Kowaris and Koalas:
Evaluating the natural integrity of Queensland's protected areas

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Protected areas provide many economic and social benefits for the community, including recreation, rural employment, tourism and ecosystem services such as catchment protection (e.g. World Conservation Union (IUCN) *et al.* 1991, Queensland National Parks and Wildlife Service 2001), but these benefits can be delivered in the long-term only if the integrity of the protected areas is maintained.

The continuing focus of protected area management must be ensuring the protection of natural and cultural values. For Queensland's system of over 300 protected areas, this clear priority is given in the *Nature Conservation Act 1992* and re-affirmed in the Parks Master Plan (Queensland National Parks and Wildlife Service 2001). A substantial segment of society is also concerned that conservation has precedence. Two recent community attitude surveys have found a very high level of appreciation for the role of parks in protecting and conserving natural values (ACNielson 2000, 2003).

There is also a strong mandate for the Queensland Parks and Wildlife Service (QPWS) to report to the public about the extent to which the protected area system is actually doing the job for which it exists. To do this we must be able to:

- define natural and cultural integrity both generally and in particular protected areas;
- undertake some type of measurement on the extent to which integrity is conserved;
- analyse the results; and
- adjust management to maintain or improve our performance.

This paper outlines the approaches being trialed to evaluate the effectiveness of managing natural integrity and cultural integrity on protected areas. The very close links between natural and cultural heritage are recognised (see below) and field evaluation and reporting is addressing both of these components. However, this paper will concentrate on natural integrity evaluation.

'It is so important that land is still looked after. People (and community) go out to hunt and gather food to be close spiritually and for healing. It is not a land without people. People and land are one, because through land is survival. We call it Mother Nature.' Gladys Tybingoompa, quoted in QPWS 2000.

1 Defining natural integrity

Concepts of ecological integrity and health have been much discussed and debated in recent scientific literature (e.g. Karr 1992, Costanza 1992, Kay 1993, King 1993, Regier 1993, Rapport *et al.* 1995, Okey 1996, Crossley 1996, Parks Canada 1998, Parks Canada Agency 2000). While the terms are often used interchangeably, ecosystem integrity can be regarded as a measure of the well-being of natural and near-natural ecosystems, while ecosystem health can also characterise systems with a substantial degree of human modification.

In Queensland, natural integrity – the ecological integrity of natural systems - has been defined in the Queensland Parks Master Plan (Queensland National Parks and Wildlife Service 2001) as *the condition of an ecosystem where biological diversity and ecosystem processes are optimal and are likely to persist.*

Natural integrity is characterised by certain system properties (Costanza 1992, Okey 1996) including:

1. Stability: the ability of the ecosystem to maintain some form of equilibrium in the presence of perturbations (Okey 1996) - that is, to withstand stress;
2. Resilience: the ability of the ecosystem to return to a state of equilibrium after disturbance (Pimm 1986) or the ability to maintain structure and function in the face of disturbance (Holling 1986);
3. Sustainability: ability to maintain structure and function indefinitely;
4. Self-organisation: relating to the extent of adaptability and evolutionary capabilities through natural 'feed-back' mechanisms and complexity; and
5. Diversity/ complexity: the number of species or system components and the complexity of relationships between entities.

Natural integrity has components of scale in both space and time (King 1993), with events that seem catastrophic on a small scale, such as fire or flood, creating a mosaic of habitats, which actually contribute to ecosystem integrity on a larger scale. The maintenance of this mosaic is an important goal, along with the maintenance of connections between parts of the mosaic. It is important for park managers to consider different scales of space and time, rather than attempting to maintain the current status in a particular small area. This means management must consider a protected area system as a whole – with links in the broader landscape – when aiming for long-term integrity.

In reality, managing these components of integrity is extremely difficult except in the largest and most remote of protected areas. For example, managing small remnants of ecosystems which are normally subject to occasional very hot fires is an enormous challenge for park management, especially when the park's urban or rural interface makes a 'natural' fire regime impossible.

There may be a number of different 'optimum operating states' for any particular ecosystem. Crossley (1996, p.465) stresses the importance of ecosystem management which is based 'on the science of surprise, complexity, non-linearity and other properties of complex systems'. Recognising change as a natural part of the system is important.

