

Covering Letter

4th February 2011

Committee Secretary
Senate Standing Committee on Environment, Communications and the Arts
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The Inquiry into the status, health and sustainability of Australia's koala

The Australian Koala Foundation is pleased to provide these comments to the Senate Standing Committee on Environment, Communications and the Arts for consideration.

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I would appreciate it if the Committee could (tick as appropriate):

- make the submission and my name public;
- make the submission public but withhold my name; or
- keep the submission confidential

The Inquiry into the status, health and sustainability of Australia's koala

Submission by the Australian Koala Foundation (AKF)

Introduction

The Australian Koala Foundation (AKF) is the principal non-profit, non-government organisation dedicated to the conservation and effective management of the wild koala and its habitat.

Since 1986, the AKF has, as its mission statement, been dedicated to the preservation of the wild koala and its habitat. The AKF is also the largest funding body of koala science and has funded over 100 scientific papers contributing to the scientific literature

Purpose of this Submission

The purpose of this submission is to provide further information, evidence and observations in relation to the following terms of reference:

1. The iconic status of the koala and the history of its management;
2. Estimates of koala populations and the adequacy of current counting methods;
3. Knowledge of koala habitat;

4. Threats to koala habitat such as logging, land clearing, poor management, attacks from feral and domestic animals, disease and roads, and urban development;
5. The listing of the koala under the EPBC Act;
6. The adequacy of the National Koala Conservation and Management Strategy;
7. Appropriate future regulation for the protection of koala habitat;
8. Interaction of state and federal laws and regulations; and
9. Any other related matters.

Evidence and Observations

1. The iconic status of the koala and the history of its management

1.1 The Koala is an iconic symbol of Australia.

An AKF funded study – ‘Koalas and Tourism: an economic evaluation’ identifies that the koala creates over 9000 jobs and contributes between \$1.1 billion and \$2.5 billion for tourism per year to Australia. See Appendix 1 - (Hamilton and Hundloe, 1997).

1.2 The koala, like other iconic species: elephants, whales, and gorillas, is loved by people all over the world. AKF supporters are those people that believe Australia has the responsibility to protect this unique

species for future generations. The first thing Oprah Winfrey did when she landed on our shores was cuddle a koala.



Oprah Winfrey cuddling a koala at Hamilton Island (Leys et al., 2010)

1.3 Key points in early history - See Appendix 2 - (Fowler, 1993)

- Up until the 1930s millions of koalas were shot for the fur trade. There may have been up to 10,000,000 koalas, given that 3 million were shot in one year. There is evidence to suggest that 4 times the number of koalas were shot, as often damaged skins did not reach the market.
- In 1919, Queensland had an open season and 1 million koalas were shot.

- In 1924, South Australian koalas became extinct, New South Wales were severely depleted and Victorian koalas were as low as 500.
- 1927, from 1st to 31st August, Queensland held the last open hunting season on koalas. Approximately 800,000 were killed. This number by any reckoning exceeds the total number of koalas which remain alive today in the whole of Australia.
- In the late 1930's the koala was declared a 'protected species' but their habitat has never been protected, particularly on private land.

Recommendation for Consideration by the Committee

- Acknowledge the *iconic* significance of the koala and its *economic* value to Australia.
- Ministers with tourism portfolios recognise the importance of koalas to tourism.

2. Estimates of koala populations and the adequacy of current counting Methods

- 2.1 AKF estimates the national koala population is between 43,515 and 84,615 individuals. See Appendix 3 - AKF Revised Koala Status Estimate June 2010 Map. See Appendix 4 - Koala Population Estimates Explanation of Methodology & Recommendations to the Threatened Species Scientific Committee (TSSC).

- 2.2 The Australian Government does not have a definite number to counter AKF's and has spent more time trying to diminish AKF methodologies than actually accept these realities.
- 2.3 AKF methodology is based on sound science and is a collective of over 100 research papers, funded by AKF and elsewhere. More importantly our certainty comes from countless hours in the bush, looking up into individual trees and individually measuring them. This is an unprecedented data base which does not come close to existing in Government.
- 2.4 The United States Government listed the koala as vulnerable under the Endangered Species Act in the year 2000. See Appendix 5 – Final Determination of Threatened Status for the Koala. The U.S. Scientific Authority determined that the koala had to be vulnerable given the amount of land clearing at that time. The Australian Government were very displeased with this determination.
- 2.5 The AKF methodology has taken into account the complexities of isolated habitats or islands like Kangaroo Island (as did the U.S. Government), but it is imperative to say, in a nutshell, that each of these animals have identical genes. They have been through at least 3-6 genetic bottlenecks and cannot be considered to have long term genetic viability. This is something both the Victorian and South Australian State Governments absolutely fail to acknowledge, even with countless science to support the view. On Kangaroo Island, up to 29% of the animals have morphological changes, including one or two testicles missing. Victoria too.
- 2.6 Island habitats are often used by Governments to hide their mismanagement of koalas and in the case of the Victorian Government regard the koala as a "pest". On Snake Island, Victoria, an Asian deer has more protection than the koala. The Victorian Government also

uses large and repeated public relations campaigns where they talk about “putting the koala on the pill”, making a national estimate of low numbers of koalas seem implausible. It is clever and manipulative public relations.

- 2.7 Using population estimates of unviable populations to make an assessment of ‘vulnerability’ or other category is flawed. The U.S. Determination makes this point clear and identifies that this is a problem.
- 2.8 The population figures AKF suggest reflect the view that these numbers are for genetically healthy koalas capable of long term sustainability.
- 2.9 Inadequate counting methods prevail. Often inexperienced and naive researchers will misrepresent small amounts of data from a small area and extrapolate numbers of koalas over large areas of forest. The U.S. Government determination identified this flaw in science. This assumes that an area has identical habitat quality and that disturbances are uniform. Koala distributions are completely different across their range. Rich fertile forests on the east are completely different to harsh desert like areas in the west.
- 2.10 At the time of writing, most koala scientists of repute accept that the AKF methodology for a whole of landscape approach to estimating koala numbers has merit. This comment has been made by Dr Alistar Melzer, a senior koala research scientist at Central Queensland University. “I am firmly of the view that the general approach taken here is the only way to assess potential koala habitat on a continental basis (Melzer, A. pers. Comm.)” See Appendix 6 – Letter Alistair Melzer to Deborah Tabart and Dave Mitchell. See Appendix 4 - Koala Population Estimates Explanation of Methodology &

Recommendations to the Threatened Species Scientific Committee (TSSC).

- 2.11 Currently the NSW Government and the Victorian Government acknowledge the AKF's Koala Habitat Atlas (KHA). The rogue state Queensland, has tried to emulate our success in mapping koala habitat, but has failed.

Recommendation for Consideration by the Committee

- Recognise AKF's Koala Habitat Atlas as best practice mapping.

3. Knowledge of koala habitat

- 3.1 Stable Koala populations can only persist if suitable habitat is available. Natural population densities are directly related to the quality of habitat which is in turn determined by the presence and density of primary and secondary food trees.
- 3.2 The presence of food trees as a fundamental requirement of Koala survival is recognised by and publicised on the websites of Environment and Conservation Departments in NSW, QLD, SA and VIC.
- 3.3 Other factors affecting the presence of Koala populations include habitat loss and fragmentation, urban settlement (particularly dogs and

cars), soil fertility, disease, rainfall and stochastic events such as bushfire and drought.

- 3.4 The koala occurs across 1,572,000 km² of eastern Australia, an area which includes 300 Local Government Areas (LGA) and 30 Catchment Management Authorities (CMA). In order to conserve and restore suitable koala habitats it is necessary to identify them and produce a habitat map which can then form the basis for planning and management decisions throughout this huge area by LGA and CMA Planners and Environmental Managers.
- 3.5 In 1994 the AKF developed the Koala Habitat Atlas (KHA) in recognition that identifying, mapping and ranking the quality of different habitats was crucial for the koala's long-term survival.
- 3.6 AKF has now mapped 335,000 km² in NSW, QLD and VIC using data from 80,000 trees at 2000 field locations in 20 study areas. These numbers may seem impressive, but it is a paltry 21% of the koala's geographic range. The KHA is recommended as a satisfactory means to map Koala habitats by DSE (VIC) and DECCW (NSW) in their respective Koala Management Plans.
- 3.7 The Koala Habitat Atlas relies on accurate vegetation mapping which clearly identifies the percentages of Primary and Secondary food trees within each distinctive forest or woodland community. This information is not included in any mapping carried out by State or Federal agencies, KHA practitioners must assume that species are listed in order of decreasing dominance. In most cases this assumption may be sufficient but cannot be confirmed as correct.
- 3.8 QLD and VIC have reasonable quality preclearing vegetation maps to which the KHA methodology can be applied for habitat restoration.

NSW and SA do not have this data, which is crucial for the long-term recovery of Koala populations.

- 3.9 AKF has on many occasions commissioned its own vegetation mapping for areas where there is insufficient detail and accuracy in available mapping (e.g. VIC) or a complete lack of mapping (SA and parts of NSW). Vegetation mapping is perhaps the greatest research cost the AKF faces.
- 3.10 To AKF's knowledge there have been only two other koala habitat mapping projects published, Coffs Harbour (NSW DECCW) and the Southeast Queensland Regional Planning Area (DERM).
- 3.11 The South East Queensland map commissioned by DERM and completed by a private consultant at a huge cost \$900,000 (which did not go to tender) completely ignores the presence of the primary food tree *Eucalyptus tereticornis* even though this species is the first one listed on DERM's website. That this species is "missing" from the SEQ Koala Habitat Values Map beggars belief. Many people in SEQ have commented about the inadequacies of the DERM mapping, and when they see the AKF's KHA for their area of interest they are reassured that they are not crazy or stupid because these maps reflect what is actually on the ground. AKF is under siege from the community and constantly trying to update and review this flawed Government data. The community however is forced to work with the DERM mapping because it has policy backing and frustrations abound. See Appendix 7 - AKF Koala Habitat Atlas Moreton Bay Rail Link 2010 Map. See Appendix 8 – Department of Environment and Resource Management Moreton Bay Rail Link Route 2010 Map. It is important to note that AKF offered the Queensland Government our mapping for "free" and it was ignored.

- 3.12 In AKF's experience many more Councils would adopt a Koala Plan of Management, but the KHA which underpins such Plans needs an accurate and detailed vegetation map which is beyond the financial resources of most Councils, CMAs and especially community organisations.
- 3.13 The Executive Steering Committee for Australian Vegetation Information (ESCAVI) was formed in 2001 by the Australian Government and all States and Territories to improve Australia's vegetation information as an input to better vegetation management, to facilitate development of a comprehensive and accessible information system for vegetation which could better inform decision making. DEWHA is the primary sponsor of ESCAVI.
- 3.14 ESCAVI initiated the National Vegetation Information System (NVIS) framework which allows for different hierarchies of vegetation mapping detail and accuracy.
- 3.15 At present, NVIS offers a very general vegetation map of Australia with vegetation classes like "Eucalypt Tall Open Forest" which can only be described as "Potential Koala Habitat" owing to the absence of any information on tree species. This data is totally inadequate for any habitat planning or management purposes.
- 3.16 Previously, the most common development occurring was urban development in coastal areas and landclearing in inland areas. Today resource extraction (coal, gas) provides a threat to koala habitats throughout the koala's geographic range. Surely it is time to know exactly what we are doing to koala habitats.

Recommendations for Consideration by the Committee

- Recognise the AKF's Koala Habitat Atlas as the most effective tool for koala habitat mapping.
- Provide resources for improved vegetation mapping at a national level, beginning with areas where koalas are under most pressure from habitat destruction.
- See Appendix 9 – Australian Vegetation Project – “Truthing The Land”.

4. Threats to koala habitat such as logging, land clearing, poor management, attacks from feral and domestic animals, disease and roads, and urban development

4.1 Koalas in the wild face a series of threats to their continued survival. The main threat is loss of habitat. Clearing of the eucalypt forests means that koalas, will suffer from:

- injury or death from traffic,
- injury or death from dogs (over 4000 koalas are killed each year by cars and dogs),
- effects of garden pesticides getting into waterways and excess agricultural fertilisers impacting negatively on native forests,
- increased competition for food and territory because of overcrowding,
- increased stress on animals, making them more susceptible to disease (Chlamydia is harmless in populations with unlimited resources, but manifests in times of stress, which happens when habitat is reduced).

- 4.2 Often habitat loss is made to appear less drastic, when 're-vegetation' (plans which are often poorly developed and or not followed through at all) is put on the table, for example "environmental offsets".
- 4.3 To assist in understanding the inadequacy of revegetation as a solution to land clearing - we have been advised of a Quarry development in Mt Cotton, Qld that plans to plant 66,000 offset trees to replace 14,000 mature koala trees. By our calculations, in order to replace the carbon value of the 14,000 trees, 103,600,000 saplings need to be planted. This would require 10 360 hectares of land.
- 4.4 The clearing of land for the expansion of human settlement, (for example, for housing, mining, forestry, shops, factories and roads) is a major threat to the koala. While humans require modern conveniences, we should be trying to expand in places where koalas and other wildlife are not already living, and think of other solutions to the problems of modern life, such as improving public transport.
- 4.5 A prime example of urban development that has not taken koalas and the landscape into account during the planning stage is Cleveland/Redland Bay. As a result the local koala population has severely declined (from 20,000 to 2,000 during AKF's existence).
- 4.6 Over the years, both the AKF and the community have come up with real life, practical solutions for preventing damage to koala habitat. For example, the AKF suggested to the New South Wales Government a reasonable solution for a road upgrade. See Appendix 10 – Letter, Deborah Tabart OAM to The Hon. Morris Lemma MP Premier. See Appendix 11 – Bonville Upgrade Bongil Bongil National Park Section Koala Habitat Atlas 2005 Map. These solutions are repeatedly ignored.

- 4.7 The threat of 'poor management' arises from lack of understanding and inadequate planning. These flawed strategies exist in every level of government. AKF has been witness to numerous policies and plans of management that have been inadequate. In Qld, since 1994, there have been 16 policy documents which have presided over the death of 25,000 koalas, all beautifully collated on the DERM (formerly EPA) website. They are great at statistics, particularly towards extinction.
- 4.8 Logging – other groups will focus on this issue, but it is our experience that pre-logging surveys are completely inadequate in their endeavours to find koalas and this koala (pictured) was found in a Government logging coup. Clearly this could be considered a breach of the Regional Forest Agreements.



Koala remains found after logging (front view)



Koala remains found after logging (rear view)

- 4.9 No Tree No Me - the importance of our biodiversity and the Australian eucalypt forests cannot be underestimated, for their carbon value. See Appendix 12 – Carbon and Koalas Collide: The science of trees, mapping and the carbon economy.

Recommendation for Consideration by the Committee

- Recognise the underlying threat to koalas is habitat loss.
- Instigate an immediate moratorium on all koala trees as listed under Essential Immediate Solutions (See page 17).
- Recognise the value of Australian koala forests as a carbon sink with potential for carbon trading.

5. The listing of the koala under the EPBC Act

- 5.1 There is currently no Federal legislation that specifically provides for the protection of the koala or its habitat. The koala is protected only as “native species” under the EPBC Act 1999 (EPBC Act) and this protection applies only to Commonwealth area.
- 5.2 The AKF has repeatedly tried to have the koala listed as vulnerable under the EPBC Act. See Appendix 13 – (Williams, 2010). Even if that was to occur, it would be at the tail end of a 1700 strong list of species already listed and all of those are waiting for a recovery plan. AKF has argued that if protection of koala forests was to occur, that around 1000 species, currently listed as vulnerable, would be potentially protected, saving the Commonwealth thousands of dollars in recovery plans. These thoughts fall on deaf ears. I even have to think that those deaf ears do not really even understand the Australian bush and the losses that have occurred. After 23 years, I have only ever bumped into one Government scientist doing koala research.
- 5.3 Even with a listing, the ironic thing is that “land clearing of koala habitat”, does actually not trigger the Act into protection. Land clearing is seen as a “threatening process”, but little more. Many have argued that the EPBC Act is totally incapable of protecting anything, until there are only a few left of the species.
- 5.4 The disadvantages in not having the koala listed are numerous and align directly with the protections that could and should be offered under the EPBC Act. These include:
- a. The koala is not afforded any legal protection as a “threatened species”. Therefore, it cannot benefit from a **recovery plan**

which “provides for the research and management actions necessary to stop the decline of, and support the recovery of, the listed threatened species or listed threatened ecological community so that its chances of long-term survival in nature are maximized.”

- b. Approved **conservation advice** is not required because the koala is not listed as a threatened species.
- c. The koala is not subject to the permit system which concerns members of listed threatened species being killed, taken, and moved.
- d. There is no requirement to identify **critical habitat** and because the koala has not been listed, then koala habitat is not listed and therefore it is not an offence to damage it.
- e. A conservation order controlling activities and requiring specified people to take specified actions cannot be issued.
- f. Because it is not listed as threatened, the koala does not fall within one of the seven **Matters of National Environmental Significance** (MNES)

5.5 The AKF contends that the koala should be immediately listed as vulnerable under the EPBC Act. The AKF has repeatedly argued with the Federal Government on numbers of koalas and we are hoping the Senate will accept the following scenario as outlined in our letter to former Minister Garrett. See Appendix 14 – Letter, Deborah Tabart OAM to The Honourable Peter Garrett MP Minister for Environment Protection, Heritage and the Arts.

- If AKF is right and there are no more than 100,000 koalas, then the decline is 75% which more than meets the decline needed for a vulnerable listing – it would even meet Endangered.
- If AKF doubles it figures to 200,000, then the decline is 50% - which again more than meets the Vulnerable listing for a 30% decline.
- If AKF trebled the figures to 300,000 – then the decline is 25% which almost sneaks in for the 30% decline. There are not 300,000 koalas in Australia.

Recommendation for Consideration by the Committee

- At a minimum, list the koala as vulnerable under the EPBC Act.
- Create new, specific legislation – The National Koala Act. See Appendix 15 – (Guglielmi, 2007).

AKF, after extensive consultation with our counterparts in the United States believes that biodiversity protection must have a three pronged approach.

1. Protection of the species
2. Legislation that has planning power
3. Tax incentives to encourage and support private landholders to protect biodiversity.

The United States Government created such legislation – The Bald Eagle Protection Act, for their iconic animal. This legislation has ensured its future

protection and survival, so much so that the Bald Eagle is now off the endangered species list. This is certainly a great achievement.

6. The adequacy of the National Koala Conservation and Management Strategy

- 6.1 The document commissioned at a cost of \$50,000 by the Federal Government and written by Parsons Brinckerhoff identifies that the koala was not protected under this strategy. See Appendix 16 – (Parsons Brinckerhoff, 2008).
- 6.2 I (Deborah Tabart OAM) was a member of the Steering Committee to review and write the new National Koala Conservation and Management Strategy and I am confident that it will fair no better. By and large it leaves the management of the koala to the States under bilateral arrangements. With 25,000 dead koalas in South East Queensland alone in the last 10 years, one could strongly argue that this strategy has not done a good job. It is our opinion that the failings of this strategy fell on deaf ears in meetings in Canberra.
- 6.3 AKF's specific concerns with the National Koala Conservation and Management Strategy 2009-2014 include:
- a. **Implementation Team**
Whilst an implementation team has been established as part of this strategy, the membership does not enable the team to understand the complexities of land use solutions (i.e. landscape ecologists, wildlife veterinarians etc). Further, the implementation team has no power to enforce the uptake of their recommendations.

b. **State Government and Local Planning Scheme compliance**

No formal mechanism exists to incorporate the outputs of the strategy into koala management practices at a State or Local level. State Government policy has proved to be ineffective at reducing habitat loss which is the major cause of koala decline. Legislative power is required to ensure koala habitat is properly protected under planning schemes, either by overruling planning schemes or forcing schemes to be consistent with koala habitat mapping.

c. **Aim and Objectives of the Strategy**

The aim of the strategy is to conserve the species and retain viable populations. However the strategy does not detail the actions required to achieve this aim.

Recommendation for Consideration by the Committee

- Protect individual trees - instigate an immediate moratorium on all koala trees as listed under Essential Immediate Solutions (See page 17).
- Address the major threats facing the species.
- Implement a recovery plan at a Federal level, duly funded.
- Implement funded, standardized, high resolution vegetation and koala habitat mapping protocols.
- Ensure policy instruments recognise the presence of koalas/koala habitat.

7. Appropriate future regulation for the protection of koala habitat

7.1 The Creation of The National Koala Act (See 5. The listing of the koala under the EPBC Act).

Recommendation for Consideration by the Committee

- Create new, specific legislation – The National Koala Act. See Appendix 15 – (Guglielmi, 2007).

8. Interaction of state and federal laws and regulations

8.1 The Australian Koala Foundation's Board of Directors have always queried who is actually the "custodian" of the koala. If you can imagine 25,000 cats and dogs being starved to death, ripped apart by predators, or run over by cars over a lengthy period, you would imagine that "someone", the RSPCA, would find someone to prosecute or blame. This is not the case with native wildlife. When a developer cuts down a koala tree and the animal is subsequently killed because it is homeless, nothing happens. It is the view of the AKF that the Australian Federal Government should declare itself the custodian of the koala and ensure its protection. Repeatedly the koala "falls between the stools". Council's blame State Governments and State Government's tell the Federal Government they have it under control.

If this was true and State Governments did have adequate protection for the koala, then why are hundreds of animals killed on a weekly basis?

- 8.2 The following is a brief history that should give an overview of the current state of protection:

Queensland

The Queensland Government was forced to recognize that the koala was vulnerable in South East Queensland in 2003. This only occurred because of an AKF nomination which was reviewed by an independent scientific panel. Prior to this, the Government repeatedly tried to stop the koala's protection, in part, because they wanted to build a road through a major koala habitat. The Goss Government lost power because of that road.

The independent committee is now disbanded and a "technical committee" is in place, which consists of Government bureaucrats. A further nomination by the AKF to have the "Koala Coast koala population", listed as "Critically Endangered" has languished on the shelf. The Koala Coast population is now functionally extinct.

Redlands Shire Council has a \$195,000 website encouraging people to protect the koala, but in reality it is too late. One has to ask, does Council have the power to tell the Queensland Government they need and want protection for the koala? Resolution after resolution at Council are made, but they fall on deaf ears at the State Government level.

In the rest of the State, the koala is listed as "common", which is ridiculous given the new threats of coal mining, coal seam gas, flood and drought.

New South Wales

The koala was listed as the equivalent of vulnerable in the early 1980's. A recovery plan was announced by Premier Carr over 10 years ago as an election promise. Approximately \$880,000 was announced. This was never spent and the document languishes on the floor. \$250,000 was spent on a community survey with fruitless results. By and large koala conservation is left to Councils and the community.

Victoria

Despite the recommendations made in the Koala Management Strategy, Ballarat is the only government authority to fully implement a Koala Management Plan to date. AKF funded a full time field officer in Ballarat for over 10 years to achieve this. It received a cursory comment in the new Federal Strategy. It is a strong and working document that could lead the way for protection of koalas in Victoria. The lack of appreciation for AKF's efforts by Government is staggering.

The Victorian Government loves to think they have "too many" koalas and as quoted previously, uses cunning public relations to make it look like the koala is in plague proportions. A scientific paper written by Dr. Steve Phillips, clearly shows that normal koala populations in Victoria are suffering the same rate of declines as in NSW and Queensland. When I was on the Government Committee (for the National Koala Conservation and Management Strategy), this research was impossible to put on the table as Victorian bureaucrats were constantly defending their positions. It is AKF's view that French Island and other habitat isolates are kept as breeding colonies so that the continued decline of koalas in places like Ballarat, The Grampians and Mount Macedon can be ignored as a management issue.

Recommendation for Consideration by the Committee

- Investigate Government mapping and rectify inaccuracies.
- All State Governments should undertake high resolution, interoperable mapping using AKF's methodology.
- Independent advice from independent external ecologists should be sought where conflicts exist.
- Appoint an Environment Ombudsman who has the power to examine developments in koala habitat areas.
- Enforce habitat protection covenants and offsets as part of planning schemes.
- Create new, specific legislation – The National Koala Act. See Appendix 15 – (Guglielmi, 2007).

Conclusions

In summary, it is the AKF's considered opinion that;

1. Habitat destruction is the biggest threat to koalas.
2. State Government policies are hopelessly inadequate.
3. Sound management needs to be based on sound habitat mapping.
4. AKF believes there is no solid commitment/political will from any level of Government for the protection of koala habitat.

Summary of recommendations

1. The Federal Government must assume the custodial role for the koala and create new, specific legislation – The National Koala Act.
2. Standardized koala habitat mapping, using best practice methodology must be undertaken and used to inform all planning decisions.
3. Instigate an immediate moratorium on the following koala trees for each state.

VICTORIA		
Botanical name	Common name	Koala food tree ranking
<i>Eucalyptus agglomerata</i>	Blue-leaved Stringybark	Secondary
<i>Eucalyptus albens</i>	White Box	Secondary
<i>Eucalyptus angophoroides</i>	Apple-topped box	Secondary
<i>Eucalyptus angophoroides</i>	Apple-topped box	Secondary
<i>Eucalyptus baxteri</i>	Brown Stringybark	Secondary
<i>Eucalyptus bridgesiana</i>	Apple box	Secondary
<i>Eucalyptus camaldulensis</i>	River Red-gum	Primary
<i>Eucalyptus consideniiana</i>	Yertchuk	Secondary
<i>Eucalyptus cypellocarpa</i>	Mountain Grey-gum	Primary
<i>Eucalyptus globulus</i> ssp. <i>bicostata</i>	Eurabbie	Primary
<i>Eucalyptus globulus</i> ssp. <i>pseudoglobulus</i>	Gippsland Blue-gum	Primary
<i>Eucalyptus gonicalyx</i>	Bundy	Secondary
<i>Eucalyptus intertexta</i>	Gum-barked Coolibah, Inland Red Box	Secondary
<i>Eucalyptus largiflorens</i>	Black Box	Secondary
<i>Eucalyptus melliodora</i>	Yellow Box	Secondary
<i>Eucalyptus microcarpa</i>	Grey Box	Secondary
<i>Eucalyptus muelleriana</i>	Yellow Stringbark	Secondary
<i>Eucalyptus nortonii</i>	Silver Bundy	Secondary
<i>Eucalyptus obliqua</i>	Messmate	Secondary
<i>Eucalyptus pauciflora</i>	Snow Gum	Sup
<i>Eucalyptus polyanthemos</i> ssp. <i>vestita</i>	Red Box	Secondary
<i>Eucalyptus regnans</i>	Mountain Ash	Secondary
<i>Eucalyptus tereticornis</i>	Forest Red Gum/QLD Blue	Primary

	Gum	
<i>Eucalyptus viminalis</i> ssp. <i>pryoriana</i>	Coast Manna-gum	Secondary
<i>Eucalyptus viminalis</i> subsp. <i>cygnetensis</i>	Rough-barked Manna Gum	Secondary
<i>Eucalyptus viminalis</i> subsp. <i>viminalis</i>	Manna Gum	Primary

QUEENSLAND		
Botanical name	Common name	Koala food tree ranking
<i>Eucalyptus bancroftii</i>	Orange Gum	Primary
<i>Eucalyptus bancroftii</i>	Orange Gum	Primary
<i>Eucalyptus biturbinata</i>	Grey Gum	Secondary
<i>Eucalyptus bridgesiana</i>	Apple box	Secondary
<i>Eucalyptus camaldulensis</i>	River Red-gum	Primary
<i>Eucalyptus cambageana</i>	Dawson Gum/Coowarra Box	Secondary
<i>Eucalyptus chloroclada</i>	Dirty Red Gum	Secondary
<i>Eucalyptus conica</i>	Fuzzy Box	Secondary
<i>Eucalyptus coolabah</i>	Coolibah	Primary
<i>Eucalyptus largiflorens</i>	Black Box	Secondary
<i>Eucalyptus major</i>	Grey Gum	Secondary
<i>Eucalyptus melliodora</i>	Yellow Box	Secondary
<i>Eucalyptus microcarpa</i>	Grey Box	Secondary
<i>Eucalyptus microcorys</i>	Tallow-wood	Primary
<i>Eucalyptus moluccana</i>	Inland Grey Box	Secondary
<i>Eucalyptus obliqua</i>	Messmate	Secondary
<i>Eucalyptus ochrophloia</i>	Yapunya	Secondary
<i>Eucalyptus orgadophila</i>	Mountain Coolabah	Secondary
<i>Eucalyptus pilligaensis</i>	Pilliga Box	Secondary
<i>Eucalyptus populnea</i>	Poplar Box	Secondary
<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum	Secondary
<i>Eucalyptus racemosa</i>	Narrow-leaved Scribbly Gum	Secondary
<i>Eucalyptus resinifera</i>	Red Mahogany	Secondary
<i>Eucalyptus robusta</i>	Swamp Mahogany	Primary
<i>Eucalyptus seeana</i>	Narrow-leaved Red Gum	Secondary
<i>Eucalyptus siderophloia</i>	Grey Ironbark	Secondary
<i>Eucalyptus signata</i>	Scribbly Gum	Secondary
<i>Eucalyptus tereticornis</i>	Forest Red Gum/QLD Blue Gum	Primary
<i>Eucalyptus thozetiana</i>	Thozet's Box	Primary
<i>Eucalyptus tereticornis</i>	Forest Red Gum/QLD Blue Gum	Primary
<i>Eucalyptus tindaliae</i>	Tindals Stringybark	Secondary

NEW SOUTH WALES		
Botanical name	Common name	Koala food tree ranking
<i>Eucalyptus agglomerata</i>	Blue-leaved Stringybark	Secondary
<i>Eucalyptus albens</i>	White Box	Secondary
<i>Eucalyptus amplifolia</i>	Cabbage Gum	Secondary
<i>Eucalyptus angophoroides</i>	Apple-topped box	Secondary
<i>Eucalyptus bancroftii</i>	Orange Gum	Primary
<i>Eucalyptus amplifolia</i>	Cabbage Gum	Secondary
<i>Eucalyptus angophoroides</i>	Apple-topped box	Secondary
<i>Eucalyptus bancroftii</i>	Orange Gum	Primary
<i>Eucalyptus baxteri</i>	Brown Stringybark	Secondary
<i>Eucalyptus biturbinata</i>	Grey Gum	Secondary
<i>Eucalyptus bridgesiana</i>	Apple box	Secondary
<i>Eucalyptus camaldulensis</i>	River Red-gum	Primary
<i>Eucalyptus chloroclada</i>	Dirty Red Gum	Secondary
<i>Eucalyptus conica</i>	Fuzzy Box	Secondary
<i>Eucalyptus consideriana</i>	Yertchuk	Secondary
<i>Eucalyptus coolabah</i>	Coolibah	Primary
<i>Eucalyptus cypellocarpa</i>	Mountain Grey-gum	Primary
<i>Eucalyptus globulus</i> ssp. <i>bicostata</i>	Eurabbie	Primary
<i>Eucalyptus goniocalyx</i>	Bundy	Secondary
<i>Eucalyptus intertexta</i>	Gum-barked Coolibah, Inland Red Box	Secondary
<i>Eucalyptus largiflorens</i>	Black Box	Secondary
<i>Eucalyptus major</i>	Grey Gum	Secondary
<i>Eucalyptus melliodora</i>	Yellow Box	Secondary
<i>Eucalyptus microcarpa</i>	Grey Box	Secondary
<i>Eucalyptus microcorys</i>	Tallow-wood	Primary
<i>Eucalyptus moluccana</i>	Inland Grey Box	Secondary
<i>Eucalyptus muelleriana</i>	Yellow Stringbark	Secondary
<i>Eucalyptus nortonii</i>	Silver Bundy	Secondary
<i>Eucalyptus obliqua</i>	Messmate	Secondary
<i>Eucalyptus ochrophloia</i>	Yapunyah	Secondary
<i>Eucalyptus pauciflora</i>	Snow Gum	Sup
<i>Eucalyptus pilligaensis</i>	Pilliga Box	Secondary
<i>Eucalyptus polyanthemos</i> ssp. <i>polyanthemos</i>	Red Box	Secondary
<i>Eucalyptus polyanthemos</i> ssp. <i>vestita</i>	Red Box	Secondary
<i>Eucalyptus populnea</i>	Poplar Box	Secondary
<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum	Secondary
<i>Eucalyptus punctata</i>	Grey Gum	Secondary
<i>Eucalyptus racemosa</i>	Narrow-leaved Scribbly Gum	Secondary
<i>Eucalyptus resinifera</i>	Red Mahogany	Secondary

Eucalyptus robusta	Swamp Mahogany	Primary
Eucalyptus seeana	Narrow-leaved Red Gum	Secondary
Eucalyptus siderophloia	Grey Ironbark	Secondary
Eucalyptus signata	Scribbly Gum	Secondary
Eucalyptus tereticornis	Forest Red Gum/QLD Blue Gum	Primary
Eucalyptus tindaliae	Tindals Stringybark	Secondary
Eucalyptus viminalis subsp. viminalis	Manna Gum	Primary

SOUTH AUSTRALIA		
Botanical name	Common name	Koala food tree ranking
Eucalyptus baxteri	Brown Stringybark	Secondary
Eucalyptus camaldulensis	River Red-gum	Primary
Eucalyptus gonicalyx	Bundy	Secondary
Eucalyptus largiflorens	Black Box	Secondary
Eucalyptus microcarpa	Grey Box	Secondary
Eucalyptus obliqua	Messmate	Secondary
Eucalyptus viminalis subsp. cygnetensis	Rough-barked Manna Gum	Secondary
Eucalyptus viminalis subsp. viminalis	Manna Gum	Primary

References

Leys, N., Byrne, F., Michael, P. 2010. Oprah Windfey Lands in Australia and Cuddles a Koala. *News Limited newspapers*, [online] 08/12/2010. Available at: [http://www.dailytelegraph.com.au/oprah-winfrey-lands-in-australia-and-cuddles-a-koala/story-fn6l6axd-1225967810687].[02/02/2011].

List of Appendices

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<https://www.savethekoala.com/pdfworddocs/general/tourism.pdf>

Appendix 2.

Fowler, G. 1993. *Black August Queensland's Open Season on Koalas in 1927*, Thesis submitted in partial fulfilment of the requirements of a Bachelor of Arts Degree with Honors in History at the Australian National University,
<https://www.savethekoala.com/pdfworddocs/vulnerable/nom-Appendix%203.pdf>

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Appendix 5.

