Chapter 11
landscape values

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This section of the scientific report pertains to those natural values that express themselves at the landscape scale, with the exception of geological ecosystem processes, which are covered in Chapter 5, and of biological ecosystem processes, which are covered in section Chapters 6–10. Physical ecosystem processes, relating to fire, air and water, in its many different states, form the central part of this consideration. These can be described in scientific terms. The other natural landscape values addressed in this section are cultural constructs of nature: wilderness and natural beauty.

People are obviously part of nature, but it is convenient in discussing natural landscape values to regard as unnatural the impacts and scale of human activities that postdate gathering and hunting societies, while regarding those of the gatherers and hunters as natural. This convention is adopted below. It must also be recognised that there is no ecosystem in Kosciuszko National Park that is totally natural in the above sense. At one extreme there are ecosystems like ski villages that bear little resemblance to the natural. At the other extreme there are some parts of the park that are dominated by the same trees that grew there in gathering and hunting times, have few or no changes in biotic and edaphic conditions since these times, but have an atmospheric composition and radioactive particles in the soils that are clearly unnatural.

In the continuum from unnatural to natural, it is convenient to classify as natural those areas that have ecosystems that are predominantly similar to those found in the mid eighteenth century, and to leave in the unnatural class villages, dams, roads, powerlines and cultivated land, while recognising that it is possible to improve the naturalness of much land that is classified as natural.

Physical ecosystem processes - fire, air and water

Introduction

Before people invaded Australia, the biota, landforms, soils and waterforms of Kosciuszko National Park largely evolved in response to physical ecosystems processes, and their variations through time. The exact degree and kind of impacts of gathering and hunting *Homo sapiens* on the expressions of these ecosystem processes in the environment is currently a matter of some debate, especially in relation to the role of *H. sapiens* in the extinction of the Pleistocene megafauna. However, the palynological evidence suggests that the influences of people on Australian ecosystems were subdued, in comparison to the influences of climatic change, until the invasion of agricultural *H. sapiens* in the late eighteenth century (Kershaw et al. 2002).

"Old trees are generally regarded as more beautiful than young, in contrast to the convention with humans."

Temperature, precipitation and fire regimes still strongly influence the biota, landforms, soils and waterforms of Kosciuszko National Park. They are thus critical in the maintenance of other values. They are also, to some degree, values in themselves, as with the importance of snow and cloud in the beauty of the park.

Basis for management

In section 2A(1)(a) of the *National Parks and Wildlife Act 1974* (1974), the conservation of nature is made an object of the Act. Section 30E (2)(a) makes the conservation of natural phenomena and landscapes a principle in national park management. Section 72A(1)(g) makes the maintenance of natural processes one of the matters that needs to be considered in the drafting of a management plan. Fire and weather are both natural phenomena and natural processes. However, the legal and administrative constraints on fire management in national parks in New South Wales (NSW) relate more to a misperception of the utility of planned burning in preventing the loss of human life and

property than to the maintenance of natural processes and the conservation of natural phenomena.

At the national and international levels, the mitigation of climatic change induced by human activity is a widely accepted goal, implying a positive valuation of natural climatic systems.

Significance

The significance of physical ecosystem processes in Kosciuszko National Park lies largely in their importance in maintaining and creating other values. These, of course, include much of the water supply of Adelaide, most of the irrigation industry of the Murray-Darling basin, and the ski industry of NSW. More importantly, in the context of the present discourse, they are necessary for the perpetuation of almost all of the other natural values of Kosciuszko National Park.

The processes of snow fall, accumulation and melt are particularly critical in maintaining many of the most significant biological and aesthetic values of the park. The park contains the largest contiguous area of snow country in NSW and in Australia, making it of both state and national significance for this phenomenon.

Natural fire regimes, which are partly a function of climate, have created subalpine, montane and lowland landscapes covered with a catena of eucalypts, interspersed with small patches of less fire-adapted vegetation, such as *Atherosperma moschatum* closed-forest, *Callitris* woodland and *Acacia sylvestris* closed-forest. The role of fire regimes is therefore indirectly of potential international significance, as discussed in Chapter 12, related to the eucalypt theme. The fire regimes of the park could not be regarded as natural, even though some evidence from nearby mountains suggests that they more closely approximate the natural than the regimes between European occupation and 1970 (Banks 1982, 1997). The fire regimes thus have no significance in themselves.

