Flora and Fauna Assessment

TO ACCOMPANY A PROPOSED REZONING SUBMISSION OVER VARIOUS ALLOTMENTS AT VALLEY VIEW PLACE, NULKABA

Job Reference No. 22103
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**PROJECT:** FLORA & FAUNA ASSESSMENT FOR VARIOUS ALLOTMENTS AT NULKABA

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<th><strong>CLIENT:</strong></th>
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EXECUTIVE SUMMARY

A Flora and Fauna Assessment has been prepared for a proposed rezoning over various allotments at Nulkaba, near Cessnock, NSW.

The site was found to contain three vegetation assemblages, being Modified Lower Hunter Spotted Gum Ironbark Forest (LHSGIF), Modified Hunter Lowland Redgum Forest (HLRF) and Cleared Land. The Cleared Land, which covers the majority of the site, is comprised of a suite of introduced grass and weed species with occasional scattered trees, presumably remnants of the original communities in the area. Both the areas of HLRF and LHSGIF qualify as Endangered Ecological Communities (EEC's). However, these areas of bushland are considered to be highly modified remnants, consisting only of canopy trees, most of which are immature, with no semblance of an understorey.

No threatened flora species were recorded and it is considered that no preferred habitat for the vast majority of threatened flora species known from the area exists on the site. However, it is possible that the threatened tree species, *Eucalyptus glaucina* (Slaty Red Gum), is present within the HLRF remnant or present as individual remnant trees in Area C. Differentiation between the common *E. tereticornis* (Forest Red Gum) and *E. glaucina* is often difficult and requires the collection and identification of fruit and juvenile leaves. As this was not possible on this occasion impact on this species may need to be assessed further at a later stage. Identification and assessment is made more difficult by the fact that these two species readily intergrade in the Lower Hunter Region (K. Hill pers. comm.).

An assessment under Section 5A of the *EP&A Act 1979* (Eight Part Tests), assuming all of the EEC remnants on the site are cleared, has found that the proposal is unlikely to result in a significant impact on the conservation status of these communities. This was concluded due to the highly modified state of the remnants (barely reminiscent of the original community structure) and their isolated nature, suggesting that the ecological value of the remnants to the viability of the respective communities throughout the region was quite low.

The remnant native vegetation within the study area does provide some potential habitat for native fauna species although this is believed to be greatly limited by the isolated and modified/degraded nature of the vegetation, general lack of an understorey or shrub layer as well the proximity to residential dwellings. The Cleared Land offers little or no potential habitat for neither threatened fauna nor native fauna species in general.

One threatened fauna species has been recorded on site, being *Pomatostomus temporalis* (Grey-crowned Babbler). Assessment of potential impacts upon this species resulting from the proposed rezoning has been considered in accordance with Section 5A of the *EP&A Act 1979* (Eight Part Tests), the conclusion reached being that the proposal is unlikely to result in a significant impact on this species. A number of recommendations for further investigation and impact mitigation measures have been made to ensure that any future development of the site avoids impacting upon the local population of this species.

Following the ecological assessments it was deemed that the site may offer some limited potential habitat for other threatened species of fauna known from the vicinity of the site. However, it has been determined that the proposal would not significantly impact upon any of these species such that local extinctions would occur. This has been determined due to the following factors:

- The general isolation of the habitat remnants from adjacent bushland areas;
- The highly disturbed / modified nature and small size of the habitat remnants present;
EXECUTIVE SUMMARY

• Proximity of habitat to existing housing and associated pressures and;
• The noted existence of large areas of more suitable habitat both locally and on a regional scale.

Notwithstanding, a number of recommendations have been devised to ensure that any potential ecological impacts that may result from the proposal would be minimised, including impacts to any potentially occurring threatened species. The recommendations are:

• Closer inspection of Red Gum species on the site should be carried out to ascertain whether or not *E. glaucina* occurs therein;

• Ground inspection of each of the canopy trees on the site for hollows that could provide potential nesting and roosting habitat for threatened Microchiropteran bats and Petaurid Gliders should be carried out during any subsequent development application stage (this was unable to be undertaken during the current investigation due to restricted access to Areas A and C);

• Should any tree hollows be deemed appropriate for use by threatened fauna, an inspection of any hollows prior to clearing should be undertaken to confirm whether or not these are being used by any such species;

• Further to the above recommendation, an appropriately qualified ecologist / wildlife carer should be present on the site during clearing activities in the event that any displaced wildlife is present and needs to be recovered and subsequently relocated;

• In the event that any hollow bearing trees need to be removed, either hollow limbs or artificial nest boxes should be relocated / erected in appropriate nearby areas to compensate for the loss of such habitat on the site;

• Inspection of trees within the site for possible nests of *Pomatostomus temporalis* (Grey-crowned Babbler) should be undertaken prior to any clearing. Any trees containing nests should be retained where possible. Should any nests need be removed, this should **not** be undertaken between the months of July and February, the known breeding period for this species; and

• In general, as many canopy trees should be retained as possible in order that potential foraging resources for threatened birds, such as the Swift Parrot and Regent Honeyeater, are retained.