Department of the Interior Fish and Wildlife Services 2000. *Endangered and Threatened Wildlife and Plants; Final Determination of Threatened Status for the Koala*. 50 CFR Part 17 RIN 1018 - AE43, Federal Register, Vol. 65. No. 90,
<https://www.savethekoala.com/pdfworddocs/vulnerable/nom-Appendix%204.pdf>

Appendix 6.

Melzer, A. to Tabart, D. and Mitchell, D. 2010 Re: AKF Submission. [email] 17/12/2010

Appendix 7.

Australian Koala Foundation (AKF) 2010, *Koala Habitat Atlas, Moreton Bay Rail Link*, Queensland, Australian Koala Foundation.

Appendix 8.

Department of Environment and Resource Management 2010, Proposed Moreton Bay Rail Link Route, Queensland, Australian Koala Foundation.

Appendix 9.

Australian Koala Foundation 2004, *Australian Vegetation Project – “Truthing The Land”*. [Report]. February 2011.

Appendix 10.

Tabart, D. to Lemma, M. 2005. *Re: Pacific Highway Upgrade – Coffs Harbor*. [letter] 18/10/2005.

Appendix 11.

Australian Koala Foundation (AKF) 2005, *Pacific Highway – Bonville Upgrade Bongil Bongil National Park Section Koala Habitat Atlas*. Australian Koala Foundation.

Appendix 12.

Australian Koala Foundation (AKF), 2009. *Carbon and Koalas Collide: The science of trees, mapping and the carbon economy*, [report]. February 2010.

Appendix 13.

Williams, B., 2010. Plea to List Dwindling Koalas. *The Courier Mail*, 12 November, <https://www.savethekoala.com/pdfworddocs/media/20101112%20plea%20to%20list%20dwindling%20koalas.pdf>

Appendix 14.

Tabart, D. to Garrett, P. 2010. *Re: Listing of Koala as Vulnerable under the EPBC Act.* [letter] 15/06/2010.

Appendix 15.

Guglielmi, J. Australian Koala Foundation, 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*, Master's degree Law student, University of Nice, France.

Appendix 16.

Parsons Brinckerhoff, 2008, *Department of the Environment, Water, Heritage and the Arts, Review of progress in implementing the 1998 National Koala Conservation Strategy*, <http://environment.gov.au/biodiversity/publications/koala-strategy/pubs/review.pdf>

APPENDIX 1.

Hundloe, T.J. & Hamilton, C. 1997. *Koalas and Tourism: an economic evaluation*, Discussion Paper, Australia Institute, Lyneham, Act.

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APPENDIX 3.

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Explanation of Methodology & Recommendations to the Threatened Species
Scientific Committee (TSSC) Threatened Species Assessment of *Phascolarctos
cinereus* (Koala).



Australian Koala Foundation

**The Australian Koala Foundation
(AKF)**

Koala Population Estimates
Explanation of Methodology

&

Recommendations to the
Threatened Species Scientific Committee (TSSC)

Threatened Species Assessment of *Phascolarctos cinereus*
(Koala)

Australian Koala Foundation
GPO Box 2659 Brisbane QLD 4001
ACN 010 922 102

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Introduction

In early 2005 the Australian Koala Foundation (AKF) Board of Directors recognised the need to derive current estimates for Australia's koala population, in order to provide baseline figures with which future population estimates could be compared and monitored. The methodology outlined below builds upon that initial work. Further impetus for the project was generated by the AKF's Nomination for listing the koala as Vulnerable under the EPBC Act, with the aim of addressing the questions and inevitable controversy generated by any attempt to derive an accurate population estimate of Koalas throughout their geographic range.

The Australian Koala Foundation (AKF) has worked towards improving the identification and conservation of Koala habitat throughout New South Wales, Queensland and Victoria using the Koala Habitat Atlas (KHA) methodology (Phillips *et al.*, 2000; Phillips & Callaghan, 2000). KHAs provide a sound underpinning for Comprehensive Koala Plans of Management which may be adopted by Local Governments in order to identify and protect key koala habitat areas and to provide strategic direction for habitat restoration programs, threat mitigation measures, community awareness, and ongoing monitoring and reporting.

In designing the methodological steps outlined below, AKF has drawn on the collective research funded and managed by the AKF under the auspices of many eminent koala scientists (some of whom were employed by AKF and others in academia) in Australia. Mr. David Mitchell, Dr. Stephen Phillips, Mr. John Callaghan, Mr. Rolf Schlagloth, Dr. Douglas Kerlin. It has also called upon the research of Dr. Alistair Meltzer, Dr. Bill Foley, Dr. Stephen Cork, Professor Peter Timms, Dr. Jeff McKee, Dr. Rosemary Booth, Professor Paul Canfield, Dr. Mark Krockenberger, Dr. Robert Close, Mr. Tristan Lee, Dr. Damien Higgins. Dr. Clive McAlpine, Dr. Leonie Seabrook. Ms. Christine Hoskings, Dr. Jonathan Rhodes, Professor William Sherwin, Dr. Greg Baxter, Dr. Guy Castley, Ms. Alexa Mossaz, Dr. Bronwyn Houlden, Dr. Lester Pahl, Dr. John Woolcock, Dr. Julie Haynes. See Appendix 2 for a list of AKF funded research.

The methodological steps taken to create the Koala Habitat Atlas (KHA) is derived from an amalgamation of research resulting from the above scientists. These fields of research are

continually improving and with these adjustments, follows adjustments in AKF's methodological approach to estimating koala populations.

In addition to the peer reviewed research papers AKF has drawn on and contributed to, we draw your attention to amount of time AKF scientific staff, some of which are those mentioned above, have spent researching in the field. 400 days, each with four people, equaling 1600 days working, collecting data from the bush and recording the reality of their surroundings. This has resulted in an unprecedented data base of 80,000 individually measured trees (available to all researchers) and 2000 field sites across the koala's natural range.

Methodology

Koala Habitat Mapping

Koala habitat mapping was based on the Native Vegetation Information System (NVIS) mapping. The Australian Native Vegetation Assessment 2001 (Cofinas & Creighton, 2001) reports that the NVIS mapping is focused on major vegetation groups and broad-scale vegetation clearing, and that the mapping products are designed primarily for use at national and State-wide scale and for simple regional vegetation descriptions. The NVIS mapping involved compilation of a wide range of data sources with varying capture scales (Cofinas & Creighton, 2001).

The NVIS dataset used in this analysis is the now-superseded Version 1; at a future stage the analysis can be performed using NVIS Version 3 data, however this would require computing power somewhat beyond the AKF's present capabilities. NVIS Version 1 delineates 23 major vegetation groups (MVGs) in Australia. The MVGs which include trees used by koalas include: Eucalypt tall open forests, Eucalypt open forests, Eucalypt woodlands, Eucalypt open woodlands, and Callitris forests and woodlands. These MVGs are hereafter referred to as potential Koala habitat.

It is important to note that, with a cell size of 0.01 degrees or approximately 1 km², the dataset does not show riparian habitats. However, as of 2005 (when this analysis was first conducted), NVIS Version 1 was the only uniform vegetation mapping covering the

range of the koala. Again, it is envisaged that these analyses will be redone when feasible, using NVIS Version 3 which, with a cell size of 100 metres, will capture riparian habitats more effectively.

For our analysis the area within the approximate koala distribution in mainland Australia, was clipped from the Australia-wide NVIS dataset and MVGs that do not typically contain eucalypts were removed using the Vertical Mapper grid analysis add-on in MapInfo 7.5. Interim Bioregions (IBRA 5.1) were then intersected with the remaining NVIS cells (Figure 1). The number of eucalypt cells in each Bioregion were tallied, producing an estimate for the area of available potential koala habitat used for subsequent population model.

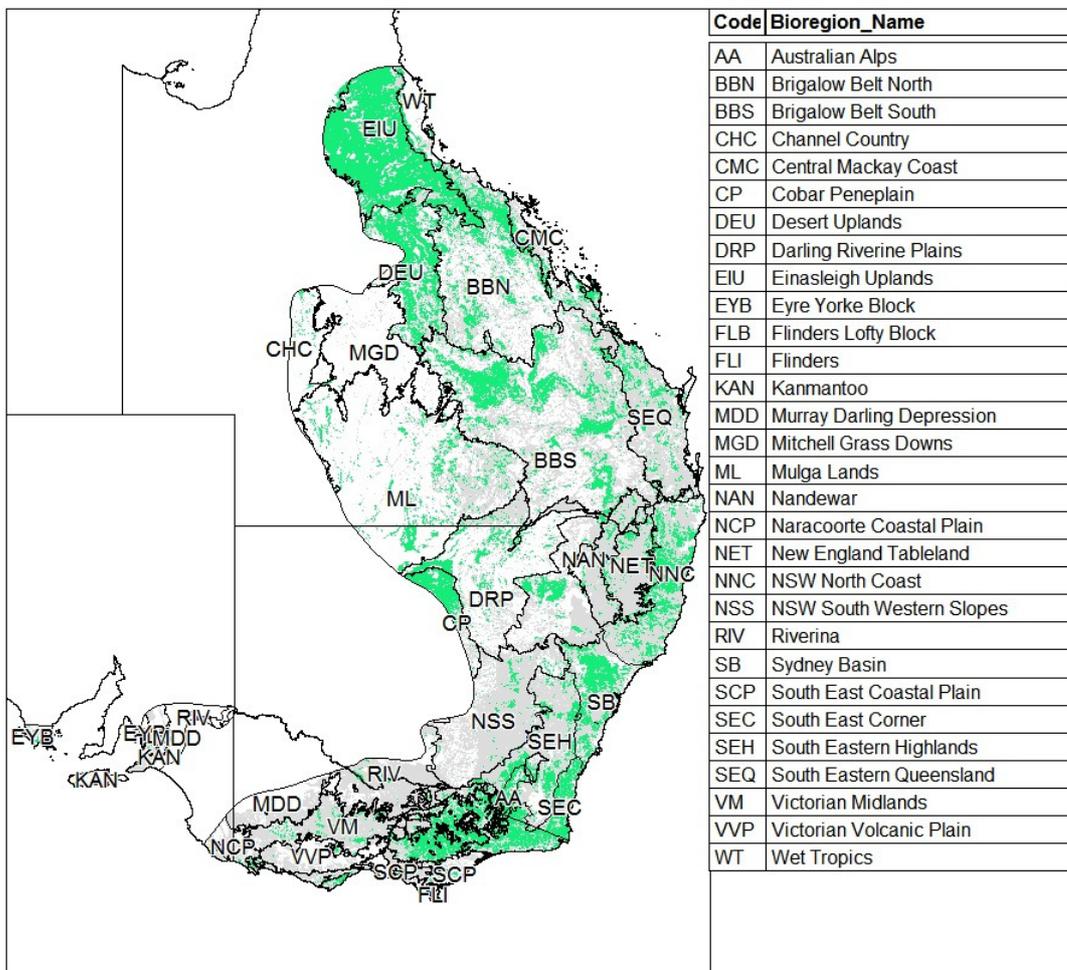


Figure 1: Bioregions within Koala's geographic range with potential koala habitat. NVIS 2001 eucalypts=green, NVIS 1750 eucalypts green and grey, white=not suitable.

Field data collection

Since 1994 the Australian Koala Foundation (AKF) has conducted field work at 1,995 field sites across the natural range of the koala (Figure 2). At each field site, koala habitat utilisation and tree species preferences were assessed using the KHA methodology, supported by the Spot Assessment Technique (SAT) where appropriate (for more details, refer to Phillips *et al.*, 2000; Phillips & Callaghan, 2000).

In brief, both the KHA and the SAT employ a standardised faecal pellet search methodology. At each site, living trees (with the exception of tree ferns, palms and cycads) with a diameter at breast height (dbh) of at least 100mm are identified and marked. A systematic search for koala faecal pellets is conducted beneath each of the marked trees, with a cursory inspection of the undisturbed ground surface, followed (if no faecal pellets are initially detected) by a more thorough inspection involving disturbance of the leaf litter and ground cover within the prescribed search area (a radius of 1m around the base of each tree). At each tree, searching is conducted for two-person minutes, or until a koala pellet is found. Field plot sites are categorised as either 'active' or 'inactive' on the basis of whether koala faecal pellets were present or absent. Searches for koalas are also conducted at each field site.

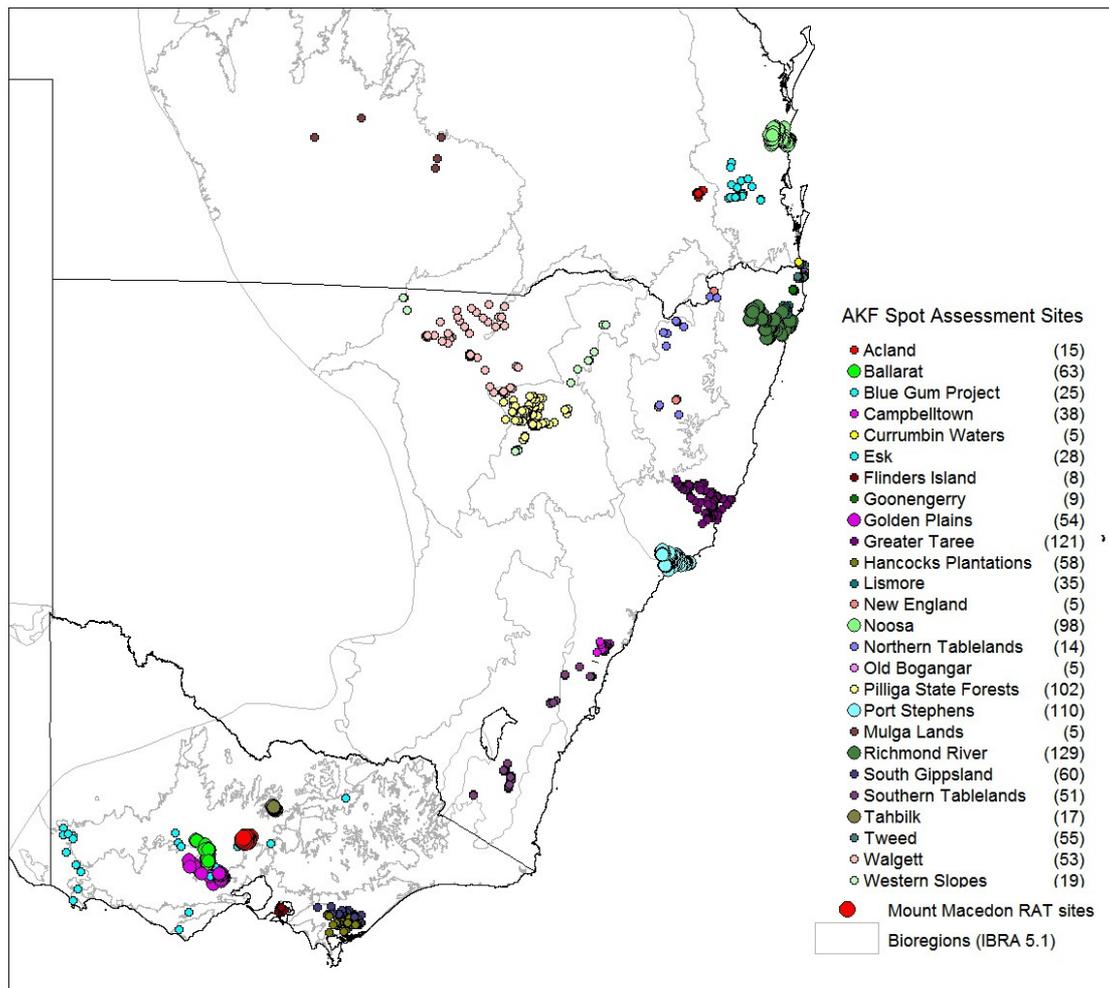


Figure 2: Locations of AKF SAT and RAT field sites. Larger circles (with presence/absence data) were used in analysis.

Tree species preferences are identified on the basis of statistical examination of variation (heterogeneity) amongst strike rates (i.e., the proportion of surveyed trees for each given species that recorded koala pellet evidence), for tree species data that satisfy validation criteria, using G-tests for independence, followed by analysis of use versus availability. Tree species are subsequently ranked into primary and secondary koala habitat tree species (collectively referred to as preferred species), and supplementary species.

Prior analysis has indicated that some tree species can be of significantly greater importance to koalas when occurring on particular substrates, generally those with higher nutrient status and moisture availability (Phillips et al. 2000; Phillips & Callaghan 2000). Where there is significant variation in soil types and underlying geology within a study

area, the tree use dataset is grouped accordingly and the analysis is repeated for each grouping.

Following the identification and ranking of local tree species preferences, detailed vegetation and soil landscape classifications and accompanying descriptions are used to assign primary, secondary, and marginal koala habitat categories to a detailed vegetation map of the study area. These habitat rankings subsequently inform the preparation of a GIS-based Koala Habitat Atlas (KHA) map for the study area. A KHA represents a ranked koala habitat map

(Callaghan et al., *in review*)

While there has been some criticism of the SAT methodology in the literature (Dique et al., 2004), it is important to note that the SAT was developed to provide a rapid, cost effective assessment of koala tree species preferences. The presence of faecal pellets under trees does not indicate feeding by koalas, or provide any indication of the amount of time spent in a particular tree; analysis of the contents of faecal pellets could be used to establish a firmer link between tree use as a food resource and pellet presence/ absence. However, given the desire to develop a rapid and cost effective assessment methodology, and given that the results of SAT sampling generally reflect the scientific consensus with regards to important koala habitats, we feel that the SAT has merit. It is critical to note that the SAT merely provides an assessment of koala habitat quality, and does not, in and of itself, provide any estimates of koala abundance. It does however provide information on Koala distribution within a study area as shown for the former Noosa Local Government Area in Figure 3.

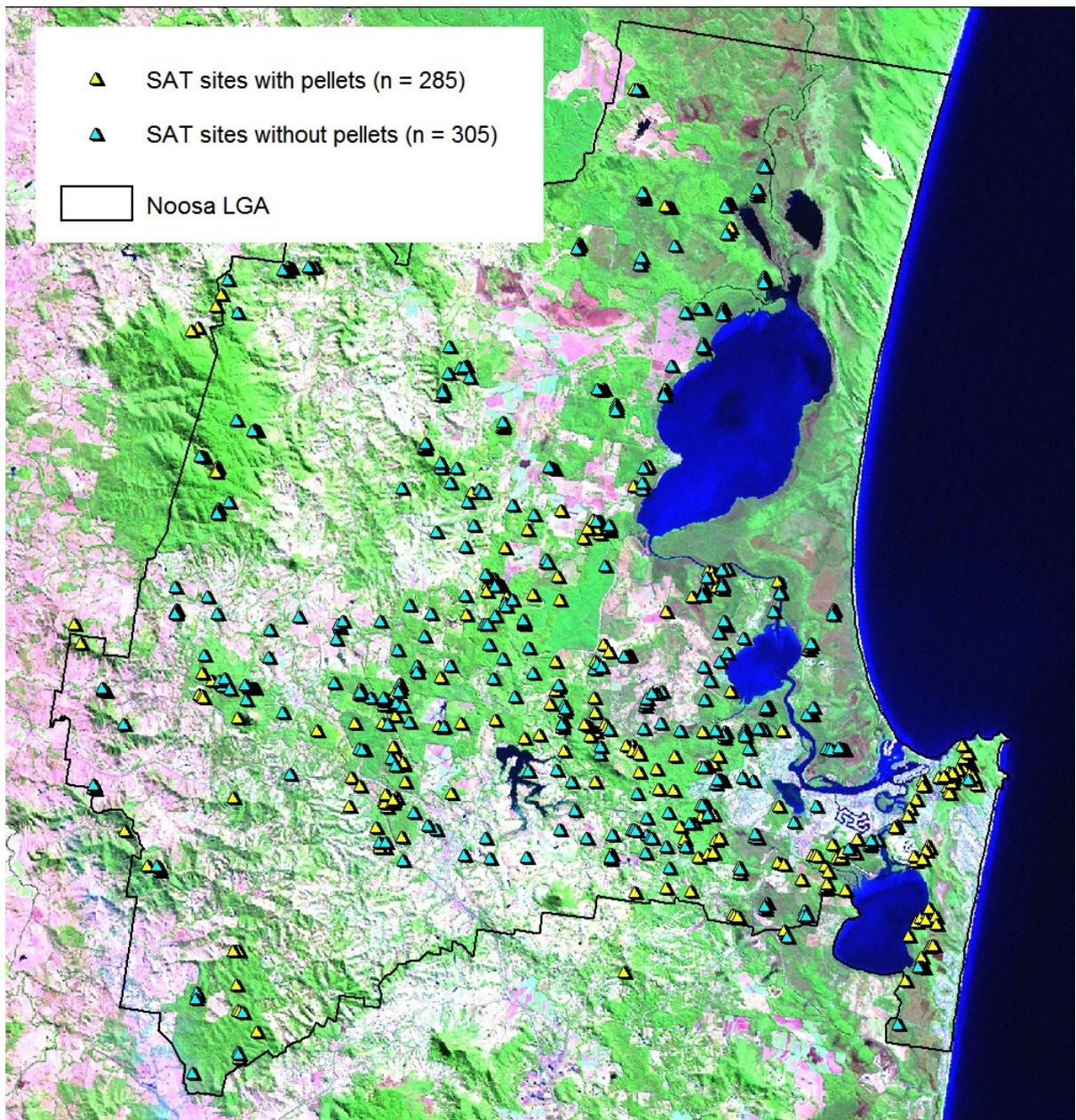


Figure 3: Spot Assessment sites for former Noosa LGA. Yellow = sites with fecal pellets, blue = without. 48% of sites recorded pellets. (Note: map includes additional sites excluded from population modeling).

Estimating Koala Abundance

Koala abundance was estimated based on one of two methods. Where available, data pertaining to koala home range sizes was utilised to help with estimation of koala density and abundance. For example, data collected by the AKF on the Tweed Coast in northern NSW provided helpful estimates of average koala home range size, and extent of home range overlap (Table 1; AKF unpub. data). For locations where home range data was available from previous studies by koala researchers, estimates of koala abundance were more straight-forward, with narrower confidence limits.

For locations that lacked koala home range data, we constructed models for population estimation using parameters derived from available published sources from similar or nearby regional areas.

Table 1. Koala home range sizes from the Tweed Coast, northern NSW (AKF unpub. Data).

State	Area	Male			Female			Overlap (%)
		Min.	Max.	Mean	Min.	Max.	Mean	
NSW	Tweed Coast	10.78	42.78	20.3	1.84	16.28	8.82	20

Modeling Koala Abundance

Parameters of the Model

Previous attempts to estimate the abundance and population status of koalas in Australia have been criticised for failing to adequately consider variation across the species range. For example, a previous population viability analysis was criticised for only using reproductive parameters from a single population, rather than using parameters derived from a wider sample of populations. In this study, we have instead collated data from field study sites across the species range, and from sources in the scientific literature, to reflect the broad variation in koala habitat quality and population density.

In order to capture variation in this collated data; we assume that the reported values for the different sites are representative of various probability distributions that capture the variation across the whole country (including unsampled sites). For example, while the sampled proportion of active sites ranges from 0.3 to 0.7, we might expect that we could find values across the country ranging from 0 to 1, but that the sampled values from 0.3 to 0.7 are indicative of the shape of the probability distribution which describes the proportion of active sites. We can determine the most likely probability distributions from which those numbers may have been derived. We use a beta distribution for those parameters which are limited between 0 and 1 (proportions), and a Weibull distribution for other, positive parameters. By sampling randomly from these distributions in an iterative fashion, the results generated provide a robust estimate of koala abundance. To illustrate this process, Figure 4 displays a sample beta probability distribution, generated to model the proportion of preferred koala habitat in a landscape (mean = 0.33, 95% confidence intervals = .04, .73).

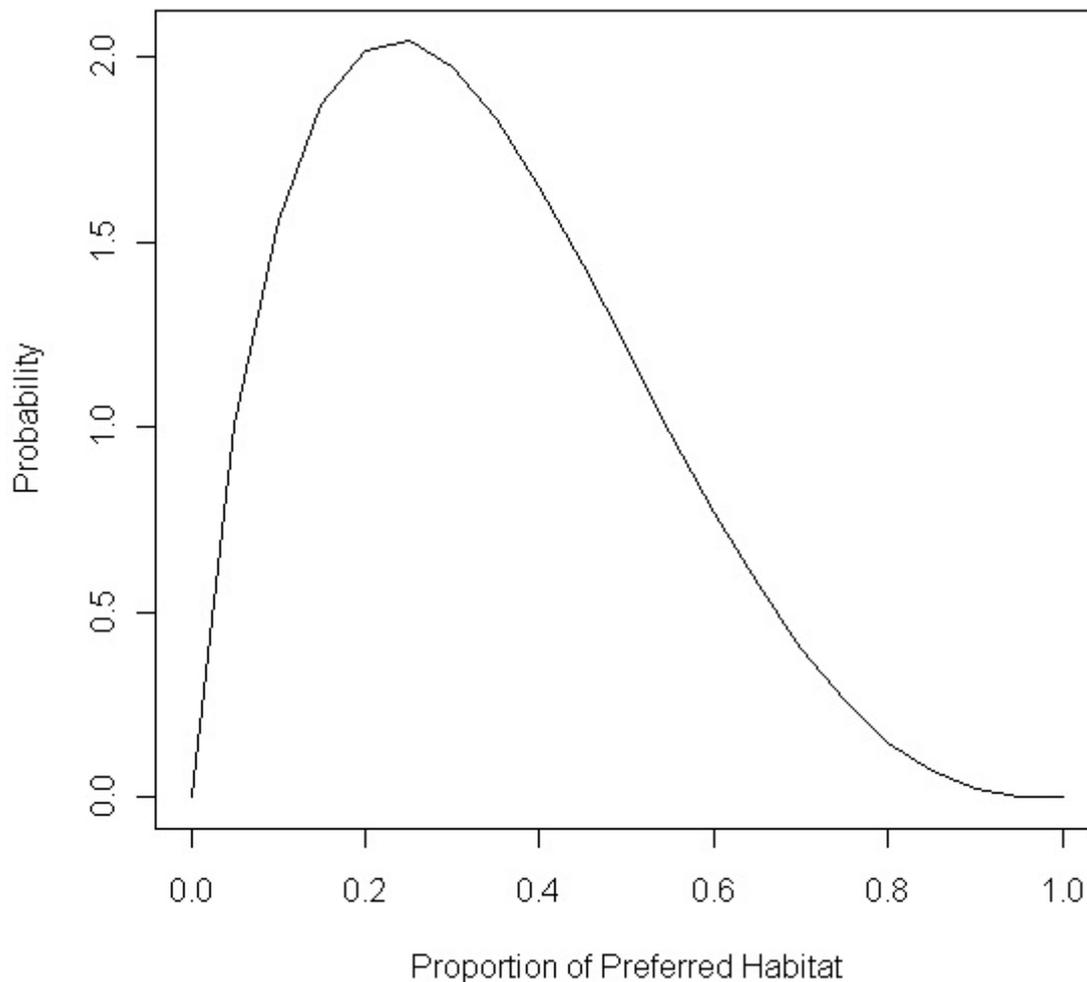


Figure 4: Beta Probability distribution modeling the proportion of preferred habitat. Note that this distribution is based on all available data, rather than the closest three study areas.

To better reflect regional variation in the population dynamics of koalas, parameters for koala populations in any given area were determined using data from the three nearest study areas. Where there was insufficient available data to model each geographic group separately, parameters were modelled using all available data.

We specify model parameters as probability distributions; distributions are constructed to provide four model parameters: the proportion of occupied habitat, the proportion of preferred habitat, koala densities, and the proportion of koalas in preferred habitat, relative to supplementary habitat.

Analyses were conducted using the R software environment for statistical computing and graphics (Ihaka and Gentleman, 1996).

Proportion of Occupied Habitat

The KHA methodology typically involved a combination of random stratified and targeted survey techniques for site selection; the non-random nature of sampling makes inferences problematic. However, in a small number (6) of study areas, SAT sites were randomly determined *a priori*. These study areas provide an ideal data set to evaluate the proportion of habitat occupied by koalas. The proportion of occupied habitat was assessed using data from six study areas, where SAT surveys had been conducted at randomly selected sites (Table 2). Other study areas were excluded from this compilation as sites were only selected where evidence of koalas was found (pellets or sightings). The proportion of occupied habitat was modelled by fitting a beta probability distribution to available data.

Table 2. The proportion of active sites within randomly sampled study areas. Mean proportion of active sites 0.664, s.d.= 0.145

Study Area	State	Number of sites sampled	No of active sites	Proportion active
Golden Plains	Vic	134	76	0.567
Tahbilk	Vic	90	60	0.667
Hanging Rock	Vic	74	27	0.365
Port Stephens LGA	NSW	110	79	0.718
Richmond River LGA	NSW	127	90	0.709
Noosa	QLD	98	66	0.673
Ballarat	VIC	100	76	0.76
Campbelltown	NSW	38	18	0.473
Taree	NSW	126	84	0.667
Tweed Coast	NSW	53	39	0.736
Strzelecki Ranges	VIC	62	54	0.871

Proportion of Preferred Habitat

Data pertaining to the proportion of total potential habitat (all eucalypt forests and woodlands) classified as preferred habitat was compiled from 13 Koala Habitat Atlases (KHAs) (Table 3). The proportion of preferred habitat was modelled by fitting a beta probability distribution to available data.

Table 3. Koala Habitat Atlas results for the proportion of preferred koala habitat in each KHA area.

Study Area	State	Total Area (ha)	Total Potential Koala Habitat (ha)	Proportion of Preferred Habitat
Ballarat LGA	Vic	70912.25	6903	68.872
HVP Native Forest	Vic	34072	27308	32.353
Golden Plains	Vic	165606.75	39939	30.271
Tahbilk	Vic	11698.24	3522	35.484
Port Stephens LGA	NSW	85582.73	41699	12.928
Hawkes Nest	NSW	1180.21	390	8.592
Campbelltown LGA	NSW	31045.88	15881	15.258
Greater Taree LGA	NSW	367648.53	170681	52.835
Richmond River LGA	NSW	197625.95	77376	38.088
Tweed Coast	NSW	43072.68	8980	55.979
Walgett LGA	NSW	1420134.73	441929	5.851
Pilliga State Forests	NSW	389751	368798	40.785
SEQ Bioregion (Queensland Only)	QLD	6061480.57	2219568	36.609

Koala Densities

Data on koala densities was drawn from the available scientific literature (Table 4). For most studies, minimum and maximum density estimates were available. However, for two studies (Eden and Central Queensland), only a mean estimate was provided. A Weibull probability distribution reflecting the observed variation in density was constructed. Mean density was calculated by assuming reported densities came from a normal distribution, and that the minimum and maximum densities reported represent the 95% confidence intervals (CI) of this distribution. Similarly, observed minimum density and observed maximum density estimates were assumed to reflect the 95% CI of the modelled Weibull distribution.

Table 4. Koala density estimates drawn from the literature.

State	Location	Koalas/ha		Source
		Min	Max	
SA	Kangaroo Island	0.11	5.01	Masters <i>et al</i> 2004
Vic	Fragmented Habitats	8.6	8.9	Mitchell 1990; cited in Meltzer <i>et al</i> 2000
Vic	Phillip Island and Brisbane Ranges	0.7	1.6	Hindall 1984; cited in Meltzer <i>et al</i> 2000
NSW	Eden		0.006	Jurskis and Potter 1997; cited in Meltzer <i>et al</i> 2000
NSW	Northeast	4	8	Meltzer <i>et al</i> 2000
NSW	Tucki Tucki	1	7	Gall 1980
QLD	Mulgalands	0.001	2.513	Sullivan <i>et al</i> 2004
QLD	Southeast	0.02	1.26	Dique <i>et al</i> 2004
QLD	Central		0.01	Melzer and Lamb 1994; cited in Meltzer <i>et al</i> 2000
QLD	Southeast	1	3	Gordon <i>et al</i> 1990, Hasegawa 1995; cited in Meltzer <i>et al</i> 2000

The proportion of koalas in preferred habitat

Koala densities/sightings are expected to be higher in preferred habitats as compared to supplementary habitats. However, as a result of landclearing targeting higher fertility soils, koalas are often forced to occupy lesser quality, supplementary habitats on poorer soils. We modelled the proportion of koalas sighted in preferred habitats to incorporate differences in local koala occurrence related to habitat quality.

Observations of koalas were recorded throughout the course of KHA surveys,. Sighting data was also available from the Department of Sustainability and Environment in Victoria, the Department of Environment and Climate Change in New South Wales, and the Department of Environment and Resource Management in Queensland. Sighting data was overlaid onto KHA mapping to determine the number of sightings for preferred and supplementary koala habitat categories. Records for areas mapped as 'cleared land' were assigned to the closest preferred or supplementary habitat within 100m, or beyond this distance were deleted. Observations at the same site on the same day were assumed to

represent the same animal unless explicitly documented otherwise and deleted so as to minimise duplications.

We used this data to assess the proportion of koalas in preferred habitat (Table 5); modelled using a beta probability distribution.

Table 5. Koala Habitat Atlas results for the number of sighted koalas in preferred habitat.

Study Area	State	No.of Koalas Sighted	Proportion of Sightings in Preferred Habitat
Hanging Rock	Vic	34	0.735
Ballarat	Vic	46	0.694
Golden Plains	Vic	91	0.363
HVP Native Forest	Vic	56	0.304
Tahblik	Vic	3	0.333
East Tweed	NSW	225	0.644
Richmond River	NSW	55	0.836
Greater Taree	NSW	514	0.512
Port Stephens	NSW	2189	0.245
Pilliga	NSW	58	0.638
Walgett	NSW	35	0.057
Southeast Queensland	QLD	1045	0.372

Modeling Koala Abundance

Koala abundance modeling was undertaken on a bioregion by bioregion basis. For each bioregion, we generated a distribution of estimated abundances after conducting 10 000 iterations of the following model:

The abundance of koalas in preferred koala habitat in bioregion i was calculated using the area of available koala habitat in the bioregion as determined through koala habitat mapping (a_i). We estimate the area of habitat actually inhabited by koalas by modeling the proportion of occupied habitat (o).

Given the area of occupied habitat, we can determine the proportion likely to be classified as preferred habitat (p). Koala abundance was calculated by modeling koala density (d). Note that we assume that previous estimates of koala density are biased; previous studies have introduced sampling bias to estimates of koala density by calculating densities based on abundances at discrete sites where

koalas are known to be present, these results are then extrapolated to areas with no known koala populations. Our methodology instead assumes that koala density estimates are appropriate for areas of occupied habitat, rather than total available habitat.

