

A Marsden Jacob Report

# New South Wales nature-based outdoor economy

Key estimates and recommendations

Prepared for

Outdoors NSW & SkillsIQ

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# Outdoor recreation in NSW

## 8 headline numbers

53

Million  
Number of times NSW residents aged 15+ participated in nature based outdoor recreation in NSW in 2016

47

Million  
Hours of outdoor recreation by NSW residents aged 15+ in NSW in 2016

33%

Walking, running and cycling accounts for around 33% of total outdoor recreation by residents aged 15+ in NSW.

2

Million  
Number of days NSW schoolchildren participated in nature-based outdoor activity in NSW in 2014 (latest available data)

\$7.6

Billion  
Estimated total spending on outdoor recreation in NSW in 2016

77,000

FTE  
Full-time equivalent jobs attributable to outdoor recreation in NSW in 2016

\$4.2

Billion  
Estimated direct gross value added attributable to outdoor recreation in NSW in 2016

\$480

Million  
Lifetime avoided healthcare costs from outdoor activity in NSW

# Summary

Many in New South Wales say our nature-based, outdoor-oriented lifestyle is a key part of the state'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 the New South Wales (NSW) nature-based outdoor activity sector is a larger part of the NSW economy than most of us realise. Around \$7.65 billion is spent each year on nature-based outdoor activities in NSW. This expenditure makes a \$6.7 billion contribution to the state's economy and supports around 77,000 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 NSW economy worth at least \$480 million a year, and \$890 million in other recreation benefits for people living in NSW. For reasons we discuss in this report, these estimates more likely underestimate than overestimate the benefits of nature-based outdoor activity in NSW.

Supporting NSW'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 NSW nature-based outdoor activity participation rates and the economic activity and wellbeing outcomes that participation generates.

NSW'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 NSW's natural environments.

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

This report begins to develop this picture of NSW's outdoor sector. In doing so, the report establishes an important evidence base to underpin Outdoors NSW's core advocacy, leadership, coordination, communication and research work and highlights the importance of ensuring the development of a skilled workforce to support participation in nature-based outdoor activities.

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

Participation by NSW citizens (incidences of active and passive nature-based outdoor activity)	53 million
Hours of physical activity by NSW citizens	47 million
Nature-based outdoor activity expenditures—all sources (\$ billion 2016)	\$7.65
Gross value-added (\$ billion 2016)	\$6.7
- Direct	\$4.3
- Indirect	\$2.4
FTEs (2016)	77,300
- Direct	57,500
- Indirect	19,800
Recreation value (consumer surplus, \$ million 2016)	\$890
Avoided costs to the NSW healthcare system (\$ million 2016)	\$480

## Next steps

While NSW's nature-based outdoor activity sector is an important part of the NSW economy, this report shows that 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 NSW's nature-based outdoor activity sector in future. In particular, future work needs to:

- **Close data and knowledge gaps:** Several key knowledge gaps have been identified in this work. The largest is for participation and the economic contribution of walking, running, cycling and swimming nature-based outdoor activities in NSW. These activities account for the bulk of nature-based outdoor activity in NSW, but their informal nature means that participation numbers are hard to track, other than in parks from user surveys. There is limited data from surveys of users of parks but little on their activities. A dedicated survey looking at nature-based outdoor cycling, walking, running and swimming in NSW would increase confidence in the estimates in this report.
- **Develop a national standard approach for estimating the economic and welfare contribution of nature-based outdoor activity sectors:** Our work found that nature-based outdoor activity subsectors that are evaluating their economic contribution in NSW are often using different approaches. Work we have completed in other states shows that different approaches are being used in those jurisdictions. These approaches are not always consistent and transparent. We think that the Australian nature-based outdoor activity sector would benefit from using a uniform approach to estimate the economic and welfare contributions of the various subsectors.
- **Develop national industry-standard economic and welfare performance measures:** Similarly, the Australian nature-based outdoor activity sector would benefit from having a uniform set of economic and welfare contribution measures for evaluating industry performance over time.
- **Secure funding for further research and sector development:** Measured in terms of its economic and welfare contributions, the potentially significant size of the nature-based outdoor activity sector in NSW means it warrants further attention. This report starts to build an evidence-based case for additional funding for research into how the sector can be developed to make an even greater contribution to NSW's economy and its communities in the future.
- **Identify and develop opportunities to equip the nature-based outdoor activity workforce with the skills to meet current and future demand:** A skilled workforce is essential to meet the current demand for nature-based outdoor activity and underpin future market growth and increased economic benefit. This is particularly relevant in regional areas of NSW, which often have access to suitable environments for nature-based outdoor activities.

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# Introduction

Until now, the economic contribution of nature-based outdoor activities to the NSW economy has not been well understood. This report shows that the state's nature-based outdoors sector makes a significant contribution to our economy and to individual wellbeing in New South Wales.

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

The NSW 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 the state's natural environments.

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

This report begins to develop such a picture of the state's nature-based outdoor sector. In doing so, it establishes an important evidence base to underpin Outdoors NSW's core advocacy, leadership, coordination, communication and research work, including business case development for outdoor programs and investments. It highlights the importance of ensuring the development of a skilled workforce to support participation in nature-based outdoor activities. The report provides:

- a coherent overarching evaluation framework and evidence base of relevant existing data that demonstrates the economic impacts and value of the state's nature-based outdoor activity sector
- usable and credible economic estimates for nature-based outdoor activity in New South Wales
- discussion of other benefits and impacts of nature-based outdoor activity in New South Wales, 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 New South Wales.

Our estimates are based on sound economic principles and have been built up using the best available data. They have been tested and refined with key stakeholders listed in the acknowledgement section at the start of the report.

