

# A Marsden Jacob Report

## Victoria's nature-based outdoor economy

### Key estimates and recommendations

Prepared for

**Outdoors Victoria & Sport and Recreation Victoria**

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46 million

Number of times Victorians did nature-based outdoor activities in Victoria  
last year

\$7.4 billion

Total spending on nature-based outdoor activities in Victoria last year

71,000

Full-time equivalent jobs supported by nature-based outdoor activity in  
Victoria

\$265 million

Avoided costs to the Victorian healthcare system attributable to nature-based outdoor activities

2.5 million

Public, catholic and private school nature-based outdoor activity days last  
year

# Summary

Many Victorians say our nature-based outdoor-oriented lifestyle is a key part of Victoria's quality of life and social character. However, viewing nature-based outdoor activity merely as a leisure or lifestyle issue can obscure its economic importance.

This report shows that Victoria's nature-based outdoor activity sector is a larger part of the Victorian economy than most of us realise. Around \$7.4 billion is spent each year on nature-based outdoor activities in Victoria. This expenditure makes a \$6.2 billion contribution to Victoria's economy, and supports around 71,000 direct and indirect full-time equivalent jobs. Many nature-based outdoor activities support regional economies by shifting expenditure from urban to regional towns and cities and rural areas.

Nature-based outdoor activities provide avoided healthcare system cost benefits to the Victorian economy worth at least \$265 million a year, and \$455 million in other recreation benefits for Victorians. For reasons we discuss in this report, these estimates more likely underestimate than overestimate the benefits of nature-based outdoor activity in Victoria.

Supporting Victoria's nature-based outdoor activity economy are recreation lands, waters and supporting infrastructure. Access to, and the condition of, these outdoor places and infrastructure are key drivers of Victorian nature-based outdoor activity participation rates and the economic activity and wellbeing outcomes this participation generates.

Victoria's nature-based outdoor activities community covers a diverse range of participants and organisations – young and old, public and

private, for-profit and non-profit, community and business, voluntary and professional. All of these participants and organisations share a common interest in experiencing Victoria's natural environments.

Until now an overarching and consistent picture of Victoria's nature-based outdoor activity sector – covering participation by activity and contribution of Victoria's outdoors industries to our economy and communities – has been missing.

This report begins to develop this overarching and consistent picture of Victoria's outdoor sector. In doing so the report establishes an important evidence base to underpin Outdoors Victoria's core advocacy, leadership, coordination, communication and research work.

## Headline estimates of the economic value of Victorian nature-based outdoor activity

Participation (incidences of active and passive nature-based outdoor activity)	46 million
- By Victorians over 15	43.5 million
- By Victorian school children	2.5 million
Hours of physical activity	36 million
- By Victorians over 15	31 million
- By Victorian school children	5 million
Nature-based outdoor activity expenditures – all sources (\$ 2014)	\$7.4 billion
Gross value-added (2014)	\$6.2 billion
- Direct	\$4.1 billion
- Indirect	\$2.1 billion
FTEs (2014)	71,000
- Direct	56,000
- Indirect	15,000
Recreation value (consumer surplus \$ 2014)	\$455 million
Avoided costs to the Victorian healthcare system (\$ 2014)	\$265 million



## Next steps

This report shows that while Victoria's nature-based outdoor activity sector is an important part of the Victorian economy, more work is needed to better understand the sector and realise its growth potential.

Further work is needed to narrow and strengthen the estimates in this report, and to develop a consensus approach for evaluating the contribution of Victoria's nature-based outdoor activity sector going forward. In particular future work needs to:

- **Close data and knowledge gaps:** several key knowledge gaps have been identified in this work. The largest knowledge gap is around participation and the economic contribution of walking, running, cycling and swimming nature-based outdoor activities in Victoria. These activities account for the bulk of nature-based outdoor activity in Victoria, but their informal nature means that participation numbers are hard to track, other than in Victorian parks from user surveys. A dedicated survey looking at nature-based outdoor cycling, walking, running and swimming activities in Victoria would increase confidence in the estimates in this report. This survey could build on the existing Parks Victoria user survey approach.
- **Develop a standard approach for estimating the economic and welfare contribution of Victoria's nature-based outdoor activity sub-sectors:** our work highlighted that nature-based outdoor activity sub-sectors who are evaluating their economic contribution in Victoria are often using different approaches. These approaches are not always consistent and / or transparent. We think the Victorian nature-based outdoor activity sector would benefit from

having a uniform approach to estimating the economic and welfare contributions of nature-based outdoor activity sub-sectors. This approach should preferably be developed using Victorian Department of Treasury and Finance guidelines and support, which would ensure the approach is 'gold standard'.

- **Develop industry-standard economic and welfare performance measures:** similar to the point above, the Victorian nature-based outdoor activity sector would benefit from having a uniform set of economic and welfare contribution measures that industry performance is evaluated on over time. Again, these measures could be developed using Victorian Department of Treasury and Finance guidelines and support, plus consultation and buy-in from Regional Development Victoria and the Victorian Department of Economic Development, Jobs, Transport and Resources.
- **Secure funding for further research and sector development:** measured in terms of economic and welfare contribution, the potentially significant size of the nature-based outdoor activity sector in Victoria means it warrants further attention. This report starts to build an evidence based case for additional funding for research into how the Victorian nature-based outdoor activity sector can be developed to make an even greater contribution to Victoria's economy and its communities in the future.

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# Introduction

Until now, the economic contribution of nature-based outdoor activities to the Victorian economy hasn't been well understood.

This report shows that Victoria's nature based outdoors sector makes a significant contribution to our economy and to individual wellbeing in Victoria. It can be seen, with a bit of imagination, as the 300-pound wombat in the room: a sector that makes a significant economic impact in Victoria that until now has largely been out of the public policy discourse.

Nature-based outdoor activities are good for our health and wellbeing, our sense of community and as a driver of economic activity and employment.

Victoria's nature-based outdoor activities community covers a diverse range of participants and organisations – young and old, public and private, for-profit and non-profit, community and business, voluntary and

professional. All of these participants and organisations share a common interest in experiencing Victoria's natural environments.

Until now an overarching and consistent picture of Victoria's nature-based outdoor activity sector – covering participation by activity and the economics of outdoors industries – has been missing.

This report begins to develop this overarching and consistent picture of Victoria's nature-based outdoor sector. In doing so the report establishes an important evidence base to underpin Outdoors Victoria's core advocacy, leadership, coordination, communication and research work, including business case development for outdoor programs and investments. The report provides:

- a coherent overarching evaluation framework and evidence base of relevant existing data that demonstrate the economic impacts and value of Victoria's nature-based outdoor activity sector.
- useable and credible economic estimates for nature-based outdoor activity in Victoria. These estimates are based on sound economic principles and have been built up using best available data. The estimates in this report have been tested and refined with key stakeholders listed in the acknowledgment section at the start of this report.
- discussion of other benefits and impacts of nature-based outdoor activity in Victoria, where credible quantification of economic values is not possible for some reason.
- clear identification of possible next steps to improve our understanding of the economic value of nature-based outdoor activity in Victoria.

The Annexes to this report outline how the estimates in this report have been derived. Our approach uses best-estimates from available data and focuses on ensuring that there is no double counting of benefits and impacts. Estimates in this report have been developed using accepted approaches for estimating economic and welfare impacts of industry activity, including approaches supported by the Victorian Department of Treasury and Finance's *Economic Evaluation for Business Cases Technical Guidelines* (2013).

# Our framework

## Nature-based outdoor activity

Nature-based outdoor activity is defined broadly in this report. It includes peoples' activities and experiences in natural or semi-natural environments, whatever the motivation. A key criteria is that the natural environment is central to the nature-based outdoor activity, not just incidental to it.

To operationalise this definition we used the ABS micro-Participation in Sport and Physical Recreation 2009–14 micro-data series classification, and added several logical categories that were not included in this dataset. Table 1 shows the activity categories that we have included in our Victorian evaluation.

Many of the activities in Table 1 straddle a line of being an nature-based outdoor activity – for example activities such as walking and cycling can involve significant contact with the natural environment and engagement with the natural environment can be a central motivation for the activity (for example trail running). On the other hand, active commuting in urban areas by walking or cycling, walking to school, and fitness-oriented

walking and jogging are not nature-based outdoor activities, and are not included in this evaluation.

Where activities straddle the line we have apportioned participation for these activities between nature-based outdoor activities and non-nature-based outdoor activities. The apportionment is shown in Table 1. The Annexes to this report outline how we have developed the apportionments shown in Table 1.

A key point to note in our approach is how we have treated walking, running, cycling and swimming activities in Victoria. For this evaluation we have only included walking, cycling, running and swimming activities that occur in Victorian metropolitan and non-metropolitan parks managed by Parks Victoria.

