Lands Adjacent to Glen Artney Industrial Area Tamworth NSW

Review of 2015 Flora and Fauna Assessment

Prepared by
The Envirofactor P/L
for
Tamworth Regional Council

Sept 2016

INTRODUCTION

This review of the '*Lands Adjacent to the Glen Artney Industrial Area -Flora and Fauna Assessment*' (GHD 2015) has been prepared at the request of Genevieve Harrison, Strategic Planning Manager of Tamworth Regional Council. The original assessment by GHD (2015) looked at 4 parcels of land west of Tamworth comprising approximately 902.4ha (GHD 2015) refer Figure 1. This review focusses on one of the land parcels assessed by GHD, comprising Lot 2 in DP816346 and Lot 462 in DP1178998. This parcel (marked Area 3 on Figure 1) has an area of approximately 246ha.

The purpose of this review is to provide ecological advice as regards the GHD methods and assessment with respect to threatened species and in particular the occurrence of the Commonwealth listed critically endangered ecological community, *White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland*. Refer to Attachment A for a summary of the author's expertise.

In preparing this report the following documents were reviewed;

- GHD (2015) *Lands Adjacent to the Glen Artney Industrial Area Flora and Fauna Assessment*. Report prepared for Tamworth Regional Council by GHD, Newcastle.
- GHD Field sheets (2014) – quadrat, site data and annotated aerial photographs.
- DEH (2006) *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland.* EPBC Act Policy Statement http://www.environment.gov.au/system/files/resources/be2ff840-7e59-48b0-9eb5-4ad003d01481/files/box-gum.pdf.
- NSW NPWS (undated) Identification Guidelines for Endangered Ecological Communities - White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland). NSW National Parks and Wildlife Service http://www.environment.nsw.gov.au/resources/nature/box-gumIdGuidelines.pdf.
- OEH *Atlas of NSW Wildlife* database (accessed 2016) http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx
- DPI Threatened *freshwater species distribution maps* (accessed 2016) http://www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps
- DOE EPBC Protected Matters Search Tool (accessed 2016) https://www.environment.gov.au/epbc/protected-matters-search-tool.

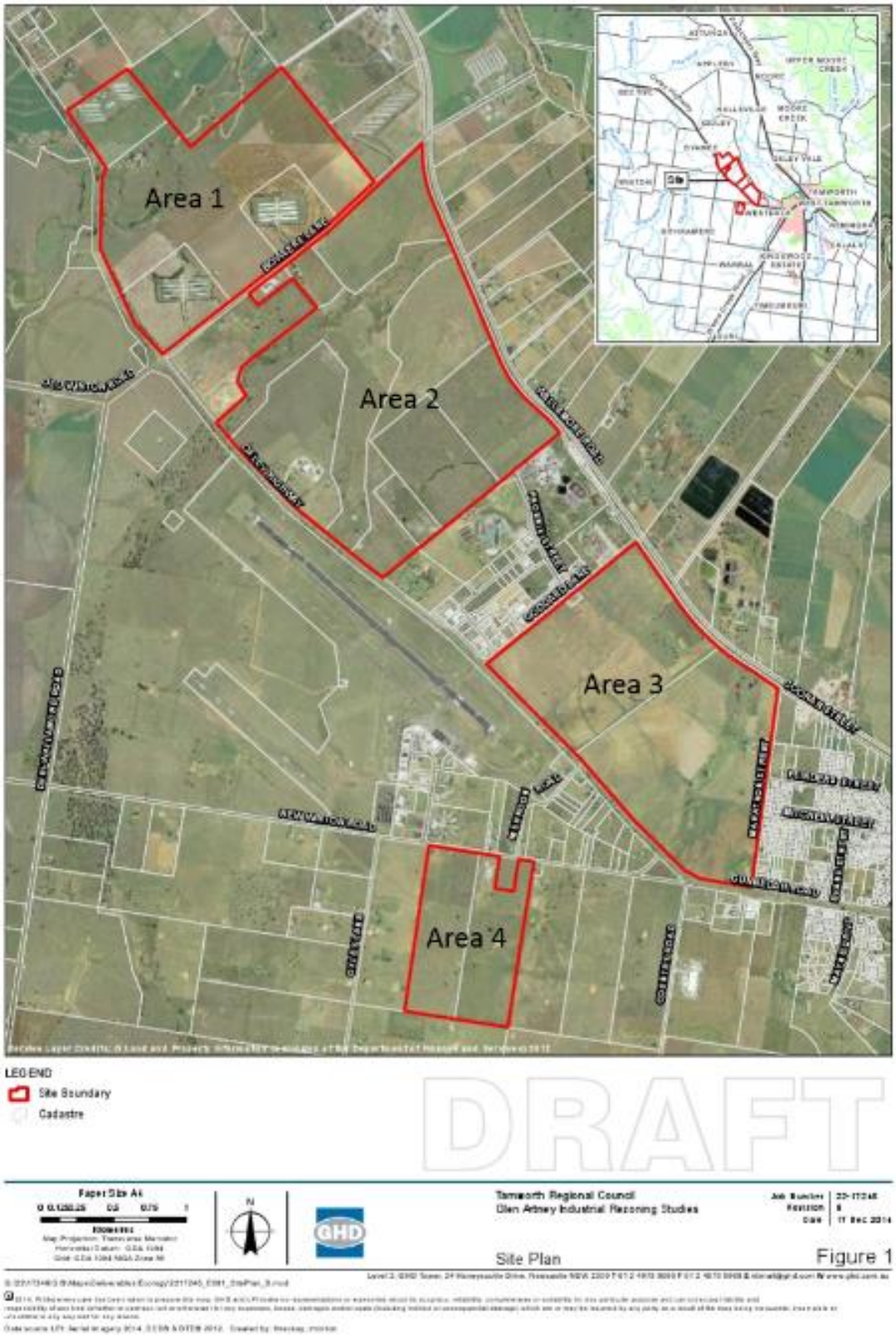


FIGURE 1: Lands adjacent to Glen Artney Industrial Area - the subject of the GHD 2015 flora and fauna assessment

