

## **Supplementary Submission – Issues Raised at Melbourne Hearing**

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### ***Executive Summary***

#### **Clarification / commentary on matters arising at Melbourne hearing**

There are various points arising from the evidence presented by the various witnesses at the Melbourne hearing. In particular, several matters raised by the Threatened Species Scientific Committee (TSSC) require clarification, these include: an apparently sanguine attitude to the prospects of recovery of western populations and the utility of the National Koala Conservation and Management Strategy 2009-2014 (NKS); what in our view is an inappropriate reliance on the southern Koala populations to discount the significance of the documented population crashes in the northern populations; a somewhat inapt analysis of the US Endangered Species Act; and a puzzling inconsistency between the major problem identified as inhibiting the TSSC deliberations (lack of widely distributed field monitoring data) and their proposed solution (better co-ordination, rather than increased practical survey and monitoring field effort).

#### **Précis of Commentary on Inquiry Terms of Reference:**

##### **a. the iconic status of the koala and the history of its management;**

As correctly pointed out by the TSSC, these are not matters for its consideration in making a recommendation for listing under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), BUT they are certainly germane to the Senate Inquiry's deliberations and point to limitations of the present legislation empowering the Commonwealth's involvement in wildlife conservation. It is arguable that substantial historic declines SHOULD be a matter for consideration in conservation protection, which isn't currently the case with the EPBC Act.

##### **b. estimates of koala populations and the adequacy of current counting methods;**

Whilst we share the TSSC's concern over the lack of adequate biodiversity survey and monitoring in Australia overall and for Koalas in particular, we are convinced that available data and an appropriately conservative application of the Precautionary Principle should lead to listing of Koalas under the EPBC Act. It should be emphasised that in order to facilitate long term studies, the study sites from which objective data on the drastic declines in Northern Koalas have been derived were selected on the basis of anecdotal background information that they were the most resilient in their respective regions; thus if drastic declines are manifest in these populations they must be considered to provide a conservative estimator of impacts on regional populations generally.

##### **c. knowledge of koala habitat;**

Whilst there is a general appreciation of the extent of Koala habitat, this is on a very coarse scale and requires considerable refinement. No Commonwealth resources are currently available for this.

##### **d. threats to koala habitat such as logging, land clearing, poor management, attacks from feral and domestic animals, disease, roads and urban development;**

These threats have been identified; for some the solutions are self-evident, but effective threat abatement outcomes are few and far between.

##### **e. listing of the koala under the Environment Protection and Biodiversity Conservation Act 1999;**

Despite deficiencies in the population data alluded to, we consider there is a compelling case for protection of the Koala under the EPBC Act and an administrative basis for achieving this; whilst we believe there is a head of power to provide such protection, if the Minister decides not to act under the EPBC provisions, it points to a more general failure of this legislation to achieve effective conservation outcomes and thus illustrates a vital need to enact specific legislation to enable use of Commonwealth resources to protect Koalas.

##### **f. the adequacy of the National Koala Conservation and Management Strategy;**

The previous national Koala strategy has been objectively assessed as ineffective and largely irrelevant. The current iteration of the NKS (National Koala Conservation and Management Strategy

2009-2014) is almost halfway through its term and is running true to previous form: examination of its own implementation reporting shows most ‘initiatives’ are really ‘re-badged’ existing responses - largely from the States and driven by State priorities, not the National Strategy. There are few tangible programs put in place and the Commonwealth’s contribution appears to have been limited to the acquisition of 43 Ha of habitat to protect Koalas as well as some insects (welcome but can only be considered very much an initial ‘down payment’) and funding of a study which is predominantly another modelling exercise.

**g. appropriate future regulation for the protection of koala habitat;**

If it transpires that the EPBC Act is a failure when it comes to protecting Koalas, we believe there will be a vital and urgent need to develop specific legislation to protect Koalas. To some extent ‘rareness and endangeredness’ have hijacked the conservation debate, not only in Australia but also worldwide, and the rigidity of the EPBC Act results *de facto* in species being ‘managed’ to the brink of extinction before the Commonwealth can become involved – even in the case of a national and international iconic species such as the Koala. An ‘Australian Koala Protection Act’ should provide a mechanism for the Commonwealth to provide resources and intervene appropriately NOW (when it is clear that Koalas are in trouble, but recovery is still probable with appropriate action); we are confident that such legislation would enjoy overwhelming community support.

**h. interaction of state and federal laws and regulations; and**

This does not appear to be a current issue, since there is precious little practical involvement by the Commonwealth. The protracted EPBC listing process by the Commonwealth is, however, being used as an excuse by the QLD Government to procrastinate on making decisions for current applications to list the most critically threatened Koala populations as ‘Endangered Wildlife’ under the Nature Conservation Act (QLD). We believe that recognition by the federal Minister that the Northern Koala (currently recognised subspecies *Phascolarctos cinereus adustus* and *P. c. cinereus*) is distinct from the Southern Koala (*P. c. victor*) will enable avoidance of any unintended consequences of listing the Koala under the EPBC Act (as acknowledged at the hearing by the VIC Government representative).

**i. any other related matters.**

The clearly parlous state of Koalas in many parts of their national distribution and the so far impotent Commonwealth response to the situation have broader implications; many citizens (including many who are not members of any conservation organisation at all) articulate the view that: “well if ‘the government’ can’t even look after Koalas, what hope has any other wildlife got?” – it’s pretty hard to refute this sentiment. Furthermore, the Koala fulfils the role of a very effective umbrella species for the considerable number of forest dwelling wildlife that depend on the same habitat.

## **Conclusion**

At present it appears to us that the only mechanism whereby the Commonwealth can have an effective involvement in Koala conservation is to list it under the EPBC Act. We consider that notwithstanding deficiencies, there is compelling evidence of a nationally significant decline of many Koala populations and a basis for separate listing of Northern and Southern Koalas to facilitate the very different management responses required for the 2 different kinds of Koalas. The available evidence shows that the National Koala Conservation and Management Strategy 2009-2014 has no real prospect, by itself, of being effective in reversing the current extinction vortex consuming the species. If the EPBC Act fails the Koala, there will be an urgent need for ‘stand alone’ legislation to provide a flexible basis for managing Koalas across their widespread and heterogeneous distribution. We strongly urge the Senate Environment and Communication References Committee to recommend to the Minister for Sustainability, Environment, Water, Population and Communities that he should use his authority under the EPBC Act to declare there are 2 ‘species’ (Northern and Southern) of Koalas for the purposes of the Act and that the Northern Koalas be declared at least ‘Vulnerable’, thus attracting appropriate Commonwealth intervention in their conservation.

## SUPPLEMENTARY SUBMISSION

### Clarification / commentary on matters arising at Melbourne hearing

**Carrick:** In answer to the question from Senator Brown, “And that paralleled not loss of habitat per se but the drought. Is that correct?” the following answer was provided: “Correct. Well, it is loss of habitat but not because people chopped the trees down but because the trees died. ....”. This answer referred to the primary effect driving the documented decline; but it is also true that between when Ben Sullivan was undertaking his work in the field during the late 1990s and the end of 2006, broadscale land clearing was proceeding apace in QLD, which exacerbated the Koalas’ problems. Moreover, the combination of tree loss due to the prolonged / continuing drought event and the results of land clearing are conspiring to make the prospects of recovery back to 20<sup>th</sup> century levels vanishingly small in this region. This is discussed at greater length further on in this submission.