As we show later in this report, walking, running, cycling and swimming account for the bulk of recreation activities in Victoria. However, because of the way this data is recorded, there isn't an easy way to distinguish between these as nature-based outdoor and non-nature-based outdoor activities – except when these activities are recorded as having taken place in one of Victoria's many metropolitan and non-metropolitan parks.

Because our evaluation only includes walking, running, cycling and swimming activities when they've occurred in Victorian parks, the nature-based outdoor activity estimates in this initial scoping report of the economic contribution of nature-based outdoor activity in Victoria are likely a lower end estimate of nature-based outdoor activity and their

economic impacts and contribution. This should be kept in mind when reading the report.

Table 1: Nature-based outdoor activities<sup>1</sup>

Nature-based outdoor activity	Apportionment
Airsports	100%
Beach activities	100%
Boating (incl. sailing, power boating)	100%
Camping <sup>2</sup>	100%
Canoeing / Kayaking / Dragon boat racing / Rowing / other	100%
Conservation Volunteering	100%
Cycling <sup>3</sup>	100%
Fishing	100%
Fossicking / Collecting <sup>2</sup>	100%
Four wheel driving <sup>1</sup>	NA
Geocaching / Treasure Hunts <sup>2</sup>	NA
Horse riding / Equestrian activities / Polo	100%
Hunting	100%
Ice/snow sports	100%
Lifesaving	100%
Rock climbing / Abseiling / Caving	100%
Running	100%
Scuba diving / Snorkelling	100%
Surf sports <sup>4</sup>	100%
Swimming / Diving	100%
Walking	100%
Wildlife Watching <sup>2</sup>	100%

<sup>1</sup> Based on ABS micro-data series unless otherwise indicated

<sup>2</sup> Not in ABS micro-data, other sources used

<sup>3</sup> Within Victorian parks only

<sup>4</sup> Including surf sports and wind surfing / sailboarding

## Nature-based outdoor sector

We use Outdoor Victoria's definition of the nature-based outdoor sector for this evaluation – this includes nature-based outdoor education, outdoor recreation, outdoor therapy and tourism.

The nature-based outdoor sector classifications included in this report are shown in Table 2.

Table 2: Outdoor Victoria nature-based outdoor sector classifications

Nature-based outdoor sector	Definition
Nature-based outdoor recreation and activity	Leisure pursuits engaged in the outdoors, in natural or semi-natural settings.
Nature-based outdoor education	Experiential learning in, for, or about the outdoors. Refers to a range of organised activities that take place in a variety of ways in predominantly outdoor environments.
Nature-based outdoor therapy	A subset of adventure-based therapy. It is the use of outdoor settings for the purpose of therapeutic intervention.
Nature-based tourism	Tourism based on the natural attractions of an area. Examples include birdwatching, photography, stargazing, camping, hiking, hunting, fishing, and visiting parks.

<sup>5</sup> <http://www.tourism.vic.gov.au/research/domestic-and-regional-research/regional-map.html>

## Outdoor regions

We use Victoria's tourism campaign regions as the basis for our evaluation.

Table 3 lists Victoria's campaign regions, based on Australian Bureau of Statistics classification<sup>5</sup>. These classifications form the basis of data reported in the *National Visitor Survey*, and the *International Visitor Survey* and the *Survey of Tourist Accommodation*.

We have used Victorian campaign regions because they provide a reasonable level of geographic coverage that matches data availability. Data availability and quality deteriorates with datasets that aggregates tourism activity at smaller geographic scales.

Table 3: Tourism Victoria Campaign Regions

Campaign Region	Population	Area sqkm
Victoria total	5,534,526	227,495
Daylesford and Macedon Ranges	57,286	5,623
Gippsland	229,224	40,558
Goldfields	263,343	13,090
Grampians	105,965	56,546
Great Ocean Road	353,132	25,073
High Country	144,841	23,541
Melbourne	3,542,407	3,802
Murray	228,996	49,322
Mornington Peninsula	279,211	854
Phillip Island	30,024	999
Yarra Valley and Dandenong Ranges	300,097	8,086

## Economic framework

Victorian nature-based outdoor activities contribute to our economy directly and indirectly. Nature-based outdoor activities also impact on our wellbeing, health and happiness, which has implications for all of us and our economy.

We have designed our framework to estimate the economic contribution of nature-based outdoor activities to Victoria, and their welfare contribution. Figure 1 summarises the approach followed to map out these contribution pathways.

### Economic contribution

The economic contribution pathway estimates how Victoria's nature-based outdoor activity sector contributes to the Victorian economy through market transactions and output. The significance of a sector is usually defined by its relative share of market transactions and output compared to other industries.

The economic contribution part of the analysis presented in this report uses a bottoms-up approach to estimate the economic contribution of nature-based outdoor activity. We do this by identifying the types of expenditures associated with nature-based outdoor activities from available surveys and industry data. Figure 1 and

Table 4 show the economic contribution categories that we estimate in this report – these categories include nature-based outdoor activity product sales, trips and travel related spending, and expenditure on infrastructure that supports nature-based outdoor activities.

Annex B discusses how we have come up with estimates for these Victorian expenditures in more detail, and the data sources used. The data we have used in coming up with these estimates includes expenditure and participation data. We have organised this data into general expenditure categories to calculate economic contribution.

Our economic contribution calculations are done using Regional Development Victoria's Input-Output model for recreation activities. This purpose built model uses Local Government Area (LGA) level data on economic and industry relationships to simulate revenue flows to existing businesses (direct contributions), flow-on effects to related industries from which purchases are made (indirect contributions), and effects from expenditures made through household income and salaries (induced contributions).

We report three key gross measures of economic contribution in this report. Each of the measures provides a different measure of gross economic contribution. Importantly, they cannot be added together. Also, because they are gross measures they do not account for the fact that if expenditure did not occur on nature-based outdoor activity in Victoria,

the expenditure would likely occur somewhere else in the Victorian economy on other goods and services.

The measures are standalone measures of economic contribution:

- **Expenditure** this is the value of the initial (direct) stimulus that is relevant to each industry – it is expenditure by Governments, businesses and individuals involved in nature-based outdoor activity.
- **Gross value-added (GVA)** is a subset of Gross economic output. Gross value-added includes local business profits and wages paid, and therefore represents economic returns on local capital and labour resources. Gross value-added measures true contribution of nature-based outdoor activity to the Victorian economy, because it backs out leakage out of the economy. In this report we report total GVA (direct plus indirect GVA) impacts.
- **Employment** is the number of full time equivalent (FTE) jobs generated and / or supported in the creation of local Gross economic output and Gross value-added. In this report we report total FTE (direct plus indirect FTE) impacts.

## Welfare contribution

The economic benefits of nature-based outdoor activities to Victoria extend well beyond gross and net economic contributions that are measured through transactions in markets.

Nature-based outdoor activity generates wellbeing benefits for individuals and communities. We call these benefits welfare benefits. These benefits can include better physical and mental health from nature-based activity, and the value of environmental services provided by outdoor recreation areas to non-recreators. It can also include individual and community benefits of volunteerism.

These welfare benefit contributions are significant in their own right but often go unmeasured or, where they are measured, are sometimes viewed with scepticism because the benefit values are not measured by market transactions.

Annex B in this report outlines the approaches we have used to estimate the welfare benefit values included in this study. Our welfare benefit estimates have been sourced from contemporary Australian and international literature on the benefits of outdoor recreation and education.

We report three key measures of welfare benefit contribution in this report. Each of the three benefit estimates provides a different measure of economic welfare contribution. Importantly, for reasons we discuss later, the welfare contribution values cannot be added together. The welfare contribution measures are:

- **Avoided healthcare benefits** measured as the net (adjusted for injury) avoided costs to the Victorian healthcare system attributable to nature-based outdoor activity.
- **Recreation benefits** in addition to what people pay for nature-based outdoor activities, they also obtain benefits above those payments.



The difference between what consumers are willing to pay for outdoor recreation and what they actually pay is a welfare benefit.

- **Production and productivity impacts** looks at how (outdoor) physical (in)activity changes labour productivity – positive changes in labour productivity contribute to economic output. We include the productivity benefits in the welfare contribution section of this report rather than the economic contribution section mainly because these contributions stem from labour downtime avoided (absenteeism and presenteeism) because of nature-based outdoor activity, as compared to direct expenditure.

There are other potential benefits of outdoor activities, not encompassed in the above framework and not quantified in this report. These may include, for example:

- **Education and developmental benefits.** Outdoor education can deliver direct knowledge and skills to students, and can help foster positive character traits such as resilience, confidence, and leadership skills. These benefits may translate into both personal wellbeing, and broader economic, benefits over time.
- **Social cohesion.** Nature-based outdoor activities often involve a social component, and particularly in smaller regional communities, can be a critical part of a community's social landscape. The benefits of such social connectivity are probably substantial, but again very difficult to quantify.

