capital ecology

Woodbury Ridge Estate, Sutton, NSW

Biodiversity Certification Assessment Report

Final 01 – 1 November 2021
Prepared for the Estate of the late W.A. Cartwright

Document Information

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- Tony Carey – Director, Tony Carey Consulting.
- Elizabeth Slapp – Director / Senior Town Planner, PLANNED.

We acknowledge the Traditional Custodians of the land on which we work. We pay our respects to Elders past and present.

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Executive Summary

The Estate of the late W.A. Cartwright (the 'Proponent') is currently progressing the planning and approval process for the proposed subdivision of Woodbury Ridge Estate (Lot 1 DP1272209), Sutton, NSW (the 'proposed development' of the 'subject land'). The proposed development includes the establishment of four Biodiversity Stewardship Sites that will protect and manage the majority of the significant ecological values that occur in the subject land.

Capital Ecology Pty Ltd (Capital Ecology) has been commissioned by the Estate of the late W.A. Cartwright to complete the necessary biodiversity surveys and prepare this Biodiversity Certification Assessment Report (BCAR) to identify and assess the significance of the impacts that the proposed development will have on the biodiversity values of the subject land

Scope

Although general biodiversity values are identified and considered, the primary purpose of this BCAR is to present the results of Capital Ecology's application of the NSW Biodiversity Assessment Method (BAM) to assess the significance of the impacts of the proposed development on biota listed as threatened under the NSW *Biodiversity Conservation Act 2016* (BC Act).

This BCAR also includes assessment of the potential impacts of the proposed development on Matters of National Environmental Significance (MNES) listed pursuant to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Please note that the impact of the proposed development was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) on 26 May 2021 (Referral No. 2021/8965), and on 14 July 2021 it was determined that the proposed development is a controlled action to be assessed by preliminary documentation.

The Subject Land and Development Footprint

The subject land for this BCAR is 187.04 ha and encompasses the whole of Lot 1 DP1272209, Sutton, NSW.

The 'development footprint' for this BCAR relates only to the portions of the subject land that will be impacted by the proposed development. The development footprint encompasses a total area of 54.49 ha, which equates to approximately 29% of the subject land.

The remaining vegetation and habitat in the subject land will be protected and managed through the establishment of four Biodiversity Stewardship Sites that will encompass 100 ha (52%) of the subject land, and through the protection and management of 33.58 ha (18%) of retained vegetation and habitat in large lots.

Survey Overview

Vegetation and potential flora/fauna habitat were surveyed and mapped in accordance with the BAM. This involved the following nine ecological surveys performed by Capital Ecology between 3 September 2019 and 15 September 2021.

- Plant Community Type and Vegetation Zone assessment and mapping.
- BAM plots.
- A tree habitat assessment.

- Threatened flora surveys via targeted survey and opportunistic observations.
- Threatened bird surveys via areas searches and opportunistic observations.
- A fauna nesting survey via inspections of remnant trees in the subject land for signs of fauna breeding in hollows or nests.
- A full program of targeted Striped Legless Lizard *Delma impar* surveys, involving 10 checks of 10 grids (50 tiles per grid) following methodology consistent with the Commonwealth guidelines.
- A full program of targeted Golden Sun Moth *Synemon plana* surveys, involving belt transects on four separate days following methodology consistent with the Commonwealth guidelines.
- Anabat® surveys for threatened bats.

Results

Native vegetation

The subject land supports two Plant Community Types (PCT).

- PCT1093 – *Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*.
- PCT1330 – *Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion.*

Before European occupation, the subject land would have been characterised by a dry sclerophyll forest (PCT1093) along the elevated areas in the south-west that merged with an open grassy woodland (PCT1330) lower in the landscape. However, the subject land has been in the ownership of the Cartwright family for more than 150 years and is a remnant of a previously much larger farming and grazing property. This history of agricultural activity has altered the original woodland vegetation through successive years of cropping, pasture improvement, and livestock grazing. This has included removal of approximately 50% of the original woody vegetation (canopy, midstorey, and shrubstorey) across the subject land. The areas which have retained a woody overstorey have still undergone historic thinning and largely lack a midstorey and shrubstorey. Despite the history of grazing, the groundstorey across the majority of the subject land is generally dominated by native species. The exceptions to this are a recently cultivated paddock in the north-east of the subject land that is entirely dominated by exotic species, and a historically cultivated paddock in the north-west of the subject land that is dominated by a mix of native and exotic species. In general, the areas that have retained a native dominant groundstorey support a low diversity of native species. However, two substantial patches of vegetation in the south-east and south-west of the subject land support a moderate to high diversity of native species.

The riparian vegetation in the subject land is limited to a small section along the north-eastern boundary adjacent to Yass River. This vegetation is composed of a variety of exotic trees, shrubs, grasses, and broadleaf weeds.

Threatened ecological communities

EPBC Act Box-Gum Woodland

PCT1330 is identified as the potential EPBC Act listed TEC *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (EPBC Act Box-Gum Woodland). The areas mapped as PCT1330 Zone 1, Zone 2, and Zone 5 meet the criteria for the EPBC Act listed TEC. In total, the subject land is therefore estimated to support 57.39 ha of EPBC Act Box-Gum Woodland (i.e. 19.58 ha of PCT1330 Zone 1, 25.93 ha of PC1330 Zone 2, and 11.88 ha of PCT1330 Zone 5).

BC Act Box-Gum Woodland

PCT1330 is identified as the potential BC Act listed TEC *White Box – Yellow Box – Blakely's Red Gum Woodland* (BC Act Box-Gum Woodland). PCT1330 Zones 1, 2, 3, 4, and 5 support vegetation which meets the criteria for this TEC in moderate to high condition, and PCT1330 Zone 6 supports vegetation which meets the criteria for this TEC in low condition. PCT1330 Zone 7 lacks a native overstorey and has a groundstorey that is highly modified and dominated by perennial exotic grasses and herbaceous weeds. As such, PCT1330 Zone 7 does not support vegetation which meets the criteria for this TEC under the BC Act.

The subject land is therefore estimated to support 134.49 ha of BC Act Box-Gum Woodland. Of that, 57.39 ha (43%) supports vegetation which meets the criteria for this TEC in high condition (i.e. PCT1330 Zone 1, Zone 2, and Zone 5), 35.23 ha (26%) in moderate condition (i.e. PCT1330 Zone 3 and Zone 4), and 41.87 ha (31%) in low condition (i.e. PCT1330 Zone 6).

Threatened species

Threatened birds

A total of 35 bird species were recorded across all surveys. This included the following threatened birds: Superb Parrot *Polytelis swainsonii* (EPBC Act and BC Act vulnerable); Dusky Woodswallow *Artamus cuanopterus* (BC Act vulnerable); Varied Sittella *Daphoenositta chrysoptera* (BC Act vulnerable); and White-fronted Chat *Epthianura albifrons* (BC Act vulnerable). Of the threatened species recorded in the subject land, only the Superb Parrot is identified as a species credit species for breeding. The remaining species are assumed to be present in the subject land as ecosystem credit species.

Superb Parrots were observed on 26 occasions across all surveys. The majority of these observations were of individual birds or small flocks of birds foraging or flying through the canopy. However, there were five observations of individual birds or pairs of birds entering or residing in Scribbly Gum *Eucalyptus rossii* hollows. These observations were taken to be indications of breeding activity. Superb Parrot breeding habitat in the subject land was estimated by applying a 100 m buffer around each nest tree. The subject land was therefore estimated to support 13.05 of Superb Parrot breeding habitat.

Threatened flora

One BC Act listed threatened species, Silky Swainson-pea *Swainsona sericea* (BC Act vulnerable), was recorded in low numbers just outside the development footprint in PCT1330 Zone 5. Approximately 20 plants were recorded in total. EcoLogical Australia (2018) also recorded one Silky Swainson-pea in PCT1330 Zone 1. The confirmed Silky Swainson-pea habitat in the subject land was estimated by applying a 30 m buffer to the above records. Following this method, the subject land was estimated

to support 1.24 ha of confirmed Silky Swainson-pea habitat in distinct patches of PCT1330 Zone 1 and Zone 5.

On the Southern Tablelands the Silky Swainson-pea is found in moderate to good condition Natural Temperate Grassland and Box-Gum Woodland. For the purposes of calculating the impact of the proposed development on Silky Swainson-pea, Silky Swainson-pea habitat is assumed to occur in all of the moderate to high diversity zones of PCT1330, being PCT1330 Zone 1 and Zone 5.

Threatened invertebrates

A total of 247 Golden Sun Moths were recorded in the subject land across four surveys. Golden Sun Moths were recorded at low density across the entire subject land, with the only exception being the recently cultivated paddock in the north-eastern corner. The subject land is therefore estimated to support 168.99 ha of Golden Sun Moth habitat. The areas of confirmed habitat were generally flat or gently sloping, dominated by a varying mix of Speargrasses *Austrostipa* spp., Kangaroo Grass *Themeda triandra*, and Wallaby Grasses *Rhytidosperma* spp.. All of the habitat in the subject land is assumed to be functionally connected. Given that the subject land is surrounded by road infrastructure (Sutton Road and the Federal Highway), urban development (Sutton Township), natural barriers (Yass River), and cleared agricultural land, the Golden Sun Moth habitat in the subject land is considered unlikely to be functionally connected to any Golden Sun Moth habitat that occurs outside of the subject land.

Threatened bats

A total of 1,535 identifiable bat passes were analysed by Fly By Night Bat Surveys Pty Ltd. One threatened species, Large Bent-winged Bat *Miniopterus orianae oceanensis* (BC Act vulnerable), was detected. The Large Bent-winged Bat is identified as an ecosystem credit species (foraging) and species credit species (breeding). The subject land does not support potential Large Bent-winged Bat roosting and/or breeding habitat (caves, mines, water tunnels, etc.).

Avoidance and Minimisation

Biodiversity Stewardship Sites

The proposed development includes the establishment of four Biodiversity Stewardship Sites that will encompass 100 ha (52%) of the subject land. The biodiversity values that the proposed Biodiversity Stewardship Sites support will be detailed in a separate Biodiversity Stewardship Site Assessment Report. In brief, the proposed Biodiversity Stewardship Sites will protect and manage the majority of the significant ecological values that occur within the subject land, including the following.

- 88.20 ha (66%) of the BC Act Box-Gum Woodland, which includes 53.46 ha (93%) of the EPBC Act Box-Gum Woodland.
- 96.36 ha (57%) of the Golden Sun Moth habitat.
- Three (60%) of the Superb Parrot nesting trees.
- 1.22 ha of confirmed Silky Swainson-pea habitat.
- 6.08 ha (52%) of the moderate to high diversity dry sclerophyll forest (i.e. PCT1093 – *Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*).
- Habitat for a variety of threatened woodland birds, bats, and other native fauna.

A preliminary stewardship site assessment indicates that the combined Biodiversity Stewardship Sites would generate the following classes and numbers of credits.

- 22 PCT1093 - *Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion* credits.
- 344 PCT1330 - *Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion* credits.
- 30 Superb Parrot breeding credits
- 5 Silky Swainson-pea credits.
- 365 Golden Sun Moth credits.

The above credits have been estimated assuming that both required management actions (i.e. management plans, fire management, grazing management, native vegetation management, threatened species habitat management, integrated pest animal control, integrated weed management, management of human disturbance, and monitoring) and specific active restoration management actions (i.e. supplementary planting) are carried out.

Retention of vegetation and habitat in large lots

In addition to the proposed Biodiversity Stewardship Sites, 33.58 ha (18%) of the residual vegetation and habitat within 'R5 – Large Lot Residential' zoned lots will be retained and protected through the combination of a NSW Biodiversity Certification Agreement, a Section 88E positive covenant registered over each lot (with the Minister for Planning and Public Spaces, being the minister responsible for DPIE-BCD, as the benefited prescribed authority), and specific environmental protection by-laws to be written as part of the proposed Woodbury Ridge Community Management Statement.

Woodbury Ridge is to be developed as a Community Scheme pursuant to the NSW *Community Land Development Act 1989*. The Proponent has selected this tenure scheme as it is considered to provide superior opportunities (compared to a Torrens Title project) to apply specific enforceable by-laws with respect to a number of matters, including, of relevance, by-laws and management plans to identify and protect significant vegetation and habitats. The Development Application (DA) for the proposed development notes this intent, and also includes the definition on plan of limited building envelopes and effluent disposal areas on all proposed lots within areas of significant habitat. Upon approval of the DA and Biodiversity Certification, the proponents will prepare a Biodiversity Management Plan (BMP) for inclusion in the Section 88E and by-laws for all other lots. This BMP, which will also form part of the Biodiversity Certification Agreement and be developed to the satisfaction of DPIE, will stipulate the conservation-focused management measures that the responsible party (i.e. the owner of the relevant private lot) will implement. In combination, the Biodiversity Certification Agreement, Section 88E, and Woodbury Ridge Community Management Statement by-laws will provide the best available legal mechanisms to achieve the environmental protection aspirations of the proposal.

These measures will protect and manage:

- 25.27 ha (19%) of the BC Act Box-Gum Woodland, which includes 1.83 ha (3%) of the EPBC Act Box-Gum Woodland;
- 33.58 ha (20%) of the Golden Sun Moth habitat;

- 2.99 ha (26%) of the moderate to high diversity dry sclerophyll forest (i.e. PCT1093 – *Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*); and
- habitat for a variety of threatened woodland birds, bats, and other native fauna.

Combined avoidance and minimisation measures

When the Biodiversity Stewardship Sites and retained vegetation and habitat in large lots are considered together, the proposed development therefore avoids impacts to 70% of the subject land. These areas support the majority of the significant ecological values that occur in the subject land, including:

- 96% of the EPBC Act Box-Gum Woodland;
- 95% (784) of the 829 remnant trees;
- 84% of the BC Act Box-Gum Woodland;
- 78% of the moderate to high diversity dry sclerophyll forest;
- 77% of the Golden Sun Moth habitat;
- 60% of the Superb Parrot nesting trees;
- habitat for Silky Swainson-pea; and
- habitat for a variety of threatened woodland birds, bats, and other native fauna.

Impacts

Native vegetation

The proposed development will result in the clearance of the following native vegetation.

- 0.25 ha of PCT1093 Zone 1 – mature canopy, native dominant understorey, and moderate to high native forb diversity (BC Act native vegetation).
- 2.32 ha of PCT1093 Zone 2 – mature canopy, native dominant understorey, and low native forb diversity (BC Act native vegetation).
- 0.28 ha PCT1330 Zone 1 – mature canopy, regeneration, native dominant understorey, and moderate to high native forb diversity (EPBC Act and BC Act Box-Gum Woodland, BC Act native vegetation).
- 0.96 ha of PCT1330 Zone 2 – mature canopy, regeneration, native dominant understorey, and low native forb diversity (EPBC Act and BC Act Box-Gum Woodland, BC Act native vegetation).
- 4.76 ha of PCT1330 Zone 3 – mature canopy, native dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland, BC Act native vegetation).
- 7.05 ha of PCT1330 Zone 4 – mature canopy, exotic dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland, BC Act native vegetation).

- 0.58 ha of PCT1330 Zone 5 – no canopy, native dominant understorey, and moderate to high native forb diversity (EPBC Act and BC Act Box-Gum Woodland, BC Act native vegetation).
- 6.38 ha of PCT1330 Zone 6 – no canopy, native dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland, BC Act native vegetation).
- 30.84 ha of PCT1330 Zone 7 – no canopy, exotic dominant understorey, and low native forb diversity (exotic vegetation).
- A maximum of 45 remnant trees.

In total, the proposed development will result in the clearance of 22.58 ha of BC Act native vegetation, 1.82 ha of which meets the criteria of EPBC Act Box-Gum Woodland and 20.01 ha of which meets the criteria of BC Act Box-Gum Woodland.

The subject land contains the following vegetation with a vegetation integrity score that requires offsetting for impacts on ecosystem credits.

- PCT1093 Zone 1 – vegetation integrity score of 43.9, proposed clearance of 0.25 ha.
- PCT1093 Zone 2 – vegetation integrity score of 31.2, proposed clearance of 2.32 ha.
- PCT1330 Zone 1 – vegetation integrity score of 45.3, proposed clearance of 0.28 ha.
- PCT1330 Zone 2 – vegetation integrity score of 31.7, proposed clearance of 0.96 ha.
- PCT1330 Zone 3 – vegetation integrity score of 21.6, proposed clearance of 4.76 ha.
- PCT1330 Zone 5 – vegetation integrity score of 19.6, proposed clearance of 0.58 ha.

PCT1330 is listed as a serious and irreversible impacts (SAII) entity ('BC Act Box-Gum Woodland'). Accordingly, the proposed development could result in an SAII on a BC Act listed entity. However, as detailed in this BCAR, the substantial avoidance, minimisation, and mitigation measures incorporated into the proposed development reduce the likelihood of a SAII on BC Act Box-Gum Woodland.

The proposed development will not result in any other direct impacts on native vegetation and is unlikely to result in biodiversity impacts that are unforeseen or uncertain.

Threatened species habitat

The proposed development will result in the clearance of the following threatened species habitat.

- 37.45 ha of Golden Sun Moth habitat (EPBC Act critically endangered, BC Act endangered), located in PCT1093 Zone 1, PCT1093 Zone 2, PCT1330 Zone 1, PCT1330 Zone 2, PCT1330 Zone 3, PCT1330 Zone 4, PCT1330 Zone 5, PCT1330 Zone 6, and PCT1330 Zone 7.
- 0.86 ha of Silky Swainson-pea habitat (BC Act vulnerable), located in PCT1330 Zone 1 and PCT1330 Zone 5.

The proposed development will have an indirect impact on 6.53 ha of Superb Parrot (EPBC Act and BC Act vulnerable) breeding habitat, located in PCT1093 Zone 1, PCT1093 Zone 2, PCT1330 Zone 2, PCT1330 Zone 3, and PCT1330 Zone 6.

The clearance or indirect impact of the above threatened species habitat requires the following offsetting for impacts on species credits.

- Superb Parrot – habitat condition (vegetation integrity) loss of 11.6 – 43.9, proposed indirect impact of 6.53 ha.
- Silky Swainson-pea – habitat condition (vegetation integrity) loss of 19.6 – 45.3, proposed clearance of 0.86 ha.
- Golden Sun Moth – habitat condition (vegetation integrity) loss of 10.8 – 45.3, proposed clearance of 37.45 ha.

Golden Sun Moth is listed as a SAII entity. Accordingly, the proposed development could result in an SAII on a BC Act listed entity. However, as detailed in this BCAR, the substantial avoidance, minimisation, and mitigation measures incorporated into the proposed development reduce the likelihood of a SAII on Golden Sun Moth.

The proposed development will not result in any other direct impacts on threatened species habitat and is unlikely to result in biodiversity impacts that are unforeseen or uncertain.

Assessment and Approval Requirements

Commonwealth EPBC Act

The proposed development is unlikely to have a significant impact on EPBC Act listed flora given the subject land does not support any EPBC Act listed flora species.

However, the proposed development will impact 1.82 ha of EPBC Act Box-Gum Woodland, 37.45 ha of Golden Sun Moth habitat, and indirectly impact 6.53 ha of Superb Parrot breeding habitat, all of which are listed under the EPBC Act.

Accordingly, the impact of the proposed development was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) on 26 May 2021 (Referral No. 2021/8965), and on 14 July 2021 it was determined that the proposed development is a controlled action to be assessed by preliminary documentation.

NSW BC Act – Biodiversity offset credit calculations

The proposed development will involve the clearance of vegetation which generates the following ecosystem credits, as determined by the BAM Calculator on 22 September 2021.

- PCT1093 – clearance of 2.57 ha generates 37 ecosystem credits.
- PCT1330 – clearance of 50.85 ha generates 98 ecosystem credits.

The proposed development will involve the clearance of threatened species habitat which generates the following species credits, as determined by the BAM Calculator on 22 September 2021.

- Superb Parrot *Polytelis swainsonii* – indirect impact of 6.53 ha generates 87 species credits.
- Silky Swainson-pea *Swainsona sericea* – clearance of 0.86 ha generates 12 species credits.
- Golden Sun Moth *Synemon plana* – clearance of 37.45 ha generates 419 species credits.

As mentioned previously, a preliminary stewardship site assessment indicates that the combined Biodiversity Stewardship Sites would generate a number of ecosystem credits and species credits. The credits generated by the proposed Biodiversity Stewardship Sites can therefore be used to meet the credit obligation generated by the impacts associated with the proposed development.

As shown in the table below, the credit obligation can be met for PCT1330. However, the credits generated by the proposed Biodiversity Stewardship Sites are insufficient for PCT1093, Silky Swainson-pea, Superb Parrot breeding habitat, and Golden Sun Moth. As such, the outstanding credit obligation for PCT1093, Superb Parrot, Silky Swainson-pea, and Golden Sun Moth must be met through other means.

Entity	Credit Obligation	Credits Generated	Credit Balance
PCT1093 - *Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*	37	22	- 15
PCT1330 - *Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion*	98	344	+ 246
Polytelis swainsonii Superb Parrot	87	30	- 57
Swainsona sericea Silky Swainson-pea	12	5	- 7
Golden Sun Moth *Synemon plana*	419	365	- 54

NSW Koala SEPP – Koala Habitat Protection Requirements

Regarding the application of the *State Environmental Planning Policy (Koala Habitat Protection) 2021* (the 'Koala Habitat Protection SEPP') for the proposed development of the subject land, the following points are noted.

1. The subject land is located within the Yass Valley Council Local Government Area (LGA), which is an LGA to which he Koala Habitat Protection SEPP applies as listed in Schedule 1.

2. The subject land has an area of greater than 1 hectare and there is no approved Koala Plan of Management.

3. The subject land supports a number of the tree species listed in Schedule 2 of the Koala Habitat Protection SEPP. Accordingly, the subject land supports 'potential koala habitat'.

4. There are no recent records of Koalas in the locality, with the most recent being from 2005. This Koala record is approximately 4.5 km to the east of the subject land and is separated from the subject land by the federal highway and expanses of cleared farmland (Figure 8). In general, Koala are not known to occur in the lowland agricultural lands of the Yass Valley LGA.

With regard to the above and with respect to the Koala Habitat Protection SEPP, the subject land is therefore considered unlikely to constitute important or occupied Koala habitat now or in the future.

In light of the above, Council can be satisfied that the subject land is not Koala habitat, and it is therefore not prevented, because of the Koala Habitat Protection SEPP, from granting consent to a development application within the subject land.

1 Introduction

The Estate of the late W.A. Cartwright (the 'Proponent') is currently progressing the planning and approval process for the proposed subdivision of Woodbury Ridge Estate (Lot 1 DP1272209), Sutton, NSW (the 'proposed development' of the 'subject land'). The proposed development includes the establishment of four Biodiversity Stewardship Sites that will protect and manage the majority of the significant ecological values that occur in the subject land.

Capital Ecology Pty Ltd (Capital Ecology) has been commissioned by the Estate of the late W.A. Cartwright to complete the necessary biodiversity surveys and prepare this Biodiversity Certification Assessment Report (BCAR) to identify and assess the significance of the impacts that the proposed development will have on the biodiversity values of the subject land.

Although general biodiversity values are identified and considered, the primary purpose of this BCAR is to present the results of Capital Ecology's application of the NSW Biodiversity Assessment Method (BAM) (NSW Government 2017a[1]) to assess the significance of the impacts of the proposed development on biota listed as threatened under the NSW *Biodiversity Conservation Act 2016* (BC Act).

This BCAR also includes assessment of the potential impacts of the proposed development on Matters of National Environmental Significance (MNES) listed pursuant to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Please note that the impact of the proposed development was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) on 26 May 2021 (Referral No. 2021/8965), and on 14 July 2021 it was determined that the proposed development is a controlled action to be assessed by preliminary documentation.

1.1 Subject Land and Development Footprint

The subject land for this BCAR is 187.04 ha and encompasses the whole of Lot 1 DP1272209, Sutton, NSW (Figure 1, Figure 2, and Figure 3).

The 'development footprint' for this BCAR relates only to the portions of the subject land that will be impacted by the proposed development (refer to Section 1.5.1.2). The development footprint encompasses a total area of 54.49 ha, which equates to approximately 29% of the subject land (Figure 2 and Figure 3).

The subject land, as shown in Figure 1 and Figure 3, is bordered by:

- the existing township of Sutton to the north;
- Sutton Road to the west, beyond which is RU1 zoned agricultural land;
- Yass River to the east, beyond which is RU1 zoned agricultural land; and
- the Federal Highway to the south, beyond which is RU1 zoned agricultural land.

Located in the Yass Valley Local Government Area (LGA), pursuant to the *Yass Valley Local Environmental Plan 2013*, the subject land is zoned[2] 'RU5 – Village', 'R5 – Large Lot Residential', and

[1] NSW Government (2017a). *Biodiversity Assessment Method*. NSW Office of Environment and Heritage. Published LW 25 August 2017.
[2] Yass Valley Local Environmental Plan 2013. *Land Zoning Map - Sheet LZN_005* and *Sheet LZN_005F.*

'E3 – Environmental Management', with a minimum lot size[3] of 'X1 – 5,000 m^{2}', 'Y2 – 1.5 ha', and 'AB3 – 20 ha' and 'AB5 – 40 ha', respectively.

The majority of the subject land is identified on the *Yass Valley Local Environmental Plan 2013* Natural Resources Biodiversity Map[4]; these areas correspond to the parts of the subject land that support a remnant canopy. A small section of the subject land along the eastern boundary is also identified on the NSW Government Biodiversity Values Map[5]; this area corresponds to the riparian corridor associated with Yass River.

The subject land comprises a range of slope gradients, ranging from very gentle (< 3%) to moderately sloping (10-15%). The topography across the subject land falls relatively steadily from 678 m Australian Height Datum (AHD) in the south-western corner to 633 m AHD in the south-eastern corner, 615 m AHD in the north-western corner, and 606 m in the north-eastern corner adjacent to Yass River.

The subject land contains one drainage line associated with a dam, and one tributary that flows along the south-eastern boundary and then into Yass River. The drainage line and tributary were dry at the time of survey, are only likely to convey water following substantial rain events, and do not support any riparian vegetation. There are four large dams and four small dams in the subject land. All of the dams held a small to moderate amount water at the time of survey. As mentioned previously, the north-eastern boundary of the subject land boarders Yass River and includes a small section of the associated riparian vegetation. This vegetation is composed of a variety of exotic trees, shrubs, grasses, and broadleaf weeds.

Before European occupation, the subject land would have been characterised by a dry sclerophyll forest along the elevated areas in the south-west that merged with an open grassy woodland lower in the landscape. However, the subject land has been in the ownership of the Cartwright family for more than 150 years and is a remnant of a previously much larger farming and grazing property. This history of agricultural activity has altered the original woodland vegetation through successive years of cropping, pasture improvement, and livestock grazing. This has included removal of approximately 50% of the original woody vegetation (canopy, midstorey, and shrubstorey) across the subject land. The areas which have retained a woody overstorey have still undergone historic thinning and now largely lack a midstorey and shrubstorey. Despite the history of grazing, the groundstorey across the majority of the subject land is generally dominated by native species. The exceptions to this are a recently cultivated paddock in the north-east of the subject land that is entirely dominated by exotic species, and a historically cultivated paddock in the north-west of the subject land that is dominated by a mix of native and exotic species. In general, the areas that have retained a native dominant groundstorey support a low diversity of native species. However, two substantial patches of vegetation in the south-east and south-west of the subject land support a moderate to high diversity of native species; these areas largely occur within the proposed Biodiversity Stewardship Sites.

The main existing infrastructure in the subject land is Guise Street, which occurs along the north-western boundary of the subject land. Apart from that, the only other built infrastructure in the subject land are the stock fences, which are in a generally good condition.

[3] Yass Valley Local Environmental Plan 2013. *Lot Size Map - Sheet LSZ_005* and *Sheet LSZ_005F.*
[4] Yass Valley Local Environmental Plan 2013. *Natural Resources Biodiversity Map – Sheet NRB_005.*
[5] https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

1.2 Version History

In comparison to Draft version 03 of this BCAR (Capital Ecology 2021[6]), this version includes the following revisions and updates.

- The development footprint has been updated to include impacts from Telstra pits, associated access easements, and small alterations to the layout of the proposed development.
- A tree hollow survey and fauna nesting survey have been conducted in September 2021 across the entire subject land. This survey recorded additional indications of Superb Parrot *Polytelis swainsonii* breeding, resulting in an increase in the number of Superb Parrot nest trees from three to five (refer to Section 2.3.5.2). Of those, the proposed development retains three Superb Parrot nest trees and indirectly impacts two.
- The addition of a new section on consultation and public exhibition (Section 1.3 and Appendix I).
- The addition of new section which addresses the information requirements of the Biodiversity Certification Agreement process (Section 3.6).
- The addition of new information with respect to:
    - the proposed mitigation measures for Superb Parrot, including trialling tailored artificial nest boxes and more intensive, targeted monitoring (Section 3.3).
    - the proposed management actions related to the Biodiversity Stewardship Sites (Section 3.1 and Section 3.3); and
    - Golden Sun Moth Serious and Irreversible Impacts (Section 3.4.1).

1.3 Consultation and Public Exhibition

The NSW Department of the Planning, Industry and Environment (DPIE), Yass Valley Council, DAWE, and the general public have been consulted on numerous occasions throughout the planning, design, and assessment phases of the proposed development (refer to Appendix I). In addition to multiple emails and phone conversations, the meetings and official communication detailed in Section 1.3.1 to Section 1.3.4 have taken place.

Of particular relevance to the Biodiversity Certification assessment process are (refer to Appendix I):

- the formal consultation with both DPIE and Yass Valley Council on previous drafts of this BCAR; and
- public exhibition of a previous version of this BCAR (Capital Ecology 2021) from 14 June 2021 to 26 July 2021, where submissions were invited from the public.

[6] Capital Ecology (2021). *Woodbury Ridge Estate, Sutton, NSW – Biodiversity Certification Assessment Report*. Draft 03 – April 2021. Prepared for Woodbury Ridge Estate Pty Ltd. Authors: S. Reid, S. Thompson, C. Ross, and R. Speirs. Project no. 2980

While no submissions were received during the public exhibition of the BCAR, comments from DPIE and Yass Valley Council resulted in the following variations to the design of the proposed development.

- The location of the building envelope and EMZ in one of the proposed Biodiversity Stewardship Sites was moved in order to provide the suggested setbacks to an identified Superb Parrot nest tree (50 m for a building envelope or road, 30 m for an Indicative/Special EMZ).
- Ongoing monitoring of Superb Parrot nesting behaviour in the subject land as development progresses was included as a mitigation measure.
- The extent of the subject land was increased in order to encompass Guise Street and all associated impacts.

1.3.1 Consultation with NSW Department of Planning, Industry and Environment

- 21 March 2017 – Site visit by the landowners, Project Team, Yass Valley Council representatives, DPIE representatives, and others to discuss the proposed development, examine the condition of the vegetation and habitat on site, and to discuss minimising the potential environmental impacts.
- 26 April 2018 – Meeting between the Project Team and Yass Valley Council, DPIE, and DAWE to discuss certain issues and consult on the proposal.
- 15 June 2018 – Meeting between the Project Team, Yass Valley Council, and DPIE to discuss updated subdivision plans, ecological considerations, biodiversity impacts, bushfire, and possible lot yields.
- 26 November 2018 – Gateway Determination by DPIE.
- 19 February 2019 – Meeting between the Project Team, Yass Valley Council, and DPIE to discuss and consult on the proposal, including consideration of the revised planning and proposed community title controls.
- 23 April 2019 – Revised Planning Proposal addressing the comments received from the nominated agencies and stakeholders submitted to DPIE for endorsement. It is noted that another Council resolution or an altered Gateway Determination were not necessary for the revised Planning Proposal.
- 5 May 2020 – Rezoning approved by the NSW Minister for Planning.
- 13 August 2020 – Meeting with DPIE to discuss the results of the BAM Stage 1 assessment and the preliminary NSW Biodiversity Offset Scheme (BOS) credit estimates.
- 21 October 2020 – Letter sent by DPIE in response to the preliminary design of the proposed subdivision and associated BOS credit estimates.
- 12 November 2020 – Email sent by Tony Carey Consulting to DPIE in relation to the design of the proposed development.
- 29 March 2021 – Letter sent by DPIE in response to the submission of the draft BCAR (version 2) sent to the consent authority for review on 18 February 2020.

- 29 March 2021 – Meeting with DPIE to discuss the draft BCAR (version 2) sent to the consent authority for review on 18 February 2020.
- 23 April 2021 – Email sent by DPIE in response to the measures proposed to reduce the impact of the proposed development on Superb Parrot breeding trees.
- 8 June 2021 – Email sent by DPIE in response to the submission of the draft BCAR (version 3) sent to the consent authority for review on 30 April 2021.
- 17 June 2021 – Letter sent by DPIE in response to the submission of the draft BCAR (version 3) sent to the consent authority for review on 30 April 2021.
- 13 August 2021 – Meeting with DPIE to discuss the next steps in the Biodiversity Certification process.
- 22 September 2021 – Submission of draft BCAR (version 4) to the consent authority for review.

1.3.2 Consultation with Yass Valley Council

- 2009 to 2015 – Multiple meetings with Yass Valley Council to discuss the possibility of developing portions of the proposed development area.
- March 2017 – Tony Carey Consulting (on behalf of the landowners) lodged a comprehensive submission to Yass Valley Council in response to the draft Masterplan as it affected the subject land.
- 21 March 2017 – Site visit by the landowners, Yass Valley Council representatives, DPIE representatives, and others to discuss the proposed development, examine the condition of the vegetation and habitat on site, and to discuss minimising the potential environmental impacts.
- 22 November 2017 – Sutton Master Plan and Planning Team recommendations considered and endorsed by Yass Valley Council Councillors.
- 26 April 2018 – Meeting between the Project Team and Yass Valley Council, DPIE, and DAWE to discuss certain issues and consult on the proposal.
- 15 June 2018 – Meeting between the Project Team, Yass Valley Council, and DPIE to discuss updated subdivision plans, ecological considerations, biodiversity impacts, bushfire, and possible lot yields.
- 19 July 2018 – Woodbury Ridge Estate Planning Proposal submitted to Yass Valley Council Planning Team for consideration.
- 28 August 2018 – Presentation to Yass Valley Council regarding the Planning Proposal following consideration of all submissions. At that meeting, Council resolved that:
    - the Planning Proposal for 2090 Sutton Road, Sutton be endorsed as exhibited and modified so the proposed RU5 Village zone does not extend any further than the existing RU5 Village zone within the village; and
    - the modified Planning Proposal be forwarded to the Minister for Planning to request the amendment to be made to the *Yass Valley Local Environmental Plan 2013.*

- 26 September 2018 – Yass Valley Council resolved that the Planning Proposal be endorsed and forwarded to the Minister for Planning to request a Gateway Determination.
- 19 February 2019 – Meeting between the Project Team, Yass Valley Council, and DPIE to discuss and consult on the proposal, including consideration of the revised planning and proposed Community title controls.
- 28 August 2019 – Rezoning of the subject land approved by Yass Valley Council meeting.
- 12 December 2020 – DA lodged with Yass Valley Council.
- 29 March 2021 – Email sent by Yass Valley Council in response to the submission of the draft BCAR (version 2) sent to the consent authority for review on 18 February 2020.
- 29 March 2021 – Meeting with Yass Valley Council to discuss the draft BCAR (version 2) sent to the consent authority for review on 18 February 2020.
- 28 April 2021 – Email sent by Yass Valley Council in response to the measures proposed to reduce the impact of the proposed development on Superb Parrot breeding trees.
- 11 June 2021 – Email sent by Yass Valley Council in response to the submission of the draft BCAR (version 3) sent to the consent authority for review on 30 April 2021.
- 22 September 2021 – Submission of draft BCAR (version 4) to the consent authority.

1.3.3 Consultation with DAWE

- 26 April 2018 – Meeting between the Project Team and Yass Valley Council, DPIE, and DAWE to discuss certain issues and consult on proposal.
- 26 May 2021 – Referral of the proposed development to DAWE by Capital Ecology. Following a resubmission request, the referral was accepted and published by DAWE on 15 June 2021.
- 14 July 2021 – Letter and decision notice sent by DAWE determining that the proposed development is a controlled action that will be assessed by preliminary documentation.
- 6 August 2021 – Letter sent by DAWE requesting further information in relation to the proposed development and preliminary documentation guidelines detailing the specified information requirements.
- 22 September 2021 – Submission of the draft preliminary documentation (version 1) to the consent authority for review.
- 19 October 2021 – Comments by DAWE in response to the submission of the draft preliminary documentation (version 1) sent to the consent authority for review on 22 September 2021.

1.3.4 Public consultation

The current Development Application (DA) seeks to develop the land in accordance with a previously approved re-zoning Planning Proposal, which was uplifted (via amendments) into the *Yass Valley Local Environmental Plan 2013* on 8 May 2020. It is noted that the Planning Proposal was publicly exhibited by Yass Valley Council and included a conceptual development scheme for the site, which was not too dissimilar to the subdivision layout plan forming part of the current DA (Place Logic

2020a[7]). During the public exhibition period for the re-zoning Planning Proposal, a total of ten public submissions were received. The main issues raised in objection to the Planning Proposal related to biodiversity implications, traffic, capacity of local services and amenities, water supply and security, loss of agricultural land, property values, and consistency with the character of Sutton village.

It is important to note that the re-zoning Planning Proposal went through a number of iterations prior to the amendments being gazetted in the *Yass Valley Local Environmental Plan 2013*. These iterations were in response to the matters raised by the Yass Valley Council and relevant NSW Government agencies as well as the public submissions.

The current DA was publicly exhibited by Yass Valley Council from 22 January 2021 to 12 February 2021. During the public exhibition of the DA, four public submissions were received. The submissions did not seek to expressly oppose or support the proposal, but rather offered opinion as to how it could be improved. The Proponent prepared and submitted a considered response back to Yass Valley Council to assist them in progressing the assessment of the DA. Whilst the response considered that the development as proposed should remain unchanged to that as originally submitted, the Proponent did concede to work with Council to accept suitably worded consent conditions in relation to the following.

- The installation of a gate to the southern boundary of the proposed lot fronting the Yass River, so as to create a pedestrian/equestrian linkage along the Old Federal Highway to proposed Fire Trail 02.
- Re-alignment of the common boundary between proposed lots 'bj' and 'bk' so that it does not traverse the identified Potential Aboriginal Archaeological Deposit.
- The upgrading and sealing of Guise Street for its entire length (i.e. to its eastern most extent as it adjoins the proposed development area).
- The provision of a landscaping strip for planting and establishment of suitable endemic species within the part of the subject land with frontage to Sutton Road.
- The installation of appropriate signposting identifying the use of the proposed subdivision roads by pedestrians and cyclists.
- Removal of the proposed 'Woodbury Ridge Estate' entry signage (only if directly required by Yass Valley Council).
- The re-planting of native trees (of semi-mature stock) within the Guise Street verge post completion of the road upgrade works.

In addition to the above, the Proponent initiated a number of direct meetings[8] with the Sutton and District Community Association Inc. (SDCA) and its members through the re-zoning Planning Proposal process and as part of the current DA. Finally, it is to be noted that no direct consultation with the Local Aboriginal Land Council (LALC) has been conducted. This was on the basis of the recommendations made in the Aboriginal Due Diligence Report prepared by Past Traces Heritage Consultants (2020)[9] that no areas of potential archaeological deposits or heritage sites were

[7] Place Logic (2020a). *Woodbury Ridge Estate, Sutton, NSW – Subdivision DA Layout Plan.* Date: 09/12/20, Rev 10, Drawing No. 106.0.
[8] Multiple meetings held in 2016, 2017, 2019, 2020, and 2021.
[9] Past Traces Heritage Consultants (2020). *Aboriginal Due Diligence Assessment Report – Woodbury Ridge Estate Sutton NSW*. Prepared for Planned, 3 November 2020.

identified within the development area and that the potential for Aboriginal or historical heritage objects within the development area was assessed as low.

It is noted that no 'reports' were prepared by the Proponent following their meetings with the SDCA. It is understood that the SDCA lodged a submission to the current DA during its public exhibition. The Proponent's response directly responds to the matters raised by the SDCA.

More recently, as per the requirements of the Biodiversity Certification process, a previous version of the BCAR (Capital Ecology 2021) was publicly exhibited from 14 June 2021 to 26 July 2021 and submissions were invited from the public. No submissions were received.

1.4 Background to the Proposed Development

1.4.1 Previous ecological studies of the subject land

The ecological values of the subject land were investigated by EcoLogical Australia (2018)[10], which included the following surveys.

- A rapid vegetation assessment (July 2016).
- Targeted flora and fauna surveys (11 – 14 October 2016), which included detailed vegetation mapping and vegetation plots, threatened flora surveys, threatened bird surveys, threatened bat surveys, and Pink-tailed Legless Lizard *Aprasia parapulchella* surveys.

In summary, EcoLogical Australia (2018) detailed the following points in relation to the ecological values that occur in the subject land.

- The subject land has had a long history of agricultural use (> 150 years) that has simplified the original woodland vegetation through successive years of cropping, pasture improvement, and livestock grazing.
- The subject land supports two Plant Community Types (PCTs), being PCT277 – *Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion* and PCT349 – *Inland Scribbly Gum – Red Stringybark open forest on hills composed of silicous substrates in the mid-Murrumbidgee and upper Lachlan catchments mainly in the western South Eastern Highlands Bioregion*.
- The subject land supports 46.9 ha of critically endangered EPBC Act Box-Gum Woodland and 125.28 ha of critically endangered BC Act Box-Gum Woodland.
- The following threatened species were recorded in the subject land.
    - Silky Swainson-pea (BC Act vulnerable), recorded in 'good' condition Box-Gum Woodland (corresponding to PCT1330 Zone 1 in this BCAR).
    - Superb Parrot (EPBC Act and BC Act vulnerable). Superb Parrot breeding habitat was assumed across the areas supporting a remnant canopy, based on the species being recorded in the subject land and the presence of hollow-bearing trees.
    - Varied Sittella *Daphoenositta chrysoptera* (BC Act vulnerable).

[10] EcoLogical Australia (2018). *Planning Proposal Ecological Investigation*. Prepared for Tony Carey Consulting, July 2018.

- Large Bent-winged Bat *Miniopterus orianae oceanensis* (BC Act vulnerable).
- A potential Southern Myotis *Myotis macropus* (BC Act vulnerable) observation.
- A potential Yellow-bellied Sheathtailed Bat *Saccolaimus flaviventris* (BC Act vulnerable) observation.

The findings from EcoLogical Australia (2018) were used to revise a previous concept plan in order to avoid and minimise impacts to the identified significant ecological values that occur in the subject land. This resulted in an increase to the extent of conservation offset areas from 40 ha to 95.27 ha. As stated in EcoLogical Australia (2018):

> *The revised concept plan overlayed on mapped vegetation (Figure 7) demonstrates that residential areas have been situated within exotic vegetation within the northwest and northeast corners of the study area, and the large lot zone has been placed within low condition Box Gum Woodland and moderate condition Scribbly Gum woodland. The highest biodiversity value land will be conserved in Stewardship sites which will conserve and restore moderate, good and high condition Box Gum Woodland and good condition Scribbly Gum Woodland.*

1.4.2 Re-zoning of the subject land

As discussed in the Statement of Environmental Effects (Planned 2020[11]):

> *Following the adoption of the Yass Valley Settlement Strategy in September 2017, the Yass Valley Council resolved to adopt the Sutton Village Master Plan on 20 December 2017. The subject land, which is significant to Sutton in that it is the 'front door' of the Village (when approaching from the Federal Highway), was nominated as being capable of accommodating an extension to Sutton Village.*
>
> *In response to the adoption of the Master Plan, the Cartwright family worked in close collaboration with a team of technical sub-consultants as well as the Yass Valley Council, the NSW Department of the Planning, Industry and Environment (DPIE), and the Office of Environment and Heritage (now NSW Environment, Energy and Science) to prepare a re-zoning Planning Proposal that was sympathetic to the environmental attributes of the land.*
>
> *The re-zoning Planning Proposal was lodged with the Yass Valley Council on 6 November 2018 and the DPIE issued the Gateway determination – to proceed subject to conditions, on 26 November 2018. Following on from the Gateway determination, the Planning Proposal went through a number of iterations prior to Yass Valley Council returning it to the DPIE on 11 September 2019.*
>
> *The final version of the Planning Proposal sought to re-zone the land from RU1 Primary Production to part RU5 Village, part R5 Large Lot Residential and part E3 Environmental Management with corresponding minimum lot size controls of 5,000m², 1.5 hectares, 20 hectares and 40 hectares respectively. In relation to the R5 Large Lot Residential Zone, an additional local provision was proposed enabling the subdivision of the land where the average area of all lots created would be 1.5 hectares – none of the lots created would be able to have an area of less than 5,000m² and an area of no greater than 2.5 hectares.*

[11] Planned (2020). *Statement of Environmental Effects*. Prepared for Cartwright Family Holdings Pty Ltd, Presented 11/12/2020, Rev: Final.

The Planning Proposal was approved, and the amendments published in the Yass Valley Local Environmental Plan 2013 on 8 May 2020.

The Cartwright family is now seeking to develop the land in accordance with the adopted provisions of the Yass Valley Local Environmental Plan (as amended) and have prepared this Development Application, which proposes a sensitive and staged subdivision of the site.

The *Yass Valley Local Environmental Plan 2013* therefore allocates land to either conservation or development in a manner that protects the majority of the significant biodiversity conservation values that occur in the subject land. As discussed in subsequent sections of this BCAR, the land allocated for conservation is proposed to be protected and managed through the establishment of four Biodiversity Stewardship Sites.

1.5 Description of the Proposed Development

1.5.1 The proposed residential subdivision

As described in the Civil Report (Spiire 2020[12]) and shown in Figure 2:

The project is proposed to be created as a Community Title subdivision, with public roads and a community owned non-potable water supply network supplied by a community owned bore reticulation system.

Cartwright Family Holdings Pty Ltd[13] *propose to deliver 19 lots zoned RU5 Village with minimum lot sizes of 5,000 m^2 and 43 lots zoned R5 Large Lot Residential with average lot sizes of 1.5 hectares(*). Approximately 100ha of Woodbury Ridge Estate will be conserved in 4 stewardship sites, protected in perpetuity with three minimum sizes of 20ha and one of 40ha within the zoned E3 Environmental Management. A total of 66 residential and stewardship lots across the Site is proposed. In addition to this, almost 2 hectares of communal open space is proposed for a park, river-side corridor and equestrian trails.*

The development is defined by the topography and expansive views with access to the site from the North. A focus has been placed on creating a road and block layout that celebrates the Woodbury Ridge Estate's remanent trees and environmentally significant habitat. Woodbury Ridge Estate has been carefully designed to maximise topographical features of the site with three internal roads of varying carriageway and verge widths. Two internal fire trails are proposed; one adjoining Sutton Road to the west and the other adjoining Old Federal Highway to the east.

The Woodbury Ridge Estate development proposes a stormwater management strategy that utilises road side swales, grassed open channels and a community association owned retardation basin. The site will be serviced via underground electrical and telecommunication infrastructure connected to the existing Sutton Road infrastructure. Cartwright Family Holdings Pty Ltd propose to include within the Estate a community bore or multiple bores to supply groundwater via a reticulated network to each residential lot in the development. The non-potable supply is proposed for non-drinking uses such as private garden watering and irrigation of the communal open space within the development. As the Site is currently

[12] Spiire (2020). *Woodbury Ridge Estate Civil Engineering Report.* Report for Woodbury Ridge Estates. Issue Date 10/12/2020, Rev No. 1.

[13] Please note that the quoted reference to Cartwright Family Holdings Pty Ltd is incorrect. The correct owner is the Estate of the late W A Cartwright.

located outside of Yass Valley Council's sewer service areas, Onsite Sewer Management systems are therefore proposed and this will be at the individual lot owner's responsibility

As outlined in the Statement of Environmental Effects (Planned 2020), the project is to be developed as a Community Title scheme in accordance with the provisions of the NSW *Community Land Management Act 1989*. It will comprise 66 large lot residential and rural residential lots, to be developed across four stages (refer to Figure 20). Some or all stages may be constructed concurrently (subject to demand).

- Stage 1 – Nineteen (19) large lot residential lots (minimum 5,000 m^2) and four (4) rural residential lots (average 1.5 ha each).
- Stage 2 – Eighteen (18) rural residential lots (average 1.5 ha each), including one (1) stewardship lot (minimum 40 ha).
- Stage 3 – Eleven (11) rural residential lots (average 1.5 ha each).
- Stage 4 – Fourteen (14) rural residential lots (average 1.5 ha each), including three (3) stewardship lots (each a minimum of 20 ha).

One community association lot (comprising a number of separate parcels – the internal park, the riverside reserve, pedestrian/cycle lanes, and an access reserve for Telstra) is to be delivered over the four stages.

To enable safe vehicular and pedestrian/cycle access, it is proposed to upgrade Guise Street along the frontage of the property. It should be noted however that some parts of Guise Street are to be left largely "as is" (width, alignment, and construction) to avoid impacts to high quality native vegetation on crown land north of the site. This treatment has been detailed on plan[14] and has been agreed with Yass Valley Council.

Each proposed development lot contains a building envelope (within which a dwelling and all ancillary infrastructure will be contained) and an Indicative or Special Effluent Management Zone (EMZ). On approximately half of the lots, the effluent disposal area may be located within the identified building envelope and/or the 1,250 m^2 Indicative EMZ. On lots that require a Special EMZ:

- effluent disposal will be restricted to the Special EMZ only;
- owners will be required to install Secondary Treatment Systems (including disinfection), to maximise the quality of effluent produced and to minimise potential impacts to surface or groundwater systems;
- effluent irrigation systems shall be permanent – fixed or semi-fixed systems, which cannot be moved to areas outside of the identified Special EMZ, to minimise the contamination risk to surface or groundwater systems on neighbouring properties; and
- effluent disposal must be via subsurface drip irrigation to areas of fully managed lawn.

A survey of all existing trees within the subject land shaped the concept design process (Veris 2020[15]). Internal road alignments, driveways, building envelopes, and effluent disposal areas were

[14] General Arrangement Plan Sheet 1 (Drawing No. 307996CA006), Typical Cross Sections Sheet 4 – 6 (Drawing Nos. 307996CA123,CA124 and CA125), and Grading Plan Sheet 1 (Drawing No. 307996CA200).
[15] Veris (2020). *Plan of Detail Survey – Lot 5 DP 838497 – 2090 Sutton Road, Sutton, NSW*. Drawn 24/06/2020, Rev 22020.054_DT_01.dwg, Project No. 22020.054.

located in order to reduce the number of trees impacted by the proposed development. As a result, a maximum of 45 (5%) of the 829 remnant trees that occur in the subject land will be removed. Only five of these remnant trees support function hollows, and none are nest trees for the Superb Parrot.

As detailed in EcoLogical Australia (2020)[16], the design of the proposed development and location of building envelopes in open areas also reduces the impacts associated with APZs. The identified APZs therefore do not currently support a high canopy cover or substantial regeneration of the overstorey. When combined with an absent midstorey and shrubstorey across most of subject land, the required management actions within APZs will therefore not require the removal of remnant trees or substantial impacts to any other strata.

The landscaping plan (Place Logic 2020b[17]) for the proposed development will utilise local endemic and non-invasive species that are sympathetic with the adjacent areas of environmental conservation significance. The landscaping plan incorporates the following features.

- Planting of two native tree species (*Eucalyptus albens* and *E. cinerea*). These species were selected as they are suitable for wider verges and are complementary to the existing Box-Gum Woodland vegetation.
- Formal avenue planting along part of Road 01. The formal avenue planting transitions to informal planting for the remainder of the Estate, which will supplement the existing mature native trees that are proposed to be retained along the internal road corridors.
- Planting of a native seed mix along road verges adjacent to the proposed Biodiversity Stewardship Sites.
- Communal parkland space (approx. 10,730 m²) incorporating nature play area, electric BBQ, shade structure, seating, and pedestrian paths. This parkland will form part of the community association property.
- Communal open space (approx. 8,000 m²) along the Estate's frontage to Yass River. This area (which is currently highly degraded) will not be formalised and will form part of a Riverine Rehabilitation Management Plan to improve the environmental integrity of Yass River (as it adjoins the subject land). These works would include the removal of noxious weed species, bank stabilisation, and revegetation with appropriate native species.
- A proposed fencing strategy that aims to reduce impacts on biodiversity through alignment (which avoids the removal of any mature native trees) and design (with predominantly 'post and rail' boundary fencing and 'wire fencing with ring lock' block fencing, which will reduce potential indirect impacts on Golden Sun Moth habitat connectivity between areas of retained habitat).

[16] EcoLogical Australia (2020). *Bushfire Protection Assessment – Subdivision – Woodbury Ridge Estate Lot 5 DP 838497 Sutton.* Prepared for Woodbury Ridge Estate, December 2020.
[17] Place Logic (2020b). *Woodbury Ridge Estate, Sutton, NSW – Landscape Master Plan.* Date: 09/12/20, Rev B, Drawing No. 401.0.

1.5.1.1 Anticipated timing and duration

The entire proposed development is expected to be delivered between January 2022 and December 2025.

As noted previously, the project is divided into four stages (Figure 20). However, subject to demand, two or more stages may be constructed concurrently.

- If developed in one combined stage, the construction period is (subject to approvals) likely to run for approximately 18 months from mid-2022 to the end of 2023.
- If developed in stages, it could conceivably take until December 2025.

At the date of this report, the former scenario is the most likely.

1.5.1.2 Defining the development footprint and areas of retained vegetation and habitat

As mentioned previously, the development footprint for this BCAR relates only to the portions of the subject land that will be directly impacted by the proposed development. The development footprint encompasses the impacts associated with (refer to Figure 2 and Figure 3):

- roads, fire trails, pedestrian paths, and the equestrian trail, including impacts from grading, batters, and cut and fill;
- upgrades to Guise Street, including a 1.5 m footpath between Sutton Road and the first entrance to the proposed estate;
- building envelopes, 4.0 m wide driveways, and Indicative and Special EMZs;
- 2.0 m wide new fencing corridors;
- the community association lot;
- indicative water tank locations; and
- site compounds, haulage tracks, and stockpile locations.

Indicative and Special EMZs, new fencing corridors, the Guise Street footpath, Telstra pits, and the community association lot will only impact the groundstorey vegetation and associated threatened species habitat (i.e. Golden Sun Moth and Silky Swainson-pea); these impacts are therefore assessed via management zones in the online BAM Calculator. All other impacts are assumed to entirely clear all vegetation and habitat. As mentioned previously, the management actions associated APZs will not require the removal of remnant trees or substantial impacts to any other strata; APZs are therefore not included in the development footprint. However, as per the BAM, the 'gain' for vegetation and habitat of APZs within the four proposed Biodiversity Stewardship Sites has been set to zero in the BAM Calculator for the credit calculations as the required management actions are likely to limit the expected conservation gains.

Please note that the location of water tanks and associated infrastructure is indicative only as invasive soil testing is yet to occur. As such, the exact locations may differ to that currently shown. However, the impact of the water tanks and associated infrastructure, and thus the associated BOS offset liability, are captured here by the indicative locations.

Finally, as discussed in detail in Section 3.1 and Section 3.3, the residual vegetation and habitat within 'R5 – Large Lot Residential' zoned lots will be retained and protected and are therefore not included in impact calculations.

The development footprint therefore encompasses a total area of 54.49 ha, which equates to approximately 29% of the subject land (Figure 2 and Figure 3). Of that, 8.13 ha will only impact groundstorey vegetation and associated habitat; the remaining 46.36 ha is assumed to clear all of the vegetation and habitat that occurs within the development footprint.

1.5.2 Biodiversity Stewardship Sites

As discussed in detail in Section 3.1 and Section 3.3, four Biodiversity Stewardship Sites will be established under the BC Act (Figure 3, Figure 15, and Figure 16). In combination, these Biodiversity Stewardship Sites will encompass approximately 100 ha (53%) of the subject land, 97.24 ha[18] (52%) of which will be managed for conservation. The biodiversity values that the proposed Biodiversity Stewardship Sites support will be in a combined Biodiversity Stewardship Site Assessment Report (BSSAR) that is currently being developed by Capital Ecology on behalf of the Proponent. In brief, the proposed Biodiversity Stewardship Sites will protect and manage the majority of the significant ecological values that occur in the subject land, including the following.

- 88.20 ha (66%) of the BC Act Box-Gum Woodland, which includes 53.46 ha (93%) of the EPBC Act Box-Gum Woodland.
- 96.36 ha (57%) of the Golden Sun Moth habitat.
- Three (60%) of the five Superb Parrot nesting trees**.**
- 1.22 ha of confirmed Silky Swainson-pea habitat.
- 6.08 ha (52%) of the moderate to high diversity dry sclerophyll forest (i.e. PCT1093 – *Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*).
- Habitat for a variety of threatened woodland birds, bats, and other native fauna.

1.5.3 Retained vegetation and habitat in large lots

The residual vegetation and habitat within 'R5 – Large Lot Residential' zoned lots will be retained and protected through the combination of a NSW Biodiversity Certification Agreement, Section 88E, and specific environmental protection by-laws to be written as part of the proposed Woodbury Ridge Community Management Statement. With respect to tree protection and vegetation management, the Woodbury Ridge Community Management Statement will take on board the requirements of the DA and Biodiversity Certification Agreement approvals.

In total, 33.58 ha (18%) will be retained and protected in lots, including the following (refer to Figure 3, Figure 15, and Figure 16).

- 25.27 ha (19%) of the BC Act Box-Gum Woodland, which includes 1.83 ha (3%) of the EPBC Act Box-Gum Woodland.

[18] The area managed for conservation in the Biodiversity Stewardship Sites excludes building envelopes, EMZs, 4.0 m wide driveways, 2.0 m fencing corridors, and water tank locations.

- 33.58 ha (20%) of the Golden Sun Moth habitat.
- 2.99 ha (26%) of the moderate to high diversity dry sclerophyll forest (i.e. PCT1093 – *Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*).
- Habitat for a variety of threatened woodland birds, bats, and other native fauna.

1.5.4 Combined avoidance measures

When the Biodiversity Stewardship Sites and retained vegetation and habitat in large lots are considered together, the proposed development therefore avoids impacts to 70% of the subject land (Figure 3, Figure 15, and Figure 16). These areas support the majority of the significant ecological values that occur in the subject land, including:

- 96% of the EPBC Act Box-Gum Woodland;
- 95% (784) of the 829 remnant trees;
- 84% of the BC Act Box-Gum Woodland;
- 78% of the moderate to high diversity dry sclerophyll forest;
- 77% of the Golden Sun Moth habitat;
- 60% of the Superb Parrot nesting trees;
- habitat for Silky Swainson-pea; and
- habitat for a variety of threatened woodland birds, bats, and other native fauna.

1.6 Commonwealth and State Assessment and Approval Processes

1.6.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the key Commonwealth Government legislation for the protection and conservation of Australia's environment and biodiversity. The EPBC Act provides the legislative framework for the assessment and approval mechanism requiring that proposed 'actions' to be assessed in terms of their potential to impact upon 'Matters of National Environmental Significance' (MNES). MNES currently listed under the EPBC Act are:

- world heritage properties;
- national heritage places;
- wetlands of international importance (listed under the Ramsar Convention);
- threatened species and ecological communities;
- migratory species (protected under international agreements);
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

Where a potential impact on a MNES may occur as a result of a proposed development, the significance of that impact must be assessed. Guidelines for determining whether an impact is significant are provided by DAWE (Commonwealth of Australia 2013a[19]). If it is determined that a proposed development will, or is likely to, have a significant impact on a MNES, the action must be referred to the Commonwealth Minister. The Department will then consider the referred action and the Minister (or his/her Delegate) will make a determination regarding whether the action requires assessment and approval under the EPBC Act and associated conditions and controls.

As mentioned previously, the impact of the proposed development was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) on 26 May 2021 (Referral No. 2021/8965), and on 14 July 2021 it was determined that the proposed development is a controlled action to be assessed by preliminary documentation.

The following website provides further information regarding the EPBC Act referral and approval process: http://www.environment.gov.au/epbc/index.html

1.6.2 NSW Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017, the purpose of which is "*to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development*" (BC Act Part 1, Section 1.3). The BC Act outlines the NSW framework for addressing impacts on biodiversity from development and clearing. Supported by the NSW *Biodiversity Conservation Regulation 2017* (BC Regulation), the BC Act establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS).

1.6.2.1 NSW Biodiversity Offset Scheme

The BOS creates a transparent, consistent, and scientifically based approach to biodiversity assessment and offsetting for all types of development that are likely to have a significant impact on biodiversity. The BOS aims to ensure a no-net-loss outcome for biodiversity by applying a framework which requires that impacts are first avoided and minimised, and where this cannot be fully achieved, residual impacts must be offset. The BOS also establishes Biodiversity Stewardship Agreements (BSAs), which are voluntary in-perpetuity agreements entered into by landholders, to secure and manage offset sites for biodiversity conservation. The two key elements of the BOS are as follows.

1. A developer, landholder etc. who undertakes an activity (i.e. development, clearing, other impact) which generates a credit obligation must retire the necessary credits to offset their activity.

2. A landholder who establishes a biodiversity stewardship site on their land generates credits which may be sold to developers or landholders who require those credits to offset their credit obligation.

[19] Commonwealth of Australia (2013a). *Matters of National Environmental Significance - Significant Impact Guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth Department of the Environment.

Under the BC Act, the BOS is triggered for proposed development or clearing which:

- will involve clearance of native vegetation (including trees, understorey plants, groundcover plants, and wetland plants) or a prescribed impact (as set out in clause 6.1 of the BC Regulation) on land identified on the Biodiversity Values Map; and/or
- will exceed the native vegetation clearance threshold for the smallest minimum lot size associated with the subject land; and/or
- may significantly impact one or more BC Act listed entities (i.e. threatened species or ecological communities).

1.6.2.2 NSW Biodiversity Assessment Method

The NSW Biodiversity Assessment Method (BAM) is the assessment manual that outlines how an accredited person (i.e. a BAM Assessor) assesses impacts on biodiversity at development sites or assesses the biodiversity values of stewardship sites. The BAM is a scientific document that provides:

- a consistent (standard) method for the assessment of the biodiversity values of a proposed development site, major project site, or vegetation clearing site, or stewardship site;
- guidance on how a proponent (i.e. developer, landholder) can avoid and/or minimise potential biodiversity impacts, or assessment of the management requirements at a proposed biodiversity stewardship site and the likely improvement in biodiversity values that are predicted to occur over time; and
- the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity values for a development site, or the number and class of biodiversity credits to be generated by a proposed stewardship site.

