NEW SOUTH WALES KANGAROO MANAGEMENT PROGRAM: 2002 AND BEYOND

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Immediately following the review of the New South Wales (NSW) Kangaroo Management Program (KMP) in 1997, the NSW National Parks and Wildlife Service initiated a strategic planning process involving the NSW Kangaroo Management Advisory Committee. In April 2000 the strategic planning process progressed into a full review of the KMP 1998-2002 and various reports were commissioned. The draft KMP 2002-2006 was released for public comment on 14 July 2001. Key issues considered when preparing the new program were the legislative framework, the inclusion of goals and objectives that can be audited, the merits of damage mitigation as a rationale for commercial kangaroo use and the format and writing style of the KMP 1998-2002. Following analysis of submissions on the draft KMP 2002-2006, the program was finalised and submitted to the Australian Commonwealth Government for approval. The KMP 2002-2006 was approved by the Commonwealth and is valid from 1 January 2002 to 31 December 2006. The KMP 2002-2006 has a single overarching goal to maintain viable populations of kangaroos throughout their ranges in accordance with the principles of ecologically sustainable development. This goal is serviced by six new management-based objectives, each of which is covered by a specific section in the new management program. The new management program no longer relies on identification of damage as justification for commercial kangaroo use, and facility for an adaptive management approach has been added for the first time. Specific arrangements for ongoing program audits, periodic full program reviews and community awareness and participation are further additions to the new management program.

Key words: Kangaroo Management Program, ecologically sustainable development, *Macropus rufus*, *Macropus giganteus*, *Macropus fuliginosus*, *Macropus robustus*.

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KANGAROOS have been shot commercially and non-commercially in New South Wales (NSW) since the 1800s (Walton and Richardson 1989) and bounties were sometimes available. Commercial use of kangaroos was principally skins-only up until the late 1950s / early 1960s when the kangaroo meat industry commenced using infrastructure from the recently collapsed rabbit meat industry (Walton and Richardson 1989). The four commercially utilised kangaroo species (red kangaroo *Macropus rufus*; eastern grey kangaroo *Macropus giganteus*; western grey kangaroo *Macropus fuliginosus*; common wallaroo *Macropus robustus*) are widespread and abundant in NSW. The 2001 population estimate for western NSW was in excess of thirteen million (Gilroy 2001).

This paper discusses the major components of a Kangaroo Management Program (KMP), the two most recent program reviews in NSW, and finalisation of the KMP 2002-2006. This management program and its objectives are reviewed highlighting additions, (adaptive management, community awareness and participation), and ongoing critical components, (monitoring kangaroo populations, quota determination and licensing).

Australian Commonwealth Government legislation requires that a management program is prepared and approved before export of a native species is permitted. The management program essentially provides the framework for the commercial use and export of kangaroos, and in doing so must promote utilisation that is sustainable and the primary aim must be to conserve the species. As such, without the commercial use and export of kangaroos a management program satisfying the Commonwealth legislation would not be required. In this situation licences would still be issued to take kangaroos for non-commercial culling where they are perceived by land managers to be a pest.
A significant proportion of kangaroo meat and skins from the commercial take are ultimately exported overseas. Any management program for which an Australian State or Territory seeks Commonwealth approval must therefore satisfy the requirements of both the relevant State (e.g., in NSW the National Parks and Wildlife Act 1974) and Commonwealth (until the end of 2001 the Wildlife Protection (Regulation of Exports and Imports) Act 1982) legislation. Periodical review of the approved programs is also required by the Commonwealth legislation. Other than a general requirement for consultation with affected stakeholders, the Commonwealth legislation provides no framework for the review process.

Commercial use of kangaroos has always been characterised by the diverse and conflicting views of the major interest groups, i.e., landholders (fewer kangaroos through a commercial take to minimise impacts on primary production), animal welfare and conservation (no kangaroos taken commercially) and the kangaroo industry (a system of monitoring and management that ensures kangaroos remain widespread and abundant at densities suitable for commercial use). While these typical policy positions remain incompatible it is unlikely that a management program for kangaroos can fully satisfy any or all of the interest groups and it is understandable that this has not been achieved in the past. This is highlighted by regions where commercial kangaroo use is economically marginal due to low kangaroo densities, however landholders still report that kangaroos in this same area are negatively impacting on their production.

Since the 1980s consultation with stakeholders, including management program reviews, has been focussed through the NSW Kangaroo Management Advisory Committee (KMAC). Convened by the NSW National Parks and Wildlife Service (NPWS), the Committee provides advice to the Director General of NPWS on all issues relevant to the KMP. The Committee membership includes representatives of landholder organisations, animal welfare and conservation groups, the kangaroo industry and government.