Figure 1: Economic and welfare contribution of nature-based outdoor activities to Victoria

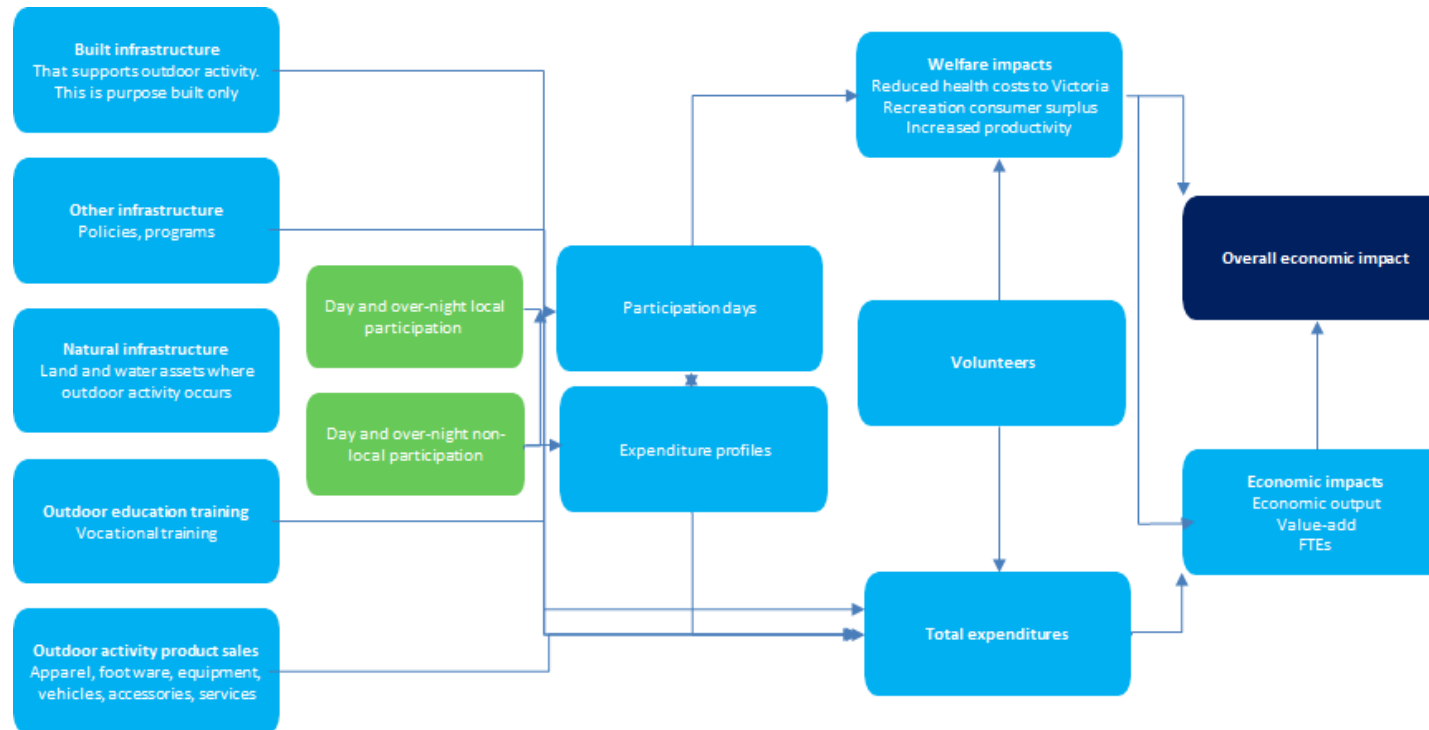


Table 4: Economic benefit values in scope

Economic benefit value	Scope	Relevant measures
Economic contribution	<p><b>Services and goods, non-tourism.</b> Nature-based outdoor recreation expenditure by Victorians (i.e. money spent during outdoor recreation by Victorians, plus money spent by Victorians on retail, wholesale, education and manufacturing goods supporting the activities).</p> <p><b>Services and goods, tourism.</b> Nature-based outdoor recreation expenditure by non-Victorians (i.e. money spent during outdoor recreation by non-locals, plus money spent on retail, wholesale, education and manufacturing goods supporting the activities in Victoria by non-locals).</p> <p>Economic impact of nature-based <b>outdoor recreation infrastructure</b> (capital and maintenance).</p>	Expenditure, direct and indirect Gross value-add and FTEs
Welfare contribution	<p>Individual welfare (aggregates as community welfare):</p> <ul style="list-style-type: none"> <li>Avoided health costs</li> <li>Production and productivity from lower absenteeism and presenteesim</li> <li>Recreation value (consumer surplus)</li> <li>Community and social cohesion and education impacts</li> </ul>	<p>Avoided cost</p> <p>Consumer surplus</p> <p>Not valued</p>

## Information sources

Annex B identifies all of the information sources that we have used for our evaluation. Key sources are summarised below.

Table 5: Key data sources

Key Sources	Comment
4177.0 – Participation in Sport and Physical Recreation, Australia, 2009-14	Data provides total effort (duration, frequency) in outdoor recreation. Note not all Outdoor Victoria categories apply. Data limited to persons 15 and over.
Parks Victoria Tourist Survey, 2014-15	Provides first and all mention physical activities by metropolitan and non-metropolitan parks operated by Parks Victoria, based on in-park surveys.
Tourism Research Australia National Visitor Survey, 2009-14	Provides activities by stopover for domestic trips, day and overnight. International activities at the Australia/total trip level only. Includes visitors aged over 15 years only.
4156.0.55.002 - Value of Sport, Australia, 2013	Includes expenditure per household per week (2009-10) on selected sport and physical recreation products: bicycles, boating and accessories (\$2.30 per week), camping equipment (\$0.70), fishing equipment (\$0.55), golf equipment (\$0.45).
IBISWorld Australian Market industry reports, Nature-based outdoor sector specific studies	Industry sector data for Bicycle Retailing and Repair, Sports and Recreation Facilities, Marine Equipment Retailing, Hiking and Outdoor Equipment Stores We have identified and drawn on data and findings from studies for specific Victorian nature-based outdoor activities. These studies use a range of approaches to measure economic impacts and welfare values.

# Headline estimates

We estimate that residents and visitors to Victoria spend at least \$7.4 billion each year on nature-based outdoor activities and equipment.

Nature-based outdoor activity contributes to avoided healthcare system costs in Victoria worth at least \$265 million a year, and recreation benefits worth \$455 million a year.

Our headline estimates underscore the significance of the nature-based outdoor activity sector to Victoria's economy, and the wellbeing of Victorians. We unpack these headline estimates in more detail in the following sections.

As we've stated earlier in this report, because some of these estimates overlap the values are not additive. Also, because the headline estimates are based on constructed data for nature-based outdoor activities where actual data is not available, the values in Table 6 are order of magnitude estimates, based on best available data.

Moreover, because our estimates only include walking, running, cycling and swimming activities when they've occurred in Victorian parks, the headline estimates of economic contribution of nature-based outdoor

activity in Victoria are likely a lower end estimate of nature-based outdoor activity and their economic impacts and contribution.

According to our estimates using the available data, last year around 46 million nature-based outdoor activities occurred in Victoria, including around 36 million nature-based walking, running, cycling and swimming activities in Victorian Parks. We estimate the 46 million instances of nature-based outdoor activity include around 36 million hours of physical activity, including around 18 million hours of walking activity.

Total nature-based outdoor activity related expenditure currently generates in the order of \$7.4 billion of sales within Victoria a year. These sales generate substantial wages, profits and rents for Victoria of around \$4.1 billion (i.e. gross value-add direct contribution), and another \$2.1 billion in supply chain activity to generate nature-based outdoor activity goods and services (indirect gross value-add contribution).

Approximately 71,000 full-time equivalent positions are supported in Victoria as a result of nature-based outdoor activity expenditure. This estimate includes full-time and part-time positions and does not distinguish between them or identify the number of hours worked within each position.

In addition to the direct and indirect economic contribution, nature-based outdoor activities in Victoria are estimated to generate significant health and wellbeing values for Victorians. We estimate that the avoided costs to the Victorian healthcare system attributable to nature-based outdoor activity alone are worth at least \$265 million a year.