Provided that these recommendations are given due consideration, it is considered that the proposed rezoning is unlikely to result in any significant impact on threatened species, populations or ecological communities.
1 INTRODUCTION

A Flora and Fauna Assessment has been undertaken over land located off Main Rd, Nulkaba (see Figure 1-1). Land includes Lot 8 DP 749628 (Area A), Lots 91 and 92 DP1064064 (Area B) and various allotments to the south (Area C). The study area is the subject of a rezoning proposal, the report herewith designed to provide information pertaining to the ecology of the study area and to make an assessment of the potential for ecological impacts.

This report aims to examine the likelihood of the proposal to have a significant effect on any threatened species, populations or ecological communities listed within the Threatened Species Conservation Act 1995 (TSC Act 1995) or within the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EP&BC Act 1999).

Figure 1-1 shows the study area locality.

1.1 Scope of the Study

This study was designed to:

- identify any remnant native vegetation within accessible parts of the study area and make an assessment of conservation significance;
- identify any threatened flora and fauna species or presence of potentially important habitat attributes;
- assess the suitability of the habitat(s) present for native species in general; and
- address the possibility of the site, or parts thereof, being significant for any threatened species, populations or ecological communities and if necessary, provide appropriate recommendations to prevent or mitigate any potential impacts on threatened flora and fauna.

This study has been structured on the guidelines laid down in the EP&A Act 1979, which requires consideration of the impact of the proposed development upon any protected fauna but particularly on ‘Threatened’ species, Endangered Populations or Endangered Ecological Communities expected or occurring on the site. Consideration of potential constraints has also been undertaken in relation to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EP&BC Act 1999).

An ecologist carried out an initial site inspection on the 31st August 2004 within Area B (see Figure 1-1). A second site inspection over the entire study area was undertaken on the 27th April 2005 to update and expand on the information collected during the initial site inspection. Access to Areas A and C was restricted during this latter visit, however it was possible to categorise community remnants and habitat types from outside the boundary of the site and to make an adequate assessment of any potential habitat for threatened species. A number of recommendations for additional field investigations have been made where necessary.
WARNING
Note that this Vegetation Community Map depicts clearly defined boundaries between vegetation communities that are the product of individual interpretation and are not distinguished by clearly defined boundaries 'on the ground'. Therefore, this map should only be treated as an indication of approximate peripheries between delineated vegetation communities. Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.

No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from Harper Somers O’Sullivan Pty Ltd.

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2 EXISTING ENVIRONMENT

Vegetation

The study area has been almost entirely cleared of vegetation in the past, and consists only of small remnant patches of native bushland and various planted native and exotic species (see Figure 1-1).

Consultation of the Lower Hunter & Central Coast Regional Environmental Management Strategy (LHCCREMS) Extant Vegetation of the Lower Hunter and Central Coast Map (NPWS 2000; House 2003) was undertaken to determine the broad categorisation of remnant vegetation in the general area. The results of this investigation are presented as Figure 2-1.

The two areas of remnant bushland within the site are categorised by LHCCREMS as consisting of the Endangered Ecological Community (EEC), Lower Hunter Spotted Gum Ironbark Forest (LHSGIF). A visit to the site found that the remnant within Area A (see Figure 1-1) indeed consists of tree species consistent with this community, predominantly Corymbia maculata (Spotted Gum), while the remnant in Area C consists of trees consistent with a remnant of Hunter Lowland Redgum Forest (HLRF) community, also an EEC.

In Area A the LHSGIF remnant is less than 1 hectare in size and in Area C the HLRF has been estimated to be less than half a hectare in total. Both remnants are highly modified, a result of complete removal of the understorey vegetation. The impact of redevelopment on both EEC remnants, assuming they are to be cleared, has been assessed in accordance with Section 5A of the EP&A Act 1979 (Eight Part Tests) in Appendix B.

Corymbia maculata dominated the canopy of the LHSGIF remnant in Area A. A number of sub-dominant Ironbarks were also present, probably Eucalyptus fibrosa (Broad-leaved Ironbark) and/or Eucalyptus crebra (Narrow-leaved Ironbark). In Area C Eucalyptus tereticornis (Forest Red Gum) was clearly dominant with a number of Ironbarks subdominant here also. It is possible that the threatened tree, Eucalyptus glaucina is present within this remnant or as scattered individual trees within the site. Differentiation between Eucalyptus tereticornis and Eucalyptus glaucina is difficult and usually requires the collection and identification of fruit and juvenile leaves. As this was not possible on this occasion impact on this species may need to be assessed further at a later stage.

In Area B there was no vegetation of significance onsite that was reminiscent of any of the communities identified as being in this area. Some Paperbarks (Melaleuca spp.), potentially remnant of the nearby remnant Central Hunter Riparian Forest community, were found along the northern boundary, while the remainder of the vegetation consisted of planted and regrowth native species located around the boundaries of the Lot and in patches through the site. This vegetation included endemic species such as Allocasuarina torulosa (Forest Oak), Melaleuca armillaris (Bracelet Honeymyrtle), Melaleuca quinquenervia (Broad-leaved Paperbark), Leptospermum spp. and planted species such as Acacia baileyana (Cootamundra Wattle).

