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ecoplanning
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10 January 2019

Re: Ecological Constraints Assessment, Lot 47 // DP 1204727 (12 Tait Crescent), Goulburn.

Dear Greg,

Please find below a description of the ecological values and constraints identified during a site visit at 12 Tait Crescent (Lot 47 // DP 1204727), Goulburn, NSW, hereafter referred to as the 'study area' (**Figure 1**).

Background and purpose of report

The study area is located within the Goulburn-Mulwaree Local Government Area (LGA). The majority of the property is currently zoned RU2 - Rural Landscape with two small sections along the northern boundary zoned IN1 - General Industrial under the Goulburn-Mulwaree Local Environmental Plan (GMLEP) 2013. The study area covers the entire the lot (approx.13.00 ha).

This report describes the ecological values and constraints in the study area to inform possible future development. It provides a list of threatened species that are found in the broader area and identifies those that may use the study area. A site survey collected data to identify the native vegetation communities in the study area and their conservation status, and the report has ranked the ecological constraints on site as high, medium or low. This report will accompany a Planning Proposal to rezone the land.

Methods

Literature review and database analysis

A site-specific literature and database review were undertaken prior to the field survey and the preparation of this report. This included desktop analysis of aerial photography and review of regional scale information from the following sources:

- NSW Planning Viewer (NSW Dept. of Planning and Environment 2019)
- BioNet Atlas of NSW Wildlife (NSW Office of Environment and Heritage 2019a)
- Protected Matters Search Tool (Commonwealth Department of the Environment and Energy 2019)
- SIX Maps (LPI 2019)
- Native Vegetation of South East NSW (Tozer et al. 2006 – mapping)

- Native Vegetation of South East NSW (Tozer et al 2010 – report)
- Threatened Biodiversity Profile Searches (OEH 2019c)
- Local Land Services Vegetation Mapping (LLS 2014)
- NSW Vegetation Information System (OEH 2019b)
- Flora and Fauna Assessment for proposed road extension – Lockyer Street and Tait Crescent (Ecoplanning 2018)

Threatened species, populations and migratory species recorded within 5 km of the subject site were consolidated in a search of the Atlas of NSW Wildlife (BioNet) (OEH 2019). Their likelihood of occurrence was assessed by:

- review of location and date of recent (<5 years) and historical (>5-20 years) records
- review of available habitat within the subject site and surrounding areas
- review of the scientific literature pertaining to each species and population
- applying expert knowledge of each species

Following a review of available habitat within the subject site, the potential for each threatened species, population and/or migratory species to occur was considered. The potential for species to use the site and to be affected directly or indirectly by the proposed action were considered as either:

- "Recent record" = species has been recorded in the subject site a within the past 5 years
- "High" = species has previously been recorded in the subject site (>5 years ago) or in proximity to (for mobile species), and/or habitat is present that is likely to be used by a local population
- "Moderate" = suitable habitat for a species is present onsite but no evidence of a species detected and relatively *high* number of recent records (5-20 years) within 5 km of the study area or species is highly mobile
- "Low" = suitable habitat for a species is present onsite but limited or highly degraded, no evidence of a species detected and relatively *low* number of recent records within 5 km of the study area
- "Not present" – suitable habitat for the species is not present onsite or adequate survey has determined species does not occur in the subject site.

Field survey

Site inspection was conducted by Elizabeth Norris (Senior Ecologist/Botanist) over approximately 6 hours. The area was traversed on foot and the location of hollow bearing trees and other areas of conservation significance recorded using a handheld GPS (Avenza Maps).

Results

Vegetation

Native vegetation within 5 km of the study area was assessed using a desktop GIS analysis (**Figure 2**). The vegetation mapping by Tozer et al. (2006) and Local Land Services (2014) revealed that much of the native vegetation surrounding the study area has been cleared

(~80%, 6,927 ha). Fragmented tracts of native vegetation occur to the west and north west of the study area, the residential area of Goulburn occurs to the north and north east whilst cleared farming land occurs to the east and south of the study area. Larger tracts of native vegetation occur distant from the study area to the east and south-west (**Figure 2**).

The study area has been historically cleared for grazing and is currently under horse agistment. Pasture and weed species predominate across the site. A proposal to extend Tait Crescent is currently in the planning phase with Goulburn-Mulwaree Regional Council with the road easement crossing the western portion of the study area (**Figure 1**).

Tozer et al. (2006) regional vegetation mapping and Local Land Services (2014) regional vegetation mapping did not record any vegetation community types as occurring within the study area (**Figure 3** and **Figure 4**). Two vegetation communities have been recorded and mapped within the public reserve located to the west of the study area (**Figure 3** and **Figure 4**). The equivalent Plant Community Types (PCTs) and conservation status of these vegetation communities are provided in **Table 1**.

Table 1: Vegetation communities and equivalent PCTs recorded adjacent to the study area

Vegetation communities (Tozer 2010)	Vegetation communities (LLS 2014)	Vegetation type Ecoplanning 2018)	Equivalent PCTs (OEH 2018)	TEC
Tableland Hills Grassy Woodland (GW p23)	Broad-leaved Peppermint – Red Stringybark grassy open forest on undulating hills, South Eastern highlands Bioregion (SR524)	-	Broad-leaved Peppermint – Red Stringybark grassy open forest on undulating hills, South Eastern highlands Bioregion (PCT 731)	No
Tableland Grassy Box Gum Woodland (GW p24)	Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands (SR670)	Box Gum Woodland – Remnant condition	Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion (PCT 1330)	Yes

TEC: Threatened Ecological Community

Field assessment determined that two vegetation communities occurred within the study area:

- Box – Gum Woodland
- Tableland Hills Grassy Woodland

The two native vegetation communities have been further classified based on their condition. Field assessments identified one condition class of Box – Gum Woodland – 'degraded' (0.07 ha) (**Figure 5** and **Plate 1**), and Tableland Hills Grassy Woodland – 'derived native grassland' (0.10 ha) (**Figure 5** and **Plate 2**).

The remainder of the study area consists of cleared land (12.83 ha), which is largely managed for horse agistment. A small business enterprise also operates from the work shed located at the western end of the study area (**Figure 5**).

Box – Gum Woodland - degraded

Box – Gum Woodland – degraded is represented on site by several trees of *Eucalyptus melliodora* (Yellow Box) and *Eucalyptus blakelyi* (Blakely's Red Gum) (**Plate 1**). These trees occur over a highly modified and degraded understorey dominated by exotic pasture and weed species. One individual of each species was found to be in poor condition with canopy foliage observed in a sub-optimal condition. One stag was also present.

