

6/05/2011

Directors

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Review of the Hollow Bearing Tree Assessment of lands at Warrah Road, North Nowra

Dear Sirs,

OMVI Ecological has conducted peer review of the hollow-bearing tree assessment of lands at Warrah Road, North Nowra as requested. The Biosis Research assessment conducted across Lot 24 covered just under 74ha, all of which is currently zoned for rural use under the Local Environment Plan (LEP). It is understood that Shoalhaven City Council (SCC) has prepared a revised draft LEP (DLEP 2009) which has Lot 24 zoned predominantly as Environmental with a small area residential. This revision of the zoning appears to be mostly based on the environmental studies undertaken for Council by Alison Hunt and Associates in 2008, of which only portions of Lot 24 were examined (AHA, 2008).

The hollow-bearing tree assessment conducted by Biosis Research aimed to clarify the results of the AHA assessment and to determine the number of additional hollow-bearing trees across the entire Lot 24 area in order to inform potential changes in the rezoning of the property.

It is understood that the main aim of the owners of Lot 24 is to sustainably create a residential yield that does not significantly impinge on the local biodiversity and does not greatly detract from the sites current ecological connectivity.

The results of the review:

The Gibbons and Lindenmayer assessment of hollows is recognised as a suitable assessment for many forested ecosystems but does have some bias toward species that occupy mature forest and woodland with limited reference to heathland. In regard to Warrah Road some of the key conservation significant fauna that rely on hollows prefers smaller hollows in dryer heaths and woodlands such as the Eastern Pygmy Possum. The Gibbons and Lindenmayer weighting for larger hollows along creeklines possibly under ranks the smaller more suitable hollows for such species as has been recorded across the Scribbly Gum Woodland of the Warrah Road site which is largely proposed to be zoned environmental.

Nevertheless, a majority of both high ranked (82%) and medium ranked (61%) hollow-bearing trees are recorded within the areas mapped as 'proposed environmental' in the Biosis Research Report and these occur in all vegetation types. Additionally almost half (48%) of low ranked hollow-bearing trees are also within the proposed environmental zoning. Biosis Research notes that the low ranked hollows were generally recorded as small pipes or spout hollows in Hard-leaved Scribbly Gum that were of lower conservation significance. However, considering the broad local and regional distribution of this vegetation community and with more than half in the proposed environmental zoning, numerous similar small hollows would remain locally and are likely to continue to develop within the environmental zones and would continue to provide shelter for conservation dependant species such as the Eastern Pygmy Possum, should those be lost in the proposed residential area.

Of the five vegetation communities recorded on and adjacent to Lot 24, the Scribbly Gum Woodland harboured approximately 915 of the hollows of all sizes within 320 Scribbly Gums averaging over 70 cm DBH (Table 1). When compared to the other species of tree containing hollows across the site, Scribbly Gums also averaged approximately 3 hollows per tree and represented more than 72% of the total number of hollows observed during the survey and 70% of the top ranked 200 trees.

The next species with the most number of hollows and the greatest number of hollow per tree on average was the Grey Gum which predominantly were recorded in the gullies and along the creeklines of the site within the proposed environmental zoning (Figure 2 of the Biosis Research 2011). The majority Grey Gums and Turpentine's recorded with hollows were found within the creekline buffers proposed.

Table 1: Hollow-bearing tree count data (from Biosis Research 2011)

Species	Sum of Hollows	No of trees	% trees with Hollows	% Total hollows
<i>Corymbia gymmifera</i>	2	1	0%	0%
<i>Corymbia maculata</i>	5	2	0%	0%
<i>Eucalyptus punctata</i>	131	43	10%	12%
<i>Eucalyptus sclerophylla</i>	784	283	69%	71%
<i>Eucalyptus sieberi</i>	47	26	6%	4%
<i>Eucalyptus sp.</i>	116	48	12%	10%
<i>Melaluca sp.</i>	3	1	0%	0%
<i>Syncarpia glomulifera</i>	18	8	2%	2%
Grand Total	1106	412		

When comparing this to the results of the AHA report conducted over a smaller area of Lot 24 the number and type of hollows appear to be very similar and the densities of hollow-bearing trees appear to be similarly concentrated, as they are in the Biosis analysis, in the Hard-leaved Scribbly Gum woodland which would be more than half conserved in the proposed environmental zoning. The Biosis report highlights that approximately 63.5% of the hollow-bearing trees were recorded in the proposed environmental zone and of these approximately 62 were ranked as having high conservation significance (i.e.16.3% of all hollows over the entire site), 153 as medium (i.e.40.2% overall) and 27 ranked as low (i.e.7.1% overall) (Table 2). Comparing this to the 139 hollows recorded in the proposed residential areas (36.5% overall), approximately 82% of the high ranked, 61% of medium ranked and 48% of the low ranked hollow-bearing trees would be conserved under the proposal. With the careful design of the residential layout the percentages of retained hollow-bearing trees could be further increased.

