

Review of progress in implementing the 1998 National Koala Conservation Strategy

September, 2008

Department of the Environment, Water,
Heritage and the Arts



Parsons Brinckerhoff Australia Pty Limited ABN 80 078 004 798

*Ernst & Young Centre,
Level 27, 680 George Street
Sydney NSW 2000
GPO Box 5394
Sydney NSW 2001
Australia
Telephone +61 2 9272 5100
Facsimile +61 2 9272 5101
Email sydney@pb.com.au*

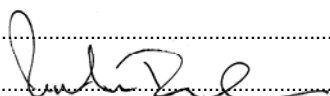
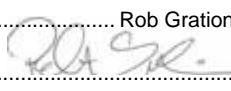
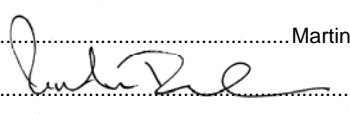
NCSI Certified Quality System ISO 9001

This report should be cited as:

Predavec, M. 2008. Review of progress in implementing the 1998 National Koala Conservation Strategy. Report prepared by Parsons Brinckerhoff for the Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra.

© Parsons Brinckerhoff Australia Pty Limited (PB) [2008].

Copyright in the drawings, information and data recorded in this document (the information) is the property of PB. This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by PB. PB makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information.

Author:Martin Predavec
Signed: .....
Reviewer: Rob Gratton and Bruce Lean
Signed: .....
Approved by:Martin Predavec
Signed: .....
Date: 29 September 2008
Distribution: DEWHA, PB File

Contents

	Page Number
Summary	iii
1. Introduction	1
1.1 The 1998 National Koala Conservation Strategy	1
1.2 The aim and structure of this review	2
2. Current overview	3
2.1 Queensland	3
2.1.1 <i>Status</i>	3
2.1.2 <i>Issues</i>	4
2.1.3 <i>Conservation status, legislation and policies</i>	4
2.1.4 <i>Significant changes in the state over the last 10 years</i>	5
2.2 New South Wales	6
2.2.1 <i>Status</i>	6
2.2.2 <i>Issues</i>	6
2.2.3 <i>Conservation status, legislation and policies</i>	7
2.2.4 <i>Significant changes in the state over the last 10 years</i>	8
2.3 Australian Capital Territory	9
2.3.1 <i>Status</i>	9
2.3.2 <i>Issues</i>	9
2.3.3 <i>Conservation status, legislation and policies</i>	9
2.3.4 <i>Significant changes in the state over the last 10 years</i>	9
2.4 Victoria	10
2.4.1 <i>Status</i>	10
2.4.2 <i>Issues</i>	10
2.4.3 <i>Conservation status, legislation and policies</i>	11
2.4.4 <i>Significant changes in the state over the last 10 years</i>	11
2.5 South Australia	11
2.5.1 <i>Status</i>	11
2.5.2 <i>Issues</i>	12
2.5.3 <i>Conservation status, legislation and policies</i>	12
2.5.4 <i>Significant changes in the state over the last 10 years</i>	13
2.6 Nationally	13
2.6.1 <i>Status</i>	13
2.6.2 <i>Conservation status, legislation and policies</i>	13
2.6.3 <i>Significant changes over the last 10 years</i>	14
2.7 Internationally	14
2.7.1 <i>Conservation status, legislation and policies</i>	14
3. Review methods	17
3.1 Interviews	17
3.2 Written submissions	18
3.3 Literature review	18
3.4 Quotes and key messages	19
4. Review of the Strategy	21
4.1 The primary aim	21
4.2 Threats for koalas	21
4.3 Objective 1: To conserve koalas in their existing habitat	22
4.4 Objective 2: To rehabilitate and restore koala habitat and populations	29
4.5 Objective 3: To develop a better understanding of the conservation biology of koalas	32
4.6 Objective 4: To ensure that the community has access to factual information about the distribution, conservation and management of koalas at a national, state and local scale	34
4.7 Objective 5: To manage captive, sick or injured koalas and orphaned wild koalas to ensure consistent and high standards of care	36
4.8 Objective 6: To manage over-browsing to effectively prevent both koala starvation and ecosystem damage in discrete patches of habitat	38
4.9 The overall Strategy	41
5. Future directions	43

Contents (continued)

	Page Number
5.1 Implementation of the Strategy	43
5.2 Review of the Strategy	44
5.3 Funding the Strategy	44
5.3.1 <i>Tax incentives</i>	44
5.4 Legislative changes	45
5.5 Research and new and emerging threats	47
5.5.1 <i>Climate change</i>	48
5.5.2 <i>Genetics of the koala across its range</i>	48
5.5.3 <i>New diseases — koala retrovirus</i>	48
6. Conclusions	51
7. References	53

List of tables

Table 3-1 Number of interviews and written submissions	18
Table 4-1 Inclusion of threats in state strategies or plans	28

List of figures

Figure 4-1 Scores on the effectiveness of the Strategy relating to Objective 1	23
Figure 4-2 Scores on the effectiveness of the Strategy relating to Objective 2	30
Figure 4-3 Scores on the effectiveness of the Strategy relating to Objective 3	33
Figure 4-4 Scores on the effectiveness of the Strategy relating to Objective 4	35
Figure 4-5 Scores on the effectiveness of the Strategy relating to Objective 5	37
Figure 4-6 Scores on the effectiveness of the Strategy relating to Objective 6	39
Figure 4-7 Scores on the overall effectiveness of the Strategy	41

List of appendices

Appendix A	
Participants – Interviewees and written submissions	
Appendix B	
Literature search	

Acknowledgements

A number of participants provided their time and open comment regarding the implementation and effectiveness of the Strategy. All participants displayed a passion for koalas that is hopefully reflected in the outcomes of this review. The PB team preparing this review included Rob Gration, Ed Meyer, Ellen Ryan-Colton, Bronte Nixon, Leisa Prowse, Emma Dixon and Alex Lewis. From within the Department of the Environment, Water, Heritage and the Arts, support for the review was provided by Glenda Shelley and Saravan Peacock. Valuable input and comment on a draft report was provided by members of the Steering Committee.

Summary

Koalas (*Phascolarctos cinereus*) are tree-dwelling, medium-sized marsupials that have an iconic status: an important part of Australia's natural and cultural heritage. Koalas are found largely on flat, fertile lands of the eastern and southern parts of Australia. These lands are those generally preferred for both urban and agricultural development, and as such, the extent of koala habitat has declined. In 1996 concern for the koala's numbers, welfare and conservation, with its numbers declining in part of its range, resulted in the development of the National Koala Conservation Strategy.

The National Koala Conservation Strategy was signed in 1998 by the Commonwealth, States and Territories through the then Australian and New Zealand Environment and Conservation Council. The Strategy recognised that protecting and managing koalas is a complex task and that the need for a strategic approach to the management of koalas had become urgent, and was needed to maximise the effectiveness of conservation efforts.

The Strategy identified the major issues for koalas as clearing, fragmentation and degradation of habitat, disease, natural disasters, roads, dogs, and over-browsing. The Strategy addressed these issues with six objectives comprising: conservation of koalas in existing habitat; restoration of degraded habitat; better understanding of the conservation biology of koalas; education; management of captive, sick or injured koalas; and management of over-browsing.

The aim of the Strategy was to conserve koalas by retaining viable populations in the wild throughout their natural range.

In 2006 the Natural Resource Management Ministerial Council agreed to review the Strategy. Reviewing the Strategy will allow nationally consistent objectives for protection and management of koala populations to be updated and used as a guide for regional and local land-use decision-makers.

Since the release of the Strategy, major changes have occurred in the legislative context in which the Strategy operates, with new legislation formulated at both state and federal levels — some specific to koalas. There has also been a substantial amount of research and work related to the conservation and management of koalas around the country. Since 1998 there have, however, also been significant local declines in koala populations and koala habitat in Queensland, New South Wales and Victoria, and large numbers of animals continue to die from disease, traffic injury and dog attacks.

In reviewing the Strategy, interviews were completed with a range of stakeholders to determine how effective the strategy had been in achieving its primary aim and the six objectives. Written submissions were also invited.

In general, there has been some work completed towards achieving the aim and objectives of the Strategy, but the Strategy itself has not been properly implemented. There is little evidence to demonstrate that the Strategy has driven any of the achievements over the last 10 years. Although connections can be drawn between the Strategy and some state-based initiatives, such as the koala management and conservation plans in Victoria, New South Wales and Queensland, these connections have not been widely promoted and appear not to be coordinated through the Strategy. There is a lack of implementation of both the aim and the six objectives of the Strategy.

That is not to say that the Strategy cannot work going into the future, the Strategy remains a good framework for the conservation and management of koalas. However, recognition, promotion, funding and leadership are required to ensure that its aim and objectives are met.

However beautiful the strategy, you should occasionally look at the results

Winston Churchill

1. Introduction

In 2006 the Natural Resource Management Ministerial Council agreed to review the National Koala Conservation Strategy (the Strategy), which was signed in 1998 by the Australian Government, States and Territories through the former Australian and New Zealand Environment and Conservation Council. Reviewing the Strategy will allow an update of the nationally consistent objectives for the protection of local koala populations that are under threat, so that they can be used as a guide for regional and local land-use decision-makers.

Koalas (*Phascolarctos cinereus*) are tree-dwelling, medium-sized marsupials that have an iconic status, play an important part of Australia's natural and cultural heritage (Jackson 2007a), and contribute a significant amount to the Australian economy through tourism (Hundloe & Hamilton 1997). Koalas are found largely on flat, fertile lands in the eastern and southern parts of Australia. These lands include areas generally preferred for both urban and agricultural development, and as such, the extent of koala habitat has declined. In 1996 the koala had already been rejected for listing as threatened at the national level, but concern remained for its numbers, welfare and conservation, with its numbers declining in part of its range. The response to this concern was the National Koala Conservation Strategy (1998).

1.1 The 1998 National Koala Conservation Strategy

The National Koala Conservation Strategy (1998) was written in 1996. The Strategy recognised that protecting and managing koalas is a complex task and that the need for a strategic approach to the management of koalas had become urgent in order to maximise the effectiveness of conservation efforts. Following public display, consultation, revision and completion in 1997, the Strategy was signed in 1998.

The Strategy identifies the major issues for koalas as clearing, fragmentation and degradation of habitat, disease, natural disasters, roads, dogs, and over-browsing. The Strategy addresses these issues with six objectives comprising: conservation of koalas in existing habitat; restoration of degraded habitat; better understanding of the conservation biology of koalas; education; management of captive, sick or injured koalas; and management of over-browsing.

The primary aim of the Strategy, based on a number of statements of acknowledgement, recognition and agreement, is to conserve koalas by retaining viable populations in the wild throughout their natural range.

The Strategy indicates the importance of review of the Strategy in light of experience with its implementation and developing knowledge. It indicates further that a review with public consultation would be appropriate after the Strategy had been implemented for a period of five years. This document is the first review of the Strategy since its inception.

The original published strategy consisted of two documents: the Strategy itself (ANZECC 1998) and an overview of current approaches to conservation and management of koalas in Australia (ANZECC 1996). This review relates only to the Strategy document, although reference is made to the overview document.

1.2 The aim and structure of this review

The aim of this review is to gather information on the implementation of the Strategy from a range of responsible parties (those responsible for the implementation of the Strategy) as well as a range of stakeholders. A further aim is to provide recommendations as to how the Strategy may be updated so as to provide for ongoing conservation and management of koalas.

The review is split into the following chapters.

Chapter 2 – Current overview: describes the status, issues and legislative framework relating to koalas in Australia as well as internationally.

Chapter 3 – Review methods: describes the methods used in reviewing the Strategy.

Chapter 4 – Results of the review: presents the information collected during the review.

Chapter 5 – The way forward: discusses changes to the Strategy that should be considered for the future.

Chapter 6 – Conclusions.

2. Current overview

This chapter describes the current status, issues and legislative framework for the conservation and management of koalas within Australia. It highlights the current state of knowledge and in particular highlights changes that have occurred since the release of the Strategy. The 1996 ANZECC overview document that led to the formation of the Strategy (ANZECC 1996) looked at current management and issues relating to koalas — this is used as the baseline condition for much of the discussion in this chapter.

2.1 Queensland

2.1.1 Status

The 1996 overview of current approaches to conservation and management of koalas in Australia (ANZECC 1996) indicated that, at the time, the status of the koala in Queensland was known only at a broad scale, with detailed information coming from local areas. While the document didn't provide numbers, it indicated that there were a number of regions in which the status of the koala was satisfactory, but that overall the koala population was declining. In some areas the koala population had declined severely, and active declines were still occurring. The level of habitat protection was considered to be very poor.

Overall, the summary of status provided in 1996 is very similar to that in 2008. The Nature Conservation (Koala) Conservation Plan 2006 (Queensland Environmental Protection Agency 2006) estimated the number of koalas in Queensland to be between 100,000 and 300,000. This number was based on a variety of local and regional surveys, such as those completed in the Mulga Lands bioregion (Sullivan *et al.* 2004), and more localised population estimates on the coast, such as on the Koala Coast (Dique *et al.* 2003a; Dique *et al.* 2004). The Australian Koala Foundation has suggested that the numbers of Sullivan *et al.* (2004), on which the state population estimate is in part based, may overestimate the abundance of koalas (Australian Koala Foundation 2004c). They suggest a population estimate closer to 50,000 based on potential koala habitat maps (Australian Koala Foundation 2008a).

Given that the earlier overview document did not provide numbers, it is hard to determine at the state level if the numbers of koalas have continued to decline. However, a review of the impacts of land clearing practices on wildlife in Queensland (Cogger *et al.* 2003) estimated that between 1997 and 1999, 19,000 koalas died as a result of clearing of remnant vegetation. The total extent of yearly vegetation clearing in Queensland continued at a relatively constant level at least until 2004 (Cork *et al.* 2006; Natural Resources and Mines 2006), suggesting that the extent of koala habitat and the number of koalas has continued to decline during that period.

In some specific areas where the number of koalas has been estimated, there have been clear population declines. For example, recent (2005-2006) surveys of koalas on the Koala Coast estimated a population of 4,611 animals (Environmental Protection Agency 2007). Based on the 1996-1999 survey estimates of 6,246 koalas (Dique *et al.* 2004), this represents a decline in abundance of 26% over seven years. Surveys in the Pine Rivers Shire (GHD 2008) indicated an average 45% decline in koalas in urban areas between 2001 and 2008, and a 15% decline in bushland areas.

2.1.2 Issues

The overview document identified clearing of habitat for development as the major issue facing koalas in Queensland in 1996, with conservation/welfare issues such as dog attack, road injury and disease secondary issues. There was little protection of koala habitat, particularly on private lands.

The situation today appears to be similar, with the loss and fragmentation of habitat still playing a key role in the decline of koala populations (Dique 2004; Dique *et al.* 2003a). Admission statistics at two south-east Queensland hospitals indicate that the numbers of koalas admitted has remained relatively constant over the last 10 years (an average of 1,241 per year between 1997 and 2007 - Environmental Protection Agency 2008). These numbers suggest that threats to koalas are ongoing, but should be used with caution to indicate trends in population numbers.

The numbers of sick and injured koalas requiring care and rehabilitation is in itself an issue. In 1996 this was considered an important issue in areas where there was a significant interface between koalas and expanding urban populations. Today this continues to be an important issue in Queensland, particularly in the south-east of the state.

The bacterium *Chlamydia* is present in a large proportion of the Queensland koala population (approximately 70%), but overt symptoms of *Chlamydia* related disease are relatively low (approximately 9%). Relatively new diseases such as those caused by the koala retrovirus (Hanger 1998; Hanger *et al.* 1998) are present in the Queensland population, but population level impacts of this virus are not known.

2.1.3 Conservation status, legislation and policies

The *Nature Conservation Act 1992* provides for the listing of native plants and animals into one of the following categories:

- Extinct in the wild
- Endangered
- Vulnerable
- Rare
- Near Threatened
- Least Concern.

The koala is listed as 'vulnerable' under the *Nature Conservation Act 1992* in the South East Queensland bioregion and as 'of least concern' elsewhere in the state.

A Wildlife Clearing Permit is required where a development is proposed to impact species listed from Endangered to Near Threatened in Schedules 2 to 5 of the Nature Conservation Regulation 2006.

The Nature Conservation (Koala) Conservation Plan 2006 (Queensland Environmental Protection Agency 2006) is a subordinate statute to the *Nature Conservation Act 1992*. This plan was prepared following the species being listed as 'regionally vulnerable' within the South East Queensland bioregion. The plan aims to promote the continued existence of viable koala populations in the wild, prevent the decline of koala habitats and promote future

land use and development that is compatible with the survival of koala populations in the wild. Under the plan, and the Nature Conservation (Koala) Management Program 2006–2016, the state has been divided into the following three districts to direct management regimes:

- Koala District A: comprising 12 local government authorities (or part thereof)¹ in the southern portion of the South East Queensland bioregion, where koalas are listed as vulnerable. This district has the highest densities of koalas, but also the greatest threats. Within this district, Koala Habitat Areas have been identified and mapped and are provided statutory protection.
- Koala District B: comprising 8 local government authorities (or part thereof) in the northern portion of the South East Queensland bioregion, where koalas are listed as vulnerable. This district is largely rural and contains lower koala population densities than District A.
- Koala District C: comprising the remaining 56 local government authorities where koalas are found. Although there is evidence of overall decline in koala abundance in this district, they are classed as of least concern because of a lower perceived threat (Queensland Environmental Protection Agency 2006).

Other Queensland legislation and policies in place with relevance to koala conservation include:

- *Integrated Planning Act 1997*
- *Vegetation Management Act 1999*
- South East Queensland Regional Plan 2005-2026.

2.1.4 Significant changes in the state over the last 10 years

Since the release of the Strategy a number of developments have occurred in Queensland that relate either directly or indirectly to conservation and management of koalas. Significant changes overall include:

- Gazetting of the South East Queensland Regional Plan 2005-2026 (this document is currently under review).
- The listing of the koala as regionally vulnerable in the South East Queensland bioregion.
- The integration of koala habitat into the planning process in the South East Queensland region through the release of the Nature Conservation (Koala) Conservation Plan 2006 and the Nature Conservation (Koala) Management Program 2006–2016.
- Introduction of the *Vegetation Management Act 1999*, aimed at controlling the broad-scale loss of vegetation.

¹ Local government authorities in Queensland were amended in March 2008 when a number of former local governments were amalgamated to create new entities. This means that the numbers of local government authorities in each koala district presented in this report differ from those presented in the published Nature Conservation (Koala) Conservation Plan 2006.

2.2 New South Wales

2.2.1 Status

The overview document indicated that by 1996 the koala had disappeared from between 50 and 75% of its known range in New South Wales, with the population estimate placed at between 1,000 and 10,000 animals based on expert opinion provided to the New South Wales Scientific Committee (Lunney *et al.* 2000). More recent studies suggest that the earlier estimate of population numbers across the state were low. A study of koalas in the Pilliga region of New South Wales (Barrott 1999; Kavanagh & Barrott 2001), estimated approximately 15,000 koalas in the Pilliga forests alone.

The New South Wales Scientific Committee further indicated that the population size was known to be rapidly declining in specific regions (Lunney *et al.* 2000). Examples of rapidly declining populations include Pittwater (NSW Scientific Committee 1999b), which declined from a population of 123 in the 1970s to less than six animals in 1998; Tea Gardens and Hawks Nest Populations (NSW Scientific Committee 1999a), declining from 21 animals in 1989 to 12 in 1998; and Iluka (Lunney *et al.* 2002), declining from 16 animals in 1990 to an estimated three animals in 1999. A report on the impact of land clearing in New South Wales (Johnson *et al.* 2007) estimated that 3,591 koalas are killed each year, based on estimates of population density and land clearing extent (this figure is for 1995), suggesting that population declines may still be occurring.

While there is currently no clear indication of koala numbers across New South Wales, a recent community-based survey across the state provides the opportunity to compare results for 1986 with those in 2006. Preliminary results indicate that the koala has experienced declines in many areas along the coast including the north (Tweed Heads and Iluka) and central coast (Taree and Nelson Bay) and in individual areas on the south coast. These data suggest small areas west of the Great Dividing Range may have increased populations (Dan Lunney, Mathew Crowther, Ian Shannon and Jessica Bryant, NSW Department of Environment and Climate Change, *unpublished data*).

2.2.2 Issues

As in Queensland, loss of habitat is a key issue for koalas in New South Wales, with other factors such as dogs, road death and disease related to the loss and fragmentation of habitat. These same issues are evident today in a number of populations around the state. The overview document indicated that koala habitat was poorly represented in national parks and nature reserves around the state (ANZECC 1996). Recent community survey data show that the majority of koala habitat is located on private lands, with 73% of the surveyed grid squares containing koalas on private lands and only 17% in national parks and 10% in state forests (Lunney *et al.* 2007a).

Koalas in New South Wales carry the bacterium *Chlamydia* spp. with the expression of clinical signs more prevalent in animals exposed to environmental stresses (e.g. Hume 1990). The koala retrovirus has been recorded in New South Wales populations.

2.2.3 Conservation status, legislation and policies

The New South Wales *Threatened Species Conservation Act 1995* provides for the listing of native plants and animals into one of the following categories:

- Presumed extinct
- Critically endangered
- Endangered
- Vulnerable
- Endangered population.

The koala is listed as Vulnerable under the NSW *Threatened Species Conservation Act 1995*. In addition, two populations within New South Wales have been listed as Endangered Populations: the population in the Hawks Nest and Tea Gardens area, and the population in the Pittwater local government area. The listing of a species under the *Threatened Species Conservation Act 1995* triggers the need for assessment of projects under Section 5A of the *Environmental Planning and Assessment Act 1979* (the seven part test) or under heads of consideration for State significant projects assessed under Part 3A of the Act.

Under the *Threatened Species Conservation Act 1995*, 32 priority actions have been developed for the koala (Department of Environment and Climate Change 2008). A draft recovery plan has also been prepared for the koala (NSW National Parks and Wildlife Service 2003b) that takes its objectives directly from the Strategy. While this document has been in draft form since 2003, it is understood that the recovery plan will be finalised soon. A recovery plan has also been prepared and approved for the Hawks Nest and Tea Gardens population (NSW National Parks and Wildlife Service 2003a) that again takes its objectives directly from the Strategy.

Recently the Department of Environment and Climate Change released a management framework for the far south coast koala populations in New South Wales (EcoLogical Australia 2006). The management framework is not equivalent to a recovery plan as defined by the *Threatened Species Conservation Act 1995*, or a comprehensive or individual Koala Plan of Management as defined in State Environmental Planning Policy 44 - Koala Habitat Protection (SEPP 44), but rather seeks to inform the future development of such documents (EcoLogical Australia 2006).

Clearing of Native Vegetation is listed as a Key Threatening Process under the *Threatened Species Conservation Act 1995*. The koala is listed in the final determination for this threatening process as a species that may be adversely affected (NSW Scientific Committee 2001). However, no threat abatement plan has been prepared.

At the local government level, protection for koala habitat is provided by SEPP 44. This policy was enacted in 1995 and aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas, in order to ensure that permanent, free living populations are maintained over their present range. It requires the assessment of potential and core koala habitat in conjunction with local councils. Under this SEPP 'potential koala habitat' refers to areas of native vegetation where the trees that are listed in Schedule 2 of the policy constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. 'Core koala habitat' refers to land with a resident population of koalas, evidenced by attributes such as breeding females and recent sightings as well as historical records of a population.

SEPP 44 applies to land within local government areas listed in Schedule 1 of the policy for which a development application has been made and for which Council is the determining authority. SEPP 44 does not apply to land listed under the *National Parks and Wildlife Act 1974*, or the *Forestry Act 1916* as state forest or flora reserve, or to land where Council is not the determining authority.

Part 3 of SEPP 44 relates to preparation of plans of management relating to koalas. These can be prepared for:

- the whole of a local government area listed in Schedule 1, or
- a part of such a local government area (including an area of land that is the subject of a development application).

All plans of management must be approved by the Director-General of the Department of Environment and Climate Change.

Some plans of management have been prepared (e.g. Port Stephens and Coffs Harbour - Lunney *et al.* 1999; Port Stephens Council 2002), although others have remained in draft form (e.g. Campbelltown and Taree - Callaghan *et al.* 2002; Callaghan *et al.* 2003), despite being finalised a number of years ago. However, the number of plans prepared is small compared to the 106 Council areas listed in SEPP 44 as containing koala habitat.

Part 4 of SEPP 44 relates to the identification of potential and core koala habitat and giving consideration to preparing an appropriate development control plan for land that is, or adjoins, core koala habitat.

The SEPP also gives authority to the Director-General of the Department of Environment and Climate Change to require studies as part of a local environment plan if it is proposed to zone or rezone land that is potential koala habitat or core koala habitat, other than where it is proposed to be rezoned for environmental protection.

Other New South Wales legislation in place with relevance to the conservation of koalas includes:

- *Environmental Planning and Assessment Act 1979*
- *Native Vegetation Act 2003*
- *National Parks and Wildlife Act 1974*
- *Exhibited Animals Protection Act 1986*
- *Local Government Act 1993*.

2.2.4 Significant changes in the state over the last 10 years

Since the release of the Strategy a number of developments have occurred in New South Wales that relate either directly or indirectly to the conservation and management of koalas. Significant changes overall include:

- Preparation of the draft Koala Recovery Plan.
- Two populations have been listed as Endangered under the *Threatened Species Conservation Act 1995*.
- A plan of management has been prepared for the South Coast populations.

- Comprehensive Koala Plans of Management have been prepared for Coffs Harbour and Port Stephens.
- A state-wide community-based survey of koalas was undertaken in 2006.
- The *Native Vegetation Act 2003* was enacted, aiming to reduce broad scale vegetation clearing on rural lands and providing for protection of vegetation on private property.

2.3 Australian Capital Territory

2.3.1 Status

In 1996 the status of free-ranging koalas in the Australian Capital Territory was unknown, but were thought to be low density (ANZECC 1996). This is still the case today, with generally only transient animals occurring. Even though more than 50% of the territory is protected in national parks or reserves, very little of the area within the territory containing forest vegetation is considered to be koala habitat (Murray Evans, Senior Wildlife Ecologist, ACT Government, *personal communication*, 19 August 2008).

2.3.2 Issues

The main issue then and now for koalas in the Australian Capital Territory relates to management of captive populations. A small number of koalas were kept in an enclosure at Tidbinbilla Nature Reserve, all of which were sterilised, being derived from Kangaroo Island translocated stock. All of these animals were killed by significant fires in 2003 (one survived in 'intensive care' until 2008, when she was put down). The koalas at Tidbinbilla are for public display, and the territory government has sourced another eight sterilised koalas from Kangaroo Island, to replace the lost animals. These koalas do not play any part in any conservation programs apart from raising public awareness (Murray Evans, Senior Wildlife Ecologist, ACT Government, *personal communication*, 19 August 2008).

2.3.3 Conservation status, legislation and policies

The koala is not listed under the Australian Capital Territory *Nature Conservation Act 1980*.

Other legislation in place relevant to the conservation of koalas in the Australian Capital Territory includes:

- *Animal Welfare Act 1992*
- *Land (Planning and Environment) Act 1991*.

2.3.4 Significant changes in the state over the last 10 years

There has been no change in the status of koalas within the Australian Capital Territory over the last 10 years.

2.4 Victoria

2.4.1 Status

The overview document indicates that koalas were widespread throughout much of lowland and eastern Victoria, with high population numbers in some areas, however much of the remaining habitat was fragmented, resulting in isolated populations (ANZECC 1996). The overview doesn't mention numbers of animals within the state. Neither does it discuss as part of the status section that the majority of animals within Victoria are the result of a long history of translocations (Menkhorst 2008). Victoria's Koala Management Strategy (Menkhorst 2004) similarly does not discuss numbers across Victoria, but does indicate that densities are generally low (less than 1 per hectare), but that in some areas higher densities can occur.

Numbers of koalas in certain regions of Victoria have played an important role in the ongoing debate about numbers of koalas nationally. In response to the nomination to list koalas under the United States *Endangered Species Act 1973* (see Section 2.7), Roger Martin indicated that numbers of koalas in the Strathbogie Ranges were in the order of between 50,000 and 180,000. These numbers have been questioned, however, by the Australian Koala Foundation and Stephen Phillips (Phillips 2000) and have been used to highlight the uncertainty regarding koala population numbers.

2.4.2 Issues

Overabundance and translocation of koalas was put forward in the overview document as the major issue relating to koalas in Victoria (ANZECC 1996). The Victorian translocation program has a long history, with over 24,600 koalas translocated to over 250 release sites across Victoria between 1923 and 2006 (Jackson 2007a; Menkhorst 2008). The goal of the initial program of translocation in Victoria was restocking of habitat that had seen significant declines in population numbers, as well as addressing overabundance issues in some island populations (e.g. Quail, French and Phillip Islands). More recently, however, the goal of translocation has related to addressing the issue of over population in some habitat isolates where over-browsing has taken place.