The appendixes to the report outline how the estimates 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 regional economic contribution approaches for estimating the economic and welfare impacts of industry activity. Note that time and resourcing constraints prevented the use of computable general equilibrium analysis, which is our preferred approach for estimating economic impacts of activity. The estimates in this report are also directly comparable with estimates in our companion report for Outdoors Victoria, *Victoria's nature-based outdoor economy: key estimates and recommendations*.

# Our framework

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

## Nature-based outdoor activity

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

Many of the activities in Table 1 straddle a line determining whether they are nature-based outdoor activities. 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 an 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 in those activities between nature-based and non-nature-based outdoor activities. The apportionment is shown in Table 1. The appendixes to this report outline how we developed the apportionments shown in the table.

A key point to note in our approach is the way we have treated walking, running, cycling and swimming activities in NSW. For this evaluation, we have included only walking, cycling, running and swimming activities that occur in NSW metropolitan and non-metropolitan parks managed by the NSW National Parks and Wildlife Service (NPWS).

As we show later in the report, walking, running, cycling and swimming account for the bulk of recreation activities in New South Wales. However, because of the way this data is recorded in the ABS micro-participation data series, there is no easy way to distinguish between nature-based and non-nature-based outdoor activities—except when those activities are recorded as having taken place in one of New South Wales many metropolitan and non-metropolitan parks.

Because our evaluation includes walking, running, cycling and swimming activities only when they have occurred in NSW parks, the nature-based outdoor activity estimates in this scoping report of the economic contribution of nature-based outdoor activity in New South Wales are likely to be lower end estimates of nature-based outdoor activities and their economic impacts and contributions. This should be kept in mind when reading the report.

Table 1: Nature-based outdoor activities

Nature-based outdoor activity	Apportionment
Air sports	100%
Beach activities	100%
Boating (including sailing and power boating)	100%
Canoeing / kayaking / dragon boat racing / rowing / other	100%
Conservation volunteering	100%
Cycling <sup>a</sup>	100%
Fishing	100%
Four wheel driving <sup>a</sup>	n.a.
Geocacheing / treasure hunts <sup>a</sup>	n.a.
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>b</sup>	100%
Swimming / diving	100%
Walking	100%

a Within NSW parks only.

b Including surf sports and windsurfing/sailboarding.

Note: Based on ABS micro-data series unless otherwise indicated.

## The nature-based outdoor sector

We used Outdoors NSW'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: Outdoors NSW 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.

# Outdoors regions

We used Destination NSW tourism regions as the basis for our evaluation.

Table 3 lists Destination NSW tourism regions, based on ABS data.<sup>1</sup> These classifications form the basis of data reported in the National Visitor Survey, the International Visitor Survey and the Survey of Tourist Accommodation.

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

Table 3: Destination NSW campaign regions

Campaign region	Population ('000)	Area (sq km)
Blue Mountains	106.5	11,454
Capital Country	177.5	30,077
Central Coast	333.1	1,681
Central NSW	259.7	104,125
Hunter	638.5	25,091
New England North West	186.9	99,145
North Coast	595.8	39,622
Outback NSW	43.5	297,483
Riverina	146.4	61,732
Snowy Mountains	35.7	23,457
South Coast	471.6	15,779
Sydney	4,349.1	7,287
The Murray	114.5	83,876

## Economic framework

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

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

## Economic contribution

The economic contribution pathway estimates how the NSW nature-based outdoor activity sector contributes to the state's 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.

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<sup>1</sup> Regional tourism statistics, <http://www.destinationnsw.com.au/tourism/facts-and-figures/regional-tourism-statistics>.

The economic contribution part of the analysis presented in this report uses a bottom-up approach to estimate the economic contribution of nature-based outdoor activity. We do this by identifying the types of expenditures associated with those 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.

Appendix B discusses how we came up with estimates for these NSW expenditures, and the data sources used, in more detail. The data we used for the estimates includes expenditure and participation data. We organised it into general expenditure categories to calculate economic contributions.

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).

The limitations of input-output models are discussed in Appendix B. Time and resourcing constraints prevented the use of computable general equilibrium analysis, which is our preferred approach for estimating economic impacts of activity, in this project.

We report three key gross measures of economic contribution in this report. Each provides a different measure of gross economic contribution. Importantly, they cannot be added together. The measures are stand-alone measures of economic contribution:

- **Expenditure** 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. GVA includes local business profits and wages paid, and therefore represents economic returns on local capital and labour resources. It measures the true contribution of nature-based outdoor activity to the NSW 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 GVE. In this report, we report total FTE (direct plus indirect FTE) impacts.

## Welfare contribution

The economic benefits of nature-based outdoor activities to New South Wales 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'. They 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. They 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.

Appendix B outlines the approaches we 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. Each of the three benefit estimates provides a different measure of welfare contribution. Importantly, for reasons we discuss below, the welfare contribution values cannot be added together. The welfare contribution measures are as follow:

- **Avoided healthcare benefits:** These are measured as the net (adjusted for injury) avoided costs to the NSW 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:** Outdoor physical activity or inactivity 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<sup>2</sup>) because of nature-based outdoor activity, as compared to direct expenditure.

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

- **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. Particularly in smaller regional communities, they can be a critical part of the community's social landscape. The benefits of such social connectivity are probably substantial, but again are very difficult to quantify.

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<sup>2</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.