Two main elements of natural integrity are ecosystem services and biodiversity. Maintenance of the 'ecological services' provided by intact environments is a vital function for protected areas, can be assigned an economic value, and can be appreciated by local communities (Aylward and Barbier 1992, Richards 1994, UNEP/CBD/COP/5/23 2000). Ideally, protected areas allow for uninterrupted ecosystem functions through having:

- unpolluted water, with natural systems of cycling and drainage working effectively;
- natural nutrient cycles, with nutrients returned to the soil and cycled through living things;
- evolutionary processes continuing without interference;
- clean air; and
- a 'normal' rate of soil formation and erosion.

Biodiversity is also a critical factor in natural integrity, and loss of species is a serious concern even if the overall functioning of the system is not clearly affected. While environmental problem that is inherently reversible, extinction of species is not (Myers 1996). Four scales of biological diversity are recognised in the Queensland legislation. These are:

1. Regional diversity (the diversity of the landscape components of a region, and the functional relationships that affect environmental conditions within ecosystems).
2. Ecosystem diversity (the diversity of the different types of communities formed by living organisms and the relations between them).
3. Species diversity (the diversity of plant and animal species).
4. Genetic diversity (the diversity of genes within each species)

The protected area system managed by the Queensland Parks and Wildlife Service (QPWS) aims to protect biodiversity at each of these levels. On individual protected areas, management usually aims to keep the mosaic of ecosystems and communities, to protect the existing range of native plants and animals, and to maintain genetic diversity by ensuring individual species still occur across their natural range.

Often the only measure of management success is the survival or demise of single rare, threatened or icon species such as kowaris and koalas. But how should parks be evaluated in terms of the long-term survival of the abundant species, such as goannas and galahs?

2 Evaluating natural integrity

2.1 Towards an integrated approach

In the past, reporting and evaluation in QPWS in relation to natural systems in protected areas was focussed on reporting activities, such as how much time and money was spent on fuel reduction burning and weed spraying. This reflects the fact that within protected area management work units and programs, the focus has traditionally been less on considering and protecting ecological integrity as a whole than on particular aspects of natural resource management, such as managing fire, controlling invasive species, and to a lesser extent regenerating degraded ecosystems or conservation of particular species, usually rare or threatened species.

It has been increasingly recognised that we needed a better basis for judging or improving performance in the key area of protected area management. The benefits of evaluating management effectiveness of protected areas have been increasingly recognised over recent years (Leverington and Hockings in press). A rich picture of effectiveness can be achieved by evaluating a number of the components of management effectiveness, including context, processes, inputs, outputs and outcomes (Hockings 1997; Hockings *et al.* 2000).

In Queensland, two linked evaluation systems are being trialed, both of which fit within the WCPA framework for evaluating management effectiveness (Hockings *et al.* 2000). The 'rapid assessment' system measures a range of processes and systems, including those concerned with natural resource management, while the 'natural integrity statements' record context and outcomes relating to natural integrity. The natural integrity statements are developed concurrently with cultural integrity statements, to ensure the links between these are well recognised.

It is proposed that through these two systems, evaluation of management effectiveness can be achieved quickly and at a low cost when incorporated as part of the normal business cycle. The information for both these systems is collected in 'park and forest folios', spreadsheets which can be consist of a number of worksheets including the following:

- Master sheet with basic tenure information;
- Statement of management purposes and direction;
- Evaluation of natural integrity (5 sheets: ecosystems, species, ecosystem processes, threats, management responses);
- Evaluation of cultural integrity; and
- Rapid assessment data sheets.

These spreadsheets can be held at individual park, forest or district offices, providing relevant and accessible information to local managers. The system is also being used for forest areas, which are also managed by QPWS.

2.2 Rapid assessment

A project to measure management processes and systems in a 'rapid assessment' survey was trailed in 2000 and implemented across the protected area and forest system in 2003. This rapid assessment survey was aimed at measuring the processes and systems of management in four areas of park management: conservation, presentation, community relations and management performance. The assessment process is based on the assumption that certain activities characterise good park management. For example, a park with an approved management plan will be managed better than a park without an approved management plan (Leverington and Harper 1999). Other examples are that well-managed parks would have:

- identified the natural and cultural values of the park;
- research and monitoring programs in place to keep track of changes in these values;
- identified the processes threatening the park's natural and cultural values;
- a program to restore degraded areas;
- programs to manage cultural heritage; and
- programs to manage fire and pest plants and animals.