Dependence

Kosciuszko National Park contains almost all of the area in NSW that is covered by snow for more than 30 days a year (Whetton 1998). It contains most of the country in Australia that is covered by snow for more than 60 days a year (Whetton 1998). In Australia, outside the Main Range, there are very few snow patches that last into summer (Galloway et al. 1998).

Condition and trend in condition

Several tendencies, putatively largely related to human activities at a global scale, have been recognised in the climate of Kosciuszko National Park and adjacent areas since 1900 (Broomhall 1998; Davis 1998; Osborne et al. 1998; Whetton 1998; Hennessy et al. 2003). These tendencies are:

- a decrease in winter rainfall;
- a decrease in snow incidence;
- an increase in temperatures; and
- an increase in ultraviolet radiation.

In most cases the data are not overwhelmingly convincing for the region, but seem highly credible in the context of national climatic change. A striking feature of graphs showing changes in temperature, one major determinant of snow cover, is a rapid rise from 1950 and relatively constancy since 1980. Interpolation of global climatic tendencies to regions is not appropriate, and the best models that have been used are relatively coarse (Whetton 1998). Nevertheless, the balance of the evidence suggests that the proportion of years with low snow cover and duration are likely to increase during this century as a result of global greenhouse warming (Whetton 1998; Hennessy et al. 2003).

Ultraviolet (UV) radiation inputs are sensitive to lower atmospheric conditions as well as to the condition of the ozone layer. The present condition is poor, with UV-B circumstantially, and experimentally, implicated in the decline of frog species in Kosciuszko National Park (Broomhall 1998; Osborne et al. 2002). The medium and longer term prognosis is for improvement, as a result of international success in reducing the release of ozone-depleting substances.

Fire regimes in Kosciuszko National Park over the last forty years probably approximate the natural in alpine vegetation and closed-forest, in that fire has been largely absent from these ecosystems. Elsewhere in the park there are some areas, frequently burned for hazard reduction, that are probably burned more often than in the natural condition, and large areas probably burned less often than in the natural condition. These regimes are taking place in vegetation modified from that which covered the country when occupied by gatherers and hunters. The combination of burning and stock grazing that took place over most of the area occupied by dry and subalpine eucalypt forest and woodland for more than one hundred years has dramatically changed vegetation structure over much of the present park. In some cases this unnatural management resulted in the elimination of trees. In others it resulted in dense stands of regrowth trees where previously woodland with old growth trees predominated. The wet eucalypt forest seems likely to have been burned more frequently than in the natural condition. In recent decades, there have been some extensive landscape fires that have replaced older trees with younger ones.

The desired outcome with physical ecosystem processes is an increase in the degree of their naturalness.

Pressures

Global warming, and concomitant change in other climatic factors, appears likely to continue even if greenhouse gas inputs were to be dramatically reduced immediately. As there seems little or no prospect that the release of greenhouse gases will be controlled on a global basis, it seems precautionary to plan with the assumption of increasing temperatures and decreasing snow. The expectation of poor snow years, in itself, is likely to increase the pressures to establish more snow-making infrastructure, to engage in cloud seeding and to extend skiing infrastructure to higher altitudes. All of these activities are likely to have substantial negative impacts on natural values and naturalness, as are the climatic changes themselves (see chapter 19, this volume, Scherrer and Pickering (2001); and Hill and Pickering (2002) for a discussion of some of these impacts).

Interim recovery actions may be necessary for species susceptible to morbidity and mortality from UV-B, until natural levels of radiation are achieved.

The major pressure in relation to fire regimes is an inappropriate legal and administrative framework, combined with a wide social and political misperception of appropriate solutions to fire hazard problems. The major misperception is that widespread hazard reduction burning in parks is necessary to prevent loss of property and life outside parks, when CSIRO research has shown that the critical variables are fuel conditions in close proximity to buildings, simple fire protection measures for buildings, and human behaviour as a fire approaches are the critical variables. Hazard reduction burning was of no use in the 2003 fire, when flames moved unhindered through recently burned areas. The other major problem is a reluctance to engage in ecological burns: those burns necessary to maintain or improve naturalness. Given the legal and physical hazards, it is much easier to not burn than burn.

Opportunities

As down hill skiing becomes more and more dependent on snow-making, serious consideration should be given to investigating the potential for establishment of ski slopes in subalpine and montane valleys outside the park, in places where minimum temperatures are lower than in the alpine zone, thereby facilitating snow-making, and the weather generally better during the daytime.

