



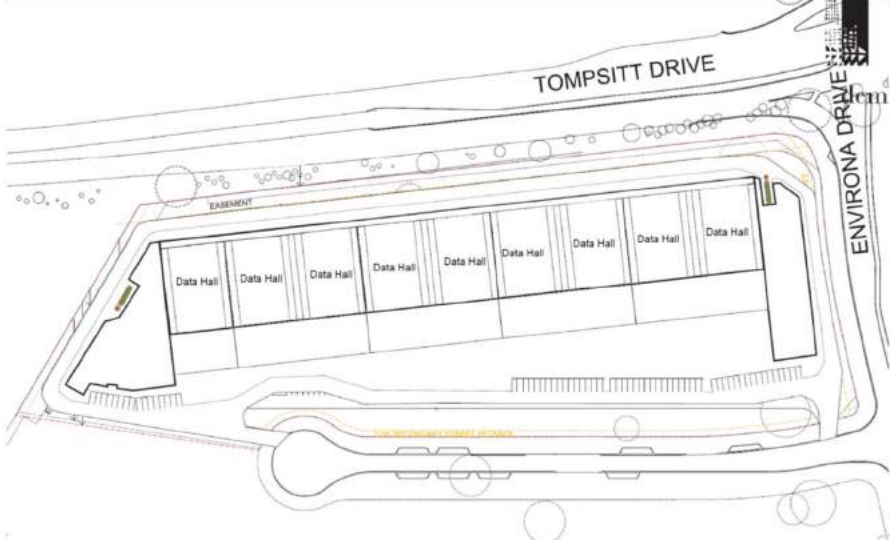
DCI Canberra Data Centre Project – Scoping Report

Appendix C

Biodiversity Development Assessment Report (BDAR) Waiver Request

Note: This table should be read in conjunction with the Scoping Report, which provides further details on the site and proposed development, including full size plans.

Item	Required Information	Comment
Admin	Applicant name and contact details	NineZero DC Sub TC 1 Pty Ltd (trading as DCI Data Centers, or DCI) 90 Peter Brock Drive EASTERN CREEK NSW 2766 C/- Phillip Jones, PJEP Environmental Planning Pty Ltd Ph. 0400 392 861
	Project ID and status	State Significant Development Request for SEARs submitted
	BDAR waiver author and qualifications	Phillip Jones, B.App.Sc Principal Planner, Director PJEP Environmental Planning Pty Ltd
Site details	Site address	300 Lanyon Drive JERRABOMBERRA NSW 2619
	Real property description	Part Lot 1 in DP 1263364
	LGA	Quenbeyan-Palerang
	Site description	Vacant land (historically grazing land). The site forms part of the Poplars Innovation Precinct (Stage1), and is currently undergoing transformation by the estate owner (Poplars) to urban land use (estate works currently underway).
	Location maps – Aerial photo – Locality (Note that estate development works currently underway, not shown)	
Location maps – Aerial photo – Site (Note that estate development works currently underway, not shown)		

<i>Item</i>	<i>Required Information</i>	<i>Comment</i>
Proposed development	Project description Proposed conceptual site plan	Construction and operation of a new state-of -the-art Data Centre, including ancillary offices and services
		
Impacts on biodiversity values	Vegetation abundance	<p>Biodiversity assessment and management, including biodiversity offsetting, has been addressed by Poplars (the estate owner) as part of the estate development. In this regard, the estate development involves clearing of all vegetation across the estate including the site, and included a comprehensive Biodiversity Development Assessment Report (BDAR) to assess these impacts (see Attachment A).</p> <p>The BDAR identified some areas of Box Gum Woodland¹ endangered ecological community (EEC) within the estate, as well as the threatened Golden Sun Moth, both of which are critically endangered under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) and the NSW <i>Biodiversity Conservation Act 2016</i> (BC Act).</p> <p>To offset the residual impacts of the development of the Poplars Innovation Precinct (including the site) on these threatened species/communities, the estate approval requires Poplars to retire ecosystem and species credits under the BC Act (see Attachment B). Poplars also obtained Commonwealth approval under the EPBC Act for the residual impacts on Matters of National Environmental Significance (Approval No. EPBC 2020/8801 – see Attachment C).</p> <p>As biodiversity assessment, management and offsetting has been addressed at the estate level, no further biodiversity assessment is considered to be required at the site level for the proposed data centre. No off-site vegetation disturbance is required for the proposal.</p>
	Vegetation integrity	See above (and Attachment A). The proposed data centre is not expected to adversely affect vegetation integrity.
	Threatened species abundance	See above (and Attachment A). The proposed data centre is not expected to adversely affect threatened species abundance.
	Habitat connectivity	See above (and Attachment A). The proposed data centre is not expected to adversely affect habitat connectivity.
	Threatened species movement	See above (and Attachment A). The proposed data centre is not expected to adversely affect threatened species movement.
	Flight path integrity	See above (and Attachment A). The proposed data centre is not expected to adversely affect flight path integrity.
	Water sustainability	There are no waterbodies on the site, and the proposed development is not expected to result in any significant off-site water impacts. A stormwater management plan will be developed for the proposal, in accordance with Council's requirements.

¹ White Box-Yellow Box-Blakely's Red Gum Woodland under the EPBC Act, and Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion (PCT 1334) under the BC Act.

Attachment A – Biodiversity Development Assessment Report



Poplars Innovation Precinct (Stage 1), Jerrabomberra, NSW

Biodiversity Development Assessment Report

Final 01 – August 2020

Prepared for Poplars Developments Pty Ltd

Document Information

Report for: Poplars Developments Pty Ltd
Prepared by: Sam Reid, Shannon Thompson, and Robert Speirs
Capital Ecology project no.: 2971

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Version Control

Version	Internal reviewer	External reviewer	Date of issue
Draft version 01	Robert Speirs	Chris Daly	07/08/2020
Final version 01	Robert Speirs	-	12/08/2020

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Capital Ecology gratefully acknowledges the contributions and/or assistance of the following people and organisations in undertaking this study.

- Chris Daly – Director, Black Mountain Construction Assurance Pty Ltd.

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Executive Summary

Poplars Developments Pty Ltd (Poplars Developments) is currently progressing the planning and approval process for the development of Stage 1 of the Poplars Innovation Precinct in portions of Lot 1 DP1263364, Jerrabomberra, NSW (the 'proposed development' of the 'subject land'). Capital Ecology Pty Ltd (Capital Ecology) has been commissioned by Poplars Developments to complete the necessary biodiversity surveys and prepare this Biodiversity Development Assessment Report (BDAR) to identify and assess the significance of the impacts that the proposed development will have on the biodiversity values of the subject land.

Background

The property known as "The Poplars" occupies land to the north (known as the "North Poplars") and south (known as the "South Poplars") of Tomsitt Drive, Jerrabomberra, NSW. The ecological values of "The Poplars" property have been investigated since the early 1990s. Each study identified the western portions of the land as supporting significant ecological values and recommended conservation of the land, and each study also identified the eastern portions of the land as supporting highly degraded vegetation of little conservation significance and noted the suitability of the land for development. Consistent with these findings, the *Queanbeyan Local Environmental Plan (Poplars) 2013* (Poplars LEP) allocated land to either conservation or development in a manner that protected the vast majority of the land supporting significant biodiversity conservation values. This land has since been formally conserved under two BioBanking Agreements.

Scope

Although general biodiversity values are identified and considered, the primary purpose of this BDAR 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).

While this BDAR 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), a separate report has been developed by Capital Ecology to assess the combined impact of current and future stages of the Poplars development on MNES (Capital Ecology 2020a¹). That report will be the primary informing document for an EPBC Act referral and will ensure that the full impact of the entire Poplars development on MNES is appropriately assessed.

The 'study area' for this BDAR is 87.00 ha and encompasses the whole of Lot 1 DP1243031 and portions of Lot 1 DP1126721, Lot 6 DP1246134, and Lot 1 DP1263364, Jerrabomberra, NSW. The northern and southern sections of the study area are bisected by Tomsitt Drive, and the southern section is bisected by Environa Drive (currently under construction).

The subject land for this BDAR, located in the north-western corner of Lot 1 DP1263364 and encompassing an area of 10.03 ha, relates only to the portion of the study area that will be impacted by the proposed development.

¹ Capital Ecology (2020a). "The Poplars", Jerrabomberra, NSW – *Matters of National Environmental Significance Assessment Report*. Draft 01 – August 2020. Prepared for Poplars Developments Pty Ltd. Authors: S. Reid, S. Thompson, and R. Speirs. Project no. 2971.

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 27 September 2019 and 23 July 2020.

- Plant Community Type and Vegetation Zone assessment and mapping.
- BAM plots.
- A remnant tree survey.
- Threatened flora surveys via transect surveys, surveys of rocky areas, and opportunistic observations.
- Threatened bird surveys via areas searches and opportunistic observations.
- A fauna nesting survey via inspections of each tree for signs of fauna breeding in hollows or nests.
- A full program of targeted Striped Legless Lizard *Delma impar* surveys, involving 10 checks of 11 grids (50 tiles per grid) following methodology consistent with the Commonwealth guidelines.
- Surveys for the Pink-tailed Worm-lizard *Aprasia parapulchella* via an intensive rock turning survey 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.

Results

Native vegetation

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

- PCT320 – *Kangaroo Grass - Redleg Grass forb-rich temperate tussock grassland of the northern Monaro, ACT and upper Lachlan River regions of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion.*
- PCT1334 – *Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion.*

Before European occupation, the whole of the study area would have been characterised by an open grassy woodland PCT (i.e. PCT1334), merging with grassland lower in the landscape to the west. (i.e. PCT320) (Figure 6, Table 8).

The study area has been substantially modified by its current and past land use, which has primarily been grazing (sheep and cattle). Approximately 97% of the original woody vegetation (canopy, midstorey, and shrubstorey) has been historically cleared across the study area to promote the pastoral productivity of the land. The areas which retain some of the original canopy occur as isolated paddock trees or small, scattered patches of vegetation. The majority of the study area has been historically pasture improved and is dominated by exotic pasture grasses (especially *Phalaris*

Phalaris aquatica) and a variety of weeds. There is a severe infestation of Serrated Tussock *Nassella trichotoma* in the low-lying land in the south-western corner of the study area.

Some portions of the groundstorey across the study area have a dominance of native grasses and forbs; these areas are largely restricted to the northern section of the study area, the northern boundary of the southern section, and the south-western corner of the southern section. However, the prolonged period of stock grazing combined with historic pasture improvement has greatly depleted the native species diversity in the groundstorey across these areas.

The riparian vegetation in the study area is generally dominated by exotic pasture grasses along the wet, low-lying areas bordering the drainage line in the south-east.

The majority of the vegetation in the study area is therefore largely characterised by an absent or low-density canopy of mature remnant eucalypts, an absent midstorey and shrubstorey, and a low diversity groundstorey dominated by disturbance tolerant native species or exotic grasses and weeds.

Finally, the study area is bordered to the east and south-east by urban development, to the south by Jerrabomberra Creek, and to the north and west by relatively intact grassland and woodland vegetation (i.e. two BioBanking Sites).

Threatened ecological communities

PCT320 is identified as the potential EPBC Act listed threatened ecological community (TEC) *Natural Temperate Grassland of the South Eastern Highlands*. PCT320 Zone 1 meets the listing criteria for NTG-SEH as it is characterised by a native groundstorey with moderate to high native forb diversity. PCT320 Zone 1 does not occur in the subject land and so will not be impacted by the proposed development. PCT320 Zone 2 does not meet the listing criteria for NTG-SEH as it is characterised by a clearly exotic groundstorey. PCT320 Zone 2 does not occur in the subject land and so will not be impacted by the proposed development. As such, while the wider study area supports Natural Temperate Grassland of the South Eastern Highlands in the areas defined by PCT320 Zone 1, the subject land does not.

PCT1334 is identified as the potential EPBC Act listed TEC *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. PCT1334 Zone 1 meets the criteria for the EPBC Act listed TEC. However, PCT1334 Zone 1 does not occur in the subject land and so will not be impacted by the proposed development. PCT1334 Zones 2 to 5 do not meet the listing criteria. As such, while the wider study area supports EPBC Act Box Gum Woodland in the areas defined by PCT1334 Zone 1, the subject land does not.

The subject land therefore does not support either of the EPBC Act listed threatened ecological communities with the potential to occur in the locality.

Threatened species

The historic activities which have occurred across the majority of the subject land have substantially degraded the habitat value for native flora and fauna. As a result, no threatened flora species were recorded within the subject land, nor were the majority of the threatened fauna species considered to have the potential to occur. However, targeted surveys did detect Golden Sun Moth (EPBC Act critically endangered, BC Act endangered).

A total of 188 Golden Sun Moths were recorded in the study area across the four surveys. Golden Sun Moths were recorded at low to moderate density across those zones with a native dominant

groundstorey (i.e. PCT320 Zone 1 and PCT1334 Zones 1, 2, and 4). The exception to this is the patch of Golden Sun Moth habitat immediately to the east of Environa Drive, which supported a greater density of moths. The areas of confirmed habitat are generally flat or gently sloping, dominated by a mix of Tall Speargrass and Wallaby Grasses, and contain low herbage mass and extensive patches of bare ground.

The study area was assessed as supporting 22.40 ha of Golden Sun Moth habitat, 3.33 ha of which has been subsequently removed by the construction of Environa Drive. Of the remaining 19.07 ha of Golden Sun Moth habitat in the study area, 4.58 ha occurs in the subject land and will be impacted by the proposed development. This equates to an impact of 24% of the remaining habitat in the study area, and an impact of 5% when the 83.48 ha of habitat in the adjoining BioBanking Sites are also considered.

Impacts

Native vegetation

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

- 0.32 ha of PCT1334 Zone 3 – mature canopy, regeneration, exotic dominant understorey with low diversity (BC Act Native Vegetation, BC Act Box-Gum Woodland);
- 4.58 ha of PCT1334 Zone 4 – low diversity native pasture (BC Act native vegetation, BC Act Box-Gum Woodland); and
- 13 remnant trees located in PCT1334 Zone 3, four of which contain at least one functional hollow.

In total, the proposed development will result in the clearance of 4.90 ha of BC Act native vegetation, all of which meets the criteria of BC Act Box-Gum Woodland.

Only PCT1334 Zone 3 has a vegetation integrity score that requires offsetting for impacts on ecosystem credits.

- PCT1334 Zone 3 – vegetation integrity score of 30.3.

PCT1334 is listed as a serious and irreversible impacts (SAIL) entity ("BC Act Box-Gum Woodland). Accordingly, the proposed development could result in a SAIL on a BC Act listed entity. However, as detailed in this BDAR, following substantial avoidance, minimisation, and mitigation measures, the proposed removal of 4.90 ha of BC Act Box-Gum Woodland is unlikely to constitute a SAIL.

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.

- 4.58 ha of Golden Sun Moth habitat (EPBC Act critically endangered, BC Act endangered), located in PCT1334 Zone 4.

The clearance of 4.58 ha of Golden Sun Moth in PCT1334 Zone 4 requires offsetting for impacts on species credits.

- Golden Sun Moth – habitat condition (vegetation integrity) loss of 8.3.

Golden Sun Moth is listed as a serious and irreversible impacts (SAIL) entity. Accordingly, the proposed development could result in a SAIL on a BC Act listed entity. However, as detailed in this BDAR, following substantial avoidance, minimisation, and mitigation measures, the proposed removal of 4.58 ha of Golden Sun Moth habitat is unlikely to constitute a SAIL.

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 or ecological communities given the subject land does not:

- support any EPBC Act listed flora species; or
- support any EPBC Act listed ecological communities;

However, the proposed development will impact 4.58 ha of Golden Sun Moth habitat, a threatened species listed under the EPBC Act. As mentioned previously, a separate report has been developed by Capital Ecology to assess the impact of the current and future stages of the Poplars development on MNES (Capital Ecology 2020a). That report will be the primary informing document for any EPBC Act referral and will ensure that the full impact of the entire Poplars development on MNES is appropriately assessed.

Given that the proposed development of the subject land is a component of the wider action of The Poplars development land (which will have a larger impact on Golden Sun Moth) referral of the larger action to the Commonwealth Minister for Agriculture, Water and the Environment is considered warranted and is recommended. Accordingly, Poplars Developments will refer the larger action in parallel with this BDAR.

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 12 August 2020.

- PCT1334 Zone 3 – clearance of 0.32 ha generates 5 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 12 August 2020.

- Golden Sun Moth *Synemon plana* – clearance of 4.58 ha generates 29 species credits.

NSW Koala SEPP – Koala Habitat Protection Requirements

Regarding the application of the Koala SEPP for the proposed development of the subject land, the following points are noted.

1. The subject land is located within the Queanbeyan-Palerang Local Government Area (LGA), an LGA which is listed in Schedule 1 of the Koala Habitat Protection SEPP, however:

2. There is no approved Koala Plan of Management which includes the subject land, and:
 - a. while no part of the subject land or wider study area is identified on the Koala Development Application Map, a small proportion of the canopy across the Poplars North BioBanking Site is; and
 - b. the subject land, which is under the same ownership as the Poplars North Site, has an area of greater than 1 hectare.

As demonstrated by the above assessment, the development control provisions of the Koala Habitat Protection SEPP apply to the proposed development.

However, as detailed in this BDAR, “The Poplars” is in an isolated peri-urban location that has largely been cleared of its natural woody vegetation. No Koalas or signs of Koala presence were detected during the surveys conducted for this BDAR or by previous ecological surveys of The Poplars, and no Koalas have been recorded within 2.5 km in the past 18 years (the nearest record is over 6 km to the west and separated by large expanses of urban development). As such, “The Poplars” does not support Koala habitat and is therefore unlikely to constitute important or occupied Koala habitat now or in the future.

As such, the application of the Koala SEPP should not constrain the proposed development of the subject land.

1 Introduction

Poplars Developments Pty Ltd (Poplars Developments) is currently progressing the planning and approval process for the development of Stage 1 of the Poplars Innovation Precinct in a portion of Lot 1 DP1263364, Jerrabomberra, NSW (the 'proposed development' of the 'subject land'). Capital Ecology Pty Ltd (Capital Ecology) has been commissioned by Poplars Developments to complete the necessary biodiversity surveys and prepare this Biodiversity Development Assessment Report (BDAR) 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 BDAR is to present the results of Capital Ecology's application of the NSW *Biodiversity Assessment Method* (BAM) (NSW Government 2017a²) 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).

While this BDAR 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), a separate report has been developed by Capital Ecology to assess the combined impact of current and future stages of the Poplars development on MNES (Capital Ecology 2020a³). That report will be the primary informing document for an EPBC Act referral and will ensure that the full impact of the entire Poplars development on MNES is appropriately assessed.

1.1 Study Area and Subject Land

As shown in Figure 3, the property known as "The Poplars" property" occupies land to the north (known as the "North Poplars") and south (known as the "South Poplars") of Tomsitt Drive, Jerrabomberra, NSW.

The 'study area' for this BDAR is 87.00 ha and encompasses the whole of Lot 1 DP1243031 and portions of Lot 1 DP1126721, Lot 6 DP1246134, and Lot 1 DP1263364, Jerrabomberra, NSW (Figure 1, Figure 2, and Figure 3). As shown in Figure 3, the northern and southern sections of the study area are bisected by Tomsitt Drive, and the southern section is bisected by Environa Drive (currently under construction).

The subject land for this BDAR, located in the north-western corner of Lot 1 DP1263364 and encompassing an area of 10.03 ha, relates only to the portion of the study area that will be impacted by the proposed development (Figure 1, Figure 2, and Figure 3).

The study area, as shown in Figure 1 and Figure 3, is bordered by:

- urban development to the east and south-east;
- 'E2 – Environmental Conservation' zoned land to the north and west that supports relatively intact grassland and woodland vegetation (i.e. the BioBanking Sites, see Section 1.2); and

² NSW Government (2017a). *Biodiversity Assessment Method*. NSW Office of Environment and Heritage. Published LW 25 August 2017.

³ Capital Ecology (2020a). "The Poplars", Jerrabomberra, NSW – *Matters of National Environmental Significance Assessment Report*. Draft 01 – August 2020. Prepared for Poplars Developments Pty Ltd. Authors: S. Reid, S. Thompson, and R. Speirs. Project no. 2971.

- Jerrabomberra Creek to the south, beyond which lies unzoned land that supports moderately to highly disturbed grassland vegetation.

Located in the Queanbeyan-Palerang Local Government Area (LGA), pursuant to the *Queanbeyan Local Environmental Plan (Poplars) 2013* (Poplars LEP), the subject land is zoned⁴ 'B7 – Business Park' with a minimum lot size⁵ of 'W – 4,000 m²'. The remainder of the study area is zoned 'RE2 – Private Recreation' and 'B1 – Neighbourhood Centre'.

The study area is not identified on the *Queanbeyan Local Environmental Plan 2012* (Queanbeyan LEP) Terrestrial Biodiversity Map⁶, NSW Government Biodiversity Values Map⁷, or Koala Development Application Map⁸. The adjoining E2 zoned land immediately to the west of the study area (i.e. the BioBanking Sites) is identified on the NSW Government Biodiversity Values Map, and portions of the canopy in North Poplars (i.e. the northern BioBanking Site) is identified on the Koala Development Application Map.

The topography across the southern section of the study area falls steadily from 625 m Australian Height Datum (AHD) in approximately the centre to 580 – 590 m AHD along the southern boundary adjoining Jerrabomberra Creek. The topography across the northern section of the study area is relatively flat, ranging from approximately 610 – 620 m AHD.

As mentioned previously, the northern and southern sections of the study area are bisected by Tomsitt Drive, and the southern section is bisected by Environa Drive (currently under construction) (Figure 3). Otherwise, the built infrastructure in the study area is restricted to existing boundary and internal fences, which are in a generally functional condition.

The subject land does not contain any tributaries or well-formed drainage lines (Figure 4). The wider study area supports two tributaries which join Jerrabomberra Creek immediately to the south, and one drainage line that terminates in the south-east of the study area. The tributaries were dry at the time of survey and are only likely to convey water following substantial rain events. The riparian vegetation in the study area is generally dominated by exotic grasses along the wet, low-lying areas bordering the drainage line in the south-east. There are eight small to moderately sized dams in the study area, one of which occurs in the subject land. All of the dams held a small to moderate amount of water at the time of survey, and the two dams that occur along the drainage line in the south-east of the study area are fringed by largely exotic vegetation.

Before European occupation, the study area would have been characterised by an open grassy woodland that merges with grassland lower in the landscape to the west. However, the study area has been substantially modified by its current and past land use, which has primarily been grazing (sheep and cattle). Approximately 97% of the original woody vegetation (canopy, midstorey, and shrubstorey) has been historically cleared across the study area to promote the pastoral productivity of the land. The areas which retain some of the original canopy occur as isolated paddock trees or small, scattered patches of vegetation. The majority of the study area has been historically pasture improved and is dominated by exotic pasture grasses (especially *Phalaris aquatica*) and a variety of weeds. There is a severe infestation of Serrated Tussock *Nassella trichotoma* in the low-lying land in the south-western corner of the study area. Some portions of the groundstorey across the study area have a dominance of native grasses and forbs; these areas are largely restricted to

⁴ Queanbeyan Local Environmental Plan (Poplars) 2013. *Land Zoning Map - Sheet LZN_001*.

⁵ Queanbeyan Local Environmental Plan (Poplars) 2013. *Lot Size Map - Sheet LSZ_001*.

⁶ Queanbeyan Local Environmental Plan 2012. *Terrestrial Biodiversity Map – Sheet BIO_001*.

⁷ <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap>

⁸ <https://webmap.environment.nsw.gov.au/Html5Viewer291/index.html?viewer=KoalaSEPP.htm5>

the northern section of the study area, the northern boundary of the southern section, and the south-western corner of the southern section. However, the prolonged period of stock grazing combined with historic pasture improvement has greatly depleted the native species diversity in the groundstorey across these areas.