The response to Senator Brown's question: "Lastly, following the Gunnedah experience, do you see any hope of replanting in Central Queensland—Central Queensland coming to the rescue of the declining population?" - needs to be clarified in that not only replanting, but also encouragement of natural regeneration (from the ridiculous pre-emptive clearing that occurred up to December 2006 prior to the ban on broadscale clearing), in Central QLD can ‘come to the rescue’ of declining populations further West (e.g. to compensate for the Mulgalands populations that will probably never fully recover), but is NOT relevant to the denser coastal populations. No feasible amount of habitat restoration in inland areas will compensate for loss of inherently denser populations in coastal strongholds (or at least they have been strongholds previously).

It also needs to be said that in the TSSC’s formal advice to the Minister they acknowledge that on the evidence they had before them it was a ‘line ball call’ to recommend Koalas not be listed. Since that advice was provided, the Mulgaland decline has been revised from 50% to 80%; it has become clear that the coastal South East Queensland (SEQ) declines have not been stabilised, let alone reversed; ‘Myrtle Rust’ has emerged as a significant new threat to Koala habitat; a probably congenital eye disease is emerging in the VIC populations; and an unusually early and severe bushfire season in QLD (as a consequence of vegetation growth following the recent *La Niña* event – which itself must have directly caused Koala mortality in many areas) is threatening the recovery of severely drought affected populations. It is our considered opinion that even if the evidence available to the TSSC when it made its recommendation just failed to reach the threshold for listing (which we disagree with anyway), these recently identified factors must tip the balance in favour of listing. It also needs to be said that ‘time is of the essence’ for many Koala populations, so we would be appalled if the question of listing the Koala were to be referred back to the TSSC for a new round of consideration that will, even optimistically, take several months to conclude. We strongly urge that having fulfilled his obligation to seek the advice of the TSSC and taking into account that advice in the context of the newly identified factors, the Minister proceed urgently to list the Koala so that it can receive Commonwealth protection.

**Friends of the Earth:** Some issues were identified in this evidence that we consider to require urgent follow up in terms of national significance to the Koala. A detailed epidemiological evaluation of the prevalence of optic nerve coloboma in various VIC populations and the other probably congenital defects identified in the Sandy Point and Raymond Island Koalas should be undertaken as a matter of high priority by the VIC authorities. These defects could be indicators that the feared instability of the genetically impoverished VIC Koalas is eventuating and could well produce a precipitate decline. We await with interest the publication of the *in press* paper referred to in evidence – it appears that the

Strzelecki population has genetic heterozygosity at the low end of, but comparable with the genetic diversity of Northern Koalas and is probably representative of what was once the genetic norm in Southern Koalas. We concur that in this case, the South Gippsland animals warrant treatment as a discrete management unit and we take the liberty of recommending that any further translocations into this region would be extremely imprudent. It is also important that an effort be made to quantify the extent of the significant Koala mortality due to the catastrophic 2009 bushfires, which was referred to in evidence.

**Phillip Island Nature Parks & Friends of the Koalas, Phillip Island:** We believe that the key message from the Koala experience on Phillip Island is just how rapidly and dramatically an apparently thriving Koala population can crash to functional extinction in the wild. Although originally established by translocation, the animals were sourced from a variety of locations on mainland VIC as well as French Island and were observed to have the highest allelic diversity in the State apart from the South Gippsland population. From a situation where several thousand Koalas were translocated off Phillip Island and it was used as an exemplar of why there should be no concern about declines of Koalas in other parts of Australia, there are now said to be less than 20 Koalas in the wild on the island and the decline continues. Individual Koalas are naturally long-lived, so the current situation is probably the tail end of the local extinction process and the species is functionally extinct in the wild on Phillip Island, though Koalas will continue to be seen in captivity there. It appears that the fate that has befallen Phillip Island's Koalas is due to a similar suite of factors as in coastal NSW and QLD; those associated with inadequately controlled development. Even when (a) the demise of the island's population was evident, (b) vehicle mortality had been identified as a major causal factor and (c) a particular stretch of roadway had been identified as responsible for many Koala deaths and injuries; the response of the then local council was to INCREASE the speed limit on that stretch of road from 60 to 80 Kph!

**Hancock Victorian Plantations:** An important issue that we commend to the Inquiry's attention is the matter of replanting after logging operations. Whilst we agree with another witness that when *Eucalyptus regnans* plantations are logged (clear felled) and replanted, the likely outcome (assuming always that appropriate connectivity is maintained, etc.) will be that Koalas can persist at populations less than in *E. regnans* dominated native forest and but greater than agricultural land (not hard – since this is essentially nil in the latter situation). However, if *E. regnans* plantations are replaced with *E. nitens* (as we understand is happening in at least some of the Hancock plantations), this will generate a worse outcome for Koalas than if the replanting was of exotic pine trees – especially if, as is the case in Tasmania, the *E. nitens* planted are cultivars specially selected for very high foliar allelochemical content to deter browsing.

**Somerset:** The activities of the local community to preserve and restore the important representative group of Koalas in the far South Coast of NSW are to be applauded. However, it is probable that the residual South Coast NSW forests are now capable of supporting only quite low density populations (which are vulnerable to 'small population paradigm' hazards [stochastic events, etc.] and increasing loss of connectivity). The huge harvests of Koalas (millions) from southern NSW in the late 19<sup>th</sup> Century were derived from locations like the Bega Valley before their native forests were cleared; resulting in the near extinction of Koalas in coastal areas between Sydney and the NSW / VIC border. The residual forests were probably marginal habitat (low carrying capacity) at that time, but now they are all the species has left; in our view, this does not imply that the remaining populations should be 'written off' but rather that efforts should be redoubled to secure them for the long term, whilst recognising that without extensive restoration of riparian forests the population will remain relatively small.

**SA Department of Environment and Natural Resources & VIC Department of Sustainability & Environment:** Since the evolutionary relevance of the current SA Koala population seems questionable due to its derivation from translocated animals after the extinction of the original SA Koalas, we have not identified particular issues in the evidence from SA presented in Melbourne. However, we note the novel concept of Koalas as “dangerous”.

The evidence from the VIC Government representative reiterated the substantially different issues involved in managing Southern Koalas. An interesting point raised was that even historically, some Southern Koala populations may have exhibited major eruptions, consequential habitat damage and subsequent localised population crashes. This contrasts markedly with the situation with Northern Koalas, which have certainly been observed to have major population ‘blooms’, but have auto-regulated down without causing long-term habitat damage. It reinforces our view that “what’s odd about Northern Koalas that prevents them destructively over-browsing their habitat?” is the wrong question. Northern Koalas do what ecologists would predict a population of large mammals with a low reproductive potential (at the most 1 baby per year – typically 2 babies every 3 years) to do – breed up till they reach the carrying capacity of the habitat, when resource constraints will inhibit reproductive output and the population will decline to sustainable numbers. The right question is “what’s odd about VIC Koalas and / or VIC that allows Southern Koalas to escape the usually expected resource inhibition”.

We note the support in this evidence for recognition of 2 kinds of Koalas (Northern and Southern) and its utility in providing a pragmatic solution to the disparate management challenges facing Koalas nationally.

We also note that apart from the intensively managed populations there has been no population monitoring by government agencies in VIC; some population estimation by non-governmental entities was alluded to, but the published material with which we are familiar is a decade or two old. Given the dramatic declines in Northern Koala populations over this timecourse, it seems that the basis of the TSSC’s confidence that there is a very substantial population in VIC is predicated on ‘educated guesstimates’ for anywhere other than the managed populations that VIC authorities are trying to reduce.

