

# Attachment 1. Survey of Bohena Creek riparian plant communities

Report for *Upper Mooki Landcare Inc*



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# Summary

The riparian vegetation bordering Bohena Creek was surveyed to describe its plant community type, diversity, structure and condition. The following are the main findings of this survey:

- The plant community along the banks of Bohena Creek is typically a grassy woodland, dominated by Blakely's Red Gum, Rough-barked Apple and White Cypress Pine. Other species such as Yellow Box and Kurrajong also occur less frequently in the canopy.
- The Plant Community Type which best fits this community is PCT544 *Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion* due to the similarity in species composition and topographical position.
- PCT 399 *Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion* was encountered within the creekbed environment at two sites.
- PCT401 *Rough-barked Apple – Red Gum - Cypress Pine woodland on sandy flats, mainly in the Pilliga region* was detected once, showing very little difference with the more frequently encountered red gum community, apart from the presence of Baradine Red Gum.
- PCT408 *Dirty Gum (Baradine Gum) – Black Cypress Pine – White Bloodwood shrubby woodland* was found at one creekside site due to some outcropping sandstone.
- Based on the similarity with characteristic species listed in the scientific determination for *White Box Blakely's Red Gum Yellow Box Woodland* (37%) the community identified here as PCT544 shows a high level of correspondence with the EEC.
- Due to the variation on site condition, eight of the sites would meet the understorey criteria for the Commonwealth-listed CEEC *White Box Blakely's Red Gum Yellow Box Woodland and Derived Native Grassland*.
- One site and one transect in particular (4.2) was found to be in poor condition, with high levels of dead trees, weed cover and low plant diversity. The reasons for this dieback remain unclear.

# Background

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Bohena Creek is a 5th order stream and the most important stream in the eastern Pilliga, feeding into the Namoi River 9 km north-west of Narrabri at the junction with Namoi Creek. In the upper reaches, the Bohena splits into two creeks within the Pilliga East State Conservation Area, the Borah and Yaminbah Creeks whose source is south of the Pilliga. In all, the catchment of these streams covers some 100km in length, north to south.

While regarded as an intermittent creek, Bohena is capable of discharging huge surface flows following times of good rain into the Namoi. In addition, this is aided by a perched aquifer which supports both riparian communities and groundwater dependence but also assists in rapid discharge of surface flow.

Bohena Creek flows north through the middle of the proposed Narrabri Gas production field and so it is important to understand the significance of this major stream both at a local and regional scale.

In the light of the recent submission of the EIS for the Narrabri Gas Project, this study attempts to verify the types riparian plant communities along Bohena Creek, to describe their condition, structure and composition.

## Methodology

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### Site selection

Site selection was predominately governed by two main factors:

1. Proximity to creek. All transects were to be conducted as close as possible to the creekside environment.
2. Access ease. All sites were located within 200m of access roads, primarily Creaghs Road, Bohena Creek Road and McCanns Road and the Newell Highway.
3. Sites were located as far as possible at a distance of 5km from each other. Some sites ended up further apart, some were closer due to logistical constraints.

In all, eight 'sites' were selected, each with two vegetation survey transects and one creekbed assessment area. The sites are depicted in Figure 1.



*Figure 1. Location of study sites*

## Site surveys

Figure 2 shows the site layout with survey transects and quadrats. Two plots were located at each site of the creek, along with a central creekbed assessment area. Vegetation surveys were carried out using the methodology as outlined in the Framework for Biodiversity Assessment (FBA) of a nested quadrat to survey diversity and a central transect line to survey cover. The following modifications were made to the methodology:



*Figure 2. Layout of site surveys.*



1. Transects were conducted over 100m in order to get a more detailed assessment on the number of dead standing trees and dominants in the different canopy layers above ground-level. All trees (>10cm dbh) were counted within an area 40m wide by 100m long (0.4 ha) and all overstorey and midstorey species were noted.
2. Cover estimates of the cover of the different vegetation strata and weeds were made across 20 points along the transect, each point 5 m apart. Where no 'hits' were recorded but plants in that layer or category were observed, this is recorded as <5%.
3. Creekbed assessments were undertaken within the 100m length of creekbed in line with the vegetation transects. This involved a walk over of the area, noting common species and a visual estimate of cover for the different strata. 'Island' vegetation were excluded from this analysis as they were found to be inhabited by terrestrial vegetation, more resembling the creek terraces.

## Results

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### Community type

The site data is presented in Appendix 1. Four communities within the VIS Plant Community Type database were identified in the transects surveyed. Two community types, PCT544 (n=13) and 401 (n=1) were found to have a woodland structure, matching the criteria of the Grassy Woodland Keith Formation. One site was found to support the shrubby woodland type PCT 408, matching the criteria of the Dry Sclerophyll Forest (shrubby) Formation. One transect (4.2) was found to be in such poor condition that assigning a community type was based on assumptions about its natural condition.



*Figure 3. PCT 544 (Transect 1.2)*



*Figure 4. PCT401 (Transect 4.1)*



*Figure 5. PCT 408 (Transect 5.1)*

Not counting 'islands' which were not sampled, only two creek-bed sites (S7 and S8) were found to support a vegetation community, most being too bare to qualify as plant communities. These sites match the criteria of the plant community type 399, another Dry Sclerophyll Forest (shrubby) formation, though also labelled as being a 'wetland' which matches the on-ground conditions at these sites.





*Figure 6. Creekbed at Site 7 (PCT399)*

Permanent or semi-permanent waterholes were also detected at sites S5, S7 and S8, which are surrounded by similar wetland vegetation described as being PCT 399, though were not surveyed.



*Figure 6. Waterhole at Site 4.*

## Native Plant diversity

Not all species were identified so total diversity across the sites is somewhat higher than presented here. In total, 69 species were identified in the PCT complex 544/401, with the most diverse layer being groundstorey, forbs with 27 identified species, grasses contributing 13 species. Understorey was not particularly diverse with 14 species, midstorey and canopy with six and seven species respectively.

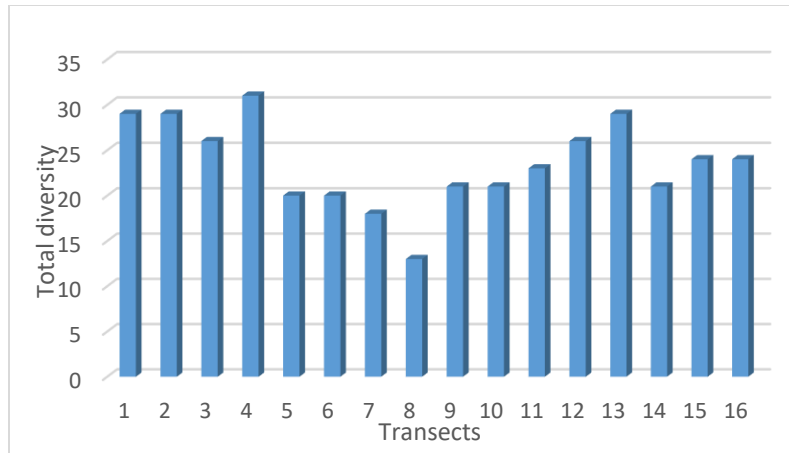


Figure 7. Native plant diversity across sites.

