Chapter 23
findings and recommendations

This chapter brings together the findings and recommendations of the Independent Scientific Committee (ISC). It summarises the findings and recommendations that are made in the individual values and overview chapters of this report.

Major findings

The major findings of the ISC are as follows:

The values of the Kosciuszko National Park should be recognised in the park's plan of management, which should incorporate strategies for their conservation.

The knowledge base for the park's values should be continually updated by a structured program of research and knowledge management. This will require leadership and commitment by New South Wales (NSW) National Parks and Wildlife Service (NPWS), and cannot be left to research institutions to address in an unstructured or opportunistic way.

The park should be managed conservatively and sustainably to ensure that its values are not degraded and that pressures that might contribute to the degradation of values are recognised and managed before serious degradation occurs. Adaptive management is needed to ensure that management strategies can be changed if they are contributing to degradation of the values.

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Monitoring of the condition of the park's values should be a programmed activity, with a reliable budget. Monitoring should address agreed indicators, and the results should be reported publicly. It is noted that some values have existing data sets on which to build, but for others, there is no existing reliable information.

Findings — condition of values

The terms of reference required the ISC to identify, describe and report on the condition and trend in condition of the natural, cultural, recreational, economic and social values of Kosciuszko National Park.

As explained in Chapter 20, there are several reasons why it is not possible to make a meaningful general comment on condition and trend in condition of the park's values. For example the values are very diverse; there are different ways of expressing their condition; and some values have become degraded, or are threatened with degradation, while others are in good condition or improving.

Comments on condition are included in the individual reports on earth sciences, soils, aquatic ecosystems, flora, fauna, fire regime, landscape (wilderness, aesthetics), cultural heritage, social values, recreation and economic use values. Chapter 20 summarises the information on the condition and trend in condition of the values of Kosciuszko National Park.

Findings — pressures

The ISC makes the following findings in respect of pressures on the park's identified values.

General

Finding

The park's natural heritage values underpin the majority of its other values; thus, the pressures on its ecosystems and fundamental ecological processes such as increased development, fire management and introduced species have the greatest potential to affect the values of the park. The impacts increase in severity when these pressures are overlaid with increase in visitor use and intensification of regional development.

While all parts of the park are affected by individual or cumulative pressures, the alpine and subalpine areas are the most vulnerable, and increased pressures from tourism and recreation activities and facilities are of particular concern.

Recommendation

The pressures on the park's values demand adequate capacity within the NPWS and the understanding and support of the community to effectively manage the full range of the park's values.

Climate change

Finding	*Recommendation*
Climate change is a pressure beyond the ability of the park to manage directly, but will have profound impacts on some values.	The Kosciuszko National Park Plan of Management needs to recognise the implications of the climate change as a pressure on the park and to incorporate a planned management response based on conservation of the park's values.

Development

There will be increased pressure on the park's values if there is expansion of development within the park for increased access and tourism infrastructure, both for summer and winter facilities and services. Most demands will be motivated by commercial reasons, and there may also be commercial pressure to expand snowfields resort areas. Development for infrastructure also affects the park's values.	Management of all development needs to give priority to conservation of the core values of the park, on which sustainable tourism and high quality visitor experience depends.

Visitor use

Increasing visitor use has widespread implications for loss or degradation of the park's values. In particular, the increase in visitors in the alpine and subalpine areas in summer is of concern.	The pressure of increase in visitors in the alpine and subalpine areas in summer needs to be addressed by management as a high priority.

Park management

The process of park management can itself be a pressure on the park's identified values.	The park will need to institute a program of continuous development and retention of appropriate and adequate skills, knowledge, competencies and resources to manage the park's values;

Pressures on ecological processes

Finding	*Recommendation*
Pressures caused by disturbance of catchments, the managed fire regime, and by introduced plant and animal species are causing substantial impacts on the park's biodiversity and the natural ecological communities by disturbance of the ecological processes on which their conservation depends. There are major pressures on the ecological integrity of the park caused by catchment and hydrological pressures, invasive introduced species and inappropriate fire regimes that interrupt the natural ecological processes.	Some pressures on ecological processes need the understanding of the community and there is need for a program that builds the community's involvement and knowledge of the issues.

Regional land use

The regional setting of the park brings pressures as intensified land use and new developments, some stimulated by the existence of the park itself, potentially isolate the park as a natural area, and create edge impacts on the boundary areas of the park.	Pressures caused by changes in regional land use require an inclusive regional management approach by the park.

Cumulative effects of pressures

Most values are experiencing more than one pressure.	The cumulative effect of pressures on the park's values needs to be considered in management.

Values as pressures

Some pressures have been identified that might also be related to, or part of, other values of the park.	Pressures that are also values will need careful consideration and management.

Findings — knowledge gaps

The ISC makes the following findings and recommendations in respect of knowledge gaps concerning the park's identified values.