**Forests NSW:** Unfortunately, most of the population estimates in this submission and evidence were based on studies carried out one to two decades ago – as for the bulk of the VIC Koala population there is no evidence that Koalas on public lands in NSW have not experienced the same sort of declines as documented elsewhere in that State and in QLD in the last quarter of a century. The witnesses offered the Inquiry some information suggesting that forestry operations did not threaten Koala populations, based on radio-tracking studies and surveys. A simplistic interpretation of their evidence could be taken to imply that heavy logging benefited Koalas; based on a 22% sighting rate in heavily logged forests compared with 5% sighting rates in unlogged or selectively logged forests. Whilst the similar sighting rates in unlogged and selectively logged areas in concert with the tracking data can probably be fairly interpreted as evidence that properly conducted selective logging is relatively benign as far as Koalas (though not necessarily other forest-dwelling fauna) are concerned, we dare to suggest that a higher sighting rate in heavily logged areas is much more plausibly interpreted as being due to the concentration of remaining Koalas in the reduced number of available trees and the much improved detectability in the much reduced canopy foliage! We also wonder about the applicability of the observations undertaken in northern and western NSW to forestry operations in the far southern coastal forests – if the southern coupes are essentially clear-felled as in the VIC forestry operations previously discussed, we support the testimony of a previous witness that such operations must inevitably reduce Koala abundance – and there are precious few Koalas remaining in those areas, so the impact might be anticipated to be quite significant.

**Threatened Species Scientific Committee:** In the TSSC's opening remarks, it was stated that, "The scope of the committee's membership and expertise is deliberately broad, but we all have considerable expertise in conservation biology and related fields. That is a deliberate strategy in order to provide as comprehensive as possible an assessment of all components of Australia's environment and biodiversity rather than a narrow focus on more conspicuous and better-known components." Whilst this approach is understandable, unfortunately it could also have the unintended consequence of an unconscious prejudice in considering nominations for "more conspicuous and better-known components".

Whilst we concur that "Assessment of the koala is neither straightforward nor simple", the assertion that "historically, koala populations have shown very substantial fluctuations" neglects the context that most of the observed "fluctuations" have been population crashes associated with anthropogenically driven factors such as profligate hunting and major disease epizootics following hard on the heels of major habitat destruction episodes (as reported by Reed & Lunney, 1990).

In deciding to undertake "its assessment on the basis of a single, national population" the TSSC appears to have adopted a stance not reflected in the formal advice and again highlights one of the several internal inconsistencies in its letter to the Minister of 30 September 2010. We note that our reading of the Act is that it does not require that 'a distinct population of biological entities' needs "evolutionary distinctiveness" or any particular threshold of genetic distinctiveness. It is unclear what the TSSC means by "long-term separation of koala populations throughout its range"; mitochondrial DNA (mtDNA) data show that there has been little or no gene flow between some populations for probably a few thousand years. There is now essentially almost zero probability of gene flow between the major Koala populations and there is compelling evidence that neutral nuclear markers can differentiate in decades, not centuries – thus geographically separated populations are already different and are getting more different.

The TSSC's conclusion "was that the koala approached, but did not reach, the threshold required to qualify for listing as vulnerable under criterion 1" and despite recognising "that the species suffers a series of conservation problems across its range and is in decline", its "conclusion in 2010 was that the koala should not be listed as threatened". The assertion that its decision "does not mean that the koala will be treated with management neglect or disdain" is a significant departure from reality; unless listed, there will be no trigger for protection by the EPBC Act and the species will continue to have such a low priority for resource allocation from the Commonwealth that the TSSC's desired improvements in survey and monitoring data will never eventuate, until such time as the population contracts to such low numbers that the counting task is really easy.

The TSSC noted "that there is a national management plan for the species and specific conservation measures in all of its range states." This rather smacks of sophistry: no resources and no tangible Commonwealth involvement are committed under the NKS; and as for the quoted example that "one population in the south-east Queensland bioregion at greatest risk is listed as vulnerable under Queensland legislation", the reality is that essentially this has nothing to do with the national strategy, albeit it is consistent with NKS objectives!

The Acting Chair asked the TSSC representatives, "Again, there is an 80 per cent loss in the mulga lands of Queensland and evidence that such drought impacts will potentially be visited on the habitat of the koala elsewhere—and that includes everywhere—into the future, and there is erosion through human occupation of key koala habitats in South-East Queensland and north-east New South Wales. We are not here talking about the extreme interpretation of the precautionary principle. Let us take your moderate view. Do those factors not qualify in a moderate view of utilising the precautionary

principle about the future of the range of the koala and the health of its habitat across its range in Australia?” To which the TSSC responded “Clearly, all those things are going to impact on them”, but then qualified the acknowledgement, “Many of them are not going to impact in the time frame in which the EPBC Act works, which is three koala generations or 100 years, whichever is the least, I think. If things are going to impinge in 100 years time—say, from climate modelling—that is really not an issue that can be taken into account for a specific listing.” Well maybe, but the premise is quite false – the Mulgaland crash has happened in less than a decade, as have the catastrophic declines in the coastal populations and these are ongoing, it’s in train now – the climate science projections simply confirm that these are almost certainly not just part of normal climate cycles and will get worse – it’s NOT the case that climate change impacts on Koalas won’t happen till next Century.

The TSSC went on to discount the significance of the well documented collapse of the extensive Mulgalands population: “If we have an 80 per cent decline in one population, as has been recognised for the mulga lands, the significance of that is a relative to the total population size.” Yes, but we are certainly not talking about “one” population; the Springsure and SEQ populations have also crashed by >80%. “For example, if we wanted to draw human population demographic trends for Australia, we would go beyond simply what is happening at Milikapiti or Ramingining; we would try to ensure that we had population change information from as wide a range of the population as possible.” This seems to us like something of a *non sequitur* – and it also appears to ignore the reality that Australians (rightly) pay many millions of dollars and have a permanent government agency to undertake the Census, as is now currently underway! A recurring lament from the TSSC is that such comprehensive data are not available for Koalas. An entrenched view of the TSSC was then expressed as, “In the case of the koalas, we recognise that it is still a very substantial population in Victoria and that makes up a very large proportion of the total koala national population.” Hang on – a bit of a reality check is required here: (1) Except for the actively managed populations in Victoria, there have essentially been no abundance estimates based on recent surveys, with the asserted large VIC population size based on ‘educated guesstimates’ – this seems to be a kind of ‘inverse precautionary principle’; lack of widely distributed population monitoring sites in NSW and QLD is used by the TSSC to discount the unequivocal evidence from the sites in those States with hard data, but an even more unrepresentative sampling of VIC is accorded the presumption that the trends seen in the monitored sites are representative of VIC overall!? This is inconsistent to say the least. (2) The VIC population may well be relatively large but qualitatively is genetically depauperate, consequently has low evolutionary potential and is already showing signs of instability that could well presage a precipitous decline. This is compounded by the perhaps most disturbing view of all that, “It is certainly undeniable and it is most unfortunate that there have been population declines in parts of Queensland, but we think that over the national perspective, which is our brief, the total population decline is substantially less than that.” Well firstly the total population decline is the total population decline – presumably what was meant was the proportional decline relative to the entire population? The implication and logical conclusion of this position is that the entire NSW population or QLD population or both could become extinct, but as long as there were still plenty of Koalas in Victoria, it wouldn’t really matter! We reject this as false logic and quite inconsistent with National Strategy for the Conservation of Australia's Biological Diversity.