The implementation of the KMP is undertaken in accordance with the National Parks and Wildlife Act 1974 and the approved management program. Kangaroos are taken under Occupier’s Licences issued to landholders. An Occupier’s Licence authorises the number of each species that can be taken on a specific property. If the kangaroos are to be used commercially, they must be taken by the holder of a current Trapper’s Licence. Trapper’s Licences can only be issued to people who have successfully completed the Firearms Accreditation for Trappers run by the NSW Firearms Safety Awareness Council. This accreditation includes a written examination and an accuracy test with a firearm. Uniquely numbered tags must be attached to all kangaroos taken by the Trapper and then the kangaroos can be sold to a licensed Fauna Dealer. The Fauna Dealer can buy, sell and process kangaroos at registered premises, and under a separate licence import from interstate and export kangaroos interstate and overseas. The legislation enables NPWS to add licence conditions, such that all kangaroos must be taken in accordance with the Code of Practice for the Humane Shooting of Kangaroos and all licensees must submit regular returns to NPWS.

1997 KMP REVIEW

The 1997 review of the KMP 1993-1997, like previous reviews, started with the public release of a new draft program that had been developed internally by NPWS. KMAC would comment on the revised program and examine any submissions. The differing views of organisations represented on the Committee often produced confrontational meetings. The essentially polarised ideologies and views combined with provocative behaviour frequently exacerbated this situation.

The Committee was convened in 1997 to review submissions on the KMP 1998-2002. No clear advice or direction was provided to NPWS from the Committee during the review process as the Committee was unable to reach consensus on any issue. Indeed the very nature of the Committee and its representation inhibited consensus. Both NPWS and Committee members believed that the KMP review process needed to be, and could be changed to improve stakeholder participation. Three key issues were then considered by NPWS in early 1998:

1. Could the functioning of KMAC be improved and was there any value in continuing to convene a committee where meetings were dominated by conflict, and consensus was rarely reached?

2. Assessment of the management program review that had been traditionally undertaken by NPWS.

3. Assessment of KMAC’s role in the management program review.

In an attempt to resolve these issues, independently facilitated sessions of the Committee commenced in 1998. During the first independently facilitated session the members of KMAC agreed that they had a worthwhile role and that the meetings should continue. The Committee developed a set of rules for the conduct of members both within meetings and out of session. These independently facilitated sessions were then progressed into a strategic planning process by NPWS.
REVIEW OF THE KMP 1998-2002

In April 2000 the Committee agreed to extend the strategic planning process into a full review of the KMP 1998-2002 where the Committee would operate as a working group with an independent facilitator. It was agreed also that it remained the role of NPWS to write the new KMP and that Committee members would not be required to endorse or have ownership of any outcome. At this time NPWS committed to a complete and comprehensive revision of all aspects of the program.

To clarify a number of key issues on kangaroos and kangaroo harvesting, the Committee requested various background reports including:

- a review by Olsen and Braysher (2001) of literature on kangaroos, kangaroo biology and kangaroos in the rangelands,
- kangaroo genetics and the impacts of harvesting (Hale 2001),
- Kangaroo Management Zones and their boundaries (Gilroy and Muston 2000), and
- a report on the roles and responsibilities of government agencies in relation to the KMP (Tunstall 2000).

These reports were completed under contract with NPWS and funded by the budget of the Kangaroo Management Unit. In addition several briefings were provided on native title and commercial use of wildlife, a comparison of the NSW program and the management programs of other States and a summary of current kangaroo related research projects. All reports and briefings were provided to Committee members and discussed at subsequent meetings.

Commercial use of kangaroos for damage mitigation

Under the KMP 1998-2002 damage mitigation was the only justification for the issuing of licences to take kangaroos commercially or non-commercially. Any commercial use was, in fact, solely the by-product of culling kangaroos to mitigate damage. Section 1.8 of the KMP 1998-2002 states:

‘Applications to take kangaroos must be justified on the basis that the numbers of kangaroos are such that significant damage to crops or pastoral production or rangeland is occurring or likely to occur. Landholders thus have no prima facie right to take kangaroos independently of this need to protect their rangelands, agricultural lands or pastoral production.’

From a process point of view we could expect both proof of damage and proof that culling kangaroos had alleviated the situation and actually reduced the damage. However, the KMP 1998-2002 contained no mechanisms to identify where kangaroos had caused or would cause damage. Of particular significance is that there were no mechanisms to audit the performance or success of the cull of kangaroos on the basis of damage mitigation. This core element of the program could not be audited. As a consequence the KMP 1998-2002 was fundamentally flawed.

Olsen and Braysher (2000) specifically considered the issue of damage and damage mitigation.