Estimated koala abundance was adjusted to consider the effect of the modelled proportion of preferred habitat (p), and proportion of koalas sighted in preferred habitat (s), to reflect any inherent variation in habitat usage. Koala sightings were taken from Wildlife Atlas records.

For each iteration of the model, we randomly generate values for parameters p , o , d and s by sampling from the respective described probability distributions. We assumed the true abundance for each bioregion lies between the 95% percentile intervals of the generated distribution of abundances.

Finally, estimated abundance was modified where additional information was available from other sources, including research investigators, wildlife carers and verified government sources. A flow chart of the process is illustrated in Figure 5. For the final map, Bioregion population estimates were proportionately redistributed to Federal electorates.

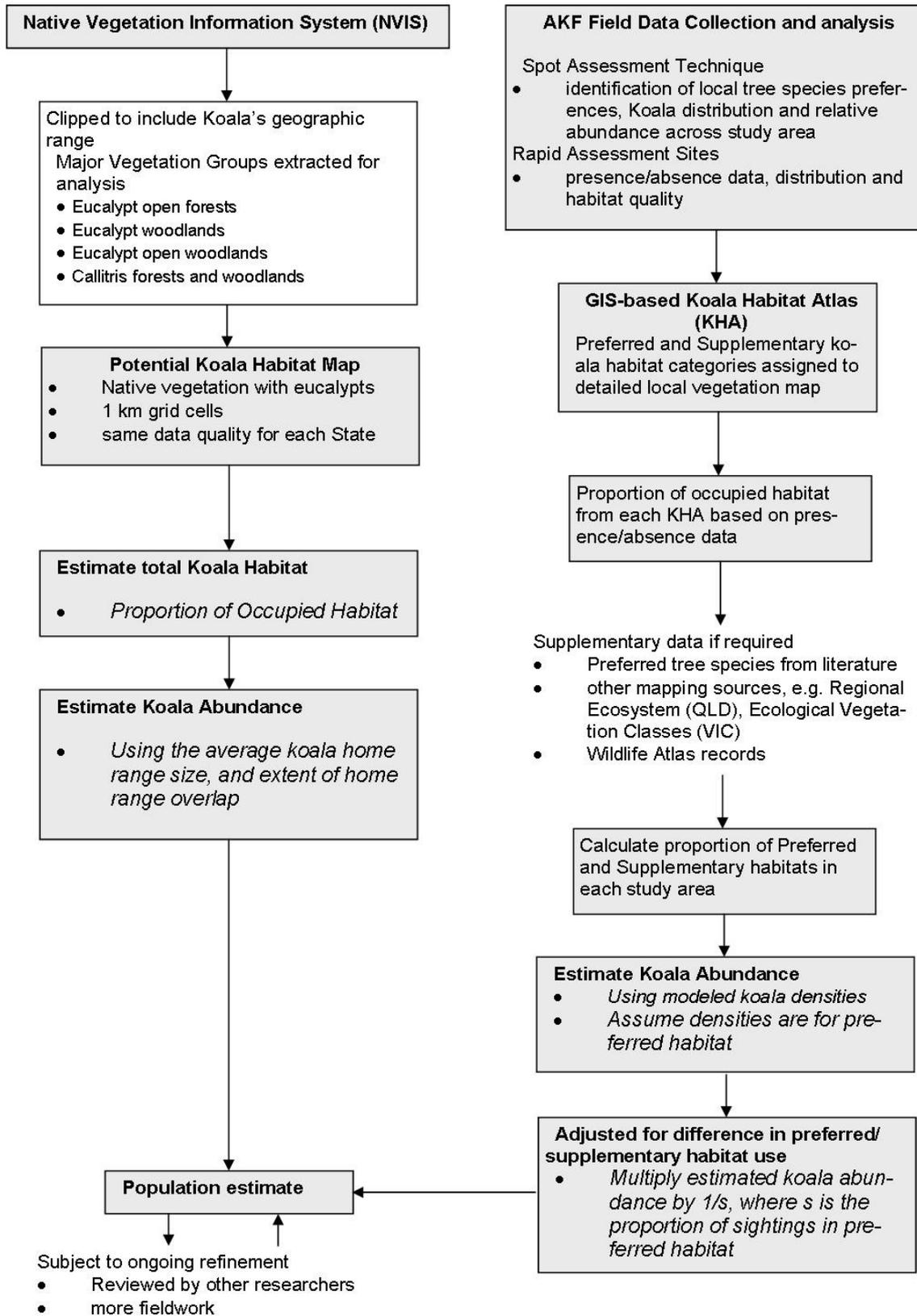


Figure 5: Modeling Process

Discussion

We have sought to formulate a repeatable methodology for calculating meaningful estimates of koala population size and distribution across eastern Australia.

Whilst the methodology is open to criticism and will require ongoing refinement, the AKF holds that it draws credibility by incorporating the best available data from a wide range of sources. It provides a starting point for future monitoring programs and a sound basis for refining population estimates in collaboration with koala researches throughout the koala's remaining geographic range.

References

Callaghan, J., McAlpine, C., Thompson, J., Mitchell, D., Bowen, M., Rhodes, J., de Jong, C., Sternberg, R. & Scott, A. (*in review*) Ranking and mapping koala habitat quality based on tree species preferences for conservation planning: A case study of Noosa Shire, southeast Queensland. *Wildlife Research*.

Cofinas, M. & Creighton, C.A.N.V.A. (2001) *Australian Native Vegetation Assessment 2001*. National Land and Water Resources Audit. Commonwealth of Australia., Canberra. .

Dique, D.S., Preece, H.J., Thompson, J. & de Villiers, D.L. (2004) Determining the distribution and abundance of a regional koala population in south-east Queensland for conservation management. *Wildlife Research*, **31**(2), 109-17.

Gall, B.C. (1980) Aspects of the Ecology of the Koala, *Phascolarctos-Cinereus* (Goldfuss), in Tucki-Tucki-Native-Reserve, New-South-Wales. *Australian Wildlife Research*, **7**(2), 167-76.

Ihaka, R. and Gentleman, R. (1996) R: A language for data analysis and graphics. *Journal of Computational and Graphical Statistics*, **5**(3), 299-314.

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*, **31**, 267-72.

Melzer, A., Carrick, F., Menkhorst, P., Lunney, D. & St. John, B. (2000) Overview, critical assessment, and conservation implications of koala distribution and abundance. *Conservation Biology*, **14**(3), 619-28.

Phillips, S. & Callaghan, J. (2000) Tree species preferences of koalas (*Phascolarctos cinereus*) in the Campbelltown area south-west of Sydney, New South Wales. *Wildlife Research*, **27**(5), 509-16.

Phillips, S., Callaghan, J. & Thompson, V. (2000) The tree species preferences of koalas (*Phascolarctos cinereus*) inhabiting forest and woodland communities on Quaternary deposits in the Port Stephens area, New South Wales. *Wildlife Research*, **27**(1), 1-10.

Sullivan, B.J., Baxter, G.S., Lisle, A.T., Pahl, L. & Norris, W.M. (2004) Low-density koala (*Phascolarctos cinereus*) populations in the mulgalands of south-west Queensland. IV. Abundance and conservation status. *Wildlife Research*, **31**(1), 19-29.

APPENDIX 2 Research Funded by the Australian Koala Foundation

- Allen, C., (2005) Draft Koala Report NSW Far South Coast, Department of Environment and Conservation.
- Australian Koala Foundation, (2002) Port Stephens Council Comprehensive Koala Plan of Management.
- Callaghan, J. McAlpine, C., Thompson, J., Mitchell, D., Bowen, M., Rhodes, J., de Jong, C., Sternberg, R. and Scott, A. (in final stage of review). Koala tree species preferences and habitat mapping as a basis for landscape-scale conservation: a case study in Noosa Shire, southeast Queensland. *Wildlife Research*.
- Callaghan, J., Curren, T. Thompson, J., Floyd, R. (2002) Greater Taree City Council Comprehensive Koala Plan of Management, Australian Koala Foundation.
- Callaghan, J., Curren, T. Thompson, J., Taylor, A. (2003) Campbelltown City Council Comprehensive Koala Plan of Management, Australian Koala Foundation.
- Canfield, P., Spencer, A., Hartley, W., Spielman, D. Vogelneust, I. & Hulst, F. (1992) Disorders of keratinization in a group of related, captive koalas (*Phascolarctos cinereus*), with a review of other skin conditions in koalas. *J. Zoo Wildl. Med.*, 23: 414-421.
- Canfield, P.C., D.P. Higgins and M.B. Krockenberger. Diseases of Koalas. Wildlife Pathology Short Course, Taronga Zoo, Sydney, Australia 21st-24th August 2008.
- Canfield, P.J. & Hemsley, S. (1996) Thymic lymphosarcoma of T cell lineage in a koala. *Aust. Vet. J.* 74: 151-154.
- Canfield, P.J. & Spencer, A.J. (1993) Renal complications of cystitis in koalas. *Aust. Vet. J.*, 70: 310-311.
- Canfield, P.J. & Spencer, A.J. (1993) Secondary degenerative arthropathy (osteoarthrosis) of the hip joints in ageing, free-living koalas. *Aust. Vet. J.*, 70: 394-395.
- Carter D., L. Campbell, N. Saul and M. Krockenberger (In Press). Sexual reproduction of *Cryptococcus gattii* – a population genetics perspective. In: *Cryptococcus neoformans* Eds: A. Casadevall and J. Heitman.
- Carter, D.A. Saul, N. Campbell, L. Bui, T and Krockenberger, M. (2007). "Sex in natural populations of *Cryptococcus gattii*" In: *Sex in fungi: Molecular Determination and Evolutionary Implications*. Eds: J. Heitman, J. Kronstadt, J. Taylor and L. Casselton. ASM Press, Washington D.C.
- Cocciolone, R.C. and Timms, P. (1992) DNA profiling of Queensland koalas reveals sufficient variability for individual identification and parentage determination. *Wildlife Research* 19 : 279-287.
- Connolly J.H., Canfield P.J., Hemsley S. & Spencer A.J. (1998) Lymphoid neoplasia in the koala. *Aust. Vet. J.* 76: 819-825.

- Connolly J.H., Krockenberger M.B., Malik R., Canfield P.J., Wigney D.I. & Muir D.B. (1999) Asymptomatic carriage of *Cryptococcus neoformans* in the nasal cavity of the koala (*Phascolarctos cinereus*). *Med. Mycol.* 37: 331-33.
- Devereaux, L., Polkinghorne, A., Meijer, A. and Timms, P. (2003) Molecular evidence for novel chlamydial infections in the koala (*Phascolarctos cinereus*). *Systematic and Applied Microbiology* 26 : 245-253.
- Fowler, E., Hoeben, P. and Timms, P. (1999) Randomly amplified polymorphic DNA variation in populations of eastern Australian koalas, *Phascolarctos cinereus*. *Biochemical Genetics* 36 : 381 – 387.
- Fowler, E., Houlden, B., Hoeben, P. and Timms, P. (1999) Genetic diversity and gene flow among southeastern Queensland koalas (*Phascolarctos cinereus*). *Molecular Ecology* 8:.
- Fowler, E., Houlden, B., Hoeben, P. and Timms, P. (2000) Genetic diversity and gene flow among southeastern Queensland koalas (*Phascolarctos cinereus*). *Molecular Ecology* 9 : 155-164.
- Fowler, E., Houlden, B., Sherwin, W., Hoeben, P. and Timms, P. (1998) Genetic variation in captive koalas (*Phascolarctos cinereus*) ; parentage determination and individual identification. *Biochemical Genetics* 36: 193-206.
- Girjes, A., Hughall, A, Timms, P. and Lavin, M. (1988) Two distinct forms of *Chlamydia psittaci* associated with disease and infertility in *Phascolarctos cinereus* (koala). *Infection and Immunity* 56 : 1897 – 1900.
- Glassick, T.V., Giffard, P. and Timms, P. (1996) Outer membrane protein 2 gene sequences indicate that two chlamydial species, *Chlamydia pecorum* and *Chlamydia pneumoniae* cause infections in koalas. *Systematic and Applied Microbiology* 19: 457-464.
- Griffith J.E. (submitted) Studies into the diagnosis, treatment and management of chlamydiosis in koalas, PhD thesis, University of Sydney
- Griffith J.E., Dhand N.K., Krockenberger M.B., Higgins D.P. A retrospective study of Admission trends of koalas at a wildlife rehabilitation facility in Coastal New South Wales, Australia: 1975-2004.
- Griffith, J.E. (2009) “Koalas, the clap and all that.” Wildlife Health and Conservation Centre Conference, Faculty of Veterinary Science, University of Sydney, Camden, NSW.
- Griffith, J.E., “Do drugged koalas really get high?” (2008) National Wildlife Rehabilitation Conference, Canberra, ACT, Australia.
- Griffith, J.E., D.P. Higgins, K.M. Li, M.B Krockenberger and M. Govendir (In Press) Absorption of enrofloxacin and marbofloxacin after oral and subcutaneous administration in koalas (*Phascolarctos cinereus*). *Journal of Veterinary Pharmacology and Therapeutics* (accepted 2/12/09)

- Griffith, J.E., Higgins, D.P., Krockenberger, M.B., Canfield, P. (2009) "Clinical response to selected fluoroquinolone treatment of chlamydial disease in koalas." Wildlife Disease Association - Australasian Section and Wildlife Society of New Zealand Veterinary Association, joint conference, the Catlins, New Zealand.
- Griffith, J.E., Higgins, D.P., Li, K.M., Krockenberger, M.B. & Govendir, M, (2008) "Do drugged koalas really get high?" Wildlife Disease Association - Australasian Section annual conference, Kiola, NSW, Australia.
- Griffith, J.E., Higgins, D.P., Li, K.M., Krockenberger, M.B. & Govendir, M (2008) "Do drugged koalas really get high?" The College Science Week - Australian College of Veterinary Scientists, Gold Coast, Qld, Australia.
- Higgins DP and Canfield PJ (2009) Histopathological examination of the pancreas of the koala. *Journal of Comparative Pathology* 140:217-224
- Higgins DP Chlamydial disease in koalas and its investigation. Chapter 13 in: Wildlife. Proceedings 371. Pub. The Post Graduate Foundation in Veterinary Science (2008) . pp223-240.
- Higgins DP. Chlamydial disease in koalas. Proceedings, Wildlife Pathology Short Course, Taronga Zoo (2008), pp. 247-255
- Higgins DP. Chlamydial disease of koalas: the host-pathogen interaction. Brisbane International Chlamydia Congress, Queensland University of Technology, Brisbane (2005)
- Higgins DP. Chlamydiosis in koalas. Australian Association of Veterinary Laboratory Diagnosticians (AAVLD) Annual Conference, Taronga Zoo, Sydney Australia. (26-27th October, 2006).
- Higgins DP. Koala lymphosarcoma. Proceedings, Wildlife Pathology Short Course, Taronga Zoo (2008), pp. 256-257
- Jackson, M., Giffard, P. And Timms, P. (1997) Outer membrane protein A gene sequencing demonstrates the polyphyletic nature of koala *Chlamydia pecorum* isolates. *Systematic and Applied Microbiology* 20 : 187-200.
- Jackson, M., White, N., Giffard, P. and Timms, P. (1999) Epizootiology of *Chlamydia* infections in two free-range koala populations. *Veterinary Microbiology* 65: 255-264.
- Januchowski, SR, McAlpine, C.A., Callaghan, JG, Griffins, CB, Bowen, ME, Mitchell, D & Lunney, D (2008) Identifying multiscale habitat factors influencing koala (*Phascolarctos cinereus*) occurrence and management in Ballarat, Victoria, Australia. *Ecological Management and Restoration*, 9(2): 134-142.
- Jobbins, S.E. (submitted) Further insights into the adaptive immune response of the koala (*Phascolarctos cinereus*) PhD Thesis, University of Sydney.
- Krockenberger, M., N. Saul, S. Jobbins, P. Canfield and R. Malik. Cryptococcus in Koalas: Pathogenesis and Epidemiologic Aspects for Understanding Human Infection.

- Australian Society of Infectious Diseases Annual Scientific Meeting, Cypress Lakes Resort, Hunter Valley, NSW Australia March 25-28th (2009).
- Krockenberger, M.B. Cryptococcosis of koalas. Wildlife Pathology Short Course, Taronga Zoo, Sydney, Australia 21st-24th August (2008).
- Krockenberger, M.B. The Investigative Approach to Diseases of Naturally-Occurring Animal Populations. Centre of Veterinary Education Wildlife Proceedings 371, 19th-20th April (2008).
- Krockenberger, M.B., K. Stalder, P.J. Canfield and R. Malik (2005). Cryptococcosis of Australian Wildlife. *Microbiology Australia* 26(2):69-71
- Krockenberger, M.B., P. Canfield, N. Saul, S. Jobbins, M. Govendir, B. Kimble and R. Malik. Pathogenesis And Epidemiology of Cryptococcosis In Animals: Implications For Understanding Human Cryptococcosis. Pan Pacific Veterinary Conference. Brisbane, Qld, Australia 24th-28th May (2010)
- Lawler, IR, Foley WJ, Eschler B, Pass DM, Handasyde K (1998) Intraspecific variation in secondary metabolites determines food intake by folivorous marsupials. *Oecologia* 116:160 – 169
- Malik, R., M.B. Krockenberger, C.R. O'Brien, D.A. Carter, W. Meyer and P.J. Canfield (In Press). Veterinary Insights into Cryptococcosis, *Cryptococcus neoformans* and *Cryptococcus gattii*. In: *Cryptococcus neoformans* Ed. A. Casadevall and J. Heitman
- Markey, B., Wan, C., Hanger, J., Phillips, C. and Timms, P. (2007) Use of quantitative real-time PCR to monitor the shedding of chlamydiae in the koala (*Phascolarctos cinereus*). *Veterinary Microbiology* 120: 334 - 342.
- McAlpine, C.A., Bowen, M, Callaghan, J, Lunney, D, Rhodes, J, Mitchell, D, Pullar, D and Possingham, HP (2006) Testing alternative models for the conservation of koalas in fragmented rural-urban landscapes. *Austral Ecology*, 31: 529-544.
- McAlpine, C.A., Rhodes, J, Bowen, M, Lunney, D, Mitchell, D, Callaghan, J and Possingham, H (2008) Can multi-scale models of a species' distribution be generalised from region to region? A case study of the Koala. *Journal of Applied Ecology*, 45: 558-567.
- McAlpine, C.A., Rhodes, JR, Callaghan, J, Bowen, M, Lunney, D, Mitchell, D, Pullar, D and 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. *Biological Conservation*, 132: 153-165.
- McAlpine, CA, Callaghan, JG, Lunney, D, Bowen, ME, Rhodes, JR, Mitchell, DL and Possingham, HP (2005) Conserving south-east Queensland koalas: how much habitat is enough? *Proceedings of the 2004 south east Queensland biodiversity conference (Part II)*. University of Queensland, Gatton Campus, Gatton, Australia, September 2004.

- McGill, S., R. Malik, N. Saul, S. Beetson, C. Secombe, I. Robertson, P. Irwin (2009). Cryptococcosis in domestic animals in Western Australia: a retrospective study from 1995–2006. *Medical Mycology* 47: 625-639.
- Melzer, A. & Lamb, D. (1994). Low density populations of the koala (*Phascolarctos cinereus*) in Central Queensland. *Proc. R. Soc. Qld* 104: 89-93.
- Mitchell, C., Mathews, S., Theodoropoulos, C. & Timms, P. (2009) In vitro characterisation of koala *Chlamydia pneumoniae* : morphology, inclusion development and growth. *Veterinary Microbiology* 136 : 91 – 99.
- Mitchell, D. (2008) Richmond Valley Koala Habitat Atlas, Australian Koala Foundation.
- Moore BD, Foley WJ (2000) Feeding and diet selection in koalas. *Australian Journal of Zoology* 48:317-333
- Moore BD, Foley WJ, Wallis IR, Cowling, A, Handasyde KA (2005) A simple understanding of complex chemistry explains feeding preferences of the koala. *Proceedings of the Royal Society: Biology Letters* 1:64-67
- Mossaz, A. Estimating low-density koala populations in Southeast Queensland: Comparing the spot assessment technique and distance sampling. Honours Thesis. Griffith School of Environment, Griffith University,(2010).
- Myers, G., Mathews, S., Eppinger, M., Mitchell, C., O'Brien, K., White, O., Benahmed, F., Brunham, R., Read, T., Ravel, J., Bavoil, P. & Timms, P. (2009) Evidence that human *Chlamydia pneumoniae* was zoonotically acquired. *Journal of Bacteriology* 191 : 7225 – 7233 (doi:10.1128/JB.00746-09v1) IF : 4.1
- Palmer H, Canfield R, Krockenberger M, Malik R and Hemsley S. (2009). Computerised Tomographic investigation of the koala nasal cavity and cranium. In preparation for submission to *Research in Veterinary Science*.
- Palmer H, Hemsley S, Canfield R, Krockenberger M and Malik R (2008). Computerised Tomographic investigation of the koala nasal cavity and cranium. *Wildlife Disease Association (Australasian Section) Annual Meeting, Kioloa, NSW*
- Phillips, S., Callaghan, J. (1996) Port Stephens Local Government Area Koala Habitat Atlas, Australian Koala Foundation
- Phillips, S., Callaghan, J. (1996) Tweed Coast Koala Habitat Atlas, Australian Koala Foundation.
- Phillips, S., Callaghan, J. (1998) Campbelltown Koala Habitat Atlas, Australian Koala Foundation.

- Phillips, S., Callaghan, J. (1998) Campbelltown Koala Habitat Atlas, Australian Koala Foundation.
- Rhodes, JR, Callaghan, J, McAlpine, C.A., de Jong, C, Bowen, ME, Mitchell, D, Lunney, D and Possingham, H (2008) Regional variation in habitat-occupancy thresholds: a warning for conservation planning. *Journal of Applied Ecology*, 45: 549-557.
- Rhodes, J. R., McAlpine, C.A., Lunney, D., and Callaghan, J. (2005), Evaluating natural resource management strategies under parameter uncertainty: an outranking approach applied to koala conservation, in Zerger, A. and R. M. Argent (editors), *MODSIM 2005 International Congress on Modelling and Simulation*, Modelling and Simulation Society of Australia and New Zealand, <http://www.mssanz.org.au/modsim05/papers/rhodes.pdf>, 2540-2546.
- Rhodes, JR, McAlpine, C.A., Lunney, D and Possingham, HP (2005) A spatially explicit habitat selection model incorporating home range behavior. *Ecology*, 86: 1199-1205. IF=4.87.
- Rhodes, JR, McAlpine, C.A., Peterson, A, Callaghan, JG, Lunney, D, Possingham, HP, Mitchell, DL and Curran, T (2008). Linking landscape ecology to planning for koala conservation. *Australian Planner*, 45(2): 24-25.
- Rhodes, JR, McAlpine, C.A., Zuur, AF, Smith, GM and Ieno, EN (2009) GLMM applied on the spatial distribution of koalas in a fragmented landscape. Chapter 22 in: A.F. Zuur, E.N. Ieno, N.Walker, A.A. Saveliev and G. M. Smith, (eds), *Mixed Effects Models and Extensions in Ecology with R*. Springer, New York.
- Rhodes, JR, Tyre, AJ, Jonzen, N., McAlpine, C.A. and Possingham, HP (2006) Optimising presence/absence surveys for detecting population trends. *Journal of Wildlife Management*, 70: 8-18. IF=1.32.
- Rhodes, JR, Wiegand, T, McAlpine, C.A., Callaghan, J, Lunney, D, Bowen, M and Possingham, HP (2006) Modeling species distributions for improving conservation in semi-urban landscapes: A koala case study. *Conservation Biology*, 20: 449-459. IF = 4.71, ERA Rank A*.
- Saul N, Krockenberger M, Carter D (2008). Evidence of recombination in mixed mating type and a-only populations of *Cryptococcus gattii* sourced from single *Eucalyptus* tree hollows. *Eukaryotic Cell* 7(4):727-734
- Saul, N. (2009). Ecology, Molecular Epidemiology and Population Genetics of *Cryptococcus gattii* in Australia. PhD Thesis, University of Sydney.
- Saul, N., D. Carter and M.B. Krockenberger (2006). Koala cracks *Cryptococcus* case wide open. 8th International Mycological Congress (IMC8) Cairns, Australia. 21st -25th August, 2006
- Saul, N., M. Krockenberger, R. Malik and D. Carter (2005). Mating and gene flow within and between environmental populations of *Cryptococcus gattii* in Australia. 6th International Conference on *Cryptococcus* and *Cryptococcosis*, Boston, MA, U.S.A. June 24th-28th, 2005.

- Saul, N.T., D. Ellis, B. Currie, R. Malik, D. Carter and M.B. Krockenberger (2008). Environmental isolation and molecular diversity of environmental and clinical isolates of *Cryptococcus gattii* VGII in Arnhem Land, an area of high endemic disease in Australia. 7th International Conference on Cryptococcus and Cryptococcosis, Nagasaki, Japan September 11-14, 2008.
- Schwartz, L, Griffith, J., Flanagan, C. (2008) 'The last supper: molar microwear features of *Phascolarctus cinereus* and the effects of age, sex and season' *Journal of Vertebrate Paleontology*, 28: Supplement to Number 3, p.139A
- Seabrook, L. McAlpine, C., Phinn, S., Callaghan, J., and Mitchell, D. (2003) Landscape legacies: Koala habitat change in Noosa Shire, South-East Queensland. *Australian Zoologist* 32: 446-461.
- Spencer, A.J. & Canfield, P.J. (1993) Haematological characterisation of heavy tick infestation in koalas (*Phascolarctos cinereus*). *Comp. Haematol. Int.* 3: 225-229.
- Spencer, A.J. & Canfield, P.J. (1993) Renal failure in a koala. *Aust. Vet. J.*, 70: 309-310.
- Spencer, A.J. & Canfield, P.J. (1994) Age-related changes in the haematology of young koalas (*Phascolarctos cinereus*) up to one year old. *Comp. Haematol. Int.*, 4:146-151.
- Spencer, A.J. & Canfield, P.J. (1994) Enhanced Heinz body formation, cell lysis and anaemia in a koala (*Phascolarctos cinereus*). *Comp. Haematol. Int.*, 4:114-117.
- Spencer, A.J. & Canfield, P.J. (1995) Bone marrow examination in the koala (*Phascolarctos cinereus*). *Comp. Haematol. Int.* 5: 31-37.
- Spencer, A.M. & Canfield, P.J. (1996) Lymphoid neoplasia in the koala - a review and classification of 31 cases. *J. Zoo Wildlife Med.* 27: 303-314
- Sullivan, B.J., Baxter, G.S. & Lisle, A.T. (2002). *Low-density koala (Phascolarctos cinereus) populations in the mulgalands of south-west Queensland. I. Faecal pellet sampling protocol. Wildlife Research* 29, 455-462
- Sullivan, B.J., Baxter, G.S. & Lisle, A.T. (2003), Low-density koala (*Phascolarctos cinereus*) populations in the mulgalands of south-west Queensland. III. Broad-scale patterns of habitat use. *Wildlife Research* 30, 583-591.
- Sullivan, B.J., Baxter, G.S., Lisle, A.T., Pahl, L., & Norris, W.M. (2004), Low-density koala (*Phascolarctos cinereus*) populations in the mulgalands of south-west Queensland. IV. Abundance and conservation status. *Wildlife Research* 31, 19-29.
- Sullivan, B.J., Norris, W.M. & Baxter, G.S. (2003), Low-density koala (*Phascolarctos cinereus*) populations in the mulgalands of south-west Queensland. II. Distribution & diet. *Wildlife Research* 30, 331-338.
- Timms, P. and Wood, M. (1990) Koala Chlamydia detection made easy. *Today's Life Science Dec* : 38-40.
- Timms, P., Eaves, F., Girjes, A and Lavin, M. (1988) Comparison of Chlamydia psittaci

isolates by restriction endonuclease and DNA probe analysis. *Infection and Immunity* 56 : 287 – 290.

Timms, P., Kato, J., Maugeri, M. and White, N. (1994) DNA fingerprint analysis of a free-range koala population. *Biochemical Genetics* 31 : 361-372.

Wardrop, S., Fowler, A., O'Callaghan, P., Giffard, P and Timms, P. (1999)
Characterization of the koala biovar of *Chlamydia pneumoniae* at four gene loci - *ompAVD4*, *ompB*, 16S rRNA, *groESL* spacer region. *Systematic & Applied Microbiology* 22: 22-27.

White, N.A. and Timms, P. (1994) *Chlamydia psittaci* in a koala (*Phascolarctos cinereus*) population in south east Queensland. *Wildlife Research* 21:41-47.

Wood, M. and Timms, P. (1992) Evaluation of methods for the diagnosis of chlamydial infection in koalas. *J. Clin. Micro.* 30 : 3200-3205

APPENDIX 3



15th June 2010

The Honourable Peter Garrett MP
Minister for Environment Protection, Heritage and the Arts
PO Box 6022
House of Representatives
Parliament House
Canberra ACT 2600

Dear Mr. Garrett

Re: Listing of Koala as Vulnerable under the EPBC Act

On behalf of the Australian Koala Foundation (AKF) I write to advise that the koala should be listed as Vulnerable under the EPBC Act.

Over our twenty four year history, the AKF has funded university research, in-house research, but more importantly has instigated state of the art innovative habitat mapping and the writing of Koala Plans of Management for many communities around Australia. Our efforts have cost in excess of \$8m.

This has led us to have unprecedented data over the whole of the Australian koala landscape with 80,000 individually measured trees in nearly 2000 field sites. This is not something you can peer-review.

What this field data gives is innate confidence and when our Chairman, Mr. Robert Gibson insisted, in 2006 (after the previous koala listing rejection), that my team produce the attached Koala Habitat Atlas and estimated koala numbers, we created it based on our own fieldwork and from the scientific literature in Australia. It is galling to AKF that by and large your Department has refused to acknowledge this work. In recent days we have asked the Chancellor of University of Queensland to make it known to you that this is not the case and of course researchers from all over the country have advised us, and hopefully you, of our massive contribution to the literature. Their papers are identified in our methodology document.

As we send you our methodology for our Koala Numbers – I am mindful of the past and I hope that in your deliberations about the koala you take into account the precautionary approach and why the koala is so important to Australia.

When AKF looks at the TSSC nomination – you have not been able to establish a compelling argument for the numbers in 2006 – at 390,000. You have failed to produce significant science to support that argument and worse still have not been able to articulate numbers today. Without that, how can you predict decline?

AKF is going to try and put this simply:

In 2006 your document estimates approximately 400,000 koalas and you have no estimate for now in 2010. Why not?

If AKF is right and there are no more than 100,000 koalas, then the decline is 75% which more than meets the decline needed for a vulnerable listing – it would even meet Endangered.

If AKF doubles its figures to 200,000, then the decline is 50% - which again more than meets the Vulnerable listing for a 30% decline.

If AKF trebled the figures to 300,000 – then the decline is 25% which almost sneaks in for the 30% decline. There are not 300,000 koalas in Australia.

We absolutely dispute the Central Queensland Koala Numbers in the Brigalow Belt – of between 70,000 and 215,000. You have no evidence to support that.

We absolutely dispute the koala numbers in Victoria of 73,000, but even if we do accept them, it would still allow a national Vulnerable listing to apply.

We absolutely dispute the koala numbers in the Victorian Strathbogies.

We absolutely dispute koala numbers in the Otways – and the Victorian Government has produced no more than 4 field sites to support their assertions.

So, it comes to who is right? And are you, as Minister prepared to take a precautionary approach which is mandated in the legislation? We urge you to do so. We urge you not to believe the State Governments who say they are capable of protecting the environment. If the States had done a good job up until now, the koala hospitals would not be full of patients or dead bodies and the recent review of the National Koala Strategy 1998, would not have said it didn't work. The new Strategy will be more of the same. Ironically I watched as the document was watered down by State and Federal bureaucrats.

So, here is our document and we are confident there are no more than 100,000 koalas in Australia and if you, or your Committee, or the States provide adequate information for us to change our view then we would do so. You will see in our methodology document, the work that underpins our thoughts on koala numbers has the cream of Australian koala scientists behind it and represent over 100 peer reviewed papers.

AKF scientists will be happy to provide advice to the TSSC should you need it. Dr. Kerlin, recently graduated from Glasgow University, and Mr. John Callaghan before him have created the modeling and both of them and AKF's Mr. David Mitchell will be happy to visit Canberra should you require this.

The Australian Koala Foundation also knows that we have the voice of the people behind us and they believe the koala should be protected as Vulnerable. They have watched their koala populations decline before their eyes in recent years with development and infrastructure projects running rampant over environmental legislation.

Yours,

A handwritten signature in black ink that reads "Deborah Tabart". The signature is written in a cursive style with a large initial 'D'.

Deborah Tabart OAM
Chief Executive Officer

cc. Associate Professor Robert Beeton

APPENDIX 5.

Department of the Interior Fish and Wildlife Services 2000. *Endangered and Threatened Wildlife and Plants; Final Determination of Threatened Status for the Koala*. 50 CFR Part 17 RIN 1018 - AE43, Federal Register, Vol. 65. No. 90.

Available: <https://www.savethekoala.com/pdfworddocs/vulnerable/nom-Appendix%204.pdf>

APPENDIX 6.

Melzer, A. to Tabart, D. and Mitchell, D. 2010 Re: AKF Submission. [email]
17/12/2010

From: Alistair Melzer [mailto:a.melzer@cqu.edu.au]
Sent: Friday, 17 December 2010 1:30 PM
To: 'Dave Mitchell'; 'Deborah Tabart'
Cc: Alistair Melzer
Subject: RE: AKF submission

Dear Dave and Deborah,

Thank you for the opportunity to read the methodology behind the koala population methodology. I am firmly of the view that the general approach taken here is the only way to assess potential koala habitat on a continental basis. I particularly commend you on an approach that allows the influence of the aberrant populations from that very small part of the koalas range (Victoria and South Australia) to be partitioned. There will always be arguments about technical approaches and these arguments will change as the knowledge bank changes. The main issues with your approach are the uncertainties around the data and the resolution of the mapping and modeling. I am not a mathematician or a modeler so I pass no comment on that aspect of the approach. I have read the report with a mind to what criticism could be leveled at the approach and the output. If you think that these are valid then you could preempt such questions by placing some caveats within the document – perhaps in a section that addresses limitations, uncertainties and research/monitoring required to refine the tool. In that light I feel that the current discussion is too limited and should be expanded.