Knowledge gaps

There is a strong need for research directed towards developing techniques for unbounded patch burning within the dry eucalypt and lowland grassland ecosystems of the park.

Indicators and monitoring

Climatic data need to continue to be collected within the park. Best guess ranges of appropriate fire frequencies should be established for the ecosystems of the park and data on actual fire frequency should be compared with these using spatial information system technology. The indicator would be the proportion of area of the park that has had fire regimes within the appropriate range. On ground monitoring of biotic responses to fire will also be necessary to allow adaptive management (ie shifting of the ranges of appropriate fire frequencies in response to increasing knowledge).

Wilderness

Introduction

Wilderness constitutes an important recreational resource, and is also highly important for the conservation of nature and natural aesthetic value (Helman et al. 1976; Kirkpatrick 1994a).

Wilderness is land in a natural condition that is remote from mechanised access (Helman et al. 1976; Kirkpatrick and Haney 1980). Remoteness from mechanised access is generally taken to be equivalent to distance from roads, while naturalness is generally taken to be the degree to which the ecosystems, view fields and aural fields resemble those in the mid eighteenth century.

Boundaries between wilderness and non-wilderness are, to some degree, arbitrary. There are several reasons for this: there is a continuum from the natural to the unnatural; the nature of 'natural' is debatable; susceptibility to mechanised access is often more a matter of regulation, and its enforcement, than of infrastructural availability. However, all ways of defining wilderness areas require a core area that is in a close to natural condition and that is remote from roads that are available for general use.

Basis for management

Wilderness areas are legally defined in NSW by declaration under the *Wilderness Act* 1987. Section 2A(1)(a)(iv) of the *National Parks and Wildlife Act 1974* makes the protection of wilderness and wild rivers objectives of the Act. Under section 72AA(1)(f), the protection of wilderness values is defined as one of the objectives of management plans for national parks.

At the national level, protection of at least 90% of forested wilderness was one of the objectives of the Regional Forest Agreement Process, but is not mentioned directly in the criteria for nationally significant heritage values developed under the *Environmental Protection and Biodiversity Conservation Act 1999*. This act recognises and protects world heritage values. Therefore, if the Kosciuszko National Park were part of a successful world heritage area nomination in which the maintenance of

wilderness would be necessary to maintain world heritage values, national significance would be recognised. The world heritage criteria do not directly mention wilderness. However, the concept of natural aesthetic value present in the world heritage criteria is logically related to wilderness, in that wilderness requires a high degree of naturalness, as does natural aesthetic value.

Significance

In the Kosciuszko National Park there are nine legally recognised wilderness areas, which constitute 346, 257ha, or 50.15% of the park (See Map 11.1):

- Byadbo (80,725 ha) - The Byadbo wilderness includes extensive areas of cypress pine and white box woodland in the rain shadow of the alps, as well as some dry montane forest and woodland.
- Pilot (80,168 ha) - This wilderness area contains subalpine grassland and woodland, montane forests, and dry forest and woodland. The Murray River rises within this area, which is contiguous with legally defined wilderness in Victoria.
- Jagungal (67,188 ha) - This wilderness area includes subalpine grasslands and woodland in the snow country, and montane forest in areas of high relative relief.
- Bogong Peaks (28,797 ha) - The Bogong Peaks wilderness ranges from cypress pine woodlands on the lower slopes to subalpine woodlands and heath on the plateau, with rugged country occupied by montane forest in between.
- Goobaragandra (33,666 ha) - This highly rugged wilderness area in the north of the park and consists largely of montane forest and woodland.
- Bimberi (18,004 ha in Kosciuszko National Park, 56,088 ha in total) - The Bimberi wilderness extends from Kosciuszko National Park to other reserves, including Namadgi National Park in the Australian Capital Territory. In the Kosciuszko National Park it covers steep slopes ranging from the alpine environment of Mount Bimberi to dry forest in lowland river valleys.
- Indi (11,636 ha) - This small wilderness area extends from near the Murray River to the Alpine Way, south of Khancoban, on the western slopes of the park. Most of the area is steep and heavily forested, with some areas of old growth.
- Western Fall (15,174 ha) - The Western Fall wilderness encompasses much of the steep western fall of the Main Range. Its steep slopes support much wet eucalypt forest, some of which is old growth.
- Bramina (10,899 ha) – This area at the northern end of KNP is centred on Bramina Hill (1400m), cascading via Cooleman and Bull Flat Creek's deep gullies, to the Goodradigbee River at 700m. Moist montane forests dominate with Alpine Ash and Snow Gum communities at higher elevations.