Translocation also raises the issue of genetic variability given that many of the koalas in Victoria come from limited founding stock. This has reduced the overall genetic variability of koalas in the state and lowers their overall contribution to the national conservation of the species. An exception to this appears to be the Strzelecki population, which has the highest level of allelic diversity and heterozygosity in Victoria (Seymour *et al.* 2001).

Associated with the translocation program is a program of sterilisation. Monitoring of individuals released through translocation immediately following surgical sterilisation showed a high rate of mortality (Parks Victoria 2003). More recently a significant research program into the use of subdermal contraceptives has been undertaken (e.g. Mate *et al.* 1998; McLean 2003; Middleton *et al.* 2003) so as to reduce the impacts on individual animal welfare.

The loss of habitat in Victoria was considered a major issue at the time of the overview document, with only 6% of privately-owned lands still containing more than 10% tree cover. The limited amount of tree cover is still an issue in Victoria, with land clearing continuing throughout 2001 to 2004 (Cork *et al.* 2006), although the extent of clearing has been slowed due to legislation aimed at improving the overall cover of vegetation.

The bacterium *Chlamydia* is present in Victoria's koala populations, although its distribution and impacts are not fully understood (Menkhorst 2004). However, populations on French Island and at Tower Hill and Framlingham are *Chlamydia* free (Jackson 2007b).

2.4.3 Conservation status, legislation and policies

The koala is not listed as a threatened species under the Victorian *Flora and Fauna Guarantee Act 1988*, but is listed as Other Protected Wildlife under the *Wildlife Act 1975*. This Act places responsibility for native fauna in Victoria under the Crown.

Victoria has in place a Koala Management Strategy (Menkhorst 2004), which is intended to sit beneath the National Koala Conservation Strategy. The management strategy identifies key issues that influence koala population trends and management in Victoria along with the objectives to be achieved in order to address each key issue and actions that need to be undertaken.

At the local level, Ballarat City Council has developed a draft Comprehensive Koala Plan of Management (Schlagloth et al. 2006a). The purpose of the plan is to provide for the long-term survival of koala populations through the implementation of actions aimed at safeguarding the koala within its natural range within the municipal boundaries. Associated with the plan is an Environmental Significance Overlay that provides the opportunity for Council to assess developments in terms of their possible impacts on identified environmental characteristics.

Other Victorian legislation and policies in place with relevance to the conservation and management of koalas include:

- *Environment Effects Act 1978*
- Victoria's Native Vegetation Management – A Framework for Action
- *Catchment and Land Protection Act 1994*
- *Local Government Act 1989*.

2.4.4 Significant changes in the state over the last 10 years

Since the release of the Strategy a number of developments have occurred in Victoria that relate either directly or indirectly to conservation and management of koalas. Significant changes overall include:

- release of Victoria's Koala Management Strategy
- establishment of the Koala Technical Advisory Committee
- preparation and endorsement of the Ballarat Comprehensive Koala Plan of Management
- an ongoing program of translocation and management
- the introduction of Victoria's Vegetation Management Framework.

2.5 South Australia

2.5.1 Status

The status of koalas within South Australia was, and is, characterised by introductions and reintroductions, with the majority of existing populations outside the natural range of the

species. Original stocks of 18 koalas from French Island in Victoria were released onto Kangaroo Island between 1925 and 1936. Further animals were released onto the island in the 1950s (Jackson 2007b). During the 1960s, animals from Kangaroo Island were released onto mainland South Australia both outside their natural range on the Eyre Peninsula as well as into their former range in the south-east of the state.

By 1994 numbers of koalas on Kangaroo Island were estimated at between 3,000 and 5,000. Concern was raised about the impacts of this density of animals on the island's vegetation (St. John 1997), particularly on the manna gums, with significant areas of canopy defoliation. A control program was implemented in 1997 that included both sterilisation and translocation off the island to mainland South Australia. Surveys in 2001 estimated approximately 27,000 animals on Kangaroo Island, suggesting that earlier population estimates were significant underestimates (Masters et al. 2004). It should be noted that past and current estimates of koala numbers on Kangaroo Island have been questioned by the Australian Koala Foundation (see Wilks 2007).

The koala population on the island is now estimated at 16,000. Eight thousand animals have been sterilised over the past 10 years and 4,000 have been relocated to the south-east of the state.

2.5.2 Issues

The issue for koalas in South Australia was, and is, one of management of numbers. The introduced populations on Kangaroo Island are largely free of predators and disease, which has allowed population numbers to increase. This has resulted in issues for the conservation of habitat and the environment on the island, which is affected by the high numbers of koalas. These issues have, controversially, caused koalas to be considered a pest in the majority of South Australia by some researchers (Masters et al. 2004).

The issue of how to manage very high numbers of an iconic species in introduced habitat remains. After originally recommending culling as an option to reduce numbers of animals on the island, the Koala Management Task Force revised their recommendations following significant public and political backlash (see Lunney et al. 2007b; Wilks 2007). Culling is not supported as a management technique by either the South Australian Government, or by the National Koala Conservation Strategy.

The introduced population on the mainland in the Mount Lofty Ranges is also increasing. This area is in the urban fringe and the increase of both koalas and humans in the area has resulted in increased animal welfare issues relating to dog attack and road injuries.

2.5.3 Conservation status, legislation and policies

The koala was, until recently, listed as Rare under Schedule 9 of the South Australian *National Parks and Wildlife Act 1972*. It was removed from the Schedules in February 2008. The Act does not provide for any significant consequences to flow from such listing other than penalties relating to taking, keeping or killing of protected species. Wildlife habitat is protected under the *Native Vegetation Act 1991*.

Currently there is no state plan of management or strategy relating to management of koalas in South Australia.

2.5.4 Significant changes in the state over the last 10 years

There have been few changes in South Australia relating to the management of koalas as it is seen as an ongoing process. The koala has been removed from the Schedules of the *National Parks and Wildlife Act 1972*.

2.6 Nationally

2.6.1 Status

The status of the koala nationally is a difficult issue that has been the subject of significant debate and controversy (see Phillips 2000). On the one hand population estimates are largely made up of information presented above from each of the states, but at the same time the International Union for the Conservation of Nature (IUCN) criteria from local regions cannot be added to determine the overall national status (IUCN 2001). The number of koalas nationally was the focus of the nomination of the koala for listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Australian Koala Foundation 2004c) and the subsequent advice of the Threatened Species Scientific Committee to the Minister to reject the nomination (Threatened Species Scientific Committee 2006). A key focus of the determination was the extent of habitat loss, and therefore, numbers of koalas over three generations. Although the Threatened Species Scientific Committee agreed that there had been significant historical declines of koalas, they concluded that this did not amount to declines equal to 30% over three generations (Threatened Species Scientific Committee 2006). While there has been information collected on population change at the local scale (see state information above), there has been little apparent change in the information at the national scale since the advice of the Threatened Species Scientific Committee. The federal Minister of the Environment recently announced that the koala is included in the Finalised Priority Assessment List for the assessment period commencing 1 October 2008 (Department of the Environment Water Heritage and the Arts 2008). This means that the status of the koala at the national level will be reassessed.

2.6.2 Conservation status, legislation and policies

The primary piece of legislation relating to environmental protection at the national level is the EPBC Act. The koala was nominated twice for listing as Threatened under the former *Endangered Species Protection Act 1992* and once under the EPBC Act. The koala is not listed under the EPBC Act. The assessment of the nomination under the EPBC Act found that the koala did not meet the requirements for listing as a threatened species (Australian Koala Foundation 2004c).

The primary focus of the EPBC Act is matters of national environmental significance, which includes nationally threatened species. Assessment under the Act is triggered when an action is likely to have a significant impact on a matter of national environmental significance (Department of the Environment and Heritage 2005). As such, unless a species is listed under the Act, the Act will not be triggered.

Some protection for koalas under the provisions of the EPBC Act relates to actions occurring on Commonwealth land (e.g. lands owned by the Department of Defence) or carried out by Commonwealth agencies. Under the provisions of the Act, actions on Commonwealth land or carried out by Commonwealth agencies must consider the potential impacts of the action

on the environment, including any environmentally sensitive features (Department of the Environment and Heritage 2006).

The Act also lists Key Threatening Processes, which currently includes Land Clearance (Threatened Species Scientific Committee 2001). Land clearance is considered a major threat to koalas in some regions. The Act indicates that a threat abatement plan can be prepared for Key Threatening Processes, but the Threatened Species Scientific Committee has recommended that a threat abatement plan is not considered a feasible, effective or efficient way to abate the process of land clearance and that each state and territory should prepare an individual response (Threatened Species Scientific Committee 2001).

The EPBC Act also controls the export of animals for education or exhibition purposes. The koala is singled out along with Platypus, Wombats and Tasmanian Devils (along with listed threatened species) as a species requiring special 'Ambassador Agreements' on their care, transport and disposal, including any progeny.

Although they contain no legislative powers, two national documents consider the koala and its conservation status. The koala is listed as Lower Risk (Near Threatened) under the Action Plan for Australian Monotremes and Marsupials (Maxwell *et al.* 1996). This document is based on the IUCN red list criteria. The action plan includes the completion and implementation of the National Koala Conservation Strategy as an action (Maxwell *et al.* 1996).

The koala was listed as one of six indigenous pest species in the State of the Environment Indicators for Exotic Environmental Pest Species (Clarke *et al.* 2000). The reason given for this listing related to the loss of eucalypts as a result of high population numbers of koalas and over-browsing in introduced and isolated populations such as Kangaroo Island (Clarke *et al.* 2000).

These listings highlight the complexity of koala conservation and management at the national level. As noted by Krebs, 'a ... complex situation arises when a desirable native species like the koala is having detrimental impacts on other native species' (Krebs 2007).

2.6.3 Significant changes over the last 10 years

Since the release of the Strategy a number of changes have occurred nationally that relate either directly or indirectly to conservation and management of koalas. These include:

- Introduction of the EPBC Act.
- The nomination and subsequent rejection of the nomination to list the koala as Vulnerable under the EPBC Act.

2.7 Internationally

2.7.1 Conservation status, legislation and policies

Until recently, at the international level the koala was listed as Lower Risk/Near Threatened (LR/nt) by the IUCN (Australasian Marsupial & Monotreme Specialist Group 1996). A taxon is Lower Risk when it has been evaluated, but does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Near Threatened taxa do not qualify for the category Conservation Dependent, but are close to qualifying for Vulnerable.

In the 2008 IUCN Red List, the koala has been listed as Least Concern in view of its wide distribution, presumed large population, and because it is unlikely to be declining at the rate required to qualify for listing in a threatened category (IUCN 2008).

The 2008 IUCN evaluation lists the threats for the koala as including:

- 1 - Residential & commercial development
- 1.1 - Housing & urban areas
- 5 - Biological resource use
- 5.3 - Logging & wood harvesting
- 7 - Natural system modifications
- 7.1 - Fire & fire suppression
- 7.1.3 - Trend Unknown/Unrecorded
- 8 - Invasive & other problematic species & genes
- 8.1 - Invasive non-native/alien species (IUCN 2008).

In 2000, the koala was listed as 'Threatened' under the United States *Endangered Species Act 1973* by the United States Fish and Wildlife Service, citing the continued loss and deterioration of limited habitat as the primary cause for the listing. The *Endangered Species Act 1973* is not restricted to species native to the United States, or those subject to international trade. The Act considers national boundaries, but makes that consideration secondary to the concern for the survival of species. Under the Act the US Fish and Wildlife Service is obliged to make a determination in response to a petition, regardless of the geographic location or extent of the species (US Fish and Wildlife Service 2000). To date 568 species of animal outside the jurisdiction of the United States have been listed under the *Endangered Species Act 1973*, including 46 Australian species. The Act lists a total of 1,238 species of animal. Listing under the Act has little legal standing outside of the United States apart from restrictions on trade of the species and allowances for the provision of conservation funds. The listing does, however, place restrictions on the movement of koalas between zoos within the United States and from the United States to other countries.

3. Review methods

Information gathering for the review was based on a combination of interviews, written submissions and literature review of work published or released since 1998.

3.1 Interviews

Interviews were completed with a range of participants, based on an initial list provided by the Steering Committee for the review. This list was developed further and added to following discussions and interviews. The aim of the interviews was to cover a broad range of stakeholders from varied backgrounds.

In total, 56 interviews were completed (refer Table 3-1 and Appendix A). The majority of interviews were undertaken over the telephone, although some were completed face to face, either individually or in groups.

Interviews were completed using an interview guide to ensure consistency of interviews. Questions related to:

- the participant's area of work relating to koalas and how the Strategy influenced their work
- the current threats to koalas (including those covered by the Strategy and others)
- the effectiveness of the Strategy in achieving the primary aim of conserving viable populations in the wild throughout their natural range
- the effectiveness of the Strategy in relation to each of the six objectives
- changes needed to the Strategy
- the level at which the Strategy is pitched.

For each of the six objectives outlined in the Strategy, and for the Strategy as a whole, interview participants were asked to score the effectiveness of the Strategy on a scale of 1 to 5, with 1 being very ineffective, 5 being very effective and 3 being neutral. The aim of the scoring was to focus the responses rather than provide extensive numerical data for analysis. However, the results of these scores are graphically presented in the review so as to present the overall impression and spread of the responses. Some participants felt that they could not provide scores for specific objectives because the objectives were not relevant to their area of work, which has resulted in different total scores for different objectives. Although participants have different levels of knowledge and experience on the various factors covered by the Strategy, the responses of all participants have been treated equally in the presentation of the results.

The scores are presented based on the primary organisation of the participant (grouped as Government at all levels, University, Wildlife/Conservation Group), although it is recognised that many participants work across multiple groups (for example both conservation groups and government contribute towards research). The scores are presented based also on the primary state in which the participant undertakes work on koalas, although again it is recognised that some participants work across multiple states. Scores based on states are not presented for South Australia, since not enough participants from that state provided scores. The position of those participants is still reflected in the review and summary of the data.

Participants were asked if their name could be listed in the review, but it was agreed at the start that names would not be attributed to specific comments unless they related to data that couldn't otherwise be referenced.

Interviewees were provided with a web link to the Strategy and were asked to read the document prior to the interviews.

Participants were given the opportunity to provide further information outside of the interviews in the form of written submissions.

3.2 Written submissions

Written submissions were invited through an advertisement placed in The Australian newspaper on 5 July 2008 as well as on the Department of the Environment, Water, Heritage and the Arts website. The advertisement was further sent out to a range of stakeholder groups asking for it to be passed on through their networks.

Thirty-eight written submissions were received (refer Table 3-1 and Appendix A).

Table 3-1 Number of interviews and written submissions

Group*	Number of interviews	Number of written submissions	Total participants
Wildlife carer/hospital	3	10	13
Commonwealth government	1	-	1
State/Territory government	20	-	20
Researcher	20	1	21
Local government	5	3	8
Developer	1	-	1
Conservation group	6	16	22
Other	-	8	8
TOTAL	56	38	94

A number of participants can cross a number of categories (e.g. a number of researchers are also associated with State Government or with conservation groups), but have been listed in terms of their primary association

3.3 Literature review

In order to gauge the amount of research and publications related to each of the six objectives, and koalas in general, a general search of the literature was completed. This is presented in Appendix B. The overall relevance of each piece of work was determined for the six objectives (refer Appendix B).

3.4 Quotes and key messages

Selected quotes from interviews and written submissions have been included in the review in separate text boxes, but are not attributed to participants. If taken from a written submission then a direct quote is provided. Quotes from interviews are paraphrased. The quotes were selected to be representative of the general position of the participants relating to a particular objective or topic.

Key messages are also included in the text relating to each of the objectives and the Strategy as a whole. These key messages are presented as a summary of the overall impression presented by the participants, as a means of consolidating the information, and do not necessarily represent the position of all participants.

4. Review of the Strategy

This chapter presents the results of the review. It looks separately at the primary aim of the Strategy, the effectiveness of implementing the six objectives, as well as the Strategy as a whole.

4.1 The primary aim

The primary aim of the Strategy is to conserve koalas by retaining viable populations in the wild throughout their natural range. Within the Strategy this aim is arrived at following a number of points of acknowledgement, recognition and agreement that set the framework for the Strategy.

Only a few points were raised about the primary aim of the Strategy. One participant stressed that the aim did not reflect the fundamental solution, which was the preservation of sufficient habitat into the future. This point has been put forward by Clarke *et al* (2000), who suggest that the general aim lacks the specificity concerning process and content necessary for practical implementation. It should be noted however that the first point of agreement in the Strategy is that conservation of koalas depends on the conservation of their habitat.

4.2 Threats for koalas

The Strategy lists the major issues for koalas as:

- habitat loss, fragmentation and degradation
- over-browsing
- natural disasters
- disease
- roads
- predation by dogs.

The Strategy further identifies loss of habitat as the major threat to koalas and the main factor responsible for declining populations.

Habitat loss is still a major threat for koalas, but many participants put an equal, if not greater, focus on the fragmentation of habitat as a result of habitat loss. Fragmentation is seen as a major driver for other issues coming into play, including predation and road kill, and increasing the effects of issues such as disease, natural disasters and over-browsing (e.g. Hume 1990). The interaction between the various threats is also important. For example, habitat fragmentation can lead to stress in the animals, which in turn may increase their susceptibility to diseases such as those caused by *Chlamydia* spp.. Disease may in turn make the animals more susceptible to attack from dogs.

A number of new or emerging threats are also important for the koala, including:

- climate change, including changes in food nutritional quality, fire regimes and drought
- emerging infectious diseases, including the koala retrovirus
- loss of genetic diversity.

These additional threats are discussed further in Section 5.5.

4.3 Objective 1: To conserve koalas in their existing habitat

To be achieved by:

- Identification and conservation of habitat important for koala conservation and where appropriate legal protection of habitat of major significance to koala conservation.
- Monitoring koala habitat and koalas at a national, regional and local level.
- Integration of koala conservation planning into local government planning processes.
- Development and implementation of incentive-based mechanisms for conservation of koala habitat on private land.
- Implementation of strategies which minimise the impacts of dogs on koala populations in both urban and rural areas.
- Development of appropriate road design in koala habitat.
- Inclusion of threats such as fire, extractive industries, disease and drought in local and State and Territory strategies.

This objective is a major thrust of the Strategy, dealing with major threats facing extant populations of koalas.

Overall, the majority (57%) of participants felt that the Strategy had been either very ineffective or ineffective relating to conserving koalas in their existing habitat (refer Figure 4-1). This opinion was particularly held by those involved in conservation or wildlife carer groups, but was not as prevalent among those involved in research or in government agencies. Comparison across the states showed that the Strategy was generally seen to be more effective by participants from Victoria and New South Wales than from those from Queensland (refer Figure 4-1). This pattern may be the result of a greater percentage of participants from New South Wales and Victoria being from government agencies.

A number of participants put forward the continuing decline in numbers in some regions as evidence that the Strategy had not been effective in terms of this broad objective. For example, recent (2005-2006) surveys of koalas in the Koala Coast of Queensland estimated a population of 4,611 animals (Environmental Protection Agency 2007). Based on the 1996-1999 survey estimates of 6,246 koalas (Dique et al. 2004), this represents a decline in abundance of 26% over 7 years. The largest declines in this region were associated with urban areas (Environmental Protection Agency 2007). More recent surveys in more localised areas of south-east Queensland suggest even greater declines (GHD 2008). Similar local declines have been recorded in NSW (e.g. Iluka - Lunney et al. 2002) and Victoria (e.g. Ballarat - Schlagloth *et al.* 2006b).

Some participants acknowledged good on-the-ground works or strategies such as SEPP 44 in New South Wales or Comprehensive Koala Plans of Management, but suggested that these works either predated the Strategy or else were not the direct result of the Strategy.

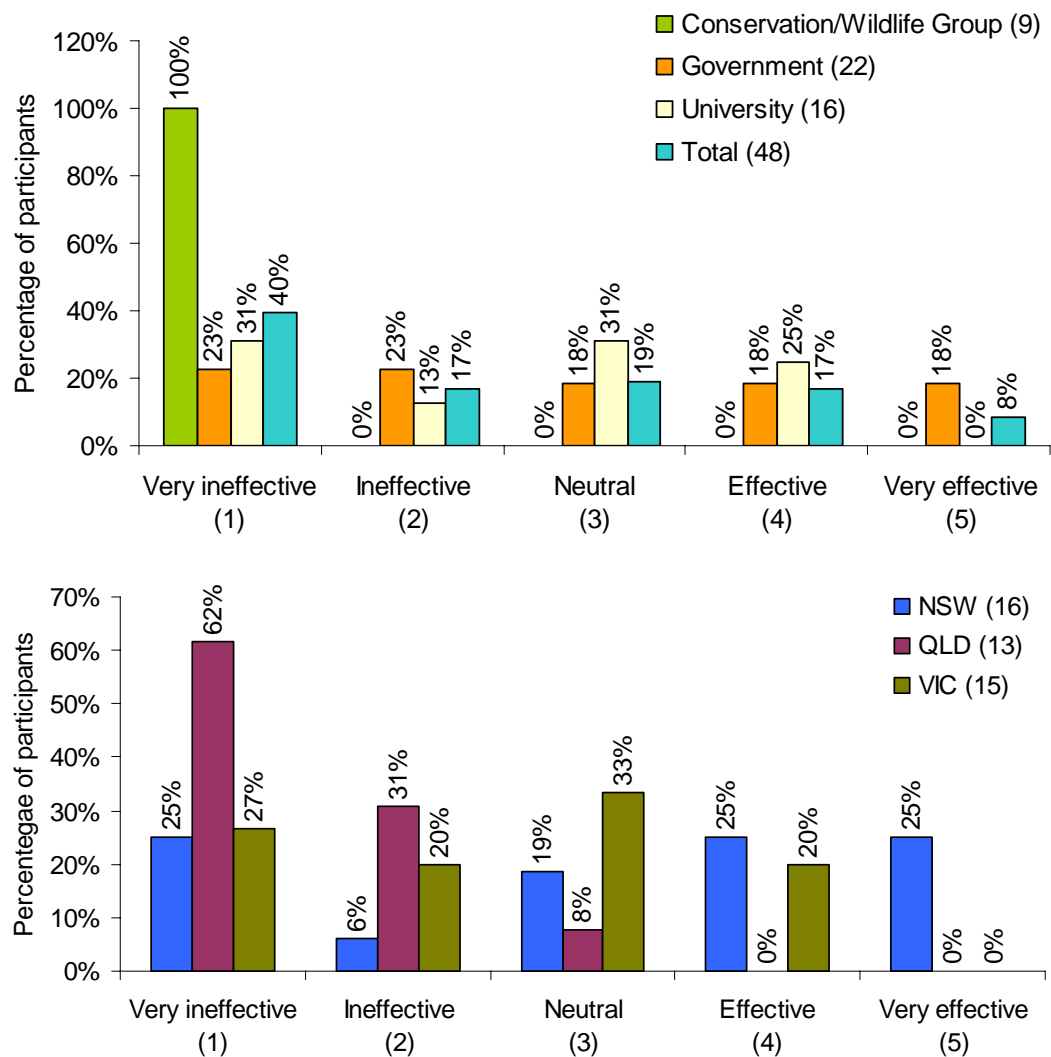


Figure 4-1 Scores on the effectiveness of the Strategy relating to Objective 1

Given the range of issues covered by this broad objective and the seven actions, each action is in this case considered separately.

Identification and conservation of habitat important for koala conservation and where appropriate legal protection of habitat of major significance to koala conservation

Identification and subsequent protection of key habitat for a species is vital for effective conservation.

'Some progress has been made in mapping important habitat. Some degree of protection has occurred, but it may be too little, too late. Stronger protective measures are needed.'

This has not occurred in any sense nationally. Where mapping has occurred, it appears generally to have been undertaken across small, local areas and was not driven by the Strategy. A number of participants pointed towards the koala habitat mapping completed by the Australian Koala Foundation (e.g. Australian

Koala Foundation 2008b; Callaghan *et al.* 2000; Phillips & Callaghan 1996) as evidence of work completed under this objective. However, while some mapping of habitat has been completed, this has not necessarily translated into conservation and legal protection of the mapped habitat.

The management/conservation/recovery plans of Queensland (Queensland Environmental Protection Agency 2006), New South Wales (NSW National Parks and Wildlife Service 2003b) and Victoria (Menkhorst 2004) all include mapping of koala habitat and the translating of this into protective measures and actions. Koala habitat has been mapped in south-east Queensland (Koala District A) as part of the Nature Conservation (Koala) Conservation Plan 2006 (Queensland Environmental Protection Agency 2006). The plan does provide protection to this habitat, although the extent of mapping and the level of protection has been criticised (GHD 2008). In other areas it appears that in only a few cases, such as where Comprehensive Koala Plans of Management have been prepared (e.g. Coffs Harbours, Port Stephens and Ballarat - Lunney et al. 1999; Port Stephens Council 2002; Schlagloth et al. 2006a) has the mapping been translated into conservation of habitat.

While some progress had been made in achieving this objective and some degree of protection had occurred, the protection or conservation of habitat had not gone far enough to halt the overall loss of habitat.

Monitoring koala habitat and koalas at a national, regional and local level

Monitoring of habitat and populations at various spatial scales is important. Much focus has been placed on changes of habitat at the national scale, since it is at this level that the determination of listing under the EPBC Act is considered (Australian Koala Foundation 2004c; Threatened Species Scientific Committee 2006). However, monitoring at the local scale is also important in determining appropriate conservation and management measures for a population. For example research in Noosa suggests that when the spatial extent of habitat within a landscape falls below 45%, koalas are less likely to be present, while research at Port Stephens suggests a similar threshold of 40% (McAlpine et al. 2006b). Recent research has highlighted regional variation in habitat-occupancy thresholds (Rhodes et al. 2008) and warned against applying general rules across different landscapes. Also important is monitoring of the size, shape and arrangement of habitat patches within the landscape (McAlpine et al. 2006a; McAlpine et al. 2006b). Monitoring of koala habitat has also been carried out at the state level in order to detect changes as a result of over-browsing (Menkhorst 2004, 2008).

Most progress in terms of monitoring of habitat and koala populations has been achieved at the local or regional scale (e.g. Environmental Protection Agency 2007; Masters et al. 2004). However, there has not been a consistent approach to monitoring habitat or numbers, with a variety of different methods used. This means that a comparison between areas of survey is often difficult and the surveys cannot easily be combined to provide information for larger regions. Once again, the monitoring that has occurred has not been a result of the Strategy, but rather put in place and driven by individuals or local organisations.

Integration of koala conservation planning into local government planning processes

This objective was seen as one of the most important, in that planning decisions are largely made at this level and it is at the local level that influence can be brought to bear on private lands, where the majority of koala habitat occurs. There are some good examples of this having occurred, particularly with the preparation of Comprehensive Koala Plans of Management. Such plans have been prepared in a few cases at a shire-wide scale (e.g. Ballarat, Coffs Harbour and Port Stephens) or at the scale of local development (e.g. Koala Beach Estate).

'As things stand KPOMs are being created on an ad hoc basis whereby each area of potential and core habitat is being dealt with in a piecemeal fashion with no data being available on the cumulative effect on the koala population.'

In New South Wales the link to local planning processes is found within SEPP 44. The purpose of this policy is to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas, in order to ensure that permanent, free living populations are maintained over their present range. It requires the assessment

of potential and core koala habitat in conjunction with local Council. Part 3 of SEPP44 relates to preparation of plans of management relating to koalas.

Part 4 of SEPP44 relates to the identification of potential and core koala habitat and giving consideration to preparing an appropriate development control plan for land that is, or adjoins, core koala habitat.

Schedule 1 of SEPP 44 lists 106 council areas that the SEPP applies to, yet only two Comprehensive Koala Plans of Management have been prepared and implemented — Coffs Harbour and Port Stephens (Lunney et al. 1999; Port Stephens Council 2002). While a few other plans have been prepared, they remain drafts (e.g. Campbelltown – Callaghan *et al.* 2003).

A similar pattern is seen in Victoria where the Victorian management strategy indicates that habitat should be identified and planning controls put in place. However, only one Comprehensive Koala Plan of Management has been prepared in Victoria (Ballarat).

It is tempting in these cases to see the links between the Strategy and the local plans of management. While the plans do make reference to the Strategy and follow through with its actions and objectives, the Strategy was not the driving force behind the development of these local plans. For example, the Ballarat Plan of Management supports the actions of the Victorian Management Strategy (see page 12 of the Ballarat Plan) but the plan was commenced before the Victorian strategy was put in place. This highlights the issue of how much of the completed work is a direct result of the Strategy and how much would have happened regardless. In many cases the success stories appear to be driven by individuals or small groups rather than by the Strategy.

Within Queensland, the Nature Conservation (Koala) Conservation Plan 2006 does integrate koala habitat protection with local planning schemes, at least in Koala District A, which has the highest density of koalas and the greatest threats from increasing development. The plan allows koala habitat to be identified in planning schemes and for local infrastructure to be designed and located in appropriate areas to minimise impacts to koala habitat. The plan allows for the Environmental Protection Agency to be a concurrence agency under the *Integrated Planning Act 1997* for development proposed in identified koala habitat areas. Development proposals must address koala conservation criteria prior to approval. The Queensland plan has, however, been criticised in that it allows for a number of exemptions to occur, including community infrastructure, mineral extraction and 'committed developments' (Bragg 2006) and in that it places the responsibility of extending koala habitat mapping with local governments (e.g. GHD 2008).

There appears to be no consistent approach to how the Strategy and koala conservation is integrated with local planning processes and little in the way of follow-through with the plan. Accepting that each state must conform to local planning acts, the few examples of local koala plans of management that exist indicate that a relatively consistent approach can be

developed. Once again the point was made strongly by participants that gains have resulted from local efforts and have not been the result of the Strategy.

Development and implementation of incentive-based mechanisms for conservation of koala habitat on private land

Both at the state and national levels, a wide range of programs are available to provide incentives for land owners to protect biodiversity and vegetation on private lands. These programs address a variety of objectives, employ a range of methods and are delivered via different organisations including the Australian Government, state, territory and local governments, natural resource management regional bodies, industry organisations and other non-government organisations. Current programs include: funding schemes for on-ground works, such as Caring for our Country and landcare; voluntary conservation agreements and public covenants with associated tax benefits; and non-binding agreements such as Wildlife Refuges or Land for Wildlife that provide extension services. The level of incentives varies considerably across the different programs.

These schemes can clearly contribute towards conservation of koala habitat. Within Queensland, as of May 2006, 205 nature refuges protecting 464,365 hectares were registered with the Environmental Protection Agency across the state, with at least 10 protecting koala habitat (Queensland Environmental Protection Agency 2006). Similarly, in New South Wales, many Voluntary Conservation Agreements are on sites that support koalas or potential koala habitat and an agreement has been established at Wedderburn for the primary purpose of conserving koalas (NSW National Parks and Wildlife Service 2003b).

While certain mechanisms are in place, there appears, however, to be little connection to Koala habitat *per se*. and no link to the Strategy.

It is also noted that some current tax incentive schemes relating to the agricultural and private forestry industries may in fact encourage the clearing of native vegetation, including at times koala habitat.

Implementation of strategies which minimise the impacts of dogs on koala populations in both urban and rural areas

Attacks from dogs can cause stress, injury or death to koalas. Dog attacks can occur in both rural and urban areas, but the impact is likely to be most significant in rapidly expanding urban areas where there is a high density of dogs. There is a strong relationship between the density of dogs in an area and the number of koala attacks (de Villiers *et al.* (in press)). A summary of koala hospital presentations for the years 1997 to 2007 in south-east Queensland indicated that 1,277 koalas had been presented at the EPA Koala Hospital, Moggill, and the Australian Wildlife Hospital, Beerwah, as a result of dog attacks (Environmental Protection Agency 2008). Nine hundred and seventy-three of these animals were either dead on arrival or were euthanased on arrival. In an area where the koala population is declining (Dique 2004; Environmental Protection Agency 2007; GHD 2008), this is a significant number.

A radio-tracking study of koalas in the Port Stephens area indicated that dog attacks accounted for 43% of recorded mortality (Lunney *et al.* 2004). Based on these data, a study using population viability analysis indicated that reducing dog-related mortality could have a significant impact on both rate of survival of koalas and their population numbers (Lunney *et al.* 2007c).

In most cases, control of dogs at the local level relates to control of dogs in public spaces supported by education of dog owners (e.g. Port Stephens Council 2002). However, in some cases there have been attempts to bring control onto private properties. For example, under Pine Rivers – Local Law 42 – Animal Control, Clause 26(2) states that ‘the keeper of a dog at premises in a Designated Koala Area shall, on becoming aware there is a koala at large upon the premises, protect such koala by restraining or confining the dog until the koala has left the premises’ (Ashworth 1998). In a plan of management for a new residential estate (Koala Beach Estate) dogs are not allowed into the development (Australian Koala Foundation 2004b). However, these examples are the exception and policing of such laws may be difficult, particularly as they relate to private property.

Development of appropriate road design in koala habitat

In a similar manner to dog attacks, koala hospital statistics indicate that vehicle deaths are a major cause of mortality in koalas. Between 1997 and 2007, 3,767 koalas were presented to two koala hospitals in south-eastern Queensland as a result of being hit by a vehicle (Environmental Protection Agency 2008). Of this number 2,350 were dead on arrival and a further 787 were euthanased on arrival (Environmental Protection Agency 2008). As with mortality from dog attacks, this number of deaths is significant in a population that is declining (Dique 2004; Dique et al. 2003b; Environmental Protection Agency 2007; Pyper 2004).

There has been some success in relation to reducing wildlife road mortality, particularly along state-controlled roads and highways. The provision of fauna fencing, underpasses, and in some cases overpasses, has proved successful in a number of cases, such as along the Pacific Highway in New South Wales (Australian Museum Business Services 2001a, 2001b, 2001c, 2001d).

Mortality from vehicle collisions on local roads is still a significant issue that has not been sufficiently addressed in terms of infrastructure planning and education (see McAlpine et al. 2006b).

Inclusion of threats such as fire, extractive industries, disease and drought in local and State and Territory strategies

Three of the five states and territories where koalas live have plans or strategies relating to koalas. However the threats listed in the Strategy are generally not included in specific management actions within the state strategies — apart from fire in the case of the New South Wales recovery plan and disease in the Victorian strategy (refer Table 4-1).

Local strategies such as the Ballarat Comprehensive Koala Plan of Management (Schlagloth et al. 2006a) and Coffs Harbour Comprehensive Koala Plan of Management (Lunney et al. 1999) do include actions related to threats such as fire.

Table 4-1 Inclusion of threats in state strategies or plans

State ¹	Fire	Extractive industries	Disease	Drought
QLD	Included as a threat but with no associated actions.	Included as an exemption under certain circumstances.	Included in the plan as a threat and as part of determining the health of populations.	Included as a threat but with no associated actions.
NSW	Actions including related to informing relevant Bush Fire Management Committees of koala habitat and suitable fire regimes.	Not included.	Included as a threat but with no associated actions.	Included as a threat but with no associated actions.
VIC	Not included.	Not included.	Actions relating to investigating the role of disease in population processes.	Not included.

1: Queensland - Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 (Queensland Environmental Protection Agency 2006), Victoria - Victoria's Koala Management Strategy (Menkhorst 2004), New South Wales – draft recovery plan for the koala (NSW National Parks and Wildlife Service 2003b).

Key messages relating to Objective 1

1. Some work has been completed relating to mapping koala habitat but there is not enough focus on the conservation and protection of this habitat.
2. There are no standard techniques in place to map koala habitat or monitor koala numbers
3. Some local governments have put in place Comprehensive Koala Plans of Management and this is seen as a good way of incorporating the goals of the Strategy at the local level. However, there is no consistent approach to implementing such plans.
4. There is a need to initiate work/planning at the local level directed from above.
5. Some good results from these strategies and from actions such as effective road design could be more widely implemented.
6. Work that has been completed under this objective has largely not been the result of the Strategy and would have happened regardless.

4.4 Objective 2: To rehabilitate and restore koala habitat and populations

To be achieved by:

- Revegetation to re-create and supplement habitat, and/or link areas of habitat with corridors to facilitate natural dispersal.
- Complying with the 1987 IUCN Translocation Guidelines for translocations of koalas for introductions, reintroductions and restocking.
- Provision of extension and advisory services to encourage retention and restoration of koala habitat and implement management practices on private land which are not harmful to koalas or koala habitat.
- Integrate koala conservation objectives more effectively into existing Government revegetation programs.

In many areas of the koala's natural range, habitat has been lost and fragmented and in some cases local populations have gone extinct. Revegetation is seen as an important strategy in order to re-create habitat and in particular link areas of habitat that have in the past been fragmented. In areas where koalas have become locally extinct or severely depleted, translocation is an option for restocking.

The majority of participants (64%) felt that the Strategy had been very ineffective or ineffective in implementing this objective (refer Figure 4-2), despite it being important overall. The same pattern was evident across the three groups of participants identified, but was strongest amongst the conservation and wildlife care groups. This pattern was not, however, consistent across the three states. Participants in Queensland and New South Wales generally thought that the Strategy had been ineffective with regard to this objective. Participants in Victoria thought generally that the Strategy had been effective, particularly with regard to the translocation program (refer Figure 4-2).

'In our view work which supports broadly agreed objectives and priorities at the local and regional level is more likely to contribute to the maximisation of koala management and conservation outcomes than work which is uncoordinated or unknown to other local and regional stakeholders.'

With regard to revegetation, the work that has been done is generally small-scale and driven by local communities rather than by the Strategy. Positive examples provided by participants related to specific examples where success had been achieved by local landcare groups. For example one participant indicated that Lismore Council had been successful in receiving two grants under the

NSW Environmental Trust program to restore and increase koala habitat in Lismore's south-east key habitat area. Revegetation programs can work. For example recent studies by State Forests in New South Wales indicate that koalas will use eucalypt plantations within five years of them being established (R. Kavanagh, NSW State Forests, *personal communication*, 1 July 2008).

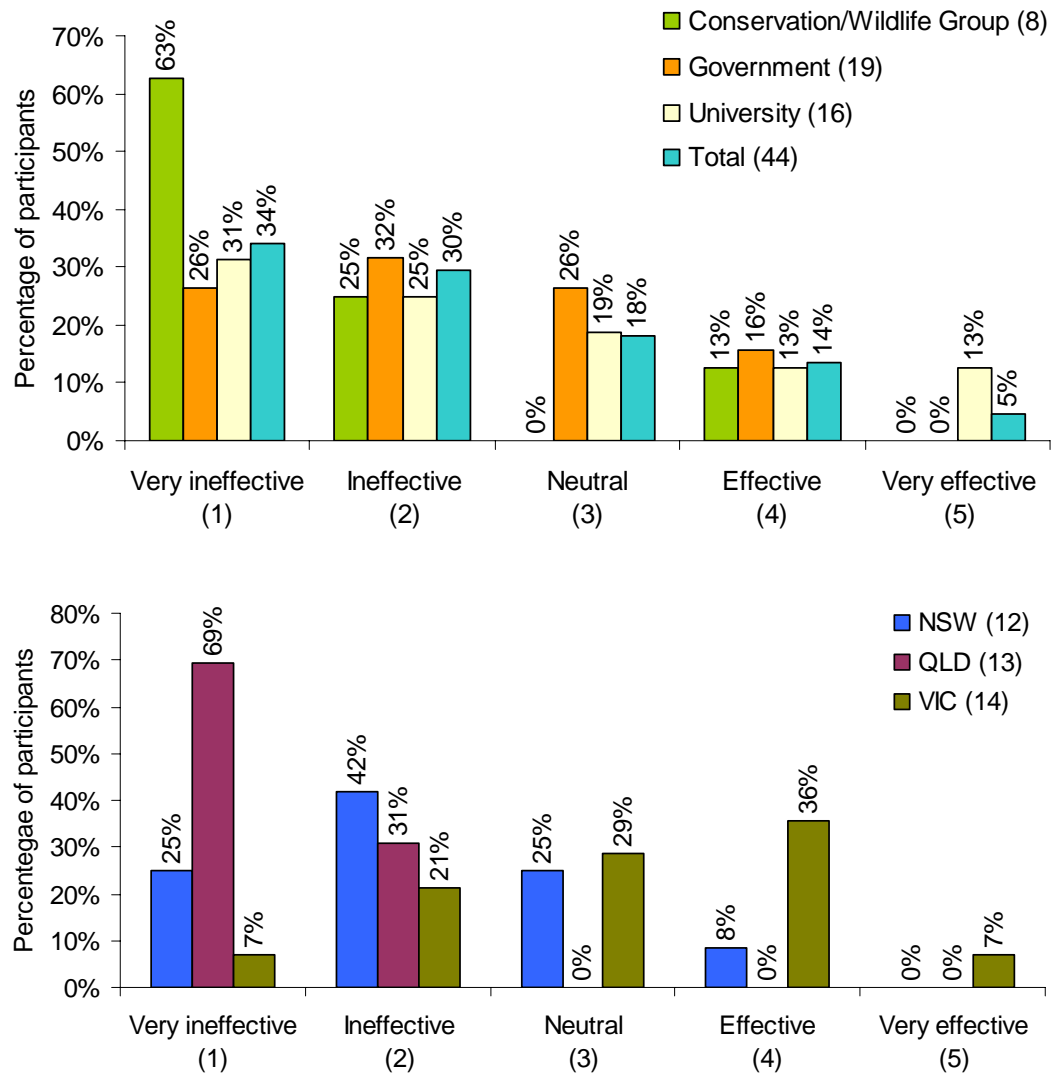


Figure 4-2 Scores on the effectiveness of the Strategy relating to Objective 2

The revegetation/rehabilitation works completed appear to be ad hoc and generally lack coordination. There is a general lack of funding for rehabilitation programs and the Strategy has not led to national initiatives for revegetation, possibly through integration with existing funding opportunities.

The funding that is available is not targeted specifically towards koala habitat, and there is little integration of the Strategy with existing funding initiatives. Recent Federal initiatives, such as Caring for our Country, are a good opportunity for the Federal government to support initiatives relating to the protection of koala habitat. A priority area of the Caring for our Country initiative is biodiversity and natural icons, which could presumably include koalas. There is also potential for carbon trading and sequestration programs to contribute to koala habitat protection and restoration. What is required is a mechanism to link these initiatives with the Strategy, and to identify and prioritise projects relating to the rehabilitation and restoration of koala habitat.

Translocation guidelines are included in the Queensland Koala Conservation Plan (Queensland Environmental Protection Agency 2006), Victoria's Koala Management Strategy (Menkhorst 2004) and the draft New South Wales Koala Recovery Plan (NSW National Parks and Wildlife Service 2003b). Although these documents do not make reference to the 1987 IUCN Guidelines for Translocation (IUCN 1987), they do generally follow the principles.

Victoria has used translocation extensively over a number of years, with over 24,000 koalas translocated to approximately 250 release sites in the program's 84 years (Menkhorst 2008). Translocation in Victoria has, however, moved from being a means of reintroduction/restocking to a control means for overabundant populations. A similar program of translocation is being implemented in South Australia.

'IUCN guidelines are not being followed and we are seeing translocation replace habitat protection. This is not appropriate as carrying capacity is unknown and/or underestimated.'

Different views were put forward as to the success of the translocation program, and to what constitutes a measure of success. On the one hand it has been suggested the translocation program in Victoria has resulted in koalas being widespread (albeit in fragmented habitat) across much of their former range (see Menkhorst 2008). Within South Australia, the translocation program has partially contributed towards the reduction of browsing pressure on

the vegetation of Kangaroo Island, although it has contributed to increased pressure in other areas. At the population level many view the translocation programs as a success.

At the level of the individual animal, some argue that often translocation has been inappropriate and unsuccessful and that strict guidelines have not been followed. Low survival rate of translocated animals had, in some cases, been used to argue that translocations have been mismanaged. For example, a monitoring trial of animals translocated to Mount Eccles National Park showed mortality rates between 27.3% and 90.9% (61.8% across all groups including both intact and sterilised individuals) (Parks Victoria 2003). The Australian Koala Foundation has produced ethical standards and protocols for wild koalas involved in management and research activities (Australian Koala Foundation 2004a).

The issue of genetics relating to translocation is also important. The founding stock of the French Island population in Victoria was small, creating a genetic bottleneck. Using this population to restock mainland Victoria has resulted in reduced genetic variability in this state (refer Section 5.5.2) compared to other areas. A similar pattern is seen in South Australia on Kangaroo Island and on the mainland.

There is a need for a national approach to translocation — putting in place standards and guidelines that take into consideration the conservation and management drivers for translocation as well as the welfare of individual animals. Development of national strategies and guidelines form part of the IUCN position statement (IUCN 1987).

Key messages relating to Objective 2

1. Revegetation programs tended to be small-scale and directed from a local level. Overall coordination is needed in this regard.
2. Available funding opportunities have not been realised with regard to the restoration of Koala habitat.
3. Translocation has been extensively used, particularly in Victoria and South Australia, and success has varied across several components of the program:
 - a. translocation, particularly in its early stages of use, has been successful in widening the distribution of the koala
 - b. partially successful in reducing pressure from over-browsing
 - c. in a small number of cases translocations have resulted in negative impacts on the welfare of individual koalas, particularly when combined with surgical sterilisation..
4. There is a need for national standards for translocation.

4.5 Objective 3: To develop a better understanding of the conservation biology of koalas

To be achieved by:

- Rigorous scientific research which is essential to guide effective koala management practices, including:
 - Mapping and assessment of koala populations
 - Identification and ranking of koala habitat
 - Assessment of koala population dynamics
 - Formulation and testing of approaches to re-establishing and/or recovering koala populations and habitat
 - Assessment of the economic and other non-biological values of koalas to local communities and Australia generally.

Important elements of conservation biology are monitoring and understanding the success of management actions, so that they can be modified for future use. This objective relates to the undertaking of sound research into the biology of koalas so that management can be targeted in the future.

'We need a more holistic approach. Currently koala research is driven by independent research groups, and these efforts need to be better coordinated. The research efforts have not however been driven by the Strategy.'

More than any other, this objective produced a split response from participants (refer Figure 4-3). It was felt generally that a lot of research had been completed on conservation biology of koalas; much of the results of this work can be seen in Appendix B.

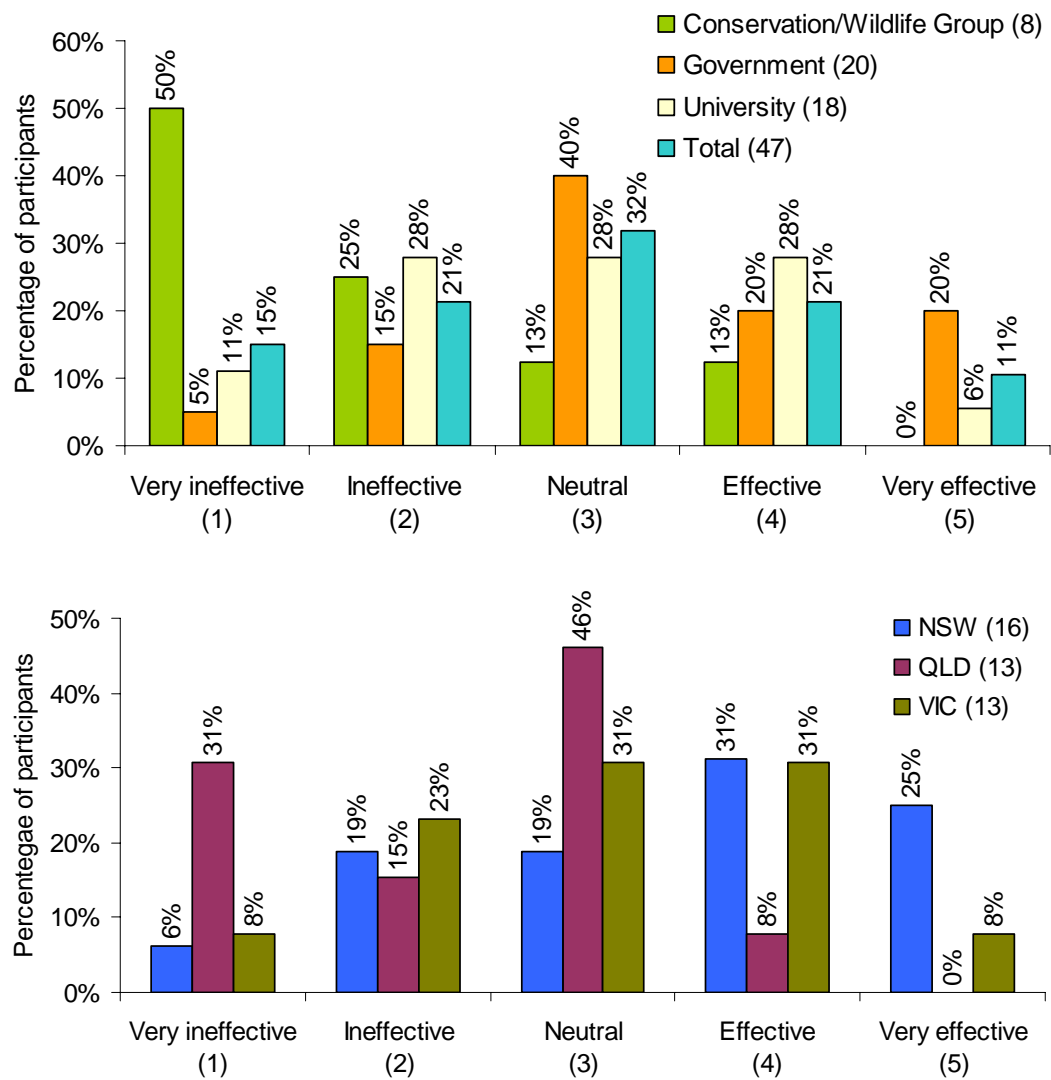


Figure 4-3 Scores on the effectiveness of the Strategy relating to Objective 3

'Some progress has been made as there is an improved knowledge and understanding of koala biology. However this is not the result of the Strategy as such, although some Commonwealth support has come via the Australian Research Council (ARC). ARC applications do not make reference to the Strategy, nor does the Commonwealth give priority to funding of research that addresses the Strategy's objectives.'

Three hundred and fifty papers published or released since 1998 are listed in Appendix B. This is not a complete list of all publications during this time, but it gives a good representation of the extent of work completed and their relevance to the Strategy (refer Appendix B). This extensive body of work builds upon the extensive work completed prior to 1998. It is fair to say that we know a lot about the biology of the koala.

It appears that the work completed and published since 1998 was not a direct result of the Strategy and that an opportunity has been missed in terms of directing and coordinating research and in particular setting research priorities.

Participants picked up on the issue of funding for research and presented a mixed view of the influence of the Strategy in obtaining research funding. Some researchers indicated that they have used the Strategy to support their application for research funding, while others indicated that the Strategy was rarely used in obtaining funding.

Key messages relating to Objective 3

1. A lot of research has been completed on the conservation biology of koalas, however, an opportunity has been missed in terms of directing and coordinating research effort.

4.6 Objective 4: To ensure that the community has access to factual information about the distribution, conservation and management of koalas at a national, state and local scale

To be achieved by:

- Development and distribution of educational material to provide accurate information about the distribution, conservation and management of the koala.
- Involvement of the community in koala conservation.

The Strategy is very clear that community participation is important, because much koala habitat occurs on private land, and acknowledges that the community has a significant role to play in the conservation of koalas and their habitat.

'The community collects good information and willingly provides it to agencies – but the community is often bullied and exploited in this regard.'

According to 65% of those interviewed, the Strategy has been very ineffective or ineffective in achieving this objective (refer Figure 4-4). While state governments and non-government organisations (e.g. Australian Koala Foundation) have played a significant role in dissemination of information, this is often ad hoc and lacking in general

coordination. Some participants indicated that information that was available was often not factual — such comments were levelled at both non-government and government organisations.

'Very little information is provided to the community, and if so, it is difficult to access. This suggests the Strategy is ineffective.'

There were differences in the responses provided by participants in different states, with those in New South Wales presenting a more positive picture (refer Figure 4-4). Participants who indicated that the Strategy had been effective pointed to the access that was provided to scientific

results and literature and the willingness of researchers to publish their data and views. The conservation debate surrounding koalas in the wider community was seen as a positive element, although access to information such as the success or otherwise of translocation programs, was seen as an element largely missing from the available information. Another missing element was data relating to wildlife care programs, including methods used and the number of animals cared for. While much of these data are provided to government agencies, they are not generally made available to the wider community.

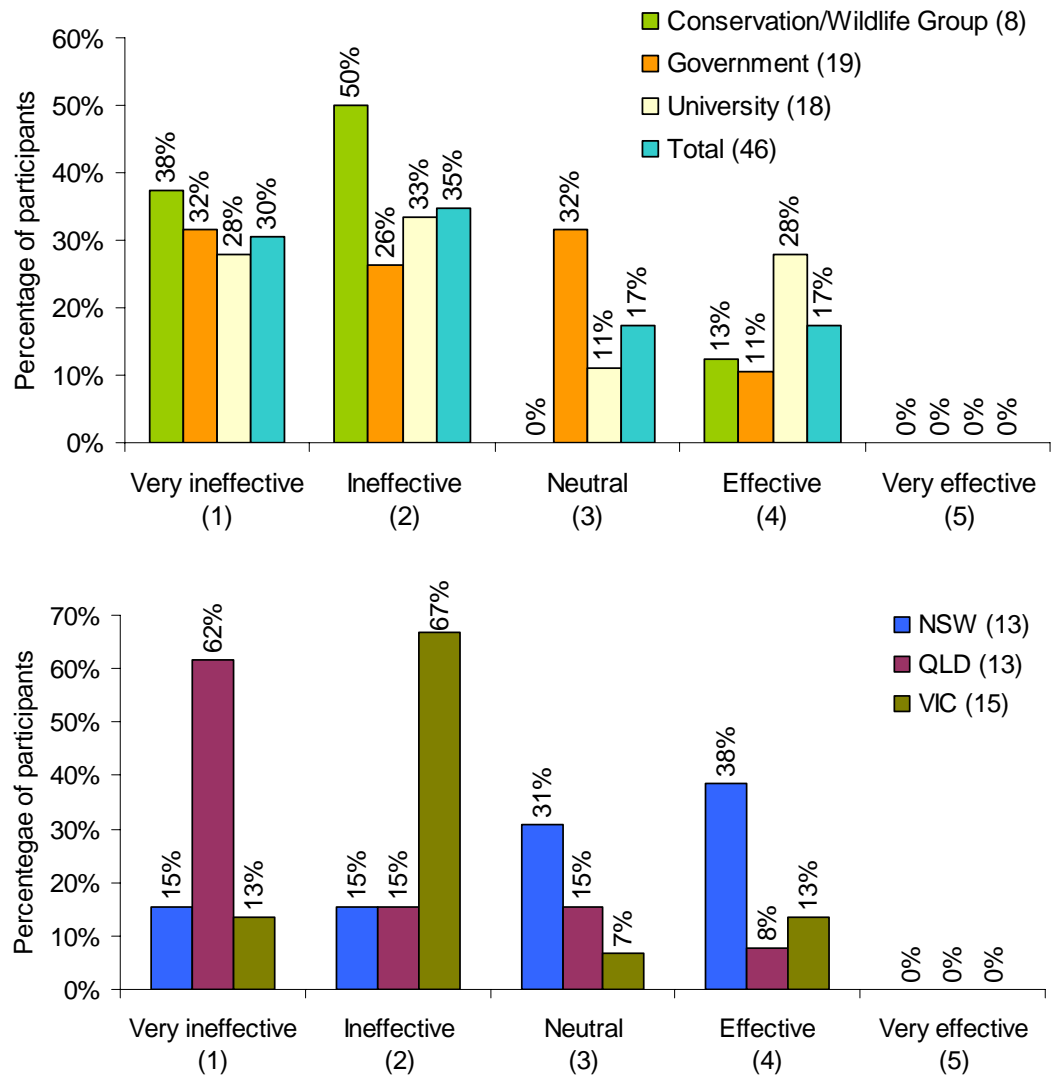


Figure 4-4 Scores on the effectiveness of the Strategy relating to Objective 4

Education of children with regard to koala conservation was seen as an important element of any conservation program. This is an opportunity to reach not only children, but also the wider community. The koala could be used as a flagship species, informing the community of wider biodiversity issues.

Key messages relating to Objective 4

1. Although information is generally available, it is often not in a format that is readily available to the wider community. There has been little coordination of the information that is available.
2. While a lot of government data is available, better access to data needs to be given, which may inform the overall conservation and management debate.
3. Information both from and for wildlife care groups should be made more broadly available.

4.7 Objective 5: To manage captive, sick or injured koalas and orphaned wild koalas to ensure consistent and high standards of care

To be achieved by:

- Development of national guidelines for all aspects of captive care and management.
- Further develop conditions and agreements under the *Wildlife Protection (Regulation of Imports and Exports) Act 1982* for export of koalas.

A large number of injured or orphaned koalas are brought into care each year. For example, in south-eastern Queensland 13,678 koalas were taken to two hospitals over a period of 11 years from 1997 (Environmental Protection Agency 2008). Of this number 3,031 animals were released.

Rehabilitation of injured koalas can be successful: a study comparing the rate of survival of rescued and rehabilitated koalas with that of uninjured koalas following fire in the Port Stephens area indicated a similar rate of survival (Lunney et al. 2004).

This objective showed the most positive responses from those interviewed (refer Figure 4-5), largely related to the good work of individuals. However, there were differences among the groups represented, with the conservation and wildlife care groups giving lower overall scores for this objective. There were also overall differences among states, with more positive responses coming from New South Wales. Overall it appears that the level of care provided by individuals and groups is good. As with other objectives, however, it appears that much of the good work carried out relating to the care of koalas is being driven by individuals or non-government groups rather than by the Strategy.

National guidelines for the care and rehabilitation of koalas have not been developed, although state-based guidelines pre-dating the Strategy do exist (e.g. Lunney & Matthews 1997). Care of sick or injured koalas is covered under State strategies and plans in Queensland, Victoria and NSW, but there is inconsistency in how care is delivered within the plans and in how the plans and care are delivered and monitored. Some participants indicated a variable level of care around the country.

'The Strategy is entirely ineffective. Standards are not high enough overall, although some institutions are doing a good job. Injured animals require prompt medical attention and this is not being provided.'

There is a need to have consistent guidelines across the country based on the good work that is currently carried out by individuals. There is also a need for guidance and direction on when care should be given as well as how — particularly in cases where over-browsing may be occurring or during catastrophes such as fires.

A major concern raised by many participants was the general lack of support and funding for both wildlife carers and veterinarians who support them. While many veterinarians provide their time free of charge, medicines are often charged back to the wildlife carer, which can over a year amount to a considerable sum. Some participants felt that there was a need for tax relief or the like for veterinarians who supplied support to wildlife carers.

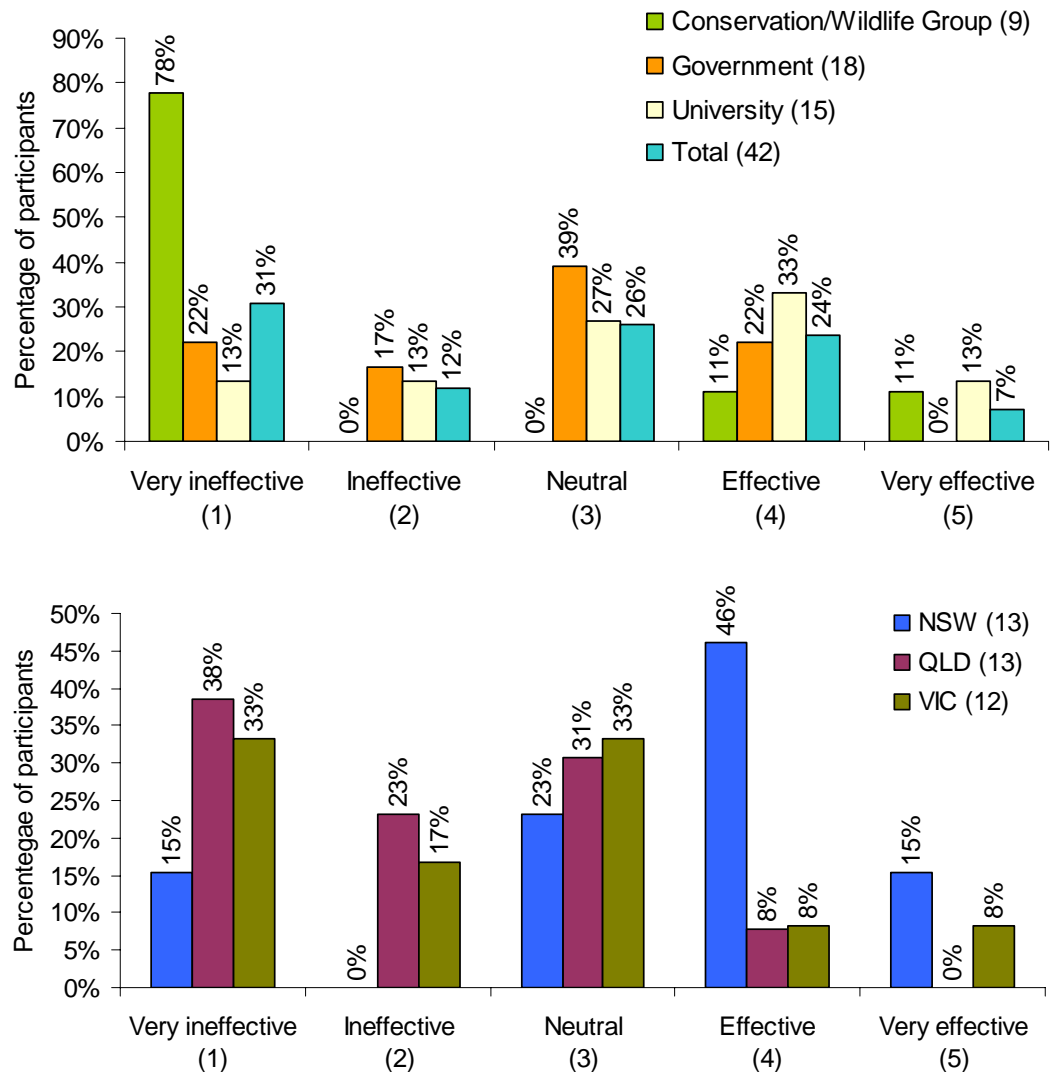


Figure 4-5 Scores on the effectiveness of the Strategy relating to Objective 5

Guidelines have been produced on the care of koalas by the Australasian Society of Zoo Keepers (Jackson et al. 2000). These guidelines include the *NSW Exhibited Animals Protection Act Standards for Exhibiting Koalas in New South Wales* and the *Queensland Wildlife Parks Association Code of Practice for Exhibiting Fauna in Queensland* (1995). The Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) have also produced a guide relating to koalas in zoos (ARAZPA 1999). The Commonwealth government has prepared guidelines for the conditions of overseas transfer of koalas (Department of the Environment and Heritage 2004).

Some participants felt that this overall objective does not have a place in a Strategy concerned with conservation, given that it is a welfare issue. However, the number of koalas presented at hospitals in areas where populations are declining suggests that wildlife carers can, and do, make a significant contribution to the continued survival of these populations. Directions and a coordinated approach to care will only benefit the koala.

A final point raised by a number of wildlife carers was that carers should be represented on any steering committee relating to the Strategy.

Key messages relating to Objective 5

1. There is inconsistency of care and survival across the country. The Strategy has not influenced the delivery of care.
2. There is a need for national guidelines that cover all aspects of care of injured koalas, including direction on when care and rehabilitation should and should not be used.

4.8 Objective 6: To manage over-browsing to effectively prevent both koala starvation and ecosystem damage in discrete patches of habitat

To be achieved by:

- Identification of potential problems at an early stage through regular assessment of koala abundance and the extent of crown defoliation of preferred food tree species.
- Development of management programs to regulate koala density to a level below that which causes severe tree defoliation.

This objective relates to the environmental impact associated with high, and unsustainable, densities of koalas, particularly on islands or in isolated habitat patches. Over-browsing has been recognised as an issue in Victoria for a number of years (Menkhorst 2008) and in parts of South Australia, particularly on Kangaroo Island (Masters *et al.* 2004; Wilks 2008).

Many of the participants felt that they did not have the knowledge or expertise to comment on this objective given that it related largely to the issues occurring in South Australia and Victoria and hence did not provide scores. Scores provided by participants overall were however evenly spread, with 35% of participants feeling the Strategy had been either ineffective or very ineffective, 32% indicating the Strategy had been effective or very effective and 32% presenting a neutral position. (Figure 4-6). Interestingly, while over-browsing is an issue in areas of both Victoria and South Australia, the major focus of comment from many participants was the South Australian situation.

Out of the entire review, this objective provided one of the few instances where participants showed directly a link between the Strategy and actions on the ground. The foreword of the Strategy indicates that the issue of culling was considered in the development of the Strategy, but was rejected as a management tool by Ministers at the meeting of Council in 1996. This statement within the Strategy has been used to justify the South Australian Government position to oppose culling of koalas and is highlighted in the discussion of culling in the Victorian Koala Management Strategy (Menkhorst 2004).

'A disproportionate amount of time and money has been invested in managing over-browsing. There should be a realistic scrutiny based on science rather than emotion to decide the cost effectiveness of translocations..'

Participants working on the ground in South Australia indicated that there had been progress towards protecting habitat and identifying numbers on Kangaroo Island. Numbers of koalas are fewer on Kangaroo Island than 10 years ago. The population has gone from an estimated 27,000 in 2001 (Masters *et al.* 2004) to approximately 16,000.

Eight thousand animals have been sterilised over the past 10 years and 4,000 have been

relocated to the south-east of South Australia. As a result there has been improvement in the overall habitat quality on the island, although some put forward the idea that the level of habitat restoration was not sufficient. While the Strategy was seen as having influenced the design of the control program, it has had little influence over the last five years in terms of on-ground delivery other than to stop culling. Some participants indicated that the program on Kangaroo Island was largely reactive and that the underlying causes of increased numbers and habitat degradation were not well understood and hence were not being effectively managed.

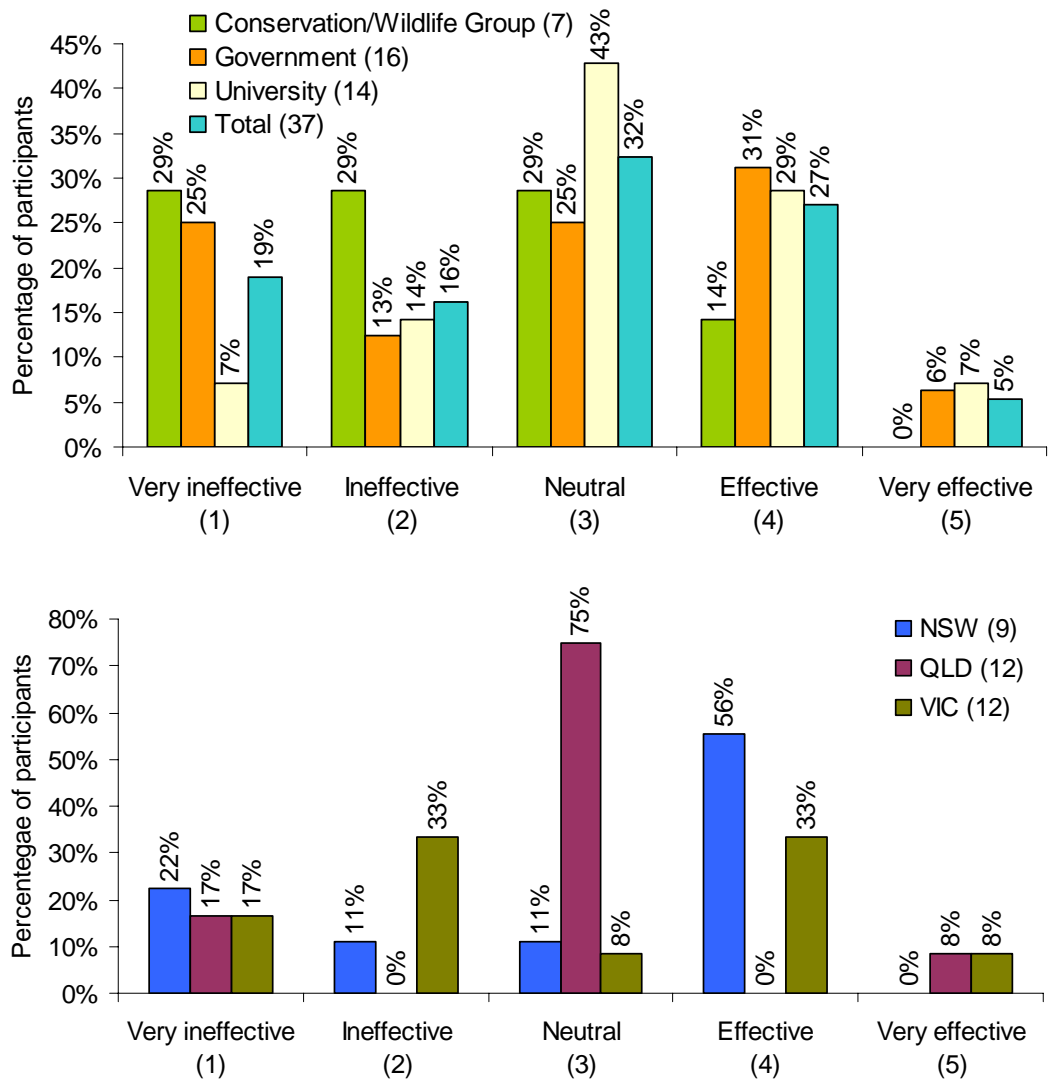


Figure 4-6 Scores on the effectiveness of the Strategy relating to Objective 6

The Victorian Koala Management Strategy (Menkhorst 2004) includes consideration of the issue of over-browsing and presents key points to be considered when developing a strategy to control koala over-browsing at a given site. These points include, among others: the early identification of high population levels and the use of local knowledge to eliminate other causes of dieback; implementation of a control strategy, including an ecological rationale; consideration of sterilisation as part of a translocation program; modelling koala populations as part of the control program; and protecting individual trees. While the program of

managing over-browsing was seen to be effective in some cases in Victoria (e.g. French Island), in others it was not (e.g. Raymond Island and Framlingham) (see Menkhorst 2008). Actions were however seen to be largely locally driven and certainly not driven by the national Strategy.

A significant program of research into mechanisms of fertility control has been undertaken and there have been large advances in this field since the Strategy was written. A number of options are now available or being trialled, including surgical sterilisation, steroid-based contraception, GnRH agonist contraception and immuno-contraception. The option used depends on the aims of the control program, funding, the size of the population, and whether permanent or temporary fertility suppression is required (e.g. Cooper 2004; Duka & Masters 2005; Herbert 2007; Mate et al. 1998; McIlwee 2003; Middleton et al. 2003). Field trials of progestin hormone implants conducted in Victoria (Middleton *et al.* 2003) suggest that non-surgical methods of fertility control are practical, although still costly (Menkhorst 2008).

Culling is clearly a controversial issue, and one that was dealt with prior to the release of the Strategy. A number of participants felt that culling should once again be considered for the Kangaroo Island population, or at least that a debate should be entered into that presented scientific facts relating to the issue. While the program of sterilisation was thought to have been successful to some degree, many felt that the numbers on the island had not been reduced sufficiently as a result of the program and that ongoing environment degradation was occurring. This was presented not as an issue for the koala, but rather as a broader environmental issue to be dealt with.

'The Strategy is not the sole driver of this objective. The South Australian management program has been highly effective in reducing starvation and reducing ecosystem damage.'

Overabundant populations, and their control, have taken the required focus away from declining populations in other parts of the country. This has been largely the result of the politics of the situation rather than being based on biology. This point has been raised by Lunney et al (2007b) who suggest that media attention on over-abundant populations has moved not only the focus

but also funding from declining populations.

The Strategy needs to accommodate, as well as distinguish clearly between, issues associated with declining populations within the koala's natural range and issues of overabundant populations. This is a distinction between conservation of koala populations and management of koala impacts. Both situations can, and should, be dealt with in the Strategy, but will have differing goals and means to achieve them. South Australia also requires a clear management plan for the koala, which should be a public document open to scrutiny and discussion.

Key messages relating to Objective 6

1. Issues of over-browsing need to be separated from the issue of declining populations and habitat.
2. A broad strategy needs to be put in place in South Australia for the management of koalas.

4.9 The overall Strategy

Overall, the Strategy appears to have had little influence and has been ineffective with regard to the conservation of koalas (refer Figure 4-7). The aim, goals and objectives of the Strategy were, and still are, relevant and the document is a good overarching framework for the conservation of koalas. However, the Strategy has failed in its implementation.

Those who viewed the effectiveness of the Strategy more favourably (19% of those interviewed) tended to be from government agencies. Examples of the success of the Strategy included the draft recovery plan within New South Wales (NSW National Parks and Wildlife Service 2003b) and the management plans in Victoria and Queensland (Menkhurst 2004; Queensland Environmental Protection Agency 2006). These success stories arise from situations where the connection between the Strategy and the outcomes can be clearly seen by those involved in their implementation. However, where conservation group members, wildlife carers, researchers and the community are seeing koalas dying and their habitat being lost, the connection is not clear and the Strategy is viewed as having failed.

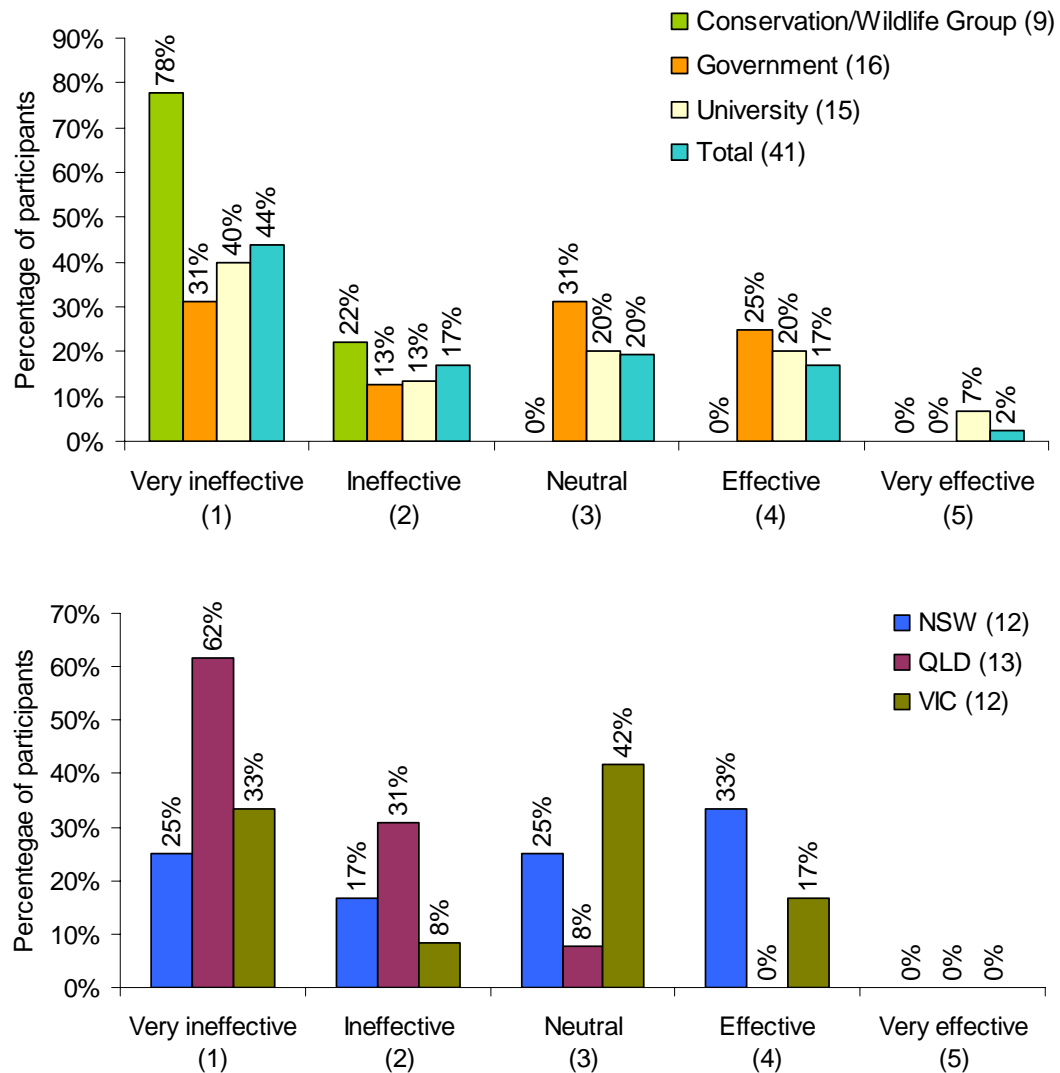


Figure 4-7 Scores on the overall effectiveness of the Strategy

'The National Koala Conservation Strategy is still a very relevant and well written document. Sadly the situation for the koala Australia-wide remains precarious as the objectives of this strategy have not been adequately implemented.'

'I consider the NKCS to be an important statement of national concern for koala conservation and an expression of intent to address koala conservation and management issues.'

'Although the National Koala Conservation Strategy has indentified the key threats to koalas, and proposed effective basic conservation strategies, it has failed resoundingly in providing effective implementation and compliance strategies.'

'During the 10 years of its existence the national strategy has not achieved its original goals in providing clear guidance for agencies accountable for koala management and conservation. Worryingly it is evident that some key personnel in key agencies are not even aware of the national strategy.'

'25,000 dead koalas is evidence that the Strategy is not working.'

Issues relating to the overall Strategy include:

- The lack of clear deliverables, responsibilities and performance criteria for the strategy.
- What has been achieved is not necessarily related to the Strategy, and where the Strategy has played a role, this success has not been communicated.
- The lack of integration with other plans, strategies or legislation.
- The lack of legislative weight for the Strategy.
- The lack of funding for the Strategy.
- The lack of participation by the Commonwealth.
- The need to better direct how the Strategy can and should be implemented at state and local levels.

The major issue relates to the lack of implementation of the Strategy as a whole, largely due to a lack of coordination and funding.

Key messages relating to the overall Strategy

1. Although the Strategy contains good information and presents a good overarching framework, it has been ineffective because of the way that it has been implemented.
2. There is a need for strong coordination of the implementation of the Strategy.
3. Successes of the Strategy need to be clearly and widely publicised.

5. Future directions

This section looks at changes to the Strategy and its surrounding context that could be implemented in the future, as suggested by participants. It further looks at issues that were not addressed in the current Strategy.

5.1 Implementation of the Strategy

'The general view is that the Strategy is well written and provides a sound framework for the management of koalas across Australia. Sadly the implementation of the Strategy has not occurred due mainly to the lack of robust complementary Commonwealth and state-level legislation to ensure objectives are achieved.'

The active implementation of the Strategy is probably the most significant thing that can be changed to improve its effectiveness. While the Strategy can be seen as the first stage of the process or as an overarching framework, it needs to be supported by action plans that can be followed and monitored. The Strategy indicates that it will need to be integrated with other conservation and management actions, but this clearly has not taken place, apart from in some specific instances. It will be necessary to clearly identify

the other strategies and plans that the Strategy can integrate with. Integration should occur across all levels of government and include existing government frameworks, such as the Native Vegetation Framework, the National Biodiversity Strategy and any actions taken on climate change (see below). It is important that the Strategy integrates with overall biodiversity conservation.

Many participants considered the Commonwealth to be the most appropriate driver of the Strategy (possibly because of their role in the review) rather than being an equal partner in the Strategy along with the states. While it is clear in the Strategy that the states are largely responsible for its implementation, there are a number of objectives and tasks that could fall to the Commonwealth, not least being a guiding/directing role.

'We are looking for Government to clearly articulate a resourced framework of partnerships and processes that will maximise koala conservation outcomes by ensuring appropriate co-ordination and guidance at the national, station, regional and local levels.'

The Strategy needs to be associated with a strong committee or secretariat that drives its implementation and that has the authority to do so (see legislation section below). The committee should be charged with ensuring that the Strategy is better understood by all stakeholders, that action plans are developed and that monitoring takes place. The Strategy should also be driven to the various implementation levels through education. Targets are needed within the associated plan so that the success of

the Strategy can be better monitored in the future. Timeframes need to be associated with the plans and Strategy.

The Strategy should remain a flexible document, which can account for the regional differences in both the conservation and management of koalas.

5.2 Review of the Strategy

The Strategy indicates that a review would occur after five years, yet the current review has occurred after 10 years. In order for the success or otherwise of the Strategy to be assessed there must be clear objectives, actions and targets assigned to specific bodies or agencies. Review of the Strategy and any associated plans should be regular and frequent.

5.3 Funding the Strategy

'Without a significantly increased level of support and promotion, and without clear policy statements and guidelines, I am confident that the NKCS will fail to provide an effective framework for conservation action at local, regional and national scales.'

'The Strategy needs to be integrated into existing Commonwealth programs such as Caring for our Country'

'Federal funding for infrastructure, such as roads, could be tied to provisions for wildlife mitigation such as overhead crossings, and also for vegetation offset purchases.'

The Strategy identifies that while there are already resources directed towards koala issues, additional resources may be necessary to implement the Strategy. It notes further that there will be a need to ensure that attention is given to the most effective use of resources. This is clearly still the case and the future development of the Strategy will need to clearly articulate funding sources and priorities for implementation.

Future funding must be distributed in a manner that is transparent, with justification as to the merits of the funding relative to the Strategy.

An assessment of the economics of tourism related to koalas indicated that the species contributes over \$1.1 billion per year through its

iconic role in attracting international tourists to Australia (Hundloe & Hamilton 1997). Some of these funds could be directed towards koala conservation. The Australian Koala Foundation has further suggested the use of EcoLabels and a means of directing funds toward conservation. This warrants further consideration by the committee.

5.3.1 Tax incentives

On the ground funding for implementation of the Strategy, in particular the retention of koala habitat, may come from implementation of tax incentives. The National Framework for the Management of Australia's Vegetation indicates that tax incentives, and discounts on property rates, via differential rating, are most effectively used to market incentives to a wide range of landholders. Further, that tax incentives that allow donations of property, conservation covenants and money to organisations involved in the conservation of native vegetation have the potential to significantly increase private investment in the conservation and rehabilitation of native vegetation (Natural Resource Management Ministerial Council 2001).

As noted in Section 4.3, there are a number of incentive-based mechanisms currently available at both state and federal levels. However, there needs to be better recognition of these mechanisms within the Strategy and a mechanism by which incentives can be tied to koala conservation.

The Strategy may also consider the negative role that some current tax incentives may play in supporting land clearing, including known and potential koala habitat.

5.4 Legislative changes

Many participants felt that legislative change was needed at the Federal level in order to provide weight and credibility to the Strategy and allow the Commonwealth to effectively drive the Strategy. As noted by Clarke *et al.* (2000), while the Strategy conveys an authoritative message, it lacks the power to control koala policy.

The majority of suggestions relating to legislative change focussed on the EPBC Act, with a number of different approaches.

Some put forward the view the koala should be listed as Vulnerable under the Act. Under the EPBC Act a species can be listed as Vulnerable if it meets one of the following criteria:

1. It has undergone, is suspected to have undergone or is likely to undergo in the immediate future a substantial reduction in numbers.
2. Its geographic distribution is precarious for the survival of the species and is limited.
3. The estimated total number of mature individuals is limited and either of (a) or (b) is true:
 - (a) evidence suggests that the number will continue to decline at a substantial rate, or
 - (b) the number is likely to continue to decline and its geographic distribution is precarious for its survival.
4. The estimated total number of mature individuals is low.
5. The probability of extinction in the wild is at least 10% in the medium-term future (Threatened Species Scientific Committee (TSSC) 2008).

A nomination to list the koala as Vulnerable under the Act was put forward in 2004 (Australian Koala Foundation 2004c), based largely on Criterion 1 and using Population Viability Analysis of local populations to address Criterion 5. Despite declines in some local populations, the koala was found not to be eligible for listing as a nationally threatened species based on the available data (Threatened Species Scientific Committee 2006). The Threatened Species Scientific Committee indicated that the species had not undergone, and is unlikely to undergo, a substantial reduction in numbers across its national or natural range, equivalent to 30% or more of the total population over three generations. As such the species was not eligible for listing under Criterion 1 (Threatened Species Scientific Committee 2006). The Committee further indicated that modelling of population declines in local areas cannot be extrapolated to determine the probability of extinction across the koala's national or natural range (Criterion 5).

Listing of the koala as Vulnerable under the EPBC Act would mean that actions likely to have a significant impact on the species would require approval from the Commonwealth Minister for the Environment. In reality this means that the action would need to have an impact on an important population of the species, defined as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range (Department of the Environment and Heritage 2005).

The federal Minister of the Environment recently announced that the koala is included in the Finalised Priority Assessment List for the assessment period commencing 1 October 2008 (Department of the Environment Water Heritage and the Arts 2008). This means that the status of the koala at the national level will be reassessed. Any listing of the koala at the national level will need to take into consideration and balance the conservation and management requirements of declining populations with the management requirements dealing with koala impacts.

Other suggestions relating to the EPBC Act included:

1. Changing how the criteria for listing are applied and in particular using greater flexibility in their application. The criteria used currently are based broadly on the IUCN Red List Categories and Criteria Version 3.1 2001. The Threatened Species Scientific Committee is not strictly bound by these criteria, but has regard to them when making judgements about species in terms of their biological contexts, and on a case by case basis (Threatened Species Scientific Committee (TSSC) 2008). While there is general agreement about historical population declines, the current view presented by the Scientific Committee relates to the change in population over the three generations and the extrapolation of declines in local populations to the national scale. While population declines over three generations (18 years) have been identified in a number of local populations (e.g. Mt Macedon, Tucki, and Barrenjoey, see Phillips 2000), these data cannot be extrapolated to a national level (IUCN 2001).
2. Adding a new Matter of National Environmental Significance that can account for the iconic status of the koala or the economic significance of the species.
3. Listing of the koala in separate regions (e.g. south-eastern Queensland). The option to list populations of species is open to the Minister and this has been done for the Grey Nurse Shark (east and west coast populations) and the Spot-tailed Quoll (SE mainland and Tasmanian populations). However, difficulty may arise with the koala in defining separate populations. Population level listings are generally only pursued where there are clearly distinct genetic differences (see below). The Threatened Species Scientific Committee considered this issue in its 2006 listing assessment and the Minister accepted its recommendation that a population level listing was not appropriate for the koala (Threatened Species Scientific Committee 2006).
4. Using the provisions of the Act relating to Key Threatening Processes. Land Clearance is already listed as a Key Threatening Process under the Act. However the listing advice for this process indicated that a threat abatement plan was not appropriate in this case and that any abatement of broad scale clearing must be addressed by the states (Threatened Species Scientific Committee 2001).
5. Defining and listing critical habitat for the koala under the Act. This would be a major change to the types of listing of critical habitat and would have broad-scale implications for any future use of the land designated as critical habitat. Critical habitat in itself is not listed as a Matter of National Environmental Significance and currently there is no trigger for environmental assessment of impacts on critical habitat, apart from through consideration of impacts on the threatened species that occupy this habitat.

6. The use of the Minister's powers to develop a Wildlife Conservation Plan under Section 285 of the EPBC Act. While the provisions are in place for plans to be prepared for conservation dependent species (although not species listed as Threatened), there is little authority associated with these plans apart from directing Commonwealth agencies to take all reasonable steps to act in accordance with a wildlife conservation plan (section 286).

The Australian Koala Foundation has suggested that instead of modifying the EPBC Act a National Koala Act should be put in place (Guglielmi 2007). The Australian Koala Foundation suggest that this new Act would bypass discussion regarding the need for koalas to be listed as Threatened at a national level and would incorporate planning powers and tax incentives at the federal level relating to protection of koala habitat. A key element of this proposed legislation would be the creation of a koala secretariat, which would be the only authority with the powers to manage koala habitat and regulate its use (Guglielmi 2007). It is suggested the Act and the secretariat would provide many of the provisions outlined in the National Koala Conservation Strategy, including identification and mapping of habitat; prioritisation of areas for habitat restoration; prioritisation of research activities; and incorporating local planning provisions. Developments in areas of koala habitat would require assessment and approval under the Act (Guglielmi 2007).

Whether or not conservation needs to be driven by legislation from the top (i.e. at national level), or if it can be guided simply by a framework with legislation and policies implemented at a more local level has been looked at in an assessment of the koala conservation policy process (Clark et al. 2000). The bottom up approach is largely the direction that the Strategy has taken, with the idea that a well-crafted Strategy can support needed change at the operation levels.

Related to the change at the local level, a number of participants mentioned the need for changes to planning laws and implementation by local governments, or at least strong guidance in implementing existing laws. Many participants, particularly in New South Wales, mentioned SEPP 44 and how this was an appropriate means to incorporate koala population and habitat conservation into local planning decisions. This was however seen as an element that had not been well implemented and that was in need of revision.

Recently a number of researchers have developed a planning guide for local governments related to local conservation (McAlpine et al. 2006b).

5.5 Research and new and emerging threats

'There is a growing need to identify and promote koala research priorities to ensure that available resources are directed to areas of greatest need and contribution to conservation planning and management of koala populations in the wild.'

While there has been a lot of research relating to koalas and their conservation and management, it will be necessary to better coordinate this work and the priorities for funding.

Associated with this, information needs to be collected in a central location — with community access provided.

As part of this review a number of new and emerging issues have been brought up that were not covered to a great extent in the Strategy, either because at the time it was not considered a significant issue or because the issue itself was not understood or known.

5.5.1 Climate change

Climate change is happening (Garnaut 2008) and will need to be dealt with in any future Strategy. The impacts of climate change are likely to be wide-ranging and may include:

- changes in the chemical composition of the koala's food, with increased carbon dioxide affecting the nutritional balance of eucalypt leaves (Australian Academy of Science 2008)
- changes in the composition of plant communities, including the possible presence of koala food trees
- increased frequency and intensity of drought
- increased frequency and intensity of wildfire.

The overall impacts of such changes on the population of koala are not known, but the above changes may result in increased stress for the animals, and therefore, disease, and may also place the animals at more risk of harassment by dogs or injury from vehicles as they move across the landscape in search of food.

Changes as a result of climate change are likely to place a greater reliance on conservation on private lands as koala habitat is not well represented in current conservation reserves.

5.5.2 Genetics of the koala across its range

Genetics of koalas across their range is important for two reasons. As a result of past patterns of management and translocation, koalas in the south of their range (Victoria and South Australia) have low genetic variability. This has not only resulted in the appearance of some genetic disorders such as testicular aplasia (Seymour *et al.* 2001), but also raises issues relating to future translocations and the overall conservation of the species. There is a need for study of the genetics of koalas Australia-wide with the aim of establishing genetic management units across the current koala distribution. This may allow better identification of priority areas for conservation. It may also be used as part of current or future translocation programs aimed at addressing the reduction in genetic variability seen in some introduced populations.

Secondly, the question of the genetics of koalas across their range relates to their listing as distinct units under the EPBC Act. Studies have suggested a degree of genetic variation within the koala population from north to south, with distinct variation in the south-east Queensland population (e.g. Sherwin *et al.* 2000). However this has been taken as possibly simply the result of selection within a broader genetic cline (e.g. Martin *et al.* 2008).

5.5.3 New diseases — koala retrovirus

New and emerging diseases require further investigation, in particular diseases such as the koala retrovirus (Hanger 1999). The koala retrovirus has been associated with a range of diseases in koalas including lymphoma and other neoplastic diseases, and may further be immunosuppressive, thereby contributing to chlamydial infections (Tarlinton *et al.* 2006). While population level impacts are not known at this stage, it is likely to be having an impact on the koala population in a number of direct as well as indirect ways (P. Young, University of Queensland, *personal communication*, October 2008). The retrovirus is still undergoing insertion into the koala genome (Tarlinton *et al.* 2006). The koala retrovirus is present, at variable copy numbers, in the germline of all koalas in Queensland, However animals from some areas of southern Australia (e.g. Kangaroo Island) lack the provirus (Stoye 2006;

Tarlinton *et al.* 2006). This suggests an ongoing process of infection and endogenisation spreading from a focal area in the northern half of the koala's range, that possibly started within the last 100 to 200 years (Stoye 2006).

The low genetic variation found in koalas throughout much of their range may make them less able to deal with new diseases as they appear. The recent appearance of Devil Facial Tumour Disease is a prime example of how quickly a new disease can move through a population, with devastating effect. It will be important to identify and deal with such diseases early, since the costs associated with disease management can be high.

6. Conclusions

Enslaved in their ever shrinking environment, the slow-breeding creatures are no match for the hazards of settlement, with its clearing, bush-fires, introduced foes, and disease – (Troughton 1946).

The above quote sounds very familiar and can be applied equally sixty-two years later. In 1998 concern for the koala's numbers, welfare and conservation resulted in the National Koala Conservation Strategy.

Since the release of the Strategy a number of significant changes have taken place including: preparation of management and conservation plans in three states, across the koala's natural range; incorporation of koala conservation at the local planning level in some locations; inclusion of koala protection measures in some road designs; a significant program of research focussing on their biology; and implementation of a management program to address overpopulation in some unnatural and isolated populations. Despite all of this work and effort, koala populations are still declining and many koalas are dying from disease, traffic injuries and dog attacks.

The majority of those providing information for this review felt that the Strategy has been ineffective both overall and with regard to the six objectives. Those of the opinion that the Strategy is effective were generally from government agencies, who could clearly see the connection between the Strategy and state plans and actions. However the link between the Strategy and on ground works was not clearly made in the mind of members of conservation groups and wildlife carers. Comparing across the states, a greater percentage of participants in Queensland thought the Strategy ineffective, compared to participants from New South Wales and Victoria.

In general it was felt that the Strategy has not been effective in maintaining viable populations of koalas across their natural range. While considerable work has been completed relating to the conservation biology of koalas, generally:

- it has not been enough — koalas are still declining in many areas
- it has not been coordinated
- little is directly related to the Strategy.

That is not to say that the Strategy cannot work in the future, but the key element will be its active and effective implementation and promotion. The Strategy remains a good framework for the conservation and management of koalas, but will require recognition, promotion, funding and leadership to ensure that the objectives are met. This may be achieved by:

- developing and implementing clear action plans relating to the Strategy
- integrating the Strategy with other government programs, such as those aimed at providing funding or incentives for protection and rehabilitation of habitat
- providing suitable funding for the implementation of the Strategy
- regularly monitoring the implementation of the Strategy against clear targets
- distinguishing within the Strategy the inherent differences between conservation and management of declining populations and their habitat and management of impacts from abundant populations outside the natural range

- a strong group taking leadership with regard to the implementation of the Strategy
- undertaking education and promotion of the Strategy, its actions and its successes.

The koala is a unique and iconic species that is recognised the world over. It contributes significantly to the Australian economy through tourism, and is an important flagship species for the conservation of the Australian 'bush' and its biodiversity. But it is a species that is subject to a number of significant ongoing threats and management issues. These threats were recognised in 1946 (see above) and continued to be recognised 10 years ago with the release of the Strategy. These threats and issues continue today and with new issues such as climate change appearing we need to refocus our efforts with regard to the conservation and management of the koala. The National Koala Conservation Strategy is a framework for the conservation and management of this species, but significant changes need to be made to its future implementation if we are to see it as an effective strategy.

7. References

ANZECC 1996, *Overview of current approaches to conservation and management of koalas in Australia*, Environment Australia, Canberra, Australia,

——— 1998, *National Koala Conservation Strategy*, Environment Australia, Canberra, Australia,

ARAZPA 1999, *A Guide to Koalas in Your Zoo.*, Australasian Regional Association of Zoological Parks and Aquaria, Mosman.

Ashworth, G 1998, 'How Pine Rivers Shire is protecting Koalas from dog attacks', paper presented to Conference on the Status of the Koala in 1998, Coffs Harbour, NSW.

Australasian Marsupial & Monotreme Specialist Group 1996, '*Phascolarctos cinereus*', in *2007 IUCN Red List of Threatened Species.* , IUCN 2007.

Australian Academy of Science 2008, *Koalas Under Threat From Climate Change*, ScienceDaily, viewed 5th June 2008, <<http://www.sciencedaily.com/releases/2008/05/080508131118.htm>>.

Australian Koala Foundation 2004a, *Ethical Standards and Protocols for Radio Tracking, Capture and Veterinary Procedures on Wild Koalas Involved in management and Research Procedures*, Australian Koala Foundation, Brisbane.

——— 2004b, *Koala Beach Koala Plan of Management*, Australian Koala Foundation for the Ray Group Pty. Ltd., Brisbane.

——— 2004c, *Nomination form for listing, changing the status, or delisting a native species under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, Australian Koala Foundation, <<https://www.savethekoala.com/vulnerable.html>>.

——— 2008a, *Act or Axe*, Australian Koala Foundation, viewed 25 September 2008, <<https://www.savethekoala.com/actoraxe/electorateqld.html>>.

——— 2008b, *Koala Habitat Atlas*, Australian Koala Foundation, viewed 4th June 2008, <<https://www.savethekoala.com/kha.html>>.

Australian Museum Business Services 2001a, *Fauna Underpass Monitoring Stage One - Final Report – Bulahdelah to Coolongolook*, Report prepared for the Roads and Traffic Authority, Sydney.

——— 2001b, *Fauna Underpass Monitoring Stage One – Final Report – Brunswick heads*, Report prepared for the Roads and Traffic Authority, Sydney.

——— 2001c, *Fauna Underpass Monitoring Stage One – Final Report – Herons Creek*, Report prepared for the Roads and Traffic Authority, Sydney.

——— 2001d, *Fauna Underpass Monitoring Stage One – Final Report – Taree*, Report prepared for the Roads and Traffic Authority, Sydney.

Barrott, E 1999, 'Census techniques, habitat use and distribution of Koalas in the Pilliga State Forests', Honours thesis, University of Sydney.

Bragg, J 2006, *New Koala Conservation Laws for Queensland*, Environmental Defenders Office (Qld) Inc, Brisbane.

Callaghan, J, Curran, T, Thompson, J & Floyd, R 2002, *Greater Taree City Council Draft Comprehensive Koala Plan of Management*, Prepared by the Australian Koala Foundation on behalf of Greater Taree City Council.

Callaghan, J, Curran, T, Thompson, J, Taylor, A & Mitchell, D 2003, *Campbelltown City Council Draft Comprehensive Koala Plan of Management, Part 1: The CKPoM*, Prepared by the Australian Koala Foundation on behalf of Campbelltown City Council.

Callaghan, J, Thompson, J & Mitchell, D 2000, 'The Noosa Koala Habitat Atlas: Prepared for Noosa Shire Council by the Australian Koala Foundation.' paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.

Clark, TW, Mazur, N, Cork, SJ, Dovers, S & Harding, R 2000, 'Koala conservation policy process: Appraisal and recommendations', *Conservation Biology*, vol. 14, no. 3, pp. 681-90.

Clarke, GM, Grosse, S, Matthews, M, Catling, PC, Baker, B, Hewitt, CL, Crowther, D & Saddler, SR 2000, *Environmental Pest Species in Australia*, Australia: State of the Environment, Second Technical Paper Series (Biodiversity), Department of the Environment and Heritage, Canberra.

Cogger, H, Ford, H, Johnson, C, Holman, J & Butler, D 2003, *Impacts of Land Clearing on Australian Wildlife in Queensland*, WWF Australia, Brisbane.

Cooper, DW 2004, 'Should immunocontraception be used for wildlife population management?' *Australian Mammalogy*, vol. 26, no. 1, pp. 61-5.

Cork, S, Sattler, P & Alexandra, J 2006, *Biodiversity Theme Commentary*, Report prepared for the 2006 Australian State of the Environment Committee, Canberra.

de Villiers, DL, Preece, HJ & Dique, DS (in press), 'Domestic dog related koala (*Phascolarctos cinereus*) mortality in southeast Queensland', *Wildlife Research*

Department of Environment and Climate Change 2008, *Threatened species, populations and ecological communities*, NSW Department of Environment and Conservation, 2008, <<http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>>.

Department of the Environment and Heritage 2004, *Conditions for the overseas transfer of koalas, effective from May 2004*, Australian Government,

——— 2005, *EPBC Act - Principal Significant Impact Guidelines 1.1. Matters of National Environmental Significance*, Department of the Environment and Heritage, Canberra.

——— 2006, *EPBC Act Policy Statement 1.2 Significant Impact Guidelines - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies*, Department of the Environment and Heritage, Canberra.

Department of the Environment Water Heritage and the Arts 2008, *Finalised Priority Assessment List for the Assessment Period Commencing 1 October 2008*, DEWHA, viewed 25 September 2008, <<http://www.environment.gov.au/biodiversity/threatened/publications/pubs/priority-assessment-list.pdf>>.

Dique, DS 2004, 'The distribution, abundance and dynamics of a regional koala population in south east Queensland', PhD thesis, University of Queensland.

Dique, DS, de Villiers, DL & Preece, HJ 2003a, 'Evaluation of line-transect sampling for estimating koala abundance in the Pine Rivers Shire, south-east Queensland', *Wildlife Research*, vol. 30, no. 2, pp. 127-33.

Dique, DS, Preece, HJ, Thompson, J & de Villiers, DL 2004, 'Determining the distribution and abundance of a regional koala population in south-east Queensland for conservation management', *Wildlife Research*, vol. 31, no. 2, pp. 109-17.

Dique, DS, Thompson, J, Preece, HJ, Penfold, GC, De Villiers, DL & Leslie, RS 2003b, 'Koala mortality on roads in south-east Queensland; the koala speed-zone trial', *Wildlife Research*, vol. 30, pp. 419-26.

Duka, T & Masters, P 2005, 'Confronting a tough issue: Fertility control and translocation for over-abundant Koalas on Kangaroo Island, South Australia', *Ecological Management & Restoration*, vol. 6, no. 3, pp. 172-81.

EcoLogical Australia 2006, *Far South Coast Koala Management Framework*, Report prepared for the Department of Environment and Conservation, Sydney.

Environmental Protection Agency 2007, *Report on Koala Coast Surveys 2005-2006*, Queensland Environmental Protection Agency, Brisbane.

——— 2008, *Summary of Koala Hospital Presentations, Release and Major Causes of Death, 1997 to end of April 2008 - Southeast Queensland*, Environment Protection Agency, <http://www.epa.qld.gov.au/publications/p02476aa.pdf/Summary_of_Koala_Hospital_presentations_releases_and_major_causes_of_death_1997_to_end_of_April_2008_Southeast_Queensland.pdf>.

Garnaut, R 2008, *Garnaut Climate Change Review*, Commonwealth of Australia, Canberra.

GHD 2008, *Caboolture, Pine Rivers and Redcliffe Councils. Report for Koala Habitat Survey and Mapping*, Report prepared for the Queensland Environment Protection Agency, Brisbane.

Guglielmi, J 2007, *Analysis of the EPBC Act with regards to the protection of the koala + The Australian Koala Foundation's vision for a National Koala Act*, Australian Koala Foundation, Brisbane.

Hanger, J 1998, 'The Gold Coast Koala Relocation Project', paper presented to Conference on the Status of the Koala in 1998, Coffs Harbour, NSW.

——— 1999, 'An investigation of the role of retroviruses in leukaemia and related diseases in koalas', PhD thesis, University of Queensland.

Hanger, J, McKee, J, O'Brien, T & Robinson, WF 1998, 'Update on Lymphoma and Koala Retrovirus Research', paper presented to Conference on the Status of the Koala in 1999, Coffs Harbour, NSW.

Herbert, CA 2007, 'From the urban fringe to the Abrolhos Islands: management challenges of burgeoning marsupial populations', in D Lunney, P Eby, P Hutchings & S Burgin (eds), *Pest or Guest: The Zoology of Overabundance*, Royal Zoological Society New South Wales, Taronga Zoo, Mosman, pp. 129-41.

Hume, ID 1990, 'Biological basis for the vulnerability of koalas to habitat fragmentation', in D Lunney, CA Urquhart & P Reed (eds), *Koala Summit: managing koalas in New South Wales*, NSW National Parks and Wildlife Service, Sydney.

Hundloe, T & Hamilton, C 1997, *Koalas and Tourism: An Economic Evaluation*, Discussion Paper Number 13, The Australia Institute.

IUCN 1987, *The IUCN Position Statement on Translocation of Living Organisms*, Prepared by the Species Survival Commission in collaboration with the Commission on Ecology, and the Commission on Environmental Policy, Law and Administration, Gland.

——— 2001, *IUCN Red List Categories and Criteria: Version 3.1*, ICUN, Gland, Switzerland and Cambridge, UK.

——— 2008, *2008 IUCN Red List of Threatened Species.*, IUCN, viewed 6 October 2008, <<http://www.iucnredlist.org/details/16892>>.

Jackson, S 2007a, *Koala. Origins of an Icon.*, Jacana Books, Crows Nest.

——— 2007b, *Koala: Origins of an Icon*, Jacana Books, Allen & Unwin. , Crows Nest.

Jackson, S, Perry, L, O'Callaghan, P, Spittal, D, Romer, L & Reid, K 2000, *Koala Phascolarctos cinereus: Captive husbandry guidelines*, Australasian Society of Zoo Keepers, Healesville.

Johnson, C, Cogger, H, Dickman, C & Ford, H 2007, *Impacts of Landclearing; The Impacts of Approved Clearing of Native Vegetation on Australian Wildlife in New South Wales.*, WWF-Australia Report, WWF-Australia, Sydney.

Kavanagh, RP & Barrott, E 2001, 'Koala populations in the Pilliga Forests', in J Dargavel, D Hart & B Libbis (eds), *Perfumed Pineries: Environmental history of Australia's Callitris forests*, CRES, Australian National University, Canberra, pp. 93-103.

Krebs, CJ 2007, 'Foreword', in D Lunney, P Eby, P Hutchings & S Burgin (eds), *Pest or Guest: The Zoology of Overabundance*, Royal Zoological Society of New South Wales, Mosman, p. vii.

Lunney, D, Crowther, M, Bryant, J & Shannon, I 2007a, *The Distribution and Status of the Koala in New South Wales* Presentation to the Australian Mammal Society Annual Conference, Sydney.

Lunney, D, Curtin, A, Ayers, D, Cogger, HG, Dickman, CR, Maitz, W, Law, B & Fisher, D 2000, *The Threatened and Non-threatened Native Vertebrate Fauna of New South Wales:*

Status and Ecological Attributes, Environment and Heritage Monograph Series No. 4. NSW National Parks and Wildlife Service. , Hurstville.

Lunney, D, Eby, P, Hutchings, P & Burgin, S 2007b, 'Pest or Guest: the cultural context of the zoology of overabundance', in D Lunney, P Eby, P Hutchings & S Burgin (eds), *Pest or Guest : The Zoology of Overabundance*, Royal Zoological Society New South Wales, Taronga Zoo, Mosman, pp. 258-69.

Lunney, D, Gresser, S, O'Neill, LE, Matthews, A & Rhodes, J 2007c, 'The impact of fire and dogs on Koalas at Port Stephens, New South Wales, using population viability analysis', *Pacific Conservation Biology*, vol. 13, no. 3, pp. 189-201.

Lunney, D, Gresser, SM, Mahon, PS & Matthews, A 2004, 'Post-fire survival and reproduction of rehabilitated and unburnt koalas', *Biological Conservation*, vol. 120, no. 4, pp. 567-75.

Lunney, D & Matthews, A 1997, *Guidelines for Koala Care in New South Wales*, NSW National Parks and Wildlife Service, Hurstville.

Lunney, D, Moon, C, Matthews, A & Turbill, J 1999, *Coffs Harbour City Koala Plan of Management. Part A The Plan.* , NSW National Parks and Wildlife Service, Hurstville,

Lunney, D, O'Neill, L, Matthews, A & Sherwin, WB 2002, 'Modelling mammalian extinction and forecasting recovery: koalas at Iluka (NSW, Australia)', *Biological Conservation*, vol. 106, no. 1, pp. 101-13.

Martin, R, Handasyde, K & Krockenberger, A 2008, 'Koala (*Phascolarctos cinereus*)', in S Van Dyck & R Strahan (eds), *The Mammals of Australia*, Reed New Holland, Sydney, pp. 198-201.

Masters, P, Duka, T, Berris, S & Moss, G 2004, 'Koalas on Kangaroo Island: from introduction to pest status in less than a century', *Wildlife Research*, vol. 31, no. 3, pp. 267-72.

Mate, KE, Molinia, FC & Rodger, JC 1998, 'Manipulation of the fertility of marsupials for conservation of endangered species and control of over-abundant populations', *Animal Reproduction Science*, vol. 53, no. 1-4, pp. 65-76.

Maxwell, S, Burbridge, A & Morris, K 1996, *Action Plan for Australian Marsupials and Monotremes*, Department of Environment and Heritage.

McAlpine, CA, Bowen, ME, Callaghan, JG, Lunney, D, Rhodes, JR, Mitchell, DL, Pullar, DV & Possingham, HP 2006a, 'Testing alternative models for the conservation of koalas in fragmented rural-urban landscapes', *Austral Ecology*, vol. 31, no. 4, pp. 529-44.

McAlpine, CA, Rhodes, JR, Peterson, A, Possingham, HP, Callaghan, J, Curran, T, Mitchell, D & Lunney, D 2006b, *Draft Planning Guidelines for Koala Conservation and Recovery - A guide to best planning practice*, The University of Queensland, Australian Koala Foundation and the NSW Department of Environment and Conservation.

McIlwee, A 2003, *Post-release monitoring of surgically sterilised and relocated koalas*, Parks Victoria, Victoria.

McLean, N 2003, 'Ecology and management of overabundant Koala (*Phascolarctos cinereus*) populations', PhD thesis, University of Melbourne.

Menkhorst, P 2004, *Victoria's Koala Management Strategy*, Victorian Department of Sustainability and Environment,

——— 2008, 'Hunted, marooned, re-introduced, contracepted: a History of Koala management in Victoria', in D Lunney, A Munn & W Meikle (eds), *Too Close for Comfort: Contentious Issues in Human-Wildlife Encounters*, Royal Zoological Society of New South Wales, Mosman.

Middleton, DR, Walters, B, Menkhorst, P & Wright, P 2003, 'Fertility control in the koala, *Phascolarctos cinereus*: the impact of slow-release implants containing levonorgestrel or oestradiol on the production of pouch young', *Wildlife Research*, vol. 30, no. 3, pp. 207-12.

Natural Resource Management Ministerial Council 2001, *National Framework for the Management and Monitoring of Australia's Native Vegetation*, Department of Environment and Heritage, Canberra.

Natural Resources and Mines 2006, *Land Cover Change in Queensland 2003–2004. A Statewide Landcover and Trees Study Report.*, Queensland Government, Brisbane.

NSW National Parks and Wildlife Service 2003a, *Approved Recovery Plan for the Hawks Nest and Tea Gardens Endangered Koala (*Phascolarctos cinereus*) Population*, NSW National Parks and Wildlife Service, Hurstville,

——— 2003b, *Draft Recovery Plan for the Koala*, New South Wales National Parks and Wildlife Service, Hurstville, NSW.

NSW Scientific Committee 1999a, *Koala population, Koala population, Hawks Nest and Tea Gardens - endangered population listing*, NSW National Parks and Wildlife Service, Hurstville.

——— 1999b, *Koala population, Pittwater Local Government Area - endangered population listing*, NSW National Parks and Wildlife Service, Hurstville.

——— 2001, *Final determination to list the clearing of native vegetation as a key threatening process*, NSW National Parks and Wildlife Service, Hurstville.

Parks Victoria 2003, *Post-release monitoring of surgically sterilised and relocated Koalas, Mt Eccles National Park, Victoria. Unpublished report.*, Parks Victoria, Melbourne.

Phillips, S 2000, 'Population trends and the koala conservation debate', *Conservation Biology*, vol. 14, no. 3, pp. 650-9.

Phillips, S & Callaghan, J 1996, *Koala Habitat Atlas Project no. 4: Tweed Coast*, Prepared for Tweed Shire Council by the Australian Koala Foundation, Brisbane.

Port Stephens Council 2002, *Port Stephens Council Comprehensive Koala Plan of Management (CKPoM) - June 2002*, Prepared by Port Stephens Council with the Australian Koala Foundation and NSW National Parks and Wildlife Service,

Pyper, W 2004, 'Koalas are losing out to Traffic', *Ecos*, vol. 118, p. 31.

Queensland Environmental Protection Agency 2006, *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016*, Queensland Government,

Rhodes, JR, Callaghan, JG, McAlpine, CA, De Jong, C, Bowen, ME, Mitchell, DL, Lunney, D & Possingham, HP 2008, 'Regional variation in habitat-occupancy thresholds: a warning for conservation planning', *Journal Of Applied Ecology*, vol. 45, no. 2, pp. 549-57.

Schlagloth, R, Callaghan, J & Thomson, H 2006a, *Draft Comprehensive Koala Plan of Management, Part 1: The Plan*, Ballarat City Council, Ballarat and the Australian Koala Foundation, Brisbane.

——— 2006b, *Draft Comprehensive Koala Plan of Management, Part 2: Resource Document*, Ballarat City Council, Ballarat and the Australian Koala Foundation, Brisbane.

Seymour, AM, Montgomery, ME, Costello, BH, Ihle, S, Johnsson, G, St John, B, Taggart, D & Houlden, BA 2001, 'High effective inbreeding coefficients correlate with morphological abnormalities in populations of South Australian koalas (*Phascolarctos cinereus*)', *Animal Conservation*, vol. 4, pp. 211-9.

Sherwin, WB, Timms, P, Wilcken, J & Houlden, B 2000, 'Analysis and conservation implications of koala genetics', *Conservation Biology*, vol. 14, no. 3, pp. 639-49.

St. John, B 1997, 'Risk Assessment and Koala Management in South Australia', *Australian Biologist*, vol. 10, pp. 47-56.

Stoye, JP 2006, 'Koala retrovirus: a genome invasion in real time', *Genome Biology*, vol. 7, p. 241.

Sullivan, BJ, Baxter, GS, Lisle, AT, Pahl, L & Norris, WM 2004, 'Low-density koala (*Phascolarctos cinereus*) populations in the mulga lands of south-west Queensland. IV. Abundance and conservation status', *Wildlife Research*, vol. 31, no. 1, pp. 19-29.

Tarlinton, RE, Meers, J & Young, PR 2006, 'Retroviral invasion of the koala genome', *Nature*, vol. 442, no. 7098, pp. 79-81.

Threatened Species Scientific Committee 2001, *Land Clearance: Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee on a public nomination of a Key Threatening Process under the Environment Protection and Biodiversity Conservation Act 1999*, Department of the Environment and Heritage, Canberra.

——— 2006, *Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee (the Committee) on Amendments to the list of Threatened Species under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*, Department of the Environment and Heritage, Canberra.

Threatened Species Scientific Committee (TSSC) 2008, *Guidelines for Assessing the Conservation Status of Native Species according to the Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) and EPBC Regulations 2000.*, Department of the Environment Water Heritage and the Arts, Canberra.

Troughton, E 1946, *Furred Animals of Australia*, 3rd edn, Angus and Robertson, Sydney.

US Fish and Wildlife Service 2000, 'Endangered and Threatened Wildlife and Plants; Final Determination of Threatened Status for the Koala', *Federal Register*, vol. 65, no. 90, pp. 26762-71.

Wilks, S 2007, 'How Many Koalas are there on Kangaroo Island', in S Wilks (ed.), *Seeking Environmental Justice*, Rodopi, Amsterdam.

——— 2008, 'Different Portrayals of Koala on Kangaroo Island', in D Lunney, A Munn & W Meikle (eds), *Too Close of Comfort: Contentious Issues in Human-wildlife Encounters*, Royal Zoological Society of New South Wales, Mosman, pp. 22-32.

Appendix A

Participants – Interviewees and
written submissions

Names and contact details not publicly available due to privacy requirements.

Table A-1: Interviews completed

Name - Association

██████

Notes: 1 – interviewed in groups, 2 - interviewed via email, 3- provided information via email

Table A-2: Written submissions received

Name	Role	Association
██████	██████	██████

Appendix B

Literature search

Objectives of the National Koala Conservation Strategy 1998

Objective 1: To conserve koalas in their existing habitat

Objective 2: To rehabilitate and restore koala habitat and populations

Objective 3: To develop a better understanding of the conservation biology of koalas

Objective 4: To ensure that the community has access to factual information about the distribution, conservation and management of koalas at a national, State and local level

Objective 5: To manage sick or injured koalas and orphaned wild koalas to ensure consistent and high standards of care

Objective 6: To manage over-browsing to effectively prevent both koala starvation and ecosystem damage in discrete patches of habitat

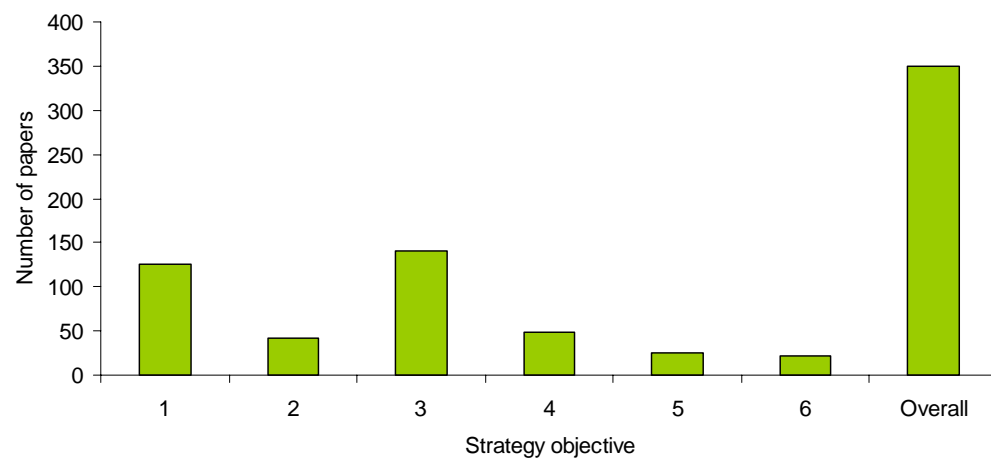


Figure B1 Publications since 1998 and their general relevance to the Strategy

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
							Akcakaya, HR, Ferson, S, Burgman, MA, Keith, DA, Mace, GM & Todd, CR 2000, 'Making consistent IUCN Classifications under Uncertainty', <i>Conservation Biology</i> , vol. 14, no. 4, pp. 1001-13.
						X	Albrecht, G 2000, 'The koala and a native sense of place: the urgent need for a distinctively Australian environmental ethic', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
X	X						Allen, C 2001, 'Towards the recovery of koalas on the far south coast of New South Wales', paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
		X					Allen, CD, Burrige, M, Mulhall, S, Chafer, ML, Nicolson, VN, Pyne, M, Zee, YP, Jago, SC, Lundie-Jenkins, G, Holt, WV, Carrick, FN, Curlewis, JD, Lisle, AT & Johnston, SD 2008, 'Successful artificial insemination in the koala (<i>Phascolarctos cinereus</i>) using extended and extended-chilled semen collected by electroejaculation', <i>Biology Of Reproduction</i> , vol. 78, no. 4, pp. 661-6.
X							Ashworth, G 1998, 'How Pine Rivers Shire is protecting koalas from dog attacks', paper presented to Conference on the Status of the Koala in 1998, Coffs Harbour, NSW.
		X					Augustine, DJ 1998, 'Modelling Chlamydia-koala interactions: coexistence, population dynamics and conservation implications', <i>Journal Of Applied Ecology</i> , vol. 35, no. 2, pp. 261-72.
X		X					Austin, M, Pausas, J & Noble, I 1999, 'Modelling environmental and temporal niches of eucalypts', in J Williams & J Woinarski (eds), <i>Eucalypt Ecology</i> , pp. 129-50.
		X					Australian Academy of Science 2008, <i>Koalas Under Threat From Climate Change</i> , ScienceDaily, viewed 5th June 2008, http://www.sciencedaily.com/releases/2008/05/080508131118.htm
X	X	X					Australian Koala Foundation 2008, <i>Koala Habitat Atlas</i> , Australian Koala Foundation, viewed 4th June 2008, < https://www.savethekoala.com/kha.html >.
X						X	Azerrad, JM & Nilon, CH 2006, 'An evaluation of agency conservation guidelines to better address planning efforts by local government', <i>Landscape And Urban Planning</i> , vol. 77, no. 3, pp. 255-62.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X	X		X				Ballarat City Council 2006 <i>The Koala Plan of Management for the City of Ballarat</i> , Joint project between the Australian Koala Foundation and City of Ballarat, Ballarat.
X							Barrott, E 1999, 'Census techniques, habitat use and distribution of koalas in the Pilliga State Forests', Honours thesis, University of Sydney.
						X	Baxter, PWJ, McCarthy, MA, Possingham, HP, Menkhorst, PW & McLean, N 2006, 'Accounting for management costs in sensitivity analyses of matrix population models', <i>Conservation Biology</i> , vol. 20, no. 3, pp. 893-905.
						X	Bennett, AF, Lumsden, LF & Menkhorst, PW 2006, 'Mammals of the Mallee Region, Victoria: past, present and future', <i>Proceedings of the Royal Society of Victoria</i> , vol. 118, no. 2, pp. 259-80.
		X					Bercovitch, FB & Tobey, JR 2004, 'Maternal effort and sex differences in koala joey development', <i>Integrative & Comparative Biology</i> , vol. 44, no. 6.
		X					Bercovitch, FB 2007, 'Biodiversity Animal Treasury - Connecting conservation biology with evolutionary ecology: The case of the koala', <i>Biodiversity</i> , vol. 8, no. 3, pp. 33-7.
		X					Bercovitch, FB, Tobey, JR, Andrus, CH & Doyle, L 2006, 'Mating patterns and reproductive success in captive koalas (<i>Phascolarctos cinereus</i>)', <i>Journal of Zoology</i> , vol. 270, no. 3, pp. 512-6.
X			X				Biodiversity Assessment and Management 2002, <i>Draft Noosa Council Conservation Action Statement No. 1 - Koala</i> , Prepared for Noosa Shire Council.
X	X		X				Biolink Ecological Consultants 2008a, <i>Area 13 UIA Koala Plan of Management</i> , Biolink Ecological Consultants, Uki NSW.
		X					Bird, PS, Huynh, SC, Davis, D, Love, DN, Blackall, LL & Seymour, GJ 2002, 'Oral disease in animals: The Australian perspective. Isolation and characterisation of black-pigmented bacteria from the oral cavity of marsupials', <i>Anaerobe</i> , vol. 2, no. 2, pp. 79-87.
						X	Bobek, G & Deane, EM 2001, 'Possible antimicrobial compounds from the pouch of the koala, <i>Phascolarctos cinereus</i> ', <i>Letters in Peptide Science</i> , vol. 8, no. 3-5, pp. 133-7.
		X					Bodetti, T, Johnston, S, Pospischil, A, Knox, C & Timms, P 2000, 'Screening semen from koalas (<i>Phascolarctos cinereus</i>) for Chlamydia species by PCR', <i>Veterinary Record</i> , vol. 151, pp. 147-9.
		X					Bodetti, T, Viggers, K, Warren, K, Swan, R, Conaghty, S, Sims, C & Timms, P 2003, 'Wide range of Chlamydiales types detected in native Australian mammals', <i>Veterinary Microbiology</i> , vol. 96, pp. 177-87.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
		X					Bodetti, TJ & Timms, P 2000, 'Detection of <i>Chlamydia pneumoniae</i> DNA and Antigen in the circulating mononuclear cell fractions of humans and koalas', <i>Infection and Immunity</i> , vol. 68, no. 5, pp. 2744-7.
						X	Bodetti, TJ, Jacobson, E, Wan, C, Hafner, L, Pospischil, A, Rose, K & Timms, P 2002, 'Molecular evidence to support the expansion of the host range of <i>Chlamydophila pneumoniae</i> to include reptiles as well as humans, horses, koalas and amphibians', <i>Systematic & Applied Microbiology</i> , vol. 25, no. 1, pp. 146-52.
		X					Bodetti, TJ, Johnston, SD, Pospischil, A, Knox, C & Timms, P 2001, 'PCR detection of Chlamydia in koala (<i>Phascolarctos cinereus</i>) semen', paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
				X			Booth, R 2000, 'Threatening processes for koalas: A wildlife veterinarian's perspective', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
						X	Bradshaw, D 1999, 'Ecophysiological studies on desert mammals: Insights from stress physiology', <i>Australian Mammalogy</i> , vol. 21, no. 1, pp. 55-65.
X		X					Braithwaite, LW 2004, 'Do current forest practices threaten forest fauna? A perspective', in D Lunney (ed.), <i>Conservation of Australia's Forest Fauna</i> , 2nd Edition edn, Royal Zoological Society of New South Wales, Mosman, NSW, pp. 513-36.
						X	Breed, WG, Leigh, CM & Ricci, M 2001, 'The structural organisation of sperm head components of the wombat and koala (suborder: Vombatiformes): An enigma amongst marsupials', <i>Journal of Anatomy</i> , vol. 198, no. 1, pp. 57-66.
X			X				Cahill, V 1999, 'The status of the koala on Magnetic Island', paper presented to Conference on the Status of the Koala in 1999, Phillip Island, VIC.
X							Callaghan, J & McAlpine, CA 2003, <i>Documentation in support of a nomination for listing the koala as Vulnerable in Queensland. Unpublished nomination report to the Queensland Scientific Advisory Committee</i> . Australian Koala Foundation, Brisbane.
X	X		X				Callaghan, J 2004, (<i>Updated</i>) <i>Koala Beach Koala Plan of Management</i> , Prepared for Ray Group Pty Ltd by the Australian Koala Foundation, Brisbane.
X	X		X				Callaghan, J, Curran, T, Thompson, J & Floyd, R 2002, <i>Greater Taree City Council Draft Comprehensive Koala Plan of Management</i> , Prepared by the Australian Koala Foundation on behalf of Greater Taree City Council.
X	X		X				Callaghan, J, Curran, T, Thompson, J, Taylor, A & Mitchell, D 2003a, <i>Campbelltown City Council Draft Comprehensive Koala Plan of Management</i> , Part 1: The CKPoM, Prepared by the Australian Koala Foundation on behalf of Campbelltown City Council.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X	X		X				Callaghan, J, Curran, T, Thompson, J, Taylor, A & Mitchell, D 2003b, <i>Campbelltown City Council Draft Comprehensive Koala Plan of Management</i> , Part 2: Resource Document, Prepared by the Australian Koala Foundation on behalf of Campbelltown City Council.
X		X					Callaghan, J, De Jong, C & Sternberg, R (in review), 'Population decline of the Koala <i>Phascolarctos cinereus</i> in South East Queensland (Australia): preliminary modelling using mortality data', <i>Environmental Management</i> .
X	X		X				Callaghan, J, Thompson, J & Mitchell, D 2000, 'The Noosa Koala Habitat Atlas: Prepared for Noosa Shire Council by the Australian Koala Foundation.' paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
				X			Caneris, A 2000, 'The spirit of the volunteers: Redlands after hours wildlife ambulance', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
			X	X			Central Queensland Koala Volunteers 2008, <i>Central Queensland Koala Volunteers</i> , Central Queensland Koala Volunteers, viewed 6th June 2008, < http://www.cqkoala.org.au/index.htm >.
X							Centre for Environmental Management 2001, <i>Preliminary koala habitat capability assessment of Crown Land in Victoria. Unpublished report to Department of Natural Resources and Environment</i> , University of Ballarat, Ballarat, Victoria.
						X	Chapman, JA, Leigh, CM & Breed, WG 2006, 'The zona pellucida of the koala (<i>Phascolarctos cinereus</i>): its morphogenesis and thickness', <i>Journal of Anatomy</i> , vol. 209, no. 3, pp. 393-400.
	X	X					Clark, S 1998, <i>Koala responses to translocation to the south east of South Australia, particularly in Red Gum dominated communities</i> , Department of Environmental Management, University of Adelaide, Adelaide, South Australia.
	X						Clark, TW & Wallace, RL 1998, 'Understanding the human factor in endangered species recovery ', <i>Endangered Species Update</i> , vol. 15, no. 1, pp. 2-9.
X						X	Clark, TW, Mazur, N, Begg, RJ & Cork, SJ 2000, 'Interdisciplinary guidelines for developing effective koala conservation policy', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 691-701.
			X			X	Clark, TW, Mazur, N, Cork, SJ, Dovers, S & Harding, R 2000, 'Koala conservation policy process: Appraisal and recommendations', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 681-90.
					X		Clarke, GM, Grosse, S, Matthews, M, Catling, PC, Baker, B, Hewitt, CL, Crowther, D & Saddler, SR 2000, <i>Environmental Pest Species in Australia</i> , Australia: State of the Environment, Second Technical Paper Series (Biodiversity), Department of the Environment and Heritage, Canberra.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X						X	Cogger, H, Ford, H, Johnson, C, Holman, J & Butler, D 2003, <i>Impacts of land clearing on Australian wildlife in Queensland</i> , Unpublished Report by WWF Australia.
		X					Coles, KA, Timms, P & Smith, DW 2001, 'Koala biovar of <i>Chlamydia pneumoniae</i> infects human and koala monocytes and induces increased uptake of lipids in vitro', <i>Infection and Immunity</i> , vol. 69, no. 12, pp. 7894-7.
		X					Connolly, JH 2000, 'Immunopathological characterisation of infectious diseases in the koala and the platypus', PhD thesis, University of Sydney.
		X					Connolly, JH, Canfield, PJ, Hemsley, S & Spencer, AJ 1998, 'Lymphoid neoplasia in the koala', <i>Australian Veterinary Journal</i> , vol. 76, no. 12, pp. 819-25.
		X					Connolly, JH, Krockenberger, MB, Malik, R, Canfield, PJ, Wigney, DI & Muir, DB 1999, 'Asymptomatic carriage of <i>Cryptococcus neoformans</i> in the nasal cavity of the koala (<i>Phascolarctos cinereus</i>)', <i>Medical Mycology</i> , vol. 37, no. 5, pp. 331-8.
	X				X		Cooper, DW 2004, 'Should immunocontraception be used for wildlife population management?' <i>Australian Mammalogy</i> , vol. 26, no. 1, pp. 61-5.
						X	Coorey 2007, <i>Demise of the Koala?</i> Cosmos Magazine, viewed 6th June 2008, < http://www.cosmosmagazine.com/features/online/1155/demise-koala >.
X							Cork, SJ 2001, 'The concept of ecosystem services and what it means for conservation of koalas', paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
X							Cork, SJ, Clark, TW & Mazur, N 2000a, 'Conclusions and recommendations for koala conservation', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 702-4.
						X	Cork, SJ, Clark, TW & Mazur, N 2000b, 'Introduction: an interdisciplinary effort for koala conservation', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 606-9.
X		X					Cork, SJ, Hume, LD & Foley, WJ 2000, 'Improving habitat models and their utility in koala conservation', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 660-8.
						X	Crompton, A, Owerkowicz, T & Lieberman, D 2007, 'Motor control of masticatory muscles in placental and marsupial herbivores', <i>Journal of Vertebrate Paleontology</i> , pp. 62A-3A.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X			X				Curtin, A, Lunney, D & Matthews, A 2002, 'A survey of a low-density koala population in a major reserve system, near Sydney, New South Wales', <i>Australian Mammalogy</i> , vol. 23, no. 2, pp. 135-44.
			X			X	Dargavel, J, Hart, D & Libbis, B 2001, <i>Perfumed Pineries: Environmental history of Australia's Callitris forests</i> , CRES, Australian National University, Canberra.
X			X				De Villiers, DL 1999, 'Koala management in south east Queensland – how do we know if it works?' paper presented to Conference on the Status of the Koala in 1999, Phillip Island, VIC.
X		X					De Villiers, DL 2000, 'Aspects of koala mortality in the Koala Coast: cars and dogs', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
X	X		X	X			De Villiers, DL, Dique, DS, Jonnes, R, Kraschnefski, K, Preece, HJ & Siebuhr, L 2000, 'The Role of the QLD Parks and Wildlife Service in koala conservation and management in SE QLD', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
		X		X			De Villiers, DL, Dique, DS, Preece, HJ, Thompson, J, Leslie, RS, de Villiers, MA & Penfold, GC (in press), 'The capture, handling and radio collaring of koalas <i>Phascolarctos cinereus</i> in south-east Queensland: Associated impacts and ethical considerations', <i>Australian Mammalogy</i> .
X		X					De Villiers, DL, Preece, HJ & Dique, DS (in press), 'Domestic dog related koala (<i>Phascolarctos cinereus</i>) mortality in southeast Queensland', <i>Wildlife Research</i> .
		X					Denner, J 2007, 'Transspecies transmissions of retroviruses: New cases', <i>Virology</i> , vol. 369, no. 2, pp. 229-33.
				X			Department for Environment and Heritage (South Australia) 2006a, <i>Media Release - Koala Management - Saving Kangaroo Island's threatened eucalypt habitats</i> , Department for Environment and Heritage (South Australia).
						X	Department for Environment and Heritage (South Australia) 2006b, <i>Media Release - Koala population in Adelaide Hills healthy despite drought</i> , Department for Environment and Heritage (South Australia).
X						X	Department of Natural Resources and Water (Queensland) 2000 - 2007, <i>Land cover change in Queensland (1997-1999 through to 2004-2005): a Statewide Landcover and Trees Study (SLATS) Report, February 2007</i> , Department of Natural Resources and Water, Brisbane, < http://www.nrw.qld.gov.au/slats/report.html >.
				X			Department of the Environment and Heritage 2004, <i>Conditions for the overseas transfer of koalas, effective from May 2004</i> , Australian Government.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X							Department of Urban Affairs and Planning 1998, <i>Procedures for preparing Comprehensive Koala Plans of Management under State Environmental Planning Policy 44 - Koala Habitat Protection</i> , Department of Urban Affairs and Planning, Sydney.
						X	Deptula, W, Pawlikowska, M & Travnicek, M 2002, 'Chlamydiae in animals and humans', <i>Medycyna Weterynaryjna</i> , vol. 58, no. 5, pp. 337-40.
		X					Devereaux, LN, Polkinghorne, A, Meijer, A & Timms, P 2003, 'Molecular evidence for novel chlamydial infections in the koala (<i>Phascolarctos cinereus</i>)', <i>Systematic & Applied Microbiology</i> , vol. 26, no. 2, pp. 245-53.
		X					Dique, DS 2000, 'Koala research in the Koala Coast', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
X							Dique, DS 2004, 'The distribution, abundance and dynamics of a regional koala population in south east Queensland', PhD thesis, University of Queensland.
		X					Dique, DS, de Villiers, DL & Preece, HJ 2003, 'Evaluation of line-transect sampling for estimating koala abundance in the Pine Rivers Shire, south-east Queensland', <i>Wildlife Research</i> , vol. 30, no. 2, pp. 127-33.
X							Dique, DS, De Villiers, DL, Thompson, J, Preece, HJ, Penfold, GC & Leslie, RS 2000, <i>The impact of differential speed signs on koala mortality on roads in south east Queensland</i> , Queensland Parks and Wildlife Service, Brisbane.
X		X					Dique, DS, Penfold, GC, Thompson, J, Leslie, RS & Preece, HJ 2001, 'Koala distribution and density in southeast Queensland: the accuracy and precision of koala surveys. ' in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 105-21.
X		X				X	Dique, DS, Preece, HJ & De Villiers, DL (in press), 'The role of research in the conservation and management of urban koala <i>Phascolarctos cinereus</i> populations in south east Queensland', <i>Australian Mammalogy</i> .
X		X					Dique, DS, Preece, HJ & De Villiers, DL 2003, <i>Koalas in Pine Rivers Shire: Distribution, abundance and management</i> , Queensland Parks and Wildlife Service.
X		X					Dique, DS, Preece, HJ, Thompson, J & de Villiers, DL 2004, 'Determining the distribution and abundance of a regional koala population in south-east Queensland for conservation management', <i>Wildlife Research</i> , vol. 31, no. 2, pp. 109-17.
X		X					Dique, DS, Thompson, J, Preece, HJ, de Villiers, DL & Carrick, FN 2003, 'Dispersal patterns in a regional koala population in south-east Queensland', <i>Wildlife Research</i> , vol. 30, no. 3, pp. 281-90.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X							Dique, DS, Thompson, J, Preece, HJ, Penfold, GC, De Villiers, DL & Leslie, RS 2003, 'Koala mortality on roads in south-east Queensland; the koala speed-zone trial', <i>Wildlife Research</i> , vol. 30, pp. 419-26.
						X	Donegan, J (no date), 'Unfair Game: Queensland's open season on Koalas in 1927', <i>Access: History</i> , vol. 3, no. 1, pp. 35-50.
					X		Duka, T & Masters, P 2005, 'Confronting a tough issue: Fertility control and translocation for over-abundant koalas on Kangaroo Island, South Australia', <i>Ecological Management & Restoration</i> , vol. 6, no. 3, pp. 172-81.
						X	Ebbers, MJH, Wallis, IR, Dury, S, Floyd, R & Foley, WJ 2002, 'Spectrometric prediction of secondary metabolites and nitrogen in fresh <i>Eucalyptus</i> foliage: towards remote sensing of the nutritional quality of foliage for leaf-eating marsupials', <i>Australian Journal of Botany</i> , vol. 50, pp. 761-8.
		X					Ellis, W, Carrick, F, Lundgren, P, Veary, A & Cohen, B 1999, 'The use of faecal cuticle examination to determine the dietary composition of koalas', <i>Australian Zoologist</i> , vol. 31, no. 1, pp. 127-33.
X	X						Ellis, W, Hale, PT, Carrick, F, Hasegawa, M, Nielsen, M & Esser, D 2001, 'Aspects of the ecology of koalas at Blair Athol coal mine', in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 105-21.
		X				X	Ellis, W, Sullivan, BJ, Lisle, AT & Carrick, F 1998, 'The spatial and temporal distribution of koala faecal pellets', <i>Wildlife Research</i> , vol. 25, pp. 663-8.
		X					Ellis, WA, Hale, PT & Carrick, F 2002, 'Breeding dynamics of koalas in open woodlands', <i>Wildlife Research</i> , vol. 29, no. 1, pp. 19-25.
		X					Ellis, WAH, Melzer, A, Carrick, FN & Hasegawa, M 2002, 'Tree use, diet and home range of the koala (<i>Phascolarctos cinereus</i>) at Blair Athol, central Queensland', <i>Wildlife Research</i> , vol. 29, no. 3, pp. 303-11.
				X			Environmental Protection Agency 2005, <i>Aims for koala rehabilitation</i> , Environmental Protection Agency, Queensland Government, < http://www.epa.qld.gov.au/register/p01469ak.pdf >
						X	Esson, C & Armati, PJ 1998, 'Development of the male urogenital system of the koala <i>Phascolarctos cinereus</i> ', <i>Anatomy & Embryology</i> , vol. 197, no. 3, pp. 217-27.
		X					Fiebig, U, Hartmann, MG, Bannert, N, Kurth, R & Denner, J 2006, 'Transspecies transmission of the endogenous koala retrovirus', <i>Journal of Virology</i> , vol. 80, no. 11, pp. 5651-4.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
						X	Field, SA, Tyre, AJ, Jonzen, N, Rhodes, J, McCarthy, M, Wintle, B & Possingham, HP 2004, 'Minimizing the cost of threatened species management: Can error rates be optimized?' <i>Ecological Society of America Annual Meeting Abstracts</i> , vol. 89, no. 154.
						X	Field, SA, Tyre, AJ, Jonzen, N, Rhodes, JR & Possingham, HP 2004, 'Minimizing the cost of environmental management decisions by optimizing statistical thresholds', <i>Ecology Letters</i> , vol. 7, no. 8, pp. 669-75.
X			X				FitzGibbon, SI & Jones, DN 2006, 'A community-based wildlife survey: the knowledge and attitudes of residents of suburban Brisbane, with a focus on bandicoots', <i>Wildlife Research</i> , vol. 33, no. 3, pp. 233-41.
X						X	Floyd, R 2000, 'Those Bloody Planners', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
X	X		X				Australian Koala Foundation 2008, <i>Koala Beach Housing Development</i> , Australian Koala Foundation, viewed 5th June 2008, < https://www.savethekoala.com/koalabeach.html >.
		X					Fowler, EV, Hoeben, P & Timms, P 1998, 'Randomly amplified polymorphic DNA variation in populations of eastern Australian koalas, <i>Phascolarctos cinereus</i> ', <i>Biochemical Genetics</i> , vol. 36, no. 11-12, pp. 381-94.
		X					Fowler, EV, Houlden, BA, Hoeben, P & Timms, P 2000, 'Genetic diversity and gene flow among southeastern Queensland koalas (<i>Phascolarctos cinereus</i>)', <i>Molecular Ecology</i> , vol. 9, no. 2, pp. 155-64.
		X					Fowler, EV, Houlden, BA, Sherwin, WB, Hoeben, P & Timms, P 1998, 'Genetic variation in captive koalas (<i>Phascolarctos cinereus</i>): Parentage determination and individual identification', <i>Biochemical Genetics</i> , vol. 36, no. 5-6, pp. 193-206.
X			X				Friends of the Earth Melbourne 2005, <i>Strzelecki Koala Mapping Project 2005</i> , viewed 5th June 2008, < http://www.hancock.forests.org.au/docs/koala2005.htm >.
X			X				Friends of the Koala Inc. 2008, <i>Friends of the Koala - Conserving koalas and their habitat in the Northern Rivers of NSW</i> , Friends of the Koala Inc, viewed 6th June 2008, < http://www.friendsofthekoala.org/fok/ >.
			X				Friends of the Koalas Inc. 2008, <i>Friends of the Koalas Inc. - The little Australian Phillip Island would hate to lose</i> , Friends of the Koalas Inc., viewed 6th June 2008, < http://home.vicnet.net.au/~koalas/welcome.htm >.
						X	Gardenfors, U, Hilton-Taylor, C, Mace, GM & Rodriguez, JP 2001, 'The application of IUCN Red List Criteria at regional levels' <i>Conservation Biology</i> , vol. 15, no. 5, pp. 1206-12
X	X		X				Gibson, M, Leversha, J, Prevett, P & Milne, R 1999, <i>Koala habitat assessment. Report to Parks Victoria</i> , Centre for Environmental Management, University of Ballarat.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
						X	Gibson, R.J, Leigh, CM & Breed, WG 2000, 'Unusual macromorphology of the ductuli efferentes and epididymis of the koala (<i>Phascolarctos cinereus</i>)', <i>Australian Journal Of Zoology</i> , vol. 48, no. 6, p. 2000.
						X	Gifford, A, Fry, G, Houlden, BA, Fletcher, TP & Deane, EM 2002, 'Gestational length in the koala, <i>Phascolarctos cinereus</i> ', <i>Animal Reproduction Science</i> , vol. 70, no. 3-4, pp. 261-6.
	X						Goosem, M, Izumi, Y & Turton, S 2001, 'Efforts to restore habitat connectivity for an upland tropical rainforest fauna: A trial of underpasses below roads', <i>Ecological Management & Restoration</i> , vol. 2, no. 3, pp. 196-202.
						X	Gordon, G & Hrdina, F 2005, 'Koala and possum populations in Queensland during the harvest period, 1906-1936', <i>Australian Zoologist</i> , vol. 33, no. 1, pp. 69-99.
X							Gordon, G, Hrdina, F & Patterson, R 2006, 'Decline in the distribution of the koala <i>Phascolarctos cinereus</i> in Queensland', <i>Australian Zoologist</i> , vol. 33, no. 3, pp. 345-58.
X							Gowans, S, Gibson, M & Prevet, P 2000, 'Habitat assessment and koala density in the Brisbane Ranges National Park, Victoria: Preliminary findings.' paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
				X			Grabowski, W 2000, 'Our spirit, our land: The Pine Rivers Koala Care Association Incorporated', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
						X	Grand, TI & Barboza, FS 2001, 'Anatomy and development of the koala, <i>Phascolarctos cinereus</i> : an evolutionary perspective on the superfamily Vombatoidea', <i>Anatomy And Embryology</i> , vol. 203, no. 3, pp. 211-23.
						X	Guglielmi, J 2007, <i>Analysis of the EPBC Act with regards to the protection of the koala, and The Australian Koala Foundation's vision for a National Koala Act</i> , University of Nice, France.
X						X	Hamilton, C, Lunney, D & Matthews, A 2000, 'An economic appraisal of evaluation of local government approaches to koala conservation', <i>Australian Journal of Environmental Management</i> , vol. 7, pp. 158-69.
	X						Hanger, J 1998, 'The Gold Coast Koala Relocation Project', paper presented to Conference on the Status of the Koala in 1998, Coffs Harbour, NSW.
		X					Hanger, J, McKee, J, O'Brien, T & Robinson, WF 1998, 'Update on lymphoma and koala retrovirus research', paper presented to Conference on the Status of the Koala in 1999, Coffs Harbour, NSW.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
		X					Hanger, JJ 1999, 'An investigation of the role of retroviruses in leukaemia and related diseases in koalas', PhD thesis, University of Queensland.
		X					Hanger, JJ, Bromham, LD, McKee, JJ, O'Brien, TM & Robinson, WF 2000, 'The nucleotide sequence of koala (<i>Phascolarctos cinereus</i>) retrovirus: A novel type C endogenous virus related to gibbon ape leukemia virus', <i>Journal of Virology</i> , vol. 74, no. 9, pp. 4264-72.
X							Harris, JM & Goldingay, RL 2003, 'A community-based survey for the koala <i>Phascolarctos cinereus</i> in the Lismore region of north-eastern New South Wales', <i>Australian Mammalogy</i> , vol. 25, pp. 155-67.
X	X		X				Harris, JM 1999, 'A foundation for the development of a Koala Management Plan for the Lismore Local Government Area', Honours thesis, Southern Cross University.
X	X		X				Hastings Council & Connell Wagner Pty Ltd 1999, <i>Kings Creek Koala Plan of Management</i> , Hastings Council.
						X	Haynes, JI 2001, 'The marsupial and monotreme thymus, revisited', <i>Journal of Zoology</i> , vol. 253, no. 2, pp. 167-73.
		X					Haynes, JI, Askew, MJ & Leigh, C 2004, 'Dietary aluminium and renal failure in the koala (<i>Phascolarctos cinereus</i>)', <i>Histology & Histopathology</i> , vol. 19, no. 3, pp. 777-84.
		X					Hemsley, S, Govendir, M, Canfield, PJ & Connolly, JH 1998, 'Diabetes mellitus in a koala (<i>Phascolarctos cinereus</i>)', <i>Australian Veterinary Journal</i> , vol. 76, no. 3, pp. 203-8.
					X		Herbert, CA 2007, 'From the urban fringe to the Arolhos Islands: management challenges of burgeoning marsupial populations', in D Lunney, P Eby, P Hutchings & S Burgin (eds), <i>Pest or Guest: The Zoology of Overabundance</i> , Royal Zoological Society New South Wales, Taronga Zoo, Mosman, pp. 129-41.
			X				Herbert, CA, Webley, LS, Trigg, TE, Francis, K, Lunney, DH & Cooper, DW 2001, 'Preliminary trials of the GnRH Superagonist Deslorlein as a safe, long-acting and reversible contraceptive for koalas.' paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
						X	Higgins, DP, Hemsley, S & Canfield, PJ 2004, 'Assessment of anti-bovine IL4 and IFN gamma antibodies to label IL4 and IFN gamma in lymphocytes of the koala and brushtail possum', <i>Veterinary Immunology & Immunopathology</i> , vol. 101, no. 3-4, pp. 153-60.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
		X					Higgins, DP, Hemsley, S & Canfield, PJ 2005, 'Immuno-histochemical demonstration of the role of Chlamydiaceae in renal, uterine and salpingeal disease of the koala, and demonstration of Chlamydiaceae in novel sites', <i>Journal of Comparative Pathology</i> , vol. 133, no. 2-3, pp. 164-74.
		X					Houlden, BA, Costello, BH, Sharkey, D, Fowler, EV, Melzer, A, Ellis, W, Carrick, F, Baverstock, PR & Elphinstone, MS 1999, 'Phylogeographic differentiation in the mitochondrial control region in the koala, <i>Phascolarctos cinereus</i> (Goldfuss 1817)', <i>Molecular Ecology</i> , vol. 8, no. 6, pp. 999-1011.
						X	Hrdina, F & Gordon, G 2004, 'The koala and possum trade in Queensland, 1906-1936', <i>Australian Zoologist</i> , vol. 32, no. 4, pp. 543-85.
		X				X	Hudgens, BR & Haddad, NM 2003, 'Predicting which species will benefit from corridors in fragmented landscapes from population growth models', <i>American Naturalist</i> , vol. 161, pp. 808-20.
				X			Hume, ID 2005, 'Nutrition of marsupials in captivity', <i>Annales Academiae Regiae Scientiarum Upsaliensis</i> , vol. 39, pp. 117-32.
						X	Hundloe, T & Hamilton, C 1997, <i>Koalas and tourism: An economic evaluation</i> , Discussion Paper Number 13, The Australia Institute.
						X	Iason, G 2005, 'The role of plant secondary metabolites in mammalian herbivory: ecological perspectives', <i>Proceedings Of The Nutrition Society</i> , vol. 64, no. 1, pp. 123-31.
X							ISHTA Consultants 1999, <i>Progress report on the monitoring program of the koala barrier fence/underpass system at the Raymond Terrace bypass</i> , ISHTA Consultants, Dromana, Australia.
		X					Jackson, M, White, N, Giffard, P & Timms, P 1999, 'Epizootiology of Chlamydia infections in two free-range koala populations', <i>Veterinary Microbiology</i> , vol. 65, no. 4, pp. 255-64.
			X			X	Jackson, S 2007, <i>Koala: Origins of an Icon</i> , Jacana Books, Allen & Unwin., Crows Nest.
				X			Jackson, S, Perry, L, O'Callaghan, P, Spittal, D, Romer, L & Reid, K 2000, <i>Koala Phascolarctos cinereus: Captive husbandry guidelines</i> .
				X			Jackson, S, Reid, K, Spittal, D & Romer, L 2003, 'Koalas', in S Jackson (ed.), <i>Australian Mammals: Biology and Captive Management</i> , CSIRO Publishing, Collingwood, Victoria.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X							Januchowski, SR, McAlpine, CA, Callaghan, JG, Griffin, CB, Bowen, M, Mitchell, D & Lunney, D 2008, 'Identifying multiscale habitat factors influencing koala (<i>Phascolarctos cinereus</i>) occurrence and management in Ballarat, Victoria, Australia', <i>Ecological Management & Restoration</i> , vol. 9, no. 2, pp. 134-42.
					X		Johnston, SD 1999, 'Studies towards the development of an artificial insemination program in the koala (<i>Phascolarctos cinereus</i>). ' PhD thesis, The University of Queensland.
						X	Johnston, SD, Lopez-Fernandez, C, Gosalbez, A, Zee, YP, Holt, WV, Allen, C & Gosalvez, J 2007, 'The relationship between sperm morphology and chromatin integrity in the koala (<i>Phascolarctos cinereus</i>) as assessed by the sperm chromatin dispersion test (SCDt)', <i>Journal Of Andrology</i> , vol. 28, no. 6, pp. 891-9.
		X					Johnston, SD, McGowan, MR, O'Callaghan, P, Cox, R & Nicolson, V 2000a, 'Natural and artificial methods for inducing the luteal phase in the koala (<i>Phascolarctos cinereus</i>)', <i>Journal of Reproduction & Fertility</i> , vol. 120, no. 1, pp. 59-64.
		X					Johnston, SD, McGowan, MR, O'Callaghan, P, Cox, R & Nicolson, V 2000b, 'Studies of the oestrous cycle, oestrus and pregnancy in the koala (<i>Phascolarctos cinereus</i>)', <i>Journal of Reproduction & Fertility</i> , vol. 120, no. 1, pp. 49-57.
		X					Johnston, SD, McGowan, MR, O'Callaghan, P, Cox, R, Houlden, B, Haig, S & Taddeo, G 2003, 'Birth of Koalas <i>Phascolarctos cinereus</i> at Lone Pine Koala Sanctuary following artificial insemination', <i>International Zoo Yearbook</i> , vol. 38, pp. 160-72.
		X					Johnston, SD, McGowan, MR, Phillips, NJ & O'Callaghan, P 2000, 'Optimal physicochemical conditions for the manipulation and short-term preservation of koala (<i>Phascolarctos cinereus</i>) spermatozoa', <i>Journal of Reproduction & Fertility</i> , vol. 118, no. 2, pp. 273-81.
		X					Johnston, SD, O'Boyle, D, Frost, AJ, McGowan, MR, Tribe, A & Higgins, D 1998, 'Antibiotics for the preservation of koala (<i>Phascolarctos cinereus</i>) semen', <i>Australian Veterinary Journal</i> , vol. 76, no. 5, pp. 335-8.
		X					Johnston, SD, O'Callaghan, P, Nilsson, K, Tzipori, G & Curlewis, JD 2004, 'Semen-induced luteal phase and identification of a LH surge in the koala (<i>Phascolarctos cinereus</i>)', <i>Reproduction</i> , vol. 128, no. 5, pp. 629-34.
X							Jones, R & Carter, J 2000, <i>Summary of Queensland Parks and Wildlife Service Koala Reports for Redland Shire, 1999</i> , Unpublished Report, Queensland Parks and Wildlife Service, Brisbane.
				X			Jones, R 2000, 'History of the Koala Ambulance Service operating within the Koala Coast', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X		X					Jurskis, V 2001, 'A review of some techniques used to describe koala habitat and its use by koalas with particular reference to low density populations at Eden', in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 71-88.
X		X					Jurskis, V, Douch, A, McCray, K & Sheilds, J 2001, 'A playback survey of the koala, <i>Phascolarctos cinereus</i> , and a review of it's distribution in the Eden Region of south-eastern New South Wales.' <i>Australian Forestry</i> , vol. 64, no. 4, pp. 226-31.
X		X					Kavanagh, RP & Barrett, E 2001, 'Koala populations in the Pilliga Forests', in J Dargavel, D Hart & B Libbis (eds), <i>Perfumed Pineries: Environmental history of Australia's Callitris forests</i> , CRES, Australian National University, Canberra, pp. 93-103.
		X					Kavanagh, RP, Stanton, MA & Brassil, TE 2007, 'Koalas continue to occupy their previous home-ranges after selective logging in Callitris-Eucalyptus forest', <i>Wildlife Research</i> , vol. 34, no. 2, pp. 94-107.
						X	Kelso, R 2001, 'All creatures are equal, though some are more equal than others: the moral and political agency of koalas', in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton.
						X	Kempster, RC & Hirst, LW 2002, 'Bony orbital anatomy of the koala (<i>Phascolarctos cinereus</i>)', <i>Anatomical Record</i> , vol. 267, no. 4, pp. 288-91.
						X	Kempster, RC, Bancroft, BJ & Hirst, LW 2002, 'Intraorbital anatomy of the koala (<i>Phascolarctos cinereus</i>)', <i>Anatomical Record</i> , vol. 267, no. 4, pp. 277-87.
X							Knott, T, Lunney, D, Coburn, D & Callaghan, J 1998, 'An ecological history of Koala habitat in Port Stephens Shire and the Lower Hunter on the Central Coast of New South Wales, 1801-1998', <i>Pacific Conservation Biology</i> , vol. 4, no. 4, pp. 354-68.
X			X				Koala Action Group 2004, 'Loss of bushland - Still a major concern', <i>Koala Action Group Newsletter</i> , vol. 1, February-March 2004.
				X			Koalas in Care Inc 2008, <i>Koalas in Care Inc</i> , viewed 6th June 2008, < http://www.gtcc.nsw.gov.au/Directory/S2_Item.asp?Mkey=430&S3Key=92 >.
						X	Kobayashi, K, Kumakura, M, Yoshimura, K, Nonaka, K, Murayama, T & Henneberg, M 2003, 'Comparative morphological study of the lingual papillae and their connective tissue cores of the koala', <i>Anatomy & Embryology</i> , vol. 206, no. 4, pp. 247-54.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
						X	Kong, S, McKinnon, RA, Mojarrabi, B & Stupans, I 2002, 'Absence of type 1 11 beta-hydroxysteroid dehydrogenase enzyme in koala liver', <i>Comparative Biochemistry And Physiology C-Toxicology & Pharmacology</i> , vol. 131, no. 1, pp. 39-50.
				X			Kraschnefski, K 1999, 'The Moggill Koala Hospital - the past, present and future', paper presented to Conference on the Status of the Koala in 1999, Phillip Island, Victoria.
				X			Kraschnefski, K 2000, 'The Moggill Koala Hospital's role in koala conservation and management in Southeast Queensland', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
		X					Krockenberger, A 2003, 'Meeting the energy demands of reproduction in female koalas, <i>Phascolarctos cinereus</i> : Evidence for energetic compensation', <i>Journal of Comparative Physiology B Biochemical Systemic & Environmental Physiology</i> , vol. 173, no. 6, pp. 531-40.
		X					Krockenberger, AK & Hume, ID 2007, 'A flexible digestive strategy accommodates the nutritional demands of reproduction in a free-living folivore, the Koala (<i>Phascolarctos cinereus</i>)', <i>Functional Ecology</i> , vol. 21, no. 4, pp. 748-56.
		X					Krockenberger, AK, Hume, ID & Cork, SJ 1998, 'Production of milk and nutrition of the dependent young of free-ranging koalas (<i>Phascolarctos cinereus</i>)', <i>Physiological Zoology</i> , vol. 71, no. 1, pp. 45-56.
		X					Krockenberger, MB, Canfield, PJ & Malik, R 2002, 'Cryptococcus neoformans in the koala (<i>Phascolarctos cinereus</i>): Colonization by <i>C. n. var. gattii</i> and investigation of environmental sources', <i>Medical Mycology</i> , vol. 40, no. 3, pp. 263-72.
		X					Krockenberger, MB, Canfield, PJ & Malik, R 2003, 'Cryptococcus neoformans var. <i>gattii</i> in the koala (<i>Phascolarctos cinereus</i>): A review of 43 cases of cryptococcosis', <i>Medical Mycology</i> , vol. 41, no. 3, pp. 255-34.
		X					Krockenberger, MB, Canfield, PJ, Barnes, J, Vogelnest, L, Connolly, J, Ley, C & Malik, R 2002, 'Cryptococcus neoformans var. <i>gattii</i> in the koala (<i>Phascolarctos cinereus</i>): Serological evidence for subclinical cryptococcosis', <i>Medical Mycology</i> , vol. 40, no. 3, pp. 273-82.
X	X						Larsen, D 1999, 'How can you keep koalas on private land?' <i>Land for Wildlife</i> , vol. Note no. 9, Novemeber 1999.
		X					Lawler, IR 1998, 'Variation in marsupial folivory between and within <i>Eucalyptus</i> species: the roles and actions of plant secondary metabolites', Ph.D thesis, Australian National University.
		X					Lawler, IR, Foley, WJ & Eschler, BM 2000, 'Foliar concentration of a single toxin creates habitat patchiness for a marsupial folivore', <i>Ecology</i> , vol. 81, pp. 1327-38.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
		X					Lawler, IR, Foley, WJ, Eschler, BM, Pass, DM & Handasyde, K 1998, 'Intraspecific variation in Eucalyptus secondary metabolites determines food intake by folivorous marsupials', <i>Oecologia</i> , vol. 116, no. 1-2, pp. 160-9.
						X	Lawson, VJ & Carrick, FN 1998, 'Morphology of the thyroid in coastal and noncoastal populations of the Koala (<i>Phascolarctos cinereus</i>) in Queensland', <i>General & Comparative Endocrinology</i> , vol. 110, no. 3, pp. 295-306.
						X	Liapis, P, Pass, GJ, McKinnon, RA & Stupans, I 2000, 'Characterisation of tolbutamide hydroxylase activity in the common brushtail possum, (<i>Trichosurus vulpecula</i>) and koala (<i>Phascolarctos cinereus</i>): Inhibition by the Eucalyptus terpene 1,8-cineole', <i>Comparative Biochemistry & Physiology Part C Toxicology & Pharmacology</i> , vol. 127C, no. 3, pp. 351-7.
		X					Logan, M & Sanson, GD 2002a, 'The association of tooth wear with sociality of free-ranging male koalas (<i>Phascolarctos cinereus</i> Goldfuss)', <i>Australian Journal Of Zoology</i> , vol. 50, pp. 621-6.
		X					Logan, M & Sanson, GD 2002b, 'The effect of tooth wear on feeding behaviour of free-ranging koalas (<i>Phascolarctos cinereus</i> , Goldfuss)', <i>Journal of Zoology (London)</i> , vol. 256, pp. 63-9.
		X					Logan, M & Sanson, GD 2002c, 'The effects of tooth wear on the activity patterns of free-ranging koalas (<i>Phascolarctos cinereus</i> Goldfuss)', <i>Australian Journal Of Zoology</i> , vol. 50, no. 3, pp. 281-92.
		X					Logan, M & Sanson, GD 2003, 'The effects of lactation on the feeding behaviour and activity patterns of free-ranging female koalas (<i>Phascolarctos cinereus</i> Goldfuss)', <i>Australian Journal Of Zoology</i> , vol. 51, no. 4, pp. 415-28.
		X					Logan, M 2001, 'Evidence for the occurrence of rumination-like behaviour, or merycism, in the koala (<i>Phascolarctos cinereus</i> , Goldfuss)', <i>Journal of Zoology (London)</i> , vol. 255, no. 1, pp. 83-7.
		X					Logan, M 2003, 'Effect of tooth wear on the rumination-like behavior, or merycism, of free-ranging koalas (<i>Phascolarctos cinereus</i>)', <i>Journal of Mammalogy</i> , vol. 84, no. 3, pp. 897-902.
						X	Lunney, D & Burgin, S 2004, 'Urban Wildlife: More than Meets the Eye', in D Lunney & S Burgin (eds), <i>Urban Wildlife: More than Meets the Eye</i> , Royal Zoological Society New South Wales, Taronga Zoo, Mosman.
						X	Lunney, D & Matthews, A 2003, "'Throw a koala on the barbie" (Daily Telegraph 15 July 1997): An analysis of wildlife reporting in two daily newspapers', <i>Australian Zoologist</i> , vol. 32, no. 2, pp. 288-97.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
			X				Lunney, D, Coburn, D, Matthews, A & Moon, C 2001, 'Community perceptions of koala populations and their management in Port Stephens and Coffs Harbour local government areas, New South Wales', in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 48-70.
					X		Lunney, D, Eby, P, Hutchings, P & Burgin, S 2007, 'Pest or Guest: the cultural context of the zoology of overabundance', in D Lunney, P Eby, P Hutchings & S Burgin (eds), <i>Pest or Guest: The Zoology of Overabundance</i> , Royal Zoological Society New South Wales, Taronga Zoo, Mosman, pp. 258-69.
X		X					Lunney, D, Gresser, S, O'Neill, LE, Matthews, A & Rhodes, J 2007, 'The impact of fire and dogs on Koalas at Port Stephens, New South Wales, using population viability analysis', <i>Pacific Conservation Biology</i> , vol. 13, no. 3, pp. 189-201.
X		X		X			Lunney, D, Gresser, SM, Mahon, PS & Matthews, A 2004, 'Post-fire survival and reproduction of rehabilitated and unburnt koalas', <i>Biological Conservation</i> , vol. 120, no. 4, pp. 567-75.
X	X		X				Lunney, D, Matthews, A, Moon, C & Ferrier, S 2000, 'Incorporating habitat mapping into practical koala conservation on private lands', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 669-80.
X	X		X				Lunney, D, Matthews, A, Moon, C & Turbill, J 2002, 'Achieving fauna conservation on private land: Reflections on a 10-year project', <i>Ecological Management & Restoration</i> , vol. 3, no. 2, pp. 90-6.
X	X		X				Lunney, D, Moon, C, Matthews, A & Turbill, J 1999a, <i>Coffs Harbour City Koala Plan of Management. Part A The Plan.</i> , NSW National Parks and Wildlife Service, Hurstville.
X	X		X				Lunney, D, Moon, C, Matthews, A & Turbill, J 1999b, <i>Coffs Harbour City Koala Plan of Management. Part B Coffs Harbour Koala Study</i> , NSW National Parks and Wildlife Service, Hurstville.
						X	Lunney, D, O'Neill, L, Matthews, A & Coburn, D 2000, 'Contribution of community knowledge of vertebrate fauna to management and planning', <i>Ecological Management & Restoration</i> , vol. 1, no. 3, pp. 175-84.
X		X					Lunney, D, O'Neill, L, Matthews, A & Sherwin, WB 2002, 'Modelling mammalian extinction and forecasting recovery: koalas at Iluka (NSW, Australia)', <i>Biological Conservation</i> , vol. 106, no. 1, pp. 101-13.
X							Lunney, D, Phillips, S, Callaghan, J & Coburn, D 1998, 'Determining the distribution of Koala habitat across a shire as a basis for conservation: A case study from Port Stephens, New South Wales', <i>Pacific Conservation Biology</i> , vol. 4, no. 3, pp. 186-96.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
				X			Lynch, M & Martin, R 2003, 'Capture of koalas (<i>Phascolarctos cinereus</i>) by remote injection of tiletamine-zolazepam (Zoletil(R)) and medetomidine', <i>Wildlife Research</i> , vol. 30, no. 3, pp. 255-8.
X		X					Lyons, K, Melzer, A, Carrick, F & Lamb, D 2001, <i>The Research and Management of non-urban Koala Populations</i> , Koala Research Centre of Central Queensland, Rockhampton.
		X					Markey, B, Wan, C, Hanger, J, Phillips, C & Timms, P 2007, 'Use of quantitative real-time PCR to monitor the shedding and treatment of chlamydiae in the koala (<i>Phascolarctos cinereus</i>)', <i>Veterinary Microbiology</i> , vol. 120, no. 3-4, pp. 334-42.
X							Marohasy, J 2005, <i>Are koalas in decline?</i> Institute of Public Affairs, viewed 4th June 2008, <BNet Australia http://findarticles.com/p/articles/mi_qa5490/is_200506/ai_n21375208 >.
						X	Marsh, H, Dennis, A, Hines, H, Kutt, A, McDonald, K, Webber, E, Williams, S & Winter, J 2007, 'Optimising allocation of management resources for wildlife', <i>Conservation Biology</i> , vol. 21, no. 2.
		X					Marsh, KJ, Wallis, IR & Foley, WJ 2007, 'Behavioural contributions to the regulated intake of plant secondary metabolites in koalas', <i>Oecologia</i> , vol. 154, no. 2, pp. 283-90.
						X	Martin, RW & Handasyde, KA 1999, <i>The Koala: Natural History, Conservation and Management</i> , University of New South Wales Press, Sydney.
					X		Masters, P, Duka, T, Berris, S & Moss, G 2004, 'Koalas on Kangaroo Island: from introduction to pest status in less than a century', <i>Wildlife Research</i> , vol. 31, no. 3, pp. 267-72.
					X		Mate, KE, Molinia, FC & Rodger, JC 1998, 'Manipulation of the fertility of marsupials for conservation of endangered species and control of over-abundant populations', <i>Animal Reproduction Science</i> , vol. 53, no. 1-4, pp. 65-76.
		X					Matthews, A, Lunney, D, Gresser, S & Maitz, W 2007, 'Tree use by koalas (<i>Phascolarctos cinereus</i>) after fire in remnant coastal forest', <i>Wildlife Research</i> , vol. 34, no. 2, pp. 84-93.
						X	Maxwell, T & Harrower, K 2001, 'An investigation into the coprophilous microbiota of the koala (<i>Phascolarctos cinereus</i> , (Goldfuss, 1815)). ' in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala Populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 153-77.
X							McAlpine, CA & Eyre, TJ 2002, <i>Indicators of habitat loss and fragmentation for conserving biodiversity in Eucalypt forest of sub-tropical Australia. Part A: St Marys State Forest case study</i> , Forest and Wood Products Research and Development Corporation, Canberra.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
						X	McAlpine, CA 2000, 'Koalas, spirit and the land: realising the unity in diversity', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
X							McAlpine, CA 2003, 'A Bioregional assessment of woody vegetation cover loss throughout the range of the Koala in Queensland based on available SLATS data sets', in J Callaghan & CA McAlpine (eds), <i>Appendix 1 of Documentation in support of a nomination for listing the Koala as Vulnerable in Queensland. Unpublished Nomination</i>
X		X					McAlpine, CA, Bowen, ME, Callaghan, JG, Lunney, D, Rhodes, JR, Mitchell, DL, Pullar, DV & Possingham, HP 2006, 'Testing alternative models for the conservation of koalas in fragmented rural-urban landscapes', <i>Austral Ecology</i> , vol. 31, no. 4, pp. 529-44.
X		X					McAlpine, CA, Callaghan, J, Bowen, M, Lunney, D, Rhodes, JR, Mitchell, D, Pullar, DV & Possingham, HP (in review), 'Landscape ecology as a predictive science: case study of the Koala (<i>Phascolarctos cinereus</i>) in fragmented landscapes ', <i>Landscape Ecology</i> .
X		X					McAlpine, CA, Callaghan, J, Lunney, D, Bowen, M, Rhodes, JR, Mitchell, D & Possingham, HP 2004, 'Conserving Southeast Queensland Koalas: How much habitat is enough?' paper presented to 2004 Southeast Queensland Biodiversity Conference, University of Queensland, Gatton Campus.
X						X	McAlpine, CA, Fensham, RJ & Temple-Smith, DE 2002, 'Biodiversity conservation and vegetation clearance in Queensland: principles and thresholds', <i>The Rangeland Journal</i> , vol. 24, no. 36-55.
						X	McAlpine, CA, Heyenga, S, Taylor, B, Peterson, A & McDonald, G 2007, 'Regional planning in Queensland's rangelands: Challenges and prospects for biodiversity conservation', <i>Geographical Research</i> , vol. 45, no. 1, pp. 27-42.
X							McAlpine, CA, Possingham, HP, Rhodes, JR & Bowen, M 2001, 'Vegetation Clearance Policy and Koala Conservation', paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
		X					McAlpine, CA, Rhodes, JR, Bowen, ME, Lunney, D, Callaghan, JG, Mitchell, DL & Possingham, HP 2008, 'Can multiscale models of species' distribution be generalized from region to region? A case study of the koala', <i>Journal Of Applied Ecology</i> , vol. 45, no. 2, pp. 558-67.
		X					McAlpine, CA, Rhodes, JR, Callaghan, JG, Bowen, ME, Lunney, D, Mitchell, DL, Pullar, DV & Possingham, HP 2006, 'The importance of forest area and configuration relative to local habitat factors for conserving forest mammals: A case study of koalas in Queensland, Australia', <i>Biological Conservation</i> , vol. 132, no. 2, pp. 153-65.
X	X		X				McAlpine, CA, Rhodes, JR, Peterson, A, Possingham, HP, Callaghan, J, Curran, T, Mitchell, D & Lunney, D 2006, <i>Draft Planning Guidelines for Koala Conservation and Recovery - A guide to best planning practice</i> , The University of Queensland, Australian Koala Foundation and the NSW Department of Environment and Conservation.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
	X			X	X		McIlwee, A 2003, Post-release monitoring of surgically sterilised and relocated koalas, Parks Victoria, Victoria.
						X	McIlwee, A, Lawler, IR, Cork, SJ & Foley, WJ 2001, 'Coping with chemical complexity in mammal-plant interactions: near-infrared spectroscopy as a predictor of Eucalyptus folia nutrients and of the feeding rates of folivorous marsupials', <i>Oecologia</i> , vol. 128, pp. 539-48.
		X					McKee, J, Phillips, S & Hanger, JJ 2004, A preliminary appraisal of the health and ecological status of koalas on Raymond Is. Victoria (Summary Report). For the Steve Irwin Conservation Foundation, Victoria.
		X			X		McLean, N & Handasyde, KA 2006, 'Sexual maturity, factors affecting the breeding season and breeding in consecutive seasons in populations of overabundant Victorian koalas (<i>Phascolarctos cinereus</i>)', <i>Australian Journal Of Zoology</i> , vol. 54, no. 6, pp. 385-92.
					X		McLean, N 2003, 'Ecology and management of overabundant Koala (<i>Phascolarctos cinereus</i>) populations ', PhD thesis, University of Melbourne.
		X					McLean, S, Brandon, S, Davies, NW, Boyle, R, Foley, WJ, Moore, B & Pass, GJ 2003, 'Glucuronuria in the koala', <i>Journal of Chemical Ecology</i> , vol. 29, no. 6, pp. 1465-77.
		X					Melzer, A & Houston, W 2001, 'An overview of the understanding of koala ecology: how much more do we need to know?' in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 6-45.
						X	Melzer, A 2008, 'Koalas: Historical, Cultural and Social Context for Research and Management', <i>Journal of Mammalian Evolution</i> .
X		X					Melzer, A, Carrick, F, Menkhorst, P, Lunney, D & John, BS 2000, 'Overview, critical assessment, and conservation implications of koala distribution and abundance', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 619-28.
					X		Menkhorst, P, Middleton, D & Walters, B 1998, 'Managing over-abundant koalas (<i>Phascolarctos cinereus</i>) in Victoria: A brief history and some potential new directions', in <i>Managing marsupial abundance for conservation benefits</i> , Society for Conservation Biology, Sydney.
X	X		X		X		Menkhorst, P 2004, <i>Victoria's Koala Management Strategy</i> , Victorian Department of Sustainability and Environment.
					X		Middleton, DR, Walters, B, Menkhorst, P & Wright, P 2003, 'Fertility control in the koala, <i>Phascolarctos cinereus</i> : the impact of slow-release implants containing levonorgestrel or oestradiol on the production of pouch young', <i>Wildlife Research</i> , vol. 30, no. 3, pp. 207-12.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
						X	Miller, RR, Jr., Sheffer, CJ, Cornett, CL, McClean, RB, MacCallum, C & Johnston, SD 2004, 'Sperm membrane fatty acid composition in the Eastern grey kangaroo (<i>Macropus giganteus</i>), koala (<i>Phascolarctos cinereus</i>), and common wombat (<i>Vombatus ursinus</i>) and its relationship to cold shock injury and cryopreservation success', <i>Cryobiology</i> , vol. 49, no. 2, pp. 137-48.
X	X					X	Moilanen, A, Franco, AMA, Eary, RI, Fox, R, Wintle, B & Thomas, CD 2005, 'Prioritising multiple-use landscapes for conservation: methods for large multi-species planning problems', <i>Proceedings of the Royal Society Biological Sciences Series B</i> , vol. 272, no. 1575, pp. 1885-91.
		X					Montgomery, ME 2001, 'Male reproductive characteristics and inbreeding depression in koala populations', PhD thesis, University of NSW.
		X					Montgomery, ME, Duckett, R, Houlden, BA & Taggart, DA 2001, 'Inbreeding depression in male koalas', paper presented to Veterinary conservation biology wildlife health and management in Australia, Taronga Zoo, Sydney, July 2001.
		X					Moore, BD & Foley, WJ 2000, 'A review of feeding and diet selection in koalas (<i>Phascolarctos cinereus</i>)', <i>Australian Journal Of Zoology</i> , vol. 48, no. 3, pp. 317-33.
		X					Moore, BD & Foley, WJ 2005a, 'Eucalyptus foliar chemistry explains selective feeding by koalas', <i>Biology Letters</i> , vol. 1, no. 1, pp. 64-7.
		X					Moore, BD & Foley, WJ 2005b, 'Tree use by koalas in a chemically complex landscape', <i>Nature</i> , vol. 435, no. 7041, pp. 488-90.
		X					Moore, BD, Wallis, IR, Marsh, KJ & Foley, WJ 2004a, 'The role of nutrition in the conservation of the marsupial folivores of eucalypt forests', in D Lunney (ed.), <i>Conservation of Australia's Forest Fauna</i> , Royal Zoological Society of New South Wales, Mosman, Australia, pp. 549-75.
						X	Moore, BD, Wallis, IR, Marsh, KR & Foley, WJ 2004b, 'Foliar nutrition, site quality, and temperature influence foliar chemistry of Tallwood (<i>Eucalyptus microcorys</i>)', <i>Ecological monographs</i> , vol. 74, pp. 553-68.
			X				Morgan, DG 1999, <i>Snake Island Koala population, September 1999. Unpublished report to Parks Victoria.</i> , Department of Zoology, the University of Melbourne.
						X	Munemasa, M, Nikaido, M, Donn'ellan, S, Austin, CC, Okada, N & Hasegawa, M 2006, 'Phylogenetic analysis of diprotodontian marsupials based on complete mitochondrial genomes', <i>Genes & Genetic Systems</i> , vol. 81, no. 3, pp. 181-91.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X							Newburn, D, Reed, S, Berck, P & Merenlender, A 2005, 'Economics and land-use change in prioritising private land conservation', <i>Conservation Biology</i> , vol. 19, no. 5, pp. 1411-20.
						X	Ngo, S, Kong, S, Kirlich, A, McKinnon, RA & Stupans, I 2000, 'Cytochrome P450 4A, peroxisomal enzymes and nicotinamide cofactors in koala liver', <i>Comparative Biochemistry And Physiology C-Toxicology & Pharmacology</i> , vol. 127, no. 3, pp. 327-34.
						X	Ngo, SNT, McKinnon, RA & Stupans, I 2003, 'Identification and cloning of two forms of liver peroxisomal fatty Acyl CoA oxidase from the koala (<i>Phascolarctos cinereus</i>)', <i>Gene (Amsterdam)</i> , vol. 309, no. 2, pp. 91-9.
						X	Nimmo, JS, Snowden, K & O'Donoghue, P 2007, 'Fatal encephalitozoonosis in two koalas', <i>Australian Veterinary Journal</i> , vol. 85, no. 10, pp. 428-32.
	X						Nottidge, BJ 2002, 'Monitoring the health and dispersal of rehabilitated and translocated koalas (<i>Phascolarctos cinereus</i>) at two release sites on the Gold Coast', Honours thesis, University of Queensland.
X	X		X				NSW National Parks and Wildlife Service 2003a, <i>Approved Recovery Plan for the Hawks Nest and Tea Gardens Endangered Koala (Phascolarctos cinereus) Population</i> , NSW National Parks and Wildlife Service, Hurstville.
X	X		X				NSW National Parks and Wildlife Service 2003b, <i>Draft Recovery Plan for the Koala</i> , New South Wales National Parks and Wildlife Service, Hurstville, NSW.
		X					Oliveira, NM, Farrell, KB & Eiden, MV 2006, 'In vitro characterisation of a koala retrovirus', <i>Journal of Virology</i> , vol. 80, no. 6, pp. 3104-7.
						X	Osborne, MJ, Christidis, L & Norman, JA 2002, 'Molecular phylogenetics of the Diprotodontia (kangaroos, wombats, koala, possums, and allies)', <i>Molecular Phylogenetics & Evolution</i> , vol. 25, no. 2, pp. 219-28.
	X				X		Parks Victoria 2003, <i>Post-release monitoring of surgically sterilised and relocated Koalas, Mt Eccles National Park, Victoria. Unpublished report.</i> , Parks Victoria, Melbourne.
		X					Penn, AM, Sherwin, WB, Gordon, G, Lunney, D, Melzer, A & Lacy, RC 2000, 'Demographic forecasting in koala conservation', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 629-38.
X	X						Pert, I 2000, 'Years of studying Noosa's koalas and their diminishing habitat.' paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
		X					Pfeiffer, A, Melzer, A, Tucker, G, Clifton, D & Ellis, W 2005, 'Tree use by koalas (<i>Phascolarctos cinereus</i>) on St Bees Island, Queensland - Report of a pilot study', <i>Proceedings of the Royal Society of Queensland</i> , vol. 112, pp. 47-51.
			X				Phillip Island Nature Park 1998, <i>Nature Notes: Everything you ever wanted to know about koalas</i> , Phillip Island Nature Park, Cowes, Vic.
						X	Phillips, MJ & Pratt, RC 2008, 'Family-level relationships among the Australasian marsupial "herbivores" (Diprotodontia: Koala, wombats, kangaroos and possums)', <i>Molecular Phylogenetics & Evolution</i> , vol. 46, no. 2, pp. 594-605.
X		X					Phillips, S & Callaghan, J 2000, 'Tree species preferences of koalas (<i>Phascolarctos cinereus</i>) in the Campbelltown area south-west of Sydney, New South Wales', <i>Wildlife Research</i> , vol. 27, pp. 509-16.
X		X					Phillips, S & Callaghan, J submitted, 'The spot assessment technique for determining the significance of habitat utilisation by Koalas', <i>Biological Conservation</i> .
X		X					Phillips, S 1999, 'Habitat utilisation by the Koala <i>Phascolarctos cinereus</i> - towards a new approach for effective conservation and management ', Ph.D thesis, Southern Cross university.
X		X					Phillips, S, Callaghan, J & Thompson, V 2000, 'The tree species preferences of koalas (<i>Phascolarctos cinereus</i>) inhabiting forest and woodland communities on Quaternary deposits in the Port Stephens area, New South Wales', <i>Wildlife Research</i> , vol. 27, no. 1, pp. 1-10.
X						X	Phillips, SS 2000, 'Population trends and the koala conservation debate', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 650-9.
X		X					Phinn, SR, Scarth, P & Mitchell, D 1999, 'Estimation of forest structural parameters for forestry and koala habitat monitoring in south-east Queensland, Australia. ' paper presented to 4th International Airbone Remote Sensing Conference and Exhibition/21st Canadian symposium on remote sensing, Ottawa, Ontario, 21-24 June 1999.
						X	Piper, KJ 2005, 'An early Pleistocene record of a giant koala (<i>Phascolarctidae</i> , <i>Marsupialia</i>) from western Victoria', <i>Australian Mammalogy</i> , vol. 27, no. 2, pp. 221-3.
X	X		X				Port Stephens Council 2002, <i>Port Stephens Council Comprehensive Koala Plan of Management (CKPoM) - June 2002</i> , Prepared by Port Stephens Council with the Australian Koala Foundation and NSW National Parks and Wildlife Service.
				X			Powell, M 2000, 'My veterinary experiences with Noosa koalas over the last 17 years', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
		X					Preece, HJ & Phinn, SR 2002, 'Counting koalas from space: integrating remote sensing, GIS and traditional ecological survey techniques', paper presented to 11th Australasian Remote Sensing and Photogrammetry Conference 2002, Canberra.
X							Preece, HJ 2000, 'The role of Queensland Parks and Wildlife Service in koala conservation and management', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
X							Prevett, P, Pope, R, Callaghan, J & Bailey, L 2001, 'The Koala Habitat Atlas: preliminary results for koala tree species preferences in the City of Ballarat local government area. ' in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton.
						X	Prevett, PT 1998, 'National Legislation for Koala Conservation: what legislation is necessary and will it protect Koalas.' paper presented to Conference on the Status of the Koala in 1998, Coffs Harbour, NSW.
						X	Prevett, PT 2000, 'The koala and a native sense of place: the urgent need for a distinctively Australian environmental ethic', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
				X			Pye, GW, Hamlin-Andrus, C & Moll, J 2008, 'Hip dysplasia in koalas (<i>Phascolarctos cinereus</i>) at the San Diego Zoo', <i>Journal Of Zoo And Wildlife Medicine</i> , vol. 39, no. 1, pp. 61-8.
X							Pyper, W 2004, 'Koalas are losing out to Traffic', <i>Ecos</i> , vol. 118, p. 31
X							Queensland Environmental Protection Agency 2007, <i>Report on Koala Coast Koala Surveys 2005-2006</i> , Queensland Environmental Protection Agency.
X							Queensland Environmental Protection Agency 2006a, <i>Koala Plan Maps</i> , Queensland Government, viewed 4th June 2008, < http://www.epa.qld.gov.au/nature_conservation/wildlife/koala_plan/koala_plan_maps/ >.
X	X		X				Queensland Environmental Protection Agency 2006b, <i>Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016</i> , Queensland Government, < http://www.epa.qld.gov.au/publications/p01950aa.pdf/Nature_Consevation_Koala_Consevation_Plan_2006_and_Management_Program_2006__2016.pdf >
				X			Radford, SL, McKee, J, Goldingay, RL & Kavanagh, RP 2006, 'The protocols for koala research using radio-collars: A review based on its application in a tall coastal forest in New South Wales and the implications for future research projects', <i>Australian Mammalogy</i> , vol. 28, no. 2, pp. 187-200.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
		X					Ramsay, S 1999, 'The ecology and dispersal patterns of juvenile koalas, <i>Phascolarctos cinereus</i> , in fragmented habitat.' PhD thesis, University of Sydney.
			X				Redland City Council 2008, <i>Koala Summit 2007</i> , Redland City Council, viewed 5th June 2008, < http://www.redland.qld.gov.au/Environment/Wildlife/Koalas/Pages/Koala%20Summit%202007.aspx >.
X		X					Rhodes, JR, Callaghan, JG, McAlpine, CA, De Jong, C, Bowen, ME, Mitchell, DL, Lunney, D & Possingham, HP 2008, 'Regional variation in habitat-occupancy thresholds: a warning for conservation planning', <i>Journal Of Applied Ecology</i> , vol. 45, no. 2, pp. 549-57.
		X					Rhodes, JR, McAlpine, CA, Lunney, D & Callaghan, J 2005, 'Evaluating natural resource management strategies under parameter uncertainty: an outranking approach applied to koala conservation', in A Zenger & RM Argent (eds), <i>MODSIM 2005 International Congress on Modeling and Simulation.</i> , Modeling and Simulation Society of Australia and New Zealand.
		X					Rhodes, JR, McAlpine, CA, Lunney, D & Possingham, HP 2005, 'A spatially explicit habitat selection model incorporating home range behavior', <i>Ecology</i> , vol. 86, no. 5, pp. 1199-205.
X							Rhodes, JR, McAlpine, CA, Peterson, A, Callaghan, J, Lunney, D, Possingham, HP, Mitchell, D & Curran, T 2008, 'Linking landscape ecology to planning for koala conservation', <i>Australian Planner</i> , vol. 45, no. 2, pp. 24-5.
						X	Rhodes, JR, Possingham, HP & McAlpine, CA 2001, 'The role of quantitative methods in development and implementation of a National Koala Act.' paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
		X					Rhodes, JR, Tyre, AJ, Jonzen, N, McAlpine, CA & Possingham, HP 2006, 'Optimising presence-absence surveys for detecting population trends', <i>Journal Of Wildlife Management</i> , vol. 70, no. 1, pp. 8-18.
		X					Rhodes, JR, Wiegand, T, McAlpine, CA, Callaghan, J, Lunney, D, Bowen, M & Possingham, HP 2006, 'Modeling species' distributions to improve conservation in semiurban landscapes: Koala case study', <i>Conservation Biology</i> , vol. 20, no. 2, pp. 449-59.
						X	Richter, C 2006, 'Chrono-ethologic investigations on the Queensland koala (<i>Phascolarctos cinereus adustus</i>) in captivity', <i>Zoo Biology</i> , vol. 25, no. 5, pp. 357-68.
						X	Rio Tinto 2008, <i>Media release - Heavy rains bring koala baby boom</i> , viewed 6th June 2008, < http://www.riotintocoalaustralia.com.au/media/38_media_releases_1134.asp >.
						X	Roberge, J & Angelstam, P 2004, 'Usefulness of the umbrella species concept as a conservation tool ', <i>Conservation Biology</i> , vol. 18, pp. 76-85.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X							Rolfe, J 2001, 'Valuation and management options for koala habitat in the desert uplands bioregion of Queensland', in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 139-52.
X	X						Rowland, DT 2002, 'Urban design guidelines for koala habitat', Masters thesis, Queensland University of Technology.
						X	Sanchez-Villagra, MR & Wible, JR 2002, 'Patterns of evolutionary transformation in the petrosal bone and some basicranial features in marsupial mammals, with special reference to didelphids', <i>Journal Of Zoological Systematics And Evolutionary Research</i> , vol. 40, no. 1, pp. 26-45.
	X				X		Santamaria, F 2001, 'Aspects and issues of koala translocations in Victoria', paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
	X				X		Santamaria, F 2002, 'Outcomes and implications of a Koala translocation in the Ballarat region', PhD thesis, University of Ballarat.
X					X		Sarre, A 1999, 'Caught in the crossfire', <i>Ecos</i> , vol. 99, pp. 9-14.
X	X		X				Schlagloth, R, Callaghan, J & Thomson, H 2006a, <i>Draft Comprehensive Koala Plan of Management, Part 1: The Plan</i> , Ballarat City Council, Ballarat and the Australian Koala Foundation, Brisbane.
X	X		X				Schlagloth, R, Callaghan, J & Thomson, H 2006b, <i>Draft Comprehensive Koala Plan of Management, Part 2: Resource Document</i> , Ballarat City Council, Ballarat and the Australian Koala Foundation, Brisbane.
X						X	Seabrook, LM, McAlpine, CA & Phinn, SR 2002, 'An ecological history of koala habitat in Noosa Shire, south-east Queensland, 1860 to 1997', paper presented to Conference on the Status of the Koala in 2002: How the past affects the koala's future, Ballarat.
X						X	Seabrook, LM, McAlpine, CA, Phinn, SR, Callaghan, J & Mitchell, D 2003, 'Landscape legacies: Koala habitat change in Noosa Shire, South-east Queensland', <i>Australian Zoologist</i> , vol. 32, no. 3, pp. 446-61.
		X			X		Seymour, AM, Montgomery, ME, Costello, BH, Ihle, S, Johnsson, G, St John, B, Taggart, D & Houlden, BA 2001, 'High effective inbreeding coefficients correlate with morphological abnormalities in populations of South Australian koalas (<i>Phascolarctos cinereus</i>)', <i>Animal Conservation</i> , vol. 4, pp. 211-9.
						X	Shaw, J 2001, 'The plight of the koalas in Hawks Nest/Tea Gardens', paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X						X	Shelly, D 1998, 'Survey of vertebrate fauna and habitats in a cypress pine-ironbark forest in central-west New South Wales', <i>Australian Zoologist</i> , vol. 30, no. 4, pp. 426-36.
		X					Sherwin, WB, Timms, P, Wilcken, J & Houlden, B 2000, 'Analysis and conservation implications of koala genetics', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 639-49.
						X	Short, J & Calaby, JH 2001, 'The status of Australian mammals in 1922: Collections and field notes of museum collector Charles Hoy', <i>Australian Zoologist</i> , vol. 31, no. 4, pp. 533-62.
			X				Siebuhr, L 2000, 'Community education in the Koala Coast', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
X	X						Sluiter, AF, Close, RL & Ward, SJ 2002, 'Koala feeding and roosting trees in the Campbelltown area of New South Wales', <i>Australian Mammalogy</i> , vol. 23, no. 2, pp. 173-5.
X	X						Smith, AP 2004, 'Koala conservation and habitat requirements in a timber production forest in north-east New South Wales. ' in D Lunney (ed.), <i>Conservation of Australia's Forest Fauna</i> , 2nd Edition edn, Royal Zoological Society of New South Wales, Mosman, NSW, pp. 591-611.
X	X						Stratford, E, Mazur, N, Lunney, D & Bennett, D 2000, 'Managing the koala problem: Interdisciplinary perspectives', <i>Conservation Biology</i> , vol. 14, no. 3, pp. 610-8.
						X	Stupans, I, Jones, B & McKinnon, RA 2001, 'Xenobiotic metabolism in Australian marsupials', <i>Comparative Biochemistry And Physiology C-Toxicology & Pharmacology</i> , vol. 128, no. 3, pp. 367-76.
X							Sullivan, BJ 1999, 'Estimating the Abundance of Broadscale, Low Density Populations: Koalas in the Mulgalands of South- west Queensland. ' PhD thesis, University of Queensland (Gatton College).
X	X						Sullivan, BJ, Baxter, GS & Lisle, AT 2002, 'Low-density koala (<i>Phascolarctos cinereus</i>) populations in the mulgalands of south-west Queensland. I. Faecal pellet sampling protocol', <i>Wildlife Research</i> , vol. 29, no. 5, pp. 455-62.
X	X						Sullivan, BJ, Baxter, GS & Lisle, AT 2003, 'Low-density koala (<i>Phascolarctos cinereus</i>) populations in the mulgalands of south-west Queensland. III. Broadscale patterns of habitat use', <i>Wildlife Research</i> , vol. 30, no. 6, pp. 583-91.
X	X						Sullivan, BJ, Baxter, GS, Lisle, AT, Pahl, L & Norris, WM 2004, 'Low-density koala (<i>Phascolarctos cinereus</i>) populations in the mulgalands of south-west Queensland. IV. Abundance and conservation status', <i>Wildlife Research</i> , vol. 31, no. 1, pp. 19-29.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X		X					Sullivan, BJ, Norris, WM & Baxter, GS 2003, 'Low-density koala (<i>Phascolarctos cinereus</i>) populations in the mulgalands of south-west Queensland. II. Distribution and diet', <i>Wildlife Research</i> , vol. 30, no. 4, pp. 331-8.
				X			Sullivan, JA 2004, 'A brief profile on the koala regeneration centre at Narrandera', paper presented to Rotary District 9700 Conference 2004.
X					X		Tabart, D 2000, 'Perspective on the management of isolated/island koala populations', paper presented to Australian Veterinary Association Conference, Perth, June 2000.
						X	Tabart, D 2002, Koala myth becomes scientific fact, Australian Koala Foundation, viewed 16 July 2008, < https://www.savethekoala.com/mythbecomesfact.html >.
		X					Takami, K, Yoshida, M, Yamamoto, Y, Harada, M & Furuyama, J 1998, 'Genetic variation of mitochondrial cytochrome b genes among the subspecies of koala, <i>Phascolarctos cinereus</i> ', <i>Journal Of Veterinary Medical Science</i> , vol. 60, no. 10, pp. 1161-3.
		X					Tarlinton, R, Meers, J, Hanger, J & Young, P 2005, 'Real-time reverse transcriptase PCR for the endogenous koala retrovirus reveals an association between plasma viral load and neoplastic disease in koalas', <i>Journal of General Virology</i> , vol. 86, no. Part 3, pp. 783-7.
		X					Tarlinton, RE, Meers, J & Young, PR 2006, 'Retroviral invasion of the koala genome', <i>Nature</i> , vol. 442, no. 7098, pp. 79-81.
		X					Taylor, AC, Graves, JM, Murray, ND, O'Brien, SJ, Yuhki, N & Sherwin, B 1997, 'Conservation genetics of the koala (<i>Phascolarctos cinereus</i>), low mitochondrial DNA variation amongst southern Australian populations', <i>Genetical Research</i> , vol. 69, no. 1, pp. 25-33.
X							Taylor, BD & Goldingay, RL 2003, 'Cutting the carnage: wildlife usage of road culverts in north-eastern New South Wales', <i>Wildlife Research</i> , vol. 50, pp. 529-37.
						X	Taylor, J, Ruehli, FJ, Brown, G, De Miguel, C & Henneberg, M 2006, 'MR imaging of brain morphology, vascularisation and encephalization in the koala', <i>Australian Mammalogy</i> , vol. 28, no. 2, pp. 243-7.
		X					Thackway, R, Lee, A, Donohue, R, Keenan, RJ & Wood, M 2007, 'Vegetation information for improved natural resource management in Australia', <i>Landscape And Urban Planning</i> , vol. 79, no. 2, pp. 127-36.
					X		The Koala and Kangaroo Contraception Program 2007, <i>The Koala and Kangaroo Contraception Program - About us, project team, research</i> , ANZCoL, viewed 5th June 2008, < http://www.conservation.bees.unsw.edu.au/koala/index.shtml >.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X		X					Thompson, EJ 1998, 'Vegetation of the Koala Bushland Coordinated Conservation Area, southeastern Queensland. Part 1, A structural/floristic classification and map of the vegetation, and their accountability. ' <i>Proceedings of the Royal Society of Queensland</i> , vol. 107, pp. 73-87.
		X					Thompson, J 2001, 'The Role of Research in Koala Management: Case Studies from South-East Queensland', in K Lyons, A Melzer, F Carrick & D Lamb (eds), <i>The Research and Management of Non-urban Koala Populations</i> , Koala Research Centre of Central Queensland, Rockhampton, pp. 89-104.
		X					Timms, P 2000, 'Koala Chlamydia from East to West', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
						X	Tisdell, C & Swarna Nantha, H 2007, 'Comparison of funding and demand for the conservation of the charismatic koala with those for the critically endangered wombat <i>Lasiornhinus krefftii</i> ', <i>Biodiversity And Conservation</i> , vol. 16, no. 4, pp. 1261-81.
		X					Tobey, JR, Andrus, CH, Doyle, L, Thompson, VD & Bercovitch, FB 2006, 'Maternal effort and joey growth in koalas (<i>Phascolarctos cinereus</i>)', <i>Journal of Zoology</i> , vol. 268, no. 4, pp. 423-31.
		X			X		Todd, CR, Forsyth, DM & Choquenot, D 2008, 'Modelling the effects of fertility control on koala-forest dynamics', <i>Journal Of Applied Ecology</i> , vol. 45, no. 2, pp. 568-78.
						X	Tomo, S, Tomo, I, Townsend, GC & Hirata, K 2004, 'The masticatory muscles and masseteric foramens in koala (<i>Phascolarctos cinereus</i>)', <i>Anatomical Science International</i> , vol. 79, no. August.
		X					Tucker, G, Melzer, A & Ellis, W 2007, 'The development of habitat selection by subadult koalas', <i>Australian Journal Of Zoology</i> , vol. 55, no. 5, pp. 285-9.
X						X	Turbill, J 2000, 'Koala habitat and the NSW Native Vegetation Conservation Act 1997', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
	X	X					Van Kampen, T & Connel, M 2004, <i>Koala habitat linkage: Tiaro to Maryborough</i> , Tiaro and District Landcare Group Inc
				X		X	Vogelnest, LJ, Vogelnest, L & Mueller, RS 2000, 'An undescribed <i>Demodex</i> sp. and demodicosis in a captive koala (<i>Phascolarctos cinereus</i>)', <i>Journal of Zoo & Wildlife Medicine</i> , vol. 31, no. 1, pp. 100-6.
			X				Walker, C 2005, EK news - Essentially Koala, Queensland Parks and Wildlife Service, Queensland Government, viewed 16 July 2008, < http://www.epa.qld.gov.au/nature_conservation/wildlife/daisy_hill_koala_centre/discover_koalas/ek_newsletter/ >.