The majority of the vegetation in the study area is therefore characterised by an absent or low-density canopy of mature remnant eucalypts, an absent midstorey and shrubstorey, and a low diversity groundstorey dominated by disturbance tolerant native species or exotic grasses and weeds.

1.2 Previous Studies

The ecological values of “The Poplars” property have been investigated since the early 1990s. As such, there are a large number of reports which describe the ecological values of the study area and surrounding land. The reports of most relevance to the study area include Davis (1991⁹), Kevin Mills & Associates (1994¹⁰), Biosis Research (2003¹¹), Kevin Mills & Associates (2009¹²), Kevin Mills & Associates (2015¹³), Umwelt (2015¹⁴), Umwelt (2019¹⁵), Capital Ecology (2019¹⁶), and Capital Ecology (2020b¹⁷).

In combination, these reports have involved the following surveys across “The Poplars” property.

- Plant Community Type (PCT) and vegetation zone mapping.
- Vegetation plots and transects.
- Habitat assessment for threatened flora, fauna, and ecological communities.
- Threatened flora surveys.
- Grassland Earless Dragon *Tympanocryptis pinguicolla* spider-tube surveys.
- Pitfall trapping for Striped Legless Lizard *Delma impar* and Grassland Earless Dragon.
- Pink-tailed Legless Lizard *Aprasia parapulchella* rock-turning surveys.
- Active searches for threatened reptiles.

⁹ Davis, M.S. (1991). *The Poplars, Queanbeyan. Preliminary Vegetation Survey and Delineation of Fauna Habitat*. Prepared for Scott & Furphy Pty Ltd, Belconnen, August.

¹⁰ Kevin Mills & Associates (1994). *Fauna Survey and Assessment “The Poplars” Queanbeyan, NSW*. Prepared for Mr D.H.T. Larcombe.

¹¹ Biosis Research (2003). *Final Draft: Flora & Fauna Assessment at 300 Lanyon Drive, Queanbeyan*. Report for Queanbeyan City Council, June 2003. Project No. S3777/M3225

¹² Kevin Mills & Associates (2009). *Proposed New Road. The Poplars – North Tralee. City of Queanbeyan*. Prepared for The Village Building Company, August 2009.

¹³ Kevin Mills & Associates (2015). *Ecological Assessment. Northern Road Access Route. Stage 3, South Tralee, Queanbeyan. The Village Building Company, Canberra*. Prepared for The Village Building Company, December 2015.

¹⁴ Umwelt (2015). *BioBanking Agreement for ‘The Poplars’, Jerrabomberra, NSW*. Prepared on behalf of Robin Pty Limited, March 2015.

¹⁵ Umwelt (2019). *Briefing Note – Poplars Environmental Assessment*. 01 March 2019.

¹⁶ Capital Ecology (2019). *Proposed modification of the approved layout for Stage 3 of the Poplars Northern Entry Road – Preliminary Ecological Impact Assessment*. Project No. 2921, 30 September 2019.

¹⁷ Capital Ecology (2020b). *“The Poplars” – Review of previous ecological studies and rationale behind the allocation of land for development or conservation*. Project No. 2945, 18 June 2020.

- Golden Sun Moth *Synemon plana* surveys (southern and central sections of North Poplars, west of the ridgeline of South Poplars).
- Threatened woodland bird surveys.
- Threatened microbat Anabat surveys.
- Spotlight surveys.
- Nocturnal frog call surveys.

The ecological/biodiversity values of “The Poplars” property have been identified and described in a generally consistent manner since the early 1990s. As the condition of the vegetation and flora/fauna habitat varies significantly across “The Poplars” property, the biodiversity values of distinct areas are summarised separately below (refer to Figure 3).

North Poplars – western and northern sections (i.e. the Poplars North BioBanking Site)

- Relatively intact native grassland, much of which meets the listing criteria for the EPBC Act listed ‘Natural Temperate Grassland of the South Eastern Highlands’ (NTG-SEH).
- Relatively intact woodland vegetation, much of which meets the listing criteria for the BC Act and EPBC Act listed ‘White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland’ (Box-Gum Woodland).
- Threatened flora, specifically populations of Button Wrinklewort *Rutidosia leptorrhynchoides* and Hoary Sunray *Leucochrysum albicans* var. *tricolor*.
- Grassland Earless Dragon habitat.
- Golden Sun Moth habitat.
- Threatened woodland bird habitat. Threatened species recorded in or immediately adjacent to “The Poplars” property include Dusky Woodswallow *Artamus cyanopterus*, Gang-gang Cockatoo *Callocephalon fimbriatum*, Varied Sitella *Daphoenositta chrysoptera*, Little Eagle *Hieraetus morphnoides*, Scarlet Robin *Petroica boodang*, Flame Robin *Petroica phoenicea*, Speckled Warbler *Pyrrholaemus sagittatus*, Diamond Firetail *Stagonopleura guttata*, and the migratory White-throated Needletail *Hirundapus caudacutus* and Rainbow Bee-eater *Merops ornatus*.
- Habitat for ACT listed species, including Perunga Grasshopper *Perunga ochracea*, or species considered ‘rare and uncommon’ in the region, including Canberra Raspy Cricket *Cooraboorama canberra* and Key’s Matchstick Grasshopper *Keyacris scurra*.
- There are signs that portions of this area have historically been cultivated and/or pasture improved.

North Poplars – south-eastern section

- Scattered remnant trees.
- Signs of historic cultivation and/or pasture improvement, heavily grazed, and a highly disturbed understorey that is dominated by a variety of exotic grasses and weeds.
- Some areas are heavily infested with Serrated Tussock *Nassella neesiana*.

- This portion of “The Poplars” property does not contain any NTG-SEH or EPBC Act Box-Gum Woodland and was considered unlikely to support habitat of significance to any threatened flora or fauna species.

South Poplars – west of the central ridge line (i.e. the Poplars South BioBanking Site)

- Relatively intact native grassland, much of which meets the listing criteria for the EPBC Act listed NTG-SEH.
- Grassland Earless Dragon habitat.
- Golden Sun Moth habitat.
- Pink-tailed Legless Lizard habitat.
- Habitat for ACT listed species, including Perunga Grasshopper, or species considered ‘rare and uncommon’ in the region, including Canberra Raspy Cricket and Key’s Matchstick Grasshopper.
- Scattered trees and disturbed woodland vegetation, some of which meets the listing criteria for BC Act Box-Gum Woodland.
- Large areas infested by a variety of by exotic shrubs.
- Substantial areas are heavily infested with Serrated Tussock.
- There are signs that portions of this area have historically been cultivated and/or pasture improved.

South Poplars – east of the central ridge line

- Scattered trees and disturbed woodland vegetation, some of which meets the listing criteria for BC Act Box-Gum Woodland.
- Large areas infested by a variety of by exotic shrubs.
- Signs of historic cultivation and/or pasture improvement, heavily grazed, and a highly disturbed understorey that is dominated by a variety of exotic grasses and weeds.
- Substantial areas are heavily infested with Serrated Tussock.
- This portion of “The Poplars” property did not contain any NTG-SEH or Box-Gum Woodland and was considered unlikely to support habitat of significance to any threatened flora or fauna species.

In summary, each study identified the western portions of the land as supporting significant ecological values and recommended conservation of the land, and each study also identified the eastern portions of the land as supporting highly degraded vegetation of little conservation significance and noted the suitability of the land for development.

Consistent with these findings, the Poplars LEP allocated land to either conservation or development in a manner that protected the vast majority of the land supporting significant biodiversity conservation values. As shown in Figure 3 and discussed below, this land has since been formally conserved under two BioBanking Agreements.

1.2.1 BioBanking / BAM credits

The establishment of the 'The Poplars North' and 'The Poplars South' as BioBanking Sites under BioBanking Agreements provides a formal, legally binding, and audited conservation focussed management regime for the portions of "The Poplars" property recognised as supporting significant biodiversity values. In exchange for actively managing the land for these values, Robin Pty Ltd (the landowner) has obtained the stipulated credits which they may retire at their discretion (i.e. use to offset an impact elsewhere or sell to another party).

As described in the following two sections, 'The Poplars North' and 'The Poplars South' BioBanking Sites protect approximately 50% (98.46 ha) of "The Poplars" property, including the vast majority of the identified significant biodiversity values. Protected values include:

- 87.42 ha of grassland vegetation (i.e. MR631/PCT1202 and PC686/PCT1289), the majority of which is likely to meet the listing criteria for EPBC Act listed NTG-SEH;
- 10.65 ha of woodland vegetation (i.e. MR648/PCT1330), the majority of which is likely to meet the listing criteria for EPBC Act and/or BC Act listed Box-Gum Woodland;
- 83.48 ha of Golden Sun Moth habitat;
- 61.86 ha of Grassland Earless Dragon habitat; and
- 18.63 ha of Pink-tailed Legless Lizard habitat.

In addition, the BioBanking Sites also protect habitat for threatened flora (i.e. Button Wrinklewort and Hoary Sunray), threatened birds (i.e. Dusky Woodswallow, Gang-gang Cockatoo, Varied Sitella, Little Eagle, Scarlet Robin, Flame Robin, Speckled Warbler, Diamond Firetail, and the migratory White-throated Needletail and Rainbow Bee-eater), and ACT listed or 'rare and uncommon species' (i.e. Perunga Grasshopper, Canberra Raspy Cricket, and Key's Matchstick Grasshopper).

1.2.1.1 North Poplars BioBanking Site

On 23 August 2018, a BioBanking Agreement was made between the NSW Minister for the Environment and Robin Pty Ltd to establish 'The Poplars North' biobank site¹⁸. The Poplars North biobank site encompasses 42.91 ha of "The Poplars" property and is roughly consistent with the area zoned 'E2 – Environmental Conservation'.

As determined via the completed assessment of reasonable equivalence¹⁹, the BioBanking Credits generated by The Poplars North biobank site have been transformed into BAM credits under the current NSW Biodiversity Offset Scheme (BOS). The outcome of this is summarised in Table 1.

¹⁸ NSW Office of Environment & Heritage (2018a). *BioBanking Agreement ID: BA310 – Poplars North*.

¹⁹ *Biodiversity Credit Ownership Report – Biodiversity credits owned under the Biodiversity Banking and Offsets Scheme and reasonable equivalence to credits under the Biodiversity Offsets Scheme* (ref: DOC19/495776-4). Dated 12 September 2019.

Table 1. Poplars South BioBanking / BAM Credits.

BioBanking Scheme			Biodiversity Offset Scheme		
Value	Area (ha)	Credits	Value	Area (ha)	Credits
MR631	10.27	71	PCT1202	10.27	57
MR686	22.34	103	PCT1289	22.34	102
MR648	9.91	46	PCT1330	9.91	38
Golden Sun Moth	38.10	174	Golden Sun Moth	38.10	111
Grassland Earless Dragon	20.27	215	Grassland Earless Dragon	20.27	145

1.2.1.2 South Poplars BioBanking Site

On 23 August 2018, a BioBanking Agreement was made between the NSW Minister for the Environment and Robin Pty Ltd to establish ‘The Poplars South’ biobank site²⁰. The Poplars South biobank site encompasses 55.55 ha of “The Poplars” property and is roughly consistent with the area zoned ‘E2 – Environmental Conservation’.

As determined via the completed assessment of reasonable equivalence²¹, the BioBanking Credits generated by The Poplars South biobank site have been transformed into BAM credits under the current NSW Biodiversity Offset Scheme (BOS). The outcome of this is summarised in Table 2.

Table 2. Poplars South BioBanking / BAM Credits.

BioBanking Scheme			Biodiversity Offset Scheme		
Value	Area (ha)	Credits	Value	Area (ha)	Credits
MR631	16.42	120	PCT1202	16.42	68
MR686	38.39	271	PCT1289	38.39	173
MR648	0.74	5	PCT1330	0.74	2
Golden Sun Moth	45.38	322	Golden Sun Moth	45.38	201
Grassland Earless Dragon	41.59	295	Grassland Earless Dragon	41.59	187
Pink-tailed Legless lizard	18.63	132	Pink-tailed Legless Lizard	18.63	85

²⁰ NSW Office of Environment & Heritage (2018b). *BioBanking Agreement ID: BA309 – Poplars South*.

²¹ *Biodiversity Credit Ownership Report – Biodiversity credits owned under the Biodiversity Banking and Offsets Scheme and reasonable equivalence to credits under the Biodiversity Offsets Scheme* (ref: DOC19/495776-3). Dated 12 September 2019.

1.3 Proposed Development

1.3.1 The Poplars development

As detailed on the Poplars website²²:

Positioned on the border of New South Wales and the ACT, Poplars takes full advantage of its proximity to Parliament House, Federal Government Departments, Canberra's CBD and the region's international airport. Poplars is positioned at the confluence of a number of key transport routes including the Monaro Highway and the soon to be completed Edwin Land Parkway/Ellerton Drive link. These transport links allow the business park to be a hub with convenient access for business travel and the movement of freight. The local council and NSW State Government have highlighted the Poplars area as a location for economic development and employment, while infrastructure grants have also been issued.

Poplars has been designed to foster a centre of collaboration and out-of-the-box thinking. The development will provide a working environment where organisations can meet and explore concepts that change our future. By taking cues from the best workplaces, the Innovation Precinct provides for worker wellbeing with open greenspaces, landscaped verges and a masterplan based upon sustainable development practices.

The Poplars development is designed around the following four precincts: Retail + Services Precinct (Stage 1 completed); Innovation Precinct; Learning Precinct; and Grasslands Reserve (i.e. the BioBanking Sites).

Retail + Services Precinct

Poplars Retail + Services precinct has opened the doors to local and national brands, which will service the Innovation Precinct and surrounding area. The marketplace style offering will provide a fun destination for people to meet, shop, eat and unwind.

Innovation Precinct

The Innovation Precinct understands the advantages of co-locating with like-minded businesses. While Poplars will be a base for a range of organisations, we are focused on the following sectors: Space and Defence Sectors; Information and communication technologies; and Scientific Research Services.

Learning Precinct

The Poplars Learning Precinct is set to be a networking hub for Poplars residents, where knowledge is shared and ideas are formed. The precinct's innovation centre, for entrepreneurs, start-ups, businesses and investors, will sit between the existing primary school and the future STEM-based high school.

Grassland Reserve

The Poplars Grassland Reserve comprises over 100 ha of conservation area. The area is protected under a Biodiversity Stewardship agreement with the NSW Office of Environment and Heritage.

²² <https://www.poplars.com.au/>

1.3.2 The proposed development – Poplars Innovation Precinct (Stage 1)

The proposed development seeks to subdivide the subject land for commercial purposes. As shown in Place Logic's Subdivision Layout²³ (included herein as Figure 2) and detailed in the Statement of Environmental Effects²⁴:

The proposed subdivision is for eight Torrens Title Lots ranging in area from 7,444m² to 20,732m². The proposed subdivision also includes a range of site establishments works including, land grading for individual lots and the access road, and a comprehensive package of civil engineering works including construction of roads and drainage, installation of essential services including water, sewage, communications, stormwater, gas and electricity.

Place Logic has completed a landscape masterplan for the subdivision. The landscape design intent proposes a contemporary, sophisticated character, complementing the existing site condition, characteristics and proposed future character for the area.

As detailed in the site analysis section of this report, the site contains a drainage dam which were established over the history of its use as agricultural/grazing. The proposal will remove the existing dam and undertake earthworks to grade and deliver the proposed lot subdivision, construction of roads, verges, services and associated works. The Civil Design Package (refer to DA submission package) details the location of proposed stormwater connections throughout the subdivision. The general arrangement plans illustrate the stormwater connections are contained with gutters along the proposed network of boulevards, roads and laneways. Furthermore, the typical road sections detail the design of the proposed gutters and location of below ground pipes for stormwater management across the subdivision.

For the purposes of this BDAR, it is assumed that the proposed development will clear all of the subject land's currently remaining vegetation. As such, this does not include the vegetation which has already been cleared by the construction of Envirova Drive, which extends into the eastern boundary of the subject land (Figure 3).

1.3.3 Assessment of the current and future stages of the Poplars development

The Poplars has been highlighted as an economic development area by both the NSW State and Local Governments. To trigger employment and educational opportunities at "The Poplars" property, the NSW Government has committed a grant of \$23M to trunk infrastructure for the site with Queanbeyan-Palerang Regional Council contributing up to \$8M. As part of this process, developers are gifting land to the NSW Government under a voluntary planning agreement.

As described in Section 1.2, the ecological/biodiversity values of "The Poplars" property have been identified and described in a generally consistent manner since the early 1990s. Each study identified the western portions of the property as supporting significant ecological values and recommended conservation of the land (now BioBanking Sites, refer to Figure 3). Each study also identified the eastern portions of the property as supporting highly degraded vegetation of little conservation significance and noted the suitability of the land for development. Consistent with these recommendations, the allocation of land for either conservation (i.e. E2 zoned land across the BioBanking Sites, refer to Figure 3) or development (i.e. B1, B7, and RE2 zoned land) via the Queanbeyan Local Environmental Plan (Poplars) 2013 aligns with the known significant ecological

²³ Place Logic (2020). *Poplars Innovation Precinct Stage 1 [7486] Tomsitt Drive / Jerrabomberra NSW 2619. Site Plan, Revision B, Drawing No. 7486-DA-001, 06.08.2020.*

²⁴ Statement of Environmental Effects. *Subdivision and early works 300 Lanyon Drive Jerrabomberra.* Prepared by Capital Region Planning for Poplars and Black Mountain Construction Assurance. July 2020.

values of “The Poplars” property. As such, from the early planning stages the Poplars development has been designed to avoid the known significant ecological values of the area.

Since that time, the first phase of the Retail + Services has been completed and Environa Drive is currently under construction. The design and planning process for Stage 1 of the Innovation Precinct, which is the subject of this BDAR, is well advanced and development is expected to commence in early 2021. Furthermore, commitments have also been made for a school to be constructed and operational by 2023 in the south-eastern corner of Lot 1 DP126134. The remainder of The Poplars development is expected to occur over a subsequent 10 to 20-year timeframe.

However, surveys performed for this BDAR recorded Golden Sun Moth across patches of native dominant vegetation in some of the areas earmarked for development (refer to Section 2.3.4.2 of this BDAR). This finding, which was unexpected given the modified condition of the vegetation in the study area and the substantial number of previous ecological studies of “The Poplars” property, has the potential to substantially delay Stage 1 of the Innovation Precinct and the planned school. Accordingly, Poplars Developments and Capital Ecology have liaised with both the Commonwealth Department of Agriculture, Water and the Environment (DAWE) and NSW Department of Planning, Industry, and Environment (DPIE) and proposed the following.

- Proceed with a BDAR for Stage 1 of the Poplars Innovation Precinct (i.e. this BDAR).
- The BDAR for Stage 1 of the Poplars Innovation Precinct will occur concurrently with the EPBC Act referral and assessment process for the broader development (i.e. the combined impact of current and future stages of the Poplars development). This will ensure that the full impact of the entire Poplars development on MNES is appropriately assessed.
- Proceed with a second BDAR for the school that is planned in the south-east corner of Lot 1 DP126134.
- Develop a Biodiversity Certification Assessment Report (BCAR) and pursue biodiversity certification for the remainder of “The Poplars” property, incorporating the remainder of the proposed development area and the existing BioBanking Sites.

This approach has received in-principle support for both DAWE and DPIE and would ensure an outcome that balances the economic development of the land, financial considerations, time constraints, and the overarching biodiversity conservation objectives.

1.4 Commonwealth and State Assessment and Approval Processes

1.4.1 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 action, the significance of that impact must be assessed. Guidelines for determining whether an impact is significant are provided by the Department of Agriculture, Water and the Environment (Commonwealth of Australia 2013a²⁵). If it is determined that a proposed action will, or is likely to, have a significant impact on a MNES, the action must be referred to the Minister. The Department will then consider the referred action and the Minister (or his/her Delegate) will make a decision regarding whether the action requires assessment and approval under the EPBC Act and associated conditions and controls.

As mentioned previously, a separate report has been developed by Capital Ecology to assess the impact of the current and future stages of the Poplars development on MNES (Capital Ecology 2020a). This report will be the primary informing document for an EPBC Act referral and will ensure that the full impact of the entire Poplars development on MNES is appropriately assessed.

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

1.4.2 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).

1.4.2.1 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

²⁵ 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.

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.

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).

1.4.2.2 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.

1.4.3 NSW State Environmental Planning Policy (Koala Habitat Protection) 2019

The *NSW State Environmental Planning Policy (Koala Habitat Protection) 2019* (the ‘Koala SEPP’) encourages the conservation and management of Koala habitat to ensure populations remain in their present range and the trend of population decline is reversed. The SEPP is made under the *Environmental Planning and Assessment Act 1979* (EP&A Act) and commenced on 1 March 2020 replacing the previous *State Environmental Planning Policy No 44 - Koala Habitat Protection*. The associated *Koala Habitat Protection Guideline*²⁶ (the ‘Guideline’) guides consent authorities, professionals, and the community to understand and implement the requirements of the Koala SEPP. As detailed in the Guideline:

The development control provisions of the SEPP apply to development applications relating to land within a council area where the SEPP applies 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. *is identified on the Koala Development Application Map, and*

²⁶ NSW Government (2020). *Koala Habitat Protection Guideline. Implementing State Environment Planning Policy (Koala Habitat Protection) 2019*. First published March 2020.

- b. has an area of more than 1 hectare, or
- c. has, together with any adjoining land in the same ownership, an area of more than 1 hectare, whether or not the development application applies to the whole, or only part, of the land.

If the Koala SEPP applies, then an assessment of the proposed development must be undertaken in accordance with the Guideline. Depending on the nature of the proposed development and its direct and indirect impacts, this assessment may involve detailed site surveys to map habitat and determine Koala presence, preparation of a Koala Assessment Report, and provision of compensatory measures.

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

1.5 Biodiversity Development Assessment Report

As prescribed under Part 6, Division 3, Section 6.12 of the BC Act, a BDAR is –

“a report prepared by an accredited person in relation to proposed development or activity that would be authorised by a planning approval, or proposed clearing that would be authorised by a vegetation clearing approval, that:

(a) assesses in accordance with the biodiversity assessment method the biodiversity values of the land subject to the proposed development, activity or clearing, and

(b) assesses in accordance with that method the impact of proposed development, activity or clearing on the biodiversity values of that land, and

(c) sets out the measures that the proponent of the proposed development, activity or clearing proposes to take to avoid or minimise the impact of the proposed development, activity or clearing, and

(d) specifies in accordance with that method the number and class of biodiversity credits that are required to be retired to offset the residual impacts on biodiversity values of the actions to which the biodiversity offsets scheme applies.”

A BDAR prepared applying the BAM by an accredited BAM Assessor must accompany any development application for which the BOS is triggered. As detailed previously, the BOS is triggered for a proposed development 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).

With regard to the above, the minimum lot size for the subject land is ‘W = 4,000 m²’ (Queanbeyan LEP (Poplars) 2013 *Lot Size Map - Sheet LSZ_001*). Therefore, in accordance with Part 7, Clause 7.2 of the BC Regulation, if the BC Act ‘native vegetation’ (defined in Part 5A of the *Local Land Services Act*

2013 as plant species indigenous to NSW) clearance exceeds 2,500 m² (0.25 ha) in total, then the BOS is triggered.

Whilst the proposed development is not identified on the Biodiversity Values Map, it will involve the clearance of 4.90 ha of BC Act 'native vegetation' and has the potential to significantly impact two BC Act listed entities (Golden Sun Moth and Box-Gum Woodland); the BOS is therefore triggered and a BDAR is required to assess the impacts of the proposed development.