Rapid assessment is conducted through filling out 'tick a box' questionnaires totaling over 70 questions addressing key aspects of estate management (see example below). This process has been shown to be most effective when conducted in distinct or sub-district meetings (up to about 15 staff) to enable discussion and sharing of ideas. A 'facilitator' with statewide perspective helps to ensure the process and results are consistent and comparable. The information can be entered directly onto a spreadsheet and analysed against results from other areas. Questionnaires for protected areas over an entire district can be completed in each one-day meeting. Table 1 presents an example of the questions in regards to conservation.

Table 1: Example of Rapid Assessment questions

Flora/Vegetation		
1. Does the park have maps showing native plant community distribution at a scale appropriate to management needs?		
No		
Yes (for some native plants)	**Scale:**	**On GIS?**
Yes (for most native plants)	250000	
Yes (for all native plants)		
2. Does the park have maps showing rare and threatened native plants at a scale appropriate to management needs?		
No		
Yes (for some rare and threatened species)	**Scale:**	**On GIS?**
Yes (for most rare and threatened species)		
Yes (for all rare and threatened species)		
3. Has a plant species list been compiled for the reserve?		
No		
Yes (incidental)		
Yes (Preliminary)		
Yes (comprehensive)		

Figure 1 indicates the results for one of the three QPWS regions of in regards to Conservation Management (QPWS 2003). These types of reports can be generated on a state or individual park basis, and comparison to state-wide averages easily made.

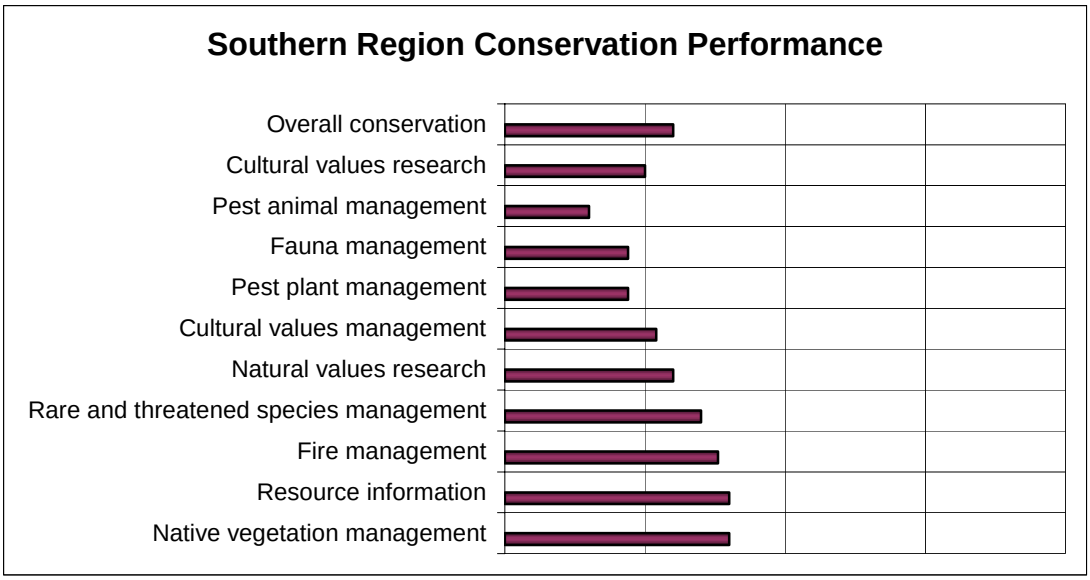

Figure 1: Example of rapid assessment results

2.3 Natural integrity statements

As discussed above, the use of rapid assessment as an evaluation tool is based on the assumption that better systems and processes will lead to better management. However, it is essential that we also evaluate the *outcomes* of management. It is widely recognised that while 'outcome' evaluation, such as the evaluation of natural and cultural integrity, is generally the most difficult and expensive to undertake, it is the most useful in generating real information on whether protected areas are fulfilling the roles for which they were declared. It is also critical for providing information to improve future management.

Many inventory, monitoring and research programs are undertaken in Queensland's protected areas, usually with a high level of expertise and scientific rigour. However, reporting of these programs is generally inadequate and uncoordinated. Staff and scientists at a workshop in 2000 agreed that the state-wide picture could be greatly improved through better coordination and communication, common standards for data collection, an ability to 'roll-up' results for park-wide, bioregional or state-wide reporting, and greater efficiencies in data storage and accessibility.

