

**INQUIRY INTO THE STATUS, HEALTH AND
SUSTAINABILITY OF AUSTRALIA'S KOALA POPULATION**

SUBMISSION REGARDING KOALAS IN SOUTH-EASTERN NSW
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1 SUMMARY AND INTRODUCTION

1.1 Overview of this submission

This submission provides a summary and introduction and then attempts to address in sequence the categories listed in the terms of reference of the Senate Inquiry.

1.2 My background

I have been involved in and witness to efforts to conserve Koalas in SENSW since 1990, initially as a participant and representative of the forest conservation movement, and since 2001, as an employee of what is now the Department of Environment, Climate Change and Water (DECCW).

In that latter capacity I have managed Koala surveys, Koala habitat rehabilitation projects and other Koala-related community outreach initiatives and participated in inter-departmental processes that have attempted to advance Koala conservation. I also contributed to the 2009 DEWHA-initiated workshop: *Estimating national Koala population numbers and trends*.

In my capacity as a DECCW employee I have assisted preparations for the DECCW submission to the Senate Inquiry, but believe that more detail from a local and broader perspective and covering a longer period than that of my employment, may also be useful.

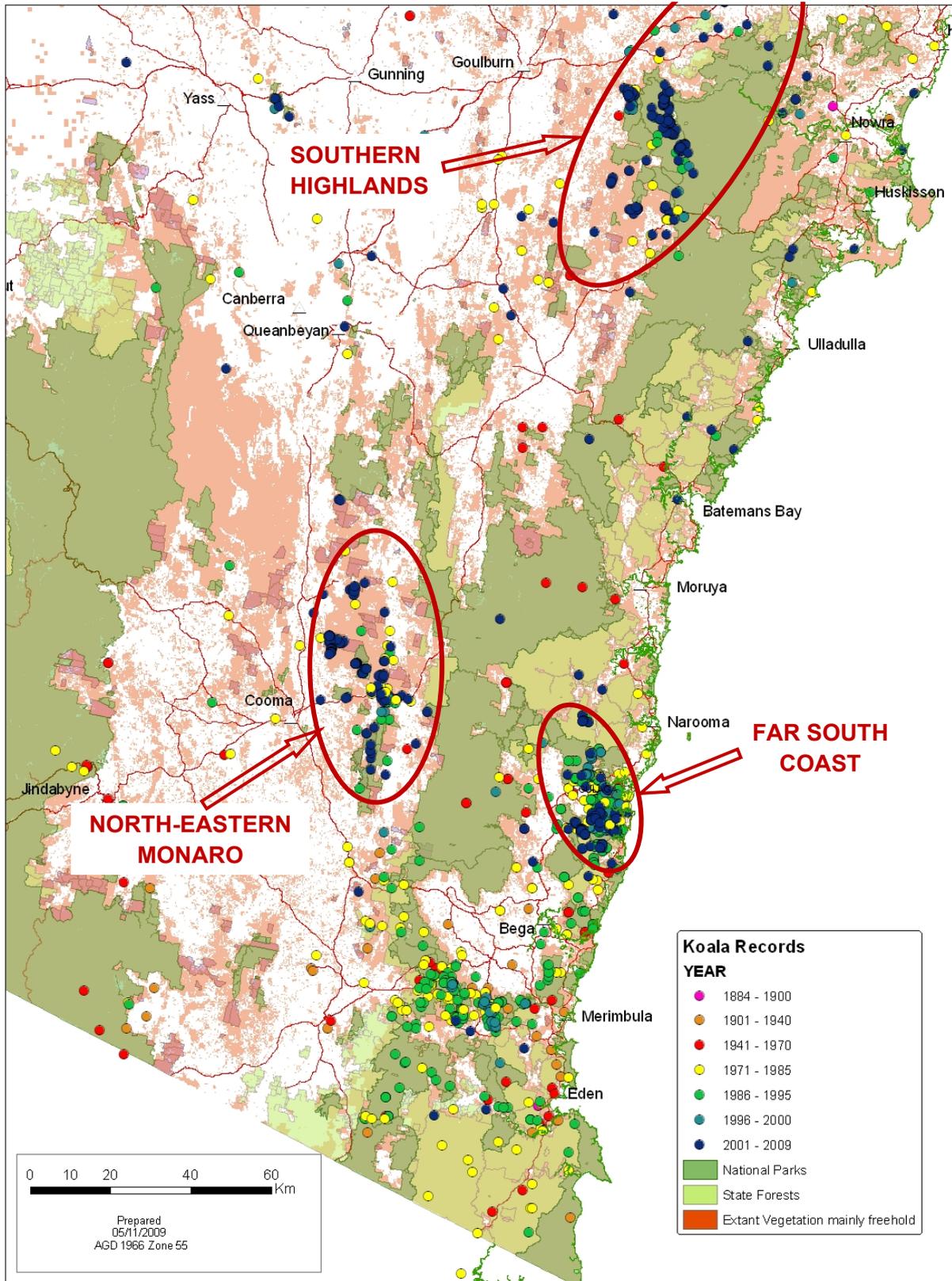
Hence this personal submission. Although I refer to internal reports I have prepared as an employee the views expressed here are my own and do not necessarily represent those of the department that I work for.