Table 6: Headline estimates of the economic value of Victorian nature-based outdoor activity

Participation (incidences of active and passive nature-based outdoor activity)	46 million
- By Victorians over 15	43.5 million
- By Victorian school children	2.5 million
Hours of physical activity	36 million
- By Victorians over 15	31 million
- By Victorian school children	5 million
Nature-based outdoor activity expenditures – all sources (\$ 2014)	\$7.4 billion
Gross value-added (2014)	\$6.2 billion
- Direct	\$4.1 billion
- Indirect	\$2.1 billion
FTEs (2014)	71,000
- Direct	56,000
- Indirect	15,000
Recreation value (consumer surplus \$ 2014)	\$455 million
Avoided costs to the Victorian healthcare system (\$ 2014)	\$265 million

# Economic contribution

We estimate that residents and visitors to Victoria spend around \$7.4 billion each year on nature-based outdoor activities and equipment

## Equipment and recreation

Victoria's nature-based outdoor activity sector is driven by Victorians and non-Victorians spending. This spending takes two main forms: the purchase of gear and equipment (including apparel, footwear, equipment, vehicles, and services), and dollars spent in Victoria on trips, travel and activities (including food and drink, transportation, fees, activities, accommodation and other).

Our evaluation estimates that equipment and trip and travel related expenditure readily identifiable by Victorians and non-Victorians total some \$7.4 billion each year, based on available data.

Total equipment purchases make up around 10 percent of total nature-based outdoor activity expenditures. These include purchases of nature-based outdoor activity equipment (4 percent) and aircraft, bicycles and

boats for recreation (4 percent). Participant day trip expenditures largely comprise shopping (28 percent) petrol (25 percent), food and beverages (12 percent) and takeaway or restaurant meals (20 percent). For overnight visits, accommodation is the major expenditure item (25 percent) and domestic airfares (15 percent) are added to day trip mix with takeaway / restaurant meals (15 percent) petrol (10 percent) and food and beverages (12 percent) and shopping (8 percent) also significant.

Table 7: Equipment and recreation expenditure (direct and indirect, \$ billion, except FTEs)

	Expenditure	GVA	FTEs
Total	\$7.4	\$6.2	71,000
Trips, travel and activities	\$6.3	\$5.1	57,700
Equipment and vehicles	\$1.1	\$1.1	13,000

## Activity-based contribution analysis

The headline economic contribution estimates in this report are based on a bottom-up accounting of participation and equipment and trip expenditures attributable to the nature-based outdoor activities in Victoria shown in Table 1, where this data is available.

Overall, based on the available data our evaluation shows that walking, running and cycling within Victorian parks, as well as beach activities, fishing and snow sports (in and outside parks) are Victoria's most popular measured in terms of the number of participant hours each year. These activities contribute around \$5.2 billion in combined expenditure every year in Victoria's economy.

Table 8: Top four equipment and recreation expenditure (direct and indirect, \$ billion)

	Participant hours (million)	Expenditure	GVA	Gross FTEs
Walking, running, cycling (Victorian Parks)	17.4	\$1.2	\$0.9	11,600
Fishing	1.5	\$2.4	\$2.0	24,500
Beach activities	1.7	\$1.3	\$1.1	13,000
Ice/snow sports	0.7	\$0.3	\$0.3	3,000

## Economic contribution by region

Our economic contribution analysis of the 11 Tourism Victoria campaign regions highlights that nature-based outdoor activities make significant contributions to many of Victoria's regional economies. Tables 10-13 show participation hours, GVA and FTE contribution by tourism campaign region.

These estimates have been developed using regional primary data where available (for example surveys of participation and expenditure completed by an industry group, and Parks Victoria visitor survey data). Where primary data is not available for regions we have used ABS and TRA nature-based outdoor activity data and distributed these activities by region largely based on within-region population. Annex B discusses this disaggregation approach in more detail.

Parks Victoria survey data is aggregated at the level of metropolitan and national park visits for walking, cycling, running and swimming. This data has not been regionalised in this report.

Table 9: Regional nature-based outdoor activity participation hours

Campaign region	Activity hours (million)
Victoria total	36.0
Parks Victoria metropolitan parks	5.5
Parks Victoria National Park	11.8
Daylesford and Macedon Ranges	0.9
Gippsland	1.3
Goldfields	0.9
Grampians	0.3
Great Ocean Road	2.0
High Country	0.9
Melbourne	9.7
Murray	0.6
Mornington Peninsula	0.8
Phillip Island	0.7
Yarra Valley and Dandenong Ranges	0.9

Table 10: Regional nature-based outdoor activity Gross value-added (direct and indirect, \$ billion)

Campaign region	GVA
Victoria total	\$6.2
Parks Victoria metropolitan parks	\$0.1
Parks Victoria National Park	\$0.0
Daylesford and Macedon Ranges	\$0.1
Gippsland	\$0.9
Goldfields	\$0.2
Grampians	\$0.2
Great Ocean Road	\$1.1
High Country	\$1.1
Melbourne	\$1.0
Murray	\$0.7
Mornington Peninsula	\$0.4
Phillip Island	\$0.4
Yarra Valley and Dandenong Ranges	\$0.1

Table 11: Regional nature-based outdoor activity FTE contribution (direct and indirect)

Campaign region	FTE
Victoria total	71,000
Parks Victoria metropolitan parks	800
Parks Victoria National Park	700
Daylesford and Macedon Ranges	1,000
Gippsland	11,200
Goldfields	1,200
Grampians	2,000
Great Ocean Road	12,600
High Country	13,200
Melbourne	10,000
Murray	8,500
Mornington Peninsula	4,000
Phillip Island	4,800
Yarra Valley and Dandenong Ranges	1,100

Our evaluation shows participant hours by tourism region are driven largely by specific activities and population distribution (Table 12).

Based on discussions with Parks Victoria we know swimming, running, walking and cycling participation hours in Victorian urban and peri-urban parks are strongly related to population size, as most visitors to these parks are locals. This means participation ratios across all regions will be higher than those shown in Table 12 if the Parks Victoria tourism survey data was able to be disaggregated by region. It also means the figures shown in Table 12 largely reflect the distribution of activities shown in Table 1, excluding those activities listed as Parks Victoria data.

Snow activities (skiing and snow-sports) dominate the High Country, and seaboard activities (going to the beach etcetera) dominate coastal areas.

Consistent with the results of the activity-based evaluation, regions with larger economic contributions from nature-based outdoor activity generally have larger populations and / or higher economic value nature-based outdoor activities (snow and water sports) in their region.

Our evaluation highlights that nature-based outdoor activity is a means of moving income from urban to regional areas in Victoria. Regional expenditure creates a redistribution of wealth between the place of origin and the recreation destination.

Although out-of-region visitors were not accounted for directly in this study, an inference can be made by comparing total participant days in each region to the population (Table 12). This evaluation again excludes the Parks Victoria survey data which is not disaggregated, but which is also mainly local activity. This evaluation highlights several regions where participant days are greater than what would be expected for the region based on the population – it is reasonable to assume some of this participation comes from out-of-region.



Table 12: Participant days and ratio per resident population<sup>6</sup>, excluding walking, cycling, swimming and running activities in Victorian parks

Nature-based outdoor sector	Population	Participation days <sup>7</sup>	Participation ratio
Daylesford and Macedon Ranges	57,300	116,300	2.03
Gippsland	229,200	304,700	1.33
Goldfields	263,300	138,100	0.52
Grampians	106,000	63,500	0.60
Great Ocean Road	353,100	458,000	1.30
High Country	144,800	205,000	1.42
Melbourne	3,542,400	2,471,600	0.70
Murray	229,000	143,800	0.63
Mornington Peninsula	279,200	164,300	0.59
Phillip Island	30,000	140,300	4.67
Yarra Valley and Dandenong Ranges	57,300	116,300	2.03

## Infrastructure

Victoria's nature-based outdoor activity sector is supported by an extensive public and private support infrastructure. This infrastructure includes nature-based outdoor activity provider infrastructure such as camps and activity grounds, 'grey' infrastructure – such as bicycle and walking trails, and green infrastructure – i.e. the natural environment where the nature-based outdoor activities occur.

<sup>6</sup> For some activities there is a significant passive element (air sports) and so the activity will be a larger multiple of the exercise component, while others (cycling) much of the participation will correspond with the exercise component.

Public and private nature-based outdoor activity infrastructure support Victoria's economy and add to our state's natural and built asset base. The infrastructure also generates demand and economic activity for maintenance and other services.

Based on Treasury budget and Parks Victoria annual report data we estimate that the Victorian Government alone spend some \$400 million on specific outdoor infrastructure and in supporting public outdoor areas in 2014-15. These investments will have contributed to an estimate \$380 million in Gross value-added and some 3,750 FTEs in Victoria.

