Great Forest National Park: economic contribution of park establishment, park management, and visitor expenditure

3 February 2017

Acknowledgements

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Executive summary

Nous Group (Nous) was engaged by The Wilderness Society to undertake a **narrowly scoped analysis**, projecting the **additional economic activity** generated by the Great Forest National Park (GFNP) through **park establishment, park management** and **potential additional visitor expenditure.** The impact of the establishment of the GFNP on other forms of economic activity was specifically not in scope[1].

Under the GFNP proposal prepared by forest conservation groups, the existing reserve system in the Central Highlands will be expanded by approximately 353,000 hectares to create a contiguous reserve system spanning 537,000 hectares.

The scientific case for the GFNP has been examined relatively extensively. The ecological imperative for protecting the Mountain Ash ecosystem of the Central Highlands from further damage (and the threatened species which inhabit it such as Leadbeater's possum), and the value of ecosystem services such as biodiversity preservation, water provisioning and carbon sequestration have been considered in detail in other research.

Consultations with stakeholders undertaken over the course of this project highlighted the significant tourism appeal of the Central Highlands' Mountain Ash Forests. As the tallest flowering trees in the world, they provide a point of differentiation and set the forests of the Central Highlands apart as a unique place to visit.

Visitation and satisfaction data for existing National Parks in the proposed GFNP system (specifically the Yarra Ranges, Kinglake, Lake Eildon and Baw Baw National Parks) indicates that the tourism potential of the Mountain Ash Forests has not been realised under existing arrangements. Specifically, poor accessibility to the forests' most spectacular attractions limits visitation and is detrimental to public perception and awareness of the forests as a tourist destination.

Given planning for the GFNP is in the preliminary stages, our analysis considers the economic impact of the GFNP under three distinct scenarios which represent different options for implementing the GFNP proposal. The analysis is conservative and based on publicly available information.

- **Scenario 1 – *Change in tenure*:** involves only a change in tenure with no other changes made to the status quo.

- **Scenario 2 – *Publicly funded attraction*:** considers the scenario where the park is established with funding from the government for infrastructure and more extensive park management.

- **Scenario 3 – *Private investment*:** assumes private investment is attracted to the region, contributing to the establishment of the GFNP as a significant tourism destination and enabling the GFNP to realise more of its tourism potential.

Analogous case studies and research highlighted by stakeholders through the consultation process were drawn on to inform defensible assumptions and derive estimates of increased direct expenditure from park establishment, park management and higher visitation. Estimates of direct expenditure were then used to approximate the GFNP's contribution to economic activity (measured through Gross Value Added – GVA) using a purpose-built IO model tailored to the specific Local Government Areas (LGAs) in the study area.

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[1] For example, the impact of the establishment of the GFNP on the forest logging industry was not in scope, although this has been the subject of other studies e.g. Dench, McClean Carlson – K2 Planning, *Assessment of the Economic, Environmental and Social Impact of the Proposal Great Forest National Park to the Yarra Ranges Municipality*. March 2016.

In the final year of the forecast period for this analysis, Scenarios 1, 2, and 3 generated an additional $7.5 million, $48.6 million and $71.1 million respectively. These results, and the trend in GVA over time across all three scenarios, are presented in the figure below.
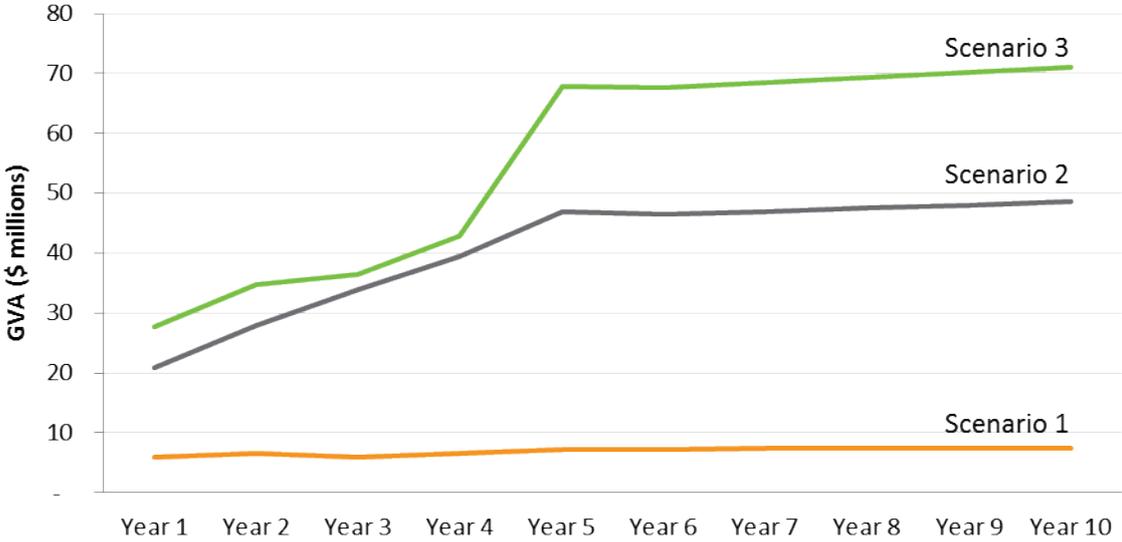
The additional economic activity created by the GFNP will support additional regional employment, with estimates of direct and indirect employments effects derived using standard employment coefficients. In the final year of the forecast period for this analysis, Scenarios 1, 2, and 3 were associated with an additional 80, 520 and 760 FTE jobs respectively. Most of the additional regional employment occurs in the development phase of the establishment of the GFNP. For example, under Scenario 3, the GFNP will support an additional 720 FTE jobs by year 5 of the forecast period.

While the modelled visitation effects focused predominantly on tourism potential for the region, we also note that the GFNP has potential, as an iconic attraction, to boost tourism to the state of Victoria more broadly. By providing a unique, appealing nature-based attraction which can be marketed to interstate and international visitors, the GFNP can be leveraged to provide economic benefits which extend beyond the regions studied.

Further, we note that government investments in park management or infrastructure are often developed on a case-by-case basis, with a broadly linear relationship whereby more investment leads to greater benefits. Scientists have identified that a GFNP may need enhanced levels of management and restoration, which would in turn drive increased economic benefits, but due to the absence of comparable publicly available data in analogous settings, this additional investment has not been included in the analysis.

1 The economic potential of the Great Forest National Park has received little attention to date.

The Great Forest National Park (GFNP) is a proposed parks system in Victoria's Central Highlands which will see over ten smaller parks incorporated into a single, contiguous reserve system.[2] The Central Highlands region of Victoria is located around towns such as Healesville, Kinglake, Toolangi, Warburton, Marysville and Wood's Point.[3] The current reserve system consists of only 184,000 hectares, spread across a number of small, fragmented reserves.[4] Existing parks include:

- Yarra Ranges National Park;
- Baw Baw National Park;
- Kinglake National Park;
- Lake Eildon National Park;
- Cathedral Range State Park;
- Upper Yarra Reservoir Park;
- Kurth Kiln Regional Park;
- Moondarra State Park; and
- Bunyip State Park.

A map of the proposed plan for the GFNP is provided in Figure 1.

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[2] Working Group for the Great Forest National Park, *A new park economy*, MyForests Inc, Canberra, 2016. Accessed from: http://www.greatforestnationalpark.com.au/park-economy.html

[3] David Lindenmayer, *Why Victoria needs a Great Forest National Park,* MyForests Inc, Canberra, 2016. Accessed from: http://www.greatforestnationalpark.com.au/park-plan.html.

[4] Ibid.

Figure 1: Map of the proposed GFNP system (shaded dark green)[5]
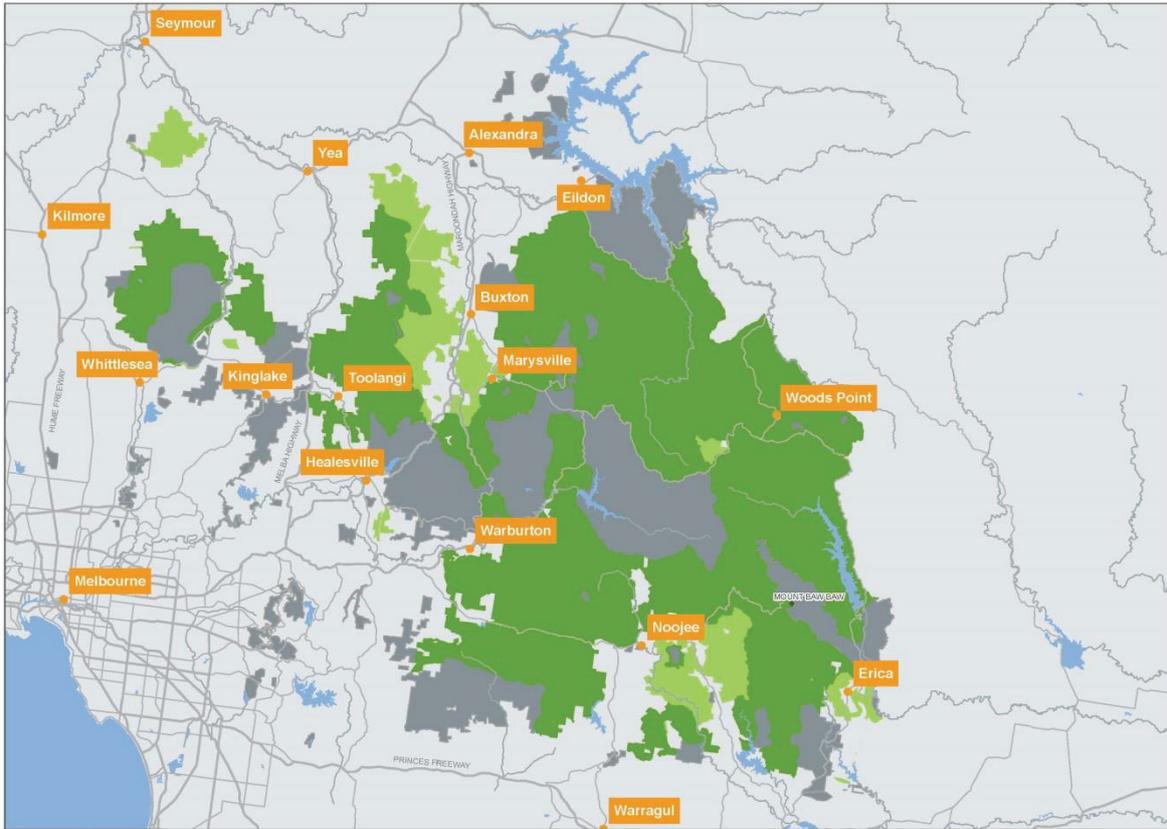
Under the GFNP proposal the reserve system will be expanded by approximately 353,000 hectares to create a contiguous reserve system spanning 537,000 hectares.[6] This is summarised in Table 1.

Table 1: Extension of the reserve system under the GFNP

	Existing land tenure area (ha)	Proposed change in area (ha)	Proposed land tenure area (ha)	Percentage increase/decrease
Conservation reserves	183,542	+353,213	536,755	+192
State forest	417,916	-353,213	64,703	-86

Source: Working Group for the Great Forest National Park, Great Forest National Park Tenure, values and reserve design methodology, 2015.

The creation of new national parks in eastern Victoria is currently being considered by the Victorian State Government (the State Government) through a taskforce comprised of representatives from

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[5] This product incorporates data 1999-2016 (c) The State of Victoria, Department of Environment, Land Water and Planning (c) Commonwealth of Australia (Geoscience Australia) and licensed for re-use under the Creative Commons Attribution 4.0 International Licence (or former Creative Commons licences)

[6] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

industry, environment and community groups including The Wilderness Society, the Victorian National Parks Association (VNPA), the Victorian Association of Forest Industries (VAFI), MyEnvironment, the Australian Conservation Foundation (ACF), and the Construction, Forestry, Mining and Energy Union (CFMEU).[7] The taskforce has been charged with coming to a 'consensus' that meets conservation needs while simultaneously protecting jobs.[8]

While the scientific case for the establishment of the GFNP has been extensively researched and documented, the GFNP's potential to contribute economically to output and employment has received little attention. Nous was engaged by The Wilderness Society to project the additional economic activity generated by the GFNP through park establishment, park management and additional visitor expenditure. Planning for the GFNP is still in its early stages and, without a clear budget allocation; the exact nature of the changes which will be implemented has yet to be confirmed. As such, this analysis is exploratory in nature, and makes use of public information to form defensible assumptions in the absence of more substantive, case-specific data.

Economic impacts were derived from our assumptions using Input-Output (IO) modelling. IO analysis is a widely used approach for understanding the economic contribution of increased spending at a regional level.[9] IO models account for intermediate flows between sectors to derive estimates of the total economic impact of introducing a change in activity to the region.[10] IO models produce quick, indicative estimates of economic impact based on a set of implicit assumptions (most significantly, they assume there are no crowding out or industry substitution effects: all expenditure is new economic activity and there is sufficient slack in the economy to meet additional demand without transferring significant resources from other uses).[11] As such, they are ideally suited to initial, exploratory analysis, and are the most appropriate tool for this exercise.

It should be noted that economic value is a much wider concept than is dealt with in this report. Figure 2 provides examples of other benefits considered in economic evaluations of national parks such as the recreational value derived by park users[12] and environmental value (see Section 5). Based on initial scoping discussions with this project's steering group, only a brief, qualitative discussion of the environmental value of ecosystem services (Section 4.2.3) was included to avoid diluting the focus of this report: articulating the potential of the GFNP to contribute to Gross Regional Product (GRP) and employment through park establishment, park tourism and park management.

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[7] F Tomazin, *Minister flags new national park within this term to save the possum*, Fairfax Media, Melbourne, 2016. Accessed from: http://www.theage.com.au/victoria/minister-flags-new-national-park-within-this-term-to-save-the-possum-20150502-1mydgl.html.

[8] Ibid.