Box – Gum Woodland is a component of 'White Box, Yellow Box, Blakely's Red Gum Grassy Woodland' which is listed as an Endangered Ecological Community (EEC) under the NSW *Biodiversity Conservation Act 2016* (BC Act) and part of the Critically EEC 'White Box, Yellow Box, Blakely's Red Gum Grassy Woodland and Derived Native Grassland' listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Commonwealth Conservation Advice for White Box, Yellow Box, Blakely's Red Gum Grassy Woodland and Derived Native Grassland (TSSC 2006) provides condition thresholds for when a patch retains sufficient conservation value to be considered as a Matter of National Environmental Significance (MNES) (**Appendix A**). A review of the approved Conservation Advice (TSSC 2006) concluded that the Box – Gum Woodland – degraded within the study area does not meet the condition thresholds to be categorised as a MNES and will not require assessment in accordance with the Significant Impact Guidelines (DoE 2013).

The NSW Scientific Determination for Box – Gum Woodland describes the condition of remnants from relatively good to highly degraded such as paddock remnants with weedy understoreys, with this latter condition describing the condition of the patch of Box – Gum Woodland occurring within the study area (**Figure 5**). Disturbed remnants are still considered to form part of the community including remnants where the vegetation, either understorey, overstorey or both, would, under appropriate management, respond to assisted natural regeneration, such as where the natural soil and associated seed bank are still at least partially intact. Further, they may still have high conservation value due to the flora and fauna they support and the faunal habitat they provide. The conservation value of remnants may be independent of remnant size.

Tableland Hills Grassy Woodland – derived native grassland (DNG)

Tableland Hills Grassy Woodland – derived native grassland was present adjacent to the western fence line adjoining the public reserve (**Figure 5** and **Plate 2**). This patch, which lacks tree and shrub species, was dominated by *Austrostipa scabra, Microlaena stipoides* and *Austrostipa bigeniculata*. Native bushland inspected within the adjacent public reserve has been previously mapped as Tableland Hills Grassy Woodland and as the ground-layer species recorded in the patch of DNG in the study area also occur in Tableland Hills Grassy Woodland, the DNG patch has been assigned to this community. Some native tree plantings are also present within the public reserve adjacent to the study area.

Exotic grassland and weed species

Most of the study area comprises grazing land that is dominated by exotic pasture species and weeds (**Figure 5**, **Plate 3** and **Plate 4**). Exotic grass species included *Cenchrus*

*clandestinus** (Kikuyu Grass), *Paspalum dilatatum* (Paspalum), *Cynodon dactylon* (Couch), *Eragrostis curvula* (African Lovegrass), *Vulpia bromoides* (Squirrel Tail Fescue), *Anthoxanthum odoratum* (Sweet Vernal Grass), *Dactylis glomerata* (Cocksfoot), *Phalaris aquatica* (Phalaris), *Nassella neesiana* (Chilean Needlegrass) and *Nassella trichotoma* (Serrated Tussock). Other common non-grass exotic species include *Hypericum perforatum* (St John's Wort), *Echium plantagineum* (Paterson's Curse), *Rubus fruiticosus* species aggregate (Blackberry), *Paronychia brasiliana* (Chilean Whitlow), *Hypochaeris radicata* (Catsear), *Plantago lanceolata* (Lambs Tongue), *Cirsium vulgare* (Spear Thistle) and *Carduus tenuiflorus* (Winged Slender Thistle).

Few exotic shrubs were recorded in the grassland areas but included one *Crataegus monogyna* (Hawthorn), one *Sorbus aucupara* (Rowan Tree, suspected planting) and several *Lycium ferocissimum* (African Boxthorn).

Ten weeds listed under the NSW *Biosecurity Act 2015* were recorded in the study area, five of which are Weeds of National Significance (WoNS) Table 2.

Table 2: Priority Weeds and Weeds of National Significance (WoNS).

Common name	Scientific name	WoNS	Duty
Azolla	*Azolla pinnata*	N	**General Biosecurity Duty** All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable
Hawthorn	*Crataegus monogyna*	N	**General Biosecurity Duty** As above.
Paterson's Curse	*Echium plantagineum*	N	**General Biosecurity Duty** As above.
African Lovegrass	*Eragrostis curvula*	N	**General Biosecurity Duty** As above.
St John's Wort	*Hypericum perforatum*	N	**General Biosecurity Duty** As above. **Regional Recommended Measure** Land managers should mitigate the risk of new weeds being introduced to their land, and mitigate the spread from their land. The plant should be eradicated from the land and the land kept free of the plant.
African Boxthorn	*Lycium ferocissimum**	Y	**Mandatory Measure** Must not be imported into the State or sold. **General Biosecurity Duty** As above

Common name	Scientific name	WoNS	Duty
Serrated Tussock	*Nassella trichotoma**	Y	**Mandatory Measure** Must not be imported into the State or sold. **General Biosecurity Duty** As above **Regional Recommended Measure** As above
Chilean Needlegrass	*Nassella neesiana*	Y	**Mandatory Measure** Must not be imported into the State or sold. **General Biosecurity Duty** As above **Regional Recommended Measure** As above
Blackberry	*Rubus fruiticosus spp. agg.*	Y	**Mandatory Measure** Must not be imported into the State or sold. **General Biosecurity Duty** As above
Fireweed	*Senecio madagascariensis*	Y	**Mandatory Measure** Must not be imported into the State or sold. **General Biosecurity Duty** As above

Wetland flora species

Several farm dams were present across the study area (Dams 1 – 5, **Figure 5**) containing wetland species including the native species *Lythrum hyssopifolium, Paspalum distichum* (Water Couch), *Eleocharis* sp., *Persicaria decipiens* (Slender Knotweed), *Persicaria lapathifolia* (Pale Knotweed), *Vallisneria australis* (Ribbonweed), *Potamogeton* sp. (a Pondweed) and exotic species including *Salix* sp. (Willow) and *Cyperus eragrostis* (Umbrella Sedge).

Infrastructure and disturbed land

These areas comprise existing access roads, built structures and associated infrastructure (septic tanks and absorption trenches) and rubbish (**Plate 5** and **Plate 6**).

Threatened species

A search of the Atlas of NSW Wildlife (OEH 2019) indicated that eighteen threatened species have previously been recorded within a 5 km radius of the study area (**Appendix A**). This consists of fifteen fauna and three flora species (**Figure 6**).

Ten threatened or migratory bird species have been recorded in the area, most of which are > 5 km distant from the study area. Three species have been recorded within 5 km of the study area with the closest record being *Hieraaetus morphnoides* (Little Eagle) which was documented approximately 800 m to the south east of the study area in 2008. The most recent record was that of *Daphoenositta chrysoptera* (Varied Sittella), recorded in 2016

approximately 4.9 km to the north east of the study area. There are few records of these species in the area and they have 'low' likelihood of using the study area.

