; and
- $188.4 million (23%) in the South West region.

Figure 39: GSP Impacts ($'millions) by region 2008-09

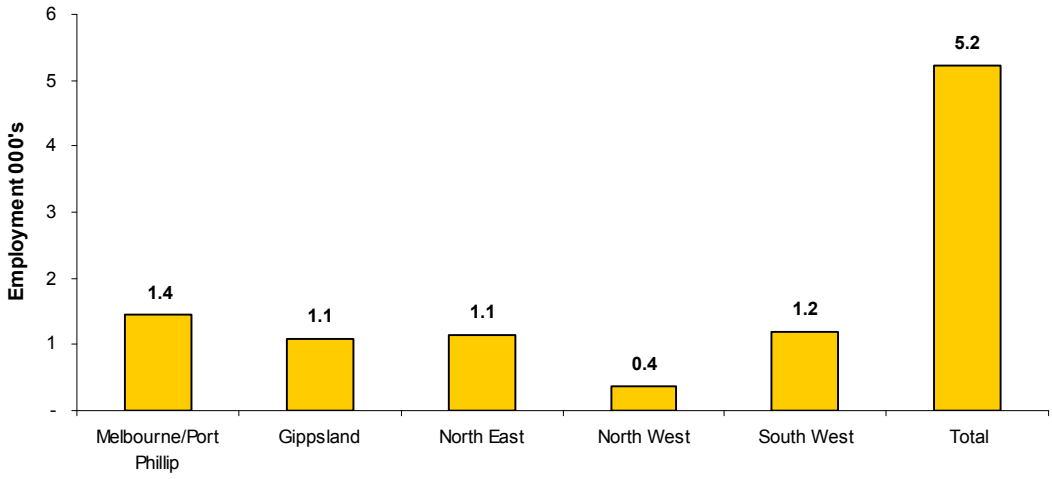


The regional employment outcomes have also been produced for 2008-09. The regional employment outcomes for 2008-09, based on the direct and flow on contribution of the recreational fishing industry, include:

- 1,400 in Melbourne/Port Phillip;
- 1,100 in Gippsland;

- 1,100 in the North East region;
- 400 in the North West region; and
- 1,200 in the South West region.

Figure 40: Employment impacts by region 2008-09



Appendix A Recreational fishing survey form

The purpose of this survey is to collect data to establish the nature and scale of recreational fishing in Victoria, and the contribution it makes to the State's economy.
Thank you for your time, this survey will take less than 10 minutes to complete.

Screener / demographics

1. What is your gender?

Male ☐
Female ☐

2. Which of the following age groups do you fit into?

18 – 24 years ☐
25 – 34 years ☐
35 – 44 years ☐
45 – 54 years ☐
55+ years ☐

3. Which of these household income groups do you fall into? Household income is the total income earned by all household occupants.

Under $20,000 ☐
$20,000 - $39,999 ☐
$40,000 - $59,999 ☐
$60,000 - $79,999 ☐
$80,000 - $99,999 ☐
$100,000 - $199,999 ☐
$200,000 + ☐
Refused ☐

4. What is your household disposable income as a percentage of your total household income? Household disposable income is what is left after all required household expenditure including food, rent/mortgage, transport costs and other necessary purchases. (Your best guess is all

we are after)

0- 10% ☐
11 – 20% ☐
21 – 30% ☐
31 – 40% ☐
41 – 50% ☐
51 – 60% ☐
61 – 70% ☐
71 – 80% ☐
81 – 90% ☐
91 – 100% ☐

5. What is your residential postcode? .....

6. Have you gone fishing for recreational purposes in the past 12 months anywhere?

Yes ☐

No ☐ *Please proceed to Question 48*

7. In which seasons have you participated in recreational fishing over the past 12 months? Please estimate, using percentages (must total 100%).

Season	%
Spring	%
Summer	%
Autumn	%
Winter	%

Based on the number of days that were spent fishing.

8. Did you go fishing for recreational purposes **outside Victoria** in the past 12 months?

*Please note that for the purpose of determining whether fishing is taking place within Victoria, your fishing location refers to where you are staying. For example, if you are fishing on the NSW side of the Murray River but are staying in Victoria this is **NOT** considered to be fishing outside Victoria.*

Yes ☐

No ☐ ***Please proceed to Question 13***

9. Where? (may tick more than one)

NSW	☐
Queensland	☐
WA	☐
SA	☐
ACT	☐
Northern Territory	☐
Tasmania	☐
New Zealand	☐
Overseas (other than New Zealand)	☐