Page 4 Koala Habitat Mapping Par 4. Your approach currently does not resolve riparian communities through the Mitchell Grass Downs (as you have noted) but seems to also exclude those Acacia communities that have a eucalypt component as well (Brigalow, Boree, Rosewood, Lancewood). In that light the approach will underestimate the extent of koala habitat – albeit low density populations.

Page 7 Par 1. The qualification with regard to the use of scats and the lack of association with density is a good one. You comment that the approach does provide data on the distribution of koala activity. There are two minor comments here. Firstly the rise in the use of GPS collars is showing that koalas can range much more widely than previously believed – in Qld at least – and so the approach will most likely be an underestimate at a local scale. Secondly the use of scats as indicators provides a temporal limitation to the data – this being set by (a) the rate of decay of pellets on the ground and (b) the deposition rate by the population.

Page 8 Estimating koala abundance (1) While it is necessary to use the home range data at hand (mostly based on location of the koala during the day) it is important to note that the application of GPS collars is resulting in completely new perspectives in habitat use and ranging behavior. These data are largely unpublished to date but it will all change very soon. So some qualification with regard to this is warranted. (2) Home range estimates vary greatly depending on the analytical tool used and are not easily comparable. You should make some statement about the estimator applied across the home range data e.g. all were minimum convex polygon 95%.

Page 12 The proportion of koalas in preferred habitat par 2. Using koala observation from multiple sources bring with it bias derived from the nature of the records. For example, some Qld Museum wildlife data, when mapped, provided a coarse map of the major roads in Queensland. Koala observations are usually biased towards major settlements, EIS activity, localities with raised public awareness and nodes of research activity. Areas with poor access, low population density and low resource interests are under surveyed in this approach.

Finally, I have two reservations regarding the extrapolation of koala population densities across map units. Firstly the data sources come from different time periods and do not take account of site population changes since the work was published. Secondly there is almost certainly a lot of unrecognized variability in population size across landscapes within map units – perhaps reflecting underlying geology, fire history, successional stage of plant communities, local land use issues, weather events and disease issues and more. This is not a criticism of the AKF approach but rather an unavoidable limitation of what is probably the only effective approach. The challenge is, understanding this limitation, to undertake the necessary information gathering to negate or work around these limitations.

So, in summary, the approach the AKF has taken to put a number to national and regional koala abundance is probably the only feasible approach currently available. It is certainly an acceptable approach to map current and potential koala habitat. However, there are limitations and uncertainties as I have noted above. Where you agree with these, I suggest that they are acknowledged in this technical report on methodology to underpin your mapping and estimates. Finally, these raise opportunities for further actions (research, monitoring) to refine the approach.

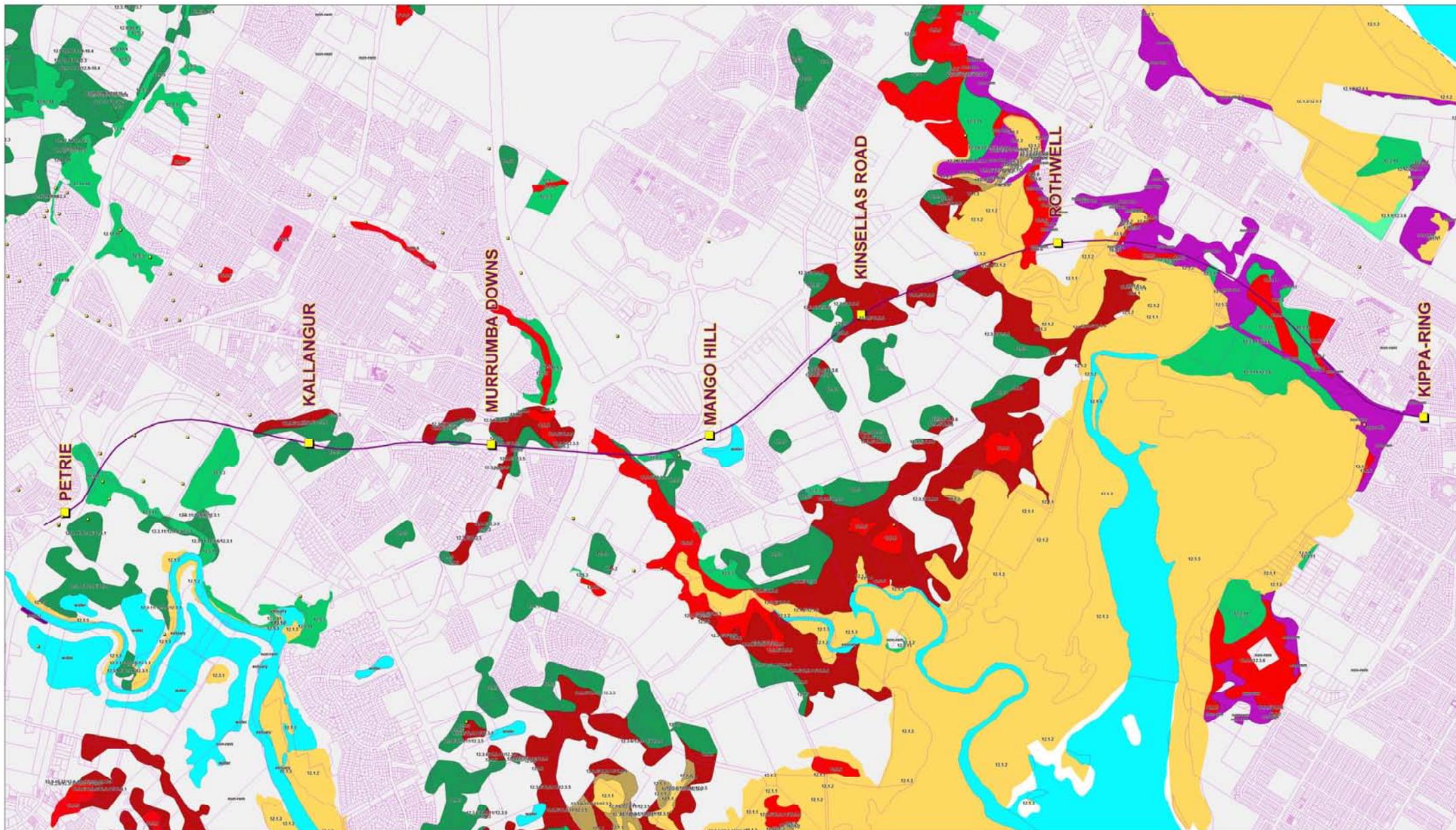
I hope this is useful.

Sincerely

Alistair Melzer

APPENDIX 7.

Australian Koala Foundation (AKF) 2010, *Koala Habitat Atlas, Moreton Bay Rail Link*, Queensland, Australian Koala Foundation.



www.savethekoala.com



KOALA HABITAT ATLAS

Moreton Bay Rail Link

Edition 1 - November 2010



Habitat categories

- Primary Habitat
- Secondary Habitat (Class A)
- Secondary Habitat (Class B)
- Secondary Habitat (Class C)
- Other vegetation
- Mainly cleared
- Water
- Unknown Habitat Quality

High-Value Regrowth

- Railway Stations
- Railway Line
- Wildnet Koala records
- Cadastral boundaries

REMNANT ECOSYSTEMS WITH KOALA TREE SPECIES

RE	VMA Status	Species
12.3.11	O-dom	<i>E. tereticornis</i> , <i>E. sideroxipha</i> , <i>Corymbia intermedia</i>
12.3.5	No/OC	<i>Melaleuca quinquenervia</i> +/- <i>E. robusta</i> , <i>E. tereticornis</i> , <i>E. bancroftii</i>
12.3.8	No/OC	<i>E. quinquevrvia</i> , <i>E. tereticornis</i> , <i>Lophostemon suaveolens</i>
12.5.2	E-dom	<i>E. tereticornis</i> , <i>C. intermedia</i>
12.5.3	E-dom	<i>E. lindleyae</i> and/or <i>E. racemosa</i>

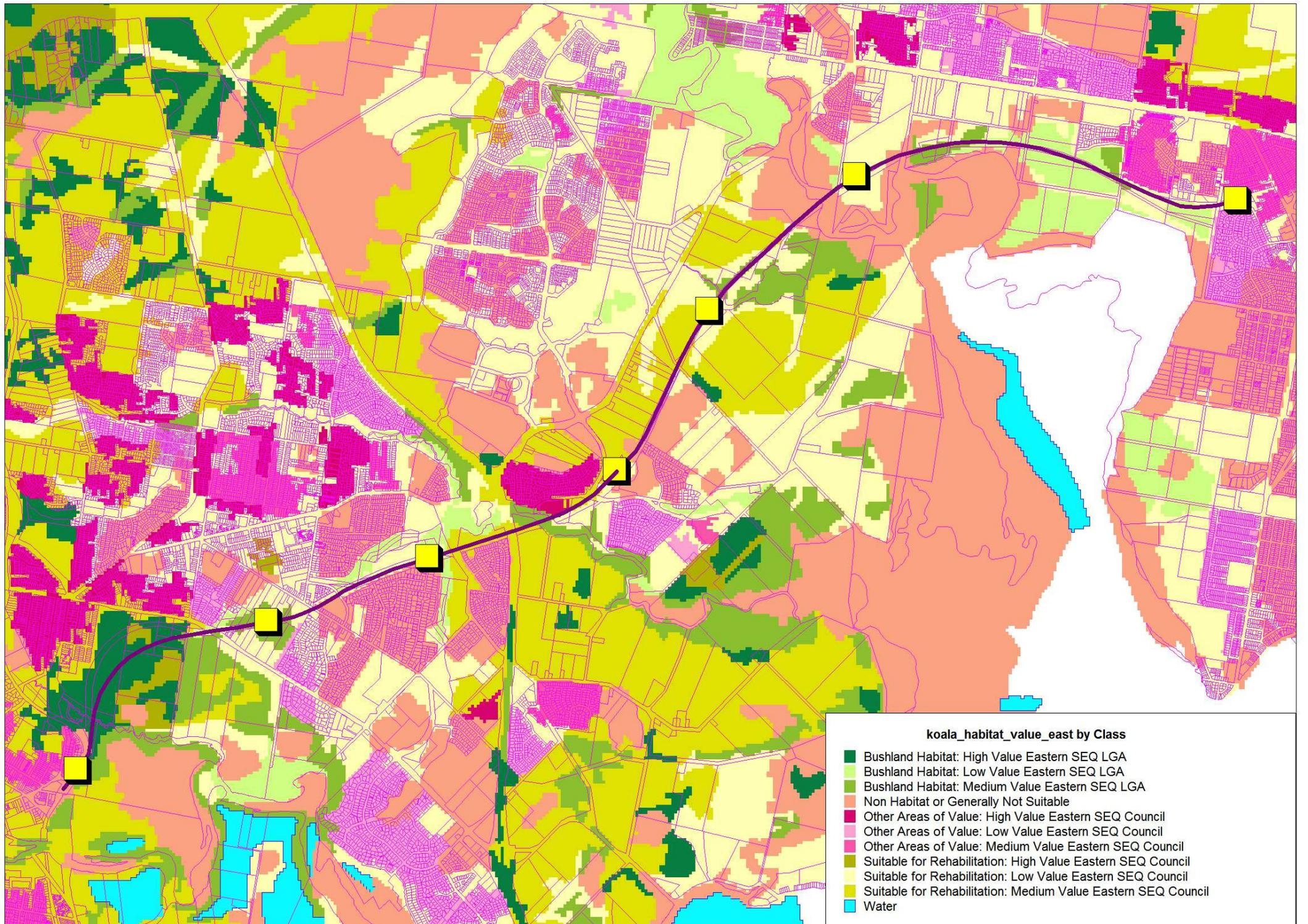
REGROWTH ECOSYSTEMS WITH KOALA TREE SPECIES (species as above)

RE	VMA Status
12.3.11/12.3.8/12.3.1	E-subdom
12.3.5/12.3.8	No/OC
12.3.8/12.3.8	No/OC
12.5.3	E-dom

Koala Habitat Atlas Map Copyright AKF 2010
Habitat mapping derived from QLD Herbarium Regional Ecosystem Mapping Version 6.0 and High-quality Regrowth intersected with Pre-clearing REs
Vegetation data & Wildnet records Copyright DETRMQLD Govt

APPENDIX 8.

Department of Environment and Resource Management 2010, Proposed Moreton Bay Rail Link Route, Queensland, Australian Koala Foundation.



koala_habitat_value_east by Class

- Bushland Habitat: High Value Eastern SEQ LGA
- Bushland Habitat: Low Value Eastern SEQ LGA
- Bushland Habitat: Medium Value Eastern SEQ LGA
- Non Habitat or Generally Not Suitable
- Other Areas of Value: High Value Eastern SEQ Council
- Other Areas of Value: Low Value Eastern SEQ Council
- Other Areas of Value: Medium Value Eastern SEQ Council
- Suitable for Rehabilitation: High Value Eastern SEQ Council
- Suitable for Rehabilitation: Low Value Eastern SEQ Council
- Suitable for Rehabilitation: Medium Value Eastern SEQ Council
- Water

APPENDIX 9.

Australian Koala Foundation, 2004, *Australian Vegetation Project – “Truthing The Land”*. [Report]. February 2011.

AUSTRALIAN VEGETATION PROJECT – “*TRUTHING THE LAND*”

BACKGROUND

Over the last twelve months, a multidisciplinary group of individuals has met for discussions in Canberra, Brisbane and Sydney to explore the concept of a national vegetation project that would see the creation of a data base comprising high resolution, ground-truthed vegetation data for the continent of Australia.

The participants were:

Dan Paull – Chief Executive Officer, Public Sector Mapping Authority (PSMA) Australia Ltd (the cross-jurisdictional body responsible for national data sets)

Prof. Peter Woodgate – Chief Executive Officer, Cooperative Research Centre for Spatial Information (CRC-SI), University of Melbourne

Deborah Tabart – Executive Director, Australian Koala Foundation (AKF), Brisbane

David Hocking – Chief Executive Officer, Australian Spatial Information Business Association (ASIBA), Canberra

Wal Mayr – Products Director (Australia & SE Asia), MapInfo Australia (GIS software and data value-adder/reseller), Brisbane

Jack de Lange – The Australian Spatial Information Business Association (ASIBA), Brisbane

Robert Starling – Chairman, Asia Pacific Development Network Pty. Ltd., and member of Open GIS Consortium (the international body for spatial data standards), Sydney

Dave Mitchell – GIS Officer, Australian Koala Foundation (AKF), Brisbane

For the purposes of this document, the group is referred to as “The Mapping Group” (TMG).

TMG aims to secure a Federal government commitment to Australia-wide vegetation mapping at a scale that is useful to a wide range of stakeholders.

Those attending the meetings represent stakeholder groups in business and the community. The driver for the project - the Australian Koala Foundation - has mapped significant areas of Australian vegetation for koala protection and management over the past eight years. This mapping has been carried out at great expense to the AKF.

TMG appreciates that the National Land and Water Resources Audit (NLWRA), funded through the Natural Heritage Trust (NHT), has done an excellent job in collating the current data available into the National Vegetation Information System (NVIS). At the same time, however, the NLWRA process draws attention to the many deficiencies inherent in the base data used for the NVIS. These deficiencies include gaps in mapping coverage, different mapping scales, standards and formats, and some data in excess of 30 years old. This also has been the experience of TMG and its members’ colleagues in their use of vegetation mapping on a day-to-day basis. TMG is confident that this is a common experience for strategic planning, environmental, sustainability and many other practitioners needing to use vegetation data throughout Australia.

It is generally acknowledged throughout the user community that the scale of vegetation mapping in Australia is too broad, yet this data purports to support policy on some of the more significant sustainability and environment decisions taken by governments. The consequences of the lack of data can sometimes be dire, e.g. the economic, environmental and political fallout from Regional Forestry Agreements (RFAs) relying on inadequate data for resource determination and allocation. At the moment it is ‘like trying to find your way around Sydney using a map of Australia’.

TMG intends beginning extensive lobbying to convince governments of the importance of an adequate investment in vegetation mapping for Australia. All of its members feel that with the many and varied issues facing Australia today (e.g. fire, biota, homeland security, compensation for protection packages, global warming), governments at both State and Federal levels need to examine the potential of this vision. As Peter Woodgate commented “we need data an order of magnitude better”. TMG concurred that now is the time to address mapping shortcomings.

NVIS - CURRENT DATA SHORTCOMINGS

TMG has analysed the achievements of the NLWRA with the NVIS program to date. The overall impression was that a tremendous amount of work has been done to collect and collate vegetation data from about one hundred Government sources, to standardise the data derived from different jurisdictions, and - most importantly - to make this data freely available through Environment Australia's web portal (under the Commonwealth Spatial Data Access and Pricing Policy), so that end users may derive their own products. NVIS has an hierarchical classification system based on six levels, with Levels I-III suitable for national scales, and Levels IV-VI with more detailed information for use at regional scales. The hierarchy facilitates the incorporation of additional or finer-scale data as it is created.

The stated aim of the NLWRA is "...its (the NVIS framework) application and adoption means that Australia has a robust and flexible system for collecting, compiling, analysing and reporting on vegetation information from regional to national levels."

What is missing from this fine achievement is data that can be used at sub-regional, catchment, Local Government, forestry, farm or even site scales. NVIS data at scales of 1:250,000 or 1:100,000 with a 20 hectare-minimum threshold is not suitable for any meaningful analysis at end-user scales. For instance, riparian and wetland vegetation was excluded from NVIS data because of these scale issues, yet these areas are crucial to any meaningful management of salinity or water quality. TMG suggests that scales of 1:25,000 (coastal and near-urban areas), and 1:50,000 for the remainder of the Intensive Agricultural Zone will be much more useful to a wide range of stakeholders.

TMG's push for finer-scale data has in part come from the Australian Koala Foundation (AKF), and is borne of many years frustration at the lack of suitable vegetation data as the basis for the AKF's Koala Habitat Atlas project which aims to identify and rank koala habitat over the koala's current range (covering 1.25 million square km and 320 Local Government Areas). The AKF has spent large amounts of time and money mapping approximately 9,000 sq. km of vegetation (in six LGAs) for use in the Atlas. [An additional 33,354 sq. km of suitable mapping was obtained from other sources.]

Local Authorities associated with AKF vegetation mapping projects have seized the opportunity to incorporate the mapping into their strategic and environmental planning, and for use in day-to-day assessment of Development Applications etc. Vegetation data at this resolution provides

transparency and certainty in Local Government, thereby removing a great source of potential conflict within local communities. There are also economic benefits arising from this transparency - apart from reduced development costs, detailed vegetation mapping has the potential to actually increase the amount of land available for development. A broader-scale NVIS-standard mapping unit, for example, might be split into two or three different finer-scale units.

Other members of TMG have suggested additional uses for this data: fire management planning, private forestry, ecological services, land swaps, farm-scale planning, global warming monitoring and even homeland security. Again, the scale of current NVIS data precludes its use in these areas.

TMG also strongly takes the view that this finer-scale mapping is the only way to effectively monitor outcomes of NHT-funded projects such as Landcare, and to assess the environmental benefits of future NHT-funded projects (e.g. corridor planning and revegetation).

Currently-available NVIS data has a limited range of users; primarily State and Federal authorities and academia. TMG envisages a huge increase in the useage of finer-scale data. Such users would include an increased range of State authorities, Local authorities, Landcare groups, farmers, developers, forestry companies, catchment management groups and other community-based groups such as the Australian Koala Foundation.

Finally, ASIBA sees great economic opportunity in deriving value-added products suited to a wide range of end-users who may not have the time or knowledge required to get the information they require from the data.

“SELLING” THE AUSTRALIAN VEGETATION PROJECT (AVP)

With the NHT moving into a new phase, TMG understands that the Federal Government is seeking a more strategic position on the allocation of funding for the regeneration and repair of the Australian landscape. This task will be impaired if the lack of suitable vegetation mapping is not addressed. It is therefore our intention – throughout 2004 - to educate politicians and their advisors on the urgent need for better data to implement and assess these strategies. The TMG’s working title for its proposed mapping initiative is the “Australian Vegetation Project – *Truthing the Land*” .

TMG has spent a considerable amount of time discussing possible strategies needed to promote the AVP as part of a planned concept presentation to necessary individuals in Canberra.

TMG feels that the Federal Government should see the provision of a detailed national vegetation data base as the “horse in the front of the environment cart”. To date, more than \$1.5bn has been spent via the National Heritage Trust to return the environment to a more sustainable course. Critics say the plan is ill-conceived and disbursement of NHT funds has no strategic thinking, for example Professor Henry Nix says “to date we have replaced a floorboard in a house suffering with white ants”. TMG feels that we could argue a strong case that this lack of strategic thinking and planning could be addressed with mapping at a finer scale, and that many conflicts happen when they could be avoided with better data.

The Koala could act as a flagship to encourage our political leaders to understand the importance of mapping, encompassing the reasons previously stated. Additionally, the Koala taps into the heart-strings of all Australians - it is a potential vote winner, and a symbol of everything our country holds dear.

TMG understands that the public would need a simple message to understand and support this complex issue, most people would comprehend that it is difficult to save or protect anything if you do not know what already exists in the landscape. The use of the Koala as a flagship makes sense, especially given that the Koala’s current range overlaps with the Intensive-use Agricultural Zone where more detailed mapping is most urgently needed.

The Koala Habitat Atlas would provide an excellent educational tool for those who may not appreciate the value of good-quality maps. These maps are remarkably simple to understand and have already made significant inroads in Local Government planning throughout eastern Australia. Although the National Vegetation Project is certainly more involved than just mapping koala habitat, the Koala Habitat Atlas is a “value-added product” that can be used to show that the Australian Vegetation Project (AVP) is worthwhile and “money well spent”.

Put simply, the Koala Habitat Atlas can be used to gain awareness of an end product that has real-world outcomes.

The AKF is willing to participate in any public awareness campaign, focusing on the Koala will also bring into focus the issues of vegetation mapping that are so fundamental to a range of government priorities in the environment.

TMG has not at this time sought support from other agencies except informally with key industry professionals (including NVIS advisers). To date, all have enthusiastically supported the concept and none could argue against our proposition that Australia needs better vegetation mapping. TMG recognises that there may be some initial opposition to the concept, for instance within Environment Australia. However, TMG feels that such “turf wars” are unnecessary and easily avoided by fostering a collaborative spirit “for the good of Australia”.

AUSTRALIAN VEGETATION PROJECT STRATEGY

Phase I

Phase II

APPENDIX 10.

Tabart, D. to Lemma, M. 2005. *Re: Pacific Highway Upgrade – Coffs Harbor*. [letter]
18/10/2005.



18th October 2005

The Hon. Morris Iemma MP
Premier
Level 40
Governor Macquarie Tower
1 Farrer Place
SYDNEY NSW 2000

Dear Premier,

RE : PACIFIC HIGHWAY UPGRADE – COFFS HARBOUR.

On behalf of the Australian Koala Foundation (AKF) I respectfully request that you and your Ministers examine our proposal (maps attached) which will vastly improve conservation outcomes arising from the planned realignment and upgrading of the Pacific Highway through Bongil Bongil National Park, (formerly Pine Creek State Forest (PCSF) which is part of the Bonville Upgrade.

Events have occurred during the last few months which, we believe, warrant a serious reappraisal of the Approved Route. The original route was first approved while New South Wales State Forests managed the then Pine Creek State Forest. During the transfer process to the Department of Environment and Conservation (DEC) State Forests logged two Hardwood Plantations (Flooded Gum) parallel to almost the whole Approved Route. Many in the community believed that this was the beginning of the clearing for the upgrade, but in fact it is just routine clearing which has now prompted us to write to you.

2...

The Australian Koala Foundation and others believe that the Approved Route could now quite feasibly be moved a short distance into the already logged areas to provide the anticipated positive conservation outcome. More importantly it would help to preserve some of the best old growth forest in Bongil Bongil National Park. Our Koala Habitat Atlas has identified the area for the proposed upgrade as some of the finest Koala Habitat in the whole Park and we are completely perplexed how the original route could have even been approved, given the nature of the habitat involved. Tenderers will now be under immense pressure from local environment groups when they have to start destroying this beautiful bush.

Our suggested route would result in an increase in road length of only 40 metres. It will save twenty-four hectares of native forest in Bongil Bongil National Park, including 22.6 hectares of core koala habitat which includes eight hectares of old growth forest, it would result in less disruption to highway traffic during construction, it would be safer, and a well-designed road sympathetic to the landscape it traverses. These factors will ensure greater acceptance and approval from the local community. It is undisputed that this area of Bongil Bongil is crucial to the long-term survival of koalas on the east coast of Australia.

I urge you to re-consider. The attached maps are completely self explanatory. When I met with National Parks and Wildlife Service recently, they could see that our suggestion had good conservation outcomes but flagged that because the now logged area has already been deemed National Park, that your Government would be loathe to change the boundaries. I am confident that common sense will prevail and that you can see the merit in our approach. Legislation similar to the *National Parks and Wildlife (Further Adjustment of Areas) Act 2005 No 60* (Section 5 Subsection 2) could be used and should be no problem.

Please feel free to contact me – I would be happy to visit Sydney to discuss this with your officers.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'D. Tabart', enclosed within a hand-drawn circle.

Deborah Tabart
Executive Director

APPENDIX 11.

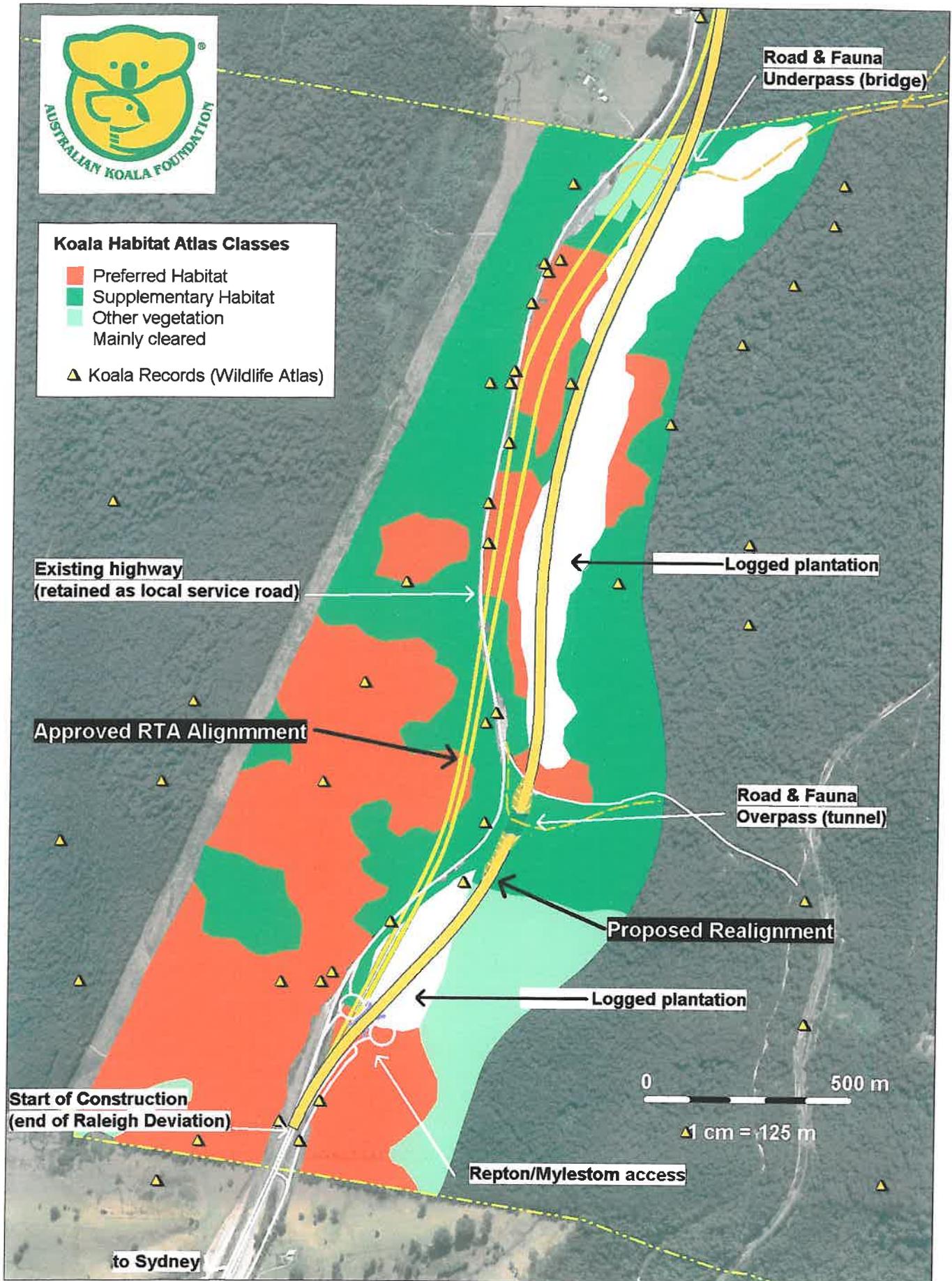
Australian Koala Foundation (AKF) 2005, *Pacific Highway – Bonville Upgrade Bongil Bongil National Park Section Koala Habitat Atlas*. Australian Koala Foundation.



Koala Habitat Atlas Classes

- Preferred Habitat
- Supplementary Habitat
- Other vegetation
Mainly cleared

▲ Koala Records (Wildlife Atlas)



**PACIFIC HIGHWAY - BONVILLE UPGRADE
BONGIL BONGIL NATIONAL PARK SECTION
KOALA HABITAT ATLAS**

KHA based on mapping from various sources including AKF fieldwork. Date of map 19-10-2005
Koala Habitat Categories as per Draft Koala Recovery Plan (NPWS 2003). © 2005 AKF

APPENDIX 12.

Australian Koala Foundation (AKF), 2009. *Carbon and Koalas Collide: The science of trees, mapping and the carbon economy*, [report]. February 20100.



Carbon and Koalas Collide: The science of trees, mapping and the carbon economy

This document articulates two things:

1. **Protecting the koala forests of Australia is an imperative step towards reducing greenhouse emissions in Australia and,**
2. **Our science shows it will be impossible to replace the carbon in those forests if they are destroyed.**

THE AUSTRALIAN KOALA FOUNDATION'S VIEW FOR THE FUTURE OF THE PLANET

As the AKF prepares to visit Copenhagen for the United Nations Climate Change Conference, we are coming to grips with the fact that the protection of existing forests in a country like Australia has limited relevance to the existing discussions. After watching the October negotiating sessions in Bangkok with interest, we feel that our worst fears are going to be realised – there is the potential for financial support for increased industrial logging of natural forests, and the conversion of these forests to plantations. Rather than finding real solutions, it appears that the “old system” is simply trying to work the “new system” to its advantage. Developing countries fear native forest protection, but ironically it could be their and the world's salvation.

The AKF is arguing for a new way of thinking. Like HRH the Prince of Wales' Rainforest Project, the AKF believes the global community must recognise the true value of our natural forests on all continents, not just the Third World. If we do not, we know the future of life on earth will change forever. We cannot continue to delude ourselves that planting new saplings will counteract the removal of existing forests. The figures below will stand for themselves.

The core of AKF's philosophy and message is that the argument for preservation of carbon sinks such as Australian bushland has become increasingly relevant. We need to rethink our attitudes to our forests, and make a new assessment as to how we value these areas.



Let's start with the basics.

1. Money in the Bank.

Existing forests are our 'carbon vault' – money in the bank so to speak. What is the point of attempting to reduce our carbon emissions if the carbon already locked up, the carbon 'in the bank,' is not protected?

Protecting existing forests, and repairing and restoring degraded habitats will secure and renew the carbon we already have in the bank. As these forests continue to grow and thrive, we can be assured of a good rate of return; these forests will sequester and store significant stocks of carbon, and augment other climate change prevention measures. The koala rejects outright the premise that anyone has the right to cut down a tree.



2. Mapping with integrity leads to good solutions.

Mapping biodiversity is easy, and knowing each and every tree on the Australian landscape is not actually impossible. In fact the AKF's current data comes close to doing just that. Why is it that the business world can map telephone poles, bus shelters, all manner of human infrastructure, but fail to acknowledge and map the life force of this planet - the environment? It is staggering that our Governments worldwide have little regard for mapping of our biodiversity. Even if mapping has been done, it is often at too high a resolution to be useful for the hard decisions needed in planning and sadly is often mapped to watch for declines rather than promote regeneration.

So, how can we protect our forests and the carbon within if we do not know what we have? Only by mapping our vegetation, our trees, can we properly value our existing forests. The next logical step from that is to use those maps to broker relationships between companies around the world who want to voluntarily offset their emissions and landholders wanting income and biodiversity protection. If you can accurately measure the carbon in existing trees, then offsetting schemes could have far more integrity than those currently on the table. Companies contributing to the protection of trees can actually pinpoint the trees they are responsible for protecting. In short, accurate, high quality mapping can bring credibility



to carbon offsets and of course lead to strategic and logical plantings to decrease fragmentation, the curse for all animals on the planet.

3. Investing in our wild places

It is critical that we are able to attract the necessary funds to provide proper management of our existing forests and landscapes.

The AKF knows that there are conscientious and responsible people who want to help protect our environment. There is already a voluntary market, to provide funds to provide for the protection of the forests of Australia, and the world. Why isn't it on the table at Copenhagen?

In Australia, the Carbon Pollution Reduction Scheme (CPRS) only directly affects the top 1,000 polluting companies. This leaves over 99% of companies in Australia with no legislative requirements to invest in the carbon economy, but we know a portion of these people will still want to invest in Australia's future. The AKF wants to broker partnerships with the landowners of Australia and those that have responsible business practice. Bringing them together will provide a strong investment in our future, and the future of the planet.