Figure 1: Economic and welfare contribution of nature-based outdoor activities to New South Wales

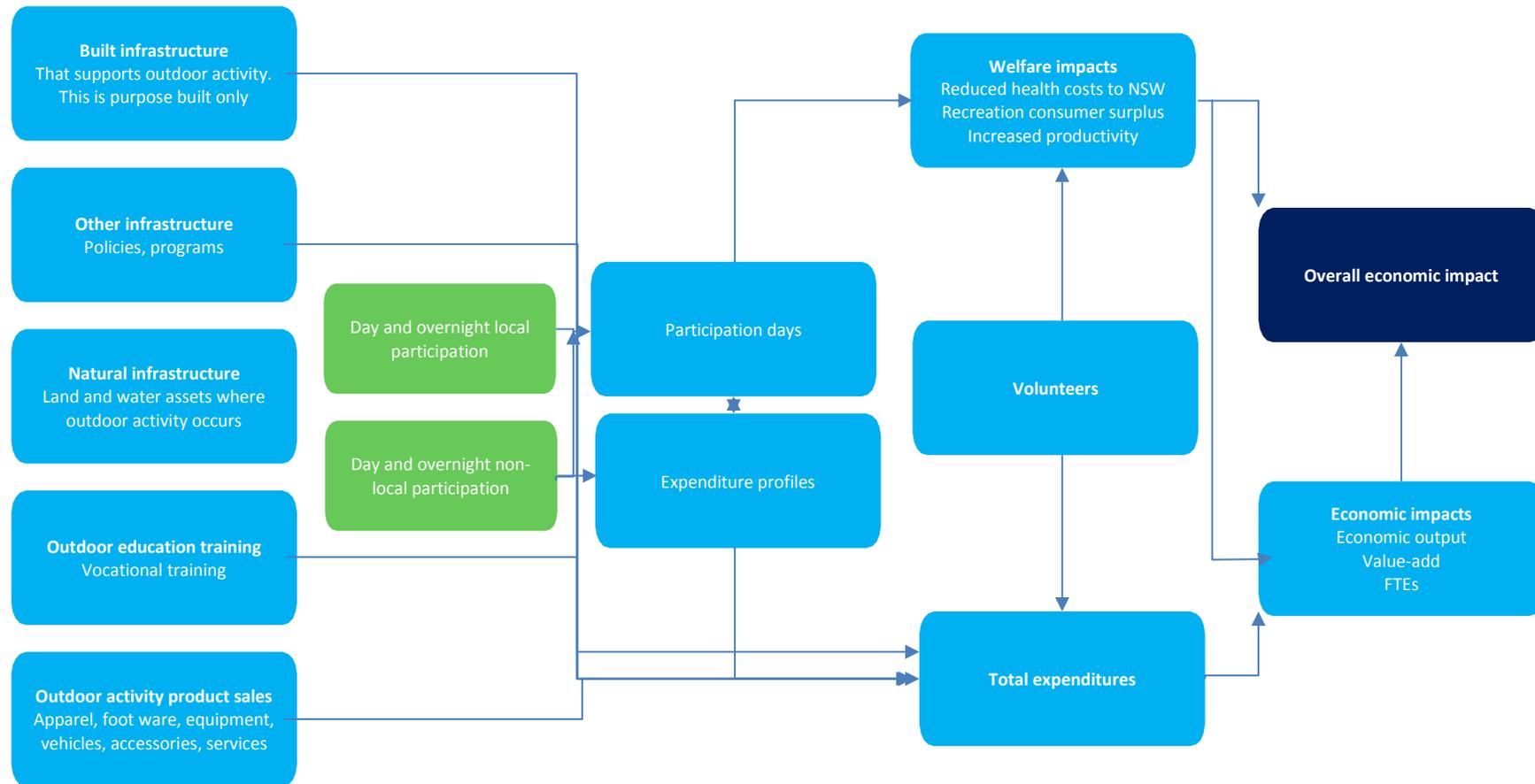


Table 4: Economic benefit values in scope

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

## Information sources

Appendix B identifies all of the information sources that we used for our evaluation.

Key sources are summarised below.

Table 5: Key data sources

Key sources	Comment
ABS, <i>Participation in sport and physical recreation, Australia, 2009–14</i> , cat. no. 4177.0	Data provides total effort (duration, frequency) in outdoor recreation. Note that not all Outdoors NSW categories apply. Data limited to people 15 years and over.
Department of Environment and Heritage Survey, 2014	Provides broad activities in metropolitan and non-metropolitan parks operated by NPWS, 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.
ABS, <i>Value of sport, Australia, 2013</i> , cat. no. 4156.0.55.002	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,	Industry sector data for bicycle retailing and repair, sports and recreation facilities, marine equipment retailing, hiking and outdoor equipment stores.
Nature-based outdoor sector-specific studies	We identified and drew on data and findings from studies for specific NSW 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 New South Wales spend at least \$7.65 billion each year on nature-based outdoor activities and equipment.

Nature-based outdoor activity contributes to avoided healthcare system costs in New South Wales worth at least \$480 million a year and recreation benefits worth \$890 million a year.

Our headline estimates underscore the significance of the nature-based outdoor activity sector to the NSW economy and the wellbeing of NSW citizens. We unpack these headline estimates in more detail in the following sections.

As stated above, 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 the best available data.

Moreover, because our estimates include walking, running, cycling and swimming activities only when they have occurred in NSW parks, the headline estimates of economic contribution of nature-based outdoor activity in New South Wales are likely to be lower end estimates of nature-based outdoor activities and their economic impacts and contribution.

According to our estimates using the available data, last year around 53 million nature-based outdoor activities occurred in New South Wales, including around 31 million nature-based walking, running, cycling and swimming activities in NSW parks. We estimate that the 53 million instances of activity included around 47 million hours of physical activity, including around 9.6 million hours of walking activity.