These wilderness areas do not include some areas of Kosciuszko National Park that are regarded by wilderness users as wilderness, nor are they consistent with any particular threshold for wilderness definition. The official and unofficial wilderness areas have a high degree of significance at a regional and state level. State significance has been recognised legislatively for the wildernesses listed above.

At national and international levels, the wilderness areas of Kosciuszko National Park could be significant on a legal basis if their natural aesthetic values were recognised as part of a successful case for world heritage listing (see natural aesthetic values section below). Nationally, most of the types of wilderness country found in the Kosciuszko National Park are also found in wilderness in Victoria and the Australian Capital Territory. However, this increases, rather than decreases, their potential national and international value as part of a potential Australian Alps nomination (Kirkpatrick 1994b).

Dependence

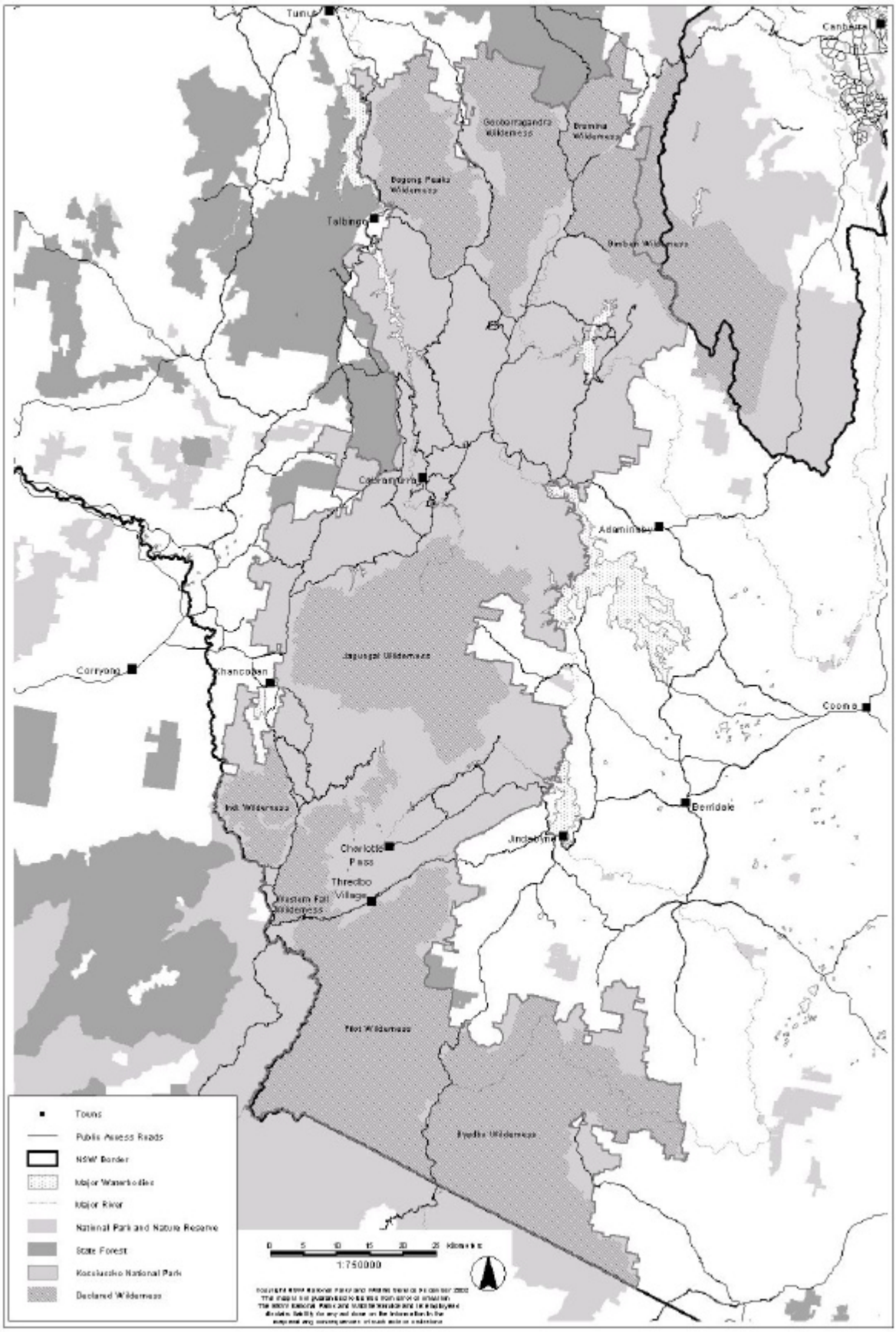
Kosciuszko National Park contains 18.6% of the declared wilderness of NSW, while constituting 0.86% of the total land area of the state. The landscapes and ecosystems contained within the Kosciuszko National Park wilderness areas are, with few, and minor, exceptions, absent from the other wilderness areas of NSW. Therefore, these types of wilderness are largely dependent on Kosciuszko National Park for their future in NSW. The dependence is less extreme nationally (see above).