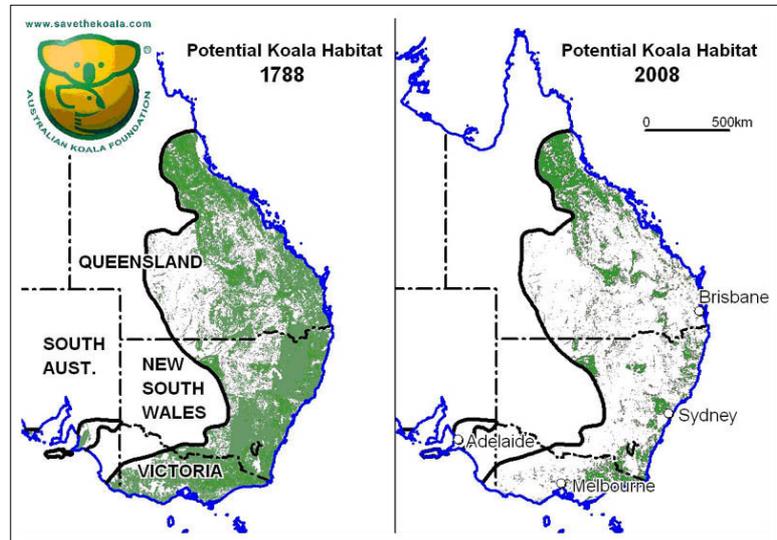
We must remember that there are governments, international organisations, businesses and NGOs who believe that carbon trading will be a magic bullet. However, a lot of what we see and read could easily be described as "the Emperors New Clothes." Without an ethical approach and integrity, carbon trading will become the new sub-prime. The same forces that caused the global financial crisis could well be at work here.

Ultimately, we believe that the answers will be in the trees. Protect what we already have around us. Give a true value to our Earth's assets. Save every tree, regenerate what has been lost, and let nature take its course. This is not about political games or opportunities for big business. It is about the planet. It is about the long term survival of our world and the future of the collective people who live here.



THE STORY SO FAR

Since 1788, when Australia was first settled by Europeans, nearly 65% of the koala forests of Australia have been cleared – over 116 million hectares. The remaining 35% - approximately 41 million hectares - remains under threat from land clearing for agriculture, urban development and unsustainable forestry. The koala forests of Australia are located along the east



coast, and currently constitute about 5% of the landmass of Australia. These forests constituted approximately 20% of the landmass at the time of European settlement.

The Australian Koala Foundation knows that Australia could lead by example and protect these forests, whether under the Kyoto Protocol or some other instrument, by recognising their cultural and economic importance, and their contribution to the carbon debate. If these forests are acknowledged, the koala would then be able to show simple solutions to global problems for both developed and developing nations. Like AKF's motto: *No Tree, No Me*.

The AKF has done the maths, and there are staggering consequences for the removal of existing native koala forests and the carbon¹ they contain. It may be an impossible task to replace this carbon stock.

DO WE PLACE THE RIGHT VALUE ON OUR (KOALA) FORESTS?

In 1968, Garrett Hardin suggested that pollution resulted from a fundamental failure of markets to incorporate the full cost of their economic activities². Similarly, **the koala forests of Australia are being cleared because our society fails to place an appropriate economic value on our forests** - even though koala tourism was projected to earn Australia \$2.5 billion during the Olympic year in 2000³. Ironically, the Australian Government does not make the link. Protect the forests, conserve the koalas, and watch the tourism industry flourish. These natural assets are just taken for granted.





On a day-to-day basis, these forests provide a range of services to our society, including (but not limited to) water purification, erosion control, sources of pharmaceutical and industrial products, and carbon sequestration and storage. Forests also have psychological, spiritual and cultural value.

These forests are also home to the koala – a unique marsupial, with beauty and charm, loved around the world.

Yet the economic value of forests is only seen in terms of timber, land for development, or urbanisation. Farmers of course recognise the importance of forests to food production, but this can be lost on the average urban dweller and even this land is now under threat from drought and mineral exploration.

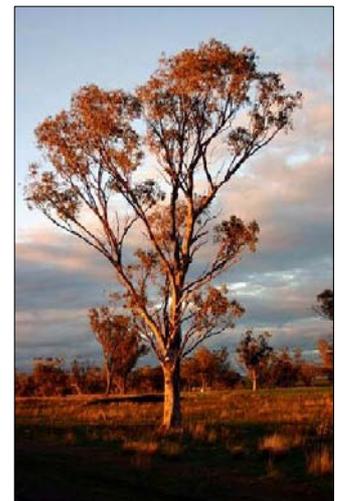
Under those scenarios, do we actually receive value for money? More importantly, is it sustainable?

In some instances, wood harvested from these koala forests continues to be sold for as little as \$2.50 to \$6 a tonne⁴. In third world countries, wood prices are reduced even further or worse illegally logged. Similarly, agricultural activities on marginal land in some parts of Australia are resulting in the clearing of koala forests and the degradation of land for approximately \$5 a hectare. There must be a better way to manage and restore these massive and damaged landscapes.

SEEING THE CARBON FOR THE TREES

It is well recognised that existing eucalyptus forests play an important role in carbon sequestration and storage. Even school children know that trees take CO² from the atmosphere and convert it into organic carbon as they grow. As long as the trees in existing forests do not decompose or burn, the carbon is safely locked away.

Natural forests are far more valuable than plantations as carbon sinks. They are more resilient to climate change and disturbances than plantations because of their genetic, taxonomic and functional biodiversity. This resilience includes regeneration after fire, resistance to and recovery from pests and diseases, and adaptation to changes in radiation, temperature and water availability (including those resulting from global climate change)⁵. There is also evidence that mixed species communities are capable of sequestering and storing more carbon than monocultures^{6,7}.





Australia's intact koala forests constitute a significant standing stock of carbon that should be protected from carbon emitting land-use activities for a range of reasons.

It is tragic to think of what has already been lost. The broadscale destruction of our forests, in the past and at present, contributes to and is arguably a leading cause of the majority of our problems, both in the first and third worlds. Protecting these forests must be one of the solutions.

PROTECTING FORESTS IN DEVELOPED COUNTRIES IS JUST AS IMPORTANT AS IN DEVELOPING COUNTRIES

What is the point in protecting the forests of developing countries while we destroy the forests in developed countries? Why haven't the Kyoto Protocol and Reducing Emissions for Deforestation and Degradation (REDD) discussions recognised the importance of this? Under existing agreements, the destruction of existing forests is merely included within emissions and removals from Land Use and Land Use Change and Forestry (LULUCF). However, LULUCF accounting has been flawed, and there are no real incentives offered to protect these forests. While REDD will provide incentives to protect existing forests, these incentives will only be available to developing countries.



The IPCC estimates suggest that deforestation is responsible for the loss of up to 18% of global carbon emissions⁸, and the effects of climate change will likely increase this as bushfires and drought become more prevalent. It is imperative that the world understands that by protecting all of our existing forests, we guard ourselves against the impacts of climate change. If the world's forests were protected, we would realise a significant drop in carbon emissions. Our oceans, currently under immense pressure absorbing our carbon emissions, would also get a well deserved rest. If the world is serious about reducing carbon emissions, why are we willing to see the continued destruction of natural forests, such as the koala forests of Australia, and the loss of the carbon these forests contain?



WHY DON'T WE PROTECT OUR FORESTS?

Because they are currently being logged and cleared for all sorts of financial gain. But what people do not realise is that this is causing untold damage to the landscape, and of course creating more greenhouse emissions. And these forests are impossible to replace.

WHY IS GLOBAL ATTENTION NOT FOCUSED ON THE PROTECTION OF FORESTS?

Primarily, discussions have not focused on the protection of existing forests as a result of Kyoto Protocol rules and a lack of political will⁹.

Existing, natural forests are considered unimportant, because:

1. Everyone wants the status-quo and wants to be able to continue to do as they please. By and large logging native forests is still a very lucrative endeavour.
2. It is easier to tell another country what to do than protect your own forests.
3. People believe that these forests have, by and large, already done their job, having sequestered large amounts of carbon over previous decades.
4. Young trees supposedly sequester and store carbon better than old trees.

Yet scientific evidence suggests old-growth forests remain active carbon sinks; old-growth forests continue to sequester significant amounts of carbon. And newly planted saplings will require years to sequester similar amounts of carbon; at a conservative estimate, the carbon stored in the average mature Eucalypt tree (a tree with a dbh¹⁰ of approximately 50 cm) is equivalent to planting 1,500 saplings.

Despite the evidence, the value of keeping existing forests in their natural state has not been recognised in the Copenhagen discussions. Instead, we have a situation where forests in developed countries are not protected, and forests in developing countries are potentially at risk from forestry and plantations. Why?

HOW CAN WE PROTECT THE KOALA FORESTS OF AUSTRALIA?

The Australian Government has recently tabled their Carbon Pollution Reduction Scheme (CPRS) in Parliament. They claim that “addressing climate change is one of the key economic and environmental challenges facing Australia and the rest of the world.”¹¹





However, while the sentiment and the rhetoric are great, the actions of the Australian Government tell a very different story.

Australia is misleading the world. Our Government talks about protecting forests in developing nations, but ignores the destruction of habitat and the continuing production of carbon emissions in Australia. While National Greenhouse Accounts figures suggest a reduction in emissions since 1990, data supplied by the Statewide Landcover and Trees Study (SLATS) in Queensland suggest the total amount of land clearing in Queensland is approximately 50 per cent higher than the amount estimated by the Federal Government's National Carbon Accounting System (NCAS)¹². LULUCF agreements may require reductions in emissions from land clearing, but we have little confidence that these agreements are being reflected in on-the-ground action.

At the same moment the CPRS is being debated, koala forests are being cleared for development on the East coast of Australia. On the eastern side of the Great Dividing Range, forests are being cleared for roads, agriculture and urban development, and on the western side the Australian Government is allowing large areas of agricultural land to be allocated for mineral exploration by Australian and international gas and coal companies, with the aim of extracting millions, perhaps billions of tons of coal.

Not only is this counter productive to the argument for a sustainable planet at this time, but it is a great threat to future food production in Australia, and to our chances for a sustainable future. The desire for a sustainable way of life is a growing trend, but even if we waved a magic wand and everyone wanted sustainability right now, there is a long way to go because so much of our landscape has already been severely degraded. It will take hundreds, perhaps thousands of years to restore the Australian landscape.

Our political leaders remain stuck in a robber baron mentality, actively pursuing activities which increase the country's and the world's carbon emissions, whilst ignoring the benefits of protecting existing forests. **Eucalypt forests have been shown to be some of the most valuable carbon sinks in the world¹³.** Our Governments are not showing leadership nor accepting that the world cannot continue to expand in this way. With an estimated world population of nearly 10 billion by 2060 – as food land becomes increasingly scarce – our Government's actions do not auger well for a sustainable and green future.

Our governments have failed to embrace and encourage investment in new technologies, and there is little political will to introduce cradle to grave controls of the exports of Australia's vast and numerous minerals.



Instead, we suggest that the carbon economy is headed towards a system of perverse rewards.

REWARDED FOR BAD BEHAVIOUR

If you look at the proposals currently on the table for Copenhagen and presumably in meetings to follow, the system is merely providing opportunities for those who have already destroyed their natural resources and environment.

CDM legislation will provide carbon credits for restoring land cleared prior to 1990. It's like rewarding a child that has broken his toy.

REDD mechanisms will allow countries to seek financial incentives for promising not to clear forests. The child who has started to destroy his toy and who is now threatening to break it further, will also get rewarded.



But, the person who has kept their toy/land in pristine condition gets nothing. Why is this?

Sadly this story is the basis of most restorative landcare funding in Australia and elsewhere in the world. Those that have preserved and protected are ignored and those lands are becoming more and more important.

The Parties to the Kyoto Protocol, and the Copenhagen talks themselves, have forgotten about those landowners who have protected and managed their land. The world at large has failed to recognise their enormous importance for the future of the planet. There are a growing number of 'good' landholders who wish to protect their trees. Carbon incentives, if offered, will be snapped up by those wishing to do so.

Why should the importance of regenerating cleared, barren, or degraded land be recognised as a priority under the agreements reached at Copenhagen while the protection of pristine forests in the first world be forgotten? Our research has shown that new plantations will not and cannot offset the current trends in Australia and presumably elsewhere.

We must recognise the value of the carbon stored in existing forests, and provide incentives to allow proper management of these assets.

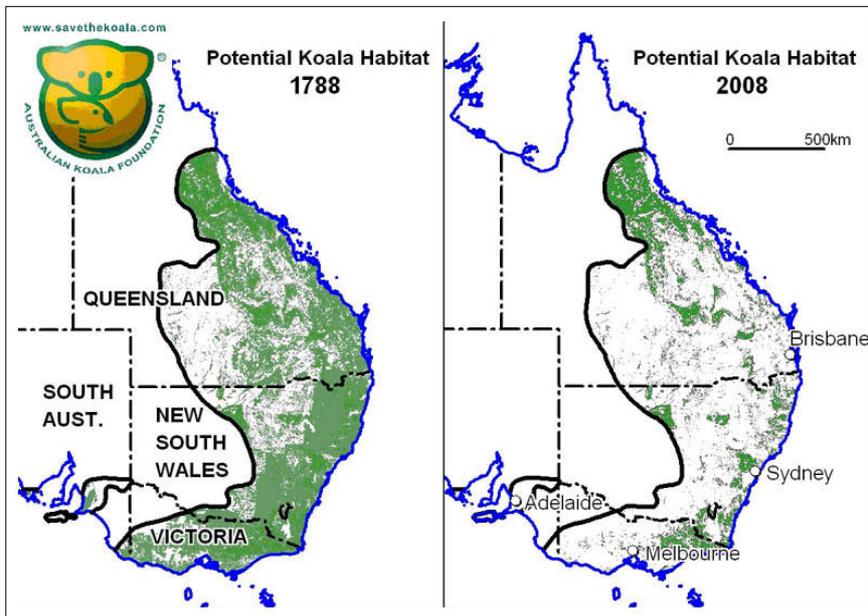


WHAT VALUE SHOULD WE PLACE ON OUR FORESTS?

The Australian Koala Foundation (AKF) has been funding and conducting research in the koala forests of Australia for more than 20 years. **Our database contains the records of over 80,000 trees across 2,000 field sites; we have utilised this data to provide estimates for the carbon densities in forests across the East coast of Australia.** Expanding this research, in June 2009 the AKF conducted a thorough survey, measuring every tree on “*Illawarra*”, a typical property on the outskirts of



Brisbane, Australia to determine how much carbon (CO₂) was stored in the trees. The results of these studies provide a staggering insight into the importance of existing forests in the carbon debate.



A total of 921 trees were assessed. Using a scientifically accepted methodology for evaluating the amount of carbon stored in trees, we estimate 330 tonnes of carbon is held on this 1.2 ha site. If these trees were felled, replacing this amount of carbon would require planting 660,000 saplings over 66 hectares - a ridiculous scenario that is impossible to achieve. **Yet**

such concerns have not entered the climate debate.

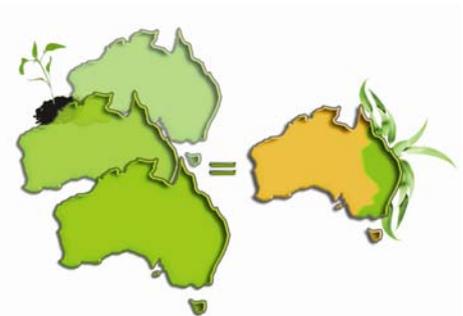
In the AKF maps¹⁴, we identify the amount of remnant vegetation left in Australia (41 million hectares). Using the carbon figures from the “*Illawarra project*,” we can produce an estimate of the amount of carbon held in the koala forests of Australia¹⁵.



If we assume a carbon price of \$AU35/tonne, even a conservative estimate of the value of the existing koala forests of the East coast of Australia would equal \$AU 393 billion (38.6% of the GDP of Australia in 2009).

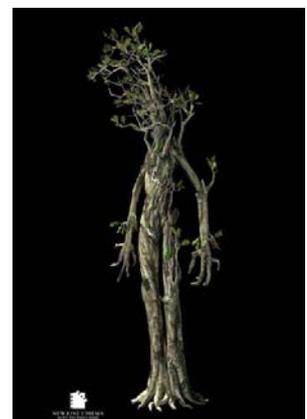
If these trees were to be cleared, the number of saplings required to replace this carbon tomorrow would equal 22.5 trillion trees.

Replanting this many trees will require an area equivalent to three times the total area of Australia!



WILL THE NUMBERS STACK UP?

An old tree in the suburbs of Brisbane, Australia, a *Eucalyptus tereticornis*, was measured. This tree, named after a character from Tolkien's Lord of the Rings, *Treebeard*, is of unknown age. Given his immense size, however, we estimate he is more than 200 years old, and holds 180 tonnes of carbon. This carbon has taken hundreds of years to sequester; how can we put a price on this? On a global carbon market, this tree could be worth \$AU 6,000 (at \$AU 35 per tonne), or even \$AU 9,000 (at \$AU 50 per tonne). A much younger nearby tree, a *Corymbia maculata* was known to have been planted on 1st February, 1988. To continue with the literary reference, let's call him *Quickbeam*. The AKF measured this tree, and we estimate it contains 0.7 tonnes of carbon, equivalent to \$AU 24.50. *Quickbeam* has been growing for more than 20 years, yet still does not even hold 1% of the carbon contained in *Treebeard*. Similarly, a new plantation sapling does not contain even 0.1% of the carbon held in *Quickbeam*.



The older the tree, the more valuable it is in the fight against climate change. We should be seeking to protect trees such as *Quickbeam*, so that one day it can be as imposing as *Treebeard*.



Until the global community recognises the environmental and carbon value of existing forests, these trees will continue to be destroyed. We need to rethink our economic assessment of the value of these areas. We may find that there is greater value in protecting our forests, rather than alternative land management regimes (such as timber production, agriculture and unsustainable housing projects that cover arable land with concrete).

But there are no incentives currently available to support land-holders to maintain the carbon stored in existing forests, and no incentives to protect these forests. The AKF will argue in Copenhagen that we need to recognise the significance of our forests in the climate debate, and introduce effective measures to help protect and restore these precious places. The AKF will argue that even without the support of the Protocol, voluntary markets will move into place once the above logic has been adopted.

WHAT IS THE RIGHT PRICE FOR CARBON?

Who knows? Many believe the carbon market will not even get off the ground. As existing forests are not on the negotiating table, many think the protection of existing forests can only be relegated to the “voluntary” markets.

Is there a voluntary market?

We think so.

We know of several companies from the United States and England who have voluntarily wanted to offset their footprints and have found it almost impossible to find legitimate ways of doing so.

In comes the AKF's “*Illawarra project*.” This land holder could make \$12,000 from the carbon stored on the property (at \$AU35/tonne). Forty percent of this money could be paid out over the first two years, with the remainder withheld, and only paid out if the trees remain after five years or longer. That money could provide a strong incentive to manage and protect existing forests or even individual trees. One could imagine a school with a large tree being paid to keep it – opening up all sorts of economic incentives if it was brokered correctly.

If we extrapolate the results from the Illawarra project over the whole East coast of Australia – then the amount of carbon that could be “sold” on the market is \$AU 400 billion – equal to 38.6% of the GDP of Australia. If the price of carbon were to increase to say \$AU70-90/tonne – it would become nearly a trillion dollar market force.



Over one trillion dollars for trees that are doing “nothing.” Or as one member of the community said years ago “for trees laying idle.”

These are staggering sums and could set the way for a completely new market economy. People owning large tracts of unproductive cattle and sheep grazing land could well see the argument for keeping their trees and indeed being paid to manage to keep them, not only for economic reasons but for the environmental protection of the planet. Ideas abound!

WHERE TO NOW?

To seek new partnerships with people and organisations who think like we do, and to Copenhagen to tell the story of the koala. Dr. Douglas Kerlin, Chief Ecologist of the AKF and myself will be in Copenhagen to find opportunities for collaboration with people of like mind. We must all work together to find solutions that are realistic. We have the science and the solutions for many of the issues on the table. The global community must acknowledge that our existing forests are a bank, holding our carbon savings. We must seek to identify and audit our carbon savings, and provide incentives to allow the long term protection of these assets, and this planet. **Are you interested?**

The beautiful koala has taught me all I need to know at this time in history – koala trees have carbon in them and they must be protected if we are to save both the planet and the koala for future generations.

Deborah Tabart OAM
Chief Executive Officer
Australian Koala Foundation
akf@savethekoala.com
Phone: +61 (7) 3229 7233



Notes

¹ For the purposes of this document, the term carbon is used to refer to CO² equivalent.

² Hardin, G. 1968. The Tragedy of the Commons. *Science* 162:1243-1248.

³ Hundloe, T. and Hamilton, C. 1997. Koalas and tourism: An economic evaluation.

<https://www.savethekoala.com/pdfworddocs/general/tourism.pdf>

⁴ Egan, C. State's cheap timber sales 'undermine native forest policy' *The Age* April 5, 2009.

⁵ Mackey, B.G., Keith H., Berry, S.L. and Lindenmayer, D.B. 2008. 2008. Green Carbon: The role of natural forests in carbon storage. ANU E Press, Canberra.

⁶ Forrester, D.L. Bausch, J. and Cowie, A.L. 2005. On the success and failure of mixed-species tree plantations: lessons learned from a model system of *Eucalyptus globulus* and *Acacia mearnsii*. *Forest Ecology and Management* 209:147-155.

⁷ Forrester, D.L. Bausch, J. and Cowie, A.L. 2006. Carbon allocation in a mixed-species plantation of *Eucalyptus globulus* and *Acacia mearnsii*. *Forest Ecology and Management* 233:275-284.

⁸ Intergovernmental Panel on Climate Change (IPCC). 2007. The Fourth Assessment Report Climate Change 2007: Synthesis report, Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/>

⁹ Keith, H., Mackey, B.G. & Lindenmayer, D.B. 2009. Re-evaluation of forest biomass carbon stocks and lessons from the world's most carbon-dense forests. *Proceedings of the National Academy of Sciences* 106:11635-11640.

¹⁰ Diameter at breast height

¹¹ Australian Government. Carbon Pollution and Reduction Scheme Green Paper. July 2008.



¹² MacIntosh, A. 2007. The National Greenhouse Accounts and Land Clearing: Do the numbers stack up? https://www.tai.org.au/file.php?file=web_papers/WP93.pdf

¹³ Keith H., Mackey B.G., Lindenmayer D.B. 2009. *Ibid.*

¹⁴ These maps are a culmination of 8 million dollars of peer-reviewed research conducted by the AKF and universities research groups, and over twenty years of field research and ground truthing. For further information, refer to <https://www.savethekoala.com/conservation.html>

¹⁵ This estimate is a rough figure. Estimates of the amount of carbon stored in the koala forests of Australia range from 85t/ha in Southwest Queensland, to over 1000t/ha in the highlands of Central Victoria.

APPENDIX 13.

Williams, B., 2010. Plea to List Dwindling Koalas. *The Courier Mail*, 12 November.

Available:

<https://www.savethekoala.com/pdfworddocs/media/20101112%20plea%20to%20list%20dwindling%20koalas.pdf>

APPENDIX 14.

Tabart, D. to Garrett, P. 2010. *Re: Listing of Koala as Vulnerable under the EPBC Act.* [letter] 15/06/2010.



AUSTRALIAN KOALA FOUNDATION

The international organisation dedicated to saving the koala and its habitat

Conservation of the wild koala and its habitat is of global significance

15th June 2010

The Honourable Peter Garrett MP
Minister for Environment Protection, Heritage and the Arts
PO Box 6022
House of Representatives
Parliament House
Canberra ACT 2600

Dear Mr. Garrett

Re: Listing of Koala as Vulnerable under the EPBC Act

On behalf of the Australian Koala Foundation (AKF) I write to advise that the koala should be listed as Vulnerable under the EPBC Act.

Over our twenty four year history, the AKF has funded university research, in-house research, but more importantly has instigated state of the art innovative habitat mapping and the writing of Koala Plans of Management for many communities around Australia. Our efforts have cost in excess of \$8m.

This has led us to have unprecedented data over the whole of the Australian koala landscape with 80,000 individually measured trees in nearly 2000 field sites. This is not something you can peer-review.

What this field data gives is innate confidence and when our Chairman, Mr. Robert Gibson insisted, in 2006 (after the previous koala listing rejection), that my team produce the attached Koala Habitat Atlas and estimated koala numbers, we created it based on our own fieldwork and from the scientific literature in Australia. It is galling to AKF that by and large your Department has refused to acknowledge this work. In recent days we have asked the Chancellor of University of Queensland to make it known to you that this is not the case and of course researchers from all over the country have advised us, and hopefully you, of our massive contribution to the literature. Their papers are identified in our methodology document.

2...

AUSTRALIA - HEAD OFFICE:	USA REGISTERED OFFICE:	USA CORRESPONDANCE TO:	JAPAN - DONATIONS TO:
Australian Koala Foundation (AKF) ACN 010 922 102 ABN 90 010 922 102 GPO Box 2659 Brisbane Qld 4001 Ph: 61-7-3229 7233 Fax: 61-7-3221 0337 Email: akf@savethekoala.com Website: www.savethekoala.com	Friends of the AKF C/- The Nolan/Lehr Group Inc. 214 West 29th St, Suite 1 002 New York, NY, 10001 Ph: 1-212-967 8200 Fax: 1-212-967 7292 Toll Free: 1 800 MY KOALA Website: www.savethekoala.com	Friends of the AKF C/- ATC International 8660 Cherry Lane, Suite 8-10 Laurel, Maryland 20707 Ph: 1-240-456 0101, Fax: 1-240-456 0086 Toll Free: 1 800 MY KOALA Email: akf@savethekoala.com Website: www.savethekoala.com	Australian Koala Foundation Post Office Remittance Number: Koala Kikin 00100-8-762653 At all Post Offices in Japan Email: japan@savethekoala.com Website: www.savethekoala.com

As we send you our methodology for our Koala Numbers – I am mindful of the past and I hope that in your deliberations about the koala you take into account the precautionary approach and why the koala is so important to Australia.

When AKF looks at the TSSC nomination – you have not been able to establish a compelling argument for the numbers in 2006 – at 390,000. You have failed to produce significant science to support that argument and worse still have not been able to articulate numbers today. Without that, how can you predict decline?

AKF is going to try and put this simply:

In 2006 your document estimates approximately 400,000 koalas and you have no estimate for now in 2010. Why not?

If AKF is right and there are no more than 100,000 koalas, then the decline is 75% which more than meets the decline needed for a vulnerable listing – it would even meet Endangered.

If AKF doubles it figures to 200,000, then the decline is 50% - which again more than meets the Vulnerable listing for a 30% decline.

If AKF trebled the figures to 300,000 – then the decline is 25% which almost sneaks in for the 30% decline. There are not 300,000 koalas in Australia.

We absolutely dispute the Central Queensland Koala Numbers in the Brigalow Belt – of between 70,000 and 215,000. You have no evidence to support that.

We absolutely dispute the koala numbers in Victoria of 73,000, but even if we do accept them, it would still allow a national Vulnerable listing to apply.

We absolutely dispute the koala numbers in the Victorian Strathbogies.

We absolutely dispute koala numbers in the Otways – and the Victorian Government has produced no more than 4 field sites to support their assertions.

So, it comes to who is right? And are you, as Minister prepared to take a precautionary approach which is mandated in the legislation? We urge you to do so. We urge you not to believe the State Governments who say they are capable of protecting the environment. If the States had done a good job up until now, the koala hospitals would not be full of patients or dead bodies and the recent review of the National Koala Strategy 1998, would not have said it didn't work. The new Strategy will be more of the same. Ironically I watched as the document was watered down by State and Federal bureaucrats.

So, here is our document and we are confident there are no more than 100,000 koalas in Australia and if you, or your Committee, or the States provide adequate information for us to change our view then we would do so. You will see in our methodology document, the work that underpins our thoughts on koala numbers has the cream of Australian koala scientists behind it and represent over 100 peer reviewed papers.

AKF scientists will be happy to provide advice to the TSSC should you need it. Dr. Kerlin, recently graduated from Glasgow University, and Mr. John Callaghan before him have created the modelling and both of them and AKF's Mr. David Mitchell will be happy to visit Canberra should you require this.

The Australian Koala Foundation also knows that we have the voice of the people behind us and they believe the koala should be protected as Vulnerable. They have watched their koala populations decline before their eyes in recent years with development and infrastructure projects running rampant over environmental legislation.

Yours,

A handwritten signature in black ink that reads "Deborah Tabart". The signature is written in a cursive, flowing style.

Deborah Tabart OAM
Chief Executive Officer

cc. Associate Professor Robert Beeton

APPENDIX 15.

Guglielmi, J. Australian Koala Foundation, 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*, Master's degree Law student, University of Nice, France.

October 2007

Written by Julie Guglielmi, Master's degree Law student, University of Nice, France, and
National Koala Act Research Officer

In Consultation with Deborah Tabart, Chief Executive Officer,
Australian Koala Foundation

**Analysis of the EPBC Act with regards to the
protection of the koala**

+

**The Australian Koala Foundation's vision for a
National Koala Act**



Context

State based legislation is failing to protect the koala and its habitat

The current protection of the koala and its habitat under the existing Federal legislation is insufficient

- 1) The koala is not currently a listed threatened species under the EPBC Act
- 2) The koala is protected only as “native species” under the EPBC Act

Action is needed before the Koala reaches endangerment

Background to the Australian Koala Foundation

1) Changing the EPBC Act

Why is the EPBC Act, in its current form, not suitable to protect the koala and its habitat?

- 1) The protective provisions of the EPBC Act mostly relate to Commonwealth areas and reserves, where koala populations do not occur
- 2) The EPBC Act doesn't have planning powers
- 3) The EPBC Act doesn't provides economic incentives to landowners
- 4) The EPBC Act suffers from a lack of enforcement
- 5) Land clearing doesn't trigger the operation of the EPBC Act, although it is seen as a threatening process
- 6) The implementation of important protective provisions is uncertain
 - a) Existence of exemptions
 - b) Ministerial discretion

Assessment of the different possibilities under the EPBC Act to take action

1) Including the koala in the threatened species list

Which provisions could the koala really benefit from if it was included in the list, and are they efficient to protect the species or its habitat?

- a) Provisions specifically triggered by a “listed threatened species”
- b) Provisions the koala would benefit from simply because it is a “native species”

2) Lobbying the Minister to implement a threat abatement plan to mitigate the effect of land clearing

3) Adding a Matter of National Environmental Significance

How are MNES adopted?

Would public pressure be useful to have a new MNES added?

“Species of national cultural significance” as MNES

“Species of national economic value” as MNES

“Nationally significant vegetation” as MNES

Key inadequacies under the revised 2006 version of the EPBC Act

Conclusion

II) Creating a new legislation – the National Koala Act

Part 1. Biodiversity

Koala to lead the way

The establishment of a precedent

Part 2. Planning

The National Koala Act would have powers over Planning Codes

Creation of a Koala secretariat

Developers required to prove that their project will be neutral to the environment

Planners bound by the planning guidelines for koala conservation – site level planning

Part 3. Tax

Tax and other incentives to protect and restore koala habitat

East of the Great Dividing Range

Revolving conservation funds

Donation of land for conservation purposes subject to a life interest

Bargain sale of land for conservation purposes

Development incentives whereby a landholder may be allowed to develop part of their property in return for dedicating another part to conservation

West of the Great Dividing Range

Conservation covenant

Voluntary conservation agreement

Landowner Incentive Program

Donation of a conservation easement

Bargain sale of a conservation easement

Accreditation schemes and environmental management systems to promote products from farmers who invest in biodiversity conservation practices

Incentive payments

- Annual rental payments (10-, 15- or 20-year agreements)

- Easement payment (30-year or permanent)

Carbon sequestration

Conservation banking

Preference of the Australian Koala Foundation regarding the different economic incentives

Examples of actions landowners would be encouraged to undertake

Could the Commonwealth legislate to adopt the National Koala Act?

International policies that are currently used to protect biodiversity

Bibliography

Context

Koalas are endemic to Australia, and can be found in four different Australian States: Queensland, New South Wales, Victoria, and South Australia. They occur now as disjunct populations within these States.

They are in serious decline, suffering from the effects of habitat destruction (land clearing being the biggest threat to koalas and wildlife in general in Australia), domestic dog attacks, bushfires and road accidents. The Australian Koala Foundation estimates that there are less than 100 000 koalas left in the wild.

It is the Australian Koala Foundation's opinion that koalas are currently not protected adequately across their geographic range: the distribution of power at State and local government level is inadequate, and the protection for koalas under the current Federal legislation is insufficient: the legislation is weak and not specifically triggered by the koala. Indeed no Federal or State-based legislation in Australia has proved capable of reducing the decline of koala populations in the wild.

State based legislation is failing to protect the koala and its habitat

Under State legislation the koala is listed as follows:

- *Common* in Queensland, under the Nature Conservation Act 1992. In 2003 the species was upgraded to *vulnerable* in South East Queensland
- *Vulnerable* in New South Wales, under the Threatened Species Conservation Act 1995
- *No official listing* in Victoria. The koala is not on the official Threatened Species list
- *Rare* in South Australia , under the National Parks and Wildlife Act 1972

The Federal government considers the protection of the species and its habitat to be primarily each State's responsibility. The main environmental legislation at Federal level –

the *Environment Protection and Biodiversity Conservation Act 1999* (the “EPBC Act”) allows the Minister, on behalf of the Commonwealth, to enter into a bilateral agreement with a State or self-governing Territory. A bilateral agreement provides, among other things, for protecting the environment and/or for promoting the conservation and ecologically sustainable use of natural resources.

Although all of the States now protect koalas from being deliberately killed or harmed, and they each have legislation under whose jurisdiction koalas and their habitat fall, there is not always the political will to adequately implement and enforce the legislation or to protect the koala and its habitat. See for example the Queensland Government Environmental Offsets Draft (2007) which advocates restoring vegetation somewhere else to compensate for environmental impacts – this is highly inadequate regarding koala habitat as the death of koalas due to the destruction of their habitat is of course irreversible and therefore no offset is acceptable, or the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016 (the Koala Plan) for Queensland, which consists mainly of recommendations: the action taken by the State doesn’t trigger an efficient protection because the plan itself is weak.

When State governments are willing to take action the authorities often lack financial resources to achieve their aim. Thus a New South Wales National Parks and Wildlife Service (2003) Draft Recovery Plan for the Koala (State-wide plan) has been written but due to insufficient funds this recovery plan remained a mere draft and was not implemented. It is useless now. Examples such as the New South Wales Recovery Plan for the Hawks Nest and Tea Gardens Endangered Koala Population (2003), which was allocated \$60,000 by the State government to ensure the long-term survival of the koala population concerned, are rare. In 2003 a man was also convicted in the Land and Environment Court and fined \$40,000 for damaging the core habitat of the endangered Hawks Nest and Tea Gardens koala population.