Habitat features in the study area consist of cleared land, tussock grasses, farm dams, one hollow bearing tree, one stag and patches of dense blackberry thickets. Most of the study area has been cleared (approximately 95% cover or 12.4 ha) and is dominated by exotic pasture grasses and weed species and some scattered rubbish. The remainder of the study contains five farm dams (0.43 ha) and two native vegetation communities (0.17 ha). Throughout the study area, mid-story vegetation, when present, consisted of the woody weeds *Lycium ferocissimum* (African Boxthorn) *and Rubus fruiticosus* spp. agg. (Blackberry). Further, one hollow bearing tree was recorded containing two hollows, with one of these occupied by European Honey Bee. These habitat features are also likely to provide habitat for native arboreal fauna, including mammals, amphibians, reptiles and birds.

The study area contains potential microbat roosting/breeding and foraging habitat, including the hollow bearing tree and sources of water (i.e. farm dams). Threatened microbats recorded within 10 km of the study site area could potentially use these resources.

Riparian corridors

One watercourse occurs within the study area, which is impeded by five dams used for watering stock (**Figure 5**). This watercourse is mapped as a 1st order stream between the second, fourth and fifth dam (**Figure 5**) (Strahler 1953 in DPI 2012). It flows in a southerly direction and joins an east-flowing un-named creek located south of the study area. This un-named creek flows into the Mulwaree River (~1.5 km east of the study area).

In accordance with the *Water Management Act 2000*, any activity within 40 m of waterfront land (which includes streams) requires referral to the Department of Industry – Water (formerly the NSW Office of Water). Field validation of this watercourse found no discernible bed and bank along the length of the watercourse (upstream and downstream of all dams), although some erosion scouring was present between Dams 2 and 4. The Department of Primary Industries (DPI 2012) Guidelines note that where a 1st order watercourse does not exhibit the features of a defined channel with bed and banks, the Department of Industry – Water may determine that the watercourse is not waterfront land for the purposes of the *Water Management Act 2000* and as such the provision of riparian buffers may not be required.

At the time of survey, the dams contained some aquatic and emergent vegetation and it's likely that these dams have habitat value for native aquatic species.

The largest of the dams provided habit for Australasian Grebe (*Tachybaptus novaehollandiae*) that, at the time of survey, were seen to be nest building on the dam. Several frog species were also recorded around the dams and included the Bleating Tree Frog (*Litoria dentata* – adjacent to Dam 1), Spotted Marsh Frog (*Limnodynastes tasmaniensis* – Dam 5) and Beeping Froglet (*Crinia parinsignifera* – Dam 1).

Conservation values in the study area

Given the modified and degraded condition of the study area, the vegetation is generally in a 'low' condition state, but areas of 'moderate' conservation significance have also been mapped (**Figure 7**). In addition, the hollow bearing tree is of 'high' ecological value as such

trees are a limited resource that can take more than 100 years to form and provide habitat for hollow dependant threatened fauna, particularly microbats.

Native vegetation which is not an EEC and farm dams have 'moderate' conservation significance and represent a 'moderate' ecological constraint. Cleared land and weedy/exotic patches of vegetation are mapped as 'low' conservation significance and ecological constraint.

Assessment pathway

The NSW *Biodiversity Conservation Act 2016* came into effect on the 25th August 2017 and establishes a scientific method for assessing the impacts on biodiversity values of proposed development and land use change. Part 6 of the BC Act establishes an offsets scheme which aims to ensure there is no net loss of biodiversity values. For the site, entry into the offset scheme would be triggered by exceeding the thresholds as outlined in Part 7 of the NSW *Biodiversity Conservation Regulation 2017* (BC Reg). Specifically clearing of native vegetation across an area of greater than 1 ha (based upon minimum lot size 100 ha) would trigger the offset scheme. The clearing threshold includes all proposed clearing of native vegetation including Asset Protection Zones (APZs).

Based on the site inspection, the area of native vegetation in the study area is less than 1 ha. Therefore, future assessment of the site under Part 4 of the *Environmental Planning and Assessment Act 1979* would not trigger the Biodiversity Offset Scheme, and the impact of the proposal on the environmental values could be assessed via a Flora and Fauna Assessment.

Conclusions and recommendations

Desktop analysis and field survey found that the study area predominantly consists of land that is of 'low' conservation significance (i.e. the cleared land and weeds/exotics). However, due the presence of a degraded patch of Box – Gum Woodland EEC and the hollow bearing tree, parts of the study area represent a 'moderate' and 'high' ecological constraint, respectively. Hollow bearing trees should be retained where possible.

A number of Priority Weeds and Weeds of National Significance have been recorded across the study area. A vegetation Management Plan, or similar, which includes the control and prevention of spread should be required as part of any future development application.

There are five dams across the study area. Should these dams be removed, a Dam Dewatering Report may be required in order to manage the environmental impacts that may arise as a result of dewatering.

A mapped first order watercourse, linking the three southern-most dams, occurs in the study area although this watercourse lacks discernible bed and bank characteristics. As such, the Department of Industry – Water may determine that the watercourse is not waterfront land for the purposes of the *Water Management Act 2000*.

Given that the minimum lot size for the study area is 100 ha, and the total area of native vegetation mapped in this survey was 0.17 ha, future development of the study area would not trigger entry into the 'biodiversity offsets scheme' under the BC Act.

If you would like to discuss any of the above comments and recommendations further, please contact me on the below details.