ASSESSMENT METHODS

Determination of threatened species likely to occur on the project area

The desktop assessment provided in the GHD report includes the identification of threatened flora and fauna species records within 20km of the proposal site, which is appropriate given the paucity of flora and fauna survey effort in and around the Tamworth area (refer Appendix C, GHD report, 2015). As per standard desktop assessment procedure, the likely occurrence of these species has then been assessed against their habitat requirements. Only those species with suitable habitat on site are considered as occurring on the project area, and therefore potentially impacted by the rezoning and subsequent development of the site. However, it is the opinion of this author that some species have been incorrectly culled from the likely occurrence list shown in the document including:

- *Thesium australe* (TSC Act) – '*Occurs in grassland or grassy woodland, and is often found in association with Kangaroo Grass* (Themeda australis)' (GHD 2015). According to the flora species list provided in the report kangaroo grass is present on the proposal area, although there is no indication of its abundance. Consequently, habitat for this species may potentially be present.

- Regent Honeyeater (*Anthochaera phrygia*) (TSC & EPBC Acts) – '*is generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany*' (OEH Regent Honeyeater Threatened Species Profile http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10841). Given this is a wide ranging species and the project area supports a number of mature White Box and Yellow Box trees, the Regent Honeyeater may well use the area for foraging.

- Little Lorikeet (*Glossopsitta pusilla*) (TSC Act) - '*Inhabits dry, open eucalypt forests and woodlands….. On the western slopes and tablelands* Eucalyptus albens *and* E. melliodora *are particularly important food sources for pollen and nectar respectively*' (GHD 2015). Given this is a wide ranging species and proposal area supports a number of mature *E. albens* and *E. melliodora*, the Little Lorikeet may well use the area for foraging.

- Swift Parrot *(Lathamus discolor*) (TSC & EPBC Acts) – '*On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as….. White Box (*E. albens*)*' (OEH Swift Parrot Threatened Species Profile http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10455). Again, given this is a wide ranging species and the proposal area supports a number of mature White Box trees the Swift Parrot may well use the area for foraging.

- Koala (*Phascolarctos cinereus*) (TSC and EPBC Acts) – GHD report (2015) states the preferred feed trees for the koala are not present. White box is however listed as a preferred feed species under SEPP 44[1], while yellow box and white box have been listed as secondary feed species under the NSW *Koala Recovery Plan* (DECC 2008). A more recent koala expert forum undertaken in Armidale 2015 for the Northern Tablelands Local Land Services, *Koala Recovery Strategy for the Northern Tablelands 2015-2025* (Hawes *et al* 2016) identified both white box and yellow box as 'preferred' koala feed trees across the Northern Tablelands area. Although this recovery strategy didn't include the Tamworth region it is unlikely, given the similarity in vegetation, climate and landscape, that

[1] As indicated by GHD (2015) Tamworth Regional Council is not listed under Schedule 1 of SEPP 44, however the constituent councils that were amalgamated to form the Tamworth Regional Council are.

koalas would significantly change their food tree preferences from adjoining slopes areas. Consequently, koala habitat is present on the proposal area.

- Grey-headed Flying-fox (*Pteropus poliocephalus*) (TSC & EPBC Acts) – '*Forages in …… tall sclerophyll forests and woodlands, heaths, swamps and street trees, particularly in eucalypts*, *melaleucas and banksias'* (GHD 2015). If this highly mobile species capable of foraging in street trees it is also likely to forage in the scattered eucalypt trees and woodland within the project area.

In addition to the above species, there are a number of other threatened species for which the area potentially provides habitat. Although there are no records of these species within 20km, their known distribution and habitat preferences overlap the project area. These species include:

- Little Pied Bat (*Chalinolobus picatus*) (TSC Act)
- Pale-headed Snake (*Hoplocephalus bitorquatus*) (TSC Act)
- Bush Stone-curlew (*Burhinus grallarius*) (TSC Act)
- Flame Robin (*Petroica phoenicea*) (TSC Act)
- Dusky Woodswallow (*Artamus cyanopterus cyanopterus)* – TSC Act listed 2016
- Purple Spotted Gudgeon (*Mogurnda adspersa*) (FM Act)
- Digitaria porrecta (TSC Act)
- *Picris evae* (TSC & EPBC Acts).

With exception of the Dusky Woodswallow, which was only listed in 2016, it is unclear why these species were not considered as potentially having habitat on the project area. With regard to threatened fish the report does state, '*the ephemeral nature of these creeklines mean that they are unlikely to support the threatened aquatic fish that occur in the local area*' (GHD 2015). It should be noted the ephemeral nature of the majority of Australian waterways is not a limiting factor to their habitat value for threatened fish species. Degradation and changes to hydrology/flooding regimes are the factors that limit habitat value for aquatic fauna. DPI (Fisheries) species distribution map for the Purple Spotted Gudgeon include both Tangaratta and Bolton's Creeks on Areas 1 and 2 (http://www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps).