Table 2: Summary Hollow-bearing tree data and percentages within Lot 24 – from Biosis Research 2011

HBT Rating	Proposed Residential Zoning (30.1 ha)	Proposed Environmental Zoning (43.9 ha)	Totals (74 ha)
Low	29 (7.6%)	27 (7.1%)	56 (14.7%)
Medium	96 (25.2%)	153 (40.2%)	249 (65.3%)
High	14 (3.7%)	62 (16.3%)	76 (20.0%)
Totals	139 (36.5%)	242 (63.5%)	381 (100%)

Given that the hollow counts are relatively consistent with other counts in similar vegetation types within the locality (AHA 2008, B Ryan *pers obs*) the averages observed within this area could be attributed to the vegetation types generally in the locality and region and given that there is more than 33,500 hectares of Scribbly Gum, over 48,000 hectares of Spotted Gum and over 33,000 hectares of Grey Gum Woodland recorded within Shoalhaven LGA (SCC SOE Mapping 2004), the Warrah Road site would represent only a small proportion of an assumed consistent density of hollows in these vegetation types.

While the number of hollows is critical for the suitability of habitat for a wide variety of native species, the presence and occupation by such hollow-dependant fauna derives the hollows' conservation significance. Similarly, the proximity of suitable hollows to foraging resources and the abundance of these foraging resources area is also essential as the limiting resource in some ecosystems maybe the feeding resources rather than the shelter.

Given the presence of several hollow-dependant threatened species on the Warrah Road site or nearby, such as the Yellow-bellied Glider, Glossy Black Cockatoo and Powerful Owl, the larger slower produced hollows will likely be the main limiting resource within suitable foraging habitat. Most (82%) of the suitable mature senescent trees large hollows are to be found within the areas mapped as environmental in the Biosis Research Report and most are within intact forest and woodland with foraging resources for these species . For the Yellow-bellied Glider and Powerful Owl, the taller eucalypt forest with alluvial soils provide the habitat most associated with their respective shelter sites and the majority of these forest types are within the environmental zones. Yellow-bellied gliders will use multiple hollows within their home-ranges and have been recorded using up to 13 (Craig 1985) and share with up to 4 other individuals (Gibbons and Lindenmayer 2002). It is likely that the Yellow-bellied Gliders recorded near the site will utilise the larger hollows in denser forest of the gullies and toward the Shoalhaven River over the dryer open woodlands such as the Scribbly Gum Woodland. The Powerful Owl, while not recorded on Lot 24 has been recorded nearby similarly roosting in a large tree with multiple large hollows adjacent to creeklines in dense forest with a thick mid-storey. The majority of similar dense forest is within the proposed environmental zoning in Lot 24.

The Eastern Pygmy Possum prefers the small to medium sized hollows, up to 9 hollows within their home range (Ward 1990), within heathlands and heathy woodlands such as the Scribbly Gum Woodland. More than half would be included in the proposed environmental zoning and this includes the western area of Lot 24 which adjoins the same vegetation type to the west and north-west on other lots as well as south and south west to the Shoalhaven River.

The Scribbly Gum Woodland across the locality and region generally has a very high density of hollows. Hard-leaved Scribbly Gums are often recorded with hollows of varying sizes, resulting from past disturbance such as fires. They generally appear to be more mature due to less anthropogenic disturbance as *E. sclerophylla* is not regarded as a timber tree and the soils, on which it grows, generally have poor fertility and are not ideal for agriculture. It is clearly observed on the current site where the highest density of hollows recorded were in this community averaging above 10 hollow-bearing trees per hectare.

Despite the relatively high retention of hollows within the proposed environmental zone, the current proposed zoning will result in losses of both numerous hollows and known threatened species habitat. Having said this, the environmental zone as proposed conserves more than 63% of the hollows recorded across the Warrah road site and more than 50% of the Scribbly Gum, 83% of the large high conservation ranked hollow-bearing trees and 100% of the more dense Riparian Forests.

The larger (23.8 ha) proposed residential lot on the eastern portion of Lot 24 has the lowest density averaging 2.5 hollow-bearing trees per hectare and considering the prior disturbance of this area it is understandable. This figure is considerably less than the proposed environmental zone which averages 5.6 hollow-bearing trees per hectare.

The smaller western proposed residential lot does contain numerous (average 12.2 per hectare) hollow-bearing trees and area was also identified in the AHA report as highly conservation significant. The occupation of these hollows and their significance in a local or regional context may need to be considered and their overall conservation significance assessed in the local and regional context.

Conclusion

Overall there will be a loss of hollows for any residential proposal approved for lot 24, however, a very large percent of the most conservation significant trees with hollows are incorporated in the proposed environmental zones and the trees with medium and low ranking are similarly well represented in the environmental zones as well as in the areas beyond Lot 24. With appropriate planning the more mature and senescent trees could be further incorporated in to the environmental zoning, where appropriate, or where outside this zoning may potentially be conserved as part of the landscaping, within residential lots or a part of the streetscape.

The hollow-bearing trees themselves do not represent the conservation significance of an area and the density size or number become relevant only with occupation of hollow-dependant, conservation significant fauna. The proposed zoning put forward by the owner does aim to conserve a large percent of hollows as well as fauna habitat across Lot 24. With careful planning the area could potentially yield residential development while maintaining the local biodiversity and connectively for locally occurring flora and fauna.

If you require any additional information, or if you would like to discuss the brief assessment please do not hesitate to contact me on 0402 032 231 or e-mail brendan@omvi.com.au

Regards,



Brendan Ryan
Director

References

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