### ***Drought***

In response to questions from the Inquiry regarding the collapse of western Koala populations associated with prolonged drought, the TSSC stated that they disregarded “responses to climatic fluctuations” and “had to use judgment about whether the drought had ceased and whether it was reversible.” Presumably they considered that the observed drastic decline in western Koalas was just a response to a climatic fluctuation and referred to “other droughts, including specifically the Federation drought of 1901 or thereabouts, which had as serious impact on the koala's habitat in Queensland.” As

discussed below, this is not really the case – certainly widespread defoliation may have been reported but not extensive death of mature trees as is the current situation. We would be surprised if “koalas recovered from that one within 20-30 years” since 30-40 years appears to be required for Koalas to recover properly from major stochastic events. In any case 20-30 years is 3 ½ to 5 Koala generations and this requires the event to be accounted for even under IUCN criteria. Although the TSSC may regard it as “still moot about whether climate change will increase the severity and frequency of drought”, they judge that “It is likely that it will, but we were forced to assess the immediate drought impacts over a 20-year period.” We agree, but interpret the situation as not being reversible for probably millennia and certainly not within the 3 koala generations or so encompassed by “20 years” – thus providing the basis for listing these animals using the TSSC’s criteria. Thus it is puzzling that they discount the 80% decline (which if this population was considered in its own right would require it to be listed as ‘Critically Endangered’) despite conceding that compared with other recorded drought events, “It is likely that the cocktail of factors this time around may be more damaging”.

We have to say that it is more than just “likely”. Koala researchers, natural historians and landholders in central QLD have noted a widespread decline in plant community health related to drought and, in places, associated wildfires in central QLD. Most importantly this includes the death of mature eucalypt trees across a range of species including *Eucalyptus tereticornis* (e.g. Springsure region & even St Bees Island near Mackay), *E. camaldulensis* (e.g. headwaters of Ward River near Tambo), *E. melanophloia*, (e.g. headwaters of Ward River near Tambo), *E. orgadophylla* (e.g. Albinia NP near Rolleston), *E. portuensis* (e.g. Cawarral area near Rockhampton), *Corymbia tessellaris* (e.g. Albinia NP near Rolleston, Springsure region), *C. intermedia* (e.g. Cawarral area near Rockhampton), *C. clarksoniana* (e.g. St Bees Island near Mackay).

From the perspective of Koala conservation, the declines in *E. tereticornis* and *E. camaldulensis* are of most concern. Drought impacts on these species have been associated with catastrophic declines in local Koala numbers at Mungallala Creek (*E. camaldulensis*, see Greg Gordon's research) and Springsure (*E. tereticornis* - A. Melzer unpublished data already supplied). Both these species are keystone species for Koalas over much of eastern (*E. tereticornis*) and western QLD (*E. camaldulensis*).

*Eucalyptus camaldulensis* is a long lived species (500 to 1000 years – Jacobs, 1955) and its recovery is likely to be slow. Indeed recovery is impeded by stock grazing - especially by sheep - and the loss of mature trees causes the loss of seed source. In some places in the head waters of the Ward River, for example, some stream reaches show a total loss of *E. camaldulensis*. There are areas of regrowth but these are associated with flood pools associated with instream barriers constructed by graziers. So, here, the habitat structure has changed from a continuous linear array of fodder trees to a very patchy mosaic habitat separated by relatively large areas of grassland or woodland of little browse or moisture value to Koalas. As this continuing change occurs, Koalas must spend increased time on the ground with reduced access to structures for retreat or shelter. Dingoes and eagles are abundant in these regions and are both known to be predators of Koalas.

In this landscape under current land management practices, it is unlikely that Koala habitat will recover. Even in the absence of grazing, the recovery of *E. camaldulensis* requires the presence of appropriate germination and, more importantly, establishment conditions. Competition from overstorey trees and dense understorey grasses significantly reduce seedling survival. Germination and establishment best occurs on surfaces exposed by retreating flood waters - although the season when this occurs is important. Recovery will be favoured by spring floods retreating in late spring / early summer, whilst winter floods are unfavourable. So in an ungrazed landscape with unpredictable weather patterns it seems that habitat will require a very long time to recover to the point where there is any prospect that Koala densities may be restored. It is clear that many decades will be required (if



not a century or more) for the vegetation structure to recover to pre-drought levels, always assuming there is a post-drought return to 'normal'. (see [www.anbg.gov.au/cpbr/WfHC](http://www.anbg.gov.au/cpbr/WfHC) )

Jacobs, M.R. (1955) Growth habits of the eucalypts. Forestry and Timber Bureau, Canberra (Cited in Water for a Healthy Country, CSIRO [www.anbg.gov.au/cpbr/WfHC](http://www.anbg.gov.au/cpbr/WfHC)).

**The widespread death of *E. camaldulensis* shows that this is not a mere “climatic fluctuation”, but that changes are underway that have not happened for 500 to 1,000 years and surpass previously recorded experiences – including the “Federation Drought”.**

A similar situation applies to *E. tereticornis* east of the Great Divide. This is a palatable species for stock, especially cattle, and recovery generally requires protection from grazing. Where we are attempting restoration of riparian *E. tereticornis* (Xstrata funded community program at Springsure, Central QLD) competition from dense ground cover is resulting in a 99% loss of planted tube stock. At these sites natural recovery is totally absent. So again, despite any tendency for the Koalas to recover their breeding capacity after rain, the fodder resources to support more widespread populations or populations of greater density are not likely to be available for many Koala generations.

Observations from Central QLD over the last 15 years indicate that Koala populations retreat to refuges during drought. In some cases this involves animals retreating to water courses in the dry and then expanding into the surrounding landscape in the wet. However, in severe drought survival depends on drought refuges that are characterized by subsurface water supporting tree survival of palatable species that have characteristics that allow them to regulate water loss. Koala populations dependent on species with poor water management characteristics die out as available leaf moisture becomes insufficient to maintain the Koalas' physiological needs. As drought severity increases (consistent with predictions in most climate change models) these drought refuges become fewer and, consequently, even more vitally important for Koala conservation.

In the past, Koalas would have expanded from these refuges after drought conditions had receded, as leaf moisture in fodder species recovered and was maintained. Colloquial accounts suggest that this takes at least 30 to 40 years in Central QLD (and similar times appear to have been required for recovery of Koala populations from the last QLD 'Open Season' and major disease epizootics even in coastal areas). However, even assuming the best weather conditions, extensive areas of QLD have been cleared since the 1950's and this habitat destruction continued through until the end of 2006; thus the contemporary landscape is now more highly fragmented. It has become very difficult for areas of suitable habitat to be recolonised. Furthermore, the development of the resource sector and extensive coastal development has resulted in the expansion of zones of extremely high mortality across the country (24 hr high speed road and rail corridors, intensive urban development with cars and dogs). This environment will limit recolonisation of isolated habitat patches. Where these pressures are adjacent to or overlie drought refuges, the unrelenting mortality will suppress any natural recovery in a post-drought environment.

Finally, the predictions on changing weather patterns in a warming climate suggest that droughts will occur with increasing frequency and severity. If these predictions are accepted; and current evidence gives weight to the predictions and, indeed shows that we are probably in the midst of the predicted changes already, then the habitat with sustained suitable moisture availability for recolonisation will be further reduced.