‘Although studies are few, kangaroos do not appear to impact greatly on wool production and compelling evidence of competition between kangaroos and sheep is lacking.’ (page 84)

‘Simplistic removal of kangaroos will not necessarily allow replacement with the equivalent in stock or improvement of productivity (e.g. wool production).’ (page 77)

Drafting of the KMP 2002-2006

After considering the various background reports, the comments of the Committee on these reports and the outcomes of KMAC’s strategic planning sessions, four key issues emerged for drafting the KMP 2002-2006:

1. the relevant provisions of the State and Commonwealth legislation;
2. the inclusion of goals and objectives that can be audited, and accountabilities and responsibilities that are both transparent and clearly stated;
3. the merits of managing kangaroos for damage mitigation; and

PUBLIC RELEASE OF DRAFT KMP 2002-2006

The draft KMP 2002-2006, explanatory circular, background reports and links to relevant legislation were released publicly on 14 July 2001 and were placed on the KMP review web page. The draft KMP 2002-2006 could also be requested via a dedicated e-mail address or telephone. Public notices in various newspapers and media releases supported the release of the draft KMP 2002-2006. Submissions on the KMP 2002-2006 were e-mailed or posted. The Commonwealth distributed the KMP 2002-2006 in a separate process required by their legislation. Submissions received by NPWS were analysed by NPWS with the assistance of KMAC. The analysis of submissions was completed by NPWS considering the comments of the Committee. The KMP 2002-2006 was then revised, progressed through the appropriate State processes and submitted to the Commonwealth for final approval. The KMP 2002-2006 was approved by the Commonwealth in December 2001 and is valid from 1 January 2002 to 31 December 2006.
THE KMP 2002-2006

The KMP 2002-2006 has a single overarching goal, “maintain viable populations of kangaroos throughout their ranges in accordance with the principles of ecologically sustainable development”. The management program is restricted in its application to the wild take of M. rufus, M. fuliginosus, M. giganteus and M. robustus (in the program known as ‘the kangaroos’) within NSW. Any other aspects of management relevant to these species, e.g., tourism and health and hygiene, are beyond the scope of this management program. For example, health and hygiene are the responsibility of Safe Food Production NSW.

While the KMP 1998-2002 is justified on the basis of damage mitigation, the KMP 2002-2006 is not justification-driven. Instead, the KMP 2002-2006 is outcome and performance-driven. Ecologically sustainable development has been elevated to the primary overarching outcome of the program. The focus of the KMP 2002-2006 and primary measure of program success is the sustainability of the populations of kangaroos taken commercially. The program has been developed on foundations of transparency and accountability. A new set of objectives has been included with the principles of management actions are described relative to each of the objectives. The various responsibilities and accountabilities of people who engage in commercial kangaroo use are expressed in the new program in a way that ensures that their performance can be audited. Animal welfare considerations have been included as auditable conditions of licensing. All kangaroos must be taken in accordance with the Code of Practice for the Humane Shooting of Kangaroos.

Program objectives

In line with its purpose of damage mitigation, the KMP 1998-2002 had a large number of objectives. However the bulk were essentially ideological or rhetorical, few of these objectives were served by specific obligations or actions in the body of the program and very few were auditable. The single goal of the KMP 2002-2006 is served by six new management-based objectives, each of which is covered by a specific section of the program. The objectives of the KMP 2002-2006 are:

1. **MANAGEMENT (LICENSING) OF COMMERCIAL USE.** Manage the utilisation of the four kangaroo species in accordance with the provisions of the National Parks and Wildlife Act 1974 (which contains the framework for the licensing) and Regulation, NSW Government policies, the Code of Practice for the Humane Shooting of Kangaroos and this management program.

2. **ADAPTIVE MANAGEMENT.** Promote adaptive management experiments and studies using historical data from kangaroo industry returns and population data to improve our understanding of kangaroos and their interaction with environmental, social and economic systems.

3. **MONITOR KANGAROO POPULATIONS.** Monitor kangaroo populations and set commercial quotas to ensure kangaroos are utilised in accordance with the management program goal and objectives. Direct and indirect monitoring will be undertaken in all areas where kangaroos are commercially utilised.

4. **MONITOR INDUSTRY COMPLIANCE.** Monitor the kangaroo industry to ensure compliance with this management program, licence conditions, the requirements of the Act and Regulation and the Code of Practice for the Humane Shooting of Kangaroos.

5. **PROGRAM AUDIT AND REVIEW.** Undertake regular audits and a final program review in consultation with affected community, private sector and government stakeholders to ensure that the management is fully informed and to ensure outcomes remain consistent with the goal and objectives of the management program.

6. **COMMUNITY AWARENESS AND PARTICIPATION.** Promote best practice in all aspects of this program through informed public and private sector participation in management of the utilisation of kangaroos.”