Condition and trend in condition

The National Wilderness Inventory (NWI) provides a technique for measuring the components of the wilderness resource. The results of initial mapping using this technique indicates variable quality in the Kosciuszko wildernesses.

The wilderness areas of Kosciuszko National Park are traversed by vehicle tracks, contain a wide variety of human artefacts, have substantial populations of introduced organisms, and have large areas of soil and vegetation modified by human use since the European invasion of Australia. On the positive side of the ledger, the tracks are not available to recreational vehicles; the artefacts, with a few exceptions, including huts, are no longer functional; the introduced organisms form a small component of the biomass; and the modifications have largely ceased.

Map 11.1 Kosciuszko National Park Wilderness Areas



The removal of the post-Aboriginal cultural disturbances, such as stock grazing, that changed the soils and vegetation of much of the wilderness areas has placed these areas on a trajectory of recovery to naturalness. Limited data from snow gum woodlands in the nearby Australian Capital Territory (Banks 1982, 1997) suggest that the post 1970 incidence of fire was similar to that in the eighteenth century, after an intervening period of massively increased incidence. This, if maintained, would also tend to result in a return towards naturalness. There is therefore a general trend of improvement in wilderness condition.

The desired outcome with wilderness is maintenance or improvement of National Wilderness Inventory values.

Pressures

The pressures on wilderness values relate largely to the maintenance of naturalness. Unless active management prevents it, there will be continuing growth in the populations of many exotic plants and animals. There is also, in some wilderness areas, some pressure to impose fire regimes designed to reduce so-called 'hazard', rather than to maintain naturalness, and an embarrassing lack of data on the fire regimes that are appropriate to maintain naturalness in some ecosystems. A tendency to exclude fire if there is no evidence to suggest that it is needed can result in a drift from naturalness, as much as the past propensity to burn frequently in the same circumstances.

Potential increased recreational use could result in localised damage in the form of pads, tracks and degraded camp sites, although the resistance and resilience of the ecosystems of the Kosciuszko National Park to these forms of degradation is generally high.

A loss of the feeling of remoteness in some parts of some wilderness areas could result from developments within, and outside, the park that disrupt the naturalness of the view and aural fields.

Opportunities

The major opportunity for improvement of the Kosciuszko National Park wilderness resource lies in vehicle track closure and restoration.

Knowledge gaps

A critical review is needed of the economic, social and environmental benefits and costs of fire trails and other management access roads in wilderness.

Indicators and monitoring

The national wilderness inventory will be updated every five years and changes in values quantified and mapped.

Natural aesthetics

Introduction

Natural aesthetic value is the beauty that people perceive in nature. This beauty may relate to any of the senses. The sounds, smells and feelings of nature are important in the total aesthetic experience. For example, the sound of chainsaws can destroy contemplation of nature, even if no chainsaws are visible. At a landscape scale the non-indigenous cultural perception of visual natural beauty has long related positively to the presence of water and high relative relief (Mendel and Kirkpatrick 1999). Early painters of the Australian Alps, such as Nicholas Chevalier and Eugene von Guerard, imposed their Gothic vision of natural beauty by creating precipitousness where gentleness prevailed (Kirkpatrick 1994b). In contemporary celebrations of beautiful natural landscapes the Gothic is selected, rather than enhanced. For example, there are two landscape scale photographs of the Australian Alps in the 2002 Wilderness Diary (Australian Conservation Foundation 2001). One, not in Kosciuszko National Park, contains a waterfall and cliff. The other shows the steep western escarpment of the Main Range in the background of a magnificent alpine wildflower display. The persistence of wilderness romanticism (Bonyhady 1991) is exemplified.