The lowest levels of diversity were found at transects 4.1 (#7) and 4.2 (#8) which also correlates with lower levels of 'condition' at these sites.

The most common overstorey species were Blakely's Red Gum, Rough-barked Apple and White Cypress Pine, occurring in different levels of dominance across the transects, though always present. Yellow Box was uncommonly encountered while Kurrajong and Bull Oak were encountered only once.

Mid-storey was usually dominated by one species, Dean's Wattle, though sometimes scattered tea tree and bottlebrush also occurred. These species were not present at most transects despite them being placed along the bank of the creek.

The understorey was generally dominated by two sedge species, Long-leaf Lomandra *Lomandra longifolia* and Rough Saw-sedge (*Gahnia aspera*) across most transects, along with the rushes *Juncus* sp and *Cyperus* sp. Xeric heaths and peas were generally scarce in the riparian zone examined, with the Darling Pea *Swainsona cadellii*, the most common of the Fabaceae in this layer.

Ground forbs were reasonably diverse, with ground-storeys commonly dominated by *Dichondra repens*, *Sida corrugata* and *Oxalis perrenans*. Grasses at the transects were most commonly the wire-grass *Aristida ramosa*, *Austrostipa setacea*, *Digitaria diffusa* and Weeping Grass *Microleana stipoides*. The exotic grass cover, couch *Cynodon dactylon*, was common.

One threatened species was detected, *Commersonia procumbens* at Transect 1.2.

## Condition

Two measures of condition were analysed across the transects, numbers of dead standing trees and weed cover.



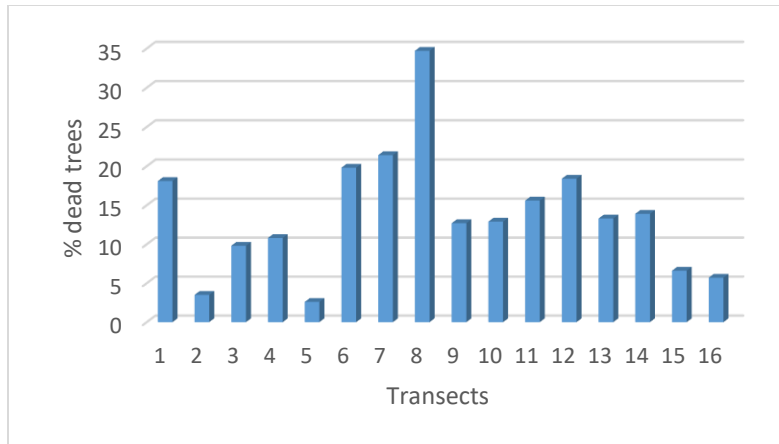


Figure 8. Proportion of dead standing trees as percentage of total standing stems across the transects.

Transect 4.2 has significantly more dead trees as a proportion of total standing stems than the other sites (with 34% of all standing stems being dead). Otherwise the normal level of standing dead trees lies between 2 and 20% of total standing stems in the rest of transects.

Where high numbers of dead trees were detected, resembling areas of dieback, it was found that the Blakely's Red Gum was the most affected. Transect 4.2 also contained a substantial number of trees suffering from dieback but for which regeneration has occurred along the stems. These were counted as 'live' trees in this study.

Drone footage of the creek vegetation along Bohena Creek south of X-Line Road up to the Plumb Road intersection shows distinct patches of red gum dieback in this part of the creek (Appendix 3).

Weed cover varied considerably at sites to between 5 and 50% cover within the groundstorey and understorey considered together. Consistent with the results concerning diversity and % dead trees, weed-cover was highest at the transects at site 4.

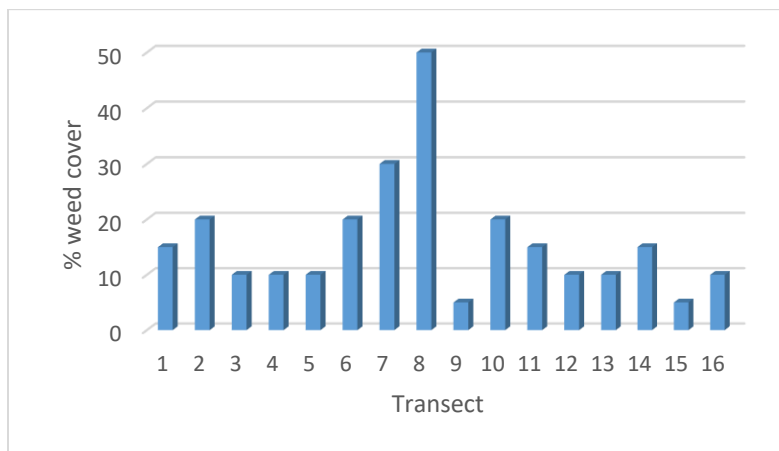


Figure 10. % weed cover across the transects

Nine weed species were commonly occurring at the survey sites, the species which account for most of the groundcover were Mayne's Curse *Glandularia aristigera*, Fleabane *Conzys bonariensis* and sometimes

Sticky Beak *Bidens pilosa*. Other commonly occurring species are *Cynodon dactylon*, *Sonchus oleaceus*, *Polycharpon tetraphyllum*, *Anagallis arvensis*, *Xanthium strumarium* and Prickly Pear *Opuntia stricta*.

## Discussion

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### Community types

There was some variation in floristics and structure of the woodland communities within the study area, despite the targeting in the location of sites.

While most of the creek and riparian environment can be described as an alluvial environment, with creekbed and creek terraces on loam-sand soils, Pilliga Sandstone can abut the creekbed itself as was observed at one site. At transect 5.1, the geological boundary was noticeable on the eastern side of the creek, rising some three metres above the level of the creekbed. This area supported shrubby woodland.

One community was categorized as the PCT 401 due to the presence of Baradine Red Gum, *E. chloroclada*, though for the rest of the species within the community, it was not found to be measurably different from the more common type, identified here as PCT 544.

