

# Economic impacts of national park tourism on gateway communities: the case of Kosciuszko National Park

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Kosciuszko National Park (KNP) is a major tourist attraction for Australians, featuring the highest mountain on the Australian mainland (Mount Kosciuszko) and including popular ski resorts and wilderness. The region adjoining KNP includes townships with a total population of some 25,000 people, whose economic welfare is increasingly affected by tourism to KNP. This paper reports research that surveyed expenditure by visitors to KNP, which injects new activity into the adjoining regional economy. The paper uses the first round of an input–output process to model the impacts of such expenditure on the region, and also develops a spreadsheet model for allocating visitor expenditure between businesses within the park and businesses within the adjoining regional economy.

*Keywords:* economic impact; national parks; gateway communities; Kosciuszko National Park; Australia

Kosciuszko National Park (KNP) is one of Australia's greatest national parks and is the largest in the state of New South Wales (NSW). It includes the highest mountains on the Australian continent, and the headwaters of the famous Snowy, Murray and Murrumbidgee Rivers. The park covers 690,000 ha and contains NSW's only alpine resorts and cross-country skiing terrain. (See Figure 1.)

The area attracts significant visitation in winter due to the opportunities for downhill skiing, snowboarding and cross-country skiing. While recognized for its winter skiing pursuits, it also is an attractive summer visitation option due to the displays of wildflowers and bushwalking experiences.

There is significant commercial development in the park, and its management is under pressure to allow more. A key policy question is the extent to which such development would detract from the economic impact of park tourism on the surrounding gateway communities.

Research for this study was funded by the Cooperative Research Centre for Sustainable Tourism, NSW Parks and Wildlife Service, and Planning NSW.



The Centre for Tourism Research at the University of Canberra carried out an extensive year-long survey of visitors to KNP in 2001. This survey provided data on visitor expenditure which has been used in the present study in conjunction with NSW state input–output tables to derive estimates of the impacts of visitor expenditure on gross state product and employment, both for the state as a whole and for the region.

### Economic value of national parks

Research on the economics of natural areas can be divided into three main categories:

- methods of valuing non-priced assets;
- economic impact on a macro-level; and
- economic impact on adjoining communities.

Research of the first type sees national parks and other common-property natural resources as having economic value to society as protected areas, as opposed to rival uses of the resources such as mining, forestry and agriculture. Such economic value consists of two parts (IUCN, 1998):

- use values (such as tourism, water catchment, species habitat) and options for future possible use; and
- non-use values (such as existence and bequest values).

The measurement of use values of direct commercial relevance includes the value to consumers of the protected areas, plus the value to the firms supplying goods and services as part of the consumption. Thus in the case of tourism values, the visitors to a park receive a benefit, as do the firms supplying inputs into tourism (accommodation, transport, food and beverages, etc).

Measurement of the consumption values obtained by park tourists is often done using consumer surplus. This requires the estimation of some kind of relationship between park visitation and the (hypothetical) entry fee, for which the travel cost method is commonly used. The travel cost method takes the travel cost to the consumer as a proxy for the entry fee, and the resultant consumer surplus estimate can be found whether or not there is an actual entry fee. See Knapman and Stanley's (1993) study of Kakadu National Park and Clough and Meister (1991), who applied the technique to the Whakapa Skifield.

On the other hand, non-use values are often captured using contingent valuation methods, which measure willingness to pay for the preservation of the resource. Lee and Han (2002) applied contingent valuation to five national parks in Korea, while Driml and Common (1995) applied it in a total economic value study of five World Heritage Areas in Australia.

There have been many studies on the economic impacts of tourism to national parks, in which the impacts are usually measured with respect to a state or regional economy. Vogelsang and Graefe (2001) outline the methodology, while applications include Colorado (Donnelly *et al*, 1998), Noosa National Park (Pearson *et al*, 2000), Mt Cook National Park (Kerr *et al*, 1986) and Grampians National Park (Read Sturgess and Associates, 1994). The Noosa and Grampians studies are of particular interest here as they feature regional

economic impacts, whereas many tourism economic impact studies focus on the state or national economy.

There has not been a great deal of research on the third topic – the way in which tourism to parks has an economic impact on nearby gateway communities. Much of the research on gateway communities looks at the opportunities for such tourism to raise community living standards in developing countries. For example, Goodwin (2002) examines gateway communities near parks in Indonesia, India, Zimbabwe and the Philippines, while Walpole and Goodwin (2000) measure the local impacts of tourism to Indonesia's Komodo National Park.

### **Economic impact of visitors to KNP**

Visitors to KNP spend money at business houses within the park and in the various towns adjoining it. This expenditure has two levels of economic impact: first, the impact on the state of NSW and second, the impact on the towns and settlements of the adjoining region. The latter impact derives not only from the direct expenditure in those adjoining communities but also from flow-on effects of the expenditure that occurs within the park itself. For example, food purchased inside the park may have been conveyed there by a transport business established in an adjoining town.

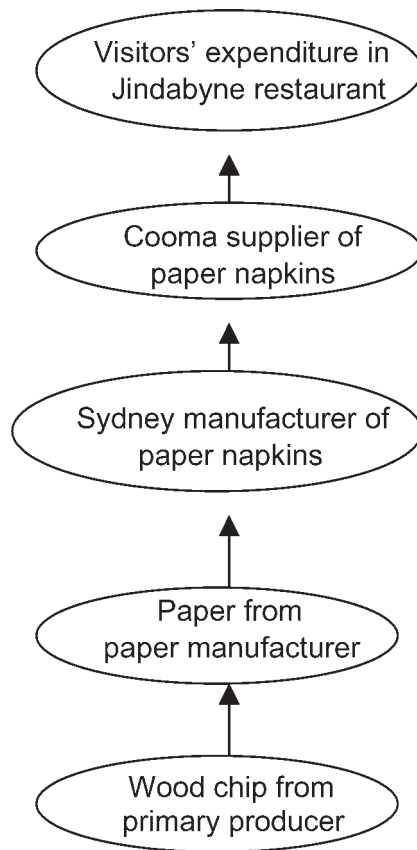
State-level economic impacts would be estimated using a state-level economic model, and would count only expenditure by visitors who were not residents of NSW. This restriction is due to the fact that residents of NSW who spend money in the park are merely transferring money from one part of the state to another, and so there is no net increase in economic activity. This level of impact is not relevant for the purposes of this paper.

The second level is of interest in this study, specifically the economic impact of expenditure by visitors to KNP on the adjoining towns. When the focus of interest is the surrounding region, expenditure by visitors from elsewhere in NSW now becomes relevant. For example, if visitors from Sydney spend money at Jindabyne (a park gateway community), there is no increase in state economic activity (merely a transfer from Sydney to Jindabyne), but such a transfer clearly boosts economic activity in Jindabyne.

A further issue that arises when focusing on the region adjoining the park is the method of modelling the economic impacts. The state–input output model is used when the focus is the state economy, but there is no input–output model for the regional economy surrounding KNP, and the costs of constructing such a model are beyond the scope of the present study.

The method for solving this problem here involves modifying the way in which the state input–output model is used. An input–output model links all industries in the state using the notion that the output of one industry is often required as an input to another. Households are linked in the model via their wage earnings and their household expenditure.

The input–output process can be segmented into several links. Figure 2 depicts an example in which tourism expenditure in a restaurant in Jindabyne requires the restaurant to purchase paper napkins from a supplier in Cooma (a gateway town). The supplier has transported the napkins, amongst other goods,



**Figure 2.** Example of input–output links.

from Sydney. The Sydney manufacturer of paper napkins has purchased paper from a paper mill, which in turn has purchased wood chip from a primary producer. Transport services are involved in most links of the chain, as well as labour being employed and business income being generated.

The total NSW impacts include those on all the links in the chain, but only the so-called ‘first-round’ effects have an impact on the surrounding region; that is, the purchase of napkins from the Cooma supplier. Thus our ‘first cut’ at estimating regional effects was to run all visitor expenditure through the model as far as the first-round effects only.

There are five Local Government Areas (LGAs) adjoining KNP: Cooma-Monaro, Snowy River, Bombala, Tumut and Tumbarumba. The major towns and settlements within these LGAs and their populations are shown in Table 1. In this paper we address the question of the extent to which tourism to KNP has economic impacts on these regions as a group.

Table 1. Towns and settlements adjoining KNP.

Sub-regional centres		Secondary centres		Local centres	
Settlement	Population	Settlement	Population	Settlement	Population
Cooma	7,150	Jindabyne	4,732	Adaminaby	366
Tumut	5,915	Batlow	1,069	Cabramurra	203
		Berridale	1,277	Dalgety	150
		Bombala	1,380	Delegate	326
		Tumbarumba	1,502	Nimmitabel	268
				Khancoban	379
				Talbingo	250

Source: Australian Bureau of Statistics.

### The data

The results reported in this paper are based on the responses to surveys distributed to visitors to KNP over a 12-month period from March 2001 to March 2002. Self-completion surveys were distributed via visitor centres, entry stations, ski tube stations, chair-lift ticket offices and retail and accommodation businesses. Some 3,096 usable questionnaires were returned, a response rate of 11%.

A reply-paid envelope was provided with each questionnaire and an incentive prize was offered (entry to a lottery with the chance to win A\$500 cash) to encourage visitors to return completed surveys. There were also drop boxes provided at visitor centres, retail centres, accommodation and transport centres, etc.

Table 2 indicates that about 50% of visitors originate from within NSW and the Australian Capital Territory and Victoria each account for 17%.

As mentioned above, when the focus of interest is on the region/towns adjoining the park, it is necessary to include in the analysis the expenditure by visitors from parts of NSW (other than the towns themselves). Such

Table 2. Origin of visitors to KNP (N = 3,055).

	%
ACT	17.3
New South Wales	50.2
Victoria	17.4
Tasmania	0.6
South Australia	2.1
Western Australia	1.1
Queensland	5.2
Northern Territory	0.1
International	6.0

Table 3. Aggregate expenditure by all visitors, 2001, A\$ million.

	Winter visitors	Summer visitors	Total
Accommodation	127.56	24.74	152.30
Food and drink	59.25	17.42	76.67
Transport	34.44	12.42	46.86
Park entry fees	12.91	4.45	17.36
Lift tickets, licences	114.03	6.81	120.85
Shopping, ski hire	53.38	11.69	65.07
Entertainment	33.42	7.34	40.76
Other	22.15	7.27	29.42
<i>Total</i>	<i>457.14</i>	<i>92.14</i>	<i>549.28</i>

expenditure would be excluded from the analysis of the statewide effects because it would be viewed as being a transfer of expenditure within the state.

Table 3 shows the total expenditure, estimated as the product of average per-person expenditure (from the survey) and the total number of visitors (obtained from Australia's Bureau of Tourism Research). Total annual expenditure in the park was estimated at A\$549.28 million in 2001–02. This indicates that NSW residents account for 80% of the total expenditure by visitors to the park.

While expenditure by winter visitors clearly dominates the total, accounting for 83%, the A\$92 million spent by summer visitors is a source of business that should not be ignored, especially as summer visitor numbers have grown from 11% in 1994 (KPMG Consulting, 1994) to 35% in 2001.

It is also interesting to note that winter visitors spend almost as much on lift tickets as they spend on accommodation and that together these two items account for 44% of total annual visitor expenditure. The extent to which these two items of expenditure flow on to the local region will be important to the determination of the economic impacts of the resorts on local economic activity outside the park.

As a first cut at this issue, this study uses the NSW input–output model to calculate the 'first-round' of economic flow-on, or multiplier effect, of the visitor expenditure shown in Table 2. The first round of the multiplier is analogous to the first link in the supply chain shown in Figure 2. The total sales output data which are typical of input–output tables were converted to value-added, which is the same as gross state product (GSP) and employment using state ratios.

The economic impact on the region is then estimated as the sum of the direct expenditure (first circle in Figure 2) and the first-round effect (second circle in Figure 2). The economic effects are shown in Table 4, and it is worth repeating here that a significant amount of the GSP generated has been transferred from other parts of NSW to the region adjoining the park.

While this modelling exercise is meant to be indicative only, it is interesting to note that it indicates a significant impact on manufacturing in the area. While at first sight this may appear surprising, given the apparent rural nature of the region, data from the Australian Bureau of Statistics show that there were actually 968 people employed in manufacturing in the region. It clearly has

Table 4. Economic impacts of KNP visitors on regional economy.

	GSP, A\$ million			Employment, FTE		
	Winter	Summer	Total	Winter	Summer	Total
Agriculture	3.00	0.70	3.70	63	15	78
Mining	0.54	0.14	0.68	2	1	3
Manufacturing	28.42	7.18	35.6	346	87	433
Electricity, gas, water	4.71	0.90	5.61	22	4	26
Construction	0.93	0.19	1.12	19	4	23
Wholesale	6.67	1.51	8.18	95	21	116
Retail	26.99	5.89	32.88	871	190	1,061
Accommodation, cafés	79.63	16.82	96.45	1,496	316	1,812
Transport, storage	16.26	5.23	21.49	246	79	325
Communication	6.86	1.34	8.2	58	11	69
Finance, insurance	10.02	1.78	11.8	77	14	91
Property, business services	109.82	12.83	122.65	1,214	142	1,356
Government	0.58	0.13	0.71	9	2	11
Education	0.60	0.10	0.70	12	2	14
Health	0.15	0.04	0.19	3	1	4
Culture and recreation	26.09	5.61	31.7	340	73	413
Personal services	14.39	4.59	18.98	361	115	476
<i>Total</i>	<i>335.66</i>	<i>64.98</i>	<i>400.64</i>	<i>5,235</i>	<i>1,078</i>	<i>6,313</i>

the capacity to handle the first-round effects of tourism to KNP on manufacturing.

The regional property and business services sector is also strongly affected, because of its strong links with the retail trade, accommodation, cafes and restaurants and cultural and recreational services sectors.

Two caveats should be made regarding the data in Table 4 insofar as they purport to represent the economic impacts on the region:

- (1) As they show direct plus first-round effects, they do not include any subsequent impacts on the region arising from subsequent links in the production chain, and nor do they specifically account for induced household consumption effects arising from income generated in subsequent rounds.
- (2) They assume that all first-round effects have an impact on the region, when in reality some are almost certainly going to impact on other regions, most probably Sydney.

These two qualifications will tend to cancel each other out in the overall picture, but the impacts on any particular sector in the region may not be well represented by these estimates.

### Expenditure in the park and gateway communities

Like many large national parks in North America (for example, Yosemite), KNP is characterized by some large-scale tourism developments within its



boundaries. Businesses in the park supply accommodation, meals, transport, retail services, ski hire and night-time entertainment for visitors. In doing so, they are in competition with similar businesses located in the gateway communities.

Park managers attempt to balance the demand for on-mountain services, including accommodation, with concerns for the environment and the welfare of existing businesses in the gateway communities. To do this, they need knowledge of how much benefit or damage would be experienced by gateway communities if they were to reject or approve new developments in the park.

In this section, the focus is on the geographical split in expenditure between the park and the adjoining towns and settlements. This split enables the direct economic links between the park and its region to be estimated. In the case of KNP, visitors must travel overland through at least one of the gateway communities as there is no airport inside the park. This journey is done mostly by motor vehicle and so it may be that, even when visitors have accommodation inside the park, they will still spend money in the gateway communities as they pass through them.

The 2001 survey of visitors to KNP estimated total visitor expenditure at A\$549.28 million (see Table 3), and attributed A\$457.14 million of this to winter tourism. However, the survey was not able to distinguish between expenditure inside the park and in the adjoining region.