In the opinion of this author none of the above species can be discounted from occurring on the project area. Further field work may be able to discount some of these species, particularly the flora species and some of the more sedentary fauna species, if investigations are undertaken by a suitably qualified person at an appropriate time of year. However for most of the fauna, their presence and use of habitat may be intermittent and/or transitory (eg Swift Parrot and Regent Honeyeater) or they themselves may be difficult to trap/observe (eg Pale-headed Snake) making a making a conclusion of absence difficult. The best approach is considered an assessment of the habitat value of the area assuming a species' presence, and where possible avoiding and or mitigating potential impacts of any proposed development.

Field Survey

A field survey of the project area was carried by GHD ecologists over 4 days from 30th June to 3rd July, 2014 and over a further 2 days on 15th and 16th December 2014, which involved:

- 17 flora quadrats (20m x 20m), although field data sheets indicate 18 quadrats were undertaken
- an unspecified number of random meander transects for threatened flora
- fauna habitat searches

- bird census
- opportunistic sightings of flora and fauna (GHD 2015).

It is unclear in the report what survey activities were conducted within the 4 and 2 day survey periods specified. However the field sheets indicate the flora survey work was carried out in the 4 day June-July period. This is important because, as acknowledged in the GHD report (2015 - s3.4.1 p10), June and July are not an ideal time for either flora or fauna survey. In the case of flora it is outside the active growing, flowering and seed set period for most summer flowering ground layer species in northern NSW. This makes identifying the presence of many native species difficult if not impossible, and tends to bias results towards introduced weed species which are often more actively growing at this time. Similarly for fauna, many small species (frogs, bats and reptiles) enter torpor or hibernate through winter to protect their energy reserves during a time of reduced temperature and food availability. As a consequence survey activities during this period are likely to miss significant numbers of species. Although no systematic fauna survey was carried out, the survey timing will have influenced the results of the fauna habitat searches, bird census and opportunistic sightings.

Apart from the 17 or 18 (20m x 20m) quadrats, the degree of survey effort undertaken is not quantified for either flora or fauna except to say survey activities were undertaken by two ecologists. There is no indication of where fauna habitat searches, bird census or random meanders for threatened flora species were located or how much time was spent on these activities. None of the flora quadrats undertaken were located within Area 3 (refer Figure 2), nor Area 4 the land parcel to the south comprising Lots 5 & 6 in DP 7100986 9.

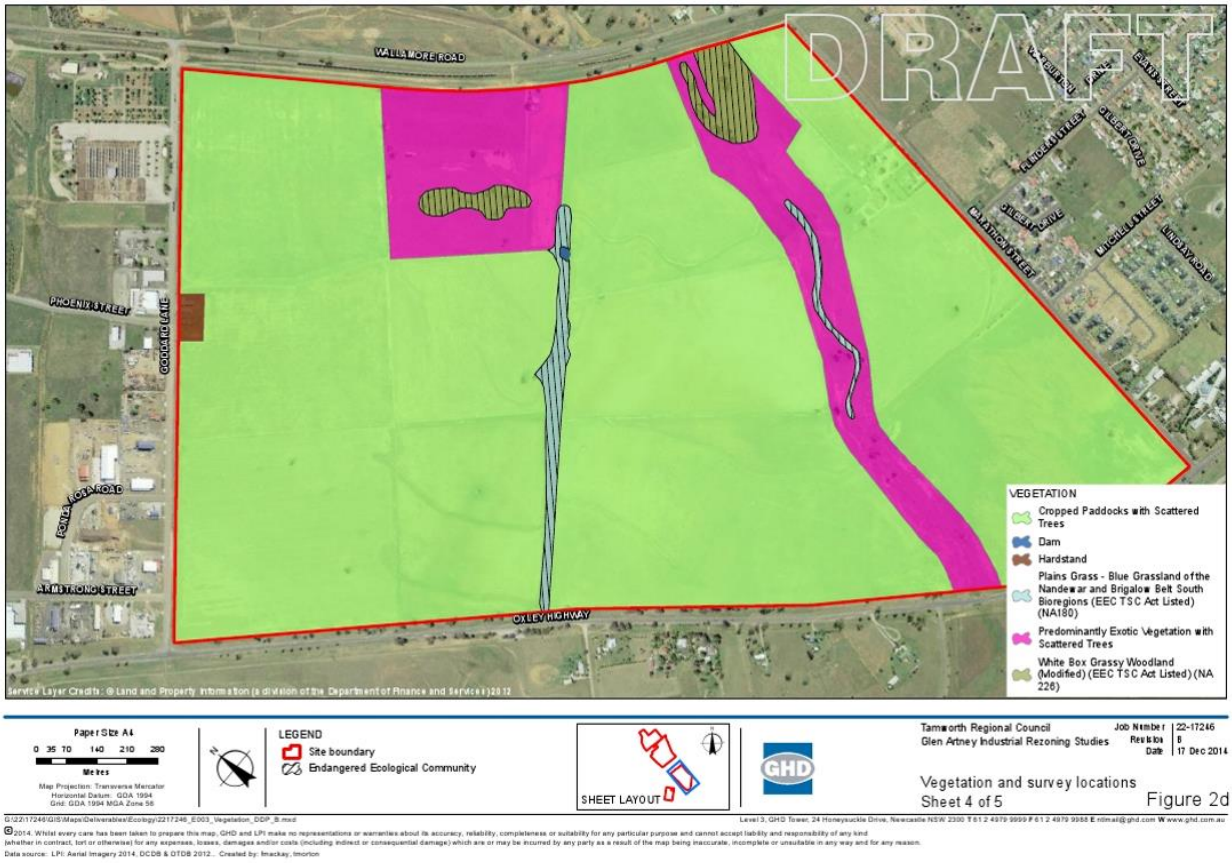


Figure 2: Area 3 adjacent to Glen Artney Industrial Estate - Vegetation mapping and flora and fauna survey locations (GHD 2015)