Natural aesthetic value does not only occur at the landscape scale. It also occurs at the individual and community scales, as in the examples of the Corroboree Frog and tall alpine herbfield in the 2002 Wilderness Diary. Colour substitutes for cliffs.

Natural aesthetic value is not necessarily constant. In a continent in which snow is a rarity, this ephemeral solid state of water imparts considerable natural aesthetic value. Some ephemeral qualities of light and sky are considered beautiful, while others are not. Old trees are generally regarded as more beautiful than young, in contrast to the convention with humans.

Basis for management

In section 2A(1)(a) of the *National Parks and Wildlife Act 1974* the conservation of nature is made an object of the Act. As natural aesthetic values are partly contingent on human perceptions, this object does not necessarily make the conservation of aesthetic qualities an object. For example, a forest recently burned for ecological reasons may not be perceived as being as attractive as one not burned recently. However, by definition, natural aesthetic values cannot persist in the face of artiface, so the conservation of nature provides one prerequisite for the conservation of natural aesthetic value. In section 2A(1)(b) the Act also makes conservation of cultural values of the landscape an object, firmly placing the maintenance of natural aesthetic values as

an implied objective. The principles for National Park management in section 30E reiterate the importance of nature conservation and landscape cultural values. In section 72A(1)(d) the protection of scenic features is required to be to be taken into consideration in the preparation of a plan of management. These, of course, may be artefactual, natural, or a mixture thereof, but are likely to be natural in a national park.

It is envisaged that the criteria for national significance under the *Environmental Protection and Biodiversity Conservation Act 1999* will include the importance of a place 'in exhibiting particular aesthetic characteristics valued by a community or cultural group'.

Article 2 of the World Heritage Convention makes outstanding natural beauty a component in two of its three clauses that define natural heritage. The criteria developed by the World Heritage Committee to determine suitability for listing include: 'iii. contain superlative natural phenomena or areas of superlative natural beauty and aesthetic importance'.

Significance

There is much steep country, sometimes juxtaposed to water, within the Kosciuszko National Park, but the natural aesthetic qualities that make it an exceptionally beautiful place for many people lie in the pastel pastiche of eucalypts, cypress pines, scleromorphic shrubs and tussock grasses that clothes gently undulating hills and flat-floored valleys, and the mosaic brightness of flowering daisies on the rounded slopes within the alpine plateau, not in cliffs, lakes or torrents, which are in shorter supply, and less extreme manifestation here, than in most mountainous regions of the world.

Many of the invading Europeans found the typical Australian bush harsh and ugly (Taylor 1992). This is not the current perception of most inhabitants of Australia. The Heidelberg School first captured the beauty of the texture, mood and form of the dry eucalypt forest, an untidy, pastel beauty well divorced from that of the, still much-admired, emerald green rainforest. Kosciuszko National Park has 106 ha of rainforest, 0.02% of its area. It has 604, 935 ha of forest and woodland dominated by eucalypts or cypress pines, or 87.62% of its area. Of this, 466,302 ha, or 67.54% of the park, is the dry forest and woodland celebrated by the Heidelberg School. Variations in tree species dominance produce subtle changes in canopy colour melded into topography, while variations in the understorey substitute different sets of flowering grasses, herbs and shrubs, depending on moistness, soil type and disturbance history. In recently burned forest, delicate native orchids and lilies flower abundantly among blackened stems.

Most of the 80,363 ha (11.64%) of the park covered by herbfield and grassland produces outstanding wildflower displays in late spring and throughout summer (Costin et al. 2000). Even before the peak of flowering there is a wondrous variation in foliage cover in the vegetation mosaics of the alpine country and limestone plains. There are even a few lower altitude valley grasslands where grey kangaroos emerge from the red heads of the dominant kangaroo grass. Such scenes were once common in much of south-eastern Australia, but are now rare (McDougall and Kirkpatrick 1994).

The Main Range in the Kosciuszko National Park is one of the few areas of Australia where snow can still be relied upon to sit through winter and persist, in small patches, until early summer. Snow, at its peak, submerges the treeless areas and decorates the twisted subalpine trees. In its recession it highlights both the geomorphological complexities of the landscapes and the fresh life that emerges as it melts.