Our conclusion is that a 'normal' recovery under 'usual' post-drought conditions is not possible because:

- (a) recent 20th Century clearing has fundamentally altered the landscape leaving it highly fragmented and dramatically different to the situation at the conclusion of the “Federation Drought”,
- (b) extensive resource development and urban expansion has introduced very high, unrelenting levels of mortality preventing post-drought expansion of many Koala populations, and
- (c) stochastic events associated with extreme climate variability are likely to render potential habitat patches unsuitable for Koalas with frequent periods when available moisture is not sufficient to sustain them.

### ***National Koala Conservation and Management Strategy 2009-2014 (NKS)***

Much was made in the TSSC’s formal advice and letter to the Minister referred to previously, concerning the National Koala Conservation and Management Strategy 2009-2014 (NKS). This was reiterated in evidence “During the process of this most recent assessment of the koala as a nationally threatened species, the National Koala Conservation and Management Strategy was being developed. As part of our assessment process we were mindful of that and were briefed on its development. We feel that it is a positive step in creating an overarching strategy that could be used to enhance management of the koala by trying to nationally coordinate information, resources, implementation of the strategy and also to coordinate in some research, hopefully having sufficient long-term resources that would go into monitoring of key populations. That monitoring should feed back in an adaptive management framework into the strategy so that the strategy can be continually reappraised and therefore evolve over time to become more effective.” This sounds like it could have been drafted by Sir Humphrey Appleby GCB, KBE, MVO, MA (Oxon) – in reality, the NKS contains no commitment to tangible action or resource provision by the Commonwealth, the previous version was shown to be ineffective and irrelevant and it is now almost halfway through its present incarnation with precious little of practical benefit to Koalas that can be attributed to the strategy.

The evidence from the TSSC continued, “We looked at this as the potential option as a plan of management under the act that might qualify the koala as conservation dependent. We discussed this at great length and decided that at its present stage of development it lacked sufficient detail for us to be confident that, even though the local or regional populations that were most threatened have been identified, how it would be implemented to act in a conservation dependent manner would ensure that the decline in those populations would be halted and recovery enabled.” We certainly do not disagree with the TSSC that the NKS is far from an effective national recovery plan, but their evaluation is then woven into a somewhat counterintuitive TSSC position: If the NKS was actually an effective detailed management plan, Koalas would be listed as ‘Conservation Dependent’ and qualify for Commonwealth support under the EPBC Act, BUT since the TSSC judges that the NKS is ineffective Koalas can’t be listed as ‘Conservation Dependent’ and the TSSC has declined to list Koalas as threatened, they don’t receive any protection at all under the EPBC Act? Instead the TSSC “considered it (*the NKS*), .... a positive first step to provide an overall framework. It recognises the importance of the koala and the importance of the threats that are operating in different ways across its jurisdiction, and we would hope that an implementation strategy could be developed which would allow it to *be* truly effective and focused on those populations in dire need of better management.” It appears that ‘hope springs eternal’ in the TSSC.

### ***Southern Koalas: Significance and Differences***

We disagree with the TSSC’s positions (a) that effectively ‘a Koala is a Koala, is a Koala’ and (b) that whilst ever there are lots of Koalas in VIC (accepting for the sake of argument that the numbers being bandied about for the southern population are legitimate), whatever happens in the other states is discounted when averaged over the national Koala population with the VIC animals lumped in. In our

judgement this position is badly flawed in both major respects. The TSSC advances the view that there is not “any evidence across the range for long-term separation of any populations from each other” without defining what is meant by “long term”. This interpretation that there is a lack of distinctiveness between various populations is predicated on genetic information hampered by lack of “a comprehensive comparison of all of the data that we have from across the country” with “extra sequences added to the dataset from localised regions”; the lack of data from the southern Australian populations reduces the power of comparisons. We agree with the TSSC that “it is something that really should be done to back up some of the claims about distinct populations”, but equally it is inconclusive in discounting the significance of observed ecological, morphological and physiological differences. The TSSC acknowledges, “There is a lot of evidence that, for example, localised populations are suffering from recent habitat fragmentation impacts. So, in that sense, yes, they are genetically distinct, but that sort of genetic distinction can arise over the last two generations where major roads have gone in and stopped koalas from being able to disperse from one shire to another or one region—for example, in south-east QLD where dispersal was stopped around local areas.” Yes the nuclear markers (microsatellites) certainly demonstrate this, but mtDNA shows there has also been longer term differentiation (centuries at least rather than decades) over relatively short geographic distances – making it implausible that there has been no meaningful differentiation between Northern and Southern Koalas over thousands of years.

Furthermore, the existing mtDNA sequences we have to work with indicate that even geographic and reproductive isolation for around 8,000 years produces relatively subtle changes. Thus we come back to the issue of what timescale of separation the TSSC regards as meaningful? We’d have thought that the pattern existing 200 years ago should provide the baseline (though we don’t really know this anyway) rather than some hypothesised condition at some extraordinarily remote time. The TSSC presented the opinion, “That creates that level of genetic distinction is present that a lot of people talk about, but it is not necessarily the level of genetic distinction that we would consider to be significant in terms of an evolutionary scale distinction that might suggest that those populations had some sort of local adaptation that would make them behave differently to one another.” We feel obligated to point out that (1) there are morphological, physiological and behavioural differences between Northern and Southern Koalas that are not reflected in current genetic comparisons – this may not be too surprising since all the genetic data are based on neutral markers, which by definition are not expected to reveal much about adaptation; (2) the EPBC Act does not require genetic differences to be demonstrated – molecular genetics simply provides a convenient and often (though not universally) useful indication of distinctiveness between populations; (3) if evolutionary potential is what counts, this provides a strong argument for considering the genetically depauperate populations in SA and VIC separately from the Northern populations (NSW and QLD), with the Strezlecki / Bermagui populations managed as a third group or amalgamated with the Northern group. The TSSC was asked the question, “What would be an evolutionary scale genetic difference?” and responded “As I said, I would love to see a network of sequences from across the range of the species. There are lots of gaps in the sampling.” Whilst we agree that it would be very useful to have more comprehensive genetic data, this does not answer the question of what is the arbitrary quantum of difference the TSSC considers to be of significance on an “evolutionary scale”; thus their assessment of what the existing genetic picture tells us is a bit subjective.

The TSSC indicated that they “have always dealt with the idea that koalas, until European settlement, were a fairly continuous population.” We beg to differ; whilst the distribution was probably more or less “continuous”, by the time of European occupation there were already substantial discontinuities (e.g. SA Koalas were pretty much isolated as was the North Stradbroke Island population) and on the continental scale, it is a virtual certainty that ‘isolation by distance’ was well established. Given the observed differentiation (as revealed by microsatellite markers) over one or two decades caused by major roads, etc. we again advance the view that it is implausible that significant differentiation

between Northern and Southern Koalas had not occurred over millennia. The TSSC evidence continued, “We know that they occur on both sides of the Great Dividing Range and they occur on both sides of rivers et cetera. So, unlike a lot of other species for which there are biogeographic zones where you can identify that there are discrete populations that occur that are separated by some sort of barrier, that is not really evident across the range of the species.” This is not really so - we have mtDNA evidence that there is reproductive isolation even associated with the coastal ranges in SEQ – there are clearly discrete populations so it comes down to the question of how different a ‘distinct population segment’ (to use the ESA terminology) has to be for the TSSC to recognise the difference in order to warrant consideration as an entity.