## Economic contribution from Victorian schools

As part of our evaluation we specifically looked at nature-based outdoor activity participation and the economic contribution of Victorian public, private and catholic schools. Our evaluation used the 'Student Activity Locator' database and data on camping occupancy from the Australian Camps Association (Australian Camps Association, 2012).

The ACA database lists Victorian public and catholic school excursions and trip data. We have extrapolated participation data for private schools based on Victorian public and catholic school participation and

Participation instances have been translated into participation days (8 hour day) in the same proportion as the exercise component of the participation multiplied by two (2). This would represent a minimum multiple.

<sup>7</sup> Participation days are calculated as (participation hours/8)

expenditure. The Australian Camps Association report provides total camping participation and spending; this is attributed to schools according to the ACA's survey. These two sources are combined to provide estimates of total school outdoor excursions and spending.

According to our estimates and using the available data, in 2014 there were around 2.5 million nature-based outdoor activity participant days by Victorian school children. After leakages are accounted for, total nature-based outdoor activity related expenditure for Victorian schools generates in the order of \$225 million of expenditure within Victoria. This translates into some \$71 million in profits, wages and rents (i.e. direct gross value-added), and \$37 million in supply chain activity to generate nature-based outdoor activity goods and services (indirect gross value-added).

Table 13: Estimates of the economic value of school nature-based outdoor activity in Victoria

Participation Days ('000)	2,500
- daytrips ('000)	1,475
- overnight trips ('000)	975
Expenditure (\$ million, 2014)	\$225
Gross value-added (direct and indirect) (\$ million, 2014)	\$108
FTEs (direct and indirect) (2014)	2,200

<sup>8</sup> <http://www.tourism.vic.gov.au/research/economic-significance.html>

## Industry comparisons

As a final point of comparison Table 14 below sets out our estimates of the economic contribution of nature-based outdoor activity relative to other Victorian industries. Because the economic contribution of nature-based outdoor activity spans across multiple sectors the numbers are not additive, and nature-based outdoor activity is already embedded in the topline industry numbers. What the Table shows is the size of the nature-based outdoor activity sector relative to other significant sectors of the economy.

We think Table 14 highlights that Victoria's nature-based outdoor activity sector is a larger part of the Victorian economy than most people realise.

Table 14: Nature-based outdoor activity economic contribution, 2013-14<sup>8</sup>

Share of State Total by Industry	GVA	FTE
State total	\$330 billion	2.9 million
Nature-based outdoor activity – direct	1.2%	2.0%
Financial and insurance services	11.1%	4.1%
Professional, scientific and technical services	8.4%	8.8%
Manufacturing	8.0%	9.7%
Health care & social assistance	7.4%	8.6%
Construction	6.4%	8.6%
Education & training	5.9%	8.0%
Agriculture, forestry and fishing	2.8%	3.1%
Mining	2.5%	0.5%
Tourism	5.5%	7.1%

# Welfare contributions

We estimate that nature-based outdoor activities in Victoria contribute to avoided healthcare system costs in Victoria worth at least \$265 million a year.

## Health and wellbeing

Nature-based outdoor activity and recreation delivers health and wellbeing benefits – this conclusion is clearly supported by a large and robust international evidence base of outcome-based studies (Godbey, 2009; Dickson, Gray, & Mann, 2008). An emerging evidence base also indicates nature provides an added value to the known benefits of (indoor) physical activity (Mitchell, 2013; Pasanen, Tyrväinen, & Korpela, 2014; Coon, et al., 2011; Bowler, Buyung-Ali, Knight, & Pullin, 2010).

Collectively, these studies show the benefits of outdoor physical activity are directly associated with improved cardiovascular health, obesity, blood pressure, and stress related illness and mental health. The health benefits of nature based activity reflect the type, duration, intensity and frequency of activity, as well as the person doing the nature-based outdoor activity.

We estimate the health benefits of nature-based outdoor activity in Victoria are worth more than \$265 million each year, measured as the net (adjusted for injury) avoided costs to the Victorian healthcare system. Because of the way we have calculated these avoided healthcare benefits, these estimates likely understate the real health and wellbeing impacts of outdoor recreation in Victoria. Annex B discusses how we have estimated these net avoided cost impacts using recent Department of Infrastructure and Transport estimates.

The health benefit estimates shown in the table below include walking, swimming, running and cycling activities within Victorian parks only. Again, because we know that these activities also occur as nature-based outdoor activities outside parks we know the real health and wellbeing benefit figure is higher than \$265 million a year.

Table 15: Net avoided healthcare costs each year in Victoria – some key activities

Nature-based outdoor activity	Net health benefit (adjusted for injury) per hour	Total benefit (\$ million)
Walking in Victorian parks	\$4	\$63
Running in Victorian parks	\$15	\$16
Swimming in Victorian parks	\$15	\$7
Cycling in Victorian parks	\$15	\$20
Surf sports	\$15	\$35
Triathlons	\$15	\$20
Horse riding	\$4	\$20
Ice / snow sports	\$15	\$10

## Recreation benefit values

People obtain benefits from nature-based outdoor activity over and above how much they pay to do these activities. Economists call the difference between the maximum amount that consumers are willing to pay for nature-based outdoor activities and what they actually have to pay consumer surplus. Consumer surplus is a direct measure of welfare contribution.

For example, if the maximum amount a Victorian is willing to pay for a nature-based outdoor activity is \$90 per day including all trip and equipment expenditure and the amount they have to pay is only \$50 then the person gets a consumer surplus of \$40. Even though this \$40 consumer surplus does not get exchanged through any marketplace transaction, the existence of the consumer surplus is a benefit that should be counted in economic analysis, and is also central to the individual's decision to do the nature-based outdoor activity.

We estimate that the value of recreation (consumer surplus) to Victorians is in the order of \$455 million each year. This estimate is based on the number of nature-based outdoor activity participation days in Victoria each year (Table 12) and estimates from Australian and international literature of participation day consumer surplus from nature-based

outdoor activity. Annex B discusses our estimation approach in more detail.

## Productivity and production

Similar to the way nature-based outdoor activity reduces healthcare costs in Victoria, nature-based outdoor activity likely contributes towards higher productivity and production in Victoria by lowering absenteeism and presenteeism at work<sup>9</sup>.

The effect of physical activity on labour productivity in Australia has been looked at previously (Medibank Private and KMPG-Econtech, 2008). This work estimates that in 2007-08:

- physical inactivity<sup>10</sup> in Australia contributed to absenteeism and presenteeism that caused GDP to be more than \$9 billion lower than if the population was active
- on average, physical inactivity results in a direct loss of 1.8 working days per worker each year for an average Australian worker. This loss of labour costs Australia around \$458 per employee in foregone labour each year, measured in 2007-08 dollars.

The Australian Bureau of Statistics *Australian Health Survey: Physical Activity, 2011-12* estimates that around 43 percent of Victorians aged 18

<sup>9</sup> Presenteeism is lost productivity that occurs when employees come to work but do not function at their full capacity because of illness or other factors.

<sup>10</sup> The National Physical Activity guidelines for Australians recommend 30 minutes of moderate-intensity physical activity on most days of the week as the minimum requirement for good health. To be considered 'physically active' people need to participate in at least 150 minutes of moderate - intensity

physical activity over at least five sessions in a week. People are physically inactive if they do not reach this exercise target (Medibank Private and KMPG-Econtech, 2008).

and over were physically active in 2011-12 - i.e. around 57 percent were insufficiently active. The ABS also estimates around 2.9 million Victorians are currently employed on a seasonally adjusted basis (Australian Bureau of Statistics, 2015).

Unfortunately we can't estimate how nature-based outdoor activity contributes to productivity directly by lowering absenteeism and presenteeism. What we can do is estimate an order of magnitude of the cost of labour that nature-based outdoor activity contributes towards in some part, based on labour force participation, physical activity rates and the cost of lost labour from insufficient physical activity. The lost cost of labour attributable to absenteeism and presenteeism is different to the loss of production and productivity - it reflects the cost that employers pay out as salaries when employees are absent from work, not the economic value of lost production.

Based on the assumptions set out in Annex B, we estimate that the lost labour cost to the Victorian economy due to physical inactivity is somewhere in the order of \$900 million in 2014-15. Another way of looking at this is that the gain resulting from 44 percent of the Victorian workforce being physically active is somewhere in the order of \$720 million. Nature-based outdoor activity contributes to some of this productivity gain.

Consistent with the earlier work by Medibank Private and KMPG-Econtech, these estimates likely understate the productivity impacts of nature-based outdoor activity for at least two reasons:

- they don't include people not in the workforce at all because of physical inactivity

- they don't include the value of unpaid work from volunteers and volunteerism.

# Unquantified impacts

## Social cohesion and education

We know that nature-based outdoor activity can help to develop positive relationships among community members and that this can increase mental and personal wellbeing, as well as feelings of community connection. Many, but not all, of the benefits of social cohesion will be reflected in the welfare contribution values discussed in the last section - for example through improved health and wellbeing, lower absenteeism and presenteeism rates, and through the recreation consumer surplus. To avoid the risk of double counting we don't attempt to parcel out a separate welfare contribution for these impacts.

There are likely to be benefits from nature-based outdoor activity that extend beyond the health and wellbeing and labour productivity benefits we estimated in the last section. For example:

- meta-analyses show that outdoor education programs can improve self-concept and teamwork amongst primary and secondary school kids. Importantly, these positive impacts often appear to persist over time (Neill, 2008). In primary and secondary school students,

the main benefits relate to the development of life effectiveness skills (Queensland Outdoor Recreation Federation, 2012), which could translate over time into better workplace performance.

- Outdoor therapy and activities has been linked to reduced delinquency among adolescents at risk (Bowen & Neilla, 2015; Bowen & Neilla, A meta-analysis of adventure therapy outcomes and moderators, 2013). Thus, it is reasonable to conjecture that increases in nature-based outdoor activity among at-risk groups in particular could reduce future costs associated with offending, including law enforcement, the direct damage caused by offending.
- the ABS 2006 General Social Survey found that people 18 and over who participated in sport or physical recreation were more likely than others to be a volunteer in some capacity (Queensland Outdoor Recreation Federation, 2012).
- There is some evidence that nature-based outdoor activities contribute towards developing greater environmental awareness and stewardship. What these attitude changes mean over the longer term for environment and sustainability haven't been examined through longitudinal research yet (Dickson, Gray, & Mann, 2008).

# Next steps

This report shows that Victoria's nature-based outdoor activity sector is an important part of the Victorian economy, and likely makes far more of a contribution to Victorians' wellbeing and community than many of us realise.

Many of the estimates in this report are approximations. Our main aim in this report has been to present order of magnitude estimates of the economic and welfare contribution of Victoria's nature-based outdoor activity sector to our community, based on best available evidence.

Further work is needed to narrow and strengthen the estimates in this report, and to develop a consensus approach for evaluating the contribution of Victoria's nature-based outdoor activity sector going forward. In particular future work needs to:

- **Close data and knowledge gaps:** several key knowledge gaps have been identified in this work. The largest knowledge gap is around participation and the economic contribution of walking, running, cycling and swimming nature-based outdoor activities in Victoria. These activities account for the bulk of nature-based outdoor activity in Victoria, but their informal nature means that participation numbers are hard to track, other than in Victorian parks from user surveys. A dedicated survey looking at nature-based outdoor cycling, walking, running and swimming activities in Victoria would increase confidence in the estimates in this report.

This survey could build on the existing Parks Victoria user survey approach.

- **Develop a standard approach for estimating the economic and welfare contribution of Victoria's nature-based outdoor activity sub-sectors:** our work highlighted that nature-based outdoor activity sub-sectors who are evaluating their economic contribution in Victoria are often using different approaches. These approaches are not always consistent and / or transparent. We think the Victorian nature-based outdoor activity sector would benefit from having a uniform approach to estimating the economic and welfare contributions of nature-based outdoor activity sub-sectors. This approach should preferably be developed using Victorian Department of Treasury and Finance guidelines and support, which would ensure the approach is 'gold standard'.
- **Develop industry-standard economic and welfare performance measures:** similar to the point above, the Victorian nature-based outdoor activity sector would benefit from having a uniform set of economic and welfare contribution measures that industry performance is evaluated on over time. Again, these measures could be developed using Victorian Department of Treasury and Finance guidelines and support, plus consultation and buy-in from Regional Development Victoria and the Victorian Department of Economic Development, Jobs, Transport and Resources.
- **Secure funding for further research and sector development:** measured in terms of economic and welfare contribution, the potentially significant size of the nature-based outdoor activity sector in Victoria means it warrants further attention. This report starts to build an evidence based case for additional funding for

research into how the Victorian nature-based outdoor activity sector can be developed to make an even greater contribution to Victoria's economy and its communities in the future.

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# Annex A: Glossary of terms<sup>11</sup>

## Economic Terms

**Expenditure** this is the value of the initial (direct) stimulus that is relevant to each industry – it is expenditure by Governments, businesses and individuals involved in nature-based outdoor activity

**Gross economic output** is a measure of total production or expenditure in a local economy that is either directly or indirectly related nature-based outdoor activity expenditure. It estimates how nature-based outdoor activity expenditure shifts through the Victorian economy to supply goods and services, jobs and incomes and taxation revenue.

**Gross value-added** is a subset of Gross economic output, as imported goods and services used to service incremental expenditures are excluded. Gross value-added includes local business profits and wages paid, and therefore represents economic returns on local capital and labour resources. Gross value-added measures true contribution of

nature-based outdoor activity to the Victorian economy, because it backs out leakage out of the economy

**Employment** is the number of full time equivalent (FTE) jobs generated and / or supported in the creation of local Gross economic output and Gross value-added.

**Direct Contribution** direct sales or margins of sales associated with the initial expenditure. Some expenditures are assumed to translate into purchases made outside the state.

**Indirect Contribution** sales to the businesses where expenditures are made (e.g. intermediary inputs bought in the supply chain). For example, petrol stations purchasing petrol refined in Victoria produce a flow-on contribution to other parts of the Victorian economy.

**Induced Contribution** sales of goods and services purchased by employees of directly and indirectly affected businesses. A ski-field employee that buys milk from Gippsland using income they earned in the nature-based outdoor activity sector is creating an induced contribution for the Victorian economy.

**Economic Impact** are the net changes in Victorian economic activity that are generated by an industry sector (i.e. nature-based outdoor activity economy).

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<sup>11</sup> This glossary adopts many of the definitions provided in Briceno & Schundler (2015) and Tourism Research Australia's Glossary of Research Terms.

**Economic Multiplier** in this report the economic multiplier refers to the ratio between initial expenditures and total economic contribution (also called the Keynesian multiplier). It shows how initial expenditures generate additional economic activity as the initial money is re-spent by other businesses and workers. An illustration of this follows below:

A hotel is paid \$150 to house a nature-based outdoor activity participant for the night. The hotel owner keeps \$15 as profit, employees are paid \$85 and \$50 are spent importing goods from outside Victoria).

The employees spend \$85 on food. Most of the food is imported from outside Victoria so only \$10 of the expenditure goes to wages and profit for the grocery store.

The hotel owner sends her \$15 to his daughter in Western Australia which creates no further economic activity in Victoria (this is called economic leakage).

Based on the above transactions there has been \$110 (\$15 profit + \$85 wages + \$10 to grocery store) of economic activity in Victoria from the initial \$150. If no further activity occurs then the economic contribution multiplier is  $.73$  ( $110$  divided by  $150$ ).

**Economic activity** refers to different types of economic exchanges as they circulate through a region's economy. In this study, the direct, indirect, and induced contributions represent total economic activity (e.g. sales, production and consumption of goods and services, employment, tax payments, etc.) associated with nature-based outdoor activity. Gross state product (GSP) is a common measure of Victorian economic activity.

**Economic Leakage** this is money that leaves a regional economy when an expenditure is made by a consumer. Leakages generally happen because some of the expenditures for goods and services used in the regional economy (for example petrol) is made outside the local economy and the person selling the petrol within the regional economy has to send money outside of the regional economy to pay for these, or because producers get their inputs from outside the state.

**Economic Benefit** an economic benefit is the wellbeing a consumer gains as a result of her consumption of a specific good or service, expressed in monetary terms. This is also known as consumer surplus. It is the difference between the maximum amount a person is willing to pay to get a good or service and what they actually end up having to pay.

**Regional Development Victoria (RDV) Input-Output model** RDV I/O model is a purpose built economic model that allows the user to estimate total economic activity generated by tourism and infrastructure expenditures in a Victorian regional economy.

## Nature-based outdoor activity terms

**Participant Day** a singular visit to a nature-based outdoor activity location or a one-time engagement by one individual in a recreational activity.

**Visitors** nature-based outdoor activity participants who travel more than 50 kilometres from their home to visit one of Victoria's nature-based outdoor activity locations.

**Nature-based outdoor activity participants** are people that engage in nature-based outdoor activities irrespective of how often they do this.

**Domestic day trip visitors** are those people who travel for a round trip distance of at least 50 kilometres and who do not spend a night away from home as part of their travel. Same day travel as part of overnight travel is excluded.

**Domestic overnight visitors** are people aged 15 years and over who undertake an overnight trip of one night or more and at least 40 kilometres away from home are referred to as overnight visitors.