Adapting a concept from Parks Canada, a relatively simple reporting mechanism - the natural integrity statement - was developed. An integrity statement captures the current ecological state of each individual protected area in a subjective manner by gathering corporate, indigenous, local and scientific knowledge into one system. A number of statements over time can be used to evaluate management effectiveness, and over the protected area system they can be 'rolled up' into regular statewide reports.

The natural integrity statement is based on a proposed state-wide monitoring framework (see Table 5), combined with a values-based approach (e.g. Hockings *et al.* 2001, 2001). Natural values relating to both biodiversity and ecosystem processes are recorded, along with the natural values relevant to presentation and research. The goals for managing these values are also recorded. In most cases goals are simply to maintain the values, but in some cases the goal is to restore or improve condition or

increase or decrease a population to more sustainable levels. Information for this section of the statement can be drafted at the beginning of the evaluation exercise as a desk-top exercise, using existing information such management plans, surveys and park gazettal proposals.

The next – and most critical – part of the statement records the current status of each value. Information about status is discussed at a round-table meeting of protected area staff and other experts. Ideally, traditional owners and community members could be included at this discussion. Where monitoring or other scientific information is available, this is sourced and used as the basis for the entry. However, in many cases the status recorded is a subjective and qualitative statement – a record of the opinions and experiences of those gathered. The text relating to status is kept simple, but can easily be hyperlinked to other sheets, workbooks, documents, graphs or photographs which further illustrate the points or provide more solid evidence for the assertion. Alternatively, footnotes and references can be added.

Table 2 shows an example of a section of a natural integrity statement for a wetland park in South-western Queensland. Most of the 'status' information is from Ranger observations, but some is backed up by scientific studies.

Table 2: Section of Natural Integrity Statement (Currawinya National Park) referring to threatened species

Natural values of reserve	Management goal	Status 2003
Significant animal species		
Major Mitchell/ pink cockatoo	Map nesting sites and protect	Regularly seen on park - believed to be resident and breeding
Freckled duck	Maintain nesting habitats - record population level	Seen in large numbers in season (Aug/Sep) - breed on park
Bilby	Introduce and establish viable population - captive breeding program inside fence at present	None yet introduced due to drought conditions
Macropods	Maintain at levels conducive to conservation of all species	Overgrazing by macropods is identified as a problem on the park, especially in grassland areas and around lakes
Waterbirds including swans, pelicans, stilts, grebes, avocets	Maintain habitat requirements and control feral animals, visitor use and park management activities to ensure waterbirds are not disturbed	Numbers fluctuate - major breeding site for pelicans, swans, cormorants, terns, gulls, shovellers, coots etc. Good records have been kept. (ref provided)

Other sections of the natural integrity statement record the estimated levels of current and potential threats and the impacts of these threats (Table 3). In an attempt to quantify these so the results can be rolled up across districts or the state, threats are rated on their extent and severity. Again the summarised information can be linked – for example to maps of pest plant distribution where this is available.

Table 3: Section of natural integrity statement (Culgoa Floodplain National Park) referring to threats

Pest plants	**Current extent of impact** ***very low***	**Anticipated extent of impact in 5 years (given existing management input)** ***low***
	Current severity of impact ***low***	**Anticipated severity of impact** ***Low to medium***
Buffel grass	Confined to the sand ridge around the base area – approx 20 ha. Extent is now so great that it is impractical to spray; very dense stand	Unlikely that it will get any more dense; has the potential to spread, but it is unlikely that it will spread onto the heavier floodplain soils; potential to spread via floodwaters and/or via wind is just as great
Common pest pear, saffron thistle, crownbeard; parthenium	Common pest pear, saffron thistle and crownbeard – isolated populations; has been found along main road edges near Byra homestead – no other recordings have been found since	With vigilance – unlikely to change
Bathurst burr, mother-of-millions, datura (spiny thornapple), caltrop, spiny emex	Actively spraying and monitoring effectiveness; very small isolated outbreaks; mother of millions – base area; datura – Myola house site; Bathurst burr – Byra-Mertters road; spiny emex – base; caltrop – base	Hopefully fully controlled, depending on favourable seasons
Noogoora burr	Starting to occur in isolated pockets right throughout the floodplain section of the park; dependent upon seasons; has responded after a small amount of rain	Without some effective control strategies, it is unlikely to be controllable due to the park being a floodplain

The final part of the integrity statement is a brief summary of recent and proposed natural resource management activities. This is not to replace a more detailed plan, but to provide a context for interpreting the evaluation.