The cleared areas consisted of a range of pasture grasses such as Cynodon dactylon (Common Couch), Axonopus affinis (Narrow-leaf Carpet Grass) and Pennisetum clandestinum (Kikuyu).
Habitat

The majority of the study area consists of cleared grassland and gardens with limited planted and regrowth native and exotic species. Canopy trees remnant of the original communities are also scattered throughout the study area in gardens and undeveloped allotments. The extent of such habitats can be clearly seen in Figure 2-1 and the photographic record presented as APPENDIX A. The cleared areas provide little habitat for native species aside from potential foraging habitat for grazing species such as Macropods or granivorous birds. The planted native and exotic species within the site may provide some habitat for native fauna as discussed below.

The remnant vegetation within the site could provide suitable habitat for a suite of native fauna, to the greatest extent from the canopy trees that dominate. These canopy species could provide foraging opportunities for nectivorous, herbivorous and insectivorous species such as a range of avifauna and arboreal mammals. These trees would be best utilised by such fauna guilds during flowering periods.

Any hollows could be used as a nesting or roosting resource for hollow-dependant birds or mammals. Notably though, very few mature trees were apparent and it is considered that the site provides very limited potential habitat for hollow dependant fauna if any. The habitats present throughout the site occur commonly in the locality and in abundance throughout the region.

An evaluation of the habitat attributes of the site as they relate to the known or potentially occurring threatened species has identified the following attributes as potentially important:

- Nectar producing tree species including *Eucalyptus* spp. and *Corymbia* spp. that may provide foraging resources and habitat for a number of threatened birds;
- Forested and open areas providing suitable foraging habitat for Microchiropteran bat species.
- Trees potentially containing hollows of a suitable size for Microchiropteran bats and Petaurid Gliders.

The remnant native vegetation does provide some potential habitat for native fauna species although this is believed to be greatly limited by the isolated and modified/degraded nature of the vegetation, general lack of an understorey or shrub layer in parts as well the proximity to residential dwellings. The Cleared Land offers little or no potential habitat for neither threatened fauna nor native fauna species in general.
Fauna Recorded on the Study Area

Avifauna recorded on the study area included a composition of species commonly encountered in similar disturbed habitats throughout the region. Species such as *Malurus cyaneus* (Superb Fairy-Wren), *Rhipidura leucophrys* (Willie Wagtail), *Acanthiza nana* (Yellow Thornbill), *Taeniopygia bichenovii* (Double-barred Finch) and *Platycerus eximius* (Eastern Rosella) were recorded. These birds are commonly found in similar habitat throughout the region.

In addition, one threatened species of avifauna was recorded onsite during the inspection, *Pomatostomus temporalis* (Grey-crowned Babbler). A family group of approximately four birds was observed in the roadside garden of a dwelling located along the western boundary in Area C. They were observed within a planted *Acacia* sp. and remnant *Eucalyptus tereticornis* tree. Any potential for impact on this species has been assessed further in Table 3-1 and Appendix B.
Note: Ground truthing revealed vegetation as HLRF
3 ASSESSMENT OF THE PROPOSAL

The investigations undertaken have revealed that the cleared and developed areas of the subject site offer little opportunity for native species other than those preferring open spaces or tolerant of highly disturbed / modified habitats.

The identified areas of remnant Modified HLRF and LHSGIF and the canopy trees within these are considered to provide potential habitat for a number of threatened species known to utilise habitats in this general area and as such have been considered further in section 3.1 – Threatened Species Assessment.

One threatened fauna species was recorded within the study area and a number of others that are known to use habitats in the area could potentially occur. These have been considered for their potential to use the site on a regular basis.

3.1 Threatened Species Assessment

3.1.1 Identification of Subject Species

Outlined below in Table 4-2 is a list of those threatened flora and fauna species (as listed under the Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999), which have been recorded from within a 5km radius of the site within the Atlas Wildlife Database (NPWS, 2005). Each species is considered for its potential to occur upon the site and the likely level of impact as a result of the proposal (see Table 3-1). Any species or EEC with a low / moderate or higher likely level of impact are subjected to an eight-part test of significance (refer to Appendix B).
### Table 3-1 Threatened Species Considered for the Study Area and Assessment of Potential Impacts