Your sincerely,

Elizabeth Norris

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References

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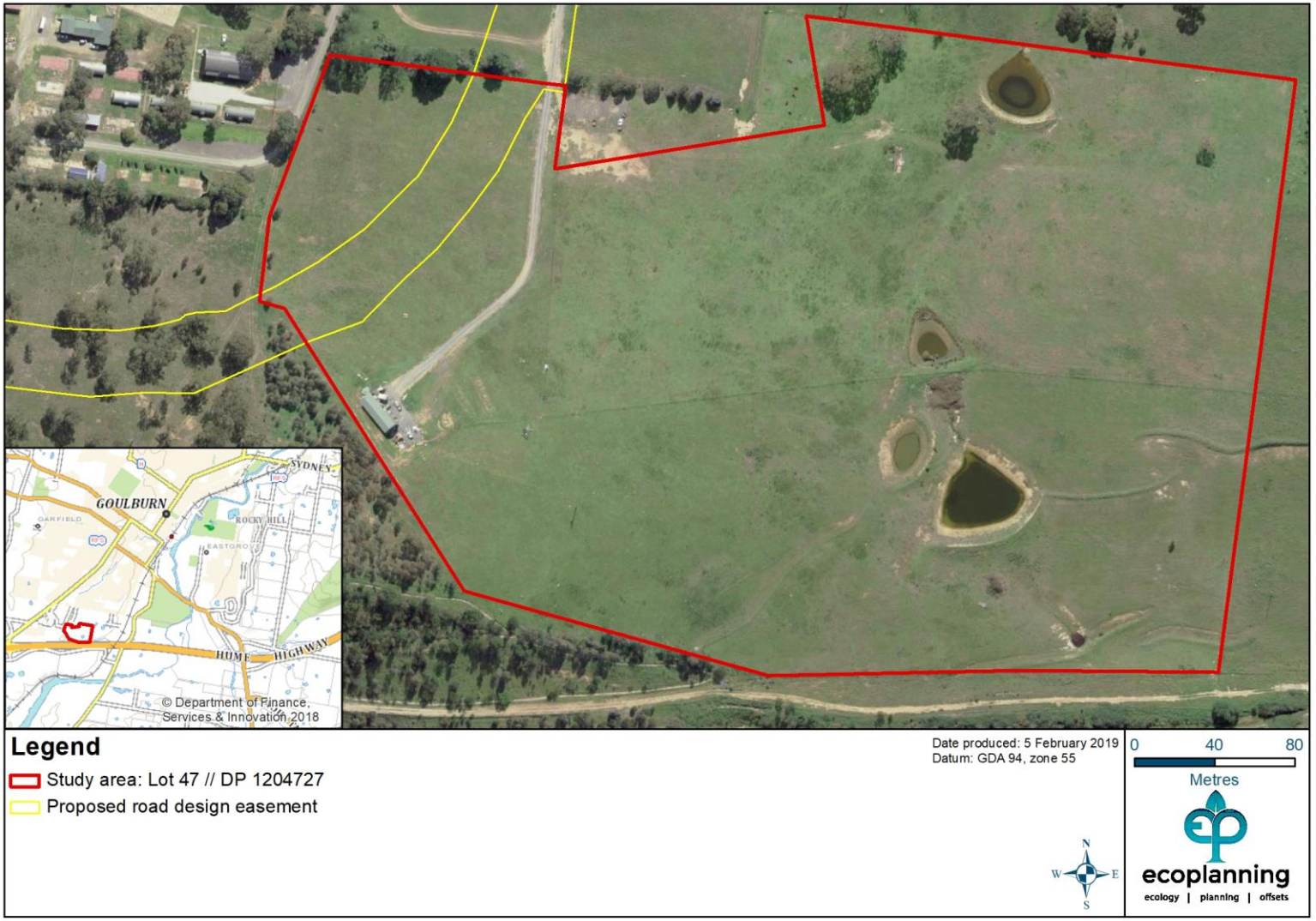

Figure 1: Study area.

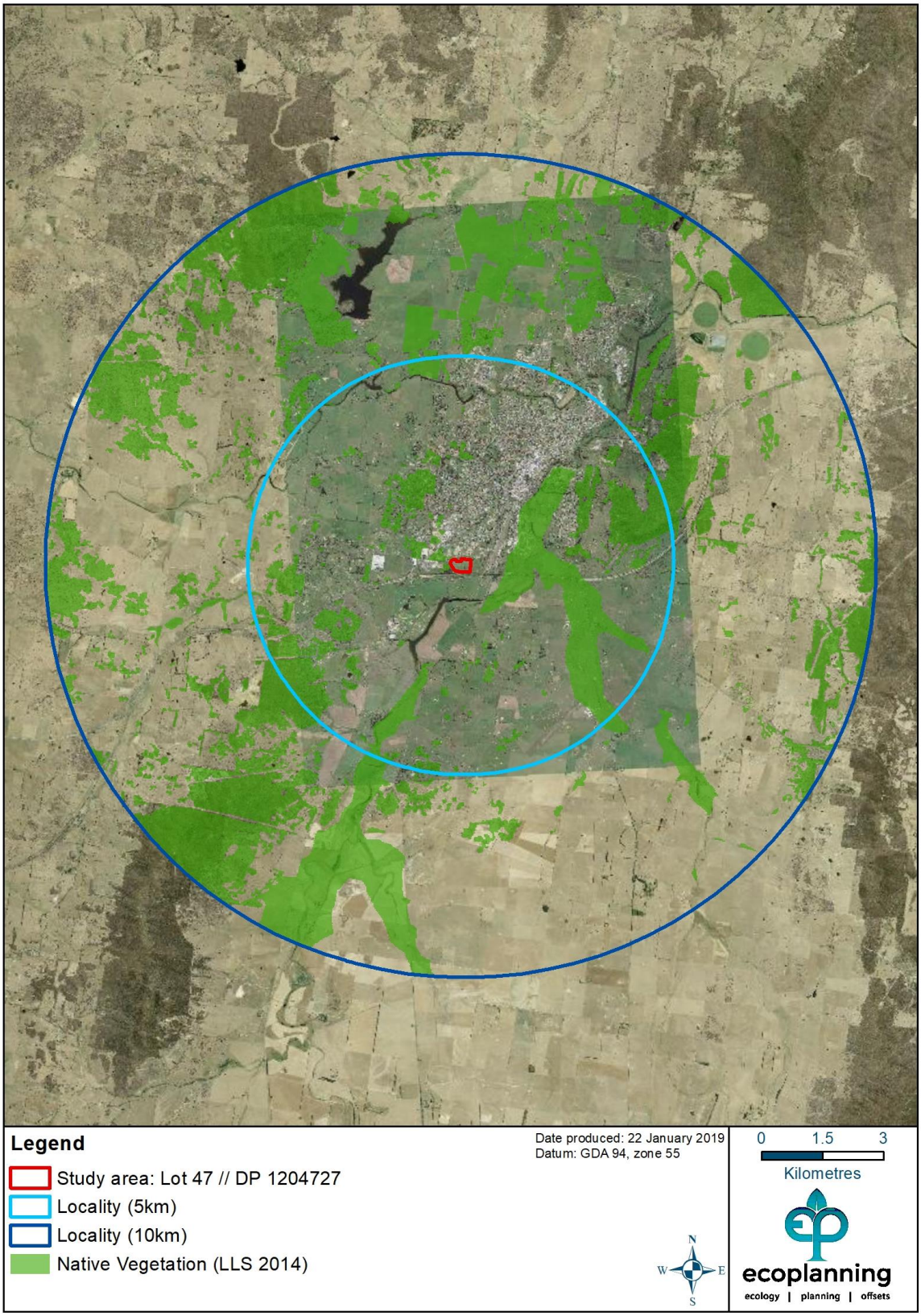

Figure 2: Native vegetation within 5 km and 10 km of the study area (Tozer et al. 2006).