EcoLogical Australia (2016) have mapped several communities along Bohena creek, though categorise the dominant creekside community containing Blakely's Red Gum as being PCT399 *Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion*. From the Dry Sclerophyll (Shrubby) Forest and Western Slopes Dry Sclerophyll Forests Keith Class, the PCT description is as follows:

|  |  |
|--|--|
| <p>399 Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion</p> | <p><i>Eucalyptus blakelyi</i>, <i>Eucalyptus camaldulensis</i> &lt;--&gt; <i>chloroclada</i>, <i>Angophora floribunda</i>, <i>Callitris glaucophylla</i> / <i>Leptospermum polygalifolium</i> subsp. <i>transmontanum</i>, <i>Acacia deanei</i> subsp. <i>paucijuga</i>, <i>Acacia penninervis</i> var. <i>penninervis</i>, <i>Callistemon linearis</i> / <i>Arundinella nepalensis</i>, <i>Juncus continuus</i>, <i>Cyperus lucidus</i>, <i>Alternanthera denticulata</i></p> |
|--|--|

This assignment cannot be supported for the following reasons:

- (a) The riparian woodland in question was found generally to contain a low overstorey height of 10-20 m, a relatively little mid-storey (0-30%) or understorey shrub cover (5-30% cover), a lack of sclerophyllous shrubs, and having a high litter cover with groundcover dominated by grasses and forb species. This would fall within the Keith formation as "Grassy Woodland", not "Dry sclerophyll (shrubby) forest".
- (b) The species composition of this community was found to be more consistent with the grassy woodland type PCT 544 *Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion*, as it always contained White Cypress Pine *Callitris glaucophylla* and sometimes Yellow Box *Eucalyptus melliodora* in the overstorey; a mid-storey dominated by the soft-leaved wattle *Acacia deanii* with only scattered sclerophyllous species, such as *Persoonia*; a low shrub cover mostly dominated by

*Lomandra longifolia* and *Gahnia aspera*; sometimes aquatic plants are present, eg, *Juncus* and *Cyperus*; and a groundstorey containing species typically found in North-west Slopes and New England grassy woodlands, such as *Dichondra repens*, *Chrysocephalum*, *Glycine*, *Wahlenburgia*, *Chielianthes*, *Austrostipa*, *Micloeana* and *Aristida* grass spp. In the spring, this community typically contains high numbers of greenhood *Pterostylis* and *Diuris* orchids, while in autumn providing habitat for the lily *Crinum flaccidum*.

The VIS database description of this community states the following typical community composition. Except for the presence of Native Olive *Notolea microcarpa*, there is a high level of correspondence with the species common at the survey sites:

|   |  |
|---|--|
| 544      Rough-barked Apple - White Cypress Pine -<br>Blakely's Red Gum riparian open forest /<br>woodland of the Nandewar Bioregion and<br>New England Tableland Bioregion | Angophora floribunda, Eucalyptus blakelyi , Callitris glaucophylla ,<br>Eucalyptus melliodora / Notelaea microcarpa var. microcarpa ,<br>Leptospermum polygalifolium subsp. transmontanum / Lomandra<br>longifolia , Dichondra sp. a , Microlaena stipoides var. stipoides ,<br>Cyperus gracilis |
|---|--|

Considerable ground-truthing in the project area by Ethical Ecology has shown that PCT 399 is present, though generally found to be associated with lower order streams where the banks are less developed or absent. This describes the majority of streams in the Pilliga forests. Tea-tree and bottlebrush seems to grow as dominant parts of the understorey where there are relatively high levels of surface or shallow groundwater flow (hence its description as a 'wetland' in the VIS database). Intermittent spring and rain flow from the minor streams all feed into the Bohena alluvium.

As found in this study, some areas of the creekbed, particularly containing waterholes, conform to this community, though most of Bohena Creek has relatively little aquatic vegetation.

PCT ID401 covers over 7,500 ha and is called '*Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region*' in the VIS database. On the ground, Black Cypress Pine *Callitris endlicheri* was found to be not present in these claypan areas where this community occurs, but instead is occupied by White Cypress Pine. This appears to be an error within the PCT database itself as the original description of this community (in Benson *et al.* 2010) gives the associated *Callitris* as White Pine *C. glaucophylla*.

## Correspondence with Box Gum Woodland

Appendix 2 also shows the levels of correspondence of the dominant woodland in this study with characteristic species listed under the NSW listing of the endangered ecological community *White Box Blakely's Red Gum Yellow Box Woodland*.

Of the 68 species identified in this study as being part of the riparian woodland community, 25 (37%) of these are listed as characteristic species under the Box Gum Woodland NSW Scientific Committee determination. Of the 94 characteristic species listed in the determination, 28 (28.7%) were found within the targeted riparian community. In both regards this measure of correspondence with the scientific determination is high, supporting the notion that the community described at PCT544 matches the listing of Box Gum Woodland under the *Threatened Species Conservation Act 1997*.



For the Commonwealth-listed Box Gum Woodland CEEC, key is the diversity of the forb component of the groundstorey;

*“A patch in which the perennial vegetation of the ground layer is dominated by native species, and which contains at least 12 native, non-grass understorey species (such as forbs, shrubs, ferns, grasses and sedges) is considered to have a sufficiently high level of native diversity to be the listed ecological community”.*

Only eight of the 16 surveyed transects would meet this criterion, due to the variation in condition encountered at the transects. Overall it could be easily acknowledged that this community does correspond with the Commonwealth listing.

## Tree dieback

Within the central area of Bohena Creek, between where Oil Well Road and Brandon’s Road intersect Bohena Creek Road, patches of dieback seem to be affecting the riparian red gums. Some regrowth on the branches of these red gums is occurring now, no doubt in response to above average rainfall in 2016, but dead tree rates of 30% of all standing stems are high as was noticed at one site. Drone imagery of Bohena Creek above and below X-Line Road show significant areas of red gum dieback on both sides of the creek.

What is causing this dieback? A likely candidate is reduced surface flow due to drought throughout the 2000s as well as hot years in 2014 and 2015. But if this were the case why is there no evidence of significant dieback outside the affected zone?

Another potential impact on tree health would be depressed water tables. Red Gums are known to have relatively shallow root systems, and are prone to drops in water tables. But again, why only within one zone?

An inescapable correlation is the fact that the dieback zone lies within an area with a high number of active and historic gas wells. Given the environmental risk assessment provide in the EIS, impacts from gas activities could result in aquifer depressurisation as well as contamination from coal seam water or other chemicals.

Further studies on water depth and quality in Bohena Creek warrants further investigation.



## References

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Benson JS, Richards PG, Waller S and Allen CB. 2010, 'New South Wales vegetation classification and assessment: Part 3 Plant communities of the NSW Brigalow Belt South, Nandewar and west New England Bioregions and update of NSW Western Plains and South-western Slopes plant communities, Version 3 of the NSWVCA database', *Cunninghamiana* 11(4), pp 457-579.

EcoLogical Australia, 2016. *Narrabri Gas Project: Ecological Impact Assessment*. Prepared for Santos NSW (Eastern) Pty Ltd.

## Appendix 1: Data sheets for site surveys

| Site No           |                  | 1                    |                        |   |                          |
|-------------------|------------------|----------------------|------------------------|---|--------------------------|
| Description       | Creaghs Crossing | Creaghs Road         | Borah Creek            |   |                          |
| t1                |                  | -30.77747            | 149.549219             |    |                          |
| PCT               | 544              |                      |                        |   |                          |
| Diversity         | 29               |                      |                        |   |                          |
| Weed cover        | 15%              |                      |                        |   |                          |
| Overstorey cover  | Total 30%        | Angophora floribunda | Eucalyptus blakelyi    | Callitris glaucophylla  |                          |
| height            | 15-20m           |                      |                        |   |                          |
| Number >10cm      | 113 alive 25     | 64                   | 9                      | 40  |                          |
| Dead trees        | (18.1%)          |                      |                        |   |                          |
| Midstorey cover   | Total 10%        | Acacia polybotrya    | Callitris glaucophylla | Acacia deanii   | Acacia sertiformis       |
| Understorey cover | Total 20%        | Xanthorrhoea acaulis | Hibbertia obtusifolia  | Lomandra longifolia   | Dianella revoluta        |
| Groundcover       | Grasses 5        | Forbs 12             | litter                 | bare  |                          |
| Cover             | 5%               | 5%                   | 70-80%                 | 5-10%   |                          |
| Diversity         | 6                | 11                   |                        |   |                          |
| t2                |                  | -30.77789            | 149.54866              |  |                          |
| PCT               | 544              |                      |                        |   |                          |
| Diversity         | 29               |                      |                        |   |                          |
| Weed cover        | 30%              |                      |                        |   |                          |
| Overstorey cover  | Total 20%        | Angophora floribunda | Eucalyptus blakelyi    | Callitris glaucophylla  | Allocasuarina luehmannii |



|                   |           |               |                     |                   |                       |
|-------------------|-----------|---------------|---------------------|-------------------|-----------------------|
| height            | 15-20m    |               |                     |                   |                       |
| Number            |           |               |                     |                   |                       |
| >10cm             | 111       | 86            | 20                  | 4                 | 1                     |
| Dead trees        | 4 (3.5%)  |               |                     |                   |                       |
| Midstorey cover   | Total 10% | Acacia deanii | Acacia polybotrya   |                   |                       |
| Understorey cover | Total 5%  | Cyperus       | Lomandra longifolia | Dianella revoluta | Lepidosperma laterale |
| Groundcover       | Grasses   | Forbs         | litter              | bare              |                       |
| Cover             | <5%       | <5%           | 90%                 | 5%                |                       |
| Diversity         | 6         | 10            |                     |                   |                       |
| bed               | -30.77755 | 149.54896     |                     |                   |                       |
| Overstorey cover  | Total 0   |               |                     |                   |                       |
| Dead trees        |           |               |                     |                   |                       |
| Midstorey cover   | Total <5% | Acacia deanii |                     |                   |                       |
| Understorey cover | Total <5% |               |                     |                   |                       |
| Groundcover       | Total     |               |                     |                   |                       |
| Cover             | <5%       |               |                     |                   |                       |



| Site No 2   |                   |                      |                     |
|-------------|-------------------|----------------------|---------------------|
| Description | Garlands Crossing | Garlands Road        | Bohena Creek        |
| t1          |                   | -30.70468            | 149.56732           |
| PCT         | 544               |                      |                     |
| Diversity   | 26                |                      |                     |
| Weed cover  | 10%               |                      |                     |
| Overstorey  | Total             | Angophora floribunda | Eucalyptus blakelyi |




|                      |              |                        |                         |                  |
|----------------------|--------------|------------------------|-------------------------|------------------|
| cover                | 20-25%       |                        |                         |                  |
| height               | 15-20m       |                        |                         |                  |
| Stems >10cm          | 111          | 58                     | 53                      |                  |
| Dead trees           | 12 (9.8%)    |                        |                         |                  |
|                      |              | Acacia<br>deanii       | Callistemon<br>linearis |                  |
| Midstorey<br>cover   | Total<br>10% |                        |                         |                  |
|                      |              | Lomandra<br>longifolia | Olearia<br>elliptica    | Gahnia<br>aspera |
| Understorey<br>cover | Total<br>35% |                        |                         |                  |
| Groundcover          | Grasses      | Forbs                  | litter                  | bare             |
| Cover                | 20%          | 30%                    | 40%                     | 10%              |
| Diversity            | 5            | 15                     |                         |                  |

|    |           |           |
|----|-----------|-----------|
| t2 | -30.70471 | 149.56652 |
|----|-----------|-----------|


|            |     |
|------------|-----|
| PCT        | 544 |
| Diversity  | 31  |
| Weed cover | 10% |



|                   |            |                      |                      |                        |                       |                        |
|-------------------|------------|----------------------|----------------------|------------------------|-----------------------|------------------------|
| Overstorey cover  | Total 30%  | Angophora floribunda | Eucalyptus blakelyi  | Callitris glaucophylla | Eucalyptus melliodora | Brachychiton populneus |
| height            | 15-20m     |                      |                      |                        |                       |                        |
| Number >10cm      | 83         | 16                   | 28                   | 37                     | 1                     | 1                      |
| Dead trees        | 10 (10.8%) |                      |                      |                        |                       |                        |
| Midstorey cover   | Total 5%   | Acacia deanii        | Callistemon linearis |                        |                       |                        |
| Understorey cover | Total 10%  | Lomandra longifolia  | Dianella longifolia  | Gahnia aspera          |                       |                        |
| Groundcover       | Grasses    | Forbs                | litter               | bare                   |                       |                        |
| Cover (%)         | 20         | 40                   | 30                   | <5                     |                       |                        |
| Diversity         | 6          | 16                   |                      |                        |                       |                        |

|                   |              |               |   |  |  |         |               |
|-------------------|--------------|---------------|---|--|--|---------|---------------|
| bed               | -30.70449    | 149.567004    |  |  |  |         |               |
| Overstorey cover  | Total<br>0   |               |   |  |  |         |               |
| Midstorey cover   | Total<br>5%  | Acacia deanii |   |  |  |         |               |
| Understorey cover | Total<br>5%  | Juncus        |   |  |  | Cyperus | Gahnia aspera |
| Groundcover Cover | Total<br><5% |               |   |  |  |         |               |

|                |          |
|----------------|----------|
| <b>Site No</b> | <b>3</b> |
|----------------|----------|

|                   |                      |                       |  |                        |  |
|-------------------|----------------------|-----------------------|--|------------------------|--|
| Description       | Oil Well Rd crossing | Bohena Creek          |  |                        |  |
| t1                | -30.65929            | 149.59342             |  |                        |  |
| PCT               | 544                  |                       |  |                        |  |
| Diversity         | 20                   |                       |  |                        |  |
| Weed cover        | 10%                  |                       |  |                        |  |
| Overstorey cover  | Total<br>10%         | Angophora floribunda  | Eucalyptus blakelyi  | Callitris glaucophylla |  |
| height            | 15m                  |                       |  |                        |  |
| Number >10cm      | 76                   | 39                    | 6  | 31                     |  |
| Dead trees        | 2 (2.6%)             |                       |  |                        |  |
| Midstorey cover   | Total<br><5%         | Acacia deanii         | Olearia elliptica  |                        |  |
| Understorey cover | Total<br>10%         | Hibbertia obtusifolia | Melichrus urceolatus   |                        |  |
| Groundcover Cover | Grasses<br><5%       | Forbs<br><5%          | litter<br>85%  | bare<br>10%            |  |
| Diversity         | 5                    | 8                     |  |                        |  |



|                   |            |                      |
|-------------------|------------|----------------------|
| t2                | -30.65931  | 149.59219            |
| PCT               | 544        |                      |
| Diversity         | 20         |                      |
| Weed cover        | 30%        |                      |
| Overstorey cover  | Total 15%  | Angophora floribunda |
| height            | 15-20m     |                      |
| Number >10cm      | 69         | 27                   |
| Dead trees        | 17 (19.8%) |                      |
| Midstorey cover   | Total 10%  | Acacia deanii        |
| Understorey cover | Total <5%  | Lomandra longifolia  |
| Groundcover       | Grasses    | Forbs                |
| Cover             | <5%        | <5%                  |
| Diversity         | 6          | 9                    |



Eucalyptus blakelyi

42

Callistemon linearis

Gahnia aspera

litter 70%  
bare 25%

|                    |           |               |
|--------------------|-----------|---------------|
| bed                | -30.65926 | 149.59287     |
| Overstorey cover   | Total 0   |               |
| Dead trees         |           |               |
| Midstorey cover    | Total <5% | Acacia deanii |
| Understorey cover  | Total <5% | Juncus        |
| Groundstorey cover | Total <5% |               |



Gahnia aspera

| Site No           | 4                 |  |                 |               |  |               |                 |                 |             |
|-------------------|-------------------|--|-----------------|---------------|--|---------------|-----------------|-----------------|-------------|
| Description       | Bohena Creek Road | Sth of Brandons Rd junction  |                 |               |  |               |                 |                 |             |
| t1                | -30.60316         | 149.63229  |                 |               |  |               |                 |                 |             |
| PCT               | 401?              |  |                 |               |  |               |                 |                 |             |
| Diversity         | 18                |  |                 |               |  |               |                 |                 |             |
| Weed cover        | 35%               |    |                 |               |  |               |                 |                 |             |
| Overstorey cover  | Total             |  |                 |               |  | A. floribunda | C. glaucophylla | E. chloroclada  | E. blakelyi |
| height (m)        | 20%               |  |                 |               |  |               |                 |                 |             |
| Number >10cm      | 15                |  |                 |               |  |               |                 |                 |             |
| Dead trees        | 92                |  |                 |               |  | 27            | 54              | 9               | 2           |
|                   | 25 (21.4%)        |  |                 |               |  |               |                 |                 |             |
| Midstorey cover   | Total             | A. deanii  | C. glaucophylla |               |  |               |                 |                 |             |
|                   | 25%               |  |                 |               |  |               |                 |                 |             |
| Understorey cover | Total             | Lomandra longifolia  |                 | Gahnia aspera |  |               |                 |                 |             |
|                   | 10%               |  |                 |               |  |               |                 |                 |             |
| Groundcover       | Grasses           | Forbs  | litter          | bare          |  |               |                 |                 |             |
| Cover             | 5%                | 5  | 75              | 15            |  |               |                 |                 |             |
| Diversity         | 5                 | 6  |                 |               |  |               |                 |                 |             |
| t2                | -30.60343         | 149.63084  |                 |               |  |               |                 |                 |             |
| PCT               | 544               |  |                 |               |  |               |                 |                 |             |
| Diversity         | 13                |  |                 |               |  |               |                 |                 |             |
| Weed cover        | 50%               |  |                 |               |  |               |                 |                 |             |
| Overstorey cover  | Total             |  |                 |               |  | E. blakelyi   | A. floribunda   | C. glaucophylla |             |
| height            | 5%                |  |                 |               |  |               |                 |                 |             |
| Number >10cm      | 20m               |  |                 |               |  |               |                 |                 |             |
| Dead trees        | 47                |  |                 |               |  | 12            | 10              | 25              |             |
|                   | 25 (34.7%)        |  |                 |               |  |               |                 |                 |             |

|                   |         |               |        |         |
|-------------------|---------|---------------|--------|---------|
| Midstorey cover   | Total   | A. deanii     |        |         |
|                   | <5%     |               |        |         |
| Understorey cover | Total   | L. longifolia |        | Cyperus |
|                   | 10%     |               |        |         |
| Groundcover       | Grasses | Forbs         | litter | bare    |
| Cover             | <5%     | <5%           | 20%    | 70%     |
|                   | 4       | 3             |        |         |

|                   |           |           |
|-------------------|-----------|-----------|
| bed               | -30.60327 | 149.63158 |
| Overstorey cover  | Total     |           |
| Dead trees        | 0         |           |
| Midstorey cover   | Total     |           |
|                   | <5%       |           |
| Understorey cover | Total     |           |
|                   | <5%       |           |
| Groundcover       | Total     |           |
| Cover             | <5%       |           |



|                |          |
|----------------|----------|
| <b>Site No</b> | <b>5</b> |
|----------------|----------|

|             |                   |                            |
|-------------|-------------------|----------------------------|
|             | Bohena Creek Road | Sth of Apple road junction |
| Description |                   |                            |

|            |           |           |
|------------|-----------|-----------|
| t1         | -30.56915 | 149.64954 |
| PCT        | 409       |           |
| Diversity  | 21        |           |
| Weed cover | 5%        |           |



|                  |       |                      |                        |                        |                     |
|------------------|-------|----------------------|------------------------|------------------------|---------------------|
| Overstorey cover | Total | Angophora floribunda | Callitris glaucophylla | Eucalyptus chloroclada | Eucalyptus blakelyi |
| height           | 15m   |                      |                        |                        |                     |
|                  | 15%   |                      |                        |                        |                     |

|                            |                 |   |    |   |   |
|----------------------------|-----------------|---|----|---|---|
| Number >10cm<br>Dead trees | 48<br>7 (12.7%) | 4 | 38 | 5 | 1 |
|----------------------------|-----------------|---|----|---|---|

|                      |              |                         |                           |                     |                         |
|----------------------|--------------|-------------------------|---------------------------|---------------------|-------------------------|
| Midstorey<br>cover   | Total<br>10% | Acacia deanii           | Callitris<br>glaucophylla |                     |                         |
| Understorey<br>cover | Total<br>30% | Melichrus<br>urceolatus | Calytrix<br>tetragona     | Cryptandra<br>amara | Leucopogon<br>muricatus |
| Groundcover          | Grasses      | Forbs                   | litter                    | bare                |                         |
| Cover                | 5%           | 5%                      | 60%                       | 30%                 |                         |
| Diversity            | 3            | 8                       |                           |                     |                         |

|     |           |           |
|-----|-----------|-----------|
| t2  | -30.56858 | 149.64850 |
| PCT | 544       |           |



|            |     |
|------------|-----|
| Diversity  | 21  |
| Weed cover | 20% |

|              |           |                        |                           |
|--------------|-----------|------------------------|---------------------------|
| Overstorey   | Total     | Eucalyptus<br>blakelyi | Callitris<br>glaucophylla |
| cover        | 10%       |                        |                           |
| height       | 15-20m    |                        |                           |
| Number >10cm | 46        | 21                     | 25                        |
| Dead trees   | 8 (12.9%) |                        |                           |
| Midstorey    | Total     | Acacia deanii          |                           |
| cover        | 30%       |                        |                           |
| Understorey  | Total     | Lomandra<br>longifolia | Gahnia aspera             |
| cover        | 30%       |                        |                           |
| Groundcover  | Grasses   | Forbs                  | litter                    |
| Cover        | 5%        | 5%                     | 80%                       |
| Diversity    | 4         | 13                     |                           |

|                   |           |               |
|-------------------|-----------|---------------|
| bed               | -30.55889 | 149.64905     |
| Overstorey cover  | Total     | E. blakelyi   |
| Dead trees        | <5%       |               |
| Midstorey cover   | Total     | Acacia deanii |
|                   | 5%        |               |
| Understorey cover | Total     | Phragmites    |
|                   | <5%       |               |



|         |   |
|---------|---|
| Site No | 6 |
|---------|---|



|             |                 |             |              |
|-------------|-----------------|-------------|--------------|
| Description | Maudes Crossing | Maudes Road | Bohena Creek |
|-------------|-----------------|-------------|--------------|

|            |           |           |
|------------|-----------|-----------|
| t1         | -30.53889 | 149.65956 |
| PCT        | 544       |           |
| Diversity  | 23        |           |
| Weed cover | 15%       |           |



|                   |            |                     |               |                 |
|-------------------|------------|---------------------|---------------|-----------------|
| Overstorey cover  | Total      | E. blakelyi         | A. floribunda | C. glaucophylla |
| height            | 10%        |                     |               |                 |
| Number >10cm      | 15m        |                     |               |                 |
| Dead trees        | 108        | 8                   | 1             | 96              |
|                   | 20 (15.6%) |                     |               |                 |
| Midstorey cover   | Total      | Acacia deanii       |               |                 |
|                   | 10%        |                     |               |                 |
| Understorey cover | Total      | Lomandra longifolia | Gahnia aspera |                 |
|                   | 5%         |                     |               |                 |
| Groundcover       | Grasses    | Forbs               | litter        | bare            |
| Cover             | 10%        | 20%                 | 40%           | 30%             |
| Diversity         | 5          | 13                  |               |                 |



|                   |            |                      |  |                   |                 |
|-------------------|------------|----------------------|--|-------------------|-----------------|
| t2                | -30.53917  | 149.65875            |    |                   |                 |
| PCT               | 544        |                      |  |                   |                 |
| Diversity         | 26         |                      |  |                   |                 |
| Weed cover        | 10%        |                      |  |                   |                 |
| Overstorey cover  | Total 20%  | Angophora floribunda |  |                   |                 |
| height            | 15m        |                      |  | E. blakelyi       | C. glaucophylla |
| Number >10cm      | 80         | 16                   |  | 16                | 48              |
| Dead trees        | 18 (18.4%) |                      |  |                   |                 |
| Midstorey cover   | Total 60%  | A. deanii            |  | C. glaucophylla   |                 |
| Understorey cover | Total 30%  | Lomandra longifolia  |  | Crinium flaccidum | Gahnia aspera   |
| Groundcover       | Grasses    | Forbs                |  | litter            | bare            |
| Cover             | 20%        | 20%                  |  | 60%               | 0%              |
| Diversity         | 5          | 14                   |  |                   |                 |
| bed               | -30.53900  | 149.65916            |  |                   |                 |
| Overstorey cover  | Total 0    |                      |  |                   |                 |
| Midstorey cover   | Total 0    |                      |  |                   |                 |
| Understorey cover | Total <5%  |                      |  |                   |                 |
| Groundcover Cover | Total <5%  |                      |  |                   |                 |

| Site No     | 7         |              |              |
|-------------|-----------|--------------|--------------|
| Description | Teds Hole | McCanns Road | Bohena Creek |

|    |           |           |
|----|-----------|-----------|
| t1 | -30.48398 | 149.65308 |
|----|-----------|-----------|

|            |     |
|------------|-----|
| PCT        | 544 |
| Diversity  | 29  |
| Weed cover | 10% |



|                  |            |                      |                     |                       |                        |
|------------------|------------|----------------------|---------------------|-----------------------|------------------------|
| Overstorey cover | Total      | Angophora floribunda | Eucalyptus blakelyi | Eucalyptus melliodora | Callitris glaucophylla |
| height           | 15         |                      |                     |                       |                        |
| Number >10cm     | 78         | 19                   | 12                  | 2                     | 45                     |
| Dead trees       | 12 (13.3%) |                      |                     |                       |                        |

|                 |       |               |                        |
|-----------------|-------|---------------|------------------------|
| Midstorey cover | Total | Acacia deanii | Callitris glaucophylla |
|                 | 5%    |               |                        |

|                   |       |                     |               |
|-------------------|-------|---------------------|---------------|
| Understorey cover | Total | Lomandra longifolia | Gahnia aspera |
|                   | 20%   |                     |               |

|             |         |       |        |      |
|-------------|---------|-------|--------|------|
| Groundcover | Grasses | Forbs | litter | bare |
| Cover       | 20%     | 40%   | 35%    | 5%   |
| Diversity   | 6       | 16    |        |      |

|    |           |           |
|----|-----------|-----------|
| t2 | -30.48431 | 149.65398 |
|----|-----------|-----------|

|            |     |
|------------|-----|
| PCT        | 544 |
| Diversity  | 21  |
| Weed cover | 15% |



|                  |       |                     |                      |                        |
|------------------|-------|---------------------|----------------------|------------------------|
| Overstorey cover | Total | Eucalyptus blakelyi | Angophora floribunda | Callitris glaucophylla |
|                  | 5%    |                     |                      |                        |

|             |         |            |               |      |
|-------------|---------|------------|---------------|------|
| height      | 15      |            |               |      |
| Number      |         |            |               |      |
| >10cm       | 93      | 21         | 4             | 68   |
|             | 15      |            |               |      |
| Dead trees  | (13.9%) |            |               |      |
| Midstorey   | Total   | Acacia     |               |      |
| cover       | 5%      | deanii     |               |      |
| Understorey | Total   | Lomandra   | Gahnia aspera |      |
| cover       | 10%     | longifolia |               |      |
| Groundcover | Grasses | Forbs      | litter        | bare |
| Cover       | 10%     | 10%        | 75%           | 5%   |
|             | 4       | 11         |               |      |