<table>
<thead>
<tr>
<th>Species</th>
<th>Habitat Description / Comment</th>
<th>Chance of Occurrence</th>
<th>Level of Potential Impacts from the Proposal</th>
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<tbody>
<tr>
<td><strong>Plants</strong></td>
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<tr>
<td>Acacia bynoeana</td>
<td>Small, prostrate shrub found in low heath and open woodland, generally on loamy days and sand. Occurs from the Lower Hunter south to Southern Highlands. Recently found in several locations within the greater Cessnock LGA where it has been found growing in Kurri Sand Swamp Woodland (KSSW) and Yellow Bloodwood Woodland.</td>
<td>Low – Not recorded within 5 km. Marginal, very limited habitat onsite.</td>
<td>LOW – The study area does not contain the preferred habitat for the species (Kurri Sand Swamp Woodland) and very limited understorey vegetation exists on the site.</td>
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<tr>
<td>Callistemon linearifolius (V)</td>
<td>Species grows in dry sclerophyll forest on the coast and adjacent ranges. A significant population occurs within Werakata National Park. Re-sprouting / juvenile specimens difficult to identify.</td>
<td>Low/Moderate – Recorded within 5 km of the subject site but limited potential habitat within the site</td>
<td>LOW - Limited potential habitat exists within the study area, the understorey almost completely absent as a result of extensive clearing within the site.</td>
</tr>
<tr>
<td>Eucalyptus glaucina Slaty Red Gum (V, V*)</td>
<td>Species grows mostly on gentle slopes near drainage lines in alluvial and deep, fertile and moist clayey soils, mostly in open forest and grassy woodland. It is closely aligned with <em>E. tereticornis</em> (Forest Red Gum; with which it is also known to intergrade), but distinguished by the glaucous buds.</td>
<td>Moderate – Recorded within 5 km of the subject site and HLRF community present onsite.</td>
<td>LOW / further work required - Limited potential habitat exists within the study area, however a number of individuals may be present within the remnant HLRF community. Note: Due to access restrictions further work is required to establish presence or absence of this species on the site.</td>
</tr>
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<td>Eucalyptus parramattensis subsp. decadens Drooping Red Gum (V, V*)</td>
<td><em>Eucalyptus parramattensis</em> ssp. <em>decadens</em> is distributed across the lower Hunter Valley (N.S.W) from Tomago to Kurri Kurri. It occurs in woodland on sandy soils in wet sites. Any occurrences are likely to be restricted to areas along riparian vegetation strips or within close proximity to the water table.</td>
<td>Low/Moderate – Recorded within 5 km of the subject site but limited potential habitat within the site</td>
<td>LOW - No specimens have been found within the subject site and no potential habitat (Kurri Sand Swamp Woodland) is present.</td>
</tr>
<tr>
<td>Grevillea parviflora subsp. parviflora (V, V*)</td>
<td><em>Grevillea parviflora</em> ssp. <em>parviflora</em> is distributed from Prospect to Camden and Appin, with disjunct northern populations occurring near Putty, Cessnock and Cooranbong. It occurs in light clayey soils in woodlands.</td>
<td>Low/Moderate – Recorded within 5 km of the subject site but limited potential habitat within the site</td>
<td>LOW - Limited potential habitat exists within the study area, the land almost completely cleared to accommodate past and present land use.</td>
</tr>
<tr>
<td>Rutidosis heterogama (V, V*)</td>
<td>Small Asteraceous herb recently rediscovered in the Hunter Region growing in disturbed areas and adjacent parcels of bushland.</td>
<td>Low – Limited potential habitat onsite</td>
<td>LOW - Limited potential habitat exists within the study area, the land almost completely cleared to accommodate past and present land use.</td>
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<td><strong>Birds</strong></td>
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<td>Lathamus discolor Swift Parrot (E, E*)</td>
<td>On mainland this species lives in Eucalypt forests and woodlands with large trees having high nectar production in winter. Sites used vary from year to year.</td>
<td>Low/Moderate – Not Recorded within 5 km of the site but may use the site on an irregular, seasonal basis</td>
<td>LOW – <em>Corymbia maculata</em> present on the site, therefore the subject site offers some potential foraging habitat for this species, albeit a small amount. Potential for impact considered as low given the small area of habitat to be cleared.</td>
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<tr>
<td>Chthonicola sagittata Speckled Warbler (V)</td>
<td>Occupies Eucalypt and cypress woodlands on the western slopes of the Great Dividing Range, and in drier coastal areas. Appears to be extinct in districts where no fragments larger than 100ha remain.</td>
<td>Low – Recorded within 5 km of the subject site but limited potential habitat within the site</td>
<td>LOW - Limited potential habitat exists within the study area, the land almost completely cleared to accommodate past and present land use.</td>
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## Flora and Fauna Assessment

### Various Allotments, Nulkaba

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<tr>
<th>Species</th>
<th>Habitat Description / Comment</th>
<th>Chance of Occurrence</th>
<th>Level of Potential Impacts from the Proposal</th>
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</table>
| **Pomatostomus temporalis**  
Grey-crowned Babbler (V) | Typically occupies open woodlands dominated by mature Eucalypts, with regenerating trees, tall shrubs, with an intact ground cover. Recent anecdotal evidence suggests that in the Lower Hunter region this species is persisting in partially cleared and fragmented habitats (HSO ecologists pers. obs.). Also threatened by aggressive competitors. | High – Recorded in the study area | LOW / MODERATE – Unlikely to be significantly affected given that recommendations pertaining to pre-clearing surveys are adhered to.  
However, has been addressed under the 8-part test in Appendix B. |
| **Melanodryas cucullata**  
Hooded Robin (V) | Found in a range of Eucalypt woodlands, Acacia shrublands and open forests. Favours areas with sparse shrub cover and fallen timber. Appears unable to persist in remnants less than 100-200ha. | Low – Recorded within 5 km, no preferred habitat onsite | LOW - No preferred habitat within the subject site. |
| **Xanthomyza phrygia**  
Regent Honeyeater (E, E*) | Nomadic honeyeater that breeds west of the divide, disperses to areas including the coast in winter, where winter flowering trees are sought. | Low / Moderate – Some potential foraging habitat present onsite | LOW – Corymbia maculata present on the site, therefore the subject site offers some minor potential foraging habitat for this species. Potential for impact considered as low given the small area of habitat to be cleared. |