Finding	*Recommendation*
The park needs a system that would make existing knowledge available, incorporate and disseminate new knowledge as it becomes available, and record advice on existing and new knowledge needs of the park.	The Kosciuszko National Park Plan of Management should establish a protocol for knowledge management for the park.
The park's values are not fully known or understood.	The values of the park should be reviewed from time to time to incorporate new knowledge and understanding. This process should not be dependent on a review of the plan of management, but should be a periodic and systematic procedure.
Kosciuszko National Park is a Biosphere Reserve, a status conferred by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1977, but this has not been used to the advantage of the park.	The Biosphere Reserve concept deserves to be implemented, as it has the ability to incorporate regional perspectives, management and planning within its structure.
The cooperative management and liaison arrangements established for the Australian Alps national parks offer opportunities to share knowledge about the Alps.	The cooperative management and liaison arrangements established for the Australian Alps national parks should be encouraged and strengthened.
Kosciuszko National Park is significant in its context as part of the Australian Alps.	A National Heritage Listing of the whole of the Australian Alps is a possibility that should be pursued through pooling and co-ordination of the knowledge held by each of the alps protected area management authorities.
The ISC recognises (and regrets) the continuing reduction in in-house resources devoted to research by the NPWS.	Opportunities for collaborative research between the NPWS and other organisations should be pursued.
With continued reductions in specialist personnel, there will be loss of understanding of essential knowledge areas and diminished and inadequate ability to translate this knowledge into appropriate management responses to conserve the park's values (eg fire ecology and research).	The NPWS must maintain a high level of expertise in all of the park's value areas.

Finding

The plan of management is an appropriate vehicle for ensuring that the knowledge needed for management is acquired and used effectively.

Recommendation

The knowledge gaps about the Kosciuszko National Park identified by the ISC should be addressed systematically in conjunction with the implementation of the plan of management.

Indicators and monitoring of values

Recommendations

As part of the process of completing the management plan, the ISC recommends that the NSW NPWS add additional indicators relating to the other elements of the World Commission on Protected Areas framework. Specification of some of these indicators will have to await the completion of a draft of the management plan, as they will relate to the specifics of objectives and strategies in the plan. However, the general nature of these indicators can be outlined now.

Context

This report identifies the significant values of the area and the pressures (threats) acting on these values. The status and trend, both of values and pressures, should be monitored as part of the outcomes component of the monitoring program.

Planning

As part of the preparation of the management plan, the adequacy of existing general protected area legislation and policy should be assessed. Similarly, the plan should contain an assessment of the strengths and weaknesses in the design of Kosciuszko National Park. Any deficiencies in design can then be addressed through acquisition or adoption of relevant management strategies. This design assessment should be conducted in relation to the major park values identified in this report. The new management plan should also assess current issue-oriented planning documents and identify requirements for development or review of subordinate plans.

Inputs

As a minimum, a structure should be developed for monitoring the allocation of resources (staff and funds) to major aspects of park management. Ideally, there would also be a parallel process for identifying needs in relation to each aspect of management, so that some assessment of adequacy of resourcing can be undertaken.

Processes

Evaluation of the appropriateness of management processes requires that a set of relevant management standards be prepared as a basis against which the assessment can be made. The preparation of the management plan provides an ideal opportunity for establishing such a set of standards. Existing consultative mechanisms set up for the plan's preparation could be used to obtain stakeholder input to the standards. Evaluation could be undertaken by scoring current management practices against the ideal standards, with assessments repeated every 1–2 years to track progress in management practices.

Outputs

The preparation of the management plan also provides an opportunity to develop a system for monitoring later implementation of the plan. This can be done using a simple database that lists the policies and actions proposed in the plan, and provides for annual recording of the status of implementation of each. Additional fields characterising the nature of the policies and actions would allow more sophisticated analysis of trends in plan implementation.

Indicators of key program outputs should also be monitored. The selection of attributes to be monitored should be made as part of the planning process, but preference should be given to those management activities that relate to the maintenance of park values or the abatement of threats (eg completion of annual burning programs). Other output indicators that should be monitored are key demand indicators that reflect external demands placed on the staff managing the park (eg visitor numbers).

Outcomes

Indicators for monitoring the status of identified values and the abatement of threats are specified in Table 22.2. Additional monitoring of key management plan objectives should also be undertaken, indicators for which will need to be specified as part of, or following the development of, the management plan.

General findings

Introduced grazing herbivores

Finding	*Recommendation*
The individual and combined grazing pressure of introduced species (rabbits, hares, horses, pigs, deer and goats) is substantial. Populations of these herbivores are affecting vegetation and sensitive areas like bogs. The alpine area is highly vulnerable, particularly under changing population sizes and climate change; unchecked invasion by some of these herbivores is likely to change the structure of the alpine vegetation and move it away from the present insect-dominated system. In the absence of natural enemies (predators, parasites) or control, these species represent a major threat to the natural integrity of the park. According to the ecological concept of “trophic cascades”, the suite of exotic herbivores current present in the park may represent a major problem that is not visible or at least perceived at present.	Reestablishment of the pre-European predator system should be incorporated into control measures for introduced grazing herbivores. Control of introduced herbivores within an adaptive experimental management framework should be a major management program of the park.