[9] S Driml, *The economic value of tourism to national parks and protected areas in Australia,* Sustainable Tourism Cooperative Research Centre, Queensland, 2009.

[10] Deloitte Access Economics, *How do you value and icon? The Sydney Opera House: economic, cultural and digital value*, Deloitte Touche Tohmatsu, Sydney, 2013.

[11] Marsden Jacob Associates, *Victoria's nature-based outdoor economy – Key estimates and recommendations*, Outdoors Victoria, 2016.

[12] PricewaterhouseCoopers, *Economic Contributions of Victoria's Parks Case Studies Part 1*, Parks Victoria, Melbourne, 2003.

Figure 2: Value of national parks
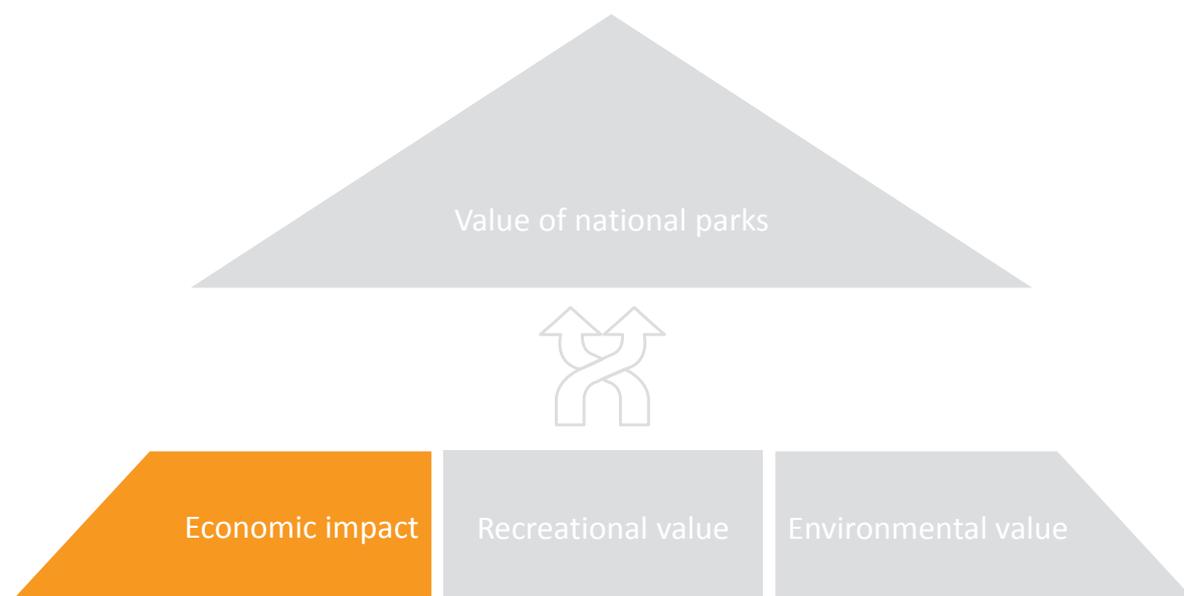
2 The GFNP presents a significant opportunity to boost regional tourism.

2.1 The forests of the Central Highlands are a tourism asset.

The forests of the Central Highlands host a range of attractions that could make it a major visitor drawcard if properly leveraged. From a tourism perspective, the tall Mountain Ash trees are a key tourism resource. As the tallest flowering trees in the world,[13] they provide a point of differentiation and set the forests of the Central Highlands apart as a unique place to visit. Stakeholders consulted for the purposes of this project consistently pointed to being able to visit natural forest ecosystems dominated by stands of tall Mountain Ash as a source of significant appeal for visitors.

The Mountain Ash trees of the Central Highlands are complemented by other natural features. The central geological attraction is the Cerberean Caldera, an ancient 30 kilometre wide volcano. Waterfalls and ranges distributed across the eroded rim of the volcano such as the Cathedral Ranges provide visitors with different vantage points and outlooks to appreciate the region's natural features.[14] The forests of the Central Highlands are also home to a diverse range of flora and fauna species including

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[13] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[14] Working Group for the Great Forest National Park, *Victoria's Great Forest Experience- Melbourne's New Playground*, MyForests Inc, Canberra, 2016. Accessed from: http://www.greatforestnationalpark.com.au/

Leadbeater's Possum – Victoria's critically endangered faunal emblem,[15] the Sooty Owl, the Powerful Owl, the Yellow-bellied Glider, the Greater Glider and the Smoky Mouse. [16]

The appeal of the Central Highlands' Mountain Ash Forests is enhanced by its proximity to Melbourne. The forests are less than a 90 minute drive east of Melbourne, and a significant part of the forest system lies within a 100 kilometre radius of the city.[17] Accessibility to major markets has been identified as a significant determinant of the attractiveness of national parks, [18] and of tourist destinations more broadly.[19] Accordingly the forests' closeness to Melbourne, Victoria's most populous city[20] is a major boon for its tourism appeal.

Interstate evidence supports the potential of the forest as a tourism resource. In Tasmania, forests and natural features are recognised as core to the state's attraction for tourists. Investment in forest tourism such as the $3 million directed towards the development of environmentally sensitive tourism infrastructure through the Tasmanian Forest Tourism Initiative reflects the premium placed by the state on realising the economic and commercial benefits of forest tourism while protecting conservation values.[21]

New South Wales' Blue Mountains National Park illustrates the visitation potential of a significant forest reserve system near a major city. Much like the forests of the Central Highlands, a significant portion of the Blue Mountains National Park lies within a 100 kilometre radius of Sydney.[22] In 2014, the national park drew 4.2 million visitors which accounted for approximately 14 per cent of visitation to NSW national parks and was the most of any national park in the state. As data is not collected on international visitation, this pertains only to domestic visitors. Consequently, visitation numbers cited are understated.[23]

2.2 The forests' tourism potential has not been fully realised under existing management arrangements.

The potential of the Central Highlands' Mountain Ash Forests as a tourist destination is not being fully realised. Existing parks and reserves draw a relatively modest level of visitation, attracting only 7 per cent of total visitation to all Victorian national and state parks in 2010-11.[24] This is partly explained by

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[15] Ibid.

[16] Victorian National Parks Association, *Great Forest National* Park, Victorian National Parks Association, Melbourne, 2015. Accessed from: http://vnpa.org.au/page/nature-conservation/protecting-special-places/great-forest-national-park

[17] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[18] Victorian Environmental Assessment Council, *River Red Gum Forests Investigation Final Report*, Victorian State Government, Melbourne, 2016. Accessed from: http://www.veac.vic.gov.au/documents/352-VEAC_RRGF_final_report-all.pdf

[19] G I Crouch, *Modelling destination competitiveness: A survey and analysis of the impact of competitiveness attributes,* Sustainable Tourism, 2007.

[20] Australian Bureau of Statistics, *QuickStats*, Commonwealth Government of Australia, Canberra, 2016. Accessed from: http://www.abs.gov.au/websitedbs/censushome.nsf/home/quickstats?opendocument&navpos=220

[21] Department of Environment and Energy, *Tasmanian Forest Tourism Initiative*, Commonwealth Government of Australia, Canberra, 2005. Accessed from: http://www.environment.gov.au/node/20486

[22] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[23] Office of Environment and Heritage, *Domestic Visitation to NSW National Parks*, New South Wales State Government, Sydney, 2015.

[24] Parks Victoria, *Parks Visitation Statistics,* Victorian State Government, Melbourne, 2011.

the fact that a large proportion of the park is a designated water catchment area and therefore not accessible for recreational use.

Figure 3: Visitation to parks and reserves to be integrated into the GFNP – percentage of total visitation, 2010-11.

Parks and reserves of the GFNP
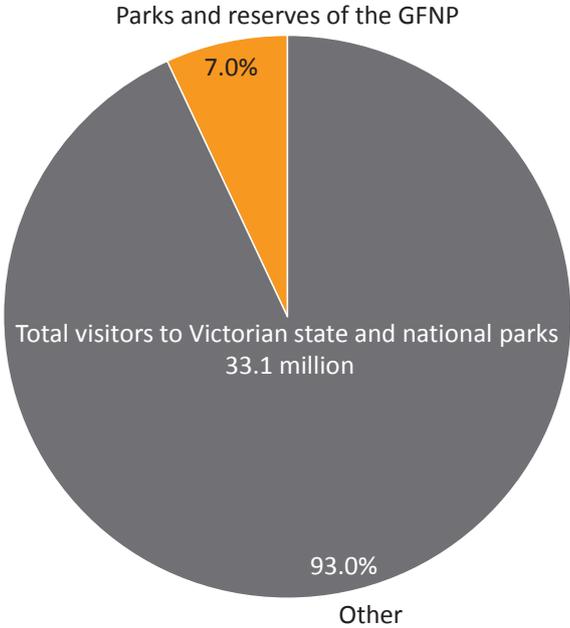
Source: Parks Victoria, Visitation data, 2011.

The existing national parks in the study area (the Yarra Ranges, Kinglake, Lake Eildon and Baw Baw National Parks) draw approximately 5 per cent of visitors to Victorian state and national parks. Other reserves in the study area only draw approximately 2 per cent of visitors.[25] Table 2 shows visitation, size and distance from Melbourne for Victoria's ten most visited national parks and the four national parks which will be integrated into the GFNP (note that the Yarra Ranges, Kinglake and Lake Eildon National Parks are within the top ten most visited parks).

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[25] Parks Victoria, *Visitation data*, Victorian State Government, Melbourne, 2011.

Table 2: Visitation, size and distance from Melbourne for Victoria's ten most visited national parks and existing national parks in the study area, 2010-11.

	Size (ha)	Visitation	Distance (km)	Geodesic distance (km)
1. Dandenong Ranges National Park	3,540	3,454,984	43	37
2. Great Otway National Park	10,300	1,855,362	210	164
3. Grampians National Park	167,200	1,573,429	258	239
4. Alpine National Park	647,400	1,320,618	373	176
5. Mornington Peninsula National Park	2,686	1,004,895	100	57
6. Wilsons Promontory National Park	50,500	700,543	215	167
7. Yarra Ranges National Park	76,000	580,591	69	56
8. Point Nepean National Park	560	573,941	112	58
9. Kinglake National Park	23,120	519,567	92	53
10. Lake Eildon National Park	27,750	377,694	162	108
22. Baw Baw National Park	13,530	128,633	174	126

Source: Parks Victoria, Visitation data, 2011 .

Visitation appears much lower than what one would expect given the attraction of the Central Highlands' Mountain Ash Forests and their proximity to Melbourne. Visitation numbers also appear to reflect a reduction on historical figures.[26] Stakeholders highlighted a general lack of awareness of the

[26] The Yarra Ranges National Park Management Plan (2002) reports 800,000 visits per annum, compared to more recent visitation numbers at just over 580,000 per annum. Accessed from:
http://parkweb.vic.gov.au/__data/assets/pdf_file/0005/313466/Yarra-Ranges-National-Park-Management-Plan.pdf
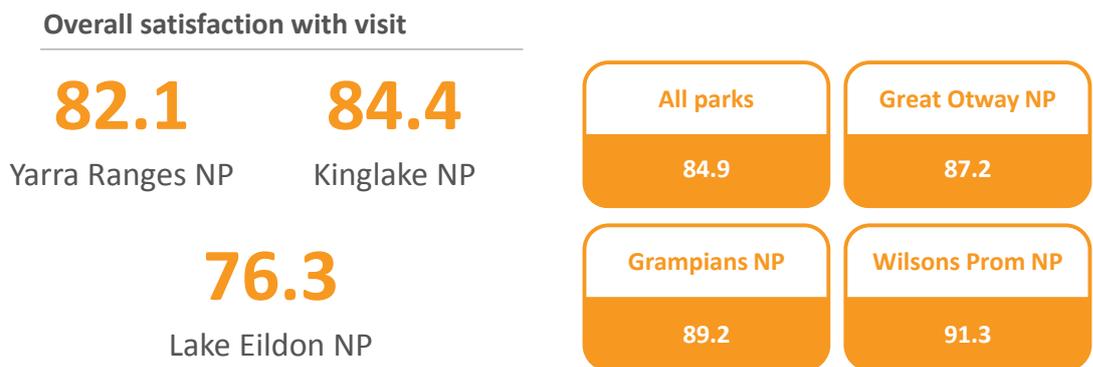
region's natural features as a driver of subdued visitation, exacerbated by a lack of visitor infrastructure in existing parks which detracts from the accessibility of key natural attractions for park visitors.

Survey data collected by Market Solutions for visitors to selected national parks for Parks Victoria's Visitor Satisfaction Monitor (VSM) supports these hypotheses. Of the national parks which will be integrated into the GFNP reserve system, VSM data was available for three:

- Yarra Ranges National Park;
- Kinglake National Park; and
- Lake Eildon National Park.

Figure 4 compares visitors' overall satisfaction with their visit to the national park and park management for the Yarra Ranges, Kinglake and Lake Eildon National Parks with all sampled parks in Victoria, and a selection of more highly visited national parks for which VSM data was provided. Satisfaction with overall visit is marginally lower in the existing national parks of the GFNP relative to all surveyed national parks. The difference is more pronounced when compared to selected individual national parks including the Great Otway National Park, the Grampians National Park and Wilsons Promontory National Park.[27]

Figure 4: Visitor satisfaction with visit, 2016

Overall satisfaction with visit

82.1 Yarra Ranges NP	**84.4** Kinglake NP	**All parks** 84.9 **Great Otway NP** 87.2
	76.3 Lake Eildon NP	**Grampians NP** 89.2 **Wilsons Prom NP** 91.3

Source: Parks Victoria, Visitor Satisfaction Monitor, 2016

Satisfaction with specific park services and facilities is broken down in Figure 5 to isolate specific drivers behind the discrepancy in overall visit satisfaction. The same figures are presented in Figure 6 for the Great Otway, Grampians and Wilsons Promontory National Parks as a point of reference. Notably, existing parks in the study area (especially the Yarra Ranges and Lake Eildon National Parks) tend to underperform against the average in areas related to park natural features and access-enabling infrastructure such as tracks and signage, whereas the three comparator parks outperform the average across these categories.[28]

These features are core to the park experience. Park visitors across the Parks Victoria estate rank park landscape (including natural features) as the most important aspect of park services and facilities. Well designed and maintained tracks and paths, and clear and helpful direction signage rank third and fourth respectively.[29] The relatively low scores received by parks in the study area in terms of park landscape contrasts sharply with the views of the area's natural features presented by a wide range of stakeholders

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[27] Parks Victoria, *Visitor Satisfaction Monitor*, Victorian State Government, Melbourne, 2016.
[28] Ibid.
[29] Ibid.

and is likely symptomatic of the low awareness and poor accessibility consistently identified during consultations.