### Mammals

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</thead>
</table>
| **Petaurus australis**  
Yellow-bellied Glider (V) | Inhabits tall mature Eucalypt forest. Nests in large tree hollows. | Low – Marginal potential habitat onsite | LOW - Small incremental loss of non-preferred potential habitat. As a precaution impact mitigation measures as recommended within this report should be employed in the event that any suitable hollows are found onsite. |
| **Petaurus norfolcensis**  
Squirrel Glider (V) | Inhabits a variety of Eucalypt forests and woodlands. | Low – Marginal potential habitat onsite | LOW - Small incremental loss of non-preferred potential habitat. As a precaution impact mitigation measures as recommended within this report should be employed in the event that any suitable hollows are found onsite. |
| **Miniopterus schreibersii**  
Eastern Bentwing-Bat (V) | Cave dwelling species foraging above forest and woodland communities. The study area offers potential foraging resources. | Moderate – Some potential foraging habitat present onsite and recorded within 5km. No roosting habitat onsite. | LOW - Clearing of the subject site is not considered likely to have a significantly deleterious effect on the foraging habitat of this species. |
| **Myotis adversus**  
Large-footed Myotis (V) | Prefers to reside and forage in close proximity to water. Roosts in caves. | Low – No preferred habitat onsite | LOW - Small incremental loss of non-preferred potential foraging habitat. |
| **Scoteanax rueppellii**  
Greater Broad-nosed Bat (V) | Hollow dwelling species that prefers to forage in wooded areas (not thick) and open spaces / ecotones. Potential foraging habitat present. | Low / Moderate – Not recorded within 5km of the study area but potential foraging habitat onsite | LOW - Clearing of the subject site is not considered likely to have a significantly deleterious effect on the foraging habitat of this species. Some potential roosting habitat in the form of hollow bearing trees may be removed by the proposal. Impact mitigation measures as recommended within this report should be employed in the event that any suitable hollows are found onsite. |

### Endangered Ecological Communities

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<tr>
<th>Species</th>
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</thead>
</table>
| **Lower Hunter Spotted Gum – Ironbark Forest** | Comprises LHCCREMS Map Unit 17. Occurs principally on Permian geology in the central to lower Hunter Valley. Dominated principally by Corymbia maculata and Eucalyptus fibrosa. | High – Recorded in the study area | LOW / MODERATE - The subject site contains less than 1 ha of this community.  
However, has been addressed under the 8-part test in Appendix B. |
<table>
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<tr>
<th>Species</th>
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<tbody>
<tr>
<td>Hunter Lowland Redgum Forest</td>
<td>Comprises LHCCREMS Map Unit 19. Found on gentle slopes arising from depressions and drainage flats on permian sediments of the Hunter Valley floor in the Sydney Basin and NSW North Coast Bioregions.</td>
<td>High – Recorded in the study area</td>
<td>LOW / MODERATE - The subject site contains less than 0.5 ha of this community. However, addressed under the 8-part test in Appendix B.</td>
</tr>
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</table>

Key:  
(V*) = Vulnerable Species listed under Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999).  
(E*) = Endangered Species listed under EPBC Act 1999.
3.2 Section 5A of the EP&A Act (Eight Part Test) Considerations

As derived from Table 3-1, only one (1) threatened species and two (2) endangered ecological communities have been identified as occurring on the site and as having at least a low / moderate probability of being affected by development of the site. As such, an eight-part test for these species / communities has been undertaken under the guidelines of Section 5A of the Environmental Planning & Assessment Act 1979 (see Appendix B). These species / community include:

**Threatened Fauna**

- *Pomatostomus temporalis*  
  Grey-crowned Babbler

**Endangered Ecological Communities**

- Lower Hunter Spotted Gum Ironbark Forest
- Hunter Lowland Redgum Forest

3.3 Key Threatening Processes

A threatening process is defined in the Threatened Species Conservation Act 1995 (TSC Act 1995) as a process that threatens, or could threaten, the survival or evolutionary development of species, populations or ecological communities. Something can be a threat if it:

- adversely affects two or more threatened species, populations or ecological communities; or
- could cause species, populations or ecological communities that are not currently threatened to become threatened.

Key Threatening Processes are listed in Schedule 3 of the TSC Act 1995. The most applicable to the current proposal (both directly and indirectly) would appear to be ‘Clearing of Native Vegetation’. The proposed rezoning of this land may result in a loss of less than 1 hectare of Modified Lower Hunter Spotted Gum Ironbark Forest and less than 0.5 hectares of Modified Hunter Lowland Redgum Forest. This small incremental loss is not considered as potentially threatening the survival or evolutionary development of species, populations or ecological communities.

3.4 Assessment under the EPBC Act 1999

Considerations have been made to the Commonwealth Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act 1999). Searches of the Environment Australia On-line Database were undertaken to gather baseline data on the site and general locality. This data, combined with other local knowledge and records, was utilised to assess whether the type of activity proposed on the site will have, or is likely to have a significant impact upon a matter of National Environmental Significance (NES), or on the environment of Commonwealth land*.

* The site is not land owned by the Commonwealth, and hence this portion of the Act is not applicable. The matters of NES and site-specific responses are listed below.
Matters of National Environmental Significance

- **World Heritage areas:**
  The site is not a World Heritage area, and is not in close proximity to any such area.