10. How often do you participate in recreational fishing outside of Victoria?

Interstate		**Overseas**	
Weekly	☐	Weekly	☐
About every two weeks	☐	About every two weeks	☐
Monthly	☐	Monthly	☐
Every two months	☐	Every two months	☐
Every four months	☐	Every four months	☐
Every six months	☐	Every six months	☐
About once a year	☐	About once a year	☐
Once every 2 years	☐	Once every 2 years	☐
Less than once every 2 years (please specify how often) …….	☐	Less than once every 2 years (please specify how often) …….	☐

If no overseas trips indicated in question 10, skip questions 13 - 15

11. How many people, on average, accompany you on each **interstate** trip?
12. Approximately how much would your group spend on each of these **interstate** trips, including accommodation, travel etc? $.....
13. How many people, on average, accompany you on each **overseas** trip?
14. Approximately how much would your group spend on each of these **overseas** trips, including accommodation, travel etc? $.....
15. Do you book your international trips in Victoria?

Yes ☐
No ☐
N/a ☐

16. Have you gone fishing for recreational purposes **in Victoria** in the past 12 months?

Please note that for the purpose of determining whether fishing is taking place within Victoria, your fishing location refers to where you are staying. For example, if you are fishing on the NSW side of the Murray River but are staying in Victoria, this is considered to be fishing in Victoria.

Yes ☐
No ☐ *Please proceed to Question 45*

Please note that all questions following relate to fishing IN VICTORIA ONLY

17. How many days have you gone fishing in Victoria in the past 12 months?

Daily ☐
Several times a week ☐
Weekly ☐
About every two weeks ☐
Monthly ☐
Every two months ☐
Every four months ☐
Every six months ☐
About once a year ☐

18. How many people, on average, accompany you on each fishing trip in Victoria?

.....persons

19. What is the age of each accompanying person, and do they participate in recreational fishing? [survey note – please put continuing options for more than 4 accompanying persons]

Person 1

Under 18	☐	Fishing	☐
18 – 24 years	☐	Accompanying only	☐
25 – 34 years	☐		
35 – 44 years	☐		
45 – 54 years	☐		
55+ years	☐		

Person 2

Under 18	☐	Fishing	☐
18 – 24 years	☐	Accompanying only	☐
25 – 34 years	☐		
35 – 44 years	☐		
45 – 54 years	☐		
55+ years	☐		

Person 3

Under 18	☐	Fishing	☐
18 – 24 years	☐	Accompanying only	☐
25 – 34 years	☐		
35 – 44 years	☐		
45 – 54 years	☐		
55+ years	☐		

Person 4

Under 18	☐	Fishing	☐
18 – 24 years	☐	Accompanying only	☐
25 – 34 years	☐		
35 – 44 years	☐		
45 – 54 years	☐		
55+ years	☐		

20. What percentage of your time do you spend fishing in each of the following waters?

[Set the tally to check for 100% in the specs for the survey]

Inland .....% ***If zero, skip questions 20 & 21***

Estuarine .....% ***If zero, skip questions 22 & 23***

Marine .....% ***If zero, skip questions 24 & 25***

Based on the number of days spent fishing.

21. What type/s of fish does your fishing group normally target when fishing in inland waters?

Trout ☐

Redfin ☐

Murray cod ☐

Yellow belly ☐

Other (please specify) ☐

22. What type/s and quantities of fish, on average, does your fishing group actually catch, and how many of these do they release, on each inland water fishing trip?

Trout ☐ Quantity caught ..... Quantity released.....

Redfin ☐ Quantity caught .... Quantity released.....

Murray cod ☐ Quantity caught .... Quantity released.....

Yellow belly ☐ Quantity caught .... Quantity released.....

Other (please specify) ☐ Quantity caught .... Quantity released.....

23. What type/s of fish does your fishing group normally target when fishing in estuarine waters?

Bream ☐

Mullet ☐

Mulloway ☐

Estuary Perch ☐

Other (please specify) ☐

24. What type/s and quantities of fish, on average, does your fishing group actually catch, and how many of these do they release, on each estuarine water fishing

trip?

Bream	☐	Quantity caught ..... Quantity released.....
Mullet	☐	Quantity caught ..... Quantity released.....
Mulloway	☐	Quantity caught ..... Quantity released.....
Estuary Perch	☐	Quantity caught ..... Quantity released.....
Other (please specify)	☐	Quantity caught ..... Quantity released.....

25. What type/s of fish does your fishing group normally target when fishing in marine waters?

Flathead	☐
Whiting	☐
Snapper	☐
Calamari (squid)	☐
Rock lobster	☐
Abalone	☐
Gummy shark	☐
Tuna	☐
Other (please specify)	☐

26. What type/s and quantities of fish, on average, does your fishing group actually catch, and how many of these do they release, on each marine water fishing trip?