Total nature-based outdoor activity related expenditure currently generates in the order of \$7.65 billion of sales within New South Wales each year. These sales generate substantial wages, profits and rents for New South Wales of around \$4.3 billion (that is, GVA direct contribution) and another \$2.4 billion in supply chain activity to generate nature-based outdoor activity goods and services (indirect GVA contribution).

Approximately 77,000 FTE positions are supported in New South Wales 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 New South Wales are estimated to generate significant health and wellbeing values for the state. We estimate that the avoided costs to the NSW healthcare system attributable to nature-based outdoor activity alone are worth at least \$480 million a year.

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

Participation (incidences of active and passive nature-based outdoor activity)	53 million
- By NSW citizens over 15 years	52 million
- By NSW schoolchildren	1.1 million
Hours of physical activity	
- By NSW citizens over 15 years	45 million
Nature-based outdoor activity expenditures—all sources (\$ billion 2014)	\$7.6
Gross value-added (\$ billion 2014)	\$6.7
- Direct	\$4.3
- Indirect	\$2.4
FTEs (2014)	
- Direct	57,500
- Indirect	19,800
Recreation value (consumer surplus \$ million 2014)	\$890
Avoided costs to the NSW healthcare system (\$ million 2014)	\$480

# Economic contribution

We estimate that residents of and visitors to New South Wales spend around \$7.6 billion each year on nature-based outdoor activities and equipment.

## Equipment and recreation

The nature-based outdoor activity sector in New South Wales is driven by NSW and non-NSW spending. That spending takes two main forms: the purchase of gear and equipment (including apparel, footwear, equipment, vehicles and services), and dollars spent in New South Wales on trips, travel and activities (including for food and drink, transportation, fees, activities, accommodation and other services).

Our evaluation estimates that equipment and trip and travel related expenditure readily identifiable by NSW and non-NSW sources totals some \$6.4 billion each year, based on available data (Table 7).

Participant day-trip expenditures largely comprise shopping (28%), petrol (25%), food and beverages (12%) and takeaway or restaurant meals (20%). For overnight visits, the major expenditure items are accommodation (25%), domestic airfares (15%), takeaway/restaurant meals (15%), petrol (10%), food and beverages (12%) and shopping (8%).

Table 7: Equipment and recreation expenditure (direct and indirect)

	Expenditure (\$ billion)	GVA (\$ billion)	FTEs
Total	\$7.1	\$6.1	72,500
Trips, travel and activities	\$6.4	\$5.4	64,500
Local expenditure	\$0.7	\$0.7	8,000

## 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 New South Wales shown in Table 1, where this data is available.

Overall, based on the available data, our evaluation shows that walking, running and cycling within NSW parks, as well as beach activities, fishing and snow sports (in and outside parks) are the state's most popular activities, measured in terms of the number of participant hours each year (Table 8). These activities contribute around \$5.2 billion in combined expenditure every year to the NSW economy.

Table 8: Top four equipment and recreation expenditures (direct and indirect)

	Participant hours (million)	Expenditure (\$ billion)	GVA (\$ billion)	Gross FTEs
Walking, running, cycling (NSW parks)	15.5	\$1.3	\$1.1	13,000
Fishing	2.0	\$0.4	\$0.3	3,400
Beach activities	9.0	\$2.0	\$1.7	20,000
Ice/snow sports	1.0	\$0.9	\$0.8	9,400

## Economic contribution, by region

Our economic contribution analysis of the 11 Destination NSW campaign regions found that nature-based outdoor activities make significant contributions to many NSW regional economies. Tables 9 to 12 show participation hours, GVA and FTE contributions 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 visitor survey data). Where primary data is not available for regions, we used ABS and Tourism Research Australia (TRA) nature-based outdoor activity data and distributed the activities by region largely based on within-region population. Appendix B discusses this disaggregation approach in more detail.

Table 9: Regional nature-based outdoor activity participation hours

Campaign region	Activity hours (million)
New South Wales total	45.1
Blue Mountains	0.6
Capital Country	1.0
Central Coast	2.0
Central NSW	1.5
Hunter	3.8
New England North West	1.1
North Coast	3.5
Outback NSW	0.3
Riverina	0.9
Snowy Mountains	0.2
South Coast	2.8
Sydney	26.8
The Murray	0.7

Note: Does not include allocations of school camp participation hours.

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

Campaign region	GVA
New South Wales total	\$6.6
Blue Mountains	\$0.2
Capital Country	\$0.1
Central Coast	\$0.2
Central NSW	\$0.2
Hunter	\$0.5
New England North West	\$0.1
North Coast	\$1.0
Outback NSW	\$0.0
Riverina	\$0.1
Snowy Mountains	\$0.8
South Coast	\$0.8
Sydney	\$2.4
The Murray	\$0.1

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

Campaign region	FTEs
New South Wales total	77,300
Blue Mountains	1,800
Capital Country	1,400
Central Coast	2,800
Central NSW	2,500
Hunter	5,500
New England North West	1,000
North Coast	12,000
Outback NSW	300
Riverina	1,100
Snowy Mountains	10,100
South Coast	9,700
Sydney	28,000
The Murray	1,300

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

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

Snow activities (skiing and other snow sports) dominate the Snowy Mountains, and seaboard activities (going to the beach, fishing and so on) 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, are sites for nature-based outdoor activities with higher economic value (snow and water sports), or both.

Our evaluation found that nature-based outdoor activity is a means of moving income from urban to regional areas in New South Wales. 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 NPWS survey data, which is not disaggregated but which is also mainly local activity. The evaluation highlights several regions where participant days are greater than would be expected for the region based on the population; it is reasonable to assume that some of this participation comes from out of the region.