- **Wetlands protected by international treaty (the RAMSAR convention):**
  The site is not part of any RAMSAR Wetland area, and is not in proximity to any such area.

- **Nationally listed threatened species and ecological communities:**
  All potentially occurring threatened species listed within the *EP&BC Act 1999* have been considered by this proposal specifically in relation to potential impacts under state legislation. In each case, these species were found unlikely to be significantly affected by any proposed activity on the site.

- **Nationally listed migratory species:**
  No listed migratory species were observed upon the site during field surveys conducted as part of these investigations. Whilst some species may potentially utilise this area on an irregular / seasonal / nomadic basis, it considered highly unlikely that activity on the site would significantly affect populations or habitat availability for any listed migratory species, nor upset migratory patterns.

- **All nuclear actions:**
  No type of nuclear activity is proposed for the site.

- **The environment of commonwealth marine areas:**
  The proposed activity on the site will not have a significantly adverse effect on any commonwealth marine area.
4 CONCLUSION

Flora, fauna and habitat investigations over Lot 8 DP 749628, Lots 91 and 92 DP 1064064 and various allotments to the south in Area C have led to the production of this Flora and Fauna Assessment. The study area has been found to contain three vegetation communities, being Cleared Land, and Modified Lower Hunter Spotted Gum Ironbark Forest (LHSGIF) and Modified Hunter Lowland Redgum Forest (HLRF), both of which comprise remnant stands of Endangered Ecological Communities.

The LHSGIF remnant (less than 1 hectare in size) and the HLRF remnant (less than half a hectare in total) are both considered highly modified - a result of complete removal of the understorey vegetation. The impact of redevelopment on both EEC remnants, assuming they are to be cleared, was assessed in accordance with Section 5A of the EP&A Act 1979 (Eight Part Tests). This test concluded that the clearing of these remnants would be unlikely to significantly impact upon the conservation status of Lower Hunter Spotted Gum Ironbark Forest or the Hunter Lowland Redgum Forest.

The modified remnants do provide some potential habitat for native fauna species, although this is believed to be greatly limited by the isolated nature of the remnants and general lack of an understorey or shrub layer as well the proximity to residential dwellings. The Cleared Land is of little or no habitat value for native fauna of the area.

No threatened flora species were recorded and it is considered that no preferred habitat for the vast majority of threatened flora species known from the area exists on the site. However, it is possible that the threatened tree species, Eucalyptus glaucina (Slaty Red Gum), is present within the HLRF remnant or present as individual remnant trees in Area C. Differentiation between the common E. tereticornis (Forest Red Gum) and E. glaucina is often difficult and requires the collection and identification of fruit and juvenile leaves. As this was not possible on this occasion impact on this species may need to be assessed further at a later stage. Identification and assessment is made more difficult by the fact that these two species readily intergrade in the Lower Hunter Region (K. Hill pers. comm.).

One threatened fauna species has been recorded on site, being Pomatostomus temporalis (Grey-crowned Babbler). Assessment of the potential for impact resulting from the proposed rezoning has been considered in accordance with Section 5A of the EP&A Act 1979 (Eight Part Tests), the conclusion reached being that the proposal is unlikely to result in a significant impact on this species. As a precaution it is recommended that the site be checked for potential nests of the species by a qualified ecologist. If possible any trees containing nests should be retained. If any nests need be removed this should not be undertaken between the months of July and February, the breeding period for P. temporalis, to avoid any potential disruption of nesting birds.

It is believed that the site may offer some limited potential habitat for a number of other threatened species recorded from the vicinity of the site. However, due to the questionable nature of the habitat present due to past disturbances and current land uses and the lack of functional connections to contiguous habitat, it is considered unlikely that the site represents habitat of significance to any of these species. Therefore, it is considered unlikely that the proposal would significantly impact upon any threatened species such that local extinctions would occur. Indeed, the majority of future development on the site is likely to be situated within areas that are currently totally cleared. As such, landscaping and tree planting associated with such developments may benefit native fauna in the longer term.
RECOMMENDATIONS

Should the following recommendations be taken into consideration, it is feasible that any ecological impacts can be minimised, including potential impacts to threatened species.

- Closer inspection of Red Gum species on the site should be carried out to ascertain whether or not *E. glaucina* occurs therein;

- Ground inspection of each of the canopy trees on the site for hollows that could provide potential nesting and roosting habitat for threatened Microchiropteran bats and Petaurid Gliders should be carried out at the development application stage (this was unable to be undertaken during the current investigation due to restricted access to Areas A and C);

- Should any tree hollows be deemed appropriate for use by threatened fauna, an inspection of any hollows prior to clearing should be undertaken to confirm whether or not these are being used by any such species;

- Further to the above recommendation, an appropriately qualified ecologist / wildlife carer should be present on the site during clearing activities in the event that any displaced wildlife is present and needs to be recovered and subsequently relocated;

- In the event that any hollow bearing trees need to be removed, either hollow limbs or artificial nest boxes should be relocated / erected in appropriate nearby areas to compensate for the loss of such habitat on the site;

- Inspection of trees within the site for possible nests of *Pomatostomus temporalis* (Grey-crowned Babbler) should be undertaken prior to any clearing. Any trees containing nests should be retained where possible. Should any nests need be removed, this should not be undertaken between the months of July and February, the known breeding period for this species; and

- In general, as many canopy trees should be retained as possible in order that potential foraging resources for threatened birds, such as the Swift Parrot and Regent Honeyeater, are retained.