The first objective relates to licensing of all of the activities associated with the commercial use of kangaroos. However, the KMP 2002-2006 recognises that management of natural systems has inherent uncertainties. The second objective therefore introduces the expectation that the management program itself will be used to improve knowledge and understanding that will ultimately inform subsequent program reviews. The third (audit conditions of kangaroo populations) and fourth objectives (audit kangaroo industry) make information gathering fundamental to regulation of commercial use and the monitoring of kangaroo populations. Such information is essential to achieve the audit requirements of objective five. The fifth and sixth objectives relate to transparency and accountability of the new program. The fifth objective sets the framework for regular and transparent audit and importantly introduces the requirement for a comprehensive final review. The sixth objective makes management of the program more inclusive, involving mechanisms that not only engage nominated representatives of non-government organisations, but also extends direct contact between program managers and interested parties through a KMP web page. This provides for participation by interested members of the wider community.
Licensing system and conditions for licences
The framework of program management and accountabilities have been strengthened and modernised. However, the day to day operational arrangements have not changed significantly. The general system of licence applications, issuing of licences and tags and submitting returns remains essentially the same. Property owners and existing licence holders will not need to adjust to a new system.

Kangaroo monitoring & commercial quotas
Three techniques may be used for direct monitoring of kangaroo populations.
1. broad-scale aerial surveys using fixed-wing aircraft (fixed strip-width transect surveys);
2. medium / small-scale surveys using a helicopter (line transect surveys) primarily in rugged areas such as the Barrier Ranges that are not suitable for fixed-wing surveys; and
3. small-scale surveys conducted on foot (line transect surveys).

Kangaroo population estimates obtained from direct monitoring are used to determine commercial quotas approved annually by the Commonwealth. The quota will be adjusted based on the most recent population estimate. Full details of survey techniques and data analysis protocols will be contained in the annual kangaroo commercial quota submission to the Commonwealth. Direct monitoring provides population estimates for each Kangaroo Management Zone. Commercial quotas are then set for each zone at a proportion of the population estimate for that zone and at levels considered sustainable in the long-term. The commercial quota for a management zone is the maximum number of kangaroos that can be taken commercially in any calendar year. While the KMP 2002-2006 will run for a maximum of five years, it is sufficiently flexible to allow for consideration and incorporation of new information when annual commercial quotas are determined.

Special quota
When the commercial quota for a Kangaroo Management Zone has been fully allocated, a Special Quota enables kangaroos that would otherwise have been taken non-commercially to be taken commercially and then sold. In this way the Special Quota will minimise the number of kangaroos that are shot and left in the field under the normal non-commercial system. Allocation of special quota also enables a licensed person who has completed the various courses and accreditations for commercial Trappers to take the kangaroos.

Adoption of an adaptive management approach
Our ability to manage natural systems is hampered by uncertainty, limited understanding of the system and natural variation in system processes (Parma 1998). Adaptive management, through controlled intervention and monitoring of outcomes, addresses this uncertainty and attempts to gain an improved understanding of the system. Learning can be accelerated through management deliberately intervening in the system and providing contrasts between different management units (Walters and Holling 1990; Parma 1998). The management program becomes a means to actively gather information for the next review of the program. This is a central strategy of the KMP 2002-2006.

When preparing the KMP 2002-2006, considerable time and resources were devoted to examining the relevant literature. Much of the research appeared to be conceived and conducted on the basis that the results would influence kangaroo management and the commercial use of kangaroos. Often findings were confounded by differences between the artificial experiment and the ‘real world’, e.g., grazing trials conducted in small experimental blocks on Lake Mere (Wilson 1991). Consequently relevance to areas outside of the artificial experiment is questionable and results cannot necessarily be applied in the management program with confidence. Pople and McLeod (2000) also discuss the Lake Mere grazing trials and difficulties in interpreting the results that were caused, in part, by the use of captive kangaroos. It is hoped that results from adaptive management experiments conducted in the real world can be applied more readily to future kangaroo management programs.

Based on Walters and Holling (1990), Parma (1998) and Johnson (1999), the active adaptive management process for the purposes of the KMP 2002-2006 follows these steps:
1. awareness of relevant background information;
2. consideration of alternative models / hypotheses;
3. a monitoring program must be described;
4. critical evaluation of the merits of every experiment / proposal including evidence that risk of permanent damage to kangaroo populations is low;
5. consistent with the program goal; and
6. as understanding of the system improves, consideration of how management may be modified to accommodate the new knowledge gathered from the intervention.

Full details of any active adaptive management experiments approved by NPWS will be in the annual
kangaroo commercial quota submission and posted on the KMP web page.

REFERENCES


