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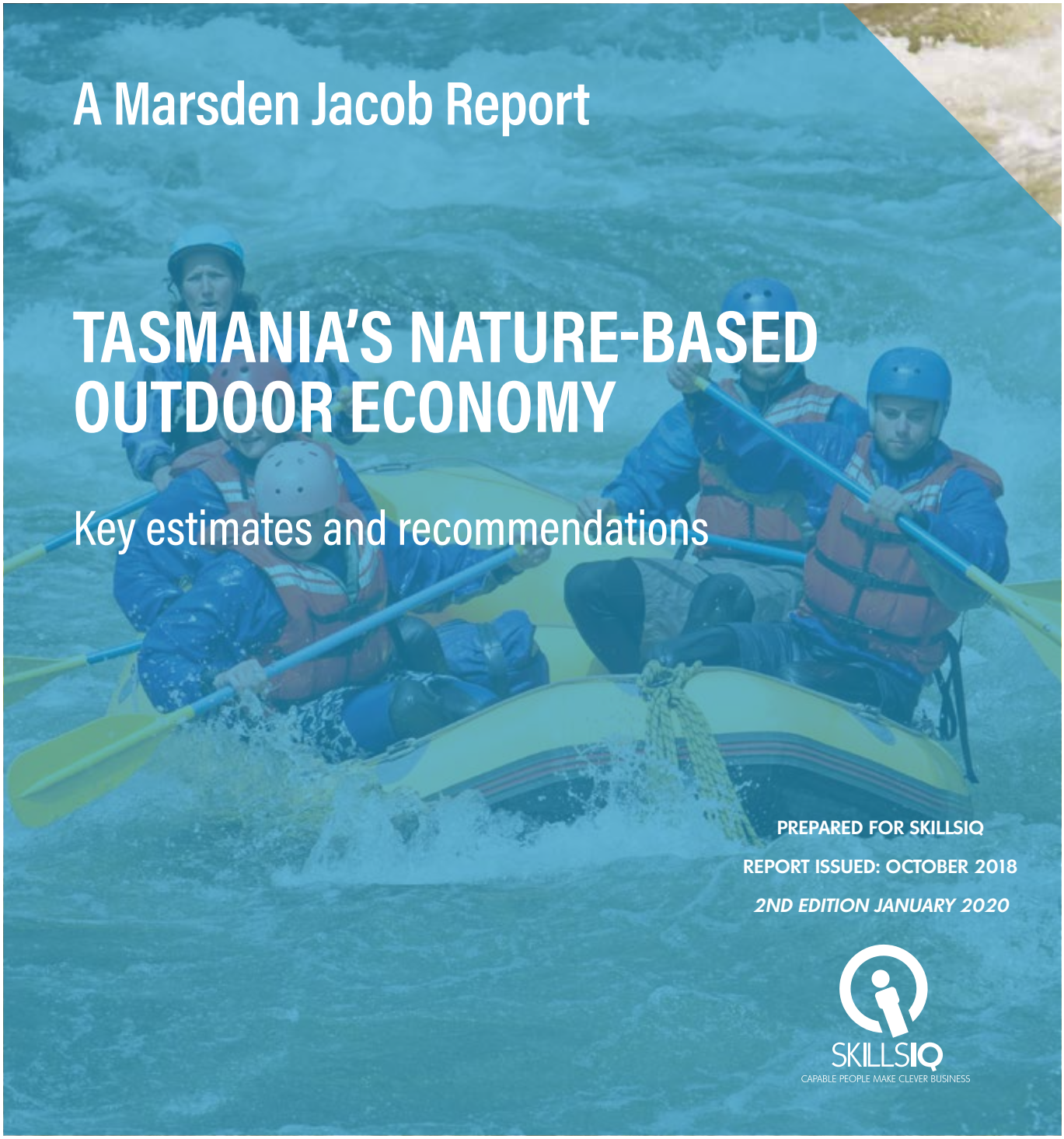

A Marsden Jacob Report

TASMANIA'S NATURE-BASED OUTDOOR ECONOMY

Key estimates and recommendations

PREPARED FOR SKILLSIQ

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SKILLSIQ

CAPABLE PEOPLE MAKE CLEVER BUSINESS

Outdoor recreation in Tasmania (2016)