The process for cultural integrity evaluation is similar. In the example below, an Indigenous park ranger with good knowledge of the park and its cultural heritage completed the evaluation. Wider community involvement would be desirable.

Table 4: section of cultural integrity evaluation - Currawinya NP.

Currawinya National Park **Cultural heritage values**		
Values	**Management Goal**	**Status in baseline review (2002)**
Known values and significance to Indigenous people		
Spiritual, ceremonial, burials and physical artefact sites; continued ties with country by traditional people	Ensure sites are recorded and recommendations are made for the sites, and that traditional owners are able to access these sites.	Sites are being progressively recorded. Recommendations have been made for recorded sites. Continual contact with traditional owners on cultural issues.
Historical, scientific and aesthetic values	Ensure sites and history are recorded and recommendations are made for the sites, and that traditional owners continue to be consulted in relation to potential impacts on those values.	Ongoing consultation with traditional owners and recommendations put into practice

2.4 Themes for monitoring natural integrity

As discussed above, the values recorded and evaluated in the integrity statement for each park are based on four themes for monitoring and reporting on natural integrity across the protected area system. Within each of these themes, some indicators can be common across the state and others must be defined for individual parks, ecosystems or bioregions. The four themes for monitoring are:

a) ***Biodiversity*** at ecosystem, species, population and genetic levels;
b) ***Ecosystem processes/ functions*** relating to values and desired conditions of the park in relation to 'ecosystem services' such as providing clean water, climate control and erosion protection;
c) ***Other park values*** such as cultural links to nature, interpretive opportunities; and
d) ***Threats and opportunities, impacts and responses*** including fire, pest plants and animals, visitor number sand providing wildlife corridors.

As shown in Table 5, these themes tie in with and can provide information for reporting based on the condition-pressure-response model used in Queensland's State of the Environment reporting.

Table 5: proposed list of indicator types for the Parks system

GOAL **CONDITION**	**INDICATORS** *(note these are broad indicators only and more specific indicators need to be defined)*	**NOTES**
Biodiversity		
Maintenance of diversity at landscape/ subregional level	Progress to C.A.R. system -(% of regional ecosystems represented in parks) Progress to an integrated subregional conservation strategy	Existing SOE (State of Environment) indicator. Measured statewide.
Maintenance of diversity at ecosystem level	Extent and condition of key ecosystems identified for each park	Satellite imagery with ground truthing
	Status of threatened ecosystems	Satellite imagery with ground truthing -
	Spatial change of RE boundaries	Satellite imagery with ground truthing -

GOAL	INDICATORS	NOTES
Maintenance of biodiversity at species level	Rare and threatened species	These will vary from park to park -report on current status and change in status
	Identified key or indicator species or broader specific taxon eg. Frogs, macropods, heath plants	These will vary from park to park - may choose common indicators for ecosystem or bioregion. Need to develop A-E rating on status and change in status.
	Birds	Atlassing with Birds Australia - comparison over time and with adjacent non-park areas
	Aquatic invertebrates?	
	Other possible standard indicators??	
Biodiversity at species and genetic level	Park-specific taxa and genetic diversity measurements -eg presence/abundance data on all species at a range of sites where possible	For presentation in park NIS but not in state-wide reporting
Ecological processes		
Catchment protection and water quality protection	Standard indicators for water quality of selected systems Extent of modification of waterways in park	Use EPA standard systems for monitoring
Other values as defined for individual park	As defined in NIS	
Other values		
Cultural and scenic values relating to landscape and biodiversity	As defined in NIS for individual park	May also be common indicators at subregional level.
THREATS AND POTENTIAL		
Internal fragmentation	Extent of internal fragmentation e.g. roads, powerlines.	Develop A-E condition and change rating
2.4.1.1 Isolation or connectivity of park with surrounding landscape	Percentage of boundary properties cleared	Complex indicators for connectivity are also available
2.4.1.2 Grazing impact	% of bare ground proportion of annual and perennial grasses	Standard reporting from Q-graze?
Impacts of visitors and park operations	Measure against limits of acceptable change. Indicators include extent of bare ground, erosion, nutrient levels, disturbance/ feeding of animals/	Develop A-E condition and change rating
Impacts of pest species	Abundance and impact of pest animals	Need consistent monitoring and reporting mechanisms
	Abundance and impact of pest plants	Need consistent monitoring and reporting mechanisms
Others	Park specific (could include diseases, pollution, disturbance by park operations or other activities)	
MANAGEMENT RESPONSES	-	
Level of Indigenous and community involvement in nrm management	Qualitative report for each park	
Control of pests	Effectiveness of pest animal and plant control programs (% reduction of impacted area of pest plants; estimated reduction in pest animal numbers)	Level of control effort and process reported in rapid assessment
Rehabilitation of degraded systems	% of denuded/ degraded land successfully replanted	
Interpretive opportunities offered	Qualitative report on activities	
Use of park as benchmarks for landscape monitoring	-Extent to which parks in region are links to broader landscape management -. Improved conservation practices in area	
2.4.1.3 Fire management	- Adherence to adaptive fire plans - fuel loads - timing - species response - Fire plans and fire management are protecting resources	Park-specific reporting only. Statewide process reporting (rapid assessment)

