KOALAS IN THE NORTH EASTERN PART OF THE MONARO REGION OF SENSW

SUMMARY
This paper has been prepared primarily to inform staff of the NPWS, DLWC, the Cooma-Monaro Shire Council and Greening Australia about koalas in the Numeralla/Chakola region of SENSW. These koalas form a unique, low-density population that deserves careful management to ensure its long-term viability.

The population extends from the catchments of the Schofields, Cowra and Buchans Creeks in the north to the headwaters of the Kybean River and Calminda areas to the south, a distance of approximately 60 kilometers (See Map 1). The population probably extends both further north and south of this area, though further surveys are needed to confirm this.

Until now it has been assumed that koalas feed exclusively on foliage, predominantly that of eucalypts. The evidence of bark chewing by koalas in the Chakola region (Figures 1 & 2), gathered over the past decade, indicates a population with a unique ecology. This highlights both its conservation significance and the need for further research.

Because most of the forest and woodlands in this region are on private land, the management of these areas is key to the long-term conservation of koalas in the region.

Included in this paper is a brief case study of the interactions between state and local government authorities and the landholders of Lot 1, Rose Valley Rd, Bunyan who are undertaking a commercial firewood operation on their 1500 ha property. The landholders are attempting to meet legislative planning requirements and guidelines in the hope that the ecologically sustainable management of their forest is achieved. The case study examines the likely impacts on koalas known to be present on this property and the consequences for the population should these occur more generally.

In conclusion, recommendations to assist in the long-term conservation of this koala population are provided.

KOALA SURVEYS IN THE REGION

Background

Information in this paper is based on the results of targeted surveys that were undertaken in 1999 (Allen 1999) and 2001 (AKF unpublished data) and detailed observations recorded by landholders in the Chakola area.

Koala survey in the Numeralla area

Allen (1999) provides information on a targeted koala survey undertaken in the Numeralla area to the south of the Numeralla township (Map 1). The main results of this survey were:

- Evidence of koalas was found at all eight areas searched in this survey. Koalas appeared to be occupying at least some of these areas permanently.
- There was extensive anecdotal information of koalas in the general area that had not been reported.
- At least one species of insect was present in the area that lived in and fed on koala fecal pellets, suggesting the long-term and uninterrupted occupation of the area by koalas.

Anecdotal information from the Black Ridge property

- Another area where information about koalas has been collected was at 'Black Ridge', a property of nearly 2000 ha in the Chakola region, north-east of Cooma (Map 1). This was purchased in 1992 by a number of people interested in preserving its conservation values and subsequently a Voluntary Conservation Agreement covering the whole property was entered into with the NSW National Parks and Wildlife Service.

The terrain of this property is undulating to hilly and the vegetation ranges from grassy woodland to open

forest. To date twelve species of eucalypts have been identified.

Soon after purchase some of the owners noticed distinctive chew marks on the bark of some eucalypts (Figures 2 & 3). Subsequently the areas around the trees were searched for fecal pellets. Under nearly every tree with fresh chew marks koala pellets were found. Furthermore, scratch marks consistent with those made by koalas were typically present on the trunks of the trees. Koalas have been seen on the property. On two occasions National Parks personnel were with some of the owners. One sighting was of a mother koala and rather advanced young one.

FIGURES 2 & 3: KOALA CHEW-MARKS ON *E. MANNIFERA*

A summary of observations made by some of the owners over about nine years follows.