The TSSC declared that “our primary object is the national range of the species and preventing the species as a whole from becoming extinct.” With the greatest possible respect, the stated objective of the EPBC Act is to preserve BIODIVERSITY - which is not synonymous with ‘species’; furthermore, the National Strategy for the Conservation of Australia’s Biological Diversity confirms that this is not the national aspiration. Whilst the Act refers to ‘species’ as a convenience, it makes it explicitly clear that any distinctive group of organisms can be protected by the mechanism of the Minister declaring it to be a species for the purposes of the Act. The TSSC continued, “For the koala, there are three recognised subspecies which happen to coincide with jurisdiction boundaries and it is clearly an artifice with no genetic underpinning whatsoever.” This is a rather simplistic analysis – whilst the State borders are obviously not barriers or species boundaries, the erection of the QLD subspecies was based on a sample of Koalas (from around Biloela from memory) that showed substantial morphological differences from the original Koala type specimens (collected from NSW). Now there are reasons for thinking that this was an inadvertently biased sample and that there is no substantial difference between NSW (*P. c. cinereus*) and QLD (*P. c. adustus*) Koalas – from the limited comparative morphological data, there also seems to be little or no difference between QLD and even far South Coast NSW – BUT significant differences exist between NSW (including the far South Coast) and VIC (*P.c. victor*) and also between QLD and VIC – this is inconsistent with a straightforward cline. Moreover, the subspecies are still recognised by ABRS and it has to be said that “genetic underpinning” is not the be-all and end-all of taxonomy, genetic markers provide one set of characters (often very informative characters) but there are others; this is just as well for the palaeontologists. The TSSC then added, “All species which occur continuously across eastern Australian forests will have some genetic variation across that range, but in most cases it is continuous; it is clinal variation and it is impossible to come up with any meaningful disjunctions in that genetic composition.” Where are the data to support this assertion? As the TSSC notes, there are no such data for Koalas; the data do not exist and that is part of the problem. In any case, the EPBC Act does not require supporting genetic data – this is something the TSSC has adopted for convenience.

When asked for an estimate of the current national population size, the TSSC responded that, “There are no scientifically corroboratable, published estimates available of the total abundance of the koala, but our overall estimate, being conservative in aggregating the regional population data, was that it was over 200,000.” We certainly agree with the first part of the answer, but in these circumstances it’s pretty much a case of ‘pick a number, any number!’ - in any case this is vastly less important than the trend. However, Australia ought to be able to do better than a ‘guesstimate’ for an international icon. We certainly agree with the TSSC that, “it is revealing that there is such disparity in perspectives about this particular question for such a large, conspicuous mammal. If we are failing to get a good population handle on this species then clearly we are having trouble managing biodiversity in the country anyway.” Surely this should compel us to do better – starting with the Koala! In arriving at their ‘guesstimate’ the TSSC included “probably about 20,000 koalas now in South Australia” – but if evolutionary potential is important, why is this group of Koalas really relevant in a national context since they are not descendents of the original SA population but are all translocated, mostly from VIC;

next the Koalas in WA at Yanchep and other locations will be added in? The TSSC total also included “probably at least 30,000 koalas on public land in New South Wales” – but this is based on figures from at least a decade ago during which time other populations have experienced ~80% decline. To put this in perspective, even if the 200,000 total were to be accepted, this probably represents at least a 90% to 95% decline from the Koala population just prior to Federation!

Highlighting one of our concerns with their present approach is the TSSC’s response to a question about how the IUCN classification scheme, as employed for the EPBC Act, deals with organisms that were abundant but have demonstrated declines (as is happening with the Koala) as opposed to organisms that have historically had quite small populations. The Inquiry was told that the “passenger pigeon example would very much come under criterion 1, where there has been a marked reduction in a limited time period in the total population, regardless of what the initial total population was. Certainly there were very many millions of them in the 1840s. By 1921, there were none left. It would certainly have triggered criterion 1 to be recognised as threatened”. On the contrary, we seriously doubt with the information then on hand that a 19<sup>th</sup> Century TSSC would have listed the Passenger Pigeon if there had been an EPBC equivalent in existence. The following appraisal is derived from various on line sources. Actually in the 1840s there were still BILLIONS of Passenger Pigeons; the crash from billions to millions occurred over about 5 decades, but the final demise from millions to extinction took a decade or less; with the final demise from over 250,000 to extinction in the wild happening in just 5 years! On a single day in 1860 some 235,200 harvested birds were shipped East from Grand Rapids in Michigan – obviously there were lots of this species and it is virtually certain that an application for listing would have failed. In 1869, Van Buren County, also in Michigan, sent 7,500,000 birds to the East – no show of listing in these circumstances. Even in 1880, when we now know numbers had already been severely reduced, some 527,000 birds were shipped east from Michigan – obviously with these numbers how could anyone list them as threatened with extinction? During 1874 Oceana County in Michigan sent over 1,000,000 birds to the markets in the East and two years later was sending a peak of 400,000 a week, for an annual total of 1,600,000. One of the last large breeding aggregations of Passenger Pigeons (Petoskey, Michigan, in 1878) produced a daily yield of 50,000 birds killed each day, with the hunt continuing for nearly five months. When the adult birds that survived the slaughter had a second attempt to nesting at new sites, they were located and killed before they had a chance to raise any young - but with a commercial harvest of over 7,500,000 there must still be plenty! In 1896, a flock of 250,000 were killed by hunters – it transpired that it was the last flock of that size – but in the absence of detailed population surveys from throughout the continental range of this migratory species (some - at least 1 anyway - really big flocks were still in the summer breeding grounds, so it would probably have been argued that there were likely to be still lots of birds down South in winter) – in the circumstances we think it less likely than more likely for the species to have been listed and in any case it is virtually certain that the species was then past the point of no return. The last fully authenticated record of a wild bird was near Sargents, in Ohio on 22 March 1900. On 01 September 1914, Martha, the last known Passenger Pigeon, died in the Cincinnati Zoo in Ohio. So our apprehension is that the hypothetical 19<sup>th</sup> Century TSSC wouldn’t have recommended listing until Passenger Pigeons were nearly all gone (though a few hundred thousand remained) and probably not till after they were beyond recovery (the species actually relied upon huge breeding aggregations for successful reproduction); as much as any other factor, the lack of data on documented declines across the whole of the species’ extensive range would almost certainly have precluded listing.

Turning to the likely resilience of Northern versus Southern Koalas, the TSSC conceded that “it would be fairly generally agreed that a population with lower genetic diversity has lower evolutionary potential and lower potential to adapt to new challenges. So in that case, yes, I would say that in the longer term there could be unforeseen threats over the horizon that might impact koalas in Victoria more than they would elsewhere.” We absolutely agree – so how can the TSSC proposition be

sustained that since there are lots of VIC Koalas, this counterbalances the drastic population declines in evidence to the North? The TSSC qualified the significance of the well-established, much lower heterozygosity (albeit in terms of neutral markers) of the Southern Koalas on the basis of uncertainty regarding the extent to which the severe bottleneck in VIC has reduced that population's fitness. The rapid expansion of the French Island population and the apparent bottleneck in the human population (said to have occurred ~70,000 years ago) were cited. However, the suggested human population size at the nadir of its bottleneck is estimated to have been about 15,000 individuals, many orders of magnitude greater than the 2 or 3 individuals that founded the French Island Koala population (and thus predominantly the VIC mainland and SA present day populations). Generally a founder population for conservation purposes needs to be established with 30 to 50 individuals that are not closely related if the source gene pool is to be sampled adequately. Whereas a bottleneck of 15,000 would have preserved all but the very rarest alleles, a bottleneck of 2 or 3 individuals **MUST** have resulted in the loss of many genes – almost certainly including important adaptive alleles. Survival for 70,000 years (and the burgeoning human population) demonstrates that the human bottleneck (whatever its actual quantum) has not been too deleterious in the long term (and probably has long since been superseded by natural mutation), but it has only been about 20 Koala generations (a little over a century) since the VIC bottleneck effectively started) and it is concerning that we are probably beginning to see evidence of genetic load (ophthalmic and genital defects, etc.). Despite the established severity of the VIC population bottleneck and the emerging (probably congenital) health issues, the TSSC was disinclined to recommend Commonwealth action “because we do not have scientific evidence, and under the act we require some scientific evidence to prove that.” Generally evidence does not really “prove” something, though by being consistent with an hypothesis it fails to disprove the hypothesis – thus there is a reasonable basis (approaching ‘beyond reasonable doubt’) that on the balance of probabilities, the genetic impoverishment of the bulk of the VIC population is a threat and not a remote one, which should be accorded significant weight in the listing assessment.