There are currently approximately 320 local governments responsible for planning decisions affecting koalas in their area. It is the Australian Koala Foundation’s view that the current multiplicity of local authorities is highly inadequate to deal with a koala habitat stretching across multiple administrative districts: we can easily understand that a general view of

koala habitat is needed to successfully protect, restore and connect koala habitat(s); however at the moment the different Council jurisdictions on which koalas occur are not coordinated. They manage koala habitat each in a different way and with different rules, making the implementation of a conservation strategy very difficult.

Conserving biodiversity should be the Federal government's responsibility. The decisions must come from Federal level and consider koala habitat beyond local administrative boundaries. It is the only way koala habitat can be managed in a coherent manner and therefore koalas can have a chance to thrive again.

The current protection of the koala and its habitat under the existing Federal legislation is insufficient

Currently, there is no Federal legislation that specifically provides for the protection of the koala or its habitat.

In 2004 the Australian Koala Foundation submitted a nomination to list the Koala as "vulnerable" at national level, under the EPBC Act. The Federal government rejected the nomination in 2006.

1) The koala is not currently a listed threatened species under the EPBC Act

Therefore the koala is not afforded any legal protection as a "threatened species":

It cannot benefit from a **recovery plan**, which "provides for the research and management actions necessary to stop the decline of, and support the recovery of, the *listed threatened species* or listed threatened ecological community concerned so that its chances of long-term survival in nature are maximised" (270(1)).

The Minister doesn't have to ensure that there is approved **conservation advice**, because they are needed only for *listed threatened species* (266B).

The koala is not subject to the **permit system**, which concerns members of *listed threatened species* being killed, taken, moved... So such action is not an offence (except if the action is taken in a Commonwealth *reserve*, because then the koala would be protected as a “native species” and killing, taking... a koala or other native species in a Commonwealth reserve is prohibited under the EPBC Act).

The Minister does not have to identify **critical habitat**, because such habitat should be critical only to “the survival of a *listed threatened species* or listed threatened ecological community”. As koala habitat is not listed as critical habitat it is not an offence to damage it.

A **conservation order** controlling activities and requiring specified people to take specified actions cannot be issued, because according to section 464(2) “the Minister may only make a conservation order if he or she reasonably believes that it is necessary to make the order to protect a *listed threatened species* or a listed threatened ecological community”.

Currently the koala doesn't fall within one of the seven Matters of National Environmental Significance (“MNES”), which include *listed threatened species*. Therefore even if an action is likely to have a significant impact on the koala **Commonwealth assessment and approval** is not required.

The decision whether to include the koala in the list of threatened species under the EPBC Act will be reviewed in 2008.

2) *The koala is protected only as “native species” under the EPBC Act*

A protection does exist for native species under the EPBC Act. Section 303 provides that “in particular, the regulations may prohibit or regulate actions affecting a member of a *native species* in a Commonwealth area”, and several protective provisions refer to native species. As a species that is “indigenous to Australia” the koala falls into the category “native species” under the Act. The following provisions could in theory be used:

Native species may be protected **while in a Commonwealth reserve**: section 354A(1) provides that a person commits an offence if the person takes an action in a Commonwealth reserve and the action “results in the death, injury, taking, trade, keeping or moving of a member of a *native species* in the reserve”. The offence is punishable on conviction by imprisonment and/or a fine. Strict liability applies.

The Minister may also protect the koala by **adding a threatening process to the list**, if satisfied that it is eligible to be treated as a key threatening process. “A process is a threatening process if it threatens, or may threaten, the survival, abundance or evolutionary development of a *native species* or ecological community”(188(3)). A threatening process is eligible to be treated as a key threatening process if it could (among other things) cause a native species or ecological community to become eligible for inclusion in a threatened species list (188(4)(b)). Land clearing, which is the biggest threat to koala because it destroys their habitat, has been included in the key threatening process list.

The Minister may **make a threat abatement plan** to reduce the effect of a *key threatening process*: section 270A(1) provides that the “Minister may at any time decide whether to have a threat abatement plan for a threatening process in the list of key threatening processes established under section 183”. A threat abatement plan must provide for the research, management and other actions necessary to reduce the key threatening process concerned to an acceptable level in order to maximise the chances of long-term survival in the nature of *native species* and ecological communities affected by the process (271(1)). A threat abatement plan has not been made so far to reduce the effect of land clearing.

A threat abatement plan can only be made for a key threatening process in the list. Having a threatening process added to the list is the first step, it allows a threat abatement plan to be later created to reduce the effect of the process. But this step alone doesn't have the result of triggering an operation of the EPBC Act. The key threatening process is acknowledged but remains a mere expression in a list, nothing more, until a threat abatement plan is introduced and implemented. Only a *threat abatement plan* would reduce the effect of the key threatening process.

It results from the above that land clearing, which is on the list but for which no threat abatement plan has been made, does not currently trigger an operation of the Act. Koala habitat could not currently be protected from land clearing using this provision.

Beyond the creation and implementation of a threat abatement plan for land clearing, the following provision could be used to protect koala *habitat*:

Under section 28 an action taken by the Commonwealth or a Commonwealth agency that has, will have or is likely to have a significant impact on the environment “inside or outside the Australian jurisdiction”, koala habitat included, may trigger the operation of the EPBC Act, namely the assessment and approval provisions.

Sections 26 and 27 regard the taking of an action that is likely to have a significant impact on the environment of Commonwealth land as an offence. Such action requires approval before it can be undertaken.

This protection is insufficient: the EPBC Act is currently only triggered under the following circumstances: the koala is in a *Commonwealth reserve* and is killed, injured, traded, kept, or moved by a person in the reserve; the *Commonwealth or a Commonwealth agency* takes an action that is likely to have a significant impact on its habitat anywhere in Australia; or the koala is on *Commonwealth land* and a person takes an action that is likely to have a significant impact on the environment (koala habitat) of this land. Given the power of Ministerial discretion, which can provide exemptions (approval is not needed prior to damaging the environment), and especially the fact that almost all of the koala habitat is found outside of Commonwealth areas and Commonwealth reserves, the implementation of these provisions is very unlikely to happen.

In conclusion under the EPBC Act’s current form the protection for koalas and their habitat is nearly non-existent.

Action is needed before the Koala reaches endangerment

Due to the increase in human population, the koala's habitat is being cleared to build houses, buildings, roads, for industry purpose and other development, at an overwhelming rate. It is estimated that around 80% of the Eucalyptus forests from the koala's range has been cleared since European settlement. Aside from the direct loss of habitat, urbanisation can also increase other risks facing koalas, vehicle related mortality and dogs attacks among others.

As a result koalas now exist predominantly in severely fragmented and isolated populations within many parts of their original geographic range, and are suffering from a sharp decline in numbers. Fragmentation of koala habitat is having a devastating effect on the koala, its natural habitat and Australian biodiversity in general. It places koalas under increased threat of extinction.

The koala's habitat destruction is still in progress. More illegal clearing is undertaken now and the habitat is lost faster than ever before, due to a diminution of rangers and other staff in charge of keeping watch over the habitat. The koala's limited distribution will reduce further. The situation is critical.

It is imperative that action is taken now while there is still adequate habitat capable of protecting large numbers of koalas. A species should not be afforded legislative protection only when it is threatened with extinction. Once a species reaches endangerment, it might be too late to save it. The conservation of the koala requires thousands (1,000s) of wild koalas in large tracts of land that are capable of sustaining the koala populations indefinitely.

The Australian Koala Foundation decided it is time to take action.

The Australian Koala Foundation in this draft draws the outline of what such an action could be. The action would consist in either *writing a new piece of unprecedented*

legislation – a National Koala Act, or *improving the existing legislation*, the EPBC Act, or both.

The proposed National Koala Act would consist of Federal legislative and policy initiatives designed to protect the koala and its habitat throughout its natural range. It would comprise three sets of powers – biodiversity, planning and tax.

Background to the AKF

The Australian Koala Foundation (“AKF”) is the principal non-governmental organization in Australia focused on saving the koala and its habitat.

To achieve this aim the AKF has raised and funded since its inception in 1986 approximately \$1 million into research on the koala and has committed a further \$6.5 million towards koala conservation projects throughout eastern Australia.

The AKF is committed to forming meaningful partnerships with scientists, individual landholders, conservationists, primary producers, foresters, politicians and developers to create a clear and workable strategy and a concrete means to save the koala. It also broadens public awareness about the koala, provides koala conservation advice and makes educational resources available to students and the general public.

One of the AKF’s greatest achievements is the Koala Habitat Atlas, an on-going project created to identify and map all remaining koala habitat in Australia using the results of extensive field surveys in conjunction with the latest in GIS-computer technology. The Koala Habitat Atlas was awarded a Computerworld Smithsonian Award Medal for Innovative Use of Technology in Washington, DC in April 1998.

The AKF acts as an umbrella organisation for many small groups and individuals that represent the koala, and hosts annual conferences for scientists, planners, land managers, developers and koala care-givers.

For further information please visit the AKF web site at www.savethekoala.com.

I) Changing the EPBC Act

As we have seen the power to manage koala habitat must come from Federal level. An environmental legislation at Federal level already exists, the EPBC Act. However it is the Australian Koala Foundation's view that whether or not the koala is listed as a threatened species the EPBC Act is unable to efficiently protect the species and its habitat.

Why is the EPBC Act, in its current form, not suitable to protect the koala and its habitat?

1) The protective provisions of the EPBC Act mostly relate to Commonwealth areas and reserves, where koala populations do not occur

Section 303 provides that the regulations under the EPBC Act "make provision for the conservation of biodiversity *in Commonwealth areas*". Many of the important provisions protecting the threatened species or their habitats require that they be in or on a Commonwealth area in order to be protected:

Damaging **critical habitat** is an offence only if the habitat is "in or on a *Commonwealth area*" (207B(1));

Only a contract designed for the sale or lease of *Commonwealth land* containing critical habitat must include a covenant the effect of which is to protect the critical habitat (207C);

A **conservation order** prohibits or restricts specified activities on or in *Commonwealth areas* and may require specified persons to take specified action on or in *Commonwealth areas*;

The EPBC Act created a **permit system** to conserve Australia's Biodiversity on Commonwealth land. It is designed to protect threatened species, by making it an offence to kill, injure, take, trade, keep, or move a member of a listed threatened species in or on *Commonwealth area* except in certain circumstances. The offence is punishable on conviction by imprisonment and/or a fine. Strict liability applies.

Native species may also be protected from being killed, injured, taken etc while in a *Commonwealth reserve* (354A(1)).

Under section 525(1) of the EPBC Act the definition of Commonwealth area is as follows:

“Each of the following, and any part of it, is a *Commonwealth area*:

- (a) land owned by the Commonwealth or a Commonwealth agency (...) and airspace over the land;
- (b) an area of land held under lease by the Commonwealth or a Commonwealth agency (...) and airspace over the land;
- (c) land in an external Territory (...) or the Jervis Bay Territory and airspace over the land;
- (d) the coastal sea of Australia or an external Territory;
- (e) the continental shelf, and the waters and airspace over the continental shelf;
- (f) the waters of the exclusive economic zone, the seabed under those waters and the airspace above those waters;
- (g) any other area of land, sea or seabed that is included in a Commonwealth reserve”.

80% of koala habitat is situated on *privately owned* land and, as for the remaining 20%, koalas are very rarely found in Commonwealth reserves and areas. These provisions of the EPBC Act are not relevant because they let the koala mostly unprotected.

In the same way section (26) provides that a person must not take an action that has, will have, or is likely to have a significant impact on the environment on *Commonwealth land*.

Although such action may trigger the operation of the EPBC Act the koala is unlikely to benefit from the provision.

2) The EPBC Act doesn't have planning powers

The habitat of a species is vital for the animal. It is where it lives, grows and breeds; it is also used for feeding, as a shelter, and for many daily activities. In order to be viable a koala population requires a minimum amount of suitable habitat and large areas of connected forest, among others because male koalas must disperse to nearby areas to avoid inbreeding. They will travel long distances along tree corridors in search of new territory and mates.

When the planners and developers are free to carry out any development they want, and therefore to clear trees within patches that are koala habitat, they may increase the distance between mature trees. This has a major impact on koalas. In a fragmented landscape koalas may be required to travel across cleared areas between habitat patches, which makes them much more vulnerable to predators. They might also have to cross a road when attempting to reach the closest koala habitat patch and be killed. Moreover koalas are nocturnal animals and, in the event of a koala being unable to reach his destination during the night, it will still be on the ground in the morning and therefore be extremely vulnerable to attacks by roaming or domestic dogs.

It is fundamental that the legislation has powers over Planning Codes to be able to protect koala habitat from threatening development or planning which would require land clearing. Directions need to be given to Councils. Councils should be obliged to take koalas into consideration when designing or assessing rezoning proposals and development applications. The EPBC Act is silent concerning powers over Planning Codes. The current Planning Codes do not take into account the specificities inherent to koalas.

3) The EPBC Act doesn't provide economic incentives to landowners

Although koalas are protected by law, their remaining habitat is almost never protected by legislation because as we have seen it occurs mostly on privately owned land. On private

land the fate of the koala is contingent upon the owner of the land, who may clear land that is koala habitat. The Australian Koala Foundation believes that most landowners would be willing to protect the koala and its habitat on their land if they were given financial and/or technical assistance. The EPBC Act doesn't offer such incentives.

4) The EPBC Act suffers from a lack of enforcement

It appears that in practice the EPBC Act is discredited and therefore *rarely used*, because it is considered weak, unable to generate a real outcome. It doesn't provide means of enforcing it. It is seen as written by bureaucrats with no field experience, merely using imposing words to give an appearance of strength. It is also complicated and unclear. As a result the EPBC Act is not properly implemented: it can be changed, it is easy to get around it legally or override it.

On the contrary a shorter, conclusive and precise document is needed, making it easier for a Court to rule and for individuals to know their obligations and what they are not allowed to do. Enforcement should also be planned and coordinated (hiring of more rangers for example).

5) Land clearing doesn't trigger the operation of the EPBC Act, although it is seen as a threatening process

Habitat destruction is the biggest threat to koalas and land clearing needs to be prohibited in areas of significant koala habitat. Land clearing has been included in the Key Threatening Processes list under the EPBC Act and the inclusion has become effective on the 4th of April 2001. However the EPBC Act fails to manage to halt land clearing, because as we have seen a threat abatement plan has not been made and implemented. The Australian Koala Foundation considers this as ludicrous and a major loophole in the EPBC Act. There is no point of having "land clearing" listed if this does not trigger the operation of the Act.

6) The implementation of important protective provisions is uncertain

The Minister is responsible for making decisions concerning the enforcement of the EPBC Act. It appears that many ways are offered to the Minister to evade his national

environmental responsibilities: many provisions of the EPBC Act can be avoided via Ministerial discretion. The Minister has the possibility to avoid the implementation of the environmental assessment and approval provisions. Exemptions can also be used or granted.

An amendment to section 206A removing the right to appeal threatened species (among others) permit decisions to the Administrative Appeals Tribunal if the decision was made personally by the Minister also shows that the Minister is “above due process” (A. Macintosh). The power of the Minister over the implementation of the EPBC Act is incontestable.

a) Existence of exemptions

Under the EPBC Act actions that are likely to have a significant impact on a Matter of National Environmental Significance (“MNES”), on the environment of Commonwealth land, and actions taken by the Commonwealth that are likely to have a significant impact on the environment anywhere in the world are subject to Commonwealth assessment and approval before they can lawfully be undertaken.

However the Act provides that *environmental approvals are not needed* for the following actions:

- Actions covered by bilateral agreements between the Commonwealth and the State or Territory in which the action is taken;
- Actions covered by Ministerial declarations and accredited management arrangements or accredited authorization processes;
- Actions covered by Ministerial declarations and bioregional plans;
- Actions covered by conservation agreements;
- In regions covered by Regional Forest Agreements, for certain RFA forestry operations;
- Actions in the Great Barrier Reef Marine Park, provided that the action is taken in accordance with a permission;
- Actions with prior authorisation

(if the action is declared by the agreement or by the Minister not to require approval).

These actions are not *controlled actions*, so it is not an offence to undertake them without approval. They can be freely carried out, even though they may have a significant impact on a MNES or on the environment.

A person wishing for example to clear land and knowing or suspecting that this would result in the death of protected animals in the wild must have his/her application assessed and be granted approval before this person can proceed with the proposed activity, *except* where an exemption applies. Therefore the assessment and approval provisions are only theoretical.

The exemption concerning forestry operations in regions covered by Regional Forest Agreements (RFAs) is among the most dangerous flaws in the EPBC Act, because RFAs regulate the management of a large portion of Australia's forests, which is also essential habitat for the koala. Other regions with koala habitat are subject to a process of negotiating a Regional Forest Agreement. All forest activities, anywhere in Australia, if they may have a significant impact on a MNES or on the environment should be subject to Commonwealth environmental assessment and approval.

It is the same under the permit system. Ministerial approval may be given, a recovery plan or conservation agreement for example may authorise the action if this action is provided for by, and done in accordance with it. Then the action on the species is not an offence.

The existence of exemptions undermines the spirit and efficiency of the provisions. Even if the koala was protected by a MNES it might be useless in some cases because the protective provisions would not be triggered.

b) Ministerial discretion

Some of the provisions can only be triggered by the Minister, and therefore their implementation is contingent upon his will. For example:

The *Minister* needs to ensure that a recovery plan is in force for a listed threatened species *only if he decides* to have a recovery plan;

The *Minister may* decide whether to have a threat abatement plan and *may* make the plan;

The *Minister may* make conservation orders;

Application to the Federal Court for a remediation order may *only* be made by the *Minister*;

Ministerial discretion may be used to grant exemptions. As stated above the *Minister* is allowed to exempt actions from requiring environmental approval, for example “a person may take an action described in a provision of Part 3 [requirements for environmental approvals] without an approval under Part 9 [approval of actions] if (a) the action is an action, or one of a class of actions, *declared by the Minister* under section 37A not to require approval... (because the taking of the action is in accordance with a particular bioregional plan)”. The Minister cannot make exemptions in certain circumstances: he “must not make a declaration [the action does not require approval] if he considers that the action, or an action in the class, if taken, would have unacceptable or unsustainable impacts on a matter [MNES] protected by the provision”. But what is an action that has unacceptable or unsustainable impacts? The definition is not clear. And how to prove that the Minister was of bad faith?

This is the same for actions declared under a conservation agreement, the *Minister* can by declaration exempt them from the application of Part 3. But section 306A provides that the Minister must not enter into a conservation agreement that contains a declaration to the effect that actions in a specific class do not need approval, unless the Minister is satisfied that the actions to which the declaration relates “are not likely to have a significant impact on the matter protected by the provision of Part 3 proposed to be specified in the declaration”;

The *Minister*, in deciding whether to amend the list of threatened species, must obtain and consider advice from the Threatened Species Scientific Committee on the proposed amendment. Nevertheless he does not have to act in accordance with the TSSC’s advice. The *Minister* makes the final decision; on the contrary in New South Wales under the Threatened Species Conservation Act 1995 an independent *Scientific Committee* decides

whether a proposed listing should be accepted (or rejected) and a species or ecological community should be listed, and under which category it should be listed;

There is no positive requirement on the Minister to declare critical habitat. The *Minister may* list habitat identified by him as being critical to the survival of a listed threatened species in a register. Currently there are only five entries on the register of critical habitat;

The *Minister* under section 201 *may* issue a permit authorising a person to take, trade, keep or move – or take an action that result or may result in the death or injury of, a member of a listed threatened species in or on a Commonwealth area. Then certain protective provisions of the EPBC Act (sections 196, 196A, 196B, 196C, 196D and 196E) will not be breached. A permit can also be granted by the Minister authorising a person to take an action that significantly damages or will significantly damage critical habitat for a listed threatened species in or on Commonwealth area. The Minister must, in deciding whether to issue the permit, have regard to any approved conservation advice for the listed threatened species, and must not issue the permit unless satisfied that [four conditions follow]. The Minister needs to be satisfied with only one of the conditions. The conditions are easily fulfilled, and the decision genuinely belongs to the Minister.

In particular the Minister may avoid responsibility for existing Matters of National Environmental Significance: he has the capacity to exempt actions potentially affecting MNES from environmental impact assessment and approval, because the implementation of the provisions is also contingent upon his decision. Despite the fact that these provisions confer one of the most important and potentially efficient power under the EPBC Act.

The *Minister* indeed must decide *whether the action* that is the subject of a proposal referred to him *is a controlled action* (75(1)(a)). That is to say whether the action requires approval. An action that a person proposes to take is a controlled action if the taking of the action by the person without approval would be prohibited by the provision. It is an offence to take a controlled action before it has been approved. The EPBC Act was amended in 2006, and section 78A now allows members of the public to request the Minister to reconsider his decision (the Minister decided that the proposed action was not a controlled action and therefore could be undertaken without approval, and a member of the public disagrees – or

the opposite). The Minister must reconsider his decision and give written notice and reasons of the outcome of the reconsideration.

In addition the *Minister* is also responsible for granting or refusing approval: after receiving the assessment documentation relating to a controlled action the *Minister may approve the taking of the action* by a person (133(1)). Section 131A provides that before the Minister decides whether or not to approve, for the purposes of a controlling provision, the taking of an action he *may* publish on the Internet the proposed decision and invite public comment. It is not specified that the Minister has to reconsider the proposed decision by taking public comment into account.

Section 391 provides that the Minister must consider the precautionary principle in making decisions, but it is impossible to prove that he didn't.

Conclusion:

A Minister who would not want, for example, to stop a development project for political reasons has therefore two ways out: he can consider that the action is not a controlled action and so can be carried out without his approval, or he can say that the action is a controlled action and then decide to approve it regardless of the significant impact.

The conditions placed on approvals are often not sufficient to mitigate environmental damage. A number of environmentally damaging actions have already been approved, as well as major developments, often with extensive conditions. "There seems to be a reluctance to use the powers under the EPBC Act given to the Minister to refuse development" (Environmental Defenders Office, May 2005).

At last the activities that pose the greatest threat to the Act's MNES are "rarely being referred to the Minister and when they are the Minister is not taking adequate steps to ensure appropriate conservation results" (The Australia Institute July 2005).

It is regrettable that environmental decisions may be influenced by political considerations. The Australian Koala Foundation, together with the Wilderness Society, is of opinion that certain activities should be “listed as prohibited activities”, without the Minister or anyone else having the possibility to allow them.

The responsibility of the Federal government should not be restricted to the 7 current MNES and to actions significantly affecting the environment on Commonwealth land and actions of Commonwealth agencies which have a significant impact on the environment anywhere in the world. Other matters should be subject to Commonwealth environmental assessment and approval, automatically in certain circumstances.

The fact that only the Minister can enforce some of the provisions is genuinely a flaw: as a result some major provisions of the EPBC Act, which could efficiently protect the koala if it was listed as a threatened species for example, may fail to be implemented. A single person should not be responsible for making all those decision and have all this power. A proper committee should be instituted. This would make the decisions more objective and less susceptible to be influenced by self-interest or pressure. The issue of biodiversity conservation is too important to be concentrated in the hands of only one individual. It is fundamental that this power is balanced so that no abuse of power – or the opposite, a passive Minister, is possible.

Assessment of the different possibilities under the EPBC Act to take action:

1) Including the koala in the threatened species list

Which provisions could the koala really benefit from if it was included in the list, and are they efficient to protect the species or its habitat?

As we have seen previously many of the provisions intending to protect threatened species would not be meaningful for the koala if it was listed as a threatened species because koalas are very rarely in or on Commonwealth area. Therefore the provisions relating to the permit system, critical habitat and conservation order will not be taken into account here.

In the EPBC Act's current form the following instruments under the Act could be used to protect the species:

a) Provisions specifically triggered by a "listed threatened species"

Recovery plan: the purpose of a recovery plan is the protection, conservation and management of a *listed threatened species*. It provides for the "research and management actions necessary to stop the decline of, and support the recovery of, the listed threatened species... concerned so that its chances of long-term survival in nature are maximized" (270(1)).

"The *Minister* must decide whether to have a recovery plan for a listed threatened species... within 90 days after the species becomes listed" or at any other time (269AA(1)).

A recovery plan must be made and in force within 3 years of the decision to have the plan. The Minister may extend the period within which a recovery plan must be made, for a maximum of 3 years (273(1) and (2)).

It would clearly be positive to have a recovery plan for the koala, because it must among other things: identify threats to the species, identify the habitats that are critical to the survival of the species and the actions needed to protect those habitats, and identify any populations of the species that are under particular pressure of survival and the actions needed to protect those populations (270(2)).

However the decision whether to have a recovery plan is contingent upon the Minister's will, so it might never happen. And even if the Minister decided to have one the period of up to 6 years before the end of which the recovery plan must be made and in force is too long.

A recovery plan binds the Commonwealth and Commonwealth agencies, which must not take any action that contravenes it, *but not individuals* (landowners for example).

At last the Minister may decide to revoke a recovery plan, but he must publish his reasons.

Conservation advice: an approved conservation advice is a “document approved in writing by the Minister that contains a statement that sets out the grounds on which the species is eligible to be included in the category in which it is listed, the main factors that are the cause of it being so eligible, and either: information about what could be done to stop the decline of, or support the recovery of, the species..., or a statement to the effect that there is nothing that could appropriately be done to stop the decline of, or support the recovery of, the species...” (266B(2)).

The Minister must ensure that there is approved conservation advice for each listed threatened species at all times while the species continues to be listed (266B(1)).

It seems that this provision is not of particular interest. Only *information* on what could be done to conserve the koala would be required, so this is not efficient if it is not followed by an action. Moreover this provision may be dangerous because it could advise that the koala is not longer eligible to be included in the threatened species list.

Commonwealth assessment and approval: the environmental protection provisions of the EPBC Act are triggered when an action has, will have, or is likely to have a significant impact on a Matter of National Environmental Significance. The action is then subject to a rigorous assessment and approval process. An action includes a project, development, undertaking, activity, or series of activities.

The Act currently identifies seven Matters of National Environmental Significance:

- World Heritage properties
- National Heritage places
- Wetlands of international importance (Ramsar wetlands)
- *Listed Threatened Species* and ecological communities
- Listed Migratory Species
- Commonwealth Marine areas
- Nuclear actions (including Uranium mining)

Actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land), and actions taken by the Commonwealth that are likely to have a significant impact on the environment anywhere in the world, may also trigger the operation of the EPBC Act.

If the koala was included in the threatened species list it would fall within one of the seven Matters of National Environmental Significance and therefore an action that is likely to have a significant impact on the koala would be subject to Commonwealth assessment and approval.

For example an action, such as land clearing needed for a development, which would “have the result to fragment an existing important population into two or more populations, adversely affect habitat critical to the survival of a species, or modify the availability or quality of habitat to the extent that the species is likely to decline” would fall in the category. A person who would take such action without an exemption or approval would be guilty of an offence (18A). The offence is punishable on conviction by imprisonment and/or a fine. Strict liability applies.

As we have seen the implementation of the provisions are contingent upon the Minister’s good will to protect the matters of national environmental significance. It means that he has the possibility, if he wants to, to allow a very damaging action to be carried out. The latest statistics on the application of the provisions are stunning: the activity report covering referrals, assessments and approvals during almost 6 years (from the commencement of the EPBC Act – the Act came into force on 16 July 2000, to the 30 June 2006), indicates that a total number of 1932 referrals have been made. 1434 of those referrals (74%) were declared “*not controlled action*”, that is to say didn’t require approval, 424 (22%) were declared “controlled actions”, 37 (2%) “lapsed or withdrawn before determination” and 37 “in process”. Regarding controlled actions approval: 148 proposals out of 152 (97.5%) were approved (138 with conditions, 10 with no conditions). Only 4 proposals (2.5%) were not granted approval. In addition many exemptions can be used to avoid the provision.

It should also be taken into account that damaging actions are not always referred to the Minister for approval, either because people are not aware of the legislation (although

“ignorance of the law is no excuse”), or are dishonest – the probability that the taking of an action is known is very low, and damaging actions often go unnoticed. Therefore the implementation of the provisions mostly relies in fact on the honesty of the person taking the action.

Only a limited number of persons are allowed to refer the proposal to the Minister, including of course certain authorities, in the rare case that they are aware that a person is intending to undertake a possibly damaging action:

- 1) *the person proposing to take the action,*
- 2) *a person on behalf of this person* for an action taken under a contract, agreement, arrangement or understanding – this is not permitted for actions taken under a “subcontract” or an agreement, arrangement or understanding “entered into for the purposes of a contract or another agreement, agreement or understanding”,
- 3) *a State, self-governing Territory or agency* of a State or self-governing Territory if they “have administrative responsibilities relating to the action”,
- 4) *a Commonwealth agency* – except in case of a proposal by the Commonwealth or a Commonwealth agency to take an action,
- 5) *the Minister* himself if he believes a person proposes to take an action that he thinks may be or is a controlled action may request referral of proposal from the person or from a State, self-governing Territory or agency... that he believes has administrative responsibilities relating to the action.

Moreover strict conditions are attached to this right (having administrative responsibilities relating to the action). The probability that the provisions are used is rather unlikely. However nothing prevents individuals to write letters to the Minister, to a Commonwealth agency... asking them to take action.

The formulation of the provisions could also be criticised for making the legislation weak. Section 68 “Referral by person proposing to take action” provides that:

- (1) A person proposing to take an action that the person thinks *may be or is a controlled action* **must** refer the proposal to the Minister for the Minister's decision whether or not the action is a controlled action.
- (2) A person proposing to take an action that the person thinks *is not a controlled action* **may** refer the proposal to the Minister for...

It is very convenient for a landowner to use section 68(2) in order to argue that he didn't have an obligation under the EPBC Act to refer the proposal to the Minister, because "he thought it was not a controlled action". It may be difficult to prove that the landowner was of bad faith, unless of course the action had very damaging consequences on a MNES. There is no penalty for breach of the provision.

This lessens the important power of the provisions and it would therefore be wise not to expect too much from them. Nevertheless when implemented the provisions would be very useful for the protection of the koala *and its habitat* (land clearing may not be approved, the great majority of approvals are *with conditions*), and it is noteworthy that they are applicable anywhere, including on private property.

b) Provisions the koala would benefit from simply because it is a "native species"

The koala, if listed, would still have the possibility to benefit from a threat abatement plan, whose aim is to reduce the effects of a key threatening process. The provisions relate to "listed threatened species" and "native species". The koala of course remains a native species.

Key threatening process and threat abatement plan: a process is a threatening process if it threatens, or may threaten, the survival, abundance or evolutionary development of a native species. The Minister must establish a list of threatening processes that are key threatening processes (183(1)).

A threatening process is eligible to be treated as a key threatening process if it could cause a native species to become eligible for listing in any category other than conservation dependent; or it could cause a listed threatened species to become eligible to be listed in

another category representing a higher degree of endangerment; or it adversely affects 2 or more listed threatened species (188(4)).

A threat abatement plan is very similar to a recovery plan, it provides for the “research, management and other actions necessary to *reduce the key threatening process* concerned to an acceptable level in order to maximise the chances of the long-term survival in nature of native species... affected by the process” (271(1)).

A threat abatement plan must among other things state the objectives to be achieved and specify the actions needed to achieve the objectives.

“The *Minister may* at any time decide whether to have a threat abatement plan for a threatening process in the list of key threatening processes. The Minister must do so within 90 days of the threatening process being included in the list; and within 5 years of the last decision... if that decision was not to have a threat abatement plan for the process”(270A(1)).

Section 273(4) sets a deadline of 3 years from the decision to have the plan for ensuring that a threat abatement plan is made and in force.

Once again the decision whether to have a threat abatement plan is contingent upon the Minister’s will, so it might never happen. Even if the decision to have a plan is taken there is also a very long (3 years) period during which making it and having it in force is not mandatory.

Having a key threatening process listed, without the creation and implementation of a threat abatement plan to reduce the effect of the process is pointless.

A threat abatement plan binds the Commonwealth and Commonwealth agencies, but it is not an offence for an *individual* to breach it. However if the koala was listed as a threatened species it would be protected under the MNES-related provisions (a landowner who would want to clear land that is koala habitat on his property would have to refer his intent to the Minister for assessment and approval). Even if no threat abatement plan is made for land clearing, indirectly landowners could in theory be prevented from clearing land or contravening a recovery plan (see above).

The Minister also may decide to revoke a threat abatement plan, but he must publish his reasons.

Conclusion:

It appears that the above provisions in the EPBC Act have many flaws. It would of course be positive if the koala was listed as a threatened species under the Act in 2008 when the Federal government will review its decision, but it would not be enough to save the koala. A different legislation would be needed because the protection afforded under the EPBC Act is weak, inadequate, and can be varied too easily. The implementation of some of the provisions is uncertain and unfair (see Ministerial discretion and exemptions). At the moment the application is too limited to provide a meaningful protection to the koala across its entire habitat range. The permit system and the applicability of many of the EPBC Act provisions (example the provisions relating to critical habitat and conservation orders, which refer only to Commonwealth areas) would need to be extended to the entire Australian jurisdiction, and especially to privately owned lands.

Furthermore the Minister's duty to keep the lists of threatened species and ecological communities up-to-date (section 185) was repealed by the 2006 amendments, and concerning the grounds on which the Minister can list species section 186(2) now provides that "in deciding whether to include a native species in a particular category (...), the only matters the Minister may consider are matters relating to: (a) whether the native species is eligible to be included in that category or (b) *the effect that including the native species in that category could have on the survival of the native species*". According to A. Macintosh from the Australia Institute the amendment allowing the Minister to "have regard to the effect of listing on the survival of the species... clarifies that the Minister could refuse to list merely on the basis that listing will not do much for the conservation of the species" and this needs to be removed. It provides indeed another excuse for the government to avoid its environmental responsibilities. How to be sure that the inclusion in the threatened species list will not stop the decline and/or increase the population of the species, when this species is considered eligible to be included in a threatened species category? It is impossible. The

Minister should never deny inclusion on this basis, especially because such inclusion can never hurt.

The “Scientific Committee and the Minister determine the timelines for completing the assessments [of an item to be included, in a threatened species list for example] and there is no limit. The timeline that is set can also be extended, but only for 5 years... [and] after the Minister receives an assessment he has 90 days to make a decision. However the Minister can extend the period indefinitely” (194P(3), 194Q(3)(4)).

Given these loopholes in the EPBC Act the inclusion of the koala in the threatened species list is *not due* to happen or to happen quickly, even if the koala without any doubt fulfilled the conditions under section 179: not to be “critically endangered” or “endangered” (a), and especially (b) to be facing a high risk of extinction in the wild in the medium-term future, and therefore would be eligible to be included in the vulnerable category under the EPBC Act.