Figure 3: Desktop assessment of vegetation mapping in the study area (Tozer et al. 2006).

Figure 4: Desktop assessment of vegetation mapping in the study area (Local Land Services 2014).

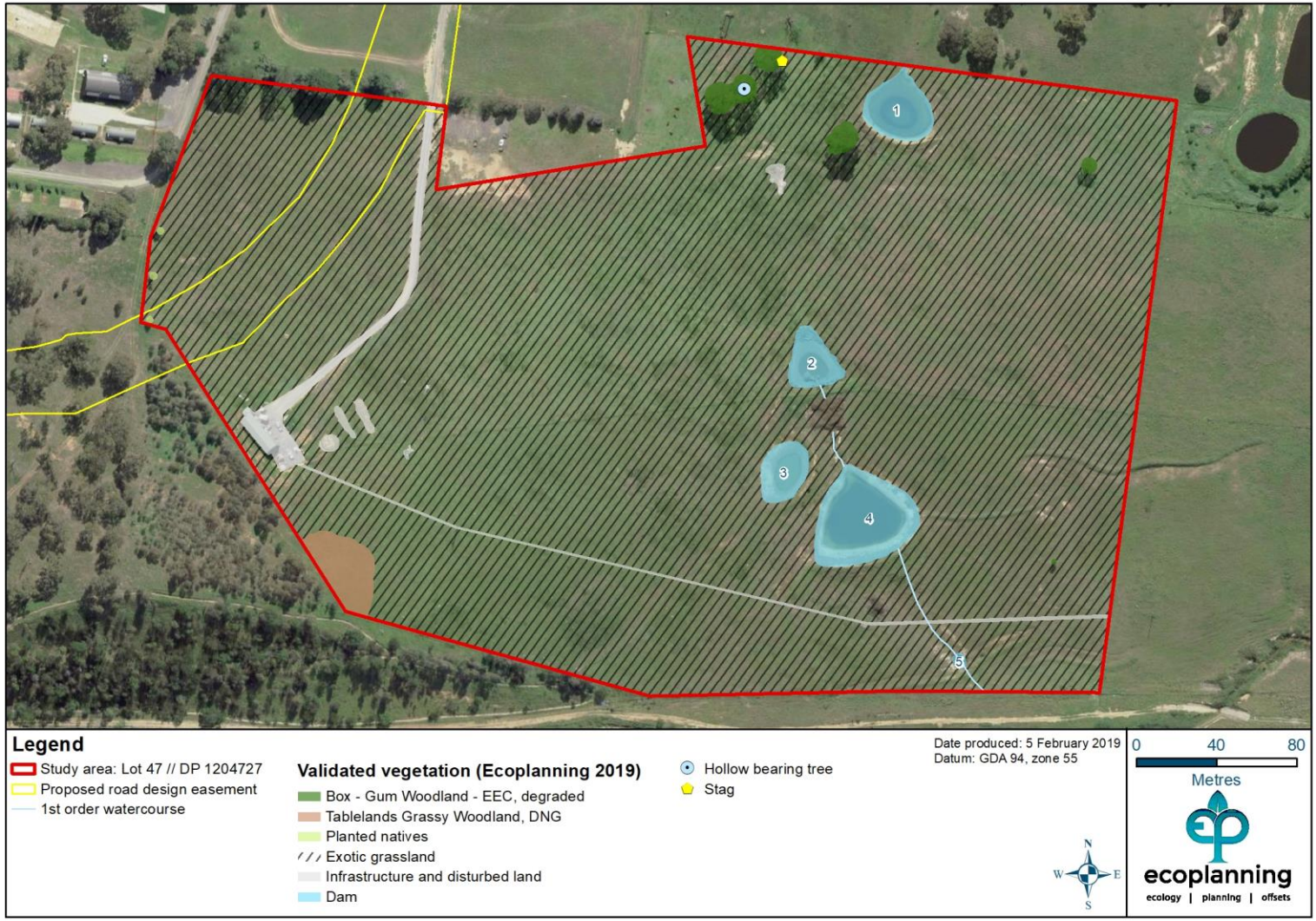

Figure 5: Field validated vegetation and hollow bearing trees, including mapped drainage lines.

Plate 1: Box – Gum Woodland – degraded condition.

Plate 2: Tableland Hills Grassy Woodland – derived native grassland.