- The bark-chewing activity is almost exclusively confined to the trunks (and sometimes larger branches) of the Brittle Gum (*Eucalyptus mannifera*). The Brittle Gum is widely distributed over the property, occasionally as pure stands but mostly in mixed stands. Only a small proportion of these trees have been chewed.
- Chew marks have been seen on the Mountain Scribbly Gum (*E. rossii*) on only two or three occasions and are never extensive.
- Chew marks usually take the form of chisel-like gouges out of the bark, leaving the orange inner bark exposed. This orange colour appears to persist for at least several months. Eventually it turns grey and scabby.
- Typically the chew marks or gouges are approximately 2 - 6 cm long, 4 - 6 mm wide and 2 - 4 mm deep. They are usually at an angle of less than 45 degrees to the horizontal and often in a row. Sometimes a second row at a different angle overlaps the first row. Sometimes they are close enough to remove a continuous area of bark. Occasionally the gouges form a star-like arrangement.
- At least three trees have been observed where the koalas have apparently eaten the bark while standing on the ground. In these cases, a continuous sheet of bark on one side of the trunk has been removed to ground level. On these trees the chewing appears to go deeper, probably to the cambium and even into the wood (xylem). One of these was found when very freshly chewed and there were many koala fecal pellets on the ground in front of the chewed section.
- Chew marks have been observed as high as 7 or 8 metres. Typically such trees have the chew marks extending along much of the main trunk.
- Some trees appear to be 'favourites' and are revisited over a number of years. One such tree has been observed for at least six years and still receives the occasional visit despite the considerable scarring from previous activity. Others might be revisited for two or three years and then are left alone. Some trees appear to have been chewed only once.
- Following scarring and bark shedding, it becomes difficult to identify trees that have been subject to chewing if no fresh chew marks are visible.
- Trees that have been chewed have been found at all elevations from the valley floors to the tops of ridges.
- The amount of bark chewing seems to vary over time. Whether this varies with the season, with rainfall (drought conditions have prevailed over much of the last ten years) or with some other factors, has yet to be determined.

- This bark-chewing activity is known to occur in areas to the south of the property being studied. There are extensive forested areas to the south east, east and north but these have not been searched for evidence of this activity.

Surveys by the Australian Koala Foundation

The Australian Koala Foundation also undertook surveys in the region in November 2001. The author of this paper participated in this survey. The following areas were searched:

- The Black Ridge property where the bark chewing activity had been observed.
- The area west of Numeralla Mountain in and near to where similar surveys (Allen 1999) had been conducted in 1999.
- An area to the north of the Numeralla township which is located between the above two survey areas.

At the Black Ridge property the team located at least five trees over a distance of more than half a kilometer that had evidence of chewing. Koala fecal pellets were found in small numbers associated with all but one of these, either on the ground or in a major fork of a branching trunk. One included fecal pellets of a young koala. Another tree that had been extensively chewed that was located approximately 4 kilometers from the above area. Fecal pellets deposited by an adult koala and a joey were located in the fork of this tree and other pellets of differing ages were located nearby. The survey team then conducted a sweep search for koala pellets in the area between this location and that where earlier observations had been made. Several sites with koala pellets were located in this search, including fresh pellets deposited by an adult koala and joey. Another extensively chewed tree with koala pellets underneath was located.

The survey team closely examined the scratch marks on the boles of the trees that had evidence of chewing. These appeared to be consistent with those made by koalas.

Koala fecal pellets were located at numerous sites in Survey Area 2. This included those of an adult koala and joey at one site, indicating that a breeding association survives in this part of the region. Although bark chewing was observed on one tree no fecal pellets were located at this site.

Koala fecal pellets were also located at many sites in Survey Area 3, including those of an adult koala and joey at one site. This confirmed that there is a breeding association between the Numeralla and Chakola areas and gives added support to the suggestion in Allen (1999) that there is a koala population stretching from the Numeralla to the Chakola areas. Although bark chewing was observed on one tree no fecal pellets were located at this site.

The survey commenced in forest where *E. mannifera* and *E. macrorhyncha* predominated and *E. rossi* was not present. Only one active site was located in this area and only a few koala pellets were found at this site. The survey team then moved into an area where *E. rossi* was common. Koala fecal pellets were then frequently encountered over an area of at least 100ha with koala pellets under many *E. rossi*. This species is not normally considered to be a feed tree species (Phillips 2000)

CONCLUSIONS

A unique population

The above information presents a powerful case of a koala population with a unique capacity to supplement its feeding with the bark and/or sap of eucalypts. Koalas have evolved to utilise a wide range of forest and woodland ecosystems across eastern Australia (Phillips 2001). There is a substantial cline in the morphological characteristics of the koala over its range (Martin 1992). It perhaps is therefore not surprising that some koalas have evolved to utilise another part of the tree in its diet.

Some observations

Apart from the information presented above, little is known about the ecology of koalas in this region. Nevertheless some tentative conclusions can be drawn from existing information:

- Although *E. viminalis* is widely recognised as an important feed tree for koalas (Phillips 2001) it may be of no more importance to this population than several other eucalypts including *E. mannifera*, *E bridgesiana*, *E. rossii, E. machoryncha* and *E rubida.* Indeed, a diversity of specific eucalypt species

may be essential to its survival.
- Currently this type of koala habitat is not protected under SEPP 44.
- The rugged, infertile (Tulau 1994) and remote nature of the habitat that is sustaining this koala population has meant that the area has had a relatively low level of human disturbance. The lack of disturbance may be a significant factor in the persistence of this population (Allen 1999).
- In these lesser-disturbed areas there tends to be a higher proportion of older trees. These appear to be particularly important for these koalas (pers. obs. of author).