The BAM provides a standard method for assessing the impacts of a development/clearance proposal. This theme should carry over to the resulting BDAR 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. The size of the BDAR should reflect the complexity of the subject land's biodiversity values and the scale and nature of the proposed development.

1.5.1 Objectives and Format

Developed to reflect the format of the BAM, this BDAR 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.

1.5.2 Technical Resources and Qualifications

This BDAR has been prepared by the following technical personnel:

- Robert Speirs – Director / Principal Ecologist
BAppSc (Ecology), DipPM, MEIANZ, CEnvP-E, Accredited BAM Assessor (No: BAAS17089)
Robert was project manager for this assessment and completed or closely supervised all field surveys, data entry, GIS mapping, BAM credit calculations, and report preparation.
- Dr Sam Reid – Senior Ecologist
BSc (Hons), PhD, MEIANZ, Accredited BAM Assessor (No: BAAS20006)
Sam undertook field surveys, BAM credit calculations, and report preparation.
- Shannon Thompson – Field Ecologist
BSc
Shannon undertook field surveys, data entry, and GIS mapping.

- Kristy Lee – Field Ecologist

BSc

Kristy undertook field surveys and data entry.

- Matthew Gale – Field Ecologist

BSc (Hons)

Matthew 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 (TRIM 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).

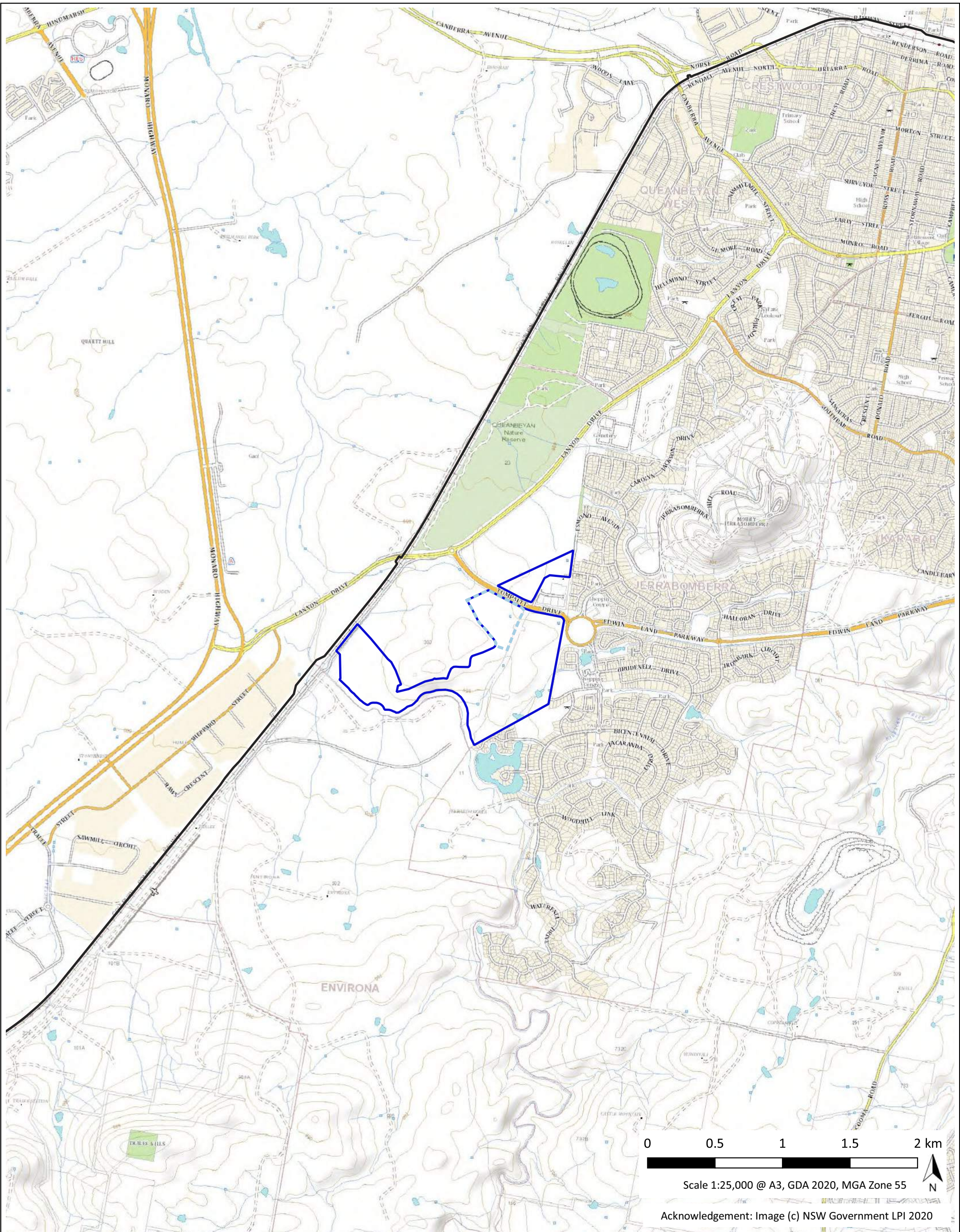





Figure 1. Locality Plan

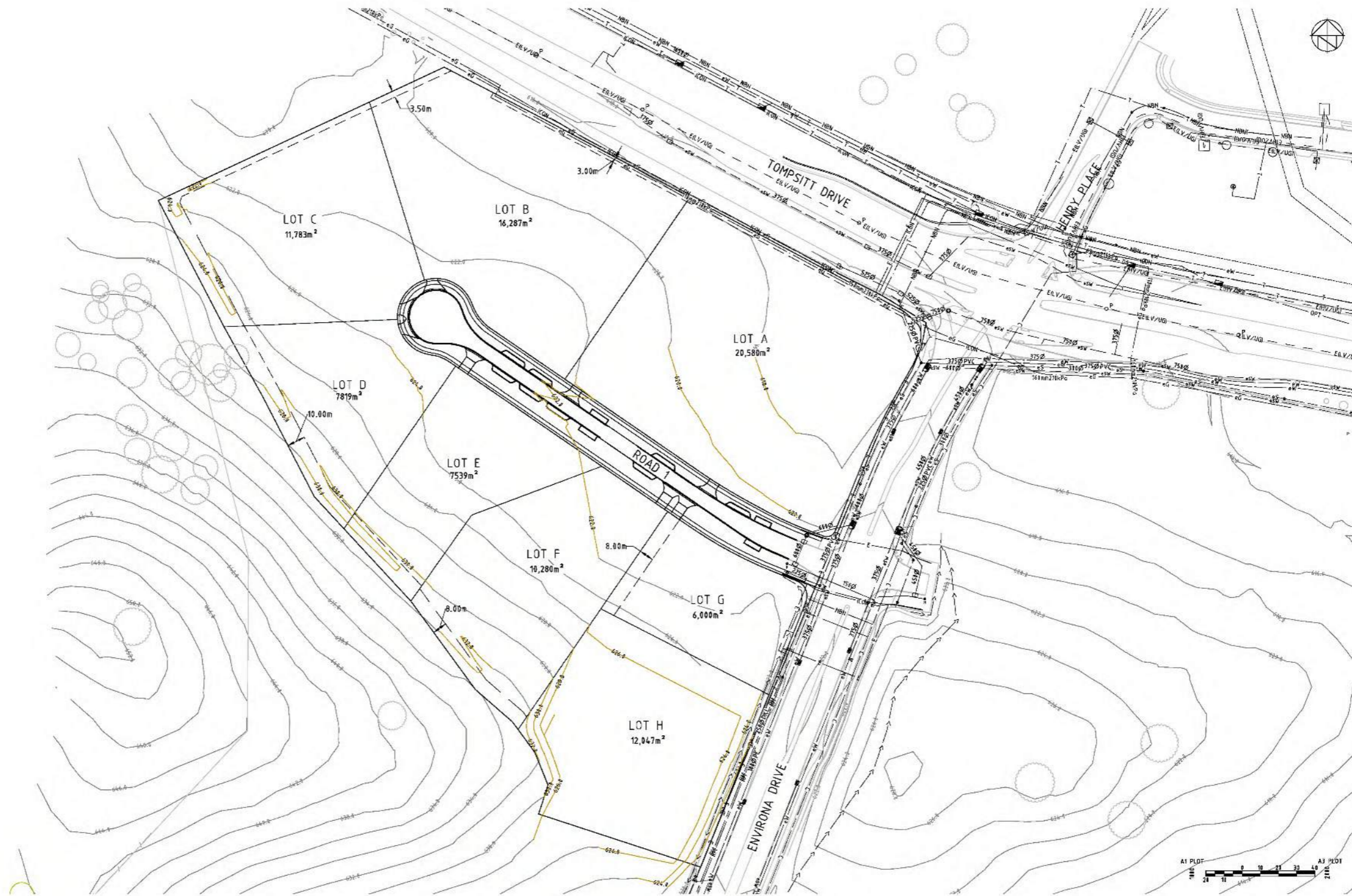
Legend

-  ACT_Border
-  Study Area
-  Subject Land - Stage 1



Capital Ecology Project No: 2971
 Drawn by: S. Reid
 Date: 6 August 2020

Figure 2. The Proposed Development



<p>PROJECT POPLARS INNOVATION PRECINCT STAGE 1 [7486] Tomsitt Drive / Jerrabomberra NSW 2619</p> <p>DATE/TITLE SITE PLAN</p>	<p>REVISION</p> <table border="1"> <tr> <td>A</td> <td>FOR INTERNAL COORDINATION</td> <td>17.11.2021</td> <td>HG</td> <td>JP</td> </tr> <tr> <td>B</td> <td>FOR DEVELOPMENT APPROVAL</td> <td>06.10.2023</td> <td>HE</td> <td>JP</td> </tr> </table>	A	FOR INTERNAL COORDINATION	17.11.2021	HG	JP	B	FOR DEVELOPMENT APPROVAL	06.10.2023	HE	JP	<p>KEY PLAN</p>	<p>APPROVED AN</p> <p>CHECKED AN</p> <p>DESIGNED JP</p> <p>DATE 07-08-20</p> <p>SCALE 1:1000 @A1</p>	<p>CLIENT</p> <p>POPLARS </p> <p>ENGINEER</p> <p>INDESCO </p>	<p>PLACE LOGIC Urban Design Landscape Architecture NSW LANDSCAPE ARCHITECTURE ACT 2012 www.placelogic.com.au A/N 25 618 175748</p> <p>PL PLACE LOGIC</p> <p>DATE DEVELOPMENT APPLICATION</p> <p>REF. NUMBER B 7486-DA001</p>
A	FOR INTERNAL COORDINATION	17.11.2021	HG	JP											
B	FOR DEVELOPMENT APPROVAL	06.10.2023	HE	JP											

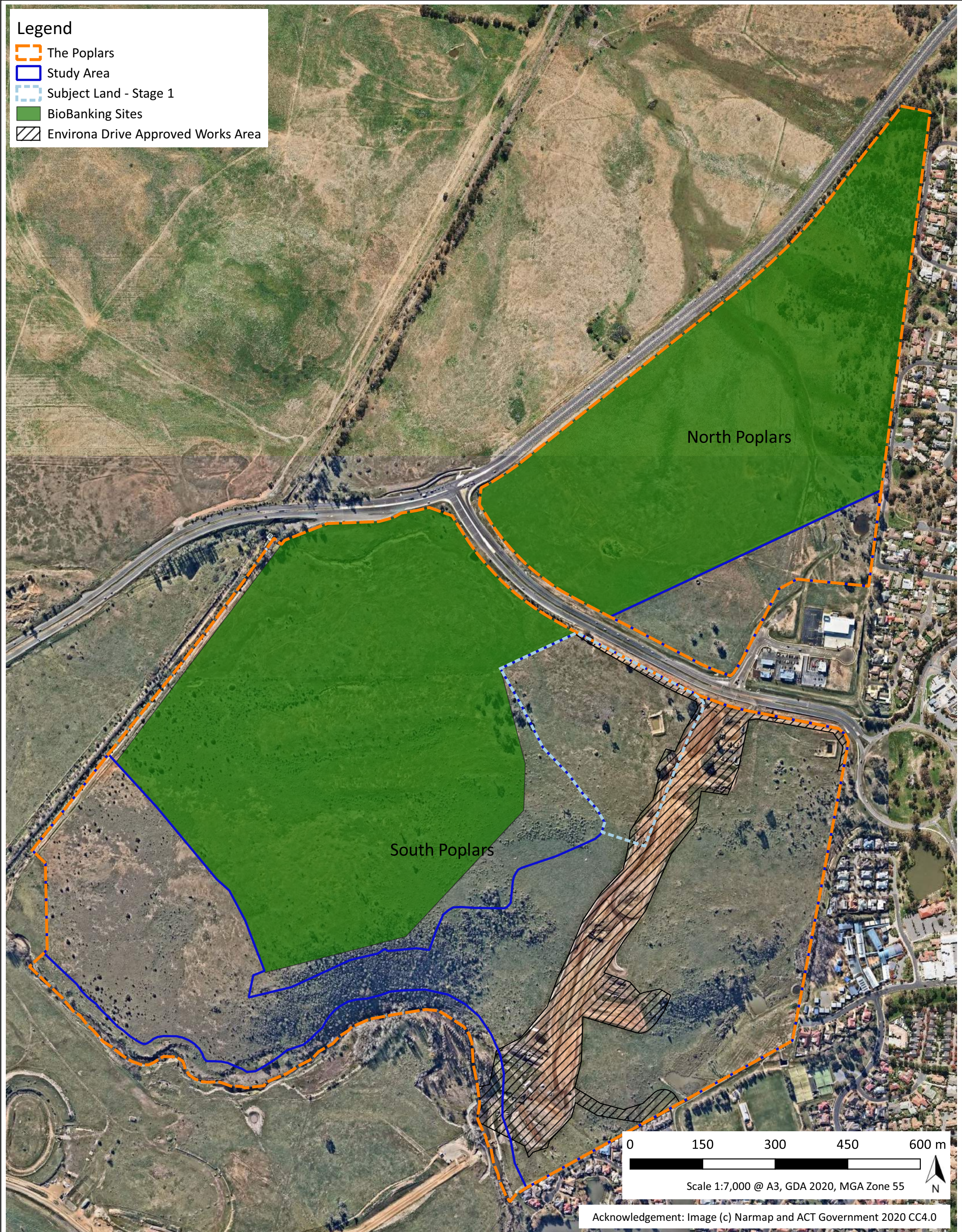


Figure 3. The Subject Land and Proposed Development on Aerial Imagery

2 Part 1 – Biodiversity Assessment (BAM Stage 1)

Part 1 of this BDAR 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 3 outlines the landscape features and overall landscape context of relevance to the subject land and wider study area.

As stated in Section 1.1, the ‘subject land’ only relates to the portions of the ‘study area’ area which will be impacted by the proposed development (Figure 2 and Figure 3).

Table 3. 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 one Mitchell Landscape: Canberra Plains .	Figure 1
Rivers, streams and estuaries (Strahler ²⁷ stream order)	<p>The subject land does not contain any tributaries or well-formed drainage lines. The wider study area supports two 1st order tributaries (defined based on the NSW LPI Hydrology Map and as per Appendix 3 of the BAM) which join Jerrabomberra Creek immediately to the south, and one 2nd order drainage line that terminates in the south-east of the study area.</p> <p>The tributaries were dry at the time of survey and are only likely to convey water following substantial rain events. The riparian vegetation in the study area is dominated by exotic grasses along the wet, low-lying areas bordering the drainage line in the south-east. The lack of native riparian vegetation indicates that the tributaries and drainage line are unlikely to provide habitat of significance to aquatic/riparian flora or fauna.</p> <p>There are eight small to moderately sized dams in the study area, one of which occurs in the subject land. All of the dams held a small to moderate amount water at the time of survey, and the two dams that occur along the drainage line in the south-east of the study area are fringed by largely exotic vegetation. The dams in the study area are only likely to be of limited value to the common native water birds, reptiles, and amphibians which occur in the locality.</p>	Figure 4 Figure 6
Wetlands (important wetlands)	The study area does not contain any important wetlands as listed in the Directory of Important Wetlands in Australia (DIWA) or coastal wetlands protected under <i>State Environmental Planning Policy No 14</i> .	-

²⁷ Strahler, AN (1952). *Hypsometric (area-altitude) analysis of erosional topology*. Geological Society of America Bulletin 63 (11): 1117–1142.

Landscape Feature	Description	Figure Reference
Connectivity	<p>Before European occupation, the study area would have been characterised by an open grassy woodland that merges with grassland lower in the landscape to the west. However, the study area has been substantially modified by its current and past land use, which has primarily been grazing (sheep and cattle). Approximately 97% of the original woody vegetation (canopy, midstorey, and shrubstorey) has been historically cleared across the study area to promote the pastoral productivity of the land. The areas which retain some of the original canopy occur as isolated paddock trees or small, scattered patches of vegetation. The majority of the study area has been historically pasture improved and is dominated by exotic pasture grasses (especially Phalaris) and a variety of weeds. There is a severe infestation of Serrated Tussock in the low-lying land in the south-western corner of the study area.</p> <p>Some portions of the groundstorey across the study area have a dominance of native grasses and forbs; these areas are largely restricted to the northern section of the study area, the northern boundary of the southern section, and the south-western corner of the southern section. However, the prolonged period of stock grazing combined with historic pasture improvement has largely depleted the native species diversity in the groundstorey across these areas.</p> <p>The riparian vegetation in the study area is dominated by exotic pasture grasses along the wet, low-lying areas bordering the drainage line in the south-east. The lack of native riparian vegetation indicates that the tributary and drainage line are unlikely to provide habitat of significance to aquatic/riparian flora or fauna.</p> <p>The majority of the vegetation in the study area is therefore characterised by an absent or low-density canopy of mature remnant eucalypts, an absent midstorey and shrubstorey, and a low diversity groundstorey dominated by disturbance tolerant native species or exotic grasses and weeds.</p> <p>Finally, the study area is bordered to the east and south-east by urban development, to the south by Jerrabomberra Creek, and to the north and west by relatively intact grassland and woodland vegetation (i.e. the BioBanking Sites).</p> <p>In light of the above, while the remnant trees and native and exotic pasture in the study area are likely to be of some habitat value to a variety of native fauna, the study area is unlikely to constitute or comprise part of an important biodiversity corridor or other notable habitat connectivity feature. This is supported by the fact that the study area does not contain 'Local Links' or 'Regional Linkage Value' on the ACT Government's ACTmap²⁸.</p>	Figure 5 Figure 6
Areas of geological significance and soil hazard	The study area 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 study area does not support or occur near any declared area of outstanding biodiversity value (AOBV).	-

²⁸ <http://app.actmap.act.gov.au/actmap/index.html?viewer=ssvcrct>

Landscape Feature	Description	Figure Reference
Percent native vegetation cover (buffer area)	<p>A 1,500 m buffer was applied to the study area resulting in an overall buffer area of 1,358 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.</p> <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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). <p>Native vegetation cover was first identified and mapped via interpretation of the available aerial imagery (ACT Government aerial imagery and NSW LPI) and publicly available spatial datasets (ACTmap²⁹). The presence of remnant canopy trees, cultivation 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.</p> <ol style="list-style-type: none"> 1. Woody vegetation cover – 282 ha (21%) of the buffer area was determined to support native woody vegetation cover. 2. Non-woody vegetation cover – 257 ha (19%) of the buffer area was determined to support native non-woody vegetation cover. <p style="text-align: center;">↓</p> <p>Total native vegetation cover – the total area of native vegetation cover in the buffer area is 539 ha (40%). This falls into the >30–70% cover class in the BAM Calculator.</p>	Figure 5