|            |       |            |           |
|------------|-------|------------|-----------|
| bed        |       | -30.48418  | 149.65361 |
| Overstorey | Total | Eucalyptus |           |
| cover      | 5%    | blakelyi   |           |
| Dead trees | 0     |            |           |



|             |       |             |                |               |
|-------------|-------|-------------|----------------|---------------|
| Midstorey   | Total | Callistemon | Leptospermum   | Acacia deanii |
| cover       | 50%   | linearis    | polygalifolium |               |
| Understorey | Total | Juncus      | Cyperus        | Gahnia        |
| cover       | 10%   |             |                | aspera        |
| Groundcover | Total |             |                |               |
| Cover       | <5%   |             |                |               |

| Site No | 8 |  |  |  |
|---------|---|--|--|--|
|---------|---|--|--|--|

|             |                      |              |  |  |
|-------------|----------------------|--------------|--|--|
| Description | Newell Hwy<br>Bridge | Bohena Creek |  |  |
|-------------|----------------------|--------------|--|--|

|    |  |           |           |  |
|----|--|-----------|-----------|--|
| t1 |  | -30.44481 | 149.67121 |  |
|----|--|-----------|-----------|--|

|            |     |
|------------|-----|
| PCT        | 544 |
| Diversity  | 24  |
| Weed cover | 5%  |



|                  |           |                      |                     |                        |
|------------------|-----------|----------------------|---------------------|------------------------|
| Overstorey cover | Total     | Angophora floribunda | Eucalyptus blakelyi | Callitris glaucophylla |
| height           | 50%       |                      |                     |                        |
| number           | 15m       |                      |                     |                        |
| <10cm            | 142       | 35                   | 11                  | 116                    |
| Dead trees       | 10 (6.6%) |                      |                     |                        |

|                 |       |                      |               |
|-----------------|-------|----------------------|---------------|
| Midstorey cover | Total | Callistemon linearis | Acacia deanii |
|                 | 5%    |                      |               |

|                   |       |                     |                       |
|-------------------|-------|---------------------|-----------------------|
| Understorey cover | Total | Lomandra longifolia | Brachyloma daphnoides |
|                   | 10%   |                     |                       |

|             |         |       |        |      |
|-------------|---------|-------|--------|------|
| Groundcover | Grasses | Forbs | litter | bare |
| Cover       | 70%     | 20%   | 10%    | 0%   |
| Diversity   | 5       | 12    |        |      |

|    |  |           |           |  |
|----|--|-----------|-----------|--|
| t2 |  | -30.44577 | 149.67001 |  |
|----|--|-----------|-----------|--|

|            |     |
|------------|-----|
| PCT        | 544 |
| Diversity  | 24  |
| Weed cover | 10% |



|                  |       |                      |                     |                        |
|------------------|-------|----------------------|---------------------|------------------------|
| Overstorey cover | Total | Angophora floribunda | Eucalyptus blakelyi | Callitris glaucophylla |
|                  | 25%   |                      |                     |                        |

|                      |                |                                |                           |            |
|----------------------|----------------|--------------------------------|---------------------------|------------|
| Number<br><10cm      | 83             | 1                              | 67                        | 15         |
| Dead trees           | 5 (5.7%)       |                                |                           |            |
| Midstorey<br>cover   | Total<br>5%    | Leptospermum<br>polygalifolium | Callitris<br>glaucophylla |            |
| Understorey<br>cover | Total<br>5%    | Lomandra<br>longifolia         | Gahnia aspera             |            |
| Groundcover<br>Cover | Grasses<br>50% | Forbs<br>20%                   | litter<br>25%             | bare<br>5% |
| Diversity            | 6              | 12                             |                           |            |

|     |           |           |
|-----|-----------|-----------|
| bed | -30.44542 | 149.67049 |
|-----|-----------|-----------|

|                     |              |                        |
|---------------------|--------------|------------------------|
| Overstorey<br>cover | Total<br>10% | Eucalyptus<br>blakelyi |
| Dead trees          | 0            |                        |



|                   |           |                      |                             |               |               |
|-------------------|-----------|----------------------|-----------------------------|---------------|---------------|
| Midstorey cover   | Total 10% | Callistemon linearis | Leptospermum polygalifolium | Acacia deanii |               |
| Understorey cover | Total 90% | Juncus               | Cyperus                     | Carex         | Alternanthera |
| Groundcover Cover | Total 5%  | Ariundella           |                             |               |               |



## Appendix 2: Species list

Table 1. Species list of community PCT 544/401 showing diversity and correspondence with characteristic species listed under the NSW listing of the endangered ecological community *White Box Blakely's Red Gum Yellow Box Woodland*.

| Overstorey  |                             | 7  |
|-------------|-----------------------------|----|
| x           | Eucalyptus blakelyi         |    |
|             | Eucalyptus chloroclada      |    |
|             | Angophora floribunda        |    |
| x           | Callitris glaucophylla      |    |
| x           | Eucalyptus melliodora       |    |
| x           | Brachychiton populneus      |    |
|             | Allocasuarina leuhmannii    |    |
| Midstorey   |                             | 6  |
|             | Acacia deanii               |    |
|             | Acacia polybotrya           |    |
|             | Acacia sertiformis          |    |
|             | Callistemon linearis        |    |
|             | Leptospermum polygalifolium |    |
|             | Senna artemisoides          |    |
| Understorey |                             | 15 |
|             | Lomandra longifolia         |    |
|             | Gahnia aspera               |    |
| x           | Brachyloma daphnoides       |    |
| x           | Dianella revoluta           |    |
| x           | Dianella longifolia         |    |
|             | Lepidosperma laterale       |    |
|             | Crinium flaccidum           |    |
|             | Persoonia sericea           |    |
|             | Juncus sp                   |    |
|             | Cyperus sp                  |    |
| x           | Hibbertia obtusifolia       |    |
|             | Xanthorrhoea acaulis        |    |
| x           | Melichrus urceolatus        |    |
|             | Swainsona cadellii          |    |
| x           | Olearia elliptica           |    |
| Grasses     |                             | 14 |
| x           | Aristida ramosa             |    |
|             | Aristida caput-medusa       |    |
|             | Aristida jerichoensis       |    |