The study team approached this issue by developing the GATE (Geographic Allocation of Tourism Expenditure) model. In GATE, the expenditure by park visitors can be represented by  $E_{ijk}$ , where  $i$  = within the park, or within the region,  $j$  ranges over the expenditure categories – accommodation; food and drink; transport; park entry fees; lift tickets, licences; shopping, ski hire; entertainment; and other (personal care) – and  $k$  represents either winter or non-winter.

Total expenditure in each category for each season in GATE ( $X_{jk}$ ) can be represented as:

$$X_{jk} = p_{jk}(X_{jk}) + (1-p_{jk})X_{jk}$$

where  $p_{jk}$  is the proportion of expenditure category  $j$  which occurs in the park in season  $k$ , and  $(1-p_{jk})$  is the proportion of expenditure category  $j$  which occurs directly in the region. For example,  $X_{12}$  would be the expenditure by park visitors in non-winter ( $k = 2$ ) on accommodation ( $j = 1$ ), and  $p_{jk}X_{jk}$  would be the amount of such expenditure that occurs in the park.

From the survey,  $X_{jk}$  is known (the amount of expenditure in each category in each season). By using imposed values for  $p_{jk}$ , it is possible to derive estimates of  $E_{ijk}$ ; that is, the amount of expenditure in each location ( $i$  = park or region) for each category and for each season.

Two sets of imposed values were trialled and they are shown in Table 5 as scenarios 1 and 2. The values as to where the split between the park and the region might be in scenario 1 were estimated from industry consultation. In scenario 2, a somewhat more 'middle-of-the-road' set of values was chosen. For example, scenario 1 has a high proportion (0.7) of accommodation expenditure allocated to the park in winter, whereas scenario 2 reduces this to 0.6. Scenario 1 has only 0.05, or 5%, of park entry fees allocated to the park in winter, whereas scenario 2 raises this to 15% (0.15).

Table 5. Scenarios for expenditure allocation.

	Scenario 1			
	Winter		Non-winter	
	KNP	Region	KNP	Region
Accommodation	0.7	0.3	0.25	0.75
Food and drink	0.5	0.5	0.2	0.8
Transport	0.3	0.7	0.05	0.95
Park entry fees	0.05	0.95	0.05	0.95
Lift tickets, licences	0.9	0.1	0.6	0.4
Shopping, ski hire	0.5	0.5	0.05	0.95
Entertainment	0.2	0.8	0.05	0.95
Other	0.2	0.8	0.05	0.95

	Scenario 2			
	Winter		Non-winter	
	KNP	Region	KNP	Region
Accommodation	0.6	0.4	0.4	0.6
Food and drink	0.4	0.6	0.1	0.9
Transport	0.2	0.8	0.1	0.9
Park entry fees	0.15	0.85	0.1	0.9
Lift tickets, licences	0.9	0.1	0.4	0.6
Shopping, ski hire	0.3	0.7	0.1	0.9
Entertainment	0.1	0.9	0.1	0.9
Other	0.1	0.9	0.1	0.9

The allocation model has been set up as a spreadsheet which enables the proportions  $p_{jk}$  to be changed as more information becomes available from further research. The spreadsheet model also allows various scenarios to be run to see how sensitive the allocation of total expenditure is to changes in the allocation proportions.

The scenarios depicted in Table 5 were run with the model and the expenditure data from the survey, with the results shown in Table 6. The total allocation to the park varies from A\$251.94 million to A\$286.24 million under the two scenarios, a variation of 13.6%. The average of the two sets of estimates is shown for total expenditure on each of the items in Table 7.

The implication of these calculations is that total annual visitor expenditure is almost evenly split between region and park. Purchases of lift tickets are predominantly in the park, while food and shopping are predominantly in the region.

Further research on the GATE model could involve a survey to determine more accurate values of the proportions  $p_{jk}$ ; this would then give a valuable insight into the links between tourism expenditure within the park and the economy of regional gateway communities.