**Interstate visitor** a person is an interstate visitor when they visit a state or territory other than that in which they reside. An interstate visitor night is any night spent in a state or territory other than that in which the visitor resides.

# Annex B: Economic evaluation approach

We have used a bottoms-up approach to estimate the economic contribution of the Victorian nature-based outdoor activity sector in this report. In broad terms, the bottoms-up approach sums the individual expenditure contributions of the sub-sectors that are included in the Victorian nature-based outdoor activity sector analysis (Table 2). The key advantage of the bottoms-up approach is that it overcomes the difficulty that arises from the lack of industry wide data.

However, consistent with previous work that has looked at the economic contribution of outdoor recreation in Australia (Queensland Outdoor Recreation Federation, 2012) the key challenges with the approach are:

- there are existing studies for only a small number of all nature-based outdoor activities
- different methodologies need to be used to estimate economic contributions
- different time periods applied to the estimates
- different economic measures were reported.

Key data sources are summarised in Table 16. Our approaches to estimating participation, economic contribution and welfare contribution are outlined below.

## Nature-based outdoor activity participation in Victoria

We have estimated nature-based outdoor activity participation as the number of days Victorians spent doing activities last year (and associated results) using one of two sources:

- nature-based outdoor activity specific participation surveys, where these were available
- the *Participation in Sport and Physical Recreation, 2013-14*, special tables obtained from the ABS. This data source is described in Table 16.

## Nature-based outdoor activity specific participation surveys

Where dedicated surveys are available for specific nature-based outdoor activities (such as skiing in the High Country and walking, swimming, running and cycling activities in Victorian parks operated by Parks Victoria), we have generally used these participation numbers. These reports also generally include estimates of how long people spend per day on nature-based outdoor activities.

In some cases activity specific surveys do not cover all of Victoria. For example, fishing in Gippsland. We have used the survey data where it is available to uplift for other regions in Victoria, using the approach discussed further below.

## Participation in Sport and Physical Recreation

Where activity specific surveys are not available or were not used, we have estimated participation based on *Participation in Sport and Physical Recreation, 2013-14*, special tables obtained from the ABS.

The participation rate in this data is the number of people aged 15 and over who participated in each activity in the ABS dataset multiplied by the number of occasions that they participated. The ABS dataset does not provide duration for the activities. We have assigned indicative exercise intensity and duration assuming a casual participant. These are then scaled up to reflect also passive enjoyment of outdoors.<sup>12</sup>

The ABS dataset measures frequency as a broad range within the year (for example 1-2 times a year, 3-6 times a year, 10-20 times a year etcetera). In generating overall participation rates, we have used the mid-point of each band was used except for the final one (105 times a year or more). In this last case, 105 was used.

## School camps and excursions

The 'Student Activity Locator' database of school excursions for both catholic and public schools was used to obtain an estimate of the number of school days that students spent in nature-based outdoor activities and

where these days were spent. The databases reported activity, duration and number of children.

These participation rates were scaled up to include other private schools in proportion to school student numbers reported by the Victorian Department of Education and Training Number of Enrolments 2015. The analysis only included that participation that were identifiably associated with nature based activities.

In addition, the Australian Camps Association's "Prices and Occupancy Report 2012" provided a top-down estimate of number of school student days spent on camp. It also provided estimates of the distribution of expenditure on accommodation, meals and activities. We have used these industry estimates to adjust the camping and overnight estimates from the school database.

## Total expenditure on nature-based outdoor activities in Victoria last year

This represents the value of spending from identified sources in the past year. The key sources for this analysis were:

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<sup>12</sup> So for example, someone bushwalking may spend a half of one day in a national park, but only two hours of that time actually walking, the rest of the time, eating, resting or taking in the views. The health

benefits are generated from the actual time spent exercising while the recreation benefits reflect the longer time.

## Trip based expenditure using Tourism Research Australia estimates of number of persons aged 15 and over who visited each region in Victoria.

This survey captures expenditure by domestic day visitors, who are people who travel for a round trip distance of at least 50 kilometres and who do not spend a night away from home as part of their travel. It also captures overnight domestic day visitors, who are visitors who travel at least 40 kilometres and stay overnight.

The survey also lists the activities engaged in by each person during the visit. Separately, TRA estimates average expenditure by day trippers and overnight stayers in each region for domestic and international visitors.

Where we have used TRA data to estimate trip based nature-based outdoor activity expenditure, we have combined nature-based outdoor activities to provide an estimate of tourism expenditure in each region and then allocated that total expenditure across different nature-based outdoor activities according to their relative frequency of participation, which is defined using the approach for estimating nature-based outdoor activity participation rates discussed above. Trip expenditures have been allocated to activities in proportion to the relative number of activities undertaken in each region. This assumes similar trip related expenses for most activity categories.

## Nature-based outdoor activity specific expenditure surveys

Where dedicated surveys are available for specific nature-based outdoor activities (such as skiing in the High Country), we have generally used the trip and equipment expenditure figures from these studies and grossed them up. These reports also generally include expenditure estimate for day and overnight activities.

We have estimated snow based trip and equipment expenditure using Alpine Resorts Co-ordinating Council (2015) *Victorian Alpine Resorts: End of season report winter 2014*. This is based on the analysis of value-added from snow activities in the Victorian Alps. We have used the weighted input-output multiplier for tourist spending in the region convert the value-added estimates in the report back to an expenditure figure. This replaces the derived figure for tourist expenditure assigned to snow activities. As this figure is a derived figure, the other activities of the Alpine total are adjusted so that overall spend by tourists is not changed in the region.

In the cases of Fishing, expenditure is based on the separate analysis of the economic impact of fishing: *Economic Study of Recreational Fishing in Victoria- Headline Results* VRFish (2009). A mark-up figure is estimated for total fishing tourist plus equipment expenditure to obtain the total fishing expenditure figure. This mark-up is applied across regions to obtain the individual local expenditure figure for each.

In the case of boating, value added data similar are estimated for the Gippsland region to estimates reported in AECOM (2014). This figure is

used to derive a Gippsland expenditure figure in a similar fashion to snow activities. In this case, the derived Gippsland expenditure figure generates a mark-up figure for local sales. This mark-up is applied to other regions based on observed participation rates from ABS and TRA data.

For walking, cycling, running and swimming we have used Parks Victoria visitor survey data obtained from Parks Victoria. This survey data tracks visitor activities for all metropolitan and National parks operated by Parks Victoria. We have used data from a second Parks Victoria survey that tracks the type of visit (local (%), day trip from home (%), part of a holiday (%)) for 28 Victorian parks managed by Parks Victoria to apportion trip type and activities for urban, peri-urban and regional parks.

## School camps and excursion trip expenditure

Day and multi-night school excursion expenditure was estimated using the average cost for day trip and overnight activities from the Australian Camping Association's *Prices and Occupancy Survey Report 2012* (inflated to 2014/15). As the respondents are overwhelmingly Victorian, the average figures are expected to be representative.

## Equipment investment

The ABS provides estimates of household expenditure on specific equipment used in nature-based outdoor activities in 4156.055.002 - *Value of Sport, Australia, 2013*. Activities in the catalogue include bicycles, boats, aircraft, fishing equipment, camping equipment, and other

categories. Detailed expenditure data per household are available at an Australian level for 2009-10. Detailed expenditure data per household for Victoria are available for 2003-04.

The ratio of Victorian expenditure per household in 2003-04 to Australian per household for 2003-04 is used to adjust the Australian figure for 2009-10. This is then grossed up for the number of Victorian households in 2014-15 and inflation.

For outdoor clothing, Australian expenditure on hiking and equipment was derived from IBISWorld's analysis of same. This analysis identified 42 percent of total expenditure on outdoor equipment as being on clothing and footwear (and therefore not double counting camping, fishing etc.). Overall, Victoria represented some 27 percent of overall sales in hiking and equipment. These two ratios were applied to generate an estimate of outdoor clothing and footwear expenditure for Victoria.

## Private (Infrastructure) investment

There is limited information on private investment in outdoor recreational facilities and infrastructure. We have used primary data where this is available.

Alpine investment in Victoria was reported for 2005 in *The Economic Significance of the Australian Alpine Resorts: Summary Report* prepared for Alpine Resorts Co-ordinating Council. This was inflated to 2014/15 prices.

Public sector expenditure comprised two elements: consumption and investment expenditure. The former comprised the ongoing costs for



Parks Victoria (annual report) which were allocated on the basis of number of visitors to national parks, state parks or waterways as a proportion of all visitors.

In addition, identified ongoing expenditure (by Outdoors Victoria) of other items in the most recent Victorian budget were included (subsidy for camps for disadvantaged children, active communities funding). Fees charged by Parks Victoria were then deducted. Identified investment in the most recent budget was separately included (SLSV clubhouse, trails, boat ramps).