A survey of the number of hollow-bearing trees and large woody debris stacks was undertaken across the extent of the project area and their locations mapped (refer Figure 3). This survey identified 165 large hollow bearing trees supporting '*a range of hollow sizes and shapes'* (GHD 2015). GHD ecologists did observed '*parrots and lorikeets*' using hollows on the project area for nesting. From the maps provided it is estimated Area 3 supports between 55-60 hollow bearing trees (refer Figure 3). Four stacks of large woody debris were also identified on Area 3 which, provide habitat for '*lizards, skinks and other reptiles*' (GHD 2015), as well as small mammals (eg Dunnarts and Antechinus) and forging substrates for birds such as the Brown Treecreeper.

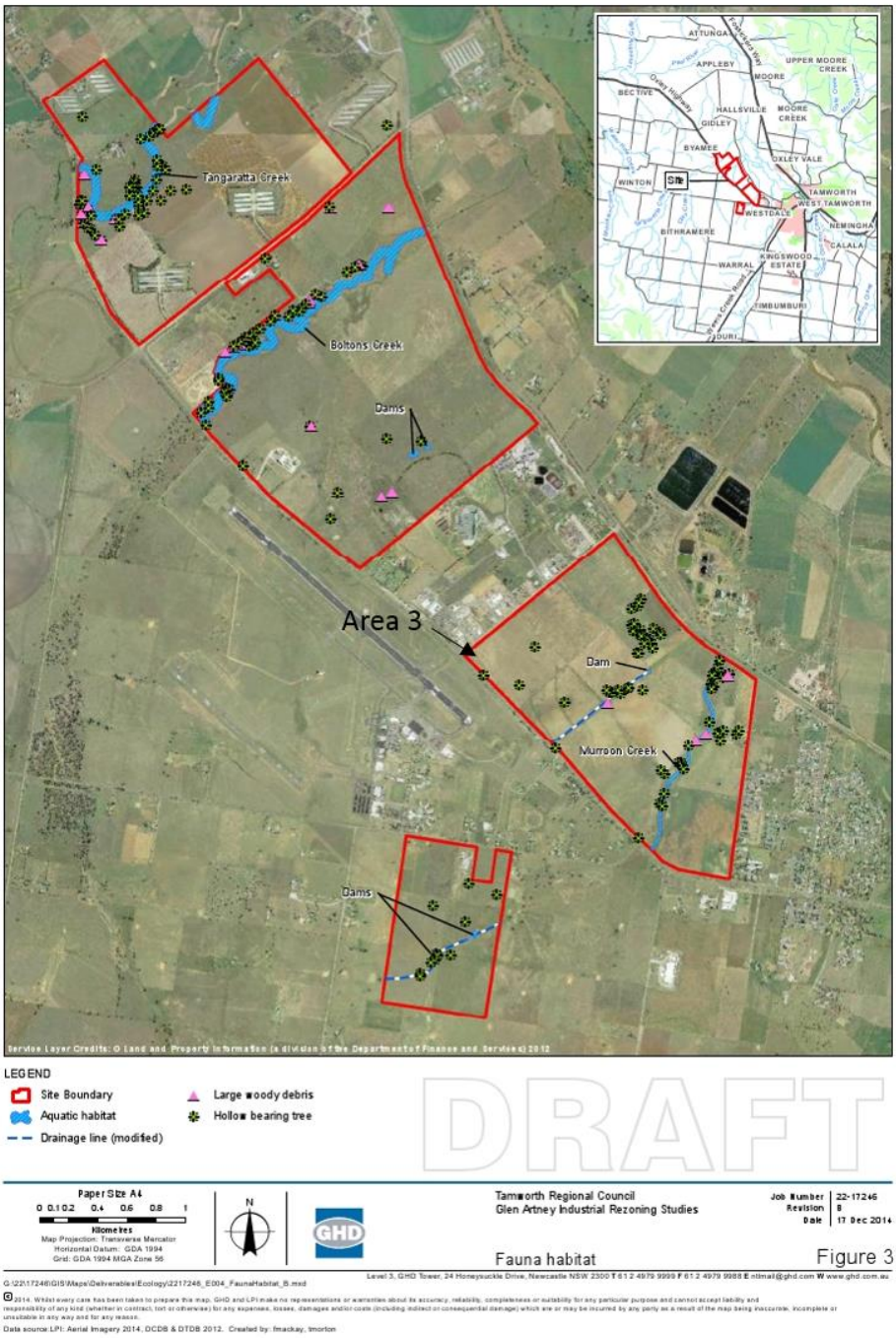


FIGURE 3: Location of hollows and large woody debris stacks on lands adjacent to Glen Artney Industrial Area (GHD 2015)

CONSISTENCY WITH THREATENED ECOLOGICAL COMMUNITY LISTINGS

Box-Gum grassy woodland

The use 20m x 20m quadrats by GHD (2015) for flora data collection is a method consistent with requirements of the NSW *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft* (DEC 2004). However, as discussed above the flora survey was carried out at an inappropriate time of year, placing a question mark over the results presented. Unfortunately the use or 20m x 20m quadrats (0.04ha) is not consistent with the Commonwealth guidelines for the identification of the CEEC which requires flora species data to be collected using a minimum 20m x 50m quadrat (0.1ha) at an appropriate time of year which in northern NSW is Oct-Mar.