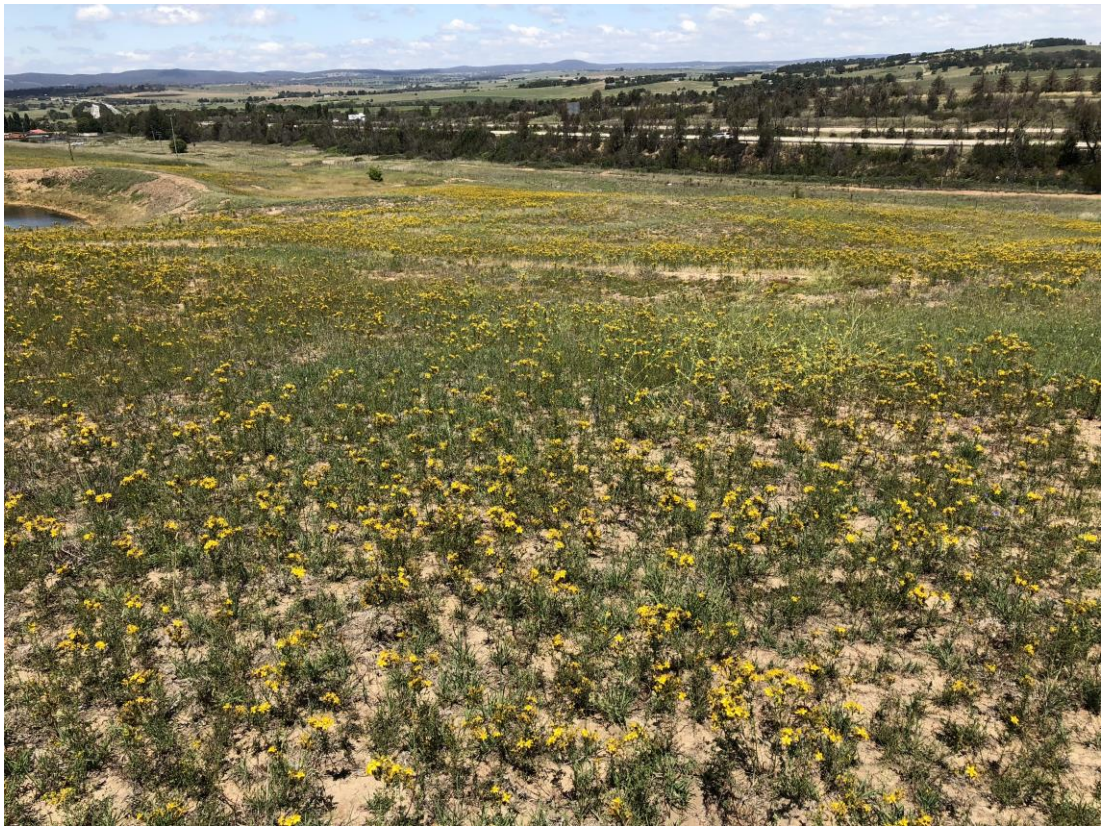

Plate 3: Exotic grassland land dominated by exotic pasture and weed species

Plate 4: Exotic grassland land dominated by exotic pasture and weed species

Plate 5: Infrastructure and exotic grassland

Plate 6: Disturbed land

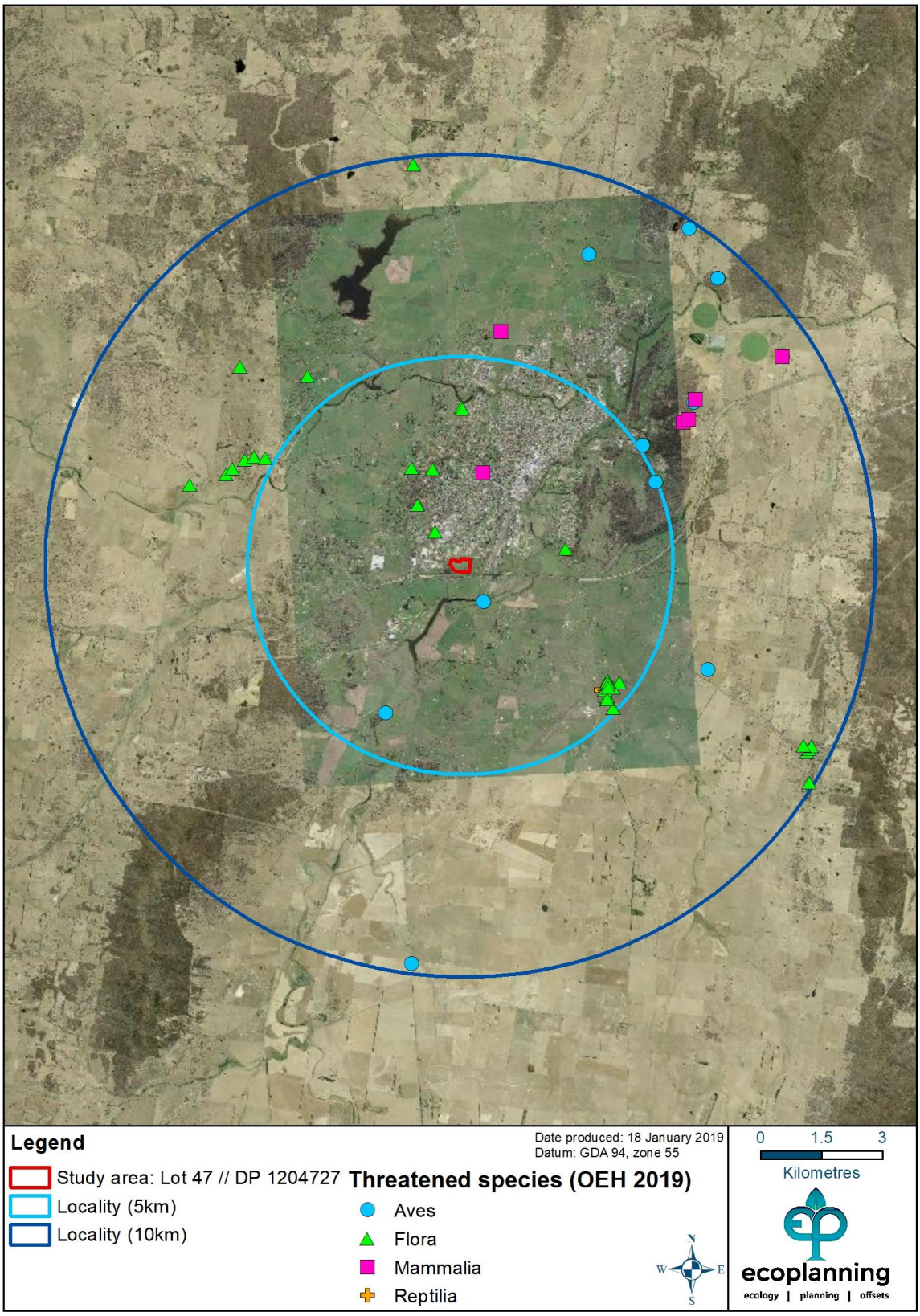

Figure 6: Threatened species within 5 km of the study area (OEH 2019).