The BAM is supported by the online BAM Calculator, into which a BAM Assessor enters the data from desktop and field investigations to determine the number and class of biodiversity credits generated:

- as an obligation for development/clearance, this obligation must be addressed by the proponent to secure approval for the development/clearance; or
- by the establishment and management of a biodiversity stewardship site, these credits being a commodity that may be sold.

The BAM determines the following two types of credits on both development/clearance sites and stewardship sites.

- Ecosystem credits, these are credits generated for impacts on, or conservation of:
  - threatened ecological communities; and
  - threatened species habitat for species that can be reliably predicted to occur within a given plant community type (PCT) (referred to in the BAM as 'ecosystem credit species').
- Species credits, these are credits generated for impacts on, or conservation of, individuals and/or the habitat of threatened species which cannot be reliably predicted to occur in a given PCT (referred to in the BAM as 'species credit species').

The BAM Assessor documents the results of the biodiversity assessment in a Biodiversity Assessment Report (BAR), of which there are the following three types.

- Biodiversity Development Assessment Report (BDAR). A BDAR is developed to assess the likely biodiversity impacts of a development or vegetation clearing proposal.
- Biodiversity Certification Assessment Report (BCAR). A BCAR is developed to assess the likely biodiversity impacts of conferring biodiversity certification over a specific area of land.
- Biodiversity Stewardship Site Assessment Report (BSSAR). A BSSAR is developed to assess the likely biodiversity conservation gain of establishing a specific area of land as a biodiversity stewardship site under a formal Biodiversity Stewardship Agreement.

1.6.3 NSW State Environmental Planning Policy (Koala Habitat Protection) 2021

The *State Environmental Planning Policy (Koala Habitat Protection) 2021* ('Koala Habitat Protection SEPP') replaced the *State Environmental Planning Policy (Koala Habitat Protection) 2020* on 17 March 2021. The associated Frequently Asked Questions[20] aim to guide consent authorities, professionals, and the community to understand and implement the requirements of the Koala Habitat Protection SEPP.

The development control provisions of the Koala Habitat Protection SEPP apply to development applications relating to land within a council area listed in Schedule 1 of the Koala Habitat Protection SEPP and:

1. *Where there is an approved Koala Plan of Management for the land*
    a. *the development application must be consistent with the approved koala plan of management that applies to the land.*
2. *Where there is no approved Koala Plan of Management for the land, if the land*
    a. *has an area of at least 1 hectare (including adjoining land within the same ownership)*

Pursuant to the Koala Habitat Protection SEPP, the council may grant development consent if the applicant provides to the council—

1. *information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application—*
    a. *does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or*
    b. *is not core koala habitat, or*
2. *information the council is satisfied demonstrates that the land subject of the development application—*
    a. *does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or*

[20] Available at https://www.planning.nsw.gov.au/Policy-and-Legislation/Environment-and-Heritage/Koala-Habitat-Protection-SEPP

b. *includes only horticultural or agricultural plantations.*

Core koala habitat is defined as:

1. *an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or*

2. *an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.*

The Koala SEPP applies in addition to any assessments required under the EPBC Act or the BC Act (i.e. BAM assessment).

1.7 Biodiversity Certification Assessment Report

As prescribed under Part 6, Division 3, Section 6.13 of the BC Act, a BCAR is –

> *"a report prepared by an accredited person in relation to the proposed biodiversity certification of land under Part 8 that, that:*
>
> *(a) assesses in accordance with the biodiversity assessment method the biodiversity values of the land proposed for biodiversity certification, and*
>
> *(b) assesses in accordance with that method the impacts on biodiversity values of the actions to which the biodiversity offsets scheme applies on the land proposed for biodiversity certification, and specifies the number and class of biodiversity credits to be retired to offset those impacts as determined in accordance with that method, and*
>
> *(c) that specifies other proposed conservation measures on or in respect of other land to offset those impacts on biodiversity values and their value (in terms of biodiversity credits) determined in accordance with that method."*

A BCAR prepared applying the BAM by an accredited BAM Assessor must accompany any biodiversity certification application.

The BAM provides a standard method for assessing the impacts of a development/clearance proposal. This theme should carry over to the resulting BCAR such that it is as concise as possible whilst still addressing all of the relevant elements of the BAM in order to provide a complete assessment of the proposed development/clearance. The size of the BCAR should reflect the complexity of the subject land's biodiversity values and the scale and nature of the proposed development/clearance.

1.7.1 Objectives and Format

Developed to reflect the format of the BAM, this BCAR comprises the following two broad parts.

- Part 1 – Biodiversity Assessment (BAM Stage 1), includes assessment of the:
  - landscape context;
  - native vegetation, threatened ecological communities (TECs), vegetation integrity; and
  - habitat suitability for threatened species.

- Part 2 – Impact Assessment (BAM Stage 2), details the:
  - proposed measures to avoid, minimise, and mitigate biodiversity impacts;
  - residual impacts (direct and indirect) of the proposed development; and
  - offset requirements relevant to the proposed development.

1.7.2 Technical Resources and Qualifications

This BCAR has been prepared by the following technical personnel:

- Dr Sam Reid – Senior Ecologist, Capital Ecology Pty Ltd.

  BSc (Hons), PhD, MEIANZ, Accredited BAM Assessor (No: BAAS20006).
  Sam was project manager and undertook or closely supervised data entry, GIS mapping, and report preparation.

- Robert Speirs – Director / Principal Ecologist, Capital Ecology Pty Ltd.

  BAppSc (Ecology), DipPM, MEIANZ, CEnvP-E, Accredited BAM Assessor (No: BAAS17089).
  Robert was project director and undertook or reviewed/supervised all aspects of the project.

- Shannon Thompson – Field Ecologist

  BSc
  Shannon undertook field surveys and data entry.

- Dr Catherine Ross – Consultant Ecologist

  BSc (Hons), PhD
  Catherine undertook field surveys and data entry.

- Belinda Wilson – Field Ecologist

  BSc (Hons), PhD Candidate
  Belinda undertook field surveys and data entry.

- Kristy Lee – Field Ecologist

  BSc
  Kristy undertook field surveys.

All surveys for this assessment were undertaken in accordance with the following.

- Capital Ecology's (Robert Speirs – Principal Investigator) Animal Research Authority (ARA) granted under the NSW Animal Research Act 1985 by the NSW Department of Primary Industries Secretary's Animal Care and Ethics Committee (CSB 15/2046).
- Capital Ecology's NSW Scientific Licence issued by the NSW Office of Environment and Heritage under s 132 C of the NSW National Parks and Wildlife Act 1974 (SL101623).

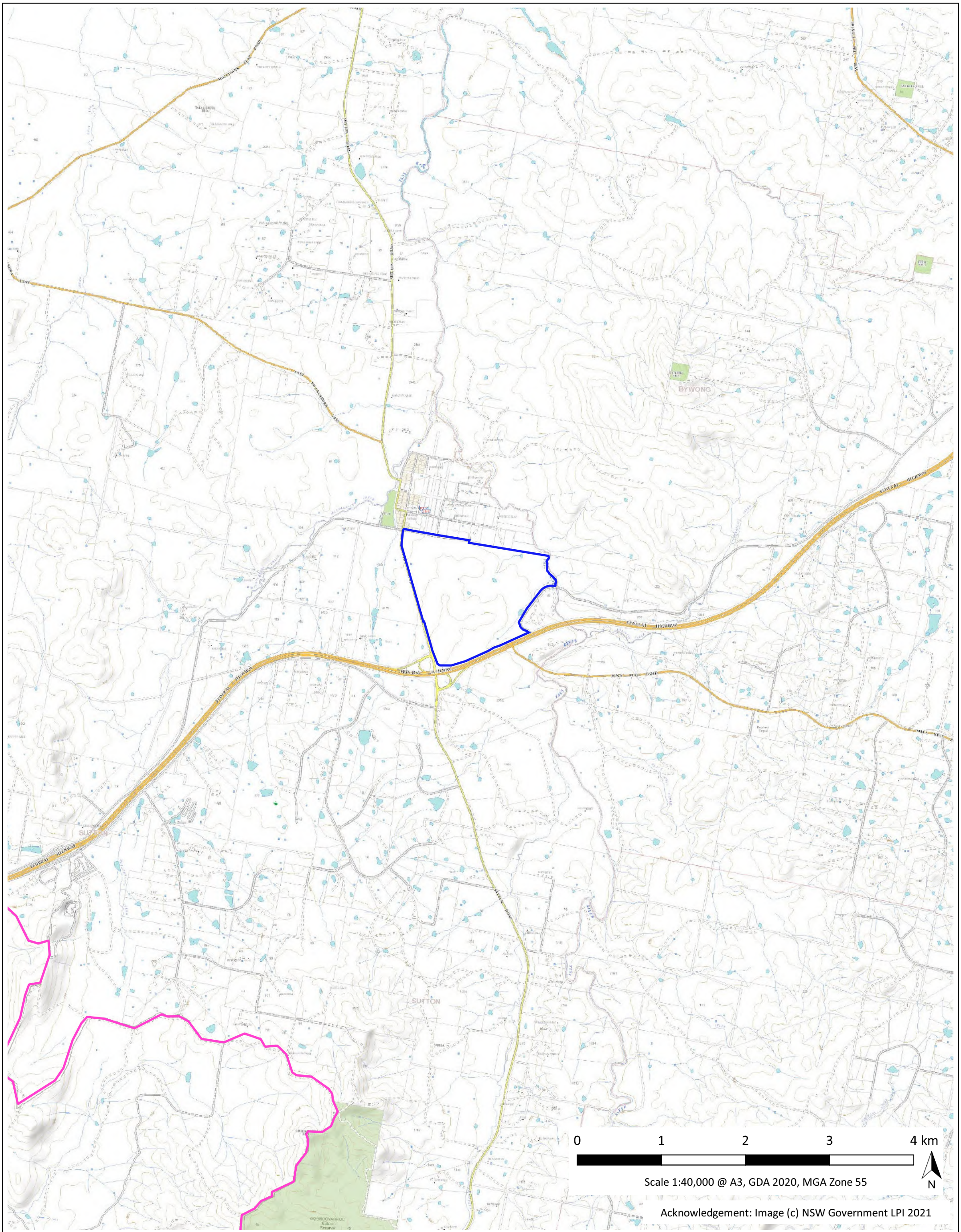

Figure 1. Locality Plan

Legend

- Australian_Capital_Territory_Border
- Subject Land

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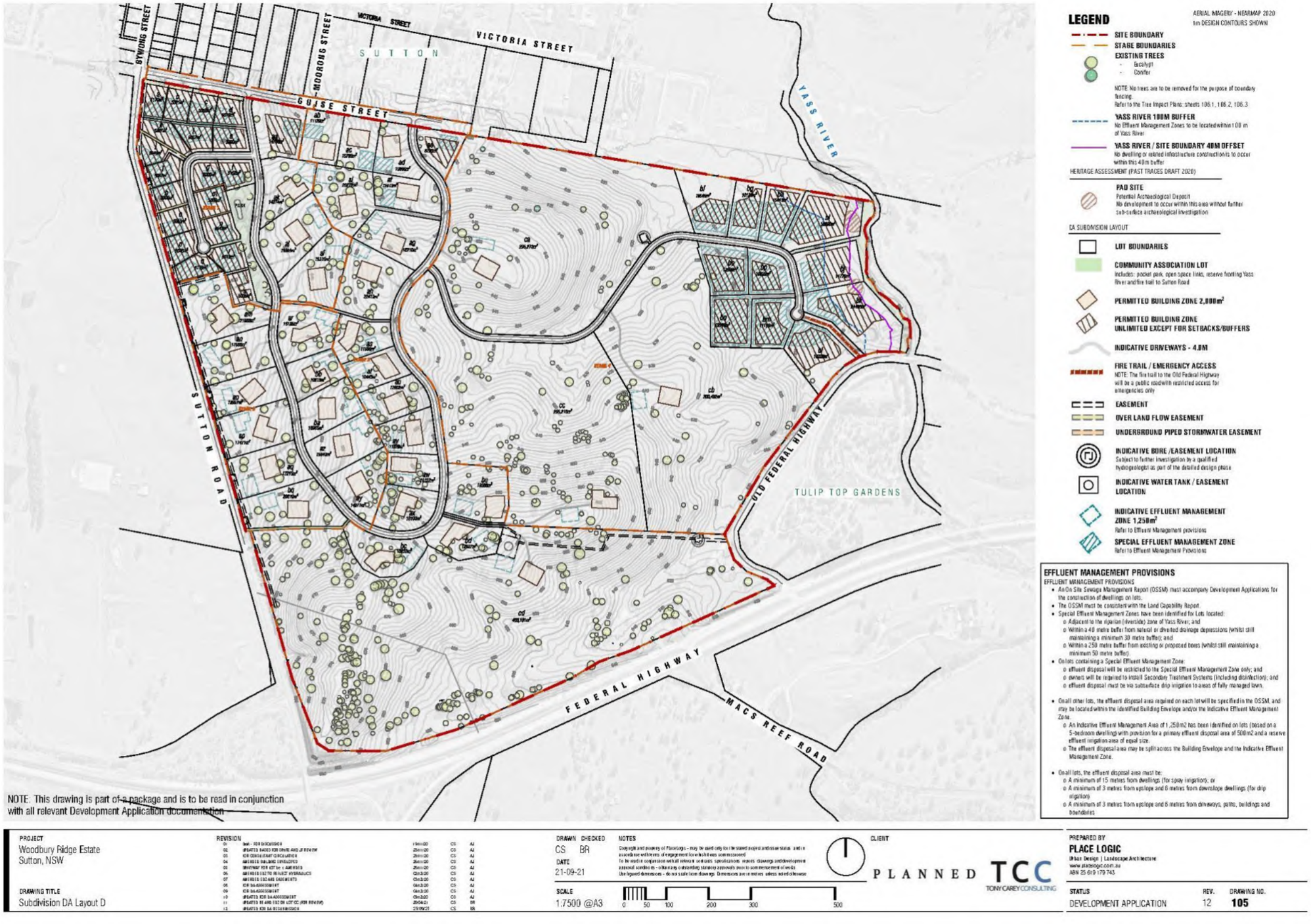
Date: 18 September 2021

capital ecology

Figure 2. The Proposed Development



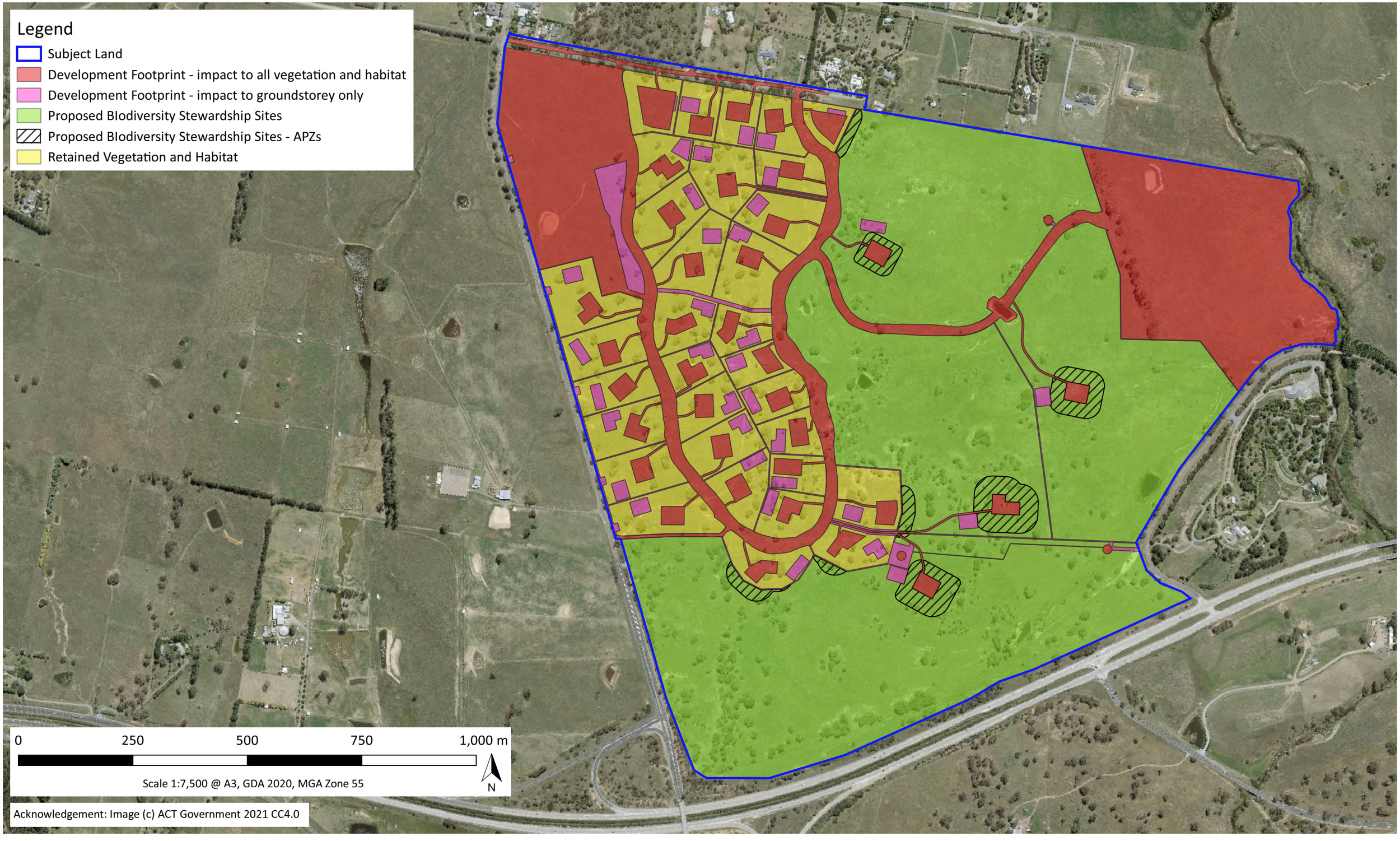


Figure 3. The Subject Land and Proposed Development on Aerial Imagery

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2 Part 1 – Biodiversity Assessment (BAM Stage 1)

Part 1 of this BCAR provides an assessment of the biodiversity values of the subject land as set out in Stage 1 of the BAM.

2.1 Landscape Context

As detailed in Chapter 4 of the BAM, a range of landscape features must be identified where they occur in the subject land or within the assessment area surrounding the subject land. These features may contain/support biodiversity values that are important for the site context of the subject land, or for informing the likely habitat suitability of the subject land. Table 1 outlines the landscape features and overall landscape context of relevance to the subject land.

Table 1. Landscape features.

Landscape Feature	Description	Figure Reference
IBRA bioregion	The subject land occurs in the **South Eastern Highlands** IBRA bioregion.	-
IBRA subregion	The subject land occurs in the **Murrumbateman** IBRA subregion.	-
BioNet NSW landscapes (Mitchell landscapes)	The subject land contains three Mitchell Landscapes: **Dalton Hills**, **Yass Channels and Floodplain**, and **Upper Murrumbidgee Channels and Floodplains**. Dalton Hills is defined as the Mitchell Landscape in the online BAM Calculator as it covers the greatest proportion of the subject land.	-
Rivers, streams and estuaries (Strahler[21] stream order)	The subject land supports one drainage line associated with a dam, and one 1st order tributary (defined based on the NSW LPI Hydrology Map and as per Appendix 3 of the BAM) that flows along the south-eastern boundary and then into Yass River. The drainage line and tributary were dry at the time of survey, are only likely to convey water following substantial rain events, and do not support any riparian vegetation. The lack of native riparian vegetation indicates that the drainage line and tributary are unlikely to provide habitat of significance to aquatic/riparian flora or fauna. The north-eastern boundary of the subject land boarders Yass River and includes a small section of the associated riparian vegetation. This vegetation is composed of a variety of exotic trees, shrubs, grasses, and broadleaf weeds. There are four large dams and four small dams in the subject land, none of which supported any native riparian vegetation. All of the dams held a small to moderate amount water at the time of survey and are only likely to be of limited value to the common native water birds, herbivores, reptiles, and amphibians which occur in the locality.	Figure 4 Figure 6
Wetlands (important wetlands)	The subject land does not contain any important wetlands as listed in the Directory of Important Wetlands in Australia (DIWA) or coastal wetlands protected under *State Environmental Planning Policy No 14*.	-
Connectivity	Before European occupation, the subject land would have been characterised by a dry sclerophyll forest along the elevated areas in the	Figure 5

[21] Strahler, AN (1952). *Hypsometric (area-altitude) analysis of erosional topology*. Geological Society of America Bulletin 63 (11): 1117–1142.

Landscape Feature	Description	Figure Reference
	south-west that merged with an open grassy woodland lower in the landscape. However, the subject land has been modified by its current and past land use, which has primarily been grazing. Approximately 50% of the original woody vegetation (canopy, midstorey, and shrubstorey) has been historically cleared across the subject land to promote pastoral productivity. The areas which have retained a woody overstorey have, in general, still undergone historic thinning and lack a midstorey and shrubstorey. The 50% of the subject land that has retained a native overstorey is likely to be of habitat value to a variety of native fauna. These areas are connected to similar strands of native vegetation that occurs outside of the subject land to both the north and south. The vegetation that occurs outside of the subject land ultimately extends to large expanses of more intact vegetation to the west. As such, the portions of the subject land that have retained a native overstorey are likely to comprise part of a biodiversity corridor and be important for habitat connectivity throughout the locality. This is supported by the fact that the subject land contains low 'Local Links' and low to moderate 'Regional Linkage Value' on the ACT Government's ACTmapi[22]. However, as the subject land is surrounded by road infrastructure (Sutton Road and the Federal Highway), urban development (Sutton Township), natural barriers (Yass River), and cleared agricultural land, the noted biodiversity corridor is only likely to be of particular significance to highly mobile species, such as birds.	Figure 6
Areas of geological significance and soil hazard	The subject land does not contain/support any karst, caves, crevices, cliffs, or other areas/features of geological significance. There are no hazard soil features.	-
Areas of outstanding biodiversity value	The subject land does not support or occur near any declared area of outstanding biodiversity value (AOBV).	-
Percent native vegetation cover (buffer area)	A 1,500 m buffer was applied to the subject land resulting in an overall buffer area of 1,736 ha. This buffer area contains both woody PCTs (i.e. woodland, dry sclerophyll forest) and non-woody PCTs (i.e. natural grassland). Accordingly, the following two categories of native vegetation were defined to identify the total are of native vegetation in the buffer. 1. Woody vegetation – The areas which have a woody PCT and retain remnant woody vegetation or woody regrowth. 2. Non-woody vegetation – The areas which either: a. have a grassland PCT and retain at least a substantial proportionate cover (i.e. > 35%) of native groundstorey species; or b. have a woody PCT from which the woody vegetation has been cleared, yet at least a substantial proportionate cover (i.e. > 35%) of native groundstorey species remains (often referred to as derived or secondary grassland). Native vegetation cover was first identified and mapped via interpretation of the available aerial imagery (ACT Government aerial imagery and NSW LPI). The presence of remnant canopy trees, cultivation	Figure 5

[22] http://app.actmapi.act.gov.au/actmapi/index.html?viewer=ssvcrt

Landscape Feature	Description	Figure Reference
	patterns in paddocks, unnaturally green and/or uniform groundstorey vegetation etc., were important factors considered during aerial interpretation. Field reconnaissance was then undertaken to ground truth and refine the mapping where possible. This field reconnaissance involved driving the publicly accessible roads within the buffer area and making observations across paddocks etc. from the roadside. 1. Woody vegetation cover – 609 ha (35%) of the buffer area was determined to support native woody vegetation cover. 2. Non-woody vegetation cover – 308 ha (18%) of the buffer area was determined to support native non-woody vegetation cover. ↓ Total native vegetation cover – the total area of native vegetation cover in the buffer area is 917 ha (53%). This falls into the >30–70% cover class in the BAM Calculator.	

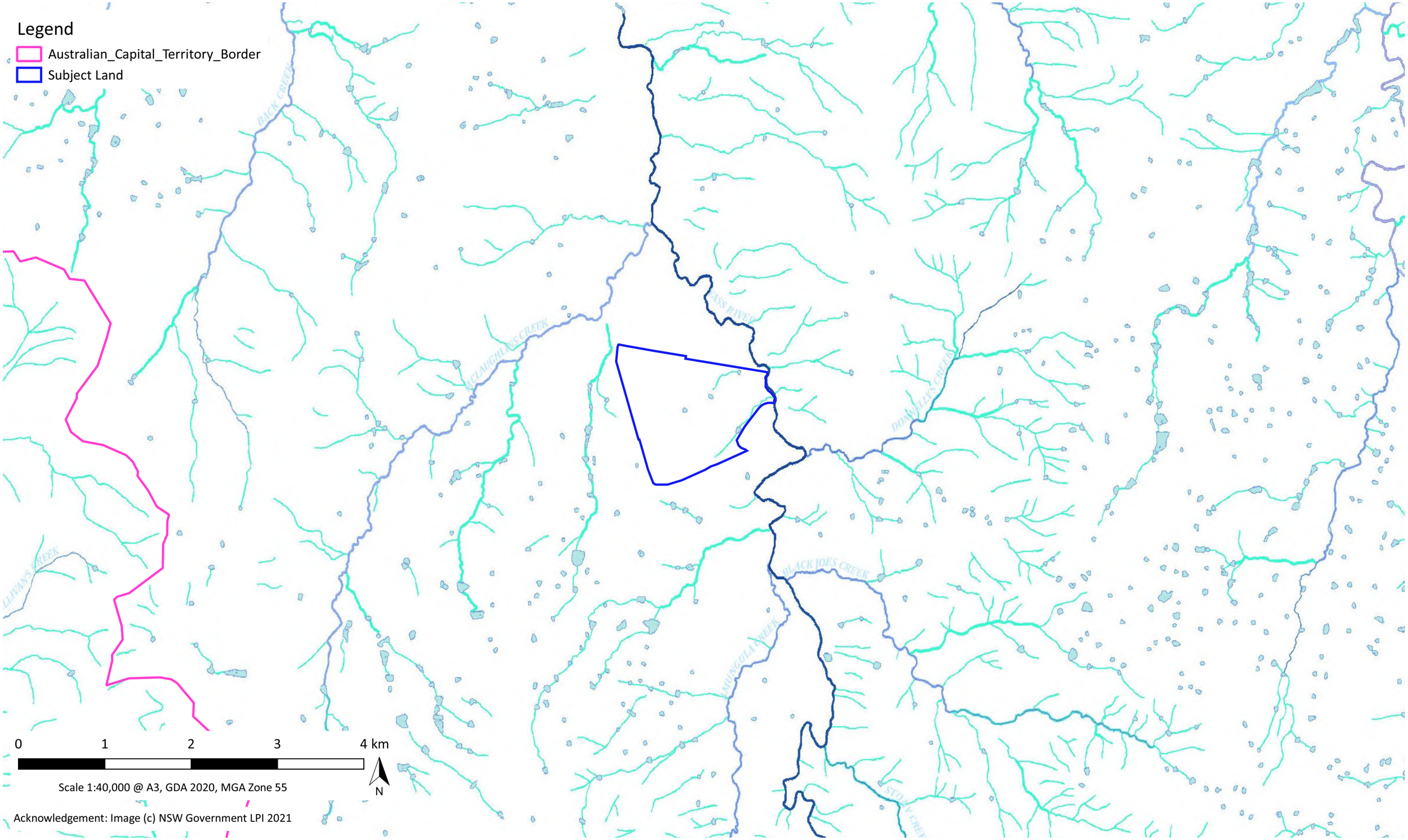

Figure 4. Hydrology

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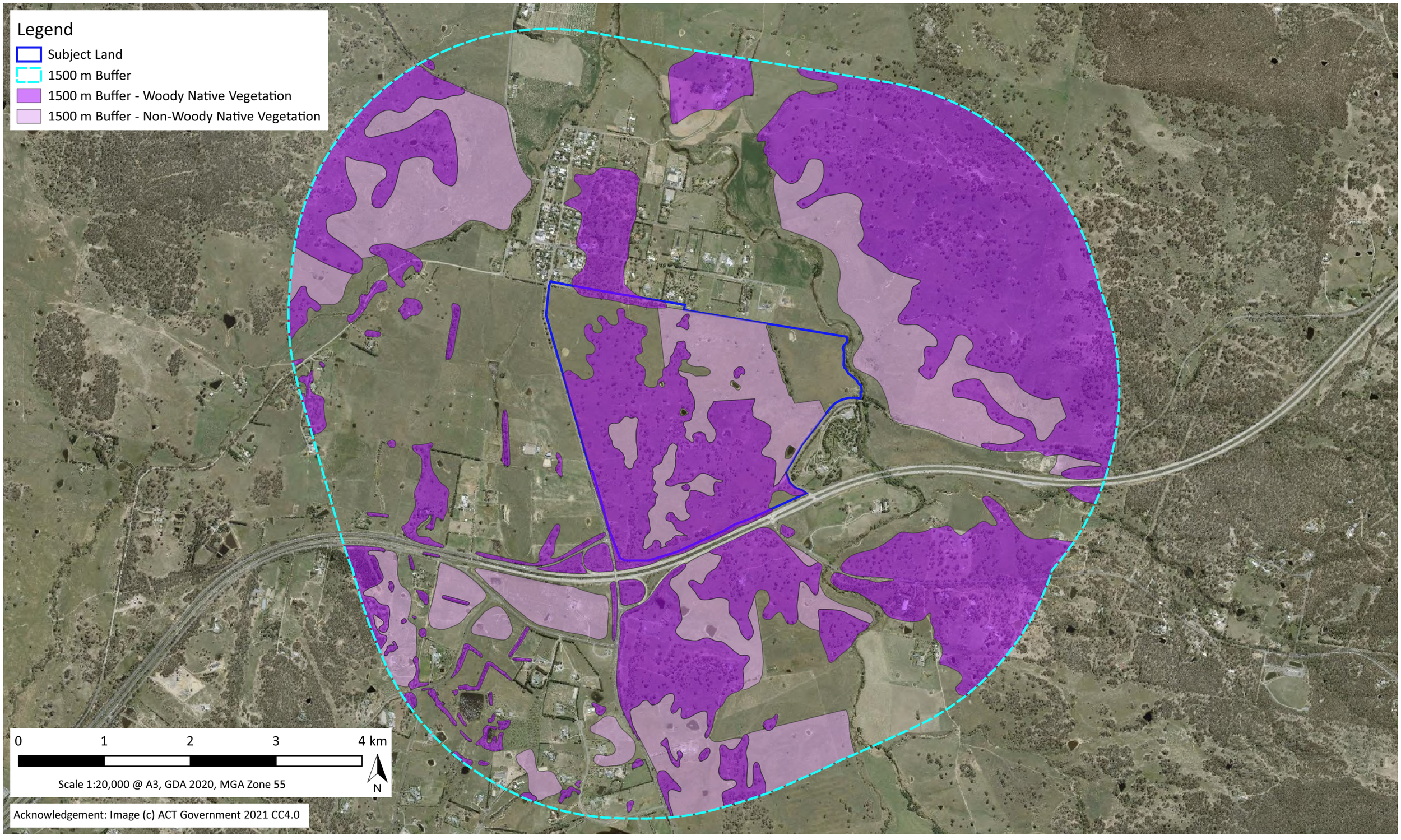

Figure 5. Site Map

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2.2 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

2.2.1 Native vegetation extent

As per the BC Act, native vegetation is defined according to Part 5A of the *Local Land Services Act 2013* (LLS Act), which states:

> *"(1) For the purposes of this Part, native vegetation means any of the following types of plants native to New South Wales:*
>
> *(a) trees (including any sapling or shrub or any scrub),*
>
> *(b) understorey plants,*
>
> *(c) groundcover (being any type of herbaceous vegetation),*
>
> *(d) plants occurring in a wetland.*
>
> *(2) A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible."*

As per this definition, planted vegetation which comprises plant species native to NSW, regardless of whether or not the species are indigenous to the specific region and/or PCT of the subject land, is classified as native vegetation.

The Commonwealth Government[23,24], ACT Government[25], and previous NSW Government[26] assessment guidelines for the temperate grassland and woodland PCTs of the NSW/ACT Southern Tablelands region each declare vegetation as native dominant if 50% or more of the perennial groundlayer is comprised of native species. However, no such threshold is defined by the BAM, and advice from DPIE has been that the criteria for use in determining native vs. exotic dominance must be more stringent than the previously applied 50/50 rule. It is understood that this is due to the potential for seasonal variation and/or assessor disparity to substantially alter the BAM mapping result. For example, a patch of vegetation that is classified as 55% native in one season may be classified as 45% native in another.

With regard to the above, for the purposes of this BCAR (and the supporting BAM assessment):

1. 'Native vegetation' is defined as any plant, naturally occurring or planted, which is native to NSW.
2. Exotic vegetation is defined as any plant which is not native to NSW.

[23] Commonwealth of Australia (2006). *Policy Statement 3.5: White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands*. Commonwealth Department of Environment and Heritage.
[24] Commonwealth of Australia (2016). *Approved conservation advice for the Natural Temperate Grassland of the South Eastern Highlands (NTG–SEH) ecological community*.
[25] ACT Government (2010). *Survey guidelines for determining lowland vegetation classification and condition in the ACT*. Environment and Sustainable Development Directorate – Conservation Planning and Research.
[26] NSW Government (2014). *BioBanking Assessment Methodology 2014*. NSW Government Office of Environment and Heritage.

3. A polygon of vegetation is 'native vegetation' if:

    a. 35% (i.e. approximately one-third) or more of the perennial groundlayer comprises species native to NSW; and/or

    b. species native to NSW are present in one or more of the other strata.

2.2.2 Vegetation survey and mapping methods

The vegetation throughout the entire subject land was surveyed and mapped in accordance with the BAM. Vegetation survey dates and survey effort are detailed in Table 2. The methodology involved the following.

- Mapping of the on-ground boundaries of the Plant Community Types (PCTs).
- Stratification of each PCT into vegetation zones reflecting the broad condition state of vegetation.
- The completion of a series of surveys to measure the composition, structure, and function attributes of the vegetation.

These steps are described in more detail below. The full BAM and supplementary resources are available online via the DPIE website https://www.environment.nsw.gov.au/biodiversity/assessmentmethod.htm.

It is important to note that the information and data collected during vegetation survey and mapping (Section 2.2.2.1 to 2.2.2.4) were also used to assess the subject land and development footprint for the presence/absence of habitat constraints and/or microhabitats for EPBC Act only listed species (Section 2.3.3), ecosystem credits species (Section 2.3.4), and species credit species (Section 2.3.5).

Table 2. Vegetation survey dates and survey effort.

Task	Method	Date	Personnel	Survey effort
PCT and Zone mapping	Random meander	14/10/2019 16/10/2019 24/10/2019 09/04/2021	1 person 1 person 1 person 1 person	8 hours 8 hours 3 hours 1 hour
Vegetation assessment	BAM plot	13/11/2019 14/11/2019	2 people 2 people	10 hours 15 hours
Tree habitat assessment	Tree survey	18/11/2020 09/04/2021 12/04/2021 09/09/2021 15/09/2021	2 people 1 person 1 person 2 people 2 people	5 hours 3 hours 3 hours 16 hours 16 hours

2.2.2.1 Plant Community Type (PCT) mapping

The on-ground boundaries of each of the Plant Community Types (PCTs) present in the subject land were mapped by marking boundaries directly onto high resolution orthorectified aerial photograph field maps. The PCTs and their characteristics are provided in the NSW Vegetation Information System (VIS) https://www.environment.nsw.gov.au/research/Vegetationinformationsystem.htm.

The PCTs were identified, and their boundaries defined, based on the:

- presence, species, growth form and density of remnant canopy trees and/or stags or stumps of these;
- presence and species of midstorey shrubs and trees;
- floristic composition of the groundstorey; and
- the landscape position and other geographical features (elevation, aspect, soils, apparent hydrology).

2.2.2.2 Vegetation zone definition and mapping

The mapped PCTs were further divided into vegetation zones based on the structure, floristic composition, and overall condition ('condition state') of the vegetation. The vegetation zones were mapped in the field and then digitised using GIS which provided accurate calculations of the total area of each vegetation zone in the subject land.

2.2.2.3 Survey Plots/Transects

A series of a BAM plots (i.e. vegetation assessment survey plot/transect sets) were completed to adequately sample each vegetation zone. As illustrated in Diagram 8 of NSW Government (2018a[27]), each BAM Plot involved:

a. one 20 x 20 m (400 m^2) plot, used to assess the composition and structure attributes;

b. one 20 x 50 m plot (1,000 m^2) plot, used to assess the function attributes; and

c. five 1 m^2 sub-plots, used to assess average little cover (and other optional groundcover components) for the plot.

All BAM plot locations were selected randomly within the vegetation zone, by marking on a map and walking to the location. As described in Section 1.5, the 'development footprint' only relates to the portions of the 'subject land' which will be impacted by the proposed development. BAM plot locations were spread throughout the entire subject land (refer to Figure 6). The information collected during this process was subsequently used to determine the condition of the vegetation present in the development footprint. This approach resulted in the assessment of a greater number of BAM plots than if the development footprint were considered in isolation, the outcomes of which are a more thorough assessment of the condition of the vegetation in the development footprint. This approach also ensured consistency between the assessment of vegetation and habitat in both the development footprint and the future Biodiversity Stewardship Sites (refer to Section 1.5).

The number of BAM plots completed in each vegetation zone of the subject land was determined as per the minimum required plot numbers specified in Table 4 of the BAM. As shown in Figure 6, a total of 30 plots were completed across nine vegetation zones.

[27] NSW Government (2018a). *Biodiversity Assessment Method Operational Manual – Stage 1*. State of New South Wales and Office of Environment and Heritage.

As stated in Section 5.1.1.5 of the BAM:

> *areas that are not native vegetation (i.e. land not included in native vegetation extent) do not require further assessment in the BAM except where:*
>
> *(a) they are proposed for restoration as part of an offset (refer to Stage 3)*
>
> *(b) they are assessed as habitat for threatened species according to Section 6.4.*

However, plots were completed in zones which did not meet the definition of BC Act 'native vegetation' (i.e. PCT1330 Zone 7, Figure 6 and Figure 7). Surveying all zones ensured that the vegetation composition (including an accurate determination of BC Act native vegetation presence/absence) and potential threatened species habitat were accurately assessed across all of the vegetation condition types present in the development footprint and subject land.

It is important to highlight that only those zones which occur in the development footprint and which are classified as BC Act native vegetation and/or threatened species habitat are subsequently used to determine the impact of the proposed development (refer to Section 2.2.4.5 and Section 3.2).

2.2.2.4 Tree habitat assessment

All of the mature remnant trees (i.e. >20 cm DBH) in the subject land were assessed for the presence of functional hollows and/or large stick nests. If either a functional hollow or large stick nest was observed, the tree was identified to species level and assessed for its value to native fauna. Particular attention was given to observations on fauna nesting in the hollows or in large stick nests. The location of any tree containing a functional hollow and/or large stick nest was recorded via hand-held GPS and the following data was taken (refer to Appendix C):

- tree number;
- tree species;
- diameter at breast height DBH (cm);
- approximate height (m); and
- characteristics of hollows and other habitat values such as nests, mistletoe etc.

2.2.3 BAM targeted survey methods

A number of threatened flora and fauna species were identified by the BAM as potentially occurring in the subject land (referred to as 'species credit species', see Section 2.3.5). Some of these species were excluded from further consideration based on factors such as habitat constraints, degraded habitat, geographical limitations, or the absence of required microhabitat features (refer to Table 22). Survey dates and survey effort for the remaining species credit species considered to have the potential to occur in the subject land are detailed in Table 3.

When combined with vegetation survey and mapping (Table 2), the survey effort for this BCAR totalled 151-person hours plus an additional 176 hours of Anabat® recordings. Weather conditions for all survey dates are detailed in Table 4.

Table 3. Flora and fauna survey dates and survey effort.

Task	Method	Date	Personnel	Survey effort
Threatened flora survey	Transect Survey	09/10/2019	1 person	3 hours
	Opportunistic observations[28]	-	1-2 people	47 hours
Threatened bird survey	Area search	14/10/2019 24/10/2019 13/11/2019 09/10/2020 26/11/2020	1 person 1 person 1 person 1 person 2 people	2 hours 3.5 hours 0.5 hours 2.5 hours 5 hours
	Fauna nesting survey	18/11/2020 09/09/2021 15/09/2021	2 people 2 people 2 people	5 hours 16 hours 16 hours
	Opportunistic observations[29]	-	1-2 people	66.5 hours
Striped Legless Lizard tile survey	10-week tile survey program	20/09/2019 25/09/2019 01/10/2019 09/10/2019 14/10/2019 23/10/2019 30/10/2019 04/11/2019 11/11/2019 20/11/2019	2 people 2 people 2 people 2 people 2 people 2 people 2 people 2 people 2 people 2 people	2 hours 3.5 hours 2.5 hours 3.0 hours 3.5 hours 2 hours 3 hours 3 hours 2 hours 2 hours
Golden Sun Moth survey	Random meander through potential habitat	30/10/2019 11/11/2019 20/11/2019 05/12/2019	2 people 2 people 2 people 2 people	4.5 hours 3.5 hours 4 hours 3 hours
Threatened bat survey	Anabat®	20/11/2019 21/11/2019 22/11/2019 23/11/2019 24/11/2019 25/11/2019 26/11/2019 27/11/2019	Two Anabat® locations over eight nights (a total of 16 trap nights).	179 hours of recordings

Table 4. Survey weather conditions (Canberra Airport, ACT).

Date	Temperature Min-Max	Wind @ 9am	Cloud (8th)	Rain
03/09/2019	2.9 – 21.7°C	-	-	0 mm
20/09/2019	5.5 – 23.3°C	-	-	0 mm
25/09/2019	-0.9 – 17.9°C	-	-	0 mm
01/10/2019	5.6 – 21.1°C	-	-	0 mm

[28] During PCT and Zone mapping, BAM plots, and tree habitat assessment.
[29] During BAM Plots, Striped Legless Lizard surveys, and Golden Sun Moth surveys.

Date	Temperature Min-Max	Wind @ 9am	Cloud (8th)	Rain
09/10/2019	1.7 – 16.3°C	-	-	11.2 mm
14/10/2019	4.3 – 22.7°C	-	-	0 mm
16/10/2019	7.8 – 24.8°C	9 km/h	1	0 mm
23/10/2019	5.8 – 29.2°C	-	-	0 mm
24/10/2019	6.8 – 31.2°C	-	-	0 mm
30/10/2019	8.8 – 29.3°C	6 km/h	0	0 mm
31/10/2019	7.0 – 31.7°C	6 km/h	0	0 mm
04/11/2019	11.5 – 22.6°C	-	-	12.4 mm
11/11/2019	3.7 – 26.4°C	-	-	0 mm
13/11/2019	6.7 – 20.8°C	20 km/h	0	0 mm
14/11/2019	7.1 – 24.7°C	-	-	0 mm
20/11/2019	8.4 – 31.4°C	-	-	0 mm
21/11/2019	10.9 – 39.0°C	-	-	0 mm
22/11/2019	16.9 – 34.9°C	15 km/h	8	0 mm
23/11/2019	12.9 – 33.1°C	-	-	0 mm
24/11/2019	8.1 – 28.6°C	-	-	0 mm
25/11/2019	10.7 – 31.5°C	-	-	0 mm
26/11/2019	15.4 – 27.3°C	-	-	0 mm
27/11/2019	1.6 – 27.1°C	-	-	0 mm
05/12/2019	11.2 – 28.2°C	28 km/h	0	0 mm
09/10/2020	10.1 – 15.4°C	26 km/h	6	2.0 mm
18/11/2020	10.8 – 25.8°C	13 km/h	4	0 mm
26/11/2020	11.5 – 30.9°C	6 km/h	0	0 mm
09/04/2021	10.5 – 23.6°C	17 km/h	0	0 mm
12/04/2021	-2.6 – 16.9°C	9 km/h	0	0 mm
09/09/2021	-0.4 –19.9°C	22 km/h	0	0 mm
15/09/2021	10.5 – 23.6°C	7 km/h	0	0 mm

2.2.3.1 Threatened flora survey

Based on the location and the ecological communities present, the subject land was assessed as having the potential to support EPBC Act and/or BC Act listed threatened flora species. Some threatened flora species are identified by the BAM as a species credit species (refer to Section 2.3.5), which is a species for which presence/absence and habitat value cannot be reliably predicted by location, vegetation type, and vegetation condition. Accordingly, targeted surveys are required to determine the species credit value of the subject land for these species.

As threatened flora surveys are not specifically required for Biodiversity Stewardship Sites, targeted threatened flora surveys were restricted to the portions of the development footprint identified as potentially supporting threatened flora species, these being the less disturbed portions of PCT1093 (i.e. PCT1093 Zone 1) and PCT1330 (i.e. PCT1330 Zone 1 and Zone 5) (Figure 9). The other vegetation zones in the development footprint have been grazed and/or pasture improved/cultivated over the past 150 years and as such have been disturbed to the extent that they are considered unlikely to support habitat for threatened flora.

Accordingly, the threatened flora transect survey involved one ecologist walking multiple transects across the identified areas (totalling 3 hours of effective survey effort across approximately 0.3 ha of potential habitat), targeting threatened flora species (Figure 9). If detected, significant species were recorded via a GPS waypoint and, if a population, the population boundary was delineated via GPS.

A thorough inventory of the flora species occurring at a site on the NSW Southern Tablelands cannot be compiled from a small number of surveys undertaken at any particular time. For example, many groundstorey flora species, notably the orchids, lilies, and peas, are only readily identifiable during their short and seasonally variable flowering period. As such, an inventory of all species identified in the subject land was commenced during the preliminary field inspection (3 September 2019) and supplemented across all of the subsequent surveys undertaken until the final field survey (15 September 2021). This inventory is presented in Appendix B (flora). Maintaining an inventory in this manner ensures that the maximum possible diversity of species is recorded, and if present, any significant species are flagged. If detected, all significant species are recorded via a GPS waypoint and, if possible, the population size is counted or estimated.

2.2.3.2 Threatened bird survey

Based on the location and the ecological communities present, the subject land was assessed as having the potential to support EPBC Act and/or BC Act listed threatened bird species. Some threatened bird species are identified by the BAM as a species credit species (refer to Section 2.3.5). Accordingly, targeted surveys are required to determine the species credit value of the subject land for these species.

Therefore, six targeted threatened bird surveys were conducted across the portions of the subject land identified as potentially supporting threatened bird habitat, these being areas with a moderate to high canopy cover (Figure 10). As described in Section 5 of DEC (2004[30]), these surveys involved 'area searches' (Loyn 1986[31]) to identify and record the terrestrial birds occurring in the subject land (totalling 13.5 hours of effective survey effort). These surveys were timed to coincide with the nesting period for the significant bird species with the potential to occur in the subject land. If detected, significant species were recorded via a GPS waypoint and notes were taken on any nesting/breeding activity.

In addition, as mentioned in Section 2.2.2.4, all of the mature remnant trees (i.e. > 20 cm DBH) present in the subject land were assessed for fauna habitat features (Figure 10). At that time, these trees were also inspected for signs of fauna nesting in hollows and/or on large stick nests (e.g. individuals in hollows, scratch/chew marks, birds flying off nests, birds 'on station'). Particular attention was given to any signs of species credit species breeding in the development footprint.

A thorough inventory of the bird species occurring at a site on the NSW Southern Tablelands cannot be compiled from a small number of surveys undertaken at any particular time. As such, an inventory of all species identified in the subject land was commenced during the preliminary field inspection (3 September 2019) and supplemented across all of the subsequent surveys undertaken until the final field survey (15 September 2021). This inventory is presented in Appendix D (fauna). Maintaining an inventory in this manner ensures that the maximum possible diversity of species is recorded, and if present, any significant species are flagged. If detected, all significant species

[30] DEC (2004). *Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft)*. New South Wales Department of Environment and Conservation, Hurstville, NSW.
[31] Loyn, R.H. (1986). '*Birds in fragmented forests in Gippsland, Victoria'.* In Keast, A., Recher, H.F., Ford, H. and Saunders, D. (eds.). In Birds of Eucalypt Forests and Woodlands; Ecology, Conservation Management, RAOU; and Surrey Beatty and Sons.

identified are recorded via a GPS waypoint and, if possible, the population size is counted or estimated.

2.2.3.3 Striped Legless Lizard survey

The NSW Government has not developed survey guidelines for the Striped Legless Lizard *Delma impar*. As such, a program of roof tile surveys was undertaken in accordance with both the Commonwealth Government survey guidelines (Commonwealth of Australia 2011[32]) and the ACT Government survey guidelines (ACT Government 2015a[33]).

As per the ACT Government survey guidelines, tiles were placed in grids of 50 (10 rows of 5) with 5 m spacing. The guidelines state that sites with greater than 30 ha of potential habitat require 10 grids for the survey program. As the subject land contains greater than 30 ha of potential habitat, 10 grids were established. Therefore, 500 tiles were placed for the survey. The location of each grid was chosen to spatially separate the grids as much as practicable to obtain an adequate coverage of the subject land whilst still ensuring grids were placed in locations with appropriate Striped Legless Lizard habitat characteristics. Where possible, grids were therefore placed in open grassland with a well-defined grass tussock structure. The location of each corner of the grid was marked with a GPS (accurate +/- 3m) and each tile was assigned a unique number (refer to Figure 12).

Following a two week 'settling in' period, each tile was checked once per week for 10 weeks. Surveys commenced on 20 September 2019 and were completed on 20 November 2019. All tiles were checked between 0730 hrs and 1230 hrs, with the exact timing of each check chosen to reflect the weather conditions. In this regard, checks were timed to occur when the tiles were warm to the touch, but not hot. Start time, finish time, and weather conditions were recorded for each check.

Any captured Striped Legless Lizard had the following data recorded.

- Location (tile number).
- Snout-to-vent (SVL) length (mm).
- Total length (mm).
- Tail condition (Full/Regrowth).
- Other relevant biometrics (markings, colour, age, etc.).
- A macro photograph of the dorsal head scales. This photo was taken as the dorsal head scales of Striped Legless Lizard are unique to each individual and can therefore be used to determine the number of unique captures across the 10-week survey period.

Once processed, captured Striped Legless Lizards are released beside the tile of capture, allowing them to move back beneath the tile or to a tussock adjacent to the tile. All other vertebrate fauna found under the tiles were visually identified to species level (refer to Appendix E).

2.2.3.4 Golden Sun Moth survey

The NSW Government has not developed survey guidelines for the Golden Sun Moth *Synemon plana*. As such, a program of four targeted Golden Sun Moth (GSM) surveys was undertaken in

[32] Commonwealth of Australia (2011). *Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for the vulnerable striped legless lizard, Delma impar – EPBC Act policy statement 3.28.*
[33] ACT Government (2015a). *Survey Guidelines for Striped Legless Lizard*. Conservation, Planning and Research, Environment and Sustainable Development Directorate.

accordance with the Commonwealth Government survey guidelines (Commonwealth of Australia 2009a[34]) and the ACT Government survey guidelines (ACT Government 2014[35]).

Each survey involved two ecologists walking transects approximately 50-100 m apart across the estimated extent of potential habitat[36] (refer to Figure 13). All observed male Golden Sun Moth flights (usually up to 20 m ahead or to either side of the ecologist) were marked via a hand-held GPS.

On each survey day, moths were confirmed to be flying in the ACT region via pre-survey checks of known habitat and/or email and phone communication with other ecologists conducting Golden Sun Moth surveys in the region.

The details of the four survey days and relevant survey conditions are provided in Table 5. In summary, the targeted surveys were undertaken during good to optimal survey conditions on days when moderate to high numbers of Golden Sun Moth were confirmed to be flying.

A GPS track was recorded for each survey; these are illustrated in Figure 13. As shown on Figure 13, effort was made to vary the alignment of the transects between surveys in order to achieve the best possible coverage of the subject land. Whilst the surveys are primarily focused on recording male Golden Sun Moth flights, the ecologists also examined the ground for female moths and pupal cases, particularly in the areas considered to have the highest potential for Golden Sun Moth occurrence.

Based on observations from the subject land and additional Golden Sun Moth survey sites throughout the ACT and NSW, it is important to note that the 2019 Golden Sun Moth flying season was unusual in comparison to previous years in that it started early (from late October), was short (ending by approximately the first week of December), and included large numbers of moths flying during non-ideal conditions (e.g. during windy days). This unusual season was likely due to the dry winter and early spring followed by dry and hot conditions prior to and throughout the flying season. In addition, Capital Ecology found that Golden Sun Moths were widely observed at moderate to high densities across most of our project sites in 2019, including sites in Yass, Murrumbateman, Sutton, and various locations across the ACT.

[34] Commonwealth of Australia (2009a). *Background Paper to EPBC Act Policy Statement 3.12 - Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana)*. Department of Environment, Water, Heritage and the Arts.

[35] ACT Government (2014). *Survey Guidelines for Golden Sun Moth*. Conservation, Planning and Research, Environment and Sustainable Development Directorate.

[36] Golden Sun Moth surveys did not occur in Guise Street as this portion of the proposed development was not initially included in the subject land. Golden Sun Moth habitat in Guise Street has therefore been assumed based on the characteristics of the groundstorey and the extent of confirmed habitat in the immediately adjoining areas of Woodbury Ridge.

Table 5. Golden Sun Moth survey conditions.

Date: 31/10/2019 (Survey 1)				**Observer/s:** ST, KL
Survey Site: Woodbury Ridge, Sutton, NSW				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1115	27.0	7 WNW	0/8	Hazy but appropriate conditions - hot, sunny, light breeze.
Finish: 1330	29.6	13 WNW	1/8	
General site notes:				
Many flying GSM males recorded during survey. The ACT GSM email forum notes that large numbers of males were also confirmed flying near Sutton (NSW), Yass (NSW), and at various locations throughout the ACT.				
Date: 11/11/2019 (Survey 2)				**Observer/s:** ST, KL
Survey Site: Woodbury Ridge, Sutton, NSW				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1220	22.0	32 NW	1/8	Breezy conditions.
Finish: 1405	24.0	38 NW	1/8	
General site notes:				
Many flying GSM males recorded during survey. The ACT GSM email forum notes that large numbers of males were also confirmed flying near Sutton (NSW), Queanbeyan (NSW), and at various locations throughout the ACT.				
Date: 20/11/2019 (Survey 3)				**Observer/s:** ST, JM
Survey Site: Woodbury Ridge, Sutton, NSW				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 0900	15.6	11 NE	0/8	Ideal conditions.
Finish: 1100	20.5	7 NW	0/8	
General site notes:				
Some flying GSM males recorded during survey, but less than on previous occasions. The ACT GSM email forum notes that low to moderate numbers of males were also confirmed flying near Queanbeyan (NSW) and at various locations throughout the ACT.				
Date: 05/12/2019 (Survey 4)				**Observer/s:** SR, JM
Survey Site: Woodbury Ridge, Sutton, NSW				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1000	21.1	32 NW	1/8	Breezy conditions.
Finish: 1130	24.3	35 W	2/8	
General site notes:				
Few flying GSM males recorded during survey.				

2.2.3.5 Threatened bat surveys

Two Anabat® detectors were deployed over eight nights (20-27 November 2019), the locations of which are illustrated in Figure 14. Locations were chosen to survey across a variety of the habitat types present in the development footprint. The weather conditions during the survey period are detailed in Table 4. The data from the Anabat® surveys were provided to Fly By Night Bat Surveys Pty Ltd for expert analysis and identification of the species recorded, the results of which are presented in Appendix F.

2.2.4 Vegetation survey and mapping results

2.2.4.1 Plant Community Type (PCT) mapping

Before European occupation, the subject land would have been characterised by a dry sclerophyll forest along the elevated areas in the south-west that merged with an open grassy woodland lower in the landscape (Figure 6, Table 6).

However, the subject land has been modified by its current and past land use, which has primarily been stock grazing. Approximately 50% of the original woody vegetation (canopy, midstorey, and shrubstorey) has been historically cleared across the subject land to promote pastoral productivity. The areas which have retained a woody overstorey have, in general, still undergone historic thinning and now lack a midstorey and shrubstorey. Despite the history of grazing, the groundstorey across the majority of the subject land is largely dominated by native species. The exceptions to this are a recently cultivated paddock in the north-east of the subject land that is dominated by exotic pasture species (especially Phalaris *Phalaris aquatica*), and a historically cultivated paddock in the north-west of the subject land that is dominated by a mix of native and exotic species (particularly Phalaris, Tall Speargrass *Austrostipa bigeniculata*, Red-leg Grass *Bothriochloa macra,* and Wallaby Grasses *Rhytidosperma* spp.).

In general, the areas that have retained a native groundstorey are dominated by a mix of Speargrasses *Austrostipa* spp., Red-leg Grass, and Wallaby Grasses, and support a low diversity of native species. However, two substantial patches of vegetation in the south-east and south-west of the subject land are dominated by Kangaroo Grass *Themeda triandra* and support a moderate to high diversity of native species; these areas largely occur within the proposed Biodiversity Stewardship Sites and will therefore be protected and managed.

The riparian vegetation in the subject land is limited to a small area along the north-eastern boundary adjacent to Yass River. This vegetation is composed of a variety of exotic trees, shrubs, grasses, and broadleaf weeds.

Table 6. PCTs recorded in the subject land.

PCT	PCT name	PCT description	Occurrence in subject land	TEC status Commonwealth / NSW	PCT % cleared
1093	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	This community occurs on ridges and slopes between 550 m and 1150 m on the Southern and Central Tablelands. In its climax form this community would have been characterised by a low open forest or woodland with a canopy dominated by Red Stringybark, Brittle Gum and Inland Scribbly Gum and an understorey of sclerophyll shrubs with a sparse groundlayer.	This PCT was mapped across the elevated areas of the subject land.	Not listed.	61%

PCT	PCT name	PCT description	Occurrence in subject land	TEC status Commonwealth / NSW	PCT % cleared
1330	Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Woodland with a sparse shrub layer and dense grassy groundcover. Occurs on loamy soils on undulating terrain between 500 m and 900 m on the tablelands.	This PCT was mapped across the majority of the subject land.	Critically Endangered (Commonwealth and NSW) when occurring in a condition consistent with the listing criteria of the TEC.	92%

2.2.4.2 Vegetation zones

As detailed in Table 7 to Table 8 and shown in Figure 6, PCT1093 was determined to comprise the following two discernible vegetation zones.

- PCT1093 Zone 1 – mature canopy, native dominant understorey, and moderate to high native forb diversity.
- PCT1093 Zone 2 – mature canopy, native dominant understorey, and low native forb diversity.

As detailed in Table 9 to Table 15 and shown in Figure 6, PCT1330 was determined to comprise the following seven discernible vegetation zones.

- PCT1330 Zone 1 – mature canopy, regeneration, native dominant understorey, and moderate to high native forb diversity (EPBC Act and BC Act Box-Gum Woodland).
- PCT1330 Zone 2 – mature canopy, regeneration, native dominant understorey, and low native forb diversity (EPBC Act and BC Act Box-Gum Woodland).
- PCT1330 Zone 3 – mature canopy, native dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland).
- PCT1330 Zone 4 – mature canopy, exotic dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland).
- PCT1330 Zone 5 – no canopy, native dominant understorey, and moderate to high native forb diversity (EPBC Act and BC Act Box-Gum Woodland).
- PCT1330 Zone 6 – no canopy, native dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland).
- PCT1330 Zone 7 – no canopy, exotic dominant understorey, and low native forb diversity.

All zones apart from PCT1330 Zone 7 meet the definition of BC Act 'native vegetation' (Figure 7). PCT1330 Zone 7 does not meet the definition of BC Act 'native vegetation' as it has a groundstorey clearly dominated by exotic grasses and forbs (i.e. > 65% perennial exotic) and lacks a cover of native trees and/or shrubs. As per Chapter 5 of the BAM, PCT1330 Zone 7 does not require assessment to determine a vegetation integrity score unless it is found to support threatened species habitat. As

detailed in Table 22 and Section 2.3.5.2, portions of PCT1330 Zone 7 are identified as habitat for a threatened species (Golden Sun Moth) and therefore require assessment to determine a vegetation integrity score. As such, all vegetation zones in the development footprint are assessed to determine vegetation integrity scores and the impact associated with the proposed development.

2.2.4.3 Tree habitat assessment

The subject land contains 168 hollow-bearing remnant trees that support combined total of 527 functional hollows (Figure 6, Appendix C). The proposed development will impact a total of 45 remnant trees, five of which support functional hollows.

Table 7. PCT1093 Zone 1 results summary.

	PCT1093 Zone 1
Description	Dry Open Forest – Moderate to High Diversity Three small patches of relatively intact vegetation, with a canopy representative of the climax community. Some scattered shrubs and regeneration of the overstorey. Moderate to high diversity groundlayer dominated by perennial native grasses and a variety of forbs. Lightly to moderately grazed by stock and Eastern Grey Kangaroos *Macropus giganteus*. This zone is entirely restricted to the proposed Biodiversity Stewardship Sites.
Area – subject land	2.90 ha.
Area – development footprint	0.25 ha.
BAM plots assessed	2.
Overstorey Species	Dominant = *E. rossii.* Associate = *E. goniocalyx* and *E. mannifera.*
Overstorey Cover	15% - 50%.
Overstorey Regeneration	Yes (scattered).
Perennial Groundlayer	99% native, with 10 - 13 native non-grass understorey species.
Significant Weeds	St John's Wort *Hypericum perforatum*.
EPBC Act and/or BC Act listed TEC	No.
BC Act Native Vegetation	Yes.

Table 8. PCT1093 Zone 2 results summary.

	PCT1093 Zone 2
Description	Dry Open Forest – Low Diversity Contains a canopy representative of the climax community, but there is very little regeneration and the midstorey and shrubstorey are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses. The density of significant weed species is low, but there some signs of historic cultivation. Lightly to highly grazed by stock and Eastern Grey Kangaroos.
Area – subject land	8.74 ha.
Area – development footprint	2.32 ha.
BAM plots assessed	3.
Overstorey Species	Dominant = *E. rossii.* Associate = *E. goniocalyx* and *E. mannifera.*
Overstorey Cover	0% - 30%.
Overstorey Regeneration	Yes (scattered).
Perennial Groundlayer	55% - 99% native, with 1 - 7 native non-grass understorey species.
Significant Weeds	St John's Wort.
EPBC Act and/or BC Act listed TEC	No.
BC Act Native Vegetation	Yes.