1.3 Koala populations in SENSW

There are three known Koala populations in South East NSW. These are located in: a) the southern parts of the Southern Highlands; b) the Southern Tablelands; and, c) the Far South Coast. These are the only populations known to be breeding in South Eastern NSW. Figure 1) delineates the approximate boundaries of these populations.

Most of the information in this submission refers to Koala conservation initiatives in the NSW Far South Coast; this has been my primary area of involvement. I have also managed Koala surveys in, and compiled local histories from, the other two regions and the information provided here about Koalas in these regions is derived from that work.

FIGURE 1: KNOWN KOALA POPULATIONS IN SOUTH EASTERN NSW



1.4 NSW Far South Coast

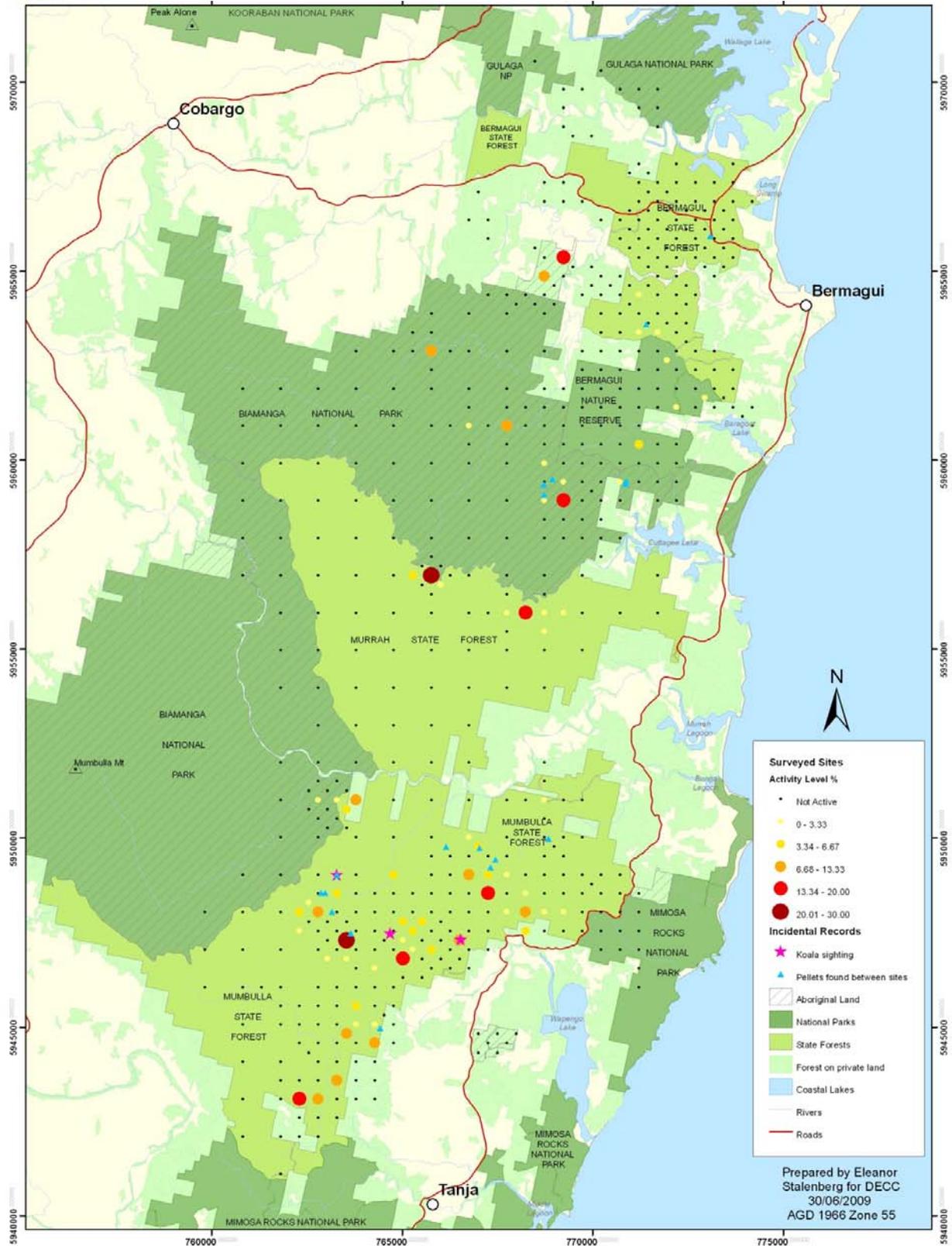
The management of Koalas in NSW Far South Coast has a long, complex and controversial history. In summary, despite a range government and community initiatives over 20 years, the key objective of reversing the long-term decline of the Koala in the region has not yet been achieved. Probably only one population of less than 50 Koalas now persists in the region (DECCW 2010).