A CASE STUDY

Commercial firewood operation

We provide background information about the commercial firewood operation at Lot 1, Rose Valley Rd, Bunyan primarily because a precedent is being set that could have serious ramifications for those koalas dependent on private land in the region.

This property adjoins the Black Ridge property on its southern boundary with the Mt Clifford NR on its eastern side. To the south and west of this property there is contiguous vegetation linking it with the Hangmans Creek Area.

Evidence of koalas on the property had been reported by the owners and neighbours.

In 1999 the landholders of the above property applied to the DLWC and the Cooma- Monaro Shire Council to undertake a large commercial firewood operation project. The logging operation proposed the patch logging of 600ha (mainly upper-slope areas) over a 50 year period.

At the time the NPWS concluded the proposal should not significantly impact on koalas or koala habitat provided all large hollow-bearing trees, stands of *E. viminalis* and trees with evidence of koala use were protected.

Because the DLWC required a number of surveys before operations could proceed the owners opted to abide by the Native Vegetation Act 1997 that permits them to remove up to 7 trees per ha per annum. The DLWC has granted approval for the trees thus logged to be marketed for firewood.

The support given for this operation thus may well set a precedent and encourage other landholders to undertake similar operations in their forests.

Impacts on koalas

However, particularly because the data on the ecology of this koala population are so limited, there is no evidence to support the view that koalas can survive either of the logging regimes proposed for this property. Indeed the following suggests the opposite:
- We do not know which trees are or will be important for the koalas in this area;
- A high proportion of *E. mannifera* and *E. rossii* (which predominate on the upper slopes and which are probably both important koala feed tree species) will probably be felled over time;
- Given the rugged and infertile nature of habitat that is sustaining the population it is probably highly vulnerable to disturbance. The impact on koalas of the removal of potential or actual feed or home range marker trees could be much more severe than in more highly fertile areas;
- The soil landscape associated with this koala habitat has been described as highly erodible (Tulau 1999). Potential erosion events are being reduced in this instance with the use of rubber-wheeled vehicles and by cutting all trees with a chainsaw, rather than pushing them over by bulldozer (James Grey, Greening Australia, pers. comm.). However snig trails will inevitably expose large areas of soil and erosion events are likely. A reduction in fertility due to soil loss will probably result in less nutritious foliage which is less likely to be able to provide adequate browse for koalas;
- The associated soil disturbance will probably lead to severe weed infestation in an area that is still relatively pristine. This would destroy a key component of the ecosystem and could in the long term stress it to the extent that the eucalypts are unable to provide adequately nutritious foliage for koalas.

For these reasons I recommend that the NPWS informs the landholders of the Bunyan property of the

importance and likely vulnerability of the koala population in this region and recommends that no felling of trees occurs in areas where koala evidence occurs. The NPWS should also gain the support of the above landholders to obtain baseline data on koalas on the Bunyan property and surrounding areas. This should be part of a region-wide survey and monitoring program that incrementally gathers further data on the ecology and distribution of the population in this region (see below).

The NPWS should also discourage any further clearing and/or degradation of koala habitat in this region at least until there is a greater understanding of the ecology of this population and its vulnerability such impacts.

Other recommendations

In order to assist the sustainable management of this koala population I recommend the NPWS undertakes the following:

1. Produce a draft leaflet about the ecology and conservation the koala population in the Numeralla region;
2. Consult other stakeholders and encourage them to support the production and mailout of the leaflet;
3. Mail out the leaflet to local landholders;
4. Contact landholders in key areas by telephone and discuss koala survey, research and recovery efforts in the region that will be undertaken;
5. Address meetings of relevant community-based associations to discuss the above initiatives;
6. Based on responses to the leaflet, design a community-based survey program that attempts to fill some of the gaps in our knowledge as regards the distribution and ecology of the species in the study area;
7. Undertake the proposed survey program.

Authored by:
Chris Allen
South Coast Management Area
Koala Recovery Program
NPWS Threatened Species Unit
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