|       |                           |    |
|-------|---------------------------|----|
|       | Microleana stipiodes      |    |
|       | Digitaria diffusum        |    |
|       | Eragrostris brownii       |    |
| x     | Cymbopogon refractus      |    |
| x     | Austrostipa scabra        |    |
|       | Austrostipa verticillata  |    |
|       | Austrostipa setacea       |    |
| x     | Themeda australis         |    |
|       | Ariundella nepalensis     |    |
| x     | Dichelachne micrantha     |    |
|       | Imperata major            |    |
|       | Forbs                     | 27 |
|       | Dichondra repens          |    |
|       | Helichrysum apiculatum    |    |
| x     | Glycine clandestina       |    |
| x     | Glycine tabacina          |    |
| x     | Oxalis perennans          |    |
|       | Pomax umbellata           |    |
|       | Fimbristylus dichotoma    |    |
|       | Urtica incisa             |    |
| x     | Rumex brownii             |    |
| x     | Sida corrugata            |    |
|       | Lomandra multiflora       |    |
| x     | Brunoniella australis     |    |
|       | Goodenia glabra           |    |
|       | Goodenia hederacea        |    |
| x     | Geranium solanderi        |    |
| x     | Plantago debilis          |    |
|       | Desmodium brachypodium    |    |
| x     | Templetonia stenophylla   |    |
|       | Poranthera microphylla    |    |
| x     | Cheilanthes sieberi       |    |
|       | Ajuga australis           |    |
|       | Einadia trigonos          |    |
|       | Podolepus jaceoides       |    |
|       | Alternanthera denticulata |    |
|       | Commersonia procumbens    |    |
|       | Vernonia cinerea          |    |
|       | Vittadinia dissecta       |    |
| 25    |                           | 69 |
| 36.8% |                           |    |

Table 2. Characteristic species of the NSW listing of the endangered ecological community *White Box Blakely's Red Gum Yellow Box Woodland* and level of correspondence with species detected in this study.

|   |                                     |   |
|---|-------------------------------------|---|
| ? | <i>Acacia buxifolia</i>             |   |
| ? | <i>Acacia implexa</i>               |   |
| ? | <i>Acacia paradoxa</i>              |   |
| ? | <i>Allocasuarina verticillata</i>   |   |
| ? | <i>Alectryon oleifolius</i>         |   |
| ? | <i>Aristida behriana</i>            |   |
| ? | <i>Aristida ramosa</i>              | x |
| ? | <i>Asperula conferta</i>            |   |
| ? | <i>Atalaya hemiglauca</i>           |   |
| ? | <i>Austrodanthonia auriculata</i>   |   |
| ? | <i>Austrodanthonia bipartita</i>    |   |
| ? | <i>Austrodanthonia racemosa</i>     |   |
| ? | <i>Austrodanthonia richardsonii</i> |   |
| ? | <i>Austrostipa aristiglumis</i>     |   |
| ? | <i>Austrostipa blackii</i>          |   |
| ? | <i>Austrostipa nodosa</i>           |   |
| ? | <i>Austrostipa scabra</i>           | x |
| ? | <i>Bothriochla macra</i>            |   |
| ? | <i>Brachychiton populneus</i>       | x |
| ? | <i>Brachyloma daphnoides</i>        | x |
| ? | <i>Bracteantha viscosa</i>          |   |
| ? | <i>Brunoniella australis</i>        | x |
| ? | <i>Bulbine bulbosa</i>              |   |
| ? | <i>Bursaria spinosa</i>             |   |
| ? | <i>Callitris endlicheri</i>         |   |
| ? | <i>Callitris glaucophylla</i>       | x |
| ? | <i>Capparis mitchellii</i>          |   |
| ? | <i>Cassinia longifolia</i>          |   |
| ? | <i>Cassinia quinquefaria</i>        |   |
| ? | <i>Cheilanthes sieberi</i>          | x |
| ? | <i>Chloris truncata</i>             |   |
| ? | <i>Chloris ventricosa</i>           |   |
| ? | <i>Chrysocephalum apiculatum</i>    | x |
| ? | <i>Cymbopogon refractus</i>         | x |
| ? | <i>Dianella longifolia</i>          | x |
| ? | <i>Dianella revoluta</i>            | x |
| ? | <i>Dichanthium sericeum</i>         |   |
| ? | <i>Dichelachne micrantha</i>        | x |
| ? | <i>Dichelacne sciurea</i>           |   |

|   |                           |   |
|---|---------------------------|---|
| ? | Diuris dendrobioides      |   |
| ? | Dodonaea viscosa          |   |
| ? | Echinopogon caespitosus   |   |
| ? | Ehretia membranifolia     |   |
| ? | Elymus scaber             |   |
| ? | Eremophila mitchellii     |   |
| ? | Eucalyptus blakelyi       | x |
| ? | Eucalyptus albens         |   |
| ? | Eucalyptus bridgesiana    |   |
| ? | Eucalyptus conica         |   |
| ? | Eucalyptus goniocalyx     |   |
| ? | Eucalyptus melliodora     | x |
| ? | Eucalyptus microcarpa     |   |
| ? | Eucalyptus nortonii       |   |
| ? | Eulalia aurea             |   |
| ? | Exocarpos cupressiformis  |   |
| ? | Geijera parviflora        |   |
| ? | Geranium solanderi        | x |
| ? | Glycine clandestina       | x |
| ? | Glycine tabacina          | x |
| ? | Glycine tomentella        |   |
| ? | Gonocarpus elatus         |   |
| ? | Goodenia pinnatifida      |   |
| ? | Hibbertia linearis        |   |
| ? | Hibbertia obtusifolia     | x |
| ? | Hypericum gramineum       |   |
| ? | Jacksonia scoparia        |   |
| ? | Jasminum lineare          |   |
| ? | Jasminum suavissimum      |   |
| ? | Leptorhynchus squamatus   |   |
| ? | Lissanthe strigosa        |   |
| ? | Lomandra filiformis       |   |
| ? | Melichrus urceolatus      | x |
| ? | Microseris lanceolata     |   |
| ? | Notelaea microcarpa       |   |
| ? | Olearia elliptica         | x |
| ? | Olearia viscidula         |   |
| ? | Oxalis perennans          | x |
| ? | Pandorea pandorana        |   |
| ? | Panicum queenslandicum    |   |
| ? | Parsonsia eucalyptophylla |   |
| ? | Pimelea curviflora        |   |
| ? | Plantago debilis          | x |

|   |                          |    |    |        |
|---|--------------------------|----|----|--------|
| ? | Plantago gaudichaudii    |    |    |        |
| ? | Poa labillardieri        |    |    |        |
| ? | Poa sieberiana           |    |    |        |
| ? | Rostellularia adscendens |    |    |        |
| ? | Rumex brownii            | x  |    |        |
| ? | Sida corrugata           | x  |    |        |
| ? | Sorghum leiocladum       |    |    |        |
| ? | Stackhousia monogyna     | x  |    |        |
| ? | Stackhousia viminea      |    |    |        |
| ? | Swainsona galegifolia    |    |    |        |
| ? | Templetonia stenophylla  | x  |    |        |
| ? | Themeda australis        | x  |    |        |
| ? | Wahlenbergia sp          | x  |    |        |
|   |                          | 94 | 28 | 28.70% |



### Appendix 3: Drone shots of red gum dieback along Bohena Creek