Whilst conceding “Genetic diversity would be one of several criteria that are normally used to identify and recognise important populations, but we have not been through that process as a committee”, the TSSC has failed to acknowledge that the unambiguously established lack of genetic diversity in the bulk of the VIC population should ‘discount’ the significance of that population in relation to determining the “national significance” of the dramatic declines clearly established in Northern Koalas. Allied to the potential (and probably actual) expression of deleterious genes, is the highly likely lowered resistance to current and emerging diseases, about which the TSSC says, “We certainly do consider it as a threat; we just cannot quantify the threat” and “We took it into account as one of the many threats that we do recognise as affecting koala populations, certainly populations in Queensland, where disease may be more of an issue than it currently is in Victoria where population growth has certainly not been affected by, at least, the chlamydia, which is already present in Victoria and has been for quite some time.” On the contrary, in our judgement the potential risk from disease is much greater in VIC – the continued expansion of some ‘overabundant’ VIC populations despite high prevalence of chlamydial infection illustrates that the odd ‘overabundance’ problems there are not fundamentally related to disease or the lack of it. In contrast, there are many examples of genetically impoverished populations succumbing rapidly and catastrophically to disease when environmental and / or microbiological conditions change – the former is almost certainly now underway. This is yet another reason to distinguish Northern from Southern Koalas for the purposes of the EPBC Act.

### ***US Endangered Species Act Listing of the Koala***

The Inquiry Acting Chair asked the TSSC, “Can you just tell us again why the koala is listed as threatened in the United States but not here?” The response was that, “There is no comparability between the way the United States Endangered Species Act works, and the criteria they use, and those

adopted under the EPBC Act.” We have to say that “no comparability” seems to be going rather too far – but the ESA and EPBC certainly incorporate different approaches. The TSSC reply continued, “The US Endangered Species Act has no qualitative or quantitative criteria about levels of endangerment, so there is no measure by which people doing an assessment can get really objective listing advice.” This is quite incorrect – the ESA does not specify arbitrary criteria as per the IUCN approach, but it certainly requires compelling evidence for listing as outlined below. The assertion was also made that there is a “lack of objectivity in the (ESA) system,” – it’s a bit of a leap to regard avoidance of arbitrary criteria as “lack of objectivity”! The TSSC reply went on to remark that, “back in 2001 it was recommended that the Endangered Species Act adopt the IUCN criteria. I believe that has not been done yet.” Well it is quite true that the US hasn’t switched to the IUCN scheme; however, maybe that’s not due to inertia, but rather that the Americans are sophisticated enough to recognise that when dealing with the complexity of nature there is merit in avoiding attempts at excessively rigid and arbitrary approaches!

***Précis of US Endangered Species Act approach (derived from various online sources):***

To be considered for listing, the species must meet one of five criteria (section 4(a)(1)):

1. There is the present or threatened destruction, modification, or curtailment of its habitat or range.
2. An over utilization for commercial, recreational, scientific, or educational purposes.
3. The species is declining due to disease or predation.
4. There is an inadequacy of existing regulatory mechanisms.
5. There are other natural or manmade factors affecting its continued existence.

If a petition presents information that the species is imperilled, a screening period of 90 days begins (interested persons and/or organization petitions only). If the petition does not present substantial information to support listing, it is denied.

If the information is substantial, a status review is started, which is a comprehensive assessment of a species' biological status and threats, with a result of: “warranted”, “not warranted”, or “warranted but precluded.”

- If there is a finding of “not warranted”, the listing process ends.
- A “warranted” finding means the agencies publish a 12-month finding (a proposed rule) within one year of the date of the petition, proposing to list the species as threatened or endangered. Comments are solicited from the public, and one or more public hearings may be held. Three expert opinions from appropriate and independent specialists may be included, but is voluntary.
- A “warranted but precluded” finding is automatically recycled back through the 12-month process indefinitely until a result of either “not warranted” or “warranted” is determined. The agencies monitor the status of any “warranted but precluded” species.

Essentially the “warranted but precluded” finding is a deferral added by the 1982 amendment to the ESA. It means other, higher-priority actions will take precedence. For example, an emergency listing of a rare plant growing in a wetland that is scheduled to be filled in for housing construction would be a “higher-priority”.

Within another year, a final determination (a final rule) must be made on whether to list the species. The final rule time limit may be extended for 6 months and listings may be grouped together according to similar geography, threats, habitat or taxonomy.

**The ESA also has a sensible mechanism to avoid arcane and unprofitable discussions of what makes a “subspecies”, by incorporating the concept of a “distinct population segment” as the smallest division of a taxonomic species permitted to be protected under the U.S. Endangered Species Act.** *Species*, as defined in the Act for listing purposes, is a taxonomic species or subspecies of plant or animal, or in the case of vertebrate species, a distinct population segment (DPS).

The criteria for designation of a population or group of populations as a DPS was most recently articulated in a 1996 joint USFWS-NMFS policy (61 FR 4722: February 7, 1996):

Three elements are considered in a decision regarding the status of a possible DPS as endangered or threatened under the Act. These are applied similarly for addition to the lists of endangered and threatened wildlife and plants, reclassification, and removal from the lists:

1. *Discreteness* of the population segment in relation to the remainder of the species to which it belongs;
2. The *significance* of the population segment to the species to which it belongs; and
3. The population segment’s conservation *status* in relation to the Act’s standards for listing (i.e., is the population segment, when treated as if it were a species, endangered or threatened?).

The TSSC also seems to have some misapprehension of the functioning of the ESA and expressed the view that, “If one takes land clearance overall as one's criterion for listing then literally most animals in Australia that live in forests would get listed. This has actually happened with the listing under the United States Endangered Species Act. They have taken into account—it is their main criterion, in fact, because they do not have any objective qualitative or quantitative criteria about endangerment—land clearance in the time of European settlement.” No – that’s not actually correct. It’s true as outlined above, that the ESA has not adopted the IUCN prescriptions, but the listing process is strongly evidence based and, as typical of the US system, it relies more on the court system to provide accountability in the process than here, where there is greater reliance on bureaucratic checks and balances. For example the successful petition compiled by ‘Australians for Animals’ that led to the listing of the Koala was as thick as the proverbial telephone book and was the most extensive review of information on the species yet assembled. The apparent TSSC view with respect to land clearing apparently was “If one did that (*i.e. adopt what was asserted to be the ESA approach*), almost any species in Australia would be listed under the EPBC Act, and that is clearly an extreme position under the precautionary principle.” This assertion does not reflect actual experience with the ESA - the annual rate of listing (*i.e. classifying species as ‘threatened’ or ‘endangered’*) has varied from 15 per year originally, 32 per year under 2 administrations, 58 per year to a peak of 65 per year before declining to 8 per year and is now about 26 per year. In all, about 1300 species from all taxa of plants and animals (aquatic, marine and terrestrial), not only from the US but also international species such as the Koala, have been listed to the present. This certainly does not represent “almost any species” in the US, let alone worldwide.