Provided that these recommendations are given due consideration, it is considered that the proposed rezoning is unlikely to result in any significant impact on threatened species, populations or ecological communities.
5 BIBLIOGRAPHY


APPENDIX A  SITE PHOTOGRAPHS

Photo 1 Lower Hunter Spotted Gum Ironbark Remnant in Area A

Photo 2 Cleared land within Area B
Photo 3 Hunter Lowland Redgum Forest remnant and existing residential development located in Area C
APPENDIX B  EIGHT PART TESTS

CONSIDERATION UNDER SECTION 5A OF THE EP&A ACT 1979

Considerations of the effects of the proposed development under the guidelines of Section 5A of the Environmental Planning and Assessment Act 1979 (EP&A Act 1979) for the concerned threatened species/populations/ecological communities are given below.

The majority of information used for the assessment has been sourced from NSW NPWS Threatened Species Information and Environmental Impact Assessment Guidelines, NPWS Atlas of NSW Wildlife and other published or widely available literature sources such as scientific journals and reports.

Endangered Ecological Communities Considered

1. Lower Hunter Spotted Gum Ironbark Forest
2. Hunter Lowland Redgum Forest

Species considered:

3. Pomatostomus temporalis  Grey-crowned Babbler

1. Lower Hunter Spotted Gum – Ironbark Forest
2. Hunter Lowland Redgum Forest

Hunter Lowland Redgum Forest (HLRF) is found on gentle slopes arising from depressions and drainage flats on Permian sediments of the Hunter Valley floor in the Sydney Basin and NSW North Coast Bioregions. It has been recorded from the local government areas of Maitland, Cessnock and Port Stephens (in the Sydney Basin Bioregion) and Muswellbrook and Singleton (in the NSW North Coast Bioregion) but may occur elsewhere in these bioregions. This community is classified by the Lower Hunter Central Coast Regional Biodiversity Conservation Strategy (REMS) as Map Unit (MU) 19 'Hunter Lowland Redgum Forest'.

Lower Hunter Spotted Gum – Ironbark Forest (LHSGIF) is widespread throughout the central to lower Hunter Valley, with forests between Cessnock and Beresfield forming the core of its distribution. This community is dominated by Corymbia maculata (Spotted Gum) and Eucalyptus fibrosa (Broad-leaved Ironbark) with occasional occurrences of E. punctata (Grey Gum) and E. crebra (Grey Ironbark). This community is classified by the Lower Hunter Central Coast Regional Biodiversity Conservation Strategy (REMS) as Map Unit (MU) 17 'Hunter Lowland Redgum Forest'.

A review of House S (2003) followed by a site inspection has shown that a small remnant patch of Modified LHSGIF (<1ha) and Modified HLRF (<0.5 ha) exists within the study area. For the purposes of this assessment it has been assumed that these remnant patches will be removed to accommodate any proposed development within the site and an assessment of the potential impacts on this community made in accordance with the guidelines of section 5A.

For the purposes of the Environmental Planning and Assessment Act 1979 and, in particular, in the administration of Sections 78, 79 and 112, the following factors have been taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats:
a) in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

Not applicable to Endangered Ecological Communities.

b) in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.

Not applicable to Endangered Ecological Communities.

c) in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.

The proposal will require the removal of less than 1.5 hectares of highly modified and isolated EEC community remnants and can only be considered a small incremental loss of actual vegetation. In terms of the overall status of the communities within the region, it is not considered that the removal of these disturbed and isolated remnants would be of any ecological value that could contribute to the viability of these communities in the long-term. Therefore it is considered that the proposal is unlikely to remove a significant area of known habitat for this ecological community.

d) whether an area of known habitat is likely to be isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.

Given the isolated nature and small size of these remnants, it is considered that no further isolation of vegetation will occur as a result of the proposal.

e) whether critical habitat will be affected.

None of the site has been designated 'critical habitat' under Part 3 of the TSC Act 1995.

f) whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region.

1. Lower Hunter Spotted Gum – Ironbark Forest

The Final Determination by the NSW Scientific Committee states:

"Approximately 1 600 hectares of Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin Bioregion occurs within Werakata National Park (Bell 2004). This represents less than 2.5% of the community's modelled pre-1750 distribution (House 2003), is distributed among several separate patches and is predominantly young regrowth forest (Bell 2004). Of an estimated 2 800 ha of the community currently within State Forests, approximately 1 770 ha is excluded from timber harvesting in Forest Management Zone reserves (State Forests of NSW, in litt.), although these areas may be subject to development of service easements, transport infrastructure and mineral exploration.