Table 12: Participant days and ratio per resident population, excluding walking, cycling, swimming and running activities in NSW parks

Region	Population	Participation days <sup>a</sup>	Participation ratio
Blue Mountains	106.5	294.7	2.77
Capital Country	177.5	491.0	2.77
Central Coast	333.1	921.5	2.77
Central NSW	259.7	718.3	2.77
Hunter	638.5	1,766.2	2.77
New England North West	186.9	516.9	2.77
North Coast	595.8	1,648.2	2.77
Outback NSW	43.5	120.2	2.77
Riverina	146.4	405.0	2.77
Snowy Mountains	35.7	98.9	2.77
South Coast	471.6	1,304.6	2.77
Sydney	4,349.1	12,488.2	2.87
The Murray	114.5	316.8	2.77

a Participation days are calculated as participation hours ÷ 8.

Note: For some activities (such as air sports), there is a significant passive element and so the activity will be a larger multiple of the exercise component; for others (such as cycling), much of the participation will correspond with the exercise component. Participation instances have been translated into participation days (8-hour day) in the same proportion as the exercise component of the participation multiplied by 2. This would represent a minimum multiple.

## Infrastructure

The NSW nature-based outdoor activity sector is supported by extensive public and private support infrastructure. The 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 (the natural environment where the nature-based outdoor activities occur).

Public and private nature-based outdoor activity infrastructure support the NSW economy and adds 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 data, we estimate that the NSW Government alone spent some \$22.2 million on specific outdoor infrastructure and in supporting public outdoor areas in 2014–15. These investments will have contributed to an estimated \$21.6 million in GVA and some 197 FTEs in New South Wales.

## Economic contribution from NSW schools

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

The ACA database lists public and Catholic school excursions and trip data. We extrapolated participation data for private schools based on NSW public and Catholic school participation and expenditure. The ACA 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 over 2 million nature-based outdoor activity participant days by NSW schoolchildren. After leakages are accounted for, total nature-based outdoor activity

related expenditure for NSW schools generated in the order of \$45 million of expenditure within New South Wales. This translates into some \$25 million in profits, wages and rents (that is, direct GVA) and \$14 million in supply chain activity to generate nature-based outdoor activity goods and services (indirect GVA).

Table 13: Estimates of the economic value of school nature-based outdoor activity in New South Wales

Participation days ('000)	2,000
– day trips ('000)	155
– overnight trips ('000)	1,850
Expenditure (\$ million, 2014)	\$45
Gross value-added (direct and indirect) (\$ million, 2014)	\$39
FTEs (direct and indirect) (2014)	460

# Welfare contributions

We estimate that nature-based outdoor activities in New South Wales contribute to avoided healthcare system costs worth at least \$480 million a year.

## Health and wellbeing

Nature-based outdoor activity and recreation deliver health and wellbeing benefits. This conclusion is clearly supported by a large and robust international evidence base of outcome-based studies (Godbey 2009; Dickson et al. 2008). An emerging evidence base also indicates that nature provides an added value to the known benefits of (indoor) physical activity (Mitchell 2013; Pasanen et al. 2014; Coon et al. 2011; Bowler et al. 2010).

Collectively, these studies show that the benefits of outdoor physical activity are directly associated with improved outcomes for 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 the activity, as well as the person doing the activity.

We estimate that the health benefits of nature-based outdoor activity in NSW are worth around \$480 million each year, measured as the net (adjusted for injury) avoided costs to the NSW 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 New South Wales. Appendix B discusses how we estimated these net avoided cost impacts using recent Department of Infrastructure and Transport estimates.

The health benefit estimates shown in Table 14 include walking, swimming, running and cycling activities within NSW parks only. Again, because we know that these activities also occur as nature-based outdoor activities outside parks, we know that the real health and wellbeing benefit figure is higher than \$480 million a year.

Table 14: Net avoided healthcare costs each year in New South Wales—some key activities

Nature-based outdoor activity	Net health benefit (adjusted for injury) per hour	Total benefit (\$ million)
Walking in NSW parks	\$4	\$63
Running in NSW parks	\$15	\$18
Swimming in NSW parks	\$15	\$59
Cycling in NSW parks	\$15	\$12
Surf sports	\$15	\$135
Triathlons	\$15	\$18
Horse riding	\$4	\$39
Ice / snow sports	\$15	\$15

## Recreation benefit values

People obtain benefits from nature-based outdoor activity over and above how much they pay to do those 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 NSW citizen 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, it is a benefit that should be counted in the 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 NSW citizens is around \$889 million each year. This estimate is based on the number of nature-based outdoor activity participation days in NSW each year (Table 12) and estimates from Australian and international literature of participation day consumer surplus from nature-based outdoor activity. Appendix B discusses our estimation approach in more detail.

## Productivity and production

Similarly to the way nature-based outdoor activity reduces healthcare costs in New South Wales, it is likely to contribute to higher productivity and production by lowering absenteeism and presenteeism at work.

The effect of physical activity on labour productivity in Australia has been looked at previously (MP–KPMG 2008). This work estimates that in 2007–08:

- physical inactivity<sup>3</sup> in Australia contributed to absenteeism and presenteeism that caused GDP to be more than \$9 billion lower than if the population were active
- on average, physical inactivity results in a direct loss of 1.8 working days each year for an average Australian worker; this loss of labour costs Australia around \$458 per employee in forgone labour each year, measured in 2007–08 dollars.

The ABS’s *Australian Health Survey: physical activity, 2011–12* estimates that around 43% of NSW citizens aged 18 or over were physically active in 2011–12; that is, around 57% were insufficiently active. The ABS also estimates that around 2.9 million NSW citizens are currently employed on a seasonally adjusted basis (ABS 2015a).

Unfortunately, for this short analysis we cannot 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 from 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 Appendix B, we estimate that the lost labour cost to the NSW economy due to physical inactivity was somewhere in the order of \$900 million in 2014–15. Another way of looking at this is that the gain

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<sup>3</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 (MP–KPMG 2008).

resulting from 44% of the NSW workforce being physically active is around \$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 are likely to understate the productivity impacts of nature-based outdoor activity for at least two reasons:

- They do not include people not in the workforce at all because of physical inactivity.
- They do not include the value of unpaid work from volunteers and volunteerism.

# Unquantified impacts

Some other potential benefits of outdoor activities are not quantified in this report.

## 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 previous section, for example through improved health and wellbeing, lower absenteeism and presenteeism rates, and the recreation consumer surplus. To avoid the risk of double counting, we do not 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 previous section:

- Meta-analyses show that outdoor education programs can improve self-concept and teamwork among primary and secondary schoolchildren. 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 (QORF 2012), which could translate over time into better workplace performance.
- Outdoor therapy and activities have been linked to reduced delinquency among adolescents at risk (Bowen & Neill 2013, 2015). 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 the costs of law enforcement and the direct damage caused by offending.
- The ABS 2006 General Social Survey found that people 18 years or over who participated in sport or physical recreation were more likely than others to be volunteers in some capacity (QORF 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 the environment and sustainability have not yet been examined through longitudinal research (Dickson et al. 2008).

# Next steps

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

This report shows that the NSW nature-based outdoor activity sector is an important part of the NSW economy, and probably makes far more of a contribution to the state's wellbeing and communities than many of us realise.

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

- **Close data and knowledge gaps:** Several key knowledge gaps have been identified in this work. The largest is for participation in and the economic contribution of walking, running, cycling and swimming nature-based outdoor activities in New South Wales. Those activities account for the bulk of nature-based outdoor activity, but their informal nature means that participation numbers are hard to track, other than in parks from user surveys. There is limited data from surveys of users of parks but little on their activities. A dedicated survey looking at nature-based outdoor cycling, walking, running and swimming activities in NSW would increase confidence in the estimates in this report.
- **Develop a national standard approach for estimating the economic and welfare contribution of nature-based outdoor activity sectors:** Our work found that nature-based outdoor activity subsectors that are evaluating their economic contribution in New South Wales are often using different approaches. Work we have completed in other states shows that different approaches are being used in those jurisdictions. These approaches are not always consistent and transparent. We think that the Australian nature-based outdoor activity sector would benefit from using a uniform approach to estimate the economic and welfare contributions of the various subsectors.
- **Develop industry-standard economic and welfare performance measures:** Similarly, the Australian nature-based outdoor activity sector would benefit from having a uniform set of economic and welfare contribution measures for evaluating industry performance over time.
- **Secure funding for further research and sector development:** Measured in terms of its economic and welfare contribution, the potentially significant size of the nature-based outdoor activity sector in New South Wales means that it warrants further attention. This report starts to build an evidence-based case for additional funding for research into how the sector can be developed to make an even greater contribution to the state's economy and its communities in the future.
- **Identify and develop opportunities to equip the nature-based outdoor activity workforce with the skills to meet current and future demand:** A skilled workforce is essential to meet the current demand for nature-based outdoor activity and underpin future market growth and increased economic benefit. This is particularly relevant in regional areas of NSW which often have access to suitable environments for nature-based outdoor activities.

# Appendix A: Glossary of terms

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

## Economic terms

**Expenditure** 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 to nature-based outdoor activity. It estimates how that expenditure shifts through the NSW economy to supply goods, services, jobs, incomes and taxation revenue.

**Gross value-added (GVA)** is a subset of gross economic output, as imported goods and services used to service incremental expenditures are excluded. GVA includes local business profits and wages paid, and therefore represents economic returns on local capital and labour resources. It measures true contribution of nature-based outdoor activity to the NSW economy because it backs out leakage out of the economy.

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

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

**Indirect contribution** is a measure of sales to businesses where expenditures are made, such as for intermediary inputs bought in the supply chain. For example, petrol stations purchasing petrol refined in NSW produce a flow-on contribution to other parts of the NSW economy.

**Induced contribution** is a measure of sales of goods and services purchased by employees of directly and indirectly affected businesses. A NSW ski-field employee who 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** is the net change in NSW economic activity that is generated by an industry sector (in this case, nature-based outdoor activity).

**Economic multiplier** is 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. For example:

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 is spent importing goods from outside NSW.

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

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

Based on these transactions, there has been \$110 of economic activity in NSW from the initial \$150 (\$15 profit + \$85 wages + \$10 to a grocery store). If no further activity occurs, the economic contribution multiplier is 0.73 (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 (sales, production and consumption of goods and services, employment, tax payments and so on) associated with nature-based outdoor activity. Gross state product (GSP) is a common measure of NSW economic activity.

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

**Economic benefit** is the wellbeing a consumer gains as a result of their 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 must pay.

**Regional Development Victoria input–output model** is a purpose-built economic model that allows the user to estimate total economic activity generated by tourism and infrastructure expenditures in a regional economy.

## Nature-based outdoor activity terms

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

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

**Nature-based outdoor activity participants** are people who 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 or over who make an overnight trip of one night or more and at least 40 kilometres away from home.

**Interstate visitors** are people who visit a state or territory other than the one they live in. An interstate visitor night is any night spent in a state or territory other than the one that the visitor lives in.

