The Australian Alps And The Great Escarpment Of Eastern Australia Conservation Corridors

Ian Pulsford, Graeme Worboys, Jane Gough and Tim Shepherd

Abstract

Two outstanding Australian conservation corridors have been established in south eastern Australia during 60 years of conservation land use decisions. The establishment of these two conservation corridors is presented. The Australian Alps conservation corridor straddles the Great Dividing Range and extends along natural lands from central Victoria through south eastern New South Wales to the Australian Capital Territory. This corridor includes the highest peaks of Australia. The southern section of another conservation corridor is located along the Great Escarpment of Eastern Australia. This geomorphic feature extends north-south from East Gippsland in Victoria to the north of Cairns in Queensland. These conservation corridors are described and their potential role in strategic biodiversity conservation at a continental scale discussed. The conservation corridors form the core around which further integrated landscape conservation management outcomes can be achieved. The benefits of an integrated landscape conservation system are being driven through a range of public and community initiatives. The national and international context for expansion of these conservation corridors is presented. The national benefits of this initiative and the steps necessary to achieve the outcome are discussed. The paper advocates long term biodiversity conservation advantages to Australia, if the southern section of the Great Escarpment of Eastern Australia conservation corridor is linked with the Australian Alps conservation corridor, to create a continental scale conservation corridor.

Introduction

Two outstanding Australian conservation corridors have been established in south eastern Australia during the last 60 years, the Australian Alps conservation corridor and the Great Escarpment of Eastern Australia conservation corridor (southern section). This paper discusses these conservation corridors and their potential role in strategic biodiversity conservation at a continental scale and at a local scale.
Biodiversity conservation, a global imperative

Worldwide, habitat loss and habitat fragmentation have been a major cause of loss of biodiversity and species extinctions:

“Global biodiversity is being lost at a rate many times higher than that of natural extinction due to land conversion, climate change, pollution, unsustainable harvesting of natural resources and the introduction of exotic species. ….. Over the last three decades decline and extinction of species have emerged as major environmental issues. ….. about 24% (1130) of mammals and 12% (1183) of bird species are currently regarded as globally threatened.” (UNEP 2002, p xxi).

Australia also has serious problems as portrayed by the Australian State of the Environment Committee (2001a). This report found land clearing to be the single greatest threat to Australian terrestrial biodiversity, with an estimated 565,000 hectares cleared in 2000 and 470,000 hectares cleared in 1999. This rate of clearing is only exceeded by 4 other countries globally, being Brazil, Indonesia, the Democratic Republic of the Congo and Bolivia (Australian State of the Environment Committee 2001a p. 73). In evaluating ecosystems and land clearing, the report *inter alia* found:

“The loss and depletion of plants through clearance destroys the habitat of thousands of other species. For example, 1000 to 2000 birds permanently lose their habitat for every 100 ha of woodland that is cleared, while the clearing of mallee for wheat farming kills, on average, more than 85% of resident reptiles and more than 200 reptiles per hectare. Broad-scale clearance can fundamentally change the functioning of ecosystems, including regional climate, and in the medium to long term undermines agricultural production and regional economies”. (Australian State of the Environment Committee 2001a p. 74).

A conservation response

The Convention on Global Biodiversity (ratified by Australia in 1993) is a significant global response to dealing with the continuing loss of biodiversity. It is a multi tiered approach to biodiversity conservation, with Article 8 of the Convention specifically requiring each signatory party to pursue *in-situ* conservation through the establishment of a system of protected areas (Worboys et al 2001 p 65.). This initiative has helped to establish some 44,000 terrestrial protected areas globally covering some 10% of the earth’s surface (Stanton 2002). However, global biodiversity conservation action is seen as too slow by some (McNeely 2002), with critical biodiversity being lost due to the pace of global development change. Australian action also has been slower than the pace of development change. Biodiversity conservation is still very much a national imperative.

Establishing protected areas is one effective response for biodiversity conservation. No other land-use classification has had the same capacity to stem the tide of development and environmental destruction (Worboys et al 2001, p. 354). For Australia, the expansion of protected areas has increased from 1% in 1968 to 8% in 1999 (Worboys et al 2001 p. 33).

Protected areas play a critical biodiversity conservation role. However their size, shape, degree of modification, and impacts of threatening processes (Worboys et al 2001, pp 229 – 249) have an influence on their effectiveness to conserve biodiversity. Protected areas as islands in an altered or fragmented landscape, are more likely to see the extinction of species over time (Soule 1986 p. 234) than large protected areas or protected areas in a natural and un-fragmented landscape.

Conservation corridors

Conservation corridors are an important tool in the conservation of biodiversity. They retain an un-fragmented landscape of natural habitat between two or more (usually) larger areas of natural habitat. Typically, they are protected areas or interlink protected areas and have a legal status that guarantees their existence. Conservation corridors have been embraced worldwide by conservationists, planners and managers as an effective conservation tool (Hamilton 1997).
Conservation corridors globally are relevant at a local scale, local government, national or international scale, for biodiversity conservation. They are natural, sustainable landscapes which commonly involve human use. They may include a range of land tenures.

Global initiatives at a national, international and continental scale include the Central Appenines in Italy spreading out from the Abruzzo National Park (Hamilton 1997); the Yellowstone to Yukon initiative linking the USA mainland through Canada to Alaska along the Rocky Mountains (Chadwick 2000); and the Paseo Pantera project and Meso-American Biological Corridor linking protected areas in Central America (Boza 2002). More recently, the EcoAmericas or Ecological Corridor of the Americas has been has been suggested (Boza 2002).

“Imagine this: a continuous biological corridor extending 20,000 kilometres along the mountain backbone of the Americas, from Alaska to Tierra del Fuego that protects a significant proportion of the biodiversity of two continents” (Boza 2002).

In Australia, the concept of conservation corridors has gained steady acceptance over the past 20 years. The value of roadside corridors and remnant vegetation has been reinforced by researchers (Saunders and Hobbs, 1991), and the importance of connectivity between natural areas of vegetation has been emphasised (Burgman and Lindenmayer 1998, p.183; Lindemayer and Nix 1993.

From the 1990’s, the concept of retaining interconnected natural lands through conservation corridors was becoming more established in local government planning schemes (Worboys et al 1996 p. 59) and the design of new protected area reserves including the establishment of the 90,000 hectare South East Forests National Park in NSW in 1997 which was extended in 1998 to 115,000 hectares (Worboys et al 2000; Worboys et al 2001, p 18). There were also some continental scale conservation corridor initiatives in Australia including the Great Barrier Reef Marine Park and the Regional Reserve system of South Australia.

A natural conservation corridor of continental dimensions

In south eastern Australia, many protected areas have been established. There is also the potential for the establishment of a continental scale conservation corridor based on essentially natural public lands remaining. It can be created through visionary and nationally focused policy decisions of governments. It requires the interconnection of natural lands of the southern parts of the 2800 kilometre north-south Great Escarpment of Eastern Australia (Ollier 1982) with the Australian Alps. The Australian Alps conservation corridor is formed by the established and interconnected national parks and reserves found along the Great Dividing Range within Victoria, the Australian Capital Territory and New South Wales. The Great Escarpment conservation corridor is formed by interconnected national parks along the southern section of the Great Escarpment. The component parts of this potential continental scale conservation corridor, their genesis and their biological setting are described further. The simple steps needed to merge the two to form a conservation corridor of continental dimensions are presented, as are the long-term economic and social benefits of such an initiative.

The Great Escarpment of eastern Australia conservation corridor

The Great Escapement of Eastern Australia is a major landform feature described by Ollier (1982). It lies to the east of the Great Dividing Range watershed for 2,800 km between Cairns in far north tropical Queensland and the NSW/Victorian border near Eden (Figure 1). Typically separating the tableland from the coast, the Great Escarpment of Eastern Australia may be prominent in form, rising abruptly from the coastal plains by several hundred to over 1000 metres in many places. It may also be obscure and at some locations, absent (Worboys 1996a).

Much of the Great Escarpment receives in excess of 1,000 mm of rainfall per year due to the elevated terrain and onshore winds that prevail along the east coast. It is the headwaters for hundreds of small easterly flowing streams which extend from the escarpment to the coast and which support a great proportion of the human population of eastern Australia. Due to the vast geographic extent, climatic variation and rugged topography, the Great Escarpment contains a variety of habitats. These range from the World Heritage listed Wet Tropics tropical rainforest communities of far northern Queensland, the disjunct protected areas of the Central Eastern Rainforest Reserves World Heritage Area and their...
diversity of cool temperate and tropical rainforests to tall wet eucalypt forests, dry open forests, heathlands, wetlands, swamps, woodlands and grassland communities (Worboys 1996a).

The Great Escarpment, with its very diverse range of habitats, is particularly species rich and parallels in biodiversity conservation importance with the flora and fauna communities of south west Western Australian. It supports very high numbers of birds, mammals, reptiles and other species (Pianka and Schall 1981; State of the Environment Advisory Council 1996). This species richness which included the presence of over 90 Eucalypt species (NSW National Parks and Wildlife Service 1998) was internationally recognised by the inscription of the Greater Blue Mountains area onto the World Heritage list in 2000.

The southern extent of the Great Escarpment has a number of interconnected protected areas in Victoria and NSW currently forming a north-south conservation corridor of over 350 kilometres. It is these reserves which form the current conservation corridor. The linking of this conservation corridor and its several connections to the coast and tablelands has only been achieved since 1997 (see Table 1).

**The Australian Alps conservation corridor**

The Australian Alps conservation corridor extends north-south along the spine of the watershed of the Great Dividing Range of Australia (Figures 1 and 3). It stretches 690 km south from Wee Jasper through the Brindabella Range on the Australian Capital Territory/NSW border, through the Snowy Mountains of NSW and along the Great Dividing Range through Victoria. The Alps form a 1,657,570 hectare continuous conservation corridor of nine protected areas crossing State and Territory borders along the highest parts of the Australian continent.

The protected area network of the Australian Alps has developed gradually since 1906. In 1944, the former Premier of NSW, Sir William McKell, responding to growing pressure caused by the impact on catchments of alpine grazing as well as the needs of the proposed Snowy Mountains Hydro Electric Scheme, established the first great alpine park in Australia (Byles and Dunphy 1966; Stanley 1983) (Figure 2). It contains the continent’s highest mountain (Mt Kosciuszko - 2228m) as well as including the entire alpine and most of the subalpine areas in NSW. It also encompasses a wide variety of montane eucalypt forest, open woodland, rain forest, heathlands, wetlands and dry semi arid callitris forests.

In Victoria, smaller icon parks were initially established. These were then linked by the Victorian Government to create the Alpine National Park (646,000ha) in 1989 from the controversial recommendations of the Land Conservation Council. Further work of the Council resulted in the creation of additional parks such as Avon Wilderness and Snowy River in the 1980’s and 1990’s. Alpine, Snowy River and Avon Wilderness National Parks extend to the south and south west and contain the alpine areas, subalpine woodland, heathlands and montane forests of the Victoria Alps (Figure 2).

The declarations of Namadgi National Park in the ACT in 1984 and Brindabella National Park in NSW (1996) extended the corridor of Australian Alps protected areas. north from the core of the Alps (Figure 2). Together these parks are now managed under a tri-state Australian Alps Parks Memorandum of Understanding for Cooperative Management.
Figure 1. The Great Escarpment of Eastern Australia and the Great Dividing Range extending from Victoria to far north Queensland.
Table 1. Time line and milestones for the establishment of the Great Escarpment and Australian Alps conservation corridor reserves in south eastern Australia.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
<th>Location</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1879</td>
<td>Royal National Park</td>
<td>World's 2nd national park</td>
<td></td>
</tr>
<tr>
<td>1916</td>
<td>Snowy Mountains National Park 100 square miles</td>
<td></td>
<td>small unique reserves</td>
</tr>
<tr>
<td>1925</td>
<td>Snowy Mountains National Park 175 square miles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1930</td>
<td>Kosciusko State Park 1,365,250 ac</td>
<td></td>
<td>iconic large park</td>
</tr>
<tr>
<td>1957</td>
<td>Nodges Fauna Reserve 20,000 ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>NSW National Parks and Wildlife Service created</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>Morton NP 194,000 ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>Bushtrway LP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>Nodges Crooklinglong Mtn &amp; Basin Reserve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>Victorian Alps Park</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>Blue Mountains NP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>Namadgi NP 105,300 ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>Transboundary Cooperative management over 3 protected areas 1,630,000 ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>Aorol Williamsers NP 40,000 ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>Alpin NP (365,000 sq km)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>Snowy River NP (95,700 ha)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>National Forest Policy Statement (Commonwealth of Australia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>SE Forest NP 30,000 ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>SE Forest NP extended to 115,000 ha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>Great Escarpment conservation corridor: Southern Regional Forest Agreement and other linking Crown land protected reserves?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>Sydney Catchment Authority Catchment management blue print</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>Great Escarpment of Eastern Aust. conservation corridor: 800 km linked</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>Catchment Blueprint: Biodiversity Landscape targets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>10% of landscape in SE NSW &quot;managed for conservation&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Voluntary incentive stewardship payments and partnerships mechanisms in place?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>Achieving Integrated Landscape Conservation?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 2. Three indicative maps illustrating progress in the expansion of the reserve system and establishment of conservation corridor linkages south eastern Australia 1944, 1980 and 2002 (Please note: Digital data were not available for reserves in Victoria or the ACT prior to 2000).
Figure 3. Extent of bioregions included in conservation reserves of the Australian Alps and the Great Escarpment of Eastern Australia conservation corridors.
Biodiversity conservation sampling for the conservation corridors

Australia is a mega-biodiverse country. National surveys undertaken through the Interim Biogeographic Regionalisation for Australia (IBRA) (Environment Australia 2000) have determined that there are 85 discreet bioregions for the nation. The Australian Alps conservation corridor includes nearly 80% of the Australian Alps Bioregion while the southern section of the Great Escarpment of Eastern Australia conservation corridor protected areas (to the Hunter Valley) sample a significant proportion of three bioregions in NSW and Victoria (Figure 3, Table 2).

Table 2. Area of IBRA* Bioregions included in protected areas in the Australian Alps and Great Escarpment of Eastern Australia conservation corridors

<table>
<thead>
<tr>
<th>IBRA* Bioregion</th>
<th>Area of bioregion (ha)</th>
<th>Area (ha) of conservation reserves in each bioregion</th>
<th>Percent of IBRA bioregion in conservation reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUSTRALIAN ALPS</td>
<td>787,432</td>
<td>629,399</td>
<td>79.9%</td>
</tr>
<tr>
<td>Australian Alps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GREAT ESCARPMENT</td>
<td>8,573,975</td>
<td>1,431,209</td>
<td>16.7%</td>
</tr>
<tr>
<td>South Eastern Highlands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney Basin</td>
<td>3,607,502</td>
<td>1,678,326</td>
<td>46.5%</td>
</tr>
<tr>
<td>South East Corner</td>
<td>2,703,706</td>
<td>753,816</td>
<td>27.9%</td>
</tr>
</tbody>
</table>

IBRA – Interim Bioregionalisation of Australia (Thackway & Cresswell, 1995)

The Greater Blue Mountains National Parks located at the northern end of the Great Escarpment conservation corridor were inscribed on the World Heritage list in 2000. The Greater Blue Mountains Area provides outstanding examples representing on-going ecological and biological processes significant in the evolution of Australia’s highly diverse ecosystems and communities of plants and animals, particularly eucalypt-dominated ecosystems. Ninety one Eucalypt taxa are represented in this area (NSW National Parks and Wildlife Service 2000) Table 3 compares the number of Eucalypt taxa in the Great Escarpment conservation corridor and Australian Alps and provides an an indication as to the comparative richness and importance of the biodiversity of these conservation corridors.
Table 3. Comparison of Eucalypt taxa represented in the Great Escarpment conservation corridor (southern section) and the Australian Alps and that are also found in Greater Blue Mountains World Heritage Area section of the Great Escarpment. Ninety one Eucalypt taxa are found in the Greater Blue Mountains Area.

<table>
<thead>
<tr>
<th>Region</th>
<th>Total No. of Eucalypt taxa</th>
<th>Eucalypt taxa that also occurring in the Greater Blue Mountains World Heritage Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Escarpment</td>
<td>78</td>
<td>37</td>
</tr>
<tr>
<td>Australian Alps</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Escarpment &amp; Alps</td>
<td>92</td>
<td>39</td>
</tr>
<tr>
<td>Taxa common to both</td>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>

A conservation corridor of continental dimensions

The interlinking of the Australian Alps conservation corridor with the Great Escarpment of Eastern Australia southern conservation corridor may be achieved by policy decisions over public lands. The principle connection needed is in Victoria and is on public lands. The Victorian Snowy River National Park interconnected with the Erimundra National Park and then connected to the Coopracambra National Park (Figure 4) achieves an interconnection between the two conservation corridors. It is considered to be the most practical connection. The status of the public lands does not have to change. Rather, there needs to be a government policy commitment that recognises the presence and status of a nationally important conservation corridor and its long term sustainability needs.

The Great Escarpment of Eastern Australia Conservation Corridor can also be extended by policy decision by government. Currently it extends some 350 kilometres north from Coopracambra National Park in Victoria to Buderoo National Park (Figure 4). The gaps in the conservation corridor are located along the escarpment in the upper Jambrero Valley and between Bargo State Recreation Area and Sydney Catchment Authority protected land. These connections (Figure 4) can extend the conservation corridor all the way to the Hunter Valley and Muswellbrook, a north-south inter-connection of over 600 kilometres. Such an initiative would need to be linked to a management framework that protects the integrity of the conservation corridor concept. In the future, it may even be possible to achieve a conservation corridor north of the Liverpool ranges in NSW to the Queensland Border and Lamington National Park along the Great Escarpment of Eastern Australia.

The two conservation corridors combined would achieve an interconnected series of public lands of national significance. They would extend from Mansfield in Victoria along the Great Dividing Range to Tumut in NSW and along the Great Escarpment of NSW to Muswellbrook in the Hunter Valley. Coastal regions near Bega would be interconnected to the Australian Alps achieving a coast to alpine area conservation sampling for the eucalyptus genus. Some of the finest conservation samplings of Australian moist eucalypt forests would be interconnected. A World Heritage Area (Greater Blue Mountains) and a Man and Biosphere Reserve (Kosciuszko National Park) would be interconnected.

The core conservation corridor and integrated landscape conservation

The benefits of a significant north-south conservation corridor from eastern Victoria, the ACT and half the length of NSW, potentially extend well beyond the reserve boundaries. The conservation corridor complements landscape conservation initiatives actively underway in Australia and it is useful to briefly illustrate what is happening at a local level in many communities.
In response to a rural environment of droughts, soil loss, rising salt, water shortages, habitat decline and declining agricultural productivity, Australian governments are currently facilitating a range of measures to achieve more sustainable land use outcomes. Governments, communities and individual property owners have embraced the Landcare program nationally, and visible progress has been made for many areas of Australia. Integrated landscape conservation is also an important approach. It is underpinned by leadership from government organisations and incentives for individual property owners to contribute to improved environments.

Catchment management reforms are a national process. Throughout NSW for example, water and native vegetation management regulatory plans are currently being developed to improve catchment protection, provide river systems with environmental flows and help conserve biodiversity and cultural heritage. In 2001, the NSW Government passed the NSW Catchment Management Amendment Act. Eighteen catchment boards established under this Act are charged with preparing “integrated” catchment management blueprints. The blueprints identify catchment objectives, targets and actions for partnerships between land managers, community members and government agencies to manage catchments, native vegetation and water sources. Through these partnerships the big issues such as salinity and clearing of native vegetation are to be tackled and to inform decisions to achieve “an optimal balance of environmental, social and economic outcomes” (Amery 2001). State Forests through audited ecologically sustainable forest management and the NPWS through voluntary conservation agreements partnerships with landholders are contributing to this approach.

Catchment boards in the south east of NSW, for example, have embraced biodiversity conservation targets which significantly complement the biodiversity conservation targets for the establishment of a comprehensive, adequate and representative reserve system. Biodiversity targets have been set to protect, connect, and manage for biodiversity conservation at a minimum of 30% of the original distribution of each native vegetation community type for the area (Southern Catchment Management Board 2002). A range of incentives are proposed, such as stewardship payments for voluntary partnerships between Government agencies and landholders, will help with this process.

These detailed local processes all benefit directly from the ecological services the conservation corridor provides. The core conservation corridor provides catchments that do not need rehabilitation. They should provide ecological services sustainably. They provide the core for the framework for integrated landscape conservation actions.
Figure 4. Conservation corridors and connections still to be achieved.
National benefits of a continental scale conservation corridor

A combined Australian Alps-Great Escarpment of Eastern Australia conservation corridor is the last chance where a significant north-south unfragmented sampling of four bioregions is possible. It is the only remaining opportunity for the retention of contiguous north-south natural lands in NSW from the Victorian border to Muswellbrook. There are national benefits in implementing this initiative.

Economically, the conservation corridor will help to underpin the basic ecological services that natural lands provide. At a landscape scale the core conservation corridor will provide critical help for the rehabilitation and sustainable use of adjoining and regional agricultural lands.

Socially, the conservation corridor will benefit Australians. It will help to conserve Australian native fauna and flora within the immediate proximity of some of the most closely settled areas of Australia. It will help maintain air quality and provide clean water and other essential ecological services. It will provide open space for recreation and add to the quality of life.

Environmentally, it will help to conserve habitats and ecosystems in one of the most biologically important areas of Australia. It will help to prevent extinctions. It will provide an ability for species to survive the perturbations of climate change. It will provide a capacity to survive the increased perturbations of disturbance through human interventions.

Politically, the initiative would see the Commonwealth, two State (and possibly three) and one Territory governments working together to achieve the conservation management of a conservation corridor in the national interest.

Conclusion

A combined Great Escarpment of Eastern Australia and Australian Alps conservation corridor is a strategic conservation investment for the future at national and local levels. It is a finite opportunity. Vital interconnections are currently at risk through incremental land-use changes. There is no alternative possible remaining for such a continental scale initiative in south eastern Australia and a continuous unfragmented system will provide economic, social, environmental and political benefits for Australia. The outcome is a better Australia, richer for the retention of its natural heritage resources and the ecological services they maintain. Completion of the corridor would be a nationally and internationally significant conservation achievement, rivalled in few locations world wide.

New opportunities for national recognition of the combined Australian Alps and Great Escarpment of Eastern Australia conservation corridors are emerging as a result of new Commonwealth Heritage legislation to amend the Environmental Protection and Biodiversity Conservation Act 1999. If passed, these will provide an opportunity for nomination of the combined Australian Alps and Great Escarpment of Eastern Australia conservation corridor to the Commonwealth for consideration for listing as National Heritage as a “national exemplar” potentially under the eucalypt theme. It is a basis for further action.

Acknowledgements

The authors would like to acknowledge the direct contribution to the development of this paper by a number of individuals. In particular, we would like to extend our thanks to:
Lesley Hodges, Deputy Director, Environmental Stewardship, Commonwealth Department of Defence;
Tom Barrett - Conservation Information Officer, Conservation Programs and Planning Division. NSW National Parks and Wildlife Service and Paul Packard, Manager Conservation Assessment and Data Unit, NSW National Parks and Wildlife Service.

The views and opinions expressed in the paper are those of the authors and do not necessarily reflect the policy or policies of any organisation.
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Day One – Mountains For Tourism
Management Of Tourism In The Kosciuszko Alpine Area

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Abstract

The alpine area around Mt Kosciusko is of high scenic, scientific, educational and nature conservation significance. As a result of past management achievements the area, in 2002, is a major tourism destination, especially for summer day-walkers to the highest peak on the Australian continent. The popularity of this natural heritage not only vindicates the historical vision for its conservation but has also created a new conservation management imperative. Managing tourism for this very confined area is placing pressure on both infrastructure and the heritage values of the region. Numbers of tourists in the snow-free months have increased from 20,000 per year in the late 1970s to around 64,000 people per year in 2000. Around 21,000 of these visitors walk to the very confined area of the summit of Mt Kosciuszko. Tourism will continue to increase as it is actively promoted by tourism organisations. Within this operating environment, the New South Wales National Parks and Wildlife Service (NSW NPWS) has undertaken management planning and is implementing works to help conserve the alpine area and to achieve sustainable tourism. This will mean dealing with many challenges.

A new Management Plan for Kosciuszko National Park is expected to be completed for exhibition in 2003. The issues raised in this paper illustrate new conservation milestones that need to be reached to ensure that the NSW NPWS conserves and sustains this scientifically significant and limited alpine area for current and future generations to enjoy.

Introduction

The most extensive contiguous alpine area in mainland Australia is found around Mt Kosciusko in the Snowy Mountains, which are part of the Great Dividing Range and associated mountains in the south east of Australia (Costin 1989; Figure 1). The area is protected within the Kosciusko National Park (698,000 ha) in New South Wales, one of a series of linked Australian Alps National Parks that conserve around 62% (15,000 km²) of the mainland alpine and subalpine region (Worboys 1996).
The alpine region around Mt Kosciuszko extends from the upper limits of tree vegetation, at about 1830 metres, to the summit of Mt Kosciuszko, at 2228 metres, and covers around 100 km², or less than 0.001%, of Australia (Costin 1989). Unlike the steep saw-tooth mountain ranges characteristic of many alpine areas elsewhere in the world, the alpine region around Mt Kosciuszko consists of an undulating plateau with a gradual stepped fall to the east, and a steeper western slope (Costin 1989).

Mt Kosciuszko and its contiguous alpine area (Figure 1) are considered to be of outstanding natural value, and this contributes to its potential for World Heritage listing, as part of a possible Australian Alps World Heritage nomination in the future (Mosley 1992; Costin et al. 2000). The alpine area is recognised as an ‘Outstanding Natural Area’ by the 1982 Kosciuszko Plan of Management. Along with the rest of the park it has also been recognised as a World Biosphere Reserve, under the UNESCO Man and the Biosphere Program, since 1977 (NSW NPWS 1982; Costin et al. 2000). The management of this area is the responsibility of the New South Wales National Parks and Wildlife Service (NSW NPWS). The vision for its management is to conserve the natural and cultural heritage values that make the area of such outstanding conservation value.

**History Of Tourism Management For The Alpine Area**

The outstanding natural scenery of the alpine area has been a major drawcard for visitors (Good 1992; Figure 2). As early as 1906, improvements to access for tourism resulted in the construction of a road to the summit of Mt Kosciuszko. Other tourism facilities that were developed during this early period include the Hotel Kosciusko at Diggers Creek, constructed in 1909, and the Chalet at Charlotte Pass, constructed in 1931 (Good 1992). The advent of the Snowy Mountains Hydro-electric Scheme resulted in a rapid expansion in mountain tourism, with the Scheme actively encouraging tourists to visit the area to view construction works. Employees of the Scheme, many of whom were post-war migrants from Europe, were also frequent users of the park, particularly in winter. Many would become pioneers of the Australian ski industry. As a result of the increased interest in ski tourism, a series of ski resorts was established in the subalpine areas of the park (Good 1992). By the late 1950s, visitors to Kosciusko State Park, as it was then named, were in the order of 100,000 per annum (Gare, pers. com.).
Figure 1. Mt Kosciuszko alpine area. (Adapted from Scherrer 2001, with base data provided by New South Wales National Parks and Wildlife Service).
Within the Kosciuszko alpine area, early pioneering skiers in the 1950s had received permission from the Kosciuszko State Park Trust to construct Lake Albina Lodge (on the western facing slopes of the Lake Albina Valley) and Kunama Lodge, near Mt Northcote (located between Mt Kosciuszko and Mt Twynam). Materials for the lodges were transported using a bulldozer and sled provided by the Trust, with the resultant track marks still apparent in 2002 (Worboys et al. 1995; authors' pers. obs.). Kunama Lodge was destroyed by an avalanche in 1956 and was never reconstructed. Professional park managers, who had been appointed by the Trust in 1959, recognised that the locations of Kunama and several other proposed lodges were inappropriate, and they prevented the reconstruction of Kunama. This was also the start of a new era of active planning and conservation of the alpine area and the park. Following the 1982 Plan of Management process and extensive public consultation, Lake Albina Lodge was removed in the early 1980s. This was done to prevent further sewage pollution of Lake Albina, one of the purest fresh water bodies in Australia and one of only five glacial lakes in the highest parts of the mountains (Virtanen 1993; Worboys et al. 1995). The importance of natural scenery and pure lake water was given precedence over a recreation facility.

Tourism in Kosciuszko National Park increased in the 1970s with substantial increases in summer tourism in the alpine area (Virtanen 1993). By the early 1970s traffic jams were common along the old gravel Summit Road. A proposal for upgrading this road was the “obvious solution”, as was development of a larger car park at Rawson Pass (just below the summit) and a back-up car park at the Snowy River bridge. Only the Rawson Pass car park was completed, despite the fact that road realignment and expansion had been surveyed and pegged ready for construction. Because of the congestion, private vehicles to the summit were banned during this time, and a shuttle bus system was used to ferry people from Charlotte Pass to Rawson Pass (Figure 2). The NSW NPWS developed a planning discussion paper for the community in the late 1970s, outlining a different solution (Worboys 1978; NSW NPWS 1980). Despite some sceptical personal views expressed by several very senior staff members in the park agency, the public discussion papers advocated a vehicle-free alpine area. There was overwhelming public support for this and for the closure of the Summit Road at Charlotte Pass. This was accomplished legally in 1982, with the adoption of the 1982 Plan of Management. Restrictions on camping in the catchment of the glacial lakes were introduced in 1988, in response to degradation of the area (Virtanen 1993; Figure 2).

**Current Tourism In The Alpine Area**

In 2002, tourism is the single largest form of land use for the alpine area (Good 1992). It is a multi-million dollar industry, and supports the economies of the principal towns surrounding the park. Tourism for Kosciuszko National Park has grown from 100,000 visitors in the late 1950s to around one million visitors in 2000 (Worboys and Pickering 2002b). The small alpine area of Kosciuszko National Park shows a similar trend, with growth in summer visitor use from an estimated 20,000 in 1977-78 (Worboys 1978) to 64,000 in 1999-2000, (Johnston, S. and Pickering 2001; Figure 3). At variance with these measures, figures from the chairlift at Thredbo apparently do not show an increase in visitor use in the last decade (Denise Allardice, Kosciuszko-Thredbo Pty Ltd, pers. comm. 2002).
1906
Summit Road constructed. Vehicles to the highest peak in Australia.

1960s
Rapid expansion of ski resorts at Thredbo and Kosciusko. Chain of ski huts across the Alpine Area stopped by Kosciusko State Park Trust staff.

1972
Car park constructed at Rawson Pass.

1973
Mt Kosciuszko Outstanding Natural Area Plan developed.

1979
Threat of upgrading of the Summit Road and expansion of the car park at Rawson Pass from 1973 eliminated in 1982 with the road closure at Charlotte Pass.

1982
Steel mesh walkway between Thredbo Top-station and Rawson Pass constructed.

1988
Potential expansion of ski resorts onto the Main Range of the park stopped as part of 1982 Plan of Management.

2002
Alpine area 20,000 visitors per annum.

Impacts to the Alpine Area through rapidly increasing visitor use include expansion of disturbed areas, further proliferation of tracks, the spread of weeds, garbage, and contamination from urine and faeces.

Water pollution, Lake Albina Hut removed as recommended in 1982 plan of management, camping within the catchments of the glacial lakes prohibited.

Strong spread of weeds a new threat.

Figure 3. Growth in summer tourism to the Kosciuszko alpine area 1977–2000. (Worboys. 1978; Johnston S. and Pickering 2001). Estimate for 1990-91 only includes people spending a half-day or longer in alpine area, and thus underestimates total numbers (Virtanen 1993).

Characteristics of Tourism
Winter tourism to the alpine area involves snow boarding, ice climbing, cross-country skiing and independent snow camping, with most people accessing the area from the adjacent subalpine resorts (Buckley et al. 2000; Pickering et al. 2002). Alpine skiing based in the ski resorts is the dominant recreation activity for the park.

Tourism to the alpine area during the snow-free period is also very popular and involves a greater range of activities and areas. Popular activities include day walks, often to the summit of Kosciuszko (81% of visitors); sightseeing (10%); bike riding (3%); camping; (2%); and other pursuits such as running, late season snowpatch skiing, photography, painting, rock climbing, abseiling, fishing, and educational activities (collectively 4% of visitors to the area) (Johnston, S. and Pickering 2001). During the snow-free period, tourists tend to access the alpine area from just two sites: the top of the Crackenback Chairlift at Thredbo Village (68%), and the road-head at Charlotte Pass (31%). Recreationalists with more detailed local knowledge also utilise the Snowy River Valley via Guthega. Within the alpine area itself the most popular walk is from the Crackenback Chairlift to the summit of Mt Kosciuszko, with around 16,000 people undertaking the 10 km return trip along the raised metal walkway to Rawson Pass and then on to the summit. Many people do not complete the full walk, but turn back before the first lookout (34%), or stop once they can see Mt Kosciuszko (10%). Eleven percent turn off the track and descend into the subalpine along the Dead Horse Gap walk (Arkle 2000).

The most popular days for visiting the alpine area during the snow-free period are the main public holidays (Christmas, New Year, the Australia Day Weekend in January, and Easter). On any given day at these times around 1500 people visit the area, with 700 reaching the summit of Mt Kosciuszko. The next busiest times are weekends, particularly during the school holidays, when around 234 people per day visit the summit. Low visitation days are during school time, when only around 134 people per day visit the summit (Arkle 2000).

There is considerable variation in usage patterns within a day. This is particularly apparent on the summit of Mt Kosciuszko, with about half of all tourists (48%) arriving between 1200 and 1330 hours. As a result there is crowding, resulting in people spreading out onto rehabilitated and natural areas and damaging native vegetation (Arkle 2000).
Benefits of Tourism

Tourism is big business in the Snowy Mountains, and it benefits local towns and a range of tourism ventures. It is an important source of employment, providing seasonal (winter and summer) work for a large number of casual workers, and jobs for a smaller permanent core of employees. There is bipartisan political support for tourism, with an expectation that tourism will continue to increase. Equally, it is viewed that the NSW NPWS will manage tourism in an ecologically sustainable manner. The effective management of tourism to the park is critical for the wellbeing of the local economy and a sustainable tourism industry (Good 1992). Poor leadership and unmanaged tourism can threaten a financially and ecologically sustainable tourism industry.

Sustainable Tourism: The Conservation Management Challenge

There have been major gains for conservation in the alpine area in the last century (Worboys and Pickering, 2002c). This has been to the major advantage of the tourism industry, given that it has underpinned the tourism and recreation values of Kosciuszko National Park. (Worboys and Pickering 2002b). However, management is a continuous process that operates in a dynamic environment. Since the last major planning statement was produced for the alpine area in 1993, there appears to have been a steady growth in visitor numbers and activities, and a resultant increase in associated environmental impacts. The current major challenge for the alpine area is to ensure that tourism is ecologically sustainable.

Impacts of Tourism

Tourism to the alpine area is having a range of negative environmental impacts. Direct impacts include: compaction of soil; erosion; trampling of vegetation; urine and faecal contamination of waterways, particularly the glacial lakes; disturbance to wildlife; noise pollution; and increased feral animal activity (Edwards 1977; Keane et al. 1979; Hardie 1993; Virtanen 1993; Good and Grenier 1994; Good 1995; CDT 1997; Parr Smith and Polley 1998; Arkle 2000; Buckley et al. 2000; Scherrer and Pickering 2001; Pickering et al. 2002). Some management infrastructure provided to facilitate tourism, such as walking tracks and huts, is also having impacts. These include compaction of soil, clearing of vegetation, assisting the introduction of alien plants, leaching of nutrients into adjacent areas, and visual impacts (Virtanen 1993; Good and Grenier 1994; Johnston F. and Pickering 2001a; Pickering et al. 2002).

The spread of weeds is a serious issue for the alpine area. Gravel roads and walking tracks, combined with regular pedestrian and vehicle (bike and motor vehicle) disturbance, have been shown to favour weeds such as yarrow (Achillea millefolium), white clover (Trifolium repens), browntop bent (Agrostis capillaris), flat weed (Hypochoeris radicata), cocksfoot (Dactylis glomerata), dandelion (Taraxacum officinale), and pellet clover (Trifolium ambiguum) (Mallen-Cooper 1990; Johnston, F. and Pickering 2001a, 2001b; Pickering et al. These proceedings; Hill and Pickering Draft manuscript). Research has shown that weeds readily colonise gravel track verges and road disturbance sites. This results in a bright-green weed verge commonly found on parts of the gravel-based and paved tourist walking track system in the alpine area. It is a green “fuse” of weed introductions to the very core of the alpine area.

Whilst the existing weed problem is bad enough, it is potentially being made worse with current NSW NPWS gravel track construction activities being made in the name of tourism development works. Such works could potentially be exacerbating the problem, while alternative raised steel mesh walkway techniques have demonstrated their weed free success (Pickering et al. This proceedings; Pickering and Hill Unpublished data). Given that weeds are still spreading in areas of natural and human disturbance in the alpine area, (Mallen-Cooper 1990; Johnston F. and Pickering 2001a, 2001b; Pickering et al. This proceedings; Hill and Pickering Draft manuscript), limiting the spread of these weeds should be the primary conservation goal of management.

We can also state the obvious. Limiting the spread of new tracks and of erosion areas caused through overuse, and preventing trampling disturbance to the most sensitive of the plant communities, such as the wetland and short alpine herbfield, is critical.

Human waste is also an important issue, as it contributes to increased nutrification and contamination of pristine waterways and has negative impacts on the tourism experience. Temporary toilets at Rawson Pass have helped to deal with some of the problems of human waste, but not adequately (Leary 2000). The
withdrawal of camping from within the catchment areas of the glacial lakes has also helped, but increasing usage of other areas by campers may result in new areas being impacted (Figure 5).

Management Response in 2002
The NSW NPWS is currently focusing on the provision of permanent toilet facilities at Rawson Pass and the continued construction of gravel walking tracks in the alpine area, based on the recommendations/priorities of the 1993 Virtanen report. In designing a toilet facility for Rawson Pass, the NSW NPWS must plan carefully to protect the visual integrity of the site. The aesthetically magnificent, natural and gentle concave sweep of the Rawson Pass landscape must be maintained. Therefore an appropriate temporary facility that does not need to be serviced by road access should be established.

Both Rawson Pass and the old Summit Road from Charlotte Pass to Mt Kosciuszko need to be rehabilitated to a weed free walking route, in keeping with the vision to rehabilitate the natural alpine landscape.

Management Lag Effect
It takes time to achieve planned outcomes: sometimes it takes too long. This is a leadership issue which will determine whether tourism to the alpine area remains a threat or not. Timely management responses are crucial. Management of issues such as appropriate levels of tourism requires leadership, constant attention and sustained and adequate investment, in preference to low frequency but big effort approaches. Research and adaptive management can also play a critical role. Improved information about the outcome of management interventions and their relative success can guide the nature of management responses.

Adaptive Management
Recent research in the alpine area provides valuable information that can contribute to effective management. It provides an opportunity for current management practices to be considered and reassessed, and for ongoing monitoring and adaptation. This information has been provided to the NPWS.

Some of the most recent tourism research in alpine areas in Australia has focused on pollution, weeds and walking tracks, and has shown that:

- Gravel tracks and roads provide habitats for weeds in the Mt Kosciuszko alpine area (Mallen-Cooper 1990; Johnston F. and Pickering 2001a, 2001b; Pickering et al. This proceedings; Hill and Pickering Draft Manuscript).
- The Thredbo Top Station to Rawson Pass raised steel mesh walkway provides a weed free environment and socially is a far more acceptable surface for visitors (Johnston S. and Pickering 2001; Hill and Pickering Draft Manuscript).
- Human waste is a serious long term problem for alpine areas (AALC 2000; Bridle and Kirkpatrick 2001).
- Visitor use is concentrated at fixed times of the year (Christmas, New Year, Australia Day weekend, Easter), and specific times of day (lunch time). This pattern of use of the alpine area exacerbates impacts (Arlke 2000).

In the light of current research and historical information (Good 1992; Worboys et al. 1995; Worboys and Pickering 2002a), future management responses to the provision of access for tourists to the Mt Kosciuszko alpine area need to consider (Figures 5 and 6):

- Minimising the spread of weeds by:
  - rapidly evaluating where weeds are found in the alpine area, including their presence in relation to the walking track/old road system
  - assessing the potential for the spread of weeds to new track construction sites and adjacent natural areas
  - making a careful evaluation of the nature, cost and impacts of different methods of weed control.
- Reviewing the real cost of the range of walking track surfaces over a long-term time-frame. For example, the construction of gravel tracks continues, with their inbuilt lifetime costs of gravel replacement, weed control on track verges and adjacent natural areas, and drainage maintenance. The steel mesh walkway
track, by comparison, inhibits the establishment and spread of weeds, and is relatively low maintenance (Authors' pers. obs.).

- Determining a sustainable tourism use limit for the track system and summit destinations, as well as maximum tourist use numbers for specific days and time of day. Managing visitor use limits for the summit may be expected to increase tourism yields for the local tourism industry.
- Establishing a ‘keep to the track’ policy.
- Reviewing how the tourism industry can work with the NSW NPWS to achieve the goal of ecologically sustainable visitor use, as well as contributing to the costs of providing and maintaining an access system which services visitor use of the alpine area.
Soil impacts
Impacts in the alpine area through site soil compaction, vegetation loss, degradation of catchments, and soil erosion.

Marketing
Preferential marketing of the summit of Mt Kosciusko and alpine area by tourism organisations: ‘the highest mountain on the continent’.

Growth
Steady growth in visitor use, with excess numbers in peak periods.

Weed impacts
Spread of weeds into disturbance niches, affecting the alpine area.

Soil impacts
Impacts in the alpine area through site soil compaction, vegetation loss, degradation of catchments, and soil erosion.

Habitat impacts
Impacts on specialised habitats in the alpine area and loss of endemic and endangered flora species through trampling and disturbance.

Pollution of water and soils
Impacts at high visitor use areas, through urine (high nitrogen values) and introduction and spread of Giardia and Cryptosporidium from faeces, despite toilet facilities and educational information.

Endangered species impacts
Large numbers of visitors walking in a dispersed manner in the confined area of the alpine area at peak times. Includes damage to the most vulnerable meadow plant communities.

Proliferation of tracks
Creation of secondary tracks: to remnant snow patches and lookout sites, despite requests for visitors to remain on primary tracks.

Inappropriate activities, not in keeping with achieving conservation of the alpine area created and promoted by the tourism industry. The alpine area is not a recreational theme park.

Vision
Managing to conserve and protect the natural and cultural heritage of the Kosciuszko alpine area.

Research and adaptive management
Management needs to respond to issues such as visitor use pressures. Researchers, and management, working together on the implementation of adaptive management practices and monitoring, will facilitate environmentally sustainable tourism.

Sustainable visitor use
Achieving the management of visitor numbers within the capacity of the official walking track system and destinations for any given day.

Scenery protection
Management has a special responsibility to continue to rehabilitate past damage to natural scenic landscapes.

Rehabilitation
Rehabilitation works need to continue.

Weeds
Weeds are a real threat to the integrity of the Alpine Area. They are occupying disturbed sites and have not yet achieved their ecological potential. Management disturbance and visitor use disturbance are two key agents of weed dispersal.

Soil erosion
Some 20 years after the finish of the Soil Conservation Works, further soil stabilisation works are required to fix the old works. New erosion problems need to be addressed.

Ski tourism encroachments
Pressures for further encroachment of the alpine area by the ski industry may arise as global warming limits snow extent and duration.

Figure 5. Tourism planning considerations for the Kosciuszko alpine area: direct and indirect impacts.

Figure 6. Management challenges of the next 20 years for the Kosciuszko alpine area.
Future Management Of Sustainable Tourism For The Alpine Area

Tourism use of the alpine area is expected to continue to grow. It is the principal future management challenge for the NSW NPWS in this area. The target is simply to achieve ecologically sustainable visitor use for the alpine area, and this involves minimising/eliminating direct and indirect impacts of tourism. This will mean dealing with many management challenges, some of which have been identified (Figure 6). A necessary approach for the future is for the NSW NPWS to work with the tourism industry more closely. It could also see industry bodies clearly understanding how they, as individual organisations, can help to contribute to a sustainable future for the alpine area. A new Management Plan for Kosciuszko National Park is expected to be completed in 2003. The issues raised by this paper illustrate the types of new conservation goals that must be formulated and achieved, to ensure that the rare and valuable alpine environment of Kosciuszko National Park is conserved for current and future generations to enjoy.

Figure 6. Management challenges of the next 20 years for the Kosciuszko alpine area.

Acknowledgments

The authors would like to acknowledge the original research and historical information on the history of management contributed by Neville Gare, Frances Johnston, Pascal Scherrer, Stuart Johnston and Andrew Growcock. Victoria Lawson’s contribution to this paper is greatly appreciated. The Cooperative Research Centre for Sustainable Tourism provided support for several of the research studies used in forming management recommendations in this paper.

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AALC See Australian Alps Liaison Committee.


CDT See Commonwealth Department of Tourism.


Hill, W. and Pickering, C.M. Management issues associated with tourism infrastructure: the effect of different walking track types on vegetation in the Kosciuszko alpine area, Australia. Draft Manuscript.


NSW NPWS See New South Wales National Parks and Wildlife Service.


Managing The Overland Track As A Sustainable Mountain Walk

Janet Mackay

Janet Mackay and Associates

Background and introduction

The Overland Track is Tasmania’s premier long-distance walking track with a significant national and international reputation. Since the inclusion of the Cradle Mountain-Lake St Clair National Park in the Tasmanian Wilderness World Heritage Area (WHA) in 1982, walker numbers have significantly increased. The track is now walked by in excess of 8,000 people each year with a high proportion from outside Tasmania.

The Track is popular for the outstanding scenery it offers in a remote area where walking is reasonably safe and easy on a good track with few major climbs and a range of accommodation options. It is the best known, most developed and most popular of Tasmania's long distance walking tracks. For many locals and visitors the Overland Track is their first extended bushwalking experience.

The Track provides a predominantly high standard of walking surface which is comfortable for the average walker. Infrastructure development has not, however, been based on a single "strategic" planning document for the Track. Accordingly, it was decided to develop a vision statement for the Overland Track, to provide a high-level strategic direction for the desired user experience and to develop strategies to achieve this vision.

The Overland Track

The total length of the Track from Cradle Valley in the north to Cynthia Bay at the southern end of Lake St Clair is around 80 kilometres. Most walkers walk the Track in its entirety with almost 90% of all walkers travelling from north to south. Whilst the recommended walking time is 5 days, the trip may also be extended by varying numbers of days to undertake side trips to significant features.

The Track is also often walked in part, either for day walks at either end of the walk, or from other access tracks. There are several access tracks into the ‘centre’ of the Overland Track from the east.

Two types of huts are provided to accommodate walkers on the Track. These are basic shelter huts available to all walkers provided by the Parks and Wildlife Service, and the huts operated by Cradle Huts Pty Ltd.

The Parks and Wildlife Service huts provide basic facilities, such as sleeping benches (no mattresses provided), cooking benches or tables (no cooking facilities provided), some seating and space heating (gas or coal stove). Water tanks outside each of the modern huts provide a rain water supply and grease traps under the outside taps provide a degree of environmental protection in the disposal of grey water.
The bulk of the camping along the track also occurs around the seven major Parks and Wildlife Service huts. At these locations walkers take advantage of the facilities provided at the huts, particularly the rain water supply and toilets. In some cases hardened tent platforms are provided.

**Values of the Track**

**Natural values**
The Overland Track offers walkers the opportunity to experience a range of the significant natural values of the WHA during the course of walking the Track. The Cradle Valley is a spectacular landscape demonstrating to the visitor evidence of past glacial activity over the past two million years. Dove Lake, Lake Wilks, Crater Lake and Cradle Mountain are the most spectacular and obvious to walkers in the northern end.

**Cultural values**
The outstanding cultural value of the Tasmanian Wilderness WHA is the rich, undisturbed suite of Pleistocene Aboriginal sites dating back over 35,000 years which include cave paintings and cultural deposits bearing testimony to an Ice Age society. Lack of disturbance enhances the value of these sites.

Cultural values of the Tasmanian Wilderness WHA also include historic features from more recent activities. The WHA also contains remains of sites related to other historic themes including exploration, Huon pine logging, mining, hunting, high altitude grazing, hydro-electric development and recreation. These sites have significance in terms of the history of Tasmania’s development.

**Recreational values**
The recreational value of the Overland Track has developed over time and remains significant within a national and international perspective. A combination of factors contribute to the high recreational value of the Track including:

- The wilderness values and apparent remoteness of the Track to a range of users
- The spectacular and accessible scenery ranging from peaks, to alpine moor-land, to lakes and forest
- The safety, comfort and relative ease of the walk
- The accommodation options available
- The distance combined with a through route track which provides a sense of achievement
- Opportunities for walking and photography

**Educational values**
The Overland Track is increasingly valued by school groups as a challenging recreational experience.

Educational value may also be attributed in terms of demonstrating and providing an understanding of natural events and environmental management practices including track management, visitor management, interpretation etc

**Usage patterns**
There were approximately 8000 walkers on the Overland Track in 2000/1. This estimate is based on 4350 private Cradle registrations, 901 private Lake St Clair registrations, an allowance for 10% registration non compliance, plus 2250 walkers on commercial trips. Table 1 shows overnight walker registrations for 1997 to 2001.
Table 1- Overnight walker registration data summary for 2000/1, Cradle Mountain

<table>
<thead>
<tr>
<th></th>
<th>1997/8</th>
<th>1998/9</th>
<th>1999/00</th>
<th>2000/1</th>
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<tbody>
<tr>
<td>Total Overland walkers includes departures from Lake St Clair + adjustment for commercial walkers</td>
<td>7 800</td>
<td>7 900</td>
<td>8 500</td>
<td>8 000</td>
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<tr>
<td>Number of private Overland walkers registering at Cradle</td>
<td>4 300</td>
<td>4 400</td>
<td>4 500</td>
<td>4 400</td>
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<tr>
<td>Number of walkers registering for overnight trips (not Overland)</td>
<td>1 400</td>
<td>1 800</td>
<td>1 600</td>
<td>1 900</td>
</tr>
</tbody>
</table>

Current Users
The users of the track can be grouped as follows:

- Commercial hut users
- Commercial camping groups
- Free independent walkers undertaking the Overland Track from one end to the other
- Free independent walkers walking only sections of the Track from either end or from access points along the Track.

The latter group may consist of day walkers (primarily at either end of the Track) or overnight or multi day use walkers.

Commercial Hut Users
Generally older and/or less fit and/or less experienced people who have sought to have an experience where the load carried is lighter, the evening stay is comfortable, and there is security in terms of navigation and safety.

This group is generally well equipped and has a good knowledge of the trip they will undertake before departure. They have generally booked well in advance.

Primarily seeking the enjoyment of the scenic and natural values but gain a sense of achievement. Many have done or plan to do other hut based multi use tracks (e.g. New Zealand).

Commercial camping participants
Range of age groups of frequently single people, with minimal overnight walking experience seeking a social group experience with the security of a guide for navigation and safety as well as food preparation. Prefer camping experience to huts. Choice of commercial tour may be influenced by price.

The group is generally well equipped and has a good knowledge of the trip they will undertake before departure. They have generally booked in advance.

Primarily seeking the challenge of the walk and social experience but gain appreciation of the natural values.

Source: Internal Tasmania Parks and Wildlife Memorandum S. Rundle, (22/8/01)
Free independent walkers
This group can be divided into three sub groups:

1. Free independent walkers Overland Track route

- Includes a range of individuals, couples and groups from mixed nationalities walking the Track independently, carrying their own equipment and supplies and using huts and established camp sites. Social contact at overnight stops forms an important component of the walk.
- Management and anecdotal evidence and consultant observation suggests that a (small) proportion of this group may be carrying limited survival equipment such as inadequate wet weather clothing, tents and stove.
- Whilst the Australian walkers in this group have generally planned their trip well in advance, it appears many of the walkers from overseas have heard of the walk in their own country, or whilst travelling in Australia, or once they have arrived in Tasmania. The level of planning by these groups is more varied and may be very limited.

2. Free independent walkers using only part of the Track for overnight walk or to access other walks

- Includes a range of more skilled bushwalkers that are familiar with the current use and experience provided on the Overland Track that are seeking more remote or less crowded experience or are seeking to undertake a specific walk including shorter walks or trips to specific peaks off the Overland Track. May access the Track from Cradle Valley, from Lake St Clair, or from side routes (Arm River being the most popular).
- A high proportion of Tasmanians within this group and generally people with considerable experience or walking with experienced people with a preference for tent camping who are self sufficient. May plan their trip in advance or at short notice.

3. Day walkers

- Day walkers at either end of the Track may undertake sections of the Overland Track (eg from Cradle Valley to Crater Lake, Cradle Mountain or Marion’s Lookout; from Lake Narcissus hut to Cynthia Bay or Pine Valley).
- Use of either end of the Overland Track by day walkers is likely to continue or increase due to the increased interest in nature-based tourism, the popularity of walking as a recreational activity and the demonstrated visitor interest in Cradle Mountain and Lake St Clair as visitor destinations.

Approximately 50% of parties and walkers on the Overland Track are from other States of Australia. Of those walkers approximately 70% are from Victoria and New South Wales. Since 1997/98 records show that the proportion of overseas walkers has been greater than the proportion of Tasmanians. Tasmanian Parks and Wildlife Service note that this does not mean that the proportion of Tasmanian parties is declining, but rather that the proportion of Tasmanians (and mainlanders) is declining in the face of an increase in the number of people from overseas.

Note: The material presented in this section is based on walker registration material collected by Tasmanian National Parks Service, unless otherwise referenced.
Table 2 Origin of private parties and walkers

<table>
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<th>Origin</th>
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<th>Number of walkers 2000/01</th>
<th>Number of walkers 1999/00</th>
<th>Number of walkers in 1998/99</th>
<th>Number of walkers in 1997/98 (sep-jun)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasmanian</td>
<td>292 (15%)</td>
<td>826 (19%)</td>
<td>876 (19%)</td>
<td>880 (20%)</td>
<td>725 (17%)</td>
</tr>
<tr>
<td>Mainland</td>
<td>888 (46%)</td>
<td>2,117 (50%)</td>
<td>2,329 (52%)</td>
<td>2,375 (54%)</td>
<td>2,427 (56%)</td>
</tr>
<tr>
<td>Overseas</td>
<td>673 (35%)</td>
<td>1,156 (27%)</td>
<td>1,091 (24%)</td>
<td>853 (19%)</td>
<td>828 (19%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>97 (5%)</td>
<td>191 (4%)</td>
<td>224 (5%)</td>
<td>311 (7%)</td>
<td>368 (8%)</td>
</tr>
<tr>
<td>Total</td>
<td>1,950</td>
<td>4,350</td>
<td>4,520</td>
<td>4,384</td>
<td>4,348</td>
</tr>
</tbody>
</table>

**Overland Track Future Demand**

Indicators point to a trend of increased activity in walking, some of which is likely to translate to overnight walking activity. The increase in supply alone of quality and diverse walking opportunities within Tasmania are likely to attract more overnight walkers.

Other indicators include:

- Tasmania is widely recognised as a haven for walking, with both national and international interest in undertaking walks, especially within the WHA and National Parks;
- A growing interest in nature based tourism and cultural based tourism opportunities within Australia;
- Bushwalking continues to rank highly as an outdoor recreational pursuit enjoyed by the Australian population, and particularly in the key market segments making up the visitor base to the State;
- Continued growth in overseas visitors to Tasmania from countries where walking is a popular activity and thus many associate holiday experiences with walking opportunities;
- There is a high participation rate in bushwalking within the Tasmanian community;
- The expectations by recreation analysts are for continued growth in walking and this will add to the demand for a range of walking opportunities that meet the varying needs of the community;
- There is likely to be continued growth in bushwalking as a result of a range of influencing social, economic and environmental factors affecting leisure generally, despite the slow population growth within Australia;
- The growth in bushwalking will continue to be individually organised but with potential for well designed commercial guiding/accommodation operations to deliver products that have appeal to the emerging market segments (especially those with tight time constraints, limited experience, not overly cost conscious and seeking educational/discovery experiences);
- Bushwalking will continue to attract participation across all age groups, with increased participation in older age groups as part of the ageing society and movement of the 'baby-boomers' into these age groups;
- The high level of satisfaction by walkers from interstate and overseas with the standard and quality of walking opportunities within the State; and
- The significant promotion and information generated by both public and private information sources about walking within the State.

The recent announcement by the Government of the purchase of two mono-hull fast ferries to ply Bass Strait is predicted to lead to an additional 36,000 people in its first year of operation, and could rise to as much as 68,000 in future years. There is no doubt that some of these visitors will want to walk the "icon" Overland Track.

**Motivation for visiting the Overland Track**

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3 Source: Internal Tasmania Parks and Wildlife Memorandum 22/8/01 S. Rundle

4 Tourism Tasmania, 1998, Advancing the Attractions Sector
Discussions with stakeholders and walkers as well as consideration of survey information has indicated that the key motivations for visiting the Overland Track include:

- To experience the natural values of the area
- To experience wilderness
- To enjoy and be inspired by the landscape
- To enjoy challenge and adventure
- To experience a sense of back to basics and not being bound by modern civilisation

**The experience people seek**

A range of experiences is currently being sought and provided by the Overland Track. The range of experiences is best described by considering the different visitor groups on the Track.

The *commercial hut walkers* experience the natural values offered by the WHA, a physical challenge (within their own experience and physical limitations) and a limited wilderness experience. These are offered at a high level of safety, security and comfort provided by fully catered and stocked huts with twin rooms, mattresses and showers and accompanying guides.

The *commercial camping walkers* experience the natural values offered by the WHA, a limited wilderness experience and a physical challenge but their experience is a more “primitive” experience because their accommodation is much more basic being tent-based and subject to the elements of nature.

The experiences of the “*free independent walker*” can also be relatively safe, secure and comfortable because of the numbers of walkers on the Track, the quality of the Track itself and the standard of public huts and camping now provided.

The most “primitive” experience is available to those who choose not to camp at the hut sites and undertake the less popular side trips.

**Significant factors affecting the experience people gain**

Research has shown that the quality of the recreational experience is related to all stages of the trip including pre-, during and after the trip. Trip stages may be defined as follows:

- Expectation and planning
- Travel to the start point
- The scenery and landscape
- The walk on the Track
- The hut or camp site
- The challenge, adventure and safety
- The education and interpretation

- Departure from the Track
- The recollection of the trip

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5 Information from the *Overland Track Walker Survey November 1999/ April 2000 University of Tasmania PhD Thesis in progress* was not available at the time of preparing this draft. This information will be incorporated into a later draft.
Information gathered from Overland and Wilderness walker surveys, Parks and Wildlife Service reports, stakeholder consultation and informal contact with walkers suggest that the following factors affect walkers’ experiences of the Overland Track:

- Adequacy of information in advance of the walk
- Perceptions of the experience they will have
- Overall packaging of the trip experience product
- Transport connections and experience
- Level of use and/or crowding at huts and camp sites
- Siting and design of infrastructure
- Standard of track surface
- Quality of interpretation of the world heritage values
- Quality of interpretation of the natural and cultural values
- Perception of wilderness
- Environmental standards
- Park management practices
- Customer orientation of the operation
- Standards for commercial operator education

**Forming the expectations**

There are a number of levels of preconceived perceptions of the Track. These can be described as:

- those that have planned their trip well in advance and have a good knowledge of what they can expect and what they should bring,
- those that have done it many years before and are pleasantly surprised at improvements, and
- those that hear it is a good walk and may have limited information about the Track in advance including limited knowledge of what they should take.

These groups have different approaches to their pre trip research and have different expectations of the experience they are likely to have which may make it better or worse than that expected. The key elements of the experience that walkers indicate has varied from expectations include:

- Track condition (for some it is better than expected, for others worse)
- Numbers of people on the Track
- Numbers of people at camp and hut sites
- The weather
- The difficulty (for some it is easier and for some harder than expected)
- The level of facilities
- The lack of a permit or fee system
- The level of development and use of wilderness

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6 Quantitative data about factors that impact on quality of experience has been collected by the Overland Track Walker Survey November 1999/ April 2000 University of Tasmania PhD Thesis, (in progress), M.Poll. This data is currently being analysed and will, when available, be incorporated into planning.
The Overland Track within the context of a spectrum of recreational opportunities

The Overland Track is a significant walking experience for Tasmania, Australia and international visitors. It provides a range of opportunities to experience the outstanding natural values and the cultural heritage in the Tasmanian Wilderness World Heritage Area. It offers outstanding scenery, a safe and comfortable walking track, and a range of infrastructure to make long distance walking accessible for a range of walker types. It provides an opportunity to showcase Tasmania and Tasmania’s best practice national park management.

The Overland Track has received high levels of growth in visitation which are affecting the experience which is provided. Continued unmanaged visitation is not sustainable in terms of the environmental and social capacity of the area and is inconsistent with demonstrating a high quality wilderness experience to users. The Track is only one in a range of walking tracks that offer a range of levels of infrastructure, usage, challenge and remoteness.

Management of the Overland Track has occurred as necessary to ensure environmental impacts are managed for the increasing numbers of walkers. This has been consistent with management plans, but not in a strategic manner addressing issues common across the track length.

The Overland Track provides a range of experiences for walkers and a range of infrastructure and services provide different opportunities for walker experience. The recreational trip experience starts with planning the trip and concludes with the recollection when the visitor has returned home. There are ways in which the Overland Trip experience could be improved at all stages.

The proposal of the Tourism Council of Tasmania which is supported by the World Heritage Area Consultative Committee that the Overland Track be developed as the "best mountain walk in the world" is achievable. The landscape quality and the natural and cultural values are there. It remains to ensure:

- that the product is sustainable through effective management;
- that best practice environmental and management standards are in place;
- that the experience of the Overland Track is recognised as more than simply the walk; and
- that marketing of the Overland Track is accurate and effective to ensure people’s expectations are met.
References


Parks and Wildlife Service Tasmania (1992) Track Pass report.(reference to be completed.)


Parks and Wildlife Service Tasmania (2001) Cynthia Bay Lake St Clair Site Plan

Parks and Wildlife Service Tasmania (2001), The Overland Track- A Walkers Notebook


Parks and Wildlife Service Tasmania Internal Memorandum- S. Rundle (August 2001) Final Overnight Walker Registration Data Summary for 2000/1, Cradle Mountain.


Tourism Value Of The Australian Alps

Trevor Mules and Natalie Stoeckl

This research was jointly funded by the Australian Alps Liaison Committee and the Cooperative Research Centre for Sustainable Tourism. Trevor Mules is coordinator of the Cooperative Research Centre for Sustainable Tourism, Canberra node, at the University of Canberra. Natalie Stoeckl was a lecturer in economics at the University of Canberra when this research was conducted. She is now employed by CSIRO, Townsville.

Introduction

The Australian Alps attracts visitors from across the nation and from overseas. The research in this paper focuses upon both the value that such visitors place on the alps for recreational use, and the economic impact of visitor expenditure on the State economies of Victoria, NSW, and the ACT.

Data for the study was collected via a 12 month sample survey of visitors from February 2000 to March 2001. Questionnaires for self-completion were distributed at visitor information centres, accommodation places, entry gates, ski chairlifts, retail outlets, and in situ on the mountains. A $500 lottery prize and post-paid return envelopes encouraged visitors to respond. There were 4791 useable responses, distributed as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Victorian Alps</td>
<td>1,500</td>
</tr>
<tr>
<td>NSW Alps</td>
<td>3,096</td>
</tr>
<tr>
<td>ACT Alps</td>
<td>195</td>
</tr>
</tbody>
</table>

In this paper, the results of the survey that are pertinent are the origins of visitors, which were collected at postcode level, and their expenditure. The latter was collected according to the major items of trip expenditure such as accommodation, transport, ski lift tickets, food and drink, etc.

Visitor Use Values – The Travelcost Method

For many years economic theory has acknowledged the many non-financial benefits attributable to the environment and has attempted to develop means of measuring them. Although the exact classifications vary, at the broadest level economists tend to divide these benefits into the broad categories of ‘use’ and ‘non-use’ benefits. Use benefits are those which are derived from direct use of the environment. Examples of these include the benefits of Recreation and Tourism, the value of goods produced, the value of maintaining and/or improving environmental quality, the value of biodiversity, educational and research values. Non-use benefits are those benefits which are derived from the environment without actually using it. Examples of these include: the benefit of preserving the environment for future use (the option value); the satisfaction derived from being able to pass the area on to other generations (the bequest value); and the benefit of simply “knowing that the area is there”, even if there is no intention of ever using it (the existence value).
In this study, the travel cost method (TCM) is used to estimate the recreation use value of the Australian Alpine areas. The TCM focuses on just one part of the environmental value of a wilderness area – that which is attributable to recreation use. It does not measure other use values, option values, or existence values.

The Concept of Consumer Surplus

In theory, a product’s Demand Curve shows how much consumers are willing to pay for each extra amount of the product. Consider the problem of water, for example. Individuals do not often pay for it, yet if asked to do so, they might consent to do so. In most cases, consumers will not be willing to pay as much for their 2nd and 3rd glasses of water as they are for their first. As shown in Figure 2, this means that demand curves – typically – slope down.
If an individual is prepared to pay $10 for a glass of water, yet is only required to pay $1, they are deemed to have a ‘surplus’ of $9 (paying only $1 for something which brings $10 of benefit). This is the surplus attributable to the first glass of water. The second glass generates $8 worth of CS; the third generates $7; and so on, until the consumer is no longer willing to pay for another glass of water since its ‘value’ to the consumer (from the demand curve) falls below its price. In total, the consumer reaps $55 worth of CS; an amount equal to the area under the demand curve (Figure 3). Importantly, this demonstrates that the ‘value’ (to consumers) of some products far exceeds its price.
Consumer Surplus and The TCM

While there are many different versions of the TCM, the simplest (hereafter referred to as the zonal TCM) is theoretically capable of generating an estimate of the consumer surplus (CS) attributable to recreation at a particular area.

TCM treats the cost of travel as a proxy for price. The first stage of the TCM involves identifying the number and origin of visitors to a recreational site, and estimating their costs in travelling from that origin to the site and back again. This information is then used to estimate the functional relationship between visitation rates and travel costs. Stage two of the process makes the assumption that individuals react to changes in travel costs in the same way as they react to changes in price, and uses the function estimated in stage one to simulate visitation responses to hypothetical changes in price. A demand curve for the recreational area is thereby derived and used to estimate consumer surplus.

To illustrate, assume that travel costs, alone, influence visitation, that the current entry price (P) is zero. Assume also that the research observes the number of visits (V) from each of three different ‘zones of origin’, at a range of different travel costs (TC). These are shown in the first three columns of Table 1. Stage one of the implementation process involves regressing V against TC to estimate $\delta V / \delta TC$ (in this case, negative 1). From this, one can infer that within any zone, $\Delta V = -1 \times \Delta TC$. Stage two of the implementation process occurs when one uses that information to predict the number of visits (from each zone) which would obtain at higher travel costs ($= TC + P$).
Table 1 - Observed and Predicted visits at two different prices (entry fees)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Observed TC</th>
<th>V</th>
<th>Simulated TC(_1) = TC + 10</th>
<th>Predicted V at TC(_1)</th>
<th>Simulated TC(_2) = TC + 20</th>
<th>Predicted V at TC(_2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>10</td>
<td>30</td>
<td>0</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>Total Visits</td>
<td></td>
<td>30</td>
<td>10</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plotting price against the total visits (observed or predicted) gives the aggregate demand curve, the and its associated CS (Figure 4)

Figure 4: The aggregate demand curve for recreation

Recreation use value, is simply the value – into perpetuity – of a stream of consumer surpluses.

Empirical travel cost studies are considerably more complex than this; the functional relation between visits and travel costs, for example, is rarely linear and almost always includes other variables. Numerous problems are also encountered when attempting to collect relevant data, and measurement difficulties abound. Nevertheless, this stylised version helps to illustrate the process underlying the TCM.
Methodological overview

Despite the very large number of empirical applications of the TCM, several theoretical and practical problems have been identified. Interested readers are directed to Stoeckl (1999); Smith (1989) and Fletcher et al (1990), all of whom provide a detailed overview of many of those problems. Suffice to say here – final estimates are not as accurate as often portrayed. This study therefore provides a range of different estimates; that range reflecting some of the uncertainties associated with the methodology.

More specifically, this study uses the zonal TCM to generate a range of estimates of the recreation use value of each of seven different regions within the Australian Alps. Rather than attempting to determine travel costs from each zone, we use the ‘great circle’ distance between each zone of origin and the location from which the survey was collected as a measure of travel costs (assuming a price of distance = $0.50 per km since distance is one-way). Distance, the population of each zone, and other socioeconomic measures (taken from the ABS’s 1996 census) are used as regressors within the visitation equation and the dependent variable is defined as the number of sampled visitors from each zone. We allow for multiple-site visitors problem by using dummy variables to identify multiple-site visitors, and estimate five different visitation equations (using five different functional forms) for each region.

The results

A total of 4,614 questionnaires were completed by Australian residents. This allowed us to allocate 16528 Australian residents into 2293 different postal ‘zones’. We then divided that data into seven different sub-sets; according to which region (within the Australian Alps) the individuals were visiting when they completed the questionnaire.

For each region, visitation equations were estimated using 5 different functional forms. The double-log version was chosen as the “correct” functional form on both practical and theoretical grounds (see Stoeckl, 1999). From this point onwards, we therefore focus on estimates associated with the double-log model.

Coefficients from the double-log visitation equation were used to generate the following estimates of CS attributable to our sample of visitors (assuming a travel costs = 50 cents per km). These estimates were scaled downwards for a range of ‘plausible’ travel costs (10 and 30 cents per km), producing a range of ‘plausible’ consumer surplus estimates attributable to our sample of visitors (Table 2).

<table>
<thead>
<tr>
<th>Region</th>
<th>CS a ten cents per km</th>
<th>CS at thirty cents per km</th>
<th>Per Person CS at ten cents per km</th>
<th>Per Person CS at thirty cents per km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yarrangobilly</td>
<td>$259,124</td>
<td>$777,372</td>
<td>$258</td>
<td>$773</td>
</tr>
<tr>
<td>Jindabyne</td>
<td>$1,049,092</td>
<td>$3,147,276</td>
<td>$113</td>
<td>$338</td>
</tr>
<tr>
<td>Tharwa</td>
<td>$356,694</td>
<td>$1,070,082</td>
<td>$537</td>
<td>$1,612</td>
</tr>
<tr>
<td>Mt Buffalo</td>
<td>$582,034</td>
<td>$1,746,102</td>
<td>$217</td>
<td>$652</td>
</tr>
<tr>
<td>Falls Creek</td>
<td>$551,102</td>
<td>$1,653,306</td>
<td>$446</td>
<td>$1,338</td>
</tr>
<tr>
<td>Bright</td>
<td>$518,780</td>
<td>$1,556,340</td>
<td>$402</td>
<td>$1,206</td>
</tr>
<tr>
<td></td>
<td>$3,428,310.00</td>
<td>$10,284,929.00</td>
<td>$286.38</td>
<td>$859.00</td>
</tr>
</tbody>
</table>

Table 2: “Plausible” Consumer Surplus Estimates from the sample of visitors

(Using the double-log visitation equation)
To calculate the minimum ‘plausible’ CS estimate attributable to all visitors, we calculated the average per-person consumer surplus attributable in each state. Our averages, are weighted by the number of sampled visitors1 from each sub-region within each State. We then multiplied the 10 cent per km per-person consumer surplus estimates by the total number of visitors to the each region, and multiplied that figure by 0.8 to generate an exaggerated lower-bound estimate. For the upper-bound estimates, we multiplied the 30 cent per km per-person consumer surplus estimates by the total number of visitors to each region, and then scaled those numbers upwards by a factor of 1.2 (so as to over-exaggerate the range). We also supply a “middle of the road” estimate; calculated using an implied price of distance equal to 20 cents, and using total visitor numbers (without scaling). These ranges are presented in Table 3.

Table 3: “Plausible” Range of Consumer Surplus Estimates for all visitors

<table>
<thead>
<tr>
<th>State</th>
<th>Region</th>
<th>Visitors</th>
<th>“Plausible” minimum CS if P = 10 cents</th>
<th>“Plausible” minimum CS if P = 20 cents</th>
<th>“Plausible” maximum CS if P = 30 cents</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>1 and 2</td>
<td>1,001,500</td>
<td>$101,752,400</td>
<td>$279,819,100</td>
<td>$457,885,800</td>
</tr>
<tr>
<td>Namadgi</td>
<td>3</td>
<td>200,500</td>
<td>$86,134,800</td>
<td>$236,991,000</td>
<td>$387,847,200</td>
</tr>
<tr>
<td>VIC</td>
<td>5, 6 and 7</td>
<td>2,506,000</td>
<td>$635,521,600</td>
<td>$1,749,188,000</td>
<td>$3,862,854,400</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td>3,708,000</td>
<td>$823,408,810.00</td>
<td>$2,265,998,120.00</td>
<td>$3,708,587,430.00</td>
</tr>
</tbody>
</table>

If one wishes to obtain an estimate of the recreation use value of an environmental area, consumer surplus estimates must be extrapolated into the future and discounted back to present values. Generally, it is assumed that current annual values of consumer surplus will continue in perpetuity, meaning that the recreation use value (RUV) of an area is given by the present value of future annual values discounted at the social discount rate.

Minimum estimates of RUV were calculated using the minimum CS estimate (from Table 3) and a discount rate of 10%, the ‘middle’ estimate was calculated from the ‘middle’ CS estimate (with a discount rate of 6%) and the maximum used the highest CS estimate with a 2% discount rate.

Table 4 - A ‘plausible’ range of estimates of RUV.

<table>
<thead>
<tr>
<th>State</th>
<th>Region</th>
<th>“Plausible” minimum RUV if P = 10 cents and δ = 10%</th>
<th>“Plausible” maximum RUV if P = 20 cents and δ = 6%</th>
<th>“Plausible” maximum RUV if P = 30 cents and δ = 2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSW</td>
<td>1 and 2</td>
<td>$1,119,276,400</td>
<td>$4,943,470,766</td>
<td>$23,352,175,800</td>
</tr>
<tr>
<td>Namadgi</td>
<td>3</td>
<td>$947,482,800</td>
<td>$4,186,841,000</td>
<td>$19,780,207,200</td>
</tr>
<tr>
<td>VIC</td>
<td>5, 6 and 7</td>
<td>$6,990,737,600</td>
<td>$30,902,321,333</td>
<td>$146,005,574,400</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td>$9,057,496,810.10</td>
<td>$40,032,633,119.06</td>
<td>$189,137,957,430.02</td>
</tr>
</tbody>
</table>

In words, this analysis allows us to say that the recreation use value of the Australian Alps lies somewhere between $9 billion and $190 billion; most likely somewhere close to $40 billion. Admittedly, that range is large - but a broad range of estimates is frequently better than no estimate at all.

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1 Eq. the average per-person CS for NSW using ten cents per km as the price of distance was calculated as \((258\times 1006 + 113\times 9303)/(1006 + 9303)\)
Economic Impact Of Visitor Spending

While alpine Parks have economic value to recreational users, they also have value to their host economies via the generation of jobs and income which would not occur in the absence of the Parks. This value is termed the economic impact, and is driven by the visitor expenditure which is incurred in the host economies.

In this study the State is viewed as the host economy, because of the high level of State Government involvement in the visitor use of the alps. This approach has led us to treat only the expenditure by visitors to the State as having an economic impact on the State economy. For the present study, input output models were developed for each of the ACT, NSW, and Victorian State economies by the Centre for Tourism Research at the University of Canberra. The models provide detailed sector multipliers for Gross State Product (GSP), which is the state equivalent of Gross Domestic Product (GDP), and for employment measured in full time equivalents (FTEs).

The economic impacts on each State/Territory are summarised in Table 5. The size of the impacts on GSP is a function of how many interstate visitors go to each of the alps destinations, and since 2001 was a low snow year, these numbers may have been lower than they otherwise might have been. The economic numbers should therefore be regarded as being towards the lower bound of annual impacts.

Table 5 - Economic Impact of Visitors to the Australian Alps, 2001

<table>
<thead>
<tr>
<th></th>
<th>GSP $m.</th>
<th>Employment FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namadgi winter</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Namadgi summer</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Namadgi Total</td>
<td>29.64</td>
<td>456</td>
</tr>
<tr>
<td>NSW winter</td>
<td>95.98</td>
<td>1540</td>
</tr>
<tr>
<td>NSW summer</td>
<td>51.67</td>
<td>840</td>
</tr>
<tr>
<td>NSW Total</td>
<td>147.65</td>
<td>2370</td>
</tr>
<tr>
<td>Victoria winter</td>
<td>102.97</td>
<td>1654</td>
</tr>
<tr>
<td>Victoria summer</td>
<td>42.06</td>
<td>675</td>
</tr>
<tr>
<td>Victoria Total</td>
<td>145.02</td>
<td>2329</td>
</tr>
</tbody>
</table>

For Namadgi National Park there was insufficient data for a winter/summer breakdown and so annual results are presented. The ACT economy receives an annual boost to GSP of $29.64 million, of which $2 million represents increased tax revenue going to the ACT Treasury. For NSW the GSP boost is $147.65 million per year, of which $10.3 million is increased tax revenue to NSW Treasury on account of expenditure by visitors to the NSW alps. For Victoria, the boost to GSP is $145.02 million annually, of which $10 million is extra State tax revenue.

The seasonality of economic impacts on NSW and Victoria has changed over the past decade, in line with the growth in summer tourism in each State’s alpine areas. Studies in the early 1990s put the winter effect at 89 per cent of the total in NSW, and 83 per cent in Victoria. This study estimates the 2001 winter percentages at 65 per cent and 71 per cent respectively.

Conclusions

This has been an empirical study of the economic values and impacts of tourism in the Australian Alps. It has estimated the capital value of the alps for recreation using the travel cost method to be likely of the order of $40 billion, and the annual economic impact at a combined $322.31 million.
References


Common, M. S., (1973), "A note on the use of the Clawson method for the evaluation of recreation site benefits", Regional studies, 7: 401 - 407


Can The Mountains Survive Without Tourism?

Greg Roberts
Director, Marketing
Tourism Snowy Mountains, New South Wales

Abstract

The Snowy Mountains is a region of south east NSW that includes the prairie like grasslands of the Monaro, a large portion of Australia’s alpine environments, and eco-systems like Australia’s only Fjeldmark that are highly limited. The region includes the highest Mountain on the mainland, has developed strong cultural history, and evokes enormous scientific interest. Within this context, tourism is the major industry of the region generating $604 million. It creates about 5000 jobs and has allowed the permanent development of communities and service industries in the surrounding towns and villages. Tourism has more benefits than negative influences. Beside jobs, sustainable tourism has ensured the maintenance of the history and culture of the post 1788 migration and has strong links to Australia’s multicultural development since 1945. Using the economic principle of yield management, the future of a sustainable tourism industry will ensure the protection of mountain communities, and the natural environments, eco-systems and species that are conserved inside and outside the boundaries of national parks and reserves. Tourism is the means to survival of mountain environments and communities.

The Snowy Mountains - NSW

Physically, this region ranges in altitude from 800 to 2228m above sea level. It takes in a variety of geophysical, geological and ecological communities. The plant communities for example, vary as widely as the vast Monaro grasslands, those prairies to the east of the mountains that are largely treeless, due as much to the effects of cold air drainage and firestick farming, as the rain shadow created by the mountains of the Kosciuszko uplift to the west. The vastness of these plains can be contrasted by the tiny plant community of the rock strewn Fjeldmark above Lake Albina, a tiny plant community, protected within Kosciuszko National Park.

The geology varies as much as the plants, but is dominated by the vast sea of granite boulders and its soils, the best examples of which can be seen around Berridale on the plains, and above Thredbo in the mountains. These eerie boulders are a constant source of interest to visitors and are a great example of the forces of nature that have moulded the regions landscape.

I have refrained from using the word unique in this description. However, the natural environment truly comes to life when it is seen within the context of the human communities that have grown around it. While the migration and aestivation of the Bogong moth is scientifically interesting, it is the association with the Aboriginal people of the Monaro, the South Coast and the people to the west that begins the story of the cultural fabric of the mountains.
The stories of the exploitation of the grasslands and high country for summer grazing, and the dependence on the horse created a cultural icon in this region that no Australian, and certainly from our experience, no international visitor has not heard of. The opening sequence of the opening ceremony of the Sydney Olympics described the deeply held relationship in the Australian community, between the high country and the Australian horse rider. Horse treks, day rides and riding tuition have, as a result, been part of the high country summer tour industry for a longer period than just about all others, save for bushwalking and bicycle touring. Mountain biking and white water rafting are young upstarts by comparison.

**Touring, tourists and tourism**

So when did tourism commence, and what impact does it have on mountains? I am not qualified nor would I indulge myself in believing I could comment on the 12-15000 year presence in the mountains of Aboriginal communities. However, I do believe that their presence in the high country for their own economic and cultural reasons does give the first insight to the need for humanity to travel, and set the scene for what was to come.

Depending on your preference, European presence was first recorded during 1823, when Ovens and Currie travelled south of “Yarralumla” into the Monaro grasslands. Edmund Strzelecki is the most recalled “explorer”, the one who climbed and named Mt Kosciuszko. Now I doubt whether even Strzelecki had that much arrogance. As an aristocratic European traveller, he was on his own journey of discovery, and it was not beneath him to employ two local Aboriginal guides to guide him to the highest peak on mainland Australia. Their names are not recorded, however they guided him along the Murray, and up what we now call Hannels Spur. Strzelecki recorded that the campfires of the local people were obvious, and he, in true aristocratic style, requested that the guides remain, like 19th century Sherpas, at the advanced camp at Moiras Flat, while he continued to the summit. Here, it seems, he decided to rename the place Mt Kosciuszko. His cultural sensitivities not as heightened as they would be today, or he would have taken the fact that it already had a perfectly legitimate, and culturally appropriate name – Targan gil.