Relevance to the Strategy

Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	General	Publications from 1998 onwards
X			X				Ward, S & Close, R 2004, 'Southern Sydney's urban koalas: community research and education at Campbelltown', in D Lunney & S Burgin (eds), <i>Urban Wildlife: More than Meets the Eye</i> , Royal Zoological Society New South Wales, Taronga Zoo, Mosman, pp. 44-54.
		X					Wardrop, S, Fowler, A, Jackson, M, O'Callaghan, P, Giffard, P & Timms, P 1998, ' <i>Chlamydia pneumoniae</i> - A disease of koalas, horses and humans', paper presented to Conference on the Status of the Koala in 1998, Coffs Harbour, NSW.
						X	Westing, P 2000, 'The art and science of koala management planning - the Port Stephens experience of a work in progress', paper presented to Conference on the Status of the Koala in 2000, Noosa, QLD.
		X					White, NA 1999, 'Ecology of the koala (<i>Phascolarctos cinereus</i>) in rural south-east Queensland, Australia', <i>Wildlife Research</i> , vol. 26, no. 6, pp. 731-44.
						X	Williams, J 2001, <i>Australian State of the Environment Report 2001 - Biodiversity Theme Report</i> , Department of the Environment and Heritage, Australian Government.
X			X				Wintle, BA, Elith, J & Potts, JM 2005, 'Fauna habitat modelling and mapping: A review and case study in the Lower Hunter Central Coast region of NSW', <i>Austral Ecology</i> , vol. 30, no. 7, pp. 719-38.
		X					Worth, G 2001, 'Studies on the persistence of koala scats under different environmental circumstances', paper presented to Conference on the Status of the Koala in 2001, Canberra, ACT.
						X	Young, LJ & Deane, EM 2001, 'Cellular composition of the late milk of the koala (<i>Phascolarctos cinereus</i>)', <i>Australian Journal Of Zoology</i> , vol. 49, no. 2, pp. 195-202.
						X	Zabaras, R, Richardson, BJ & Wyllie, SG 2005, 'Evolution in the suite of semiochemicals secreted by the sternal gland of Australian marsupials', <i>Australian Journal Of Zoology</i> , vol. 53, no. 4, pp. 257-63.