The level of voluntary involvement in agency-managed Koala surveys in the region, in which more than 300 volunteers have contributed more than 800 days of fieldwork since 2007, is a testament to the local community's commitment to the Koala, and to the DECCW for providing the level of support that it has. Survey teams have searched for Koala pellets through bush litter under more than 27,000 trees at more than 900 gridsites, enabling the assessment of Koala distribution and abundance over more than 35,000 ha of public and privately-owned forests.

This work provides the foundations and community networks for a Koala recovery program that could meet all the guiding principles of the National Koala Management and Conservation Strategy (2010) and probably could still reverse the decline of Koalas in south-east NSW. However, the extent of the intended intensive logging of forests sustaining the core of the Koala population would undermine this recovery potential.

Figure 2 shows the extent of the survey undertaken in the Mumbulla, Murrah and Bermagui State Forests, Biamanga and Mimoso Rocks National Parks and adjacent private lands where survey teams assessed 589 gridsites in the period 2007-9.

FIGURE 2: KOALA SURVEY RESULTS IN COASTAL FORESTS IN SOUTH EAST NSW 2007-9



2 ICONIC STATUS AND MANAGEMENT HISTORY

2.1 Indigenous cultural connections with the Koala

A consultancy (Wesson 2003) commissioned by DECCW that undertook a literature review and interviews with traditional Aboriginal elders to assess the cultural significance of Koalas for indigenous people concluded:

1. Stories, songs and ceremony for south-eastern Australia indicate the Koala has a key role as a creation ancestor, director of migration for ancestors and wise counsellor.
2. The Koala is connected to women's knowledge and responsibilities for Gulaga, Wadbilliga and Dignams Creek areas through spirit entities that inhabit these areas and have connections to the Koala.

Local indigenous people's commitment to the Koala has been shown by:

1. Advising on the cultural and ecological significance of Koala areas near Gulaga Mountain during the Southern Regional Forest Agreement (RFA) Process that assisted reserve decision-making.
2. Participation in Koala habitat rehabilitation projects on private land adjoining areas of Koala activity.
3. The publication of a children's bi-lingual (a local Aboriginal language, Dhurga and English) booklet about the Koala (Thomas and Allen 2009).
4. Campaigning for the protection of areas sustaining Koalas on Mumbulla Mountain¹.
5. Participation in Koala surveys, funded in part by the Management Board of the Aboriginal-owned Biamanga National Park. The Board has a majority of traditional owners. The surveys established that Koalas are persisting in the Park, with the core area of Koala activity in the adjoining Mumbulla State Forest (DECCW 2010)
6. The Board developed and approved a Fire Management Strategy that requires intensive surveys using a recently developed survey method (Regularised Grid-Based Spot Assessment Technique -RGSAT) to assess Koala activity in areas

¹ Sydney Morning Herald 14/4/10: Local Aboriginal elders have joined the call for Premier Kristina Keneally to halt logging near a Koala colony on the NSW south coast. More than 100 protesters, led by three Aboriginal elders, marched on Mumbulla State Forest near Bega on Wednesday in a bid to stop the logging by Forests NSW. The elders, who did not wish to be named, said the land should be handed over to them as they are the traditional owners. "We the traditional owners of Mumbulla Mountain are distressed that woodchip logging is taking place on part of our sacred land," they said in a statement. "The land should be handed over to us to care for it, our sacred sites and the animals that live here. "We need to preserve it for our culture and our future generations."

proposed for burning. In order to minimise risks to the population that persists in the Park, fuel reduction burns are undertaken outside any identified Koala activity area. This is the first time this approach has been used in fuel reduction planning.

2.2 Iconic status within non-indigenous community

The iconic status of Koala has been most publicly manifest in its role as the flagship for the anti-logging campaign over the past 20 years. However other dimensions of community support for the Koala, including a high number of Voluntary Conservation Agreements protecting Koala habitat, and extensive participation in community surveys (Section 1.4) also show how important the Koala is locally.

2.3 SENSW Far South Coast: Management History

2.3.1 Overview of management initiatives for Koalas in the Far South Coast SENSW

Since the early 1990's there has been a succession of state government-established committees tasked with developing research programs and management plans to enhance the conservation of the Koala regionally. These include:

1. Koala Steering Committee (1990-1994)
2. South East Forests Koala Research Committee (1994-6).
3. South Coast Management Area Koala Recovery Team (1999-2002);
4. Koala Management Framework (2005- ongoing).