That aside, Strzelecki is among the first of the European visitors. A person on a great tour of life and discovery, following what is enshrined in many cultures as a means to discover yourself, by exploring new worlds. By any standard, Strzelecki was a tourist.

Let’s look at what he did. He booked and paid passage for an international journey. He paid for land transport once in Australia, and without a “Lonely Planet” guide, investigated, contacted local community people, and hired local guides. The economic impact of his journey even then, would be significant. In today’s economy, the same tour would have invested perhaps $20 000 to the Australian economy.

Of course it is history now that the region was then exploited for grazing. It was another group of visitors, the Mountain Trails Club of which Myles Dunphy was a member, that made the first noises about the alpine area, and the need for the mountains to be protected. Following the suggestion of the Snowy Mountains Scheme, the problems of soil erosion from grazing were recognised, and the alpine region was finally protected.

A number of studies have shown that the Snowy Mountains Hydro-electric Scheme, and the natural environment and history of the mountains are two major drawcards for visitors to the mountains. So, chicken or egg? Was the Snowy Mountains Scheme good for the mountains, or did it change the mountains? The enormous influx of workers brought with it the desire to explore the mountains, seek adventure, and was to develop the snow sports industry that is the backbone of the regional tourism today. It built the infrastructure, the roads, the trails and tracks, the dams and tunnels and the Alpine Way.

All these things make the journey easier and have a cultural story of their own. When they were constructed, Australia had a different mentality to the outback than today. One such story is that of Major Clews. A post war Snowy Scheme worker whose skills with surveying have been recognised internationally along with his teaching prowess. He taught English and surveying to snowy workers and war refugees. The man’s selfless nature is an example of the cultural story of the mountains. The simple mountain pise hut where he lived can be visited off the “Alpine Way” today.
The tourism business

A study in 2000, identified a worrying trend in the Australian workforce. That trend was for the workers to take less holidays, of shorter duration, largely because the pace of the work environment, and the potential for business to change even overnight. Many workers were not taking holidays longer than 3 days, and many had not taken a break for periods of up to two years. Compounded by the competition of consumer goods for discretionary spending, this is a problem for the health of the workforce. They needed to take a break. The result was the “see Australia” campaign. One value of this is to spread economic activity into regional Australia.

In the Snowy Mountains, the Australian Bureau of Statistics puts tourism as the major economic activity, with $604 million created. In context this is ten times greater than agriculture at $64 million. Put more simply, tourism is the regional industry.

The villages and centres of the mountains benefit. While many Australian regional towns are experiencing hardship, Cooma, for example, the economic centre of the Snowy Mountains is a hive of activity. Few country towns of less than 10 000 population can boast five banks, seven schools and preschools, one tertiary institute, two doctors surgeries and a busy health services centre and hospital. There is also an entire industry servicing the tourism industry. These include, food, equipment suppliers, vehicle repairers, electrical and electronic goods suppliers, government agencies, police and of course the myriad of building suppliers and tradesmen that support the industry.

Studies have shown that the average per person per night spent in the region is $220. With churn the economic value to the community compounds to $660. As research from the Department of Industry, Tourism and Resources point out, tourism, adding about 6.5% to GDP, is a very significant producer.

In the national context it is an industry that is a net exporter too, with approx 2 million traveller arrivals last year, and dispersal right throughout the country.

Economic, political, environment conditions

On the downside, this is an industry that is heavily influenced by factors beyond its control. In the financial year 2001–2002, this region had looked forward to domestic growth following a tough year, mainly due to the effect of the Sydney Olympics, and the introduction of the GST. Evidence of this was the regional fishing competition that saw a decrease in numbers as it coincided with the first reporting statements. For international readers……just think of a new tax! Last summer, the Australian domestic market had been affected by the Ansett collapse, creating uncertainty in the travel industry. After September 11, the international market reacted strongly, and with gale force winds in the mountains and bushfires reported by main stream media as “NSW burns”, the industry was knocked. But there was some optimism, and growth in visitor numbers steadily increased. 2002, a good year for visitors, has so far been stymied by a lack of commercial operators, as the fallout from the HIH insurance collapse is felt. Small family operated horse trekking businesses for example, employing several people, are now confronted with insurance bills of $AU20 000, if they could get cover at all.

The point being that tourism is not so much a sector industry, but one that is impacted by many factors, especially government, and its bureaucracies.

Before I go onto that, I recognise that there are a number of people from the scientific community, to which a discussion without mathematics, is irrelevant. Tourism NSW have researched some interesting data.

- Australia is the 6th largest country in area
- Australia has the lowest population density in world
- Australia is the 33rd largest country in “inbound” tourism
- International tourism accounts for 20% of visitors and 40% of revenue
- A growth of 2% to 15% of bookings via internet
- Rapid growth in international tourism has given greater employment in service sector
• Australians:
  • are living longer – by 2051 the median age will be 44 (now 35.5);
  • one fifth of them will be born overseas;
  • increasingly live in cities;
  • ethic is moving towards ecological sensitivity;
  • use the internet for information;
  • are taking shorter holidays, and are shifting from active holidays to holidays as an experience eg., learning new things, authentic emotions, personal development;
  • prefer personal choices eg., food and wine, interact with hosts;
  • as consumers, are better informed, demanding choice and freedom.

Snowy Mountains – 2001 snapshot
• 554,000 visitor nights
• 96% are domestic visitors
• 23 000 are international
• 210 000 are day trips into the region
• 16% are Visiting Friends and Relatives
• 77% of trips are for holiday (state average 44%)
• Average stay is 3.3 nights
• 54% of Visitors from Sydney
• Internationally, visitors arrive from Europe, (especially Netherlands, Scandinavia) UK, Germany and US
• Transport primarily car 44%
• $604 million
• Every $1 million creates 7.7 jobs
• 5 500 jobs created
• Community benefits with infrastructure eg restaurants, cafes, attractions.

Recognition of positives
Of major importance, is the fact that tourism gives added impetus for the preservation of local cultural and natural heritage.

Consumers
So what do consumers know of the Snowy Mountains as a summer destination:
• Quiet, peaceful holiday spent in a natural environment, pursuing relaxing activities
• An escape from summer heat
• Snow capped peaks create an image of grandeur, silence, isolation and escape
• Beautiful flora and fauna
• Activities, especially hiking to the top of Mt Kosciuszko

Those were the good things. On the down side some respondents said:
• Boring destination, not enough to do
• Not enough to keep kids occupied
• No night life for DINKS
- Poor accommodation choices
- Poor quality and high price for food
- Resentment of National Park fees

(Source TNSW BTR)

Enough figures, now to the emotive stuff.

**Culture, learning and a great holiday**

There are three propositions that I wish to put to you:

The view of science, and its particular skew
Tourism and sustainability
The value of commercial tourism to preservation

**Managing tourists**

It’s a problem for me, that science so often gets it wrong. Students of ecology, natural sciences, geology or geography use the mountains for their research projects, often for exactly the same reason that visitors do. Mountains are inspiring. They pose so many questions for the science student to exploit. Unfortunately conclusions are always directed at protection: protecting a species, an environment, an ecosystem. Recommendations always seem to suggest ways of managing the major problem causer…the visitor. The implication is that, like so many of the parks manageable problems, visitors are also something that needs managing. An alternative is to encourage visitation and to engage the visitor. By inviting visitors you can achieve the same result ecologically, with huge benefits politically. By providing opportunities to experience the natural environment or local culture, you can create a committed people, champions for your cause. Treating people like another introduced species is counter productive to the very purpose of the management in the first place … I’ll explain why.

**Sustainable tourism and yield**

While sustainability has become the buzz word of the 00’s, it’s a practice that many businesses in the tourism sector have begun implementing over the last 10 or even 15 years. Sustainability is possible when the practice of yield management is adopted to ride the highs and lows of business. An industry that is so affected by politics, economics and environmental factors has to have methods to even-out cash flow over a longer term than the usual fiscal year.

**Yield v numbers**

Promoting the mountains does not mean increasing numbers, what it means is increasing the return from the visitors you get. This has a number of benefits. Getting more from the same number of visitors means that costs can be reduced. One major way of achieving this is to increase the visitor length of stay. Financially, operators can reduce costs, as room changes, cleaning, check in/outs and transport costs are all reduced. On the other hand, opportunities to market commercial and non-commercial activities/attractions are increased. There are also increased opportunities for secondary businesses, restaurants, guides, tours etc to benefit. Even better, is the heightened opportunity for learning and experiencing the mountain environment and culture. All this is a benefit to both the community and the environment. Additionally, a better educated and experienced traveller is more likely to be influenced enough to seek support for conservation, education, research and protection of the environments and species they see. Think of the battles for Pedder, South East Forests and Kakadu that have been won by the impact of visitors. In this way, the true definition of sustainability, to preserve ecological processes and to protect human heritage and biodiversity, can be achieved.
Commercial guiding operations

Now legislation affecting National Parks, and I am referring mainly to wilderness areas, has adopted as conventional wisdom, the proposition that there is to be no commercial operations. This had the intention of preventing large scale operations in an area where self reliant travel is considered “savoir faire” but it has created great difficulties for sensitive eco-tour operators and their customers. Certainly it is my experience that minimal impact techniques had been introduced by commercial operators well before it became management policy in parks. It is a ludicrous situation that operators can bring through sensitive areas, large groups of people, masquerading under the guise of education or “not for profit”. Experience tells that it is often these groups, with little control, who have the greatest impact on the environment. On the other hand, small group commercial tours, lead by experienced guides are able to learn about the ecosystems, elements of the natural environment such as the animals and plants, taught by people who have developed interest, knowledge and a love of the mountains. They are also able to teach navigation, weather and survival skills within the environment where it will be used at future times by the participants.

I have also noted that, just as the consumer research tells us, many potentially independent travellers use commercial operators for reasons such as limited personal time for planning, use of transport, and equipment hire among others. I know of examples of customers who use commercial operators just so they get to have a break and not be called back to the office from a “paid” holiday. But even better still, can you picture yourself under the mantle of a crystal clear mountain night sky, “up by Kosciuszko, where the white stars fairly blaze” with a member of a local family, telling their family stories, explaining the culture of the mountains, the origin of the noises of the night, the reasons the Corroboree Frog is now endangered……and on and on… this certainly far outweighs the oft seen summer walker, in thongs and singlet, with little protection from the sun and mountain weather, sailing past 10,000 year old glacial tarns, oblivious to the ancient geology, the Aboriginal and European culture and history, leaving the area with the opinion, that it’s a pity you can’t drive to the summit……what a different visitor experience we should all aspire to.

Conclusion

So how do you value the visitor and their economic impact? Are they a consumable to be exploited, or a problem to be managed? Is the promotion of their visits ecologically sustainable?

I believe that the potential of sustainable tourism is a means to develop a commercially viable industry, one which creates meaningful permanent jobs. It’s a way of winning the minds of the public, the legislators, and especially in protecting and preserving the ecosystems and culture of the region. It may even be a means to see the emergence of a viable and meaningful aboriginal cultural product, that we know is so eagerly sought by international visitors, and is ruthlessly exploited in the northern territory. In summary, managers, scientists and the local community should embrace tourism as a positive influence on mountains, and not a problem that requires managing! And, you will find that good commercial operators will defend the resource that feeds them and their families.
Day Two – Mountains Of Meaning
Land Affinities Of The Mountain Aborigines Of North-Eastern Victoria

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Abstract

Along with other Aboriginal people in Australia, the Aborigines of the mountain country of north-eastern Victoria held a strong affinity with their land. This was expressed in their knowledge of food resources and manufacturing technology, their group and individual identification with specific places, and their application of the Dreaming and Law. Land affinities specific to the Yaitmathang of the Omeo area are detailed in this paper, and several Yaitmathang individuals responsible for maintaining that culture are identified. The interaction between the Yaitmathang and the explorers, settlers and gold miners are explored, and reasons for the demise of Aboriginal land affinities with the Omeo region are suggested.

Introduction

Of the Aborigines who once occupied mountainous Victoria, former Museum of Victoria anthropologist, Aldo Massola, wrote: “so little is known about them, so few are the relics that they left behind, and so difficult is the country they inhabited that they must remain as the least known of the Aborigines of Victoria” (Massola, 1969: 152). Likewise, geographer Sue Wesson considered the north-eastern Victorian Aborigines to be particularly enigmatic. Compared to other parts of south-eastern Australia, there is a paucity of information on the lifestyle, customs and habits of the Aborigines who once occupied mountainous Victoria, and their interaction with the environment.

However, recent documentation has become available that allows for the extension of previous knowledge. Several manuscripts containing key insights and observations on the mountain Aborigines dating to as early as the 1840s have recently been published. For example, the diary of the journey of the Chief Protector of Aborigines, George Augustus Robinson, through mountainous Victoria was published by geographer Ian Clark in 1998. Combined with published and unpublished documentation of eighteenth century historians, anthropologists and government departments (notably the ‘Central Board appointed to watch over the interests of the Aborigines in the Colony of Victoria’), there is now sufficient information available to warrant a closer examination the Victorian mountain Aborigines.

The purpose of this paper is to briefly outline the manner in which the mountain Aborigines of north-eastern Victoria interacted with the environment. Traditional land affinities will be overviewed and the keepers and perpetrators of that knowledge will be identified. Land affinities evidenced by Aborigines during the period of European settlement of the mountains will be outlined. In addition, the question as to why no Aborigines live in the mountains today will be addressed. More details on all these aspects of Victorian mountain Aboriginal history can be found in Lawrence (in press (a) and (b)).
Who were the Victorian mountain Aborigines?

A summary of the names given to the Aborigines of the north-eastern Victorian mountains by various nineteenth century explorers, settlers, government officials and anthropologists is given in Table 1. There are essentially three names used:

- the Kunora / Gundanora / Kandangora-mittung,
- the Thed-dora / Theddora-mittung, and
- the Yaymirttong / Ya-itma-thang / Jaitmathang / Yatte mittong.

Subsequent authors such as Tindale (1940, 1974), Massola (1962, 1969), Barwick (1984), Horton (1994), Clark (1996) and Wesson (2000) all use one or several of those names. The most detailed description of the naming of the Victorian mountain Aborigines is provided by Howitt (1904). Howitt contended that the Yaitmathang Aborigines occupied the northern slopes of the Australian Alps, as depicted in his map (Figure 1), and that the Yaitmathang people were a composite of the Theddora-mittung and the Kandangora-mittung. His assessment of the spatial distribution of Victorian mountain Aborigines, as well as his spelling, has been used in this paper.

TABLE 1 Names of mountain Aborigines of north-eastern Victorian as identified by various authors

<table>
<thead>
<tr>
<th>Year</th>
<th>Name given</th>
<th>Location given</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>Kunora alias Gundanora</td>
<td>“Over the Snowy river [looking from the Monaro], and in the Alps”</td>
<td>Lhotsky (in Andrews 1979)</td>
</tr>
<tr>
<td>1844</td>
<td>Yaymirttong</td>
<td>“The Blacks of Omeo are called the Yaymirttong”</td>
<td>Robinson (in Clark 1998: 109)</td>
</tr>
<tr>
<td>1850s</td>
<td>Thed-dora</td>
<td>“The Thed-dora … inhabited the country up the Livingstone Creek… the Omeo tribe lived about the Plains, the Mitta Mitta and over eastward where they joined on to the Maneror tribes”</td>
<td>Buntine (n.d.)</td>
</tr>
<tr>
<td>1859</td>
<td>Gundanora</td>
<td>“Name of the tribe… on the elevated plain of Omeo” was the ‘Gundanora’</td>
<td>Wills (in Victoria, Legislative Council 1859: 26)</td>
</tr>
<tr>
<td>1878</td>
<td>Omeo Plains area</td>
<td>“The Ya-itma-thang, commonly called the Omeo tribe, was divided into… (a) the Theddora-mittung… and (b) the Kandangora-mittung…”</td>
<td>Howitt (1904)</td>
</tr>
<tr>
<td>1880s</td>
<td>Omeo tribe “called itself Ya-itma-thang”</td>
<td>“Sources of the Mitta-Mitta River and its tributaries down to about the Gibbo Mountain, the Upper Kiewa River and the Ovens River to the Buffalo Mountain”</td>
<td>Howitt (1904)</td>
</tr>
<tr>
<td>1904</td>
<td>Kandangora-mittung</td>
<td>“Lived on the Omeo plains, the Limestone River down to its junction with the Indi River, and the Tambo River to Tongiomungie”</td>
<td>Howitt (1904)</td>
</tr>
</tbody>
</table>
Yaitmathang lands

The Yaitmathang occupied one of the richest and diverse areas of Victoria. Four physiographic units are contained within their region:

- river valleys and associated floodplains of the upper Mitta Mitta and Kiewa valleys;
- gently sloping plains areas of alluvial deposits, such as the Omeo Plains;
- foothills abutting the plains and river valleys; and
- elevated alpine plateaux areas generally bounded by steep-sided valleys.

The spatial distribution of these landforms between the Omeo Plains and the upper Kiewa Valley are shown in Figure 2. The physiographical variation gives rise to a diverse climate. Annual rainfall varies from about 450 mm to in excess of 2500 mm in the alpine plateaux areas, where snow is a common form of precipitation (Figure 2). Temperatures vary spatially, diurnally and seasonally. On a dry, summer day there is often a 12°C difference in the temperature between river valley environments at 500 m and the highest peaks above 1750 m. Rivers in the region are permanent, and the water is of good quality. Flooding often occurs in the river valleys during the spring months, when high rates of precipitation combine with melt from the snowfields.
The variety of landscape features support a wide range of vegetation communities (Figure 2):

- the lower river valleys carry extensive stands of red gum;
- the lower elevated hills areas are covered by open forests;
- almost pure stands of alpine ash occur between about 800 and 1400 metres elevation;
- snow gum woodlands occupy areas above 1400 metres and below the tree line; and
- the vegetation on the Bogong High Plains is typified by a mosaic of mosslands, grasslands, heathlands and snow gum woodland islands.

The diversity of vegetation communities supports a native fauna consisting of more than 250 bird species, at least 30 native mammals, about 50 species of reptiles, more that 25 different species of native fish, at least 20 amphibians, and a plethora of invertebrates. Fish native to the area include cod, perch, gudgeon, galaxias and blackfish. The fauna noted by Europeans to have been utilised by the Yaitmathang are shown in Figure 2.

It is evident that the Yaitmathang occupied a region containing a range of environments. This allowed for optimal living conditions as the Yaitmathang could migrate to favourable sites within their territory at any time of the year. One such favourable site was the Omeo Plains, as explorer George MacKillop (1836: 166) recorded:

"According to the account of the native who was with me, the climate [at Omeo] is bland all the year round. When he was asked if the cold be ever great in Omio [sic.]... he replied, 'When all hills in Monero got on white night-cap (i.e. snow), in Omio, black fellow not want it blanket'."

Likewise, policeman Alfred Wills (in Victoria, Legislative Council, 1859) recorded that “in May 1835, there were about 500 or 600 men women and children, resident during a few months in each year, at their headquarters on the elevated plain of Omeo”. The rain-shadow area of gently sloping alluvial plains provided abundant supplies of resources to meet the needs of the Yaitmathang for many months of the year.
Traditional Yaitmathang land affinities

In traditional Aboriginal times, there were a number of ways in which the Yaitmathang developed specific land affinities, and included:

- the acquisition of food resources;
- manufacturing technology;
- an individual’s identification with place;
- initiation ceremonies; and
- individual totems.

A brief elaboration of those follow.

Early settler Richard Helms (1895: 394) recorded that the food of the Yaitmathang “consisted of all kinds of game, birds and birds’ eggs, reptiles, fishes, and insects”. The Yaitmathang developed such an intimate knowledge of their resource-rich territory “that by half a day’s hunting, a native could support himself for four days together” (Wills in Victoria, Legislative Council 1859: 37). The Yaitmathang developed a specific land affinity when they trekked to the alpine area to collect and feast on the Bogong moth (*Agrotis infusa*) each summer. Early settler Angus McMillan (in Clark 1998: 58) recorded:

> The Alps are called the Boogon mountains but is one mountain at Omeo where the fly [Bogong moth] is so abundant. Large numbers of blacks go thither: they are in general very thin but return stout; it is fine feasting for them... the natives... put them in a bag and shake them to break their wings and legs; then tie them up in a piece of bark and roast them: are very good.

Anthropologist Josephine Flood (1980: 61 ff.) has documented the ceremonial procedures associated with hunting the Bogong Moth. She suggested that this practice occurred for about 4000 years, indicating an acquired knowledge of food sources that transcended many generations.

The manufacture of Yaitmathang technology required knowledge of the land and its resources. Yaitmathang tool usage included yam sticks, stone axes, water containers, fibre nets, carry bags, boomerangs, spears, clubs, shields and canoes. Specific geological and ecological knowledge was required for the manufacture of tools. For example, spears were made for different purposes, as the Yaitmathang manufactured “three or four kinds of spears, which were made of reeds, seedstalks of the grasstree, boxtree, or if procurable, ironbark” (Helms 1895: 400). Likewise, collection nets made by female Yaitmathang members for the collection of Bogong Moths utilised particular wetland plant species, as Richard Helms (1895: 396) also described:

> The fine nets made of kurrajong fibre... seem to have been especially designed for the purpose of collecting the 'Bugong'. They had very fine meshes and were manufactured with great care.... A shrub (Pimelia sp.) growing abundantly in places by the river sides to a height of three or four feet, furnished the fibre... The Omeo blacks called the bush as well as the fibre kurrajong.

The Yaitmathang Aborigines identified with the Omeo region through the use of body scarring (cicatrices), and spatial associations in child naming. Both male and female members of the Yaitmathang used cicatrices to identify their family descent and tribal association. George Robinson’s sketch of the cicatrices of ‘Omeo Black Billy Blue the Traveller’ indicated five rows of vertical marks across the back, three rows across the chest and several rows down the arm (Robinson in Clark, 1998: 125). In his role as inter-tribal messenger, it would have been important that his tribal association be clearly identifiable. In relation to the names given to Yaitmathang Aboriginal children, Richard Helms (1895: 398) recorded that “children generally received a name after something remarkable that happened at the time of their birth or after something in connection with the locality of it”. This is illustrated in the names of several Yaitmathang individuals given in Table 2.
Richard Helms and Alfred Howitt have recorded aspects of Yaitmathang law. There were two distinct ceremonies for the transition of male children to manhood: the first was to remove the child from his mother’s care, and the second was to convey to the initiate the districts of friendly people and those where hereditary feuds were to be upheld. Spatial affiliations were particularly important in the second ceremony, because it was then that locational information about friends and enemies was related to the initiate (Helms 1895: 393):

At the age of 18 or 20… he was made ‘Wahu’… The men would run some distance away and returning swing the boughs with a swishing sound in a certain direction, mentioning at the same time the name of the district towards which they were pointing... Each name mentioned was preceded by the emphasised exclamation of ‘Wau-Wau!’ For instance, ‘Wau-Wau! Tumut,’ ‘Wau-Wau! Queanbeyan’… This indicated that the Wahu may go to these districts as a friend and may have luck, or on the other hand that in some of these directions lived the tribes which whom he would have to carry on the hereditary feuds, for from henceforth he was to be considered as being raised to the position of a warrior in his own tribe.

The use of totems in Yaitmathang society was two tiered. Firstly, every individual within the Yaitmathang population belonged to one of two ‘classes’. Alfred Howitt (1904: 101) recorded that the tribal totems (classes) of the Yaitmathang were “Tchuteba the rabbit-rat, and Najatejan, the bat”. Howitt also noted that whenever there was occasion for the Yaitmathang to apportion themselves into two groups, they naturally divided themselves up by ‘class’. Secondly, Yaitmathang individuals held their own totemic symbol, which may have been a bird, mammal, reptile, fish, etc. Individual totems were foundational to the social organisation of the Yaitmathang people and formed the basis for laws of marriage. Alfred Howitt provided an example of the Yaitmathang marriage rules when he compiled Table 3. In his manuscripts, Howitt recorded “the eagle, bat, pheasant and the wattlebird can not marry in themselves but they can do so with the others from tribes belonging to several hawks”. This illustrates that the two tiers of totemic usage used in marriage rules were grounded in nature.
Keepers of Yaitmathang traditions

The personnel with knowledge of traditional Yaitmathang land affinities were the elders of the group. There seems to have been five roles filled by Yaitmathang elders, and ten individuals who fulfilled those roles between the mid 1840s and 1880s (Table 4). The chief, who was known as ‘Turki’ (Howitt 1904: 301), was usually the eldest man of the group, whose advice was sought on matters to do with territorial rights, warfare and revenge (Helms 1895: 388). The medicine men (Yaitmathang term unknown) were usually noted for their abilities in healing and magic; the principle fighter was deferred to in warfare and some leadership roles; the messenger was multi-lingual and formed the main source of communication between surrounding tribes; and the song-writer displayed skills in conveying traditions through song and dance. The multiplicity of leadership roles suggested a well-organised community committed to maintaining their society in perpetuity.

TABLE 4 Yaitmathang elders. Source: adapted from Wesson (2000).

Note: nomenclature from Helms (1898) and Howitt (1904).

<table>
<thead>
<tr>
<th>Elder’s role</th>
<th>Name</th>
<th>Years of record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief</td>
<td>Wobiner</td>
<td>1844</td>
</tr>
<tr>
<td></td>
<td>Taragerer alias Motogo</td>
<td>1844 - 1855</td>
</tr>
<tr>
<td></td>
<td>Nukong</td>
<td>1844 - 1856</td>
</tr>
<tr>
<td></td>
<td>King Billy</td>
<td>1850s</td>
</tr>
<tr>
<td></td>
<td>Charlie</td>
<td>1844 - 1880s</td>
</tr>
<tr>
<td>Medicine-men</td>
<td>Taragerer alias Motogo</td>
<td>1844 - 1855</td>
</tr>
<tr>
<td></td>
<td>Corvomung alias Slarney/Larnie</td>
<td>1844 - 1851</td>
</tr>
<tr>
<td></td>
<td>Munngijowun alias Cocky</td>
<td>1844 - 1850s</td>
</tr>
<tr>
<td>Principle fighter</td>
<td>Jargair alias Johnny (Ingubiri)</td>
<td>1844 - 1846</td>
</tr>
<tr>
<td>Messenger</td>
<td>Bittocort alias Billy Blue</td>
<td>1844 - 1856</td>
</tr>
<tr>
<td>Song-writer</td>
<td>Almilgong</td>
<td>1844</td>
</tr>
</tbody>
</table>

The Yaitmathang and the explorers, settlers and gold miners

The arrival of the Europeans was to result in major disruptions to the continuance of Yaitmathang traditions, but not before the Yaitmathang had assisted in the ‘discovery’ and ‘settlement’ of the Omeo region. Table 5 outlines the role played by Aborigines in the European discovery of the north-eastern Victorian mountain country. Both Ngarigo (Monaro) and Yaitmathang Aborigines played a necessary, although usually forgotten, part in Europeans claiming the honour of being ‘the first’ into a certain area. The Aborigine’s knowledge of their own and adjacent territories was admirably displayed in the transmission of that knowledge to the European explorers.

TABLE 5 Aboriginal guides to European explorers

<table>
<thead>
<tr>
<th>Date</th>
<th>Explorer</th>
<th>Area explored</th>
<th>Guide’s name</th>
<th>Guide’s origin</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1834</td>
<td>Johann Lhotsky</td>
<td>Monaro to Omeo (?)</td>
<td>Unnamed</td>
<td>Ngarigo</td>
<td>1</td>
</tr>
<tr>
<td>1835</td>
<td>George MacKillop</td>
<td>Monaro to Omeo</td>
<td>Unnamed</td>
<td>Ngarigo</td>
<td>2</td>
</tr>
<tr>
<td>1839</td>
<td>Angus McMillan</td>
<td>Monaro to Buchan</td>
<td>Jemmy Gibber</td>
<td>Ngarigo</td>
<td>3</td>
</tr>
<tr>
<td>1840</td>
<td>Angus McMillan</td>
<td>Omeo to Gippsland Lakes</td>
<td>Cobbon Johnny and Boy Friday</td>
<td>Yaitmathang</td>
<td>4</td>
</tr>
<tr>
<td>1840</td>
<td>Paul Strzelecki</td>
<td>Monaro to Port Phillip area</td>
<td>Charley Tarra</td>
<td>Sydney area</td>
<td>5</td>
</tr>
<tr>
<td>1851</td>
<td>Brown and Wells</td>
<td>Cobungra to Bogong H. Plains</td>
<td>Larnie</td>
<td>Yaitmathang</td>
<td>6</td>
</tr>
</tbody>
</table>

Following the establishment of routes to and through Omeo with the help of the Aborigines, European squatter settlers followed. The sequence of establishment of squatting runs in the Omeo region is outlined in Table 6. It is noteworthy that, without exception, the squatters named their runs using Aboriginal terms. Also of note in Table 6 is that the nomenclature used by the Yaitmathang and settlers had a strong association with place. For example, the frequency with which the suffix ‘mungie’ was used in place names was a reference to the presence of fish or codfish in the streams (Robinson in Clark 1998: 109; Neumayer 1869: 102). It is apparent that the initial European settlers learnt the names and features of specific locations, and used those geographical indicators of the landscape features in the naming of their runs. This indicates a certain liaison between the Aborigines and the Europeans during the early years of settlement and that some of the first exchange of language related to geographical features. Several Yaitmathang Aborigines were employed by the early settlers as stockmen and bullock drivers (Tyres in The Gippsland Mercury 1875).

Gold was officially discovered in Omeo in November 1851, and produced the following changes:

- an increase in the European population from 22 in 1850 to 777 in 1861 (Australian Bureau of Statistics data);
- disruption to the forest and aquatic environments through mining disturbances, with an associated decrease in traditional Aboriginal food supplies; and
- an increase in the incidence of bushrangers and outlaws.

One incident of note occurred in January 1859, when bushrangers Chamberlain and Armstrong held up a gold escort south of Omeo, and were only apprehended when a Yaitmathang Aboriginal named Omeo Tommy successfully tracked them down in rough terrain (The Constitution and Ovens Mining Intelligencer 1859). The settlers and police obviously recognised the skill of the Aboriginal trackers from Omeo and were happy to utilise those skills in the pursuit of justice.

TABLE 6 The sequence of grazing runs taken up in the Omeo region, depicting the use of names of Yaitmathang origin.
Source: run names and dates from Spreadborough and Anderson (1983); Aboriginal associations from sources as indicated.

<table>
<thead>
<tr>
<th>Squatting Run</th>
<th>First year</th>
<th>Aboriginal Name</th>
<th>Aboriginal meaning</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omeo A</td>
<td>1835</td>
<td>Omeo / Karengo</td>
<td>Very extensive plains / unknown</td>
<td>1 and 2</td>
</tr>
<tr>
<td>Omeo B</td>
<td>1835</td>
<td>Omeo/ Nabbimunjie</td>
<td>Very extensive plains / unknown</td>
<td>1 and 2</td>
</tr>
<tr>
<td>Benambra</td>
<td>1839</td>
<td>Benambra</td>
<td>Not known</td>
<td></td>
</tr>
<tr>
<td>Tungie Mungee</td>
<td>1839</td>
<td>Tongiomungie</td>
<td>Place where fish are found in streams</td>
<td>3 and 2</td>
</tr>
<tr>
<td>Numblamunje</td>
<td>1839</td>
<td>Numblamunje</td>
<td>Place where fish are found in streams</td>
<td>3 and 2</td>
</tr>
<tr>
<td>Hinnomunjie</td>
<td>1841</td>
<td>Enoiomunjie</td>
<td>Place where fish are found in streams</td>
<td>3</td>
</tr>
<tr>
<td>Bindi</td>
<td>1845</td>
<td>Bendi</td>
<td>Home of Bindi-mittung (mittung=many)</td>
<td>3 and 4</td>
</tr>
<tr>
<td>Cobungra</td>
<td>1851</td>
<td>Karbungerer</td>
<td>Named for a chief living in the area</td>
<td>2</td>
</tr>
<tr>
<td>Bundaramunjee</td>
<td>1857</td>
<td>Bundaramunjee</td>
<td>No fish in river</td>
<td>5</td>
</tr>
<tr>
<td>Bynomunjie</td>
<td>1860</td>
<td>Binnomunjie</td>
<td>Place where fish are found in streams</td>
<td>3 and 2</td>
</tr>
<tr>
<td>Darbarlary</td>
<td>1861</td>
<td>Darbarlary</td>
<td>Not known</td>
<td></td>
</tr>
</tbody>
</table>

Why are there no Yaitmathang today?

A strong association of the Yaitmathang with the Omeo region in both traditional times and the early years of European settlement has been demonstrated. Why then, are there no remnant Yaitmathang in the Omeo region today? Table 7 outlines the many incidents that have led to the demise of the Yaitmathang. Indeed, Alfred Wills (in Victoria, Legislative Council, 1859) recorded:

> Numbers - in May 1835, there were about 500 or 600 men women and children, resident during a few months in each year, at their headquarters on the elevated plain of Omeo. In 1842 they frequently assembled there in large numbers, and often killed many cattle belonging to squatters, whose stockmen, it is said, retaliated by firing on them... In 1843 a great diminution in their numbers was first observed.

Figure 3 depicts the temporal changes in population numbers of the Yaitmathang and European residents of Omeo. It is evident that there were incremental changes in Yaitmathang numbers during the first decade of European settlement at Omeo, but that the most significant change occurred in a single event. The 1842 massacre was recorded by both Wills (in the above quote) and George Robinson (in Clark 1998: 95) who wrote in 1844 that “it was two years ago when two bush rangers shot the Omeo blacks and scattered them”. This massacre depleted Yaitmathang people to about one-quarter of their pre-settlement numbers. Further declines in Yaitmathang numbers occurred between 1843 and 1865 (Table 7), so that by 1895, there were no Aborigines living at Omeo (Helms 1895: 388).

Those Yaitmathang who survived the atrocities outlined in Table 7 did so without the guidance of their elders. Of the ten elders listed in Table 4, it is noteworthy that records relating to nine do not persist after the mid to late 1850s. It seems that all except one Yaitmathang elder did not survive the first decade of gold mining activity in the region. After the elders had died, the once-strong affinities of the Yaitmathang with the Omeo region began to dissipate. The remnant Yaitmathang moved to the Monaro, Murray valley and Gippsland areas (Bulmer 1863; Haughton in Victoria, Legislative Assembly 1861; Hagenauer in Victoria, Legislative Assembly 1861).

However, there is a twist to this story. Several residents of the Omeo district have mentioned to this author that at least one of the early settlers had children to an Aboriginal wife, but that aspect of history is not acknowledged openly today. This is to be regretted as that family can not only claim land affinities dating to the 1830s, but rather for many centuries prior to that.

TABLE 7 Incidents relating to the demise of the Yaitmathang Aborigines

<table>
<thead>
<tr>
<th>Year</th>
<th>Incident</th>
<th>Result</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late 1830s / early 1840s</td>
<td>Stockmen retaliation</td>
<td>Several Yaitmathang killed and buried in a swamp near The Brothers</td>
<td>1 2 3</td>
</tr>
<tr>
<td>1842</td>
<td>Bushranger massacre</td>
<td>Many Yaitmathang killed when performing a corroboree in the Innisfail area</td>
<td>1 4 5</td>
</tr>
<tr>
<td>1840s and ’50s</td>
<td>Venereal disease</td>
<td>Several Yaitmathang inflicted and presumed to have died from syphilis and gonorrhoea</td>
<td>5</td>
</tr>
<tr>
<td>???</td>
<td>Eating unfamiliar food</td>
<td>“Quite a few of them died” from eating uncooked rice</td>
<td>4</td>
</tr>
<tr>
<td>???</td>
<td>Deliberate poisoning</td>
<td>“Natives... given flour laced with arsenic in the Benambra area”</td>
<td>4</td>
</tr>
<tr>
<td>1844 – 1865</td>
<td>Warfare with Kurnai</td>
<td>About 150 Yaitmathang and Kurnai killed in seven separate incidents</td>
<td>5 6 7 8 9</td>
</tr>
</tbody>
</table>

FIGURE 3 Trends in population numbers in the Omeo region. Source: Aboriginal numbers from author’s research; European numbers from Australian Bureau of Statistics.

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Alps Mining – Did We Really Get Over It?

Robert J Kaufman

Heritage Consultant

I have recently had the pleasure of undertaking the Australian Alps Mining Heritage Conservation and Presentation Strategy, funded by the AALC. This project looked at the European quest for metals, from the 1850’s. It was noted, of course, that Aboriginal people were the first miners in the Alps, extracting stone for tools, and ochre for ceremonial purposes.

Gold has been overwhelmingly the most important metal mined in the Australian Alps. Gold mining is an activity that is not constrained by topography, altitude or environment, nor is it influenced by regional or even national demand. Gold was, and is, a global commodity. There would not be a creek or river within the entire Alps that has not felt the blow of a prospector’s pick and the rattle of a gold pan some time in the last 150 years, nor a mountain range that has not echoed to the hoof beats of a prospector’s pack-horse. Nearly a billion dollars worth of metals, principally gold, has been wrought from the Australian Alps National Parks and attached Historic Areas, but this is only the tip of the iceberg. Metals production itself is limited by the existence of actual resources, but perversely, mining activity is not. An important cultural dimension operated - the lure of gold and other precious metals, and the promise of instant wealth, drove the level of activity in the early years. Mining in these early years had astonishing productivity for its relatively short life, compared to other economic pursuits of the period. It was very labour intensive, and acquired a complex support infrastructure, not the least of which was a strong governmental regulatory presence.

Grazing and sawmilling have also affected large areas. Both were constrained by environmental factors – suitable high-altitude grasslands or wide lowland valleys for the former, and suitable lumber species and growth characteristics for the latter. Cattle grazing, in particular, was not labour intensive, and while the environmental influence may prove to be long-lasting, the cultural heritage is largely tied up in the legends of the relatively-few cattlemen, and the huts, rather than deeply imprinted in the landscape. Sawmilling was a service industry that, in historical times, was greatly influenced by local and regional demand. The later hydroelectric schemes and the skifields are geographically constrained, relating to developments in particular topographies and altitudes within the Alps. Their local impact may have been enormous, but they do not touch the greater portion of the Australian Alps.

While the study of such a wide-ranging and important European cultural influence as mining is necessarily complex, the results of the study were relatively simple. Historic mining sites are widespread through the Alps, and are principally archaeological in nature. By the very nature of mining, the fabric of these places is generally robust, and usually deeply imprinted in the landscape. The regrowing vegetation is an integral part of the significance and experience of these places, offering a sense of discovery, and mute evidence of the passing of a way of life. Therefore the natural and cultural environments are particularly compatible at historic mining places. Management intervention may be limited to places targeted for interpretation, places requiring risk works because of their locations, and some of the more significant and fragile machinery sites. While historic mining sites are abundant, discernible mining landscapes are not, tending to be masked by the regrowing vegetation. There are spectacular exceptions, of course, such as Kiandra.
Little is presently available in interpretation of historic mining areas throughout the Australian Alps National Parks, and the strategy recommended cultural heritage presentation works at three places in Victoria and three in NSW. In NSW, recommendations were made to extend interpretations at Kiandra, attend to minor conservation and presentation works at the battery on Three-Mile Creek near Kiandra, and to install basic cultural heritage information on a board at Thredbo Diggings. In Victoria, basic interpretations for the Brandy Creek Mine and Jokers Flat diggings were recommended, as well as conservation and presentation works at the Monarch Mine. These places are strategically located, and present the principal characteristics of mining in the Australian Alps. They have good visual qualities and show a wide range of instructive features, from gold-rush landscapes and diggings, to quartz mines with abundant artefacts of former operations. They occur in a spectacular array of natural settings, from Alpine grasslands and woodlands, to rugged mountain bushland, to scenic mountain river valleys.

Two things troubled me at the beginning of the project. The first of these was a comment by a cultural liaison person in an area of the Victorian Alps with a massive mining influence. He simply told me that the cultural heritage of the area lay with the cattlemen of the High Country, and that mining was essentially trivial. Totally ignoring thousands of years of Aboriginal occupation and use, this naturally made me wonder about the ability of this particular local area to come to grips with cultural heritage. It also made me revisit the early years of European incursion into the high Victorian Alps.

The story of John Mitchell’s journey to the Bogong High Plains in 1843 has been discredited, so we are left with an 1850’s, grazier-led European exploration of the Victorian Alps. The story is repeated in all histories relating to the region in the last 40-odd years. Brown and Wells, from Cobungra Station, blazed the first trail over Mt Hotham in 1852-3, guided by Larnie, a local Aboriginal. They were the first onto the Bogong High Plains, named most of the geographical features, pioneered high country grazing, etc. Maps have been drawn, detailing the various routes of their Alpine explorations. Strange as it may sound, none of this seemed to be part of any earlier written histories that I came across during the study. In fact, it is at odds with some of the scraps of contemporary documentation that happened to surface.

A Lands Commissioner from Benalla trying to find a route from the Ovens Valley to Omeo in January 1852 in response to gold discoveries, but turned back by unseasonal snow. A party of miners leaving Wangaratta early in 1852 to push into the ‘Buffalo and Snowy Mountains’, with hints that they had been there before. Pardoe and party ascending the Ovens River to the Buckland Gap near Mt Smythe in 1853, before descending into the Buckland valley. Von Mueller claiming to be the first (European!) person in the highest part of the Alps in 1854. A Goldfields Commissioner attempting to blaze a route over Hotham in 1854, and reporting that miners were regularly and haphazardly crossing the Alps. A newspaper report of 1866 crediting miners with systematically pushing back the frontiers in the Alps.

High country summer grazing does not even rate a mention in local histories of the late 1800’s and early 1900’s. We know it happened, but when? Alfred Howitt observed summer grazing in 1866, and the original Bogong High Plains grazing lease dates from the same year. Note that gold miners were working adjacent to the Bogong High Plains on the Mt Fainter goldfield in 1861, some five years earlier. The grazing lease was broken up into smaller leases in 1887. Around 1920, it is reported that the High Plains were rarely grazed, only intermittently for drought relief by properties to the west (ie the Kiewa valley side). This is a far cry from the annual musters of more recent times.

So what about Brown and Wells? We know that Larnie existed, provided that he is the same Slarnie or Corvomung described by Robertson in 1844. But Brown and Wells’ exploits derive solely from an interview with the McNamara brothers, revealed by Stella Carr in 1962. It is oral tradition, over one hundred years removed from the events, and confirmation was by way of corroborative tales from other local cattlemen. That is, no corroboration. This is not to say that the events described did not happen or could not have happened.

Some logic can be applied. What interest would the early graziers have had in the Alpine country of Victoria, a mere postage-stamp compared to the vast high-altitude grasslands of the NSW Alps? Before gold, grazing around the Victorian Alps was on unimproved pasture with very low stocking rates. The graziers were not the ‘squattocracy’ – these people were pushing the frontiers into what was then very marginal land. State and regional populations developed massively during the gold rushes, providing impetus to pasture improvement, higher stocking rates and the development of intensive agriculture. It
would seem likely that high country grazing was a response to post-gold pressures on stocking rates, and subsequent sensitivity to drought and fire. If Brown and Wells did explore the Victorian Alpine areas prior to the gold rushes, it is likely to have been through a spirit of adventure, rather than an economic imperative. Undoubtedly a short cut to Wangaratta would have been beneficial to them, but would a simple blazed trail over Mt Hotham have been suitable for the graziers’ needs, given the rugged and steep topography of the Ovens Valley fall?

For Brown and Wells, and their employer Gray, the Hotham route was definitely not the best short-cut across the Alps. In any case, government officials were clearly still trying to blaze this trail for gold miners in 1854.

So what is the real post-contact history of the Victorian Alps? Were gold miners in fact the first Europeans into the highest parts of these Alps? I don’t know, but perhaps a little more research and rigour could be applied to the issue. The Cattlemen of the High Country are seen as important in the European cultural heritage of the Victorian Alps, and therefore they are, quite validly. But their significance in Victorian Alpine exploration is based in tradition, and unsupported. And their incorporation as key icons into the cultural heritage and history of the Victorian Alps seems to have begun in the mid 1900’s, as Melbourne-based academics began to venture into the Alps in bush-walking clubs, skiing clubs, and for research, and were exposed to the camp-fire yarns of the cattlemen.

Throughout the Australian Alps, there is massive documentation of the oral histories of the relatively-few graziers and cattlemen, but little of the tens of thousands of miners who ventured into the Alps, establishing townships, living, working and sometimes dying in the High Country. Why? Simply because they were gone. And there has been a generational loss of their stories. In the NSW Alps, the tales of mining that are recorded are largely the testimonies of the grazier-miners, and this colours our better understanding of the mining sites and landscapes.

Have myths become facts through the retelling? There may well be many early histories throughout the Alps that need revisiting, or at least caution applied in their telling.

The second thing that troubled me was an abundance of published histories that neatly divided the history of the Alps into blocks, or phases. That is, we had the long, pre-European, aboriginal phase, followed by the European explorers and pioneer graziers. Then the miners came and left. Then came the later graziers and agriculturalists, after that the development of the skifields, National Park and tourism development, the hydro schemes etc. Well and good, perhaps, as a very rough chronology, but in the era of European exploration and use, it does a great disservice to the dynamics of regional development.

Before gold, the European presence in and adjacent to the Australian Alps was sparse at best. Gold discoveries adjacent to the Alps, at places like Adelong, Tumbarumba, Beechworth, Bright, Omeo etc, drew relatively large numbers of people into the region. Subsequent gold discoveries within the Alps further drew considerable populations into the Alps. Prospecting was widespread throughout the Alps, and townships developed in the major mining areas. In the NSW Alps, the gold was principally buried lead and alluvial, and the early camps and settlements rapidly disappeared as the surface gold deposits were worked out. In the Victorian Alps, quartz mining developed as the surface gold deposits were worked out, and the townships assumed a more settled appearance. However, even these resources were eventually depleted, and within the area of the Alps National Parks, the miners left, the townships died, and the bush slowly reclaimed the land. So was that it? Well, in examining the influence of gold mining in the Alps, it is necessary to look further. How different would the Alps, and our view of the Alps, be today without historic mining?

I certainly don’t have the answers, but I do have lots of questions. Let’s consider the Victorian Alps. Without the entrepreneurial efforts from the adjacent mining towns of Bright and Omeo, and the mining tracks and shanties across the mountains, would the Mt Hotham Ski Resort have developed? Without the local lobbying from Bright and the railway connection, what would Mt Buffalo be like today? Could it have ever been developed from what would essentially have been a dead-end valley with a small grazing presence? When would the timber industry have developed in the Alps, and how different would its incursion have been without the local demand stimulated by mining and mining populations, the developed settlements from which to base operations and draw labour, and the established roads on which to transport its products? How and from where would we access the Alps nowadays? How different
would our fundamental view and understanding of the Alps be, and how different would our conservation
needs and efforts have been?

Similar questions abound for the NSW Alps. While high country grazing had been established before the
Kiandra rush, how different would our concept of the Alps be today without the influence of Kiandra and
the large adjacent mining populations at Tumut/Adelong, Tumbarumba and Cooma? Without mining-
associated settlements on the roads to the diggings at Jindabyne, Adaminaby, etc?

Without the thousands of miners and prospectors turning the unknown into the familiar, and the daily
newspapers of the era bringing the mountains to the masses for the very first time, with every new gold
find?

From a time of very sparse European presence, mining was the engine-room that drove regional
development, and in just a few decades laid down the demographics and infrastructure that pre-
determined much of what is familiar today in the Alps.

The influence of mining can be very personal. In Bright, from my kitchen window, I look up the valley to
the snow-covered peak of Mt Bogong in winter, and from my loungeroom window I can glimpse the
snowy top of Mt Buffalo peeping above the foothills. Without gold mining, I would indisputably be
trespassing on somebody’s farm! Many of the roads we follow into the Alps only became roads because
of gold mining, even where some may have existed as trails before. Some of our lasting visual
impressions of the Alps may have thus been modified by mining. Did we really get over it? I don’t think
so.

But for a cultural influence that is so pervasive in the Alps, and occasionally so personally relevant, we
often have difficulty in effectively interpreting the historic mining sites and landscapes. It is very easy to
take the soft option, that of treating them as technological places. While evolving technologies do relate
to the development of our culture, the real cultural interest is obviously in people. We need to develop
innovative ways to put the missing people and stories back into our mining sites and landscapes. In a
very real sense, these sites and landscapes were not created by miners, as we understand the appellation
today. The gold-rushes - the great treasure hunts of the nineteenth century - cut across the whole
spectrum of society. More than in any other occupation or pursuit, the digger was ‘everyman’, or put
another way, these people were very much just you and I in another age.
Barry McGowan

The main wave of Chinese immigration into New South Wales took place in 1858, and within a few years they were firmly established on almost every major goldfield in the colony. By 1860 they had settled on the Kiandra goldfields in the Snowy Mountains. My paper explores briefly the history of the Chinese in southern NSW, particularly Kiandra, with some reference to the Chinese at Omeo in north east Victoria, and discusses the archaeology of Chinese mining, settlement and burial sites. The Kiandra Chinese camp has been examined in detail by Lindsay Smith, and is possibly one of the most important such sites in Australia.

In the early gold rush years there was a constant movement of miners across the landscape. For instance, the Chinese travelled regularly between the Braidwood goldfields, particularly Jembaicumbene, Lambing Flat and Kiandra. One consequence of this was the discovery of other gold deposits on the fringe of the mountains, and the establishment of a number of other goldfields, some of which were settled predominantly or exclusively by Chinese. Such fields existed at Craigie, the Numeralla and Big Badja Rivers, Colyers Creek and Humula. There was a similar migration between Omeo and Kiandra. A locational map is at Fig.1.

Chinese gold miners were generally well organised, worked in large cooperative groups, were well equipped and often regarded as more diligent than European miners. Contemporary accounts indicate that most Chinese were subject to the contract system of employment, which was well organised and very successful. This mode of working has important implications for the archaeological remains of their diggings, which, it will be argued, form a distinctive signature mark on the landscape.

Kiandra goldfields

At Kiandra the Chinese population increased from 80 first arrivals to a peak of around 700, or about 20 per cent of the population during July and August 1860. At the end of June 1860 the Kiandra correspondent of the Sydney Morning Herald noted that

The Chinese Camp is a little to the east of the township, pretty comfortably sheltered under the brow of a small rising piece of ground. The Commissioner has requested them to remove under the shelter of another hill-side, a small distance to the right, which a number of them have done, and thereby opened another settlement apart from all Europeans. There are supposed to be some three or four hundred Chinamen here.

Lindsay Smith has commented that, although there was very little mining done by anyone in the harsh winter conditions at Kiandra, some Chinese found other steady employment. This alternative employment proved to be of great benefit, not only to the Chinese but also to most of the European residents. The machinery for Thomas Garrett’s newspaper, The Alpine Pioneer and Kiandra Advertiser,
could not be brought into the town because of the snow, and Chinese labour was used for this purpose, and for the carriage of other goods equipment and produce. Although there were still reports of large numbers of ‘Celestials’ passing through Braidwood en route to Kiandra towards the end of August, by the end of that month Kiandra was starting to fade, and they began to disperse. By the end of the year, most of the Europeans and Chinese had left Kiandra.7

There are few other accounts of the Chinese at Kiandra until 1872. A special correspondent for the Town and Country Journal reported that the Chinese were a significant presence at Kiandra at that time. About 80 Europeans and 150 Chinese lived in the township proper, and were engaged actively in preparations for the Chinese New Year. Large supplies of groceries were brought in, and the bakers and butchers were busy, as were the Chinese tailors, who were making flags for the temples.8

In the latter part of the nineteenth century many of the remaining Chinese moved into buildings located on the southern outskirts of the town. From there they assumed a more prominent role in the Kiandra community. By this time the town had about 200 to 300 people, of whom the Chinese comprised possibly a third. At the end of the 1880s the Chinese began to abandon their camp. By the early 1890s it contained only a handful of men.9 It appears that by the turn of the century the Chinese camp at Kiandra had been completely abandoned. A Chinese presence continued well into the 1920s, Tom Yan, one of the original Chinese miners and later a storekeeper, passing away at Kiandra in 1925. At Omeo there was a similar pattern of separateness, gradual abandonment and assimilation.10

The Archaeology of the Chinese

Archaeologically there are three main questions concerning the Chinese on the goldfields, whether it is Kiandra or elsewhere; that is, where they worked, where they lived, and where they were buried? Each of these question is addressed in turn, using examples from Kiandra, Omeo and the Braidwood goldfields. The latter goldfields are important as the discourse on the archaeology of the Chinese mining sites had its origins in this area.

Firstly the mining. One difficulty in identifying distinctly Chinese workings is that the mode of working and technology were similar to those used by Europeans. Implements such as the pan and cradle, short sluice or tom, water wheel or Californian pump, and constructions such as water races and puddlers, were almost identical. One exception was the treadmill, which appears to have been used only by the Chinese.11

Another exception concerns the tailing mounds. These are elongated mounds of water worn stone piled up while working the face and floor of the diggings. The mounds were often arranged as tail races, which would in turn hold rock sluices or sluice boxes. In my earlier work I distinguished two principal types of tailing mounds; unstructured mounds, referred to as Type D1, and neatly packed vertical mounds, referred to as Type D2. It is this latter type which I have regarded as characteristic of Chinese mining sites. The ethnically determined characteristics of these mounds have been confirmed time and time again by field and archival work.12

It is worth recounting the first site of this nature that came to my attention, as it says something about the range of evidence available to the archaeologist. It is located at Mongarlowe on the Braidwood goldfields. The workings were qualitatively different to anything I had seen before. They were relatively small scale, and included vertically packed stone walls, some of which were about 12 metres long, but less than one metre high. The floor of the workings was completely clear of tailings, and the whole area looked as if it had been intensively and meticulously worked by pan and cradle.

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On a subsequent visit to the site I was accompanied by a local resident, Ted Richardson, who was then in his late 70s. He had been a miner on the Mongarlowe field in the 1930s. On seeing the site he immediately commented that it had been worked by Ah Hack, who when he saw him in the 1920s, was then a very old man. He remembered that he had a vegetable patch near his hut site and that he had been befriended by the Nomchongs of Braidwood, who took him into their home.

Subsequently, a lease map confirmed the ethnicity of this site (Fig.2). The water race on the map is referred to as the ‘Chinamans water race’ and the area south of the race as ‘occupied by Chinamen’, this area incorporating Ah Hack’s claim and a large area of paddocking. This latter site included several closely grouped hut sites, a good artefact scatter, drift tunnels and a neatly carved round hole, or well, into which part of a nearby water race was directed. Further Type D2 mounds were located at the terminus of the race.

Further field work on the several other goldfields in the Braidwood district, for instance, Araluen, Majors Creek and along the Shoalhaven River near Bombay Crossing, and at Kiandra, has revealed similar sites. At Kiandra the diggings include a large number of Type D2 tailing mounds. Of particular interest is the presence of a number of stone walled enclosures, 0.5 to one metre high, downslope and adjacent to the tailing mounds. Lindsay Smith has identified these structures as puddlers, which were used for breaking down the wash dirt. Whether this type of puddler is peculiar to Kiandra or has wider applicability is not clear, but if the latter is the case then it should also be added to the typology.

The mining typology at Omeo is also similar. Near the Chinese encampment is an extensive area of Type D2 tailing mounds with the usual complex of stone packed tail races and dams. Of particular interest is an area about two kilometres distant, which was worked by hydraulic sluicing in the 1870s by a European company known as the Oriental Sluicing Company. Some 50 to 100 metres from the face of the workings is an extensive area of Type D2 tailing mounds, which suggests that the first to have worked this site were the Chinese. There were a number of other hydraulic sluicing claims in the area, which have been identified from lease records as Chinese. However, there appears to be little in the way of mining typology to distinguish these sites from European ones.

Some mention should also be made of the alleged practice of the Chinese in digging ‘round holes’. According to popular folklore these holes warded off evil spirits or prevented the build up of noxious gases, or were dug that way for safety reasons. In my earlier work I referred to the narrow trench like shafts characteristic of high level auriferous drifts as drift shafts, or Type E workings. They were dug not only at the claims to test the extent of the wash dirt, but also along the line of race to test the drift in these areas as well. The shafts were narrower and as a rule shallower than those associated with reef mining, and did not have large mullock heaps.

In the absence of a totally convincing argument as to why round holes were Chinese I had been inclined to ignore them. However, a series of fortuitous events several years ago caused me to change my mind, for I was introduced to, or otherwise stumbled upon, three areas of symmetrically rounded shafts, all with footholds dug into their sides. These sites are at Bendigo, Little Bog Creek (south of Bombala in NSW), and Ararat in Victoria’s Western Districts. In the first two instances local residents were adamant that the ground had been worked by the Chinese. With the exception of Ararat, where there was an artefact scatter that was unmistakably Chinese, no other ethnically determined indications by way of tailing mounds, hut sites and the like existed. To add to the confusion, at Bendigo and Little Bog Creek, round and rectangular shafts were located in very close proximity.

The most convincing and plausible argument to date is that proffered in private discussion by Peter Bell, who postulated that the round shafts were dug by Chinese miners who were also well diggers. The Chinese were highly sought after as well diggers in Australia, and obviously their considerable expertise in this area was highly regarded. This would account for the relative rarity of the round holes and the incredible degree of perfection with which they were dug. It would also explain why rectangular and round shafts sometimes occurred in close proximity. The former were dug by Chinese miners who were not well diggers and the latter by Chinese who were. It is now apparent that these carefully crafted round shafts should also be added to the typology (Type E2).

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I now turn to the question of where the Chinese lived, but confine my remarks to ‘joss house’ and pig oven sites, with particular reference to the Jembaicumbene goldfield in the Braidwood area. These sites illustrate several points that are instructive to those seeking the physical heritage of the Chinese in the mountains and elsewhere.

The typical pig oven is a large stone circular structure, hollow in the middle and with a hearth at one end, although as Peter Bell indicated at the ASHA Conference in Townsville in November 2002, there are variations in design and size. In good condition they are unmistakable, but in their usually collapsed state they are identified less easily, with the clues are often well hidden under years of silt and deposition. New sites continue to be located across Australia, and a possible site at Kiandra may be excavated Lindsay Smith and a team from the ANU in the very near future.

At Jembaicumbene, there has until very recently, been no identification of any sites connected with the main Chinese village, other than the Chinese cemetery, which is located several kilometres north of the main European village on the north east slope of a hill. Some guidance has been provided by an 1877 lease map (Fig.3), which shows an area of Chinese occupation near the main village occupied by You Watt and including a store and three huts, with five other Chinese huts located nearby. Evidence from local informants also suggested strongly that the ‘joss house’ was located near these buildings. The doors from the ‘joss house’ are located at the Braidwood Museum.

The only immediately obvious physical evidence of a settlement in this area, however, is a seemingly amorphous mound of stones and rubble, suggestive of a chimney but nothing else. More recently, Lindsay Smith visited the site and noted several platforms near the alleged ‘joss house’ site, south of the sites indicated on the 1877 map. He also located another platform area of land about thirty metres away, where wombats had been digging. Miraculously, they had dug out a large number of Chinese ceramics and opium tin remains, most of which had been in a layer of earth about 5 to 8 cm from the surface. A closer examination of the alleged ‘joss house’ site also revealed some nails.

On a subsequent field trip small mounds of stones exposed by a lack of grass in the paddock hinted at the sites of two of the huts on the 1877 map. At the store site a nail and a piece of ceramics was found, this time courtesy of the rabbits. A much closer examination of the hitherto neglected large mound indicates that it is likely to be the remains of a collapsed pig oven. Possible hearthstones can be seen in front; and although the back wall is substantially covered with earth, it has a telltale curvature on both sides. These sites will be excavated in the very near future. They are likely to be the nucleus of the main Chinese village on that goldfield.

Finally, mention should also be made of the graves, for they are also distinctive. Three separate Chinese cemeteries have been located in the Braidwood area, and a further three at Kiandra and Adelong. There are, however, no headstones or grave markers in situ, although in at least one case they were there at an earlier period. What these sites have in common are their exhumed graves. In the 1860s and beyond it was common practice to remove the bones and transport them to Sydney for packing and dispatch to China.

The exhumed graves are oblong and shallow, generally between two and three metres long, and are usually found in clusters rather than singly. They can, however, be covered with leaf litter and soil and be barely discernable. At the town cemeteries at Omeo and Tumut some of the graves have headstones, and at the latter there is a burning tower. Archaeologists in search of long lost Chinese camps and villages will not, however, have these obvious indicators to guide them.

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15 Peter Bell, 2002.
18 Sydney Empire, 4 May 1864; Wilkinson and Pebesma, 1999: pp.vi-vii.
Conclusion

The 1850s and 1860s saw a mass movement of Chinese people across the New South Wales landscape. They left their mark in almost every region including the Snowy Mountains. Questions arise: are there more fields or camps, and if so where are they? Archival records provide scant clues, for many have been lost, and it is to the material evidence that we must turn. It is here that the mining typology, cemeteries and pig ovens come into their own, for they provide very obvious visual clues to the Chinese presence on the goldfields. The importance of oral and anecdotal evidence in this process cannot be stressed too highly, for where documentation is scant every clue must be grasped.

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Building as Landscape

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Acknowledgment is made to those who contributed to the reports upon which this paper is based, and to the staff of Godden Mackay Logan who contributed to its completion — Christina Vos (review), Cecilie Knowles (graphics), Annie Chandler (proofing) and Lois Brewitt (word processing).

Abstract
Mountains are ‘other’ landscapes characterised by remoteness, environmental extremes and seasonal variations. The historic uses and buildings in these landscapes are found there because of these characteristics, or else they are modified in some manner because of these unusual characteristics.

After describing some of the historic landscape types within Kosciuszko National Park (KNP), in the Snowy Mountains region of NSW, this paper discusses three case studies to highlight opportunities for a more integrated approach to the management of natural and cultural values in the alpine national parks; the concept being that the sum (the pay-off) is bigger than each of the (natural and cultural) parts.

The location of huts, and other similar building such as ski lodges, can be closely associated with the type of natural landscape they are located in, or with particular historic processes or events. However, while buildings provide an entry ‘doorway’ into landscape appreciation by providing a marker of historic use, a substantive documentary and physical analysis of the broader landscape history will yield more meaningful results. A true appreciation of landscape thus achieved allows us to intellectually and emotionally access that landscape by providing a real sense of place.

Introduction
This paper addresses an objective of one of the three conference themes; the incorporation of cultural values into natural resource management, tourism and recreation. While conclusions of this paper are relevant to other types of landscapes, the particular aspects of remoteness and seasonal imperatives more sharply define human interaction with the mountain environment and the resultant physical and cultural imprints.

The title of this paper Buildings As Landscape is a short cut to the suggestion that models for the integration of natural and cultural values management are to be found most dynamically in the natural and cultural components of landscape. The problem is that it is easy to retreat to a separation of these values into traditional professional perspectives rather than deal with the sometimes messy bits between.

In positing the notion of using landscape as the way to integrate values this paper does not make light of institutional cultures and practical challenges that stand in the way. However, an integrated approach to natural and cultural resource management is akin to the concept that the sum (the pay-off) is bigger than each of the parts.
This paper describes the range of historic landscape resources in the Kosciuszko National Park that complements the identification of Aboriginal heritage values within this area at this conference. Three case studies are presented to provide the basis for discussing opportunities and constraints for a more integrated landscape approach.

**Historic Landscape Resources in the Snowy Mountains**

Discussed below are some of the historic landscape types in Kosciuszko National Park including those that are unique to these environments such as those associated with seasonal pastoral activity and skiing. These landscapes reflect the uses before, during the long period of transition to, and since reservation as a protected landscape. Many of these uses are associated with one place at different times.

**Pastoral Landscapes**

There are some 90 intact huts and a similar number of ruins or archaeological sites in Kosciuszko National Park. Over half of these huts are associated with pastoral activity. A number of these ‘huts’ were in fact permanent or semi-permanent outstation homestead complexes associated with Southern Tablelands and Monaro pastoral holdings, such as Old Currango, c1873. Gooandra Hut, dating from the mid 1860s, is another example of a homestead complex that is associated with both mining and pastoral phases. Currango is a 20th Century complex associated with a large pastoral company. Before and after the Second World War other timber vernacular huts, such as the timber slab Teddy’s Hut near the source of the Thredbo River, were built in association with summer grazing ‘snow leases’. These landscapes contain much evidence of this pastoral activity including fences, yards, tracks and telephone lines.

**Mining Landscapes**

Mining in this area started in the mid 19th Century with gold mining at Kiandra and the many kilometres of water races constructed by Chinese miners there are still visible in the landscape. Significant relics of mining remain in addition to Kiandra: gold mines at Lorna Doone and Grey Mare; silver mines at Lobbs Hole and Blue Creek and tin mines in the southern part of Kosciuszko National Park. Remains of settlements associated with mining include the chimney of the Chinese Yan’s Store and the Court House at Kiandra, the pisé hotel remains at Lobbs Hole and isolated huts such as Tin Mines and the ruins of Pig Gully Hut. Historic mining landscapes include the water races and workings constructed around the hills at Kiandra by the Chinese, and the races at Lobbs Hole copper mine on the Yarrangobilly River.

**Recreation Landscapes**

The first skiing in Australia had occurred at Kiandra in 1861 when snowbound miners from northern Europe took to skis for fun. In the later part of the 19th Century people started to visit the Snowy Mountains for recreation as part of the ‘discovery’ of nature that had become fashionable for urban dwellers. Following the first ascent of Kosciuszko on skis by photographer Charles Kerry in 1897, the government meteorologist Clement Wragge built an observatory right on its summit. The Yarrangobilly Caves tourist complex constructed by the State Government from 1885, the Hotel Kosciuszko, 1920, and the Charlotte Pass Chalet, 1930 (and rebuilt in 1939 after a fire) are important evidence of the NSW Government’s involvement in providing the transport and accommodation infrastructure to assist this recreation development. It is likely that the elites of Sydney influenced leading Government officials to bankroll these investments in tourism and recreation in this region.

Postwar Kosciuszko State Park Trust (KSPT) involvement in the creation of ski lodge resorts at Thredbo, Smiggin Holes, Perisher and Guthega followed.

More than a dozen huts were constructed for skiing and fishing recreation in Kosciuszko National Park, including Bullock’s Hut at the junction of Thredbo and Little Thredbo Rivers built by a keen angler, Dr Bullock. Seaman’s Hut constructed in 1929 as a memorial and shelter by the family of one of two young men lost in this area a year earlier is evidence of the ‘cultural imperative’ that reaching the summit of Mount Kosciuszko has long been.

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Forestry Landscapes
A number of places are associated with the timber industry apart from Sawpit Creek — other sawmills and logging artefacts are located in KNP at Rules Point, Cumberland Hill and Alpine Creek.

Water Conservation and Power Landscapes
The conservation of water is an important part of the landscape history of the Snowy Mountains. The water races at Kiandra and the use of water in hydro-electric schemes at the Yarrangobilly Caves and the Kosciuszko Hotel are precursor examples to the Snowy Mountains Hydro-Electric Scheme for which evidence survives of the construction phase, in addition to the existing utilities themselves.

Social Landscapes
With these uses came people of many different cultures who added another dimension to these various historic landscapes. First expressed in the naming of Kosciuszko by Polish explorer Strezlecki, after a famous countryman, it continued with the Chinese and European miners at Kiandra, then the northern European skiing enthusiasts early last century, and finally the ‘New Australian’ workers for the Snowy Mountains Scheme. This cultural diversity has not only left physical reminders within the landscapes, but has altered the social (and even the culinary) landscape of Australia.

Ongoing Landscapes
For over fifty years these landscapes have been the subject of changing and new uses as part of the NSW reserve system that started with the KSPT and then NPWS. This use now has its own living history and social value that needs to be understood and respected.

Cultural Landscape Case Studies
Three case studies are presented here to show how cultural and natural values can be integrated to assist management, interpretation and tourism (see Figure 1).

Case Study 1: A Landscape Analysis of the Huts in Kosciuszko National Park
This example draws on the NPWS Huts Study 1992, Part C: Kosciuszko National Park Huts Review prepared by the author.

In addition to providing a thematic and typological analysis of huts (historic use associations and materials of construction) the study also compared this thematic analysis to landscape data (vegetation type and topographical data) to build a picture of the total landscape context of huts.

Figure 2 shows the distribution of intact huts within Kosciuszko National Park according to their primary historical association. There is a noticeable concentration of huts associated with pastoralism in the centre and eastern side of the Park. This distribution can be compared to the recorded movement of sheep and cattle into the Park during the 1954–1955 summer lease period that involved up to 200,000 sheep (Figure 3) and 17,000 cattle. The sheep arrived in the Park from western slope properties via Tumut and from Monaro properties via Yaouk (ACT), Adaminaby and Jindabyne. The cattle moved into the Park from many more routes (possibly because cattle can be herded through more broken country than sheep) and more cattle pass into the southern and western areas of the Park (rugged country more suitable to cattle).

Clearly the pastoral huts are located where the sheep and cattle were grazed, but why these fairly specific locations? Figure 4 is a map of vegetation types for Kosciuszko National Park with hut locations overlaid using the NPWS Environmental Resource Mapping System (ERMS) database. This map shows that the substantial majority of huts associated with pastoral activity are also associated with cold air drainage and herbfields vegetation areas. These natural grasslands are believed to have been formed by cold air drainage restricting growth of tree species. These grasslands were very attractive to graziers and were used particularly for sheep grazing. Comparison to the sheep movement diagram — Figure 3 — indicates that almost all the sheep movement was to these cold air drainage grass plains with almost no movement to the areas of alpine vegetation complexes. The cattle were generally moved into areas of alpine vegetation complexes.
Not only are huts shown strongly associated with the cold air drainage areas, but the huts almost invariably occur at the edges of these areas near the tree line. Supervision of stock, shelter from cold winds and the availability of shade would be some reasons for the location of huts at the edges of these plains.

Other topographic data were used to assemble comparative information on huts such as orientation, slope and height. For example, over half of the huts occur on slopes facing northeast to northwest or on flat land (no recorded orientation of slope) and occur on elevations between 1300 and 1700 metres. Other landscape associations can be identified by comparing environmental data layers with data on historical association or construction materials. For example, it appears that huts constructed of horizontal slabs which are often made from alpine ash (Eucalyptus delegatensis), mostly occur relatively close to vegetation shown as Tall Gum and Alpine Ash open forests.

Discussion
Huts act as a marker of, or door into, the history of a landscape. This is particularly the case in protected areas where huts provide evidence of land use no longer practised and/or permitted. Huts evoke other human responses: an emotional response based on the fragile/tenuous human interaction with the natural landscape; the emotive (visual and visceral) attraction of a hut as shelter and as something of human scale in an immense and potentially hostile environment.

Providing the above contextual information helps link huts to their landscape and can help the landscape stories come alive for visitors and fits within the current NSW NPWS ‘whole of landscape’ approach. However, while the ongoing conservation of huts is well deserved, the landscape history that gave birth to them is eroding away. A ‘whole of landscape’ approach means that adequate resources need to be made available to understand the landscape resource and to make sensible input decisions.

As discussed in this case study, historical and landscape data can be used effectively to link natural and cultural value management. Historical information is an under-used resource re landscape history. It can reveal useful information regarding natural landscape change (eg clearings) and it can be used to chart the important changes in Government land-management policy that is especially relevant to this alpine region as types of leases changed over time.

The subtle physical evidence of landscape use is also disappearing. Ruins (and in particular timber ones) are markers of history of the landscape that receive little attention as mostly they are not a management imperative. While archaeologists may be interested in collecting landscape archaeology data the financial imperative to employ them is seldom there. However, it does remain an area of research potential to institutions who train historians and archaeologists.

The problem is that the interface between natural and cultural values often falls between natural and cultural professional stools and methodologies for resolving issues at this interface in a collaborative manner are not strong. Issues where having these methodologies would be useful include natural re-growth in cultural precincts, restoration of natural landscape areas, cultural plantings and exotic re-growth in natural areas, fence lines, falling down stock yards, mine dumps, and the conservation of ruin sites.

Conservation Plans for huts are also costly and although recent streamlined methodologies have been developed by the NSW NPWS as Heritage Action Statements, they focus on physical conservation. This probably results in even less historical landscape analysis being possible. Broader thematic studies may be a better way of understanding landscape history but such studies need the financial support of those people who think broadly.

The professional skills brought to bear on these matters are, typically, an architect for the hut (with historical research) and a ranger with natural science training. The issues identified above suggest a larger professional mix should get involved, such as archaeologists and historians experienced in landscape assessment, and an ecologist (or similar) who is trained in balancing natural and cultural values. This approach would immensely increase knowledge of these values for management, interpretation and tourism.
Case Study 2: Ski Resort Landscapes in Kosciuszko National Park

This case study is drawn from the NPWS Kosciuszko National Park Ski Resorts Heritage Study, 1995. The ski resorts are a fascinating example of the ever changing historic relationship between conservation and recreation in protected landscapes.

Cultural attitudes towards the natural landscape of the Snowy Mountains prevalent in 1906 are evident in the first bill to protect the Snowy Mountains National Chase for "public recreation and preservation of game".

The NSW Government involvement in either directly constructing, assisting with, or controlling ski accommodation and infrastructure stretches from 1907 to the present and follows a decision by the Premier at the time to build a 51km road from Jindabyne to the summit of Mount Kosciuszko to open the area to tourism and to build the Kosciuszko Hotel, constructed in 1909.

By 1920 ski-touring enthusiasts split from the Kosciusko Alpine Club that was centred around the more sedate Kosciusko Hotel to create the Ski Club of Australia by 1920. The SCA had a vision of a chain of ski huts and convinced the Government to build the Chalet at Charlotte Pass in 1930.

With the establishment of the Kosciuszko State Park Trust (KSPT) in 1944, a balance of recreation and conservation was seen as appropriate and private ski clubs were encouraged as a way of limiting commercial interests. This dream went with the fire that destroyed the Kosciuszko Hotel in 1951.

Like the hut landscapes the five ski resort areas have specific historic reasons for being where they are located that is ‘written’ into their physical form.

Perisher had its genesis in the decision by the KSPT in 1947 to build Rock Creek Hut where Rock Creek crossed the Summit Road and to allow private ski clubs to build in this area. The dispersed quality of the cultural landscape of Perisher reflects the KSPT granting of individual ski lodge leases and the central aggregation of larger buildings reflect the granting of larger leases to provide commercial infrastructure. In the 1960s the KSPT rationalised roads and further lodge locations to create a landscape of ‘visual isolation’.

By contrast, the location of Thredbo was prompted by the construction of the Alpine Way as part of the Snowy Mountains Hydro Electric Scheme. Thredbo’s tight ‘European’ cultural landscape dating from 1957 reflects the fact that a head lease area was given to a private consortium following a KSPT decision to grant a commercial lease after the Hotel Kosciusko fire.

The cultural landscape history of Smiggin Holes is similar to that of Perisher in that it grew as individual club leases in a location that was initially occupied by several pastoral huts. These huts were also used by skiers en route to the Chalet from the Kosciusko Hotel.

Guthega like Thredbo is strongly associated with the Snowy Mountains Hydro Electric Scheme. It was established by Snowy scheme workers, initially without KSTPT approval. At least two of the existing former workers accommodation barracks were used. The linear arrangement of lodges in the Guthega landscape reflects its history.

Charlotte Pass can be thought of as the first and last resort. The Chalet is from a period when the Government provided tourist accommodation. The commercial lodges there strongly contrast as a group having generally been constructed after 1974.

The 1995 Ski Resorts Heritage Study provided an analysis of the evolution of lodge design types, many of which show the influence of the materials guidelines adopted firstly by the KSPT and later NPWS to

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4 ibid
5 Neville Gare pers com to Geoff Ashley.
ensure that the lodges responded to their natural setting. The influence of North American national parks models also found its way into the design language via the KSPT and NPWS. Some lodges show their European alpine stylistic influences and some are fine examples of contemporary modernist architecture.

The appropriately-named High Noon that was demolished at the end of 1995 is a good example of the culturally dynamic history of the ski resorts. This lodge (originally known as Roslyn) was associated with Charles Anton, a leading light in Australian ski history and with the Australian Alpine Club. It was a re-used Snowy scheme workers’ hut that was brought from Norway by the firm Selmar for the Snowy scheme and is even rumoured to have been built or used by the German Army during the War.

Discussion
The resorts in Kosciuszko National Park did not ‘fall from the sky’ into a national park landscape. Their development is closely associated with moves to create protected or controlled areas at the end of the 19th Century and they provide evidence of the dynamic relationship in the provision of recreation facilities and of nature conservation in the alpine areas.

While there has been a general shift from public to private sector investment in the creation of accommodation and infrastructure development in Kosciuszko National Park, this has been set against a dynamic Government response to its potentially conflicting responsibilities for both nature conservation and recreation. The landscape of the five resorts provide physical evidence of this dynamic relationship.

An example of a mid point in this dynamic relationship between recreation and conservation was when the KSPT, knowing that it did not have the financial resources to provide facilities, initially allowed only private clubs to develop as a way of limiting (unsuccessfully as it turned out) full commercial development. The establishment of the NPWS swung the dynamic towards nature conservation. A lack of appreciation of the past and a lack of resources to control the future left the resort areas as under-resourced ‘blind spots’ in this new ideological landscape; thus probably ensuring more private control and even less integration into a managed landscape.

Recent changes in development consent within the resorts may in part result from this historic ambivalence on part to the NPWS towards the resorts. These changes that see Planning NSW as the consent authority for the resorts could lead to an even greater movement away from integration of recreation facilities with the management of the conservation landscape unless the resorts are understood as an important part of the history of Kosciuszko National Park. This history has shaped the resultant form of each resort and the lodges themselves, many of which reflect key themes in the history of the Park.

Case Study 3: Illawong Lodge
This case study draws on a draft Illawong Lodge Conservation Plan prepared by Godden Mackay Logan for Illawong Ski Tourers in consultation with NPWS and currently with the NPWS for endorsement.

Illawong Lodge is located 2.4 km south of Guthega Dam adjacent to the Snowy River near where Pounds Creek joins the Snowy and close to Mount Twynam and Mount Anton that are part of the Main Range. It is unique as the only ski lodge outside the main resort areas. Constructed as Pounds Creek Hut in 1926/27 and adapted as Illawong Lodge in 1956/57 it links the huts and lodge case studies discussed above. Illawong Lodge provides evidence of two key stages in the history of back-country ski touring in the alpine area and the Government’s changing role in the provision of accommodation in the Park. Its location is very specifically linked to these two phases of use (which is ongoing) and is an important part of its significance.

Pounds Creek Hut was probably constructed with NSW Government Tourist Bureau assistance, and certainly with its approval, for use by (Sir) Herbert Schlink in his trip, known as The Crossing, with a party of five on skis from Kiandra to Kosciusko in 1927. Schlink had formed the Ski Club of Australia, who were interested in ski touring, in its break from the Kosciusko Alpine Club in 1920.

This association with ski touring continued after the war when skiers who skied westward off the Main Ranges added to the original hut to form Illawong Lodge. These enthusiasts were members of the Ski Tourers Association established by Charles Anton in 1950. Illawong is the last remaining back-country lodges/huts constructed by the Ski Tourers Association with KSPT approval.
Illawong Lodge has historical and social significance for its association with the history of ski touring in the Australian Alps. It has particular social significance for the members of Illawong Ski tourers, most of whom have a long and close association with the lodge for its particular sense of place (remoteness), its unique history and unusual aspects of its occupation and maintenance.

Discussion

Like the huts and resorts of Kosciuszko National Park, Illawong Lodge is an example of how the location of buildings can speak strongly of the use and history of the landscape. Illawong Lodge has a sense of place that is strongly connected to the history of remote backcountry skiing in the alpine areas in two distinct phases before and after the Second World War.

The strength of the social significance of Illawong Lodge is such that if the building is destroyed, then its reconstruction is justified on heritage grounds and its association with location is such that this should be at or near its current location. Policy on reconstruction of huts and lodges in KNP is being considered in the current KNP Plan of Management review and this should take into consideration the nature of significance and the role that location has in this significance.

Conclusions

The historic places discussed in this paper show that buildings can be a ‘door’ through which the broader landscape and a sense of place can be accessed; provided, however, that the historic relationship between the building and its landscape is fully appreciated.

The future conservation of historic resources will be best achieved by integrating their conservation with the broader landscape. The examples discussed here show that understanding these historic resources in their environmental context will help achieve this integration.

The hut landscapes in Kosciuszko National Park record, in fabric and associations, a history from prior to and since its transition from a resource to be exploited to one conserved and appreciated. The resort landscapes evolved from a time when the preservation of alpine landscapes was beginning and they continue to reveal the changing relationship between conservation and recreation in alpine landscapes. The landscape setting of Illawong Lodge provides evidence of the history of alpine ski touring, including downhill skiing off the western face of the Main Range.

The future management of the ski resorts and huts in the alpine areas of NSW is a matter of coming to terms with the history and associations that are embedded in the landscape. An integrated approach to assessment and management of the landscape based on the foundation stones of natural and cultural heritage allows the story of landscape to be told and thus a true sense of place to be appreciated by all.
Figure 1  Three case studies of historic landscapes in Kosciuszko National Park. Constructed in 1873, Currango Homestead (top) is one of the earliest pastoral structures in the Park. High Noon Ski Lodge (middle) was a re-used Snowy Mountains Scheme workers' barrack and one of the first lodges constructed in Thredbo. It was demolished in 1995. Illawong Ski Lodge (lower) began as Pounds Creek Hut (1927) and extended in 1956 (right) as Illawong Ski Lodge. This view looking west to the Main Range past the Snowy River.
Figure 2 The historic association of intact huts within Kosciuszko National Park (adapted from NPWS Huts Study 1992, Part C, KNP).
Figure 3 Sheep movement into Kosciuszko State Park in 1954–55
Figure 4 The relationship between vegetation types and hut locations in Kosciuszko National Park. Hut locations are shown as black dots. There is a strong relationship between the location of pastoral huts and the extent of Cold air drainage and herbfields natural grasslands which are shown here as the darkest tone.