A number of conservation and scientific organisations have developed similar frameworks to that above, and some have invested considerable resources in deciding on indicators and establishing desirable monitoring programs. For example, the Australian Scientific and Industrial Research Organisation (CSIRO)has been investigating the establishment of Australian standards for environmental indicators, and has developed an excellent system for quick and consistent assessment of 'landscape function' (ecosystem processes) in rangelands (Tongway and Hindley 1999). Work on indicators and common methods of monitoring for biodiversity are also progressing at national level, partly as an initiative of the Natural Heritage Trust scheme of the Australian Government.

The system for monitoring and evaluating natural integrity in Queensland parks therefore needs further development, especially in the selection of indicators, but the greatest challenge is to actually carry out the monitoring and reporting, analyse the results to give meaningful answers, and incorporate the results to improve management. This challenge is considerable for an agency like QPWS, which manages over 300 protected areas as well as marine parks and forest reserves. The environments range from arid sandy desert to rainforest, and from extensive mangrove and freshwater wetland systems to coral reefs. Many protected areas have low staffing levels, some are extremely remote, and very few have a desirable level of scientific or baseline data available.

In times of economic austerity and the need to see clear results for investments, long-term research and monitoring programs are difficult to justify, and the resources for these may not be available across a system of protected areas. It is essential to establish evaluation and reporting systems which can be implemented with a minimum of resources, and which clearly show benefits to decision-makers in the short term.

Natural integrity statements provide a simple mechanism to record the best information available now, and have the capacity to record more consistent, quantitative and comparative data in the future, as better systems and more scientific data are available.

3 Ten years of recovery: the Lochern example of natural integrity evaluation

Evaluation of natural integrity statements should begin at a baseline year and then repeated at regular intervals – about three-yearly and more frequently where there appear to be significant climatic fluctuations or other significant changes. However, there is also an opportunity to record some information retrospectively, so that the experience, memories and records of staff are usefully incorporated into future planning and corporate information.

Lochern National Park is located in central western Queensland, with an area of 24,000 ha. The area was run as an extensive sheep and cattle property for about 100 years until it was declared as National Park in 1994. The park is located in a semi-arid area with annual rainfall averaging approximately 480 mm per year, however rainfall can be as low as 100 mm and as great as 650 mm in any one year. Summer temperatures rise to 45° C with winter temperatures falling to –1°C.

One of us was involved in the recommendation for acquisition of this property and has followed its management over the past 10 years. Information recorded at and soon after gazettal included the fauna and flora records. Pasture monitoring sites have been measured over ten years, initially using photo sites and in the last four years, transect based methodologies. To date this information has not been analysed. However, the use of the natural integrity statement has allowed the capture of subjective information and its interrogation for future management scenarios.