Processes associated with the Eden (1998) and Southern RFA's (2000) also significantly contributed to this history. In the case of the former RFA, less than 50% of the habitat that was identified by a project initiated by the Commonwealth government (Commonwealth 1998) as being needed to sustain the regional Koala population was reserved. In an effort to improve outcomes for Koalas, the option developed by the conservation movement included a Koala Recovery Zone in addition to its proposed reserve system in which sawlog-only extraction by small scale mill operators was to be permitted. This option was not adopted by the Commonwealth and State Governments.

In the cases of 1) and 4), above, the initiatives were triggered by controversy over intensive logging of Koala habitat and aimed in part to address the issue of logging and Koalas. In the case of 2) the committee was established in response to controversy over the deaths and losses of Koalas being radio-tracked by FNSW staff.

A more detailed history of these initiatives could be provided to the Committee if required.

Despite a number of positive outcomes the key objective of reversing the long-term decline of the Koala in the region has not been achieved, for whilst there is evidence of localised

declines in Koala numbers and of localised extinctions in recent decades (eg Allen 2008, Allen 2010) there is no evidence that Koala numbers have increased.

A possible exception to this trend may be in Mumbulla State Forest where, though Koala numbers are still very low, there is some evidence to suggest a possible recovery is occurring (DECCW 2010).

There is no simple answer why Koala numbers have continued to decline with localised extinctions in many areas. A relentless and variable succession human-induced impacts occurring over many decades provides the most likely explanation for the disappearance of Koalas throughout much of the region. The long lag-time between impacts and ongoing declines in numbers demonstrated in Phillips (2000) suggests that impacts that occurred many decades previously may have contributed to the Koala's eventual disappearance from many localities.

In the case of Mumbulla State Forest, which is currently at the heart of Koala activity in the Far South Coast, the possible recovery that may be occurring is probably not a result of any management initiative, but rather, the absence of significant human-induced impact (including fire) for more than thirty years.

The last of the government initiatives listed above, the Koala Management Framework (commenced in 2005) has not yet completed its aims and objectives. The main reason for this is the contractual obligation (an outcome of the Eden Regional Forest Agreement) to provide tens of thousands of cubic meters of sawlogs from within or near to areas sustaining Koalas in the Mumbulla, Murrah and Bermagui Forests to the Eden-base Blue Ridge sawmill.

The issue is compounded by the industry's inability to undertake sawlog only operations profitably without subsidy, thus necessitating a woodchip/sawlog harvest regime in which up to 90% of the trees logged are felled for woodchips.

With the profound contradiction between RFA contractual commitments and conservation requirements of Koalas, the NSW government has been unable reach resolution, and the issue remains unresolved.

My view is that anything less than a very significant reduction in logging activities in these forests will probably lead to the extinction of this Koala population. My reasons are as follows:

1. The fragility of Koala populations regionally, as evidenced by localised extinctions in the EMA in recent decades and by declining numbers in the northern part of the area sustaining this population.
2. The scale and intensity of impacts on and consequent degradation of Koala habitat that has occurred in recent decades.
3. The very low numbers of Koalas remaining. At this stage, every Koala matters.
4. The scale and intensity of the logging that otherwise occur. This would bring a range of reverberating ecological consequences, most immediately a significant decrease in available browse trees and a significantly increased risk of fire.

2.3.2 Recovery Potential

Despite the dire conservation status of Koalas on the Far South Coast we still have the potential to enable recovery because there is now:

1. A sound and innovative scientific foundation that enables monitoring of population trends and hence the effectiveness of recovery actions.
2. The capacity to also monitor the presence/absence and/or distribution of a range of native fauna, thus providing additional biodiversity monitoring potential and integration into multi-species recovery programs.
3. A significant history and ongoing potential of indigenous and non-indigenous community-based involvement and community/agency partnerships.
4. Educational outreach capacities involving tertiary institutions, schools and field studies centres that enhance partnership potential and community involvement.
5. An iconic species facing regional extinction for which there is a reasonable chance of recovery if appropriate management actions are implemented.

With these foundations Koala conservation efforts on the Far South Coast have the potential to reflect all the guiding principles of the National Koala Management and Conservation Strategy (Commonwealth of Australia 2010)) and be a showcase example of a threatened species recovery program.

However, this cannot be achieved unless issues regarding the proposed logging of Koala areas in Mumbulla, Murrah and Bermagui State Forest are resolved so that Koala habitat is not further degraded.

2.4 Southern Tablelands: Management History

2.4.1 Koala survey program (1999 -2004)

The Koala population persisting in the Southern Tablelands occurs in forest and woodland areas on the eastern edge of the Monaro Plain, extending from Mount Dowling Nature Reserve in the north to the Kybeyan Nature Reserve in the south. The area consists of privately-owned and leasehold lands with relatively small Reserves scattered throughout.

Seven Koala surveys were undertaken in Southern Tablelands between 1999 and 2004 (Allen 2009). Koala evidence was relatively easily located in at least 7 localities spread over approximately 40,000ha of extant open forest and woodland eucalypt communities.