# Appendix B: Economic evaluation approach

We used a bottom-up approach to estimate the economic contribution of the NSW nature-based outdoor activity sector. In broad terms, the bottom-up approach sums the individual expenditure contributions of the subsectors that are included in the NSW nature-based outdoor activity sector analysis (Table 2). The key advantage of this 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 (QORF 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 have been 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 described here.

## Nature-based outdoor activity participation in NSW

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

- participation surveys of nature-based outdoor activity, where surveys were available
- the 'Participation in sport and physical recreation, 2013–14' tables obtained from the ABS (this data source is described in Table 16).

### 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 in NSW parks operated by the NPWS), we generally used those participation numbers. Those reports also usually include estimates of how long people spend per day on nature-based outdoor activities.

### Participation in sport and physical recreation

Where activity-specific surveys are not available or were not used, we estimated participation based on 'Participation in sport and physical recreation, 2013–14' tables obtained from the ABS.

The participation rate in this data is the number of people aged 15 years or 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 durations for the activities. We assigned indicative exercise intensity and duration assuming a casual participant. These were then scaled up to also reflect passive enjoyment of the outdoors.<sup>4</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 and so on). In generating overall participation rates, we used the mid-point of each band except for the final one (105 times a year or more). In the 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 those days were spent. The database 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 NSW Department of Education (Number of enrolments, 2015). The analysis included only participation that was identifiably associated with nature-based activities.

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

## Total expenditure on nature-based outdoor activities in New South Wales last year

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

### Trip-based expenditure using Tourism Research Australia estimates of the number of people aged 15 or over who visited each region in New South Wales

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.

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<sup>4</sup> For example, someone bushwalking may spend a half of one day in a national park, but only two hours of that time walking. The rest of the time is spent eating, resting or taking in the views. The health benefits are generated from the time spent exercising, while the recreation benefits reflect the longer time.

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 used TRA data to estimate trip-based, nature-based outdoor activity expenditure, we 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 was defined using the approach for estimating nature-based outdoor activity participation rates discussed above. Trip expenditures were allocated to activities in proportion to the number of activities undertaken in each region. This assumes similar trip-related expenses for most activity categories.

## Expenditure surveys specific to nature-based outdoor activity

Where dedicated surveys are available for specific nature-based outdoor activities (such as skiing in the high country), we used the trip and equipment expenditure figures from those studies and grossed them up. Those reports also usually include expenditure estimates for day and overnight activities.

For walking, cycling, running and swimming, we used NPWS visitor survey data obtained from the NSW Department of Environment and Heritage. This survey data tracks visitor activities for all metropolitan and national parks operated by the department. We also used the data to apportion trip types and activities.

## 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 Camps Association's *Prices and Occupancy Survey report 2012* (inflated to 2014–15). The average figures are expected to be representative and have been extrapolated based on relative student numbers for NSW.

## Equipment investment

The ABS provides estimates of household expenditure on specific equipment used in nature-based outdoor activities in *Value of sport, Australia, 2013* (ABS 2013). Products in the catalogue include bicycles, boats, aircraft, fishing equipment, camping equipment and other categories. Detailed expenditure data per household is available at the national level for 2009–10. Detailed expenditure data per household for New South Wales is available for 2003–04.

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

For outdoor clothing, Australian expenditure on hiking and equipment was derived from IBISWorld's analysis, which identified 42% of total expenditure on outdoor equipment as being for clothing and footwear (and therefore not double counting camping, fishing etc.). Overall, New South Wales represented some 32% of sales in hiking and equipment. These two ratios were applied to generate an estimate of outdoor clothing and footwear expenditure for NSW.

## Private infrastructure investment

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

Alpine investment in New South Wales was reported for 2005 in *The economic significance of the Australian alpine resorts: summary report*, which was prepared for the 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 particularly the ongoing costs for parks (sourced from annual budgets).

In addition, identified ongoing expenditure of other items in the most recent were included and identified investment, both taken from the most recent budget.

## Health benefits

Health benefits reflect the total amount of participation in nature-based outdoor activities by residents. We allocated an indicative duration/intensity 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. Assumed indicative durations and intensities are shown in Table 15.

The (net) health value of physical activity was estimated using the Australian Department of Transport's *Walking, riding and access to public transport* (2012) valuation of the 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, we assumed that the exercise duration reflected half of the overall recreation duration.

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

Table 15: 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
Windsurfing / sailboarding	Moderate	1	Medium activity, medium duration

## Productivity and production

Table 16: Key assumptions used in the productivity and production evaluation

Cost of labour lost due to absenteeism and presenteeism in NSW economy because of physical inactivity, 2015 (\$million)	912
Gain to the NSW economy from avoided absenteeism and presenteeism due to physical activity, 2015 (\$million)	717
<b>Data</b>	
CPI 2007–08 to June 2015 <sup>a</sup>	1.21
NSW employment, seasonally adjusted <sup>b</sup>	2,943,903
Cost of lost labour due to absenteeism and presenteeism per worker inactive, per annum, 2007–08 <sup>c</sup>	\$458
Percentage of population over 18 who are physically inactive, 2011–12 <sup>d</sup>	56%
<b>Key assumptions</b>	
Approximately same level of inactivity between employed and unemployed	
Levels of physical inactivity have not changed materially in the Australian population since 2011–12	
Cost of inactivity per person to the economy has not changed materially since 2007–08	

a ABS (2015b).

b ABS (2015a).

c MP–KPMG (2008).

d ABS (2013).

## Economic contribution calculations

We used the regional economic impact model developed by Regional Development Victoria (RDV) to estimate the regional economic contribution of nature-based outdoor activities in New South Wales. The model provides measures of effects from spending on infrastructure, product sales, trips and travel-related expenses for nature-based outdoor activities. In general, there are direct effects and indirect effects. In looking at the gross or net impact of nature-based outdoor activity on the NSW economy, we need to look at both.