8 HEADLINE NUMBERS

5 MILLION

Number of times Tasmanian residents aged 15 years and over participated in nature based outdoor recreation

14 MILLION

Hours of outdoor recreation by Tasmanian residents aged 15 and over

49%

Walking, running and cycling accounted for around 49% of total outdoor recreation by residents aged 15 and over

68 THOUSAND

Number of times Tasmanian schoolchildren participated in nature-based outdoor activity

$334 MILLION

Estimated total spending on outdoor recreation in Tasmania

3,100 FTE

Full-time equivalent jobs attributable to outdoor recreation in Tasmania

$173 MILLION

Estimated direct gross value added attributable to outdoor recreation in Tasmania

$28 MILLION

Lifetime avoided healthcare costs from outdoor activity in Tasmania

Summary

Many people in Tasmania 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 Tasmania's nature-based outdoor activity sector is a larger part of the Tasmanian economy than most of us realise. Around $334 million is spent each year on nature-based outdoor activities in Tasmania. This expenditure makes a $173 million contribution to the state's economy and supports around 3,100 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 Tasmanian economy worth at least $28 million a year, and $65 million in other recreation benefits for people living in Tasmania. For reasons we discuss in this report, these estimates more likely underestimate than overestimate the benefits of nature-based outdoor activity in Tasmania.

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

Tasmania'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 Tasmania's natural environments.

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

This report begins to develop this picture of Tasmania's outdoor sector. In doing so, the report establishes an important evidence base to underpin SkillsIQ'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 Tasmania's (Tas) nature-based outdoor activity	
Participation by Tas citizens (incidences of active and passive nature-based outdoor activity)	5 million
Hours of physical activity by Tas citizens	14 million
Nature-based outdoor activity expenditures—all sources ($ million 2016)	$334
Gross value added ($ million 2016) - Direct - Indirect	$254 $173 $81
FTEs (2016) - Direct - Indirect	3,100 2,500 700
Recreation value (consumer surplus, $ million 2016)	$65
Avoided costs to the Tas healthcare system ($ million 2016)	$28

Next steps

While Tasmania's nature-based outdoor activity sector is an important part of the Tasmanian 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 consensual approach for evaluating the contribution of Tasmania'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 in relation to participation and the economic contribution of walking, running, cycling and swimming nature-based outdoor activities in Tasmania. These activities account for the bulk of nature-based outdoor activity in Tasmania, 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 Tasmania would increase confidence in the estimates in this report.
- **Develop a national standard approach to 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 Tasmania 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 Tasmania 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 Tasmania'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 Tasmania, which often have access to suitable environments for nature-based outdoor activities.

Contents

Introduction

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

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

Tasmania'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 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 SkillsIQ'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 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 Tasmania
- discussion of other benefits and impacts of nature-based outdoor activity in Tasmania, where credible quantification of economic values is not possible
- clear identification of possible next steps to improve our understanding of the economic value of nature-based outdoor activity in Tasmania.

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.

The appendices 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 additional reports for other jurisdictions.

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 Tasmanian 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 appendices 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 Tasmania. For this evaluation, we have included only walking, cycling, running and swimming activities that occur in Tasmanian metropolitan and non-metropolitan parks.

As we show later in the report, walking, running, cycling and swimming account for the bulk of recreation activities in Tasmania. 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 Tasmania's many metropolitan and non-metropolitan parks.

Because our evaluation includes walking, running, cycling and swimming activities only when they have occurred in Tasmanian parks, the nature-based outdoor activity estimates in this scoping report of the economic contribution of nature-based outdoor activity in Tasmania 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[a]	100%
Fishing	100%
Four-wheel driving[a]	n.a.
Geocaching / treasure hunts[a]	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[b]	100%
Swimming / diving	100%
Walking	100%

a Within Tasmania 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 the following classifications to define the nature-based outdoor sector for this evaluation. It comprises 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: Nature-based outdoor sector classifications

Nature-based outdoor sector	Definition of classifications
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 sub-set 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.

Outdoor regions

We used Tourism Research Australia's tourism campaign regions as the basis for our evaluation.

Table 3 lists Tasmanian tourism campaign regions, with population and area based on ABS data.[1] 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: Tasmanian tourism campaign regions

Campaign region	Population	Area (sq km)
Hobart and the South	254,385	11,654
North West	109,351	7,497
Wilderness West	4,483	3,939
East Coast	10,962	5,842
Launceston, Tamar and the North	137,405	11,446

Economic framework

Tasmanian nature-based outdoor activities contribute to the 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 Tasmania, 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 Tasmanian 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.

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 developed estimates for these Tasmanian 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 indicative regional 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. However, a national analysis was subsequently conducted using the data gathered through the development of the state-based reports and computable general equilibrium modelling was applied to estimate the national economic impacts of nature-based activity. The findings of the national analysis are reported separately.

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. They are as follows:

- **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 Tasmanian 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 GVA. In this report, we report total FTE (direct plus indirect FTE) impacts.

Welfare contribution

The economic benefits of nature-based outdoor activities to Tasmania 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 as a result of nature-based activity and the value of environmental services provided by outdoor recreation areas to those who don't actively take part in outdoor recreational activities themselves. 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 in terms of 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 follows:

- **Avoided healthcare benefits:** These are measured as the net (adjusted for injury) avoided costs to the Tasmanian 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[2]) 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:

- **Volunteering:** Significant support is provided to the outdoor sector through unpaid community group and individual work. Perhaps, the most obvious example is the work by the various scouting organisations but will also include informal activities such as community members maintaining local facilities through 'working bees'.
- **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.

Figure 1: Economic and welfare contribution of nature-based outdoor activities to Tasmania (Tas)

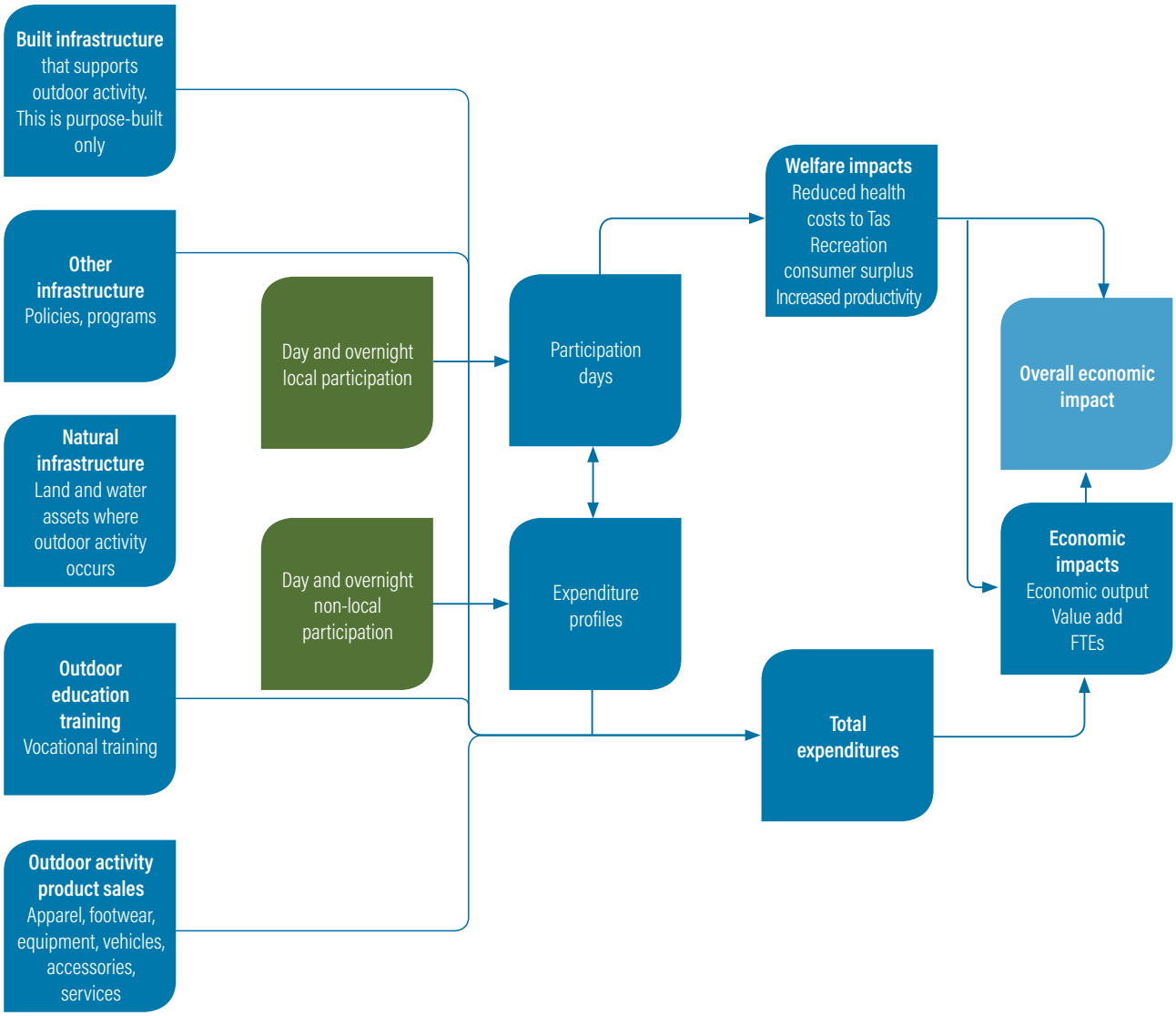

Table 4: Economic benefit values in scope

Economic benefit value	Scope	Relevant measures
Economic contribution	**Services and goods, non-tourism.** Nature-based outdoor recreation expenditure by Tas 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). **Services and goods, tourism.** Nature-based outdoor recreation expenditure by non-Tas 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 Tas by non-locals). Economic impact of nature-based **outdoor recreation infrastructure** (capital and maintenance).	Expenditure, direct and indirect GVA and FTEs
Welfare contribution	Individual welfare (aggregates as community welfare): ▪ Avoided health costs ▪ Production and productivity from lower absenteeism and presenteeism	Avoided cost
	▪ Recreation value (consumer surplus)	Consumer surplus
	▪ Community and social cohesion and educational impacts	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, *Participation in sport and physical recreation, Australia, 2009–14*, cat. no. 4177.0	Data provides total effort (duration, frequency) in outdoor recreation. Note that not all categories apply. Data limited to people 15 years and over.
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, *Value of sport, Australia, 2013*, 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 Tas nature-based outdoor activities. These studies use a range of approaches to measure economic impacts and welfare values and are identified in Appendix B.

Headline estimates

We estimate that residents and visitors to Tasmania spend at least $334 million each year on nature-based outdoor activities and equipment. Nature-based outdoor activity contributes to avoided healthcare system costs in Tasmania worth at least $28 million a year and recreation benefits worth $65 million a year.

Our headline estimates underscore the significance of the nature-based outdoor activity sector to the Tasmanian economy and the wellbeing of Tasmanian 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 Tasmanian parks, the headline estimates of economic contribution of nature-based outdoor activity in Tasmania 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, in 2016 around 5 million nature-based outdoor activities occurred in Tasmania, including around 1 million nature-based walking, running, cycling and swimming activities in Tasmanian parks. We estimate that the 5 million instances of activity included around 14 million hours of physical activity, including around 2 million hours of walking activity.

Total nature-based outdoor activity related expenditure currently generates in the order of $334 million of sales within Tasmania each year. These sales generate substantial wages, profits and rents for Tasmania of around $173 million (that is, GVA direct contribution) and another $81 million in supply chain activity to generate nature-based outdoor activity goods and services (indirect GVA contribution).

Approximately 3,100 FTE positions are supported in Tasmania 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 Tasmania are estimated to generate significant health and wellbeing values for the state. We estimate that the avoided costs to the Tasmanian healthcare system attributable to nature-based outdoor activity alone are worth at least $28 million a year.

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

Participation (incidences of active and passive nature-based outdoor activity) ▪ By Tas citizens 15 years and over ▪ By Tas schoolchildren	5 million 5 million 0.1 million
Hours of physical activity ▪ By Tas citizens 15 years and over ▪ By Tas schoolchildren	 14 million 0.1 million
Nature-based outdoor activity expenditures—all sources ($ million 2016)	$334
Gross value added ($ million 2016) ▪ Direct ▪ Indirect	$254 $173 $81
FTEs (2016) ▪ Direct ▪ Indirect	3,100 2,500 700
Recreation value (consumer surplus $ million 2016)	$65
Avoided costs to the Tas healthcare system ($ million 2016)	$28

Economic contribution

We estimate that residents of and visitors to Tasmania spend around $334 million each year on nature-based outdoor activities and equipment.

Equipment and recreation

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

Our evaluation estimates that equipment and trip and travel related expenditure readily identifiable by Tasmanian and non-Tasmanian sources totals some $281 million 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%).

In addition, we have included estimates from industry analysis where this extends the coverage. In particular, a number of Western Australian reports provide insights into tourism in specific sectors. These have been used to derive estimates for Tasmania.

The Western Australian horse riding strategy[3] reported that national recreational horse riding contributed around $650 million to national GDP and allocated some $80 million to Western Australia based on 2010 relative shares. It is likely that this estimate is not incorporated within the allocated estimates for household and tourist expenditure. We have updated this figure for inflation and more recent ABS participation data to allocate some $23 million to spending for Tasmania.

A second recreation industry that is likely to have contributed significantly to Tasmania's economy is mountain biking. A 2013 report into the northern Tasmanian mountain bike tourist market suggested that some 2,300 visitors ride while in the region and that 26,000 rode when visiting Tasmania as a whole.[4] In addition, it estimated that some 20,000 Tasmanians rode mountain bikes for recreation. In Derby, the 40km of mountain bike trails built before 2015 were expected to add $15 million to the regional economy and 100 jobs.[5] It is not clear whether this tourism spending would be in addition to or partly instead of existing nature based expenditure.

Recent reports[6] into trail bikes in Western Australia highlight the spending by participants on their activity. That state's strategy reported new and old bike sales of $61 million and $37 million respectively in 2006. There has been significant expenditure over the past five years in expanding mountain bike trails across Tasmania. It is not clear what the equivalent sales figure would be for Tasmania. We have included a pro rata estimate of $11m for new bike purchases.

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

	Expenditure ($ million)	GVA ($ million)	FTEs
Total	$281	$217	2,700
Trips, travel and activities	$158	$117	1,500
Local expenditure	$122	$100	1,200

Economic contribution by region

Our economic contribution analysis of the Tasmanian tourism campaign regions found that nature-based outdoor activities make significant contributions to many Tasmanian regional economies. Tables 8 to 11 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.

In addition, we have used surveys of park usage in a number of states to inform activities in Tasmanian parks. Survey data is aggregated at the level of metropolitan and national park visits for walking, cycling, running and swimming. This data relating to parks has not been regionalised in this report.

Table 8: Regional nature-based outdoor activity participation hours

Campaign region	Activity hours (million)
Tasmania total	**14.1**
Hobart and the South	5.7
North West	3.5
Wilderness West	0.1
East Coast	0.4
Launceston, Tamar and the North	4.4

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

Table 9: Regional nature-based outdoor activity GVA (direct and indirect, $ million)

Campaign region	GVA
Tasmania total	**$254**
Hobart and the South	$103
North West	$43
Wilderness West	$17
East Coast	$48
Launceston, Tamar and the North	$43

Note: Appendix B discusses this disaggregation approach in more detail.

Our evaluation shows that participant hours by tourism campaign region are driven largely by specific activities and population distribution. The park survey data does not provide sufficient detail to translate participation times into participation hours.

Table 10: Regional nature-based outdoor activity FTE contribution (direct and indirect)

Campaign region	FTEs
Tasmania total	**3,100**
Hobart and the South	1,300
North West	500
Wilderness West	200
East Coast	600
Launceston, Tamar and the North	500

Our evaluation shows that participant hours by tourism campaign region are driven largely by specific activities and population distribution (Table 11).

Table 11: Participant days and ratio per resident population, excluding walking, cycling, swimming and running activities in Tasmanian parks

Region	Population ('000)	Participation days[a]	Participation ratio[b]
Hobart and the South	254.4	867.4	3.41
North West	109.4	372.9	3.41
Wilderness West	4.5	15.3	3.41
East Coast	11.0	37.4	3.41
Launceston, Tamar and the North	137.4	468.5	3.41

a Participation days are calculated as participation hours ÷ 8.

b Participation ratios are defined only on a state basis.

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.

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 would be higher than those shown in Table 11 if the tourism survey data were able to be disaggregated by region. It also means that the figures shown in Table 11 largely reflect the distribution of activities shown in Table 1.

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 (water sports), or both.

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

Infrastructure

The Tasmanian 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 supports the Tasmanian economy and adds to the 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,[7] we estimate that the Tasmanian Government alone earmarked some $31 million on specific outdoor infrastructure and in supporting public outdoor areas in 2017–18. These investments will have contributed to an estimated $25 million in GVA and some 236 FTEs in Tasmania.

Economic contribution from Tasmanian schools

As part of our evaluation, we specifically looked at nature-based outdoor activity participation and the economic contribution of Tasmanian 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) and extrapolated for Tasmania.

The ACA database lists public and Catholic school excursions and trip data. We extrapolated participation data for private schools based on Tasmanian 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 2016 there were approximately 15,000 nature-based outdoor activity participant days by Tasmanian schoolchildren. After leakages are accounted for, total nature-based outdoor activity related expenditure for Tasmanian schools generated in the order of $3 million of expenditure within Tasmania. This translates into some $1.5 million in profits, wages and rents (that is, direct GVA) and $0.7 million in supply chain activity to generate nature-based outdoor activity goods and services (indirect GVA).

Table 12: Estimates of the economic value of school nature-based outdoor activity in Tasmania

Participation days ('000)	15
Expenditure ($ million, 2016)	$3.0
Gross value added (direct and indirect) ($ million, 2016)	$2.2
FTEs (direct and indirect) (2016)	28

Other contributions from nature based sub-sectors

Within the estimates described above are many sub-sectors that provide opportunities for locals and tourists to enjoy nature-based recreation and exercise in Tasmania. For locals in particular, these opportunities are often the underlying or sole reason for either day trips or overnight stays in a region. For interstate and overseas visitors, the opportunities may also be a main reason for visiting both the region and Tasmania more broadly.

The availability of these opportunities and the enhancement of their associated facilities over time provides a means for Tasmania to take advantage of its natural assets. Recent analysis has been undertaken across a range of activities and we have highlighted a number of these below.

As noted above, mountain biking is making a significant contribution to economic activity is some areas of Tasmania. This is consistent with reports elsewhere[8] that note that tourists who cycle spend more on average than other tourists. This reflects the cycling tourists' need to 'travel light' and to therefore spend more where they are visiting. In the case of international cycle tourists, these spent an average of $5,005 per person in 2013 compared with $2,870 for all international tourists.

A report on scuba diving[9] in Australia identified the amount spent by scuba club members and tourists. The latter are included within our overall tourist expenditure figures identified above. However, the report suggested that about $125 million was spent by club members in Australia in 2014. The equivalent figure for Tasmania would be included within overall household spending on water activities (some $510,000).

Welfare contributions

We estimate that nature-based outdoor activities in Tasmania contribute to avoided healthcare system costs worth at least $28 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 physical condition of the person doing the activity.

We estimate that the health benefits of nature-based outdoor activity in Tasmania are worth around $28 million each year, measured as the net (adjusted for injury) avoided costs to the Tasmanian 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 Tasmania. Appendix B discusses how we estimated these net avoided cost impacts using recent Australian Government Department of Infrastructure and Transport estimates.[10]

The health benefit estimates shown in Table 13 include walking, swimming, running and cycling activities within Tasmanian 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 $28 million a year.

Table 13: Net avoided healthcare costs each year in Tas—some key activities

Nature-based outdoor activity	Net health benefit (adjusted for injury) per hour	Total benefit ($ million)
Walking in Tas parks	$2	$1.2
Running in Tas parks	$8	$0.5
Swimming in Tas parks	$8	$0.9
Cycling in Tas parks	$8	$0.3
Swimming / Diving	$4	$3.3
Bush walking	$7	$3.0
Horse riding / Equestrian activities / Polo	$8	$2.6
Surf sports	$15	$1.6

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 Tasmanian 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 Tasmanian citizens is around $65 million each year. This estimate is based on the number of nature-based outdoor activity participation days in Tasmania each year (Table 11) 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

Similar to the way in which nature-based outdoor activity reduces healthcare costs in Tasmania, 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 (Medibank Private and KPMG-Econtech 2008). This work estimates that in 2007–08:

- physical inactivity[11] 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 Tasmanian citizens aged 18 or over were physically active in 2011–12; that is, around 57% were insufficiently active. The ABS also estimates that around 249,400 Tasmanian citizens are currently employed on a seasonally adjusted basis (ABS 2018).

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 Tasmanian economy due to physical inactivity was somewhere in the order of $85 million in 2017–18. Another way of looking at this is that the gain resulting from 41%of the Tasmanian workforce being physically active is around $59 million. Nature-based outdoor activity contributes to some of this productivity gain.

Consistent with the earlier work by Medibank Private and KPMG-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 (Queensland Outdoor Recreation Federation [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 figures presented in this report are estimates. Our main aim has been to present order of magnitude estimates of the economic and welfare contribution of Tasmania's nature-based outdoor activity sector to the community, based on the best available evidence.

This report shows that the Tasmanian nature-based outdoor activity sector is an important part of the Tasmanian 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 consensual 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 Tasmania. 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 Tasmania 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 sub-sectors that are evaluating their economic contribution in Tasmania 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 sub-sectors.
- **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 Tasmania 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 Tasmania, 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 Tasmanian economy to supply goods, services, jobs, incomes and taxation revenue.

Gross value added (GVA) is a sub-set 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 Tasmanian 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 Tasmania produce a flow-on contribution to other parts of the Tasmanian economy.

Induced contribution is a measure of sales of goods and services purchased by employees of directly and indirectly affected businesses. A Tasmanian horse riding employee who buys milk from Launceston using income they earned in the nature-based outdoor activity sector is creating an induced contribution for the Tasmanian economy.

Economic impact is the net change in Tasmanian 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 Tasmania.
>
> The employees spend $85 on food. Most of the food is imported from outside Tasmania, 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 Queensland, which creates no further economic activity in Tasmania (this is called economic leakage).
>
> Based on these transactions, there has been $110 of economic activity in Tasmania 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 Tasmanian 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 consumers gain 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 people are 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 Tasmania'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 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 Tasmanian nature-based outdoor activity sector. In broad terms, the bottom-up approach sums up the individual expenditure contributions of the subsectors that are included in the Tasmanian 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 Tasmania

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 walking, swimming, running and cycling in Tasmanian parks), 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 of 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.[12]

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 *Schools Australia, 2017*. 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 Tasmania in 2016

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 (TRA) estimates of the number of people aged 15 or over who visited each region in Tasmania.

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 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 cycling on trails), 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 National Parks and Wildlife Service (NPWS) visitor survey data for New South Wales and applied it to Tasmania. This survey data tracks visitor activities for all metropolitan and national parks. 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.

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 Tasmania is available for 2003–04.

The ratio of Tasmanian expenditure per household in 2003–04 to national expenditure per household in 2003–04 was used to adjust the Australian figure for 2009–10. This was then grossed up for the number of Tasmanian 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, Tasmania represented some 2% of sales in hiking and equipment. These two ratios were applied to generate an estimate of outdoor clothing and footwear expenditure for Tasmania.

Private infrastructure investment

There is limited information on private investment in outdoor recreational facilities and infrastructure. We used primary data where it is available. Tourism accommodation investment is allocated across regions weighted by the extent of outdoor activities.

Public expenditure

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 Tasmanian budget was included. Identified investment in the most recent budget was separately included (the 'enhanced National Parks' measure).

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 14.

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 14: Nature-based outdoor activity—assumed intensity and indicative duration

Activity	Intensity	Indicative duration	Description
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 15: Key assumptions used in the productivity and production evaluation

Cost of labour lost due to absenteeism and presenteeism in Tas economy because of physical inactivity, 2018 ($million)	85
Gain to the Tas economy from avoided absenteeism and presenteeism due to physical activity, 2018 ($million)	59
Data	
CPI 2007–08 to June 2018[a]	1.26
Cost of lost labour due to absenteeism and presenteeism per worker inactive, per annum, 2007–08[b]	$458
Percentage of population over 18 who are physically inactive, 2011–12[c]	59%
Key assumptions 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 (2018b).

b MP–KPMG (2008).

c 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 Tasmania. The model provides measures of the effects of 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 Tasmanian 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 sub-totals, 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 attributable to 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.

Table 16: Key data sources—full list

Information	Key sources	Comment
Participation and trends in outdoor recreation activity in Tas (non-tourism and tourism)	ABS, *Participation in sport and physical recreation, Australia, 2009–14,* cat. no. 4177.0	This data provides total effort (duration, frequency) in outdoor recreation activities used in this report. The data is limited to people aged 15 years or over.
	Tourism Research Australia, National Visitor Survey, 2009–14	This data provides activities by stopover for domestic trips, day and overnight. International activities are at the Australia / total trip level only. Both datasets include visitors aged 15 years and over only and are subject to sample size censoring.
Expenditure on outdoor recreation products and employment in nature-based outdoor activities	ABS, *Value of sport, Australia, 2013,* 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), Employment 2011, diving instructor (open water), fishing guide, boat builder and repairer, bungy jump master, greenkeeper, hunting guide, etc. 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 was used to estimate outdoor equipment expenditure where expenditure was not covered by the ABS *Value of sport, Australia* estimates.

Information	Key sources	Comment
Expenditure, welfare values and trends in outdoor recreation activity in Tas (non-tourism) (list not exhaustive)	Marsden Jacob Associates, *Economic impact and welfare values of Victorian regional and rural trails,* 2015 Synergies Economic Consulting, *Measuring the contribution of the outdoor recreation sector in Tasmania, 2012* (transfer values) Tasmanian Department of Sport and Recreation, *More than winning: the real value of sport and recreation in Tasmania*, 2013 Daniel Otto, Kristin Tylka, Susan Erickson, *Economic value of outdoor recreation activities in Iowa*, Iowa State University Earth Economics, *Economic analysis of outdoor recreation in Washington State*, 2015 Medibank Private, *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, MH Depledge, 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*, 2011, 45(5):1761–1772 A Ghermandi, PALD Nunes, A global map of coastal recreation values: results from a spatially explicit meta-analysis, *Ecological Economics*, 2014, 86:1–15 A Sen, A Harwood, IJ Bateman, P Munday, A Crowe, L Brander, J Raychaudhuri, AA Lovett, J Foden, A Provins, Economic assessment of the recreational value of ecosystems: methodological development and national and local application, *Environmental and Resource Economics,* 2014, 57(2).	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 study completed by Marsden Jacob Associates.
Volunteerism	ABS, *Value of sport, Australia*, 2011	This study includes some limited data on volunteerism.

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Footnotes

1 Regions shown based on Tourism Research Australia, *Regional tourism statistics*, with population and area derived from ABS Cat Nos. 3235.0, 1270.0, 9503.0.

2 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.

3 The Australian Trail Horse Riders Association *Discussion Papers: The Western Australian Recreational Horse Trail Strategy*

4 TRC (2013) *Potential for mountain biking in north eastern Tasmania: market demand and economic assessment,* report prepared for Northern Tasmania Development, March, pp. 7-8.

5 ABC News (2015) "'Mountain bike tourism' helps drive economic turnaround in Tasmania's north east", http://www.abc.net.au/news/2015-05-18/derby-mountain-bike-trails-impress-after-first-major-test/6476668, accessed 12 October 2017

6 Department of Recreation et al. (2016) *Manjimup Trail Bike Trails Hub – Feasibility Report and 2007's Back on Track – The State Trails Bike Strategy*

7 Government of Tasmania (2017) *Government Services Budget Paper No 2*, Volume 1

8 NBD Marketing *Nannup Trails Hub – Potential and Opportunities, South West Mountain Bike Master Plan*

9 Centre for Conservation Geography (2015) *The scuba dive industry in Australia: Towards estimates of economic size and impact*

10 Department of Infrastructure and Transport (2012) *Walking, Riding and Access to Public Transport. Supporting active travel in Australian communities.*

11 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 KPMG-Econtech 2008).

12 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.

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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