The relative ease with which pellets were found in these areas, compared with results from almost all surveys undertaken in the Coastal Forests NE of Bega, and indeed anywhere on the Far South Coast, suggests Koala population that is spread throughout the study area.

2.4.2 Current survey program

A DECCW initiated survey is currently underway in this region. Preliminary results and associated anecdotal reports suggest that despite the extended drought Koalas are still spread throughout this study area and that numbers appear to be stable.

An extensive hazard reduction burning program is planned by the Rural Fire Service (RFS) over the next five years. The RFS is working closely with DECCW in the survey program and the results will inform fire planning processes.

2.5 Southern Highlands: Management History

2.5.1 Survey program and wildfire

Koala surveys were undertaken in 2002 in the Southern Highlands (Allen 2002 and Allen *et al* 2002). During and immediately after a severe wildfire that occurred in December 2002, Rural Fire Service and NPWS firecrew personnel reported at least 24 Koalas in the general locality that had survived the immediate impacts of the fire (Craven 2004). In November 2003 DECCW resurveyed nine burnt sites where Koala evidence had been located in previous surveys with six yielding evidence of post-fire Koala activity (Craven 2004).

3 ESTIMATES OF KOALA POPULATIONS AND ADEQUACY OF COUNTING METHODS

3.1 Koala population estimates in Eden Region in 1990's

In the 1990's Koala population estimates for the Eden region varied between 1500 (Jurskis and Potter 1997) and less than 100 (SEFCC 1998). A workshop initiated to resolve a range of issues existing between the forest conservation movement and FNSW concluded that Koala numbers in the Eden region were in the low hundreds (Briggs 1999). In that period there was no attempt to estimate Koala numbers in the Southern Tablelands or the Southern Highlands, though anecdotal information suggested Koala numbers were higher than on the Far South Coast.

3.2 Current population estimates

3.2.1 Overview of population estimates in SENSW

On request from the Commonwealth's Threatened Species Scientific Committee Allen (2009) provided the following estimates of Koala numbers for known populations in south-east NSW to assist its assessment for listing the Koala as a threatened species under the EPBC Act.

Table 1: Koala population estimates for south-east NSW (Allen 2009)

STUDY AREA	LOCALITY	Min	Max	Average
Far South Coast	Bermagui Mumbulla	21	42	32
	Kooraban	Probably smaller		
	Tantawangalo/Yurammie	Probably smaller		
	Other?	Probably smaller		
NE Monaro				
		80	320	200
Southern Highlands (southern section)				
	Tolwong Plateau	100	400	250
	Broader study area excluding Tolwong	60	240	150
		160	640	400

The estimates were primarily based on the results of field surveys undertaken between 1996 and 2009. However, variations in survey method, and difficulties in assessing widely

scattered, cryptic populations in forested areas meant that the above estimates were tentative best-guess assessments.

3.2.2 Koala numbers and trends in the SENSW Far South Coast

Subsequent to the preparation of the report to the TSSC, DECCW undertook an extensive Koala survey in the Tantawangalo/Yurammie area (Allen 2010). No definite Koala evidence was located at any of the 168 sites sampled, compared with more 10% of sites assessed in the study of the Bermagui/Murrah/Mumbulla forests (DECCW 2010). The results suggest the population in this former area is either extinct or close to extinction.

With the probable extinction of the Tantawangalo and Yurammie population it is now broadly accepted that the only Koala population now persisting in the Eden region is the Bermagui/Murrah/Mumbulla population to the south west of Bermagui. This population probably consists of between 21 and 42 Koalas (Allen 2009).

Immediately to the north of the Eden region Koalas are persisting in the Kooraban National Park. The results DECCW-initiated surveys, commenced in 2010, currently suggest this may only be a remnant outlier of the Mumbulla-Bermagui Koala population. Koala numbers appear to be again very low although fieldwork planned for the coming months may locate other Koala activity cells.

3.2.3 Koala numbers in Southern Tablelands

The estimate provided to the TSSC (Allen 2009) for Koala numbers is between 80 and 320 Koalas. Anecdotal records of Koalas in the North-eastern Monaro appear to have increased in recent decades, with long-term residents reporting seeing and/or hearing Koalas bellowing in areas where they were not believed to be present previously.

These factors suggest that numbers may at least be stable at present.

3.2.4 Koala numbers in Southern Highlands (southern section)

Koalas are present, though widely scattered, on private land to the north east and north west of Nerriga, Morton NP, the Bungonia SRA and on adjacent private land to the south and west of these reserves, a forested and woodland area of approximately 70,000ha.

Higher densities of Koalas appear to occur over an area of approximately 10,000 ha on the Tolwong Plateau (Allen 2002). This is a relatively remote area, bounded by steep gorge country on three sides. Because of its remoteness human disturbance has been relatively low in recent decades, with the exception of human induced fire. Almost all the area is national park.