Figure 5: Satisfaction with services and facilities, 2016 (existing national parks in the study area)

Index (out of 100)
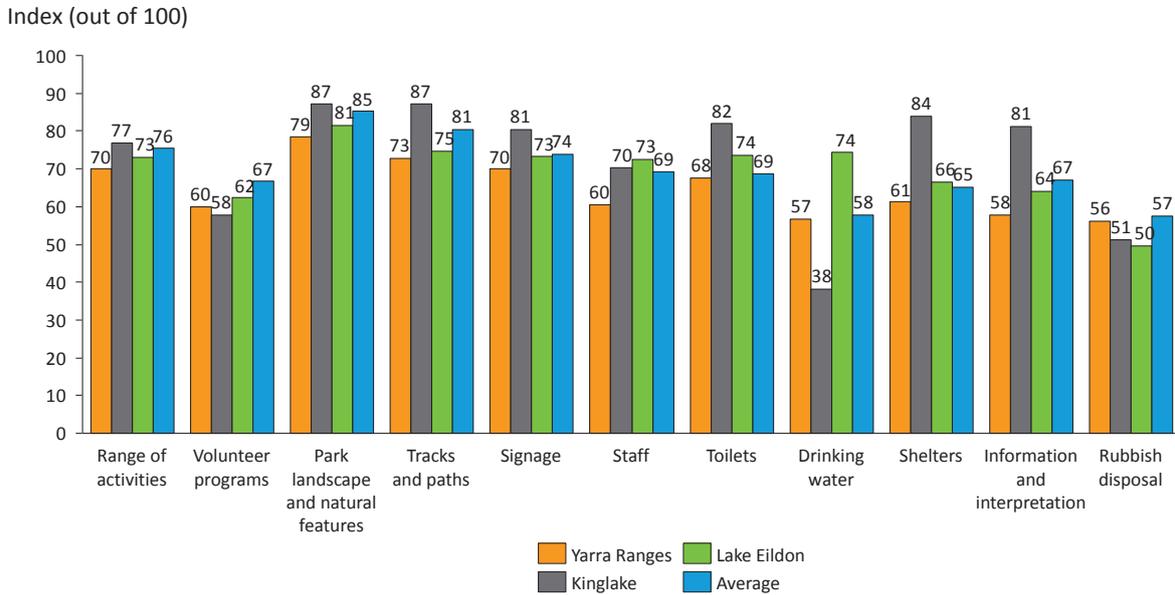
Source: Parks Victoria, Visitor Satisfaction Monitor, 2016

Figure 6: Satisfaction with services and facilities, 2016 (comparator parks)

Index (out of 100)
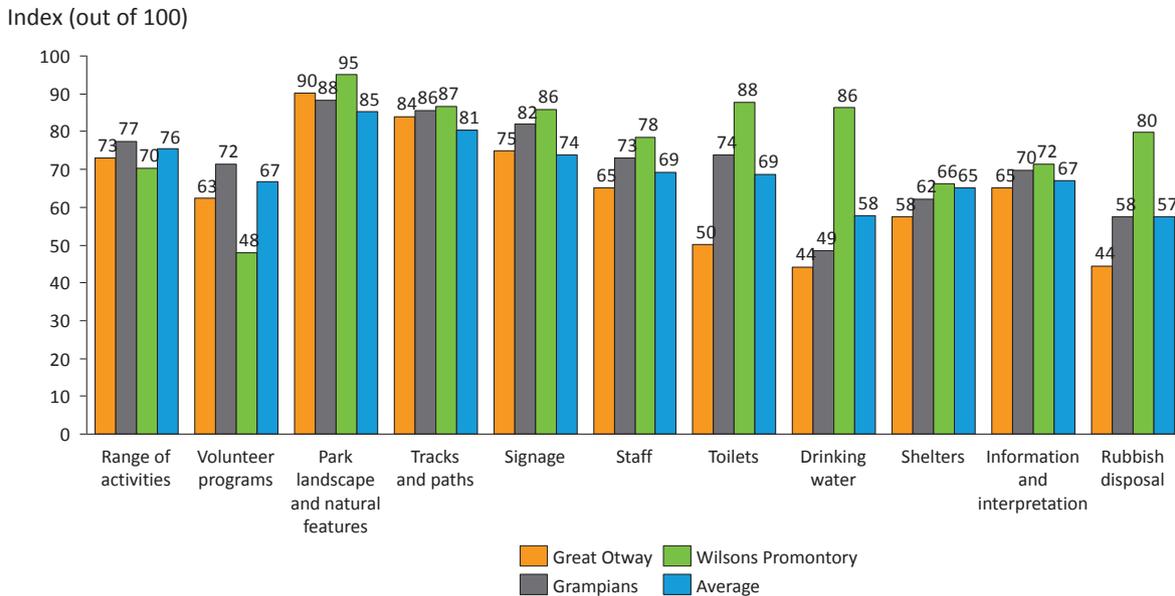
Source: Parks Victoria, Visitor Satisfaction Monitor, 2016

A comparison of the number of visitor sites within each park as listed by Parks Victoria provides further evidence of the relatively poor accessibility to unique natural assets in the study area's existing parks. Excluding picnic areas and campsites, the Yarra Ranges, Kinglake, Lake Eildon and Baw Baw National Parks cumulatively hold only 7 visitor sites which would allow park users to actively engage with their

natural features.[30] Compared to the number of sites and signature walks in other national parks such as the Dandenong Ranges (6) and the Great Otway National Park (10),[31] visitors to parks in the study area are much more limited in their ability to access natural attractions.

3 Our methodology uses analogous cases to infer park establishment, park management and visitor expenditure.

3.1 Park establishment, park management and visitor expenditure will provide economic stimulus to the region.

Figure 7 shows the three categories of expenditure considered in this analysis: park establishment, park management and visitor spending. Expenditure associated with setting up the park will provide an initial economic benefit to the region, contributing to both GRP and employment over the establishment period. Any additional expenditure on park management and the spending by additional visitors attracted to the region by the GFNP will result in ongoing economic benefits for local economies.

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[30] Parks Victoria, *Things to do*, Victorian State Government, Melbourne, 2016.

[31] Parks Victoria, *Things to do*, Victorian State Government, Melbourne, 2016.

Figure 7: Steps to calculating economic impact
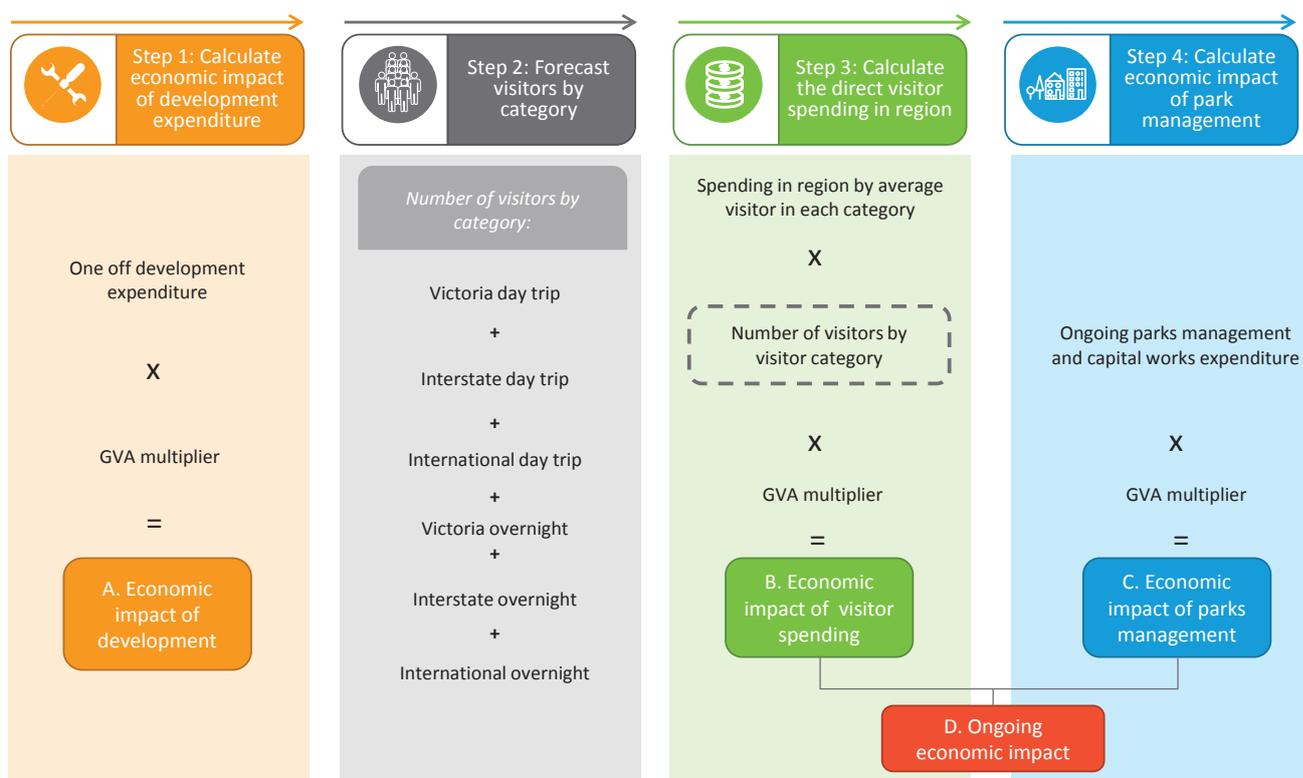
3.2 A range of comparable cases are used to model the impact of the GFNP under three scenarios.

3.2.1 Conceptual approach

As highlighted in Section 1, planning for the GFNP is still in the preliminary stages. As such, detailed information about changes which will be implemented and key attractions which will be established was not readily available. Instead, case studies of analogous changes and attractions were used as proxies to gauge likely expenditure and visitation effects. Conceptually, each individual change and attraction constitutes a 'building block' for the model. The blocks included were based on initial plans for eco-tourism infrastructure proposed for the GFNP including:

- greater signage and interpretation sites in and around or adjacent to the GFNP;

- greater accessibility in the mountains for 'grey nomads';

- greater accessibility for people with a disability;

- increased day picnic sites;

- more signed and listed campsites;

- a zipline tour in Toolangi (adjacent to park, but featured in marketing and communications);

- a multi-day walk running from Healesville to Marysville to Eildon (with smaller walks within);

- a treetop walk in Cambarville adjacent to Lake Mountain (adjacent to park, but featured in marketing and communications);[32] and

- eco-lodges (adjacent to park).

Park tourism arising from the GFNP is the most significant source of economic potential. However, estimates of the visitation effects of individual blocks are subject to significant uncertainty. Our case study approach is consistent with previous attempts to estimate the effects on visitation of a change in status to a national park which, similarly, have largely drawn on analogous cases.

The case studies chosen reflect scenarios which, on the basis of stakeholder consultations, most closely resemble the situation being modelled. This approach occasionally caused complications given that many of the case studies involved multiple building blocks and there was limited basis to distinguish between the marginal effects of each individual block. Consequently, the assumptions presented in Section 3.2.2 are, where necessary presented in aggregate to reflect the combined attraction of a set of blocks, rather than of blocks in isolation.

The blocks have been packaged together in three different ways in this report to create three distinct scenarios.

Scenario 1 – *Change in tenure*: involves only a change in tenure with no other changes made to the status quo. Practically, a scenario which only entails borders being redrawn without any changes to visitor management or infrastructure is unlikely to occur. There is also no strong comparison to infer the visitation effects of such an exercise, although they are likely to be marginal. This scenario is included for illustrative purposes only and highlights the importance of adequate investment to realise the potential of the park.

Scenario 2 – *Publicly funded attraction*: considers the scenario where the park is established with funding from the government for infrastructure and more extensive park management. Scenario 2 includes core park infrastructure, such as tracks, signage, interpretation signs, picnic sites and campsites. It also includes the establishment of the Healesville-Marysville-Eildon multi-day walk.

Scenario 3 – *Private investment*: assumes private investment is attracted to the region, contributing to the establishment of the GFNP as a significant tourism destination and enabling the GFNP to realise more of its tourism potential.

As more blocks are added in each progressive scenario, the cumulative effect of the GFNP increases. The individual blocks considered in this analysis, and the specific scenarios they are included in, are outlined in Table 3. Since the 'do nothing' case involves no change relative to the status quo, it is not explicitly considered as a scenario. However, it is the baseline against which all other scenarios are compared.

Table 3: Building blocks and scenarios

Building block	Scenario 1	Scenario 2	Scenario 3
Park boundary establishment and mapping	✓	✓	✓
Establishment of boards of management	✓	✓	✓

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[32] Working Group for the Great Forest National Park, *Victoria's Great Forest Experience- Melbourne's New Playground*, MyForests Inc, Canberra, 2016. Accessed from: http://www.greatforestnationalpark.com.au/

Building block	Scenario 1	Scenario 2	Scenario 3
Core park infrastructure		✓	✓
Multi-day walk		✓	✓
Visitor management		✓	✓
Treetop walk			✓
Zipline			✓
Eco-lodges			✓

3.2.2 Assumptions

Table 4 details the assumptions underlying each of the building blocks. Colour coding of the rows follows the conventions established in Table 3 (grey for Scenario 1, green for Scenario 2 and blue for Scenario 3). The remainder of the section details the rationale behind each of the assumptions in the context of the relevant scenario.

Table 4: Assumptions used in model

	Establishment/management expenditure	Visitation effect
Park boundary establishment and mapping	$2.9 million	24,000
Establishment of boards for co-management[33]	$1.0 million	
Conservation management	$4.2 million	
Core park infrastructure	$5.9 million	218,000
Multi-day walk	$5.0 million	
Visitor management*[34]	$7 million	
Treetop walk	$4.2 million	132,000
Zipline	$1.0 million	
Eco-lodges	$14.0 million	5,000
TOTAL	$45.2 million	379,000

Scenario 1: Change in tenure

Establishment costs
Case study: River Red Gum national parks

Detailed costing of the establishment of the GFNP has yet to be undertaken. Our consultations with Parks Victoria indicated that the costs of establishing the River Red Gum national parks would provide the best indication of establishment costs for the GFNP. Budget funding allocated to the establishment of the River Red Gum national parks related to change in tenure comprised two elements:

- park boundary establishment and mapping; and

- the establishment of boards for co-management.[35]

Both cost estimates were based on the funding allocated to each element in the 2009-10 budget estimates.[36]

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[33] Or some other form of governance – see discussion below under establishment costs.

[34] * denotes that this is management expenditure which is incurred on an ongoing basis.

[35] Note that for the River Red Gum national parks the co-management arrangement was with Traditional Owners, but we assume that there is a range of possible governance models for the GFNP

[36] J Lenders, *2009-10 budget estimates*, Victorian State Government, Melbourne, 2016.

Management costs

Land management in national parks is generally more intensive than in state forests. A 2005 study suggests that national parks received, on average 80 per cent more funding than state forests.[37] VEAC's investigation into the River Red Gum national parks estimates the additional visitor management costs incurred as a result of handing management of state forests over to Parks Victoria at approximately $1 million as explored further in the management cost section for Scenario 2.[38]

However, increased visitor management does not reflect all of the additional cost that will be incurred. PricewaterhouseCoopers' (PwC's) analysis of the economic impact of Parks Victoria assets found that fire and natural values management was, on average, approximately two-thirds of the cost of visitor management.[39] Additional costs for conservation management were derived based on the assumption that they will increase proportionately to the increase in visitor management costs.

Visitation

We estimate the likely effect on visitation of establishing the GFNP with core park infrastructure and visitor management (including marketing) to be approximately 242,000. The rationale behind this is detailed in the visitation section of Scenario 2.

The contribution of the change in tenure alone to increased visitation is likely to be relatively small. As such, only 10 per cent of the total effect (24,000 visitors) is attributed to the change in tenure. The other 90 per cent is tied to the more substantive changes implemented as part of Scenario 2.

Scenario 2: Publicly funded attraction

Establishment costs
Case study: River Red Gum national parks

The 2009-10 budget estimates allocated $2.5 million to the establishment of visitor service infrastructure (such as road upgrades, track upgrades and signage) in the River Red Gum national parks. This implies a cost per hectare of approximately $11 in 2016 dollar terms for core park infrastructure. Given the lack of infrastructure in existing national parks suggested by both Parks Victoria visitor satisfaction data and extensive consultation, significant investment in core infrastructure is also likely to be necessary in existing national parks. As such, the per-hectare rate of core infrastructure is applied across the expanded reserve system.[40]

The estimated cost of establishing the multi-day walk is based on actual projected costs for the trail put forward by the Victorian Forest Alliance.[41]

Management costs
Case study: River Red Gum national parks

VEAC's investigation into the River Red Gum national parks estimates the additional visitor management costs incurred as a result of handing management of state forests over to Parks Victoria at approximately $1 million. Parks Victoria incurs higher visitor management costs due to higher levels of

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[37] Working Group for the Great Forest National Park, *Frequently asked questions*, MyForests Inc, Canberra, 2016. Accessed from: http://www.greatforestnationalpark.com.au/faqs.html

[38] Environmental Conservation Council. *Box-Ironbark Forests & Woodlands Investigation*, Victorian State Government, Melbourne, 2001. Accessed from: http://www.veac.vic.gov.au/reports/385-BI-Complete-Report.pdf

[39] PricewaterhouseCoopers, *Economic contribution of Victoria's Parks*, Parks Victoria, Melbourne, 2001.

[40] J Lenders, *2009-10 budget estimates*, Victorian State Government, Melbourne, 2016.

[41] Victorian Forest Alliance, *Choosing a Future for Victoria's Forests*, The Wilderness Society, Melbourne, 2006.

facilities and promotion, and the provision of more rangers and visitor services. These increases are also net of any reductions in management costs associated with reduced forestry activity.[42]

The costs of additional visitor management (in 2016 dollar terms) were scaled up based on the size of the area to be transferred from DELWP to Parks Victoria management under the GFNP to derive an estimate of annual additional visitor management costs.

Visitation
Case studies: Box-Ironbark Parks, River Red Gum national parks, Great Otway National Park

A change in status to a national park is likely to increase visitation in most cases.[43] However, the precise scale of the change is difficult to predict with certainty and is dependent on a variety of factors such as:

- accessibility to major markets;

- nature of the scenic resource;

- presence of key attractors (including well-known natural or cultural heritage attractions);

- potential activities available to visitors;

- level of investment in surrounding tourist facilities; and

- expenditure by park managers on tourism and promotion.[44]

VEAC's investigations of the Box-Ironbark parks and River Red Gum parks provide a useful starting point to infer the potential visitation effects of a publicly resourced national park. The investigations themselves cite the Grampians and Murray-Sunset National Parks as sources of inspiration.

The Grampians was declared a national park in 1985. Prior to declaration, the area received an average of 1.12 million visitor days per year. The number of visitor days increased by approximately 30 per cent following declaration to 1.5 million.[45]

The remote Murray-Sunset National Park, declared in 1991, experienced a marked increase in visitation post designation. Visitor numbers post declaration of the national park were on average 2.3 times the visitor numbers preceding the declaration (visitor numbers of 27,200 post-designation compared to 12,000 pre-designation).[46]

More extensive statistical analysis of these respective cases found that the change in status to a national park had a statistically significant effect on visitation of 32 per cent for the Grampians National Park and 62 per cent for the Murray Sunset National Park net of other trends working to increase visitation (population growth, for example).[47]

Two different percentage increases are applied for the purposes of this analysis. Following both the Box-Ironbark and River Red Gum VEAC investigations, a 20 per cent increase to visitation is applied to existing state park visitation.[48,49] Visitation to existing state forests is likely to increase in a similar way

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[42] Environmental Conservation Council. *Box-Ironbark Forests & Woodlands Investigation*, Victorian State Government, Melbourne, 2001. Accessed from: http://www.veac.vic.gov.au/reports/385-BI-Complete-Report.pdf

[43] Victorian Environmental Assessment Council, *River Red Gum Forests Investigation Final Report*, Victorian State Government, Melbourne, 2016. Accessed from: http://www.veac.vic.gov.au/documents/352-VEAC_RRGF_final_report-all.pdf

[44] Victorian Environmental Assessment Council, *River Red Gum Forests Investigation Final Report*, Victorian State Government, Melbourne, 2016. Accessed from: http://www.veac.vic.gov.au/documents/352-VEAC_RRGF_final_report-all.pdf

[45] Ibid.

[46] Ibid.

[47] Ibid.

[48] Ibid.

but was omitted from this analysis as visitation data was unavailable for state forests in the study area. This is a potential source of underestimation of tourism benefits.

VEAC's investigations highlighted concerns that restrictions on activities in national parks would lead to a decrease in overall visitation. Based on the substantial increase in visitor numbers despite restrictions applied in other state forests which had been previously designated as national parks, VEAC concluded that the attractions of the national parks more than negate the effects of such restrictions on visitor numbers.[50] Further, the GFNP is being planned as a multi-tenure system and will continue to allow visitors to appropriately engage in the vast majority of recreational activities currently undertaken in the study area in selected parts of the park.

Our consultations established that the existing system of national parks in the study area (Yarra Ranges, King Lake, Lake Eildon and Baw Baw) is underperforming relative to its potential. Stakeholders highlighted the Great Otway National Park as an appropriate analogy for the visitation which the parks could draw on the basis of their natural features alone. On this basis, we project that visitation to existing national parks will increase by approximately 16 per cent through the establishment of the GFNP. This represents the effect of improving infrastructure and park management (including promotion) in a way that facilitates visitor exposure to the natural attractions of existing national parks. Under this assumption, national parks in the study area would receive the same share of visitation as the Great Otway National Park[51] and is likely to be a conservative estimate as it doesn't account for the greater proximity of the national parks in the study area to Melbourne.

The projected visitation effects of changes implemented may include visitation by residents of the region. Spending by residents in the region shouldn't be included in an assessment of regional economic impact due to likely substitution effects. New visitors or visitors spending additional time in the region bring in additional expenditure which would not have occurred in the absence of the GFNP. Any spending by local residents who visit the park, on the other hand, would likely have occurred elsewhere, even in the absence of the park. As a result it is not incremental spending for the region.

VEAC's investigation into the Box Ironbark parks suggest that approximately 35 per cent of additional visitors attracted by a change in status of a state park or state forest to a national park are likely to be local.[52] Based on the above analysis, we expect the increase in visitation will amount to approximately 297,000 excluding local visitation.

It should be noted that the Great Otway National Park features a multi-day walk (the Great Ocean Walk), and a treetop walk and zipline (the adjacent Otway Fly) among its attractions. This is not a significant issue in the case of the multi-day walk as it is part of the package of attractions introduced under Scenario 2, and its effects consequently do not need to be considered individually. The fact that visitors to the Otway Fly may also be counted among visitors to the park, on the other hand, does pose an issue.

For reasons detailed under the visitation assumptions for Scenario 3, we assume that the effect of changes introduced on visitation to existing national parks under Scenarios 1 and 2, *exclusive* of the treetop walk and zipline, is 242,000 (55,000 lower than the initial 297,000 estimate).

We make the assumption that changes implemented under Scenario 2 contribute 90 per cent (218,000) of the cumulative effect.

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[49] Environmental Conservation Council. *Box-Ironbark Forests & Woodlands Investigation*, Victorian State Government, Melbourne, 2001. Accessed from: http://www.veac.vic.gov.au/reports/385-BI-Complete-Report.pdf

[50] Victorian Environmental Assessment Council, *River Red Gum Forests Investigation Final Report*, Victorian State Government, Melbourne, 2016. Accessed from: http://www.veac.vic.gov.au/documents/352-VEAC_RRGF_final_report-all.pdf

[51] Parks Victoria, *Visitation data*, Victorian State Government, Melbourne, 2011.

[52] Victorian Environmental Assessment Council, *River Red Gum Forests Investigation Final Report*, Victorian State Government, Melbourne, 2016. Accessed from: http://www.veac.vic.gov.au/documents/352-VEAC_RRGF_final_report-all.pdf

It is important to note that the River Red Gum national parks and the Great Otway National Park differ from the Great Forest National Park in that the latter is much more proximate to the Melbourne metropolitan region. Owing to the lack of robust publicly available data, the potential additional effects of proximity has not been factored into the analysis.

Scenario 3: Additional investment

Establishment costs
Case studies: Valley of the Giants Treetop Walk, Tahune Airwalk, Illawarra Fly

Setup costs of the treetop walk are based on the Valley of the Giants Treetop Walk and the Tahune Airwalk. In 1996, $1.8 million was spent to develop the Valley of the Giants Treetop Walk[53] and $3.8 million was spent in 2005 on the Tahune Airwalk.[54] The midpoint of these costs, scaled to 2016 dollars is used as a central estimate of setup costs. The cost of adding a zipline on top of this is based on the $1.0 million spent on establishment of the Illawarra Fly.[55]

The costs of developing the eco-lodge are based on estimates presented for an eco-lodge development in Corangamite Shire along the Great Ocean Road.[56]

Management costs
Case study: River Red Gum national parks

Costs of conservation management are based on the funding allocated to conservation-related activity in the 2009-10 budget estimates. It is assumed that intensive conservation management would involve increasing per hectare costs of conservation management by 10 per cent over the baseline.[57] While the level of expenditure on park management is a matter for government, there is an argument that GFNP may require more intensive management, at least in the early years of its formation.

Other infrastructure such as the treetop walk, zipline and eco-lodge are likely to be privately operated adjacent to or outside the park, and would be expected to charge fees for the services they provide. The GVA from their operations (including management costs) is already reflected in the expenditure made by visitors to the attraction. Consequently, including management costs on top of this would result in double-counting.

Visitation
Case studies: The Otway Fly, Valley of the Giants Treetop Walk River Red Gum national parks

Through our consultations, stakeholders identified the Otway Fly as the most analogous case study to infer visitation effects for the treetop walk and zipline given the similarities between the Great Otway National Park and the study area. However, limited information was accessible on realised visitation to the Otway Fly. Based on information provided by the Victorian Forest Alliance, the Otway Fly received 220,000 visitors in its first year and this is used as the basis for our estimates.[58]

Some portion of visitors to the treetop walk may already be existing visitors to the park. In the absence of visitor data for the Otways, survey data of visitors to the Valley of the Giants Treetop Walk (VOG walk)

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[53] Department of Environment and Conservation, *Construction of the Tree Top Walk*, Western Australian State Government, Perth, 2007.

[54] *B Felmingham, Socioeconomic Benefits of the Tahune Airwalk, University of Tasmania, Hobart, 2005.*

[55] A Thompson, *Zip-line opens at Illawarra Fly*, Illawarra Mercury, Illawarra, 2014.

[56] Urbis, *Hotel development regulations in Australia*, Australian Trade Commission, Melbourne, 2015.

[57] J Lenders, *2009-10 budget estimates*, Victorian State Government, Melbourne, 2016.

[58] Victorian Forest Alliance, *Choosing a future for Victoria's Forests*

was used to estimate the proportion of total visitors attracted specifically by the establishment of the treetop walk and zipline in order to avoid overstating visitation effects.

The number of incremental visitors attracted specifically by treetop walk and zipline based attractions was inferred based on the percentage of respondents to surveys conducted at the VOG walk who cited the treetop walk as their main reason for visiting the region (40 per cent).[59]

The VOG walk is approximately five hours from Perth. Given the much greater proximity of the GFNP to Melbourne, it is likely a unique attraction or experience like the treetop walk and zipline will attract more new visitors. For the purposes of this analysis, we assume 60 per cent of visitors come specifically as a result of the treetop walk and zipline. Based on the Otway Fly visitor numbers this corresponds to 132,000 additional visitors.

There are two components to this increase in visitation. One is the component which is already captured in the Great Otway National Park visitor numbers. This component represents the portion of incremental visitation induced by the Fly which spills over into visitation to the Great Otway National Park. The other component is the incremental visitors who are not counted among visitors to the park (because they visit the Otway Fly but not the Great Otway National Park).

The increase in visitation from the treetop walk and zipline which is not already reflected in visitation to the Great Otway National Park is difficult to reliably estimate. For our central estimate, we assume 25 percent of the visitor effect implied by the Otway Fly is already reflected in park visitor numbers for the Great Otway National Park. To avoid double-counting this effect the remaining 55,000 is subtracted from visitor estimates for Scenario 2.

Given the uncertainty around how visitation to the treetop walk and zipline should be distributed between new visitation and visitation already occurring in the national park (i.e. between Scenarios 1, 2 and 3), as well as how much of this visitation should be considered above and beyond what is already reflected in visitation to the Great Otway National Park, a sensitivity analysis is conducted in Section 4.2.3 to ensure the robustness of the modelling results against a range of different assumptions.

PwC projected that an eco-lodge development in the River Red Gum national parks with similar specifications as the eco-lodge proposed for the GFNP would result in 14,239 additional visitor nights to the region.[60] This corresponds to approximately 5,000 additional visitors.

3.2.3 Limitations

While the assumptions used were based on case studies identified by stakeholders most closely resembling the GFNP, it is important to note that the case studies themselves are not perfectly analogous, especially in terms of visitation. Most importantly, none of the case studies reflect the proximity of the GFNP to Melbourne.

Melbourne is a major market for potential visitors to the GFNP. 2014 research for Tourism Victoria found that visitors from Melbourne are the most significant source of domestic overnight visitation to regional Victoria (48 per cent), followed by visitors from other areas of regional Victoria (37 per cent) and finally interstate visitation (15 per cent).[61] In 2014, this percentage of visitors corresponded to approximately 5,251,000 domestic overnight visitors to regional Victoria from Melbourne.[62] Further, Melbourne

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[59] R Goff, *The economic value of tourism and recreation in forested areas of Western Australia*, Edith Cowan University, Joondalup, 2003.

[60] PricewaterhouseCoopers, *Economic Value of River Red Gum National Parks*, Victorian National Parks Association, 2008.

[61] Tourism Victoria, *Regional Victoria Market Profile*, Victorian State Government, Melbourne, 2015.

[62] Ibid.

received 2,026,000 international visitors in 2014,[63] compared to 280,000 across the entirety of regional Victoria,[64] making it a significant potential market for international daytrip and overnight visitation as well.

2010-11 national park visitation data reflects the impact that proximity can have. The Dandenong Ranges National Park is both the closest of Parks Victoria's 10 most visited national parks to Melbourne, as well as its most visited.[65] The drop-off between the Dandenong Ranges National Park and the Great Otway National Park is significant. In 2010-11, the Dandenong Ranges National Park received approximately 3.5 million visitors while the Great Otway National Park received only 1.9 million visitors.[66] Similarly, the number of visitors to the treetop walk, zipline and ecolodge are likely to be understated given the analogies used to infer their effects do not reflect the greater appeal of more proximate attractions.

As such, the estimates presented in this report are highly conservative and should be taken as a lower bound on the economic impact which can be expected to materialise as a result of the GFNP proposal.

4 An adequately resourced GFNP could generate $71 million in GVA and 760 FTE jobs annually.

4.1 The GFNP has substantial direct expenditure impacts.

This section examines the magnitude of the core economic activities associated with the GFNP – establishment, park tourism and park management – on the basis of the assumptions presented in Section 3.2.2. Projections are presented over a 10-year period. The first five years roughly correspond to the development phase, while the following five years represent the operational phase.

4.1.1 Park establishment

The costs of each infrastructure component were provided in Section 3.2.2. However, not all establishment expenditure will be incurred in Year 1. The distribution of establishment expenditure over the projection period is presented in Table 5. Projections are based on a number of simplifying assumptions:

- all establishment work commences in Year 1 of the forecast period; and
- expenditure is distributed evenly across the duration of each project (where project duration is based on respective case studies where information was available)

Since all expenditure is incurred within the development phase of the project, Table 5 only presents results for the first 5 years.

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[63] Tourism Victoria, *Melbourne Market Profile*, Victorian State Government, Melbourne, 2015.

[64] Tourism Victoria, *Regional Victoria Market Profile*, Victorian State Government, Melbourne, 2015.

[65] Parks Victoria, *Visitation data*, Victorian State Government, Melbourne, 2011.

[66] Ibid.

Table 5: Establishment expenditure, Years 1-5[67]

	Year 1	Year 2	Year 3	Year 4	Year 5
Development phase					
Park boundary establishment and mapping	$1.5m	$1.5m	-	-	-
Establishment of boards of co-management	$0.3m	$0.3m	$0.3m	-	-
Scenario 1 total	**$1.8m**	**$1.8m**	**$0.3m**	**-**	**-**
Core park infrastructure	$2.0m	$2.0m	$2.0m	-	-
Multi-day walk	$1.0m	$1.0m	$1.0m	$1.0m	$1.0m
Scenario 2 total	**$4.7m**	**$4.7m**	**$3.3m**	**$1m**	**$1m**
Treetop walk	$1.1m	$1.1m	$1.1m	$1.1m	-
Zipline	-	-	-	$1.0m	-
Eco-lodges	$7.0m	$7.0m	-	-	-
Scenario 3 total	**$12.8m**	**$12.8m**	**$4.3m**	**$3.1m**	**$1.0m**

4.1.2 Park tourism

The aggregate assumptions used to drive visitation effects are presented in Section 3.2.2. Information on visitor origin is based on data from Parks Victoria's visitor satisfaction monitor. This information was only available for the Yarra Ranges, King Lake and Lake Eildon National Parks. An average of the visitor mix to each park weighted by visitor numbers was used to formulate the projected visitor origin to the GFNP. We assume approximately 97 per cent of visitors are domestic (95 per cent from within Victoria and 2 per cent are from interstate) and 3 per cent are from overseas.[68]

Similarly, a weighted average of visit type is taken across the three parks. On this basis, we assume 73 per cent of visits are day trip visits from home and 27 per cent of visits are overnight trips.[69]

The data was not granular enough to assume different proportions of Victorian, interstate and international visitors across different types of visits so proportions are assumed to be roughly consistent. These proportions are applied across assumed increases in visitation (except in the case of the eco-lodge: all additional visitors to the eco-lodge are assumed to be on overnight visits).

The increases in visitation resulting from each of the scenarios represent 'shocks' to the status quo and do not consider baseline growth. The baseline growth rates used in this analysis are:

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[67] Totals may not sum due to rounding error.

[68] Parks Victoria, *Visitor Satisfaction Monitor*, Victorian State Government, Melbourne, 2016.

[69] Ibid.

- 5 per cent p.a. for international visitors (based on projected growth rates for international visitation to regional Victoria);[70] and

- 1.2 per cent p.a. for domestic visitors (based on projected population growth rates for Australia).[71]

Population growth is used as a conservative estimate of growth in domestic visitation. Tourism Victoria's forecasts of nature-based visitation to Victoria indicate that domestic nature-based visitation is likely to remain stable.[72] Accordingly, population growth was used as a proxy for the baseline growth which would occur independently of any change in propensity to visit.

Projections of incremental increases in visitation relative to the baseline for each scenario are presented in Table 6. As a simplifying assumption, all visitation effects are fully realised by the end of the development period. The difference in visitation widens past the fifth year due to baseline growth rates being applied to a higher base compared to the status quo.

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[70] Tourism Research Australia, *Forecast visitation to Victoria 2016 Issue (National and State)*, Victorian State Government, Melbourne, 2016.

[71] Australian Bureau of Statistics, *Population Projections, Australia*, Commonwealth Government of Australia, Canberra, 2013.

[72] Tourism Victoria, *Victoria's nature-based tourism strategy,* Victorian State Government, Melbourne, 2008.

Table 6: Visitation effects (relative to baseline), Years 1-10

			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
			Development phase					Operational phase				
Scenario 1	Domestic	Day trip	3,450	6,941	10,473	14,049	17,667	17,879	18,093	18,310	18,530	18,752
		Overnight	1,265	2,545	3,840	5,151	6,477	6,555	6,634	6,713	6,794	6,875
	International	Day trip	99	203	312	427	548	575	604	634	666	699
		Overnight	36	75	115	157	201	211	221	232	244	256
	Incremental spending		$0.7m	$1.5m	$2.3m	$3.1m	$3.8m	$3.9m	$4m	$4m	$4.1m	$4.1m
Scenario 2	Domestic	Day trip	34,496	69,405	104,734	140,486	176,667	178,787	180,933	183,104	185,301	187,525
		Overnight	12,647	25,447	38,399	51,508	64,773	65,550	66,337	67,133	67,939	68,754
	International	Day trip	991	2,032	3,125	4,272	5,477	5,751	6,039	6,340	6,657	6,990
		Overnight	363	745	1,146	1,566	2,008	2,109	2,214	2,325	2,441	2,563
	Incremental spending		$7.5m	$15.1m	$22.8m	$30.6m	$38.5m	$39m	$39.6m	$40.2m	$40.7m	$41.3m
Scenario 3	Domestic	Day trip	34,496	69,405	104,734	140,486	270,557	273,804	277,089	280,414	283,779	287,185
		Overnight	12,647	25,447	43,260	56,426	104,174	105,424	106,689	107,970	109,265	110,576
	International	Day trip	991	2,032	3,125	4,272	8,175	8,584	9,013	9,464	9,937	10,434
		Overnight	363	745	1,285	1,713	3,151	3,309	3,474	3,648	3,830	4,022
	Incremental spending		$7.5m	$15.1m	$24.6m	$32.4m	$60.7m	$61.6m	$62.4m	$63.3m	$64.2m	$65.2m

Spending per visitor is based on statistics at the Local Government Area (LGA) level provided by Tourism Research Australia (TRA). Given the study area spans multiple LGAs, spending patterns for each visitor category are averaged between them. The LGAs considered are:

- Yarra Ranges;
- Baw Baw;
- Murrindindi; and
- Mansfield.

Weights are attached for the relative number of visitors to each LGA (i.e. weights are based on the relative significance of each LGA as a tourism destination). The resulting estimates of visitor spending patterns are presented in Table 7 and are used to derive the spending estimates presented for each scenario in Table 6.

Table 7: Visitor spending patterns

	Domestic visitors	International visitors
Day trip	$80	$56
Overnight	$889	$345

Source: Tourism Research Australia, Local Government Area Profiles, 2014

4.1.3 Conservation and visitor management

The additional per annum costs of parks management can be drawn directly from the assumptions in Section 3.2.2. Under Scenario 1, direct additional expenditure on conservation management amounts to $1.7 million. Under Scenario 2, additional visitor management expenditure of $4.5 million per year is introduced making parks management expenditure $6.2 million higher in total. Given Scenario 3 deals only with private investment, there is no additional parks management expenditure included.

Most of the additional parks management expenditure will be made by Parks Victoria as the government agency responsible for the conservation and enhancement of environmental and cultural values, and the provision of quality information and services for visitors to Victoria's parks and waterways.[73]

It should also be noted that information was unavailable on what revenue or cost recovery models might be implemented to generate some level of revenue from park visitors.

4.2 The economic contribution of direct expenditure is derived using Input Output modelling.

4.2.1 GVA effects

The additional spending estimated in Section 4.1 will accrue to local providers of goods and services in towns around, and on the way to, the park. This expenditure will generate additional economic activity as recipients of direct spending employ additional economic resources such as labour and materials.

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[73] PricewaterhouseCoopers, *Economic Contributions of Victoria's Parks Case Studies*, Parks Victoria, Melbourne, 2003.

As highlighted in Section 1, we have used IO analysis to model the effect of increased spending. Our analysis is based on the regional IO tables in the Economic Impact Analysis Tool (EIAT) developed by the Australian Workplace Innovation and Social Research Centre (WISeR). It is a purpose-built model which simulates revenue flows, flow-on effects to related industries and effects from expenditures made by households at the LGA level. [74] It uses national IO tables provided by the Australian Bureau of Statistics (ABS) and adjusts them based on regional data in order to produce estimates which are tailored to the specific context of each LGA.[75]

This section summarises the contribution of establishing the GFNP in each year of the 10-year forecast period. This is measured through GVA which is generally regarded as the most suitable measure of the contribution of an industry to the economy.[76] It constitutes local business profits and wages paid, reflecting economic returns to local capital and labour resources.

Given the study area constitutes multiple LGAs; expenditure is distributed across the LGAs (weighted by number of visitors to the region). Results for the study area in this section are presented in aggregate.

Total GVA for each scenario is presented in Figure 8. A detailed disaggregation of total GVA into direct and indirect effects can be found in Table 8. The substantively higher GVA under Scenarios 2 and 3 reflect the need to invest adequate resources in the GFNP to ensure its economic viability. Under the *Private investment* scenario, for example, GVA in the final year of the forecast period is $71.1 million compared to $7.5 million from a simple change in tenure and $48.6 million from a solely publicly funded national park.

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[74] Australian Workplace Innovation and Social Research Centre, *Economic Impact (Input-Output) Analysis Tool for Regional Infrastructure Investment Projects*, the University of Adelaide, Adelaide, 2016. Accessed from: http://eiat.aurin.org.au/#/eiat/home

[75] Australian Workplace Innovation and Social Research Centre, *Location Quotient Method*, the University of Adelaide, Adelaide, 2016. http://eiat.aurin.org.au/#/eiat/analysis

[76] Tourism Victoria, *Economic significance*, Victorian State Government, Melbourne, 2016. Accessed from: http://www.tourism.vic.gov.au/research/economic-significance.html

Figure 8: Total GVA by scenario, Years 1-10
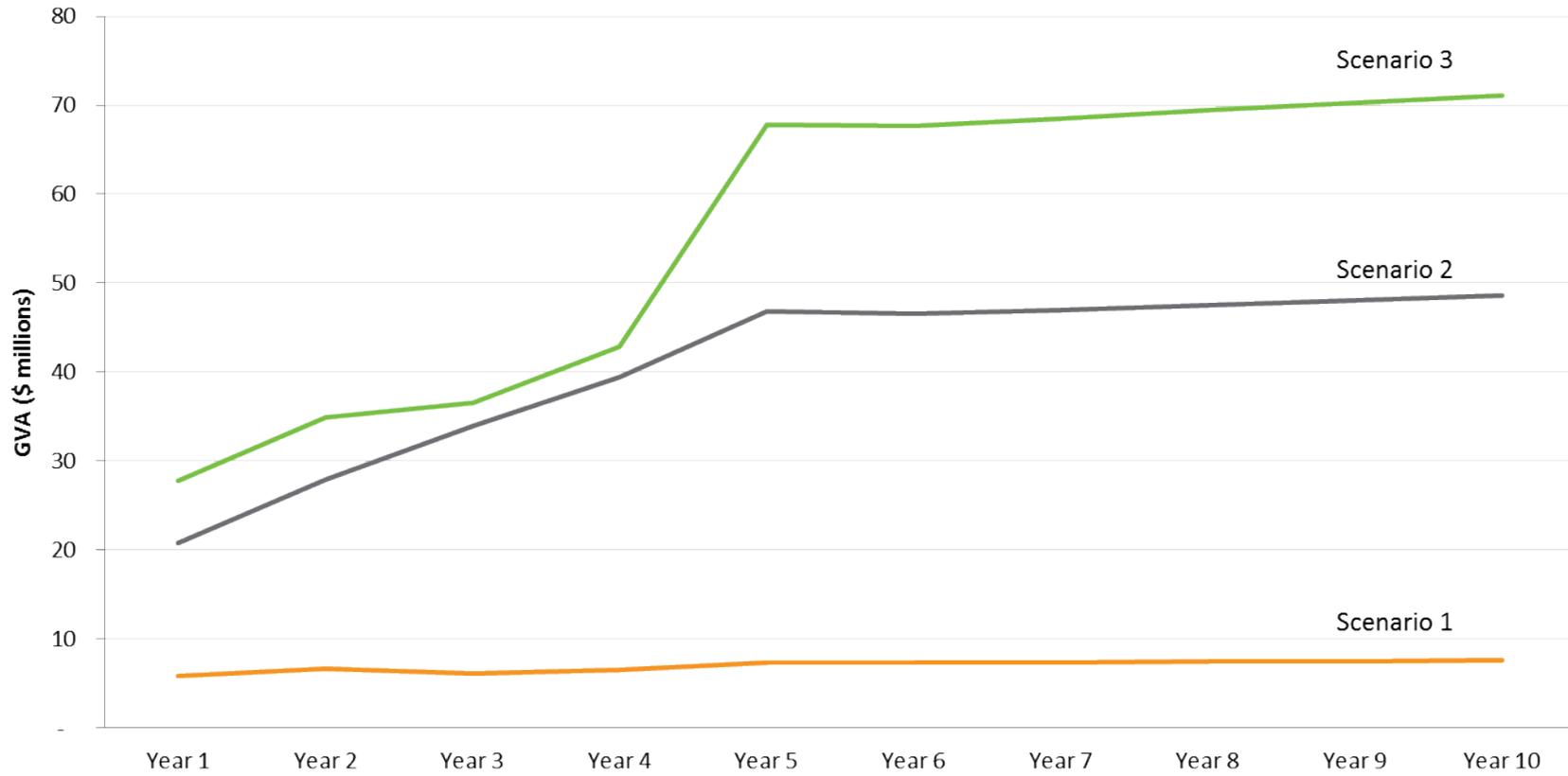
Table 8: GVA breakdown by scenario, Years 1-10

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
		Development phase					Operational phase				
Scenario 1	Direct	$2.6m	$3m	$2.9m	$3.2m	$3.6m	$3.6m	$3.7m	$3.7m	$3.7m	$3.8m
	Indirect	$3.2m	$3.6m	$3.1m	$3.3m	$3.7m	$3.7m	$3.7m	$3.7m	$3.7m	$3.8m
	Total	**$5.8m**	**$6.6m**	**$6m**	**$6.5m**	**$7.3m**	**$7.3m**	**$7.4m**	**$7.4m**	**$7.5m**	**$7.5m**
Scenario 2	Direct	$9.7m	$13.5m	$17m	$20.2m	$24.2m	$24.1m	$24.4m	$24.7m	$25m	$25.3m
	Indirect	$11.1m	$14.4m	$17m	$19.2m	$22.7m	$22.4m	$22.6m	$22.8m	$23.1m	$23.4m
	Total	**$20.8m**	**$28m**	**$34m**	**$39.4m**	**$46.8m**	**$46.5m**	**$47m**	**$47.5m**	**$48.1m**	**$48.6m**
Scenario 3	Direct	$12.2m	$16m	$18.2m	$21.8m	$35.4m	$35.5m	$35.9m	$36.4m	$36.8m	$37.3m
	Indirect	$15.5m	$18.8m	$18.4m	$21.1m	$32.4m	$32.2m	$32.6m	$33m	$33.4m	$33.8m
	Total	**$27.7m**	**$34.9m**	**$36.6m**	**$42.9m**	**$67.8m**	**$67.7m**	**$68.6m**	**$69.4m**	**$70.2m**	**$71.1m**

Figure 9, Figure 10 and Figure 11 show the contribution of park establishment, park tourism and park management for each scenario. The totals for each bar on the graph represent the cumulative GVA (equivalent to the GVA for Scenario 3) for that year. The bar is broken into segments reflecting the contribution made by changes introduced under each scenario. As the charts indicate, while GVA is higher in Scenarios 2 and 3 across all three categories of economic activity, differences in GVA from park tourism are the biggest driver in differences between the scenarios. GVA from park management remains stable over the forecast period. The increase in GVA from park tourism and visitation scales up over time. In the shift from the establishment through to the operational phase, the GVA from park establishment declines (Figure 9) and the GVA from park tourism (Figure 10) increases, and in conjunction with GVA from park management (Figure 11) leads to the overall increase in GVA from the GFNP observed in Figure 8.

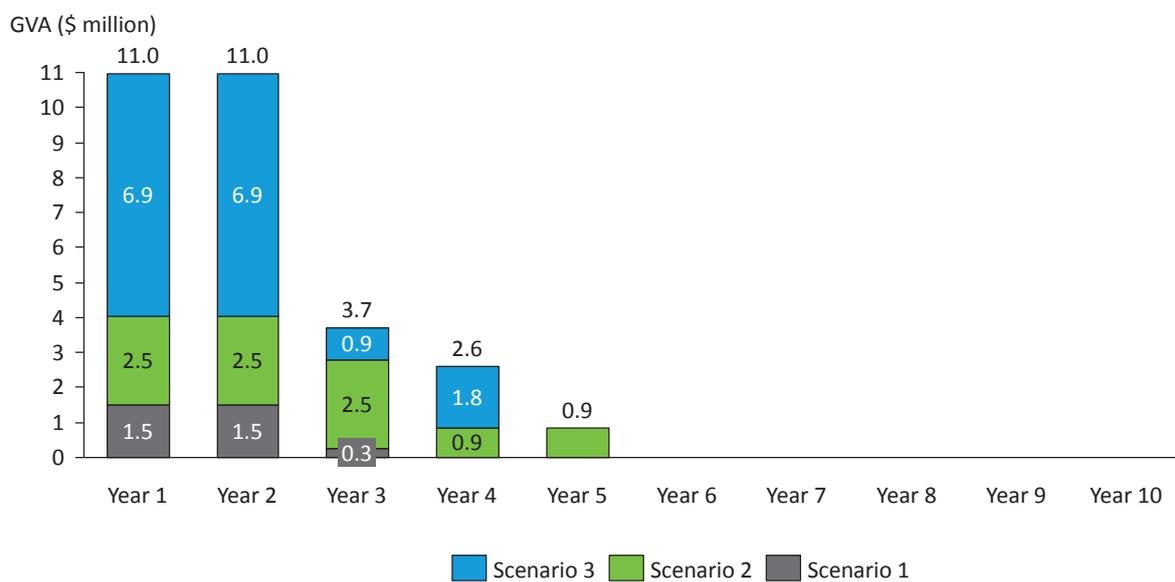Figure 9: Park establishment GVA by scenario, Years 1-10

Figure 10: Park tourism GVA by scenario, Years 1-10
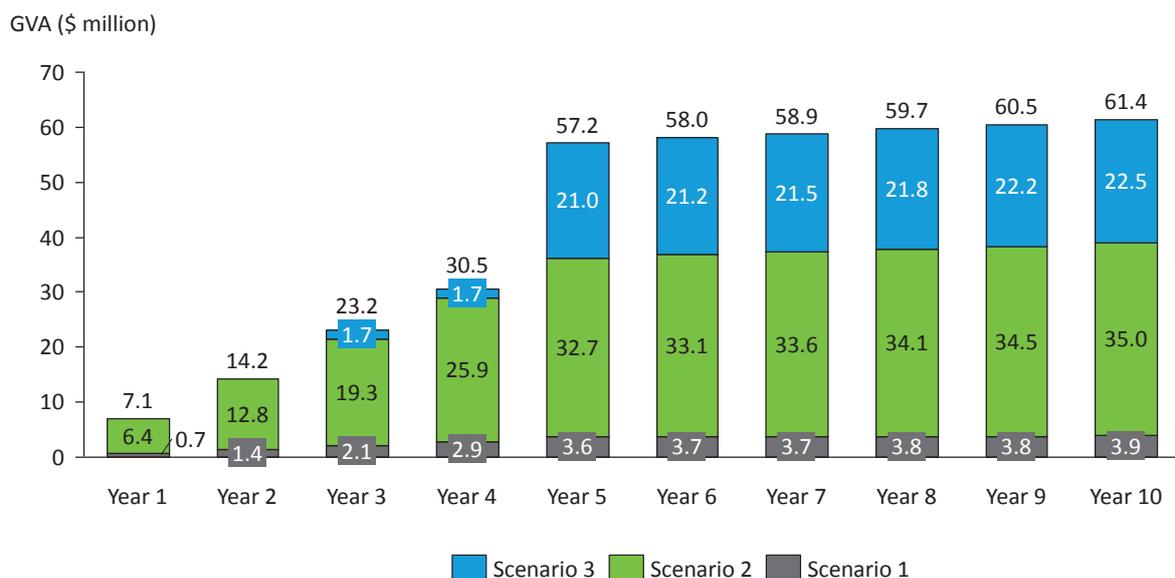
Figure 11: Park management GVA by scenario, Years 1-10
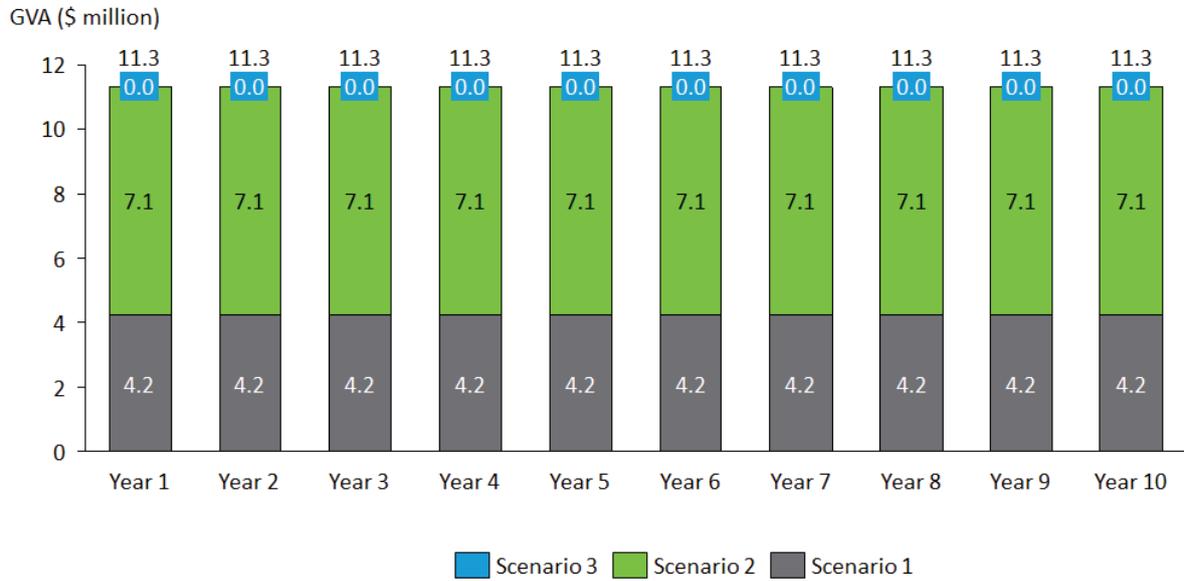
4.2.2 Employment effects

The additional economic activity created by the GFNP will support additional regional employment. Employment coefficients in the regional IO tables featured in WISeR's EIAT tool reflect the increase in employment required to support higher levels of regional output. Since employment is driven by output, it follows a very similar pattern to GVA. A disaggregation of employment effects into its direct and indirect components is provided in Table 9. Under Scenario 3, the GFNP will support an additional 760 FTE jobs by year 10 of the forecast period, showing the potential for investment in the GFNP to lead to significant regional employment opportunities. Much like GVA, additional employment is driven heavily by park tourism.

Table 9: Employment breakdown by scenario, Years 1-10

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
		Development phase					Operational phase				
Scenario 1	Direct	30	40	40	40	50	50	50	50	50	50
	Indirect	30	30	30	30	30	30	30	30	30	30
	Total	**60**	**70**	**60**	**70**	**80**	**80**	**80**	**80**	**80**	**80**
Scenario 2	Direct	120	170	210	260	310	310	310	310	320	320
	Indirect	90	120	140	160	190	190	190	190	190	200
	Total	**220**	**290**	**360**	**420**	**500**	**500**	**500**	**510**	**510**	**520**
Scenario 3	Direct	150	190	230	270	450	450	460	460	470	470
	Indirect	130	160	150	180	270	270	270	280	280	280
	Total	**280**	**350**	**380**	**450**	**720**	**720**	**730**	**740**	**750**	**760**

4.2.3 Sensitivity analysis

As highlighted in Section 3.2.2, the distribution of visitation effects from the Otway Fly case study for the treetop walk and zipline is the most significant source of uncertainty. Given the absence of a more perfect analogy, this section explores the impacts of using different assumptions. While the headline GVA and employment results are presented, it is worth noting that variations introduced in this section affect only GVA from park tourism; the results from park establishment or park management activity remain unchanged.

Table 10 shows the range of assumptions used as the basis for sensitivity testing, and the resulting visitation effect introduced under each scenario. Assumptions used in the base case are provided as a point of reference.

- Under our base case, 60 per cent of visitors come specifically to the GFNP for the treetop walk and zipline and 25 per cent of visitors must be offset as they are already reflected in visitation figures for the Great Otway National Park.

- Under pessimistic (optimistic) estimates, 40 (80) per cent of visitors come specifically to the GFNP for the treetop walk and zipline and 35 (15) per cent of visitors are already reflected in visitation figures for the Great Otway National Park.

Table 10: Variations for sensitivity analysis

|	Sensitivity	Percentage of treetop walk/ zipline visitors who are 'new'	Percentage of treetop walk/ zipline visitors to be deducted from park visitation	Resulting visitation effect
Scenario 1	Optimistic	n/a	15%	26,000
	Pessimistic	n/a	35%	22,000
	Base case	60%	25%	24,000
Scenario 2	Optimistic	n/a	15%	238,000
	Pessimistic	n/a	35%	198,000
	Base case	60%	25%	218,000
Scenario 3	Optimistic	80%	n/a	176,000
	Pessimistic	40%	n/a	88,000
	Base case	60%	25%	137,000

Results of the sensitivity analysis are presented in Figure 12 overleaf.

Under the optimistic/optimistic case (High), GVA for the final year of Scenario 3 is $81.5 million, supporting 870 FTE jobs. Under the pessimistic/pessimistic case (Low), GVA for the final year of Scenario 3 is $60.7 million, supporting 650 FTE jobs.

These combinations are unlikely to materialise in reality and an intermediate case is more likely, which would not deviate significantly from the baseline.

The most significant impact of the sensitivity analysis is in fact related to the redistribution of GVA contribution *between* scenarios. This reflects the fact that the available data allows for greater confidence in aggregate visitor impact assumptions as opposed to how effects are distributed between the scenarios.

Figure 12: Sensitivity analysis total GVA and employment, Years 1-10
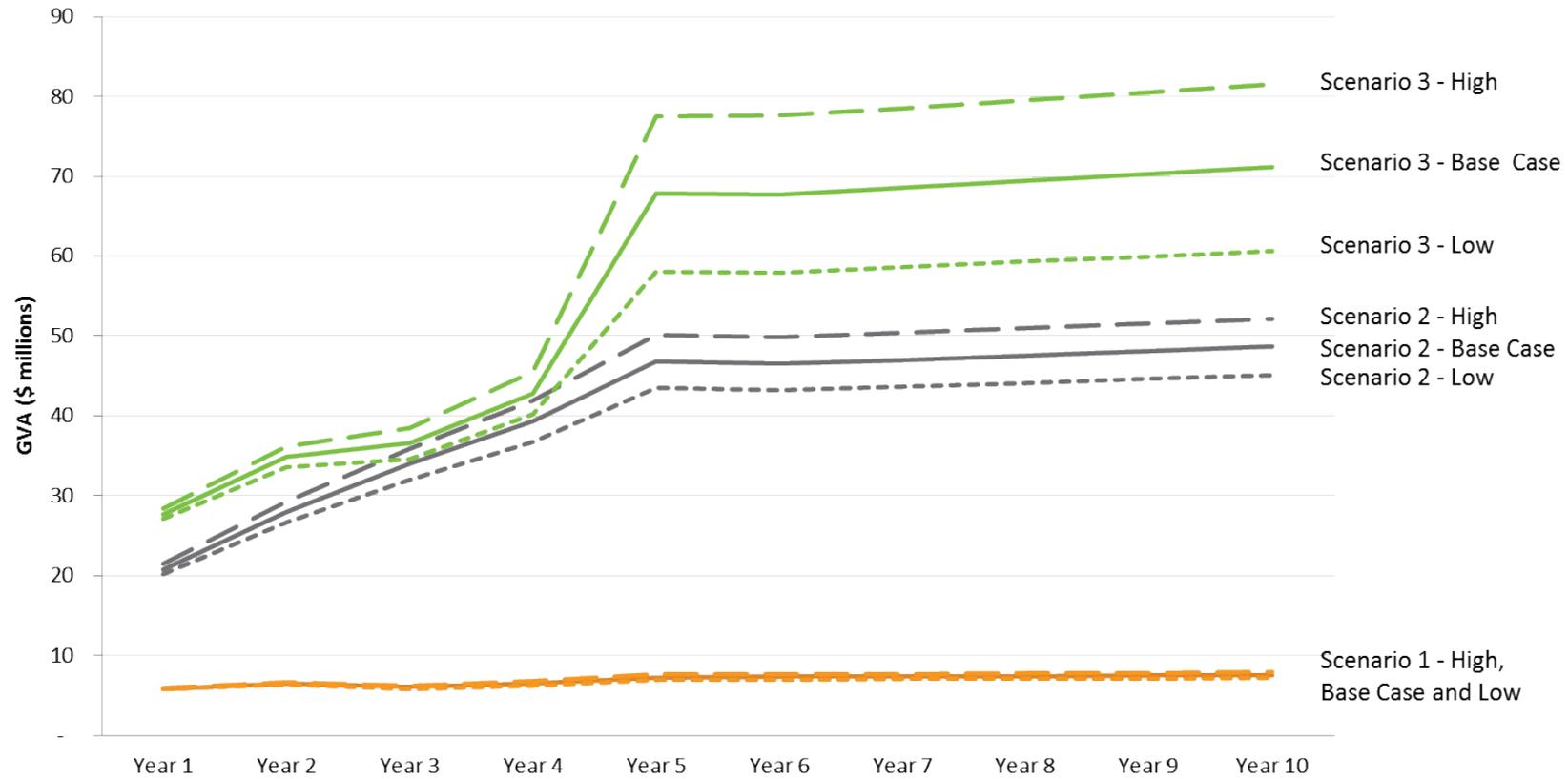
5 The establishment of an expanded reserve system is ecologically critical.

5.1 There is a growing body of research on the value of services provided by ecosystems.

People obtain benefits (known as ecosystem services) from ecosystems. [77] Mounting evidence suggests that community health and wellbeing and economic resilience are linked to healthy and resilient ecosystems, and the international community is becoming increasingly cognisant of ecosystem importance. [78]

In a Victorian setting, Parks Victoria and DELWP recently developed a collaborative study aimed at assessing the status of natural and other park assets and the contribution of the diverse range of services provided by parks to Victoria's economy and community wellbeing. [79] Through this study, they identified the key ecosystem services supported by Victoria's parks network (outlined in Table 11). Victoria's parks allow people to connect with nature, and provide diverse opportunities for outdoor recreation. They also maintain and improve Victoria's liveability and support the economy. They provide tangible services such as clean water, climate and heat regulation, nurseries for fish breeding, pollination and pest control services for agriculture, storm protection for coastal communities, and physical and mental health benefits for park visitors. They also provide benefits such as neighbourhood amenity, social cohesion and scientific and educational opportunities. [80]

Ecosystem services are generally categorised into four categories per the Common International Classification of Ecosystem Services (CICES). [81] These are:

- **Provisioning services:** Tangible goods and services that can be exchanged, traded, consumed or used directly by people e.g. provision of food, water and other raw materials.

- **Regulating services:** Ecosystems' role in controlling or modifying the parameters that define the environment; these ecosystem outputs are not consumed but affect individuals, communities and populations and their activities e.g. climate regulation; watershed regulation such as purification and flood control; and biological processes such as pest control, pollination and genetic diversity.

- **Cultural services:** Intangible ecosystem outputs that have symbolic, cultural or intellectual significance e.g. recreational services; spiritual and cultural connection; landscape amenity; health services; social cohesion and involvement.

- **Supporting services:** Services within or between ecosystems e.g. maintaining soil health and enhancing habitat for native species.

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[77] Millennium Ecosystem Assessment, *Ecosystems and human wellbeing: wetlands and water synthesis*, World Resources Institute, Washington, DC, 2005. Available in: http://www.unep.org/maweb/documents/document.358.aspx.pdf

[78] Ibid.

[79] T Varcoe, H Betts O'Shea, Z Contreras, *Valuing Victoria's Parks – Accounting for ecosystems and valuing their benefits: Report of first phase findings*, Victorian State Government, Melbourne, 2015.

[80] Ibid.

[81] Ibid.

This section details the key arguments for the GFNP from an ecological perspective. As a result, it focuses predominantly on provisioning, regulating and supporting services.

Table 11: Overview of ecosystem services[82]

Provisioning services	Regulating services	Cultural services	Supporting or Intermediate Services
Water supply/availability (for industry, household or recreational use) **Unfarmed plants and animals for food (e.g. honey)** - Nutrients and natural feed for farmed systems - Plant and animal fibres and materials (harvested for manufacturing or domestic use) - Chemicals from plants and animals **Genetic materials for breeding programs** - Biomass for fuel or energy production - Pets, exotic animals and plants for households, recreation or scientific use	**Water purification** **Water flow regulation (flooding, timing & recharge)** **Coastal asset protection** **Atmospheric regulation (carbon storage & sequestration, urban cooling)** **Soil cycle regulation (maintenance of soil quality & fertility)** **Pollination & seed dispersal** **Pest and disease control** **Maintenance of genetic diversity** **Maintenance of nursery populations** **Mass flow regulation (soil & mudflow stability)** **Bioremediation** - Maintenance of structure in cultivated systems - Noise regulation	**Recreation opportunities (enjoyment, physical & mental health)** **Information and knowledge (research & education)** **Landscape or neighbourhood amenity** **Opportunities for cultural connection** **Social cohesion and sense of place and group identity** **Non-use services (species/ecosystem existence for future generations)**	Habitat services

Source: T Varcoe, H Betts O'Shea, Z Contreras, Valuing Victoria's Parks – Accounting for ecosystems and valuing their benefits: Report of first phase findings, 2015.

5.2 The GFNP will preserve the key natural assets of the Central Highlands and the ecosystem services they support.

Extensive evidence points to the ecological imperative for establishing the GFNP. A study conducted in 2014 found that the Mountain Ash forest ecosystem of the Central Highlands was critically endangered using the IUCN Red List of Ecosystems criteria.[83] Under each of the 32 distinct scenarios considered in

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[82] Note: Services identified as related to Victorian Parks in *T Varcoe, H Betts O'Shea, Z Contreras, Valuing Victoria's Parks – Accounting for ecosystems and valuing their benefits: Report of first phase findings, 2015* are bolded in the table.

[83] E L Burns, D B Lindenmayer, J Stein, W Blanchard, L McBurney, D Blair and S C Banks, *Ecosystem assessment of mountain ash forest in the Central Highlands of Victoria, south-eastern Australia*, Austral Ecology, 40: 386–399, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/2014_ecosystem_assessment_of_mountain_ash_forest_in_the_central_highlands_etc_-_australecol_doi.pdf.

the study, there was at least a 92 per cent probability of ecosystem collapse by 2067.[84] As of 2013, 1,866 hectares of old growth forest remained in the Central Highlands region, approximately 1.5 to 3 per cent of the historical area of old growth forest.[85] The GFNP will facilitate improved management of the Mountain Ash ecosystem in Victoria, mitigating the threat posed by clearfell logging and bushfires.[86]

Clearfell logging involves the removal of all merchantable stems in an area. Leftover debris including tree heads, bark and lateral branches is left to dry then burned in high-intensity fires to regenerate new trees.[87] The population of large old trees is significantly reduced under these practices. Further, clearfelling alters ecosystem processes within the Mountain Ash forest. Fire severity is significantly higher in stands that have been logged and regenerated, increasing the fire proneness of the forests.[88] Recruitment processes for large old trees is also impaired.[89] In conjunction, both of these factors serve to rapidly accelerate the rate of loss of old trees in Mountain Ash Forests. A 2012 study of the Mountain Ash forest region found that 79 per cent of large living trees with cavities died following the major wildfires of 2009.[90] Further repeated measurements of specific burned and unburned sites under the same study revealed no recruitment of new large trees with cavities between 1997 and 2011.[91]

The human and natural disturbance events of clearfell logging and fires respectively do not act in isolation of one another. Instead, they compound each other. Unburnt areas of forest are subject to continued logging which compromises the ability of the forest to recover from fires.[92] As a result, the entire ecosystem is at risk of getting caught in a *landscape trap*, where it is maintained in a compromised structural and functional state as a result of feedback between human and natural disturbance regimes.[93]

Establishing the GFNP will expand and connect reserves and national parks in the Central Highlands to better deal with the challenges facing the Mountain Ash forest ecosystem. This larger, connected reserve system will facilitate the restoration of natural fire regimes and growth of large old trees.[94] In the case of a major disturbance event, the expanded reserve system will also likely be larger than the area affected which will build resilience in the landscape.[95] This is in contrast to the 2009 wildfires where the total area impacted was larger than the entire park reserve system, resulting in the inability of the areas affected to recover due to intensively modified areas of forest isolating them and impeding movement between fragments.[96] By better protecting the Mountain Ash forest ecosystem, the GFNP will support:

- preservation of biodiversity

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[84] Ibid.

[85] D B Lindenmayer, *Why Victoria needs a Giant Forest Natiional Park*, The Conversation, Melbourne, 2013.

[86] Ibid.

[87] D B Lindenmayer, *Victorian forestry is definitely not ecologically sustainable*, The Conversation, Melbourne, 2013.

[88] Ibid.

[89] Ibid.

[90] D B Lindenmayer, W Blanchard, L McBurney, D Blair, S Banks, G E Likens J F Franklin, W F Laurence, J A Stein and P Gibbons, *Interacting factors driving a major loss of large trees with cavities in a forest ecosystem*, PLoS ONE 7(10), 2012.

[91] Ibid.

[92] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[93] D B Lindenmayer, R J Hobbs, G E Likens, C J Krebs, *Newly discovered landscape traps produce regime shifts in wet forests*, Proceedings of the National Academy of Sciences of the United States of America 108(38), 2011. Accessed from: http://www.pnas.org/content/108/38/15887.full.

[94] D B Lindenmayer, *Why Victoria needs a Giant Forest Natiional Park*, The Conversation, Melbourne, 2013.

[95] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[96] Ibid.

- carbon sequestration; and

- water provisioning.

Each of these is discussed in turn.

5.2.1 Biodiversity

The Central Highlands supports a range of flora and fauna species. This is reflected in a report on national estate[97] values published by the Australian Heritage Commission and Department of Conservation and Natural Resources in 1994 which identified a number of areas in the Central Highlands containing uniform, modelled or complex values including flora and fauna, threatened species, natural landscapes, geology and geomorphology, and cultural and social values. The Baw Baw Plateau, for example has 28 identified national estate values including fauna refuge, flora species limit of range and high flora richness.[98]

However, the rich biodiversity of the Central Highlands is under threat. Mountain Ash trees are the world's tallest flowering plants.[99] Yet, as highlighted above, the population of Mountain Ash trees has declined sharply in recent years and the entire Mountain Ash ecosystem is critically endangered.

The large old trees in the Mountain Ash ecosystem also support endangered wildlife. Notably, large old trees with cavities are a critical habitat for Leadbeater's Possum, Victoria's faunal emblem. Leadbeater's Possum has been listed by the Australian Government as critically endangered and the loss of large old trees as a nesting and denning resource further compromises its continuing survival.[100]

The reduced, fragmented nature of old growth forest threatens the viability of other cavity-dependent species. More than 30 other cavity-using species are on a trajectory towards localised extinction in the Mountain Ash Forests of the Central Highlands.[101] A 2016 report presenting a set of experimental ecosystem accounts developed for the Central Highlands assessed the number of species classified as threatened, the threat categories and change in categories over time. Changes in threat category for a species represent changes in the extinction risk and are taken by the study to be indicative of changes in size and condition of all biodiversity in the Central Highlands area.[102] The results are presented in Table 12.

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[97] The National Estate comprises places which, as components of the natural or cultural environment of Australia have aesthetic, historic, scientific, social or other significance for present and future generations.

[98] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[99] Ibid.

[100] D B Lindenmayer, W Blanchard, L McBurney, D Blair, S Banks, G E Likens J F Franklin, W F Laurence, J A Stein and P Gibbons, *Interacting factors driving a major loss of large trees with cavities in a forest ecosystem*, PLoS ONE 7(10), 2012.

[101] D B Lindenmayer, *Victorian forestry is definitely not ecologically sustainable*, The Conversation, Melbourne, 2013.

[102] H Keith, M Vardon, J Stein, J Stein and D B Lindenmayer, *Experimental Ecosystem Accounts for the Central Highlands of Victoria*, Australian National University, Canberra, 2016.

Table 12: Change over time in number of species listed under the *Environmental Protection and Biodiversity Conservation Act 1999* (Commonwealth)

	Regionally extinct	Critically endangered	Endangered	Vulnerable	Total
2000	2	0	12	14	**28**
2005	2	1	13	15	**31**
2010	2	1	13	18	**34**
2015	2	5	14	17	**38**
Net change	**0**	**5**	**2**	**3**	**10**

Source: H Keith, M Vardon, J Stein, J Stein and D B Lindenmayer, Experimental Ecosystem Accounts for the Central Highlands of Victoria, 2016

There has been an increase in the number of critically endangered species in the last 15 years. Specific species added to the critically endangered category include:

- Leadbeater's Possum
- Regent Honeyeater
- Yellow-tufted Honeyeater
- Round-leaf Pomaderris
- Mount Donna Buang Wingless Stonefly.[103]

The remaining forest cover is also an important part of the habitat range for the Sooty Owl and the Baw Baw frog (Victoria's only endemic frog which has been listed as critically endangered under IUCN and is found only on the plateau and escarpments of Mont Baw Baw).[104]

Monitoring focused on arboreal marsupials over the past 25 years found there is a significant positive relationship between animal occurrence and hollow-bearing trees, higher numbers of animals and species in old growth forest and a significant decrease in the number of animals over time.[105] This highlights the importance of establishing the GFNP to preserve the diverse range of wildlife supported by the Mountain Ash ecosystem.

5.2.2 Carbon sequestration

Maintaining ecosystem carbon stocks is key to climate change mitigation.[106] The Central Highlands' Mountain Ash Forests are the most carbon dense in the world.[107] Maximum biomass carbon density for a

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[103] Ibid.

[104] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from:
http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[105] H Keith, M Vardon, J Stein, J Stein and D B Lindenmayer, *Experimental Ecosystem Accounts for the Central Highlands of Victoria*, Australian National University, Canberra, 2016.

[106] H Keith, M Vardon, J Stein, J Stein and D B Lindenmayer, *Experimental Ecosystem Accounts for the Central Highlands of Victoria*, Australian National University, Canberra, 2016.

Mountain Ash forest is 1,819 tC/ha (tonnes of carbon per hectare) in living, above-ground biomass and 2,844 tC/ha in total biomass in old growth forest. In Mountain Ash forest that has been logged, these values are significantly lower (as low as 262 tC/ha).[108]

Modelling of biomass carbon stocks in the Central Highlands found a total carbon stock in 2015 of 146 Mt C (megatonnes of carbon). Net annual increment in carbon stock, which represents the physical ecosystem service of sequestration and has value for climate change mitigation was found to be 1.7 Mt C per year. This is worth approximately $20 million based on a carbon price of $12.25 per tonne. The modelling also estimated the difference in the carbon density of logged and unlogged areas as an average of 143 tC/ha. This carbon stock loss due to logging was worth approximately $1,755 per hectare once again using a carbon price of $12.25.[109]

Areas with high carbon stocks have been identified across Toolangi, Warburton, Lake Mountain and the Royston Ranges. However, only half of the forest with high carbon stock falls in existing reserves. The GFNP will protect these forests from degradation and deforestation in order to maintain their carbon stocks, and allow previously logged forests to regrow, providing a valuable ecosystem service and contributing to the broader effort to combat climate change.[110]

5.2.3 Water provisioning

The Central Highlands is one of the most important regions in supplying water to the city of Melbourne and rural communities.[111] In fact, the majority of the catchment areas for Melbourne Water's ten storage reservoirs fall within the region[112] and most of the city of Melbourne's drinking water comes from it.[113] Water provisioning is a valuable ecosystem service. The experimental ecosystem accounts for the Central Highlands determined the quantity of water provided by calculating runoff spatially across the study area. This runoff provides inflows to the reservoirs. In 2014-15, Melbourne Water supplied 402 GL (gigalitres) of water, earning $876 million in revenue. Per the ecosystem accounts, this is associated with an industry value added (contribution to GDP) of $267 million which is equivalent to $2,319 per hectare (based on a catchment area of 115,149 hectares).[114]

Water yields are maximised in old growth forests. Studies conducted in the Central Highlands specifically found that runoff decreases when forest condition is disturbed and that areas disturbed by clearfelling or wildfire have significantly lower runoff. Clearly, establishing the GFNP will more effectively protect water catchments, yielding significant benefits for Melburnians in the long run.[115]

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[107] D B Lindenmayer, *Why Victoria needs a Giant Forest Natiional Park*, The Conversation, Melbourne, 2013.

[108] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[109] H Keith, M Vardon, J Stein, J Stein and D B Lindenmayer, *Experimental Ecosystem Accounts for the Central Highlands of Victoria*, Australian National University, Canberra, 2016.

[110] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

[111] Ibid.

[112] H Keith, M Vardon, J Stein, J Stein and D B Lindenmayer, *Experimental Ecosystem Accounts for the Central Highlands of Victoria*, Australian National University, Canberra, 2016.

[113] D B Lindenmayer, *Why Victoria needs a Giant Forest Natiional Park*, The Conversation, Melbourne, 2013.

[114] H Keith, M Vardon, J Stein, J Stein and D B Lindenmayer, *Experimental Ecosystem Accounts for the Central Highlands of Victoria*, Australian National University, Canberra, 2016.

[115] Working Group for the Great Forest National Park, *Great Forest National Park Tenure, values and reserve design methodology,* The Wilderness Society, Melbourne, 2015. Accessed from: http://www.greatforestnationalpark.com.au/uploads/1/5/5/7/15574924/great_forest_national_park_-_summary_report-a3.pdf.

6 The GFNP will facilitate tourism to the region and the state beyond what is quantified in this analysis.

6.1 The visitation effects of the GFNP extend beyond what is captured in this analysis.

The economic impact of the GFNP estimated in this analysis is conservative for two key reasons. The first, as highlighted in Section 3.2.3, is that the case studies used to model the GVA effects of the GFNP are conservative. In particular, the publicly available data has not allowed the analysis to accurately reflect the potential economic impact of the GFNP taking into consideration its proximity to Melbourne as a key defining feature. The second is the omission of additional economic activity enabled by the GFNP which is not reflected in park visitation.

6.2 The GFNP holds great potential for tourism in Victoria more broadly.

Tourism is a significant contributor to the Victorian economy. The 2014-15 Tourism Satellite Accounts show that tourism directly contributed $9.5 billion in GVA and indirectly contributed $9.7 billion.[116] Tourism's cumulative $19.2 billion contribution accounted for 5.8 per cent of Victoria's GVA.[117] This economic activity generated 210,400 jobs (137,400 directly and 73,000 indirectly) in 2014-15, or 7.2 per cent of jobs in the state.[118]

However, in spite of the growing prominence, and importance of nature-based tourism in Australia, Victoria has struggled to raise the profile of its nature-based offering.

In 2015-16, 68 per cent of international visitors to Australia engaged in some form of nature-based activity.[119] International nature-based visitors also generated a higher yield and stayed longer (per research conducted in 2013, they spent 17 per cent more and stayed 22 per cent longer than the average international visitor).[120] Further, 56 per cent of visitors are influenced to visit Australia based on their intent to visit a natural area[121] and visitors from key international tourist markets have ranked nature-based attractions as high as third in importance for selecting a holiday destination.[122]

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[116] Ibid.

[117] Ibid.

[118] Ibid.

[119] Tourism Australia, *Nature based tourism*, Tourism Australia, Canberra, 2016. Accessed from:
http://www.tourism.australia.com/nature-based-tourism.aspx

[120] Tourism and Transport Forum, *Nature and the Australian Visitor Economy*, Tourism Transport Forum, Sydney, 2014. Accessed from:
http://www.tourism.australia.com/documents/National-Landscapes/Presentation_TTF_NL_Forum_Aug14.pdf

[121] Tourism Victoria, *Victoria's nature-based tourism strategy*, Victorian State Government, Melbourne, 2008.

[122] Tourism and Transport Forum, *Nature and the Australian Visitor Economy*, Tourism Transport Forum, Sydney, 2014. Accessed from:
http://www.tourism.australia.com/documents/National-Landscapes/Presentation_TTF_NL_Forum_Aug14.pdf

Analysis of Victoria's positioning as a destination for world-class natural attractions found perceptions of nature-based attractions in Victoria to be surprisingly low. Only 8 per cent of surveyed individuals believed Victoria had world-class natural attractions.[123] Victoria's nature-based tourism strategy identified low consumer perception and awareness of nature-based tourism in Victoria, and the lack of engaging nature-based tourism experiences available to promote as major impediments to enhancing the competitive positioning of Victoria as a world-class nature-based tourism destination.[124]

The appeal of the GFNP can be leveraged to raise the profile of Victoria's nature-based attractions. With appropriate infrastructure in place to enhance the visitor experience, the grandeur of the Mountain Ash Forests offers a unique and highly engaging nature-based attraction. If appropriately supported by collaborative marketing efforts from Parks Victoria and Tourism Victoria to raise awareness among interstate and international tourists, the GFNP could become an iconic Victorian natural attraction which does not just benefit the regions around the GFNP by attracting intrastate visitors from elsewhere in the Victoria, but the entire state.

Whether it is at a regional or state level, the road to realising the economic benefits and associated jobs growth of the Mountain Ash Forests of the Central Highlands, starts with recognising the significance of the forests as a tourism asset that need to be protected and promoted. The exploratory analysis presented in this report demonstrates the potential for economic gain by providing indicative evidence that the GFNP proposal will both preserve an iconic Victorian landscape and bring economic activity to a region still in recovery from the devastating effects of fire.

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[123] Tourism Victoria, *Victoria's nature-based tourism strategy*, Victorian State Government, Melbourne, 2008.
[124] Ibid.