The natural scenery of Kosciuszko National Park is definitely of state and national significance. Both its wildflower displays and its snow-garnished slopes and forests exhibit aesthetic characteristics highly valued by a large proportion of the population, as is evidenced by the high frequency of their depiction in popular publications, and the popularity of the park for tourists.

Kirkpatrick (1994b) argued that the Australian Alps as a whole had outstanding universal significance for natural aesthetics in that they presented an 'unique combination of gently rounded slopes, highly floriferous alpine vegetation and the pastel untidiness of the eucalypt forest'. The fact that this combination of qualities is not one that conforms with the Eurocentric romantic vision of mountains as places of steep, crumbling, icy grandeur should not detract from its international significance, given that there is wide intercultural and intracultural variation in aesthetic perception (Dearden 1984). The presence of persistent snow is not a great selling point at the international level. The Kosciuszko National Park provides the core of the natural aesthetic qualities of the Australian Alps that may have international significance.

Dependence

The only other large area of persistent snow country in Australia lies in Victoria, where its wildflower displays are destroyed by cattle; and roads, dams and ski villages markedly reduce naturalness. Therefore, the persistence of the natural aesthetic values associated with the snow country and adjacent eucalypt clad slopes depends largely on the maintenance of naturalness in the Kosciuszko National Park.

Condition and trend in condition

View fields are the critical variable in gauging the natural scenic condition. Kirkpatrick (1979) developed a technique that allowed disturbance to the view field to be calculated. This visibility disturbance score was the percentage of the arc of visibility from the highest point in a grid square that contained roads, quarries, artificial impoundments, cleared land, buildings or forestry activity. In deriving an ultimate score the types of disturbance were weighted with roads, quarries and human artefacts weighted more heavily than less visually disruptive disturbances.

The present visual natural aesthetic condition of Kosciuszko National Park varies from extremely poor in the vicinity of ski resorts, hydroelectric infrastructure and roads in open country; to poor where impoundments, cleared land and forestry activities are visible; to excellent in the heart of much of the wilderness country. Unfortunately, the areas that have the least natural views are among those most visited.

Most of the park is remote enough from settlement and mechanized human activity to allow the sounds, smells and feelings of the bush to dominate. However, unnatural sounds can penetrate large distances in particular weather conditions, even where there is no visual disturbance. No noise mapping or monitoring has been undertaken.

The trend in condition is negative as a result of the ongoing development of skiing facilities, increasing traffic on the roads and ongoing development outside the park that is visible within it.

A desired outcome is to reduce the total visibility disturbance score by 2010.

Pressures

The tendency towards declining snow incidence (Green 1998), if continued, may create pressure for a movement of ski infrastructure to higher altitudes and for more snow-making, an activity that requires water, and, therefore, dams. Even if snow cover does not decrease we can expect pressure for further expansion of ski infrastructure. Further development could also be expected to occur around the margins of the park, particularly holiday home construction, with potential visual and aural effects.

Opportunities

It is possible to increase natural visual amenity in a variety of ways. Hard features, such as quarries, roads, buildings, sewage ponds, dams and transmission lines can be muted or screened. Inappropriate developments of lesser visual impact, such as golf courses, can be restored to natural vegetation. Natural visual and noise management can be incorporated into all planning processes, including those in the adjacent local government areas. It will be important to concentrate on those screening, restorative and preventative activities that impact most on the greatest number of people. This does not necessarily relate solely to their numbers. For example, the old road to Mount Kosciuszko disrupts the natural scene from the highest elevation on continental Australia. Given that a large number of people walk a substantial distance, for most, to attain this icon, its disruption is more severe than if it were visible from a roadside viewpoint.

Knowledge gaps

Viewfield analyses are needed as a basis for decision-making. Social research may be necessary to determine natural aesthetic usage throughout the park and the nature of people's perceptions of gradations of naturalness. The above research will be able to be used to develop priorities for action that will minimise cost while maximising social and environmental benefit. There are no data on the penetration of unnatural noise into the undeveloped parts of the park.

Indicators and monitoring

Visibility disturbance could be scored and mapped in the year of the commencement of the plan, and at least every five years thereafter, including 2010. Noise monitoring at selected critical sites is needed.