More broadly the population in the Southern Section of the Southern Highlands appears to extend over approximately 60,000ha of forest and woodland outside the core area on the Tolwong Plateau. Surveys in 2002/3 confirmed Koalas extended southwards to the Nowra/Nerriga/Braidwood Rd, south westwards to the Shoalhaven Gorge and further west into the Windellma District. The surveys also confirmed that Koalas also extend directly westwards across the Gorge into the Bungonia SCRA.

Anecdotal reports of Koala sightings from all these areas, as well as directly to the north of the Shoalhaven Gorge, and even at the settlement of Bundanoon, to the north west confirm that Koalas are persisting across this area.

As is the case with the Southern Tablelands population, much of the habitat consists of secondary and supplementary feed tree species generally growing on rugged and infertile country, but in some areas primary browse species are also present.

The Shoalhaven Gorge and surrounding areas experienced phases of intensive mining activity up until and including the period of the Great Depression. Impacts on habitat would probably have been significant, and hunting for fur would also probably have kept Koala numbers low.

Given the current distribution and disturbance history, a slow recovery in Koala numbers from this time is probably the most likely trend, punctuated with a reduction in numbers in the aftermath of severe wildfire events. The current estimate provided to the TSSC (Allen 2009) for this population is between 160 and 640 Koalas

The clearing for subdivision that has occurred in recent decades (and which is continuing) in the west, particularly in the Windellema District, has degraded and fragmented some of the habitat sustaining Koalas in the locality and probably meant a reduction in Koala numbers.

Extended drought may have impacted on the distribution and abundance of Koalas as is the case in other parts of the species' range, and further fieldwork to assess Koala numbers in this study area should give greater clarity as to the impact of this drought on the population.

4 KNOWLEDGE OF KOALA HABITAT

4.1 Koalas' Tree Species Preferences

Koala studies undertaken in four geographically and botanically distinct areas (FNSW 1996, Jurskis and Potter 1997, South East Forests Conservation Council 1998b, Allen 2002, Allen 2005, Allen 2009, DECCW 2010) consistently indicate that Koalas in SENSW feed on a diversity of commonly occurring eucalypts from the subgenuses symphyomyrtus (gum and box species) and monocalyptus (stringybark and ash species), usually growing in relatively low-fertility soils derived from metasedimentary geology.

Most of these eucalypts are identified as secondary Koala feed species as in DECCW (2008). In the past 20 years of Koala surveys there is no evidence of Koalas utilising any species as a primary species in south east NSW as defined in DECCW (2008)².

Stalenberg (unpublished) investigated how variations in the levels of nutrients and toxins in eucalypt foliage in the Mumbulla/Bermagui area influence tree selection by Koalas and found those chosen have browse of higher quality than neighbouring trees of the same species of similar size. Of the eight eucalypt species Koalas were browsing they constantly selected trees with higher nitrogen levels in the case of the monocalypts and lower toxins in the case of the symphyomyrtles.

The Koala's strategy of feeding from a diversity of eucalypt species may occur because the foliage of eucalypt forest growing low nutrient soils is usually more toxic than those growing on more fertile sites. In these lower-nutrient areas Koalas may use similar strategies to those used by possums and switch between different food sources containing non-interacting toxic secondary metabolites to reduce the risk of poisoning from ingesting a single class of poison (Marsh et al 2006).

In terms of Koala habitat management the key factors that arise from this are:

1. Koalas target specific trees from within suite of species that are usually widespread and common. Despite the relative abundance of these species, trees with suitable forage may be relatively rare and this rarity may explain why Koalas occur at low densities.
2. It is not possible to tell which trees are suitable and which are not from visual inspection.

² DECCW (2008) distinguishes between primary and secondary Koala feed tree species in that the former exhibits *a level of use that is significantly higher than that of other Eucalyptus species and independent of tree density.*

3. There may be extensive areas of habitat that can sustain Koalas, but are currently unoccupied because of past disturbance.
4. There is as yet no evidence of Koalas moving back into areas of what might be considered to be rehabilitated or regenerating primary habitat and it is unlikely to be a significant factor in Koala recovery in this part of NSW in the near future.

4.2 Koalas' growth stage preferences

The issue of whether Koalas prefer a particular age class of forest has featured in many policy and management decision-making processes since the early 1990's. Consistently Forests NSW have contended that Koalas prefer younger-aged forest, and at one stage the head of CSIRO's Wildlife and Ecology supported this view (FNSW 1995).

During that decade the evidence of the Koalas' preference for larger trees increased and was sufficient for the agency-approved Eden IFOA (Integrated Forestry Operations Approval Package for Eden Region 2000) to define Koala habitat as having *a substantial quantity of one or more ... Koala browse tree species in sizes greater than 30 centimetres diameter at breast height.*

The analysis of data derived from the Koala surveys on the Far South Coast concluded that the distribution of Koala pellets appeared to be correlated with larger trees of three species of eucalypt and was poorly correlated with plots where the sum of tree sizes was smaller DECCW (2010).