²⁹ <http://app.actmap.act.gov.au/actmap/index.html?viewer=ssvcrt>

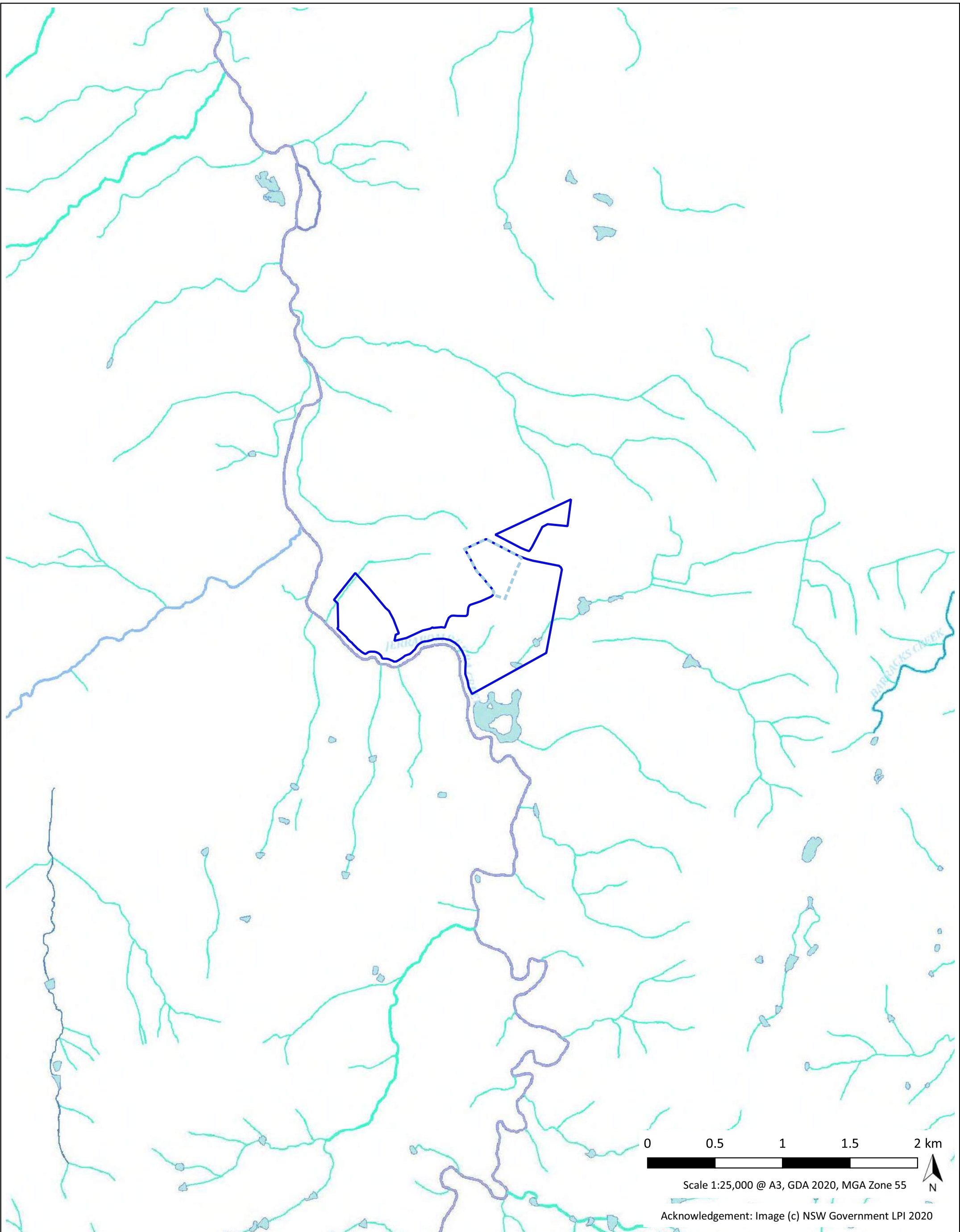


Figure 4. Hydrology

Legend

- Study Area
- Subject Land - Stage 1



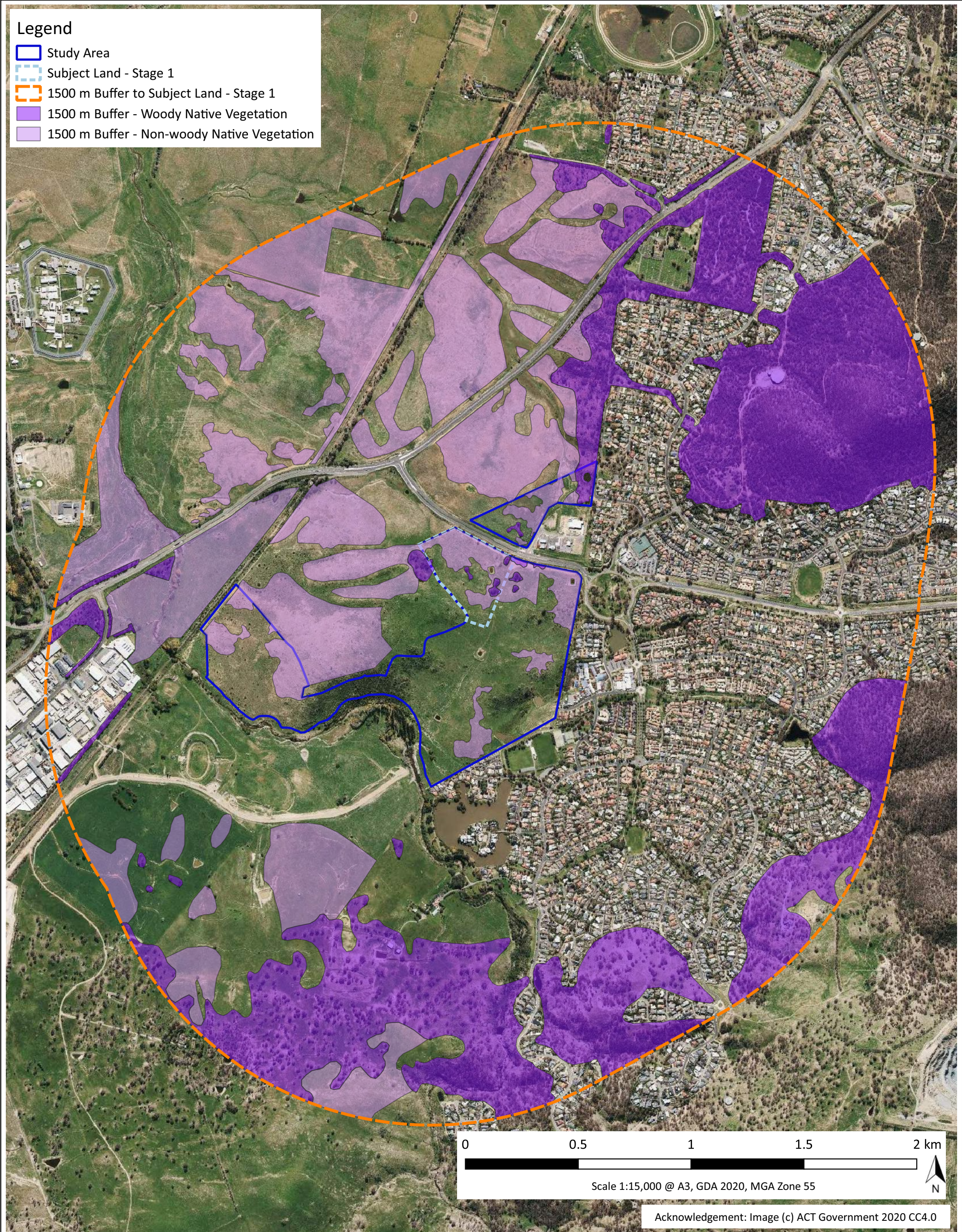


Figure 5. Site Map

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^{30,31}, ACT Government³², and previous NSW Government³³ 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 the former NSW Office of Environment and Heritage have advised (Tobi Edmonds pers. comm., September 2018) was 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 BDAR (and the supporting BAM assessment):

1. ‘Native vegetation’ is defined as any plant, naturally occurring or planted, which is native to NSW.

³⁰ 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.

³¹ Commonwealth of Australia (2016). *Approved conservation advice for the Natural Temperate Grassland of the South Eastern Highlands (NTG–SEH) ecological community*.

³² ACT Government (2010). *Survey guidelines for determining lowland vegetation classification and condition in the ACT*. Environment and Sustainable Development Directorate – Conservation Planning and Research.

³³ NSW Government (2014). *BioBanking Assessment Methodology 2014*. NSW Government Office of Environment and Heritage.

2. Exotic vegetation is defined as any plant which is not native to NSW.
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 entirety of the study area was surveyed and mapped in accordance with the BAM. Vegetation survey dates and survey effort are detailed in Table 4. 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 for the presence/absence of habitat constraints and/or microhabitats for ecosystem credits species (Section 2.3.3) and species credit species (Section 2.3.4).

Table 4. Vegetation survey dates and survey effort.

Task	Method	Date	Personnel	Survey effort
PCT and Zone mapping	Random meander	27/09/2019	1 person	1 hour
		28/10/2019	1 person	8 hours
Vegetation assessment	BAM plot	05/11/2019	2 people	16 hours
Remnant tree survey	Tree assessment	05/11/2019	2 people	8 hours
		23/07/2020	2 people	2 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 study area 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 study area.

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 from NSW Government (2018³⁴), each BAM Plot involved:

- a. one 20 x 20 m (400 m²) plot, used to assess the composition and structure attributes;
- b. one 20 x 50 m plot (1,000 m²) plot, used to assess the function attributes; and
- c. five 1 m² 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 stated in Section 1.1, the 'subject land' only relates to the portions of the 'study area' area which will be impacted by the proposed development. BAM plot locations were spread throughout the entire study area (refer to Figure 6). The information collected during this process was subsequently used to determine the condition of the vegetation present in the subject land. This approach resulted in the assessment of a greater number of BAM plots than if the subject land were considered in isolation, the outcomes of which are a more thorough assessment of the condition of the vegetation in the subject land.

The number of BAM plots completed in each vegetation zone of the study area was determined as per the minimum required plot numbers specified in Table 4 of the BAM. As shown in Figure 6, a total of 16 plots were completed across seven vegetation zones.

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. PCT320 Zone 2 and PCT1334 Zone 5, Figure 6 and Figure 7). Surveying all zones ensured that the vegetation composition (including an accurate determination of BC Act native

³⁴ NSW Government (2018). *Biodiversity Assessment Method Operational Manual – Stage 1*. State of New South Wales and Office of Environment and Heritage.

vegetation presence/absence) and potential threatened species habitat were accurately assessed across all of the vegetation condition types present in the subject land and study area.

It is important to highlight that only those zones which occur in the subject land 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 2.2.4.4 and Section 3.2).

2.2.2.4 Remnant tree survey

All of the mature remnant trees (i.e. >20 cm DBH) present in the study area were assessed. During the tree assessment, all mature remnant trees were identified to species level and assessed for their value to native fauna. Particular attention was given to observations on the presence of stick nests, hollows, or fauna nesting in hollows. The location of each tree was recorded via hand-held GPS. Data collected for each tree are detailed in Appendix C and included:

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

The data collected during this process is also used to determine the number of hollow bearing trees in each vegetation zone.

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 2.3.4). 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 21). 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 5. Weather conditions for survey dates are detailed in Table 6. In total, the survey effort for this assessment totalled 126-person hours.

Table 5. Flora and fauna survey dates and survey effort.

Task	Method	Date	Personnel	Survey effort
Threatened flora survey	Transect Survey	28/10/2019	4 people	8 hours
	Survey of rocky areas	28/10/2019	4 people	28 hours
	Opportunistic observations	-	1-4 people	25 hours
Threatened bird survey	Area search	27/09/2019	1 person	0.33 hours
		17/10/2019	2 people	3 hours
		28/10/2019	1 person	2 hours
	Opportunistic observations	-	1-4 people	111 hours
Fauna nesting survey	Tree survey	05/11/2019	2 people	8 hours
		23/07/2019	2 people	2 hours

Task	Method	Date	Personnel	Survey effort
Striped Legless Lizard tile survey	10-week tile survey program	27/09/2019	2 people	4.5 hours
		03/10/2019	2 people	4.33 hours
		10/10/2019	2 people	4.33 hours
		17/10/2019	2 people	2.0 hours
		22/10/2019	2 people	2.33 hours
		28/10/2019	2 people	3.33 hours
		05/11/2019	2 people	2.0 hours
		13/11/2019	2 people	3.0 hours
		22/11/2019	2 people	3.0 hours
		29/11/2019	2 people	3.0 hours
Pink-tailed Legless Lizard survey	Rock turning survey	28/10/2019	4 people	28 hours
Golden Sun Moth survey	Random meander through likely habitat	30/10/2019	2 people	3.0 hours
		13/11/2019	2 people	7.0 hours
		22/11/2019	2 people	4.5 hours
		29/11/2019	2 people	3.33 hours

Table 6. Survey weather conditions (Canberra Airport, ACT).

Date	Temperature Min-Max	Wind @ 9am	Cloud (8 th)	Rain
27/09/2019	0.7 – 20.8°C	7 km/h	0	0 mm
03/10/2019	4.2 – 28.0°C	2 km/h	0	0 mm
10/10/2019	1.0 – 19.2°C	9 km/h	0	0 mm
17/10/2019	9.5 – 16.1°C	26 km/h	8	4.8 mm
22/10/2019	5.8 – 28.5°C	6 km/h	0	0 mm
28/10/2019	3.7 – 22.9°C	9 km/h	0	0 mm
30/10/2019	8.8 – 29.3°C	6 km/h	0	0 mm
05/11/2019	8.6 – 19.0°C	24 km/h	2	0.2 mm
13/11/2019	6.7 – 20.8°C	20 km/h	0	0 mm
22/11/2019	16.9 – 34.9°C	15 km/h	8	0 mm
29/11/2019	12.6 – 33.1°C	2 km/h	0	0 mm
23/07/2020	-3.1 – 11.8°C	4 km/h	8	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 2.3.4), 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.

Therefore, a targeted threatened flora transect survey was conducted across the portions of the subject land and wider study area identified as potentially supporting threatened flora species, these being the less disturbed portions of PCT1334 Zones 1 to 4 (Figure 9). The transect survey involved four ecologists walking multiple transects across the identified areas (totalling 8 hours of effective

survey effort), targeting threatened flora species. If detected, significant species identified were recorded via a GPS waypoint and, if a population, the population boundary was delineated via GPS.

In farmland which has been pasture improved, cultivated, and/or intensively grazed for a prolonged period, threatened flora are only likely to persist in those areas which are difficult to pasture improve/cultivate or which are subject to a low level of grazing pressure. Often, these areas are characterised by the presence of imbedded and/or loose surface rock. As such, targeted threatened flora surveys were conducted concurrently with Pink-tailed Legless Lizard surveys (Figure 9). These targeted searches involved one full day of surveys by four ecologists, totalling an additional 28 hours of effective survey effort.

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 study area was commenced during the preliminary field inspection (27 September 2019) and supplemented across all of the subsequent surveys undertaken until the final field survey (23 July 2020). 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 identified 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 2.3.4). Accordingly, targeted surveys are required to determine the species credit value of the subject land for these species.

Therefore, three targeted threatened bird surveys were conducted across the portions of the subject land and wider study area identified as potentially supporting threatened bird habitat, these being areas with a moderate to high canopy cover or dense cover of exotic shrubs (Figure 10). As described in Section 5 of DEC (2004³⁵), these surveys involved 'area searches' (Loyn 1986³⁶) to identify and record the terrestrial birds occurring in the study area (totalling 5.33 hours of effective survey effort). If detected, significant species identified were recorded via a GPS waypoint and notes were taken on any nesting/breeding activity.

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 study area was commenced during the preliminary field inspection (27 September 2019) and supplemented across all of the subsequent surveys undertaken until the final field survey (23 July 2020). This inventory is presented in Appendix C (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

³⁵ DEC (2004). *Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft)*. New South Wales Department of Environment and Conservation, Hurstville, NSW.

³⁶ Loyn, R.H. (1986). 'Birds in fragmented forests in Gippsland, Victoria'. In Keast, A., Recher, H.F., Ford, H. and Saunders, D. (eds.). *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 Fauna nesting survey

As mentioned in Section 2.2.2.4, all of the mature remnant trees (i.e. >20 cm DBH) present in the study area 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 study area.

Surveys were timed to coincide with the nesting period for the significant bird species with the potential to occur in the study area.

2.2.3.4 Striped Legless Lizard survey

The NSW Government has not developed survey guidelines for the Striped Legless Lizard. As such, a program of roof tile surveys was undertaken in accordance with both the Commonwealth Government survey guidelines (Commonwealth of Australia 2011³⁷) and the ACT Government survey guidelines (ACT Government 2015³⁸).

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 study area contains greater than 30 ha of potential habitat, 11 grids were established. Therefore, 550 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 study area 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 11).

Following a two week 'settling in' period, each tile was checked once per week for 10 weeks. Surveys commenced on 27 September 2019 and were completed on 29 November 2019. All tiles were checked between 0730 hrs and 1130 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.).

³⁷ 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.

³⁸ ACT Government (2015). *Survey Guidelines for Striped Legless Lizard*. Conservation, Planning and Research, Environment and Sustainable Development Directorate.

- 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.

2.2.3.5 Pink-tailed Legless Lizard survey

A targeted survey was completed on Monday 28 October 2019, a sunny day with minimum temperature of 3.7 °C and maximum of 22.9 °C (Bureau of Meteorology records for Canberra Airport). As search success appears to be greatest following substantial rain, the survey was timed to occur following the 23.7 mm of rain received across the locality over the preceding three weeks. These conditions were considered optimal for Pink-tailed Legless Lizard survey.

Prior to the on-ground surveys, Capital Ecology analysed 2018 and 2019 aerial imagery in order to identify areas of potential habitat (i.e. areas containing surface rock) across the study area. These areas are included in Figure 12.

As shown in Figure 12, each patch of potential Pink-tailed Legless Lizard habitat in the study area was surveyed for Pink-tailed Legless Lizard individuals. Approximately 28 person-hours were spent during the survey (four ecologists for approximately seven hours) and involved the following.

- Searches for Pink-tailed Legless Lizard individuals or sloughed skins by carefully turning rocks over and then placing them back into position.
- Turning a minimum of 500 rocks per patch (considered adequate for confirming occurrence at large sites based on averages for detection presented in Jones 1999³⁹), or until a Pink-tailed Legless Lizard was found and thus presence in the patch confirmed. Where it was not possible to turn 500 rocks because of a shortage of surface rock, all possible rocks were turned.

If discovered, each Pink-tailed Legless Lizard is classified as either an adult (≥ 12 cm total length), juvenile (≤ 12 cm total length), or sloughed skin, and the position recorded via a handheld GPS.

The above survey methodology is consistent with the Commonwealth Survey Guidelines⁴⁰.

³⁹ Jones, S.R. (1999). *Conservation biology of the pink-tailed worm lizard (Aprasia parapulchella)*. PhD thesis Applied Ecology research group, University of Canberra.

⁴⁰ Department of Sustainability Environment, Water, Population and Communities (2011). *Survey guidelines for Australia's threatened reptiles*. Commonwealth of Australia, Canberra.

2.2.3.6 Golden Sun Moth survey

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

- *Background Paper to EPBC Act Policy Statement 3.12 - Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana)*⁴¹; and
- the ACT Government Conservation Research Unit's survey guidelines (ACT Government 2014)⁴².

Each survey involved one to two ecologists walking transects approximately 50-100 m apart across the estimated extent of potential habitat (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 7. 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 study area. 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 study area 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.

⁴¹ 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.

⁴² ACT Government (2014). *Survey Guidelines for Golden Sun Moth*. Conservation, Planning and Research, Environment and Sustainable Development Directorate.

Table 7. Golden Sun Moth survey conditions.

Date: 30/10/2019 (Survey 1)				Observer/s: RES
Survey Site: The Poplars, Jerrabomberra, NSW				
Time	Air Temp.	Wind	Cloud cover	Other weather information
Start: 1250	26.9	13 W	6/8	Very Dry Conditions, warm and sunny.
Finish: 1415	27.6	11 NNW	6/8	
General site notes:				
Good conditions. Male GSM recorded flying in low - mod numbers. Males confirmed flying near Sutton (NSW) and at multiple locations in the ACT (via ACT GSM email forum).				
Date: 13/11/2019 (Survey 2)				Observer/s: ST, KL
Survey Site: The Poplars, Jerrabomberra, NSW				
Time	Air Temp.	Wind	Cloud cover	Other weather information
Start: 1030	14.1	15 N	Fine	Calm at start of survey. Wind increasing. Warm and sunny.
Finish: 1400	19.1	20 NW	Fine	
General site notes:				
Plenty of male and female GSM recorded, mostly spontaneously flying with some flushed. Some GSM looking old and damaged. Males confirmed flying near Sutton (NSW) and at multiple locations in the ACT (via ACT GSM email forum).				
Date: 22/11/2019 (Survey 3)				Observer/s: ST, JM
Survey Site: The Poplars, Jerrabomberra, NSW				
Time	Air Temp.	Wind	Cloud cover	Other weather information
Start: 1000	28.1	6 WSW	8/8	Wind increasing towards end of survey. Smoke haze.
Finish: 1215	31.5	30 N	8/8	
General site notes:				
Male GSM flushed and flying in low numbers. Few (5-10) recorded incidentally near entrance (SLL Grid 6). Males confirmed flying at multiple locations in the ACT (via ACT GSM email forum).				
Date: 29/11/2019 (Survey 4)				Observer/s: ST, JM
Survey Site: The Poplars, Jerrabomberra, NSW				
Time	Air Temp.	Wind	Cloud cover	Other weather information
Start: 0920	20.5	6 N	Fine	Very dry conditions. Smoke haze from North Black Range Fire.
Finish: 1100	26.9	13 NNE	Fine	
General site notes:				
Male GSM observed flying in low numbers. Males observed flying at Yarralumla Brickworks (ACT) and near Queanbeyan Nature Reserve (NSW).				

2.2.4 Vegetation survey and mapping results

2.2.4.1 Plant Community Type (PCT) mapping

Before European occupation, the whole of the study area would have been characterised by an open grassy woodland PCT (i.e. PCT1334), merging with grassland lower in the landscape to the west. (i.e. PCT320) (Figure 6, Table 8).

The study area has been substantially modified by its current and past land use, which has primarily been grazing (sheep and cattle). Approximately 97% of the original woody vegetation (canopy, midstorey, and shrubstorey) has been historically cleared across the study area to promote the pastoral productivity of the land. The areas which retain some of the original canopy occur as isolated paddock trees or small, scattered patches of vegetation. The majority of the study area has been historically pasture improved and is dominated by exotic pasture grasses (especially Phalaris) and a variety of weeds. There is a severe infestation of Serrated Tussock in the low-lying land in the south-western corner of the study area.

Some portions of the groundstorey across the study area have a dominance of native grasses and forbs; these areas are largely restricted to the northern section of the study area, the northern boundary of the southern section, and the south-western corner of the southern section. However, the prolonged period of stock grazing combined with historic pasture improvement has greatly depleted the native species diversity in the groundstorey across these areas.

The riparian vegetation in the study area is generally dominated by exotic pasture grasses along the wet, low-lying areas bordering the drainage line in the south-east.

The majority of the vegetation in the study area is therefore largely characterised by an absent or low-density canopy of mature remnant eucalypts, an absent midstorey and shrubstorey, and a low diversity groundstorey dominated by disturbance tolerant native species or exotic grasses and weeds.

Table 8. PCTs recorded in the study area.

PCT	PCT name	PCT description	Occurrence in study area	TEC status Commonwealth / NSW	PCT % cleared
320	Kangaroo Grass - Redleg Grass forb-rich temperate tussock grassland of the northern Monaro, ACT and upper Lachlan River regions of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	This PCT is characterised by a mid-height to tall tussock grassland dominated by a variety of native grasses (including Kangaroo Grass, Redleg Grass, Wallaby Grasses, and Speargrasses) and forbs. Shrubs are very sparse. Surrounding scattered trees include Yellow Box, Blakely's Red Gum, and Apple Box. It occurs on fertile brown to black loam or clay soils derived from fine-grained sedimentary, metamorphic, or volcanic substrates on gentle slopes and flats between 500 and 620 m. This PCT mainly occurs in the ACT and surrounding districts of NSW.	This PCT was mapped on the low-lying gently slopes and flats in the south-western corner of the study area	Not listed (NSW). Critically Endangered (Commonwealth) when occurring in a condition consistent with the listing criteria of the TEC.	96%

PCT	PCT name	PCT description	Occurrence in study area	TEC status Commonwealth / NSW	PCT % cleared
1334	Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion	This PCT occurs on valley flats, midslopes, and occasionally on crests. It is found in the Murrumbidgee River valley south of Royalla, the upper Shoalhaven River valley south of Bungonia, east of Queanbeyan, and south of Bungendore. It is characterised by an open woodland with a grassy groundlayer and sparse shrubstorey and midstorey. Dominant overstorey species include Yellow Box and Apple Box.	This PCT was mapped across the majority of the study area.	Critically Endangered (Commonwealth) and Endangered (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 9 to Table 10 and shown in Figure 6, PCT320 was determined to comprise the following two discernible vegetation zones.

- PCT320 Zone 1 – native dominant understorey with moderate to high diversity (NTG-SEH); and
- PCT320 Zone 2 – exotic dominant understorey with low diversity.

As detailed in Table 11 to Table 15 and shown in Figure 6, PCT1334 was determined to comprise the following five discernible vegetation zones.

- PCT1334 Zone 1 – mature canopy, regeneration, native dominant understorey with moderate to high diversity (EPBC Act and BC Act Box-Gum Woodland);
- PCT1334 Zone 2 – mature canopy, regeneration, native dominant understorey with low diversity (BC Act Box-Gum Woodland);
- PCT1334 Zone 3 – mature canopy, regeneration, exotic dominant understorey with low diversity (BC Act Box-Gum Woodland);
- PCT1334 Zone 4 – no canopy, native dominant understorey with low diversity (BC Act Box-Gum Woodland); and
- PCT1334 Zone 5 – no canopy, exotic dominant understorey with low diversity.

PCT320 Zone 1 and PCT1334 Zones 1 to 4 meet the definition of BC Act 'native vegetation'. PCT320 Zone 1 and PCT1334 Zones 1 and 2 do not occur in the subject land and so will not be impacted by the proposed development.

PCT320 Zone 2 and PCT1334 Zone 5 do not meet the definition of BC Act 'native vegetation' as they have a groundstorey clearly dominated by exotic grasses and forbs (i.e. > 65% perennial exotic) and

do not contain a cover of native trees and/or shrubs. PCT320 Zone 2 does not occur in the subject land and so will not be impacted by the proposed development. As per Chapter 5 of the BAM, PCT1334 Zone 5 does not require assessment to determine a vegetation integrity score unless it is determined to be threatened species habitat. As detailed in Table 21 and Section 2.3.4.2, PCT1334 Zone 5 is not identified as habitat for threatened species and therefore does not require assessment to determine a vegetation integrity score

As such, PCT1334 Zone 2 and Zone 3 are assessed to determine vegetation integrity scores and the impact associated with the proposed development.