Table 5: Estimation of status of ecosystems over 10 years – Lochern National Park

Significant landscapes and regional ecosystems			
Natural values of reserve	**Management goal**	**Status 1993**	**Status 2003**
The park has a mosaic of Channel Country and Mitchell grassland systems within a relatively small area.	Maintain the mosaic and prevent the establishment of large monocultures.	Some monocultures are beginning to develop, in particular *Eremophila bowmani*. The ecotones between gidgee and Mitchell grass systems are beginning to be dominated by gidgee.	Fire has been used to reduce gidgee seedlings and Eremophila in small areas. In general ecotones have increasing densities of gidgee.
Old stands of gidgee with large mature trees	Maintain old growth stands while allowing successional regeneration over areas of the park.	Old growth stands in the north west of the park are in good condition. Some stands towards the southern end of the park are showing signs of seedling gidgee invasion.	Stands towards the southern end of the park appear to have minimal seedling regeneration. Gidgee seedlings appear to be increasing in more mixed open communities.
Areas of open Mitchell grass.	Maintain areas of Mitchell grass in good condition over a wide area of the park.	Areas of Mitchell grass are in poor condition due to high grazing pressure before destocking occurred. In addition this is a period of low rainfall.	Areas of Mitchell grass currently in good condition despite a long drought period extending over a 2-year period.

Table 5 indicates that the desired management outcome was to maintain a mosaic of Channel Country and Mitchell grass systems. The actual management outcome has been to maintain mosaics over small areas of the park by the use of fire. In relation to the gidgee systems, it appears that seedling gidgee invasion of the southern stands has ceased, while the mixed open communities are experiencing increased gidgee seedling growth. In relation to Mitchell grass areas, the goal was the maintenance of these pastures in condition. After ten years, the Mitchell grass plains appear to have benefited from destocking despite the current two-year drought.

The integrity statement shows that at least some of the goals associated with ecosystem management appear to have been achieved.

In addition to the integrity statements, a Rapid Assessment Survey of Lochern has been conducted on two occasions: August 2000 and February 2003. The 2000 survey indicated that a draft fire management plan was in place, that a vegetation map at a scale of 1:250,000 was available and a draft feral animal/weed plan was in place. The 2003 survey indicated that a Management Plan had been approved, fire management

plan completed, vegetation mapping refined to 1:100,000 but the feral animal/weed plan was still in draft form.

An evaluation of the above may recommend that:

- Current management should evaluate whether increased fire management is required for the management of mosaics, leading to a review of the Fire Management Plan.
- Further monitoring and analysis of the gidgee systems is required. The refined vegetation mapping will assist this process.
- Expert opinion (Phelps *pers. comm.*) indicates that Mitchell grass systems may begin to deteriorate after ten to fifteen years if no active management occurs (e.g. fire). Continued monitoring of these areas is required to monitor this situation and ensure the condition of the grasslands remains. Regular analysis of the pasture information will be required to achieve this.
- Increased efforts are required in the area of cultural resource management.

4 Using evaluation for better management

Though the evaluation systems are in their trial phase, indications are that the process itself is of great benefit. Staffs are encouraged to reflect on and record their experiences, to share information, and to refocus on their core role of protecting park values. Frequently, the process of developing natural integrity statements has resulted in an improved awareness of threats and rapid action to remedy problem situations. There is an incentive for Rangers to better observe and record natural events in the course of their duties, and to ensure they obtain results and impressions from visiting scientists and naturalists.

Information is shared among staff from different parks and support roles, and there is a direct encouragement for good practice in collating and distributing data. Importantly, the information and wisdom of field Rangers is recognised and respected. In the future, it would be desirable for traditional owners and other community members to be included in the processes so they also have the opportunity to contribute as they wish. The system allows for inclusion of information from many different sources, and accommodates both qualitative and quantitative data.

Both evaluation systems can be used to establish baseline standards for shared management. In an early case, a natural integrity statement has been used as the basis for a trusteeship agreement over a conservation park, where day-to-day management of the protected area is devolved to a local government authority. The integrity statement provides a baseline and includes guidelines for management. Especially where this is linked to more detailed information, it provides a transparent statement of current status and expected management outcomes.

Completed integrity statements can be used to develop concise reports of the status of protected areas (Appendix 1), which are easily understood by a wide audience. While these reports appear simple, they provide information which until now has never been available in a consistent, reliable form for both management and the community.

The system so far has also proven to be relatively cheap and acceptable and useful to field staff. This offers hope that it can become an accepted part of business,

demonstrating to the community that QPWS takes seriously its mandate to ensure the protection of natural and cultural values.

5 Acknowledgements

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