2) Lobbying the Minister to implement a threat abatement plan to mitigate the effect of land clearing

Land clearing is the biggest threat to koalas in Australia. Without a minimum amount of suitable habitat and large areas of connected forest a koala population is not viable and koalas in search of a new home range are under threat. If the destruction of koala habitat could be reduced or stopped this would have a salutary effect on the koala. This is the first and necessary step to stop the decline and support the recovery of koalas in the wild.

Land clearance has been included in the key threatening processes list under the EPBC Act and the inclusion has become effective on the 4th of April 2001. Section 270A(2) of the EPBC Act provides that the Minister “must decide to have a threat abatement plan for the [key threatening] process if he or she believes that having and implementing a threat abatement plan is a feasible, effective and efficient way to abate the process. The Minister must not decide to have a threat abatement plan if he or she does not believe that”.

Before making a threat abatement plan the Minister must, among other things, consider the advice of the Threatened Species Scientific Committee. The Scientific Committee asserted that a threat abatement plan was not a “feasible, effective or efficient way to abate the process”. It argued that it would not be an *efficient way* because it believed that the plan “would not contribute any additional threat mitigation over and above current initiatives, would involve setting up further consultative working groups, and would be duplicative of best practice already stated in the National Framework [for the Management and Monitoring of Australia's Native Vegetation]”. Indeed according to the Committee “in the last three and a half years (since the nomination was prepared), there have been many changes in land clearing policies and regulations in Australia. Examples include: drafting and endorsement of the National Framework for by the Australian and New Zealand Environment and Conservation Council; introduction of the *Native Vegetation Conservation Act 1997* in NSW; and introduction of the *Queensland Vegetation Management Act 1999*”. The Minister followed the Committee advice. There is no threat abatement plan to reduce the effect of land clearing at this date. Without the preparation and implementation of a threat abatement plan, the inclusion of land clearing as a key threatening process remains a paper tiger, there are no benefits obtained.

The Minister may at any time change his mind and decide to have a threat abatement plan for land clearing. In addition the Minister must reconsider the decision within 5 years of the last decision if that decision was not to have a threat abatement plan (270A).

If a threat abatement plan for the purpose of progressively stopping land clearing was made and implemented it surely would protect many habitats and would increase the chances of long-term survival of many species in the wild. But would it protect *koala habitat* from land clearing? It appears that a threat abatement plan binds only the Commonwealth and Commonwealth agencies (268), but not individuals. Considering that 80% of koala habitat is located on privately owned land the provision alone doesn't seem to be able to benefit the koala. Koala habitat could still be harmed by landowners, who can legally take an action that contravenes a threat abatement plan. Unless the koala is listed as a threatened species or falls within a MNES it will not be protected from certain land clearing. At last, it is very unlikely, politically, to happen. Conclusion: it is not advisable to lobby the Minister to implement a threat abatement plan to mitigate the effect of land clearing.

3) Adding a Matter of National Environmental Significance

Despite the opposability of many exemptions and the fact that the Minister through Ministerial discretion can override the environmental assessment provisions of the EPBC Act and approve a damaging action, it would still be extremely valuable to have the possibility to trigger this provision to protect the koala and its habitat. Actions likely to have a significant impact on the koala may be prohibited.

How are MNES adopted?

There are two options: adding MNES by regulations, made by the Governor General (section 25 and 520), or amending the EPBC Act.

Section 25(4) under subdivision G – Additional matters of national environmental significance, provides that “the regulations may prescribe different things as matter protected by this section [Matter of National Environmental Significance] in relation to different actions prescribed for the purposes of subsection (1)”.

Before the Governor-General makes regulations there is a requirement under section 25(3) for the environment Minister to notify the appropriate Minister of each State and self-governing Territory of the proposed amendment and seek their comments. However the agreement of the States is not needed to add a MNES. Section 25(3A) provides that regulations may be made “even if no agreement is reached on the matters described in paragraph (3)(d)”.

The Constitutional division of powers between the States and the Commonwealth constrains the subject of the MNES that may be added. The Commonwealth Constitution gives the Commonwealth Parliament the power to legislate on a limited list of topics (“enumerated powers”) and only them. The “environment” is not on the list and the Commonwealth has therefore no explicit Constitutional power to legislate in relation to the environment. Fortunately it is possible to rely on the “external affairs power” topic to create or amend an

environmental legislation. Article 51 under Part V – Powers of the Parliament, of the Australian Constitution provides that the Parliament shall “have *power to make laws* for the peace, order, and good government of the Commonwealth with respect to: (xxix.) External Affairs”.

An international treaty or convention, and Australia’s obligation under it, is considered an external affair. The Governor General may make regulations to the EPBC Act, and the Commonwealth Parliament has the power to legislate, and could amend the EPBC Act to add a MNES, if:

(1) *It would give effect to an international treaty or convention.*

(2) *There is an obligation on Australia under an international treaty or convention.*

Section 25(5) provides that the following action (among others) may be prescribed for the purposes of an additional MNES: (e) [action] whose regulation is appropriate and adapted to give effect to Australia’s obligations under an agreement with one or more other countries. Therefore the Commonwealth may add matters of national environmental significance where the proposed MNES would implement an obligation under an international agreement or treaty involving Australia.

Section 25(6) provides that the regulations must specify the agreement.

Regulations made in relation to an agreement that has not entered into force for Australia are not to come into operation on a day earlier than the day on which the agreement enters into force for Australia (520(4)): the regulation can come into operation only if the agreement has entered into force.

The Australian Koala Foundation recommends using the *Convention on Biological Diversity 1992* to allow the Commonwealth to legislate. This Convention is the most suitable agreement for the purpose of adding a MNES, and is specifically referred to under section 520(3): “regulations may be made for and in relation to giving effect to any of the following agreements: (i) the Biodiversity Convention”. There are currently 190 parties to the Convention. The Convention entered into force on 29 December 1993. Australia is a party to it since 1993 by ratification. Its objectives, to be pursued in accordance with its relevant provisions, are (among others) the *conservation of biological diversity* and the sustainable

use of its component (article 1). The Convention also provides that the *States* (countries) are responsible for conserving their biological diversity and for using their biological resources in a sustainable manner.

The article 8(k) of the Convention imposes an obligation to each Contracting Party to “as far as possible and as appropriate: develop or maintain *necessary* legislation and/or other regulatory provisions for the protection of threatened species and populations”. The koala being on the brink of becoming nationally threatened, amending the EPBC Act to add a new MNES is necessary to grant the species an efficient protection at last.

Would public pressure be useful to have a new MNES added?

Public pressure and especially international pressure would certainly be efficient in order to achieve our aim. The members of the Parliament and the government (the Governor-General) cannot ignore the importance and necessity of protecting the koala when the international community is pleading this cause. Pressure has been successful in the past. See for example the fact that the “originally “inevitable” cull [of eastern grey kangaroos living in the Wacol area] will not take place in the near future. This demonstrate what the community at large can achieve when it clearly express its concerns”. “The battle in favor of a ban on duck and quail hunting was won in the same way”, on community pressure (calling or writing to the local Councilor, State or Federal member, authorities or organizations involved). Jean-Pierre Jacquet, Wildlife Preservation Society of Queensland, May 2007. Hence the importance of generating and sustaining a national movement, which would mobilise public opinion.

However an “annoying” pressure may also have a perverse effect. A simple media campaign may have a better chance of succeeding. Too many people (including members of the Parliament) are unaware of the fact that koalas are in danger.

Moreover given the tremendously appealing image of the koala, refusing to protect it might give a negative image of the politician. See the culling proposal of the South Australian government in 1996 to reduce the number of koalas on Kangaroo Island. This has met with “fierce opposition both domestically and internationally. The popularity of the koala has made the possibility of a cull politically improbable, with any negative perception likely to

impact tourism and a government's electability.” It should not be difficult to engage international support. Having a politician supporting our ideas would make even more publicity and would be profitable.

Conserving biodiversity is extremely important, the future of the Planet depends upon it, and the koala should be protected with the help of every country. The world needs to protect the koala, not only Australia. This idea is expressed in the Convention on Biological Diversity: “stressing the importance of, and the need to promote, international, regional and global *co-operation* among States and intergovernmental organizations and the non-governmental sector for the *conservation of biological diversity* and the sustainable use of its components”. The article 5 of the Convention also provides that each Contracting Party shall, as far as possible and as appropriate, “co-operate with other Contracting Parties, directly or, where appropriate, through competent international organizations, in respect of areas beyond national jurisdiction and on other matters of *mutual interest*, for the conservation and sustainable use of biological diversity”.

“Species of national cultural significance” as MNES

The following articles of the Convention on Biological Biodiversity are relevant:

Article 7 – Identification and Monitoring.

“Each Contracting Party shall, as far as possible and as appropriate, in particular for the purposes of Articles 8 to 10:

- (a) Identify components of biological diversity important for its conservation and sustainable use *having regard* to the indicative list of categories set down in *Annex I*;
- (b) Monitor, through sampling and other techniques, the components of biological diversity identified pursuant to subparagraph (a) above...;
- (c) Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques”

Article 8 – In-situ Conservation.

“Each Contracting Party shall, as far as possible and as appropriate:
 (l) Where a significant adverse effect on biological diversity has been determined pursuant to Article 7, regulate or manage the relevant processes and categories of activities”

Article 14 – Impact Assessment and Minimizing Adverse Impact.

“Each Contracting Party, as far as possible and as appropriate, shall:

(a) Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects”

Biological diversity is defined in the article 2 of the Convention as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”. The koala clearly can be defined as a *component of biological diversity*. Moreover the species is without doubt *important for the conservation and sustainable use of biological diversity* (article 7(a) and (b)). A reference is made in these articles to the Annex I, which comprises species and communities of “social, scientific or *cultural* importance”, which the koala undoubtedly also is. This gives Australia, as a Contracting Party, an obligation to identify and monitor the koala.

There is, indirectly, an obligation under the Convention on Biological Diversity to *identify* and *monitor* species of cultural importance, *when* they are a component of biological diversity important for the conservation and sustainable use of biological diversity. But is this enough to argue that there is an *obligation on Australia* to *protect* such species of cultural importance? Yes. The aim of the obligation to identify these species is to *conserve biological diversity*, including the species themselves (“identify components of biological diversity important for its conservation...” (article 7(a)), and while monitoring [the components of biological diversity important for...] “particular attention to those requiring urgent *conservation* measures” must be paid (article 7(b)). The value of certain *species of cultural importance* is acknowledged, and the necessity of their protection (if required because the species is threatened or near being threatened) is implied.

In addition the concept of MNES, requiring Commonwealth assessment and approval before an action that has, will have, or is likely to have a significant impact on one of the seven listed MNES can be undertaken, can be seen as an implementation of the principles of the article 7 (c), 8 (l) and 14 (a) of the Convention on Biological Diversity requiring each Contracting Party to “*identify processes and categories of activities* which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity [the koala, as a component of biological diversity], and monitor their effects...”, “*introduce appropriate procedures* requiring environmental impact assessment of [the Party’s] proposed projects that are likely to have significant adverse effects on biological diversity with a view to *avoiding* or minimizing such effects”, and “where a significant adverse effect on biological diversity has been determined pursuant to Article 7, *regulate or manage* the relevant processes and categories of activities”.

But although the EPBC Act defines the word action (section 523 provides that an action includes a project, development, undertaking, activity or series of activities and an alteration of any of these things) and strengthens the conditions by requiring assessment *and approval* which is more severe than just a regulation or management by the Contracting Party, the Act operates on a case by case basis instead of identifying *processes and categories of activities* (although the article 14 of the Convention also refers to “proposed projects”).

Nonetheless the aim is clearly the same, preventing a reduction in, or loss of, *biological diversity* from occurring. See the different categories of MNES including wetlands of international importance, listed threatened species and ecological communities, listed migratory species and Commonwealth marine areas. These MNES are protected, by possibly prohibiting the taking of an action that would have a significant impact on them.

These obligations, combined with the recognition of species of cultural importance under the Annex I, give the possibility to add a new MNES entitled “species of national cultural significance” under the EPBC Act, in order to protect the koala. In accordance with section 25(4) and 25(5)(e) the regulation [adding a new MNES – Species of national cultural significance] would be “appropriate and adapted to give effect to Australia’s obligations under an agreement with one or more other countries [the Convention on Biological Diversity]”.

If it was added it would mean that, if a landowner wishes to clear his land and the land is koala habitat, he would have to obtain Commonwealth approval prior to the action, if the level of clearing is such that it is likely to have a significant impact on the koalas. So the legislation may prohibit broad scale land clearing.

The landowners would not like a regulation of land clearing, but here the words “land clearing” do not appear in the legislation. The change in the legislation is more susceptible to go unnoticed and not stir up controversy.

However this is rather unlikely to happen because compliance with international agreements is essentially voluntary. There is nothing that other Parties, lobby groups, non-government organisations or individuals can do to have an international convention enforced even though the Contracting Party they are from has obligations under it, and they cannot force the Minister to implement it. Only the *Minister* can decide to exercise this power.

“Species of national economic value” as MNES

Given the reference made in the Annex I under the Convention on Biological Diversity to “species of medicinal, agricultural or other *economic value*” and for the reasons stated above, it is also legally possible to include a new MNES entitled “species of national economic value”. It would be worth lobbying the Governor General and it may have a better chance to succeed. The Governor General cannot deny the fact that koalas are extremely valuable to Australia. In 1997 the AKF commissioned the Australia Institute and the University of Queensland to undertake a study entitled “Koala and Tourism: An Economic Evaluation”. The aim was to define the economic role of the koala and to put a dollar value on the contribution of koalas to the Australian tourism industry.

The study consisted of a survey of 419 departing foreign tourists, constituting a representative sample. Among the most compelling arguments the study stated that:

- 67% of respondents said that nature based activities were quite or very important to their experience in Australia

- 65% of inbound tourists said that they hoped to see a koala when making the decision to come to Australia
- For around 75% of overseas tourists, koalas played a part in their experience in visiting Australia, and possibly in their decision to come to Australia.
- When asked whether they would have changed their decision to come to Australia if there were no unique wildlife 11% said yes
- Koalas were (and still are) the major wildlife attraction. When asked which animals they particularly wanted to see in Australia 72% of respondents nominated koalas. Along with kangaroos (66%), koalas were by far the most popular creature
- 14 700 to 29 500 people were directly supported in employment due to the attraction of wildlife to overseas tourists. Much of this can be attributed to koalas. 9000 jobs were directly accounted for by koalas

Evidence carried out in this study suggests that koalas have an iconic status in attracting foreign tourists. There is a genuine “koala industry”, which comprises a very wide range of services and products which either directly or indirectly rely on koalas: visiting wildlife parks, zoos and sanctuaries to view koalas, photographs taken holding a koala, transport of visitors to places to view koalas. All this generates money. Other elements of expenditure by overseas tourists in Australia that can be attributed to the koala include accommodation and food for visitors who are going to see koalas, using the image or name of the animal to sell products, and purchasing souvenirs featuring a koala.

As a result the study showed that in 1996 revenue of \$1.1 billion was injected into Australia’s economy by foreign tourists who came to see koalas. These numbers have undoubtedly increased over the last decade and are expected to continue to grow, as overseas tourism in Australia is rising continually.

As stated in the study a large and rapidly growing part of the Australian economy has been built on the promotion of images of exotic fauna and outback expanses. As a result, the future of the tourism industry now depends heavily on the protection of Australia’s natural environment. Not protecting the environment would have very damaging consequences for wildlife species and can lead to their extinction; this would ultimately have a cost, loss in tourism revenue among others.

“Nationally significant vegetation” as MNES

The following articles of the Convention on Biological Biodiversity 1992 are relevant:

Article 7 – Identification and Monitoring.

“Each Contracting Party shall, as far as possible and as appropriate, in particular for the purposes of Articles 8 to 10:

(c) Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques”

Article 8 – In-situ Conservation.

“Each Contracting Party shall, as far as possible and as appropriate:

(c) *Regulate or manage* biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;

(d) *Promote the protection* of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;

(l) Where a significant adverse effect on biological diversity has been determined pursuant to Article 7, regulate or manage the relevant processes and categories of activities”

Article 14 – Impact Assessment and Minimizing Adverse Impact.

“Each Contracting Party, as far as possible and as appropriate, shall:

(a) Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects”

Biological resources (article 8 (c)) are defined in the article 2 of the Convention as including “genetic resources, *organisms* or parts thereof, populations, or any other biotic component of ecosystems with actual or potential use or value for humanity”. Trees and forests threatened by land clearing clearly fall into this category.

Here the basis allowing the Federal government to add a new MNES entitled “nationally significant vegetation”, beyond articles 7 (c), 8 (l) and 14 (a) which are the foundation for allowing a new MNES to be created, are formed by the articles 8 (c) and (d). These articles are clearly aiming at protecting the vegetation *in order to* ensure the survival of wildlife species. Certain vegetations, because they are necessary to certain species, are significant and must be protected. The articles could be used to claim that Australia has an obligation under the Convention on Biological Diversity to protect koala *habitat*.

The Convention also provides that “the fundamental requirement for the conservation of biological diversity is the *in-situ conservation of ecosystems and natural habitats* and the maintenance and recovery of viable populations of species *in their natural surroundings*”. It is fundamental to conserve natural habitat and the transfer of remaining threatened species to zoos for example, for conservation purposes must be avoided.

The EPBC Act would go further and specify which vegetation is “nationally significant”. Besides the fact that the vegetation is *habitat to a listed threatened species*, the *type* of the vegetation would make it nationally significant, or its *old age* for example.

An action such as land clearing would trigger the operation of the provisions if it has a significant impact on a “nationally significant vegetation”. The amount to be cleared would not necessarily be taken into account to assert that the impact is significant. For example even if only one very old tree was likely to be destroyed this would be enough to trigger the operation of the Act, and Commonwealth assessment and approval would be required.

Other arguments in favour of the theory that we could rely on the Convention on Biological Diversity to amend the EPBC Act to indirectly prohibit land clearing include the fact that the Convention is “concerned that biological diversity is being significantly reduced by certain *human activities*” and according to the Convention it is “vital to anticipate, *prevent* and attack the causes of significant reduction or loss of biological diversity at source”. The fact that environmental assessment and approval is required under the EPBC Act before a damaging action can be undertaken would indeed in theory prevent land clearing, which is undoubtedly the biggest cause of reduction of biodiversity, from being undertaken.

Even though the Commonwealth Parliament and the Governor General have the power to legislate to protect the habitat of species from actions causing significant damages, and it is legally possible to regulate or amend the EPBC Act to include “nationally significant vegetation” as a MNES, it is very unlikely politically to happen, given the strong opposition of the forestry sector and the landowners. See the fact that the Scientific Committee and the Minister have not wished to prepare and implement a threat abatement plan to reduce the effect of land clearing, which is already on the list of key threatening processes under the EPBC Act. Moreover the koala would have to be included in the threatened species list to benefit from the provision.

Key inadequacies under the revised 2006 version of the EPBC Act, with regards to the protection of the koala and its habitat:

- **The power in the hands of the Minister is far too important.** Most of the time he is the only one who decides, or he has the last word. There is no verification. The deadlines can be extended.
- **The criteria for inclusion of a native species in a threatened species category can be criticised.** The Minister can only consider whether the native species is eligible to be included in the category, or *the effect that including the native species in that category could have on the survival of the native species*. The inclusion cannot have a negative effect, and it is impossible to foresee that it will not save the species. Refusing the inclusion on this ground is absurd. However this gives a good excuse to a Minister who would not want to include a particular species.
- **Many provisions of the EPBC Act only protect the species when it is “in or on Commonwealth area”.** This is the case notably regarding the permit system, for listed threatened species. Therefore even if the koala was listed the killing etc of the species without a permit would not be prohibited under the EPBC Act *outside* a Commonwealth area (a landowner’s private property for example). The koala however is protected under other State legislations.

- **When the MNES provisions (assessment and approval) are triggered the outcome is almost never an interdiction** to undertake the action. See the statistics: 74% of referrals were declared “not controlled action” – the Minister decides they do not require to be approved; *97.5% of controlled actions were approved* (although the great majority was approved with conditions). Only 4 proposals were not granted approval, out of 152. Also only 1932 referrals have been made in 6 years (around 300 each year), which is few for all of Australia.
- **The EPBC Act doesn't protect koala habitat.** There are only 5 entries on the register of critical habitat under the EPBC Act; and damaging critical habitat is an offence only if the habitat is in or on a Commonwealth area. The provisions are only for listed threatened species. The planners and developers are free to destroy koala habitat (although at State or local government level the legislation may protect koala habitat. Example the Environmental Planning Policy No 44 in NSW).
- **From the 17 key threatening processes currently in the list only 10 triggered the creation and implementation of a threat abatement plan.** The other 7 remain a mere expression on a list.

CONCLUSION:

In every instance the Australian Koala Foundation recommends that a National Koala Act be written and the bill passed and enacted by the Parliament.

Among the most important reasons is the fact that economic incentives for landowners are fundamental, and they are not provided under the EPBC Act. 80% of koala habitat is on privately owned land: landowners have to be targeted. Most of them would be very interested in this initiative, either because they love animals but cannot afford to protect

them without financial (and material) assistance, or simply because they don't earn enough money and would really appreciate to pay less tax for example.

It would be very positive that the EPBC Act also be amended, in addition to having a National Koala Act. The two Acts would be complementary. The EPBC Act notably has the power to sanction the persons who breach the provisions, whereas under the National Koala Act private landowners would only have incentives to protect the koalas and would not be prosecuted for harming koalas or their habitat on their land.

Considering the likelihood that the proposal is passed (MNES) or accepted by the Minister and implemented, and the extent to which it would benefit the koala, the AKF advises in order of priority:

1. Listing the koala as a threatened species, in the vulnerable category

(the assessment and approval provisions of the EPBC Act *plus* other provisions may be triggered)

2. Creating and adding a new MNES, preferably “species of economic value”

(*only* the assessment and approval provisions may be triggered to protect the koala)

Having the RFA exemption removed would also be a very useful achievement.

Lobbying the Minister to implement a threat abatement plan for land clearing is not advisable.

Considering that the Scientific Committee, and the Minister, form their opinion based on their own assessment of the situation and do not truly take into account the data and evidence gathered by non-governmental organisations no more effort should be made to have the koala listed as a threatened species under the EPBC Act. The Federal government will review its decision in 2008.

II) Creating a new legislation – the National Koala Act

Given the intrinsic inability of the EPBC Act to effectively protect the koala, and the failure by all governments to adequately research and to save the species the Australian Koala Foundation decided that it is necessary to create new legislation – the National Koala Act. It is anticipated that the outline for such a document will be created in August of 2008.

The National Koala Act needs and would have a three pronged approach: biodiversity, planning powers and taxation incentives for private landowners.

Part 1. Biodiversity

As we have seen the current State laws are not sufficient to achieve the protection of the koala or its habitat, and Federal government regulation is required. The National Koala Act would afford legislative protection at *Federal level* to the koala and other species not protected adequately or sufficiently under the EPBC Act.

The National Koala Act would be specifically designed for the protection of the koala and koala habitat and would also aim at conserving biodiversity. The controversy about whether or not a species is “threatened”, which prevents the koala for example from being protected under the EPBC Act, does not take place.

The koala would be the inaugural species. The National Koala Act would set a precedent and other species would also be protected by the precedent created.

Koala to lead the way

The focus would be on the koala because of its iconic status. It is already adored by the public and would successfully attract attention and sympathy. Because of its high profile and

special place in the hearts of Australians and people all over the world, the koala may be the only native Australian species capable of inspiring this legislation.

Koalas have to be protected because they play a major role in the Australian ecology. They are part of our natural ecosystems, and possibly no-one has any idea of how important they are for the health and survival of the Australian bush.

In addition there are also strong economic reasons for ensuring the protection of koalas. They are an extremely important part of Australia's unique wildlife that tourists come to see. The first part of this document outlined compelling arguments. Nonetheless as stated in the study "Koala and Tourism: An Economic Evaluation" ethical considerations should be sufficient motivation to protect Australia's biological diversity.

The establishment of a precedent

It is expected that if the National Koala Act's initiatives were implemented they would have a positive effect on Biodiversity conservation that would be far greater than the preservation of the koala and its habitat. By means of a precedent the legislation would pave the way for other species to be identified and protected in Australia, and allow them to enjoy the benefits of sharing the koala 'conservation umbrella'.

The National Koala Act would compensate for what is missing in the EPBC Act (planning powers and tax incentives being the most important) and would be flexible, using different methods likely to satisfy the landowners.

Part 2. Planning

The National Koala Act would primarily aim at securing koala habitat. Indeed in order to save the koala protecting the existing koala habitat is a first and necessary step to achieve. After the damage is done it is too late, it would take years to recreate a habitat that has been destroyed (for example by planting trees). The second step will be to restore and improve the existing habitat.

In order to protect and effectively manage koala habitat the National Koala Act would have *powers over Planning Codes* (portion of a municipal ordinance that regulates the development and use of land within a jurisdiction), at Federal, State and local government level. It would then be able to prohibit planning and zoning review impacting on areas of koala habitat. At the moment each Council has its own set of rules. The Act would prevail over all the authorities, so that the different set of rules would be unified.

Koalas are very difficult to plan for, because of their specificities. The current planning does not prevent the koalas from being harmed. It fails to protect koalas because their existence and nomadic way of life was clearly not taken into account when designing or approving rezoning proposals or development applications. Developments damaging koala habitat or constituting a threat (road) are not prohibited and developers have been able, legally, to change the zoning by putting pressure on Councils. They undertook developments almost wherever they wanted. This has to stop.

It is time to acknowledge the fact that, due to the destruction of 80% of their original habitat, koalas were forced to live alongside people in urban areas. The Australian Koala Foundation claims that “koalas are not living in our backyards, we have moved into theirs”. Therefore “property owners have a special responsibility to take the particular needs of koalas into consideration in their lifestyle”. This should be the same for planners and developers in their profession. It is fundamental to prohibit urban development which requires land clearing within or adjacent to areas of primary and secondary koala habitat.

The National Koala Act would bind the planners and the developers by new Planning Codes incorporating provisions specifically designed to protect koala habitat.

Creation of a Koala secretariat

The Koala secretariat, based in Canberra (Federal level), would be the only authority with powers to manage koala habitat and regulate its use. It would be responsible for the protection of koala habitat and would:

- identify and map koala habitat including critical habitat that requires protection from threatening processes;
- prioritise habitat areas for protection through either regulatory or incentives measures;
- prioritise areas for habitat restoration;
- identify the location and distribution of known koala populations;
- identify threatening processes;
- specify measures to protect habitat including critical habitat;
- specify necessary actions to address threatening processes;
- outline a range of suitable incentives measures;
- provide for priority research requirements;
- provide for habitat restoration in priority areas;
- provide for ongoing monitoring and review
- implement conservation strategies
- undertake assessment of possible koala habitat and decide whether a land is koala habitat
- decide whether a proposed action would have a significant impact on the koala or koala habitat
- give approval to certain land clearing and other activities, or suggest plans of management and other activities if the land clearing is likely to have a significant impact on the koala or koala habitat

A landowner who suspects that his land is koala habitat and who wishes to take an action that will have a negative impact on the habitat, for example deforestation, would have to refer his intention to the Koala secretariat for approval.

The Koala secretariat would be in possession of up-to-date maps indicating accurately where koalas occur. It would assess the land through different techniques and decide whether this particular land is koala habitat.

- *If the land is not koala habitat* the landowner would be free to undertake the action, provided that this action is not prohibited under another legislation.
- *If the land is koala habitat* the Koala secretariat would assess the impact of the proposed action and decide whether it would have a significant impact on the koala or koala habitat. If it would have a significant impact the koala secretariat would not approve it. If the impact is minimal the Koala secretariat may approve the action. Conditions may be attached to an approval, and incentives devised for a solution.

If the Koala secretariat disapproves the action it would suggest a management plan for the property, and a wide range of other activities to the landowner, which would compensate for the loss of use of his land and therefore loss of income, and the fact that the land is worth less money if it cannot be developed. For example a different crop, a different cattle or animal to raise, or the creation of a tourist attraction “koala observation”. Ideally a landowner should be able to make more money when he doesn’t harm the land. The Koala secretariat and the landowner would work together to increase the landowner’s income while protecting koala habitat on the property.

The landowner would be free to undertake the action even if the Koala secretariat considered it would be damaging. The Koala secretariat would try to find a compromise with the landowner, and would try to deter him from taking the action. For example it would explain in vivid details what would happen to the koalas if their habitat was cleared.

The Koala secretariat would also keep watch over koala habitat through locally implanted staff and the cooperation of the public: anyone who is aware of a threatening development or land clearing, to anticipate such action in koala habitat areas and try to prevent it – it is expected indeed that landowners may not always refer their intention to the Koala secretariat.

At the moment koala populations surviving along the eastern seaboard are under immense pressure from development and expanding urbanisation. The Koala secretariat would enforce the legislation. It would for example check that approved plans submitted by *developers* do not threaten koala habitat. They may for example want to clear land that is koala habitat, in order to build on it. Criterion would be determined under the provisions of

the National Koala Act for assessing development that impacts on the koala and on koala habitat.

A conservation strategy would specify and provide for the research and management requirements to ensure the long-term survival of the species in nature. Provisions relating to the preparation, content, adoption, implementation and review of the strategies would be contained within the National Koala Act. Provisions in relation to the strategies would require their preparation and adoption within set short time limits.

It should be noted that in Australia native animals are “the property of the Crown”, and therefore even if they live on a private property they don’t belong to the landowner. No-one in particular owns them or has a right on them, and *landholders cannot make money out of the presence of wildlife unless they are granted full property right*. This is similar to a tour operator requiring a licence to generate money by allowing tourists to feed wild dolphins or watch wild penguins.

Professor Clem Tisdell, School of Economics, University of Queensland, in the article *Economic incentives to conserve wildlife on private lands* states that, depending on the species, “the best way to encourage private landholders to conserve wildlife is for governments to give them private property rights in wildlife, strengthen these rights where they exist, and promote the operation of free markets in the exchange and use of wildlife on private lands”.

As a result indeed wildlife will have a commercial value for landholders, who can appropriate economic benefits from the species and may be able to obtain more income from wildlife, through wildlife-related economic activities (viewing...) on their land than otherwise. Private property rights enable landowners to market wildlife, the species and its habitat become assets to the landowner. Thus the aim of sustainable commercial use of the black cockatoo on private land is stated to be to “promote retention and management of habitats on private lands and establish with landowners the concept that wildlife, wildlife habitats and biodiversity in general can be valuable economic assets worth considering” (Parks and Wildlife Commission of the Northern Territory, 1997).

On the contrary when the business is not based on the economic utilisation of wildlife because private property right has not been given, and no adequate economic returns can be obtained, most landholders will not protect the species. When developing other activities on their land they “can be expected to destroy the habitat of some wildlife species and reduce biodiversity”.

However the granting of private property rights to landholders cannot provide an effective economic incentive for the conservation of all species. Only some wildlife species are likely to be protected by landholders: those possessing “high *economic use value*, low mobility or low cost of confinement to a private property, and not requiring a very large geographical range for their survival”. Non use economic value cannot be marketed and made private property.

The koala may not be the best candidate, although it is highly popular and has a high economic use value, because the species is mobile and requires large areas of connected forest. It would be therefore important that the landholder has private property rights to the species *while it is on his or her land*, and that the land is part of an important koala habitat.

Moreover “even in cases where a private landholder is able to appropriate all, or a substantial part of, the economic value of the wildlife species, the landholder may not find it profitable to conserve the species. An alternative land use incompatible with survival of the species may be more profitable”, and “in some localities husbandry of existing domesticated or cultivated species will continue to be preferred by private landholders to the commercial use of wildlife species”. It is important to convince landholders that, despite what they think, they can obtain important benefits from habitat restoration and preservation, and obtain more income. Cooperation is also fundamental in the success of the project. According to the article non-governmental organisations should be involved and contribute some funds, and volunteers provide labour, to reduce the necessary public outlay.

Developers required to prove that their project will be neutral to the environment

At the moment the burden of proof is on those, NGOs, environmentalists, conservation groups etc who want to stop a development project because they think it has a negative impact on the environment. *They* have to collect evidence and must act to have a chance to stop the project. Unless the action has a significant impact on one of the seven MNES under the EPBC Act environmental assessment is not required, and a damaging project may be carried out.

The Australian Koala Foundation is of opinion that this is unacceptable in light of the growing threats of climate change and global warming. Climate change is caused by human activities, among which greenhouses gas emissions. When trees are cleared to allow development not only does this return the stored carbon to the atmosphere, but also the trees will not be there anymore to soak up carbon dioxide. If the National Koala Act was enacted the *developers* would be subject to an obligation to *prove* that their development project is neutral to the environment, or would not be granted the development permit. The importance of global climate is therefore taken into account before making a decision to approve a development project. The burden of proof is reversed.

As a result the developers, if their project is not considered neutral to the environment, would have to offset the greenhouse gas emitted – carbon dioxide for example. Carbon offsetting works by reducing emissions elsewhere. It can be achieved by paying a landowner to plant trees to absorb and store carbon dioxide, or by avoiding deforestation somewhere else. This is the idea of the “biobanking”: “developers will be able to build on environmentally sensitive land... that will allow them to offset the damage by protecting plants and animals elsewhere. It enables developers to buy credits created through land conservation elsewhere - either by the developer or another landowner - to offset a housing project on sensitive land”.

However a development on a land that is or adjoins koala habitat should be prohibited (see below). Nothing could suitably offset the destruction of koala habitat and the death of the koala population concerned. This should be the same regarding the habitat of any other threatened species. The Threatened Species Amendment (Biodiversity Banking) Bill 2006, amending the Threatened Species Conservation Act 1995 (NSW) and passed in November

2006 by the NSW Parliament, raised concern among the environmentalists. The aim was to establish a biodiversity banking and offsets scheme (the *biobanking scheme*), which has the following key elements (among others):

- a) the establishment of biobank sites on land by means of biobanking agreements entered into between the Minister for the Environment and the owners of the land concerned,
- b) the creation of biodiversity credits in respect of management actions carried out or proposed to be carried out on or in respect of biobank sites that improve biodiversity values,
- c) a system that enables those biodiversity credits, once created and registered, to be traded (including by being purchased by developers) and used as an offset against the impact of proposed development on biodiversity values.