Fire

Finding	*Recommendation*
The natural fire regime has been a feature of the development of the region's vegetation structure for millennia; it is a major determinant of vegetation and its seral stages across the Australian landscapes and affects the spatial and temporal availability of habitat for fauna. Present vegetation distribution is an expression of past fire regimes.	Fire management of the park should be based on an assessment of vegetation systems and fuel structures, applying the principles of combustion physics to ensure that desired outcomes are valid and achievable.
Fire management influences the capacity to implement other management strategies and achieve planned management outcomes, and the occurrence and distribution of vegetation communities and certain species. Fire can have deleterious impacts on Kosciuszko National Park soils, particularly the organic soils of the alpine and subalpine zones (alpine humus and transitional alpine humus soils).	A focus of fire management should be to minimise the impact of high-intensity fire on natural and human assets. The dominant objectives regarding vegetation should be to achieve a more representative range of succession, including areas of old growth vegetation (representing the end result of environmental stability) and to address the needs of fire dependent threatened species through ecologically-based fire regimes. Fire management practices should not be undertaken if, on balance, they detract from an objective of catchment protection.

Systematics (taxonomics and molecular genetics) advances

Since the original Plan of Management for Kosciusko National Park (1982) there have been many dramatic advances in systematics and the scientific tools derived from the study of molecular genetics and systematic analysis have profound implications for understanding of the park's values and their management. Many new taxa have been recognised, several of which are alpine endemics.	Systematics (taxonomics and molecular genetics) offers a most valuable new tool for Park management and should be incorporated into future research plans.

Threatening processes

Climate change

Alpine environments are a key area for research and monitoring climate change. A better understanding of the ecological functions at the systems level is needed, and present habitats must be as robust and healthy as possible to maximise resilience. The park is important as a biodiversity refugium.	Preparation for climate change requires: more detailed study of the implications for the park of enhanced climate change effects and the appropriateness of "solutions" such as cloud seeding and planning of regional-scale corridors across landscapes outside the park and integration adjacent land uses to maximise biodiversity conservation.

Introduced species

Finding	*Recommendation*
It is critical to prevent the establishment of further non-native species into the park.	Strategies are needed to ensure early identification of new introduced species, and to make every effort to eliminate any new introductions identified.

Exotic diseases and pathogens

The flora and fauna populations of the park may be vulnerable to exotic diseases and pathogens. Exotic diseases have the potential to have long-term detriment to the parks native species. In the national sense, the Australian Quarantine Inspection Serviced is the first line of defence, and park managers have powers to stop deliberate release.	Park staff must take active responsibility and remain vigilant in their surveillance and reporting and management of unusual events, with the objective of preventing the establishment of new diseases and pathogens.

Ecological research

Strategic ecological research framework

An overall framework for strategic research in Kosciuszko National Park will provide the information needed for effective management. Incorporating many of the research projects into a program of adaptive experimental management is arguably the most rewarding. In the recent past, threatened species have attracted a substantial research effort. This has been worthwhile, but a more wholistic landscape approach may prove more productive.	There is a need to establish an overall framework for strategic research in Kosciuszko National Park based on a wholistic landscape approach. An external advisory group on research should be considered to assist in this task.
For some topics (eg nutrient cycling, large owls, predation, health of system, and subterranean biodiversity) the major drivers could well be outside the park system.	Ecological research within Kosciuszko National Park should be linked to other areas outside the park.

Long-term vegetation transects

The location and history of long-term vegetation transects in the alpine and subalpine zones have been documented. There are also various photographic records of soil conditions and other features made many years ago and some of these should be located and repeated at regular intervals to yield information on trend in condition.	The long term transects must be continued not only for the information they provide on vegetation trends but also for information on the soils. There is a good case for a professional 'ecological archivist' on the park's staff to coordinate re-photography of sites for which there is a useful photographic record.

The park's future status

Finding	*Recommendation*
Biosphere Reserve status Kosciuszko National Park is a Biosphere Reserve, a status conferred in 1977 by UNESCO. Biosphere Reserves are areas of protected ecosystems where solutions to reconcile the conservation of biodiversity with its sustainable use are promoted. Collectively, Biosphere Reserves form a world network within which exchanges of information, experience and personnel are encouraged. To date, the Biosphere Reserve concept has not been utilised for Kosciuszko National Park. This listing also brings the park into the ambit of the *Environment Protection and Biodiversity Conservation Act.*	The Biosphere Reserve status of Kosciuszko National Park deserves to be reviewed and utilised as a means of incorporating regional landscape management and planning in conjunction with neighbouring authorities and the regional community.
Ramsar Wetland of International Importance — Blue Lake The listing of Blue Lake and its surrounding area as a Wetland of International Significance is an important recognition. This listing also brings the site into the ambit of the *Environment Protection and Biodiversity Conservation Act.*	Blue Lake, as a Ramsar Wetland of International Significance, should be specifically addressed in the Plan of Management.
National Heritage Listing of Australian Alps A National Heritage Listing of the whole of the Australian Alps would be appropriate, to be initiated as a result of the forthcoming new Commonwealth heritage legislation.	A National Heritage Listing of the whole of the Australian Alps should be pursued through pooling and coordination of the knowledge held by each of the Alps protected area management authorities.