However, a peer review of the analysis Welsh *et al* (2010) cautioned that because occupancy probabilities were very low the data was not sufficient to draw firm conclusions as to Koalas' habitat preferences in the study area.

For this reason, at this stage, the issue of Koalas' habitat preferences in terms of forest growth stage in this part of NSW remains unresolved at a scientific and policy level.

5 THREATS TO KOALA HABITAT SUCH AS LOGGING, LAND-CLEARING, POOR MANAGEMENT, ATTACKS FROM FERAL AND DOMESTIC ANIMALS, DISEASE, ROADS AND URBAN DEVELOPMENT

5.1 Multiple factors

In its rejection in December 2007 of a nomination to list the Koala population to the west and south west of Bermagui the NSW Scientific Committee commented that the *quality of Koala habitat in this area is deteriorating because of multiple factors including extensive canopy dieback, clearing due to rural-residential development and commercial forest harvesting* (NSW Scientific Committee 2007).

The crucial point here may be the phrase, *multiple factors*; ie a succession of different human-induced impacts. As an example of this, in the 1970's and 1980's the forests to the west of the township of Bermagui and to the north of the Bermagui River sustained relatively high numbers of Koalas (Allen 2008). In this period these forests experienced a succession of human-induced impacts that included: a) clearing for farming; b) urban sub-division and associated clearing; c) logging of State Forest and private land that primarily targeted an important Koala feed tree species (*E. longifolia*); and, d) repeated fuel reduction burns. Koalas now appear to be extinct in this part of the Far South Coast (DECCW 2010).

Taken separately, each of these impacts may not have been sufficient to cause this localised extinction. It is probably the combination these impacts, occurring in relatively rapid succession, that caused both this localised extinction, and others that have occurred in the region over the past 50 years.

5.2 Integrated logging

Many factors have probably contributed to localised Koala extinctions on the Far South Coast, some of which may be extinction debts from long ago. One of these factors is integrated logging. The impact that this has had on Koala habitat, and the overlap between widespread localised Koala extinctions and integrated logging activities of the past four decades provides a strong case that the latter is complicit in what has happened to Koalas regionally.

Forests NSW staff have acknowledged that the logging of entire compartments that occurred between 1968 and 1976 in the region undoubtedly reduced Koala numbers (Jurskis and Shields 1996), but have not accepted that alternate couple logging, introduced after that date also impacted on Koalas.

This logging would have removed a significant proportion of suitable feed trees from these forests, with published data as to when regrowth trees are capable of providing suitable browse for Koalas. At best the felling of these feed trees is a massive interruption in Koalas' food supply. With the associated topsoil loss and compaction, reduction in species diversity and structural complexity, and increased fire hazard associated with the drying out of the forest floor³ and increased fuel loads that characterise post-logging regrowth, these impacts have probably degraded the Koala habitat at least for many generations.

This is not accepted by FNSW. The perspective of this agency was demonstrated in its media release (Bega News 10/2/10) that stated: *If the recently surveyed Mumbulla Koalas are the healthiest population remaining, we should remember that the Mumbulla State Forest is approximately 50 per cent regrowth forest, mostly created by harvesting in the 1970s. There is increasing evidence from both here and other areas of NSW that logging is not the threat to Koala that is commonly perceived.*"

5.3 Fire

Another major threat faced by Koalas on the Far South Coast, and others in SENSW, is fire; both that of wildfire and prescription burning.

The impact of wildfire on Koalas is obvious, and with increasing severity and frequencies of wildfire predicted as a result of climate change, will probably increase.

Fuel reduction burning is considered to be threat to Koalas in the NSW Koala Recovery Plan (DECCW 2008). Fire applied in dense regrowth areas is likely to be more of a threat because of the difficulty in keeping flame height low in these areas.

With governments requiring an increase in the extent of fuel reduction burning, the associated risks to Koalas are likely to increase.

The Fire Management Strategy developed by the Board of the Aboriginal-owned Biamanga National Park (see Point 6, Section 2.1) provides a useful guide for fire management planning that could be applied more widely.

³ Large-scale logging could increase bushfire risk for Australia's moist mountain ash forests, creating bigger fuel loads and drier, more combustible conditions, new research says. A world-first study led by Australian National University ecologist Professor David Lindenmayer has found gaps in the forest canopy allow the forest floor to dry out, increasing flammability by as much as 50 per cent in some cases.

5.4 Forest dieback

The NSW Scientific Committee lists eucalypt dieback as one of the factors in the declining quality of Koala habitat. Jagers (2004) recorded that approximately 20% of forest in the Eden region is declining in health and that the forest types that are mostly declining in health are mainly on private lands and adjacent public lands at the interface between cleared agricultural lands and forests.