### ***Potential Solutions***

Senator Di Natale remarked that he was “shocked at how poor the data is” for Koalas; and went on to ask, “What are the tools at our disposal that allow us to improve that monitoring?” The TSSC provided a somewhat paradoxical response; indicating that they “were disappointed that not a lot had changed in terms of new information and certainty associated with abundance and trend data in populations across the koala's range when we did this latest assessment.” This is a bit odd, since although it is true that additional monitoring sites had not been established, the catastrophic declines in Northern Koalas were documented between the previous and latest assessments. But most significantly, how would one expect more population surveys or monitoring sites to be established? – As a number of members of the TSSC emphasised, the Australian Research Council just does not fund this kind of research; the only other federal funding source is the Department of Sustainability, Environment, Water, Population and Communities (DSEWPoC), but its ‘system’ is set up so that only listed species are likely to attract funding for the research and monitoring that is required to justify listing.....?!? Then followed a reiteration of one of the major inconsistencies in the TSSC’s advice, “One of the key issues that we have highlighted very strongly in our advice to the minister and in our letter to the minister is that we need national coordination of this process;” we strongly disagree that this is anything like the highest priority. What is needed is immediate, tangible assistance with habitat protection and provision of Commonwealth resources for additional survey and monitoring - NOT more facilitation and co-ordination! This curious TSSC non-solution was then repeated, “What the committee continually comes up against is data deficiency problems associated with assessing species. And even for species which, like the koala, have a large range, we have pinpricks of information across the range, but this is insufficient to give us confidence that we really understand the overall trends clearly enough to make these assessments simply. So what we have suggested as a committee numerous times is that there needs to be better national coordination of the information.” So again the TSSC correctly identifies the inadequacy of data as a problem, but then suggests the solution is better organisation of those inadequate data - what is really needed is better information, since on a national basis the information available for the Koala has been co-ordinated and found wanting. No amount of co-ordination of



existing information on the Koala will provide an adequate picture – the TSSC has said this repeatedly. Co-ordination cannot rectify data deficiency.

However, to put this in context we certainly agree that there needs to be Commonwealth resourcing of population survey and monitoring efforts – to acquire both demographic and population genetic data. But to some extent it's like arriving at a burning house and suggesting the most urgent need is to install more smoke detectors; probably a good idea after we put out the fire. What is needed most urgently for Koalas is to address the “fire” first: list them and engage the EPBC Act to assist in stopping ongoing habitat destruction. Then we can get on with the “smoke detector installation” by expanding survey and monitoring effort.

Our conclusion that the primary requirement to improve confidence in the status of Koala populations is acquisition of more and better data, should not be taken to mean we do not also see a critical need for improved co-ordination of survey and monitoring, as well as enhanced co-ordination, collaboration and networking of Koala research efforts generally. As well as providing a much more comprehensive snapshot of the status of current populations, an essential function is to evaluate the success or otherwise of conservation initiatives (e.g. planning controls, habitat restoration projects) and to provide a sound basis for adaptive management. We believe that there is a strong case to establish an “Australian Koala Institute” which could provide a networking opportunity for all those currently active in Koala research who wish to participate; a focus for conservation related research on the species with its major priority being to address present knowledge deficiencies as identified by the TSSC; a conduit for Commonwealth funding and a “hub” comparable with the National Environmental Research Program (NERP) approach. For a variety of reasons, the “hub” should be located in Southeast Queensland, with ‘spokes’ radiating North, South and West to institutions (universities, government agencies, non-government organisations and industry) in all the ‘Koala States’ with active Koala research programs, as well as establishing new collaborations as and where this would assist conservation of the species; the “Australian Koala Institute” should have a much broader networking function as well as the primary research linkages - interfacing with the social sciences, economic interests, community organisations (especially catchment management and ‘land for wildlife’ groups) in both urban and rural areas. This generally is consistent with needs identified by the TSSC. We are aware of the existence of a building (that with modest refurbishment would be ideal to house the “hub”) and associated Koala holding facilities nearby.

The Inquiry's attention was drawn to the situation “that it is ironic that the best coordinated trend information for Australian biodiversity is through the fisheries status reports” and that there “is nothing comparable for Australian terrestrial biodiversity”. This comment from the TSSC provides an apt perspective on the parlous state of applied research and conservation monitoring of Australia's biodiversity. It is not quite accurate though; there is one group of terrestrial animals for which robust and regular monitoring data are available – the commercially harvested kangaroos. This is basically for the same reasons, commercial imperatives involving obligations imposed by the licences required to undertake both marine and kangaroo harvests. For species such as the Koala which will hopefully never again be subject to hunting (either commercial or recreational - or culling), but which nevertheless generate a considerable economic return from the tourist industry, there may be additional opportunities to link economic returns and regulatory requirements to support for the species' conservation.

We certainly support the views expressed by the TSSC that the present EPBC Act is deficient in its failure to provide protection to “species which are of extreme Indigenous significance or other cultural significance”, nor to evolutionarily significant species unless and until they become threatened. This is especially pertinent to Koalas – partly because such protections are not available from the Commonwealth (though QLD, at least, affords extra attention to wildlife of “special cultural

significance”), Koalas have declined to the extent that their existence in the wild is now seriously threatened. In light of our previous comments concerning the inappropriate overemphasis on membership of somewhat arbitrary threatened species lists, it should be unsurprising that we very much endorse the sentiment expressed by the TSSC, “that it is by no means a Holy Grail to be listed as threatened” and that being listed as threatened “is sort of a house of last resort and we would rather not that”. Sadly, however, this ignores the reality that at present the only way to qualify for tangible protection and support from federal agencies is from membership of such a list; as far as the Commonwealth is concerned there are no ‘houses of first or other resort’! We acknowledge the merit of the TSSC comment that, “The (*EPBC*) act and the provisions of the act are better at regulating direct human pressures such as hunting and taking of particular species or land-use determinations preventing mining rather than they are about providing protection against indirect threats such as the effects of feral animals” (or indeed climate change). But it is precisely protection from “direct human pressures” that is the element of the EPBC Act that would most immediately assist the collapsing Northern Koala populations in coastal NSW and QLD – and the fundamental issue is that Koalas will have to be listed before they can enjoy that protection or other tangible Commonwealth support.

### **Conclusions**

In our judgement, the most urgent priority for Commonwealth action is (1) to activate EPBC Act protection to assist in resisting further habitat destruction in coastal areas inhabited by Northern Koalas and (2) to provide resources for major habitat restoration projects further West which will, at least partly, help rectify the drastic population crash due to drought and longer term climate change, as well as producing a significant benefit to our national carbon balance (which might well provide a source to help finance the habitat restoration). We consider that Koalas meet a criterion for listing as threatened under the EPBC Act, especially in light of the heightened threats identified since the TSSC provided its most recent advice. Such listing will enable the above actions to be taken and we urge the Senate Inquiry to commend this course to the Minister.