Further, no quadrat data is presented in the GHD report making it difficult to determine the relative dominance and abundance of flora species recorded. However, GHD field data sheets indicate that potentially 7 of the quadrats located within box gum woodland and/or derived grassland were dominated by native grasses at the time of survey. Based on the vegetation descriptions, field sheets and the flora species list provided, it is likely *White Box Yellow Box Blakely's Red Gum Woodland,* listed as an endangered ecological community (EEC) under NSW legislation (*Threatened Species Conservation Act 1995)* does occur on the site. As indicated in the GHD report, this listing covers a number of woodland types but only requires one or more of the tree species listed to be dominant or co-dominant. White Box and Yellow Box have both been identified as dominants or co-dominants on the area in question. Under this legislation derived grasslands, that is areas where the overstorey has been removed but the groundcover remains, are still considered part of this EEC. Consequently, as identified by GHD, derived native grasslands on the area could also comprise this EEC. Excluded from the listed community will be those derived grassland areas dominated by planted exotic grass species, with no isolated paddock trees.

White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grassland is also listed as a critically endangered ecological community (CEEC) under Commonwealth legislation (*Environment Protection and Biodiversity Conservation Act 1999*). However, the Commonwealth legislation requires areas of vegetation to meet a number of minimum condition criteria before it can be considered part of the listed community.

These minimum condition criteria are outlined in the, *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland* EPBC Act Policy Statement (DEH 2006 http://www.environment.gov.au/system/files/resources/be2ff840-7e59-48b0-9eb5-4ad003d01481/files/box-gum.pdf). Attachment B is an excerpt from this guideline showing the flowchart for the identification of the CEEC (DEH 2006). But in summary to meet these criteria an area/patch must;

1. Have, or have once had, an overstorey dominated by White Box, Yellow Box or Blakely's Red Gum (or Western Grey Box (*E. microcarpa*) or Coastal Grey Box in the Nandewar bioregion), and
2. Have a predominantly native ground layer, and
3. Be greater than 0.1ha in size, and
4. Have 12 or more native understorey species present (excluding grasses) and there must be one or more important species as defined by DOTE at, http://www.environment.gov.au/system/files/resources/be2ff840-7e59-48b0-9eb5-4ad003d01481/files/box-gum-species.pdf

Patches that do not meet this last criterion may still be considered part of the listed CEEC if;

5. The patch is greater than 2ha in size, and

6. Has an average of 20 or more mature trees per ha or there is natural regeneration of the dominant overstorey eucalypts.

The assessment of any given patch must be undertaken at a minimum of 0.1ha (ie 20m x 50m quadrat), at an appropriate time of year.

The GHD report states that, '*At the time of the survey none of the areas assessed within this vegetation type* (ie Plains Grass-Bluegrass grassland, White Box grassy woodland and Yellow Box – Blakely's Red Gum grassy woodland) *contained sufficient species diversity, number of mature trees or natural regeneration of the overstorey to meet the criteria to be included in the EPBC Act listed CEEC White Box Yellow Box Blakely's Red Gum grassy woodland and derived native grasslands'*. However, given the quadrat size used is not consistent with the Commonwealth guideline, the survey was carried out at a time of year when the least number of species are likely to be identifiable/actively growing and no quadrats were located in Areas 3 and 4 this statement cannot be substantiated.

Quadrat size notwithstanding, the combined results presented in the GHD report identifies 28 native understorey species (excluding grasses) on the two land parcels surveyed (Areas 1 and 2 – refer Figure 1). Further, the species list indicates that: *Dichanthium sericeum*, *Themeda australis, Asperula conferta, Calocephalus citreus, Calotis cuneata, C. lappulacea, Chyrsocephalum apiculatum*, *Daucus glochidiatus, Desmodium brachypodum, Glycine clandestina, G. tabacina* and *Acacia decora,* all occur on the project area. These species are listed as important species under the EPBC Act guideline. What is unclear from the data presented in the GHD report is whether an assessment based on the required 20m x 50m quadrat would meet the minimum condition criteria for the Commonwealth listed CEEC. There is also no data provided within the report or the field data sheets that establishes whether any areas of woodland support an average of 20 or more mature trees per hectare, however, field data sheets do indicate the presence of regenerating overstorey, as per the DEH (2006) guideline.

As stated previously, it appears that no flora data was collected from Areas 3 and 4 (refer Figures 1 and 3), therefore conclusions regarding the presence, absence and/or quality of the CEEC on is unproven. No definitive conclusion can therefore be drawn from the results presented in the GHD report or field sheet data as to the presence or absence of the Commonwealth listed ecological community across the project area, but more specifically within Area 3. In order to definitively establish the presence/absence of the CEEC on this area further field work is required by a suitably qualified person. This work must be undertaken at an appropriate time of year and be consistent with the DEH (2006) guideline.

Aquatic ecological community

The GHD (2015) report correctly identifies the creeklines and their floodplains on the project area, including Murroon Creek on Area 3, as comprising the *Aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River* listed under the NSW *Fisheries Management Act 1994* (http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/636498/FR22-Darling-River-EEC.pdf).