## Health benefits

Health benefits reflect the total amount of participation in nature-based outdoor activities by Victorians. For each nature-based outdoor activity identified by the ABS (and included in the outdoor analysis) and the activities identified in the school excursion participation data, an indicative duration/intensity is allocated. Assumed indicative duration and intensity assumptions are shown in Table 18.

The (net) health value of physical activity is estimated using the Department of Transport (2012) *Walking, riding and access to public transport* valuation of benefits of walking and cycling to work. The former is used as a proxy for low intensity physical activity and the latter for higher intensity activity.

## Recreation benefits

Whereas the health benefit reflects the intensity and duration of the exercise component of an activity the recreation benefit reflects the overall time spent on the activity. For the purposes of this analysis, a conservative estimate was used to reflect this passive recreation. For all categories, it is assumed that the exercise duration reflects one-half of the overall recreation duration.

A recreation value of \$50 per day equivalent was used reflecting the consistent outcome of a range of analyses.

Table 16: Nature-based outdoor activity assumed intensity and duration

Cross country running	Moderate	1	High activity, medium duration
Fishing	Light	2	Low activity, long duration
Horse riding / Equestrian activities / Polo	Moderate	1	Medium duration, medium activity
Ice / snow sports	Moderate	2	Medium activity, long duration
Motor sports	Light	1	Low activity, long duration
Orienteering	Moderate	1	Medium activity, medium duration
Rock climbing / Abseiling / Caving	Moderate	2	Medium activity, medium duration
Rowing	Moderate	1	High activity, short duration
Sailing	Light	1	Low activity, long duration
Scuba diving / Snorkelling	Moderate	1	Medium activity, long duration
Shooting sports	Light	0.5	Low activity, medium duration
Swimming	Moderate	1	Medium activity, short duration
Lifesaving	Moderate	2	High sporadic activity, long duration
Running	Moderate	1	High activity, medium duration
Surf sports	Moderate	2	Medium activity, long duration
Trail bike riding	Moderate	1	Medium activity, long duration
Triathlons	Moderate	3	High activity, short duration
Walking	Moderate	0.5	Low activity, medium duration
Water skiing / Powerboating	Light	2	Low activity, long duration
Water volleyball / Rafting / Other water sports	Moderate	1	Medium activity, medium duration
Wind surfing / Sailboarding	Moderate	1	Medium activity, medium duration

<sup>13</sup> 6401.0 - Consumer Price Index, Australia, Jun 2015<sup>14</sup> 6202.0 - Labour Force, Australia, Sep 2015

## Productivity and production

Table 17: Key assumptions used in the productivity and production evaluation

Cost of labour lost due to absenteeism and presenteeism Victorian economy of physical inactivity, 2015 (\$million)	912
Gain to the Victorian economy from avoided absenteeism and presenteeism due to physical activity, 2015 (\$million)	717
<b>Data</b>	
CPI index 2007-08 to June 2015 <sup>13</sup>	1.21
Victorian employment, seasonally adjusted <sup>14</sup>	2,943,903
Cost of lost labour due to absenteeism and presenteeism per worker inactive per annum, 2007-08 <sup>15</sup>	\$458
Percentage of population over 18 who are physically inactive, 2011-12 <sup>16</sup>	56%
<b>Key assumptions</b>	
Approximately same level of inactivity between employed and unemployed	
Levels of physical inactivity haven't changed materially in the Australian population since 2011-12	
Cost of inactivity per person to the economy hasn't changed materially since 2007-08	

## Economic contribution calculations

We have used Regional Development Victoria's regional economic impact model to estimate the regional economic contribution of nature-based outdoor activities in Victoria. The regional economic impact model

<sup>15</sup> (Medibank Private and KMPG-Econtech, 2008)<sup>16</sup> 3640DO004\_20112012 Australian Health Survey: Physical Activity, 2011-12 — Australia

provides measures of effects from infrastructure, product sales and trips and nature-based outdoor activity travel related spending. In general, there will be direct effects and indirect effects. In looking at the gross or net impact of nature-based outdoor activity on the Victorian economy, we need to look at both direct and indirect effects.

The estimates generated by RDV regional economic impact model are underpinned by an input-output model developed by SGS economics from national input-output figures from the Australian Bureau of Statistics. The ABS figures show the flow of goods and services between all the parts of the Australian economy. The figures developed for each local government area disaggregate these total figures across regions using known regional sub-totals and forcing the relationship across all regions to match the Australian total.

While this approach is considered reasonable, some limitations of using input-output models should be noted (SGS Economics, 2014).

- **The input-output approach assumes relationships between industries are static.** That is, productivity improvements are not factored in and historic relationships are assumed to hold. So, businesses are not able to adjust to changes in prices to change the way they produce things.
- **The input output approach uses total production estimates.** Consequently, the relationships are average. However, if we think about where increases in spending might occur, the stimulus would expect to look for the best value option (or a marginal option). Using an average approach does not allow for using any underutilised capacity at the industry level or better use of existing machinery, as production expands from its existing base.

- **All of the expenditure is assumed to be new economic activities in each municipality.** That is, crowding out or industry substitution effects are assumed to be negligible. This means that there is sufficient slack in the local economy to service these stimuli without transferring significant resources from other uses.

Table 18: Key data sources – full list

Information	Key Sources	Comment
Participation and trends in outdoor recreation activity in Victoria (non-tourism and tourism)	4177.0 - Participation in Sport and Physical Recreation, Australia, 2009-14	This data provides total effort (duration, frequency) in outdoor recreation activities used in this report. The data limited to persons 15 and over.
	Tourism Research Australia National Visitor Survey, 2009-14	This data provides activities by stopover for domestic trips, day and overnight. International activities at the Australia/total trip level only. Both datasets include visitors aged over 15 years only and are subject to sample size censoring.
	Parks Victoria annual visitor survey	This dataset provides first and all mention activities for metropolitan and National Parks operated by Parks Victoria. To avoid double counting we have only used the walking, running, cycling and swimming figures from this activity dataset.
Expenditure on outdoor recreation products and employment in nature-based outdoor activities	4156.0.55.002 - Value of Sport, Australia, 2013	Includes expenditure per household per week (2009-10) on selected sport and physical recreation products: bicycles, boating and accessories (\$2.30 per week), camping equipment (\$0.70), fishing equipment (\$0.55), golf equipment (\$0.45),  Employment 2011, Diving Instructor (Open Water), Fishing Guide, Boat Builder and Repairer, Bungy Jump Master, Greenkeeper, Hunting Guide etcetera  Aggregate data only based on 14,000 respondents
	IBISWorld Australian Market industry reports, Bicycle Retailing and Repair, Sports and Recreation Facilities, Marine Equipment Retailing, Hiking and Outdoor Equipment Stores	This source has been used to estimate outdoor equipment expenditure where not covered by the ABS Value of Sport, Australia publication estimates.
	Economic impact and welfare values of Victorian regional and rural trails (MJA, 2015)  Economic evaluation of recreational boating in Victoria (MJA, 2012)  Economic contribution of recreation at Victorian Parks (2014)  Economic Study of Recreational Fishing in Victoria- Headline Results VRFish (2009)  Estimating the economic impact of hunting in Victoria in 2013 (2014)  Alpine Resorts Strategic Marketing Plan 2014–2018 (summer and winter visitation statistics and expenditure)  -----  Australian Outdoor Adventure Activity Benefits Catalogue (2008)	These studies use a range of approaches to measure economic impacts and welfare values.  Most studies include estimates of gear, accessories and travel related expenses  Several studies include welfare estimates (health and wellbeing), including the studies completed by Marsden Jacob

Measuring the contribution of the Outdoor Recreation Sector in Queensland (2012) (transfer values)

The real value of sport and recreation in Western Australia (2013)

Economic Value of Outdoor Recreation Activities in Iowa

Economic Analysis of Outdoor Recreation in Washington State

The cost of physical inactivity: What is the lack of participation in physical activity costing Australia, (2008)

J. Thompson Coon, K. Boddy, K. Stein, R. Whear, J. Barton, M. H. Depledge (2011). ; Does Participating in Physical Activity in Outdoor Natural Environments Have a Greater Effect on Physical and Mental Wellbeing than Physical Activity Indoors? A Systematic Review'. *Environmental Science & Technology*. 45 (5), pp 1761–1772

A global map of coastal recreation values: Results from a spatially explicit meta-analysis (2014)

Economic Assessment of the Recreational Value of Ecosystems: Methodological Development and National and Local Application (2015)

References cited in the RFQ

Volunteerism

ABS, Value of Sport, Australia 2011

This study includes some limited data on volunteerism

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