Table 9. PCT1330 Zone 1 results summary.

	PCT1330 Zone 1
Description	Yellow Box - Blakely's Red Gum Grassy Woodland – Moderate to High Diversity Moderately intact vegetation, with a thinned canopy representative of the climax community. Some scattered shrubs and regeneration of the overstorey. Moderate to high diversity groundlayer dominated by perennial native grasses, notably Kangaroo Grass. Lightly grazed by stock and Eastern Grey Kangaroos. This zone is largely restricted to the proposed Biodiversity Stewardship Sites.
Area – subject land	19.58 ha.
Area – development footprint	0.28 ha.
BAM plots assessed	3.
Overstorey Species	Dominant = *E. melliodora*.
Overstorey Cover	5% - 20%.
Overstorey Regeneration	Yes.
Perennial Groundlayer	96% - 100% native, with 11 - 18 native non-grass understorey species.
Significant Weeds	St John's Wort, Serrate Tussock *Nassella trichotoma*, and Briar Rose *Rosa rubiginosa*.
EPBC Act and/or BC Act listed TEC	Yes (EPBC Act and BC Act).
BC Act Native Vegetation	Yes.

Table 10. PCT1330 Zone 2 results summary.

	PCT1330 Zone 2
Description	Yellow Box - Blakely's Red Gum Grassy Woodland – Low Diversity Contains a canopy representative of the climax community and low to moderate regeneration, but there is evidence of historic thinning and the midstorey and shrubstorey are largely absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Speargrass, Red-leg Grass, and Wallaby Grasses. Low to moderate density of significant weed species. Lightly to moderately grazed by stock and Eastern Grey Kangaroo.
Area – subject land	25.93 ha.
Area – development footprint	0.96 ha.
BAM plots assessed	4.
Overstorey Species	Dominant = *E. melliodora*. Associate = *E. bridgesiana.*
Overstorey Cover	0% - 25%.
Overstorey Regeneration	Yes.
Perennial Groundlayer	80% - 98% native, with 1 - 10 native non-grass understorey species.
Significant Weeds	St John's Wort, Serrated Tussock, Blackberry *Rubus fruticosus*.
EPBC Act and/or BC Act listed TEC	Yes (EPBC Act and BC Act).
BC Act Native Vegetation	Yes.

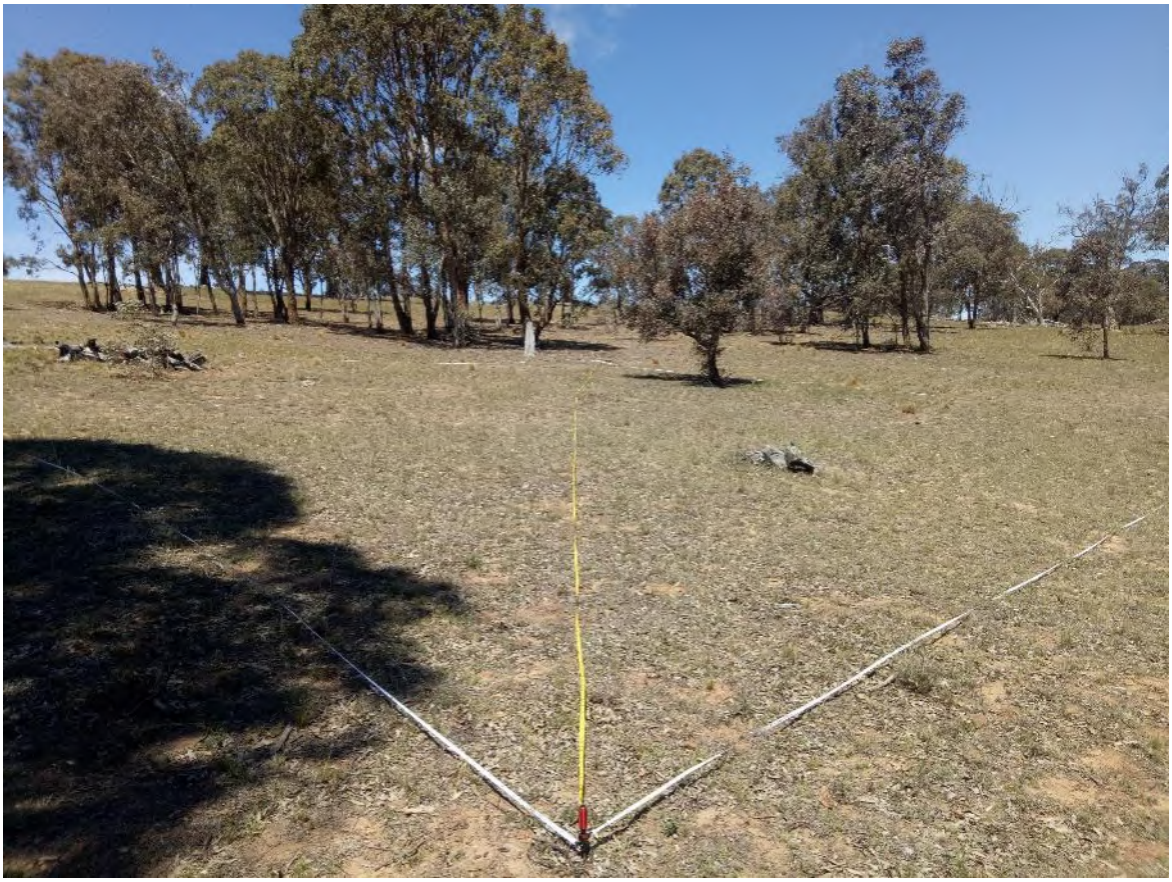

Table 11. PCT1330 Zone 3 results summary.

	PCT1330 Zone 3
Description	Yellow Box - Blakely's Red Gum Grassy Woodland – Low Diversity Contains a thinned canopy representative of the climax community and no regeneration. The midstorey and shrubstorey are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Speargrasses and Red-leg Grass. Low to moderate density of significant weed species. Lightly to moderately grazed by stock and Eastern Grey Kangaroos.
Area – subject land	14.28 ha.
Area – development footprint	4.76 ha.
BAM plots assessed	3.
Overstorey Species	Dominant = *E. melliodora*
Overstorey Cover	0% - 25%.
Overstorey Regeneration	No.
Perennial Groundlayer	22% - 79% native, with 1 - 5 native non-grass understorey species.
Significant Weeds	St John's Wort and Serrated Tussock.
EPBC Act and/or BC Act listed TEC	Yes (BC Act).
BC Act Native Vegetation	Yes.

Table 12. PCT1330 Zone 4 results summary.

	PCT1330 Zone 4
Description	Yellow Box - Blakely's Red Gum Grassy Woodland – Exotic Groundlayer Contains a thinned canopy representative of the climax community and no regeneration. The midstorey and shrubstorey are absent. Low diversity mixed native/exotic groundlayer dominated by Phalaris and disturbance tolerant native grasses. Moderate to high density of significant weed species. Moderately to highly grazed by stock and Eastern Grey Kangaroos.
Area – subject land	20.95 ha.
Area – development footprint	7.05 ha.
BAM plots assessed	4.
Overstorey Species	Dominant = *E. melliodora*. Associate = *E. bridgesiana.*
Overstorey Cover	0% - 20%.
Overstorey Regeneration	No.
Perennial Groundlayer	2% - 43% native, with 0 - 2 native non-grass understorey species.
Significant Weeds	Chilean Needlegrass *Nassella neesiana and* Serrated Tussock.
EPBC Act and/or BC Act listed TEC	Yes (BC Act).
BC Act Native Vegetation	Yes.

Table 13. PCT1330 Zone 5 results summary.

	PCT1330 Zone 5
Description	Yellow Box - Blakely's Red Gum Grassy Woodland – Moderate to High Diversity Derived Grassland Overstorey, midstorey, and regeneration are absent. Moderate to high diversity native groundlayer dominated by disturbance sensitive grasses, notably Kangaroo Grass. Lightly grazed by stock and Eastern Grey Kangaroos. This zone is almost entirely restricted to the proposed Biodiversity Stewardship Sites.
Area – subject land	11.88 ha.
Area – development footprint	0.58 ha.
BAM plots assessed	3.
Overstorey Species	None.
Overstorey Cover	0%.
Overstorey Regeneration	No.
Perennial Groundlayer	96% - 99% native, with 12 -19 native non-grass understorey species.
Significant Weeds	Saffron Thistle *Carthamus lanatus*, St John's Wort, Serrated Tussock, and Briar Rose.
EPBC Act and/or BC Act listed TEC	Yes (EPBC Act and BC Act).
BC Act Native Vegetation	Yes.

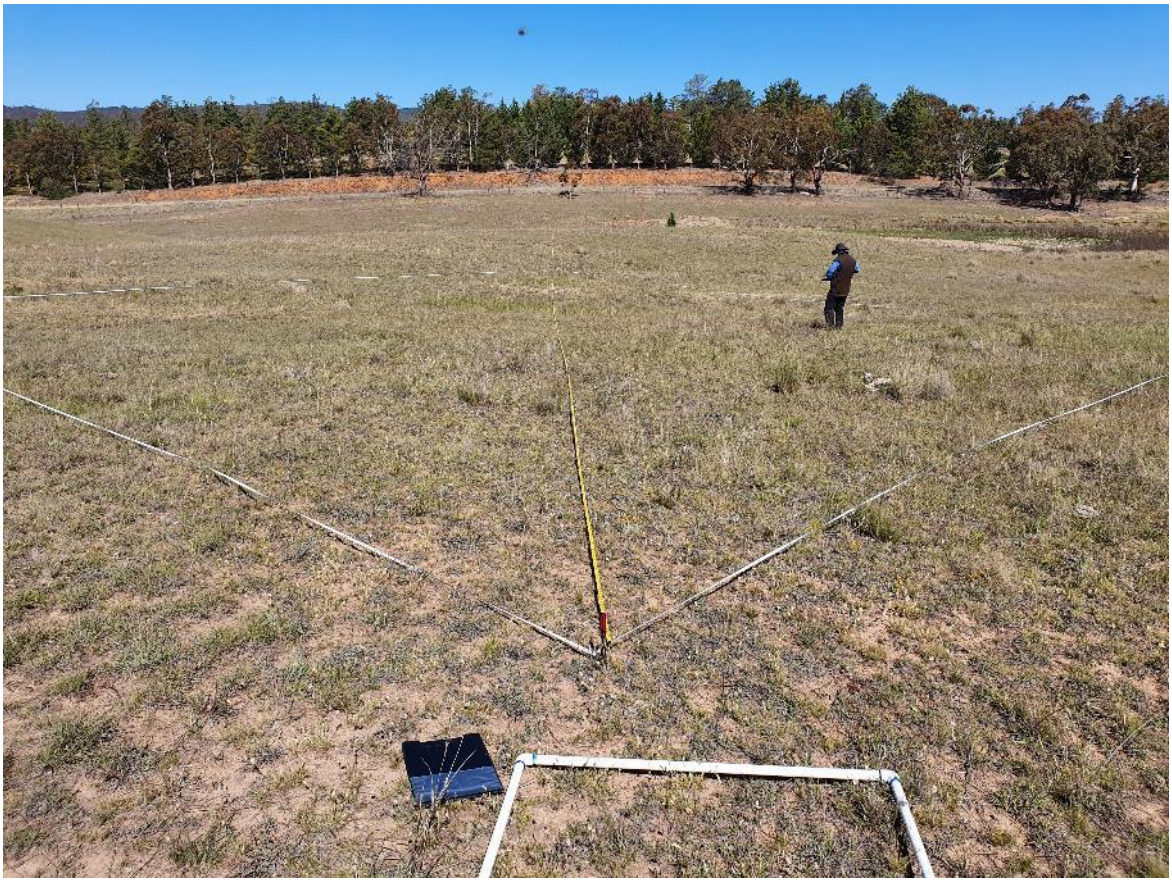

Table 14. PCT1330 Zone 6 results summary.

	PCT1330 Zone 6
Description	Yellow Box - Blakely's Red Gum Grassy Woodland – Low Diversity Native Pasture Overstorey, midstorey, and regeneration are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Speargrasses, Red-leg Grass, and Wallaby Grasses. Moderate density of significant weed species and moderately grazed by stock and Eastern Grey Kangaroos.
Area – subject land	41.87 ha.
Area – development footprint	6.38 ha.
BAM plots assessed	4.
Overstorey Species	None.
Overstorey Cover	0%.
Overstorey Regeneration	No.
Perennial Groundlayer	61% - 86% native, with 2 - 5 native non-grass understorey species.
Significant Weeds	Saffron Thistle, St John's Wort, Serrated Tussock, Briar Rose, and Blackberry.
EPBC Act and/or BC Act listed TEC	Yes (BC Act).
BC Act Native Vegetation	No.

Table 15. PCT1330 Zone 7 results summary.

	PCT1330 Zone 7
Description	Yellow Box - Blakely's Red Gum Grassy Woodland – Exotic Pasture Overstorey, midstorey, and regeneration are absent. Low diversity exotic groundlayer that shows signs of recent or historic pasture improvement and/or cultivation. Dominated by exotic pasture grasses, notably Phalaris. Moderate to high density of significant weed species. Moderately to highly grazed by stock and Eastern Grey Kangaroos.
Area – subject land	39.19 ha.
Area – development footprint	30.84 ha.
BAM plots assessed	4.
Overstorey Species	None.
Overstorey Cover	0%.
Overstorey Regeneration	No.
Perennial Groundlayer	8% - 64% native, with 0 - 4 native non-grass understorey species.
Significant Weeds	Paterson's Curse *Echium vulgare*, African Lovegrass *Eragrostis curvula*, St John's Wort, Chilean Needlegrass, Serrated Tussock, Briar Rose, and Blackberry.
EPBC Act and/or BC Act listed TEC	No.
BC Act Native Vegetation	No.

2.2.4.4 Patch size

As defined in the BAM, patch size is -

> *"an area of intact native vegetation that:*
>
> *a) occurs on the development site or biodiversity stewardship site, and*
>
> *b) includes native vegetation that has a gap of less than 100m from the next area of moderate to good condition native vegetation (or ≤30m for non-woody ecosystems).*
>
> *Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site."*

Where intact vegetation is defined as –

> *"vegetation where all tree, shrub, grass and/or forb structural growth form groups expected for a plant community type are present"*

With respect to the above, only PCT1093 Zone 1, PCT1093 Zone 2, PCT1330 Zone 1, and PCT1330 Zone 2 meet the definition of 'intact vegetation'. As shown in Figure 5, the intact native vegetation associated with these zones extends to the south and then east of the subject land for > 100 ha.

As detailed below, none of the remaining vegetation zones in the subject land meet the definition of intact vegetation as they lack some or all of the structural growth form groups expected of the PCT.

- PCT1330 Zone 3 lacks a midstorey, shrubstorey, and regeneration of the overstorey.
- PCT1330 Zone 4 lacks a midstorey, shrubstorey, regeneration of the overstorey, and native groundlayer.
- PCT1330 Zone 5 lacks an overstorey, midstorey, and regeneration of the overstorey.
- PCT1330 Zone 6 lacks an overstorey, midstorey, shrubstorey, and regeneration of the overstorey.
- PCT1330 Zone 7 lacks an overstorey, midstorey, shrubstorey, regeneration of the overstorey, and native groundlayer.

2.2.4.5 Vegetation integrity scores

As described in Section 1.5, the 'development footprint' only relates to the portions of the 'subject land' which will be impacted by the proposed development (refer to Figure 3). Zones which meet the definition of BC Act 'native vegetation' and which occur in the development footprint are used to determine vegetation integrity scores and the impacts associated with the proposed development (refer to Figure 7). Zones which do not meet the definition of BC Act native vegetation do not require further assessment in the BAM except where:

(a) they are proposed for restoration as part of an offset; or

(b) they are assessed as habitat for threatened species.

As detailed in Table 7 to Table 13 and shown in Figure 7, all zones apart from PCT1330 Zone 7 meet the definition of BC Act native vegetation. PCT1330 Zone 7 does not meet the definition of BC Act native vegetation as it has a groundstorey clearly dominated by exotic grasses and forbs (i.e. > 65% perennial exotic) and does not contain a cover of native trees and/or shrubs. As per Chapter 5 of the BAM, PCT1330 Zone 7 does not require assessment to determine a vegetation integrity score unless it is found to support threatened species habitat. As detailed in Table 22 and Section 2.3.5.2, portions of PCT1330 Zone 7 are identified as habitat for a threatened species (Golden Sun Moth) and therefore require assessment to determine a vegetation integrity score.

As such, all vegetation zones in the development footprint are assessed to determine vegetation integrity scores and the impact associated with the proposed development.

Table 16 presents the results of the BAM plot assessments and details the composition, structure, function, and resulting vegetation integrity score for all vegetation zones.

Table 16. Vegetation integrity scores.

	PCT1093		**PCT1330**						
	Zone 1	**Zone 2**	**Zone 1**	**Zone 2**	**Zone 3**	**Zone 4**	**Zone 5**	**Zone 6**	**Zone 7**
Native Canopy	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Groundstorey	Native	Native	Native	Native	Native	Exotic	Native	Native	Exotic
Native Diversity	Mod - High	Low	Mod - High	Low	Low	Low	Mod - High	Low	Low
Patch size (ha)	> 100	> 100	> 100	> 100	0	0	0	0	0
Area in the development footprint (ha)	0.25	2.32	0.28	0.96	4.76	7.05	0.58	6.38	30.84
BAM plots assessed in the subject land	2	3	3	4	3	4	3	4	4
Composition condition score	47.6	24.4	55.5	26.2	16.5	7.2	62.9	22.9	15.8
Structure condition score	70.8	40.3	71.3	52.5	31.4	12.4	57.6	48.2	18.6
Function condition score	38.4	50.6	38.4	28.0	22.4	25.4	2.1	1.4	4.3
Current vegetation integrity score	**50.6**	**36.8**	**53.4**	**33.8**	**22.6**	**13.1**	**19.6**	**11.6**	**10.8**

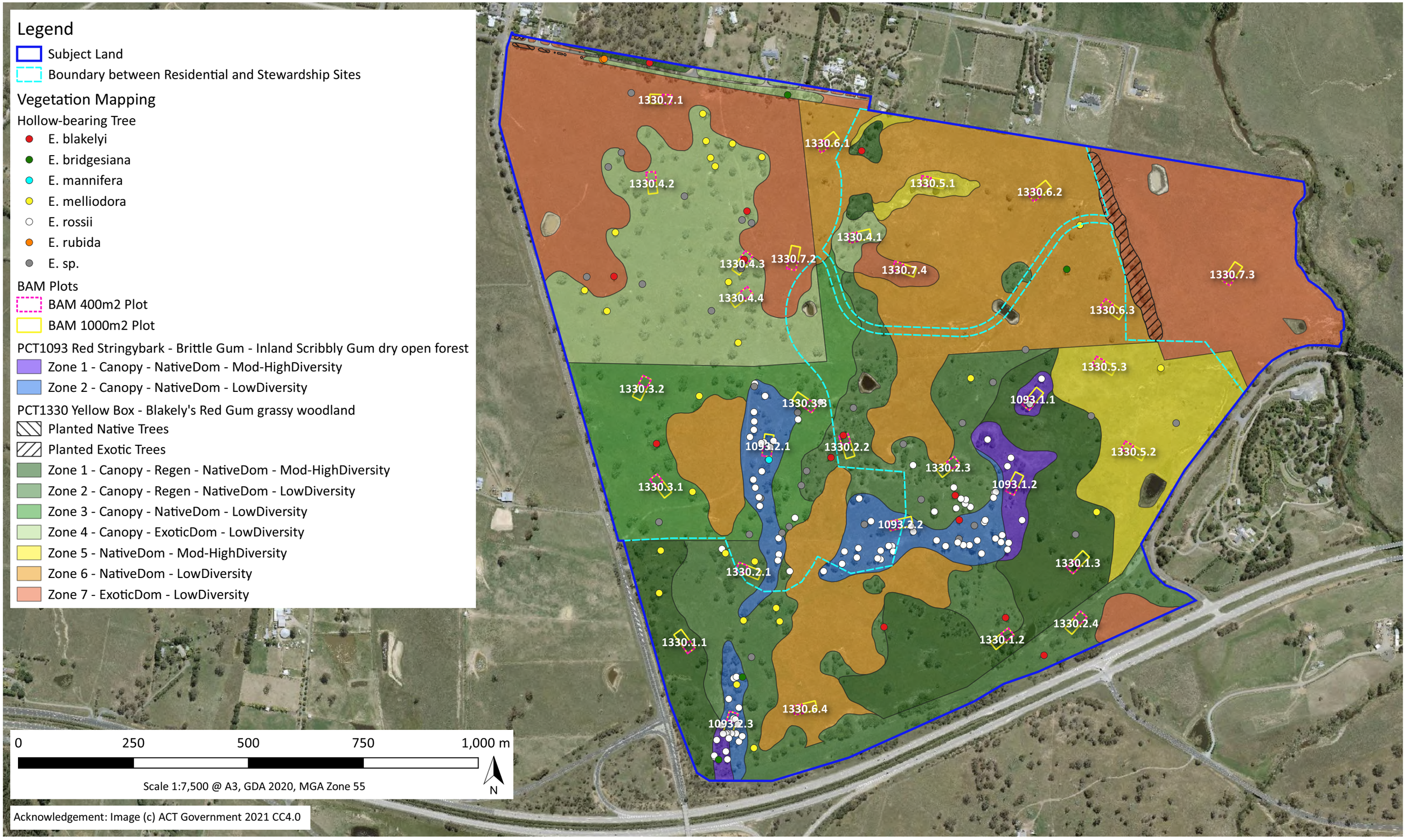

Figure 6. BAM Vegetation Mapping and Survey

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

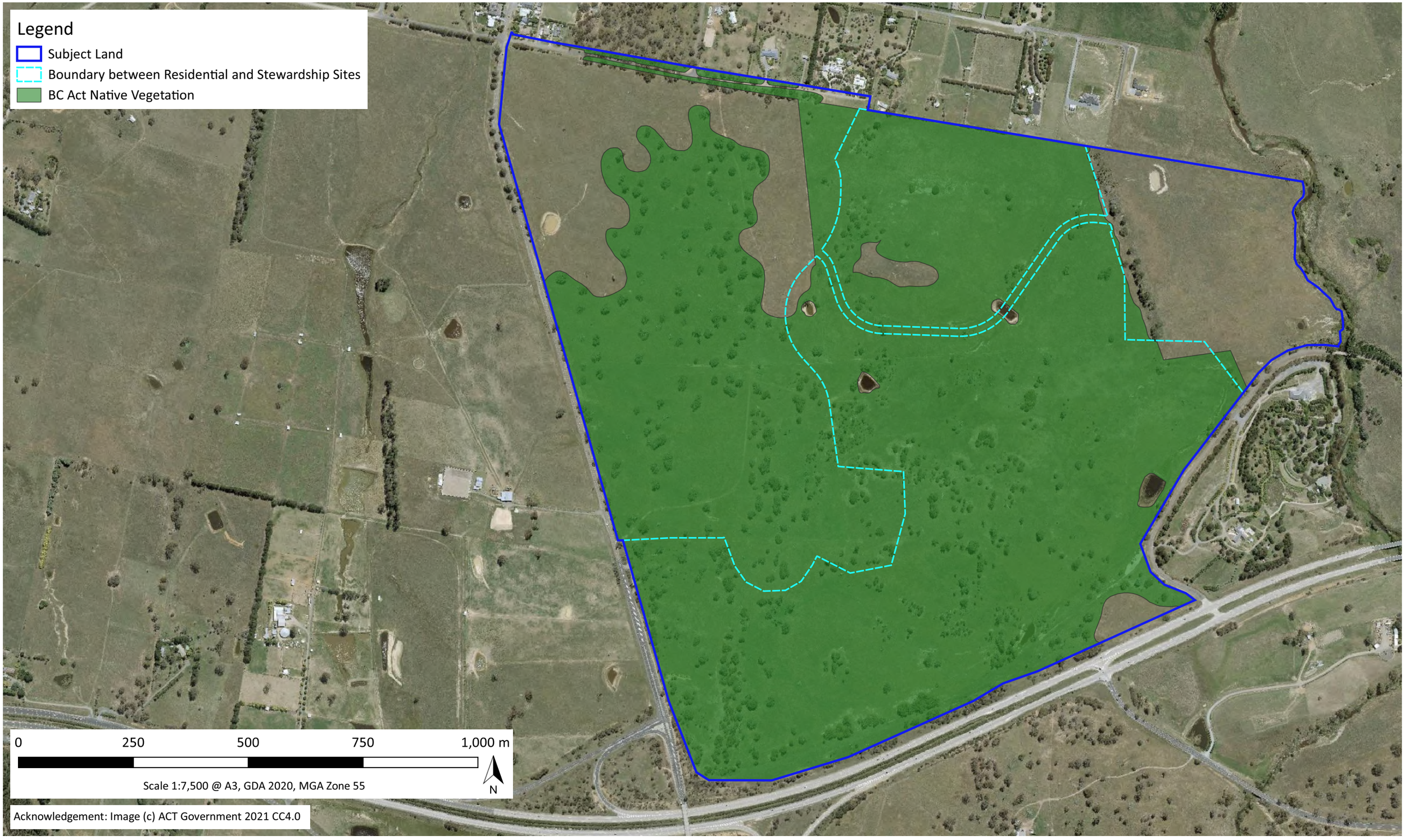

Figure 7. BC Act Native Vegetation

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

2.2.5 Threatened Ecological Communities

2.2.5.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

Two EPBC Act critically endangered listed threatened ecological communities have the potential to occur in the locality: *Natural Temperate Grassland of the South Eastern Highlands* (Natural Temperate Grassland) and *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Box-Gum Woodland). Based on the recorded vegetation types, plant species, landscape position, and the vegetation on adjoining and nearby properties, only Box-Gum Woodland is considered to have the potential to occur in the subject land.

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland – listed as critically endangered pursuant to the EPBC Act

Description – The White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC is characterised by a species-rich understorey of native tussock grasses, herbs, and scattered shrubs (where shrub cover comprises less than 30% cover), and a dominance or prior dominance of White Box and/or Yellow Box and/or Blakely's Red Gum trees. This TEC occurs along the western slopes and tablelands of the Great Dividing Range from southern Queensland through New South Wales and the Australian Capital Territory to Victoria.

Presence in the subject land – Confirmed – The entire portion of the subject land mapped as PCT1330 would have once supported the climax community of this TEC.

↓

Assessments of structure and floristic composition were undertaken in each of the seven condition categories (Vegetation Zones) of PCT1330 present in the subject land. The purpose of these assessments was to determine whether the patches of each Vegetation Zone support characteristics sufficient to meet the listing criteria for the EPBC Act listed TEC. The assessment process follows that provided in Commonwealth of Australia (2006[37]). The results of this assessment are provided in Table 17.

It is important to note that the floristic diversity recorded in plots may be lower than expected. This is due to two factors. Firstly, BAM plots are 400 m^2 while the Commonwealth assessment process assumes plots of 1000 m^2. As a result, it is probable that within a specific patch of vegetation a 400 m^2 BAM plot would record fewer flora species than a 1000 m^2 plot. Secondly, the ACT and surrounding regions experienced a very dry 2019 winter[38] and spring[39]. These conditions are likely to have disrupted flowering in several species (e.g. lilies, orchids, and peas) and thus led to lower than average floristic diversity.

As shown in Table 17 (Step 3), the two factors described above may influence the assessment of whether a patch meets the criteria for EPBC Act Box-Gum Woodland. To account for this, a marginally lower than required floristic diversity is not used as a justification for excluding a given vegetation zone from consideration as EPBC Act Box-Gum Woodland. As detailed in Table 17, the areas mapped as PCT1330 Zone 1, Zone 2, and Zone 5 meet the criteria for the EPBC Act listed TEC.

[37] Commonwealth of Australia (2006). *White box - Yellow box - Blakely's red gum grassy woodlands and derived native grasslands.* EPBC Act Policy Statements, Nationally threatened species and ecological communities.

[38] http://www.bom.gov.au/climate/current/season/act/archive/201908.summary.shtml

[39] http://www.bom.gov.au/climate/current/season/act/archive/201911.summary.shtml

Table 17. Assessment against the listing criteria for the EPBC listed TEC – White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Criterion		Assessment results						
		PCT1330 Zone 1	**PCT1330 Zone 2**	**PCT1330 Zone 3**	**PCT1330 Zone 4**	**PCT1330 Zone 5**	**PCT1330 Zone 6**	**PCT1330 Zone 7**
1.	*Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum?*	Yes Yellow Box and/or Blakely's Red Gum are dominant throughout this zone.	Yes Yellow Box and/or Blakely's Red Gum are dominant throughout this zone.	Yes Yellow Box and/or Blakely's Red Gum are dominant throughout this zone.	Yes Yellow Box and/or Blakely's Red Gum are dominant throughout this zone.	Yes Yellow Box and Blakely's Red Gum are expected to have been historically dominant or co-dominant throughout this zone.	Yes Yellow Box and Blakely's Red Gum are expected to have been historically dominant or co-dominant throughout this zone.	Yes Yellow Box and Blakely's Red Gum are expected to have been historically dominant or co-dominant throughout this zone.
2.	*Does the patch have a predominantly native understorey?*	Yes The understorey was recorded as ranging from 96% to 100% native species cover, with an average of 98%.	Yes The understorey was recorded as ranging from 80% to 98% native species cover, with an average of 89%.	No The understorey was recorded as ranging from 22% to 79% native species cover, with an average of 48%.	No The understorey was recorded as ranging from 2% to 43% native species cover, with an average of 20%.	Yes The understorey was recorded as ranging from 96% to 99% native species cover, with an average of 98%.	Yes The understorey was recorded as ranging from 61% to 86% native species cover, with an average of 72%.	No The understorey was recorded as ranging from 8% to 64% native species cover, with an average of 29%.
3.	*Is the patch 0.1 ha (1000 m^2) or greater in size with 12 or more native understorey species present (excluding grasses)? There must be at least one important species.*	Yes The patch is greater than 0.1 ha in size and an average of 14 (range 11 – 18) native non-grass understorey species were recorded across three plots.	No While the patch is greater than 0.1 ha in size, only an average of 5 (range 1 – 10) native non-grass understorey species were recorded across four plots.	No While the patch is greater than 0.1 ha in size, only an average of 3 (range 1 – 5) native non-grass understorey species were recorded across three plots.	N/A Refer Criterion 2 results.	Yes The patch is greater than 0.1 ha in size and an average of 15 (range 12 – 19) native non-grass understorey species were recorded across three plots.	No While the patch is greater than 0.1 ha in size, only an average of 3 (range 2 – 5) native non-grass understorey species were recorded across four plots.	N/A Refer Criterion 2 results.
	Or							
	Is the patch 2 ha or greater in size with an average of 20 or more mature trees per hectare, or is there natural regeneration[40] of the dominant overstorey eucalypts?	Yes The patch is greater than 2 ha and supports mature trees and natural regeneration of the overstorey.	Yes The patch is greater than 2 ha and supports mature trees and natural regeneration of the overstorey.	No While the patch is greater than 2 ha and supports mature trees, it does not support an average of 20 mature trees per hectare or natural regeneration of the overstorey.	N/A Refer Criterion 2 results.	No While the patch is greater than 2 ha, it does not support mature trees or natural regeneration of the overstorey.	No While the patch is greater than 2 ha, it does not support mature trees or natural regeneration of the overstorey.	N/A Refer Criterion 2 results.
	Does the patch meet the criteria for the listed TEC?	**Yes**	**Yes**	**No**	**No**	**Yes**	**No**	**No**

[40] Defined in Commonwealth of Australia (2006) as '*natural regeneration of the dominant overstorey eucalypts when there are mature trees* [circumference of at least 125 cm at 130 cm above the ground] *plus regenerating trees of at least 15 cm circumference at 130 cm above the ground*.'

2.2.5.2 Biodiversity Conservation Act 2016 (NSW)

Two BC Act listed ecological communities have the potential to occur in the subject land: *White Box – Yellow Box – Blakely's Red Gum Woodland* (BC Act Box-Gum Woodland) and *Monaro Tableland Cool Temperate Grassy Woodland in the South East Highlands Bioregion*.

BC Act Box-Gum Woodland

This community, listed as critically endangered in NSW, is described below, together with an assessment of its presence and condition in the subject land.

The below description is extracted from the NSW *Final Determination: White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (NSW Threatened Species Scientific Committee 2020, gazetted 17 July 2020[41]).

> *4.2. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is characterised by widely-spaced trees with canopies not touching and projected foliage cover generally less than 30% (Prober et al. 2017) ...Understorey shrubs are typically sparse or absent (Prober et al. 2017). The groundcover is dominated by perennial tussock grasses interspersed with a diverse range of forb species with the families Asteraceae and Fabaceae, and the orders Liliales and Asparagales well represented (Prober et al. 2017).*
>
> *4.3. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is characteristically dominated by one or more of the species Eucalyptus albens (White Box), E. melliodora (Yellow Box) and E. blakelyi (Blakely's Red Gum) …A number of understorey species are typically found throughout almost the entire range of the community, with the exception of the extreme north of its distribution and areas where they have been excluded by grazing.*
>
> *4.10. The distribution of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland spans a range in elevation from approximately 170 m ASL on the western slopes of the Great Dividing Range to approximately 1200 m on the Northern Tablelands of NSW (Beadle 1981), although occurrences on the ranges are typically at lower elevations (Prober et al. 2017). The topography on which the community occurs ranges from flat in the west of its range to hilly and undulating in the east (Prober and Thiele 2004).*
>
> *4.12. …For the purpose of establishing the risk of ecosystem/community collapse due to ongoing decline in distribution, it is not possible on the basis of available data, to specify thresholds in either tree cover or species diversity which are indicative of loss of function because: i) no single threshold is appropriate for the range of circumstances and pathways leading to different states of degradation (and hence the potential for recovery); ii) the point at which an ecological community has ceased to function in its original form is inherently uncertain, and the scientific basis upon which symptoms such as loss of tree cover and diversity can be related to ecological function is not established in this case; and iii) recovery may be dependent on active remediation, therefore thresholds can not be determined in absolute terms because they depend on social (collective will) and economic (cost of remediation) factors.*
>
> *3.1.4. The condition of remnants ranges from relatively good to highly degraded, such as paddock remnants with weedy understories and only a few hardy natives left. Some remnants of*

[41] NSW Threatened Species Scientific Committee (2020). *Final Determination: White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Gazetted 17 July 2020.

the community may consist of only an intact overstorey or an intact understorey but may still have high conservation value due to the flora and fauna they support.

The final determination does not provide specific listing criteria against which to assess a patch of vegetation. However, as described in the final determination, the definition for the BC Act Box-Gum Woodland TEC is extremely broad. In effect, any land for which the climax community is Box-Gum Woodland that has not been cultivated, become a stock camp, or otherwise been entirely modified, is likely to meet the minimum definition of the BC Act listed TEC.

Presence in the subject land – Confirmed – The entire portion of the subject land mapped as PCT1330 would have once supported the climax community of this TEC.

PCT1330 Zone 1 is characterised by a native overstorey with regeneration and a moderate to high diversity native understorey, PCT1330 Zone 2 by a native overstorey with regeneration and a low diversity native understorey, PCT1330 Zone 3 by a native overstorey with a low diversity native understorey, PCT1330 Zone 4 by a native overstorey with a low diversity exotic understorey, PCT1330 Zone 5 by no overstorey with a moderate to high diversity native understorey, PCT1330 Zone 6 by no overstorey with a low a low diversity native understorey, and PCT1330 Zone 7 by no overstorey with a low diversity exotic understorey.

PCT1330 Zones 1, 2, 3, 4, and 5 support vegetation which meets the criteria for this TEC in moderate to high condition, and PCT1330 Zone 6 supports vegetation which meets the criteria for this TEC in low condition.

PCT1330 Zone 7 lacks a native overstorey and has a groundstorey that is highly modified and dominated by perennial exotic grasses and herbaceous weeds. As such, PCT1330 Zone 7 does not support vegetation which meets the criteria for this TEC under the BC Act.

As such, the portions of the subject land that support BC Act Box-Gum Woodland are defined by the extent of PCT1330 Zones 1, 2, 3, 4, 5, and 6.

BC Act Monaro Tableland Cool Temperate Grassy Woodland in the South East Highlands Bioregion

The Monaro Tableland Cool Temperate Grassy Woodland (CTGW) in the South East Highlands Bioregion community, listed as critically endangered in NSW, is described below, together with an assessment of its presence and condition in the subject land.

The below description is extracted from the NSW *Final Determination for the TSC Act critically endangered listed ecological community Monaro Tableland Cool Temperate Grassy Woodland in the South East Highlands Bioregion* (NSW Threatened Species Scientific Committee 2019[42]).

Monaro Tableland Cool Temperate Grassy Woodland ranges in structure from woodland to low open woodland. It is characterised by a sparse to very sparse tree stratum dominated by Eucalyptus pauciflora either in monospecific stands or with any of Acacia melanoxylon, E. rubida subsp. rubida, E. stellulata or E. viminalis as codominants. A number of other tree species have been recorded within the community, although very infrequently and always as canopy subdominants. These include E. bridgesiana, E.dives, E. blakelyi and E. melliodora. Tree height and cover vary as a function of moisture availability, drainage and past land management. The tree stratum becomes shorter and sparser with declining moisture availability or increasing

[42] NSW Threatened Species Scientific Committee (2019). *Final Determination: Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion.* Department of Planning, Industry and Environment, Sydney. Gazetted 28 June 2019.

levels of soil waterlogging… Trees may be absent as a consequence of tree removal under pastoral management and grazing by domestic stock. A continuous herbaceous ground stratum is usually present, although this is highly variable in composition and cover as a function of grazing pressure from wild herbivores (native and exotic) and domestic stock. Ground cover species include Themeda triandra, Poa sieberiana, Elymus scaber, Hydrocotyle laxiflora, Scleranthus biflorus, Oxalis perennans, Plantago varia, Euchiton japonicus, Poa labillardieri, Hypericum gramineum, Desmodium varians, Geranium solanderi, Acaena echinata, Gonocarpus tetragynus, Microlaena stipoides, Dichondra repens, Solenogyne gunnii, Asperula conferta, Asperula scoparia, Rumex brownii, Rytidosperma laeve, Rytidosperma pilosum, Chrysocephalum apiculatum and Chrysocephalum semipapposum. The Community may develop a shrub or bracken layer as a consequence of the opening up of the ground stratum following excessive grazing by rabbits and sheep. This may include species such as Pimelea pauciflora, Acacia dealbata, Acacia melanoxylon, Acacia rubida subsp. rubida, Cassinia longifolia and Pteridium esculentum (Costin 1954).

As stated in Part 4 of the Final Determination, the occurrence or historical occurrence of Snow Gum *Eucalyptus pauciflora* is the primary characteristic for determining the presence of the community. The final determination provides a Monaro & Werriwa CTGW Assessment Spreadsheet Tool to be used in conjunction with an Advisory Layer indicating potential extent. Presence of Snow Gum, characteristic species, non-characteristic species, stumps, and the proximity to nearest Snow Gum, are entered into the assessment tool to determine the likelihood of occurrence of the community. Part 1 of the Final Determination provides a list of an assemblage of species characteristic of the Monaro Tableland CTGW.

Presence in the subject land – Absent – The dominant tree species in the subject land are not characteristic of the dominant or co-dominant species of the BC Act Monaro Tableland Cool Temperate Grassy Woodland in the South East Highlands Bioregion TEC. As such, the subject land does not support vegetation which meets the criteria for this community under the BC Act.

Conclusion

The subject land supports the BC Act listed ecological community *White Box Yellow Box Blakely's Red Gum Woodland* in the areas mapped as PCT1330 Zone 1, 2, 3, 4, 5, and 6. No part of the subject land supports the BC Act listed ecological community *Monaro Tableland Cool Temperate Grassy Woodland in the South East Highlands Bioregion.*

2.2.6 High threat weeds

Table 18 lists the 13 high threat weeds that occur in the subject land. None of the high threat weeds were very widespread or occurred at high densities.

Table 18. High threat weeds.

Table key. Commonwealth Weed of National Significance = **WoNS**. Regional Priority Weed in the South East Local Land Services region under the NSW *Biosecurity Act 2015*: **P** = Prevention; **E** = Eradication; **C** = Containment; **AP** = Asset Protection; **LM** = Species subject to Local Management programs.

Species Name	Common Name	Status
Trees		
Salix sp.	Willow	WoNS, LM/AP
Shrubs		
Rosa rubiginosa	Briar Rose	-
Rubus fruticosus aggregate	Blackberry	WoNS, LM/AP

Species Name	Common Name	Status
Forb		
Acetosella vulgaris	Sheep's Sorrel	-
Carthamus lanatus	Saffron Thistle	-
Echium plantagineum	Paterson's Curse	-
Echium vulgare	Viper's Bugloss	-
Hypericum perforatum	St John's Wort	LM
Romulea rosea	Onion Grass	-
Grass		
Eragrostis curvula	African Lovegrass	AP
Nassella neesiana	Chilean Needlegrass	AP, LM
Nassella trichotoma	Serrated Tussock	WoNS, C
Paspalum dilatatum	Paspalum	-

2.3 Habitat Suitability for Threatened Species

2.3.1 Fauna habitat

The habitat features in the subject land were identified during the field surveys and assessed regarding their potential value to native fauna species, both threatened and common. The fauna habitat features of the subject land are described in Table 19. It is important to note that the information presented in Table 19 is also used to assess the presence/absence of habitat constraints and/or microhabitats for EPBC Act only listed species (Section 2.3.3), ecosystem credits species (Section 2.3.4), and species credit species (Section 2.3.5).

Table 19. Fauna habitat features.

Habitat Feature	Description	Relevant Native Fauna Species/Assemblages
Remnant eucalypts	Historic clearing has removed approximately 50% of the native overstorey across the subject land, and the remaining patches of woodland have been historically thinned. Despite this, the subject land supports a large number of mature remnant trees, 168 of which contain functional hollows.	All remnant trees are likely to provide foraging resources for a variety of birds and marsupials when in flower, including threatened species. The hollow bearing remnant trees are likely to provide a nesting resource for birds, bats, and marsupials, including threatened species.
Other native vegetation (i.e. native shrubs, grasses, and forbs)	The midstorey and shrubstorey are largely absent throughout the majority of the subject land. The majority of the subject land supports a lightly to moderately disturbed native dominant grassy groundlayer. The value of these areas to native fauna, particularly threatened species, depends largely on the degree of modification.	The absent midstorey and shrubstorey are likely to limit the habitat value of the subject land for some of the region's threatened and rare woodland birds, which generally prefer to inhabit woodland where such features are more intact. The grasses and forbs are likely to provide a foraging resource to a variety of native birds, reptiles, and herbivorous mammals, such as the Eastern Grey Kangaroo. In addition, as detailed in Section 2.3.5.2, the areas with a native dominant groundlayer support habitat for the threatened Golden Sun Moth.

Habitat Feature	Description	Relevant Native Fauna Species/Assemblages
		Open areas are likely to provide a hunting resource for raptors and other predatory birds.
Exotic pasture	Approximately 21% of the subject land supports a highly modified pasture dominated by exotic grasses and forbs (i.e. PCT1330 Zone 7).	The exotic dominant pasture would provide a foraging resource of limited value for common birds, reptiles, and herbivores. In addition, as detailed in Section 2.3.5.2, portions of the areas with an exotic dominant groundlayer support habitat for the threatened Golden Sun Moth. Open areas are likely to provide a hunting resource for raptors and other predatory birds.
Termite mounds	The subject land supports a number of termite mounds in the less disturbed vegetation zones (i.e. PCT1093 Zone 1 and 2, PCT1330 Zone 1 and 2).	Termite mounds are likely to provide a foraging resource for the Short-beaked Echidna *Tachyglossus aculeatus*, and potentially a foraging and nesting resource for the BC Act listed Rosenberg's Goanna *Varanus rosenbergi*.
Creeks, streams, dams	The subject land supports one drainage line associated with a dam, and one tributary that flows along the south-eastern boundary and then into Yass River. The drainage line and tributary were dry at the time of survey, are only likely to convey water following substantial rain events, and do not support any riparian vegetation. There are four large dams and four small dams in the subject land, none of which supported any native riparian vegetation. All of the dams held a small to moderate amount water at the time of survey.	The lack of reliable water flows and native riparian vegetation indicates that the drainage line and tributary are unlikely to provide habitat of potential value to aquatic/riparian flora or fauna. The farm dams are only likely to be of limited value to the common native herbivores, water birds, reptiles, and amphibians that occur in the locality.

2.3.2 Threatened Biodiversity Databases

2.3.2.1 Definitions of conservation significance

The conservation significance of a species, population or community is determined by its current listing pursuant to Commonwealth and/or State legislation and associated policy, more specifically:

- National – Listed as threatened (critically endangered, endangered, vulnerable or, conservation dependent) pursuant to the EPBC Act; and
- State (NSW) – Listed as threatened (critically endangered, endangered, or vulnerable) pursuant to the BC Act.

Species listed as 'migratory' under the EPBC Act are also considered where relevant.

2.3.2.2 Database and literature review

Information regarding the suitability of the habitat in the subject land for threatened species was obtained from the Threatened Biodiversity Data Collection (TBDC), BioNet (e.g. the profile of a

threatened species), the BAM Calculator, listing determinations, and/or recovery plans prepared for the species by the Commonwealth Government and NSW Government. This information is used to assess the presence/absence of habitat constraints and/or microhabitats for species identified by the Department of Agriculture, Water and the Environment's online EPBC Act Protected Matters Search Tool (PMST) (Section 2.3.3) or flagged by the BAM as ecosystem credits species (Section 2.3.4) and species credit species (Section 2.3.5).

In addition, a database search and literature review were completed to inform likelihood of occurrence assessments and provide useful background information for this assessment. This review included obtaining:

- a list of threatened species (flora and fauna), threatened populations and threatened ecological communities (TECs) listed pursuant to the EPBC Act with the potential to occur in the subject land obtained using the Department of Agriculture, Water and the Environment's online EPBC Act PMST on 1 September 2019 and updated on 17 September 2021; and
- ecological point data from the NSW Wildlife Atlas (BioNet), downloaded on 1 September 2019 and updated on 17 September 2021, providing a list of threatened species which have previously been recorded in the broad locality of the subject land (i.e. within 10 km) (refer to Figure 8).

Literature referred to during the conduct of the surveys for this study and/or during the preparation of this BCAR is listed under References.

0 1 2 3 4 km

N

Scale 1:80,000 @ A3, GDA 2020, MGA Zone 55

Legend

- 10 km Buffer
- Subject Land

NSW Wildlife Atlas Threatened Species

- Brown Treecreeper (eastern subspecies)
- Diamond Firetail
- Dusky Woodswallow
- Flame Robin
- Gang-gang Cockatoo
- Hooded Robin (south-eastern form)
- Little Eagle
- Little Lorikeet
- Painted Honeyeater
- Regent Honeyeater
- Scarlet Robin
- Speckled Warbler
- Superb Parrot
- Swift Parrot
- Varied Sittella
- White-bellied Sea-Eagle
- Button Wrinklewort
- Hoary Sunray
- Silky Swainson-pea
- Eastern Pygmy-possum
- Koala
- Spotted-tailed Quoll
- Golden Sun Moth
- Green and Golden Bell Frog
- Little Whip Snake
- Rosenberg's Goanna

Figure 8. NSW Wildlife Atlas Threatened Species Search

capital ecology

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

2.3.3 Habitat suitability for species only listed under the EPBC Act

Threatened species identified by the PMST as potentially occurring in the subject land and listed under the EPBC Act only (i.e. not listed under the BC Act) are included in Table 20. Species listed under both the EPBC Act and BC Act are addressed in Table 21 and/or Table 22. The likelihood of these species occurring in the subject land is determined based the presence/absence of specific habitat constraints, microhabitat requirements, geographic limitations, vagrancy, species records (BioNet and ecological reports), and/or the results of targeted surveys. Information regarding habitat constraints, microhabitat requirements, geographic limitations, and vagrancy were obtained from the TBDC, BioNet (e.g. the profile of a threatened species), the BAM Calculator, listing determinations, and/or recovery plans prepared for the species by the Commonwealth Government and NSW Government. A summary of the findings from each targeted survey is given in Section 2.3.5.2.

Table 20. Candidate EPBC Act only listed species identified by the PMST as potentially occurring in the subject land.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Leucochrysum albicans subsp. tricolor Hoary Sunray	-	Endangered	This species occurs in a wide variety of grassland, woodland, and forest habitats, generally on relatively heavy soils. It can occur in modified habitats such as semi-urban areas and roadsides. It is highly dependent on the presence of bare ground for germination, and in some areas disturbance is required for successful establishment.	No – surveyed	Despite being conspicuous when present, the species was not recorded during targeted surveys, opportunistic observations, or previous ecological survey of the subject land (EcoLogical Australia 2018). Conclusion – the species is considered unlikely to occur in the subject land.
Numenius madagascariensis Eastern Curlew	-	Critically Endangered	Within Australia, the Eastern Curlew has a primarily coastal distribution and are rarely recorded inland. It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. The species breeds in Russia and north-eastern China. The TBDC lists '*as per mapped areas*' as a foraging habitat constraint for this species.	No – microhabitat features	The subject land is far from coastal regions and does not support lakes, insets, bays, estuarine habitats, mudflats, or saltmarshes. While it is possible that the species may periodically visit the subject land during movements through the landscape, the species was not recorded in the subject land and no other records occur in the locality (Figure 8). Finally, the subject land does not contain nesting resources or potentially significant foraging resources for the species. Conclusion - the species is considered unlikely to occur in the subject land.

2.3.4 Habitat suitability for ecosystem credit species

Threatened species classified as ecosystem credit species and identified by the BAM as potentially occurring in the subject land are listed in Table 21. The value of the habitat in the subject land for ecosystem credit species is determined based on the type and condition (i.e. vegetation integrity) of the vegetation present together with the landscape context (refer to Section 2.1). The likelihood of these species occurring in the subject land is determined based the presence/absence of specific habitat constraints, geographic limitations, and vagrancy. Information regarding habitat constraints, geographic limitations, and vagrancy were obtained from the TBDC, BioNet (e.g. the profile of a threatened species), and through the BAM Calculator

Table 21. Predicted ecosystem credit species identified by the BAM as potentially occurring in the subject land.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
Anthochaera phrygia Regent Honeyeater (Foraging)	Critically Endangered	Critically Endangered	Yes – assumed	-
Artamus cyanopterus cyanopterus Dusky Woodswallow	Vulnerable	-	Yes – confirmed See Section 1.4 and Section 2.3.5.2	-
Callocephalon fimbriatum Gang-gang Cockatoo (Foraging)	Vulnerable	-	Yes – assumed	-
Chthonicola sagittata Speckled Warbler	Vulnerable	-	Yes – assumed	-
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	Vulnerable	-	Yes – assumed	-
Daphoenositta chrysoptera Varied Sittella	Vulnerable	-	Yes – confirmed See Section 1.4 and Section 2.3.5.2	-
Dasyurus maculatus Spotted-tailed Quoll	Vulnerable	Endangered	Yes – assumed	-

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
Epthianura albifrons White-fronted Chat	Vulnerable	-	Yes – confirmed See Section 2.3.5.2	-
Falco subniger Black Falcon	Vulnerable	-	Yes – assumed	-
Glossopsitta pusilla Little Lorikeet	Vulnerable	-	Yes – assumed	-
Grantiella picta Painted Honeyeater	Vulnerable	Vulnerable	Yes – assumed	-
Haliaeetus leucogaster White-bellied Sea-Eagle (Foraging)	Vulnerable	-	Yes – assumed	-
Hieraaetus morphnoides Little Eagle (Foraging)	Vulnerable	-	Yes – assumed	-
Hirundapus caudacutus White-throated Needletail	-	Vulnerable	Yes – assumed	-
Lathamus discolor Swift Parrot (Foraging)	Endangered	Critically Endangered	Yes – assumed	-
Lophoictinia isura Square-tailed Kite (Foraging)	Vulnerable	-	Yes – assumed	-
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	Vulnerable	-	Yes – assumed	-

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	Vulnerable	-	Yes – assumed	-
Miniopterus orianae oceanensis Large Bent-winged Bat (Foraging)	Vulnerable	-	Yes – confirmed See Section 1.4 and Section 2.3.5.2	-
Neophema pulchella Turquoise Parrot	Vulnerable	-	Yes – assumed	-
Ninox strenua Powerful Owl (Foraging)	Vulnerable	-	Yes – assumed	-
Petaurus australis Yellow-bellied Glider	Vulnerable	-	Yes – assumed	-
Petroica boodang Scarlet Robin	Vulnerable	-	Yes – assumed	-
Petroica phoenicea Flame Robin	Vulnerable	-	Yes – assumed	-
Phascolarctos cinereus Koala (Foraging)	Vulnerable	Vulnerable	Yes – assumed	-
Polytelis swainsonii Superb Parrot (Foraging)	Vulnerable	Vulnerable	Yes – assumed	-
Pteropus poliocephalus Grey-headed Flying-fox (Foraging)	Vulnerable	Vulnerable	Yes – assumed	-

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
Scoteanax rueppellii Greater Broad-nosed Bat	Vulnerable	-	Yes – assumed	-
Stagonopleura guttata Diamond Firetail	Vulnerable		Yes – assumed	-
Suta flagellum Little Whip Snake	Vulnerable	-	Yes – assumed	-
Varanus rosenbergi Rosenberg's Goanna	Vulnerable	-	Yes – assumed	-

2.3.5 Habitat suitability for species credit species

2.3.5.1 Candidate species credit species

Threatened species classified as species credit species and identified by the BAM as potentially occurring in the subject land are listed in Table 22. The value of the habitat in the subject land for species credit species is determined based on the type and condition (i.e. vegetation integrity) of the vegetation present together with the landscape context (refer to Section 2.1). The likelihood of these species occurring in the subject land is determined based the presence/absence of specific habitat constraints, microhabitat requirements, geographic limitations, vagrancy, species records (BioNet and ecological reports), and/or the results of targeted surveys. Information regarding habitat constraints, microhabitat requirements, geographic limitations, and vagrancy were obtained from the TBDC, BioNet (e.g. the profile of a threatened species), and through the BAM Calculator. A summary of the findings from each targeted survey is given in Section 2.3.5.2.

Table 22. Candidate species credit species identified by the BAM as potentially occurring in the subject land.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Ammobium craspedioides Yass Daisy	Vulnerable	Vulnerable	The Yass Daisy is a perennial herb that bears large yellow flowerheads, with each flowerhead supported by a 30-60 cm stem. It is found from Crookwell (north of Goulburn) to near Wagga Wagga, with most populations occurring in the Yass District. The Yass Daisy occurs in dry forest, Box-Gum Woodland, and secondary derived grassland of these communities. It tolerates light grazing and areas that are irregularly mown or slashed. Flowering occurs from October to November. The BAM Calculator lists *'west of the Federal Highway'* as a geographic limitation for this species Some of the main threats to this species listed in the TBDC are habitat loss through vegetation clearing for agricultural purposes (e.g. pasture modification and cropping), overgrazing by domestic stock, and invasion of weeds including pasture grasses.	No – habitat degraded, surveyed	Approximately 81% of the subject land supports a moderately to highly disturbed groundlayer (i.e. PCT1093 Zone 2 and PCT1330 Zone 2, 3, 4, 6, and 7). These areas have been grazed and/or pasture improved/cultivated over the past 150 years and as such have been disturbed to the extent that they are considered unlikely to support habitat for this species. As threatened flora surveys are not specifically required for Biodiversity Stewardship Sites, targeted threatened flora surveys were restricted to the portions of the development footprint identified as potentially supporting threatened flora species, these being the less disturbed portions of PCT1093 (i.e. PCT1093 Zone 1) and PCT1330 (i.e. PCT1330 Zone 1 and Zone 5) (Figure 9). Yass Daisy was not recorded during these targeted surveys. Furthermore, the species was not recorded during opportunistic observations across the remainder of the subject land, has not been recorded during previous ecological survey of the subject land (EcoLogical Australia 2018), and has not been recorded within 10 km of the subject land (Figure 8). Conclusion – the species is considered unlikely to occur in the subject land.
Anthochaera phrygia Regent Honeyeater (Breeding)	Critically Endangered	Critically Endangered	This species inhabits dry open forest and woodland (particularly Box-Ironbark woodland and riparian forests of River Sheoak) that have significantly large numbers of mature trees, high canopy cover, and abundance of mistletoes. The species breeds in Box-Ironbark and other temperate woodlands, and in riparian gallery forest dominated by River Sheoak. The species usually nests in tall mature eucalypts, Sheoaks, or mistletoe haustoria. There are only three known key breeding regions: north-east Victoria (Chiltern-Albury) and NSW (Capertee Valley and the Bundarra-Barraba region). The TBDC lists *'as per mapped areas'* as a breeding habitat constraint for this species.	No – habitat constraint	The development footprint and wider subject land are not identified as an 'important area' for Regent Honeyeater on the 'BAM – Important Areas' map[43]. Conclusion – the subject land lacks the breeding habitat constraints required for this species.
Aprasia parapulchella Pink-tailed Legless Lizard	Vulnerable	Vulnerable	This species inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass. Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks. The TBDC lists *'rocky areas or within 50 m of rocky areas'* as a habitat constraint for this species. Some of the main threats to this species listed in the TBDC are habitat loss through bush-rock removal and vegetation clearing for agricultural purposes (e.g. pasture improvement including slashing, ploughing, and sowing of non-native species), overgrazing by domestic stock, and invasion of habitat by weeds.	No – habitat constraint, geographic limitation	The subject land is not located west of Dalton and does not support rocky areas or land within 50 m of rocky areas. Conclusion – the subject land lacks the habitat constraints and geographic limitations required for this species.

[43] https://webmap.environment.nsw.gov.au/Html5Viewer291/index.html?viewer=BAM_ImportantAreas

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Callocephalon fimbriatum Gang-gang Cockatoo (Breeding)	Vulnerable	-	In spring and summer, this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. Gang-Gang Cockatoos favour old growth forest and woodland for nesting and roosting. Nests are located in hollows of eucalypts that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts. The TBDC lists '*Eucalypt tree species with hollows greater than 9 cm diameter*' as a breeding habitat constraint for this species.	No – surveyed	Targeted bird surveys were conducted throughout potential habitat in the subject land (i.e. PCT1093 Zones 1 and 2, PCT1330 Zones 1, 2, 3, and 4). All mature trees in the subject land were also assessed for the presence/absence of habitat features and for signs of fauna nesting in hollows. No Gang-gang Cockatoo were recorded in the subject land and there was no sign of breeding activity. Conclusion – the species is considered unlikely to breed in the subject land.
Cercartetus nanus Eastern Pygmy-possum	Vulnerable	-	This species is found in a broad range of habitats, but in most areas woodlands and heath appear to be preferred. It feeds primarily on nectar and pollen collected from banksias, eucalypts, and bottlebrushes, but also feeds on insects throughout the year. The species shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys, or thicket of vegetation, (e.g. grass-tree skirts). Tree hollows are favoured for breeding. The TBDC lists '*declining shrub diversity in forests and woodlands due to overgrazing by stock and rabbits*', '*predation from cats, dogs and* foxes', and '*loss of nest sites due to removal of firewood*' as some of the key threats to the species.	No – microhabitat features, habitat degraded	Field surveys of the vegetation in the subject land did not record any banksias or bottlebrushes (Appendix B). Approximately 50% of the subject land has been historically cleared and the remaining areas thinned. The vast majority of the subject land does not support a midstorey or shrubstorey. A tree habitat did not record any Ringtail Possum dreys (Appendix C). Finally, the species has only been recorded twice in the locality, approximately 9 km to the south-west (Figure 8); both records are from 1981. As such, the subject land is considered to lack the primary microhabitat features required for this species and has been degraded to the extent that the species is considered unlikely to occur. Conclusion – the species is considered unlikely to occur in the subject land.
Delma impar Striped Legless Lizard	Vulnerable	Vulnerable	Striped Legless Lizard is mainly found in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. It is also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is characterised by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda triandra*, Speargrasses *Austrostipa* spp., Poa Tussocks *Poa* spp., and occasionally Wallaby Grasses *Rhytidosperma* spp.. The species can sometimes be found in modified grasslands with a significant content of exotic grasses, and in grasslands with significant amounts of surface rocks (used for shelter). Some of the main threats to this species listed in the TBDC are habitat loss through vegetation clearing for agricultural purposes (e.g. pasture improvement including slashing, ploughing, and sowing of non-native species), habitat degradation through invasion by weeds or escaped pasture species, and overgrazing by domestic stock.	No – surveyed	As described in Section 2.3.5.2, a full program of targeted surveys did not detect this species in the subject land. Conclusion – the subject land does not support habitat for this species.
Grevillea iaspicula Wee Jasper Grevillea	Critically Endangered	Endangered	The Wee Jasper Grevillea is only found in the Wee Jasper area and on the shores of Lake Burrinjuck. This species grows on rocky limestone outcrops and around sink holes and cave entrances. The species occurs in open woodland dominated by White Box *Eucalyptus Albens* and Apple Box *E. bridgesiana.* It often occurs as a co-dominant species within the shrubby understorey of its open woodland habitat. The BAM Calculator lists '*rocky areas*' and '*limestone rock substrate*' as habitat constraints for this species.	No – habitat constraint	The subject land does not contain rocky areas or limestone rock substrate, is located over 50 km from Wee Jasper, and the species has not been recorded within 10 km (Figure 8). Conclusion – the subject land lacks the habitat constraints required for this species.
Haliaeetus leucogaster White-bellied Sea-eagle (Breeding)	Vulnerable	-	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. The TBDC lists '*living or dead mature trees in suitable vegetation within 1km of a river, lake, large dam, creek, wetland, or coastline*' as a breeding habitat constraint.	No – surveyed	Targeted bird surveys were conducted throughout potential habitat in the subject land (i.e. PCT1093 Zones 1 and 2, PCT1330 Zones 1, 2, 3, and 4). All mature trees in the subject land were also assessed for the presence/absence of habitat features and for signs of fauna nesting in large stick nests. No White-bellied Sea-Eagles or large stick nests were recorded in the subject land. Conclusion – the species is considered unlikely to breed in the subject land.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Hieraaetus morphnoides Little Eagle (Breeding)	Vulnerable	-	This species occupies open eucalypts forest, woodland, or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used. The species nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. The TBDC lists *'Nest trees - live (occasionally dead) large old trees within vegetation'* as a breeding habitat constraint for this species.	No – surveyed	Targeted bird surveys were conducted throughout potential habitat in the subject land (i.e. PCT1093 Zones 1 and 2, PCT1330 Zones 1, 2, 3, and 4). All mature trees in the subject land were also assessed for the presence/absence of habitat features and for signs of fauna nesting in large stick nests. No Little Eagles or large stick nests were recorded in the subject land. Conclusion – the species is considered unlikely to breed in the subject land.
Lathamus discolor Swift Parrot (Breeding)	Endangered	Critically Endangered	This species breeds in Tasmania from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum *Eucalyptus globulus.* The species migrates between February and October to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. On the mainland, they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. In NSW, the species mostly occurs on the coast and south west slopes. The TBDC lists *'as per mapped areas'* as a breeding habitat constraint for this species.	No – habitat constraint	The subject land is not identified as an 'important area' for Swift Parrot on the 'BAM – Important Areas' map[44]. Conclusion - the subject land lacks the breeding habitat constraints required for this species.
Litoria booroolongensis Booroolong Frog	Endangered	Endangered	This species lives along permanent streams with some fringing vegetation cover such as ferns, sedges, or grasses. Adults occur on or near cobble banks and other rock structures within stream margins and shelter under rocks or amongst vegetation near the ground on the stream edge. Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or isolated pools.	No – habitat degraded, microhabitat features	The subject land does not contain potential habitat for this species as it lacks permanent streams, rivers, other suitable waterbodies, and riparian habitat. Conclusion – the species is considered unlikely to occur in the subject land.
Lophoictinia isura Square-tailed Kite (Breeding)	Vulnerable	-	This species is found in a variety of timbered habitats including dry woodlands and open forests. It shows a particular preference for timbered watercourses. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs. The TBDC lists *'nest trees'* as a breeding habitat constraint. The TBDC general notes state '*it will be difficult to identify a Kite nest (there are lots of comparable sized stick nests built by other species), especially given Kites have large territories and other stick nesters will undoubtedly also be nesting where Kites might be recorded. Kites will need be in attendance to confirm breeding sites*.'	No – surveyed	Targeted bird surveys were conducted throughout potential habitat in the subject land (i.e. PCT1093 Zones 1 and 2, PCT1330 Zones 1, 2, 3, and 4). All mature trees in the subject land were also assessed for the presence/absence of habitat features and for signs of fauna nesting in large stick nests. No Square-tailed Kite were recorded in the subject land, and none have been recorded within 10 km of the subject land (Figure 8). Conclusion – the species is considered unlikely to breed in the subject land.
Miniopterus orianae oceanensis Large Bent-winged Bat (Breeding)	Vulnerable	-	Caves are the primary roosting habitat, but the species also use derelict mines, storm-water tunnels, buildings, and other man-made structures. The species forms discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. Breeding or roosting colonies can number from 100 to 150,000 individuals. The TBDC list the following breeding habitat constraint, *'Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave", observation type code "E nest-roost", with numbers of individuals >500.'*	No – habitat constraint	The subject land does not contain potential breeding habitat (caves, tunnels, mines, culverts, etc.). Conclusion – the subject land lacks the breeding habitat constraints required for this species.

[44] https://webmap.environment.nsw.gov.au/Html5Viewer291/index.html?viewer=BAM_ImportantAreas

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Myotis macropus Southern Myotis	Vulnerable	-	The Southern Myotis occurs from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. The species roosts close to water in caves, hollow-bearing trees, man-made structures (bridges, culverts etc) and in dense foliage. Colonies occur close to water bodies, ranging from rainforest streams to large lakes and reservoirs. The species is dependent on waterways (i.e. medium to large permanent creeks, rivers, lakes, or other waterways with pools/stretches 3 m wide or greater[45]), where it catches aquatic insects and small fish with their large hind claws, and also catches flying insects. The TBDC lists *'hollow bearing trees within 200 m of riparian zone'*, *'bridges, caves or artificial structures within 200 m of riparian zone'*, and '*waterbodies; this include rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200m of the site'* as habitat constrains for this species.	No – habitat constraint, surveyed	The subject land does not contain potential breeding habitat (i.e. hollow bearing trees within 200 m of medium to large permanent creeks, rivers, lakes, or other waterways with pools/stretches 3 m wide or greater). In addition, as detailed in Section 2.3.5.2, targeted bat surveys did not detect the species. Conclusion – the subject land lacks the breeding habitat constraints required for this species.
Ninox strenua Powerful Owl (Breeding)	Vulnerable	-	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The species requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds that harass him. The TBDC lists *'living or dead trees with hollow greater than 20 cm diameter'* as a breeding habitat constraint.	No – habitat degraded	Approximately 50% of the overstorey in the subject land has been cleared and the species has not been recorded within 10 km (Figure 8). Conclusion – the species is considered unlikely to breed in the subject land.
Petauroides Volans Greater Glider	-	Vulnerable	The greater glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria, with an elevational range from sea level to 1200 m above sea level. The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, and is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species.	No – microhabitat features	The subject land does not support tall, montane, or moist eucalypt forest with relatively old trees and abundant hollows, nor does it support a particularly high diversity of eucalypts species. The subject land therefore lacks the primary microhabitat features required to support the species. In addition, the species has not been recorded within 10 km (Figure 8). Conclusion – the species is considered unlikely to occur in the subject land.
Petaurus norfolcensis Squirrel Glider	Vulnerable	-	West of the Great Diving Range, this species inhabits mature or old growth Box, Box-Ironbark woodlands, and River Red Gum forest. It prefers mixed species stands with a shrub or Acacia midstorey. The species requires abundant tree hollows for refuge and nest sites and generally relies on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely connected (i.e. no more than 50 m apart). The TBDC lists *'Loss of hollow-bearing trees'* and '*Loss of understorey food resources'* as some of the key threats to this species.	No – habitat degraded	Approximately 50% of the subject land has been historically cleared and the remaining areas thinned. The vast majority of the subject land does not support a midstorey or shrubstorey. In addition, the species has not been recorded within 10 km of the subject land (Figure 8). As such, the subject land has been degraded to the extent that the species is considered unlikely to occur. Conclusion – the species is considered unlikely to occur in the subject land.
Phascolarctos cinereus Koala (Breeding)	Vulnerable	Vulnerable	This species inhabits eucalypt woodlands and forests, feeding on the foliage of more than 70 eucalypt species and 30 non-eucalypt species. Home range size varies with quality of habitat, ranging from less than 2 hectares to several hundred hectares in size. The TBDC lists *'areas identified via survey as important habitat'* as a habitat constraint for breeding for this species. 'Important habitat' is defined in TBDC by the density of Koalas and quality of habitat as determined by on-site survey.	No – habitat constraint	There are only two records of Koala within 10 km of the subject land; one is from 2000 and is approximately 3.7 km to the south-west and the other is from 2005 and is approximately 4.5 km to the east (Figure 8). Both records are separated from the subject land by the federal highway and expanses of cleared farmland. In addition, despite being conspicuous when present, no Koalas or signs of Koala presence were detected during the surveys conducted for this BCAR or by previous ecological surveys of the subject land. The lack of Koala records in the subject land and locality indicates that the subject land could not be classified as 'important habitat' for breeding. Conclusion – the species is considered unlikely to breed in the subject land.

[45] Anderson. J., Law. B., and Tidemann (2005). *Stream use by the Large-footed Myotis Myotis Macropus in relation to environmental variables in Northern New South Wales*. Australian Mammalogy 28:15-26.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Polytelis swainsonii Superb Parrot (Breeding)	Vulnerable	Vulnerable	This species inhabits Box-Gum Woodland, Box-Cypress-pine Woodland, Boree Woodlands, and River Red Gum Forest. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used for nesting are Blakely's Red Gum, Yellow Box, Apple Box, and Red Box. The species breeds in hollow branches of tall eucalypt trees within 10 kilometres of feeding areas. The TBDC lists ''*living or dead E. blakelyi, E. melliodora, E. albens, E. camaldulensis, E. microcarpa, E. polyanthemos, E. mannifera, E. intertexta with hollows greater than 5cm diameter; greater than 4m above ground or trees with a DBH of greater than 30cm*' as a breeding habitat constraint.	Yes – surveyed	As detailed in Section 2.3.5.2, Superb Parrot were recorded breeding in the subject land. Conclusion – the subject land supports breeding habitat for this species.
Pomaderris pallida Pale Pomaderris	Vulnerable	Vulnerable	This species usually grows in shrub communities surrounded by Brittle Gum (*Eucalyptus mannifera*) and Red Stringybark (E. *macrorhyncha*) or *Callitris* spp. woodland.	No – surveyed	Despite being conspicuous when present, this species was not recorded during targeted surveys, opportunistic observations, or previous ecological surveys (EcoLogical Australia 2018). In addition, the species has not been recorded within 10 km of the subject land (Figure 8). Conclusion – the species is considered unlikely to occur in the subject land.
Prasophyllum petilum Tarengo Leek Orchid	Endangered	Endangered	Natural populations are known from a total of five sites in NSW. These are near Boorowa, Queanbeyan area, Ilford, Delegate and a newly recognised population c.10 km west of Muswellbrook. The species also occurs at Hall in the Australian Capital Territory. The species grows in open sites within Natural Temperate Grassland or Box-Gum Woodland. It often grows in associateion with River Tussock *Poa labillardieri*, Black Gum *E. aggregata,* Tea-tree *Leptospermum* spp., and Kangaroo Grass *Themeda triandra*. The species is highly susceptible to grazing, being retained only at little-grazed travelling stock reserves and in cemeteries. Some of the main threats to this species listed in the TBDC are: 1) vegetation clearing for agricultural purposes; 2) overgrazing by domestic stock; 3) competition from native species; and 4) encroachment of herbaceous perennial weeds such as St John's wort and Paterson's curse competing for space and resources.	No – habitat degraded, surveyed	Approximately 81% of the subject land supports a moderately to highly disturbed groundlayer (i.e. PCT1093 Zone 2 and PCT1330 Zone 2, 3, 4, 6, and 7). These areas have been grazed and/or pasture improved/cultivated over the past 150 years and as such have been disturbed to the extent that they are considered unlikely to support habitat for this species. As threatened flora surveys are not specifically required for Biodiversity Stewardship Sites, targeted threatened flora surveys were restricted to the portions of the development footprint identified as potentially supporting threatened flora species, these being the less disturbed portions of PCT1093 (i.e. PCT1093 Zone 1) and PCT1330 (i.e. PCT1330 Zone 1 and Zone 5) (Figure 9). Tarengo Leek Orchid was not recorded during these targeted surveys. Furthermore, the species was not recorded during opportunistic observations across the remainder of the subject land, has not been recorded during previous ecological survey of the subject land (EcoLogical Australia 2018), and has not been recorded within 10 km of the subject land (Figure 8). Conclusion – the species is considered unlikely to occur in the subject land.
Pteropus poliocephalus Grey-headed Flying-fox (Breeding)	Vulnerable	Vulnerable	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. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young. Site fidelity to camps is high; some camps have been used for over a century. The TBDC lists *'breeding camps'* as a breeding habitat constraint for this species.	No – habitat constraint	While the species is likely to visit the subject land occasionally to forage, field surveys confirmed that the subject land does not support breeding camps. Conclusion – the subject land lacks the breeding habitat constraints required for this species.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Swainsona recta Small Purple-pea	Endangered	Endangered	Before European settlement, Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum *E. blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida*, and Long-leaf Box *E. goniocalyx*. It grows in association with understorey dominants that include Kangaroo Grass *Themeda australis*, Poa tussocks *Poa* spp. and Speargrasses *Austrostipa* spp.. Some of the main threats to this species listed in the TBDC are: 1) grazing and trampling by cattle, sheep, and goats; and 2) loss, degradation, and fragmentation of habitat and/or populations for residential developments, agricultural developments, and by weed invasion (including exotic grasses mostly, as well as bridal creeper and St John's wort).	No – habitat degraded, surveyed	Approximately 81% of the subject land supports a moderately to highly disturbed groundlayer (i.e. PCT1093 Zone 2 and PCT1330 Zone 2, 3, 4, 6, and 7). These areas have been grazed and/or pasture improved/cultivated over the past 150 years and as such have been disturbed to the extent that they are considered unlikely to support habitat for this species. As threatened flora surveys are not specifically required for Biodiversity Stewardship Sites, targeted threatened flora surveys were restricted to the portions of the development footprint identified as potentially supporting threatened flora species, these being the less disturbed portions of PCT1093 (i.e. PCT1093 Zone 1) and PCT1330 (i.e. PCT1330 Zone 1 and Zone 5) (Figure 9). Small Purple-pea was not recorded during these targeted surveys. Furthermore, the species was not recorded during opportunistic observations across the remainder of the subject land, has not been recorded during previous ecological survey of the subject land (EcoLogical Australia 2018), and has not been recorded within 10 km of the subject land (Figure 8). Conclusion – the species is considered unlikely to occur in the subject land.
Swainsona sericea Silky Swainson-pea	Vulnerable	-	This species is found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland on the Monaro, and in Box-Gum Woodland in the Southern Tablelands and South West Slopes. It is sometimes found in association with Cypress-pines *Callitris* spp.. Some of the main threats to this species listed in the TBDC are loss and degradation of habitat and/or populations for: 1) residential developments; 2) invasion of weeds; 3) intensification of grazing regimes; and 4) agricultural developments.	Yes – surveyed	As detailed in Section 2.3.5.2, Silky Swainson-pea were recorded in the subject land. In addition, as detailed in Section 1.4, the species has previously been recorded in the subject land (EcoLogical Australia 2018). Conclusion – the subject land supports habitat for this species.
Synemon plana Golden Sun Moth	Endangered	Critically Endangered	The species occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which the groundlayer is dominated by Wallaby grasses *Rhytidosperma* spp.. Grasslands dominated by Wallaby grasses are typically low and open and the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth as it is typically these areas on which the females are observed displaying to attract males. Habitat may contain several Wallaby grass species, which are typically associated with other grasses particularly Speargrasses *Austrostipa* spp. or Kangaroo Grass *Themeda australis*. The TBDC lists '*Wallaby grass Rytidosperma sp., Chilean needlegrass Nassella nessiana or Serrated Tussock N. trichotoma*' as a habitat constraint. Some of the main threats to this species listed in the TBDC are loss and degradation of habitat by urban, residential, infrastructure, and agricultural development, modifications to agricultural practices (e.g. fertiliser application, ploughing, and inappropriate grazing), overgrazing by domestic stock, and invasive grasses.	Yes – surveyed	As detailed in Section 2.3.5.2, Golden Sun Moth were recorded in the subject land. Conclusion – the subject land supports habitat for this species.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Thesium australe Austral Toadflax	Vulnerable	Vulnerable	This species is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern tablelands. It occurs in grassland and grassy woodland. Austral Toadflax is a root parasite that takes water and some nutrients from other plants, especially Kangaroo Grass. It is therefore often found in association with Kangaroo Grass. Some of the main threats to this species listed in the TBDC are loss and degradation of habitat and/or populations by: 1) residential, infrastructure, and agricultural developments; 2) intensification of grazing regimes; and 3) invasion of weeds.	No – habitat degraded, surveyed	Approximately 81% of the subject land supports a moderately to highly disturbed groundlayer (i.e. PCT1093 Zone 2 and PCT1330 Zone 2, 3, 4, 6, and 7). These areas have been grazed and/or pasture improved/cultivated over the past 150 years and as such have been disturbed to the extent that they are considered unlikely to support habitat for this species. As threatened flora surveys are not specifically required for Biodiversity Stewardship Sites, targeted threatened flora surveys were restricted to the portions of the development footprint identified as potentially supporting threatened flora species, these being the less disturbed portions of PCT1093 (i.e. PCT1093 Zone 1) and PCT1330 (i.e. PCT1330 Zone 1 and Zone 5) (Figure 9). Austral Toadflax was not recorded during these targeted surveys. Furthermore, the species was not recorded during opportunistic observations across the remainder of the subject land, has not been recorded during previous ecological survey of the subject land (EcoLogical Australia 2018), and has not been recorded within 10 km of the subject land (Figure 8). Conclusion – the species is considered unlikely to occur in the subject land.

2.3.5.2 BAM targeted survey results

As described in Table 20 and Table 22, targeted surveys were completed to confirm the occurrence and/or habitat potential for some of the species credit species flagged by the BAM as having the potential to occur in the relevant PCT of the subject land.

Threatened flora

A total of 139 flora species were recorded across all field surveys, comprising 90 native species and 49 exotic species (Appendix B).

As threatened flora surveys are not specifically required for Biodiversity Stewardship Sites, targeted threatened flora surveys were restricted to the portions of the development footprint identified as potentially supporting threatened flora species, these being the less disturbed portions of PCT1093 (i.e. PCT1093 Zone 1) and PCT1330 (i.e. PCT1330 Zone 1 and Zone 5) (Figure 9). The other vegetation zones in the development footprint have been grazed and/or pasture improved/cultivated over the past 150 years and as such have been disturbed to the extent that they are considered unlikely to support habitat for threatened flora.

One BC Act listed threatened species, Silky Swainson-pea, was recorded in low numbers just outside the development footprint in PCT1330 Zone 5 (Figure 9). Approximately 20 plants were recorded in total. EcoLogical Australia (2018) also recorded one Silky Swainson-pea in PCT1330 Zone 1 (Figure 9). The confirmed Silky Swainson-pea habitat in the subject land has been estimated by applying a 30 m buffer to the above records. Following this method, the subject land is estimated to support 1.24 ha of confirmed Silky Swainson-pea habitat in distinct patches of PCT1330 Zone 1 and Zone 5.

On the Southern Tablelands the Silky Swainson-pea is found in moderate to good condition Natural Temperate Grassland and Box-Gum Woodland[46]. For the purposes of calculating the impact of the proposed development on Silky Swainson-pea, Silky Swainson-pea habitat is assumed to occur in all of the moderate to high diversity zones of PCT1330, being PCT1330 Zone 1 and Zone 5.

The proposed development will impact 0.28 ha of PCT1330 Zone 1 and 0.58 ha of PCT1330 Zone 5. The proposed development will therefore impact 0.86 ha of Silky Swainson-pea habitat, composed of 0.28 ha in PCT1330 Zone 1 and 0.58 ha in PCT1330 Zone 5.

None of remaining threatened flora species credit species identified in Table 20 or Table 22 were recorded in the development footprint or wider subject land and are therefore considered unlikely to occur.

Threatened fauna

A total of 74 native fauna species were recorded during field surveys, comprising 53 bird species, 7 reptile species, 2 amphibian species, 11 mammal species, and 1 invertebrate species (Appendix D). This included the following threatened species: Superb Parrot (breeding observations); Dusky Woodswallow *Artamus cuanopterus*; Varied Sittella; White-fronted Chat *Epthianura albifrons*; Golden Sun Moth; and Large Bent-winged Bat.

Apart from Superb Parrot (breeding) and Golden Sun Moth, the above threatened species are only identified as ecosystem credit species in Table 21.

[46] https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10783

Threatened birds

A total of 35 bird species were recorded across all surveys, comprising 31 native species and 4 exotic species (Appendix D).

A number of threatened birds were recorded in the subject land, including Superb Parrot (breeding observations), Dusky Woodswallow, Varied Sitella, and White-fronted Chat. Superb Parrot and Varied Sitella were also recorded previously by EcoLogical Australia (2018). Of the threatened species recorded in the subject land, only Superb Parrot is identified as a species credit species for breeding and is discussed in further detail below. The remaining species are assumed to be present in the subject land as ecosystem credit species.

Superb Parrot

Superb Parrots were observed on 26 occasions during the surveys associated with this BCAR. The majority of these observations were of individual birds or small flocks of birds foraging or flying through the canopy (Figure 10 and Figure 11). However, across the three years of survey, there were a total of five observations[47] of individual birds or pairs of birds entering or residing in Scribbly Gum *E. rossii* hollows. These observations were taken to be indications of breeding activity. The subject land is therefore assumed to support five Superb Parrot nest trees (Figure 10 and Figure 11). As per the TBDC:

> *Where a breeding site has been identified in accordance with the BAM the species polygon should be established by providing a circular buffer with a 100m radius around the nest tree. The purpose of the buffer is to minimise disturbance/avoid clearing, for a development application, or to conserve and improve habitat, for a biodiversity stewardship agreement, within the area essential for breeding. This includes habitat suitable for fledgling requirements. It does not account for foraging habitat. The shape of the buffer can be modified where evidence provided in the Biodiversity Assessment Report indicates an alternative shape would better meet the species needs in the context of the assessment site. For example, extant vegetation is linear and the nest tree is already located near the edge of the wooded area.*

Accordingly, Superb Parrot breeding habitat in the subject land has been estimated by applying a 100 m buffer around each nest tree. The subject land is therefore estimated to support 13.05 of Superb Parrot breeding habitat.

There are 168 hollow bearing trees in the subject land that support a combined total of 527 functional hollows (Figure 6, Appendix C). Recent research indicates that only 0.5% of available tree hollows are suitable for Superb Parrot nesting (Stojanovic *et al*. 2020[48]). When applied to the 527 hollows present within the subject land, this equals an estimated 3 hollows which would be suitable for Superb Parrot nesting. It is therefore likely that the majority, if not all, of the suitable Superb Parrot nesting hollows in the subject land have been recorded.

As mentioned, a number of individual birds or small flocks of birds were observed foraging or flying through the canopy across the majority of the subject land; this was especially true in those areas

[47] There were a total of three identified breeding pairs in both 2020 and 2021, nesting in five trees across the two years. Given that Superb Parrots return to the same locality to nest over successive years, it is possible that the three identified breeding pairs were the same between 2020 and 2021.

[48] Stojanovic, D., Rayner, R., Cobden, M., Davey, C., Harris, S., Heinsohn, R., Owens, G., and Manning, A. D. (2020). *Suitable nesting sites for specialized cavity dependent wildlife are rare in woodlands.* Forest Ecology and Management. https://doi.org/10.1016/j.foreco.2020.118718.

that support a canopy (Figure 10 and Figure 11). As detailed in the ACT Government's Superb Parrot action plan (ACT Government 2019a[49]):

> *Superb Parrots will forage in Box-Gum woodland habitats or in artificial habitats in urban areas or on private land (e.g. crops; Webster 1988; Manning et al. 2004). When breeding, Superb Parrots typically forage within 9 km of nesting habitat (see below; Webster 1988; Manning et al. 2004; Rayner et al. 2015a). The condition and connectivity of Box-Gum woodland communities that provide foraging resources proximal to Superb Parrot breeding colonies may influence the species' breeding success (Leslie 2005). In the ACT, Superb Parrot individuals will forage in urban-adjacent woodland patches (including critically endangered Yellow Box- Blakely's Red Gum Grassy Woodland) and urban forest and greenspace, particularly in flowering Eucalypts and other trees directly adjacent to playing fields (M. Mulvaney unpublished data).*
>
> *Superb Parrots feed on the ground and in trees, on a variety of plant species. Their diet includes seeds of Wallaby-grass (Rytidosperma spp.), Barley-grass (Critesion spp.), Wheat (Triticum aestivum) and Oats (Avena sativa), numerous Wattles (e.g. Silver Wattle (Acacia dealbata), Deane's Wattle (Acacia deanei), and Gold Dust Wattle (Acacia acinacea)), and Elms (Ulmus spp.). Superb Parrots feed on flowers, nectar and fruits of Eucalypts (e.g. Mugga Ironbark), Mistletoe (Amyema miquelii, Amyema quandang), Dwarf Cherry (Exocarpos strictus), and Plums (Prunus spp.). Lerps taken from Eucalypt foliage are another important component of the Superb Parrot diet (Baker-Gabb 2011). In the ACT, Superb Parrot foraging locations are positively associated with vegetation cover in the 3 to 20 m height range, and the presence of Eucalypts (Blakely's Red Gum, Argyle Apple (Eucalyptus cinerea) and River Peppermint (Eucalyptus elata)), Wattles (Cootamundra Wattle (Acacia baileyana)), and Elms (English Elm (Ulmus procera) and Chinese Elm (Ulmus parvifolia)) (ACT Government unpublished data). Observations of Superb Parrot foraging are frequently reported in Yellow Box and Mugga Ironbark.*

With respect to the above information, all of the vegetation in the subject land is therefore considered to be Superb Parrot foraging habitat and the areas that support a canopy are considered to be crucial for Superb Parrot habitat connectivity throughout the locality (Figure 10 and Figure 11). Maintaining sufficient foraging habitat and canopy cover is therefore considered vital for Superb Parrot breeding activity in the subject land.

The impact associated with the proposed development will include both direct impacts (i.e. the impacts associated with the removal of vegetation and/or habitat) and indirect impacts (e.g. the impacts associated with urban edge effects). For the purposes of this BCAR and as indicated by DPIE-BCD (refer to section 1.3), indirect impacts are assumed for nest trees that occur within 50 m of a building envelope or road, or within 30 m of an Indicative/Special EMZ.

While the proposed development will not directly impact any nest trees, it is assumed to indirectly impact two nest trees. This results in an indirect impact to 6.53 ha (50%) of the Superb Parrot breeding habitat, composed of 0.16 ha in PCT1093 Zone 1, 1.80 ha in PCT1093 Zone 2, 1.52 ha in PCT1330 Zone 2, 1.73 ha in PCT1330 Zone 3, and 1.32 ha in PCT1330 Zone 6.

The remaining three Superb Parrot nesting trees will be protected and managed within the proposed Biodiversity Stewardship Sites.

[49] ACT Government (2019a). *ACT native woodland conservation strategy and action plans*. Environment, Planning and Sustainable Development.

Striped Legless Lizard

No Striped Legless Lizards were recorded during the survey program between 20 September 2019 and 20 November 2019. All grids were placed in areas with suitable habitat characteristics, notably areas with a well-defined grass tussock structure (refer to Figure 12).

A number of non-target herpetofauna were observed during the survey program. The full survey results are attached as Appendix E.

In light of the above, it is concluded that the subject land does not support the Striped Legless Lizard.

Golden Sun Moth

Surveys were conducted through all patches of suitable habitat during appropriate survey conditions when Golden Sun Moth activity was confirmed at other ACT/NSW sites (Figure 13, Table 5).

A total of 247 Golden Sun Moths (15 females and 232 males) were recorded in the subject land across the four surveys (Figure 13). Thirty-nine (39) were recorded on 31 October 2019, 122 were recorded on 11 November 2019, 50 were recorded on 20 November 2019, and 36 were recorded on 5 December 2019.

As shown in Figure 13, Golden Sun Moths were recorded at low density across the entire subject land, with the only exception being the recently cultivated 16.33 ha paddock in the north-eastern corner[50]. The subject land is therefore estimated to support 168.99 ha of Golden Sun Moth habitat.

The areas of confirmed habitat are generally flat or gently sloping, dominated by a varying mix of Speargrasses, Kangaroo Grass, and Wallaby Grasses. All of the habitat in the subject land is assumed to be functionally connected. Given that the subject land is surrounded by road infrastructure (Sutton Road and the Federal Highway), urban development (Sutton Township), natural barriers (Yass River), and cleared agricultural land, the Golden Sun Moth habitat in the subject land is considered unlikely to be functionally connected to any Golden Sun Moth habitat that occurs outside of the subject land.

The proposed development will impact 37.45 ha (22%) of the Golden Sun Moth habitat that occurs in the subject land, composed of 0.25 ha in PCT1093 Zone 1, 2.32 ha in PCT1093 Zone 2, 0.28 ha in PCT1330 Zone 1, 0.96 ha in PCT1330 Zone 2, 4.76 ha in PCT1330 Zone 3, 7.05 ha in PCT1330 Zone 4, 0.58 ha in PCT1330 Zone 5, 6.38 ha in PCT1330 Zone 6, and 14.87 ha in PCT1330 Zone 7.

In comparison, 129.94 ha (77%) of Golden Sun Moth habitat in the subject land will either be protected and managed in the proposed Biodiversity Stewardship Sites (96.36 ha or 57%) or large lots (33.58 ha or 20%).

Threatened bats

As detailed in the report provided by Fly By Night Bat Surveys Pty Ltd (received on 20 September 2020, Appendix F), insectivorous bats were recorded at each survey location on each survey night

[50] Golden Sun Moth surveys did not occur in Guise Street as this portion of the proposed development was not initially included in the subject land. Golden Sun Moth habitat in Guise Street has therefore been assumed based on the characteristics of the groundstorey and the extent of confirmed habitat in the immediately adjoining areas of Woodbury Ridge.

(Figure 14). A total of 1,535 identifiable passes were analysed and the following eight species were identified with confidence:

- White-striped Mastiff Bat *Austronomus australis*;
- Chocolate Wattled Bat *Chalinolobus morio*;
- Gould's Wattled Bat *Chalinolobus gouldii*;
- Southern Freetail Bat *Mormopterus planiceps*;
- Eastern Freetail Bat *Mormopterus ridei*;
- Unidentified Long-eared Bat *Nyctophilus* sp.
- Large Forest Bat *Vespadelus darlingtonia*; and
- Little Forest Bat *Vespadelus vulturnus.*

The occurrence of the following additional species is considered 'probable' based on the calls recoded:

- Large Bent-winged Bat *Miniopterus orianae oceanensis* (BC Act vulnerable).

None of the above species are listed pursuant to the EPBC Act, however the Large Bent-winged Bat is listed as vulnerable pursuant to the BC Act.

The Large Bent-winged Bat is identified as an ecosystem credit species (foraging) and species credit species (breeding). As detailed in Table 22, the subject land does not support potential Large Bent-winged Bat roosting and/or breeding habitat (caves, mines, water tunnels, etc.).

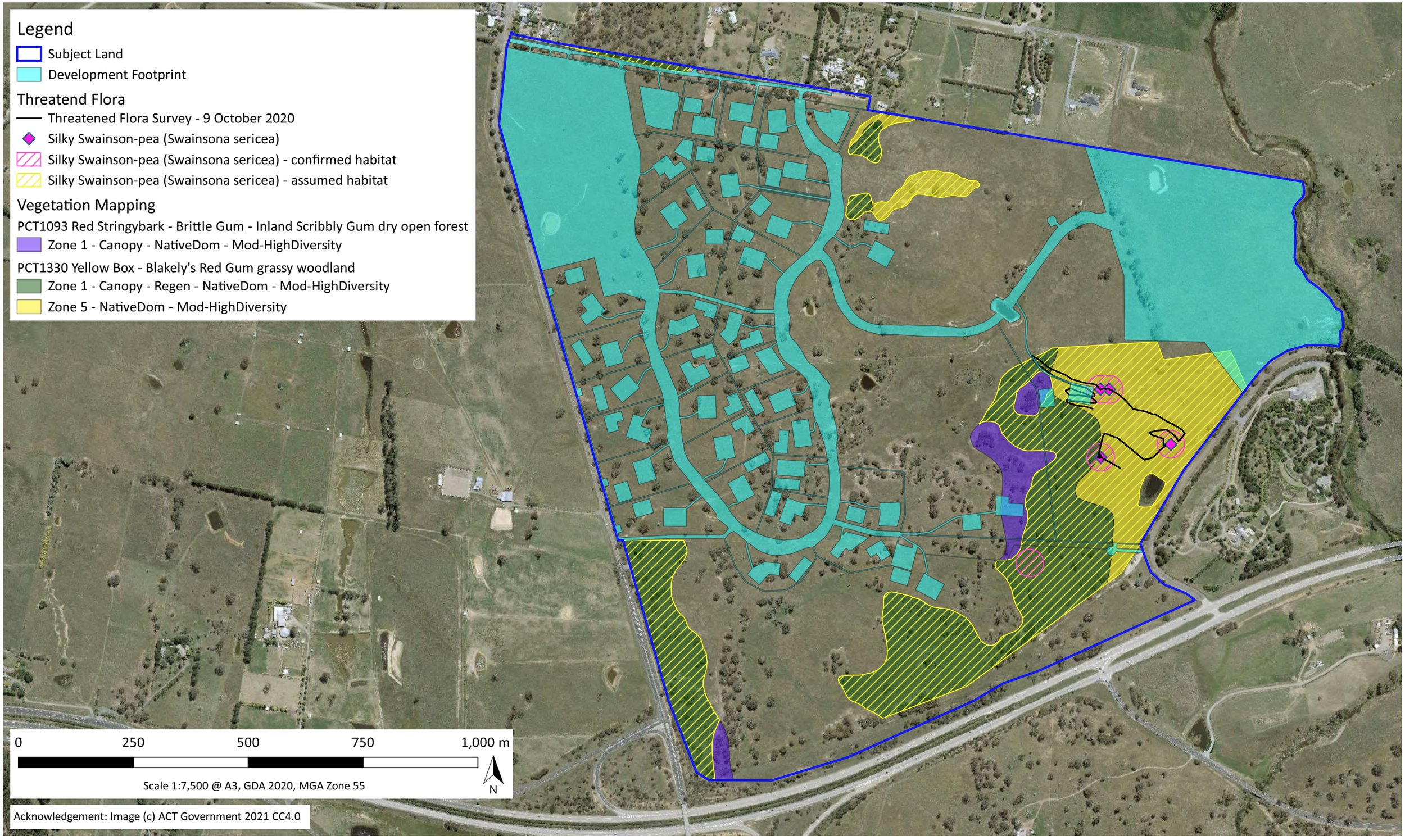

Figure 9. Threatened Flora Survey Results

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

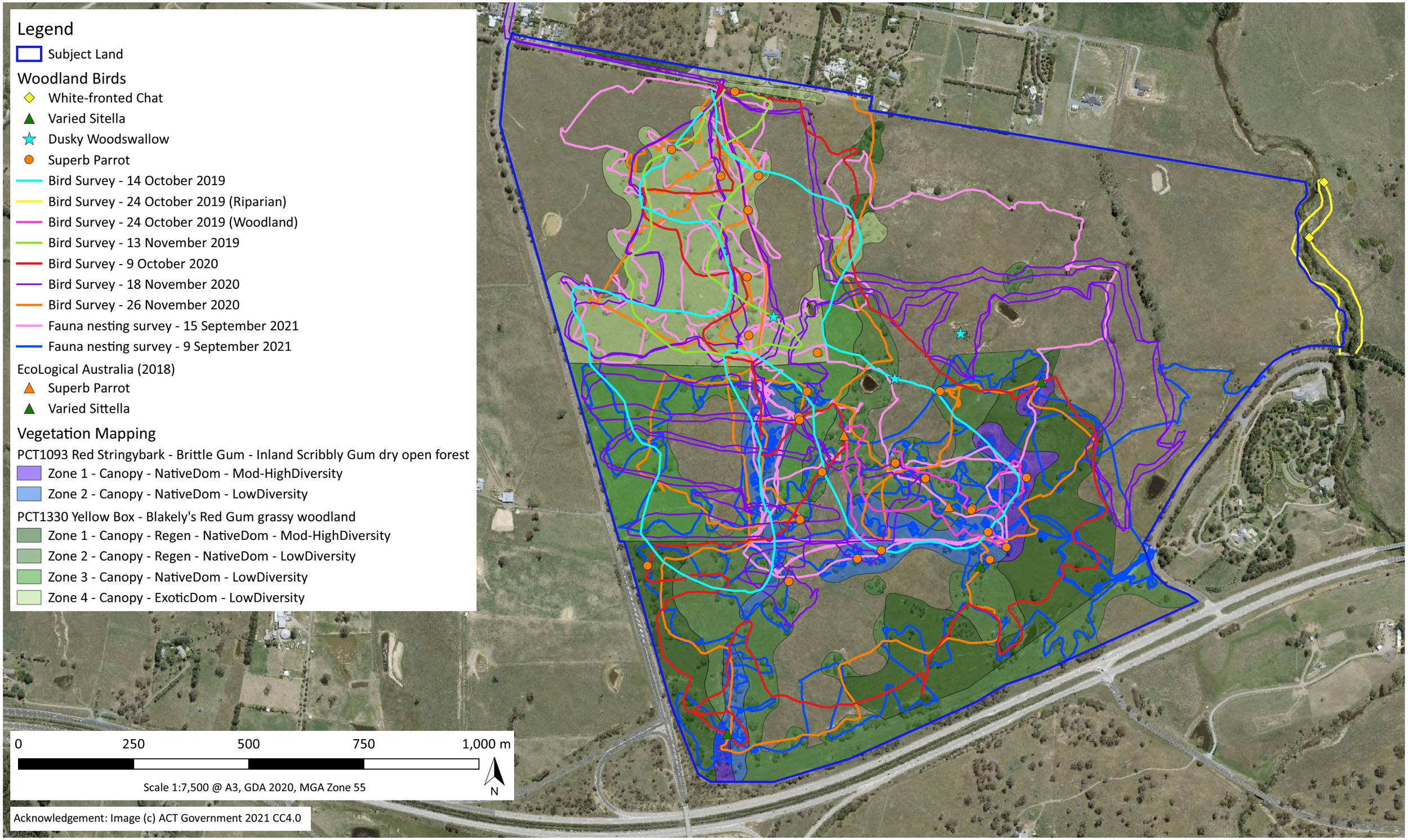

Figure 10. Threatened Bird Survey Results

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

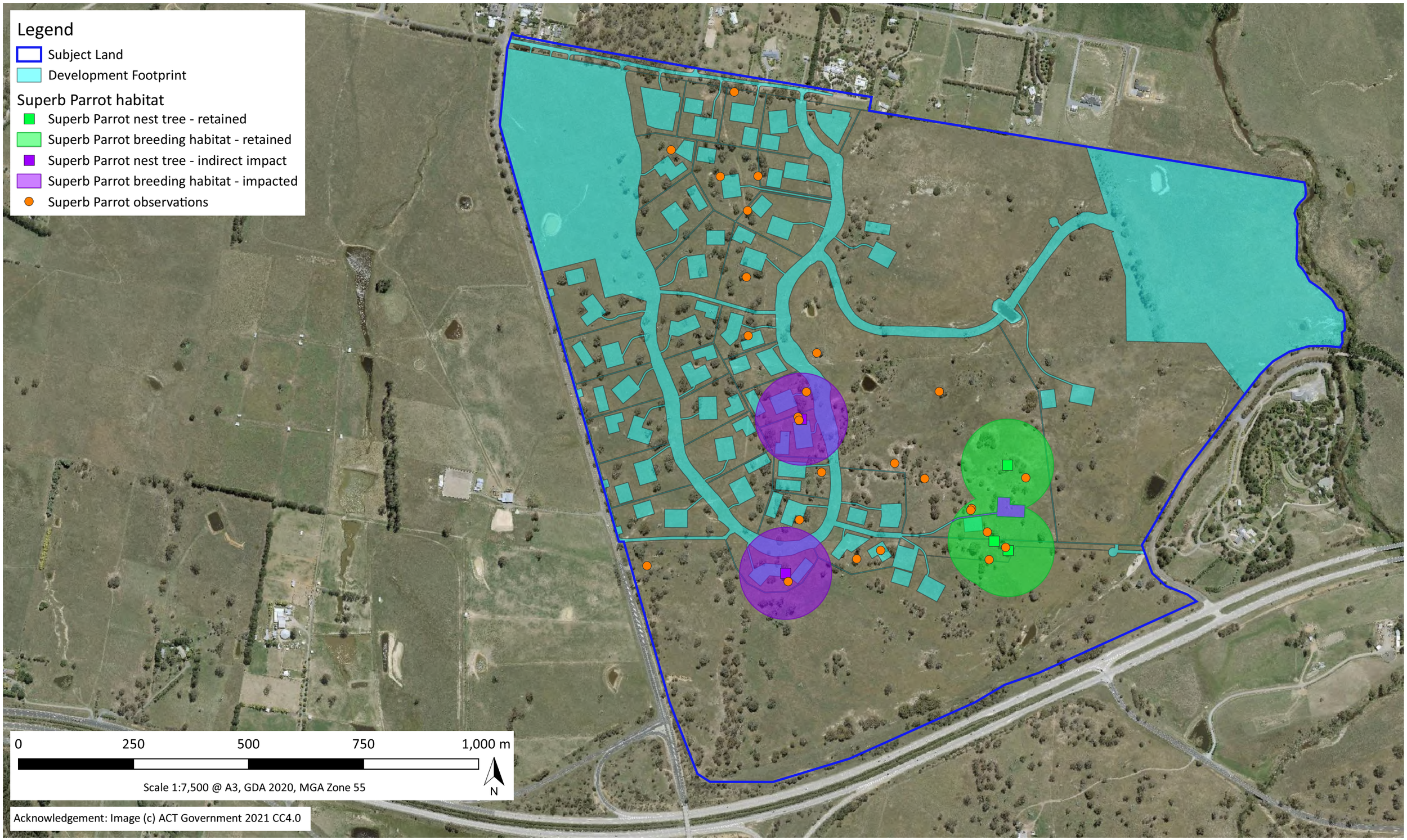

Figure 11. Superb Parrot Breeding Habitat

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

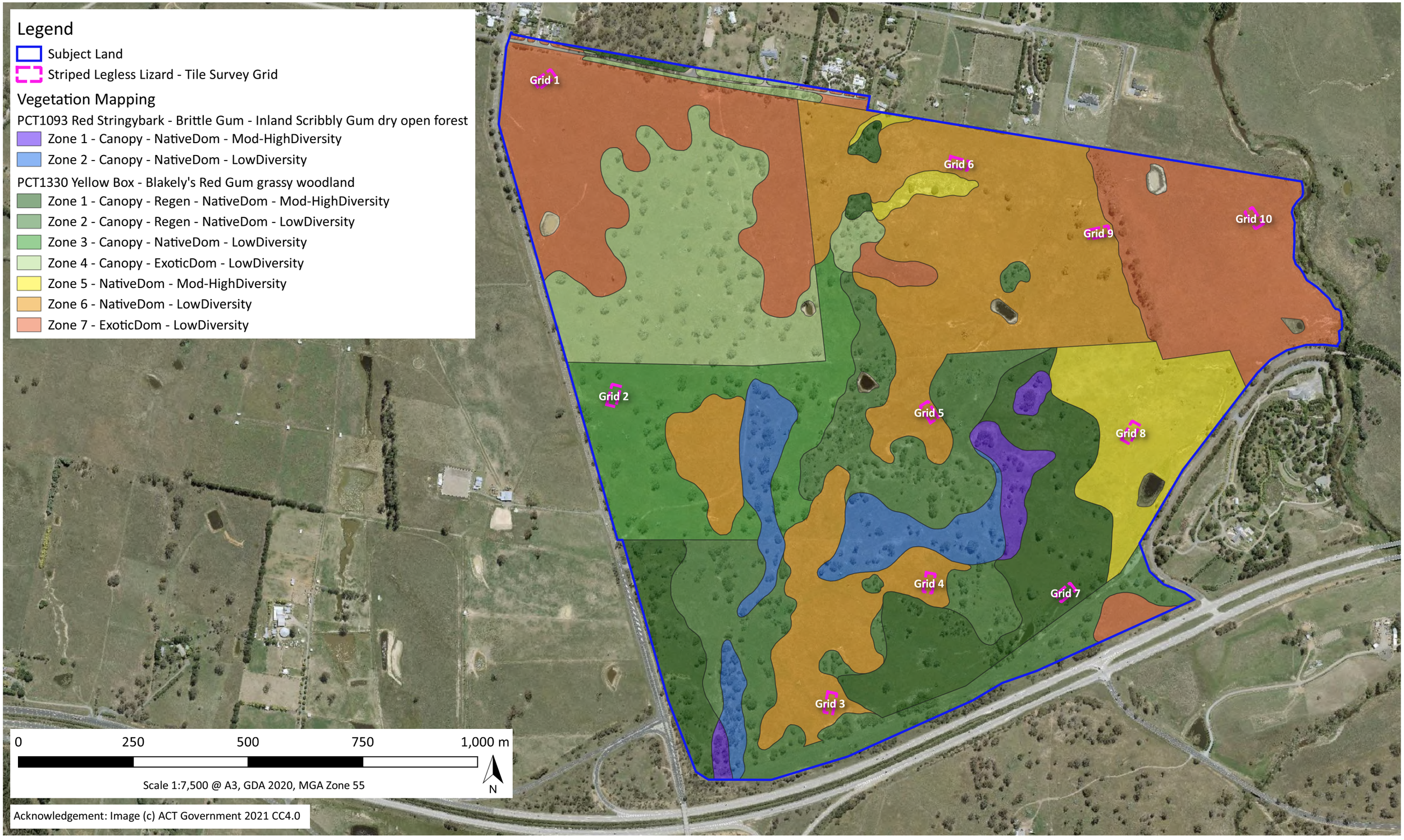

Figure 12. Striped Legless Lizard Survey Results

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

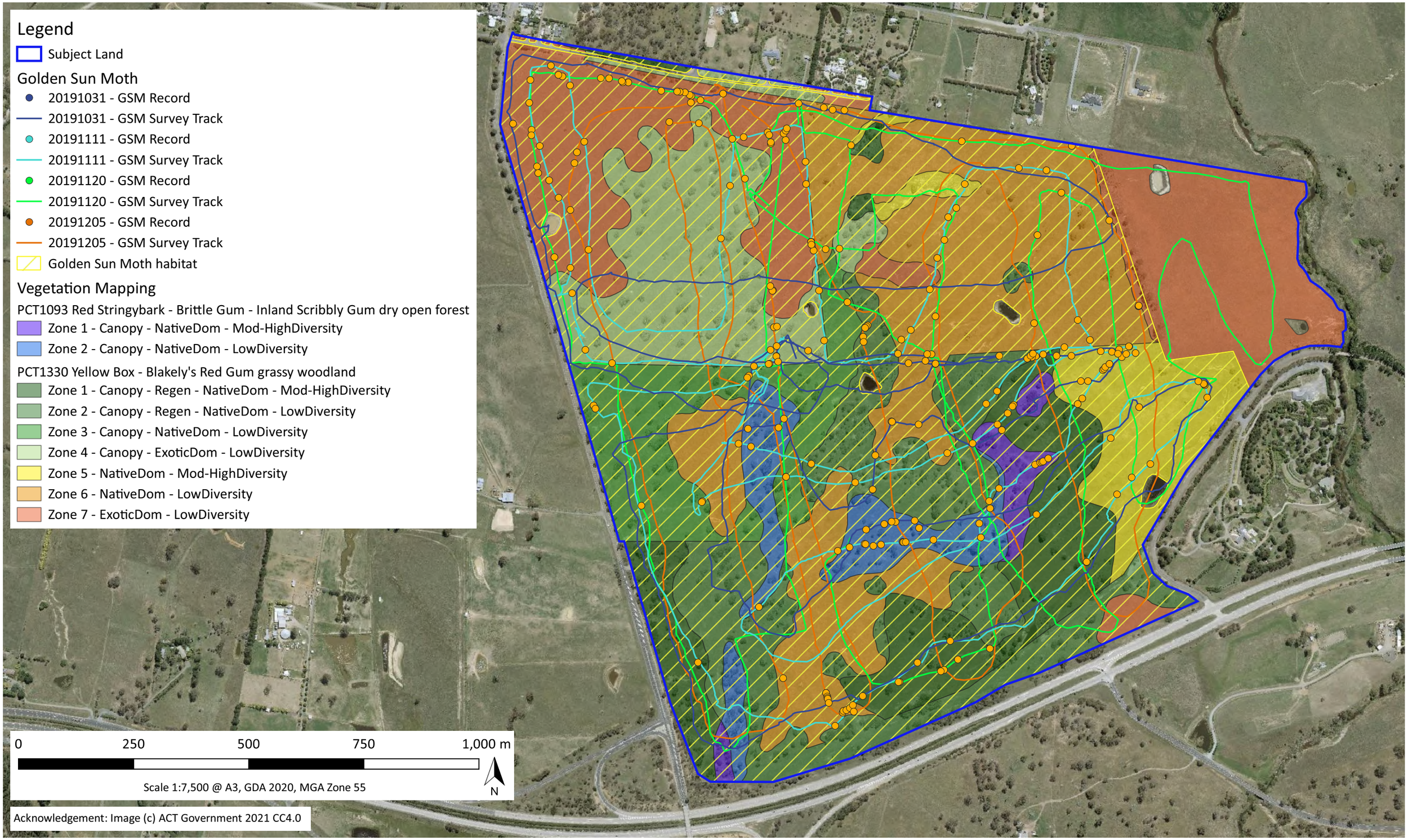

Figure 13. Golden Sun Moth Survey Results

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

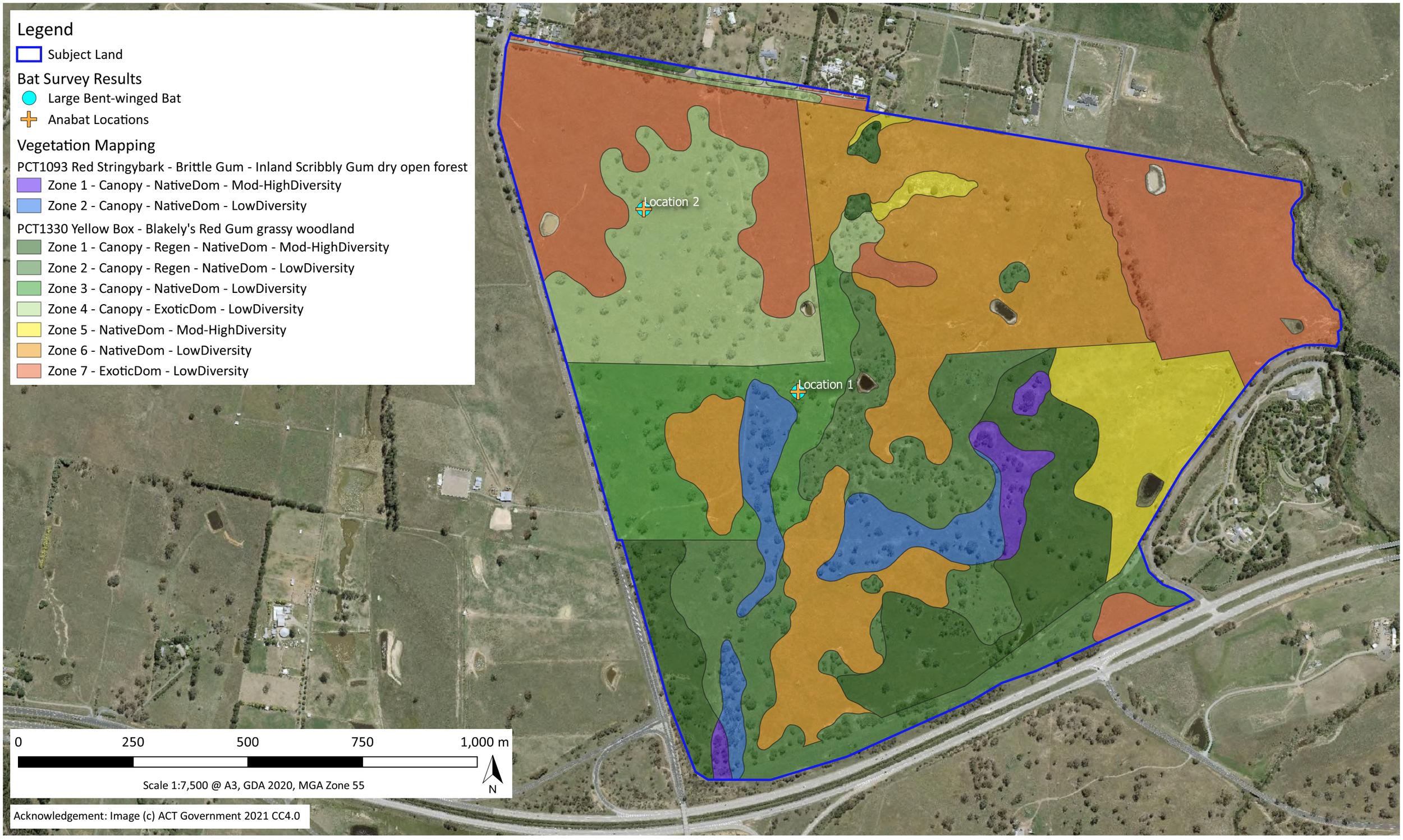

Figure 14. Threatened Bat Survey Results

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

3 Part 2 – Impact Assessment (BAM Stage 2)

Part 2 of this BCAR provides an assessment of the impacts of the proposed development as set out in Stage 2 of the BAM.

3.1 Avoidance and Minimisation of Impacts on Biodiversity Values

In accordance with Chapter 8 of the BAM, a proponent is required to demonstrate that all reasonable and practicable measures have been employed to avoid and minimise the impacts of a project on biodiversity values. Accordingly, this section outlines the avoidance and minimisation measures that have been incorporated into the proposed development.

3.1.1 Location

3.1.1.1 Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition

The proposed development impacts a total of 53.42 ha of vegetation (Figure 17). Of that, 44.24 ha (83%) is composed of vegetation zones with a vegetation integrity below 14 (i.e. PCT1330 Zone 4, PCT1330 Zone 6, and PCT1330 Zone 7, Table 16). These areas have been highly modified through successive years of cropping, pasture improvement, and livestock grazing. As a result, and as reflected in the corresponding vegetation integrity scores, 83% of the impact associated with the proposed development is located in areas that support native vegetation and threatened species habitat that is in a poor condition.

In contrast, the proposed Biodiversity Stewardship Sites and retained vegetation and habitat in lots will protect and manage (refer to Figure 3, Figure 15, and Figure 16):

- 96% of the EPBC Act Box-Gum Woodland (i.e. high condition vegetation);
- 95% (784) of the 829 remnant trees;
- 84% of the BC Act Box-Gum Woodland, including the majority of higher condition vegetation zones;
- 78% of the moderate to high diversity dry sclerophyll forest;
- 77% of the Golden Sun Moth habitat, including the majority of higher condition habitat;
- 60% of the Superb Parrot nesting trees;
- habitat for Silky Swainson-pea; and
- habitat for a variety of threatened woodland birds, bats, and other native fauna.

Furthermore, as detailed in Section 3.1 and Section 3.3, the proposed development includes a number of minimisation and mitigation measures that will reduce the impact on threatened species and ecological communities.

When considered together, the proposed development has therefore been located in areas where the native vegetation and threatened species habitat are in the poorest condition.

3.1.1.2 Locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained

As described in Section 2.1, the portions of the subject land that have retained a native overstorey are likely to comprise part of a biodiversity corridor and be important for habitat connectivity throughout the locality. However, as the subject land is surrounded by road infrastructure (Sutton Road and the Federal Highway), urban development (Sutton Township), natural barriers (Yass River), and cleared agricultural land, the noted biodiversity corridor is only likely to be of significance to highly mobile species, such as the Superb Parrot.

Within the subject land itself, all of the Golden Sun Moth habitat is assumed to be functionally connected. However, for the above-described reasons, the Golden Sun Moth habitat in the subject land is considered unlikely to be functionally connected to any Golden Sun Moth habitat that occurs outside of the subject land.

The proposed development of the subject land therefore has the potential to impact connectivity 'enabling movement of species and genetic material between areas of adjacent or nearby habitat' for both Superb Parrot and Golden Sun Moth. Accordingly, the proposed development includes the following avoidance, minimisation, and mitigation measures to reduce the potential impact on connectivity.

- The establishment of four Biodiversity Stewardship Sites that encompass approximately 52% of the subject land (refer to Figure 3, Figure 15, and Figure 16). These areas retain the majority of the high condition vegetation and habitat and ensure connectivity is maintained to both the north/south and east/west.
- The retention of approximately 18% of the vegetation and habitat in lots (refer to Figure 3, Figure 15, and Figure 16). The retention of this vegetation and habitat will help minimise the impact of the proposed development on connectivity, especially with respect to maintaining an unbroken canopy cover to both the north/south and east/west.
- The retention of 784 (95%) of the 829 remnant trees that occur in the subject land. This will help maintain habitat connectivity for highly mobile species, such as the Superb Parrot.
- A landscaping plan that will include locally indigenous and non-invasive species that are complimentary to the adjacent areas of high environmental conservation significance. This will help maintain habitat connectivity for highly mobile species, such as the Superb Parrot.
- A communal open space (approx. 8,000 m²) along the Estate's frontage to Yass River. This area (which is currently highly degraded) will form part of a Riverine Rehabilitation Management Plan to improve the environmental integrity of Yass River (as it adjoins the subject land), and will include the removal of noxious weed species, bank stabilisation, and revegetation with appropriate native species. This will improve habitat connectivity along Yass River for a wide variety of native species.
- A fencing strategy that relies predominantly on 'post and rail' boundary fencing and 'wire fencing with ring lock' block fencing. This strategy will help reduce the potential impact on Golden Sun Moth habitat connectivity between areas of retained habitat.

When considered together, the proposed development has therefore been located and designed to enable the movement of species and genetic material between areas of adjacent or nearby habitat.

3.1.2 Design

3.1.2.1 Reducing the clearing footprint of the project

The design of the proposed development was informed by previous ecological investigations of the subject land (i.e. EcoLogical Australia 2018) and by the surveys performed for this BCAR. As a result, the design of the proposed development footprint has been altered to reduce impacts on high biodiversity values. For example, the findings from EcoLogical Australia (2018) were used to revise a previous concept plan in order to avoid and minimise impacts to the identified significant ecological values that occur in the subject land. This resulted in an increase to the extent of conservation offset areas from 40 ha to 95.27 ha and included the highest biodiversity value land.

The proposed development incorporates the following measures to reduce the impact of the proposed development.

- The establishment of four Biodiversity Stewardship Sites that encompass approximately 52% of the subject land (refer to Figure 3, Figure 15, and Figure 16). These areas will retain the majority of the high condition vegetation and habitat.
- The retention of approximately 18% of the vegetation and habitat in lots (refer to Figure 3, Figure 15, and Figure 16).
- Locating roads, building envelopes, EMZs, driveways, and fences to reduce the removal of remnant trees. As a result, the proposed development will retain 784 (95%) of the 829 remnant trees that occur in the subject land. Only five of these remnant trees support function hollows, and none are nest trees for the Superb Parrot.

By reducing the clearing footprint, the proposed development avoids impacts to:

- 96% of the EPBC Act Box-Gum Woodland;
- 95% (784) of the 829 remnant trees;
- 84% of the BC Act Box-Gum Woodland;
- 78% of the moderate to high diversity dry sclerophyll forest;
- 77% of the Golden Sun Moth habitat;
- 60% of the Superb Parrot nesting trees;
- habitat for Silky Swainson-pea; and
- habitat for a variety of threatened woodland birds, bats, and other native fauna.

When considered together, the proposed development has been designed to reduce the clearing footprint, especially with respect to higher condition vegetation and threatened species habitat.

3.1.2.2 Making provision for the demarcation, ecological restoration, rehabilitation, and/or ongoing maintenance of retained native vegetation and habitat

Biodiversity Stewardship Sites

The proposed development includes the establishment of four Biodiversity Stewardship Sites that will encompass 100 ha (52%) of the subject land (refer to Figure 3, Figure 15, and Figure 16). The

biodiversity values that the proposed Biodiversity Stewardship Sites support will be detailed in separate Biodiversity Stewardship Site Assessment Reports. In brief, the proposed Biodiversity Stewardship Sites will protect and manage the majority of the significant ecological values that occur within the subject land, including the following.

- 88.20 ha (66%) of the BC Act Box-Gum Woodland, which includes 53.46 ha (93%) of the EPBC Act Box-Gum Woodland.
- 96.36 ha (57%) of the Golden Sun Moth habitat.
- Three (60%) of the Superb Parrot nesting trees.
- 1.22 ha of confirmed Silky Swainson-pea habitat.
- 6.08 ha (52%) of the moderate to high diversity dry sclerophyll forest (i.e. PCT1093 – *Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*).
- Habitat for a variety of threatened woodland birds, bats, and other native fauna.

As detailed in Appendix G, a preliminary stewardship site assessment indicates that the combined Biodiversity Stewardship Sites would generate the following classes and numbers of credits.

- 22 PCT1093 - *Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion* credits.
- 344 PCT1330 - *Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion* credits.
- 30 Superb Parrot breeding credits
- 5 Silky Swainson-pea credits.
- 365 Golden Sun Moth credits.

The above credits have been estimated assuming that both required management actions (i.e. management plans, fire management, grazing management, native vegetation management, threatened species habitat management, integrated pest animal control, integrated weed management, management of human disturbance, and monitoring) and specific active restoration management actions (i.e. supplementary planting) are carried out.

The proposed management of the Biodiversity Stewardship Sites is discussed in Section 3.3.

Retention of vegetation and habitat in the lots

In addition to the proposed Biodiversity Stewardship Sites, 33.58 ha (18%) of the residual vegetation and habitat within 'R5 – Large Lot Residential' zoned lots will be retained and protected through the combination of a NSW Biodiversity Certification Agreement, a Section 88E positive covenant registered over each lot (with the Minister for Planning and Public Spaces, being the minister responsible for DPIE-BCD, as the benefited prescribed authority), and specific environmental protection by-laws to be written as part of the proposed Woodbury Ridge Community Management Statement (refer to Figure 3, Figure 15, and Figure 16).

Woodbury Ridge is to be developed as a Community Scheme pursuant to the NSW *Community Land Development Act 1989*. The Proponent has selected this tenure scheme as it is considered to provide

superior opportunities (compared to a Torrens Title project) to apply specific enforceable by-laws with respect to a number of matters, including, of relevance, by-laws and management plans to identify and protect significant vegetation and habitats. The Development Application (DA) for the proposed development notes this intent, and also includes the definition on plan of limited building envelopes and effluent disposal areas on all proposed lots within areas of significant habitat. Upon approval of the DA and Biodiversity Certification, the proponents will prepare a Biodiversity Management Plan (BMP) for inclusion in the Section 88E and by-laws for all other lots. This BMP, which will also form part of the Biodiversity Certification Agreement and be developed to the satisfaction of DPIE, will stipulate the conservation-focused management measures that the responsible party (i.e. the owner of the relevant private lot) will implement. In combination, the Biodiversity Certification Agreement, Section 88E, and Woodbury Ridge Community Management Statement by-laws will provide the best available legal mechanisms to achieve the environmental protection aspirations of the proposal.

These measures will protect and manage:

- 25.27 ha (19%) of the BC Act Box-Gum Woodland, which includes 1.83 ha (3%) of the EPBC Act Box-Gum Woodland;
- 33.58 ha (20%) of the Golden Sun Moth habitat;
- 2.99 ha (26%) of the moderate to high diversity dry sclerophyll forest (i.e. PCT1093 – *Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*); and
- habitat for a variety of threatened woodland birds, bats, and other native fauna.

The proposed management of the retained vegetation and habitat in large lots is discussed in Section 3.3.

3.1.2.3 Locating ancillary facilities in areas: where there are no biodiversity values; where the native vegetation or threatened species habitat is in the poorest condition; and that avoid habitat for species and vegetation in high threat status categories

Given that the proposed development is located immediately adjacent to existing similar residential development, many of the biodiversity impacts associated with a new development will be reduced (i.e. impacts related to services, roads, bushfire protection, flood planning, etc.). In addition, all ancillary infrastructure associated with the construction and operation of the proposed development will be located to avoid all of the significant biodiversity values that will be retained by the proposed development.

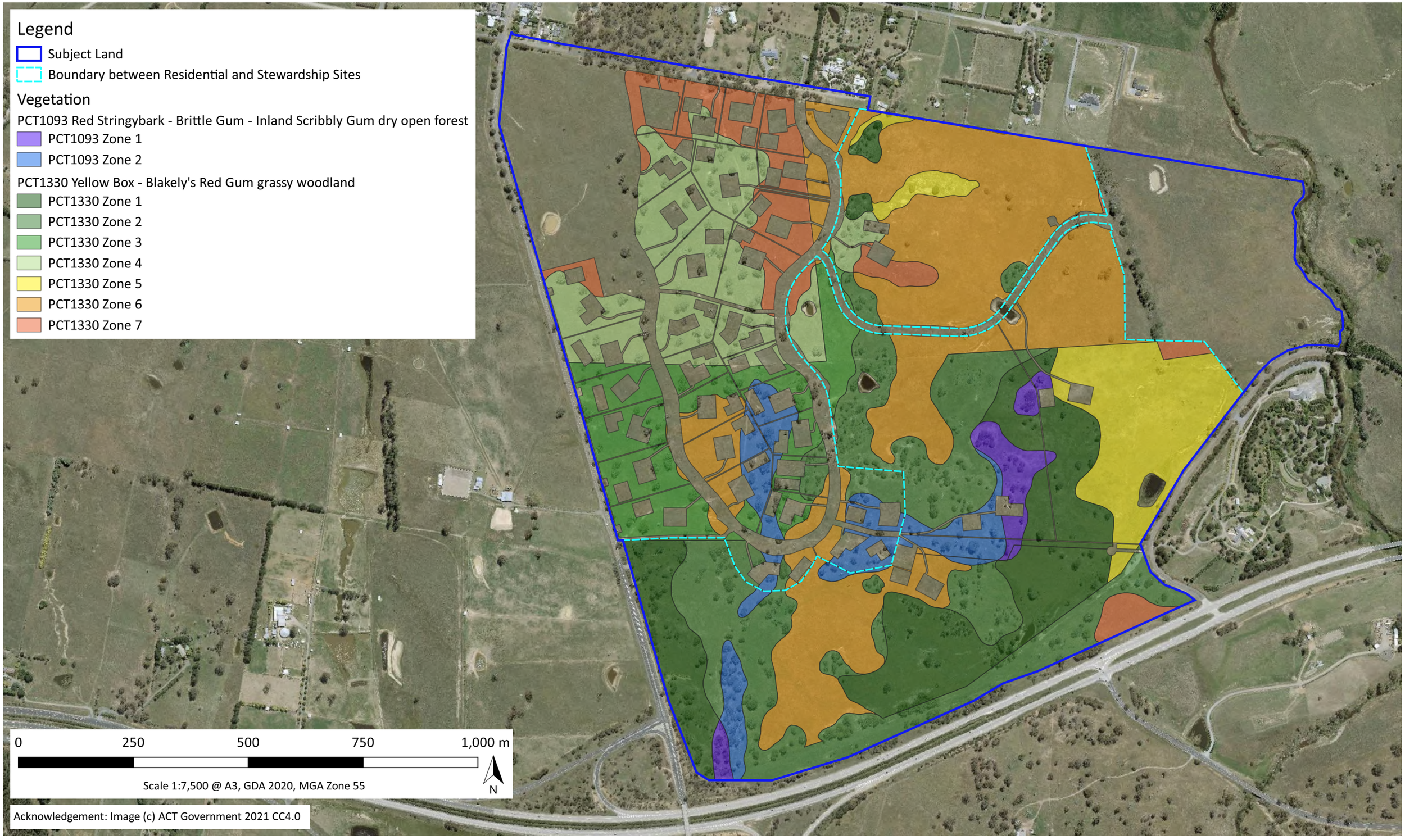

Figure 15. Avoidance, minimisation, and mitigation measures – vegetation

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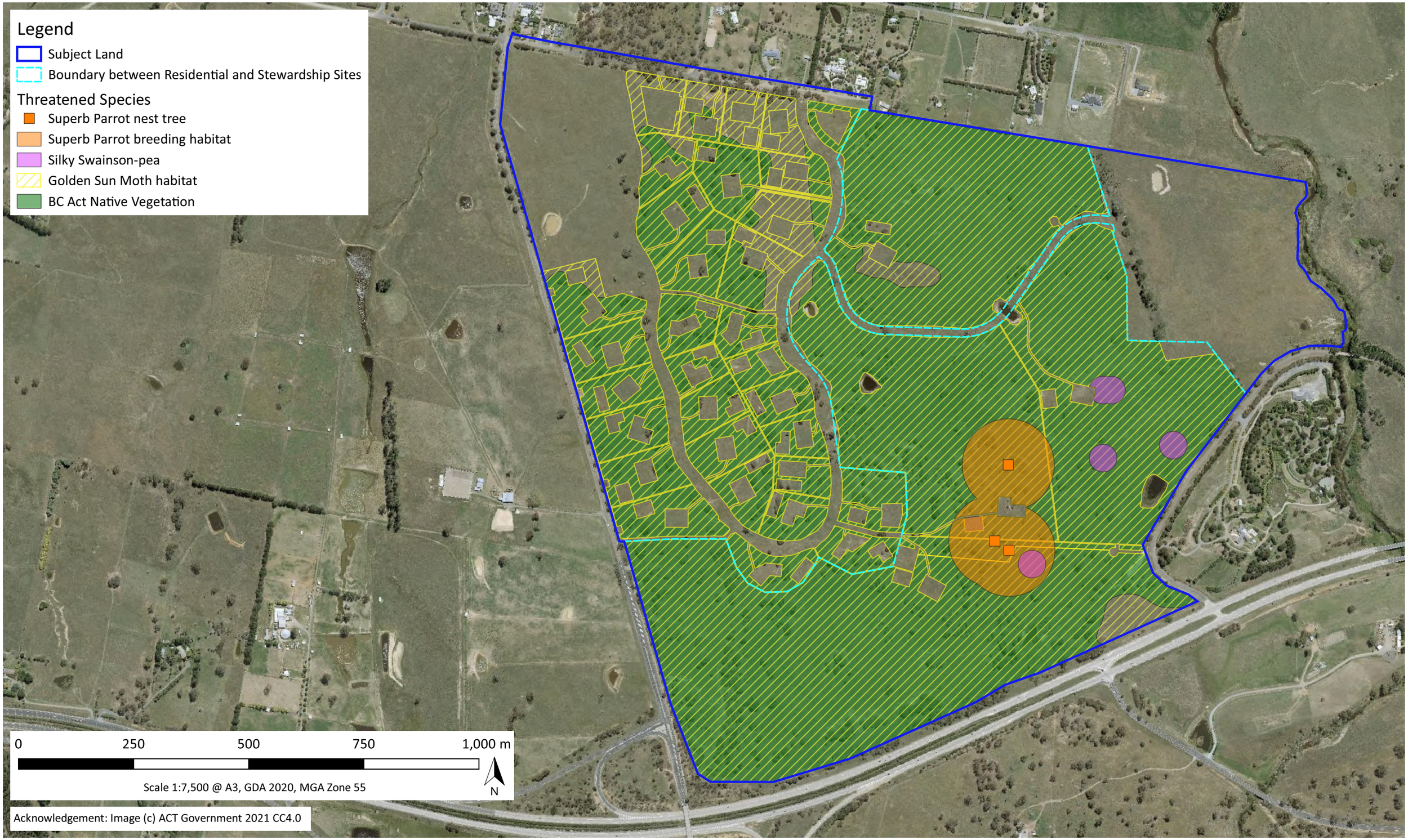

Figure 16. Avoidance, minimisation, and mitigation measures – threatened species

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3.2 Residual Biodiversity Impacts of the Proposed Development

3.2.1 Direct impacts on native vegetation and habitat

As shown in Figure 17, the proposed development will result in the clearance of the following.

- 0.25 ha of PCT1093 Zone 1 – mature canopy, native dominant understorey, and moderate to high native forb diversity (BC Act native vegetation).
- 2.32 ha of PCT1093 Zone 2 – mature canopy, native dominant understorey, and low native forb diversity (BC Act native vegetation).
- 0.28 ha PCT1330 Zone 1 – mature canopy, regeneration, native dominant understorey, and moderate to high native forb diversity (EPBC Act and BC Act Box-Gum Woodland, BC Act native vegetation).
- 0.96 ha of PCT1330 Zone 2 – mature canopy, regeneration, native dominant understorey, and low native forb diversity (EPBC Act and BC Act Box-Gum Woodland, BC Act native vegetation).
- 4.76 ha of PCT1330 Zone 3 – mature canopy, native dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland, BC Act native vegetation).
- 7.05 ha of PCT1330 Zone 4 – mature canopy, exotic dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland, BC Act native vegetation).
- 0.58 ha of PCT1330 Zone 5 – no canopy, native dominant understorey, and moderate to high native forb diversity (EPBC Act and BC Act Box-Gum Woodland, BC Act native vegetation).
- 6.38 ha of PCT1330 Zone 6 – no canopy, native dominant understorey, and low native forb diversity (BC Act Box-Gum Woodland, BC Act native vegetation).
- 30.84 ha of PCT1330 Zone 7 – no canopy, exotic dominant understorey, and low native forb diversity (exotic vegetation).
- 37.45 ha of Golden Sun Moth habitat (EPBC Act critically endangered, BC Act endangered), located in PCT1093 Zone 1, PCT1093 Zone 2, PCT1330 Zone 1, PCT1330 Zone 2, PCT1330 Zone 3, PCT1330 Zone 4, PCT1330 Zone 5, PCT1330 Zone 6, and PCT1330 Zone 7.
- 0.86 ha of Silky Swainson-pea habitat (BC Act vulnerable), located in PCT1330 Zone 1 and PCT1330 Zone 5.
- A maximum of 45 remnant trees.

In total, the proposed development will result in the clearance of 22.58 ha of BC Act native vegetation and 30.84 ha of exotic vegetation, 1.82 ha of which meets the criteria of EPBC Act Box-Gum Woodland, 20.01 ha of which meets the criteria of BC Act Box-Gum Woodland, 37.45 ha of which supports Golden Sun Moth habitat, 0.86 ha of which supports Silky Swainson-pea habitat.

The proposed development will not result in any other direct impacts on native vegetation or threatened species habitat. However, as described in the following section, the proposed development will have an indirect impact on 6.53 ha of Superb Parrot (EPBC Act and BC Act vulnerable) breeding habitat, located in PCT1093 Zone 1, PCT1093 Zone 2, PCT1330 Zone 2, and PCT1330 Zone 3 (Figure 11 and Figure 17).

3.2.2 Indirect impacts on native vegetation and habitat

The proposed development has the potential to indirectly impact retained or adjacent native vegetation and habitat. Potential indirect impacts are listed below.

- Increased sedimentation of receiving waterways (i.e. Yass River) during construction.
- Increased noise, vibration, and dust during construction.
- Weed introduction and/or spread during construction and occupation.
- Incidental damage or removal of retained native vegetation and habitat during construction and occupation.
- Increase in pest animal populations as a result of increased human activity during occupation.
- Edge effects due to increased human activity during occupation.

The above potential indirect impacts could occur during the construction and/or occupation of the subject land and are likely to reduce the extent and/or condition of the surrounding native vegetation and habitat. This may occur in the short-term during the construction phase of the proposed development and in the long-term during the occupation phase of the proposed development. By impacting native vegetation and habitat, indirect impacts also have the potential to impact the following threatened species and ecological communities.

- Golden Sun Moth, Superb Parrot, Silky Swainson-pea, EPBC Act Box-Gum Woodland, and BC Act Box-Gum Woodland.
- The retained vegetation and habitat protected in the proposed Biodiversity Stewardship Sites.
- The threatened species listed in Table 21.

The proposed development reduces the likelihood of indirect impacts by enacting the following principles detailed in Section 3.1 to avoid and minimise impacts to native vegetation and habitat.

- Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition.
- Locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained
- Reducing the clearing footprint of the project
- Making provision for the demarcation, ecological restoration, rehabilitation, and/or ongoing maintenance of retained native vegetation and habitat.
- Locating ancillary facilities in areas: where there are no biodiversity values; where the native vegetation or threatened species habitat is in the poorest condition; and that avoid habitat for species and vegetation in high threat status categories.

In addition, potential indirect impacts will be minimised and mitigated during construction by the measures outlined in Section 3.3 and during occupation by the measures outlined in Section 3.1 and Section 3.3. These measures:

- control potential sedimentation of receiving waterways during construction and operation;
- control noise, vibration, and dust spill during construction;
- control weed introduction and/or spread during construction and occupation;
- control incidental damage of retained native vegetation and habitat during construction and occupation;
- control pest animal populations as a result of increased human activity during occupation; and
- control edge effects due to increased human activity during occupation.

In combination, the above measures are considered sufficient to reduce the risk of indirect impacts to an acceptably low level for all of the identified threatened species and ecological communities apart from Superb Parrot. For the purposes of this BCAR and as indicated by DPIE-BCD (refer to Section 1.3), indirect impacts are assumed for nest trees that occur within 50 m of a building envelope or road, or within 30 m of an Indicative/Special EMZ (Figure 11 and Figure 17). The proposed development will therefore have an indirect impact on 6.53 ha of Superb Parrot breeding habitat, located in PCT1093 Zone 1, PCT1093 Zone 2, PCT1330 Zone 2, PCT1330 Zone 3, and PCT1330 Zone 6.

3.2.3 Prescribed biodiversity impacts

As described in Section 8.2 of the BAM, some types of projects may have impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. For many of these impacts the biodiversity values may be difficult to quantify, replace or offset, making avoiding and minimising impacts critical. Clause 6.1 of the BC Regulation identifies the following as impacts that are 'prescribed biodiversity impacts' that must be assessed using the BOS.

> *(a) impacts of development on the habitat of threatened species or ecological communities associated with:*
>
> *(i) karst, caves, crevices, cliffs and other geological features of significance;*
>
> *(ii) rocks;*
>
> *(iii) human made structures;*
>
> *(iv) non-native vegetation;*
>
> *(b) impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range;*
>
> *(c) impacts of development on movement of threatened species that maintains their life cycle;*
>
> *(d) impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining);*

(e) impacts of wind turbine strikes on protected animals; and

(f) impacts of vehicle strikes on threatened species or on animals that are part of a TEC.

Two potential 'prescribed biodiversity impacts' were identified during the development of this BCAR. As described in the following sections, these potential impacts were not determined to be a 'prescribed biodiversity impact' due to the avoidance and minimisation measures detailed in Section 3.1, the mitigation measures detailed in Section 3.3, and the fact that they did not impact threatened species habitat or threatened ecological communities in addition to that described in Section 3.2.1 and Section 3.2.2.

3.2.3.1 Impacts of development on the habitat of threatened species or ecological communities associated with non-native vegetation

As detailed in Section 2.3 and shown in Figure 13, within the development footprint Golden Sun Moth were recorded in 14.87 ha of exotic dominant vegetation (i.e. PCT1330 Zone 7). As such, the proposed development will impact the habitat of a threatened species that is associated with non-native vegetation.

However, as detailed in Section 3.5.2, the impact of the proposed development on these 14.87 ha of exotic dominant vegetation results in an offset obligation that generates 121 Golden Sun Moth species credits.

In light of the above, the impact of the proposed development on Golden Sun Moth habitat in exotic vegetation is appropriately accounted for. As such, the removal Golden Sun Moth habitat that is associated with non-native vegetation will not have prescribed biodiversity impact beyond that already accounted for.

3.2.3.2 impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range AND impacts of development on movement of threatened species that maintains their life cycle

As described in Section 2.1, the portions of the subject land that have retained a native overstorey are likely to comprise part of a biodiversity corridor and be important for habitat connectivity throughout the locality. However, as the subject land is surrounded by road infrastructure (Sutton Road and the Federal Highway), urban development (Sutton Township), natural barriers (Yass River), and cleared agricultural land, the noted biodiversity corridor is only likely to be of particular significance to highly mobile species, such as the Superb Parrot.

Within the subject land itself, all of the Golden Sun Moth habitat is assumed to be functionally connected. However, for the above-described reasons, the Golden Sun Moth habitat in the subject land is considered unlikely to be functionally connected to any Golden Sun Moth habitat that occurs outside of the subject land.

With respect to Superb Parrot and Golden Sun Moth, the proposed development of the subject land therefore has the potential to have a prescribed biodiversity impact on 'the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range', and/or on 'movement of threatened species that maintains their life cycle'.

Accordingly, the proposed development includes the following avoidance, minimisation, and mitigation measures to reduce the potential impact on connectivity.

- The establishment of four Biodiversity Stewardship Sites that encompass approximately 52% of the subject land (refer to Figure 3, Figure 15, and Figure 16). These areas retain the majority of the high condition vegetation and habitat and ensure connectivity is maintained to both the north/south and east/west.

- The retention of approximately 18% of the vegetation and habitat in lots (refer to Figure 3, Figure 15, and Figure 16). The retention of this vegetation and habitat will help minimise the impact of the proposed development on connectivity, especially with respect to maintaining an unbroken canopy cover to both the north/south and east/west.

- The retention of 784 (95%) of the 829 remnant trees that occur in the subject land. This will help maintain habitat connectivity for highly mobile species, such as the Superb Parrot.

- A landscaping plan that will include locally indigenous and non-invasive species that are complimentary to the adjacent areas of high environmental conservation significance. This will help maintain habitat connectivity for highly mobile species, such as the Superb Parrot.

- A communal open space (approx. 8,000 m²) along the Estate's frontage to Yass River. This area (which is currently highly degraded) will form part of a Riverine Rehabilitation Management Plan to improve the environmental integrity of Yass River (as it adjoins the subject land), and will include the removal of noxious weed species, bank stabilisation, and revegetation with appropriate native species. This will improve habitat connectivity along Yass River for a wide variety of native species.

- A fencing strategy that relies predominantly on 'post and rail' boundary fencing and 'wire fencing with ring lock' block fencing. This strategy will help reduce the potential impact on Golden Sun Moth habitat connectivity between areas of retained habitat.

In light of the above, it is considered unlikely that the proposed development will have a prescribed biodiversity impact on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range, or on movement of threatened species that maintains their life cycle.

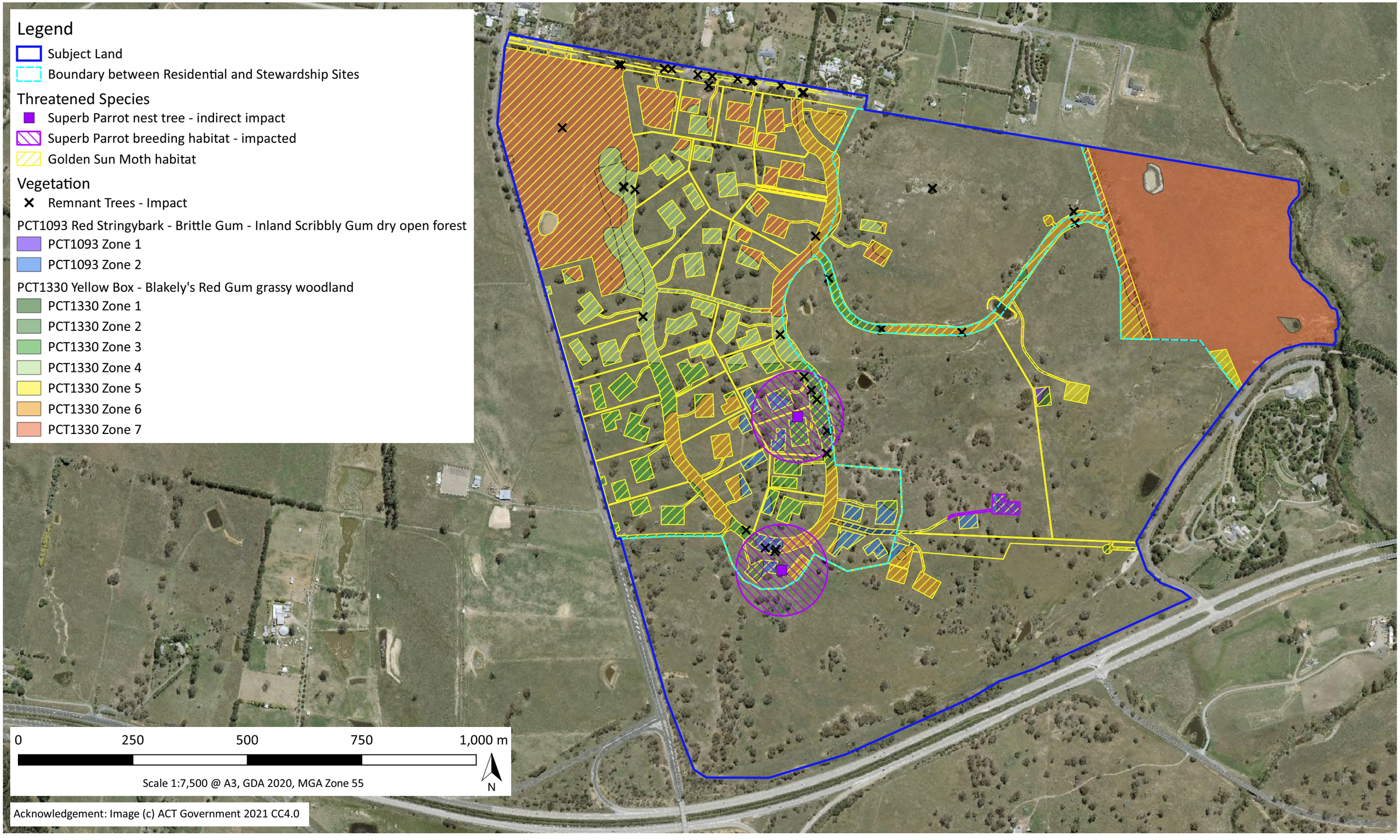

Figure 17. Residual Biodiversity Impacts of the Proposed Development

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3.3 Mitigation of Residual Impacts on Biodiversity Values

The following mitigation techniques will be implemented to address the residual impacts on biodiversity values during and after the construction phase of the proposed development. In combination, these mitigation measures are considered sufficient to reduce the risk of residual impacts to an acceptably low level.

3.3.1 Construction

A Construction Environmental Management Plan (CEMP) will be developed to guide the proposed development from before construction commences and until construction is completed. At a minimum the CEMP will include:

- site access;
- appropriate definition of clearing boundaries;
- protective fencing around sensitive values;
- buffer zones around sensitive values;
- clearing procedures;
- weed management procedures;
- sediment and erosion controls to retard and treat site run-off;
- noise, vibration, and dust control;
- flow controls;
- pollution and waste management;
- water treatment standards before release;
- re-establishing disturbed areas with endemic grass species; and
- monitoring, reporting, and compliance requirements.

All trees to be retained will be protected and managed in accordance with the CEMP and the Tree Impact Plan (Place Logic (2020c[51]).

Trees to be cleared will be removed in accordance with the CEMP and Place Logic (2020c). At a minimum this will include pre-clearance surveys, clearing outside of the breeding season of most of the locally occurring native fauna (i.e. August to December), and fauna rescue procedures.

Where appropriate, any large logs and/or tree sections will be recovered for the purpose of fauna habitat enhancement in the proposed Biodiversity Stewardship Sites.

[51] Place Logic (2020c). *Woodbury Ridge Estate, Sutton, NSW. Tree Impact Plan*. Drawing No. 106.1, Revision B, 09/12/20.

Best practice sediment and erosion control will be implemented as required during construction. These measures have been outlined within the Environmental Controls Concept Plans (Civil Drawing Nos. 307996CA800 to CA804) and include the following:

- use of existing farm dams as clear water ponds during construction;
- construction of sediment basin in Stage 1 and its use as a clear water pond until it is required for sediment and erosion control;
- the use of sediment control structures such as silt fencing and hay bales in areas that are most effective and efficient;
- the use of temporary tree protection fencing to trees immediately surrounding earthworks and heavy traffic areas; and
- the use of site fencing to limit access and to conserve as much vegetated land as possible.

A key potential risk to the biodiversity values of the subject land and adjoining areas during construction of the proposed development is the facilitated spread of the high threat weeds currently occurring in the locality and/or the introduction of new weeds. Therefore, at a minimum, the following weed management measures will be implemented during construction.

- Appropriate vehicle hygiene will be maintained. Vehicles and machinery entering the subject land will be clean of weed seed or propagules.
- Only sterile materials such as hessian/jute or rice straw will be used for soil stabilisation or similar purposes.
- High threat weeds will be prevented from establishing on newly created road verges, landscaped areas, and other open space.

3.3.2 Construction and Occupation

Apart from research conducted in the ACT, few studies have investigated the indirect impact of nearby development on Superb Parrot nesting behaviour. Accordingly, Superb Parrot nesting behaviour throughout the subject land will be regularly monitored (e.g. annually) throughout the construction phase and initial occupation phase of the proposed development. The exact monitoring methodology will be detailed in either the Biodiversity Management Plan for the known nest site in the residential lot or in the Biodiversity Stewardship Agreement for each Biodiversity Stewardship Site.

All data collected during monitoring activities will be shared with DPIE-BCD with the aim of increasing our understanding of indirect impacts from development on Superb Parrot nesting behaviour.

3.3.3 Occupation

3.3.3.1 Landscaping

The design and management of the open space areas and road verges in the proposed development will be carried out in accordance with Place Logic (2020b). This plan will utilise locally indigenous and

non-invasive species that are complementary to the adjacent areas of high environmental conservation significance. The landscaping plan incorporates the following features.

- Planting of two native tree species (*E. albens* and *E. cinerea*). These species were selected as they are suitable for wider verges and are complementary to the existing Box-Gum Woodland vegetation.
- Formal avenue planting along part of Road 01. The formal avenue planting transitions to informal planting for the remainder of the Estate, which will supplement the existing mature native trees that are proposed to be retained along the internal road corridors.
- Planting of a native seed mix along road verges adjacent to the proposed Biodiversity Stewardship Sites.
- Communal parkland space (approx. 10,730 m²) incorporating nature play area, electric BBQ, shade structure, seating, and pedestrian paths. This parkland will form part of the community association property.
- Communal open space (approx. 8,000 m²) along the Estate's frontage to Yass River. This area (which is currently highly degraded) will not be formalised and will form part of a Riverine Rehabilitation Management Plan to improve the environmental integrity of Yass River (as it adjoins the subject land). These works would include the removal of noxious weed species, bank stabilisation, and revegetation with appropriate native species.
- A proposed fencing strategy that aims to reduce impacts on biodiversity through alignment (which avoids the removal of any mature native trees) and design (with predominantly 'post and rail' boundary fencing and 'wire fencing with ring lock' block fencing, which will reduce potential indirect impacts on Golden Sun Moth habitat connectivity between areas of retained habitat).

3.3.3.2 Protection of retained vegetation and habitat in the lots

The proposed development includes the protection and management of 33.58 ha (18%) of the subject land in large residential lots. This will be achieved through the combination of a NSW Biodiversity Certification Agreement, a Section 88E positive covenant registered over each lot (with the Minister for Planning and Public Spaces, being the minister responsible for DPIE-BCD, as the benefited prescribed authority), and specific environmental protection by-laws to be written as part of the proposed Woodbury Ridge Community Management Statement.

Upon approval of the DA and Biodiversity Certification, the Proponent will prepare a Biodiversity Management Plan (BMP) for inclusion in the Section 88E and by-laws for all other lots. This BMP, which will also form part of the Biodiversity Certification Agreement and be developed to the satisfaction of DPIE, will stipulate the conservation-focused management measures that the responsible party (i.e. the owner of the relevant private lot) will implement. At a minimum, the BMP management measures will include the following.

- Mandatory measures – including targeted weed control, feral animal control, grazing control, biomass control, and protection of native vegetation and threatened species habitat. The key aims of the mandatory measures will be to protect the retained ecological values and reduce the impact of known threatening processes.
- Mandatory controls – including restrictions on the location and species of plant that may be planted and restrictions on the type of animals that may be kept. The key aims of the

mandatory controls will be to reduce the impact of human occupation on the retained ecological values. Given the proximity of Superb Parrot breeding habitat, a prohibition on keeping uncontained cats will be included in the mandatory controls.

- Optional measures – such as rehabilitation activities to improve native fauna habitat and other biodiversity values.

As the retained vegetation and habitat in large lots will be included in the Biodiversity Certification Agreement as 'avoided land', these lots will be subject to site visits and compliance audits by DPIE-BCD.

In order to ensure compliance with the BMP, the Proponents propose the following.

- The Woodbury Ridge Community Association will provide ongoing education to enable landowners to enact the BMP.
- From the time the landowner purchases the relevant lot from the Proponent, the obligation to enact the BMP will rest with the landowner and any future landowners, with oversight by DPIE-BCD.
- The Woodbury Ridge Community Management Statement will contain by-laws included at the request of DPIE-BCD which require each landowner to comply with provisions in the BMP.
- DPIE-BCD will report any non-compliance with the BMP to the landowner and the Woodbury Ridge Community Association. If the landowner continues non-compliance with the BMP, and subsequently continues to be in breach of a by-law under the Woodbury Ridge Community Management Statement, the Woodbury Ridge Community Association will have the power to require compliance with the by-law. The Woodbury Ridge Community Association will also have step-in powers to rectify the non-compliance at the cost of the landowner. If the Woodbury Ridge Community Association cannot rectify the non-compliance, or deems it inappropriate for the Community Association to do so, DPIE-BCD will retain the ability to pursue their own non-compliance processes.

The above measures will ensure that the BMP is being implemented appropriately and will allow for any non-compliance or unexpected issues to be resolved.

3.3.3.3 Biodiversity Stewardship Site

The proposed development includes the establishment of four Biodiversity Stewardship Sites that will encompass approximately 100 ha (53%) of the subject land and be established pursuant to the NSW BC Act.

The associated Biodiversity Stewardship Agreements (BSAs) will provide a formal, legally binding, and audited conservation focussed management regime for the proposed Biodiversity Stewardship Sites. These agreements will be developed in collaboration with, and to the satisfaction of, the Biodiversity Conservation Trust (BCT) and will stipulate a wide variety of management activities that are designed to protect, management, and enhance the significant biodiversity values that these areas support.

As per the BSA Landholder Guide[52], the key management obligations of BSA owners will be as follow.

- Annual management payments will be made to the landowner according to the payment schedule included in the BSA and will be used by the landholder for management of the site.
- The landholder will be responsible for management actions being correctly implemented. The active management of the BSA will be designed to actively improve the site's biodiversity values.
- Annual reporting will be submitted to the BCT and detail how the landowner has complied with the obligations under the BSA. The BCT will arrange a site visit to review the actions undertaken in the previous year and clarify expectations for the next year.

Capital Ecology, on behalf of the Proponent of the proposed action, is in the process of developing a BSSAR which will inform the development of the BSAs for the four proposed Biodiversity Stewardship Sites. An overview of the proposed management actions and activities that will become a component of the BSAs is provided in Table 23.

Compliance is also another key aspect of BSAs. The BCT will visit each Biodiversity Stewardship Site annually to confirm that the management actions committed to in the BSA are being carried out to the required standard. Where non-compliance is suspected, the BCT will use an escalating response based on the scale and impact of the non-compliance, from issuing warning letters to implementing statutory compliance mechanisms. The statutory compliance mechanisms available to the BCT are outlined in the BCT Compliance Policy[53].

Table 23. Proposed management actions and activities.

Management Action	Management Activities
Required Management Actions	
Preparation of a management plan	• Prepare a management plan for the Biodiversity Stewardship Agreement.
Fire management	• Prevent wildfire.
Grazing management	• Stock must not be grazed on the Biodiversity Stewardship Site.
Native vegetation management	• Retain and manage exiting native vegetation. • Retain and manage regrowth. • Prevent/restrict non-natural nutrient inputs and pesticides, except where permitted or required as part of a management action. • Manage native vegetation to improve Box-Gum Woodland and habitat for Golden Sun Moth and Superb Parrot. This includes slashing, if required, to manage groundstorey herbage mass. • As required, undertake control of overabundant native fauna, specifically Eastern Grey Kangaroo

[52] NSW Government (2021a). *Biodiversity stewardship agreement Landholder guide*. May 2021. Prepared by the NSW Biodiversity Conservation Trust.
[53] NSW Government (2019). *Biodiversity Conservation Trust Compliance Policy For private land conservation agreements under Part 5 of the NSW Biodiversity Conservation Act 2016*. August 2019.

Management Action	Management Activities
Threatened species habitat management	• Protect breeding habitat features and sites for Golden Sun Moth and Superb Parrot. • Undertake any other required management action identified in the Saving our Species database required for the management of Golden Sun Moth and Superb Parrot. This includes slashing, if required, to manage groundstorey herbage mass. • As required, undertake control of overabundant native fauna, specifically Noisy Miner and Eastern Grey Kangaroo.
Integrated feral pest control	• Undertake feral pest management including control of foxes, cats, avian pests, rabbits, and any other species as required.
Integrated weed management and control of high threat weeds	• Undertake weed management and activities to limit or reduce the spread of high threat weeds and other exotic vegetation, including fine-scale intensive removal of high threat exotic weeds and other exotic vegetation.
Management of human disturbance	• Dead timber and rock must not be removed from or moved within the Biodiversity Stewardship Sites. • Prevent, control, and remedy erosion. • If required, remove rubbish deposited by others. • Install signage to deter human disturbance. • Maintain fencing.
Monitoring	• Establish 360° photo points. • Establish permanent plots to provide a baseline for assessing and monitoring biodiversity outcomes. • Undertake annual performance monitoring. • Undertake ecological response target monitoring. • Monitor for evidence of plant disease or dieback within the native vegetation. • Undertake site inspections to inform all management actions and determine the physical condition of fences, gates, firetrails, and access tracks. • Certain monitoring must be carried out by an appropriately qualified person in accordance the BAM and Biodiversity Conservation Trust guidance documents.
Active Restoration Management Actions	
Native vegetation management and enhancement	• Undertake supplementary plantings in those areas that lack a canopy in order to improve composition, structure, and function.
Threatened species habitat management and enhancement	• Install artificial nest boxes to augment Superb Parrot breeding habitat. • Relocate felled trees from the development footprint to the Biodiversity Stewardship Sites.
Monitoring	• Monitoring Superb Parrot breeding activity.

3.3.4 Adaptive management for uncertain impacts

As per Chapter 9.4 of the BAM, an adaptive management strategy is required for impacts on biodiversity values that are infrequent or difficult to measure prior to commencement of the proposed development. Such impacts are referred to as uncertain impacts. If uncertain impacts are

identified, the proponent must develop an adaptive management strategy. As per Chapter 9.4.2 of the BAM, the following impacts are identified as uncertain impacts.

- Impacts related to damage to karst, caves, crevices, cliffs and other geological features of significance.
- Impacts related to subsidence and upsidence resulting from underground mining.
- Impacts related to wind turbine strikes.
- Impacts related to vehicle strikes.

The proposed development is unlikely to result in biodiversity impacts that are unforeseen or uncertain, especially given that:

- the subject land does not support karst, caves, crevices, cliffs and other geological features of significance;
- the proposed development does not include underground mining;
- the proposed development does not include wind turbines; and
- the proposed development is unlikely to substantively increase the incidence of vehicle strikes.

As such, an adaptive management strategy is not required for the proposed development. Notwithstanding this, as detailed in Section 3.3.3, the Biodiversity Stewardship Sites and BMP for retained vegetation and habitat in large lots will include adaptive management strategies. As such, the proposed adaptive management strategies will act to address any potential unforeseen biodiversity impacts on the retained vegetation and habitat.

3.4 Serious and Irreversible Impacts

The guidance to assist a decisionmaker to determine a serious and irreversible impact (NSW Government 2017b[54]) provides a list of threatened species and ecological communities which are likely to be the subject of serious and irreversible impacts (SAII). The potential for a project to impact these SAII entities must be assessed in the BCAR.

The subject land does not contain habitat of potential significance to any flora species listed as an SAII entity. However, the subject land does support the following biodiversity values, both of which are listed as SAII entities.

- Golden Sun Moth *Synemon plana*.
- PCT1330 – Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion ('BC Act Box-Gum Woodland').

The proposed development will result in the removal of (refer to Figure 17):

- 37.45 ha of Golden Sun Moth habitat, located in 0.25 ha of PCT1093 Zone 1, 2.32 ha of PCT1093 Zone 2, 0.28 ha of PCT1330 Zone 1, 0.96 ha of PCT1330 Zone 2, 4.76 ha of PCT1330

[54] NSW Government (2017b). *Guidance to assist a decision-maker to determine a serious and irreversible impact*. State of New South Wales and Office of Environment and Heritage

Zone 3, 7.05 ha of PCT1330 Zone 4, 0.58 ha of PCT1330 Zone 5, 6.38 ha of PCT1330 Zone 6, and 14.87 ha of PCT1330 Zone 7); and

- 20.01 ha of BC Act Box-Gum Woodland, located in 0.28 ha of PCT1330 Zone 1, 0.96 ha of PCT1330 Zone 2, 4.76 ha of PCT1330 Zone 3, 7.05 ha of PCT1330 Zone 4, 0.58 ha of PCT1330 Zone 5, and 6.38 ha of PCT1330 Zone 6.

The DPIE Biodiversity Conservation Division (BCD) have advised that a decision has been made not to develop entity specific thresholds for SAII. Instead, decisions will be made on a case-by-case basis. Accordingly, the below additional information is provided to support the decision maker to determine if the proposed removal of 37.45 ha of Golden Sun Moth habitat or 20.01 ha of BC Act Box-Gum Woodland constitute an SAII.

However, as detailed in the following sections, the substantial avoidance, minimisation, and mitigation measures incorporated into the proposed development reduce the likelihood of a SAII on either the Golden Sun Moth or BC Act Box-Gum Woodland.

3.4.1 Golden Sun Moth

The following information is presented according to the requirements outlined in Section 10.2 of the BAM and has been informed by the following databases and documents.

- NSW Wildlife Atlas (BioNet) Golden Sun Moth records, downloaded on 30 August 2021.
- ACT Government's ACTmapi *Significant Species, Vegetation Communities & Registered Trees*[55] Golden Sun Moth habitat spatial data, accessed on 30 August 2021.
- NSW Government Saving Our Species (SOS) Golden Sun Moth species profile[56] and project report[57].
- NSW Government Office of Environment & Heritage Golden Sun Moth profile[58].
- *ACT native grassland conservation strategy and action plans* (ACT Government 2017[59]).
- *Significant impact guidelines for the critically endangered golden sun moth (Synemon plana)* (Commonwealth of Australia 2009b[60]).
- *Background paper to Significant impact guidelines for the critically endangered golden sun moth (Synemon plana)* (Commonwealth of Australia 2009a[61]).
- *Approved Conservation Advice for Synemon plana (golden sun moth)* (Commonwealth of Australia 2013b[62]).

[55] http://app.actmapi.act.gov.au/actmapi/index.html?viewer=ssvcrt
[56] https://www.environment.nsw.gov.au/savingourspeciesapp/project.aspx?ProfileID=10791
[57] https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=839&ReportProfileID=10791
[58] https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10791
[59] ACT Government (2017). *ACT native grassland conservation strategy and action plans*. Environment, Planning and Sustainable Development, Canberra.
[60] Commonwealth of Australia (2009a). *Significant impact guidelines for the critically endangered golden sun moth (Synemon plana). Nationally threatened species and ecological communities EPBC Act policy statement 3.12.* Department of the Environment, Water, Heritage and the Arts.
[61] Commonwealth of Australia (2009b). *Background Paper to EPBC Act Policy Statement 3.12 – Nationally Threatened Species and Ecological Communities Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana).* Department of the Environment, Water, Heritage and the Arts.
[62] Commonwealth of Australia (2013b). *Approved Conservation Advice for Synemon plana (golden sun moth).* Approved by the delegate of the Minister on 17 December 2013.

3.4.1.1 Estimating Golden Sun Moth Extent of Occurrence (EOO) and occupied habitat

The NSW Wildlife Atlas contains 922 Golden Sun Moth records. For the purposes of this SAII assessment, the single record located near Tumut has been excluded as it is separated by over 60 km from the main body of Golden Sun Moth records and is therefore treated as an outlier. The remaining 921 Golden Sun Moth records span from 1993 to 2020 and represent at least 5,049 individuals (Figure 18).

As stated in ACT Government (2017) *'Based on the known former distribution of lowland Temperate Grassland in the ACT and areas surveyed for S. plana, it is unlikely any significant populations of the species remain undiscovered.'* As such, the spatial data from ACTmapi is likely to be an accurate reflection of the currently occupied Golden Sun Moth habitat in the ACT.

The NSW Wildlife Atlas (BioNet) Golden Sun Moth records and ACTmapi Golden Sun Moth habitat mapping have been combined to estimate the Golden Sun Moth Extent of Occurrence (EOO) (Figure 18). The EOO was calculated according to International Union for Conservation of Nature (IUCN) Standards and Petitions Subcommittee (2017)[63] and represents '*the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon*'. Based on this, the EOO for Golden Sun Moth is estimated to be 414,022 ha (Figure 18, Table 24). The EOO in Figure 18 agrees well with previous estimates that the species in the ACT/NSW occurs in a narrow band that is 100 km long and 30 km wide, extending from the Queanbeyan district in the south-east to the Boorowa area in the north-west (Commonwealth of Australia 2009a, ACT Government 2017).

It is difficult to accurately determine the extent of habitat currently occupied by the Golden Sun Moth in the EOO. This is because most populations are small, the species is very patchily distributed across its range, and only certain areas have been appropriately surveyed. However, as mentioned previously, the spatial data from ACTmapi is likely to be an accurate reflection of the currently occupied Golden Sun Moth habitat in the ACT. Therefore, this high-resolution data can be used to determine the proportion of the EOO in the ACT that is currently occupied by Golden Sun Moth. This finding can then be extrapolated to estimate the area of currently occupied habitat in the EOO as a whole.

As detailed in Table 24, the ACT accounts for 52,293 ha (12.63%) of the EOO. Within this area, there is 1,831 ha of Golden Sun Moth habitat (Figure 18). Therefore, 3.50% of the 52,293 ha of EOO in the ACT supports occupied Golden Sun Moth habitat. Using this value, the following estimates are made.

- NSW supports an estimated 14,498.67 ha of occupied Golden Sun Moth habitat, based on the assumption that 3.50% of the EOO supports Golden Sun Moth habitat. This finding agrees well with a previous estimate of 150 km^2 (15,000 ha) (ACT Government 2017).
- The Murrumbateman IBRA subregion supports an estimated 9,916.59 ha of occupied Golden Sun Moth habitat, based on the assumption that 3.50% of the EOO in the Murrumbateman IBRA subregion supports Golden Sun Moth habitat.

The data and estimates detailed above and presented in Table 24 are referred to throughout the following SAII assessment.

[63] IUCN Standards and Petitions Subcommittee (2017). *Guidelines for Using the IUCN Red List Categories and Criteria. Version 13.* Prepared by the Standards and Petitions Subcommittee. Available at: http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf

Table 24. Golden Sun Moth Extent of Occurrence (EOO) and estimated occupied habitat.

ID	Specific Matter	Area (ha)	Percent	Description
A	Golden Sun Moth EOO.	414,022	-	
B	ACT and EOO intersection.	52,293	12.63% (B/A)*100	The ACT accounts for 52,293 ha (12.63%) of the EOO.
C	Murrumbateman IBRA subregion and EOO intersection.	283,216	68.41% (C/A)*100	The Murrumbateman IBRA subregion accounts for 283,216 ha (68.41%) of the EOO.
D	ACTmapi Golden Sun Moth habitat in the ACT.	1,831	3.50% (D/B)*100	There is 1,831 ha of Golden Sun Moth habitat in the ACT. Therefore, 3.50% of the 52,293 ha of the EOO in the ACT supports Golden Sun Moth habitat.
E	Estimated extent of currently occupied Golden Sun Moth habitat in the EOO.	14,496.67 (A*0.035)	-	NSW supports an estimated 14,496.67 ha of occupied Golden Sun Moth habitat, based on the assumption that 3.50% of the EOO supports Golden Sun Moth habitat.
F	Estimated extent of currently occupied Golden Sun Moth habitat in the Murrumbateman IBRA subregion.	9,916.59 (C*0.035)	-	The Murrumbateman IBRA subregion supports an estimated 9,916.59 ha of occupied Golden Sun Moth habitat, based on the assumption that 3.50% of the EOO in the Murrumbateman IBRA subregion supports Golden Sun Moth habitat.

3.4.1.2 Golden Sun Moth – SAII additional information

a. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII

As shown in Figure 13, Golden Sun Moths were recorded at low density across the entire subject land, with the only exception being the recently cultivated paddock in the north-eastern corner. The subject land is therefore estimated to support 168.99 ha of Golden Sun Moth habitat.

The proposed development enacts the following principles detailed in Section 3.1 to avoid and minimise impacts to Golden Sun Moth habitat.

- Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition.
- Locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained
- Reducing the clearing footprint of the project
- Making provision for the demarcation, ecological restoration, rehabilitation, and/or ongoing maintenance of retained native vegetation and habitat.
- Locating ancillary facilities in areas: where there are no biodiversity values; where the native vegetation or threatened species habitat is in the poorest condition; and that avoid habitat for species and vegetation in high threat status categories.

As a result, the proposed development avoids impacts to 77% (129.94 ha) of the Golden Sun Moth habitat that occurs in the subject land (Figure 16).

In addition, of the areas of Golden Sun Moth habitat that will be impacted by the proposed development, 76% (28.30 ha) occurs in poor condition habitat that has a vegetation integrity below 14 (i.e. PCT1330 Zone 4, Zone 6, and Zone 7, Figure 17).

As detailed in Section 3.1 and Section 3.3, the retained Golden Sun Moth habitat in the subject land will be protected and managed in large lots and four Biodiversity Stewardship Sites (refer to Figure 3, Figure 15, and Figure 16).

With respect to the above, the proposed development has therefore been located and designed to avoid, minimise, and mitigate impacts to Golden Sun Moth habitat.

b. the size of the local population directly and indirectly impacted by the development, clearing or biodiversity certification

As outlined in ACT Government (2017), the following difficulties arise when attempting to estimate population size in the Golden Sun Moth.

- Flying adult males are the only stage and sex that are readily detected and counted, but they are short-lived and emerge across a season of several weeks.
- Counts on any particular day only reflect a single emergence cohort, and daily emergence is strongly affected by weather conditions.
- More adults emerge on hot dry days, making it difficult to differentiate between short-term weather effects and the actual size of a population.
- The length of the larval period is unclear, and it is unknown what proportion of the standing population is represented by the number of adults that fly in a given season.
- Seasonal conditions have a large effect on overall Golden Sun Moth numbers (e.g. there is a tendency for seasons to result in high, moderate, or low abundance of flying males at most sites across a large geographic area). Therefore, it is difficult to make an accurate assessment of population size based on one season of survey.

Given these difficulties, measures of relative abundance and/or maximum daily abundance combined with habitat size, condition, and connectivity are likely to be a more appropriate measure of a population than the absolute number of recorded individuals.

The BAM defines local as '*the population that occurs in the study area'.* The subject land therefore supports a local population with the following characteristics (refer to Figure 13).

- 168.99 ha of Golden Sun Moth habitat.
- A low-density population. Golden Sun Moth were recorded at an average density of 1.5 moths/hectare. This is low in comparison to other sites surveyed by Capital Ecology during the 2019 survey season. For example, another large site within 3 km of the subject land that was surveyed by Capital Ecology in 2019 recorded an average of 5.7 moths/hectare.
- Within the subject land, all of the Golden Sun Moth habitat is assumed to be functionally connected. However, the Golden Sun Moth habitat in the subject land is

considered unlikely to be functionally connected to any Golden Sun Moth habitat that occurs outside of the subject land.

The proposed development will directly impact 37.45 ha (22%) of the 168.99 ha of local Golden Sun Moth habitat (Figure 17). Of that, 76% (28.30 ha) occurs in poor condition habitat that has a vegetation integrity below 14 (i.e. PCT13330 Zone 4, Zone 6, and Zone 7).

In comparison, 77% (129.94 ha) of the Golden Sun Moth habitat in the subject land, including the majority of high condition habitat, will be protected and managed in large lots and four Biodiversity Stewardship Sites (refer to Figure 3, Figure 15, and Figure 16). Potential indirect impacts to retained habitat will be mitigated by the measures detailed in Section 3.1 and Section 3.3.

c. the extent to which the impact exceeds any threshold for the potential entity that is specified in the Guidance to assist a decision-maker to determine a serious and irreversible impact

As described above, the DPIE-BCD have advised that a decision has been made not to develop entity specific thresholds for SAII. Instead, decisions will be made on a case-by-case basis.

However, the TBDC does list the following SAII impact threshold for Golden Sun Moth:

- *Clearing of >10% of identified habitat on site*.

As mentioned previously, the subject land supports 168.99 of Golden Sun Moth habitat. The proposed development will impact 37.45 ha (22%) of that Golden Sun Moth habitat. The proposed development will therefore clear greater than the 10% clearing threshold.

d. the likely impact (including direct and indirect impacts) that the development, clearing or biodiversity certification will have on the habitat of the local population, including but not limited to:

(i) an estimate of the change in habitat available to the local population as a result of the proposed development

(ii) the proposed loss, modification, destruction or isolation of the available habitat used by the local population, and

(iii) modification of habitat required for the maintenance of processes important to the species' life cycle (such as in the case of a plant – pollination, seed set, seed dispersal, germination), genetic diversity and long-term evolutionary development.

(BioNet Atlas records or other documented, quantifiable means must be used by the assessor to estimate what percentage of the species' population and habitat is likely to be lost in the long term within the IBRA subregion due to the direct and indirect impacts of the development)

(i) and (ii). The proposed development will directly impact 37.45 ha (22%) of the 168.99 ha of local Golden Sun Moth habitat (Figure 17). As the proposed development has been located and designed to reduce potential indirect impacts on habitat connectivity (refer to 'f' below), this impact is considered unlikely to increase habitat fragmentation in the subject land or immediate locality.

While very under-surveyed to date, the land within 10 km of the subject land (the 'locality') is known to support a number of Golden Sun Moth populations. The extent of known Golden Sun

Moth habitat within the locality has been determined based on the following (refer to Figure 19).

- The ACT Government's ACTmapi, which indicates that 432.09 ha of Golden Sun Moth habitat occurs within the locality.
- A combined analysis of NSW BioNet records for Golden Sun Moth (indicating where individuals have been recorded), aerial imagery (identifying the extent of native vegetation surrounding the NSW BioNet Golden Sun Moth records), and surveys performed by Capital Ecology. Following this methodology, the locality is estimated to support 513.30 ha of Golden Sun Moth habitat.

  Based on Capital Ecology's knowledge of the vegetation and habitat throughout the Sutton/Murrumbateman region and given that very few areas within the locality are likely to have been surveyed for Golden Sun Moth, the calculated 513.30 ha is likely to be a substantial underestimation of the currently occupied habitat.

When combined with the 168.99 ha of Golden Sun Moth habitat in the subject land (refer to Table 5), the locality is estimated to support a minimum of 1,114.38 ha of Golden Sun Moth habitat.

More widely, Golden Sun Moths are known to occur from the Queanbeyan district in the south-east to the Boorowa area in the north-west (Section 3.4.1.1, Figure 18). NSW supports an estimated 14,487 ha of occupied Golden Sun Moth habitat, and the Murrumbateman IBRA subregion supports an estimated 9,913 ha of occupied Golden Sun Moth habitat (refer to Section 3.4.1.1 and Table 24).

As such, the proposed impact to 37.45 ha of Golden Sun Moth habitat will remove:

- 22% of the 168.99 ha of Golden Sun Moth habitat in the subject land;
- 3.4% of the 1,114.38 ha of Golden Sun Moth habitat in the locality;
- 0.38% of the 9,916.59 ha of Golden Sun Moth habitat in the Murrumbateman IBRA Subregion; and
- 0.26% of the 14,496.67 ha of Golden Sun Moth habitat in NSW.

(iii). The proposed development will impact 37.45 ha (22%) of the 168.99 ha of local Golden Sun Moth habitat (Figure 17). These areas support a low density of moths and 76% (28.30 ha) occurs in poor condition habitat that has a vegetation integrity below 14 (i.e. PCT13330 Zone 4, Zone 6, and Zone 7). The habitat in the subject land that will be impacted by the proposed development is therefore considered unlikely to be vital to the species' life cycle, genetic diversity, or long-term evolutionary development.

e. the likely impact on the ecology of the local population. At a minimum, address the following:

(i) for fauna:

– breeding

– foraging

– roosting, and

– dispersal or movement pathways

The proposed development will impact 37.45 ha (22%) of the 168.99 ha of local Golden Sun Moth habitat (Figure 17). These areas support a low density of moths and 76% (28.30 ha) occurs in poor condition habitat that has a vegetation integrity below 14 (i.e. PCT13330 Zone 4, Zone 6, and Zone 7). In comparison, 77% (129.94 ha) of the local Golden Sun Moth habitat, including the majority of high condition habitat, will be protected and managed in large lots and through the establishment of four Biodiversity Stewardship Sites.

As such, the proposed development is unlikely to have a significant impact on the local populations breeding, foraging, movement pathways, or long-term viability.

f. a description of the extent to which the local population will become fragmented or isolated as a result of the proposed development

All of the Golden Sun Moth habitat in the subject land is assumed to be functionally connected (Figure 13). Given that the subject land is surrounded by road infrastructure (Sutton Road and the Federal Highway), urban development (Sutton Township), natural barriers (Yass River), and cleared agricultural land, the Golden Sun Moth habitat in the subject land is considered unlikely to be functionally connected to any Golden Sun Moth habitat that occurs outside of the subject land. The proposed development therefore has the potential to fragment or isolate the local Golden Sun Moth population.

The proposed development includes the following avoidance, minimisation, and mitigation measures to reduce this potential impact.

- The establishment of four Biodiversity Stewardship Sites that encompass approximately 52% of the subject land (refer to Figure 3, Figure 15, and Figure 16). These areas will retain 57% (96.36 ha) of functionally connected Golden Sun Moth habitat.
- The retention of vegetation and habitat in lots, including 20% (33.58 ha) of the Golden Sun Moth habitat (refer to Figure 3, Figure 15, and Figure 16).
- A fencing strategy that relies predominantly on ‘post and rail’ boundary fencing and ‘wire fencing with ring lock’ block fencing. This strategy will help reduce the potential impact on Golden Sun Moth habitat connectivity between areas of retained habitat in lots.

As such, the proposed development is considered unlikely to fragment or isolate the local population.

g. the relationship of the local population to other population/populations of the species. This must include consideration of the interaction and importance of the local population to other population/populations for factors such as breeding, dispersal and genetic viability/diversity, and whether the local population is at the limit of the species’ range

Golden Sun Moth are known to occur from the Queanbeyan district in the south-east to the Boorowa area in the north-west (Figure 18). As shown in Figure 18, the local population in the subject land is located well within the estimated EOO for Golden Sun Moth and is therefore not at the limit of the species’ range.

As detailed in ACT Government (2017) *'Five major genetic clusters have been identified, one encompassing the populations from the ACT and nearby NSW'.* The local population in the subject land is therefore likely to form part of this ACT/NSW genetic cluster.

Largely due to large-scale, historic habitat destruction or modification, extant populations of Golden Sun Moth are known to be fragmented. This is true of the local population in the subject land, as it is considered unlikely to be connected to any population outside of the subject land.

Consideration of the above information indicates that it is unlikely that the local population has a wider importance to other populations for factors such as breeding, dispersal, and genetic viability/diversity.

h. the extent to which the proposed development will lead to an increase in threats and indirect impacts, including impacts from invasive flora and fauna, that may in turn lead to a decrease in the viability of the local population

The documents referenced at the start of Section 3.4.1 identify the following direct and indirect threats to Golden Sun Moth.

- Loss and degradation of habitat by urban, residential, infrastructure, and agricultural development.
- Modifications to agricultural practices (e.g. fertiliser application, ploughing, and inappropriate grazing).
- Overstocking that results in modification of soil structure through compaction, increased nutrient loads, and proportion of weeds
- Invasion of habitat by weeds (particularly St John's Wort *Hypericum perforatum* and exotic pasture species such as Phalaris *Phalaris aquatica*, Paspalum *Paspalum dilatatum*, and Oats *Avena* spp.).
- Fragmentation and small size of remnant populations.
- Rank growth of vegetation, leading to an increase in herbage mass and a decrease in inter-tussock bare ground.

As detailed throughout this BCAR, the subject land has been impacted by a number of these threats in the past as approximately 50% of the climax vegetation has been historically cleared. In addition, the remaining vegetation has been altered through successive years of cropping, pasture improvement, and livestock grazing. As a result, the majority of the subject land has been moderately to substantially disturbed.

When assessing the likely impacts of the proposed development on the viability of the local population, it is useful to also consider the likely future biodiversity values under the non-development scenario. Under the non-development scenario, it is very likely that the current land management regime would continue unchanged. This would likely mean that the subject land would continue to experience impacts from agricultural activities. These activities, over time, would likely further degrade or destroy the remaining areas of Golden Sun Moth habitat.

While the proposed development will directly impact 37.45 ha (22%) of the 168.99 ha of local Golden Sun Moth habitat, 57% (96.36 ha) will be retained in Biodiversity Stewardship Sites and 20% (33.58 ha) in large lots (refer to Figure 3, Figure 15, and Figure 16). As detailed in Section 3.1 and Section 3.3, the retained Golden Sun Moth habitat will be protected and managed in-perpetuity (refer to Figure 3, Figure 15, and Figure 16).

As such, given the current management regime, the proposed development is unlikely to lead to an increase in threats and indirect impacts, including impacts from invasive flora and fauna, that may in turn lead to a decrease in the viability of the local population. Indeed, if the measures in Section 3.1 and Section 3.3 are implemented, it is likely that the proposed development will lead to an increase in the long-term viability of the local population.

i. an estimate of the area, or number of populations and size of populations that is in the reserve system in NSW, the IBRA region and the IBRA subregion

Within the Golden Sun Moth EOO (Figure 18), the following reserves and offsets (all of which occur within the Murrumbateman IBRA subregion) are known to support the Golden Sun Moth.

- Queanbeyan Nature Reserve (area = 67 ha).
- Mcleods Creek Nature Reserve (area = 204 ha).
- Goorooyarroo Nature Reserve (area = 829 ha).
- Dunlop Grassland Nature Reserve (area = 103 ha).
- Jerrabomberra Grasslands (East and West) (combined area = 360 ha).
- Crace Grasslands Nature Reserve (area = 159 ha).
- Mulligans Flat Nature Reserve (area = 1,253 ha).
- Mulanggari Nature Reserve and Offset (combined area = 163 ha).
- Gungaderra Nature Reserve and Offset (combined area = 330 ha).
- Kinleyside Nature Reserve and Offset (combined area = 518 ha).
- Jarramlee/West Macgregor Offset (combined area = 145 ha).
- Majura West Grasslands Offset (area = 95 ha).
- Throsby North Offset (area = 172 ha).
- Throsby East Offset (area = 104 ha).
- Woolshed Creek Offset (area = 60 ha).

In total, the above reserves and offsets protect 4,562 ha of land.

j. the measure/s proposed to contribute to the recovery of the species in the IBRA subregion

The documents referenced at the start of Section 3.4.1 recommend the following management actions to protect, manage, and maintain/improve Golden Sun Moth habitat.

- Carry out targeted survey across private land and map habitat to identify priority areas for landholder engagement.
- Minimise impacts of commercial activities / agricultural practices by negotiating conservation arrangements, management agreements, and covenants on private land.
- Reduce and maintain weed densities at low levels by site-based weed control.

- Modify agricultural practices (e.g. grazing, ploughing, fertiliser application, etc.).

While the proposed development will directly impact 37.45 ha (22%) of the 168.99 ha of local Golden Sun Moth habitat, 57% (96.36 ha) will be retained in Biodiversity Stewardship Sites and 20% (33.58 ha) in large lots (refer to Figure 3, Figure 15, and Figure 16). As detailed in Section 3.1 and Section 3.3, the retained Golden Sun Moth habitat will be protected and managed in a manner consistent with the above recommendations (refer to Figure 3, Figure 15, and Figure 16). The proposed development will therefore contribute to the recovery of the species through the implementation of such measures.

Legend

- Australian_Capital_Territory_Border
- Murrumbateman IBRA Subregion
- Subject Land
- Golden Sun Moth - Extent of Occurence
- NSW BioNet Records - Golden Sun Moth
- Golden Sun Moth records - subject land
- Golden Sun Moth habitat - ACTmapi

0 5 10 15 20 km

Scale 1:320,000 @ A3, GDA 2020, MGA Zone 55

N

Figure 18. Golden Sun Moth Extent of Occurrence and Estimated Occupied Habitat

capital ecology

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

0 1 2 3 4 km

N

Scale 1:80,000 @ A3, GDA 2020, MGA Zone 55

Legend

- Australian_Capital_Territory_Border
- Subject Land
- 10 km Buffer

Golden Sun Moth

- Golden Sun Moth records - Subject Land
- NSW BioNet Records - Golden Sun Moth
- Golden Sun Moth habitat - BioNet estimate
- Golden Sun Moth habitat - ACTmapi

Figure 14. Golden Sun Moth Habitat in the Locality

capital ecology

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

3.4.2 Box-Gum Woodland

The following information is presented according to the requirements outlined in Section 10.2 of the BAM and has been informed by the following databases and documents.

- ACT Government's ACTmapi *Significant Species, Vegetation Communities & Registered Trees*[64] threatened woodland spatial data, accessed on 17 September 2021.
- *Species Impact Statement Ellerton Drive Extension* (NGH Environmental 2014[65]).
- NSW Government Saving Our Species (SOS) profile[66] and project report[67].
- *Final Determination: White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Gazetted 17 July 2020 (NSW Threatened Species Scientific Committee 2020).
- NSW Government Office of Environment & Heritage White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland profile[68].
- *ACT native woodland conservation strategy and action plans* (ACT Government 2019a[69]).
- *White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands listing advice and conservation advice*[70].
- *White box - Yellow box - Blakely's red gum grassy woodlands and derived native grasslands* (Commonwealth of Australia 2006).
- *National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (DECCW 2010[71]).

3.4.2.1 Box-Gum Woodland – SAII additional information

a. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII

As described in Section 2.2.5 and shown in Figure 6, the subject land is estimated to support 134.49 ha of BC Act Box-Gum Woodland. Of that, 57.39 ha (43%) supports vegetation which meets the criteria for this TEC in high condition (i.e. PCT1330 Zone 1, Zone 2, and Zone 5), 35.23 ha (26%) in moderate condition (i.e. PCT1330 Zone 3 and Zone 4), and 41.87 ha (31%) in low condition (i.e. PCT1330 Zone 6). The remaining 39.19 ha of PCT1330 (i.e. PCT1330 Zone 7) have been disturbed to the extent that it no longer meets the listing criteria for BC Act Box-Gum Woodland.

[64] http://app.actmapi.act.gov.au/actmapi/index.html?viewer=ssvcrt
[65] NGH Environmental (2014). *Species Impact Statement Ellerton Drive Extension*. June 2014, Final v1.2.
[66] https://www.environment.nsw.gov.au/savingourspeciesapp/project.aspx?ProfileID=10837
[67] https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=988&ReportProfileID=10837
[68] https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10837
[69] ACT Government (2019). *ACT native woodland conservation strategy and action plans*. Environment, Planning and Sustainable Development.
[70] Department of the Environment and Heritage (2006). *White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands listing advice and conservation advice*, available at https://www.environment.gov.au/epbc/publications/white-box-yellow-box-blakelys-red-gum-grassy-woodlands-and-derived-native-grasslands
[71] DECCW (2010). *National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland.* Department of Environment, Climate Change and Water NSW, Sydney

The proposed development enacts the following principles detailed in Section 3.1 to avoid and minimise impacts to BC Act Box-Gum Woodland.

- Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition.
- Locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained.
- Reducing the clearing footprint of the project.
- Making provision for the demarcation, ecological restoration, rehabilitation, and/or ongoing maintenance of retained native vegetation and habitat.
- Locating ancillary facilities in areas: where there are no biodiversity values; where the native vegetation or threatened species habitat is in the poorest condition; and that avoid habitat for species and vegetation in high threat status categories.

As a result, the proposed development avoids impacts to 84% (113.47 ha) of the BC Act Box-Gum Woodland in the subject land (refer to Figure 3, Figure 15, and Figure 16).

In addition, the proposed development minimises impacts to Box-Gum Woodland by avoiding 96% (55.29 ha) of the high condition zones and 64% (22.69 ha) of the moderate condition zones. In contrast, over 60% of the impact to PCT1330 occurs in areas that have been disturbed to the extent that they no longer meet the listing criteria for BC Act Box-Gum Woodland (i.e. an impact of 30.84 ha to PCT1330 Zone 7 across a combined impact of 50.85 ha to PCT1330, Figure 17).

As detailed in Section 3.1 and Section 3.3, the retained BC Act Box-Gum Woodland in the subject land will be protected and managed in large lots and four Biodiversity Stewardship Sites (refer to Figure 3, Figure 15, and Figure 16).

With respect to the above, the proposed development has therefore been located and designed to avoid, minimise, and mitigate impacts to BC Act Box-Gum Woodland.

b. the area (ha) and condition of the TEC to be impacted directly and indirectly by the proposed development. The condition of the TEC is to be represented by the vegetation integrity score for each vegetation zone

In total, the subject land supports 134.49 ha of BC Act Box-Gum Woodland (Figure 6). Of that, 57.39 ha (43%) supports vegetation which meets the criteria for this TEC in high condition (i.e. PCT1330 Zone 1, Zone 2, and Zone 5), 35.23 ha (26%) in moderate condition (i.e. PCT1330 Zone 3 and Zone 4), and 41.87 ha (31%) in low condition (i.e. PCT1330 Zone 6). The remaining 39.19 ha of PCT1330 (i.e. PCT1330 Zone 7) have been disturbed to the extent that it no longer meets the listing criteria for BC Act Box-Gum Woodland.

The proposed development will directly impact (i.e. remove) of a total of 20.01 ha of BC Act listed Box-Gum Woodland, composed of the following vegetation condition zones (Figure 17).

- 0.28 ha of PCT1330 Zone 1. Vegetation Integrity Score of 53.4. As described in Table 9, this zone is characterised as *'Moderately intact vegetation, with a thinned canopy representative of the climax community. Some scattered shrubs and regeneration of*

the overstorey. Moderate to high diversity groundlayer dominated by perennial native grasses, notably Kangaroo Grass. Lightly grazed by stock and Eastern Grey Kangaroo.'

- 0.96 ha of PCT1330 Zone 2. Vegetation Integrity Score of 33.8. As described in Table 10, this zone is characterised as *'Contains a canopy representative of the climax community and low to moderate regeneration, but there is evidence of historic thinning and the midstorey and shrubstorey are largely absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Speargrass, Red-leg Grass, and Wallaby Grasses. Low to moderate density of significant weed species. Lightly to moderately grazed by stock and Eastern Grey Kangaroo.'*

- 4.76 ha of PCT1330 Zone 3. Vegetation Integrity Score of 22.6. As described in Table 11, this zone is characterised as *'Contains a thinned canopy representative of the climax community and no regeneration. The midstorey and shrubstorey are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Speargrasses and Red-leg Grass. Low to moderate density of significant weed species. Lightly to moderately grazed by stock and Eastern Grey Kangaroo.'*

- 7.05 ha of PCT1330 Zone 4. Vegetation Integrity Score of 13.1. As described in Table *12*, this zone is characterised as *'Contains a thinned canopy representative of the climax community and no regeneration. The midstorey and shrubstorey are absent. Low diversity mixed native/exotic groundlayer dominated by Phalaris and disturbance tolerant native grasses. Moderate to high density of significant weed species. Moderately to highly grazed by stock and Eastern Grey Kangaroo.'*

- 0.58 ha of PCT1330 Zone 5. Vegetation Integrity Score of 19.6. As described in Table 13, this zone is characterised as *'Overstorey, midstorey, and regeneration are absent. Moderate to high diversity native groundlayer dominated disturbance sensitive grasses, notably Kangaroo Grass. Lightly grazed by stock and Eastern Grey Kangaroo.'*

- 6.38 ha of PCT1330 Zone 6. Vegetation Integrity Score of 11.6. As described in Table 14, this zone is characterised as *'Overstorey, midstorey, and regeneration are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Speargrasses, Red-leg Grass, and Wallaby Grasses. Moderate density of significant weed species and moderately grazed by stock and Eastern Grey Kangaroo.'*

The proposed development minimises impacts to Box-Gum Woodland by avoiding 96% (55.29 ha) of the high condition zones and 64% (22.69 ha) of the moderate condition zones (refer to Figure 3, Figure 15, and Figure 16). In contrast, over 60% of the impact to PCT1330 occurs in areas that have been disturbed to the extent that they no longer meet the listing criteria for BC Act Box-Gum Woodland (i.e. an impact of 30.84 ha to PCT1330 Zone 7 across a combined impact of 50.85 ha to PCT1330, Figure 17).

c. a description of the extent to which the impact exceeds the threshold for the potential entity

The TBDC does not list a SAII impact threshold for Box-Gum Woodland, and the DPIE-BCD have advised that decisions will be made on a case-by-case basis.

d. the extent and overall condition of the potential TEC within an area of 1000ha, and then 10,000ha, surrounding the proposed development footprint

EcoLogical Australia (2018) calculated the extent of Box-Gum Woodland within 1,000 ha and 10,000 ha of the subject land using a variety of data sources, some of which are not publicly available. The estimates detailed in EcoLogical Australia (2018) are considered to be an accurate representation of Box-Gum Woodland in the locality and so are used in this SAII assessment. As detailed in EcoLogical Australia (2018):

- the 1,000 ha buffer surrounding the subject land supports an estimated 138 ha of Box-Gum Woodland; and
- the 10,000 ha buffer surrounding the subject land supports an estimated 1,832 ha of Box-Gum Woodland.

The estimates of EcoLogical Australia (2018) do not include the Box-Gum Woodland that occurs in the subject land. As detailed previously, the subject land supports 134.49 ha of BC Act Box-Gum Woodland. As such, for the purposes of this SAII assessment, the following estimates are made.

- The 1,000 ha buffer supports an estimated 272.49 ha of Box-Gum Woodland.
- The 10,000 ha buffer supports an estimated 1,966.49 ha of Box-Gum Woodland.

The proportion of BC Act Box-Gum Woodland in the subject land that meets the EPBC Act listing criteria for Box-Gum Woodland was used to estimate the extent of 'moderate to good' condition BC Act Box-Gum in the buffer areas.

- The subject land supports 134.49 ha of BC Act Box-Gum Woodland. Of that, 57.39 ha (43%) meets the EPBC Act listing criteria for Box-Gum Woodland.
- The 1,000 ha buffer was therefore estimated to support 117.17 ha of moderate to good condition BC Act Box-Gum Woodland (272.49*0.43).
- The 10,000 ha buffer was estimated to support 845.59 ha of moderate to good condition BC Act Box-Gum Woodland (1,966.49*0.43).

Using all of the above information, the following estimations can be determined.

- Extent and overall condition within 1,000 ha. There is approximately 272.49 ha of BC Act Box-Gum Woodland within 1,000 ha, 134.49 ha of which is in moderate to good condition.

  The proposed impact of 20.01 ha therefore represents 7% of the 272.49 ha of Box-Gum Woodland that occurs within the 1,000 ha surrounding the subject land.

- Extent and overall condition within 10,000 ha. There is approximately 1,966.49 ha of BC Act Box-Gum Woodland within 10,000 ha, 845.59 ha of which is in moderate to good condition.

  The proposed impact of 20.01 ha therefore represents 1% of the 1,966.49 ha of Box-Gum Woodland that occurs within the 10,000 ha surrounding the subject land.

e. an estimate of the extant area and overall condition of the potential TEC remaining in the IBRA subregion before and after the impact of the proposed development has been taken into consideration

The DPIE-BCD recommended (via email of 12 September 2019 from Luke Perkins, Team Planning Leader, QPRC) for a nearby BCAR prepared by Capital Ecology that data provided for the Ellerton Drive Extension Species Impact Statement (NGH Environmental 2014) may assist in developing some sections of an SAII assessment. The Ellerton Drive Extension is approximately 20 km to the south of the subject land.

With respect to the condition and extent of Box-Gum Woodland in the IBRA subregion, the following pertinent data is presented in NGH Environmental (2014).

- Former (pre-1750) extent = 223,300 ha.
- Current extent = 12,200 ha (95% cleared).
- Total area formally reserved = 310 ha (< 0.01% of former extent). Box-Gum Woodland is therefore under-represented in the conservation reserve system.
- Fallding (2002) estimates that there is more than 106,000 ha of Box-Gum Woodland within the NSW Southern Tablelands and ACT region. This does not include areas of secondary grassland that may also comprise the community.
- Keith (2006) estimates that there is 140,000 to 230,000 ha of Box-Gum Woodland within the South Eastern Highlands Bioregion.

As detailed in above, the South Eastern Highlands is estimated to support between 106,000 ha and 230,000 ha of Box-Gum Woodland. The South Eastern Highlands is 8,376,018 ha in size. As such, approximately 1.27% (i.e. 106,000 ha) to 2.75% (i.e. 230,000 ha) of the South Eastern Highlands supports Box-Gum Woodland.

The subject land is within the Murrumbateman IBRA subregion. The Murrumbateman IBRA subregion is 630,454 ha in size. Assuming that Box-Gum Woodland is spread evenly across the South Eastern Highlands, the Murrumbateman IBRA subregion therefore supports:

- between 8,006.77 ha and 17,337.49 ha of Box-Gum Woodland before the impact of the proposed development has been taken into consideration; and
- between 7,985.79 ha and 17,316.51 ha of Box-Gum Woodland after the impact of the proposed development has been taken into consideration.

This proposed development therefore removes an estimated 0.12% to 0.26% of the Box-Gum Woodland in the Murrumbateman IBRA subregion.

f. an estimate of the area of the potential TEC that is in the reserve system within the IBRA region and the IBRA subregion

As detailed in (e) above, an estimated total of 310 ha of Box-Gum Woodland is in areas formally reserved. However, this estimate does not include the ACT (the majority of which falls within the Murrumbateman IBRA subregion). As detailed in ACT Government (2019a), approximately 4,507 ha of Box-Gum Woodland (comprised of *Blakely's Red Gum – Yellow Box (± White Box) tall grassy woodland* and *Yellow Box – Apple Box tall grassy woodland*) is in the reserve system or otherwise conserved in the ACT.

g. the development, clearing or biodiversity certification proposal's impact on:

i. abiotic factors critical to the long-term survival of the potential TEC; for example, how much the impact will lead to a reduction of groundwater levels or the substantial alteration of surface water patterns

The direct impact of the proposed development will not extend beyond the subject land. Construction and occupation of the subject land will occur in accordance with the conditions detailed in Section 3.1 and Section 3.3. This includes appropriate weed monitoring and control to manage the potential impacts of high threat weeds and appropriate site-based sediment and erosion controls. In addition, high value vegetation and habitat retained within the adjacent proposed Biodiversity Stewardship Sites will be monitored and managed in accordance with Biodiversity Stewardship Agreements and protected in large lots via a combination of a NSW Biodiversity Certification Agreement, Section 88E, and Woodbury Ridge Community Management Statement by-laws.

Given the above, it is unlikely that the proposed development will modify or destroy abiotic factors necessary for the long-term survival of the ecological community.

ii. characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of understorey species or harvesting of plants

The proposed development incorporates the following measures to reduce the impact on vegetation and habitat (refer to Figure 3, Figure 15, and Figure 16).

- The establishment of four Biodiversity Stewardship Sites that encompass approximately 52% of the subject land. These areas will retain the majority of the high condition vegetation and habitat.
- The retention of approximately 18% of the vegetation and habitat in lots.
- Locating roads, building envelopes, EMZs, driveways, and fences to reduce the removal of remnant trees. As a result, the proposed development will retain of 784 (95%) of the 829 remnant trees that occur in the subject land. Only five of these remnant trees support function hollows, and none are nest trees for the Superb Parrot.

As a result, the proposed development minimises impacts to Box-Gum Woodland by avoiding 96% (55.29 ha) of the high condition zones and 64% (22.69 ha) of the moderate condition zones. These areas, which will be protected and managed, support the majority of the characteristic and functionally important species that occur in the subject land.

The proposed development will impact 20.01 ha of BC Act Box-Gum Woodland. This represents approximately 15% of the BC Act Box-Gum Woodland that occurs in the subject land, 7% of that which occurs within 1,000 ha of the subject land, 1% of that which occurs within 10,000 ha of the subject land, and 0.12% to 0.26% of that which occurs in the Murrumbateman IBRA subregion.

Other potential impacts (such as fire/flooding regimes) will be minimised and mitigated during operation by the measures outlined in Section 3.3. These measures include:

- A CEMP to guide the proposed development from when construction commences until construction is completed.

- Best practice weed, sediment, and erosion control.
- Biodiversity Stewardship Agreements over the proposed Biodiversity Stewardship Sites.
- A BMP enforced through a combination of a NSW Biodiversity Certification Agreement, Section 88E, and Woodbury Ridge Community Management Statement by-laws to protect the retained vegetation and habitat within large lots.

In summary, the avoidance, minimisation, and mitigation measures outlined in this BCAR ensure that the proposed development is unlikely to adversely alter the species composition of the Box-Gum Woodland which surrounds the development footprint, subject land, or within any other patch, or lead to changes in fire or flooding regimes.

iii. the quality and integrity of an occurrence of the potential TEC through threats and indirect impacts including, but not limited to, assisting invasive flora and fauna species to become established or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants which may harm or inhibit growth of species in the potential TEC

Many of the exotic species which occur in the locality already occur throughout the subject land and broader locality. The proposed development is unlikely to result in the introduction and establishment of additional invasive weeds. The construction works for the proposed development may temporarily increase the occurrence of the weed species already present, however appropriate vehicle hygiene and ongoing weed management measures will be implemented to minimise the risk of weed introduction and spread (refer to Section 3.1 and Section 3.3).

Some exotic pest fauna species are likely to occur in the subject land and surrounds. The proposed development is unlikely to increase the incidence of these species given the proximity existing rural-residential areas. Notably, the proposed development is not likely to introduce or increase the numbers of exotic avifauna present in the area.

It is likely that herbicides will be used in the subject land to control the existing weed infestation and improve the overall ecological condition of the subject land and surrounds. These herbicides will be applied in a targeted manner to treat specific species. Weed control works will be undertaken by suitably qualified and experienced personnel. It is noted that such chemicals are currently widely used in the locality.

In addition, potential indirect impacts, including indirect impacts to BC Act Box-Gum Woodland, will be minimised and mitigated during operation by the measures outlined in Section 3.3. These measures include:

- A CEMP to guide the proposed development from when construction commences until construction is completed.
- Best practice weed, sediment, and erosion control.
- Biodiversity Stewardship Agreements over the proposed Biodiversity Stewardship Sites.

- A BMP enforced through a combination of a NSW Biodiversity Certification Agreement, Section 88E, and Woodbury Ridge Community Management Statement by-laws to protect the retained vegetation and habitat within large lots.

h. direct or indirect fragmentation and isolation of an important area of the potential TEC

As described in Section 2.1, the portions of the subject land that have retained a native overstorey are likely to comprise part of a biodiversity corridor and be important for habitat connectivity throughout the locality. However, as the subject land is surrounded by road infrastructure (Sutton Road and the Federal Highway), urban development (Sutton Township), natural barriers (Yass River), and cleared agricultural land, the noted biodiversity corridor is only likely to be of particular significance to highly mobile species, such as birds.

Nonetheless, the proposed development includes the following avoidance, minimisation, and mitigation measures to reduce the potential for fragmentation and isolation of retained vegetation and habitat (refer to Figure 3, Figure 15, and Figure 16).

- The establishment of four Biodiversity Stewardship Sites that encompass approximately 52% of the subject land. These areas retain the majority of the high condition vegetation and habitat and ensure connectivity is maintained to both the north/south and east/west.
- The retention of approximately 18% of the vegetation and habitat in lots. The retention of this vegetation and habitat will help minimise the impact of the proposed development on connectivity, especially with respect to maintaining an unbroken canopy cover to both the north/south and east/west.
- The retention of 784 (95%) of the 829 remnant trees that occur in the subject land. This will help maintain habitat connectivity for highly mobile species, such as the Superb Parrot.
- A landscaping plan that will include locally indigenous and non-invasive species that are complimentary to the adjacent areas of high environmental conservation significance. This will help maintain habitat connectivity for highly mobile species, such as the Superb Parrot.
- A communal open space (approx. 8,000 m²) along the Estate's frontage to Yass River. This area (which is currently highly degraded) will form part of a Riverine Rehabilitation Management Plan to improve the environmental integrity of Yass River (as it adjoins the subject land), and will include the removal of noxious weed species, bank stabilisation, and revegetation with appropriate native species. This will improve habitat connectivity along Yass River for a wide variety of native species.

While the proposed development will impact 20.01 ha of BC Act Box-Gum Woodland, this only represents approximately 15% of the BC Act Box-Gum Woodland that occurs in the subject land, 7% of that which occurs within 1,000 ha of the subject land, 1% of that which occurs within 10,000 ha of the subject land, and 0.12% to 0.26% of that which occurs in the Murrumbateman IBRA subregion

Consideration of the above information indicates that the proposed development is unlikely fragment or isolate an important area of the TEC.

i. the measures proposed to contribute to the recovery of the potential TEC in the IBRA subregion.

The NSW Government Office of Environment & Heritage *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland* profile lists the following management activities to contribute to the recovery Box-Gum Woodland.

- Undertake control of rabbits, hares, foxes, pigs, and goats (using methods that do not disturb the native plants and animals of the remnant).
- Manage stock to reduce grazing pressure in high quality remnants (i.e. those with high flora diversity or fauna habitat).
- Do not harvest firewood from remnants (this includes living or standing dead trees and fallen material).
- Leave fallen timber on the ground.
- Encourage regeneration by fencing remnants, controlling stock grazing, and undertaking supplementary planting, if necessary.
- Undertake weed control (taking care to spray or dig out only target species).
- Protect all sites from further clearing and disturbance.
- Ensure remnants remain connected or linked to each other; in cases where remnants have lost connective links, re-establish them by revegetating sites to act as steppingstones for fauna and flora (pollen and seed dispersal).

The proposed Biodiversity Stewardship Sites include 88.20 ha (66%) of the BC Act Box-Gum Woodland and the residual vegetation and habitat within large lots includes 25.27 ha (19%) of the BC Act Box-Gum Woodland (refer to Figure 3, Figure 15, and Figure 16). As detailed in Section 3.1 and Section 3.3, the BC Act Box-Gum Woodland within these areas will be protected and managed in a manner consistent with the above recommendations. The proposed development will therefore contribute to the recovery of BC Act Box-Gum Woodland through the implementation of the above measures.

3.5 Legislative Requirements

3.5.1 Commonwealth EPBC Act – Referral

The proposed development is unlikely to have a significant impact on EPBC Act listed flora given the subject land does not support any EPBC Act listed flora species.

As detailed in Section 3.2.1, the proposed development will impact 1.82 ha of EPBC Act Box-Gum Woodland, 37.45 ha of Golden Sun Moth habitat, and indirectly impact 6.53 ha of Superb Parrot breeding habitat, all of which are listed under the EPBC Act (Figure 17). Accordingly, the impact of the proposed development was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) on 26 May 2021 (Referral No. 2021/8965), and on 14 July 2021 it was determined that the proposed development is a controlled action to be assessed by preliminary documentation.

3.5.2 NSW BC Act – Biodiversity Offset Requirements

The BAM Calculator is the tool for quantifying the offset requirements for a project, the output being expressed as ecosystem credits and species credits. The results of the BAM credit calculations completed for the proposed development are provided below and detailed in Appendix H.

3.5.2.1 Biodiversity risk weighting

The biodiversity risk weighting (Section 6.6 of the BAM) is a tool used in the BOS to mitigate the risk in offsetting the loss of vegetation, threatened entities and/or their habitat. The biodiversity risk weighting does this by increasing the quantum of credits required at an impact site. The biodiversity risk weighting is derived from two components:

- sensitivity to loss – based on threat status under legislation or evidence-based information that suggests the entity is at an increased risk of loss; and
- sensitivity to potential gain – based on life history characteristics and ecological information for a species.

The subject land contains vegetation with a vegetation integrity score that requires offsetting for impacts on ecosystem credits. The subject land also contains threatened species habitat that requires offsetting for impacts on species credits. The biodiversity risk weighting for the identified ecosystem credits and species credits are shown below.

- PCT1093 – Biodiversity risk rating of 1.75.
- PCT1330 – Biodiversity risk rating of 2.5.
- Superb Parrot *Polytelis swainsonii* – Biodiversity risk rating of 2.
- Silky Swainson-pea *Swainsona sericea* – Biodiversity risk rating of 2.
- Golden Sun Moth *Synemon plana* – Biodiversity risk rating of 3.

3.5.2.2 Ecosystem credit requirements

The results of the BAM ecosystem credit calculations completed for the proposed development are provided in Table 25. As shown in Table 25, the assessed vegetation zones in the subject land have a vegetation integrity score sufficient for their clearance to result in generation of ecosystem credits, as outlined in Section 10.3.1.1 of the BAM, these being:

- *(a) a vegetation integrity score of ≥15 where the PCT is representative of an endangered or critically endangered ecological community, or*
- *(b) a vegetation zone that has a vegetation integrity score of ≥17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or is representative of a vulnerable ecological community, or*
- *(c) a vegetation zone that has a vegetation integrity score ≥20 where the PCT is not representative of a TEC or associated with threatened species habitat.*

Accordingly, the proposed development generates an ecosystem credit obligation, as determined by the BAM Calculator on 22 September 2021.

Table 25. Ecosystem credit requirements.

PCT & Vegetation Zone	Vegetation Integrity Loss[72]	Proposed Clearance Area (ha)	Ecosystem Credits
PCT1093 Zone 1	43.9	0.25	5
PCT1093 Zone 2	31.2	2.32	32
		Total	**37**
PCT1330 Zone 1	45.3	0.28	8
PCT1330 Zone 2	31.7	0.96	19
PCT1330 Zone 3	21.6	4.76	64
PCT1330 Zone 4	11.7	7.05	0
PCT1330 Zone 5	19.6	0.58	7
PCT1330 Zone 6	11.6	6.38	0
PCT1330 Zone 7	10.8	30.84	0
		Total	**98**

3.5.2.3 Species credit requirements

The subject land supports habitat of potential significance to the Superb Parrot, Silky Swainson-pea, and Golden Sun Moth, all of which are species credit species. Accordingly, as detailed in Table 26, the proposed development generates a species credit obligation, as determined by the BAM Calculator on 22 September 2021.

[72] Note: the calculated vegetation integrity loss is less than the vegetation integrity scores displayed in Table 16 due to impacts that will only remove groundstorey vegetation (refer to Section 1.5.1.2). These impacts are therefore assessed via management zones in the online BAM Calculator, the result being a reduced vegetation integrity loss for the affected vegetation zones.

Table 26. Species credit requirements.

Species	PCT & Vegetation Zone	Habitat Condition (Vegetation Integrity) Loss	Proposed Clearance Area (ha)	Species Credits
Polytelis swainsonii Superb Parrot	PCT1093 Zone 1	43.9	0.16	4
	PCT1093 Zone 2	31.2	1.80	28
	PCT1330 Zone 2	31.7	1.52	28*
	PCT1330 Zone 3	21.6	1.73	19
	PCT1330 Zone 6	11.6	1.32	8
			Total	**87**
Swainsona sericea Silky Swainson-pea	PCT1330 Zone 1	45.3	0.28	6
	PCT1330 Zone 5	19.6	0.58	6
			Total	**12**
Golden Sun Moth *Synemon plana*	PCT1093 Zone 1	43.9	0.25	8
	PCT1093 Zone 2	31.2	2.32	54
	PCT1330 Zone 1	45.3	0.28	10
	PCT1330 Zone 2	31.7	0.96	23
	PCT1330 Zone 3	21.6	4.76	77
	PCT1330 Zone 4	11.7	7.05	62
	PCT1330 Zone 5	19.6	0.58	9
	PCT1330 Zone 6	11.6	6.38	55
	PCT1330 Zone 7	10.8	14.87	121
			Total	**419**

* The impact on Superb Parrot breeding habitat is indirect. As a result, the indirect impact on Superb Parrot breeding habitat that occurs in and PCT1330 Zone 2 (1.52 ha) are greater than the direct impacts to that vegetation zone (being 0.96 ha). As such, the additional indirect impact to Superb Parrot breeding habitat for PCT1330 Zone 2 cannot be captured in the online BAM Calculator and is therefore not included in Appendix H. In order to capture that additional impact in this BCAR, a hypothetical BAM Calculator scenario was carried out that increased the impact area for PCT1330 Zone 2 and captured the total impact to Superb Parrot breeding habitat. This increased the Superb Parrot species credits for PCT1330 Zone 2 from 15 to 28. The increased species credits that were generated following this process are included in Table 26.

3.5.2.4 Credit obligation options

As detailed by the NSW DPIE[73], the proponent can address the estimated offset obligation outlined in the following two ways (options).

1. The proponent can '*identify and purchase the required 'like for like' credits in the market and then retire those credits via OEH BOAMS* [Biodiversity Offsets and Agreement Management System]. *For example, credits could be located by using the OEH registers or by retaining a broker to locate credits for them.'*

2. The proponent can '*use the Offsets Payment Calculator to determine the cost of its credit obligation, and transfer this amount to the Biodiversity Conservation Fund via OEH BOAMS.*

[73] https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/offset-obligations-and-credit-trading

The Biodiversity Conservation Trust is then responsible for identifying and securing the credit obligation.'

When the proponent has completed these steps for all credits that the proponent is required to retire, they can proceed with their activity in accordance with their approval. The consent authority is responsible for ensuring compliance with credit obligations, and any other conditions of the consent or approval.

If the proponent chooses Option 2 to meet the credit obligations, the amount which must be paid into the Biodiversity Conservation Fund is determined at the time the proponent applies for an invoice from the Biodiversity Conservation Trust. A risk premium is included in that calculation to account for fact that the risks and costs involved in securing the offset have effectively been transferred to the Biodiversity Conservation Trust. These risks include the statistical probability that the market credit price paid by the Biodiversity Conservation Trust to landholders is higher or lower than that predicted. The benefits associated with Option 2 include a more streamlined process and no ongoing obligations once the required amount has been paid to the Biodiversity Conservation Fund.

If the proponent chooses Option 1 to meet the credit obligations, the cost per credit purchased from the market is likely to be lower than that to pay into the Biodiversity Conservation Fund, and as such, the total monetary cost of the offset obligation is likely to be lower than Option 2. However, the disadvantages associated with Option 1 include a more complicated process and potential delays associated with sourcing credits from the BOS credit market.

3.5.2.5 Proposed means of addressing the offset requirements for the proposed development

As mentioned previously, the proposed development includes the establishment of four Biodiversity Stewardship Sites that will encompass 100 ha (52%) of the subject land (refer to Figure 3, Figure 15, and Figure 16). As detailed in Appendix G, a preliminary stewardship site assessment indicates that the combined Biodiversity Stewardship Sites would generate the following classes and numbers of credits.

- 22 PCT1093 - *Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion* credits.
- 344 PCT1330 - *Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion* credits.
- 30 Superb Parrot breeding credits
- 5 Silky Swainson-pea credits.
- 365 Golden Sun Moth credits.

The credits generated by the proposed Biodiversity Stewardship Sites can be used to meet the credit obligation generated by the impacts associated with the proposed development. Table 27 details the credit obligation generated by the proposed development, the estimated credits generated by the establishment of the four proposed Biodiversity Stewardship Sites, and the resultant credit balance.

As shown in Table 27, the credit obligation can be met for PCT1330. However, the credits generated by the proposed Biodiversity Stewardship Sites are insufficient for PCT1093, Silky Swainson-pea, Superb Parrot breeding habitat, and Golden Sun Moth. As such, the outstanding credit obligation for

PCT1093, Superb Parrot, Silky Swainson-pea, and Golden Sun Moth must be met through one of the options described in Section 3.5.2.4.

Table 27. Addressing the offset requirements for the proposed development.

Entity	Credit Obligation	Credits Generated	Credit Balance
PCT1093 - *Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion*	37	22	- 15
PCT1330 - *Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion*	98	344	+ 246
Polytelis swainsonii Superb Parrot	87	30	- 57
Swainsona sericea Silky Swainson-pea	12	5	- 7
Synemon plana Golden Sun Moth	419	365	- 54

3.5.2.6 Staged retirement of credits

As mentioned in Section 1.5, the proposed development is divided into four stages (Figure 20). However, subject to demand, two or more stages may be constructed concurrently.

- If developed in one combined stage, the construction period is (subject to approvals) likely to run for approximately 18 months from mid-2022 to the end of 2023.
- If developed in stages, it could conceivably take until December 2025.

The offset liability for each stage of the proposed development is shown in Table 28.

Table 28. Offset requirements for each stage of the proposed development.

Entity	Credits Required			
	Stage 1	Stage 2	Stage 3	Stage 4
PCT1093	0	24	4	9
PCT1330	0	39	36	23
Superb Parrot	0	82	0	5
Silky Swainson-pea	0	3	0	9
Golden Sun Moth	120	149	80	70

3.5.3 NSW Koala SEPP – Koala Habitat Protection Requirements

Regarding the application of the *State Environmental Planning Policy (Koala Habitat Protection) 2021* (the 'Koala Habitat Protection SEPP') for the proposed development of the subject land, the following points are noted.

1. The subject land is located within the Yass Valley Council Local Government Area (LGA), which is an LGA to which he Koala Habitat Protection SEPP applies as listed in Schedule 1.

2. The subject land has an area of greater than 1 hectare and there is no approved Koala Plan of Management.

3. The subject land supports a number of the tree species listed in Schedule 2 of the Koala Habitat Protection SEPP. Accordingly, the subject land supports 'potential koala habitat'.

4. There are no recent records of Koalas in the locality, with the most recent being from 2005. This Koala record is approximately 4.5 km to the east of the subject land and is separated from the subject land by the federal highway and expanses of cleared farmland (Figure 8). In general, Koalas are not known to occur in the lowland agricultural lands of the Yass Valley LGA.

With regard to the above and with respect to the Koala Habitat Protection SEPP, the subject land is therefore considered unlikely to constitute important or occupied Koala habitat now or in the future.

In light of the above, Council can be satisfied that the subject land is not Koala habitat, and it is therefore not prevented by the Koala Habitat Protection SEPP from granting consent to a development application within the subject land.

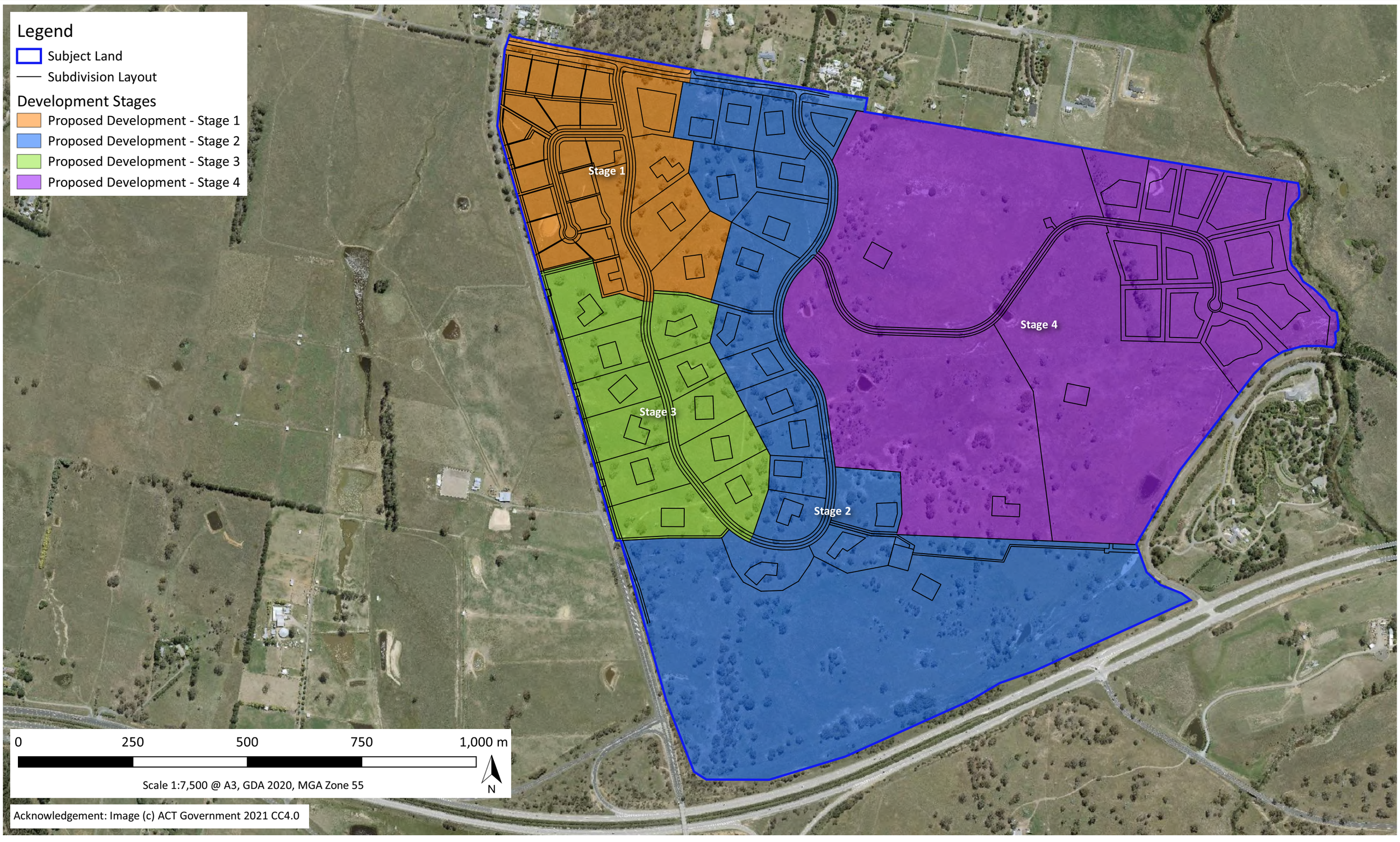

Figure 20. Development Stages of the Proposed Development

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Date: 18 September 2021

3.6 Information Requirements for the Biodiversity Certification Agreement

The information in Table 29, Table 30, Figure 21, and Figure 22 is required by DPIE-BCD in order to inform the Biodiversity Certification Agreement that will be sent to the NSW Minister for Planning for approval.

Table 29. Biodiversity Certification Areas.

General Area	Area (ha)	Native Vegetation (ha)
Biodiversity Certification Assessment Area		
- Subject Land	187.04	146.13
Land Proposed for Certification		
- Development Footprint	54.49	22.58
Avoided Land		
- Biodiversity Stewardship Sites	97.24	94.28
- Retained Vegetation and Habitat	33.58	28.26
TOTAL	**130.82**	**122.54**
Retained Land not Proposed for Certification		
- Guise Street road reserve	1.73	1.01

Table 30. Biodiversity Values within each Biodiversity Certification Area.

Biodiversity Value	Biodiversity Certification Assessment Area	Land Proposed for Certification	Avoided Land	Retained Land not Proposed for Certification	BC Act Box-Gum Woodland
Vegetation					
PCT1093 Zone 1	2.90 ha	0.25 ha	2.65 ha	0.00 ha	-
PCT1093 Zone 2	8.74 ha	2.32 ha	6.42 ha	0.00 ha	-
PCT1330 Zone 1	19.58 ha	0.28 ha	19.02 ha	0.28 ha	Yes
PCT1330 Zone 2	25.93 ha	0.96 ha	24.97 ha	0.00 ha	Yes
PCT1330 Zone 3	14.28 ha	4.76 ha	9.52 ha	0.00 ha	Yes
PCT1330 Zone 4	20.95 ha	7.05 ha	13.17 ha	0.73 ha	Yes
PCT1330 Zone 5	11.88 ha	0.58 ha	11.30 ha	0.00 ha	Yes
PCT1330 Zone 6	41.87 ha	6.38 ha	35.49 ha	0.00 ha	Yes
PCT1330 Zone 7	39.19 ha	30.84 ha	7.76 ha	0.59 ha	-
Hollow-bearing trees	168	22 (17 retained)	143	3	-
Threatened species					
Superb Parrot	13.05 ha	6.53 ha	6.52 ha	0.00 ha	-
Silky-Swainson Pea	1.24 ha	0.86 ha	1.22 ha	0.00 ha	-
Golden Sun Moth	168.99 ha	37.45 ha	129.94 ha	1.60 ha	-

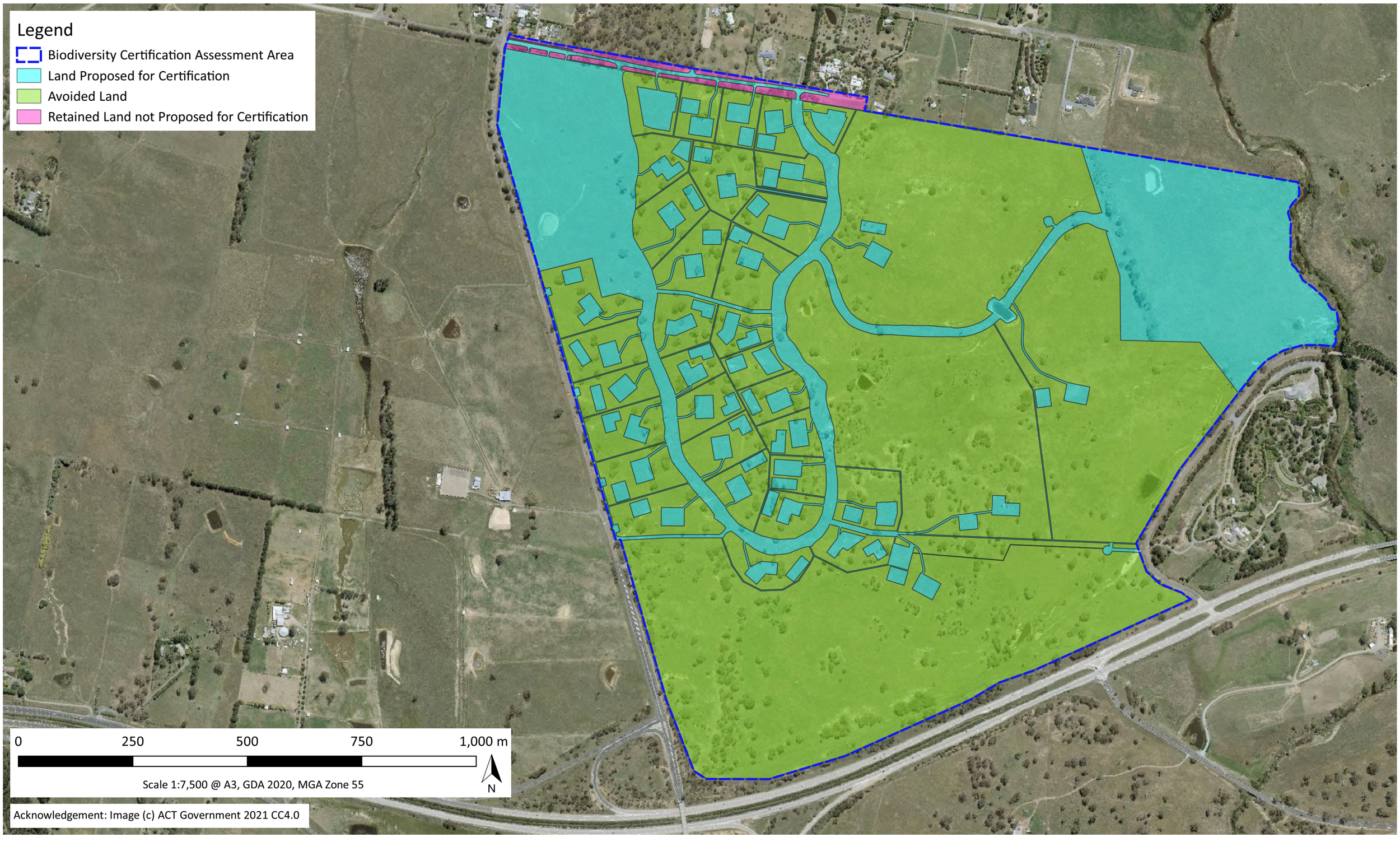

Figure 21. Biodiversity Certification Areas

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

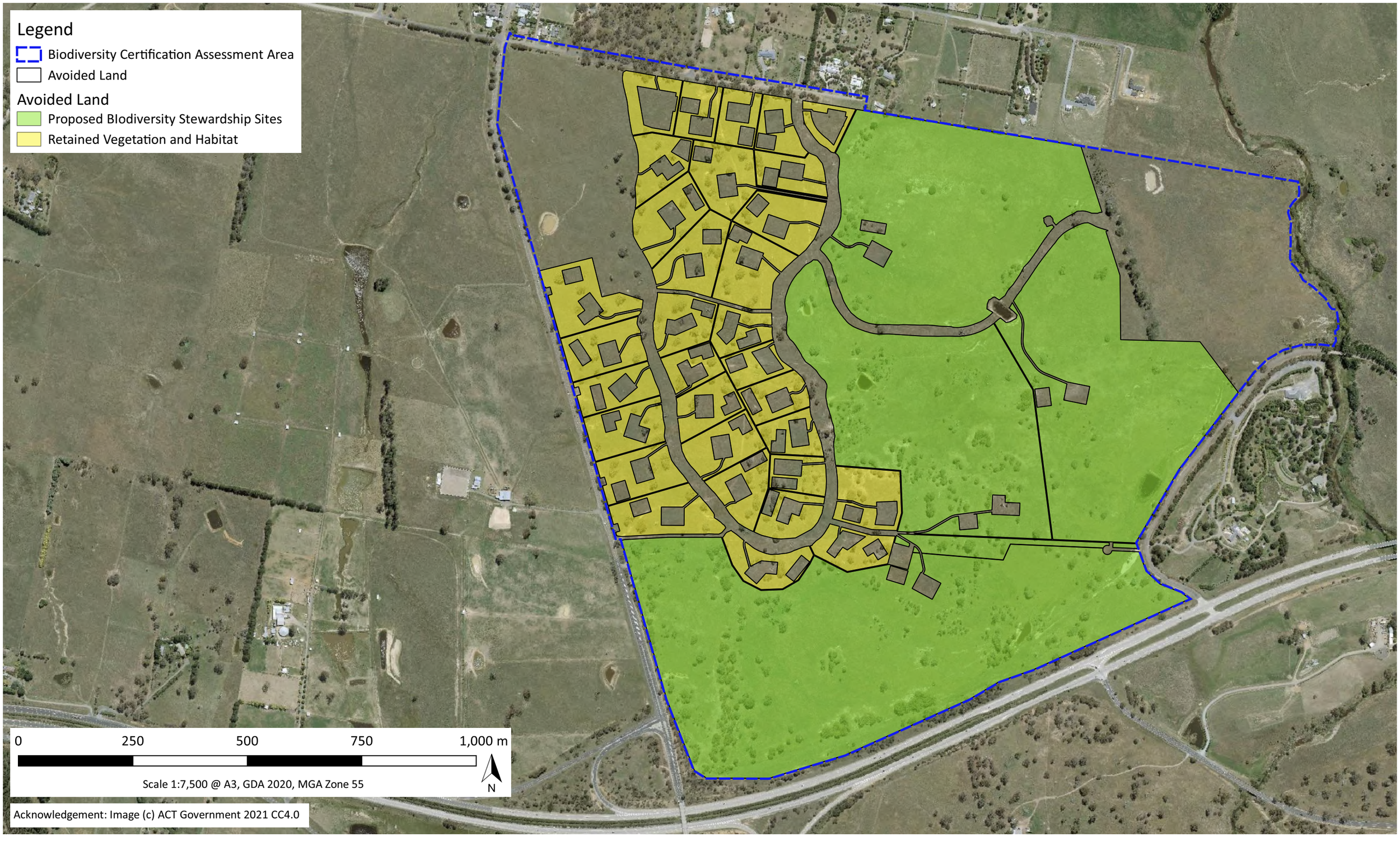

Figure 22. Biodiversity Certification Areas - Avoided Land

Capital Ecology Project No: 2980
Drawn by: S. Reid
Date: 18 September 2021

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- *Land Zoning Map - Sheet LZN_005* and *Sheet LZN_005F.*
- *Lot Size Map - Sheet LZN_005* and *Sheet LZN_005F.*
- *Natural Resources Biodiversity Map – Sheet NRB_005*.

Appendices

Appendix A. BAM Plot/Transect Scores

PCT code	Veg. Zone	Plot No.	Composition (species richness)					
			Tree	Shrub	Grass & grass like	Forb	Fern	Other
1093	1	1	2	3	10	4	0	2
		2	1	1	8	6	1	1
	2	1	2	0	8	0	0	0
		2	0	0	10	3	1	1
		3	2	0	6	1	0	0
1330	1	1	1	2	10	6	0	0
		2	1	0	9	9	0	2
		3	1	3	8	10	0	2
	2	1	0	0	6	1	0	0
		2	2	1	11	4	0	2
		3	2	0	6	3	1	1
		4	1	0	4	0	0	0
	3	1	1	0	5	0	0	0
		2	0	0	7	1	0	0
		3	1	0	4	1	0	0
	4	1	1	0	1	1	0	0
		2	0	0	4	0	0	0
		3	1	0	2	1	0	0
		4	1	0	6	1	0	0
	5	1	0	2	8	6	1	2
		2	0	1	12	14	0	1
		3	0	4	7	9	0	1
	6	1	0	0	7	4	0	0
		2	0	0	6	2	0	0
		3	0	0	7	1	0	0
		4	0	0	9	1	0	0
	7	1	0	0	7	2	0	0
		2	0	0	5	1	0	0
		3	0	0	3	0	0	0
		4	0	0	6	2	0	0

PCT code	Veg. Zone	Plot No.	Structure (% cover)					
			Tree	Shrub	Grass & grass like	Forb	Fern	Other
1093	1	1	50	0.3	27.8	0.4	0	0.2
		2	15	0.1	31.4	0.6	0.1	0.1
	2	1	10	0	25.5	0	0	0
		2	0	0	45.3	0.3	0.1	0.1
		3	30	0	8.7	0.2	0	0
1330	1	1	5	0.2	40.3	0.7	0	0
		2	20	0	52.4	1.6	0	0.2
		3	15	0.3	64.8	2.3	0	0.2
	2	1	0	0	15.3	0.1	0	0
		2	25	0.1	43.3	0.4	0	0.2
		3	6	0	28	0.4	0.1	0.1
		4	5	0	22.2	0	0	0
	3	1	25	0	13.2	0	0	0
		2	0	0	16.4	0.1	0	0
		3	2	0	21	0.1	0	0
	4	1	10	0	1	0.1	0	0
		2	0	0	23	0	0	0
		3	20	0	2	0.1	0	0
		4	0.1	0	10.3	0.1	0	0
	5	1	0	0.2	33.3	0.8	0.2	0.2
		2	0	0.1	79	1.7	0	0.1
		3	0	3.5	27.9	10.9	0	0.1
	6	1	0	0	28.4	0.4	0	0
		2	0	0	30.1	0.2	0	0
		3	0	0	40.4	0.1	0	0
		4	0	0	33.4	0.1	0	0
	7	1	0	0	20.5	0.2	0	0
		2	0	0	30.2	0.1	0	0
		3	0	0	7.1	0	0	0
		4	0	0	5.1	0.2	0	0

PCT code	Veg. Zone	Plot No.	Function									
			Stem classes					No. of large trees	Hollow bearing trees	% Litter cover	Coarse woody debris (m)	% High threat weed cover
			Regen.	5-9	10-19	20-29	30-49					
1093	1	1	Y	Y	Y	Y	Y	1	1	33	40	0
		2	-	Y	Y	Y	-	1	1	11.2	5	0.1
	2	1	-	-	-	-	-	4	3	35	30	0
		2	-	-	-	-	-	1	1	13	4	1
		3	Y	-	-	-	Y	7	5	67	35	0
1330	1	1	Y	Y	Y	-	-	1	0	5.6	3	0.2
		2	Y	Y	Y	Y	-	1	0	25.8	2	0.6
		3	Y	-	Y	-	-	1	0	15.2	12	0.1
	2	1	-	-	-	-	-	0	0	11	1	2.1
		2	Y	Y	Y	Y	-	1	1	23.2	8	0.3
		3	Y	Y	Y	Y	Y	0	0	21.6	10	1.2
		4	-	-	-	-	-	2	0	17.2	10	0.1
	3	1	-	-	-	-	-	1	1	26	8	0.1
		2	-	-	-	-	-	0	0	5.4	0	0.2
		3	-	-	-	-	-	2	1	48.4	21	0.2
	4	1	-	-	-	Y	Y	2	4	9	47	1
		2	-	-	-	-	-	0	0	21	0	0
		3	-	-	-	-	-	2	1	9	44	1.1
		4	Y	-	-	-	-	0	0	13	0	0.2
	5	1	-	-	-	-	-	0	0	12.4	0	1
		2	-	-	-	-	-	0	0	14	0	0.1
		3	-	-	-	-	-	0	0	6.6	0	0.1
	6	1	-	-	-	-	-	0	0	7.8	0	4.4
		2	-	-	-	-	-	0	0	14	0	3.2
		3	-	-	-	-	-	0	0	7.4	0	0.4
		4	-	-	-	-	-	0	0	8	0	15.1
	7	1	-	-	-	-	-	0	0	19	0	3.2
		2	-	-	-	-	-	0	0	11	0	0
		3	-	-	-	-	-	0	0	16	0	3.5
		4	-	-	-	-	-	0	0	15	0	2.3

Appendix B. Flora Species Recorded by Plot and Percent Cover or Presence

Species Name	Common Name	PCT1093					PCT1330																									Recorded Elsewhere
		Zone 1		Zone 2			Zone 1			Zone 2				Zone 3			Zone 4				Zone 5			Zone 6				Zone 7				
		P1	P2	P1	P2	P3	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P4	
Exotic																																
Acetosella vulgaris	Sheep's Sorrel							0.1		2.0						0.1	1.0				0.1			0.1						2.0	1.0	
Aira sp.	Hair-grass				0.1	0.1	0.1														0.1	0.1										
Arctotheca calendula	Cape Weed				0.1																											
Avena sp.	Wild Oats			2.0			0.1			2.0			2.0	2.0	3.0	0.1	0.1	2.0	1.0	2.0	2.0			3.0	2.0	0.5	5.0	2.0	3.0	0.2	2.0	X
Briza maxima	Greater Quaking-grass						0.1															0.1										
Briza minor	Lesser Quaking-grass																					0.1										
Bromus sp.	Brome Grass			0.5			0.1	0.2		5.0	0.1		0.1	0.2	0.1	0.1	0.1		0.1		0.2	0.1		0.1	0.5	0.1		0.1		0.1	0.1	X
Carthamus lanatus	Saffron Thistle																				0.1			2.0		0.1					1.0	
Centaurium sp.	Common Centaury																					0.1										
Cotoneaster franchetii	Grey Cotoneaster								0.1																							
Conyza sp.	Fleabane																0.1					0.1										
Dactylis glomerata	Cock's Foot							0.2						40.0	5.0		10.0	0.1						0.1						0.1	1.0	
Echium plantagineum	Paterson's Curse																													0.1		
Echium vulgare	Viper's Bugloss																									0.1						
Eleusine tristachya	Goose Grass				0.1																									0.1	10.0	
Eragrostis curvula	African Lovegrass																											0.1		0.1		X
Erodium sp.	Stork's-bill																		0.1	0.1									0.1			
Gnaphalium americanum	Purple Cudweed																				0.1	0.1										
Hirschfeldia incana	Buchan Weed						0.1	0.1		0.1			0.1						0.1		0.1	0.1		0.1	3.0	0.1				0.1	2.0	X
Holcus lanatus	Yorkshire Fog																															X
Hordeum sp.	Barley Grass									0.1			0.1				5.0		3.0	0.1											1.0	X
Hypericum perforatum	St John's Wort		0.1		1.0		0.2	0.2	0.1	0.1	0.1	1.0		0.1	0.1						0.5	0.1	0.1	2.0	3.0	0.1				0.2		
Hypochaeris glabra	Smooth Cats-ear		0.1				0.1																									
Hypochaeris radicata	Flatweed		0.1		0.2		0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.2	0.1		0.1			0.1	0.2		0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	
Lepidium africanum	Common peppercress			0.1				0.1		0.1		0.1	0.1			0.1	0.1		0.1													
Lolium perenne	Perennial Ryegrass			0.5		0.1		0.5		0.5	0.1	0.1	0.2	2.0	0.5	0.1	1.0	0.5	10.0	1.0				0.1				0.2	1.0		0.2	
Malva sp.	Mallow / Marshmallow Weed																0.1		0.1													
Myosotis discolor	Changing Forget-me-not																0.1															
Myriophyllum aquaticum	Parrot Feather																															X
Nassella neesiana	Chilean Needle Grass																		1.0	0.1								3.0				
Nassella trichotoma	Serrated Tussock							0.2			0.1					0.1			0.1	0.1	0.1			0.1	0.1	0.2	0.1	0.1		0.2	0.1	X
Onopordum acanthium	Scotch Thistle							0.1									5.0		0.1												0.1	X
Paronychia brasiliana	Brazilian Whitlow	0.1			0.1			0.1			0.1	0.1																				
Paspalum dilatatum	Paspalum Grass										0.1	0.1	0.1		0.1												15.0			1.0		
Petrorhagia nanteuilii	Proliferous Pink				0.1		0.1						0.1								0.1	0.1	0.1		0.1							
Phalaris aquatica	Phalaris	0.1		20.0									3.0	5.0	10.0	5.0	30.0	30.0	10.0	30.0				3.0		5.0	1.0	35.0	15.0	55.0	30.0	X
Plantago coronopus	Buck's-horn Plantain				0.1																											
Plantago lanceolata	Plantain / Lamb's Tongue	0.1	0.1					0.1			0.3	0.2					0.1					0.2		0.1	1.0	0.1	0.1				0.1	X
Romulea rosea	Onion Grass																				0.2											
Rosa rubiginosa	Briar Rose							0.1																0.1	0.1						0.1	X

Species Name	Common Name	PCT1093					PCT1330																									Recorded Elsewhere
		Zone 1		Zone 2			Zone 1			Zone 2				Zone 3			Zone 4				Zone 5			Zone 6				Zone 7				
		P1	P2	P1	P2	P3	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P4	
Rubus fruticosus	Blackberry											0.1												0.1							0.1	X
Rumex crispus	Curly Dock																															X
Salix sp.	Willow																															X
Salvia verbenaca	Wild Sage															0.1									0.1							
Silybum marianum	Variegated Thistle																															X
Tolpis umbellata	Yellow Hawkweed				0.1																0.1											
Trifolium sp.	Clover				0.1		1.0				0.1	0.1	2.0		5.0	0.1	0.1		0.5			0.1			10.0	1.0	5.0		1.0		15.0	X
Ulex sp.	Gorse																															X
Vulpia sp.	Rat's Tail Fescue				0.1															0.1					1.0	1.0				0.1		
Native																																
Acaena ovina	Sheep's Burr		0.1					0.1	0.1		0.1											0.2										
Aristida ramosa	Purple Wiregrass	0.1	4.0		5.0	0.1	5.0	0.1	0.5		5.0	1.0									2.0	1.0	4.0	0.1								X
Asperula conferta	Common Woodruff		0.1								0.1																					
Asplenium flabellifolium	Necklace Fern																															X
Astroloma humifusum	Native Cranberry																						0.1									
Austrostipa bigeniculata	Tall Speargrass			5.0	2.0					3.0	5.0		2.0	2.0	10.0	5.0		5.0	1.0	3.0		0.1		10.0	3.0	20.0	10.0	5.0	10.0		1.0	X
Austrostipa scabra	Rough Spear-grass	0.2	10.0	5.0	10.0	5.0	3.0	10.0		5.0	5.0	10.0	10.0			10.0		5.0		2.0	5.0	0.1	0.2		3.0						1.0	X
Bossiaea prostrata	Creeping Bossiaea	0.1																														
Bothriochloa macra	Red-leg Grass	0.1	1.0	5.0	1.0			5.0		5.0	5.0	10.0	10.0	10.0	5.0	5.0	1.0	10.0	1.0	5.0	10.0	10.0		10.0	20.0	10.0	10.0	10.0	5.0		1.0	X
Brachyloma daphnoides	Daphne Heath																				0.1											X
Bulbine bulbosa	Bulbine Lily																															X
Carex appressa	Tall Sedge																															X
Carex inversa	Knob Sedge								0.1																							
Cassinia quinquefaria	Wild Rosemary		0.1																													
Cheilanthes sieberi	Rock Fern		0.1		0.1							0.1									0.2											
Chloris truncata	Windmill Grass			0.1	1.0																					0.1						
Chrysocephalum apiculatum	Common Everlasting						0.2	0.5	0.1			0.1									0.1	0.1	10.0	0.1								X
Convolvulus erubescens	Australian Bindweed							0.1	0.1		0.1										0.1											X
Craspedia variabilis	Common Billy Buttons																															X
Crassula sieberiana	Austral Stonecrop						0.1														0.1										0.1	
Cryptandra amara	Bitter Cryptandra																															X
Cymbonotus lawsonianus	Bear's Ears																					0.1										X
Daviesia genistifolia	Broom Bitter Pea																															X
Desmodium varians	Slender Tick-trefoil	0.1	0.1		0.1			0.1	0.1		0.1	0.1									0.1	0.1	0.1									X
Dianella revoluta	Blue Flax-Lily																															X
Dillwynia sericea	Showy Parrot-Pea																															X
Einadia nutans	Climbing Saltbush	0.1				0.2		0.1		0.1																						X
Eleocharis acuta	Common Spikerush																															X
Elymus scaber	Common Wheat Grass	0.1		0.1	0.1																	0.1			0.1	0.1	0.1					
Enneapogon nigricans	Nineawn grass																				0.1											
Eryngium ovinum	Blue Devil																															X
Eucalyptus blakelyi	Blakely's Red Gum										20.0	5.0																				X

Species Name	Common Name	PCT1093					PCT1330																									Recorded Elsewhere
		Zone 1		Zone 2			Zone 1			Zone 2				Zone 3			Zone 4				Zone 5			Zone 6				Zone 7				
		P1	P2	P1	P2	P3	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P4	
Eucalyptus bridgesiana	Apple Box										5.0	1.0	5.0				10.0															X
Eucalyptus goniocalyx	Long-leaved Bundy	5.0				10.0																										
Eucalyptus macrorhyncha	Red Stringybark																															X
Eucalyptus mannifera	Brittle Gum			5.0																												X
Eucalyptus melliodora	Yellow Box						5.0	20.0	15.0					25.0		2.0			20.0	0.1												X
Eucalyptus rossii	Scribbly Gum	45.0	15.0	5.0		20.0																										X
Eucalyptus rubida	Candlebark																															X
Euchiton sp.	Cudweed				0.1																0.2			0.1								X
Exocarpos cupressiformis	Native Cherry																															X
Geranium solanderi	Native Geranium																															X
Glycine clandestina	Twining Glycine	0.1																														X
Gonocarpus tetragynus	Common Raspwort								0.1																							X
Goodenia hederacea	Ivy Goodenia	0.1					0.1																0.1									X
Hibbertia obtusifolia	Hoary Guinea Flower	0.1							0.1		0.1										0.1	0.1	0.1									X
Hydrocotyle laxiflora	Stinking Pennywort	0.1						0.1																								
Hypericum gramineum	Native St John's Wort																					0.1	0.1									X
Joycea pallida	Red-Anther Wallaby Grass	25.0				0.5	1.0																									X
Juncus australis	Austral Rush						0.1			0.2										0.1								0.2				X
Juncus filicaulis	Pinrush	0.1			0.1			0.1		0.1	0.1				0.1												0.1	0.1				
Kunzea ericoides	Burgan						0.1																									
Leptorhynchos squamatus	Scaly Buttons								1.0													0.1	0.2									X
Lissanthe strigosa	Peach Heath	0.1																					3.0									X
Lomandra bracteata	Small Mat-rush																					1.0										
Lomandra filiformis	Wattle Mat-rush	0.1							0.1																				0.1			
Lomandra coriacea	Wattle Mat-rush	1.0	1.0	0.1	0.1	1.0	3.0	0.1	2.0		0.1	1.0	0.2	0.1	0.1						0.2	1.0	0.1	0.2		0.1	0.1				0.1	X
Lomandra longifolia	Spiny-head Mat-rush					0.1																										X
Lomandra multiflora	Many-flowered Mat-rush	0.1					0.1	0.1			0.1			0.1	0.1							0.2					0.1					
Melichrus urceolatus	Urn Heath	0.1					0.1		0.1														0.3									X
Microlaena stipoides	Weeping Grass		0.2	0.2			0.1	2.0			15.0				0.1									0.1				0.1	0.1	0.1		X
Microtis unifolia	Common Onion Orchid																					0.1										
Oxalis perennans	Woody-Root Oxalis				0.1			0.1	0.1										0.1		0.1	0.1				0.1		0.1				X
Panicum effusum	Hairy Panic				1.0		1.0		0.1		5.0	1.0								0.1	1.0	0.5	0.5		1.0	0.1	5.0			2.0	1.0	X
Persicaria prostrata	Creeping Knotweed																											0.1				
Pimelea curviflora	Curved Rice-flower								0.1																							
Pimelea linifolia	Slender Rice Flower																															X
Plantago varia	Variable Plantain							0.1	0.5													0.3	0.1									X
Poa labillardieri	River Tussock-grass																															X
Poa sieberiana	Snowgrass		0.1						1.0													5.0	0.1									X
Rumex brownii	Swamp Dock						0.1								0.1		0.1			0.1		0.1		0.1	0.1		0.1		0.1		0.1	
Rytidosperma sp.	Wallaby Grass	1.0	15.0	10.0	25.0	2.0	25.0	5.0	1.0	2.0	2.0	5.0		1.0		1.0		3.0		0.1	10.0	10.0	3.0	5.0	3.0	10.0	3.0	5.0	15.0	5.0	1.0	
Schoenoplectus validus	Softstem Bulrush																															X
Schoenus apogon	Common Bog-sedge														1.0																	X

Species Name	Common Name	PCT1093					PCT1330																									Recorded Elsewhere
		Zone 1		Zone 2			Zone 1			Zone 2				Zone 3			Zone 4				Zone 5			Zone 6				Zone 7				
		P1	P2	P1	P2	P3	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P1	P2	P3	P4	P1	P2	P3	P4	
Solenogyne dominii	Smooth Solengyne		0.1						0.1													0.1	0.1									X
Stackhousia monogyna	Creamy Candles																															X
Stypandra glauca	Nodding Blue Lily																															X
Swainsona sericea	Silky Swainson-pea																															X
Themeda triandra	Kangaroo Grass		0.1				2.0	30.0	60.0		1.0										5.0	50.0	20.0	3.0			5.0	0.1				X
Tricoryne elatior	Yellow Rush-lily				0.1		0.1	0.2	0.1		0.1	0.2									0.2		0.1	0.1								X
Triptilodiscus pygmaeus	Common Sunray																					0.1										X
Typha sp.	Cumbungi																															X
Viola betonicifolia	Showy Violet																															X
Vittadinia cuneata	Fuzzweed																															X
Vittadinia muelleri	Narrow-leaved New Holland Daisy		0.1																			0.1										X
Wahlenbergia communis	Native Bluebell		0.1				0.1	0.2	0.1		0.1	0.1				0.1					0.1	0.1	0.1		0.1							X
Wahlenbergia luteola	Yellowish Bluebell		0.1					0.2	0.1													0.1	0.1									X
Wahlenbergia multicaulis	Branching Bluebell																															X
Wurmbea dioica	Early Nancy																															X
Xerochrysum viscosum	Sticky Everlasting																															X
Number of Species		24	22	15	26	11	29	34	26	16	29	22	16	13	17	16	17	9	17	16	32	41	23	25	20	20	17	17	12	17	25	
Number of Native Species		21	18	10	15	9	19	21	24	7	20	13	5	6	8	6	3	4	4	8	19	28	21	11	8	8	10	9	6	3	8	
Number of Native Non-grass Species		13	10	1	7	3	11	14	18	3	10	6	1	2	5	1	1	0	1	2	12	19	15	5	2	2	4	4	2	0	3	
Number of Exotic Species		3	4	5	11	2	10	13	2	9	9	9	11	7	9	10	14	5	13	8	13	13	2	14	12	12	7	8	6	14	17	
% Native Perennial Ground Cover		98.95	98.77	55.31	96.02	98.89	96.24	96.79	99.85	84.15	97.77	94.08	79.57	21.85	44.12	78.73	2.26	42.83	8.68	24.94	95.83	98.66	99.49	78.90	63.39	85.62	61.13	34.97	63.66	10.73	8.04	

Appendix C. Tree Habitat Assessment

Tree No.	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
1	*E. sp.*	-	78	12	0	1	0	Dead	Stag
2	*E. rossii*	Scribbly Gum	103	8	1	3	0	Alive	Red-rumped parrots nesting
3	*E. rossii*	Scribbly Gum	114	8	2	0	2	Alive	Eastern rosella pair perched
4	*E. rossii*	Scribbly Gum	121	9	1	1	0	Alive	-
5	*E. rossii*	Scribbly Gum	123	10	1	1	0	Alive	-
6	*E. rossii*	Scribbly Gum	106	10	1	1	2	Alive	Superb parrot pair perched
7	*E. rossii*	Scribbly Gum	76	11	1	1	0	Alive	-
8	*E. rossii*	Scribbly Gum	79	8	1	5	0	Alive	-
9	*E. rossii*	Scribbly Gum	119	9	1	1	2	Alive	-
10	*E. rossii*	Scribbly Gum	86	10	1	0	1	Alive	-
11	*E. blakelyi*	Blakely's Red Gum	84	9	0	1	0	Alive	-
12	*E. rossii*	Scribbly Gum	132	9	0	1	0	Alive	-
13	*E. rossii*	Scribbly Gum	102	10	2	1	1	Alive	-
14	*E. sp.*	-	119	8	3	1	1	Dead	Stag
15	*E. rossii*	Scribbly Gum	72	8	2	0	0	Alive	-
16	*E. blakelyi*	Blakely's Red Gum	117	7	3	1	0	Alive	-
17	*E. sp.*	-	64	6	3	1	0	Dead	Stag
18	*E. rossii*	Scribbly Gum	99	10	5	0	0	Alive	-
19	*E. rossii*	Scribbly Gum	133	11	4	6	4	Alive	Red-rumped parrot perched
20	*E. rossii*	Scribbly Gum	120	10	3	1	1	Alive	-
21	*E. sp.*	-	83	5	0	0	3	Dead	Stag
22	*E. rossii*	Scribbly Gum	102	6	0	2	4	Alive	-
23	*E. sp.*	-	67	7	1	1	-	Dead	Stag, exotic honeybees using S hollow

Tree No.	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
24	*E. rossii*	Scribbly Gum	57, 56, 54, 53	8	0	0	1	Alive	Four trunks from singular root system
25	*E. sp.*	-	76	6	0	2	3	Dead	Stag
26	*E. sp.*	-	67	6	0	1	2	Dead	Stag
27	*E. rossii*	Scribbly Gum	87	13	2	2	1	Alive	Eastern rosella perched in front of hollow
28	*E. sp.*	-	97	11	1	1	0	Dead	Stag
29	*E. sp.*	-	71	9	1	1	0	Dead	Stag
30	*E. sp.*	-	91	5	0	0	3	Dead	Stag
31	*E. rossii*	Scribbly Gum	101	8	1	0	3	Alive	Near stag
32	*E. sp.*	-	89	10	2	0	0	Alive	Stag
33	*E. rossii*	Scribbly Gum	131	10	5	0	0	Alive	Crimson rosella perched at S hollow
34	*E. rossii*	Scribbly Gum	101	9	2	8	0	Alive	-
35	*E. rossii*	Scribbly Gum	86, 75	13	6	0	1	Alive	Possibly two separate trees, but with combined roots
36	*E. rossii*	Scribbly Gum	131	10	2	0	0	Alive	-
37	*E. mannifera*	Brittle Gum	140	12	3	2	2	Alive	-
38	*E. rossii*	Scribbly Gum	99	7	0	3	1	Alive	-
39	*E. rossii*	Scribbly Gum	107	9	1	1	1	Alive	-
40	*E. rossii*	Scribbly Gum	116	11	1	4	0	Alive	-
41	*E. rossii*	Scribbly Gum	99	12	3	0	1	Alive	-
42	*E. rossii*	Scribbly Gum	100	7	0	0	2	Alive	-
43	*E. rossii*	Scribbly Gum	89	12	4	1	4	Alive	-
44	*E. sp.*	-	40	10	2	0	0	Dead	Stag
45	*E. rossii*	Scribbly Gum	80	11	3	1	0	Alive	-
46	*E. rossii*	Scribbly Gum	90	12	5	0	1	Alive	-

Tree No.	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
47	*E. sp.*	-	80	8	4	0	0	Dead	Stag
48	*E. rossii*	Scribbly Gum	75	10	2	2	0	Alive	-
49	*E. rossii*	Scribbly Gum	90	10	2	2	0	Alive	-
50	*E. rossii*	Scribbly Gum	60	8	3	1	0	Alive	-
51	*E. rossii*	Scribbly Gum	100	9	5	0	0	Alive	-
52	*E. melliodora*	Yellow Box	100	12	0	0	1	Alive	Extra large hollow in the trunk
53	*E. sp.*	-	60	9	4	0	0	Dead	Stag
54	*E. blakelyi*	Blakely's Red Gum	80	12	0	1	0	Alive	-
55	*E. melliodora*	Yellow Box	100	12	1	1	0	Alive	-
56	*E. melliodora*	Yellow Box	90	10	1	0	0	Alive	-
57	*E. melliodora*	Yellow Box	80	10	3	0	0	Alive	-
58	*E. rossii*	Scribbly Gum	110	12	2	2	3	Alive	-
59	*E. rossii*	Scribbly Gum	150	11	14	0	0	Alive	-
60	*E. sp.*	-	100	7	0	0	4	Dead	Stag
61	*E. sp.*	-	100	10	1	1	3	Dead	Stag
62	*E. sp.*	-	120	13	6	0	0	Dead	Stag
63	*E. sp.*	-	70	11	4	1	0	Dead	Stag
64	*E. sp.*	-	100	10	4	0	1	Dead	Stag
65	*E. melliodora*	Yellow Box	110	11	3	0	0	Alive	-
66	*E. rossii*	Scribbly Gum	105	12	2	4	2	Alive	Red-rumped parrots, superb parrots x 3 landed in tree
67	*E. rossii*	Scribbly Gum	110	8	2	2	0	Alive	-
68	*E. rossii*	Scribbly Gum	140	12	0	1	1	Alive	Eastern rosella
69	*E. rossii*	Scribbly Gum	70	9	0	1	0	Alive	Crimson rosella
70	*E. rossii*	Scribbly Gum	70	8	2	4	1	Alive	-
71	*E. rossii*	Scribbly Gum	100	11	0	3	1	Alive	-

Tree No.	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
72	*E. rossii*	Scribbly Gum	90	10	1	2	1	Alive	-
73	*E. rossii*	Scribbly Gum	70	8	0	0	1	Alive	-
74	*E. rossii*	Scribbly Gum	85	10	0	2	1	Alive	Crimson rosella pair
75	*E. sp.*	-	90	8	0	1	1	Dead	Stag
76	*E. rossii*	Scribbly Gum	80	8	0	2	1	Alive	-
77	*E. rossii*	Scribbly Gum	65	10	0	1	0	Alive	-
78	*E. rossii*	Scribbly Gum	140	Blank	1	0	2	Alive	-
79	*E. rossii*	Scribbly Gum	100	10	1	2	0	Alive	Eastern rosella
80	*E. rossii*	Scribbly Gum	130	10	0	1	0	Alive	-
81	*E. rossii*	Scribbly Gum	65	10	1	1	1	Alive	Galah in hollow
82	*E. rossii*	Scribbly Gum	75	6	0	0	1	Alive	-
83	*E. rossii*	Scribbly Gum	60	7	0	0	1	Alive	-
84	*E. rossii*	Scribbly Gum	70	9	1	0	0	Alive	-
85	*E. rossii*	Scribbly Gum	110	12	1	2	0	Alive	-
86	*E. rossii*	Scribbly Gum	70	11	0	2	1	Alive	2 superb parrots flew out
87	*E. rossii*	Scribbly Gum	60	12	0	0	2	Alive	-
88	*E. rossii*	Scribbly Gum	65	10	0	0	1	Alive	-
89	*E. rossii*	Scribbly Gum	110	11	0	3	1	Alive	Crimson rosella in hollow
90	*E. rossii*	Scribbly Gum	55	10	0	0	1	Alive	-
91	*E. rossii*	Scribbly Gum	80	8	1	0	2	Alive	-
92	*E. rossii*	Scribbly Gum	45	9	0	1	1	Alive	Pair of superb parrots inspecting hollow, female went right in, crimson rosellas also hanging around and guarding/trying to chase away superbs
93	*E. melliodora*	Yellow Box	50	10	0	2	0	Alive	-
94	*E. melliodora*	Yellow Box	62	12	0	1	1	Alive	Eastern rosella
95	*E. melliodora*	Yellow Box	55	7	0	1	1	Alive	-
96	*E. melliodora*	Yellow Box	70	10	0	2	0	Alive	-

Tree No.	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
97	*E. rossii*	Scribbly Gum	80	12	0	3	0	Alive	-
98	*E. melliodora*	Yellow Box	80	13	0	0	1	Alive	-
99	*E. melliodora*	Yellow Box	70	7	0	0	1	Alive	-
100	*E. melliodora*	Yellow Box	70	14	0	0	1	Alive	Magpie nest
101	*E. sp.*	-	100	8	0	2	2	Dead	Stag
102	*E. rossii*	Scribbly Gum	50	10	0	2	0	Alive	-
103	*E. rossii*	Scribbly Gum	90	6	0	0	3	Alive	-
104	*E. bridgesiana*	Apple Box	80	6	0	0	1	Alive	-
105	*E. melliodora*	Yellow Box	85	11	0	2	0	Alive	-
106	*E. rossii*	Scribbly Gum	45	7	0	1	0	Alive	-
107	*E. rossii*	Scribbly Gum	80	9	0	2	0	Alive	Eastern rosella
108	*E. rossii*	Scribbly Gum	45	10	0	0	1	Alive	-
109	*E. rossii*	Scribbly Gum	50	9	0	1	0	Alive	-
110	*E. rossii*	Scribbly Gum	60	9	1	0	2	Alive	-
111	*E. rossii*	Scribbly Gum	70	8	0	0	3	Alive	-
112	*E. rossii*	Scribbly Gum	40	5	0	1	0	Alive	-
113	*E. rossii*	Scribbly Gum	45	7	0	2	0	Alive	-
114	*E. rossii*	Scribbly Gum	60	6	0	0	1	Alive	-
115	*E. rossii*	Scribbly Gum	100	9	0	1	1	Alive	-
116	*E. rossii*	Scribbly Gum	70	9	1	2	1	Alive	-
117	*E. rossii*	Scribbly Gum	45	7	1	1	0	Alive	-
118	*E. rossii*	Scribbly Gum	100	10	0	1	4	Alive	-
119	*E. rossii*	Scribbly Gum	70	8	0	2	0	Alive	-
120	*E. bridgesiana*	Apple Box	90	7	0	1	2	Alive	-
121	*E. rossii*	Scribbly Gum	65	10	0	1	2	Alive	3 recently predated eggs at base of tree (chicken size)

Tree No.	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
122	*E. rossii*	Scribbly Gum	55	11	0	0	1	Alive	-
123	*E. rossii*	Scribbly Gum	60	8	0	0	1	Alive	-
124	*E. rossii*	Scribbly Gum	52	8	1	0	2	Alive	-
125	*E. rossii*	Scribbly Gum	45	5	0	1	0	Alive	Fallen over, but still alive
126	*E. melliodora*	Yellow Box	110	12	0	1	1	Alive	-
127	*E. blakelyi*	Blakely's Red Gum	65	11	0	1	0	Alive	Fluffy feathers around hollow
128	*E. blakelyi*	Blakely's Red Gum	70	11	0	1	0	Alive	-
129	*E. blakelyi*	Blakely's Red Gum	65	12	2	2	1	Alive	Mostly dead
130	*E. rossii*	Scribbly Gum	85	10	0	1	0	Alive	-
131	*E. rossii*	Scribbly Gum	75	9	0	1	0	Alive	-
132	*E. rossii*	Scribbly Gum	90	10	0	5	0	Alive	-
133	*E. rossii*	Scribbly Gum	90	9	0	1	0	Alive	-
134	*E. rossii*	Scribbly Gum	70	10	1	1	0	Alive	-
135	*E. sp.*	-	64	11	2	0	0	Dead	Stag
136	*E. sp.*	-	70	12	3	1	0	Dead	Stag
137	*E. sp.*	-	95	10	3	1	2	Dead	Stag
138	*E. melliodora*	Yellow Box	70	10	2	0	0	Alive	-
139	*E. sp.*	-	50	9	1	1	0	Dead	Stag
140	*E. blakelyi*	Blakely's Red Gum	95	9	2	2	0	Alive	-
141	*E. melliodora*	Yellow Box	160	12	2	0	0	Alive	-
142	*E. sp.*	-	80	10	2	0	1	Dead	Stag
143	*E. melliodora*	Yellow Box	80	13	1	0	0	Alive	-
144	*E. melliodora*	Yellow Box	95	9	4	0	0	Alive	Large hollow at base, sulphur-crested cockatoo pair perching
145	*E. sp.*	-	85	14	2	0	0	Dead	Stag
146	*E. blakelyi*	Blakely's Red Gum	80	12	3	0	1	Alive	-

Tree No.	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
147	*E. sp.*	-	95	9	5	3	2	Dead	Stag
148	*E. melliodora*	Yellow Box	169	12	0	0	1	Alive	7 starlings flew out on approach, red-rumped parrot perched
149	*E. sp.*	-	55	9	0	0	2	Dead	Stag
150	*E. melliodora*	Yellow Box	70	13	0	0	2	Alive	Starlings and eastern rosellas fled hollow on approach
151	*E. sp.*	-	40, 25	7	3	2	0	Dead	Stag
152	*E. sp.*	-	70	11	2	2	0	Dead	Stag
153	*E. blakelyi*	Blakely's Red Gum	120	14	0	0	1	Alive	Superb parrot pair (male and female) harassed out of tree by crimson rosellas at 12:15pm
154	*E. melliodora*	Yellow Box	110	14	0	1	2	Alive	-
155	*E. melliodora*	Yellow Box	140	13	0	0	2	Alive	1 extra large cavity in trunk
156	*E. melliodora*	Yellow Box	150	10	1	0	0	Alive	Red-rumped parrot perched
157	*E. melliodora*	Yellow Box	75	13	0	0	1	Alive	Large cavity in trunk
158	*E. melliodora*	Yellow Box	142	15	2	0	2	Alive	-
159	*E. sp.*	-	95	13	2	4	1	Dead	Stag, starlings and choughs perched
160	*E. blakelyi*	Blakely's Red Gum	80	12	1	2	0	Alive	Starlings, epicormic growth
161	*E. blakelyi*	Blakely's Red Gum	75	12	0	1	0	Alive	Eastern rosella, stick nest, epicormic growth
162	*E. bridgesiana*	Apple Box	120	8	0	1	0	Alive	Eastern rosella
163	*E. melliodora*	Yellow Box	100	10	1	1	1	Alive	-
164	*E. blakelyi*	Blakely's Red Gum	45	10	1	1	0	Alive	-
165	*E. rubida*	Candlebark	83	17	-	4	2	Alive	Superb Parrot in tree
166	*E. rubida*	Candlebark	87	15	-	2	3	Alive	Sulphur-crested Cockatoo in hollow
167	*E. bridgesiana*	Apple Box	109	10	-	-	1	A	Old dead stag, large trunk has now fallen over
168	*E. blakelyi*	Blakely's Red Gum	76	15	1	-	-	A	

Appendix D. Fauna Species Recorded

Classification	Scientific Name	Common Name	BC Status	EPBC Status
Amphibia	*Crinia parinsignifera*	Eastern Sign-bearing Froglet	Protected	-
Amphibia	*Crinia signifera*	Common Eastern Froglet	Protected	-
Aves	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	Protected	-
Aves	*Accipiter fasciatus*	Brown Goshawk	Protected	-
Aves	*Acridotheres tristis*	Indian Myna	-	-
Aves	*Acrocephalus australis*	Australian Reed-Warbler	Protected	-
Aves	*Anas gracilis*	Grey Teal	Protected	-
Aves	*Anas superciliosa*	Pacific Black Duck	Protected	-
Aves	*Anthochaera carunculata*	Red Wattlebird	Protected	-
Aves	*Anthus novaeseelandiae*	Australian (Richard's) Pipit	Protected	-
Aves	*Aquila audax*	Wedge-tail Eagle	Protected	-
Aves	***Artamus cyanopterus***	**Dusky Woodswallow**	**V1**	**-**
Aves	*Cacatua galerita*	Sulphur-crested Cockatoo	Protected	-
Aves	*Cacatua sanguinea*	Little Corella	Protected	-
Aves	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	Protected	-
Aves	*Calyptorhynchus funereus*	Yellow-tailed Black-cockatoo	Protected	-
Aves	*Chenonetta jubata*	Australian Wood Duck	Protected	-
Aves	*Colluricincla harmonica*	Grey Shrike-thrush	Protected	-
Aves	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	Protected	-
Aves	*Corcorax melanorhamphos*	White-winged Chough	Protected	-
Aves	*Corvus coronoides*	Australian Raven	Protected	-
Aves	*Corvus mellori*	Little Raven	Protected	-
Aves	*Coturnix pectoralis*	Stubble Quail	-	-
Aves	*Cracticus torquatus*	Grey Butcherbird	Protected	-
Aves	*Dacelo novaeguineae*	Laughing Kookaburra	Protected	-
Aves	***Daphoenositta chrysoptera***	**Varied Sittella**	**V1**	**-**
Aves	*Egretta novaehollandiae*	White-faced Heron	Protected	-
Aves	*Eolophus roseicapilla*	Galah	Protected	-
Aves	***Epthianura albifrons***	**White-fronted Chat**	**V1**	**-**
Aves	*Falco berigora*	Brown Falcon	Protected	-
Aves	*Falco cenchroides*	Nankeen Kestrel	Protected	-
Aves	*Grallina cyanoleuca*	Magpie-lark	Protected	-
Aves	*Gymnorhina tibicen*	Australian Magpie	Protected	-
Aves	*Hirundo neoxena*	Welcome Swallow	Protected	-
Aves	*Lalage sueurii*	White-winged Triller	Protected	-
Aves	*Malurus cyaneus*	Superb Fairy-wren	Protected	-
Aves	*Manorina melanocephala*	Noisy Miner	Protected	-
Aves	*Megalurus mathewsi*	Rufous Songlark	Protected	-
Aves	*Ocyphaps lophotes*	Crested Pigeon	Protected	-
Aves	*Pachycephala rufiventris*	Rufous Whistler	Protected	-
Aves	*Pardalotus punctatus*	Spotted Pardalote	Protected	-
Aves	*Pardalotus striatus*	Striated Pardalote	Protected	-

Classification	Scientific Name	Common Name	BC Status	EPBC Status
Aves	*Petrochelidon nigricans*	Tree Martin	Protected	-
Aves	*Philemon corniculatus*	Noisy Friarbird	Protected	-
Aves	*Platycercus elegans*	Crimson Rosella	Protected	-
Aves	*Platycercus eximius*	Eastern Rosella	Protected	-
Aves	***Polytelis swainsonii***	**Superb Parrot**	**V1**	**V**
Aves	*Psephotus haematonotus*	Red-rumped Parrot	Protected	-
Aves	*Rhipidura albiscapa*	Grey Fantail	Protected	-
Aves	*Rhipidura leucophrys*	Willy Wagtail	Protected	-
Aves	*Sericornis frontalis*	White-browed Scrubwren	Protected	-
Aves	*Smicrornis brevirostris*	Weebill	Protected	-
Aves	*Strepera graculina*	Pied Currawong	Protected	-
Aves	*Sturnus vulgaris*	Common Starling	-	-
Aves	*Tachybaptus novaehollandiae*	Australasian Grebe	Protected	-
Aves	*Threskiornis molucca*	Australian White Ibis	Protected	-
Aves	*Turdus merula*	European Blackbird	-	-
Aves	*Vanellus miles*	Masked Lapwing	Protected	-
Aves	*Zosterops lateralis*	Silvereye	Protected	-
Insecta	***Synemon plana***	**Golden Sun Moth**	**E1**	**CE**
Mammalia	*Austronomus australis*	White-striped Mastiff Bat	-	-
Mammalia	*Chalinolobus gouldii*	Gould's Wattled Bat	Protected	-
Mammalia	*Chalinolobus morio*	Chocolate Wattled Bat	Protected	-
Mammalia	*Lepus capensis*	Brown Hare	-	-
Mammalia	*Macropus giganteus*	Eastern Grey Kangaroo	Protected	-
Mammalia	***Miniopterus orianae oceanensis***	**Large Bent-winged Bat**	**V1**	**-**
Mammalia	*Mormopterus planiceps*	Southern Freetial Bat	Protected	-
Mammalia	*Mormopterus ridei*	Eastern Freetial Bat	Protected	-
Mammalia	*Nyctophilus sp*	Unidentified Long-eared Bat	Protected	-
Mammalia	*Oryctolagus cuniculus*	European Rabbit	-	-
Mammalia	*Vespadelus darlingtoni*	Large Forest Bat	Protected	-
Mammalia	*Vespadelus vulturnus*	Little Forest Bat	Protected	-
Mammalia	*Vombatus ursinus*	Common Wombat	Protected	-
Mammalia	*Vulpes vulpes*	Red Fox	-	-
Reptilia	*Delma inornata*	Olive Legless lizard	Protected	-
Reptilia	*Intellagama lesueurii*	Eastern Water Dragon	Protected	-
Reptilia	*Lampropholis delicata*	Delicate Skink	Protected	-
Reptilia	*Lampropholis guichenoti*	Garden Skink	Protected	-
Reptilia	*Morethia boulengeri*	Boulenger's Skink	Protected	-
Reptilia	*Pogona barbata*	Bearded Dragon	Protected	-
Reptilia	*Tiliqua scincoides*	Eastern Blue-tongue	Protected	-

Appendix E. Striped Legless Lizard Survey Results

CHECK	DATE	START Time	END Time	START Temp	END Temp	CLOUD	WIND	GRID	TILE_ID	SVL (mm)	Total L (mm)	Full Tail (Y/N/C)	SPECIES	COMMON NAME	OBS_TYPE	NUMBER	NOTES
1	20/09/2019	11:30:00 AM	12:30:00 PM	18.6	21.2	Fine	Slight breeze	3	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	1	
								7	-	-	-	-	-	-	Unidentified Skink	1	
								8	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	1	
2	25/09/2019	8:05:00 AM	9:50:00 AM	7	12	Fine	None	7	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	2	
3	1/10/2019	9:45:00 AM	11:00:00 AM	13	15.8	1/8	None	1	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	1	
								4	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	1	
								5	-	-	-	-	-	*Pogona barbata*	Bearded Dragon	1	
								7	-	-	-	-	-	-	Unidentified Skink	7	
4	9/10/2019	8:00:00 AM	9:30:00 AM	7	-	5/8	Slight breeze	5	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	1	
								7	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	2	
5	14/10/2020	8:00:00 AM	9:45:00 AM	10	16	Fine	None	3	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	1	
								7	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	2	
6	23/10/2019	9:30:00 AM	10:30:00 AM	15	19	Fine	None	7	-	-	-	-	-	-	Unidentified Skink	1	
7	30/10/2019	7:30:00 AM	9:00:00 AM	12	16	8/8	Slight breeze	10	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	1	
								7	-	-	-	-	-	*Morethia boulengeri*	Boulenger's Skink	1	
								3	-	-	-	-	-	*Delma inornata*	Olive Legless lizard	1	
								3	-	-	-	-	-	*Lampropholis guichenoti*	Garden Skink	1	
8	4/11/2019	10:30:00 AM	12:00:00 PM	17	18	3/8	Slight breeze	3	-	-	-	-	-	*Pogona barbata*	Bearded Dragon	1	
								7	-	-	-	-	-	*Lampropholis delicata*	Delicate Skink	6	
								8	-	-	-	-	-	*Delma inornata*	Olive Legless lizard	1	
9	11/11/2019	10:30:00 AM	11:30:00 AM	19.7	21	1/8	Slight breeze	7	-	-	-	-	-	*Tiliqua scincoides*	Eastern Blue-tongue	1	
10	20/11/2019	7:30:00 AM	9:00:00 AM	13	15.6	1/8	None	6	-	-	-	-	-	-	Unidentified Skink	2	

Table key: SVL = Snout to vent length, Total L = total length.

Appendix F. Fly By Night Bat Surveys Pty Ltd Anabat® analysis

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24th September 2020

Hi Shannon

Following are the results for the files you sent for the sites at Woodbury Ridge, near Sutton, NSW.

Best wishes

Glenn Hoye

Site	Date	A.au	M.pl	M.ri	C.go	C.mo	M.or	N.sp	V.da	V.vu	Total Identifiable Passes
L1	20/11/2019	C	C	C	C	C		C	C	C	91
L1	21/11/2019	C	C	C	C	C	Po		C	C	172
L1	22/11/2019	C	C	C	C	C			C	C	122
L1	23/11/2019	C	C	C	C	C	P	P	C	C	59
L1	24/11/2019	C	C	C	C	C			C	C	91
L1	25/11/2019	C	C	C	C	C	P	C	C	C	90
L1	26/11/2019	C	C		C		P	C	C		22
L1	27/11/2019	C	C	C	C	C	P	C	C	C	53
L2	20/11/2019	C	C	C	C	C	P		C	C	90
L2	21/11/2019	C	C	C	C	C	P	P	C	C	167
L2	22/11/2019	C	C	C	C	C	P	P	C	C	107
L2	23/11/2019	C	C	C	C	C			C	C	48
L2	24/11/2019	C	C	C	C	C	P		C	C	105
L2	25/11/2019	C	C	C	C	C	P		C	C	243
L2	26/11/2019	C	P	C	C	C			C		14
L2	27/11/2019	C	C	C	C	C	P	C	C	C	61

Species

A.au	White-striped Mastiff Bat	*Austronomus australis*	
M.ri	Eastern Freetail Bat	*Mormopterus ridei*	
C.mo	Chocolate Wattled Bat	*Chalinolobus morio*	
N.sp	Unidentified Long-eared Bat	*Nyctophilus sp.*	
V.vu	Little Forest Bat	*Vespadelus vulturnus*	
M.pl	Southern Freetail Bat	*Mormopterus planiceps*	
C.go	Gould's Wattled Bat	*Chalinolobus gouldii*	
M.or	Eastern Bent-wing Bat	*Miniopterus oriane oceanensis*	
V.da	Large Forest Bat	*Vespadelus darlingtoni*	

Confidence of Identification

C Confident **P** Probable **Po** Possible

Appendix G. BAM Summary Reports – Proposed Biodiversity Stewardship Sites

BAM Vegetation Zones Report - Stewardship Agreement

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00023845/BAAS20006/21/00023846	2892 and 2980 - Woodbury Ridge Estate - BSS Estimate	10/06/2021
Assessor Name	Report Created	BAM Data version *
	18/09/2021	45
Assessor Number	Assessment Type	BAM Case Status
	Stewardship (for offset sites)	Open
Assessment Revision	Date Finalised	
0	To be finalised	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones

BAM Vegetation Zones Report - Stewardship Agreement

1	1093_Zone_1	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Zone_1	2.65	2	Main (2.18 ha) APZ (0.47 ha)
2	1093_Zone_2	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Zone_2	3.43	2	Main (2.79 ha) APZ (0.64 ha)
3	1330_Zone_1	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_1	19.02	3	Main (18.29 ha) APZ (0.73 ha)
4	1330_Zone_2	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_2	23.14	4	Main (22.41 ha) APZ (0.73 ha)
5	1330_Zone_3	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_3	1.67	1	Main (1.67 ha)
6	1330_Zone_4	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_4	1.63	1	Main (1.57 ha) APZ (0.06 ha)
7	1330_Zone_5	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_5	11.3	3	Main (10.59 ha) APZ (0.71 ha)

8	1330_Zone_6	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_6	31.44	4	Main (30.59 ha) APZ (0.85 ha)
9	1330_Zone_7	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_7	2.43	2	Main (2.19 ha) APZ (0.24 ha)

BAM Predicted Species Report - Stewardship Agreement

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00023845/BAAS20006/21/00023846	2892 and 2980 - Woodbury Ridge Estate - BSS Estimate	10/06/2021
Assessor Name	**Report Created**	**BAM Data version ***
	18/09/2021	45
Assessor Number	**Assessment Type**	**BAM Case Status**
	Stewardship (for offset sites)	Open
Assessment Revision		**Date Finalised**
0		To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Diamond Firetail	Stagonopleura guttata	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Flame Robin	Petroica phoenicea	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Gang-gang Cockatoo	Callocephalon fimbriatum	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Greater Broad-nosed Bat	Scoteanax rueppellii	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Grey-headed Flying-fox	Pteropus poliocephalus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Koala	Phascolarctos cinereus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Little Eagle	Hieraaetus morphnoides	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Little Lorikeet	Glossopsitta pusilla	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Little Whip Snake	Suta flagellum	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Painted Honeyeater	Grantiella picta	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Powerful Owl	Ninox strenua	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Regent Honeyeater	Anthochaera phrygia	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Rosenberg's Goanna	Varanus rosenbergi	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Scarlet Robin	Petroica boodang	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Speckled Warbler	Chthonicola sagittata	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion

Spotted-tailed Quoll	Dasyurus maculatus	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Square-tailed Kite	Lophoictinia isura	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
Superb Parrot	Polytelis swainsonii	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Swift Parrot	Lathamus discolor	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Turquoise Parrot	Neophema pulchella	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Varied Sittella	Daphoenositta chrysoptera	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
White-fronted Chat	Epthianura albifrons	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
White-throated Needletail	Hirundapus caudacutus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Yellow-bellied Glider	Petaurus australis	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Predicted Species Report - Stewardship Agreement

BAM Candidate Species Report - Stewardship Agreement

Proposal Details

Assessment Id 00023845/BAAS20006/21/00023846	Proposal Name 2892 and 2980 - Woodbury Ridge Estate - BSS Estimate	BAM data last updated * 10/06/2021
Assessor Name	Report Created 18/09/2021	BAM Data version * 45
Assessor Number	Assessment Type Stewardship (for offset sites)	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Polytelis swainsonii Superb Parrot	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Synemon plana Golden Sun Moth	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report - Stewardship Agreement

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Austral Toadflax	Thesium australe	Refer to BAR
Booroolong Frog	Litoria booroolongensis	Refer to BAR
Eastern Pygmy-possum	Cercartetus nanus	Refer to BAR
Gang-gang Cockatoo	Callocephalon fimbriatum	Refer to BAR
Greater Glider	Petauroides volans	Refer to BAR
Grey-headed Flying-fox	Pteropus poliocephalus	Refer to BAR
Hoary Sunray	Leucochrysum albicans var. tricolor	Refer to BAR
Koala	Phascolarctos cinereus	Refer to BAR
Large Bent-winged Bat	Miniopterus orianae oceanensis	Refer to BAR
Little Eagle	Hieraaetus morphnoides	Refer to BAR
Pale Pomaderris	Pomaderris pallida	Refer to BAR
Pink-tailed Legless Lizard	Aprasia parapulchella	Geographic limitations
Powerful Owl	Ninox strenua	Refer to BAR
Regent Honeyeater	Anthochaera phrygia	Refer to BAR
Small Purple-pea	Swainsona recta	Refer to BAR
Southern Myotis	Myotis macropus	Refer to BAR
Square-tailed Kite	Lophoictinia isura	Refer to BAR
Squirrel Glider	Petaurus norfolcensis	Refer to BAR
Striped Legless Lizard	Delma impar	Refer to BAR
Swift Parrot	Lathamus discolor	Refer to BAR
Tarengo Leek Orchid	Prasophyllum petilum	Refer to BAR
Wee Jasper Grevillea	Grevillea iaspicula	Refer to BAR
White-bellied Sea-Eagle	Haliaeetus leucogaster	Refer to BAR
Yass Daisy	Ammobium craspedioides	Geographic limitations

BAM Biodiversity Credit Report - Stewardship Agreement

Proposal Details

Assessment Id
00023845/BAAS20006/21/00023846

Proposal Name
2892 and 2980 - Woodbury Ridge Estate - BSS Estimate

BAM data last updated *
10/06/2021

Assessor Name

Assessor Number

BAM Data version *
45

Proponent Names

Report Created
18/09/2021

BAM Case Status
Open

Assessment Revision
0

Assessment Type
Stewardship (for offset sites)

Date Finalised
To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Additional Information for Approval

Vegetation Zones With Customized Rate of Decline
No Changes

PCTs With Customized Benchmarks
No Changes

BAM Biodiversity Credit Report - Stewardship Agreement

Predicted Threatened Species Not On Site

No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be created)

Name of Plant Community Type/ID	Name of threatened ecological community	Area	HBT Cr	No HBT Cr	Total credits to be created
1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Not a TEC	6.1	22	0	22
1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	90.6	96	248	344

BAM Biodiversity Credit Report - Stewardship Agreement

1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Class	Trading group	Zone	HBT	Credits	IBRA region
	Southern Tableland Dry Sclerophyll Forests	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	1093_Zone_1	Yes	14	Murrumbateman
	Southern Tableland Dry Sclerophyll Forests	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	1093_Zone_2	Yes	8	Murrumbateman
	Vegetation Formation (offset variation rules)	Vegetation Class	Zone	HBT	Credits	Offset trading group tier (non TEC's)
	Dry Sclerophyll Forests (Shrubby sub-formation)	Southern Tableland Dry Sclerophyll Forests	1093_Zone_1	Yes (including artificial)	14	Tier 3 >=50% and <70%
	Dry Sclerophyll Forests (Shrubby sub-formation)	Southern Tableland Dry Sclerophyll Forests	1093_Zone_2	Yes (including artificial)	8	Tier 3 >=50% and <70%
1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Name of offset trading group (like for like)	Trading group	Zone	HBT	Credits	IBRA region

White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_1	No	107	Murrumbateman
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_2	Yes	89	Murrumbateman

White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_3	Yes	4	Murrumbateman
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_4	Yes	3	Murrumbateman

White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_5	No	46	Murrumbateman
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_6	No	90	Murrumbateman

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_7	No	5	Murrumbateman

Species Credit Summary

Species (Class of species credits)	Listing Status	Kingdom	Area/Count	Number of credits created
Polytelis swainsonii / Superb Parrot	Vulnerable	Fauna	6.5	30
Swainsona sericea / Silky Swainson-pea	Vulnerable	Flora	1.2	5
Synemon plana / Golden Sun Moth	Endangered	Fauna	96.4	365

BAM Credit Summary Report - Stewardship Agreement

Proposal Details

Assessment Id
00023845/BAAS20006/21/00023846

Proposal Name
2892 and 2980 - Woodbury Ridge Estate - BSS Estimate

BAM data last updated *
10/06/2021

Assessor Name

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18/09/2021

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Assessor Number

BAM Case Status
Open

Date Finalised
To be finalised

Assessment Revision
0

Assessment Type
Stewardship (for offset sites)

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Percent Cleared Value	Area (ha)	Current Vegetation integrity score	Future Vegetation integrity score without management	Future Vegetation integrity score with management	Security benefit score	Total gain in Vegetation integrity	BC Act listing status	EPBC Act listing status	Total number of ecosystem credits
Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion												
1	1093_Zone_1	Not a TEC	61	2.6	50.6	46.6	68	0	20.8			14
2	1093_Zone_2	Not a TEC	61	3.4	36.8	35.1	45.4	0	9.9			8

										Subtotal	**22**
Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion											
3	1330_Zone_1	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	94	19	53.4	49.2	71.8	0	22.4	Critically Endangered Ecological Community	Critically Endangered	107
4	1330_Zone_2	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	94	23.1	33.8	29.7	45.2	0	15.4	Critically Endangered Ecological Community	Critically Endangered	89

5	1330_Zone_3	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	94	1.7	22.6	18.8	29.5	0	10.7	Critically Endangered Ecological Community	Critically Endangered	4
6	1330_Zone_4	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	94	1.6	13.1	10.6	17.2	0	6.6	Critically Endangered Ecological Community	Critically Endangered	3

7	1330_Zone_5	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	94	11.3	19.6	18.3	34.7	0	16.3	Critically Endangered Ecological Community	Critically Endangered	46
8	1330_Zone_6	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	94	31.4	11.6	10.6	22.1	0	11.4	Critically Endangered Ecological Community	Critically Endangered	90

9	1330_Zone_7	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	94	2.4	10.8	9.3	17.2	0	7.8	Critically Endangered Ecological Community	Critically Endangered	5
											Subtotal	**344**
											Total	**366**

Species credits for threatened species

Vegetation zone name	Total gain in Habitat condition (HC)	Area (ha) / Count (no. individuals)	Constant	BC Act listing status	EPBC Act listing status	Total number of species credits
Polytelis swainsonii / Superb Parrot (Fauna)						
1093_Zone_1	20.8	1.8	0.25	Vulnerable	Vulnerable	9
1093_Zone_2	9.9	1.5	0.25	Vulnerable	Vulnerable	4
1330_Zone_1	22.4	1.9	0.25	Vulnerable	Vulnerable	11
1330_Zone_2	15.4	1.3	0.25	Vulnerable	Vulnerable	5
1330_Zone_6	11.4	0.05	0.25	Vulnerable	Vulnerable	1
					Subtotal	**30**

Swainsona sericea / Silky Swainson-pea (Flora)						
1330_Zone_1	22.4	0.38	0.25	Vulnerable	Not Listed	2
1330_Zone_5	16.3	0.84	0.25	Vulnerable	Not Listed	3
					Subtotal	**5**
Synemon plana / Golden Sun Moth (Fauna)						
1093_Zone_1	20.8	2.6	0.25	Endangered	Critically Endangered	14
1093_Zone_2	9.9	3.4	0.25	Endangered	Critically Endangered	8
1330_Zone_1	22.4	19	0.25	Endangered	Critically Endangered	107
1330_Zone_2	15.4	23.1	0.25	Endangered	Critically Endangered	89
1330_Zone_3	10.7	1.7	0.25	Endangered	Critically Endangered	4
1330_Zone_4	6.6	1.6	0.25	Endangered	Critically Endangered	3
1330_Zone_5	16.3	11.3	0.25	Endangered	Critically Endangered	46
1330_Zone_6	11.4	31.4	0.25	Endangered	Critically Endangered	90
1330_Zone_7	7.8	2.1	0.25	Endangered	Critically Endangered	4
					Subtotal	**365**

Appendix H. BAM Summary Reports

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00022866/BAAS20006/20/00022867

Assessment name
2892 and 2980 - Woodbury Ridge Estate - BCAR

BAM data last updated *
10/06/2021

Assessor Name
Samuel F Reid

Report Created
22/09/2021

BAM Data version *
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Assessor Number
BAAS20006

Assessment Type
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BAM Case Status
Finalised

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1

Date Finalised
22/09/2021

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones

1	1093_Zone_1	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Zone_1	0.25	1	Total (0.16 ha) Partial (0.09 ha)
2	1093_Zone_2	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Zone_2	2.32	2	Total (1.07 ha) Partial (1.25 ha)
3	1330_Zone_1	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_1	0.28	1	Total (0.05 ha) Partial (0.23 ha)
4	1330_Zone_2	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_2	0.96	1	Total (0.74 ha) Partial (0.22 ha)
5	1330_Zone_3	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_3	4.76	2	Total (3.51 ha) Partial (1.25 ha)
6	1330_Zone_4	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_4	7.05	3	Total (4.37 ha) Partial (2.68 ha)
7	1330_Zone_5	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_5	0.58	1	

8	1330_Zone_6	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_6	6.38	3	
9	1330_Zone_7	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone_7	30.84	4	

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00022866/BAAS20006/20/00022867	2892 and 2980 - Woodbury Ridge Estate - BCAR	10/06/2021
Assessor Name	**Report Created**	**BAM Data version ***
Samuel F Reid	22/09/2021	45
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS20006	Biocertification	Finalised
Assessment Revision		**Date Finalised**
1		22/09/2021

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Diamond Firetail	Stagonopleura guttata	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Flame Robin	Petroica phoenicea	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Gang-gang Cockatoo	Callocephalon fimbriatum	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Greater Broad-nosed Bat	Scoteanax rueppellii	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Grey-headed Flying-fox	Pteropus poliocephalus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Koala	Phascolarctos cinereus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Little Eagle	Hieraaetus morphnoides	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Little Lorikeet	Glossopsitta pusilla	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Little Whip Snake	Suta flagellum	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Painted Honeyeater	Grantiella picta	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Powerful Owl	Ninox strenua	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Regent Honeyeater	Anthochaera phrygia	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Rosenberg's Goanna	Varanus rosenbergi	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Scarlet Robin	Petroica boodang	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Speckled Warbler	Chthonicola sagittata	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion

Spotted-tailed Quoll	Dasyurus maculatus	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Square-tailed Kite	Lophoictinia isura	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
Superb Parrot	Polytelis swainsonii	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Swift Parrot	Lathamus discolor	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Turquoise Parrot	Neophema pulchella	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Varied Sittella	Daphoenositta chrysoptera	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
White-fronted Chat	Epthianura albifrons	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
White-throated Needletail	Hirundapus caudacutus	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Yellow-bellied Glider	Petaurus australis	1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion
		1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Candidate Species Report

Proposal Details

Assessment Id 00022866/BAAS20006/20/00022867	Proposal Name 2892 and 2980 - Woodbury Ridge Estate - BCAR	BAM data last updated * 10/06/2021
Assessor Name Samuel F Reid	Report Created 22/09/2021	BAM Data version * 45
Assessor Number BAAS20006	Assessment Type Biocertification	BAM Case Status Finalised
Assessment Revision 1	Date Finalised 22/09/2021	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Ammobium craspedioides Yass Daisy	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Callocephalon fimbriatum Gang-gang Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Delma impar Striped Legless Lizard	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Leucochrysum albicans var. tricolor Hoary Sunray	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Lophoictinia isura Square-tailed Kite	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Polytelis swainsonii Superb Parrot	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Pomaderris pallida Pale Pomaderris	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Prasophyllum petilum Tarengo Leek Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona recta Small Purple-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Synemon plana Golden Sun Moth	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?
Thesium australe Austral Toadflax	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Booroolong Frog	Litoria booroolongensis	Habitat degraded
Eastern Pygmy-possum	Cercartetus nanus	Habitat degraded

Greater Glider	Petauroides volans	Refer to BAR
Grey-headed Flying-fox	Pteropus poliocephalus	Habitat constraints
Koala	Phascolarctos cinereus	Habitat constraints
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Pink-tailed Legless Lizard	Aprasia parapulchella	Habitat constraints
Powerful Owl	Ninox strenua	Habitat degraded
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
Southern Myotis	Myotis macropus	Habitat constraints
Squirrel Glider	Petaurus norfolcensis	Habitat degraded
Swift Parrot	Lathamus discolor	Habitat constraints
Wee Jasper Grevillea	Grevillea iaspicula	Habitat constraints

BAM Credit Summary Report

Proposal Details

Assessment Id
00022866/BAAS20006/20/00022867

Proposal Name
2892 and 2980 - Woodbury Ridge Estate - BCAR

BAM data last updated *
10/06/2021

Assessor Name
Samuel F Reid

Report Created
22/09/2021

BAM Data version *
45

Assessor Number
BAAS20006

BAM Case Status
Finalised

Date Finalised
22/09/2021

Assessment Revision
1

Assessment Type
Biocertification

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	BC Act Listing status	EPBC Act listing status	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion											
1	1093_Zone_1	Not a TEC	50.6	43.9	0.25			High Sensitivity to Potential Gain	1.75		5
2	1093_Zone_2	Not a TEC	36.8	31.2	2.3			High Sensitivity to Potential Gain	1.75		32
										Subtotal	**37**

Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion											
3	1330_Zone_1	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	53.4	45.3	0.28	Critically Endangered Ecological Community	Critically Endangered	High Sensitivity to Potential Gain	2.50	TRUE	8

4	1330_Zone_2	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	33.8	31.7	0.96	Critically Endangered Ecological Community	Critically Endangered	High Sensitivity to Potential Gain	2.50	TRUE	19

5	1330_Zone_3	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	22.6	21.6	4.8	Critically Endangered Ecological Community	Critically Endangered	High Sensitivity to Potential Gain	2.50	TRUE	64

6	1330_Zone_4	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	13.1	11.7	7	Critically Endangered Ecological Community	Critically Endangered	High Sensitivity to Potential Gain	2.50	TRUE	0

7	1330_Zone_5	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	19.6	19.6	0.58	Critically Endangered Ecological Community	Critically Endangered	High Sensitivity to Potential Gain	2.50	TRUE	7

8	1330_Zone_6	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	11.6	11.6	6.4	Critically Endangered Ecological Community	Critically Endangered	High Sensitivity to Potential Gain	2.50	TRUE	0

9	1330_Zone_7	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	10.8	10.8	30.8	Critically Endangered Ecological Community	Critically Endangered	High Sensitivity to Potential Gain	2.50	TRUE	0
										Subtotal	**98**
										Total	**135**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Species credits
Polytelis swainsonii / Superb Parrot (Fauna)								
1093_Zone_1	43.9	43.9	0.16	Vulnerable	Vulnerable	2	False	4
1093_Zone_2	31.2	31.2	1.8	Vulnerable	Vulnerable	2	False	28
1330_Zone_2	31.7	31.7	0.96	Vulnerable	Vulnerable	2	False	15
1330_Zone_3	21.6	21.6	1.7	Vulnerable	Vulnerable	2	False	19
1330_Zone_6	11.6	11.6	1.3	Vulnerable	Vulnerable	2	False	8

							Subtotal	**74**
Swainsona sericea / Silky Swainson-pea (Flora)								
1330_Zone_1	45.3	45.3	0.28	Vulnerable	Not Listed	2	False	6
1330_Zone_5	19.6	19.6	0.58	Vulnerable	Not Listed	2	False	6
							Subtotal	**12**
Synemon plana / Golden Sun Moth (Fauna)								
1093_Zone_1	43.9	43.9	0.25	Endangered	Critically Endangered	3	True	8
1093_Zone_2	31.2	31.2	2.3	Endangered	Critically Endangered	3	True	54
1330_Zone_1	45.3	45.3	0.28	Endangered	Critically Endangered	3	True	10
1330_Zone_2	31.7	31.7	0.96	Endangered	Critically Endangered	3	True	23
1330_Zone_3	21.6	21.6	4.8	Endangered	Critically Endangered	3	True	77
1330_Zone_4	11.7	11.7	7	Endangered	Critically Endangered	3	True	62
1330_Zone_5	19.6	19.6	0.58	Endangered	Critically Endangered	3	True	9
1330_Zone_6	11.6	11.6	6.4	Endangered	Critically Endangered	3	True	55
1330_Zone_7	10.8	10.8	14.9	Endangered	Critically Endangered	3	True	121
							Subtotal	**419**

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00022866/BAAS20006/20/00022867

Proposal Name
2892 and 2980 - Woodbury Ridge Estate - BCAR

BAM data last updated *
10/06/2021

Assessor Name
Samuel F Reid

Assessor Number
BAAS20006

BAM Data version *
45

Proponent Names
Peter Cartwright

Report Created
22/09/2021

BAM Case Status
Finalised

Assessment Revision
1

Assessment Type
Biocertification

Date Finalised
22/09/2021

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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Species
Synemon plana / Golden Sun Moth

Additional Information for Approval

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Not a TEC	2.6	37	0	37
1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	50.9	83	15	98

1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Southern Tableland Dry Sclerophyll Forests This includes PCT's: 299, 349, 351, 352, 653, 701, 727, 728, 730, 888, 957, 1093, 1177	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	1093_Zone_1	Yes	5	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Southern Tableland Dry Sclerophyll Forests This includes PCT's: 299, 349, 351, 352, 653, 701, 727, 728, 730, 888, 957, 1093, 1177	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	1093_Zone_2	Yes	32	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
White Box - Yellow Box -	-	1330_Zone_1	No	8	Murrumbateman, Bondo, Crookwell,

	Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307,					Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567,	-	1330_Zone_2	Yes	19	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347,	-	1330_Zone_3	Yes	64	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	1330_Zone_4	Yes	0	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native	-	1330_Zone_5	No	7	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains.

	Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608,					or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	1611, 1691, 1693, 1695, 1698					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710,	-	1330_Zone_6	No	0	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437,	-	1330_Zone_7	No	0	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698					

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Polytelis swainsonii / Superb Parrot	**1093_Zone_1, 1093_Zone_2, 1330_Zone_2, 1330_Zone_3, 1330_Zone_6**	6.0	74.00
Swainsona sericea / Silky Swainson-pea	**1330_Zone_1, 1330_Zone_5**	0.9	12.00

Synemon plana / Golden Sun Moth	**1093_Zone_1, 1093_Zone_2, 1330_Zone_1, 1330_Zone_2, 1330_Zone_3, 1330_Zone_4, 1330_Zone_5, 1330_Zone_6, 1330_Zone_7**	37.5	419.00

Credit Retirement Options

Like-for-like credit retirement options

Polytelis swainsonii / Superb Parrot	Spp	IBRA subregion
	Polytelis swainsonii / Superb Parrot	Any in NSW
Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion
	Swainsona sericea / Silky Swainson-pea	Any in NSW
Synemon plana / Golden Sun Moth	Spp	IBRA subregion
	Synemon plana / Golden Sun Moth	Any in NSW

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00022866/BAAS20006/20/00022867

Proposal Name
2892 and 2980 - Woodbury Ridge Estate - BCAR

BAM data last updated *
10/06/2021

Assessor Name
Samuel F Reid

Assessor Number
BAAS20006

BAM Data version *
45

Proponent Name(s)
Peter Cartwright

Report Created
22/09/2021

BAM Case Status
Finalised

Assessment Revision
1

Assessment Type
Biocertification

Date Finalised
22/09/2021

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Species
Synemon plana / Golden Sun Moth

Additional Information for Approval

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	Not a TEC	2.6	37	0	37.00
1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	50.9	83	15	98.00

1093-Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Southern Tableland Dry Sclerophyll Forests This includes PCT's: 299, 349, 351, 352, 653, 701, 727, 728, 730, 888, 957, 1093, 1177	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	1093_Zone_1	Yes	5	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Southern Tableland Dry Sclerophyll Forests This includes PCT's: 299, 349, 351, 352, 653, 701, 727, 728, 730, 888, 957, 1093, 1177	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	1093_Zone_2	Yes	32	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Dry Sclerophyll Forests (Shrubby sub-formation)	Tier 3 or higher threat status	1093_Zone_1	Yes (including artificial)	5	IBRA Region: South Eastern Highlands, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Dry Sclerophyll Forests (Shrubby sub-formation)	Tier 3 or higher threat status	1093_Zone_2	Yes (including artificial)	32	IBRA Region: South Eastern Highlands, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	1330_Zone_1	No	8	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	1330_Zone_2	Yes	19	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	1330_Zone_3	Yes	64	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	1330_Zone_4	Yes	0	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	1330_Zone_5	No	7	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	1330_Zone_6	No	0	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	1330_Zone_7	No	0	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Variations)

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Polytelis swainsonii / Superb Parrot	**1093_Zone_1, 1093_Zone_2, 1330_Zone_2, 1330_Zone_3, 1330_Zone_6**	6.0	74.00
Swainsona sericea / Silky Swainson-pea	**1330_Zone_1, 1330_Zone_5**	0.9	12.00
Synemon plana / Golden Sun Moth	**1093_Zone_1, 1093_Zone_2, 1330_Zone_1, 1330_Zone_2, 1330_Zone_3, 1330_Zone_4, 1330_Zone_5, 1330_Zone_6, 1330_Zone_7**	37.5	419.00

Credit Retirement Options

Like-for-like options

Polytelis swainsonii/ Superb Parrot

Spp	IBRA region
Polytelis swainsonii/Superb Parrot	Any in NSW

Variation options

Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region

	Fauna	Vulnerable	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Swainsona sericea/ Silky Swainson-pea	Spp	IBRA region	
	Swainsona sericea/Silky Swainson-pea	Any in NSW	
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Flora	Vulnerable	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Synemon plana/ Golden Sun Moth	Spp	IBRA region	
	Synemon plana/Golden Sun Moth	Any in NSW	
	Variation options		
	Kingdom	Any species with same or higher category of listing	IBRA region

		under Part 4 of the BC Act shown below	
	Fauna	Endangered	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Biodiversity payment summary report

Assessment Id	Payment data version	Assessment Revision	Report created
00022866/BAAS20006/20/00022867		1	22/09/2021

Assessor Name	Assessor Number	Proposal Name	BAM Case Status
Samuel F Reid	BAAS20006	2892 and 2980 - Woodbury Ridge Estate - BCAR	Finalised

Assessment Type	Date Finalised
Biocertification	22/09/2021

PCT list

Price calculated	PCT common name	Credits
Yes	**1093 -** Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	37
Yes	**1330 -** Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	98

Species list

Price calculated	Species	Credits
Yes	***Polytelis swainsonii*** (Superb Parrot)	74
Yes	***Swainsona sericea*** (Silky Swainson-pea)	12
Yes	***Synemon plana*** (Golden Sun Moth)	419

Biodiversity payment summary report

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

IBRA sub region	PCT common name	Threat status	Offset trading group	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Murrumbateman	**1093 -** Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	No	Southern Tableland Dry Sclerophyll Forests >=50% and <70%	20.69%	$159.41	3.0383	$4,969.29	37	$183,863.57
Murrumbateman	**1330 -** Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Yes	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	15.97%	$279.14	2.0667	$8,372.13	98	$820,468.78

Biodiversity payment summary report

Subtotal (excl. GST)	**$1,004,332.35**
GST	**$100,433.24**
Total ecosystem credits (incl. GST)	**$1,104,765.58**

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price
10645	***Polytelis swainsonii*** (Superb Parrot)	Vulnerable	$741.31	20.6900%	$80.00	74	$72,126.84
10783	***Swainsona sericea*** (Silky Swainson-pea)	Vulnerable	$158.64	20.6900%	$80.00	12	$3,257.55
10791	***Synemon plana*** (Golden Sun Moth)	Endangered	$5,974.37	20.6900%	$238.97	419	$3,121,316.18

Subtotal (excl. GST)	**$3,196,700.57**
GST	**$319,670.06**
Total species credits (incl. GST)	**$3,516,370.63**

Grand total	**$4,621,136.21**

Appendix I. Recent Consultation and Public Exhibition

Planning, Industry & Environment

Rob Speirs
Director – Capital Ecology
PO BOX 854
Gungahlin ACT

Our ref: DOC20/858041

Your ref: 2980 Woodbury Ridge Bio Offsets Estimate

21 October 2020

Dear Rob,

Subject: Woodbury Ridge Estate proposed subdivision, Sutton

Thank you for providing preliminary offset credit estimates and for the online meeting on Monday 19 October 2020 to discuss the proposed Woodbury Ridge Subdivision, Sutton. It is our position that this project is a strong candidate for the biodiversity certification process.

We appreciate that a significant body of work has gone into developing the current layout design and biodiversity assessment work to date. Our primary concern at this preliminary stage is regarding the protection of vegetation within the proposed R5 Large Lot residential areas. Specifically, the native overstorey trees that will not be cleared during construction of infrastructure which are also located outside of the individual building envelopes. It is our understanding that vegetation outside of the development footprint and permitted building envelopes is to be retained. Protecting these trees, and remnants of higher quality native understorey within individual blocks but outside of allowable building envelopes will be critical in ensuring offset credit requirements are achievable wholly within the proposed estate. Based on the discussion held during our meeting on 19 October 2020 we anticipate that an appropriate consideration of relevant restrictions to further clearing, or land use changes that will not be permitted would be included in any future submissions, including a Biodiversity Certification Assessment Report (BCAR) should the proponent pursue a biodiversity certification. We anticipate that the BCAR would also include a discussion around how these restrictions would be enforced; such as for example through a Section 88B restriction under the NSW *Conveyancing Act 1919* or another appropriate mechanism to ensure direct and indirect impacts can be appropriately considered.

In addition, clarity around allowable asset protection zones (APZs) and their requirements to fit within the allowable building envelopes should also be discussed. We believe that including such information as this stage will be an important factor in communicating the scope of the proposal, and the extent of its impacts. Early and explicit communication of the precise nature of direct and indirect impacts will also provide clarity during the assessment of the BCAR should one be submitted.

If you wish to discuss the contents of this letter, please contact Nat O'Rourke on 02 6229 7132.

Yours sincerely,

Allison Treweek

Senior Team Leader – Planning

South East, Biodiversity, Conservation and Science

Sam Reid

From: Tony Carey <tony@tcconsulting.com.au>
Sent: Thursday, 12 November 2020 11:06 AM
To: John Mannweiler; Liz Makin; Rebecca.Widdows@yass.nsw.gov.au; Allison Treweek; Nat O'Rourke; terry.cooper@yass.nsw.gov.au
Cc: elizabeth@planned.net.au; Robert Speirs; Sam Reid; Peter Cartwright; Chelsea Corcoran; Max Bomben; John Franklin; Cartwright Paul; theplumber@ozemail.com.au
Subject: WOODBURY RIDGE ESTATE Update
Attachments: 201111_Sutton_Layout C_Rev01.pdf

Dear John, Liz, Rebecca, Terry, Allison and Nat

Referring to our recent meetings I just wanted to provide you all with an update on a number of refinements that have or are taking place as we edge closer to the DA. A **work in progress** plan is attached for comparison with the last version we sent you.

I invite any comments so we can get it right before submission. Sorry it's a bit long.

Road alignments

1. Spiire (our engineers) identified that the proposed main entry road off Guise Street and heading east over the saddle on the ridge would require a reasonably deep cut of about 2.5m to provide safe sight distance to intersections. It also would impact about 7 or 8 trees adjacent.
2. After considering all issues, we propose to delete that section of road that was to cut through the ridge replacing it with a pedestrian / equestrian link as shown, which obviously then avoids that large cut, reduces the overall area of roads and saves those trees.
3. Spiire also suggested an alternative alignment for the long east west road to the precinct adjacent to the river to fit the topography better. We have adjusted the lots to meet the minimum area requirements. We still propose to seek Council agreement to a non-standard narrower width for this road, supported by cattle grids and portals at each end to reduce impact on the landscape and slow traffic. This new alignment will also encourage slower speeds, and as it is not now a continuation of the primary entry road there will be less "accidental" use of this no through road.
4. Also as detailed design continues we have asked Spiire to make minor adjustments to the loop road to minimise tree impacts from earthworks. The original plan was impacting about 30 trees, which we have now about halved (out of many hundreds on site) so I think a pretty good result. We are asking Capital Ecology and Spiire to inspect and record each tree that is likely to be affected before we finalise the alignment to make sure we are not impacting key biota or hollow bearing trees. A report will accompany the DA.
5. We are hoping relate some of the felled trees to the proposed community park as part of a nature play installation. We will discuss this with Council in more detail at CC stage.

Effluent disposal

1. As you are aware the DA plan will show building envelopes on the R5 and E3 lots.

2. I think we may have incorrectly stated in our last meeting that they were each 4,000m2, when in fact they were only 2,000 m2. They should have been about 4,000m2.
3. After discussion with Rob Speirs (CE) John Franklin (Soil and Water) we propose that each R5 and E3 lot will have a building envelope of 2000m2 (as previously shown) and a lower impact separate Effluent Management Zone (EMZ) – irrigation area - of 1250m2. John's advice is that for a 5 bedroom home (ie larger than average) we would need a 500m2 primary EMZ and a 500m2 reserve area (plus contingency). Obviously smaller homes will require a lesser area, and John notes that in any case the reserve area is really needed. However, we need to ensure we provide adequate allowance.
4. You will see on the attached work in progress plan we have begun to show the separate EMZs, selected to be outside of tree drip lines. Some are not yet shown but will be.
5. Rob Speirs noted that this will impact on the BCAR calculations but that back of the envelope calcs suggest we will still be in balance overall. Further that the EMZs are considered in the calculator to have a lesser impact than building envelopes – hence our reference to separate those areas rather than having one larger 3,250m2 BE.
6. For the village RU5 lots, where the lots are generally smaller (5,000m2 plus) we are proposing the following.
    a. *the designation of an **"area available for building"** - would be the whole of the site less any easements, DCP setbacks, trees (don't think there are any impacting village lots); and*
    b. *the designation of an **"Effluent Management Zone** - being that part of the lot that is either at least 30m or 40m (as the case may be) from any nearby overland flow drainage line, with the following notes attached to the legend.*
        i. *in the case of all RU5 lots:*
            1. *effluent disposal (irrigation) areas may only be located within the Effluent Management Zone, and must comprise an area of at least 500m2 quarantined for effluent disposal, and a reserve area of a further 500m2 (minimum).;*
            2. *the primary and reserve irrigation areas must be a minimum of **15** m from dwellings where spray irrigation is proposed, or 3 m from upslope, or 6 m from downslope dwellings where sub-surface drip irrigation is proposed.*
            3. *A detailed effluent management plan must accompany any development application for the erection of dwellings on site; and*
        ii. *in the case of lots where the disposal area is 30m from an overland flow draining line, the disposal area will be considered as Special Effluent Management Zones which require:*
            1. *that effluent treatment systems must be Aerated Wastewater Treatment Systems (AWTS) with treated effluent dispersal through subsurface drip irrigation to areas of managed lawn**.***

DPIE Letter October 21 2020

1. Allison and Nat thanks for your letter. Contents noted.
2. Hopefully you will continue to appreciate that we are working to minimise impact as required as outlined above.
3. For the DA we will be committing to the preparation at subdivision certificate stage of a Community Management Plan and Statement for the project that will take on board the requirements of the DA and BCAR approvals with respect to tree protection and vegetation management,.
4. There will also be stewardship agreements drafted by CE for the 4 stewardship lots.
5. We undertake to continue working with you on these documents over time to meet our environmental objectives and make them workable for new residents.

Thanks for taking the time to read and consider this update. We would very much appreciate any comments you have. If we hear nothing by the end of next week (November 20) we will continue as proposed.

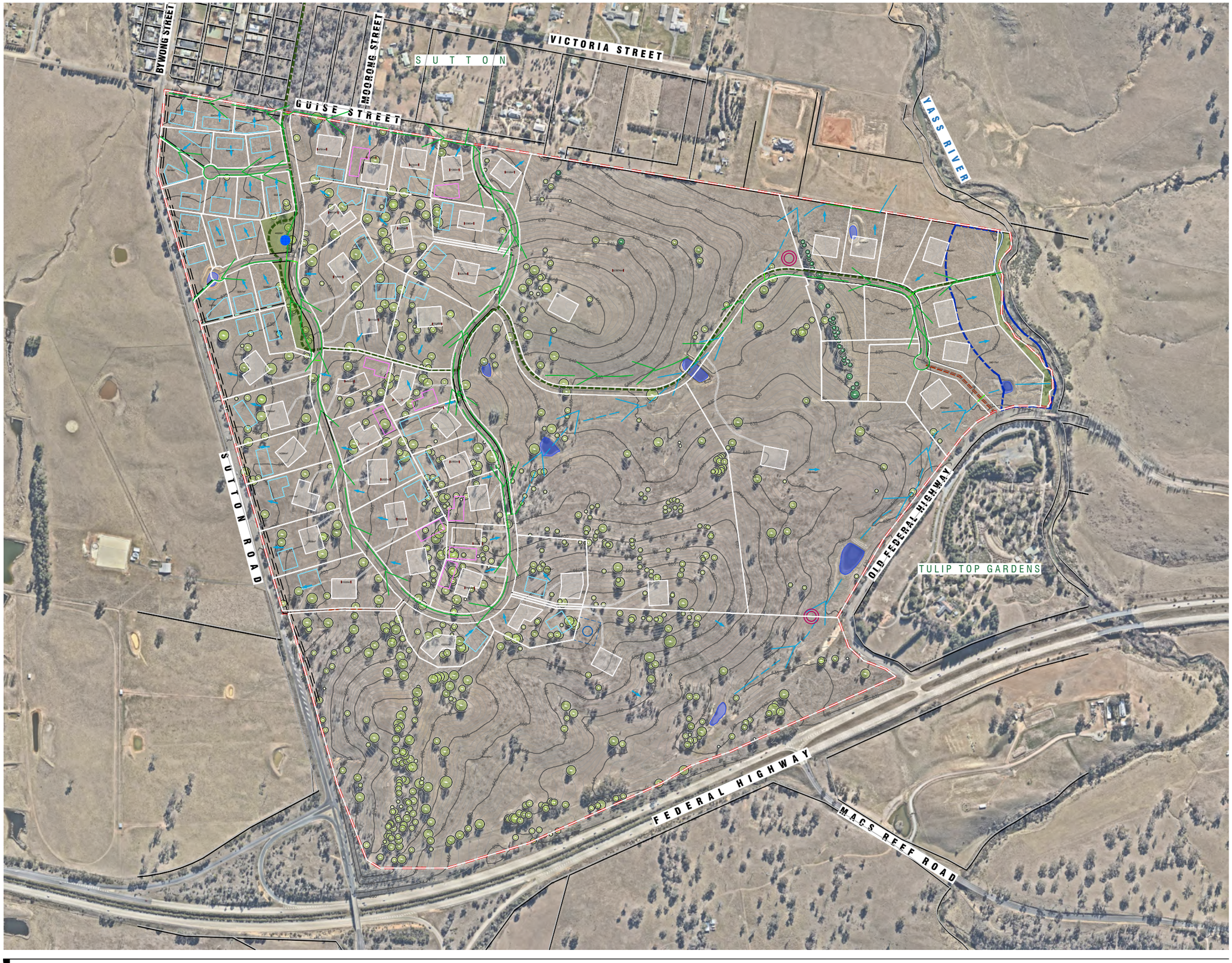
As always very happy to discuss or meet if required.

Tony and team.

Kind Regards

Tony Carey
Director

TONY CAREY CONSULTING
P 0455 23 10 57
E tony@tcconsulting.com.au



LEGEND

BOUNDARIES

SITE BOUNDARY

WATER BODIES
Existing Dams

EXISTING TREES
NOTE: No trees are to be removed for the purpose of boundary fencing

LAND CAPABILITY ASSESSMENT (2017)

YASS RIVER 100M BUFFER
To be confirmed

DA SUBDIVISION LAYOUT

LOT BOUNDARIES

BUILD ZONE 2,000m^2

EFFLUENT DISPOSAL AREA 1,250m^2
Spray Irrigation Area

EFFLUENT DISPOSAL AREA 1,250m
Sub-Surface Irrigation Area

INDICATIVE DRIVEWAYS - 4.5M

WALKING / EQUESTRIAN NETWORK
NOTE: The Equestrian Trail will not be formalised - grassed area only - Refer Landscape Master Plan

FIRE TRAIL / EMERGENCY ACCESS
NOTE: The fire trail to the Old Federal Highway will be a public road with restricted access for emergencies only.

COMMUNITY ASSOCIATION LOT
NOTE: The Community Association Lot includes a pocket park and open space links, the reserve fronting the Yass River and the fire trail to Sutton Road

OVER LAND FLOW EASEMENT

INDICATIVE BORE SITE LOCATION
Subject to further investigation by a qualified hydrogeologist as part of the detailed design phase

INDICATIVE WATER TANK LOCATION

OVERLAYS

2020 SITE SURVEY 1m CONTOURS SHOWN
AERIAL IMAGERY - NEARMAP 2020

PROJECT
Woodbury Ridge Estate
Sutton, NSW

DRAWING TITLE
Sketch DA Layout C

REVISION

01	Draft	CS	xx

DRAWN CS **CHECKED**

DATE
11-11-20

SCALE
1:7500 @A3

0 50 100 200 300 500

NOTES

To be read in conjunction with all relevant contracts, specifications, reports, drawings and development approval conditions - obtain any outstanding statutory approvals prior to commencement of works.
Use figured dimensions - do not scale from drawings. Dimensions are in metres unless noted otherwise.

CLIENT
PLANNED TCC TONY CAREY CONSULTING

PREPARED BY
PLACE LOGIC
Urban Design | Landscape Architecture
www.placelogic.com.au
ABN 25 619 179 743

STATUS DRAFT

REV. 01

DRAWING NO. **SK-105**

Rob Speirs
Director – Capital Ecology
PO BOX 854
Gungahlin ACT

Our ref: DOC21/235483

Your ref:
2980.WoodburyRidgeEstate.BCAR.Dft02.20210217

29 March 2021

Dear Rob,

Subject: Woodbury Ridge Estate proposed subdivision Draft BCAR comments

Thank you for providing the Woodbury Ridge Estate Biodiversity Certification Assessment Report (BCAR) Draft Version 02 for review. We understand that the Yass Valley Council have also been provided the BCAR for their preliminary review prior to formal application for certification and publication for public consultation.

Our comments on the draft BCAR are attached to this letter. Our comments are primarily in regard to superb parrot (*Polytelis swainsonii*) nesting tree and impacts associated with access to the subdivision.

If you wish to discuss the contents of this letter in more detail, please contact Nat O'Rourke, Senior Conservation Planning Officer on 02 6229 7132.

Yours sincerely,

Allison Treweek

Senior Team Leader – Planning

South East, Biodiversity, Conservation and Science

Attachment 1: Comments

Superb parrot nest trees

In considering new information that focuses on the scarcity of nesting sites for superb parrots (Stojanovic *et al* 2021), BCD has increasing concerns regarding the availability and viability of potential superb parrot nest trees across the entire superb parrot habitat range. BCD is currently considering the broader question of whether the removal of suitable nesting trees in the context of this new research constitutes a serious and irreversible impact as defined in the *Biodiversity Conservation Act 2016* Regulations across numerous projects.

The BCAR states that potential superb parrot breeding activity was observed at three hollow-bearing trees within the certification area. BCD note that there is no proposal to remove any of these trees. As noted in the BCAR however there is high likelihood that there will be indirect impacts on two of the three identified trees due to their proximity to the proposed development.

To mitigate indirect impacts on superb parrot nesting resources, BCD recommend placing a minimum buffer of 50 meters between all identified nesting trees and a building envelope perimeter; and a minimum buffer of 30 meters from any superb parrot nesting tree and an effluent disposal zone. We are happy to have further discussions if required.

Subdivision access

The BCAR is not clear on whether impacts within the road corridor north of Lot 5 DP838497 for two intersections between Guise Street and the subdivisions internal road, and additional single lot driveways have been considered. The subdivision layout plants indicate that Guise Street would require some form of modification to accommodate two intersections with the subdivision. Given the majority of the northern border of the subdivision is considered PCT1330 with nearby portions consistent with the box-gum woodland critically endangered ecological community, there is potential for additional PCT1330 and threatened ecological community to be impacted in the Guise Street corridor. BCD considers it important that these impacts are accounted for in the BCAR, or that a justification is provided that demonstrates these impacts have been considered and accounted for.

References

Stojanovic D, Rayner L, Cobden M, Davey C, Harries S, Heinsohn R, Owes G and Manning AD, 2021. Suitable nesting sites for specialized cavity dependent wildlife are rare in woodlands. Forest Ecology and Management 483, 1-7.

Sam Reid

From: Nat O'Rourke <Nat.ORourke@environment.nsw.gov.au>
Sent: Friday, 23 April 2021 5:35 PM
To: Sam Reid
Cc: Allison Treweek; 'Tony Carey'; elizabeth@planned.net.au; Robert Speirs
Subject: RE: Regarding: DOC21 235483 Outgoing - letter - Woodbury Ridge Subdivision Draft BCAR commentsMarch 2021.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hi Sam,

Thanks for taking a look at this. We understand your point 1 below and difficulties in reshaping design and look forward to seeing the revised mitigation measures in the updated BCAR.

Regarding point 2, we believe this modification presents an improved conservation outcome regarding indirect impacts of superb parrot nesting habitat. We would however would like to discuss this with Council – have you discussed this potential change with Council separately to us?

Also, are there any plans to monitor the potential use of the trees by superb parrots moving forward? The stewardship sites would have an element of ongoing monitoring; we're curious to explore monitoring of the three superb parrot trees (and whether this is feasible given they're on private land, who's doing the monitoring etc) to see if the indirect impacts are realised; particularly on tree where close indirect impacts are unavoidable.

Happy to discuss.

Cheers
Nat

Nat O'Rourke
Senior Conservation Planning Officer, South East
M: 0438 437 644

From: Sam Reid <sam@capitalecology.com.au>
Sent: Tuesday, 20 April 2021 4:38 PM
To: Nat O'Rourke <Nat.ORourke@environment.nsw.gov.au>

Cc: Allison Treweek <Allison.Treweek@environment.nsw.gov.au>; 'Tony Carey' <tony@tcconsulting.com.au>; elizabeth@planned.net.au; Robert Speirs <rob@capitalecology.com.au>
Subject: Regarding: DOC21 235483 Outgoing - letter - Woodbury Ridge Subdivision Draft BCAR commentsMarch 2021.pdf

Hi Nat,

We've given some thought into BCD's suggestion to move the Building Envelopes (BEs) and Effluent Disposal Areas (EDAs) to avoid indirect impacts to the identified Superb Parrot nesting trees. To address the suggested setbacks (50 m for BEs, 30 m for EDAs), we propose the following (refer to the attached Figure AA).

1. The suggested setbacks cannot be achieved for the tree in the large residential lot. As such, we will address this impact via outlining appropriate mitigation measures in the revised BCAR.
2. We propose moving the BE and EDA in the relevant Biodiversity Stewardship Site (BSS) in a manner like that shown in the attached Figure AA. This will provide the suggested setbacks while also ensuring no additional impact to EPBC Act listed Box-Gum Woodland (i.e. PCT1330 Zone 1 or PCT1330 Zone 2).

Once you have had a chance to consider the proposed changes, could you please get back to us with your agreement or suggested alterations?

Thanks Nat. Kind regards,

Sam Reid

BSc (Hons), PhD (Ecology), MEIANZ, BAM Assessor

Senior Ecologist

T 0406 776 330

E sam@capitalecology.com.au

capital ecology

PO Box 854, Gungahlin ACT 2912

www.capitalecology.com.au

We acknowledge the Traditional Custodians of the land on which we work. We pay our respects to Elders past and present.

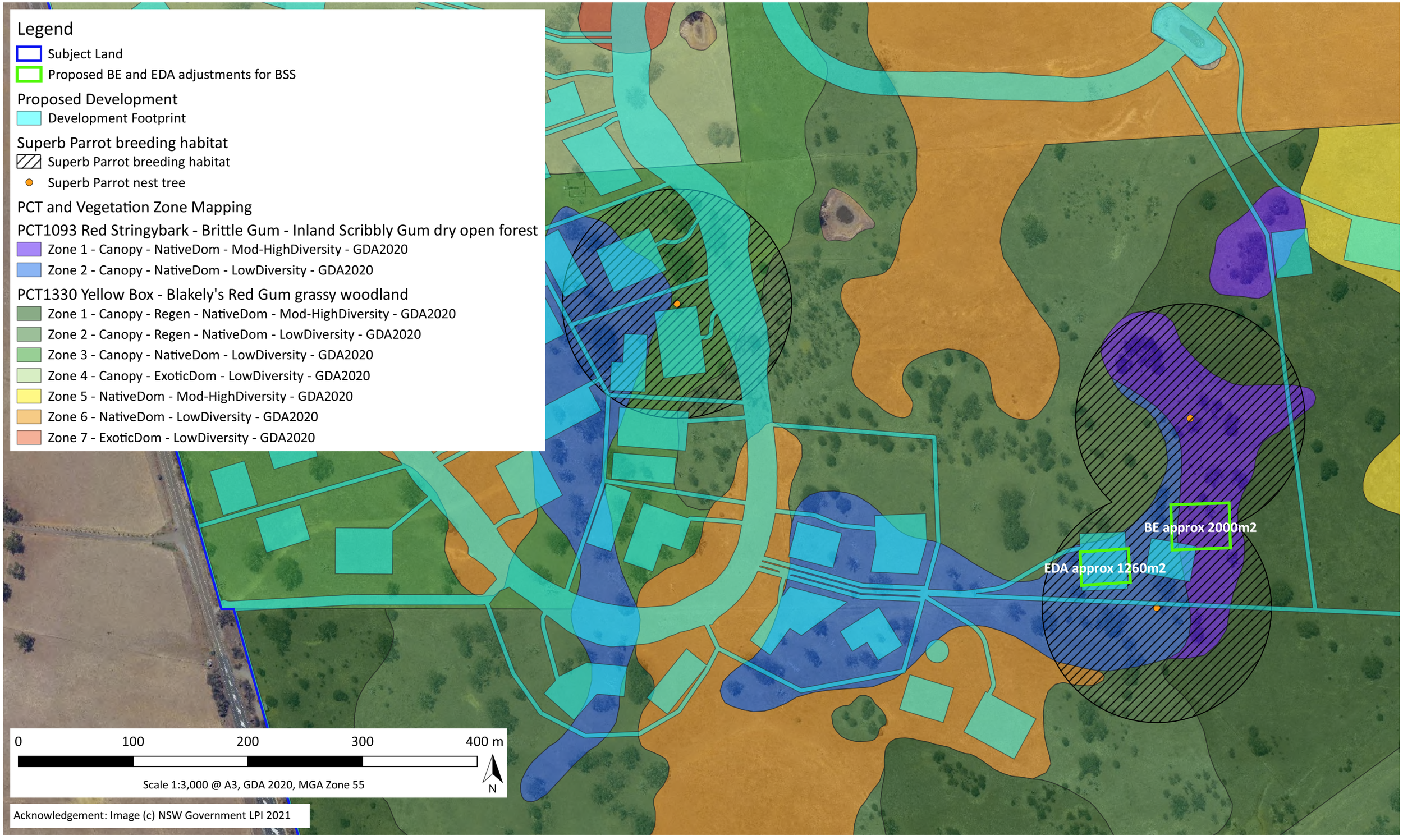


Figure AA. Superb Parrot nesting trees - recommended adjustments

Capital Ecology Project No: 2980
Drawn by: R. Speirs
Date: 12 April 2021

Rob Speirs
Director – Capital Ecology
PO BOX 854
Gungahlin ACT

Our ref: DOC21/468856

Your ref: 2980

17 June 2021

Dear Rob,

Subject: Woodbury Ridge Estate, Biodiversity Certification Assessment Report Draft 03

Thank you for providing the Woodbury Ridge Estate Biodiversity Conservation Assessment Report draft version 3 on 30/04/2021 to the Biodiversity and Conservation Division (BCD) for comment. Thank you for your cooperation in discussing our concerns and willingness to work towards achieving positive conservation outcomes in this proposed bio-certification area.

We have now completed our review of the draft BDAR (version 3) and can confirm that we are satisfied that is has addressed our previously raised comments. The draft is now able to be placed on public exhibition. We urge you to also seek formal confirmation from Yass Valley Council that they are also satisfied with the draft BCAR prior to publication.

Once the public exhibition period has been finalised, and any submissions addressed, we will be able to review the updated application. We will then prepare a recommendation to the Minister for Environment and Energy regarding certification.

If you wish to discuss the contents of this letter, please contact Nat O'Rourke, Senior Conservation Planning Officer, on 02 6229 7132.

Yours sincerely,

ALLISON TREWEEK

Senior Team Leader - South East Planning

Biodiversity and Conservation Division

Sam Reid

From: Nat O'Rourke <Nat.ORourke@environment.nsw.gov.au>
Sent: Wednesday, 22 September 2021 10:44 AM
To: Sam Reid; Allison Treweek
Cc: cartwright_peter@yahoo.com.au; Tony Carey; David Maxwell; elizabeth@planned.net.au; Robert Speirs
Subject: RE: 2980 Woodbury Ridge - Biodiversity Certification - BCAR Draft 04

Follow Up Flag: Follow up
Flag Status: Completed

Thanks Sam,

Can confirm I have been able to get in to Dropbox and download the report - thanks for organising.

If you could please forward through the associated GIS data that would be great.

Cheers
Nat

Nat O'Rourke
Senior Conservation Planning Officer, South East
M: 0438 437 644

From: Sam Reid <sam@capitalecology.com.au>
Sent: Wednesday, 22 September 2021 10:34 AM
To: Allison Treweek <Allison.Treweek@environment.nsw.gov.au>; Nat O'Rourke <Nat.ORourke@environment.nsw.gov.au>
Cc: cartwright_peter@yahoo.com.au; Tony Carey <tony@tcconsulting.com.au>; David Maxwell <david@riverviewgroup.com.au>; elizabeth@planned.net.au; Robert Speirs <rob@capitalecology.com.au>
Subject: 2980 Woodbury Ridge - Biodiversity Certification - BCAR Draft 04

Dear Allison and Nat,

Please use the below link to download a copy of Draft 04 of the BCAR for Woodbury Ridge, Sutton, NSW.

https://www.dropbox.com/sh/ - ADDRESS REMOVED FOR PRIVACY

This version of the BCAR has been updated following public exhibition of the previous version. Section 1.2 of the BCAR details the other revisions and updates which have occurred.

The associated BAM case (00022866/BAAS20006/20/00022867) has been finalised and submitted. Attached to the case are all relevant excel datasheets. As we can't attach GIS shapefiles, let me know when you would like me to forward them on to you.

Please acknowledge receipt of this email, and let myself or Rob know if you have any questions or require any further information or data.

Kind regards,

Sam Reid

BSc (Hons), PhD (Ecology), MEIANZ, BAM Assessor

Senior Ecologist

T 0406 776 330

E sam@capitalecology.com.au

PO Box 854, Gungahlin ACT 2912

www.capitalecology.com.au

We acknowledge the Traditional Custodians of the land on which we work. We pay our respects to Elders past and present.

Australian Government
Department of Agriculture,
Water and the Environment

EPBC Ref: 2021/8965

Mr David Maxwell
Director
CAPITAL PLUS 1 WOODBURY RIDGE
PTY LTD
3/28 Bougainville St
GRIFFITH ACT 2603

Dear Mr Maxwell

Decision on referral
Woodbury Ridge Estate, Sutton, NSW

Thank you for submitting a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This is to advise you of my decision about the referral of the proposed action, to subdivide Woodbury Ridge Estate (Lot 5 DP838497) into residential allotments, including supporting infrastructure, in Sutton, NSW.

As a delegate of the Minister for the Environment, I have decided under section 75 of the EPBC Act that the proposed action is a controlled action and, as such, it requires assessment and a decision about whether approval for it should be given under the EPBC Act.

The information that I have considered indicates that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- listed threatened species and communities (sections 18 & 18A).

Based on the information available in the referral, the proposed action is likely to have a significant impact on the following matters of national environmental significance, including but not limited to:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered.
- Golden Sun Moth (*Synemon plana*) – Critically Endangered.
- Superb Parrot (*Polytelis swainsonii*) – Vulnerable.

I have also decided that the project will need to be assessed by preliminary documentation (PD). A copy of the document recording these decisions is enclosed and will be published on the department's website. Please note that this decision only relates to the potential for significant impacts on matters protected by the Australian Government under Chapter 2 of the EPBC Act.

All levels of assessment include a public consultation phase, in which any third parties can comment on the proposed action. Details on the assessment process for the project and the responsibilities of the proponent are available from the department's website at http://www.environment.gov.au/epbc/publications/environment-assessment-process-flowchart.

Indigenous communities may also need to be consulted during the assessment process. For more information on how and when indigenous engagement should occur during environmental assessments, please refer to the indigenous engagement guidelines at http://www.environment.gov.au/epbc/publications/engage-early.

The National Indigenous Australians Agency (NIAA) provided comments on your referral on behalf of the Minister for Indigenous Australians. The NIAA recommended engagement with all relevant Indigenous stakeholders and that the proponent should work in collaboration with Indigenous stakeholders to undertake a cultural heritage survey to identify any cultural heritage values associated with the project area. The NIAA also encouraged the engagement of Indigenous employees and businesses as part of the project.

Please note, under subsection 520(4A) of the EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2000* your assessment is subject to cost recovery. Please find attached a copy of the fee schedule for your proposal and an invoice for Stage 1. Fees will be payable prior to each stage of the assessment proceeding. Further details on cost recovery are available on the department's website at: http://www.environment.gov.au/epbc/cost-recovery.

If you disagree with the fee schedule provided, you may apply under section 514Y of the EPBC Act for reconsideration of the method used to work out the fee.
The application for reconsideration must be made within 30 business days of the date of this letter and can only be made once for a fee. Further details regarding the reconsideration process can be found on the department's website at: http://www.environment.gov.au/protection/environment-assessments/assessment-and-approval-process/refer-proposed-action.

While I have determined that your project will be assessed by preliminary documentation, some further information will be required to be able to assess the relevant impacts of the action. You should expect to receive a letter from the department within 10 business days of the payment of Stage 1 fees, outlining the information required.

You may elect under section 132B of the EPBC Act to submit a management plan for approval at any time before the Minister makes an approval decision of the proposed action under section 133 of the EPBC Act. If an election is made under section 132B of the EPBC Act, cost recovery will apply to the approval of any action management plans you submit.

Cost recovery does not apply to the approval of action management plans where you do not elect to submit an action management plan for approval under section 132B of the EPBC Act and the approval of the action management plan does not arise from a variation to the approval conditions that you have requested. Where you vary an approval condition and it results in you being required to submit an action management plan for approval, cost recovery will apply to the approval of the action management plan.

Please also note that once a proposal to take an action has been referred under the EPBC Act, it is an offence under section 74AA to take the action while the decision-making process is on-going (unless that action is specifically excluded from the referral

or other exemptions apply). Persons convicted of an offence under this provision of the EPBC Act may be liable for a penalty of up to 500 penalty units. The EPBC Act is available on line at: http://www.environment.gov.au/epbc/about/index.html.

If you have any questions about the referral process or this decision, please contact the project manager, Augusta Mutton, by email to Augusta.Mutton@awe.gov.au, or telephone (02) 6274 1431 and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

Miriam Gerrick
Acting Assistant Secretary
Environment Assessments NSW and ACT Branch
14 July 2021

Australian Government
Department of Agriculture, Water and the Environment

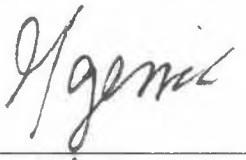
Notification of
REFERRAL DECISION AND DESIGNATED PROPONENT – controlled action
DECISION ON ASSESSMENT APPROACH

Woodbury Ridge Estate, Sutton, NSW (EPBC 2021/8965)

This decision is made under section 75 and section 87 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

proposed action	To subdivide Woodbury Ridge Estate (Lot 5 DP838497) into residential allotments, including supporting infrastructure, in Sutton, NSW. [See EPBC Act referral 2021/8965].
decision on proposed action	The proposed action is a controlled action. The project will require assessment and approval under the EPBC Act before it can proceed.
relevant controlling provisions	• Listed threatened species and communities (sections 18 & 18A)
designated proponent	CAPITAL PLUS 1 WOODBURY RIDGE PTY LTD ACN: 650 185 407
assessment approach	The project will be assessed by preliminary documentation.

Decision-maker

Name and position	Miriam Gerrick Acting Assistant Secretary Environment Assessments NSW and ACT Branch
Signature	
date of decision	14 July 2021

Sam Reid

From: [redacted]
Sent: Tuesday, 19 October 2021 4:29 PM
To: Sam Reid; david@riverviewgroup.com.au
Cc: cartwright_peter@yahoo.com.au; Tony Carey; elizabeth@planned.net.au; Robert Speirs; ali.strous@awe.gov.au; [redacted]
Subject: RE: Woodbury Ridge Estate 2021/8965 Preliminary Documentation Guidelines [SEC=OFFICIAL]
Attachments: DAWE Preliminary Documentation Comments.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

Good afternoon,

The Department of Agriculture, Water and the Environment has reviewed your *Draft 01 of the Preliminary Documentation for Woodbury Ridge Estate, Sutton, NSW (EPBC 2021/8965)* against the Preliminary Documentation Guidelines provided to you by the department on 9 August 2021. I have attached an Excel spreadsheet detailing our comments from review of this documentation. We require responses to these comments, and an updated version of the Draft Preliminary Documentation before we can accept this document and progress to the next stage of assessment.

I have included two columns in the Excel spreadsheet (highlighted in orange) for your comment and response of where the information has been added or updated in the updated Draft Preliminary Documentation. Please let me know if you have any questions or concerns.

Kind regards,

[redacted]

Department of Agriculture, Water and the Environment
Environment Approvals Division
John Gorton Building, King Edward Terrace, Parkes, ACT

I acknowledge the Traditional Owners of the land on which I work, and pay my respects to Elders past and present. I recognise their continuing connection and custodianship to land, water, and community.
Sovereignty was never ceded – Always Was, Always Will Be.

From: Sam Reid <sam@capitalecology.com.au>
Sent: Wednesday, 22 September 2021 11:06 AM
To: [redacted]
Cc: david@riverviewgroup.com.au; cartwright_peter@yahoo.com.au; Tony Carey <tony@tcconsulting.com.au>; elizabeth@planned.net.au; Robert Speirs <rob@capitalecology.com.au>
Subject: RE: Woodbury Ridge Estate 2021/8965 Preliminary Documentation Guidelines [SEC=OFFICIAL]

Dear [redacted]

Please use the below link to download a copy of Draft 01 of the Preliminary Documentation for Woodbury Ridge Estate, Sutton, NSW (EPBC 2021/8965).

https://www.dropbox.com/sh/ - ADDRESS REMOVED FOR PRIVACY

Please acknowledge receipt of this email, and let myself or Rob know if you have any questions or require any further information or data.

Kind regards,

Sam Reid

BSc (Hons), PhD (Ecology), MEIANZ, BAM Assessor

Senior Ecologist

T 0406 776 330

E sam@capitalecology.com.au

capital ecology

PO Box 854, Gungahlin ACT 2912

www.capitalecology.com.au

We acknowledge the Traditional Custodians of the land on which we work. We pay our respects to Elders past and present.

From: [redacted]
Sent: Monday, 9 August 2021 9:50 AM
To: david@riverviewgroup.com.au; Robert Speirs <rob@capitalecology.com.au>
Cc: Sam Reid <sam@capitalecology.com.au>; [redacted]
Subject: Woodbury Ridge Estate 2021/8965 Preliminary Documentation Guidelines [SEC=OFFICIAL]

Dear Mr Maxwell

Please find attached a letter and Attachment A regarding the assessment approach for your proposed action, the subdivision of ***Woodbury Ridge Estate, Sutton (EPBC 2021/8965).*** This attachment provides the guidelines for your assessment of the action. If you have any questions, please don't hesitate to get in touch.

Kind regards

[redacted]

Department of Agriculture, Water and the Environment
Environment Approvals Division
John Gorton Building, King Edward Terrace, Parkes, ACT

I acknowledge the Traditional Owners of the land on which I work, and pay my respects to Elders past and present. I recognise their continuing connection and custodianship to land, water, and community.

From: Kate Baker <Kate.Baker@yass.nsw.gov.au>
Sent: Monday, 29 March 2021 2:31 PM
To: 'elizabeth@planned.net.au' <elizabeth@planned.net.au>
Subject: RE: DA200273 - 2090 Sutton Road - BCAR & Roads

Hi Elizabeth,

Please find below comments in relation to the draft BCAR and roads.

Draft BCAR

1. Advice provided by DPIE confirms that any impact resulting from **upgrades to or construction within road reserves must be included in the BCAR**. On this basis, the study area will need to be extended to include these areas. Based on the Traffic Impact Assessment by John Randall Consulting the BCAR will need to consider:

   (i) Guise Street carriageway widening to 8.6m carriageway
   (ii) 1.5m footpath between Sutton Road and the proposed first site access point of Guise Street
   (iii) Two new three-way intersection between the internal proposed road network and Guise Street between Sutton Road and the end of Guise Street
   (iv) Upgrade of Guise Street and Sutton Road intersection – advice from TfNSW confirming upgrade requirements to be provided this week.

2. Overall, the efforts made to avoid and minimise are good. The siting of the most intensive development on the lower value vegetation and habitat sites, and the protection of extensive areas of good quality vegetation and habitat is a good outcome. The report is thorough and complies with the requirements for BCARs in Appendix K of the BAM.

3. The one exception to this is the **superb parrot nesting trees**. Although one tree will be protected in the biodiversity stewardship area, the other two have been identified as being "indirectly impacted". The nesting tree in the R5 area is directly adjacent to a building envelope and a road, and will have 4 remnant trees removed within 50m of it. I very much doubt it will continue to be used as a nesting tree. While the third nesting tree is in the proposed stewardship area, the building envelope in that lot has been sited within 50m of that tree. I feel more effort could be made to avoid indirect impacts to that tree by siting the building envelope elsewhere in that very large block, and consideration also needs to be given to changing the lot layout around the nesting tree in the R5 area.

4. Shapefiles have not been provided, and the report does not state where the **trees with hollows** being utilised by native birds are located (with the exception of the superb parrot trees). It would be good to see a map showing the location of the trees assessed for habitat as referred to in Section 2.2.2.4 and Appendix C.

5. Who manages the "**non-formal Community Open Space**" on the Yass River? Rivers are high risk weed pathways, so initial work to remediate the site as suggested, must be followed up with maintenance including weed monitoring and control.

6. Does the purchaser do all the ongoing **monitoring of the stewardship sites**?

7. The proposed **protection mechanisms** are Section 88b instruments and the Woodbury Ridge Community Management Statement by-laws for non-Biodiversity Stewardship lots. I know DPIE are looking closely at these mechanisms to decide if these will provide sufficient ongoing protection for the vegetation on the site.

Roads

8. As per the email from Terry Cooper on 18 November 2020, the reduced width of the long east west road to the precinct adjacent to the river, and consequent **variation to the Road Standards policy, is not supported**. A summary of Terry's comments is provided below:

(i) *The width is considered too narrow for the intended purpose*
(ii) *Compelling reasons for Council to approve a non-standard narrow road have not been provided*
(iii) *Our experience is that speeding occurs irrespective of the road width*
(iv) *Council constantly receive complaints about safety concerns due our standard roads being too narrow*

Please contact Terry directly to discuss the above matter.

9. As stated in point 1 above, comments from TfNSW confirming upgrade requirements for **Sutton Road/Guise Street intersection** are to be provided this week – spoke with Maurice Morgan this morning.

Kind regards,

Kate

Kate Baker | Development Planner | **Yass Valley Council**
P: +61 (0)2 6226 1477
E: Kate.Baker@yass.nsw.gov.au | W: www.yassvalley.nsw.gov.au

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Sam Reid

From: Kate Baker <Kate.Baker@yass.nsw.gov.au>
Sent: Wednesday, 28 April 2021 3:58 PM
To: Sam Reid
Cc: Robert Speirs; Rebecca Widdows
Subject: RE: Woodbury Ridge Subdivision - Draft BCAR - Comments March 2021

Hi Sam,

Thank you for your email.

Based on the described changes, Council has no further comment and looks forward to seeing the detail included in the revised BCAR.

Kind regards,

Kate

Kate Baker | Development Planner | **Yass Valley Council**
P: +61 (0)2 6226 1477
E: Kate.Baker@yass.nsw.gov.au | W: www.yassvalley.nsw.gov.au

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From: Sam Reid <sam@capitalecology.com.au>
Sent: Tuesday, 27 April 2021 12:25 PM
To: Kate Baker <Kate.Baker@yass.nsw.gov.au>; Rebecca Widdows <Rebecca.Widdows@yass.nsw.gov.au>
Cc: Robert Speirs <rob@capitalecology.com.au>
Subject: Doc 434437 FW: Regarding: DOC21 235483 Outgoing - letter - Woodbury Ridge Subdivision Draft BCAR commentsMarch 2021.pdf

Hi Kate and Rebecca,

I'm writing to inform you of changes that have been made to the design of the proposed development of the Woodbury Ridge Subdivision following comments from the Biodiversity Conservation Division (BCD) on Draft 02 of the BCAR. As detailed in the letter from BCD, there were two main concerns with respect to biodiversity issues.

1. Reducing the potential indirect impact to Superb Parrot *Polytelis swainsonii*;
2. Including impacts associated with modifications to Guise Street and subsequent access to the proposed subdivision.

As outlined in my email below, the location of one building envelope (BE) and associated effluent disposal area (EDA) has been changed as per BCD's suggestion in order to achieve appropriate setbacks to suspected Superb Parrot nesting trees (refer to the attached Figure AA). As per Nat O'Rourke's email below, BCD agree that the modification presents an improved conservation outcome regarding indirect impacts of Superb Parrot nesting habitat. In addition to this, as per BCD's request in the email

below, the next draft of the BCAR will include updated monitoring guidelines for Superb Parrot in order to assess how nesting behaviour changes as the proposed development progresses. Finally, the next draft of the BCAR will also include impacts associated with upgrades to Guise Street.

Please let us know as soon as possible if you have any comments with respect to the above information as we are intending to progress the next version of the BCAR this week based on the described changes.

Thanks and kind regards,

Sam Reid

BSc (Hons), PhD (Ecology), MEIANZ, BAM Assessor

Senior Ecologist

T 0406 776 330

E sam@capitalecology.com.au

PO Box 854, Gungahlin ACT 2912

www.capitalecology.com.au

We acknowledge the Traditional Custodians of the land on which we work. We pay our respects to Elders past and present.

From: Nat O'Rourke <Nat.ORourke@environment.nsw.gov.au>
Sent: Friday, 23 April 2021 5:35 PM

Sam Reid

From: Kate Baker <Kate.Baker@yass.nsw.gov.au>
Sent: Tuesday, 11 May 2021 10:41 AM
To: Sam Reid
Cc: Rebecca Widdows
Subject: RE: 2980 - Woodbury Ridge Estate - BCAR Draft Version 03

Follow Up Flag: Follow up
Flag Status: Completed

Hi Sam,

Please find below our comments in response to the Woodbury Ridge Estate BCAR Draft Version 03:

1. Overall the requested changes have been included, or a reasonable explanation provided as to why the change was not possible. The proposed development has given suitable consideration to biodiversity conservation and the ongoing protection of the site, resulting in a good biodiversity outcome.

2. There is a considerable increase in the number of mature trees found onsite. Were there 137 mature eucalypts in the road reserve that are now part of the subject area? There are only another 12 trees proposed to be removed.

3. Figures 15 and 16 do not seem to include the impacts to the vegetation in the road reserve, as shown in other maps in the document.

Thanks,

Kate

Kate Baker | Development Planner | **Yass Valley Council**
P: +61 (0)2 6226 1477
E: Kate.Baker@yass.nsw.gov.au | W: www.yassvalley.nsw.gov.au

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Sam Reid

From: Kate Baker <KBaker@yass.nsw.gov.au>
Sent: Wednesday, 22 September 2021 10:56 AM
To: Sam Reid
Cc: cartwright_peter@yahoo.com.au; Tony Carey; David Maxwell; elizabeth@planned.net.au; Robert Speirs; Rebecca Widdows; Liz Makin
Subject: RE: 2980 Woodbury Ridge - Biodiversity Certification - BCAR Draft 04

Hi Sam,

Thank you for the update. I'll be in touch if I have any questions.

Kind regards,

Kate

Kate Baker | Manager Development Control | **Yass Valley Council**
P: +61 (0)2 6226 1477
E: KBaker@yass.nsw.gov.au | W: www.yassvalley.nsw.gov.au

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From: Sam Reid <sam@capitalecology.com.au>
Sent: Wednesday, 22 September 2021 10:50 AM
To: Kate Baker <KBaker@yass.nsw.gov.au>; Liz Makin <LMakin@yass.nsw.gov.au>; Rebecca Widdows <RWiddows@yass.nsw.gov.au>
Cc: cartwright_peter@yahoo.com.au; Tony Carey <tony@tcconsulting.com.au>; David Maxwell <david@riverviewgroup.com.au>; elizabeth@planned.net.au; Robert Speirs <rob@capitalecology.com.au>
Subject: 2980 Woodbury Ridge - Biodiversity Certification - BCAR Draft 04

Dear Kate, Rebecca, and Liz,

For your information, we have just submitted Draft 04 of the BCAR for Woodbury Ridge, Sutton, NSW to the Department of Planning, Industry and Environment Biodiversity Conservation Division. A copy of the BCAR can be download using the below link.

https://www.dropbox.com/sh - ADDRESS REMOVED FOR PRIVACY

This version of the BCAR has been updated following public exhibition of the previous version. Section 1.2 of the BCAR details the other revisions and updates which have occurred.

Please acknowledge receipt of this email, and let myself or Rob know if you have any questions regarding the BCAR.

Kind regards,

Sam Reid

BSc (Hons), PhD (Ecology), MEIANZ, BAM Assessor

Senior Ecologist

T 0406 776 330

E sam@capitalecology.com.au

PO Box 854, Gungahlin ACT 2912

www.capitalecology.com.au

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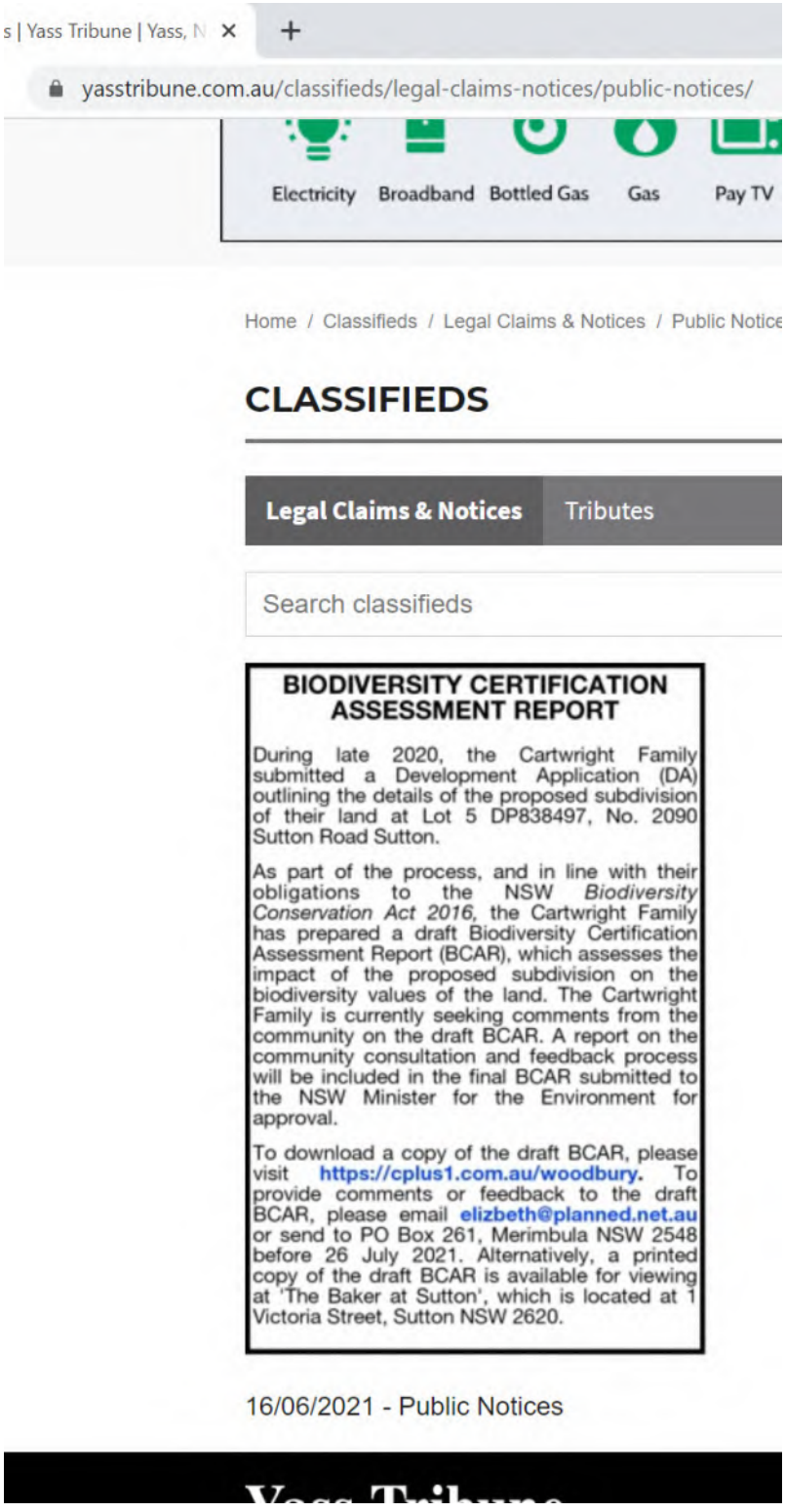
Public Exhibition Notices

Yass Tribune – 16 June 2021



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BIODIVERSITY CERTIFICATION ASSESSMENT REPORT

During late 2020, the Cartwright Family submitted a Development Application (DA) outlining the details of the proposed subdivision of their land at Lot 5 DP838497, No. 2090 Sutton Road Sutton.

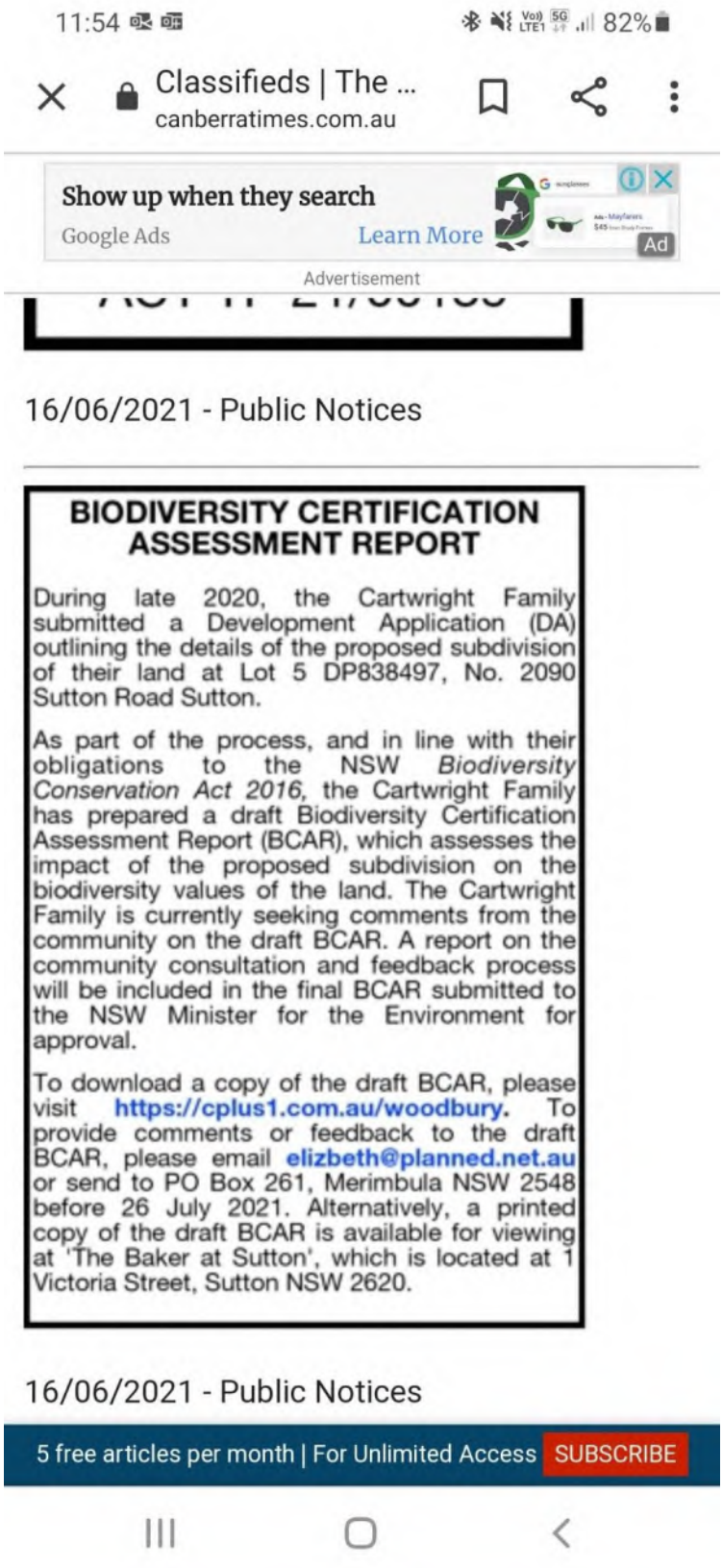
As part of the process, and in line with their obligations to the NSW *Biodiversity Conservation Act 2016*, the Cartwright Family has prepared a draft Biodiversity Certification Assessment Report (BCAR), which assesses the impact of the proposed subdivision on the biodiversity values of the land. The Cartwright Family is currently seeking comments from the community on the draft BCAR. A report on the community consultation and feedback process will be included in the final BCAR submitted to the NSW Minister for the Environment for approval.

To download a copy of the draft BCAR, please visit **https://cplus1.com.au/woodbury.** To provide comments or feedback to the draft BCAR, please email **elizbeth@planned.net.au** or send to PO Box 261, Merimbula NSW 2548 before 26 July 2021. Alternatively, a printed copy of the draft BCAR is available for viewing at 'The Baker at Sutton', which is located at 1 Victoria Street, Sutton NSW 2620.

16/06/2021 - Public Notices

Yass Tribune

Canberra Times – 16 June 2021



THE
Sutton Chatter
JULY 2021
SUTTON & DISTRICT COMMUNITY NEWSLETTER • SINCE 1999

The construction of the footpath in Victoria Street from the school to the oval has finally commenced.

Sutton Post Office… has moved back to its previous address

51 Camp Street Sutton

Opening hours
Monday–Friday:
9am–12.30pm 1.30pm–5pm
Saturday: 9am–12pm

Community Association Report

Victoria Street footpath

The construction of the footpath in Victoria Street from the school to the oval has finally commenced. Yass Valley Council has budgeted $95,000 for the project. Congratulations to the School on pursuing this initiative which will make for a much safer route for children going from the school to the oval.

No one could accuse Sutton of having too many footpaths. This is only the second concrete footpath in the Village in our 154 year history. The Community Association has previously raised the need for a footpath from the Bakery to the Post Office, but ironically the Post Office is about to move back to almost where it came from, so the extra footpath is perhaps no longer needed!

On the subject of footpaths around the village, there has been renewed interest to establishing the Greenways Trail proposed back in 1999 – a walking trail around the village for people and horses – watch this space.

Grant application for oval upgrade

Now that we're going to have a brand new footpath from the school to the oval, we need the oval upgraded.

In last month's *Chatter* we reported on the Capital Country Junior Football Club and the Community Association joining forces to apply for a Grant under the NSW Government Stronger Communities Fund Round 4 to upgrade the oval.

That application has now been submitted and we congratulate the Soccer Club Committee for the work that they put in to complete the detailed application process.

We all now eagerly await the outcome of the application which is expected some time in September.

Cartwright development – Biodiversity Certification Assessment Report

As part of the process for the Cartwright development Lot 5 DP838497 at 2090 Sutton Road, and in line with their obligations under the *NSW Biodiversity Conservation Act 2016*, the Cartwright Family has prepared a draft *Biodiversity Certification Assessment Report (BCAR)*, which assesses the impact of the proposed subdivision on the biodiversity

…continued next page

sutton village gallery

www.suttonvillagegallery.com

Sutton Hall bookings

Sutton Hall bookings can only be done online through the Yass Valley Council website: https://yassvalleycouncil.checkfront.com/reserve/

There is a red button on the bottom of the homepage which says "facility bookings".

Click on the button then follow the registration instructions to make the booking.

...continued from page 1

values of the land. The Cartwright Family is currently seeking comments from the community on the draft BCAR. A report on the community consultation and feedback process will be included in the final BCAR submitted to the NSW Minister for the Environment for approval.

To download a copy of the draft BCAR, please visit https://cplus1.com.au/woodbury. To provide comments or feedback to the draft BCAR, please email elizbeth@planned.net.au or send to PO Box 261, Merimbula NSW 2548 **before 26 July 2021**. Alternatively, a printed copy of the draft BCAR is available for viewing at The Baker at Sutton.

Cartwright development update

At the SDCA meeting on 2 June 2021, there was much concern raised about potential traffic difficulties at the corner of Guise St and Sutton Road. Some good news – there is now a new proposal by the developers to widen that intersection and incorporate a turning lane for traffic from the Federal Highway entering Guise St.

Potholes

Whilst the rain is always welcome, some of the sizeable potholes in and around the Village are not. We appreciate the timely response of Council in filling many of them in so quickly.

Country market in the village

Two Sutton residents have been working on a proposal to establish a fortnightly **Country Market** in Sutton village. Negotiations with Yass Valley Council and several organisations within the village have already commenced. We wish them well with this venture.

Electronic version of *Sutton Chatter*

Whilst it is handy to have a paper copy of the *Sutton Chatter*, to ensure timely delivery of the *Chatter* and to minimise printing costs, we are encouraging those who might wish to do so, to lodge their details and have the *Chatter* delivered electronically via email.

While the volunteers who deliver the hardcopies of the *Chatter* do their best to deliver them as soon as they are received back from the printer, to get your copy within hours of it being produced, then having it delivered via email ensures an early and speedy delivery. For people not already registered to have their *Chatter* delivered electronically but wishing to set this up, please forward your email contact to the editor at philippa@sproutdesign.com.au Likewise, if you are happy to only have an electronic version of the *Chatter* delivered to you, please advise Philippa of the address to which your current *Chatter* is delivered, and we will take you off the hardcopy mailing list.

We thank the many sponsors who support the *Chatter* and encourage you to support them.

Tail end

Two very large pine trees at the school are slated to be cut down in the next few weeks. It will be an expensive exercise to take the timber away. If anyone has any ideas on better use of the timber, please contact the school sooner rather than later phone 6230 3215.

Don't forget that if you have unused NSW Government Dine or Discover vouchers, the deadline for their use has been extended to 31 July 2021.

Mark Burgess, President SDCA

SUTTON PUBLIC SCHOOL

Valuing the future

Sutton Public School

At Sutton Public School we have enjoyed many academic, athletic and arts opportunities over 10 weeks of term 2. Each Wednesday we have been celebrating our achievements at assembly through our weekly updates, merit certificates and our Sutton Sovereign awards acknowledging the excellent efforts of our wonderful students who go 'above and beyond' expectations to make a truly positive contribution to the culture of our school.

Those of you who have been on site will have seen our serpentine pathway winding down the hill of our front courtyard. On Saturday 10th July we will continue this work with a working bee taking place from 10am–2pm.

Throughout term 3, our students will be planting seeds, propagating local native plants, establishing garden beds beside our path, making compost, and designing signage to feature in our indigenous bush tucker garden.

We look forward to Aaron Chatfield of Dreamtime Connections continuing his work with Sutton students working with our infant classes to deliver Aboriginal educational and cultural workshops.

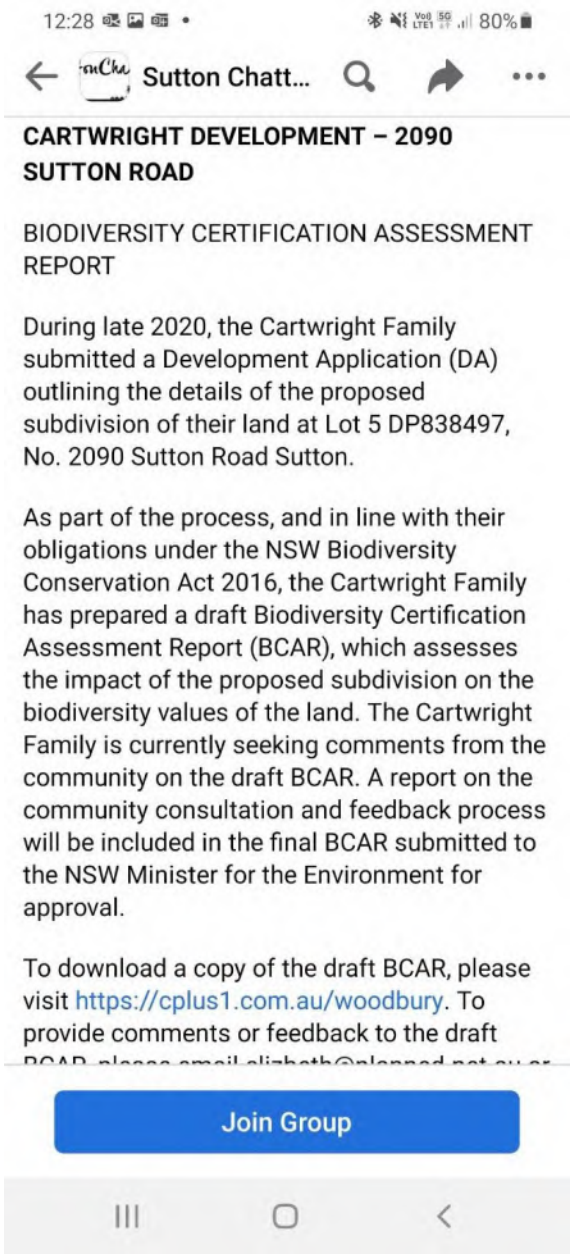
Sutton success in sport

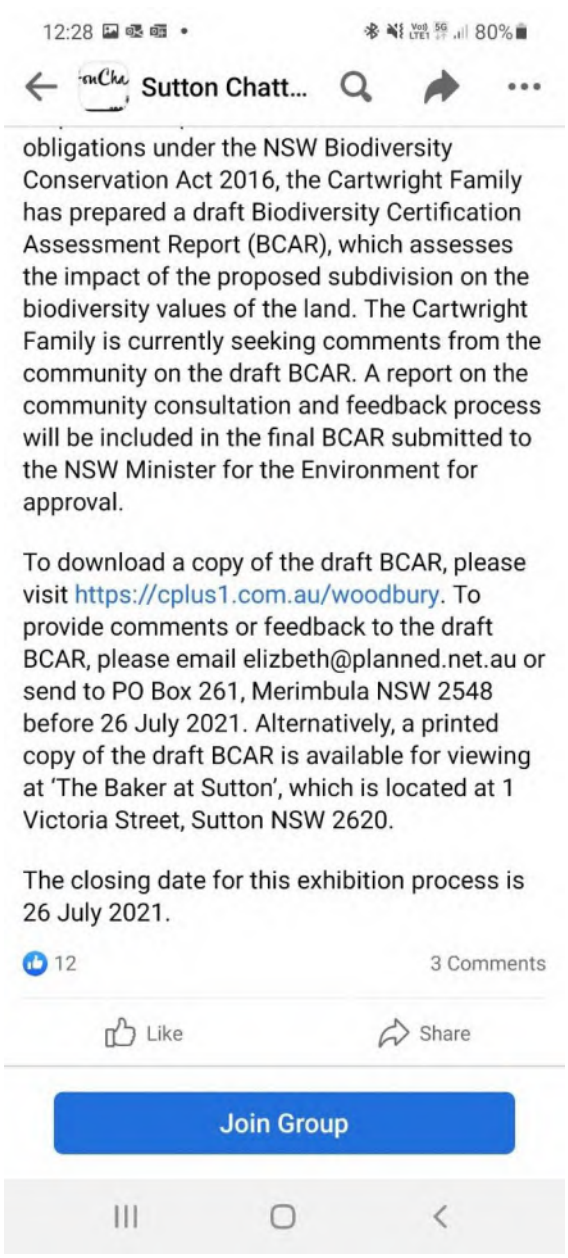
Term 2 was alive with athletics events. Our own athletics carnival for track events was held on Thursday 10th June at Wright Park in Queanbeyan – despite the freezing Winter weather. Field events were completed at school. Next term nominated students will compete at hoping for a place at the regional level.

After a fabulous performance at the Queanbeyan District Cross Country Carnival, 9 of our students went on to compete and regional level and our school was awarded the District Small Schools Cross Country Trophy.

We are also thrilled to announce that following success at the regional level, Sutton Public School siblings – Eliza, Oliver, and Verity – will all compete in the NSW All Schools Cross Country for 2021 to be held on July 16th. What a wonderful achievement for the students, their family and our school and community. Congratulations from us all.

Sutton Chatter Facebook – 16 June 2021





Yass Tribune – 23 June 2021