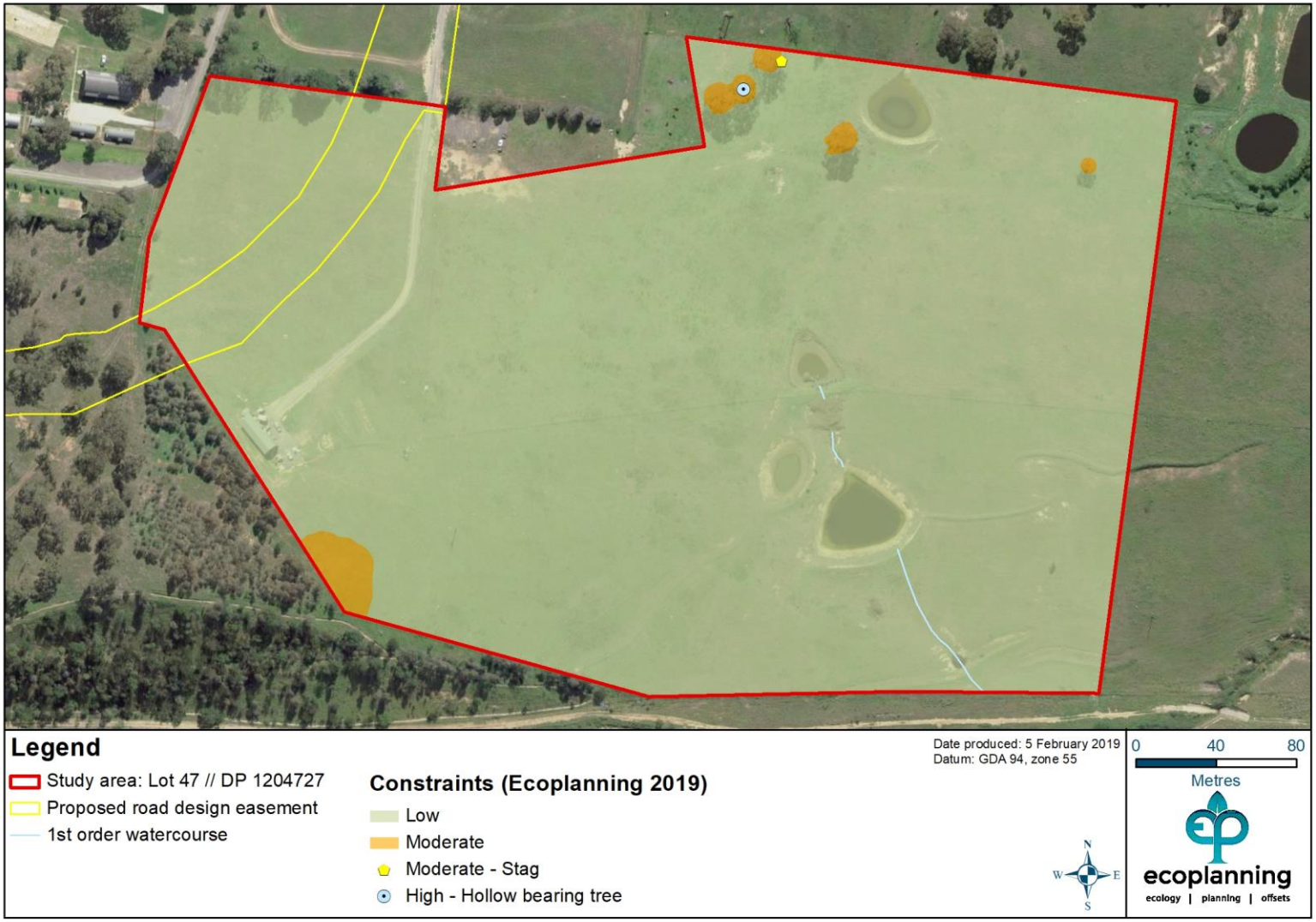

Figure 7: Ecological constraints.

Appendix A: EPBC Act condition categories, rationale and thresholds for Box – Gum Grassy Woodland and Derived Grassland (TSSC 2006)

The Box – Gum grassy woodlands that existed prior to European settlement now exist as remnants in three different states. The three states are:

1. An overstorey of eucalypt trees exists, but there is no substantial native understorey.

- Areas in which an overstorey exists without a substantially native understorey are degraded and are no longer a viable part of the ecological community. Although some native species may remain, in most of these areas the native understorey is effectively irretrievable.

2. A native understorey exists, but the trees have been cleared.

- In order for an area to be included in the listed ecological community, a patch must have a predominantly native understorey. The size and life-form of understorey species are such that viable populations can exist in very small areas. Therefore, in order to be the listed ecological community, an understorey patch, in the absence of overstorey trees, must have a high level of native floral species diversity, but only needs to be 0.1 hectares or greater in size. 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. At least one of the understorey species should be an important species (e.g. grazing-sensitive, regionally significant or uncommon species; such as Kangaroo Grass or orchids) in order to indicate a reasonable condition.

3. Both a native understorey and an overstorey of eucalypts exist in conjunction.

- Areas with both an overstorey and understorey present are also considered of sufficiently good condition to be part of the listed ecological community if the understorey meets any of the conditions above, or if they have a predominantly native understorey, are two hectares or above in size, and have either natural regeneration of the overstorey species or 20 or more mature trees per hectare.

The condition criteria outlined above are the minimum level at which patches are to be included in the listed ecological community. Such minimum conditions do not represent the ideal state of the ecological community. The larger and more diverse a patch is, the more important it is. Additionally, patches that link remnants in the landscape, that occur in depauperate areas, that contain rare, declining or threatened species and, that encompass the entire range of the ecological community, are important to the viability of the ecological community into the future.

Appendix B: Species likelihood of occurrence

Scientific Name Common Name	Legal Status	Distribution	Habitat and Ecology	No. of records	Closest record and date	Most recent and proximity	Likelihood of occurrence	
							Before (survey)	After (survey)
KINGDOM: Animalia; CLASS: Aves								
Anthochaera phrygia Regent Honeyeater	BC Act: E4A EPBC Act: CE	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia but can also be found in drier coastal woodlands and forests at times. Its range has dramatically decreased and is now only known from three known breeding regions in north-east Victoria and in NSW. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands on the Central Tablelands	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River She-oak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The Regent Honeyeater is a 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.	1	6.4 km (28/11/2000)	28/11/2000 (6.4 km)	Low	Low

Scientific Name Common Name	Legal Status	Distribution	Habitat and Ecology	No. of records	Closest record and date	Most recent and proximity	Likelihood of occurrence	
							Before (survey)	After (survey)
Artamus cyanopterus cyanopterus Dusky Woodswallow	BC Act: V	Dusky Woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from much of the upper western region.	Primarily inhabit dry, open eucalypt forests and woodlands with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. They can be found in farmland, usually at the edges of forest or woodland. Primarily eats invertebrates, mainly insects, which are captured whilst on the wing and occasionally take nectar, fruit and seed.	2	9.2 km (29/01/2008)	25/11/2014 (9.8 km)	Low	Moderate
Callocephalon fimbriatum Gang-gang Cockatoo	BC Act: V	Gang-gang Cockatoos are endemic to south-eastern Australia, being widespread in eastern New South Wales from the central slopes and tablelands to the south coast, extending through Victoria's north-eastern regions. A disjunct (cut off) population is found in the western half of Victoria from the Otway region to the South Australian border.	During summer, the Gang-gang Cockatoo is found in tall mountain forests and woodlands, with dense shrubby understoreys. In winter, Gang-gangs will move to lower altitudes into drier, more open forests and woodlands. They require tall trees for nest hollows.	1	8.1 km (8/10/2004)	8/10/2004 (8.1 km)	Low	Low

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Chthonicola sagittata Speckled Warbler	BC Act: V	The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. Declines in population have occurred where vegetation remnants are less than 100 ha.	The Speckled Warbler lives in a wide range of *Eucalyptus* dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat includes scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding.	1	9.2 km (25/03/2013)	25/03/2013 (9.2 km)	Low	Low
Daphoenositta chrysoptera Varied Sittella	BC Act: V	The species inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades.	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	3	4.9 km (21/09/2016)	21/09/2016 (4.9 km)	Low	Low

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							Before (survey)	After (survey)
Ephippiorhynchus asiaticus Black-necked Stork	BC Act: E1	Black-necked Storks are widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW. Vagrants may occur further south or inland, well away from breeding areas. In NSW, the species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney.	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. Storks usually forage in water 5-30cm deep for vertebrate and invertebrate prey. Eels regularly contribute the greatest biomass to their diet, but they feed on a wide variety of animals, including other fish, frogs and invertebrates (such as beetles, grasshoppers, crickets and crayfish).	1	3.9 km (26/04/1998)	26/04/1998 (3.9 km)	Low	Not present
Falco subniger Black Falcon	BC Act: V	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. In New South Wales there is assumed to be a single population that is continuous with a broader continental population. They are, highly mobile, commonly travelling hundreds of kilometres. The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring. Individuals may congregate at food sources	The Black Falcon inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. The Black Falcon is usually associated with streams or wetlands, visiting them in search of prey. Habitat selection is generally influenced more by prey densities than by specific aspects of habitat floristics or condition. The Black Falcon feeds mostly on other birds, especially flocking, ground-feeding granivores.	1	5.1 km (30/06/1996)	30/06/1996 (5.1 km)	Low	Low

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							Before (survey)	After (survey)
Hieraaetus morphnoides Little Eagle	BC Act: V	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW.	Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.	2	0.8 km (4/07/2006)	29/01/2008 (9.2 km)	Low	Low

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Lophoictinia isura Square-tailed Kite	BC Act: V	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March.	The Square-tailed Kite is found in a variety of timbered habitats including dry woodlands and open forests, and shows a preference for timbered watercourses. In arid north-western NSW, it has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. It is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km2. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.	1	9.8 km (10/02/2014)	10/02/2014 (9.8 km)	Low	Low

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Petroica boodang Scarlet Robin	BC Act: V	The Scarlet Robin is found from south east Queensland to south east South Australia as well as Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter.	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation and occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. The habitat usually contains abundant logs and fallen timber. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. Scarlet Robin pairs defend a breeding territory and mainly breed between the months of July and January; they may raise two or three broods in each season.	1	9.2 km (25/03/2013)	25/03/2013 (9.2 km)	Low	Low
KINGDOM: Animalia; CLASS: Mammalia								
Falsistrellus tasmaniensis Eastern False Pipistrelle	BC Act: V	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania.	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer.	2	6.2 km 2009	16/11/2009 (6.2 km)	Low	Low

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							Before (survey)	After (survey)
Miniopterus schreibersii oceanensis Eastern Bentwing-bat	BC Act: V	Along the east and north-west coasts of Australia.	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. They occur in a broad range of habitats including rainforest, wet and dry sclerophyll forest, paperbark forest and open grasslands. The species is linked to 74 vegetation classes. Forages for flying insects above the tree canopy and along waterways.	4	5.7 km 2017	7/10/2017 (5.7 km)	Low	Low
Pteropus poliocephalus Grey-headed Flying-fox	BC Act: V EPBC Act: V	Generally, found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia.	In subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	1	2.2 km 2017	26/01/2017 (2.2 km)	Low	Low

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Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	BC Act: V	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes.	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Breeding has been recorded from December to mid-March Seasonal movements are unknown and there is speculation about a migration to southern Australia in late summer and autumn.	1	9.2 km 2008	29/01/2008 (9.2 km)	Low	Moderate
KINGDOM: Reptilia								

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							Before (survey)	After (survey)
Delma impar Striped Legless Lizard	BC Act: V EPBC Act: V	The Striped Legless Lizard occurs in the Southern Tablelands, the South West Slopes, the Upper Hunter and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas. Also occurs in the ACT, Victoria and south-eastern South Australia.	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa* spp. and *Poa* spp., and occasionally wallaby grasses *Austrodanthonia* spp. Sometimes present in modified grasslands with a significant content of exotic grasses, as well as in grasslands with significant amounts of surface rocks, which are used for shelter. Actively hunts for spiders, crickets, moth larvae and cockroaches. Over-winters below ground or under rocks or logs.	1	4.4 km 1997	21/10/1997 (4.4 km)	Low	Low
KINGDOM: Plantae								

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							Before (survey)	After (survey)
Diuris aequalis Buttercup Doubletail	BC Act: E1 EPBC Act: V	The buttercup doubletail has been recorded in Kanangra-Boyd National Park, Gurnang State Forest, towards Wombeyan Caves, the Taralga - Goulburn area, and the ranges between Braidwood, Tarago and Bungendore	Recorded in forest, low open woodland with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range). Leaves die back each year and re-sprout just before flowering. Populations tend to contain few, scattered individuals; despite extensive surveys, only about 200 plants in total, from 20 populations are known.	1	1.6 km 1998	1/01/1998 (1.6 km)	Low	Low
Leucochrysum albicans var. *tricolor* Hoary Sunray	EPBC Act: E	Endemic to south-eastern Australia, where it is currently known from three geographically separate areas in Tasmania, Victoria and south-eastern NSW and ACT. In NSW it currently occurs on the Southern Tablelands adjacent areas in an area roughly bounded by Albury, Bega and Goulburn, with a few scattered localities know from beyond this region.	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Can occur in modified habitats such as semi-urban areas and roadsides. Highly dependent on the presence of bare ground for germination. In some areas, disturbance is required for successful establishment.	25	0.8 km 2002	3/12/2016 (4.6 km)	Moderate	Low

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Rutidosis leptorrhynchoides Button Wrinklewort	BC Act: E1 EPBC Act: E	Local populations are known from Goulburn, Canberra to Queanbeyan and south at Michelago. Other populations are known from Victoria.	Occurs in Box-Gum Woodland, secondary grassland derived from Box-Gum Woodland or in Natural Temperate Grassland; and often in the ecotone between the two communities. Grows on soils that are usually shallow, stony red-brown clay loams, and tends to occupy areas where there is relatively less competition from herbaceous species. Known to colonise disturbed areas (eg. vehicle tracks, bulldozer scrapings and areas of soil erosion). Susceptible to grazing, being retained in only a small number of populations on roadsides, rail reserves and other un-grazed or very lightly grazed sites. Thought to be insect pollinated, although the specific vectors are not known.	20	3.7 km 2009	3/12/2016 (4.5 km)	Low	Low