PRELIMINARY IMPACT ASSESSMENT

In their preliminary impact assessment GHD (2015) correctly identify that other than those areas protected for conservation the entire area could be cleared. They also correctly advise '*that a more comprehensive impact assessment, based on the final development footprint and informed by more extensive survey effort and assessment, would need to be undertaken at the Development Application stage should this rezoning application be successful*'. Further, this impact assessment would need to include an assessment of significance in accordance with section 5A of the EP&A Act for threatened biota listed on the TSC Act and FM Acts and an assessment of significance in accordance with the DOE (2013) guidelines for threatened and

migratory fauna listed under the EPBC Act, which are known or have potential to occur on the project site (GHD 2015).

The GHD report proposes the conservation of 92.2ha of land along the three creeklines present on the site: Tangaratta, Bolton's and Murroon Creeks (refer Figure 4). This area will protect 74.8ha of native vegetation comprising 6 vegetation types (including 56.8ha of the NSW listed Box-Gum Woodland EEC) and 17.4ha of scattered paddock trees (Table 5.1 p45, GHD 2015). This proposal will also protect occurrences of the FM Act aquatic ecological community on the project area, a number of hollow bearing trees[2] and 16 stacks of woody debris (GHD 2015).

As stated previously, the balance of the area may potentially be cleared including: 256.3ha of NSW listed Box-Gum Woodland EEC (255ha comprising derived grasslands and 1.3ha of woodland), 369ha of scattered trees in cultivation, 84ha of exotic vegetation and 16ha of planted natives (Table 5.2 p46, GHD 2015). The impacts of this clearing described in the GHD report include:

- habitat fragmentation and isolation
- fauna injury and mortality
- erosion, sedimentation and contamination
- weed invasion and edge effects
- pests and pathogens, and
- light noise and vibration.

All of these impacts will potentially result from the clearing associated with the site development. Similarly, the report correctly identifies key threatening processes likely to adversely impact threatened species, as a result of rezoning and site development. However, some of the statements in the GHD report regarding relative degree of these impacts are considered, by this author, to be pre-emptive and therefore misleading. For example, the suggestion that conversion of approximately 709ha of primarily cropping and grazing land to industrial estate will only result in a minimal increase in light, noise, vibration and the potential for fauna/vehicle collisions. The degree of these impacts may or may not be minimal, because as with any development the associated impact is highly dependent upon; lot sizes/configuration, infrastructure location/design, the types of businesses proposed and the proximity to remnant habitat.

MITIGATION OF IMPACTS

The proposed development of a Construction Environmental Management Plan (CEMP) which incorporates a Vegetation Management Plan, addressing the criteria outlined, will assist in mitigating the impacts associated with the clearing and development of the site. Incorporated into these plans should be the mitigation recommendations outlined in assessments undertaken for the development of the site under s5A of the EP&A Act and the EPBC Act assessment of significance.

[2] The number is unclear - Table 5.1 p45 gives the number of hollow bearing trees to be protected as 79 while the section 7 p57 gives the number as 97.