2.2.4.3 Remnant Trees

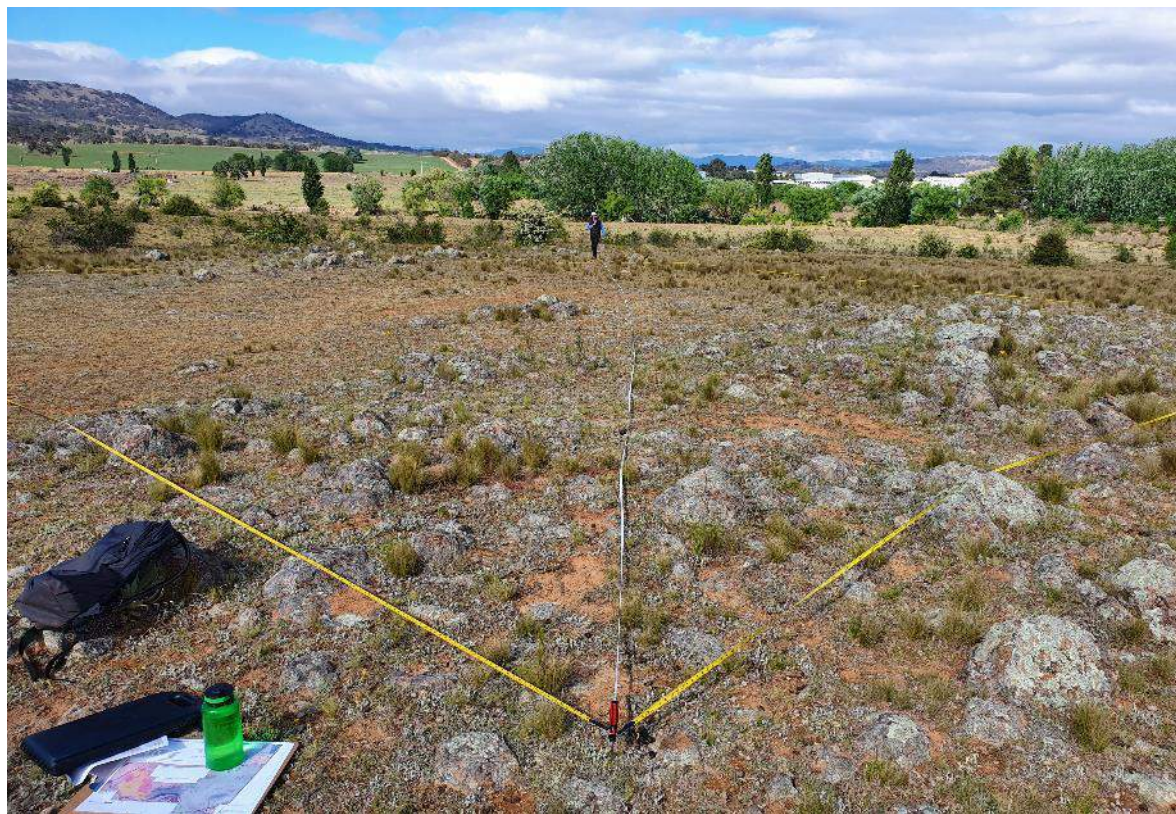
The study area supports 77 remnant trees in PCT1334 Zone 1 to Zone 3, 12 of which contain at least one functional hollow (Figure 6, Appendix C). As shown in Figure 6, 13 of those trees are approved to be removed by the development of Environa Drive.

The subject land itself supports 13 remnant trees in PCT1334 Zone 3, four of which contain at least one functional hollow. These 13 trees will be impacted by the proposed development.

No trees in the subject land or wider study area support large hollows greater than 20 cm.

Table 9. PCT320 Zone 1 results summary.

	PCT320 Zone 1
Description	<u>Natural Temperate Grassland of the South Eastern Highlands</u> Scattered patches of moderate to high diversity native grassland dominated by Wallaby Grasses <i>Rhytidosperma</i> spp., Red-leg Grass <i>Bothriochloa macra</i> , Kangaroo Grass <i>Themeda triandra</i> , Common Everlasting <i>Chrysocephalum apiculatum</i> , and a variety of native forbs. Moderate to high Serrated Tussock infestation and heavily grazed by Eastern Grey Kangaroo <i>Macropus giganteus</i> . This zone is restricted to the low-lying land in the south-eastern corner of the study area.
Area – study area	5.54 ha.
Area – subject land	0 ha.
Perennial Groundlayer	77% - 82% native.
Native Species Richness	9 - 23 total native species, 4 - 18 native non-grass species, 2 - 10 indicator species (as per Rehwinkel 2015 ⁴³).
Exotic Species Richness	7 - 9 total exotic species.
Significant Weeds	Sheep’s Sorrel <i>Acetosella vulgaris</i> , Saffron Thistle <i>Carthamus lanatus</i> , African Lovegrass <i>Eragrostis curvula</i> , St John’s Wort <i>Hypericum perforatum</i> , African Boxthorn <i>Lycium ferocissimum</i> , Serrated Tussock, and Briar Rose <i>Rosa rubiginosa</i> .
EPBC Act and/or BC Act listed TEC	Yes (EPBC Act).
BC Act Native Vegetation	Yes.



⁴³ Rehwinkel (2015). *A Revised Floristic Value Scoring Method to assess grassland condition, an addendum to Friends of Grasslands Forum Proceedings* (30 October – 1 November 2014).

Table 10. PCT320 Zone 2 results summary.

	PCT320 Zone 2
Description	<u>Exotic pasture – low diversity</u> Highly modified exotic pasture dominated by a near monoculture of Serrated Tussock. Lightly to moderately grazed by Eastern Grey Kangaroo. This zone is restricted to the low-lying land in the south-eastern corner of the study area.
Area – study area	14.18 ha.
Area – subject land	0 ha.
Perennial Groundlayer	6% - 33% native.
Native Species Richness	8 - 11 total native species, 4 - 8 native non-grass species, 0 - 2 indicator species (as per Rehwinkel 2015).
Exotic Species Richness	7 - 9 total exotic species.
Significant Weeds	Tree of Heaven <i>Ailanthus altissima</i> , Saffron Thistle, Common Hawthorn <i>Crataegus monogyna</i> , St John’s Wort, African Boxthorn, Serrated Tussock, Briar Rose, and Blackberry <i>Rubus fruticosus</i> .
EPBC Act and/or BC Act listed TEC	No.
BC Act Native Vegetation	No.

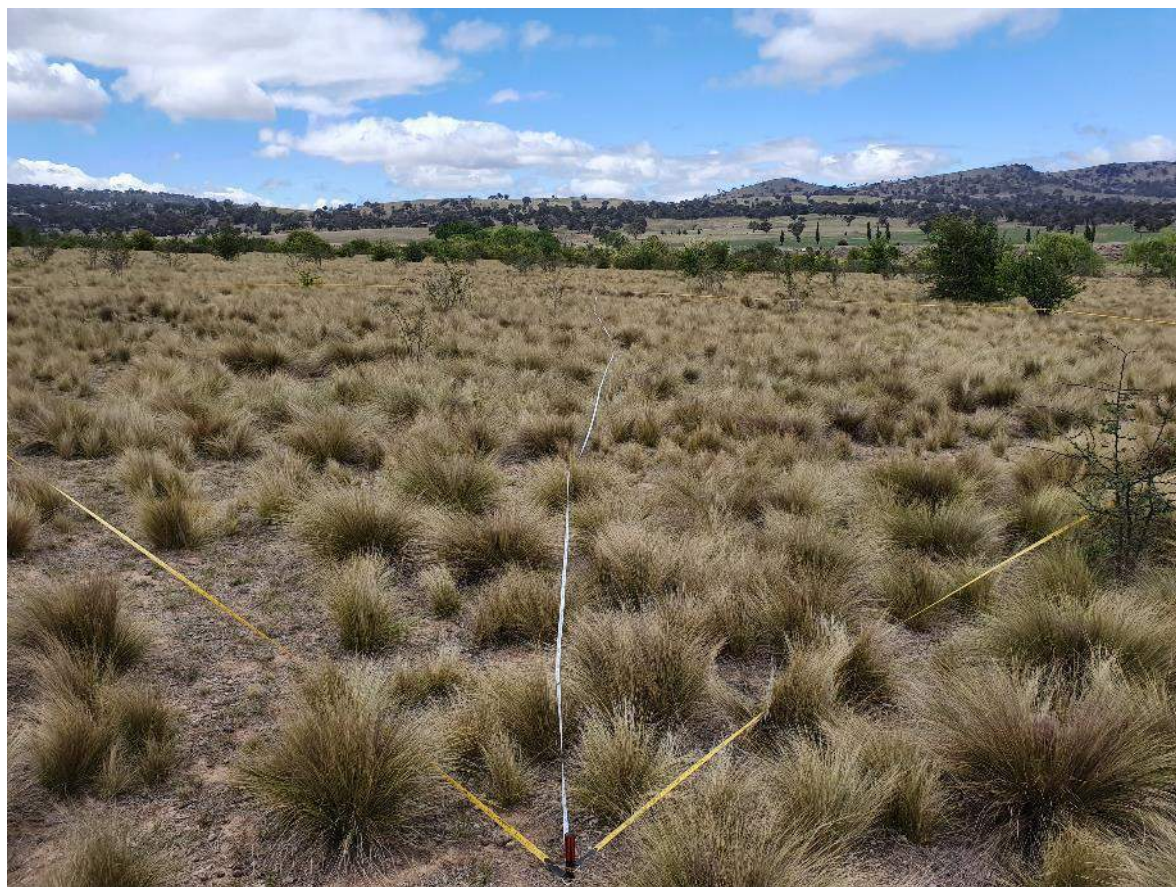


Table 11. PCT1334 Zone 1 results summary.

	PCT1334 Zone 1
Description	<p><u>Southern Tableland Grassy Woodland – Moderate to High Diversity</u> A small patch 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, including approximately 130 Hoary Sunray plants. Moderately grazed by Eastern Grey Kangaroos.</p> <p>This zone is restricted to the northern-most section of the study area adjoining the more intact vegetation retained within the Poplars North BioBanking Site.</p>
Area – study area	0.60 ha.
Area – subject land	0 ha.
BAM plots assessed	1.
Overstorey Species	Dominant = <i>E. blakelyi</i> . Associate = <i>E. melliodora</i> and <i>E. bridgesiana</i> .
Overstorey Cover	2%.
Overstorey Regeneration	Yes.
Perennial Groundlayer	92% native, with 19 native non-grass understorey species.
Significant Weeds	African Love Grass, 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 12. PCT1334 Zone 2 results summary.

PCT1334 Zone 2	
Description	<p><u>Southern Tableland Grassy Woodland – Low Diversity</u> Canopy with components of the climax community, but there is evidence of historic thinning and the midstorey and shrubstorey are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Tall Speargrass <i>Austrostipa bigeniculata</i>. Low to moderate density of significant weed species. Moderately grazed by Eastern Grey Kangaroos. This zone was restricted to a small patch of vegetation adjoining Tompsitt Drive which has subsequently been removed by the construction of Environa Drive (see Capital Ecology 2019).</p>
Area – study area	0.16 ha.
Area – subject land	0 ha.
BAM plots assessed	1.
Overstorey Species	Co-dominant = <i>E. blakelyi</i> and <i>E. melliodora</i> .
Overstorey Cover	25%.
Overstorey Regeneration	Yes.
Perennial Groundlayer	85% native, with 5 native non-grass understorey species.
Significant Weeds	African Boxthorn, Serrated Tussock, <i>Paspalum dilatatum</i> , and Briar Rose.
EPBC Act and/or BC Act listed TEC	Yes (BC Act).
BC Act Native Vegetation	Yes.



Table 13. PCT1334 Zone 3 results summary.

	PCT1334 Zone 3
Description	<u>Southern Tableland Grassy Woodland – Exotic Groundstorey</u> Canopy with the components of the climax community, but there is evidence of historic thinning and the midstorey and shrubstorey are absent. Low diversity exotic groundlayer dominated by a variety of exotic grasses, notably Phalaris. Moderate to high density of significant weed species. Lightly grazed by Eastern Grey Kangaroos.
Area – study area	1.45 ha.
Area – subject land	0.32 ha.
BAM plots assessed	1.
Overstorey Species	Co-dominant = <i>E. blakelyi</i> and <i>E. melliodora</i> . Associate = <i>E. bridgesiana</i> .
Overstorey Cover	20%.
Overstorey Regeneration	Yes.
Perennial Groundlayer	4% native, with 4 native non-grass understorey species.
Significant Weeds	Tall Flat-sedge <i>Cyperus eragrostis</i> , St John’s Wort, and Serrated Tussock.
EPBC Act and/or BC Act listed TEC	Yes (BC Act).
BC Act Native Vegetation	Yes.



Table 14. PCT1334 Zone 4 results summary.

PCT1334 Zone 4	
Description	<u>Southern Tableland Grassy Woodland – Low Diversity Derived Grassland</u> Overstorey and midstorey are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Tall Speargrass and Wallaby Grasses <i>Rhytidosperma</i> spp. Low to high density of significant weed species. Moderately to heavily grazed by Eastern Grey Kangaroos.
Area – study area	16.11 ha.
Area – subject land	4.58 ha.
BAM plots assessed	3.
Overstorey Species	None.
Overstorey Cover	0%.
Overstorey Regeneration	No.
Perennial Groundlayer	80% - 91% native, with 1 - 5 native non-grass understorey species.
Significant Weeds	Sheep’s Sorrel, Saffron Thistle, African Lovegrass, St John’s Wort, Serrated Tussock, Paspalum, and Briar Rose.
EPBC Act and/or BC Act listed TEC	Yes (BC Act).
BC Act Native Vegetation	Yes.

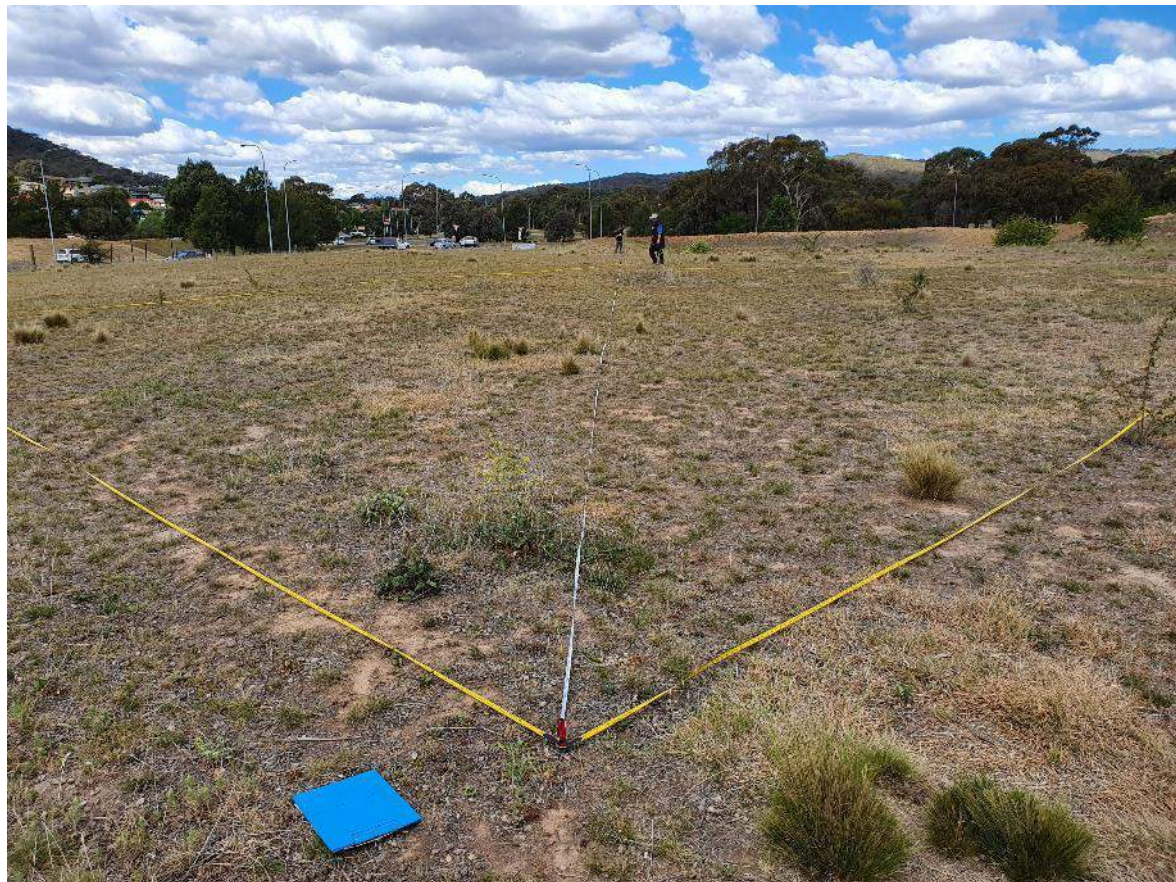
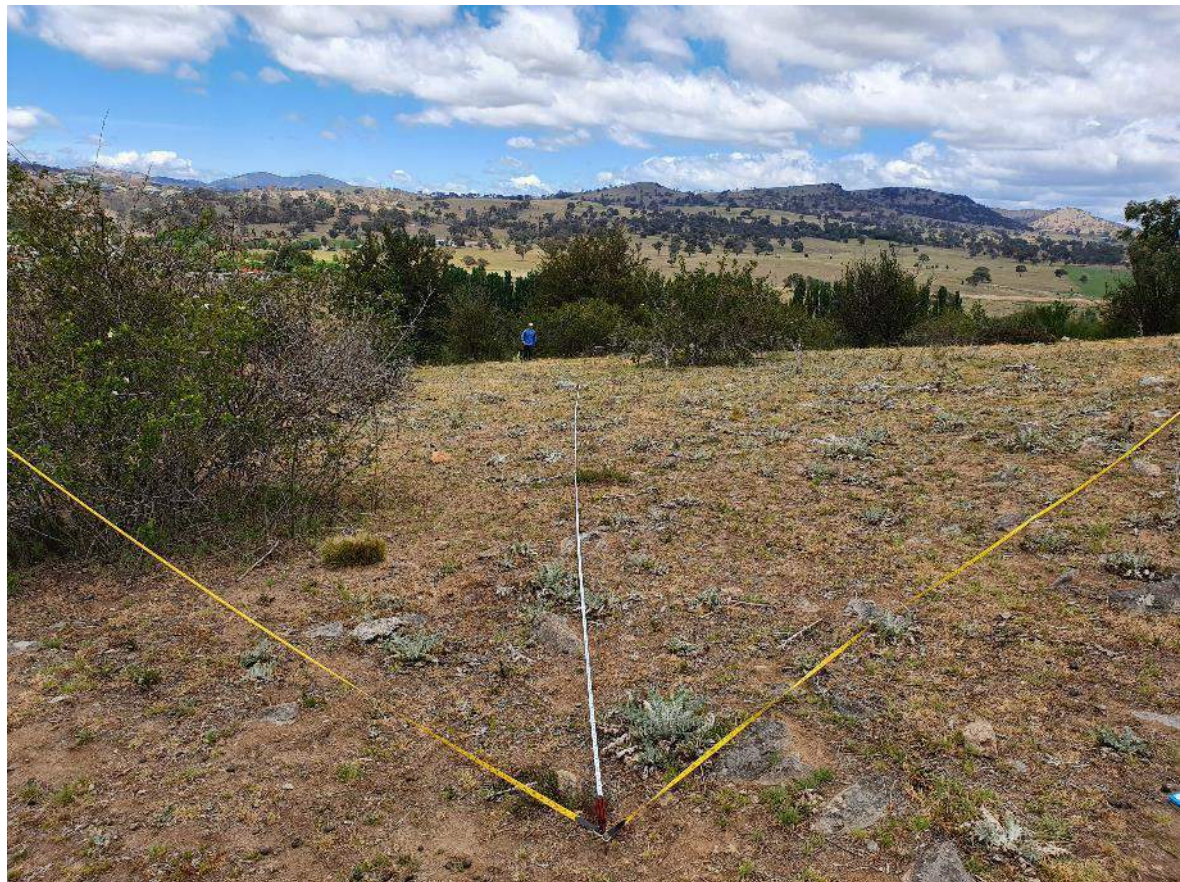


Table 15. PCT1334 Zone 5 results summary.

PCT1334 Zone 5	
Description	<u>Southern Tableland Grassy Woodland – Low Diversity Exotic Groundstorey</u> Overstorey and midstorey are absent. Low diversity exotic groundlayer dominated by a variety of exotic grasses, notably Phalaris. Evidence of historic cultivation and/or pasture improvement. High density of significant weed species. Lightly to highly grazed by Eastern Grey Kangaroos
Area – study area	48.28 ha.
Area – subject land	3.92 ha.
BAM plots assessed	4.
Overstorey Species	None.
Overstorey Cover	0%.
Overstorey Regeneration	No.
Perennial Groundlayer	0% - 14% native, with 1 - 5 native non-grass understorey species.
Significant Weeds	Sheep’s Sorrel, Saffron Thistle, African Lovegrass, St John’s Wort, Serrated Tussock, and Briar Rose.
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 $\leq 30m$ 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 PCT320 Zone 1, PCT1334 Zone 1, and PCT1334 Zone 2 meet the definition of ‘intact vegetation’. As shown in Figure 5, the intact native vegetation associated with PCT320 Zone 1 extends to the north for approximately 20 ha, and the intact native vegetation associated with PCT1334 Zone 1 extends to the north and then east of the subject land for > 100 ha. The intact native vegetation associated with PCT1334 Zone 2 does not extend outside the study area. As such, the patch size for this zone is defined by the largest patch that occurs in the study area, being 0.16 ha in size.

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

- PCT320 Zone 2 lacks a native groundstorey.
- PCT1334 Zone 3 lacks a midstorey, shrubstorey, and native groundstorey.
- PCT1334 Zone 4 lacks an overstorey, midstorey, shrubstorey, and regeneration of the overstorey.
- PCT1334 Zone 5 lacks an overstorey, midstorey, shrubstorey, regeneration of the overstorey, and native groundstorey.

2.2.4.5 Vegetation integrity scores

As stated in Section 1.1, the ‘subject land’ only relates to the portions of the ‘study area’ area 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 subject land 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 9 to Table 15 and shown in Figure 7, PCT320 Zone 1 and PCT1334 Zones 1 to 4 meet the definition of BC Act ‘native vegetation’. PCT320 Zone 1 and PCT1334 Zones 1 and 2 do not occur in the subject land and so will not be impacted by the proposed development.

PCT320 Zone 2 and PCT1334 Zone 5 do not meet the definition of BC Act ‘native vegetation’ as they have a groundstorey clearly dominated by exotic grasses and forbs (i.e. > 65% perennial exotic) and do not contain a cover of native trees and/or shrubs. In addition, PCT320 Zone 2 does not occur in the subject land and so will not be impacted by the proposed development. As per Chapter 5 of the BAM, PCT1334 Zone 5 does not require assessment to determine a vegetation integrity score unless it is determined to be threatened species habitat. As detailed in Table 21 and Section 2.3.4.2, PCT1334 Zone 5 is not identified as habitat for threatened species and therefore does not require assessment to determine a vegetation integrity score

As such, PCT1334 Zone 2 and Zone 3 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 PCT1334 Zone 3 and PCT1334 Zone 4.

Table 16. Vegetation integrity scores.