Based on my observations of dieback and defoliation processes over the past two decades in the region I can offer the following:

1. These processes are related to human impacts on forests and the soils that sustain them, but the causes are complex and our understanding of these complexities is limited.
2. Dieback and defoliation generally more severe on the forest edge. Consequently any fragmentation of habitat potentially contributes to these processes.
3. One factor that is probably important is the ebb and flow of different populations of leaf-eating insects and their prey; often trees recover from defoliation episodes.
4. Towards the end of the most recent drought the quality and extent of forest canopy improved markedly in many areas. Although dieback may be a significant threat in the long-term, currently we are in a remission phase, and this should assist surviving Koalas access suitable browse at least in the next few years.

5.5 Climate change

In addition to the threats listed above in the Senate's terms of reference there is the threat of climate change, with an associated potential increase in the severity and frequency of droughts and associated wildfire.

Even though the Koala populations on the Southern Tablelands and Southern Highlands appear not to have declined during the recent and most severe drought, the predicted changes in both climatic and browse quality brought about by increased CO₂ levels may be the greatest long-term threat faced by koalas, both locally and nationally.

6 THE ADEQUACY OF THE NATIONAL KOALA CONSERVATION AND MANAGEMENT STRATEGY

6.1 Positive Aspects of the Strategy

The Strategy's desired outcomes, principles, assessment of threats and management issues, and proposed actions, should make an important contribution to Koala conservation. Its commitment to *give cohesion to all levels of activity, and acknowledge that there is no one universal solution for managing Koalas* should bring a greater clarity as to issues, improved sense of common purpose and enhanced communication between agencies and key groups active in Koala conservation

The Strategy's acknowledgement that *protecting, restoring and managing Koalas and their habitat will have significant benefits for a wide range of other species and ecological communities* is particularly welcome, as those benefits are often not recognised, or undervalued.

6.2 Community involvement and engagement

6.2.1 Developing partnerships and supporting community ownership (Action 4.03)

The Strategy acknowledges that *community ownership of this strategy is particularly important*, with the Actions in Category 4 aiming to enhance community involvement in Koala conservation efforts. Action 4.03 commits to developing and maintaining productive, integrated partnerships to influence, and achieve greater funding for, actions, particularly with community groups, the private sector and philanthropists.

A potential limitation in this regard is that whereas the conservation of specific Koala populations needs to be a sustained initiative based on long-term plans with effective implementation of actions, funding uncertainties and the ebb and flow of community energies makes this difficult. Partnership potential could be improved with:

1. Secure funding to enable partnerships to move beyond the constant struggle for short-term funding to engage in long-term planning.
2. Easily accessible map-based information that show research, rehabilitation and conservation histories for localities where Koalas occur. This probably needs to be

managed centrally, at least to the extent that the information is consistent and verifiable.

3. Clear acknowledgement and understanding that Koala conservation is complex, multi-dimensional and often occurring in conflict situations.
4. Better conflict management; fear of conflict, particularly between agencies leads to a lack of information getting to community and increases the sense of community disempowerment;

6.3 Effective Implementation

The Strategy acknowledges that a major limitation of its predecessor (1998 National Koala Conservation Strategy) was the lack of a clear process for implementing the actions. The adequacy of this current initiative will depend largely on how effectively the Actions listed are implemented.

The implementation plan developed in the current Strategy, and the establishment of national implementation and advisory teams, should help to resolve implementation issues.

However, there needs to be clearer lines of communication between these teams and those implementing *local solutions, based on local studies and local plans*.

The failure to implement Action 1.04⁴ within the designated timeframe of 6–12 months of the publication of the Strategy is of concern. This is a relatively straightforward process and should be achieved quickly. With that completed we will gain greater confidence that the Strategy's Aims can and will be implemented and be in a better position to address more complex issues such as data integration.

7 APPROPRIATE FUTURE REGULATION FOR THE PROTECTION OF KOALA HABITAT

The key regulatory issues that need to be addressed to protect Koala habitat are:

1. An overhaul of the survey and logging protocols in the Regional Forest Agreements' IFOAs (Integrated Forestry Operations Approval Package for Eden Region 2000) so

⁴ The Strategy commits to prioritising conservation of populations under immediate pressure by holding a workshop of experts within 12 months of publication to identify where existing Koala populations are already experiencing significant loss of habitat and to identify immediate and short-term actions to secure their status.)

that these are clear, appropriate to Koala's conservation needs and are undertaken with the due diligence that the situation requires.

2. An overhaul of the Koala Feed Tree species listed in local government planning processes (primarily SEPP 44) and private forestry regulatory frameworks (Private Native Forestry Code of Practice) so that the actual habitat that Koalas are using and have the potential to use is protected. As is the case with the IFOA Protocols the survey methods need to be updated to reflect what is currently best practice, with appropriate auditing processes implemented.

Given the history and current political climate in NSW, achieving these changes is unlikely in the near future without the support of the Commonwealth government.

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