The estimates generated by the RDV regional economic impact model are underpinned by an input–output model developed by SGS Economics from national input–output figures from the ABS, which 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 subtotals and forcing the relationship across all regions to match the Australian total.

While this approach is considered reasonable, given the time and budget available to this project, input–output models have a number of limitations that mean they may overstate the economic contribution of economic activity, including the following (SGS Economics 2014; VAGO 2007):

- **The input–output approach assumes that relationships between industries are static.** That is, productivity improvements are not factored in and historical relationships are assumed to hold. 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, we expect the spender 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 for the 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 local government area.** That is, input–output models assume that labour and equipment are, in effect, unemployed and with no constraints on their availability. This means that crowding out or industry substitution effects (including from saving) 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. If that is not the case, then there is a tendency for input–output models to overstate economic value.

The input–output approach is further constrained by:

- the relevance of the most recent national input–output table, which was based on the structure of the economy in 2001–02
- the high level of discretion that can be applied when disaggregating national tables to a state and regional industry level where those local levels of data are not available.

These issues mean that input–output modelling generally overstates the gross and net economic impact of industry sectors. Changes in spending in an industry, for example, are unlikely to generate the same impact as suggested by the application of input–output multipliers. Ignoring these effects can cause input–output based estimates to overestimate the overall impact on the economy.

# References

- AECOM (2014). *The economic value of boating and marine industries associated with the use of Gippsland Lakes*. Melbourne: AECOM Australia Pty Ltd.
- ABS (Australian Bureau of Statistics) (2013). *Australian Health Survey: physical activity, 2011–12*, cat. no. 4364.0.55.004, July 2013. Canberra: ABS.
- ABS (Australian Bureau of Statistics) (2013). *Value of sport, Australia, 2013*, cat. no. 4156.0.55.002, October 2013. Canberra: ABS.
- ABS (Australian Bureau of Statistics) (2015a). *Labour force, Australia*, cat. no. 6202.0, September 2015. Canberra: ABS.
- ABS (Australian Bureau of Statistics) (2015b). *Consumer Price Index, Australia*, cat. no. 6401.0, June 2015. Canberra: ABS.
- ACA (Australian Camps Association) (2012). *Prices and Occupancy Survey report 2012*. ACA.
- ARCC (Alpine Resorts Co-ordinating Council) (2015). *Victorian alpine resorts: end of season report, winter 2014*. ARCC.
- Bowen, DJ, & Neill, JT (2013). A meta-analysis of adventure therapy outcomes and moderators. *The Open Psychology Journal*, 6, 28–53. doi:10.2174/1874350120130802001.
- Bowen, DJ, & Neill, JT (2015). Effects of the PCYC Catalyst outdoor adventure intervention program on youths' life skills, mental health, and delinquent behaviour. *International Journal of Adolescence and Youth*, doi: 10.1080/02673843.2015.1027716.
- Bowler, D, Buyung-Ali, LM, Knight, TM & Pullin, AS (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health*, 10:456, doi:10.1186/1471-2458-10-456.
- Briceno, T & Schundler, G (2015). *Economic analysis of outdoor recreation in Washington State*. Earth Economics.
- Coon, T, Boddy, K, Stein, K, Whear, R, Barton, J & Depledge, M (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*, <http://pubs.acs.org/doi/abs/10.1021/es102947t>.
- Dickson, TJ, Gray, T & Mann, K (2008). *Australian outdoor adventure activity benefits catalogue*. Canberra: Outdoor Council of Australia.
- Department of Transport (2012). *Walking, riding and access to public transport: supporting active travel in Australian communities*. Ministerial statement. Canberra: Australian Government.
- Godbey, G (2009). *Outdoor recreation, health, and wellness: understanding and enhancing the relationship*. Washington DC: Resources For the Future.

Groot, RD, Brander, L, Ploeg, SV, Costanza, R & Bernard, F (2012). Global estimates of the value of ecosystems and their services in monetary units. *Ecosystem Services*, 1(1) 50-61.

Mitchell, R (2013). Is physical activity in natural environments better for mental health than physical activity in other environments? *Social Science & Medicine*, 91:130-4.

MP-KPMG (Medibank Private and KPMG-Econtech) (2008). *The cost of physical inactivity*. Melbourne: Medibank Private.

Neill, JT (2008). Meta-analytic research on the outcomes of outdoor education. Paper presented to the 6th Biennial Coalition for Education in the Outdoors Research Symposium, Bradford Woods, Indiana, 11–13 January, 2002.  
<http://wilderdom.com/research/researchoutcomesmeta-analytic.htm>.

Pasanen, TP, Tyrväinen, L & Korpela, KM (2014). The relationship between perceived health and physical activity indoors, outdoors in built environments, and outdoors in nature. *Applied Psychology: Health and Well-Being*, 6(3):324–346.

QORF (Queensland Outdoor Recreation Federation) (2012). *Measuring the contribution of the outdoor recreation sector in Queensland*. Brisbane: QORF.

VAGO (Victorian Auditor-General's Office) (2007). *State Investment in Major Events*.

Victorian Government (2009). *Economic study of recreational fishing in Victoria: headline results, VRFish*.

# Acronyms and abbreviations

ABS	Australian Bureau of Statistics
ACA	Australian Camps Association
FTE	full-time equivalent
GDP	gross domestic product
GVA	gross value-added
LGA	local government area
NPWS	National Parks and Wildlife Service
RDV	Regional Development Victoria
TRA	Tourism Research Australia

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