	PCT1334 Zone 3	PCT1334 Zone 4
PCT	1334	1334
Zone (condition class)	3	4
Native Canopy	Yes	No
Groundstorey	Exotic	Native
Native Diversity	Low	Low
Patch size (ha)	0	0
Area (ha) in the subject land	0.32	4.58
BAM plots assessed in the study area	1	3
Composition condition score	23.0	8.4
Structure condition score	29.6	46.8
Function condition score	41.0	1.5
Current vegetation integrity score	30.3	8.3

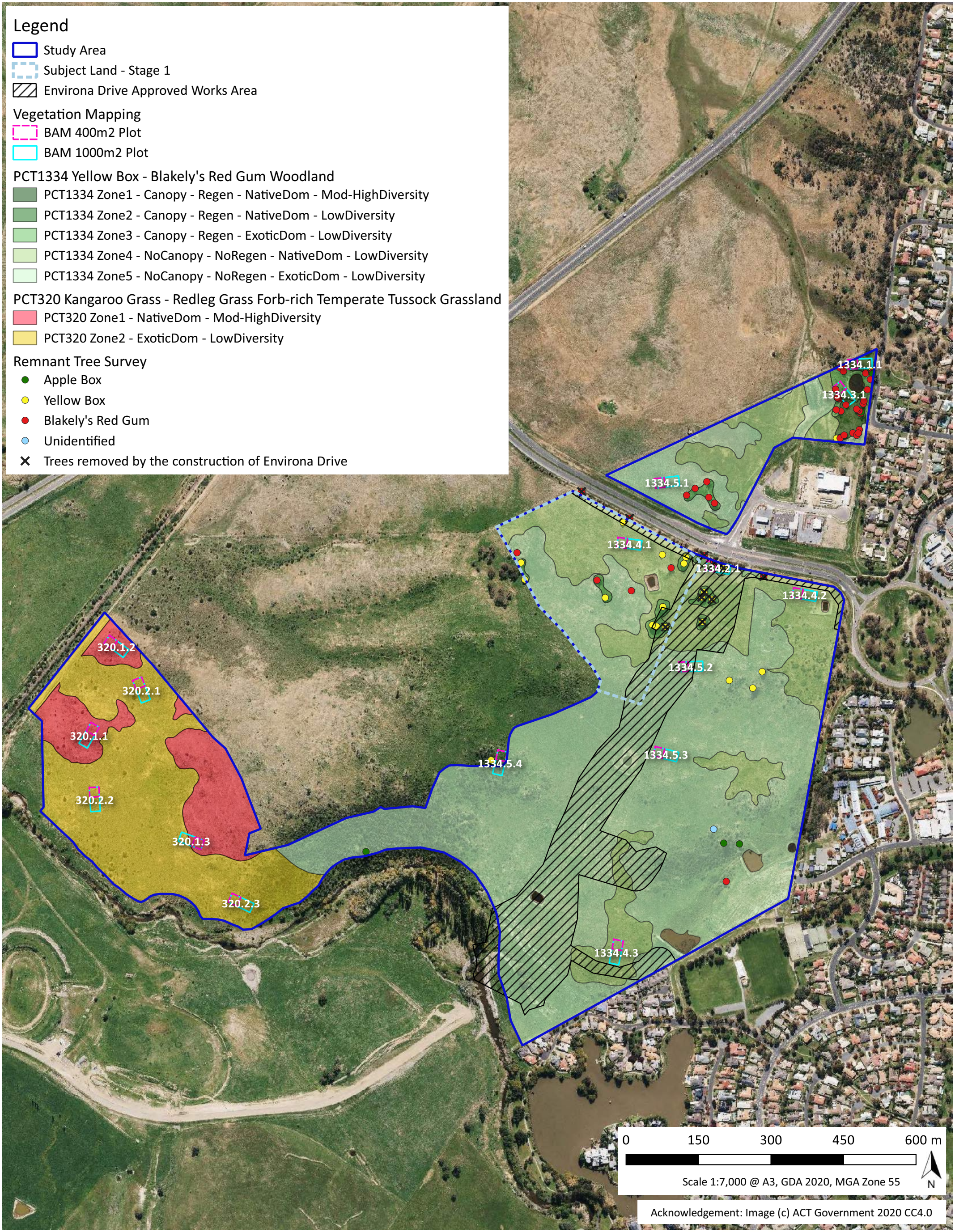


Figure 6. BAM Vegetation Mapping and Survey



Capital Ecology Project No: 2971
 Drawn by: S. Reid
 Date: 6 August 2020

Acknowledgement: Image (c) ACT Government 2020 CC4.0



Figure 7. BC Act Native Vegetation

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, both listed as critically endangered under the EPBC Act: 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).

Natural Temperate Grassland of the South Eastern Highlands – listed as critically endangered pursuant to the EPBC Act

Description – As detailed in Commonwealth of Australia (2016a⁴⁴), the Natural Temperate Grassland threatened ecological community is characterised by grassy vegetation dominated by moderately tall (25–50cm) to tall (50–100cm), dense to open tussock grasses in the genera *Austrodanthonia* (note: now *Rytidosperma*), *Austrostipa*, *Bothriochloa*, *Poa* and *Themeda*. Up to 70% of all plant species may be forbs. The community may be treeless or contain up to 10% cover of trees, shrubs or sedges.

The *Approved conservation advice for the Natural Temperate Grassland of the South Eastern Highlands (NTG–SEH) ecological community* (Commonwealth of Australia 2016a) provides the key diagnostic characteristics and condition thresholds for determining whether a patch is the listed community. A patch is the listed community, assessed via a standard sampling plot of 400 m² (i.e. 20x20 m), if it meets either of the following scenarios.

Scenario A – *The patch is characterised by at least 50 % foliage cover of the ground of either Themeda triandra, Poa labillardierei, or Carex bichenoviana.*

Scenario B – *When the cover of the grassland is not evidently dominated by the species highlighted under Scenario A:*

1. *The percentage cover of native vascular plants (including annual and perennial species) in the patch is greater than the percentage cover of perennial exotic species.*

And

2. *When assessed during favourable sampling times (i.e. spring-summer), the patch has:*

- *At least 8 non-grass native species*

OR

- *At least 2 indicator species*

OR

- *A floristic value score (FVS) of at least 5.*

Presence in the study area – Confirmed – The entire portion of the study area mapped as PCT320 would have once supported the climax community of this TEC.

PCT320 Zone 1 meets the listing criteria for NTG-SEH as it is characterised by a native groundstorey with moderate to high native forb diversity, supporting an average of 12.3 (range of 4 – 18) native

⁴⁴ Commonwealth of Australia (2016a). *Approved conservation advice for the Natural Temperate Grassland of the South Eastern Highlands (NTG–SEH) ecological community.*

non-grass species and 7 (range of 2 – 10) indicator species. PCT320 Zone 1 does not occur in the subject land and so will not be impacted by the proposed development.

PCT320 Zone 2 does not meet the listing criteria for NTG-SEH as it is characterised by a clearly exotic groundstorey (Table 10, Appendix B). PCT320 Zone 2 does not occur in the subject land and so will not be impacted by the proposed development

As such, while the wider study area supports Natural Temperate Grassland of the South Eastern Highlands in the areas defined by PCT320 Zone 1, the subject land does not.

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 study area – Confirmed – The entire portion of the study area mapped as PCT1334 would have once supported the climax community of this TEC.



Assessments of structure and floristic composition were undertaken in each of the five condition categories (Vegetation Zones) of PCT1334 present in the study area. 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 the Commonwealth EPBC Act Policy Statement 3.5 – White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands (Commonwealth of Australia 2006). The results of this assessment are provided in Table 17. As detailed in Table 17, the area mapped as PCT1334 Zone 1 meets the criteria for the EPBC Act listed TEC. However, PCT1334 Zone 1 does not occur in the subject land and so will not be impacted by the proposed development. PCT1334 Zones 2 to 5 do not meet the listing criteria.

As such, while the wider study area supports EPBC Act Box Gum Woodland in the areas defined by PCT1334 Zone 1, the subject land does not.

Conclusion

The subject land does not support either of the EPBC Act listed threatened ecological communities with the potential to occur in the locality.

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				
	PCT1334 Zone 1	PCT1334 Zone 2	PCT1334 Zone 3	PCT1334 Zone 4	PCT1334 Zone 5
1. <i>Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum?</i>	Yes Red Gum is dominant throughout this zone and Yellow Box occurs as an associated species.	Yes Yellow Box and Red Gum are co-dominant throughout this zone.	Yes Yellow Box and Red Gum are co-dominant throughout this zone.	Yes Yellow Box and Red Gum are expected to have been historically dominant or co-dominant throughout this zone.	Yes Yellow Box and Red Gum are expected to have been historically dominant or co-dominant throughout this zone.
2. <i>Does the patch have a predominantly native understorey?</i>	Yes The understorey was recorded as 92% native species cover.	Yes The understorey was recorded as 85% native species cover.	No The understorey was recorded as 4% native species cover.	Yes The understorey was recorded as ranging from 80% to 91% native species cover, with an average of 85%.	No The understorey was recorded as ranging from 0% to 14% native species cover, with an average of 4%.
3. <i>Is the patch 0.1 ha (1000 m²) or greater in size with 12 or more native understorey species present (excluding grasses)? There must be at least one important species.</i>	Yes The patch is greater than 0.1 ha in size and 19 native non-grass understorey species were recorded across the single plot.	No While the patch is greater than 0.1 ha in size, only 5 native non-grass understorey species were recorded across the single plot.	N/A Refer Criterion 2 results.	No While the patch is greater than 0.1 ha in size, only 5 native non-grass understorey species were recorded across the single plot.	N/A Refer Criterion 2 results.
Or <i>Is the patch 2 ha or greater in size with an average of 20 or more mature trees per hectare, or is there natural regeneration⁴⁵ of the dominant overstorey eucalypts?</i>	Yes When directly adjoining intact Box-Gum Woodland outside the study area is also considered, the patch is greater than 2 ha and supports mature trees and natural regeneration of the overstorey.	No While the patch does support mature trees and natural regeneration of the overstorey, the patch is less than 2 ha in size.	N/A Refer Criterion 2 results.	No PCT1334 Zone 4 does not support mature trees or regeneration of the overstorey.	N/A Refer Criterion 2 results.
<i>Does the patch meet the criteria for the listed TEC?</i>	Yes	No	No	No	No

⁴⁵ 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 endangered in NSW, is described below, together with an assessment of its presence and condition in the subject land and wider study area.

The below description is extracted from the NSW *Final Determination for the TSC Act endangered listed ecological community White Box – Yellow Box – Blakely's Red Gum Woodland* (NSW Scientific Committee 2002, gazetted 15 March 2002⁴⁶).

White Box Yellow Box Blakely's Red Gum Woodland is found on relatively fertile soils on the tablelands and western slopes of NSW and generally occurs between the 400 and 800 mm isohyets extending from the western slopes, at an altitude of c. 170m to c. 1200 m, on the northern tablelands (Beadle 1981). The community occurs within the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands and NSW South Western Slopes Bioregions.

White Box Yellow Box Blakely's Red Gum Woodland includes those woodlands where the characteristic tree species include one or more of the following species in varying proportions and combinations - Eucalyptus albens (White Box), Eucalyptus melliodora (Yellow Box) or Eucalyptus blakelyi (Blakely's Red Gum). Grass and herbaceous species generally characterise the ground layer. In some locations, the tree overstorey may be absent as a result of past clearing or thinning and at these locations only an understorey may be present. Shrubs are generally sparse or absent, though they may be locally common.

Although the final determination does not provide specific listing criteria against which to assess a patch of vegetation, a useful key is provided in *Identification Guidelines for Endangered Ecological Communities – White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland)* (NPWS 2002⁴⁷), which draws its information from the final determination. As described in the final determination and the associated key, 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 study area – Confirmed – The entire portion of the study area mapped as PCT1334 would have once supported the climax community of this TEC. PCT1334 Zone 1 is characterised by a native overstorey with a moderate to high diversity native understorey, PCT1334 Zone 2 by a native overstorey with a low diversity native understorey, PCT1334 Zone 3 by a native overstorey with a low diversity exotic understorey, PCT1334 by no overstorey with a low diversity native understorey, and PCT1334 Zone 5 by no overstorey with a low diversity exotic understorey.

PCT1334 Zones 1, 2, 3, and 4 support vegetation which meets the criteria for this TEC under the BC Act. PCT1334 Zone 5 lacks a native overstorey and has a groundstorey that is highly modified and

⁴⁶ NSW Scientific Committee (2002). *Final Determination for the TSC Act endangered listed ecological community White Box – Yellow Box – Blakely's Red Gum Woodland*. Gazetted 15 March 2002.

⁴⁷ NSW Government (2002). *Identification Guidelines for Endangered Ecological Communities - White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland)*. NSW National Parks and Wildlife Service.

dominated by perennial exotic grasses and herbaceous weeds. As such, PCT1334 Zone 5 does not support vegetation which meets the criteria for this TEC under the BC Act.

PCT1334 Zones 1 and 2 do not occur in the subject land and so will not be impacted by the proposed development. As such, the portions of the subject land that support BC Act Box-Gum Woodland are defined by the extent of PCT1334 Zones 3 and 4.

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 within the study area.

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 2019⁴⁸).

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 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.

⁴⁸ 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.

Part 1 of the Final Determination provides a list of an assemblage of species characteristic of the Monaro Tableland CTGW.

Presence in the study area – Absent – The dominant tree species in the subject land and wider study area 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 PCT1334 Zone 3 and PCT1334 Zone 4. 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 14 high threat weeds that occur in the study area. Common Hawthorn, African Boxthorn, Briar Rose, and Serrated Tussock are very widespread and often occurred at high densities.

Table 18. High threat weeds.

Species Name	Common Name	Status
Trees		
<i>Ailanthus altissima</i>	Tree of Heaven	LM
<i>Salix</i> sp.	Willow	WoNS, LM/AP
Shrubs		
<i>Crataegus monogyna</i>	Common Hawthorn	-
<i>Lycium ferocissimum</i>	African Boxthorn	WoNS, AP
<i>Rosa rubiginosa</i>	Briar Rose	-
<i>Rubus fruticosus aggregate</i>	Blackberry	WoNS, LM/AP
Forb		
<i>Acetosella vulgaris</i>	Sheep's Sorrey	-
<i>Carthamus lanatus</i>	Saffron Thistle	-
<i>Cyperus Eragrostis</i>	Tall Flat-sedge	-
<i>Echium plantagineum</i>	Paterson's Curse	-
<i>Hypericum perforatum</i>	St John's Wort	LM
Grass		
<i>Eragrostis curvula</i>	African Lovegrass	AP
<i>Nassella trichotoma</i>	Serrated Tussock	WoNS, C
<i>Paspalum dilatatum</i>	Paspalum	-

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.

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 ecosystem credits species (Section 2.3.3) and species credit species (Section 2.3.4).

Table 19. Fauna habitat features.

Habitat Feature	Description	Relevant Native Fauna Species/Assemblages
Remnant eucalypts	<p>Historic clearing has removed approximately 97% of the native overstorey across the subject land and wider study area, and the remaining small patches of woodland have been historically thinned or occur as isolated paddock trees.</p> <p>However, the study area supports 77 remnant trees in PCT1334 Zone 1 to Zone 3, 12 of which contain at least one functional hollow (Figure 6, Appendix C). The subject land itself supports 13 remnant trees in PCT1334 Zone 3, four of which contain at least one functional hollow</p> <p>No trees in the subject land or wider study area support large hollows greater than 20 cm.</p>	<p>All remnant trees are likely to provide foraging resources for a variety of birds and marsupials when in flower, including threatened species.</p> <p>The hollow bearing remnant trees are likely to provide a nesting resource for birds, bats, and marsupials.</p>
Other native vegetation (i.e. native shrubs, grasses, and forbs)	<p>The midstorey and shrubstorey are almost entirely absent throughout the subject land and wider study area.</p> <p>Approximately half of the subject land supports native dominant grassy vegetation in the form of derived grassland. The value of these areas to native fauna, particularly threatened species, depends largely on the degree of modification.</p>	<p>The absent midstorey and shrubstorey are likely to limit the habitat value of the subject land and wider study area for some of the region's threatened and rare woodland birds, which generally prefer to inhabit woodland where such features are more intact.</p> <p>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 2.3.4.2, the areas of PCT1334 Zone 4 support habitat for the threatened Golden Sun Moth.</p> <p>Open areas are likely to provide a hunting resource for raptors and other predatory birds.</p>

Habitat Feature	Description	Relevant Native Fauna Species/Assemblages
Exotic pasture	Approximately half of the subject land supports a highly modified pasture dominated by exotic grasses and forbs (i.e. PCT1334 Zone 5).	The exotic dominant pasture would provide a foraging resource of limited value for common birds, reptiles, and herbivores. Open areas are likely to provide a hunting resource for raptors and other predatory birds.
Surface rocks and rocky outcrops	Loose surface rock and embedded rocky outcrops are scattered across a substantial portion of the subject land and wider study area.	The loose surface rock is likely to provide refuge and foraging habitat for common herpetofauna and invertebrates. In addition, as detailed in Section 2.3.4.2, the areas of PCT320 Zone 1 in the wider study area that contain loose surface rock support habitat for the threatened Pink-tailed Legless Lizard
Creeks, streams, dams	The subject land does not contain any tributaries or well-formed drainage lines. The wider study area supports two tributaries which joins Jerrabomberra Creek immediately to the south, and one drainage line that terminates in the south-east of the study area. The tributaries were dry at the time of survey and is only likely to convey water following substantial rain events. The riparian vegetation in the study area is generally dominated by exotic grasses along the wet, low-lying areas bordering the drainage line in the south-east. There are eight small to moderately sized dams in the study area, one of which occurs in the subject land. All of the dams held a small to moderate amount water at the time of survey, and the two dams that occur along the drainage line in the south-east of the study area are fringed by largely exotic vegetation.	The lack of reliable water flows and native riparian vegetation indicates that the tributaries and drainage line are unlikely to provide habitat of potential value to aquatic/riparian flora or fauna. The small to moderately sized 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 Data Collection

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 (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), and through the BAM Calculator. This information is used to assess the presence/absence of habitat constraints and/or microhabitats for species flagged by the BAM as ecosystem credits species (Section 2.3.3) and species credit species (Section 2.3.4).

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 the Environment's online EPBC Act Protected Matters Search Tool (PMST) on 9 July 2019 and updated on 10 July 2020; and
- ecological point data from the NSW Wildlife Atlas (BioNet), downloaded on 11 September 2019 and updated on 7 July 2020, 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 BDAR is listed under References.

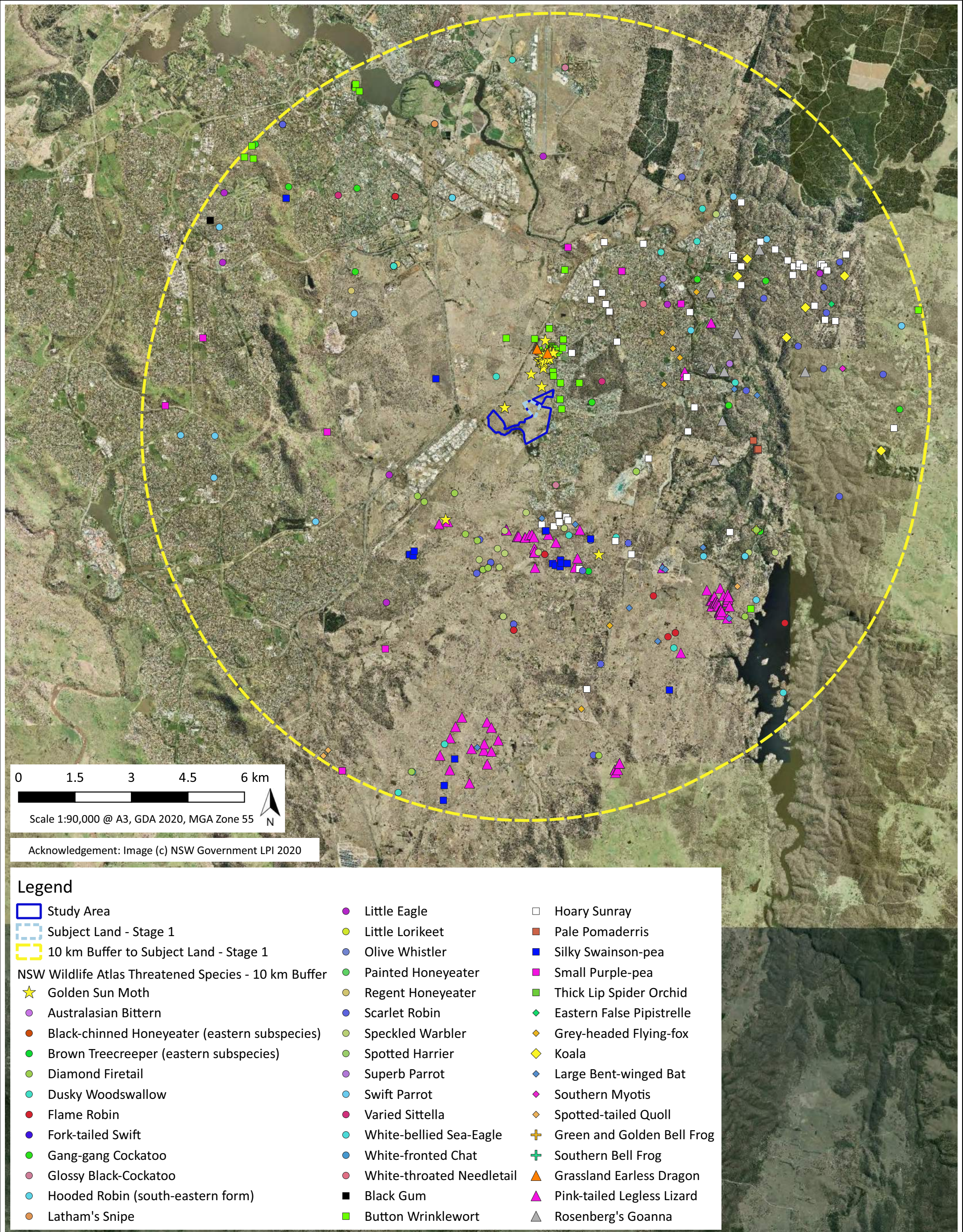


Figure 8. NSW Wildlife Atlas Threatened Species Search

2.3.3 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 20. 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 on 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 20. 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
<i>Anthochaera phrygia</i> Regent Honeyeater (Foraging)	Critically Endangered	Critically Endangered	Yes – assumed	-
<i>Artamus cyanopterus cyanopterus</i> Dusky Woodswallow	Vulnerable	-	Yes – confirmed See Section 1.2	-
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Foraging)	Vulnerable	-	Yes – confirmed See Section 1.2	-
<i>Chthonicola sagittata</i> Speckled Warbler	Vulnerable	-	Yes – confirmed See Section 1.2	-
<i>Circus assimilis</i> Spotted Harrier	Vulnerable	-	Yes – assumed	-
<i>Climacteris picumnus victoriae</i> Brown Treecreeper (eastern subspecies)	Vulnerable	-	Yes – assumed	-
<i>Daphoenositta chrysoptera</i> Varied Sittella	Vulnerable	-	Yes – confirmed See Section 1.2	-

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
<i>Dasyurus maculatus</i> Spotted-tailed Quoll	Vulnerable	Endangered	Yes – assumed	-
<i>Glossopsitta pusilla</i> Little Lorikeet	Vulnerable	-	Yes – assumed	-
<i>Grantiella picta</i> Painted Honeyeater	Vulnerable	Vulnerable	No – habitat constraint	<p>The BAM Calculator and TBDC lists the following habitat constraint:</p> <ul style="list-style-type: none"> Mistletoes present at a density of greater than five mistletoes per hectare. <p>A small number of mistletoes were recorded in the wider study area (far less than five per hectare) and no mistletoes were recorded in the subject land (Appendix C). As such, the absence of this habitat constraint removes this species as an ecosystem credit species.</p>
<i>Hieraetus morphnoides</i> Little Eagle (Foraging)	Vulnerable	-	Yes – confirmed See Section 1.2	-
<i>Lophoictinia isura</i> Square-tailed Kite (Foraging)	Vulnerable	-	Yes – assumed	-
<i>Melanodryas cucullata cucullata</i> Hooded Robin (south-eastern form)	Vulnerable	-	Yes – assumed	-
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat (Foraging)	Vulnerable	-	Yes – assumed	-
<i>Neophema pulchella</i> Turquoise Parrot	Vulnerable	-	Yes – assumed	-

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
<i>Petroica boodang</i> Scarlet Robin	Vulnerable	-	Yes – confirmed See Section 1.2	-
<i>Petroica phoenicea</i> Flame Robin	Vulnerable	-	Yes – confirmed See Section 1.2	-
<i>Phascolarctos cinereus</i> Koala (Foraging)	Vulnerable	Vulnerable	Yes – assumed	-
<i>Stagonopleura guttata</i> Diamond Firetail	Vulnerable		Yes – confirmed See Section 1.2	-

2.3.4 Habitat suitability for species credit species

2.3.4.1 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 21. 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 2.3.4.2.

