Comments on and suggestions for, the NSW Koala Strategy

<u>General comments</u>

These comments are largely directed toward koalas on the far south coast, but may have relevance to koalas in other areas.

> " . . . The quality of Koala habitat in this area is deteriorating because of multiple factors including extensive canopy dieback, clearing due to rural-residential development and commercial forest harvesting. Koalas currently occur at a low density in southeast NSW including the nominated population area." NSW Scientific Committee (2007)

> " . . . Conversely, there are measurable advantages in tree planting, a point that arises from studies on farmland in Gunnedah, north-western NSW, and this finding can apply to any cleared area, including logged coupes, cleared land and mined land (Lunney *et al*. 2012*b*)." Lunney *et al*. (2014)

With regard to koala habitat deterioration, the website for the $5.6 million 'Foundations for River Recovery and Return of Koalas to the Bega Valley' project, undertaken by Local Land Services, indicates it has been operative since 2011. However, there are no reports on its progress. Experience growing former primary koala feed species, suggest the outcome will not be a return of koalas to the Bega Valley.

While it is unclear whether those managing the afforementioned project believe soils around Bega, are as fertile as those around Gunnadah. It is apparent that koalas do not utilise existing stands of mature Forest Red Gum, adjacent to areas koalas have recently been found to occupy. Regrowth stands of Forest Red Gum are usually quite stunted, with a growth form more like Mallee.

> " . . . As a result of the RFA decision in 1999, areas of known koala habitat, such as parts of Tantawangalo and Yurammie State Forests, were included in the new National Park estate (Lunney and Matthews 2002; Lunney 2005). It is now clear that this transfer of land was too late for conserving the koala population; however, as ghost habitat, it retains its potential to once again support a koala population should koalas recolonise this area in the future." (ibid)

The $3.9 million 'Corridors and core habitat for koalas on the NSW Far South Coast' project, undertaken by the OE&H, Forestry Corporation and the EPA, has only one report, that doesn't actually mention the main focus. This being the poorly concieved and ultimately failed idea to translocate koalas from the Strzelecki's, to the South East National Park.

The major theory behind both of these projects is the notion that soil fertility has not reduced. This theory was first proposed in State Forests 'Koala management plan: Eden management area' (1997).

More recently, the NSW Forestry Corporation has formed the opinion that a lack of burning is responsible for extensive canopoy dieback and eucalyptus forest decline generally. Part of this opinion suggests koalas are associated with unhealthy forests.

For its part the OE&H appears to have settled on climate change as more important threat to koalas.

> " . . . Climate change, particularly drought and rising temperatures, has been a hitherto hidden factor that has been a major driver of the decline of the koala in the Eden region." Lunney *et al.* (2014)

The circumstances required for koalas to recolonise 'ghost habitat', reversing climate change, seems a tall order . However, during the timeframe koalas have declined in the Eden region, including translocated koalas, translocated koalas have expanded in forests from Cooma to Campbelltown.

Lunney *et al.* (2014) cite Lawler *et al.* (1996) the abstract of which is pasted below, as evidence of potential climate change impacts -

> " Seedlings of *Eucalyptus tereticornis* (Smith) were grown under two levels of availability each of CO_2 (352 and 793 µmol mol−1), soil nutrients (1/24 and 1/4 Hoagland's solution) and light (full and 30% sunlight). Low soil nutrient availability or high light increased the C:N ratio of leaves, leading to lower leaf nitrogen concentrations, higher leaf specific weights and higher levels of both total phenolics and condensed tannins. These results were consistent with other studies of the effect of environmental resource availability on foliage composition. Similar results were observed when the C:N ratio of leaves was increased under elevated CO_2. The changes in leaf chemistry induced by the treatments affected the performance of 4th-instar larvae of *Chrysophtharta flaveola* (Chapuis) fed on the leaves. Increased C:N ratios of leaves reduced digestive efficiencies and pupal body sizes and increased mortality. Below a threshold nitrogen concentration of approximately 1% dry mass, severe reductions in the performance of larvae were recorded. Such changes may have significant consequences for herbivores of *Eucalyptus,* particularly in view of projected increases in atmospheric CO_2."   Lawler *et al.* (1996)

Clearly the research found both low nutrient availabily and/or increased CO_2 levels led to " . . . lower leaf nitrogen concentrations, higher leaf specific weights and higher levels of both total phenolics and condensed tannins."