Therefore it can be stated that the community is not adequately represented in conservation reserves in the region."
2. Hunter Lowland Redgum Forest

Despite House (2003) - LHCCREMS mapping 7052 hectares of the community, as far as is known, Werakata National Park represents the only formal conservation reserve protecting examples of this vegetation type in the region (Bell 2004). Therefore it can be tentatively stated that only around 1% of the community is in conservation zoned lands. The majority of the remainder of the community is not on public land. Therefore it could be stated that this community is poorly conserved throughout its entire distribution.

\[ g) \text{ whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.} \]

Only one Threatening Process as listed within Schedule 3 of the TSC Act is considered relevant to the proposed development:

- \text{Clearing of Native Vegetation}

An area of native vegetation may be removed as a result of the rezoning of this land. This area has been shown in detail within the body of the Flora and Fauna Assessment report. The extent of the clearing is less than 1.5 hectares of already heavily modified vegetation and although this could be viewed as contributing to the cumulative impacts of clearing activities in the locality in general, it is not considered to be of a scale large enough to warrant a significant contribution to this KTP.

\[ h) \text{ whether any threatened species, population or ecological community is at the limit of its known distribution.} \]

This community occurs principally on Permian geology in the central and lower Hunter Valley. Remnants of this community occur within the LGAs of Cessnock, Maitland, Singleton, Lake Macquarie, Newcastle, Port Stephens and Dungog but may also occur elsewhere in the region.

Conclusion

Application of the 8-part test shows that the clearing of these remnants would be unlikely to significantly impact upon the EEC Lower Hunter Spotted Gum Ironbark Forest or the Hunter Lowland Redgum Forest EEC.

References:


3. *Pomatostomus temporalis*  
Grey-crowned Babbler

The eastern subspecies of the Grey-crowned Babbler ranges from Mt Lofty Range, SA to Cape York Peninsula, Qld, generally in areas receiving an average annual rainfall of between 250 and 1000 mm. The Grey-crowned Babbler inhabits open Eucalypt woodlands with a grassy groundcover and sparse, tall shrub layer. This species may also be observed along streams in cleared areas and grassy road verges (Morcombe, 2000). Grey-crowned Babblers forage mainly on insects and spiders, spending the majority of their time searching through leaf litter and soil for food, but also venturing into vegetation. They live in extended families usually consisting of a pair and offspring. Pairs mate for life and are usually the only breeding birds within the group. The other group members help them build the nest and feed the young.

Breeding occurs between July and February. Their large domed nests (up to 50cm wide) are constructed in trees at a height of about 4-7m. They tend to be built into an upward sloping or horizontal, multiple forked branch in the trees upper outer foliage and have a side entrance tunnel (Morcombe, 2000). Nest-like structures are also used for overnight roosts. The size of home ranges of family groups of this species can be between 2 - 25ha (C. Blackmore pers. comm.).

Although common in the Qld part of its range, *P. temporalis* is one of several woodland birds known to be declining in South-eastern Australia. The key threat is the highly fragmented nature of remnant habitat. The cause of declines due to fragmentation seems to be related to population dynamics such as reduced breeding success, less effective immigration and stochastic effects (Garnett et al, 2000).

*For the purposes of the Environmental Planning and Assessment Act 1979 and, in particular, in the administration of Sections 78, 79 and 112, the following factors have been taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats:*

a) *in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

A *P. temporalis* family group was seen in a garden along the western boundary of Area C. It is likely that the remnant vegetation in the wider locality is utilised by these birds, particularly areas of relatively intact, larger, less fragmented (and therefore preferred) habitat in areas around the site.

The redevelopment of this site potentially entails the removal of some of the vegetation within this site. At worst this removal will represent a small incremental loss of potential habitat for this species and therefore it is not considered likely to significantly impact upon this species such that a viable local population is placed at risk of extinction. This is supported by ongoing evidence in the Lower Hunter region that suggests that this species is able to persist in modified habitats such as those on the site (HSO ecologists pers. obs.).

It is however recommended that any trees that need to be removed be checked for *P. temporalis* nests prior to felling. If possible preference should be given to retention of trees containing nests. If any nests need be removed this should not be undertaken between the months of July and February, the breeding period for *P. temporalis*, to avoid any potential disruption of nesting birds.
b) in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.

No population of this species in the area has been identified as an endangered population on schedule 1 of the TSC Act.

c) in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed.

It is not considered that any significant area of known habitat is to be modified or removed as a result of the proposed development.

d) whether an area of known habitat is likely to be isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community.

No areas of known habitat are likely to be isolated as a result of the proposal.

e) whether critical habitat will be affected.

None of the site has been designated ‘critical habitat’ under part 3 of the TSC Act.

f) whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region.

Within the region this species is known from a number of conservation reserves containing forested areas (NPWS, 2005), including Wollemi and Yengo National Parks (HSO ecologists, pers. obs.). Also, a large number of reserves that contain wooded habitats provide potential habitat for this species. This species is known from the nearby Werakata National Park (University of Newcastle, 2001; HSO ecologists, pers. obs.) and further a field it has been recorded in known and potential habitats conserved in a number of reserves such as Goulburn River, Blue Mountains and Watagan National Parks and Parr State Recreation Area. It is considered that populations and habitats of this species appear to be adequately conserved.

g) whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process.

‘Clearing of Native Vegetation’, which is listed as a key threatening process, may occur as part of the proposed rezoning application. It is not considered that such clearing would have a significant impact on the population of *P. temporalis* on this occasion due to the small scale of potential clearing that may occur as a result.

h) whether any threatened species, population or ecological community is at the limit of its known distribution.

This species is not at its known limit of distribution in this area.

References:
