542 Moore Creek Road, Moore Creek

Biodiversity Assessment

4th November 2024

Executive summary

Flora, fauna and habitat studies have been undertaken to identify and assess the potential impacts resulting from the proposed residential subdivision of an amalgamation of residential lots at 542 Moore Creek Road, Moore Creek. These studies have been undertaken to identify and assess the potential impacts resulting from the proposed additional tourism accommodation within the area currently modified by existing guesthouse facilities.

The biodiversity assessment of the property indicated that the land is highly modified by past land use and does not contain a native vegetation community. The grasses are dominated by pasture species consistent with livestock grazing (rye, fescue, clover and chicory).

No threatened flora species that have been recorded in the local area were considered to have a moderate likelihood of occurrence on the project site based on available habitat. No five – part test for the assessment of significance were required as the proposed development was not likely to impact on potential habitat for any threatened species that would pose a risk of local extinction for that species.

Based on regional records, reports and the presence of suitable habitat, a total of eight threatened fauna species were identified with the potential to occur within the search area of the proposal site. The habitat assessment field surveys assessed that none of the threatened fauna have a 'moderate' or greater likelihood to utilise habitat available within the site, with each requiring tree hollows to nest or roost; mature vegetation for foraging or access to water.

No threatened species were observed or inferred from proxy evidence as part of the survey and assessment.

The assessment of significance of the likely impact of the development indicated through avoidance of clearing of existing trees within the drainage buffer, no threatened species are likely to be at risk of local extinction.

The proposed development shall have little or no impact on any threatened species or community in the local area.

Recommendations

- Avoid any clearing of native species within the drainage buffer.
- Boundary fencing to all lots should be encouraged to consist of plain wire strands or other methods but exclude use of barbed wire that may harm to fauna.
- Encourage replanting of native tree and shrub species in the landscaping for future dwellings to improve available habitat for native species.
- Implement disinfection protocols for personnel / equipment when working within the drainage buffer to avoid infesting potential amphibian fauna.

Contents

Abbreviations

BBCC	BioBanking Credit Calculator
BDRA	Biodiversity Development Assessment Report
BC Act	Biodiversity Conservation Act
BOS	Biodiversity Offset Scheme
BVT	Biometric Vegetation Type
CEMP	Construction Environmental Management Plan
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)
FM Act	Fisheries Management Act 1994 (NSW)
GDE	Groundwater dependent ecosystems
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of National Environmental Significance
OEH	Office of Environment and Heritage
PCT	Plant Community Type
REF	Review of Environmental Factors
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
TECs	Threatened Ecological Communities
TSPD	Threatened Species Profile Database
VIS	Vegetation Information System

1.1 Introduction

Atlus Property P/L are preparing a development application for a residential subdivision of a vacant property at 542 Moore Creek Road, Moore Creek. A preliminary review by the assessing officer at Tamworth Regional Council has indicated that a Biodiversity Assessment and 5-part test for the assessment of significance of any impacts shall be required under the Hills plains Development Controls as part of the Tamworth Region Development Control Plan (Tamworth Regional council, 2010) to accompany the development application.

1.2 Background

The subject property has been a cleared grazing property for an extended time period and has been modified since the 1850s by a range of land uses from livestock grazing, fodder crops with be local area being part of a growth area for lifestyle residential with small scale equestrian activities on the northern margin of Tamworth. The property is fenced and generally cleared of any overstorey vegetation with only isolated trees retained for shelter. The property is entirely within the R2 'Low Density Residential' land use zone of the Tamworth Region Local Environmental Plan (Tamworth Regional Council, 2010).

The proposed residential subdivision of Lot Lots 55, 56 and 57 on DP 1120933 would create 1103 residential lots with a minimum size of at least 2000m^2, each with dwelling entitlements. Assess for the subdivision is via an intersection with Moore Creek Road leading to an internal loop road and secondary outlet to Bowdens Lane as shown as shown in the preliminary subdivision plan (Figure 1).

1.3 Legislative context

A biodiversity impact assessment is required as part of the development proposal to meet the requirements of the Environmental Planning and Assessment Act (EP&A Act). Section 5AA of the EP&A Act stipulates that the Act is subject to the provisions of Part 7 of the Biodiversity Conservation Act 2016 (BC Act) and Part 7A of the *Fisheries Management Act 1994* (FM Act).

The biodiversity assessment and approval pathways are dependent on the purpose of any vegetation clearing and whether the clearing is associated with native or non-native vegetation clearing as defined under schedule Part 5A of the Local Land Services Act.

If the clearing and other impacts exceeds the trigger thresholds, the Biodiversity Offset Scheme (BOS) applies to the proposed development and a biodiversity development assessment report (BDAR) in accordance with the Biodiversity Assessment Method (OEH, 2017) is required from an accredited assessor.

Where a proposed development involves clearing of native vegetation or other impacts and is below the BOS trigger threshold, the principle certifying authority will still require a biodiversity assessment of the impact on threatened species, populations and endangered ecological communities listed under the BC Act or FM Act using a five-part test.

Where a significant impact is likely to occur, a species impact statement (SIS) must be prepared in accordance with the Director-General's requirements or if the proponent so elects

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. This includes impacts to threatened species, communities and migratory species listed under the EPBC Act.

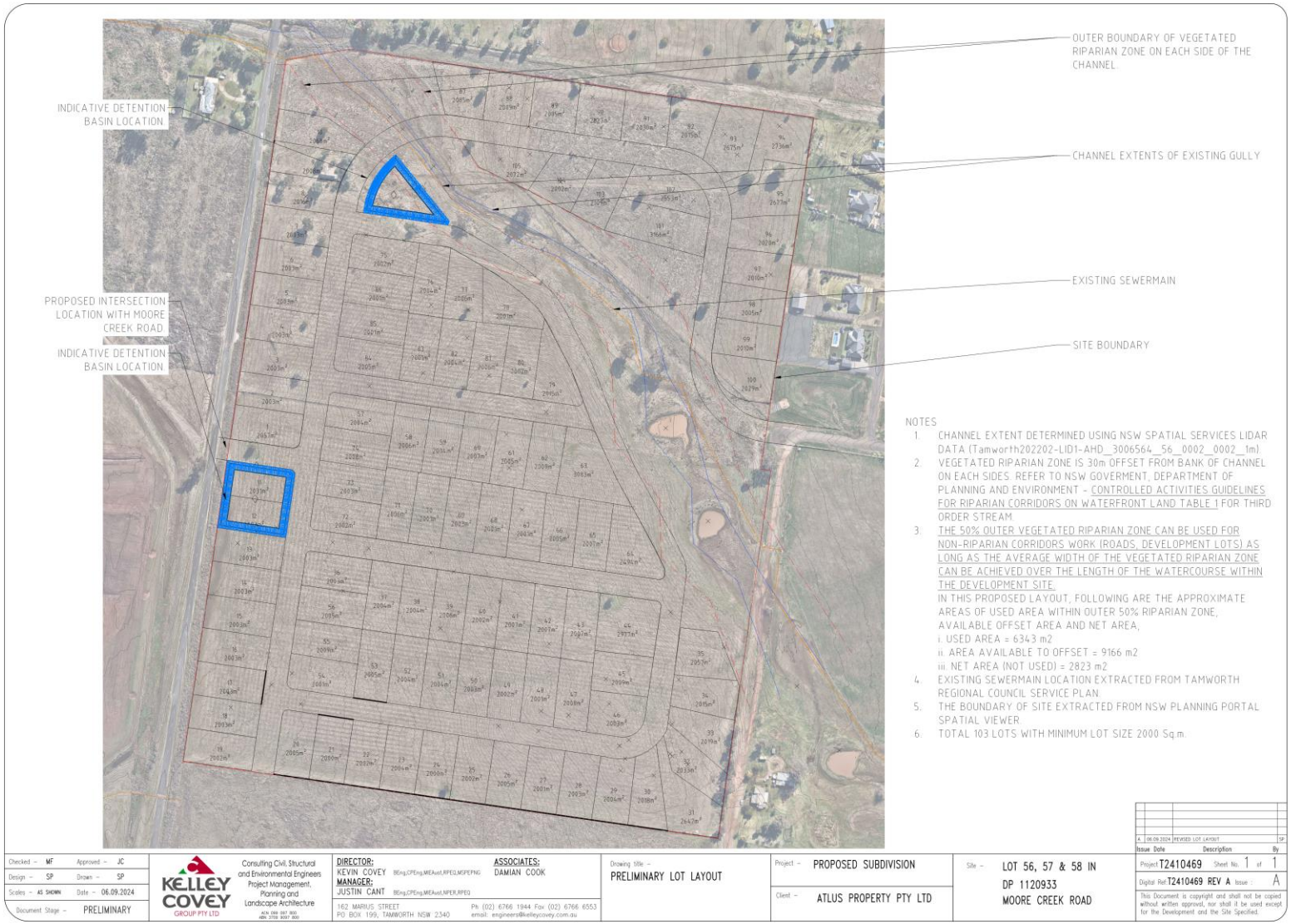

Figure 1: Preliminary subdivision plan for Lot 55, 56 and 57, DP 1120933 showing 103 residential lots and internal road connections.

1.4 Study Aims

This study aims to assess the potential impacts associated with the residential subdivision. The biodiversity impact assessment specifically aims to:

- describe the existing environment.
- determine if the project is likely to result in any significant impacts to threatened species, populations and ecological communities, or their habitats protected under Commonwealth and State legislation; and
- recommend measures to minimise any potential impacts to protected biodiversity values.

1.5 Site Description

The subject property is an undeveloped parcel of land across three land titles within the developing residential area of Mooe Creek. The property has been used for intensive livestock grazing with improved pastures and shade trees only retained along a drainage that flows through the eastern portion of the property. The land is surrounded by existing and future residential lots (Figure 2).

Figure 1: Aerial image of the subject properties surrounded by existing and future residential development of the Moore Creek area as outlined in the Hills Plain Development Controls of the Tamworth Development Control Plan (2010).

1.5.1 Requirements for biodiversity assessment

There are three triggers into the Biodiversity Offset scheme that would require a BDAR to be completed for this proposed development.

a. Located on the Biodiversity Values Map

b. Area of clearing threshold

c. Threatened Species Test of Significance

a. The Biodiversity Values Threshold Map (Figure 2) shows that there are no biodiversity values along the drainage through the subject property or within the local area covered by the Hills Plain Development Controls. The proposed development does not trigger the requirement to prepare a BDAR as part of the development application based on the Biodiversity Values Threshold map.

b. The subject property is part of future residential development area and is entirely within category 1 excluded land under the LLS Act.

c. The Threatened Species Test of Significant is prepared as part of this biodiversity impact assessment in Section 4. A BDAR may be required if the threatened species test of significance indicates that the development will have a serious and irreversible impact (SAII) on any threatened species

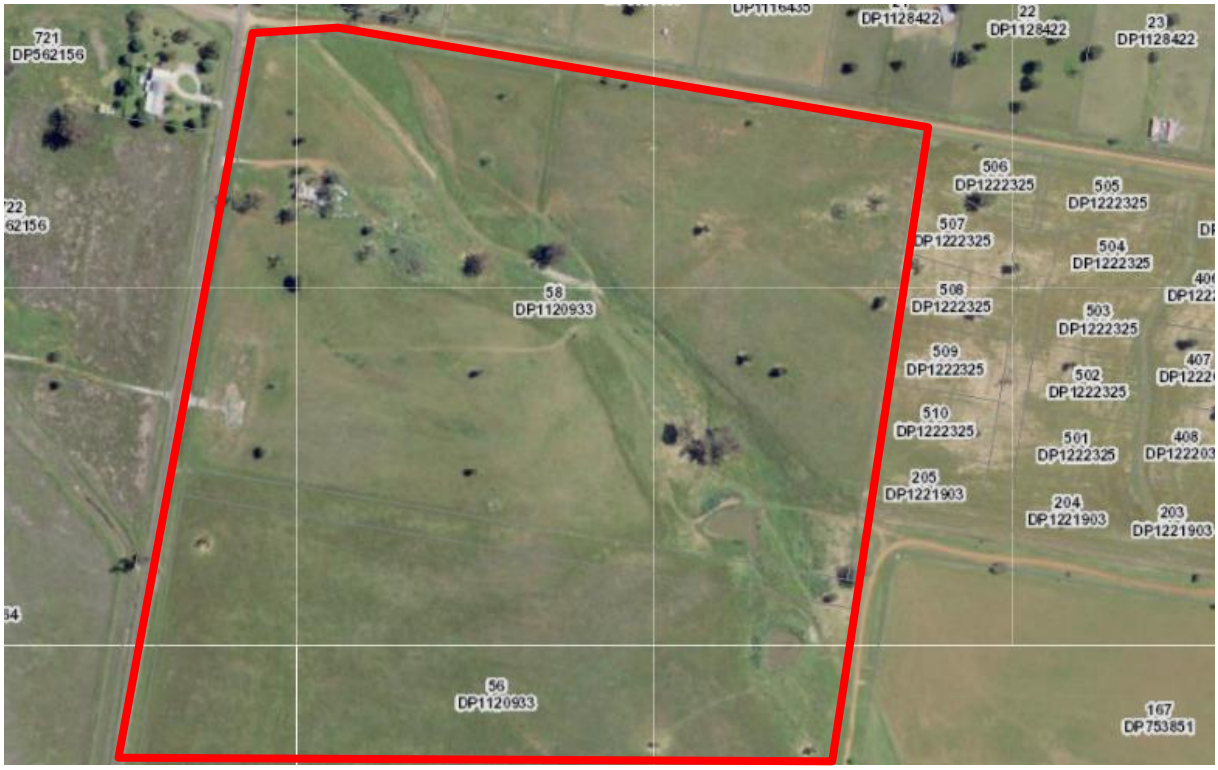

Figure 2: Biodiversity Values Map showing the that the vegetation along the drainage through the development is not included as having any biodiversity values that would trigger the requirement for a BDAR

2 Methods

2.1 Background research

A desktop assessment included searches of databases and a review of literature relevant to the site and local area, particularly:

- Office of Environment and Heritage (OEH) Atlas of NSW Wildlife database (licensed) for records of threatened species and endangered ecological communities which have been recorded within a 10 km radius (locality) of the subject site (dated 31 July 2023);
- Department of the Environment and Energy (DoEE) Protected Matters Search Tool for Matters of National Environmental Significance (MNES) listed under the EPBC Act within a 10 km radius from the site (dated 2 August, 2023);
- OEH vegetation information system (VIS) database: http://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx;
- NSW Office of Environment and Heritage (OEH) Vegetation Types Database: http://www.environment.nsw.gov.au/projects/BiometricTool.htm; and
- National Atlas of Groundwater Dependent Ecosystems: http://www.bom.gov.au/water/groundwater/gde/index.shtml

2.2 Habitat assessment

The availability of habitat within the study area was assessed taking into account a number of factors including:

- structural and floral diversity;
- occurrence and extent of habitat types in the general vicinity;
- continuity with similar habitat adjacent to the study area, or connection with similar habitat off site by way of corridors;
- key habitat features such as tree hollows, water bodies, caves and crevices, rocky areas;
- degree of disturbance and degradation;
- The extent of modification of the property for the vineyard and existing tourism development; and
- topographic features such as aspect and slope.

This information was used to evaluate the study area as potential habitat for each of the threatened species considered and assign each species with a rating based on their likelihood to occur within the subject site. The 'likelihood of occurrence' categories is detailed in Table 1. Species assigned with a rating of moderate or greater likelihood of occurrence may be impacted by the proposed rezoning of the candidate area for large lot residential development. The assessment of significance of this impact is considered where appropriate.

2.3 Field survey

A field survey was conducted on 28-29th August. The survey targeted areas to be potentially impacted by the proposed development including the vegetation along the drainage through the eastern part of the property.

Table 1: Likelihood of occurrence criteria

Likelihood Rating	Criteria
Known	The species was recorded within the study area during site surveys.
High	It is likely that a species would inhabit or utilise habitat within the subject site. Criteria for this category may include: • Species recently and/or regularly recorded in contiguous or nearby habitat. • High quality habitat types or resources present within study area. • Species is known or likely to maintain a resident population surrounding the study area. • Species is known or likely to visit during migration or seasonal availability of resources.
Moderate	Potential habitat for a species occurs within the subject site. Criteria for this category may include: • Species previously recorded in contiguous habitat albeit not recently (>10 years). • Poor quality, depauperate or modified habitat types and/or resources present within study area. • Species has potential to utilise habitat during migration or seasonal availability of resources. • Cryptic flora species with potential habitat available within the subject site that have not been seasonally targeted by surveys.
Low	It is unlikely that the species inhabits the area and would likely be considered a transient visitor if ever encountered. Criteria for this category may include: • The subject site or study area lacks specific habitat types or resources required by the species. • The subject site is beyond the current distribution of the species or is isolated from known populations. • Non cryptic flora species that were found to be absent during targeted surveys. • The subject site only contains common habitat which would not be considered important for the local survival of a threatened species.
None	The habitat within subject site and study area is unsuitable for the species.

2.3.1 Vegetation surveys

A vegetation survey was undertaken and involved a detailed ground survey using a number of sampling techniques to ensure the site was adequately sampled. The survey methods and effort are consistent with the Threatened Species Survey and Assessment Guidelines (working draft) (DEC, 2004) and the Framework for Biodiversity Assessment (FBA) (OEH 2014).

The vegetation assessment of the property was considered as a single survey area as the vegetation is highly modified by past land uses. The survey unit extended to the property boundaries although the area of impact of the residential lots and internal access road. Within this zone, the survey techniques applied included a 50m transects to assess the grassland composition.

A list of all plant species recorded during fieldwork is listed in **Appendix I**.

Vegetation communities were determined by comparing the floristic structure and composition of the vegetation on site with vegetation profiles described within the VIS database (OEH, 2016) and community descriptions of endangered ecological communities known to occur in the local area.

Random Meander Survey

Flora investigations in the manner described by Cropper (1993) as the 'Random Meander Technique' were also undertaken across the site. This involved walking in a random meander throughout the entire study area, visiting the full range of habitats and recording all plant species observed.

2.3.2 Fauna Surveys

The fauna surveys targeted those species that may occur within the limited habitat available within the subject site. The sampling methods used to survey fauna habitat within the study area are detailed below in **Table 3.**

Table 2: Fauna surveys conducted within the study area

Fauna Group	Surveys	Methods and Survey Effort
Diurnal Birds	Area search	A search was undertaken to identify any birds present. Birds were identified from observations or call identification. A search of isolated trees for the presence of nests was also included as part of the survey.
Herpetofauna	Habitat search	Opportunistic active searches for frogs and reptiles were undertaken during the survey within suitable habitat (i.e. leaf litter, ephemeral pools, under rocks and long grass). All amphibian surveys are conducted following the Hygiene Protocol for the Control of Disease in Frogs (NPWS, 2000).
Mammals	Search for scats and signs	A search for scats and other signs of animal use (e.g. scratches on trees, tracks, diggings) was undertaken on site. Thorough searches were conducted at each 50m x 40m vegetation plot and opportunistic sightings were also recorded.
All	Opportunistic sightings	Any opportunistic sightings of fauna on site were recorded.

2.4 Limitations

The effectiveness of a survey detecting a given species will be influenced by a range of factors. For this type of survey, such limitations are generally related to the short period of time in which the fieldwork was carried out during one season. Given that the property is part of a developing residential area and impacted by noise and light constraints, the time spent within the study area focussed of assessing available habitat. The detection of certain species may be limited by:

- seasonal migration (particularly migratory birds);
- seasonal flowering periods (some species are cryptic and are unlikely to be detected outside of the known flowering period);
- seasonal availability of food such as blossoms;
- weather conditions during the survey period (some species may go through cycles of activity related to specific weather conditions, for example some

microchiropteran bats, reptiles and frogs can be inactive during cooler weather); and

- species lifecycle (cycles of activity related to breeding).

The survey effort was undertaken at the start of Spring at the commencement of the optimal survey period for most species on the New England Tablelands and North west Slopes following relatively warm conditions. As such the results can best be considered as a preliminary assessment. The property has recently been slashed and under-sown with improved pastures include Rye, Clover and Chicory.

These limitations have been overcome by applying the precautionary principle in all cases where the survey effort did not record the occurrence of any species. On this basis, the presence of any species was assessed on the basis of the presence of suitable habitat and the likely significance of that habitat to support a viable local population.

3 Existing environment

3.1 Threatened Species

The following threatened species, listed in **Table 3,** have been recorded within a 10 km buffer of the subject property.

Table 3: Threatened species with potential to occur in the local area

Scientific Name	Common Name	BC Act 1995	EPBC Act 1999
Plants			
Birds			
Hieraaetus morphnoides	Little Eagle	V	
Falco subniger	Black Falcon	V	
Neophema pulchella	Turquoise Parrot		
Glossopsitta pusilla	Little Lorikeet	V	
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V
Chthonicola sagittata	Speckled Warbler	V	
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	
Stagonopleura guttata	Diamond Firetail	V	V
Petroica boodang	Scarlet Robin	V	
Mammals			
Dasyurus maculatus	Spotted-tailed Quoll	E	E
Petaurus norfolcensis	Squirrel Glider	V	
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	
Chalinolobus dwyeri	Large-eared Pied Bat	E	E
Plants			
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V
Dichanthium setosum	Bluegrass	V	V

[1] Number of OEH wildlife atlas records in selected area Approx. 10km radius [North: -30.98 West: 151.87 East: 151.08 South: -30.97].

3.2 Flora

3.2.1 Vegetation Communities

The property comprises a highly modified non-native grassland that does not meet any criteria for a Plant Community Type with less than 15 native trees present across the entire property.

Site photographs are included in Figure 4. The entire grazing land of the property has recently been slashed and drill seeded with introduced pastures includes Rye, Fescue, Clover and Chicory as shown in Figure 5.

Figure 4: Photographs showing the majority of the property is grazing land comprising introduced species and isolated weeds that does not form a native vegetation community.

Figure 5: emergent pasture species characteristic of livestock grazing in the New England / North West region.

3.2.2 Threatened ecological communities

The grazing land does not meet the criteria for any listed endangered ecological community in the BC Act and the proposed development shall not impact any potential endangered ecological community on surrounding land.

3.2.3 Threatened Flora

Database searches indicated two flora species has been recorded in the region. Given the available habitat and extensive modification of the grazing land including repeated slashed, ploughing and underplanting with non-native species and intensive grazing, no threatened species known form the local area are likely to occur on this property.

3.2.4 Noxious and environmental weeds

No weed species listed as noxious within the Tamworth region Local Government Area were recorded within the survey area.

3.3 Fauna

3.3.1 Fauna Habitat

The vegetation within the area of impact of the proposed development and extending to the property boundaries were assessed as highly modified and disconnected to intact areas of significant vegetation that occur on the hills to the east and north of the Moore Creek residential area. Increased residential development in the area has modified the existing landscape creating fences and roads as barriers to movement, with increase light and noise pollution that discourages fauna habitation. The consequence of this residential development is the removal of native shrub and grassland communities and replacement with non-native ornamental trees and shrubs with a restricted potential for the natural regeneration of existing canopy trees. As such there is a general reduction in overall habitat for a range of species at the peri-urban interface.

For this property that has been cleared and managed for livestock grazing for considerable time, only very limited habitat is available for avifauna species as a few retained mature trees along drainage. These shall be protected as part of the development and enhanced through a riparian buffer under the Hills Plain control plan.

An assessment of the habitat value of the existing vegetation communities indicated that the following features were present.

- Hollow bearing trees are uncommon within the property as most of the vegetation has been cleared for past land uses with only a few isolated trees with stunted, woodland habitat present on the development property. None of the trees have achieved a level of maturity to develop hollows suitable for habitat for avifauna. However, many of the trees provide roosting or perching sites. The abandoned homestead may provide temporary habitat for caves dwelling microbats.
- Shrub layer – Native shrubs are non-existent throughout the property. In places, introduced Hawthorn provides some shelter for small birds but is limited to areas of regrowth weed species.
- Grassland / gardens – The modified grazing area for most of the property provides limited foraging resources for fauna, except birdlife. No fallen timber was present due to an absence of a tree canopy with evidence that mature trees have been removed for firewood (Figure 6).

Figure 6: Some firewood has been collected from the remaining trees on the property.

A full list of fauna species observed during the survey is contained in **Appendix II.**

3.3.2 Habitat Trees

Trees that contain providing suitable habitat for fauna species occur only within the drainage buffer in the eastern part of the property.

No trees are required to be removed for the proposed residential development with roads and dwelling sites located to retain all existing overstorey vegetation.

3.3.3 Wildlife connectivity corridors

The development site is surrounded by existing and future residential development with very little connectivity to areas of native vegetation that occur on the hills to the east and north of the Moore Creek residential area.

No clearing associated with future dwellings will need to remove any existing vegetation and property purchasers will be encouraged to plant native species to improve the existing habitat on each lot.

3.3.4 Threatened Fauna

The database searches for the study area identified eight threatened fauna species recorded within a 10 km radius of the subject property. An assessment of the existing habitat to determine the likelihood of these species to be impacted by the proposed works is provided in **Appendix IV**. The habitat assessment identified no threatened fauna species with a 'moderate' or greater likelihood to utilise the resources available onsite.

None of the listed species recorded in the local area were observed during the assessment. The absence of suitable habitat features (large tree hollows, caves, rock overhangs, etc.) within the property restrict the likelihood of occurrence of most native fauna.

3.4 SEPP 44 Koala Habitat

Recent amendments to the SEPP and accompanying FAQ fact sheet on the NSW government webpage (Koala Habitat Protection SEPP - (nsw.gov.au)) lists a standard approach for koala assessment reports. The following attributes are considered in determining whether the SEPP has application to the proposed development and the level of survey required for the assessment report.

3.4.1 Application of SEPP Koala Habitat Protection (2021)

The following site attributes are considered to determine if SEPP Koala Habitat Protection has relevance for the proposed development.

Attribute	Comment
Asset Protection Zone (APZ)	No bushfire hazard occurs within 100m of the footprint of the proposed development and any asset protection zone (APZ) for the development is not required to achieve an acceptable solution in addressing the performance criteria in planning for Bushfire Protection.
Access roads	Property access from Moore Creek Road or the internal access road will not require clearing of native vegetation.
Land use zone	The subject property has a R2 land use zoning in the Tamworth Region Local Environmental Plan, SEPP 2021 applies to this property.
Lot size	The subject property is greater than 1 Ha in area.
Applicable LGA	Tamworth Regional Council is listed in Schedule 1 of the SEPP.
Koala Plan of Management	A koala plan of management does not exist for the Tamworth LGA.

Based on the site-specific parameters outlined above, a koala Habitat Report is required. However, koalas have not been recorded in the local area and no suitable koala feed trees occur on the property. The proposed development will have little or no impact on any koala habitat and a separate report is not required address any impact to koala habitat for this development.

3.5 Matters of National Environmental Significance

3.5.1 Migratory Species Protected Under International Agreements

Eight listed migratory terrestrial and wetland species were recorded on the DoEE protected matters database or are considered to have potential habitat available within 10 km of the site as listed in **Table 7**.

Table 4: Listed migratory species with the potential to occur in the local area.

Apus pacificus	Fork-tailed Swift
Cuculus optatus	Oriental Cuckoo
Motacilla flava	Yellow Wagtail
Rhipidura ruffrons	Rufous Fantail
Hirundapus caudacutus	White-throated Needletail
Monarcha melanopsis	Black-faced Monarch
Monarcha trivirgatus	Spectacled Monarch
Myiagra cyanoleuca	Satin Flycatcher

None of the above migratory species were recorded on site during the field survey. The proposed works are unlikely to impact on any area considered to be 'important habitat' for the above migratory species, or likely to impact a significant proportion of a migratory population.

4 Impact assessment

The potential impacts discussed in this section are based on a desktop assessment of the study area and field investigations. These impacts to the biodiversity values (including flora, fauna and vegetation communities) arise from any clearing of native vegetation associated with the proposed residential subdivision and are described in detail below.

4.1 Construction impacts

4.1.1 Loss of Vegetation and Habitat

The construction of the internal access road and proposed dwellings on the created lots may result in clearing of existing non-native grazing land. There shall be no clearing of any native vegetation within the buffer along the drainage reserve as required under the Hills Plains Control plan. This buffer shall be a minimum of 20 metres in width either side of the drainage as measures from the top of the bank with proposal to revegetation the buffer with appropriate native species. Any clearing undertaken for the development is confined to areas already highly modified by past land use (livestock grazing, pasture improvement) and will not involve the clearing of any overstorey vegetation throughout the development property.

The clearing of existing non-native highly modified vegetation will not result in the removal of hollow bearing trees hence is not considered as Key Threatening Processes under the BC Act (2016).

4.1.2 Injury and mortality

Injury and mortality of fauna could occur during construction activities when vegetation and habitat are being cleared. The absence of identified tree hollows, dense shrub vegetation or areas of overhangs and exposed rocks will limit the risk associated with injury or mortality during construction works. Policies should be considered at part of a Construction Environmental Management Plan to address the potential for injury to isolated fauna during earthworks.

4.2 Indirect/operational impacts

4.2.1 Wildlife Connectivity and Habitat Fragmentation

The removal of vegetation for the development will not increase any fragmentation of the vegetation in the Moore Creek area. The proposed development has been located in a cleared area marked for future residential development under the Hills Plains Control plan (Tamworth Regional Council, 2010) and will not impact on any riparian vegetation along the ephemeral drainage in the east of the property. Moreover, the establishment of a 20 metre buffer along this drainage and proposed revegetation of the riparian community will improve connectivity with other area of native habitat in the area.

4.2.2 Weeds

The subject property is already impacted by abundance weed species in those parts of the property that are used for livestock grazing. The movement of soil by machinery and/or water and the disturbance of soil can lead to further weed infestation within the study area. Increased weed growth has the potential to out-compete native species in the local area and further degrade habitat. Whilst no listed weeds of significance were observed during the survey, construction methods should be adopted to limit the spread of existing weed species and to prevent any offsite expansion into not affected areas where possible.

4.2.3 Removal of threatened fauna habitat

The habitat assessment did not identify any threatened species with moderate to greater likelihood of utilising available habitat on the property. The proposed development will not have

any direct removal of suitable habitat for these species. However, indirect impacts to the existing riparian communities adjacent to the subject property is possible. Compensatory planting of native tree species within the drainage buffer to recreate a riparia community shall increase available habitat for fauna over time.

4.3 Assessments of significance

Table 8 provides a summary of the outcomes of the assessment of significance under the EP&A Act, with the assessment detail provided in **Appendix IV**.

Table 5: Summary of Assessment of Significance (Section 7.3 BC Act).

BC Act significance assessments						
Threatened species	**Significance Assessment question[1]**					**Likely significant impact?**
	a	**b**	**c**	**d**	**e**	
Hollow-dependent birds *Anthochaera phyygia* (Regent Honeyeater) *Lathamus discolor* (Swift Parrot) *Hieraaetus morphnoides* (Little Eagle)	N	X	N	N	Y	No
Woodland birds *Circus assimilis* (Spotted Harrier) *Lophoictinia isura* (Square-tailed Kite) *Falco subniger* (Black Falcon)	N	X	N	N	Y	No
Woodland Animals *Dasyurus maculatus (*Spotted-tailed Quoll)	N	X	N	N	Y	No
Microchiropteran bats *Miniopteris orianae oceanensis* (Large Bent-winged Bat)	N	X	N	N	Y	No

Notes: Y= Yes (negative impact), N= No (no or positive impact), X= not applicable, ?= unknown impact.

1. Significance Assessment Questions as set out in the *Biodiversity Conservation Act 2016*

   a in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

   b in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

      (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

      (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

   c in relation to the habitat of a threatened species, population or ecological community:

      (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

      (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

      (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

d whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

e whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

4.4 Impact summary

A summary of the impacts to biodiversity associated with the planning proposal is provided in **Table 4.5**.

Table 4.5: Summary of impacts

Impact	Biodiversity values	Nature of impact	Extent of impact	Duration	Does the proposal constitute or exacerbate a key threatening process?	Confidence in assessment
Removal of native vegetation	Native vegetation	Direct	Site based, Regional	Long term	The proposal would constitute the following KTP's: • Clearing of native vegetation	Known
Removal of threatened fauna habitat on: • Hollow dependent birds • Woodland birds • Microchiropteran bats	Not present on site	Direct	Site based	Long term	The proposal would not constitute any KTP's:	Known
Injury and mortality of fauna	Fauna	Direct	Site based	Short term		Unpredictable
Invasion and spread of weeds	Native vegetation	Indirect	Local		The proposal may exacerbate the following KTP's: • Invasion of native plant communities by exotic perennial grasses • Invasion and establishment of exotic vines and scramblers • Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Known
Invasion and spread of pathogens and disease	Native vegetation, flora and fauna habitat	Indirect	Local	Short term	The proposal may exacerbate the following KTP's: • Infection of native plants by *Phytophthora cinnamomi* • Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of Myrtaceae family	Known
Fragmentation of local biodiversity links and habitat corridors	Native vegetation	Direct/ indirect	Local / Regional	Long term	• Clearing of native vegetation	Known

5 Avoid, minimise and mitigate impacts

5.1 Avoidance and minimisation

The provision of increased residential development in the Moore Creek area has the potential to impact upon habitat features present within the existing vegetation along the drainage through the property and on lands adjacent to the property. Avoidance of any potential impact can be achieved by restricting the clearing of vegetation for the proposed dwellings to that area already modified by past land use practices, including livestock grazing with no clearing of any native vegetation to occur within the drainage buffer.

The existing vegetation on the property was not identified as representative of any recognised Plant Community Type, but represents a highly modified landscape impacted by a long period of agricultural activities.

Most of the property shall remain in its current form post development with underplanting of native species (shrubs and trees) to improve the condition of existing riparian vegetation within the drainage buffer to be implemented. The proposed residential development is located in the modified area identified for future residential development under strategic planning and controlled under the Hills Plains Control plan for the area.

Strategies shall be implemented to manage stormwater runoff to ensure that the development does not impact on areas of important biodiversity to the east of the property..

5.2 Mitigation measures

The following mitigation measures should be considered as part of the development.

- Minimise clearing to the highly modified grazing land with the drainage buffer marked as a go clearing area prior to the commencement of any earthworks.
- Encourage replanting of native species by future landowners to increase the available habitat within the lots of the development.
- Encourage movement of fauna through the property and the wider Moore Creek locality through use of plain wire boundary fencing.
- Implement control measures to prevent spread of any pathogens when working within the drainage buffer through disinfecting worker foot ware and equipment prior to moving on to another riparian site.

6 Conclusion

Flora, fauna and habitat studies have been undertaken to identify and assess the potential impacts resulting from the proposed additional tourism accommodation within the area currently modified by existing guesthouse facilities.

The biodiversity assessment of the property indicated that the land is highly modified by past land use and does not contain a native vegetation community. The grasses are dominated by pasture species consistent with livestock grazing (rye, fescue, clover and chicory).

No threatened flora species that have been recorded in the local area were considered to have a moderate likelihood of occurrence on the project site based on available habitat. No five – part test for the assessment of significance were required as the proposed development was not likely to impact on potential habitat for any threatened species that would pose a risk of local extinction for that species.

Based on regional records, reports and the presence of suitable habitat, a total of eight threatened fauna species were identified with the potential to occur within the search area of the proposal site. The habitat assessment field surveys assessed that none of the threatened fauna have a 'moderate' or greater likelihood to utilise habitat available within the site, with each requiring tree hollows to nest or roost; mature vegetation for foraging or access to water.

No threatened species were observed or inferred from proxy evidence as part of the survey and assessment.

The assessment of significance of the likely impact of the development indicated through avoidance of clearing of existing trees within the drainage buffer, no threatened species are likely to be at risk of local extinction.

The proposed development shall have little or no impact on any threatened species or community in the local area.

Recommendations

- Avoid any clearing of native species within the drainage buffer.
- Boundary fencing to all lots should be encouraged to consist of plain wire strands or other methods but exclude use of barbed wire that may harm to fauna.
- Encourage replanting of native tree and shrub species in the landscaping for future dwellings to improve available habitat for native species.
- Implement disinfection protocols for personnel / equipment when working within the drainage buffer to avoid infesting potential amphibian fauna.

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Appendix I – Flora Species List

Flora Species List

The following is a list of all flora species recorded within the site. It should be noted that given the drought conditions at the time of the survey, this list cannot be considered comprehensive, but rather indicative of the flora. A period of some years is often required to identify all species present in an area, particularly for cryptic or seasonally detectable species (such as orchids, some grasses and grass-like herbs).

Scientific Name	Common Name
ASTERACEAE	
**Cardus nutans*	Nodding Thistle
**Cichorium intybus*	Chicory
**Conzya bonariensis*	Flaxleaf Fleabane
**Chrysanthemium coronarium*	Everlasting Daisy
**Taraxacum sp.*	Dandelion
CACTACEAE	
**Opuntia stricta*	Prickly Pear
CYPERACEAE	
Cyperus fulvus	Sticky Sedge
FABACEAE	
**Trifolium repens*	White Clover
GERANIACEAE	
Geranium soladeri	Geranium
JUNCACEAE	
Juncus acutus	
Juncus usitatus	Juncus
LORANTHACEAE	
Amyema pendula	A Mistletow
MALVACEAE	
Brachychiton populnea	Kurrajong
MYRTACEAE	
Angophora floribunda	Rough-barked Apple
Eucalyptus albens	White Box
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus microcarpa	Grey Box
Eucalyptus viminalis	Ribbon Gum
PLANTAGINACEAE	
**Plantain lanceolata*	Lambs Tongues
POACEAE	
**Agrostis gigantea*	Redtop Bent Grass
Bothriochloa decipiens	Redgrass
**Cenchrus clandestinus*	Kikuyu*
**Eragrostis sp.*	Lovegrass
Festucs arundinacea	Tall Fescue
**Hyparrhenia hirta*	Coolatai Grass
**Lolium perenne*	Perennial Ryegrass
**Panicum capillare*	Witchgrass

**Paspalum distichum*	Paspalum
Poa labillardierei	Tussock
URTICACEAE	
*Urtica incisa	Stinging nettle
VERBENACEAE	
**Verbena bonariensis*	Purpletop

*Indicates an exotic or non-local / planted native species

Appendix II – Fauna Species List

Fauna Species List

The following is a list of all fauna species recorded within the candidate areas during the survey period.

Scientific Name	Common Name
AVES	
FAMILY ARTAMIDAE	
Strepera graculina	Pied Currawong
FAMILY MELIPHAGIDAE	
CERTHIONYX VARIEGATUS	Painted Honeyeater
Manorina melanocephala	Noisy Miner
FAMILY PLATYCERCINAE	
Platycerus elegans	Eastern Rosella
FAMILY ARTAMIDAE	
Gymnorhina tibicen	Australian Magpie
FAMILY HALCYONIDAE	
Dacelo novaeguineae	Laughing Kookaburra
FAMILY ANSERANATIDAE	
Chenonetta jubata	Australian Wood Duck
FAMILY BOVIDAE	
**Bos Taurus*	Angus Cattle
FAMILY LEPORIDAE	
**Oryctolagus cuniculus*	European Rabbit
AMPHIBIAN	
MYPBATRACHIDAE	
Crinia signifera	Common Eastern Froglet
LIMNODYNASTES	
Limnodynastes dumerilii	Eastern Banjo Frog

* – Indicates an introduced species.
# - indicates a listed threatened species.

Appendix III – Threatened Species Habitat Assessment

Habitat Assessment for Threatened Species

Species[1]	Status[2]	Habitat Description and Locally Known Populations[3]	Likelihood of Occurrence	Assessment of Significance
Flora				
Dichanthium setosum	Vulnerable (BC Act and EPBC Act)	Bluegrass is an upright grass less than 1 m tall. It has mostly hairless leaves about 2-3 mm wide. The flowers are densely hairy and are clustered together along a stalk in a cylinder-shape. The flower-clusters grow in pairs at the end of an 8 cm-long stem and appear mostly during summer. Bluegrass occurs on the New England Tablelands, Northwest Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. It occurs widely on private property, including in the Inverell, Guyra, Armidale and Glen Innes areas.	Low Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture, The improved pastures on the property are regularly slashed, ploughed and drill seeded with non-native species limiting any possibility for this species to establish in this area.	No
Birds				
Ephippiorhynchus asiaticus Black-necked Stork	Endangered (BC Act)	Black-necked Storks are widespread in coastal and subcoastal northern and eastern Australia. Suitable habitat includes floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	Low The subject property does not provide habitat for this species and its occurrence is unlikely.	No
Haliaeetus leucogaster White-bellied Sea Eagle	Vulnerable (BC Act)	The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In New South Wales it is widespread along the east coast, and along all major inland rivers and waterways. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass. This species feeds mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion.	Low Whilst the subject property could form part of a wider range for this species, the limited wetland areas do not provide a foraging resource and the absence of tall vegetation limits the potential for any roosting habitat. The only occurrences of this species were in the vegetation surrounding Dumaresq Dam to the north of the site.	No

Species[1]	Status[2]	Habitat Description and Locally Known Populations[3]	Likelihood of Occurrence	Assessment of Significance
Hieraaetus morphnoides Little Eagle	Vulnerable (BC Act)	The Little Eagle is a medium-sized bird of prey that occurs in two colour forms: either pale brown with an obscure underwing pattern, or dark brown on the upper parts and pale underneath, with a rusty head and a distinctive underwing pattern of rufous leading edge, pale 'M' marking and black-barred wingtips. This species occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used. Breeding occurs where pairs build a large stick nest in winter in tall living trees within a remnant patch of vegetation	Low Tall trees are not present within the area of impact of the development but occur elsewhere throughout the property and on adjoining lands. There is a low likelihood of occurrence at the development site	No
Falco subniger Black Falcon	Vulnerable (BC Act)	The Black Falcon is a large (45-55 cm in length), very dark falcon with pale grey cere, eye-rings and feet. It is uniformly dark brown to sooty black, with a pale throat and an indistinct black streak below each eye. Some individuals have faint, narrow barring under the wings and tail. The dark form of the Brown Falcon Falco berigora is sometimes mistaken for the Black Falcon. However, the Brown Falcon can be distinguished by its double cheek-mark, longer legs, bicoloured, barred underwings and comparatively slow flight The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be a mis-identified Brown Falcon.	Low The species is more likely in woodland and scrub habitat in semiarid and arid areas to the north and east and not likely to occur close to urban settlement.	No

Species[1]	Status[2]	Habitat Description and Locally Known Populations[3]	Likelihood of Occurrence	Assessment of Significance
Climacteris picumnus victoriae Brown Treecreeper	Vulnerable (BC Act)	The Brown Treecreeper, Australia's largest treecreeper, is a grey-brown bird with black streaking on the lower breast and belly and black bars on the undertail. The species is found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	Low Suitable habitat is not abundant on the property to provide roosting and foraging resources Limited vegetation within the modified open grassland area selected for the proposed dwelling does not support this species.	No
Chthoniconia sagittata Spectacled Warbler	Vulnerable (BC Act)	The Speckled Warbler is a small well-camouflaged very heavily streaked ground-dwelling bird related to the scrubwrens, reaching a length of 13cm. 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 would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.	Low This species is not likely to occur within the modified grassland area on the mid-slope and removed from rocky outcrops and gullies. Available shelter for this species is limited in the area of the proposed dwelling.	No
Anthochaera phrygia Regent Honeyeater	Endangered (BC Act and EPBC Act)	The Regent Honeyeater is a striking and distinctive, medium-sized, black and yellow honeyeater with a sturdy, curved bill. The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. 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.	Low The absence of Ironbark and box trees in the area of impact would restrict the occurrence of this species within the modified grassland.	No

Species[1]	Status[2]	Habitat Description and Locally Known Populations[3]	Likelihood of Occurrence	Assessment of Significance
Petroica boodang Scarlet Robin	Vulnerable (BC Act)	The Scarlet Robin is found from southeast Queensland to southeast South Australia and also in Tasmania and southwest Western Australia. In NSW, it occurs from the coast to the inland slopes. 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. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber that are important components of its habitat.	Low An absence of extensive areas of fallen timber and logs within the modified grassland of the dwelling site limits the available habitat for this species	No
Mammals				
Miniopteus orianae oceanensis Large Bent-winged Bat	Vulnerable (BC Act)	The Eastern Bentwing-bat has chocolate to reddish-brown fur on its back and slightly lighter coloured fur on its belly that occurs 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.	Low The absence of caves, rock overhangs and cliffs within the subject property restrict roosting opportunities for this species in the local area The single recorded occurrence close to the site is not indicative of potential habitat occurring in the local area.	No

Environmental Impact Assessment

- **Review of Environmental Factors, Taren Point** *(Metrocorp for Sydney Water Corporation)* Undertook a biodiversity assessment for proposed sewer lining works at Towra Point to inform for a Review of Environmental Factors for proposed sewer protective coating works. The site was environmentally sensitive due to a number of factors, including the location of a portion of the works within Towra Point Nature Reserve (which is within a National Park and contains a Ramsar listed wetland); the presence of coastal saltmarsh endangered ecological community and protected mangroves

- **Environmental Impact Assessment,** *(Scenic World)* Stephen undertook flora and fauna surveys to support a proposed development at Scenic World, a popular tourist destination at Katoomba in response to recent land slips in the area. This work involved an assessment of the existing vegetation and to provide revegetation strategies in compensation of vegetation removed.

- **Review of Environmental Factors for construction of a substation at Smeaton Grange,** *(Consolidated Power Projects)* Consolidated Power Projects proposed to construct a substation, new power poles, electricity connection and access track at Smeaton Grange on behalf of two clients – Endeavour Energy and a private client. Stephen undertook a biodiversity assessment to inform the Review of Environmental Factors.

- **Review of Environmental Factors for Upgrade of Entrances to Nurragingy Reserve, (***Blacktown City Council)* Blacktown City Council proposed to upgrade two entrances to Nurragingy Reserve (part of the Western Sydney Parklands) in order to improve safety, pedestrian access and visibility for Reserve patrons. Stephen undertook a flora and fauna survey and prepared an assessment and compensation proposal for Cumberland Plain Woodland at both sites.

- **Review of Environmental Factors for Federation Forest Reserve,** *(Blacktown City Council)* Blacktown City Council proposed to develop part of the existing Federation Forest Reserve in order to provide improved sporting facilities. Stephen is undertaking a comprehensive flora and fauna assessment of the remnant vegetation along the adjacent Ropes Creek corridor and elsewhere within the Reserve and will prepare an assessment and compensation proposal for clearing of Cumberland Plain Woodland critically endangered ecological community present within the Reserve.

Fauna and Flora Assessments

- **Development Approval, District 5, Riparian Assessment** *(North Richmond Joint Venture)* Riparian Flora and fauna assessment.

- **Withers Road Kellyville** *(Trevet Properties)* Fauna and Flora assessor.

- **Proposed Townhouse Development Conrad Rd, Kellyville** *(Private Owner)* Fauna and Flora assessor.

- **Proposed Bike Park, New Valley Rd, Tingha** *(Private Owner)* Fauna and Flora assessor.

- **Proposed Townhouse Development, Cudgegong Rd, Rouse Hill** *(Design Cubicle Architectural Solutions)* Fauna and Flora assessor.

- **Tree Survey and Assessment of Significance, Boronia Park** *(Parramatta City Council)* Fauna and Flora assessor.

- **Residential Development, Old Northern Road, Castle Hill** *(Ionic Management)* Fauna and Flora assessor.

- **Preliminary Ecological Assessment, Withers Road, Kellyville** *(The Hills Shire Council)* Fauna and Flora assessor.

- **White Ibis Management Plan** *(Darling Harbour Foreshore Authority)* Fauna and Flora assessor.

- **Property Subdivision, Ecology Report, Berowra** (Private Owne) Fauna and Flora assessor.

- **Developmental Approval, Biodiversity Assessment, Dibble Avenue, Marrickville** *(Private Owner)*

- **Donington Gardens Ecology Report** *(Calder Flower Architects)* Undertook Flora and fauna assessment.

- **Yerrinbool Ecology Report** (*Private Owner)* Undertook Flora and fauna assessment.

- **Windsor Road Ecological Assessment** *(Garfield Property Development P/L)* Undertook Flora and fauna assessment.

- **Biodiversity Assessment, Church Street, Ryde** (*Holdmark Property Group)* Undertook Flora and fauna assessment.

- **Middle Dural Bushland Rehabilitation Plan** *(Private Owner)* Undertook Flora and fauna assessment.

- **Blackheath Ecology Report** (*Alex Symes Architects)* Undertook Flora and fauna assessment.

- **Biodiversity Assessment EL6918 Hopetoun, Uralla** *(Private Owner)* Undertook Flora and fauna assessment.

- **Ecological Assessment Taringa Nature Reserve** – Undertook Flora, fauna and Heritage assessment.

Koala Habitat Assessments

Koala Habitat Assessment reports provided for the following Councils as part of development applications

- Lismore
- Tweed Heads,
- Byron,
- Clarence Valley
- Coffs Harbour
- Nambucca
- Armidale Regional Council
- Uralla Shire Council
- Tamworth Regional Council
- Hawkesbury Shire Council
- Campbelltown City Council
- Walgett Shire Council