Flathead	☐	Quantity caught ..... Quantity released.....
Whiting	☐	Quantity caught ..... Quantity released.....
Snapper	☐	Quantity caught ..... Quantity released.....
Calamari (squid)	☐	Quantity caught ..... Quantity released.....
Rock lobster	☐	Quantity caught ..... Quantity released.....
Abalone	☐	Quantity caught ..... Quantity released.....
Gummy shark	☐	Quantity caught ..... Quantity released.....
Tuna	☐	Quantity caught ..... Quantity released.....
Other (please specify)	☐	Quantity caught ..... Quantity released.....

27. What is the name of the suburb/town/area where you fish?

.....

[Multifunction – primary place of fishing, secondary place of fishing, other place of fishing]

[drop-down menu of suburbs /towns/areas in Victoria]

28. Approximately how far are these locations from your home?

[Multifunction – primary place of fishing, secondary place of fishing, other place of fishing]

0 – 10km ☐
11 – 20km ☐
21 – 30km ☐
31 – 40 km ☐
41 – 50 km ☐
51 – 60 km ☐
61 – 70 km ☐
71 – 80 km ☐
81 – 90 km ☐
91 – 100 km ☐
100km + ☐

OR

0 – 10 mins ☐
21 – 20 mins ☐
31 – 40 mins ☐
41 – 50 mins ☐
51 – 60 mins ☐
Over an hour ☐

29. What percentage of your total fishing time do you spend on each of the following types of fishing?

[Set the tally to check for 100% in the specs for the survey]

Bait fishing	.....%
Soft plastics / hard bodied lures	.....%
Spear fishing	.....%
Fly fishing	.....%
Other (please specify)	.....%

30. What are the drivers for you participating in recreational fishing? (Please rank 1 – 8)

To be outdoors ☐
To participate in a sport ☐
To relax ☐
To be with friends / family ☐
For solitude ☐
For competition ☐
For food ☐
Other (please specify) ☐

31. Have you held a fishing licence in the past 12 months?

Yes ☐
No ☐
Exempt ☐

32. What sort of licence did you hold?

2 day licence ☐
28 day licence ☐
1 year licence ☐
3 year licence ☐

33. Do you belong to a fishing club / association?

Yes ☐
No ☐

34. Which fishing club / association do you belong to? ……..
Multiple entry capabilities …

35. Do you own a boat which you use for fishing purposes?

Yes ☐
No ☐ ***If no, please proceed to question 41***

36. What type of boat do you own?

Motor boat ☐

If motorboat, what size?

Less than 4m ☐
4m ☐

6m ☐

8m ☐

10m ☐

Yacht ☐

37. Did you buy your boat in Victoria?

Yes ☐

No ☐

38. How much did your boat cost? $.....

39. How often do you replace your boat? Every ..... years

40. How many times in the last 12 months have you used your boat for fishing purposes?

..... times a year

Expenditure on recreational fishing in Victoria

Please note that all questions relate to expenditure IN VICTORIA ONLY

41. Approximately how much do you spend on recreation per week? This includes all expenditure on items such as movies, theatre, restaurants, hobbies, holidays and any other expenditure that is directly related to recreation.

$..... per week

42. Approximately, what would be your **per trip** spend on the following items for recreational fishing?

Item	Per trip expenditure ($)
Tackle and equipment	
Bait	
Food and accommodation	
Fuel and transport	
Boat hire	
Fuel for boat	
Transport to and from fishing venue (either fuel costs or public transport costs)	
Other	

43. Approximately, what would be your **per year** spend on the following items for recreational fishing?

Item	Per year expenditure ($)
Clothing for fishing	
Fishing club fees	
Licensing costs	
Boating registration	
Boat maintenance	
Camping gear	
Other	

44. If you have purchased the following products in the past 12 months, please indicate which brand/s you have purchased (if known).

Item	Brand/s
Boat	
Tackle and equipment	
Bait	
Clothing for fishing	
Camping gear	
Other	

Unmet demand for fishing

45. What prevents you from going recreational fishing in Victoria more often? (may tick more than one)

Lack of time ☐

Lack of port facilities eg wharves, jetties & slipways ☐

Too expensive ☐

Too far from a suitable fishing location ☐

Nothing, I fish as much as I want to ☐

Other (please specify)..... ☐

46. What would motivate you to spend more on recreational fishing? (may tick more than one)

Enhanced stocking ☐

Improved access ☐

Improved port facilities eg wharves, jetties & slipways ☐

Improved research & development ☐

Improved habitat ☐

Other? Please specify .....