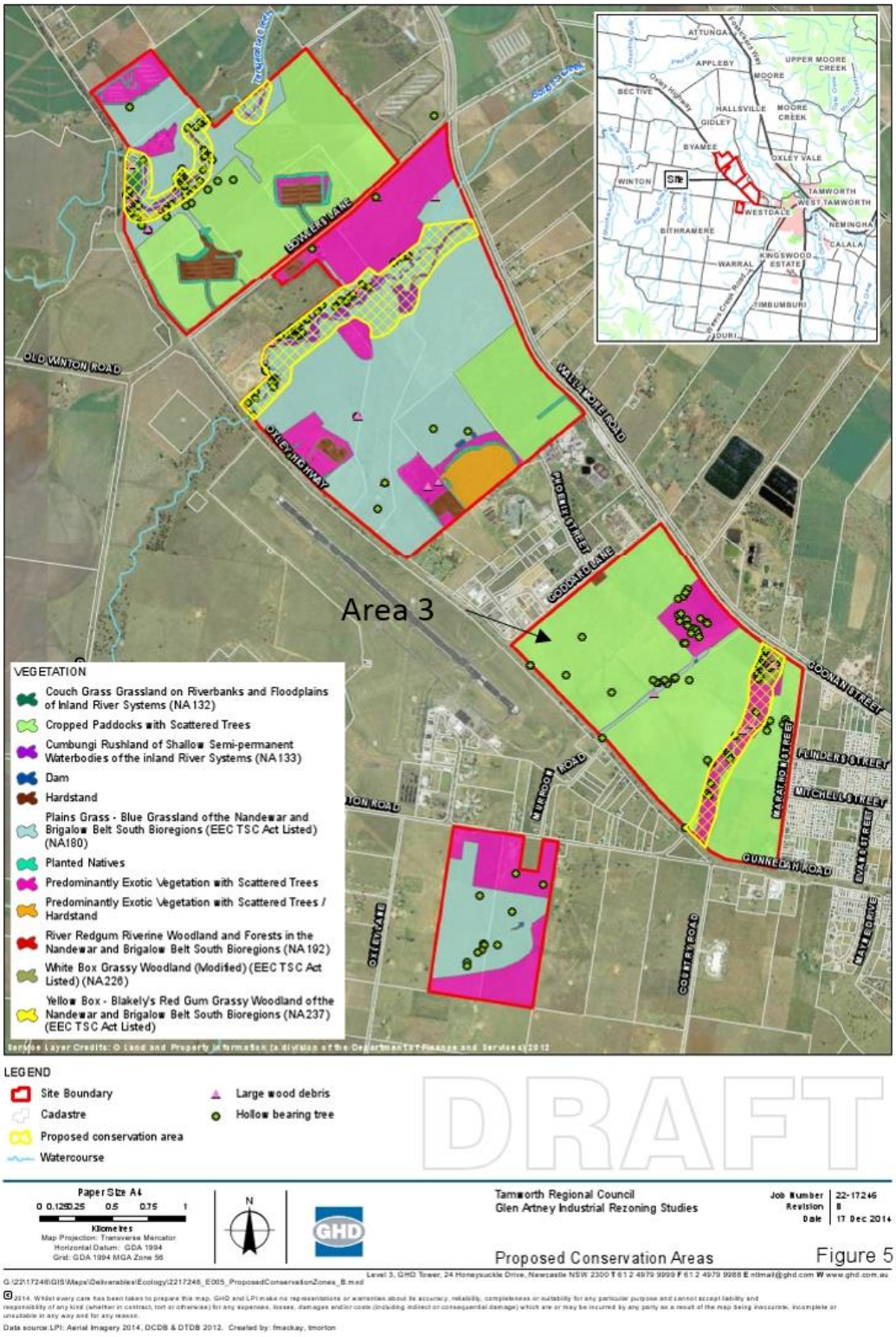


FIGURE 4: Proposed Conservation Areas for the Land adjacent to the Glen Artney Industrial Area (GHD 2015)

CONCLUSION

A failure to provide adequate field survey information in the report including: quadrat data, survey effort, and the location of random meanders, bird census and habitat searches means many of the report's conclusions cannot be substantiated. Additionally, the timing of the flora survey and the use of a 20m x 20m quadrats, rather than the 20m x 50m quadrat required by the Commonwealth guideline (DEH 2006), make difficult to affirm the report's conclusion regarding the absence of the Commonwealth listed ecological community on the project area.

In Area 3, the GHD report identifies 4 vegetation types (refer Figure 2). Two of which it states are representative of the NSW listed box-gum woodland EEC but not the Commonwealth listed CEEC. Since no flora survey quadrats were undertaken of this area, any conclusions regarding the presence/absence or condition of vegetation communities, that may or may not comprise listed threatened ecological communities are problematic. This is applies to Area 4, where similarly no apparent flora survey quadrats were undertaken.

In order to definitively establish the presence/absence of the CEEC on the project area as a whole, further field work is required by a suitably qualified person. This work must be undertaken at an appropriate time of year (October-March) and be consistent with the DEH (2006) guideline.

The above notwithstanding, there is agreement that conserving areas along the creeklines will protect areas of habitat and the aquatic ecological community listed under the FM Act. However, the efficacy of this protection for all threatened flora and fauna that potentially occur on the project area will need to be assessed under section 5A of the EP&A Act and an assessment of significance in accordance with the DOE (2013) guideline. This, as outlined by GHD, is best done at the Development Stage when the location of infrastructure, associated potential industry impacts and changes to proposed landuse are known. It should also be noted that *SEPP 44 Koala Habitat Protection* is relevant to this area.

Wendy Hawes
Principal Terrestrial Ecologist

REFERENCES

DEH (2006) *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland.* EPBC Act Policy Statement
http://www.environment.gov.au/system/files/resources/be2ff840-7e59-48b0-9eb5-4ad003d01481/files/box-gum.pdf.

DPI Threatened *freshwater species distribution maps* (accessed 2016) http://www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps

DOE (2013) *Matters of National Environmental Significance - Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999.* Australian Department of the Environment.
DOE EPBC Protected Matters Search Tool (accessed 2016)
https://www.environment.gov.au/epbc/protected-matters-search-tool.

GHD (2015) *Lands Adjacent to the Glen Artney Industrial Area Flora and Fauna Assessment*. Report prepared for Tamworth Regional Council by GHD, Newcastle.

Hawes W, Hunter JT, Lechner A and Ede A (2016) *Northern Tablelands Koala Recovery Strategy 2015-2025.* Draft report prepared for the Northern Tablelands Local Land Services.

NSW NPWS (undated) *Identification Guidelines for Endangered Ecological Communities - White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland*). NSW National Parks and Wildlife Service http://www.environment.nsw.gov.au/resources/nature/box-gumIdGuidelines.pdf.

OEH *Atlas of NSW Wildlife* database (accessed 2016)
http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx

ATTACHMENT A:

CONSULTANT'S QUALIFICATIONS AND EXPERIENCE

Wendy Hawes – Principal Ecologist

Wendy has over 20 years experience in vegetation investigations and assessment of impacts on threatened species and ecological communities. She has a Bachelor of Science and Master of Science (prelim) majoring in Ecology and Zoology from the University of New England.