Table 21. 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
<i>Anthochaera phrygia</i> 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 subject land and wider study area are not identified as an 'important area' for Regent Honeyeater on the 'BAM – Important Areas' map ⁴⁹ . <u>Conclusion - the subject land lacks the breeding habitat constraints required for this species.</u>
<i>Aprasia parapulchella</i> 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 – surveyed	As detailed in Section 2.3.4.2, the species was detected in the wider study area in PCT320 Zone 1 during targeted surveys. However, the species was not detected in the subject land. These findings are consistent with previous ecological surveys across the study area and adjoining land, which recorded habitat for the species in the Poplars South BioBanking Site (see Section 1.2). <u>Conclusion - the subject land does not support habitat for this species.</u>
<i>Callocephalon fimbriatum</i> 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	The subject land and wider study area do not support tall mountain forests or woodlands, heavily timbered or mature wet sclerophyll forests, or old growth forest or woodland. In addition, the grassy woodland across the study area is heavily degraded as approximately 97% of the overstorey has been cleared and the midstorey and shrubstorey are almost entirely absent. Finally, targeted bird surveys were conducted across the subject land and wider study area in the patches of more intact woody vegetation, and remnant trees were assessed for the presence/absence of habitat features and for signs of fauna nesting in hollows (Figure 10). No Gang-gang Cockatoos were recorded in the subject land or study area and no sign of Gang-gang Cockatoos nesting in tree hollows was detected. <u>Conclusion - the species is considered unlikely to breed in the subject land.</u>

⁴⁹ 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
<i>Delma impar</i> 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 <i>Themeda triandra</i> , Speargrasses <i>Austrostipa</i> spp., Poa Tussocks <i>Poa</i> spp., and occasionally Wallaby Grasses <i>Rhytidosperra</i> 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 2.3.4.2, targeted surveys did not detect this species in the subject land or wider study area. This is consistent with previous targeted surveys for the species in “The Poplars” property (see Section 1.2). <u>Conclusion - the subject land does not support habitat for this species.</u>
<i>Hieraaetus morphnoides</i> Little Eagle (Breeding)	Vulnerable	-	This species occupies open eucalypts forest, woodland, or open woodland. Sheoak or <i>Acacia</i> 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 ‘ <i>Nest trees - live (occasionally dead) large old trees within vegetation</i> ’ as a breeding habitat constraint for this species.	No – surveyed	Targeted bird surveys were conducted across the subject land and wider study area in the patches of more intact woody vegetation, and remnant trees were assessed for the presence/absence of habitat features and for signs of fauna nesting in stick nests (Figure 10). No large stick nests or Little Eagles were recorded in the subject land or study area. <u>Conclusion - the species is considered unlikely to breed in the subject land.</u>
<i>Lophoictinia isura</i> 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 ‘ <i>nest trees</i> ’ as a breeding habitat constraint. The TBDC general notes state ‘ <i>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.</i> ’	No – surveyed	The study area does not contain timbered watercourses and the species has not been recorded within 10 km of the subject land (Figure 8). In addition, targeted bird surveys were conducted across the subject land and wider study area in the patches of more intact woody vegetation, and remnant trees were assessed for the presence/absence of habitat features and for signs of fauna nesting in stick nests (Figure 10). No large stick nests or Square-tailed Kites were recorded in the subject land or study area. <u>Conclusion - the species is considered unlikely to breed in the subject land.</u>
<i>Miniopterus orianae oceanensis</i> 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, ‘ <i>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.</i> ’	No – habitat constraint	The subject land does not contain potential breeding habitat (caves, tunnels, mines, culverts, etc.). <u>Conclusion – the subject land lacks the breeding habitat constraints required for this species.</u>

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
<i>Myotis macropus</i> 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 ⁵⁰), 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 constraints for this species.	No – habitat constraint, microhabitat features	There are no suitable major water bodies (i.e. medium to large permanent creeks, rivers, lakes, or other waterways with pools/stretches 3 m wide or greater) in the subject land and the species is not known to venture far from such habitat features. The subject land does not contain 'bridges, caves or artificial structures', and the grassy woodland across the study area is heavily degraded as approximately 97% of the overstorey has been cleared and the midstorey and shrubstorey are almost entirely absent (i.e. there are not areas that support 'dense foliage'). The subject land therefore lacks the required habitat constraints and microhabitat features required to support this species. <u>Conclusion - the species is considered unlikely to occur in the subject land.</u>
<i>Phascolarctos cinereus</i> 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, habitat degraded	The study area is isolated from the nearest areas of intact vegetation that contain Koala records by a number of major roads and expanses or urban development (see Figure 8). Approximately 97% of the subject land and wider study area has been historically cleared and the remaining vegetation is thinned, isolated, and fragmented (Figure 6). Despite being conspicuous when present, no Koalas or signs of Koala presence were detected during the surveys conducted for this BDAR, or by previous ecological surveys of "The Poplars" property (see Section 1.2). The degraded vegetation and lack of Koala observations indicates that the subject land could not be classified as 'important habitat' for breeding. <u>Conclusion - the species is considered unlikely to breed in the subject land.</u>
<i>Rutidosis leptorrhynchoides</i> Button Wrinklewort	Endangered	Endangered	This species occurs in Box-Gum Woodland, secondary grassland derived from Box-Gum Woodland, or in Natural Temperate Grassland. It often occurs in the ecotone between Box-Gum Woodland and Natural Temperate Grassland. The species grows on soils that are usually shallow, stony red-brown clay loams and tends to occupy areas where there is relatively less competition from herbaceous species (either due to the shallow nature of the soils, or at some sites due to the competitive effect of woodland trees). It exhibits an ability to colonise disturbed areas (e.g. vehicle tracks, bulldozer scrapings and areas of soil erosion). The species is apparently susceptible to grazing, being retained in only a small number of populations on roadsides, rail reserves, and other un-grazed or very lightly grazed sites. Some of the main threats to this species listed in the TBDC are: 1) loss and degradation of habitat and/or populations by intensification of grazing regimes; 2) loss and degradation of habitat and/or populations by invasion of weeds; and 3) increased competition from other native grassland species within the habitat because of adverse increases of biomass due to absence of fire or grazing and the resultant closing up of the inter-tussock spaces that this species requires.	No – surveyed, habitat degraded	Approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos. Finally, targeted threatened flora surveys through potential habitat did not detect the species (Figure 9), and, while the species is known to occur in the Poplars North BioBanking Site, the species has not been recorded in the study area by previous ecological surveys of "The Poplars" property (see Section 1.2). <u>Conclusion - the species is considered unlikely to occur in the subject land.</u>

⁵⁰ 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
<i>Swainsona recta</i> 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 <i>E. blakelyi</i> , Yellow Box <i>E. melliodora</i> , Candlebark Gum <i>E. rubida</i> , and Long-leaf Box <i>E. goniocalyx</i> . It grows in association with understorey dominants that include Kangaroo Grass <i>Themeda australis</i> , Poa tussocks <i>Poa</i> spp. and Speargrasses <i>Austrostipa</i> 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 – surveyed, habitat degraded	Approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos. Finally, targeted threatened flora surveys through potential habitat did not detect the species (Figure 9), and the species has not been recorded by previous ecological surveys of “The Poplars” property (see Section 1.2). <u>Conclusion - the subject land has been degraded to the extent that the species is considered unlikely to occur.</u>
<i>Swainsona sericea</i> Silky Swainson-pea	Vulnerable	-	This species is found in Natural Temperate Grassland and Snow Gum <i>Eucalyptus pauciflora</i> 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 <i>Callitris</i> 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.	No – surveyed, habitat degraded	Approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos. Finally, targeted threatened flora surveys through potential habitat did not detect the species (Figure 9), and the species has not been recorded by previous ecological surveys of “The Poplars” property (see Section 1.2). <u>Conclusion - the subject land has been degraded to the extent that the species is considered unlikely to occur.</u>
<i>Synemon plana</i> 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 <i>Rhytidosperma</i> 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 <i>Austrostipa</i> spp. or Kangaroo Grass <i>Themeda australis</i> . The TBDC lists ‘Wallaby grass <i>Rytidosperma</i> sp., Chilean needlegrass <i>Nassella nessiana</i> or Serrated Tussock <i>N. trichotoma</i> ’ as a habitat constraint, and the BAM Calculator lists ‘Not east of Lake George Escarpment or Great Dividing Range’ as a geographic limitation. 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 2.3.4.2, the species was detected in PCT1334 Zone 4 of the subject land during targeted surveys. <u>Conclusion - the subject land supports habitat for this species.</u>

2.3.4.2 BAM targeted survey results

As described in Table 21, targeted surveys were completed to confirm the occurrence and/or habitat potential for the species credit species flagged by the BAM as having the potential to occur in the relevant PCT of the subject land.

Threatened flora

As detailed in Table 21, all of the threatened flora species credit species flagged by the BAM are considered unlikely to occur in the subject land given that approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extended period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos.

Notwithstanding this, targeted threatened flora surveys were conducted across rocky areas and the less disturbed vegetation zones (Figure 9). A total of 105 flora species were recorded during field surveys, comprising 49 native species and 56 exotic species (Appendix B).

One EPBC Act listed threatened species, Hoary Sunray, was recorded in the northern-most corner of the study area (Figure 9). Approximately 130 plants were recorded in 700 m² of the relatively intact PCT1334 Zone 1 located immediately adjacent to the Poplars North BioBanking Site. The proposed development of the subject land will not impact PCT1334 Zone 1 and so will not impact the Hoary Sunray.

None of remaining threatened flora species credit species identified in Table 21 were recorded in the study area and none are considered likely to occur.

Threatened fauna

A total of 42 native fauna species were recorded during field surveys, comprising 31 bird species, 4 reptile species, 3 amphibian species, 3 mammal species, and 1 invertebrate species (Appendix D). Golden Sun Moth was the only threatened fauna species detected in the study area for this BDAR during field surveys (see below for further information).

Threatened birds

A total of 35 bird species were recorded across all surveys, comprising 31 native species and 4 exotic species (Appendix D). No threatened bird species were recorded.

As detailed in Section 1.2, while not detected during the current surveys, a number of threatened bird species have previously been recorded foraging in or immediately adjacent to "The Poplars" property, including Dusky Woodswallow, Gang-gang Cockatoo, Varied Sitella, Little Eagle, Scarlet Robin, Flame Robin, Speckled Warbler, Diamond Firetail, and the migratory White-throated Needletail and Rainbow Bee-eater. Apart from the migratory species (which are only likely to visit the study area and surrounds on a transitory basis) all of the above species are assumed to be present in the subject land as ecosystem credit species (Table 20).

None of the threatened candidate species credit species identified in Table 21 were, or have previously been, recorded nesting/breeding in the subject land or study area.

In light of the above, all of the threatened bird species credit species flagged by the BAM are considered unlikely to breed in the subject land or study area.

Striped Legless Lizard *Delma impar*

No Striped Legless Lizard individuals were recorded during the survey program between 27 September 2019 and 29 November 2019. All grids were placed in areas with suitable habitat characteristics, notably areas with a well-defined grass tussock structure (refer to Figure 11).

A number of non-target herpetofauna were observed during the survey program, including Rainbow Skink *Carlia tetradactyla*, Delicate Skink *Lampropholis delicata*, Common Dwarf Skink *Menetia greyii*, and Boulenger's Skink *Morethia boulengeri*. The full survey results are attached as Appendix E.

In light of the above, it is concluded that the subject land and wider study area do not support the Striped Legless Lizard.

Pink-tailed Legless Lizard *Aprasia parapulchella*

Across the 28 hours of survey effort, one Pink-tailed Legless Lizard sloughed skin was recorded in the south-western corner of the study area in a patch of PCT320 Zone 1 that supports a high cover of loose surface rock. No individuals or sloughed skins were recorded in the subject land or remainder of the study area.

Pink-tailed Worm-lizard habitat in the study area has therefore been estimated based on the portions of PCT320 Zone 1 that support loose surface rock. As shown in Figure 12, the study area is therefore estimated to support 3.30 ha of Pink-tailed Legless Lizard habitat, all of which occurs in the south-western corner of the study area. These findings are consistent with previous ecological surveys across the study area and adjoining land, which recorded habitat for the species in the south-western corner of the Poplars South BioBanking Site (see Section 1.2).

In light of the above, while the wider study area supports habitat for the Pink-tailed Legless Lizard, the subject land does not.

Golden Sun Moth *Synemon plana*

Surveys were conducted through all patches of suitable habitat during suitable survey conditions when Golden Sun Moth activity was confirmed at other ACT/NSW sites (Figure 13, Table 7).

A total of 188 Golden Sun Moths (23 females and 165 males) were recorded in the study area across the four surveys (Figure 13, Plate 1). Twenty (20) were recorded on 30 October 2019, 121 were recorded on 13 November 2019, 29 were recorded on 22 November 2019, and 18 were recorded on 29 November 2019.

As shown in Figure 13, Golden Sun Moths were recorded at low to moderate density across those zones with a native dominant groundstorey (i.e. PCT320 Zone 1 and PCT1334 Zones 1, 2, and 4). The exception to this is the patch of Golden Sun Moth habitat immediately to the east of Environa Drive, which supported a greater density of moths.

The areas of confirmed habitat are generally flat or gently sloping, dominated by a mix of Tall Speargrass and Wallaby Grasses, and contain low herbage mass and extensive patches of bare ground. With the exception of the three patches of habitat to the east of Environa Drive, all of the remaining patches of habitat are functionally connected to the 83.48 ha of known habitat outside of the study area (i.e. in the BioBanking Sites).

The extent of habitat in the study area is based on the extent of the zones that possess a native dominant groundstorey (i.e. PCT320 Zone 1 and PCT1334 Zones 1, 2, and 4). Following this method, the study area was assessed as supporting 22.40 ha of Golden Sun Moth habitat, 3.33 ha of which has been subsequently removed by the construction of Environa Drive. Of the remaining 19.07 ha of Golden Sun Moth habitat in the study area, 4.58 ha occurs in the subject land and will be impacted by the proposed development (Figure 13). This equates to an impact of 24% of the remaining habitat in the study area, and an impact of 5% when the 83.48 ha of habitat in the adjoining BioBanking Sites is also considered.



Plate 1. Female Golden Sun Moth recorded in the study area.