The GATE model could actually be applied to any national park where there is a gateway community of towns and villages, and it could be used as an input into national Ppark management decision making about visitor numbers. The output of the model would be useful in providing information for consultation

Table 6. Expenditure allocation between park and region, A\$ million.

	Scenario 1			
	Winter		Non-winter	
	KNP	Region	KNP	Region
Accommodation	89.29	38.27	6.18	18.56
Food and drink	29.63	29.63	3.48	13.94
Transport	10.33	24.11	0.62	11.80
Park entry fees	0.65	12.26	0.22	4.23
Lift tickets, licences	102.63	11.40	4.09	2.72
Shopping, ski hire	26.69	26.69	0.58	11.11
Entertainment	6.68	26.74	0.37	6.97
Other	4.43	17.72	0.36	6.91
<i>Total</i>	<i>270.33</i>	<i>186.81</i>	<i>15.91</i>	<i>76.23</i>

	Scenario 2			
	Winter		Non-winter	
	KNP	Region	KNP	Region
Accommodation	76.54	51.02	9.90	14.84
Food and drink	23.70	35.55	1.74	15.68
Transport	6.89	27.55	1.24	11.18
Park entry fees	1.94	10.97	0.45	4.01
Lift tickets, licences	102.63	11.40	2.72	4.09
Shopping, ski hire	16.01	37.37	1.17	10.52
Entertainment	3.34	30.08	0.73	6.61
Other	2.21	19.94	0.73	6.54
<i>Total</i>	<i>233.26</i>	<i>223.88</i>	<i>18.68</i>	<i>73.46</i>

meetings between park management and local communities and local government in the gateway region.

## Discussion

The economic impact of expenditure by visitors to national parks on adjoining towns and settlements has received scant attention in the tourism and national parks research literature. While suitable expenditure data exist, regional economic models appear to be lacking. This paper has developed modelling approaches for assessing the economic impacts on the adjoining regions of expenditure by visitors to Australia's Kosciuszko National Park. The models are not specific to KNP, and are useful in situations in which an economic model such as an input–output model of the region either does not exist or would not be feasible.

The first model considered was an input–output model of the entire state economy, but limiting the estimated impacts to the first round of the input–output multiplier process. While this approach yields estimated economic impacts for the adjoining towns in total, it cannot provide a disaggregation,

Table 7. Breakdown of total visitor expenditure between park and region, A\$ million.

	KNP	Region
Accommodation	90.95	61.35
Food and drink	29.28	47.39
Transport	9.54	37.32
Park entry fees	1.62	15.73
Lift tickets, licences	106.03	14.81
Shopping, ski hire	22.23	42.84
Entertainment	5.56	35.20
Other	3.87	25.55
<i>Total</i>	269.09	280.19

which means that the impacts on each town and settlement cannot be estimated. Further research is needed on this question, especially if planners are to be informed about the impacts of business development within parks on adjoining individual towns.

Such research would need to take a more spatial approach to visitor expenditure and to business linkages. This paper has made some advances on the former, but more research is needed on the latter. This paper has developed a spreadsheet model for allocating tourist expenditure between in-park businesses and purchases made outside the park. This is useful where visitor expenditure is not collected on a spatial basis, because of survey respondents' difficulty in recalling where expenditure was incurred. The model can be used for simulating different scenarios, such as visitors staying overnight either in or outside the Park, and can be applied to situations in which the parks service operates leases to business houses within park boundaries. (This feature of national parks is very common in North America – Yosemite, Yellowstone, Banff, Jasper, etc – and could become more prevalent in Australia and New Zealand if the outsourcing philosophy which has been popular in government generally takes hold in the management of national parks.)

The model can be easily re-parameterized, based on updated knowledge about expenditure shares in and outside the park. Further refinement would be via the introduction of more than two regions. This, together with information on spatial business connections, would facilitate the estimation of economic impacts on individual towns and settlements adjoining national parks.

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