Scientific Licence: S11105

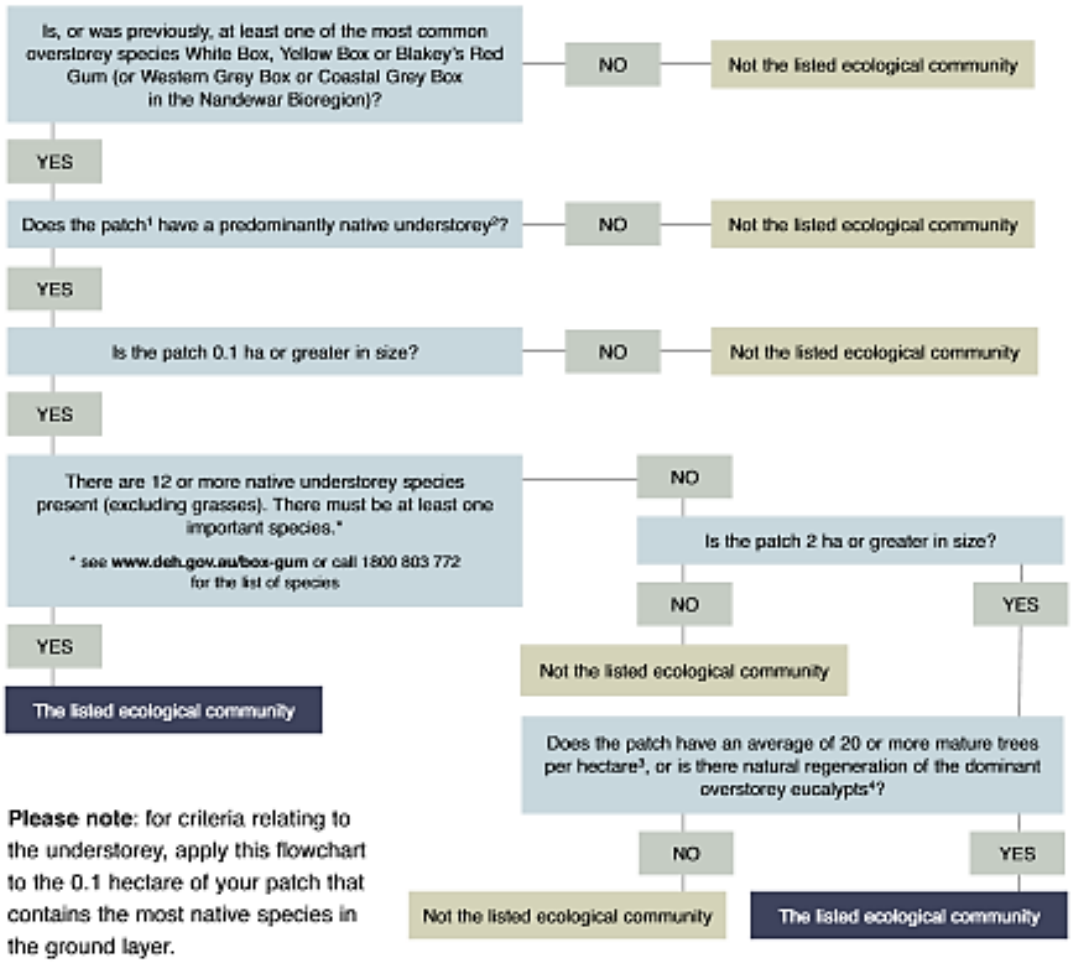
Her experience includes:

- Writing the draft national recovery plan for *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland.*
- Sitting on Department of Environment, Water, Heritage and the Arts expert panels to advise on definitions and condition criteria for threatened ecological communities under consideration by the Commonwealth Scientific Committee including; Box-Gum Grassy Woodlands, Coolabah/Black Box Woodlands, Bluegrass Grasslands and Myall Woodlands.
- Undertaking numerous assessments under the NSW *Environment Planning and Assessment Act 1979* (including Part 3A and Section 5A assessments) and EPBC Act – *Significant Impact Guidelines* for urban and rural development.
- Conducting and/or participating in numerous flora and fauna surveys for research and assessment.
- Writing guidelines for State Government departments on floristic survey, vegetation mapping, threatened species assessment.
- Conducting training courses in biodiversity, threatened species and general ecological assessment, for a range of clients.
- Preparing environmental harm reports and/or remediation plans for alleged breaches of NSW native vegetation and Commonwealth environmental legislation.
- Member of NSW Department of Environment, Climate Change and Water: Border Rivers Community Conservation Advisory Committee, Northern Tablelands Regional Advisory Committee and Goonoowigall State Conservation Area Community Advisory Group.
- Nature Conservation Council representative on Northern Tablelands Bushfire Management Committee.
- Department of Natural Resources member of expert panels benchmarking woodland communities for condition assessment, which have been utilised for state incentive funding programmes and in the Property Vegetation Planning Developer, for assessments under the *Native Vegetation Act 2003*.

ATTACHMENT B: Minimum Condition Criteria for the Commonwealth Box-Gum Woodland Critically Endangered Ecological Community (DEH 2006)

The flowchart below represents the lowest condition at which patches are included in the listed ecological community. This is not the ideal state of the ecological community. Large patches, those that link remnants in the landscape, those that occur in highly cleared areas, those that contain rare, declining or threatened species, and those that represent the entire range of the ecological community, are important for the long-term future of the ecological community.

Determining if your land has an area of the listed ecological community



Please note: for criteria relating to the understorey, apply this flowchart to the 0.1 hectare of your patch that contains the most native species in the ground layer.

[1] Patch – a patch is a continuous area containing the ecological community (areas of other ecological communities such as woodlands dominated by other species are not included in a patch). In determining patch size it is important to know what is, and is not, included within any individual patch. The patch is the larger of:
- an area that contains five or more trees in which no tree is greater than 75 m from another tree, or
- the area over which the understorey is predominantly native.

Patches must be assessed at a scale of 0.1 ha (1000m²) or greater.

[2] A predominantly native ground layer is one where at least 50 per cent of the perennial vegetation cover in the ground layer is made up of native species. The best time of the year to determine this is late autumn when the annual species have died back and have not yet started to regrow. (At other times of the year, you can determine whether something is perennial or not is if it is difficult to pull out of the soil. Annual species pull out very easily.)

[3] Mature trees are trees with a circumference of at least 125 cm at 130 cm above the ground.

[4] Natural regeneration of the dominant overstorey eucalypts when there are mature trees plus regenerating trees of at least 15 cm circumference at 130 cm above the ground.