The reluctance to accept reducing soil fertility as the major issue behind koala decline, appears to stem from a similar reluctance to accept a previously agreed understanding about forests. In particular -

> " . . . The Governments recognise the unique nature of Australia's biota and that the natural inter-relationship between native flora and fauna is essential for the health of the forest ecosystem. Accordingly, they will manage for the conservation of all species of Australia's indigenous forest fauna and flora throughout those species' ranges, and they will maintain the native forest cover where a reduction in this cover would compromise regional conservation objectives, consistent with ecologically sustainable management." National Forest Policy Statement (1995)

The 'Save our Species' proposals represent a step forward in attempts to save and potentially increase biodiversity. However, re-introducing locally extinct critical weight range species is not considered a regional priority. Rather, the Forestry Corporation has recently translocated 23 Long-nosed potoroos (*Potorous tridactylus*), from the Eden region, to Booderee National Park on Commonwealth land at Jervis Bay (Australian Government, 2016).

After providing a letter of support for community efforts to re-introduce locally extinct species. The Forestry Corporation decided not to support these Commonwealth funded efforts. The OE&H, at a regional scale, appear to hold a similar opinion about these efforts to increase biodiversity.

Consequently, the proposed management of koala habitat in the Murrah Flora Reserves reflects the NPWS's general approach, namely1080 baiting and proposals to undertake so-called 'experimental burning'.

With regard to 1080 baiting, there is no doubt this program has greatly reduced, if not eliminated wild dogs and dingoes, both in the Flora reserves and on adjacent private land. This reduction has significantly increased the numbers of common species like wallabies, kangaroos and wombats. However, the fact that this program has always been constrained to State Forest, now Flora reserve, has limited its effectiveness in controlling fox numbers. There appears to be little information on feral cats.

With regard to 'experimental burning' proposals, it difficult to believe this proposal has been influenced by credible data on forest structure. If that were the case, some consideration of recent research, the abstract of which is pasted below, would be evident.

" . . . The influence of plant traits on forest fire behaviour has evolutionary, ecological and management implications, but is poorly understood and frequently discounted. We use a process model to quantify that influence and provide validation in a diverse range of eucalypt forests burnt under varying conditions. Measured height of consumption was compared to heights predicted using a surface fuel fire behaviour model, then key aspects of our model were sequentially added to this with and without species-specific information. Our fully specified model had a mean absolute error 3.8 times smaller than the otherwise identical surface fuel model ($p < 0.01$), and correctly predicted the height of larger (≥ 1 m) flames 12 times more often ($p < 0.001$). We conclude that the primary endogenous drivers of fire severity are the species of plants present rather than the surface fuel load, and demonstrate the accuracy and versatility of the model for quantifying this." Zylstra et al. (2016)

Fuel reduction burns in these forests are unlikely to reduce the threat of wildfire. Rather, the lack of consideration about the flora species present, has led to the OE&H implementing burns that have totally scorched the canopy.

Suggestions

1. In the absence of information confirming reducing soil fertility is not the major factor behind koala extinction. The OE&H fast track the reintroduction of locally extinct fauna, into the current protected area, to ascertain the ability of the habitat to support these species. Should these attempts be successful, increasing the number of protected areas for species re-introduction is suggested.

2. Given climate change is percieved to be a major threat to koalas, management that reduces CO_2 emissions should be a priority. Similarly, should there be a wildfire, the safety of fire fighters should also be a priority. Hence, the physical removal of some tree species adjacent to roads, particularly Black forest oak (*Allocasuarina littoralis*), is likely to be the most effective method to reduce the threat of a canopy wildfire, its intensity and increase protection for fire fighters.

3. In order to utilise the biomass contained in these removed trees, any legislative constraints on either their removal and utilisation need to be relaxed.

4. To efficiently utilise this biomass, a new business specialising in pyrolisis is required in the local area. Such an enterprise would provide employment and a source of energy, that could be fed back into the electricity grid or employed to power more enviromentally sensitive electric vehicles.

5. The 'biochar' produced in such a facility is mostly carbon that can be sequestered in soils to reduce soil Ph and increase biological activity .

6. Any further attempts to restore primary koala habitat should require adequate soil preperation, to address soil compaction, changes to hydrology and incorporating appropriately treated biochar, to reduce soil Ph and increase biological activity, prior to tree planting.

7. A cross tenure approach to feral foxes and cats is required. This would seem particularly the case, as the imminent release of a new strain of rabbit Calicivirus is likely to increase feral predation on native species. Given the cryptic nature of the feral cat and the difficulty trapping them, the recent development of 'grooming traps' for cats deserves serious consideration.

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