47. If there were no constraints, such as time, cost or distance from fishing spots, how often would you go fishing?

Daily ☐

several times a week ☐

Weekly ☐

About every two weeks ☐

Monthly ☐

Every two months ☐

Every four months ☐

Every six months ☐

About once a year ☐

Please proceed to Question 53

48. What prevents you from going recreational fishing? (may tick more than one)

Lack of time ☐

Lack of port facilities i.e. wharves, jetties & slipways ☐

Too expensive ☐

Too far from a suitable fishing location ☐

Don't like fishing ☐

Other? Please specify .....

49. Would any of the following factors entice you to go recreational fishing? (may tick more than one)

Enhanced stocking ☐

Improved access ☐

Improved port facilities i.e. wharves, jetties & slipways ☐

Improved research & development ☐

Improved habitat ☐

Other? Please specify .....

50. If there were no constraints, such as time, cost or distance from fishing spots, how often would you go fishing?

Never	☐
Daily	☐
several times a week	☐
Weekly	☐
About every two weeks	☐
Monthly	☐
Every two months	☐
Every four months	☐
Every six months	☐
About once a year	☐

Other

51. What issues do you see facing the recreational fishing industry?

.....
.....
.....
.....
.....
.....
.....
.....
.....

52. Any other comments

.....
.....
.....
.....
.....
.....
.....
.....
.....

53. Do you use any of the following port facilities for recreational fishing and if so. how often?

Wharves

Drop down

Port of Port Fairy

Port of Warrnambool

Port of Port Campbell

Port of Apollo Bay

Port of Lorne

Port of Barwon Heads

Port of Port Phillip Bay, including Queenscliff

Port of Western Port

Port of Anderson Inlet

Port of Corner Inlet and Port Albert

Port of Gippsland Lakes

Port of Snowy River

Port of Mallacoota

Proposed Port of Portland

Yes ☐

No ☐

If *yes*, how often?

Daily ☐

several times a week ☐

Weekly ☐

About every two weeks ☐

Monthly ☐

Every two months ☐

Every four months ☐

Every six months ☐

About once a year ☐

Jetties

Drop down

Port of Port Fairy

Port of Warrnambool

Port of Port Campbell

Port of Apollo Bay

Port of Lorne

Port of Barwon Heads

Port of Port Phillip Bay, including Queenscliff

Port of Western Port

Port of Anderson Inlet

Port of Corner Inlet and Port Albert

Port of Gippsland Lakes

Port of Snowy River

Port of Mallacoota

Proposed Port of Portland

Yes ☐

No ☐

If *yes*, how often?

Daily ☐

several times a week ☐

Weekly ☐

About every two weeks ☐

Monthly ☐

Every two months ☐

Every four months ☐

Every six months ☐

About once a year ☐

Slipways

Drop down

Port of Port Fairy

Port of Warrnambool

Port of Port Campbell

Port of Apollo Bay

Port of Lorne

Port of Barwon Heads

Port of Port Phillip Bay, including Queenscliff

Port of Western Port

Port of Anderson Inlet

Port of Corner Inlet and Port Albert

Port of Gippsland Lakes

Port of Snowy River

Port of Mallacoota

Proposed Port of Portland

Yes ☐

No ☐

If *yes*, how often?

Daily ☐

several times a week ☐

Weekly ☐

About every two weeks ☐

Monthly ☐

Every two months ☐

Every four months ☐

Every six months ☐

About once a year ☐

54. What percentage of your total recreational fishing expenditure would you spend on fishing which utilises port facilities? Port facilities include wharves, jetties and slipways

I don't use port facilities for fishing ☐

1 – 10% ☐

11 – 20% ☐

21 – 30% ☐

31 – 40% ☐

41 – 50% ☐

51 – 60% ☐

61 – 70% ☐

71 – 80% ☐

81 – 90% ☐

91 – 100% ☐

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Adelaide
Ernst & Young Building
121 King William Street
Adelaide SA 5000
Tel: +61 8 8417 1600
Fax: +61 8 8417 1775

Brisbane
1 Eagle Street
Brisbane QLD 4000
Tel: +61 7 3011 3333
Fax: +61 7 3011 3100

Canberra
Ernst & Young House
51 Allara Street
Canberra ACT 2600
Tel: +61 2 6267 3888
Fax: +61 2 6246 1500

Gold Coast
12-14 Marine Parade
Southport QLD 4215
Tel: +61 7 5571 3000
Fax: +61 7 5571 3033

Melbourne
Ernst & Young Building
8 Exhibition Street
Melbourne VIC 3000
Tel: +61 3 9288 8000
Fax: +61 3 8650 7777

Perth
Ernst & Young Building
11 Mounts Bay Road
Perth WA 6000
Tel: +61 8 9429 2222
Fax: +61 8 9429 2436

Sydney
Ernst & Young Centre
680 George Street
Sydney NSW 2000
Tel: +61 2 9248 5555
Fax: +61 2 9248 5959