According to Gate Faehrmann, executive officer of the Nature Conservation Council, “the new law allows developers to clear habitat that could be home to threatened species... we are extremely disappointed the Government has passed this legislation, at a time when our precious environment needs protecting more than ever”. The Sydney Morning Herald, following the announcement that the bill had been passed, pointed out that “the passage of the bill followed revelations the Government had dropped its investigation of alleged illegal land clearing by Hardie Holdings, a big player in biobanking”.

In the first place developers and companies should avoid or seek to reduce their own greenhouse gas emissions, instead of “buying a licence to pollute through tree planting schemes” (Jeff Angel, Total Environment Centre). Nevertheless, when the development does not damage a threatened species habitat and therefore can be suitably compensated, it is an important solution.

Planners bound by planning guidelines for koala conservation – site level planning

Koala conservation requires habitat protection and management. It is fundamental to incorporate koala habitat conservation into the planning process: an appropriate environmental zoning is a necessary and effective instrument to protect koala habitat. Koala habitat would also be taken into account when assessing, planning and implementing development applications.

Local government planners and other authorities would be bound by the criteria specified in the *planning guidelines for koala conservation and recovery* when designing and introducing rezoning proposals or development applications within and around areas that support koalas. Therefore a Council would have to be satisfied that the land is not koala habitat or adjoining koala habitat before it grants consent to, for example, an application for consent to carry out a development in relation to areas of koala habitat.

The compatibility of *rezoning proposals* with koala conservation planning requirements, and the appropriateness of rezoning requests would be assessed. There would be performance standards for rezoning proposals.

Prior to approving any rezoning proposal the local government would have to be satisfied that possible future development or activity in accordance with the requested rezoning will:

- not allow for an intensification of land use or development within areas of primary and secondary (class A) koala habitat or habitat buffers,
- allow for only low impact development within areas of secondary (class B) and secondary (class C) koala habitat or habitat linking areas over existing native vegetation,
- be unlikely to result in the removal of any primary or secondary koala food trees,
- not result in development that would impede or stop koala movement across the site. Potential impediments include medium-high residential and industrial development, roads, and other urban infrastructure which create barriers to koala movement, and
- be consistent with the strategic planning guidelines

Current zonings that contravene the legislation would be phased out.

Planning and development applications would also have to be compatible with koala conservation planning requirements. This compatibility and the planning and development applications would be assessed.

There would be performance standards for planning and development applications. The aims of the performance standards would be to:

- ensure that koala populations are sustainable over the long-term,
- protect koala habitat areas from any development that would compromise habitat quality or integrity,
- ensure that any development within or adjacent to koala habitat areas occurs in an environmentally sensitive manner,
- ensure that acceptable levels of investigation are undertaken, considered and approved prior to any development within or adjacent to koala habitat,
- encourage koala habitat restoration,
- maintain connectivity between areas of koala habitat and minimize threats to safe koala movement between such areas,
- ensure that development does not further fragment habitat areas either through the removal of habitat or habitat linking areas or through the imposition of significant threats to koalas,
- provide guidelines and standards to minimize impacts on koalas during and after development, in conjunction with any monitoring requirements, and
- provide readily understandable advice for proponents development applications

All planning and development applications would have to demonstrate that they are consistent with the above aims and objectives. The development would be regulated.

The National Koala Act would also aim at *minimizing the impacts of roads on koala populations*. The construction of new roads within and between patches of koala habitat would be prohibited. This would be another planning constraint. Roads increase koala mortality rates; they form barriers to movement thus reducing connectivity between patches and increase habitat fragmentation. Increases in traffic volume on existing roads should also

be avoided. Increased traffic volumes would have to be accommodated by upgrading existing roads, or rerouting traffic on existing roads away from koala habitat.

Essential new roads in close proximity to koala habitat or between blocks of habitat would have to be constructed in such a way as to minimise the risk of koala-vehicle collisions. Potential mitigation measures may include low speed limits (e.g., 40-60 kph) and engineering designs to reduce traffic speed (traffic calming devices), warning signage, roadside lighting, clear road verges, and exclusion fencing (for some extreme risk situations). Measures to reduce the risk of koala mortality would be implemented particularly on roads with high traffic volumes, high speed limits, and/or poor roadside visibility.

Rules would be strengthened so that the developers could not change the zoning to fit their needs. Developers should not be legally allowed (by means of pressure) to undertake a development contrary to the zoning regulations. Otherwise the whole concept would be pointless.

It is also fundamental to ensure that no permit to clear land that is koala habitat is granted to landowners by Councils.

Part 3. Tax

The National Koala Act would have *taxation powers*. It would have the ability to encourage landowners, through the introduction of a range of tax incentives, to take pro-active measures to conserve and protect areas of koala habitat on their land. The aim is to make them willing to create, maintain, or restore koala habitat. They could for example enhance the connectivity between different habitats, or create koala corridors to protect koala habitats in adjacent regions, and in return would have to pay less tax, or would receive financial help.

This is particularly important when we know that *80% of remaining koala habitat occurs on privately owned land*. The continued survival of the koala is in the hands of all Australians and is not just the responsibility of government regulators. The AKF believes that economic costs currently deter many landholders from protecting koala habitat on their land, although

they would be willing to if they were offered technical, and especially financial, assistance. It is also reasonable to assume that landholders would refrain from clearing land if they had economic incentives not to do so.

The Koala secretariat would form relationships with the landowners and would be their correspondent. It would provide free advice to the landowners. It would answer their questions and help them to benefit from the tax and other incentives. It is important to work together with the landowners, and have their assent.

Tax and other incentives to protect and restore koala habitat

Landowners who follow the *planning guidelines for koala conservation and recovery – landscape level planning* could benefit from a wide range of financial measures. They may be granted rate relief, tax deductions, tax reduction benefits, rate rebates or discounts, tax credits, subsidies for the cost of habitat restoration and conservation on private land, or allocated grants, and could be exempted from local and/or State government rates.

They could receive awards and prizes recognizing their “excellence in both farm business management and nature conservation”, or their “environmental achievements” in conserving areas of koala habitat through an environment friendly land use practice or resource conservation.

For example the following measures from the documents *Options for Tax and Financial Incentives for Conservation* and *Economic incentives to conserve wildlife on private lands* could be implemented, and the following benefits granted to landowners:

- *Tax concessions for wildlife conservation activities* on private land, at least as generous as those allowed to agriculture and similar industries, for example *full tax deductability of expenses incurred* in wildlife conservation.

- *50% exclusion of gain on sales of land* (gross income shall not include 50% of any gain from the sale of land) or interests in land to eligible entities for conservation purposes, under certain conditions (bill introduced by Mr Jeffords in the Senate of the United States, April 15, 1999).
- *Habitat conservation and management insurance*. A subsidized insurance program could be created whereby landowners who agree to manage land in furtherance of a conservation plan would be held harmless (using the insurance proceeds) from the potential loss in value of their land from implementation activities under the plan.
- *Tax credits for habitat management expenses* – prescribed burns, exotic species removal, habitat restoration etc. Conservation management expenses would be made more valuable.
- Ownership of conservation land could be made affordable: property taxes paid on land subject to conservation easements would be eligible for treatment as a tax credit.
- The value of conservation gifts could be increased.

Also:

- Conservation transactions could qualify for low cost financing (this would make conservation organisations qualify for tax-exempt financing and can issue tax-exempt installment obligations to a seller when purchasing land).
- Conservation investments by private capital would be encouraged (incentives such as “greater deductions, tax credit, or loan guarantees” would be created for third party financing for certain conservation transactions).
- Small corporations whose primary asset is land could donate such land without triggering tax.

Landowners would be able to claim costs associated with the management of the land subject to the agreement.

The National Koala Act would make precise provisions concerning the amount of money or tax deduction offered to the landowners. It would determine criterion for assessing this amount, which would be set out within its provisions. The land management practice would

have to be consistent with the *planning guidelines for koala conservation and recovery*, and the tax deduction etc would be commensurate to the conservation value of the land, its size, the duration of the agreement, and the kind of agreement (donation, bargain sale, covenant...). Auctioning systems for determining allocations of government funding for biodiversity conservation initiatives could be established.

The National Koala Act would provide diversified economic incentives. The AKF is aware that different strategies are needed for different parts of the country: a landowner living west of the Great Dividing Range has a different lifestyle compared to a landowner living east of the Great Dividing Range. The following ideas concerning taxation and other incentives are therefore divided accordingly.

East of the Great Dividing Range

The great majority of the cities are concentrated east of the Great Dividing Range. The density of human populations is very high compared to the average population density in Australia, and is expanding. As a result this area experiences increased urbanisation and is under pressure from development. Developers are eager to buy properties, and don't hesitate to clear land to build on them. It is important to manage to convince landowners that it would be more interesting for them to benefit from the incentives than to sell their property to a developer. The following incentives are suitable:

Revolving conservation funds

The government purchases land with conservation significance, such as koala habitat, from an existing landowner. The landowner might want to sell his land to the government because he intends to live somewhere else, buy a bigger house for example. He would receive the land's current market value, so at least as much as a developer's offer.

A conservation covenant is placed on the title, with development restrictions attached to the land.

Then the government resells the land to sympathetic purchasers who care for the environment and will protect and enhance koala habitat. The land is therefore kept in private

ownership. With the money the government can buy another land at risk and sell it to another private person dedicated to the conservation of koala habitat.

Donation of land for conservation purposes subject to a life interest

Owners of land with koala habitat would be encouraged to donate that land, or part thereof, to the government or to an approved environmental organisation, which could either manage the land itself or sell the land to a purchaser dedicated to conservation management.

The landowner would have the right to continue to live on that land during his lifetime and would be entitled to a tax deduction equivalent to the market value of their land. In addition a capital gains tax exemption should apply with respect to the donation. This would be suitable for a person who doesn't make a living thanks to his/her land, and who doesn't use it.

Bargain sale of land for conservation purposes

Bargain sales of land of conservation value (koala habitat) to an approved environmental organisation or to the government would be encouraged.

The vendor (the landowner) would be allowed to claim a tax deduction when the land is sold for an amount less than a fair market price. The tax deduction would be commensurate to the difference between the market value on the day of sale and the actual sale price. Further, the portion of land donated should also be exempt from capital gains tax. This would be suitable for the same kind of landowner as described above, who would like to live somewhere else.

Development incentives whereby a landholder may be allowed to develop part of their property in return for dedicating another part to conservation

A landowner who normally would not be allowed to develop his land because the Planning Code and zoning makes it illegal would be granted the right to do so, provided that the land he wishes to clear is not koala habitat, and that he protects and restore another piece of land on his property. He would maintain ownership of the land. This piece of land would

have to be of conservation value and of similar size. For example a landowner interested in expanding housing on his property could be interested.

West of the Great Dividing Range

Revolving Conservation Funds – see East of Great Dividing Range.

Conservation covenant

Conservation covenants are land management agreements running with the land in perpetuity. They are entered into voluntarily by private landowners and a third party. They can restrict land uses that are incompatible with maintaining biodiversity and can require arrangements to be put in place to ensure ongoing management. Typically, activities such as vegetation clearing, subdivision, grazing by domestic stock and the introduction of non-indigenous flora and fauna are prohibited.

Mechanisms that would be implemented to encourage the use of conservation covenants (and revolving conservation funds) include:

- Exempting land subject to a conservation covenant from State land taxes;
- Providing landowners with local government rating rebates or discounts for land subject to a conservation covenant

Financial assistance would be provided. A tax deduction would also be offered to the landowner with respect to the loss in value of the land resulting from entry into the conservation covenant. The landowner maintains ownership of the land. This may accommodate a landowner who doesn't want or need to undertake actions that would damage the land for his work activity.

Voluntary conservation agreement

A conservation agreement is similar to a conservation covenant, in that they are both attached to the land. It therefore provides permanent protection for the land, even if the land

is sold the subsequent purchasers will also be legally bound by the agreement, and will not be permitted to undertake an action inconsistent with it.

A voluntary conservation agreement is entered into by a landowner and the Minister for the Environment. The land has to be of conservation value.

The current owner is responsible for the management of the land, and the conservation agreement can require activities that promote the protection and conservation of biodiversity to be undertaken, and can prohibit or restrict activities, for example actions that might adversely affect species or habitat in areas covered by the agreement. In return conservation agreements can oblige the Commonwealth to provide technical and financial assistance to the landowner, who would be also eligible for rate relief and tax deductions. The landowner maintains ownership of the land.

Landowner Incentive Program

Landowner Incentive Programs (LIP) are widely used in the United States. They assist private landowners in protecting and managing rare species that inhabit their land, by providing technical and financial assistance. Financial assistance in the form of cost share up to 90% of total costs incurred by landowner (the applicant should expect to contribute at least 25% of total project cost in materials or in-kind services); expert assistance from wildlife biologists, to help landowners determine which programs and practices are best suited to their land use needs and conservation objectives and how to plan and implement those conservation practices on their land.

The landowner must be able to provide suitable habitat for the species. The land will have to be managed to benefit at risk species and achieve species recovery. The landowner could for example restore or enhance the habitat of the species. He must agree to allow biologists onto his property for a pre-agreement survey and periodic progress checks to assess the success of the project objectives. He maintains ownership of the land.

Donation of a conservation easement

A conservation easement is a legal agreement between a landowner and a land trust or government agency limiting uses of the land, or a piece of the land, to protect its

conservation values, and abuses thereof. It is attached to the land, not to a person, which means that the future owners will also be bound.

The holder of the easement (the government) is allowed to use a land that it does not own or possess, for a special purpose. It would ensure for example that an area which is koala habitat remains intact. The possessor of the land (the landowner) may continue to use the easement and may exclude everyone except the easement holder from the land. He maintains ownership of the land.

The National Koala Act would provide tax credits to landowners who place an easement on their property and donate the land, or a particular area of land, to an approved conservation organisation. If the value of the easement is greater than the tax deduction granted the landowner could carry forward the deduction for additional tax years. This would be suitable for a landowner who can afford not to use a piece of his land, or whose activity is not incompatible with the conservation project.

Bargain sale of a conservation easement

The principle would be the same, but the landowner who sell his land or a piece of land for an amount less than a fair market price instead of donating it would benefit from an economic incentive less interesting. In this case ownership would be lost. A landowner in need of cash and other benefits and who can live without the easement may be interested.

The government can also offer to purchase the *development rights* of the land, through the use of a conservation easement. Then the landowner retains the property rights.

Accreditation schemes and environmental management systems to promote products from farmers who invest in biodiversity conservation practices

Producers (landowners) who meet rigorous sets of criteria for general ecological sustainability and koala conservation “above and beyond a general environmental duty of care” would be awarded a “certified koala friendly” label, such as the one existing in a program currently run by the AKF. The producer would have to comprehensively demonstrate that his products are environmentally friendly. Performance criteria would be based on measurable, on-the-ground outcomes for the environment and koala habitats.

Certified koala friendly products would be promoted, having the result of increasing product profit margin.

For example the AKF's certification program, aimed at protecting koala habitat, endorses koala and environment friendly livestock production practices, affording market recognition to these producers. Small family farms and rural communities who have taken genuine steps to balance conservation with production are supported.

In order to be granted certification the landowners would have to successfully implement a koala management system and "environmental management system". They can for example restore and link up koala habitats within and around their property and manage risks to koalas (eg. dogs, feral animals).

An environmental management system is an internationally recognised standard for managing environmental risks. It provides credible mechanisms for establishing and maintaining sustainable production systems, and is based on the continuous improvement cycle of "plan, do, check, review". It is a framework for making decisions, setting objectives and targets, implementing actions, monitoring progress and continuously improving performance. Livestock producers can be assisted in developing and implementing environmental management systems for their properties.

Incentive payments

In return for long-term and permanent easement payment or shorter-term rental agreements landowners would have to protect or restore environmentally sensitive lands on their property to provide and enhance habitat for animal species of significant ecological value, the koala for example. They would maintain ownership of the land.

- Annual rental payments (10-, 15- or 20-year agreements)

Landowners who rent their land or piece of their land to a conservation organisation would be paid. They would be provided with cost share assistance for conservation practices, and technical assistance to establish long-term, resource conserving covers to improve habitat for species. The amount of money would be commensurate to the duration of the rental agreement, the conservation value of the land and its size.

Financial assistance to cover up to ...% of costs for restoration activities.

- *Easement payment (30-year or permanent)*

Landowners would also be paid for putting a 30-year or a permanent easement on a piece of their land. They would receive technical assistance, and financial assistance (cost share payments) to cover up to ...% of the cost of restoring. The amount of money would be commensurate to the duration of the easement, the conservation value, and the size of the piece of land.

Carbon sequestration

Trees remove carbon dioxide from the atmosphere – this is referred to as carbon sequestration, and release oxygen. Landowners who store more carbon in soil and forests through reforestation for example get carbon credits, money or “an opportunity to get in on the ground floor of the market”. Carbon credit is a “generic term used for the accountable document issued to owners of sequestered carbon based on the amount of carbon sequestered. Credits are traded in carbon trading schemes”. Companies or individuals who want to offset their greenhouse gases emissions can purchase carbon credits from landowners who have sequestered carbon on their lands.

The CO₂ AUSTRALIA™ Carbon Sequestration Program for example is dedicated to establishing commercial scale, long term carbon sinks. It involves establishing plantings of mallee eucalypts for the purpose of generating carbon credits. Landowners who have at least 50 hectares of “Kyoto Consistent land” (land eligible under Article 3.3 of the Kyoto Protocol – it was clear of a forest before 31 December 1989) available for planting, can participate in the program. In return for taking arable land out of production (removing or harvesting the trees is forbidden) for the duration of the agreement – at least 100 years, CO₂ Australia will meet all costs and pay the landowner, usually an upfront payment commensurate with the current market value of the land. Farmers retain title and ownership of their land and no capital outlay is required from them. If the property is sold the “Forestry Rights” on the land will be transferred to the new owner.

It is regrettable that this system is not widespread yet, and landowners do not know in details how the system operates and where exactly the money would come from. Environmental offsets policies are relatively new. Yet an initiative on a national emissions trading network has been announced, and the carbon market is growing. Queensland Government Natural Resources and Water recently presented the concept of Green Invest – a proposed environmental offsets exchange facility for Queensland, and stated that other offsets markets, such as *carbon*, water quality... where policy *emerges* will progressively be looked at. Especially if Australia ratifies the Kyoto Protocol the market for carbon trading in Australia will expand rapidly, and the demand for carbon credits will increase significantly.

Conservation banking

In the same way conservation banking, also called mitigation banking, allows landowners who restore and protect habitat for endangered species to *sell conservation credits* to developers or others who need to compensate for the environmental impacts of their projects. Credits are units representing listed and other at risk species or habitat for those species on the conservation bank lands. A credit may be equivalent to (1) an acre of habitat for a particular species; (2) the amount of habitat required to support a breeding pair; (3) a wetland unit along with its supporting uplands; or (4) some other measure of habitat or its value to the listed species. Methods of determining available credits may rely on ranking or weighting of habitats based on habitat condition, size of the parcel, or other factors. (U.S. Fish and Wildlife Service, September 2004). Conservation banks are permanently protected.

It is noteworthy that the Kyoto Protocol currently provides no incentive to reduce or avoid deforestation: forest *conservation* activities or activities *avoiding deforestation*, which would result in emission reduction through the conservation of existing carbon stocks, *are not eligible* at this time. No carbon credits are granted to countries that demonstrate reductions in their rates of deforestation. Therefore standing trees are not protected, and are not provided an economic value.

Indeed the article 2 of the Kyoto protocol provides that “each Party included in Annex 1, in achieving its quantified emission limitation and reduction commitment under Article 3... shall: (a) implement and/or further elaborate policies and measures... such as: (ii) protection

and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol...; promotion of sustainable forest management practice, afforestation and reforestation". Article 3.3 provides that greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use and forestry activities, limited to afforestation, reforestation and deforestation shall be used to meet the commitments under this Article of each Party included in Annex 1.

Only afforestation and reforestation are eligible to produce Certified Emission Reductions in the first commitment period of the Kyoto Protocol (2008-2012). This is a major loophole given that "deforestation is the single largest cause of biodiversity loss worldwide and also accounts for approximately 20% of global greenhouse-gas emissions" (Linden Trust for Conservation).

Preference of the Australian Koala Foundation regarding the different economic incentives:

It is the AKF's opinion that *revolving funds* are the best way to protect koala and other species habitat: acquiring land to establish sanctuaries for the conservation of threatened wildlife and ecosystems, like Australian Wildlife Conservancy does, is a fantastic work but it requires an important amount of money, and a financial and human commitment over a long period of time: rates have to be paid, the land has to be looked after, managed, and protected. Feral animal control, weed eradication and fire management among others are necessary for the creation of the sanctuary to achieve its aim. Many organisations do not have sufficient funds or staff. On the contrary when a revolving fund is used the organisation or the government buy a land, attach a conservation covenant to the title, and resell the land immediately to a person interested in conservation. Then the organisation has the money to buy another land... and so on. However when the land is sold and ownership of the land is transferred taxes such as stamp duty, sales tax, and in certain circumstances capital gain tax... have to be paid, and the organisation loses money with every transaction.

It is important also to remember that maintaining ownership is extremely important to landowners, and therefore they are not prone to sell or donate their land or part of it. Even

when farming is a hobby it is the lifestyle they chose and like, landowners do not want to give it up and would not want to sell. If it remains their property they may be convinced to keep at least part of the land safe, and not develop on it, in return for other benefits and if they are offered assistance and advices. Therefore the following incentives are less likely to be accepted by the landowners: donation of land for conservation subject to a life interest, bargain sale of land for conservation, bargain sale of a conservation easement. *Incentives to encourage land to be managed for conservation benefit are preferred.* It should also be taken into account that many farmers have mortgage and are still paying it, they don't own their land and could anyway not benefit from certain incentives.

Ideally a *balance between the economic costs and the ecological profit* should be achieved.

Incentives to avoid fragmentation of habitat, for example when the property is divided between the heirs, would be strongly promoted. Landowners who refrain from habitat fragmentation and/or write this condition in their will would be greatly rewarded.

Landowners protecting the riparian system, rivers, and restoring trees around them on their property would also benefit from a very interesting incentive. Koalas are frequently seen in eucalyptus trees near water, due to the fact that their leaves are less dry.

Examples of actions landowners would be encouraged to undertake

(planning guidelines for koala conservation and recovery – landscape level planning):

- *maintain and conserve a landscape that contains a sufficient amount of habitat to sustain a viable koala population:*

maintain at least 40-50% of the landscape as primary and secondary koala habitat (the protection of primary and secondary (class A) habitats should be the top priority). To achieve this aim they should conserve and maintain the ecological integrity of areas of these habitats - priority should also be afforded to areas that are known to contain existing koala populations; and implement revegetation programs, especially

where the amount of primary and secondary habitat in the landscape is close to, or below 50%, or is highly fragmented - priority should be given to revegetating areas adjacent to contiguous blocks of existing habitat.

maintain at least 50-60% of the landscape as forest (preferably native forest).

- *maintain and restore koala habitat patches, or clusters of highly connected patches, that are large enough to sustain viable koala populations.*

They can for example implement revegetation programs to enlarge the size of remnant koala habitat patches, improve the connectivity of clusters of koala habitat patches...

- *maintain and restore a landscape that contains patches of koala habitat with shapes that minimize edge effects*

(koala habitat patches should be more circular than linear in shape).

- *maintain the integrity and quality of koala habitat patches and linkages:*

within koala habitat patches, or corridors, maintain sufficient proportions of mature preferred koala food tree species (i.e., greater than 30%). So they should avoid the removal of preferred koala food tree species and other trees known to be used by koalas, and consider planting additional preferred food trees where they are in low proportions within habitat patches or linkages.

avoid the internal fragmentation of koala habitat patches and linkages and any reduction in tree density. So they should avoid construction of roads and barriers, such as walls and fences. Within koala habitat patches or linkages, avoid clearing and thinning trees within koala habitat patches, or linkages that would substantially increase the distance between mature trees. If clearing of trees is unavoidable then this should be done so that the distance between remaining mature trees is at most 20-30 m.

maintain the structural and species diversity of trees within koala habitat patches and linkages.

- *maintain and conserve a landscape in which patches of koala habitat are sufficiently connected to sustain a viable koala population:*

maintain a network of habitat patches and corridors linking blocks of koala habitat. So they should conserve and maintain the ecological integrity of habitat identified as providing important linking functions between larger blocks of habitat, restore habitat corridors or habitat patches.

maintain areas between separate blocks of koala habitat free from barriers to koala movement. So they should avoid the construction of fences... that will impede movement of koalas between habitat patches.

Could the Commonwealth legislate to adopt the National Koala Act?

As we have seen the Commonwealth has the power to legislate if the aim is to implement an international treaty or convention and Australia's obligations under it. The Convention on Biological Diversity is once again the most relevant convention. Here is why:

The article 8(k) of the Convention provides that each Contracting Party (Australia among others) shall, as far as possible and as appropriate, "**develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations**". As we have seen it is necessary to afford an efficient legal protection to the koala at Federal level before it is too late to save it. The National Koala Act would aim at protecting the koala, through the protection of its habitat. It is noteworthy that under the Convention on Biological Diversity there is no list or definition of "threatened species". It is not excluded that the koala is considered a threatened species.

In addition the article 6 of the Convention – General Measures for Conservation and Sustainable use, provides that “Each Contracting Party shall, in accordance with its particular conditions and capabilities: (a) **develop national strategies, plans or programs for the conservation and sustainable use of biological diversity**... which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned”.

The Convention in its introduction reaffirms that “**States [countries] are responsible for conserving their biological diversity** and for using their biological resources in a sustainable manner”.

This is what the National Koala Act, which is a *Federal legislation* and whose aim is to protect the koala (a component of biological diversity) and its habitat (a biological resource) would do. The Koala secretariat in particular would “implement conservation strategies”. In addition the article 20 – Financial Resources provides that “**each Contracting Party undertakes to provide, in accordance with its capabilities, financial support** and incentives in respect of those national activities which are intended to achieve the objectives of this Convention, in accordance with its national plans, priorities and programs”. This gives us an argument to claim that Australia (the Federal government) should provide the money to create and run the Koala Secretariat, at least for implementing conservation strategies. In its introduction the Convention on Biological Diversity also refers to the “general lack of information and knowledge regarding biological diversity and of the urgent **need to develop scientific, technical and institutional capacities** to provide the basic understanding upon which to plan and implement appropriate measures”.

As we have seen Australia has an obligation under the Convention to **identify and monitor** (article 7(a) and (b)) the koala.

This is, among other things, what the Koala Secretariat would do (“identify the location and distribution of known koala populations”, “provide for ongoing monitoring and review”...). Creating and running the Koala Secretariat would implement this obligation.

The article 11 of the Convention – Incentives Measures, requires each Contracting Party to, as far as possible and as appropriate, “**adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of**

biological diversity”: there is an obligation on Australia to create incentives for the conservation of the koala as a component of biological diversity.

If the National Koala Act was passed and enacted by the Parliament its Part 3 providing “*tax incentives to protect and restore koala habitat*” would implement this article of the Convention: it is evident that in order to protect the koala the first priority is the protection, and restoration if necessary, of its habitat. The Convention itself in its articles 8(c),(d) and (f) enjoins to manage, protect, restore and enhance the ecosystems, habitats and biological resources (forests for example). The importance of conserving the vegetation that is habitat to species and enhancing this habitat is asserted: “regulate or manage *biological resources important for the conservation of biological diversity...* with a view to ensuring their conservation”, “**promote the protection of ecosystems, natural habitats** and [there is implicitly a link] the maintenance of viable populations of species *in natural surroundings*”, “**rehabilitate and restore degraded ecosystems** and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies”.

The Convention in its introduction also provides that “the fundamental requirement for the conservation of biological diversity is the *in-situ conservation of ecosystems and natural habitats* and the maintenance and recovery of viable populations of species in their *natural surroundings*”.

Therefore it is legally possible for the Commonwealth to make a law creating such incentives, because this law would give effect to some of Australia’s obligations under the Convention.

The **recovery of threatened species** (the koala) advocated in the Convention is a major objective of the National Koala Act as well. In order to achieve this objective among other things the Koala secretariat would “prioritise areas for habitat restoration” and “provide for habitat restoration in priority areas”, “specify necessary actions to address threatening processes” and as we have seen “implement conservation strategies”.

Article 14(a) requires **environmental impact assessment of the projects that are likely to have significant adverse effects on biological diversity, with a view to avoiding or minimizing such effects**. The Koala Secretariat would also have this function (it would “decide whether the proposed action would have a significant impact, and give approval to

certain land clearing and other activities, or suggest another activity if the land clearing is likely to have a significant impact on the koala or koala habitat”).

The Convention also provides that **processes and categories of activities which have or are likely to have a significant adverse impact** on (the conservation of) biological diversity **must be identified, regulated and managed** and their effects monitored (article 7(c) and 8(l)). The Koala secretariat would “identify threatening processes” and “specify necessary actions to address threatening processes”. The Koala secretariat would also go further and preventively “identify and map koala habitat including critical habitat that requires protection from threatening processes”.

The National Koala Act and the Convention on Biological Diversity share the same vision: according to the Convention it is “vital to **anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source**”. The National Koala Act’s major aim, indeed, is to manage to avoid land clearing (habitat destruction due to land clearing is the biggest threat to wildlife in Australia) and protect the vegetation, koala habitat in particular.

International policies that are currently used to protect biodiversity:

The following policies are fund raising mechanisms, from the document *Options for Tax and Financial Incentives for Conservation*. The money may be offered to landowners as subsidies or grants in return for their cooperation and the limitation of use of their land, or to fund a conservation program implemented by the Koala secretariat for example.

- Using or increasing *real estate transfer taxes* and dedicating those funds to natural area acquisition. When a land or property is sold, often for development, the transaction should provide revenue for preservation.
- Using *luxury taxes*. These taxes can provide a substantial revenue source, which may be used for land protection.

- *Using tax on minerals and other natural resources.* Those making money from resource exploitation should pay for protection.
- Using a portion of *hotel and tourism taxes* proceeds for land protection. This would target tourists who visit an area for its natural assets.
- Using the revenue from *hunting and fishing licenses*.
- Using *entrance fees*. The user-pays theory is put into practice when funds raised from park visitors are then used for additional land protection or acquisition.
- Using a percentage of *sales tax* for conservation programs. General sales tax as a funding mechanism is easy and inexpensive to collect. A very small percentage can generate substantial revenues on an annual basis, and therefore sales tax is a good source of funding for conservation related activities.
- Issuing *bonds*. Bonding is an excellent way to create large amounts of funding quickly and is common for land acquisition programs. Governments often issue bonds on the open market to cover capital expenditure. Since these public offerings are tax-exempt buyers are willing to purchase bonds at a lower interest rate.
- Allowing fillers to donate a portion of their *tax refund* to specific programs and agencies. There are a variety of agencies and projects funded through check-offs. However this source yields a relatively small and declining amount of money and is not advised for acquisition funding.
- Increasing *partnerships* between states conservation bodies, private landholders and non-government bodies with all contributing some funds and resources to wildlife conservation efforts.

The writing of the National Koala Act would require the skills of a team of lawyers, specialised in environmental law, tax law, planning, environmental law including international law, criminal law and constitutional law. It is expected that the bill would be an extensive document of 300-600 pages.

The Australian Koala Foundation recommends the following way to proceed in order to have the National Koala Act brought before the Parliament:

Using the way of a *private members' bill*: an *Independent Member of Parliament* (in the Senate or in the House of Representatives) introduces the proposed law (bill), as opposed to the bill being introduced by the government (the great majority of bills are introduced by ministers). Then the bill will be debated and voted, and if it is passed by both Houses will be enacted and become law.

It is therefore necessary to approach this person, carefully selected.

BIBLIOGRAPHY

Environment Protection and Biodiversity Conservation Act 1999, reprinted on 1 March 2007 (with amendments up to Act No. 165, 2006), reprint 3

Convention on Biological Diversity 1992, document last generated by SiSu July 13 2007

D. Tabart (2004) Draft *Protecting the Koala: A Species of National Significance – A Consultation paper proposing Commonwealth legislative and policy initiatives that will protect the Koala and its habitat throughout Australia*

C. McAlpine, J. Rhodes, A. Peterson, H. Possingham, J. Callaghan, D. Mitchell, D. Lunney (2006) *Planning guidelines for koala conservation and recovery – A guide to best planning practice*

The Wilderness Society (2006) *Submission to the Senate Inquiry into the provisions of the Environment and Heritage Legislation Amendment Bill (No1) 2006*

T. Hundloe, C. Hamilton, L. Wilks (1997) *Koalas and Tourism: An Economic Evaluation*, the Australia Institute, Discussion Paper 13

National Environmental Defender's Office Network, The Ian Potter Foundation (2000) *Disappearing Acts – A Guide to Australia's Threatened Species Law*

Queensland Environmental Defender's Office (2003) *Listing the Koala as Vulnerable or creating a Species of National Cultural Significance under the EPBC Act*

A. Macintosh (2006) The Australia Institute *Draft Review of the Environment and Heritage Legislation Amendment Bill (No.1) 2006*

State Environmental Planning Policy No 44 – Koala Habitat Protection, as at 26 April 2000

J-P. Jacquet (2007) *Wildlife Preservation Society of Queensland Newsletter May 2007*

C. Tisdell (2007) *Economic incentives to conserve wildlife on private lands* In *Australian Wildlife, Journal of the Wildlife Preservation Society of Australia Inc.*

Article about the *Wombat Protection Society* In *Australian Wildlife, Journal of the Wildlife Preservation Society of Australia Inc. Winter 3/2007*

M.D Young, N. Gunningham, J. Elix, J. Lambert, B. Howard, P. Grabosky, E. McCrone (1996) *Reimbursing the future – An evaluation of motivational, voluntary, price-based, property-right, and regulatory incentives for the conservation of biodiversity* Part 1, a report prepared by CSIRO Division of Wildlife and Ecology, the Australian Center for Environmental Law, and Community Solutions; Biodiversity Series, Paper No.9, Biodiversity Unit

Environment Protection and Biodiversity Conservation Act 1999, *Activity Report – 30 June 2006*

Options for Tax and Financial Incentives for Conservation, undated, unsigned

APPENDIX 16.

Parsons Brinckerhoff, 2008, *Department of the Environment, Water, Heritage and the Arts, Review of progress in implementing the 1998 National Koala Conservation Strategy.*

Available: <http://environment.gov.au/biodiversity/publications/koala-strategy/pubs/review.pdf>