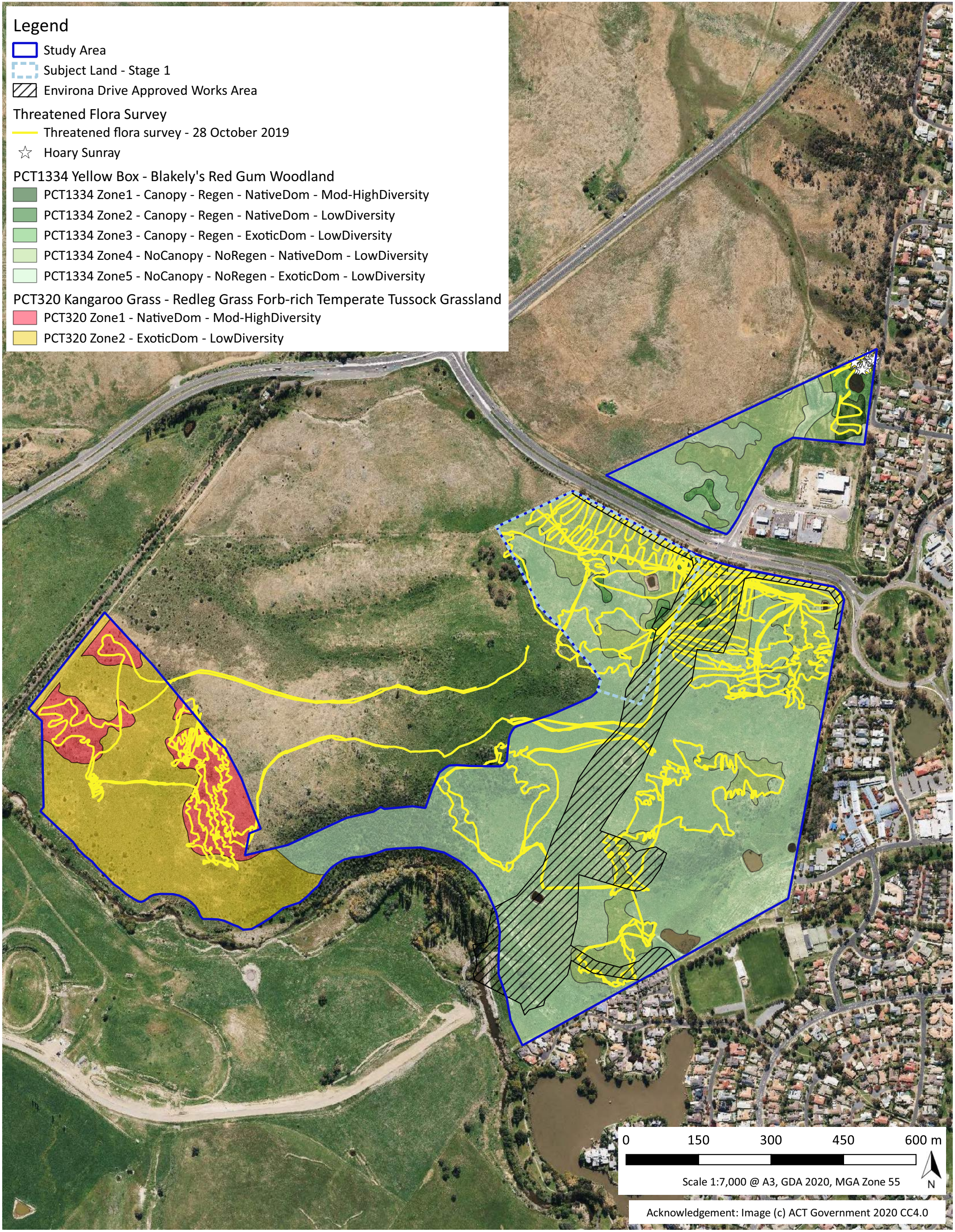


Figure 9. Threatened Flora Survey Results

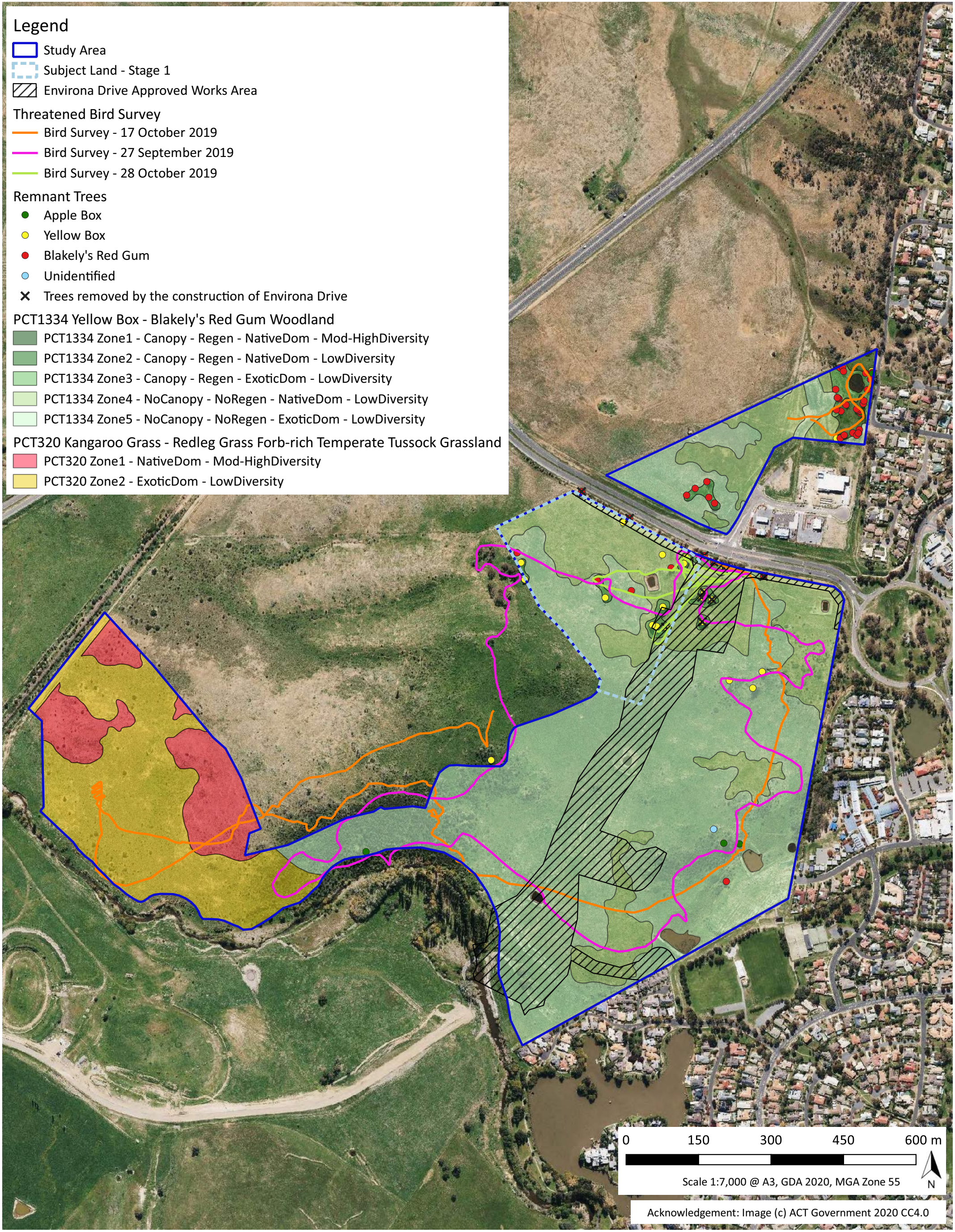


Figure 10. Threatened Bird Survey Results

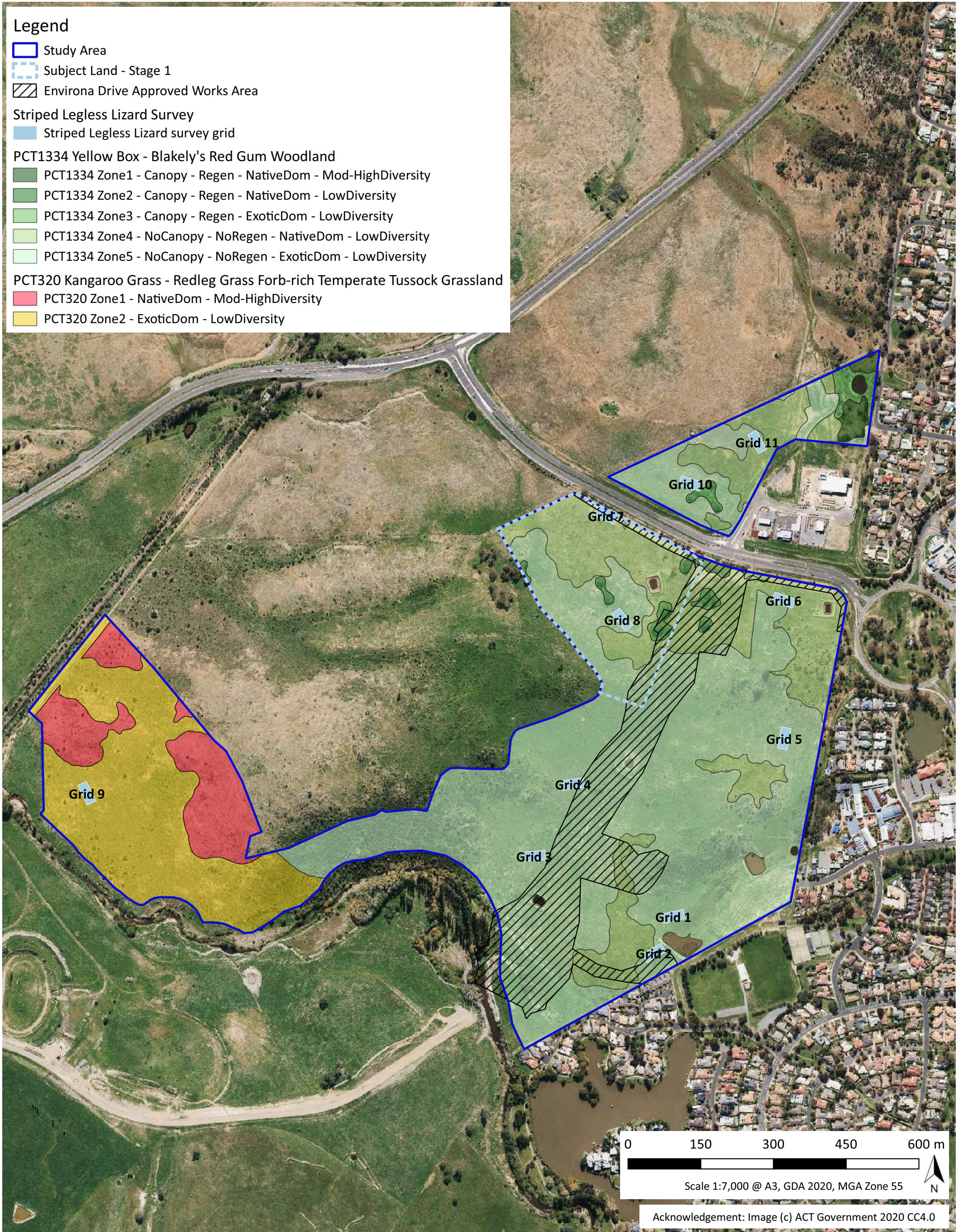
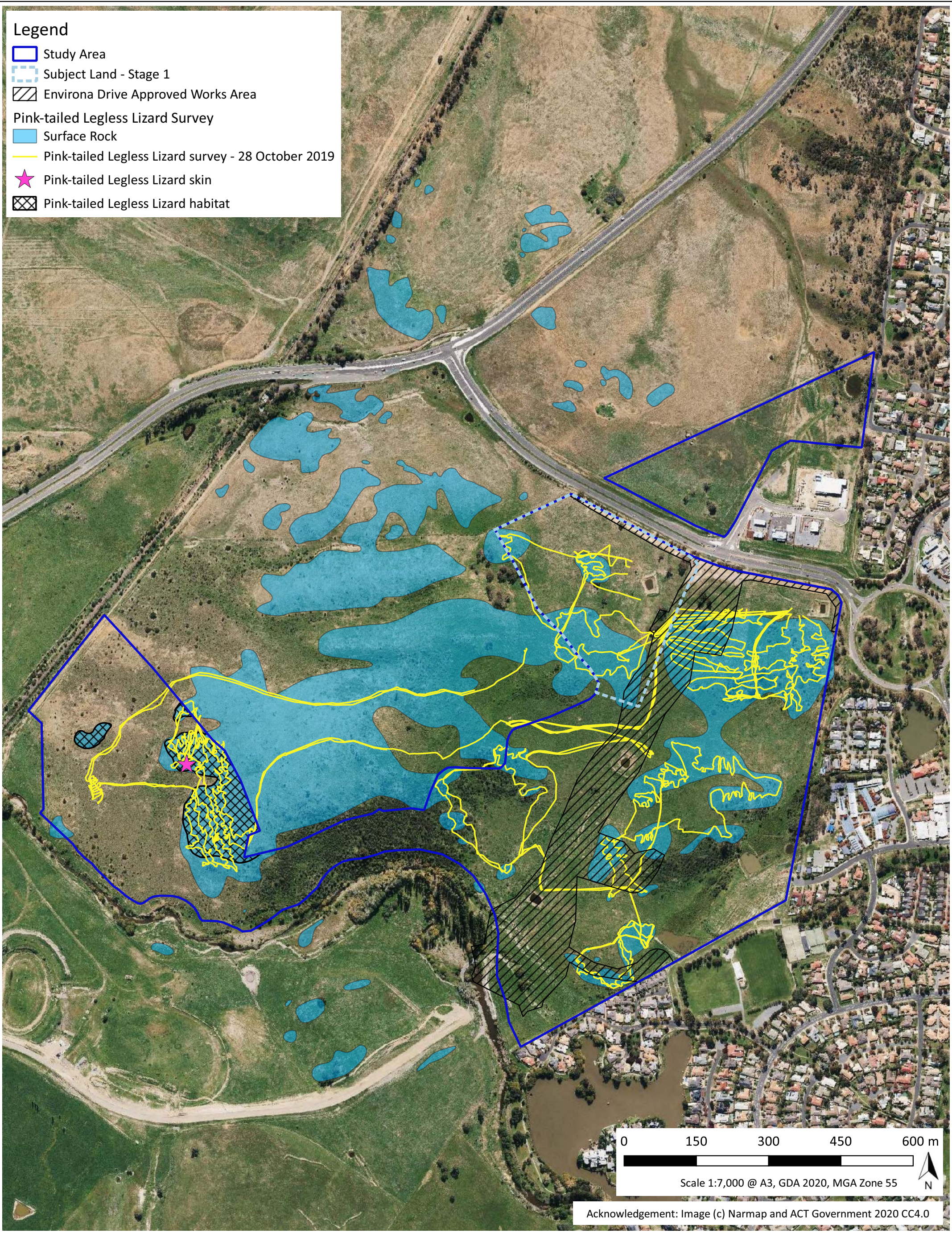


Figure 11. Striped Legless Lizard Survey Results



Legend

- Study Area
- Subject Land - Stage 1
- Environa Drive Approved Works Area
- Pink-tailed Legless Lizard Survey**
- Surface Rock
- Pink-tailed Legless Lizard survey - 28 October 2019
- ★ Pink-tailed Legless Lizard skin
- Pink-tailed Legless Lizard habitat

0 150 300 450 600 m
 Scale 1:7,000 @ A3, GDA 2020, MGA Zone 55

Acknowledgement: Image (c) Narmap and ACT Government 2020 CC4.0

Figure 12. Pink-tailed Legless Lizard Survey

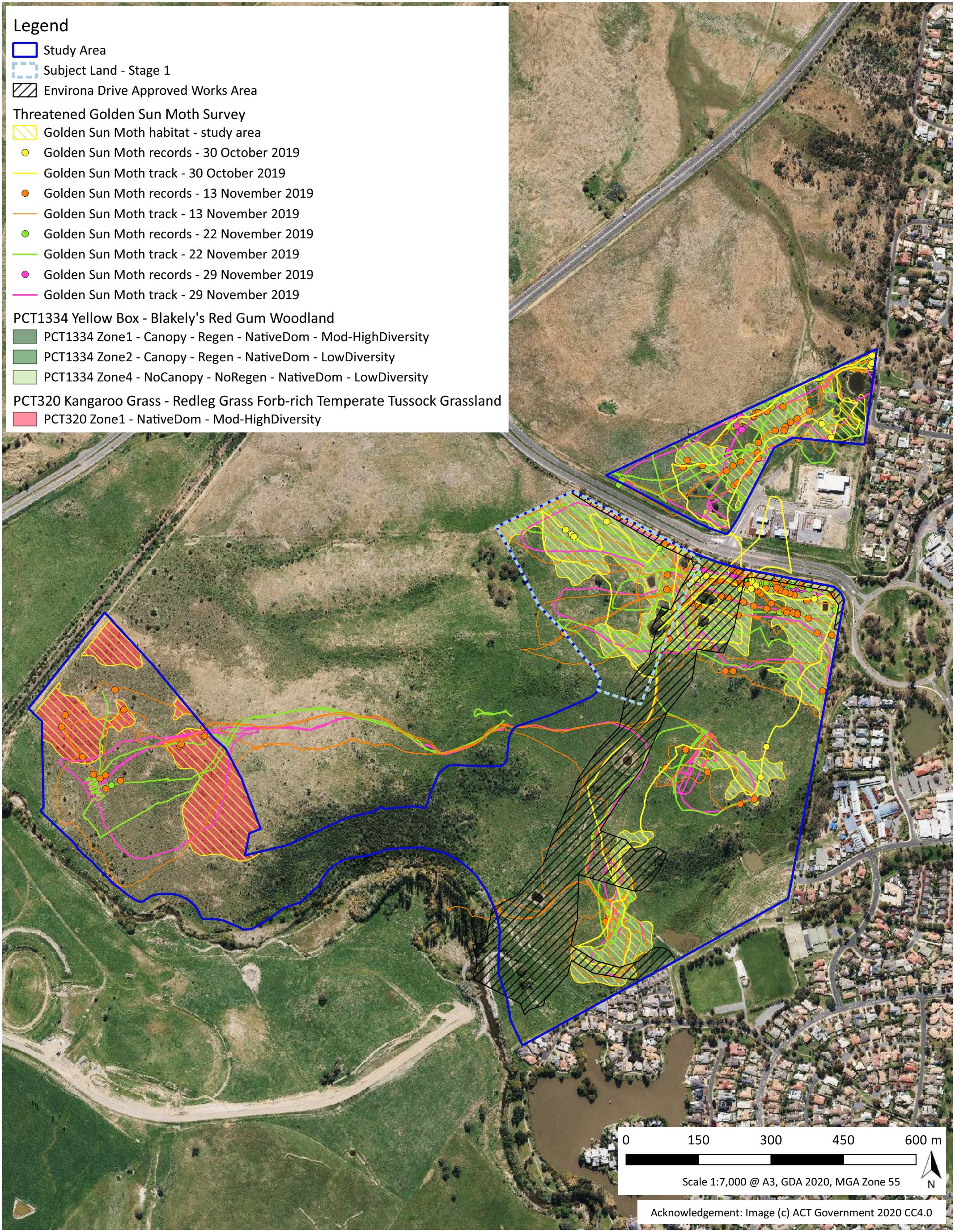


Figure 13. Golden Sun Moth Survey Results

3 Part 2 – Impact Assessment (BAM Stage 2)

Part 2 of this BDAR 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 project design of the proposed development

3.1.1 Location

3.1.1.1 Locating the project where there are low or no biodiversity values

As mentioned in Section 1.2, the ecological values of “The Poplars” property have been investigated since the early 1990s. One of the key outcomes of this work was the decision that any future development in “The Poplars” property would be designed around the existing ecological values of the land. As a result, the Poplars LEP allocated land to either conservation or development in a manner that protected the vast majority of the land supporting significant biodiversity conservation values. As shown in Figure 14, this land has since been formally conserved under two BioBanking Agreements.

The establishment of the ‘The Poplars North’ and ‘The Poplars South’ BioBanking Sites protects approximately 50% (98.46 ha) of “The Poplars” property, including the vast majority of the identified significant biodiversity values. Protected values include:

- 87.42 ha of grassland vegetation (i.e. MR631/PCT1202 and PC686/PCT1289), the majority of which is likely to meet the listing criteria for EPBC Act listed NTG-SEH;
- 10.65 ha of woodland vegetation (i.e. MR648/PCT1330), the majority of which is likely to meet the listing criteria for EPBC Act and/or BC Act listed Box-Gum Woodland;
- 83.48 ha of Golden Sun Moth habitat;
- 61.86 ha of Grassland Earless Dragon habitat; and
- 18.63 ha of Pink-tailed Legless Lizard habitat.

In addition, the BioBanking Sites protect habitat for threatened flora (i.e. Button Wrinklewort and Hoary Sunray), threatened birds (i.e. Dusky Woodswallow, Gang-gang Cockatoo, Varied Sitella, Little Eagle, Scarlet Robin, Flame Robin, Speckled Warbler, Diamond Firetail, and the migratory White-throated Needletail and Rainbow Bee-eater), and ACT listed and ‘rare and uncommon species’ (i.e. Perunga Grasshopper, Canberra Raspy Cricket, and Key’s Matchstick Grasshopper).

In contrast, approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5, Figure 14). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos.

When considered together, the vast majority of the land allocated for development across “The Poplars” property has therefore been located in areas that support very low or no biodiversity values.

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

As mentioned previously, the two BioBanking Sites protect the vast majority of higher quality vegetation (including EPBC Act listed NTG-SEH and Box-Gum Woodland) and threatened species habitat (including the majority of the Golden Sun Moth habitat, Pink-tailed Legless Lizard habitat, threatened flora habitat, and threatened woodland bird habitat, and all of the Grassland Earless Dragon habitat) that occurs across “The Poplars” property.

In contrast, approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5, Figure 14). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos.

In addition, while the proposed development of the subject land does impact 4.58 ha of Golden Sun Moth habitat, targeted surveys only recorded seven Golden Sun Moth individuals across this 4.58 ha (Figure 13). This equates to 1.5 individuals recorded per hectare. In contrast, 181 Golden Sun Moth individuals were recorded across the remaining 17.82 ha of Golden Sun Moth habitat in the wider study area. This equates to 10.2 individuals recorded per hectare. As described in Section 3.4, such a measure of relative abundance is one of the more appropriate descriptors of a Golden Sun Moth population. As such, the proposed development will impact a portion of the study area that supports lower quality Golden Sun Moth habitat.

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

3.1.2 Design

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

As mentioned in Section 1.2.1, the ‘The Poplars North’ and ‘The Poplars South’ are established as BioBanking Sites under BioBanking Agreements (Figure 14). These agreements provide a formal, legally binding, and audited conservation focussed management regime for the portions of “The Poplars” property recognised as supporting significant biodiversity values. These agreements also stipulate a wide variety of management activities that are designed to protect and enhance the significant biodiversity values that these areas support. These management activities include the following.

- Retention of remnant native vegetation, regrowth, dead timber, and rocks.
- Replanting or supplementary planting where natural regeneration will not be sufficient (Poplars South BioBanking Site only).
- An integrated weed management plan, including weed control, monitoring, and inspection of existing and new weeds.

- Control of feral and overabundant native herbivores using a variety of methods (e.g. biocontrol, baiting, warren destruction, fumigation, shooting, trapping, and harbour destruction), including monitoring and inspection requirements.
- Vertebrate pest management (foxes and other miscellaneous feral species) using a variety of methods (baiting, den destruction, shooting, and trapping), including monitoring and inspections of existing and new vertebrate pests.
- A fire management plan, including prescribed ecological burns if required.
- Stock are not permitted to graze in any area of the Biobank Sites.
- Erosion control.
- Management of site drainage from urban stormwater catchments.
- Management of human disturbance, including fencing (to deter human and vehicular access) and signage, and restrictions on permitted activities.
- Monitoring, reporting, and record keeping requirements, including:
 - site inspection and monitoring, recording ground cover, stock numbers, condition of fencing and gates, human disturbance, erosion, and waste;
 - annual reporting, detailing the completed management actions and the results of any monitoring, inspections, or survey; and
 - Record keeping, including photographs, management actions, inspections, monitoring, and surveys.
- Adaptive management, including a review of management plans every 4 to 6 years. This process considers the effectiveness of the matters contained in the current plan.

When considered together, the proposed development therefore includes provision for the demarcation, ecological restoration, rehabilitation, and ongoing maintenance of the retained native vegetation and habitat across “The Poplars” property.

3.1.2.2 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 urban and industrial 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 facility 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.

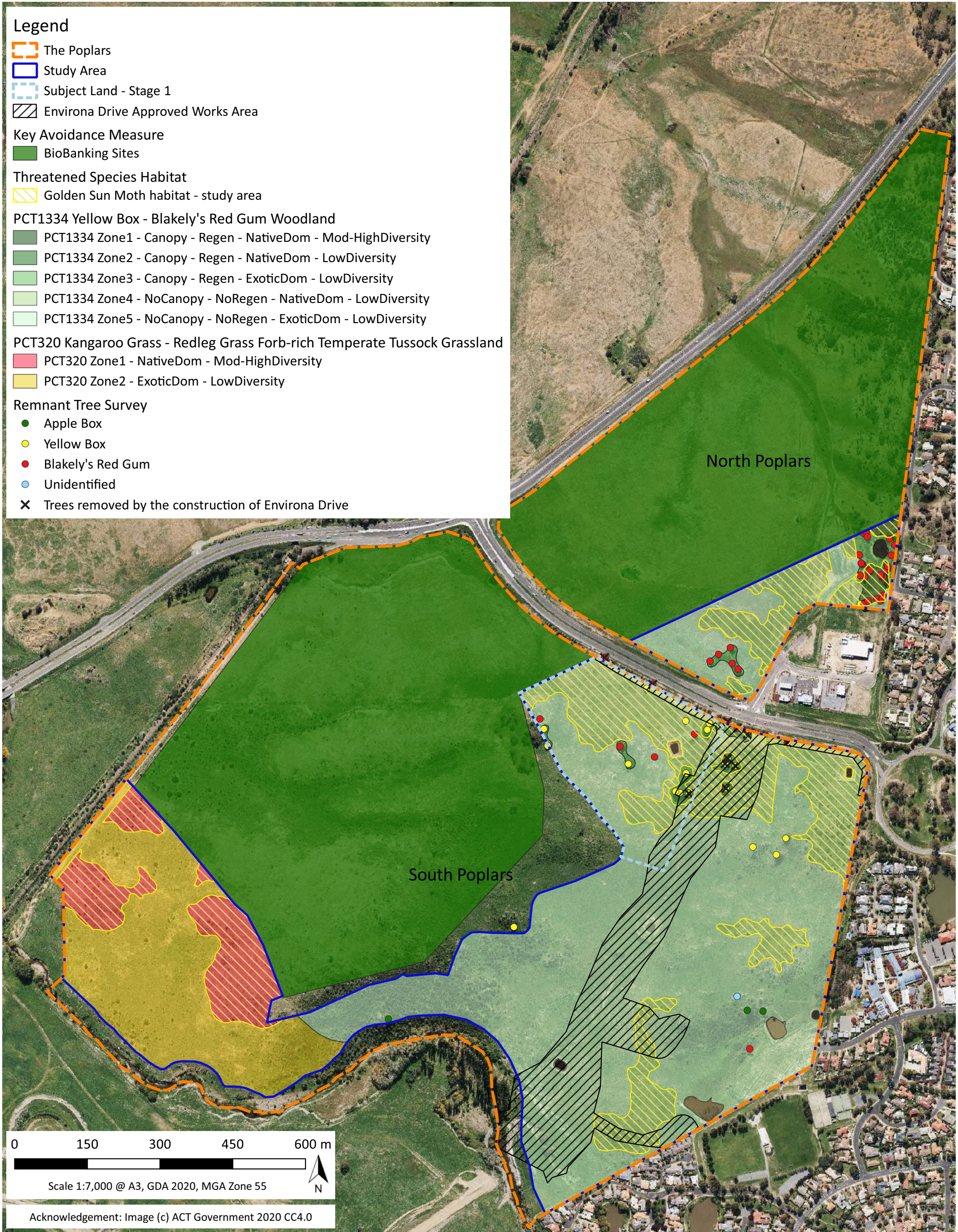


Figure 14. Avoidance, minimisation, and mitigation measures

3.2 Residual Biodiversity Impacts of the Proposed Development

3.2.1 Direct impacts on native vegetation and habitat

As shown in Figure 15, the proposed development will result in the clearance of:

- 0.32 ha of PCT1334 Zone 3 – mature canopy, regeneration, exotic dominant understorey with low diversity (BC Act Native Vegetation, BC Act Box-Gum Woodland);
- 4.58 ha of PCT1334 Zone 4 – low diversity native pasture (BC Act native vegetation, BC Act Box-Gum Woodland); and
- 4.58 ha of Golden Sun Moth habitat (BC Act endangered, EPBC Act critically endangered), located in PCT1334 Zone 4; and
- 13 remnant trees located in PCT1334 Zone 3, four of which contain at least one functional hollow.

In total, the proposed development will result in the clearance of 4.90 ha of BC Act native vegetation, all of which meets the criteria of BC Act Box-Gum Woodland and 4.58 ha of which supports Golden Sun Moth habitat. The proposed development will not result in any other direct impacts on native vegetation or habitat.

As shown in Figure 15, the proposed development will also result in the clearance of:

- 3.92 ha of PCT1334 Zone 5 – low diversity exotic pasture.

The 3.92 ha of PCT1334 Zone 5 is clearly dominated by exotic grasses and forbs, does not meet the definition of BC Act native vegetation, and is not identified as habitat for threatened species. Therefore, as per Chapter 10.4 of the BAM, PCT1334 Zone 5 does not require further assessment with respect to ecosystem credits or species credits.

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. Jerrabomberra Creek) 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.

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.
- The threatened species listed in Table 20.
- The retained vegetation and threatened species protected in the two BioBanking Sites (refer to Section 1.2.1).

However, 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 where there are low or no biodiversity values.
- Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition.
- 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; and
- control pest animal populations as a result of 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. As such, the proposed development is unlikely to result in any indirect impacts on native vegetation or habitat.

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.*

A potential 'prescribed biodiversity impact' due to the proposed development was identified during the development of this BDAR. As described in the following section, this potential impact was not determined to be a 'prescribed biodiversity impact' due to the fact that it 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.

Notwithstanding this, the avoidance and minimisation measures detailed in Section 3.1 and the mitigation measures detailed in Section 3.3 will reduce the impact of the proposed development on the below potential 'prescribed biodiversity impact'.










3.2.3.1 Rocks

As detailed in Section 2.3 and shown on Figure 12, the subject land contains patches of loose surface rock, the removal of which is identified as a potential prescribed biodiversity impact. As detailed in Section 2.2.3.5 and 2.3.4.2, a rock turning survey was performed across the subject land and wider study area in order to determine the value of the loose surface rock to threatened fauna (particularly with respect to Pink-tailed Legless Lizard, the species credit species associated with loose surface rock).

One Pink-tailed Legless Lizard sloughed skin was recorded in the south-western corner of the study area in a patch of PCT320 Zone 1 that supports a high cover of loose surface rock. No individuals or sloughed skins were recorded in the subject land or remainder of the study area. Pink-tailed Worm-lizard habitat in the study area was therefore estimated based on the portions of PCT320 Zone 1 that support loose surface rock. As shown in Figure 12, the study area is therefore estimated to support 3.30 ha of Pink-tailed Legless Lizard habitat, all of which occurs in the south-western corner of the study area. These findings are consistent with previous ecological surveys across the study area and adjoining land, which recorded habitat for the species in the south-western corner of the Poplars South BioBanking Site (see Section 1.2).

In light of the above, while the wider study area supports habitat for the Pink-tailed Legless Lizard, the subject land does not. It is therefore unlikely that the removal of rocks in the subject land will have a prescribed biodiversity impact on any threatened species or ecological community.

Legend

-  Subject Land - Stage 1
-  Study Area
-  Enviro Drive Approved Works Area
- Threatened Species**
-  Golden Sun Moth Habitat - Stage 1 impact
- Vegetation**
- PCT1334 Yellow Box - Blakely's Red Gum Woodland**
-  PCT1334 Zone3 - Stage 1 impact
-  PCT1334 Zone4 - Stage 1 impact
-  PCT1334 Zone5 - Stage 1 impact
- Remnant Trees - Impact**
-  Yellow Box
-  Blakely's Red Gum

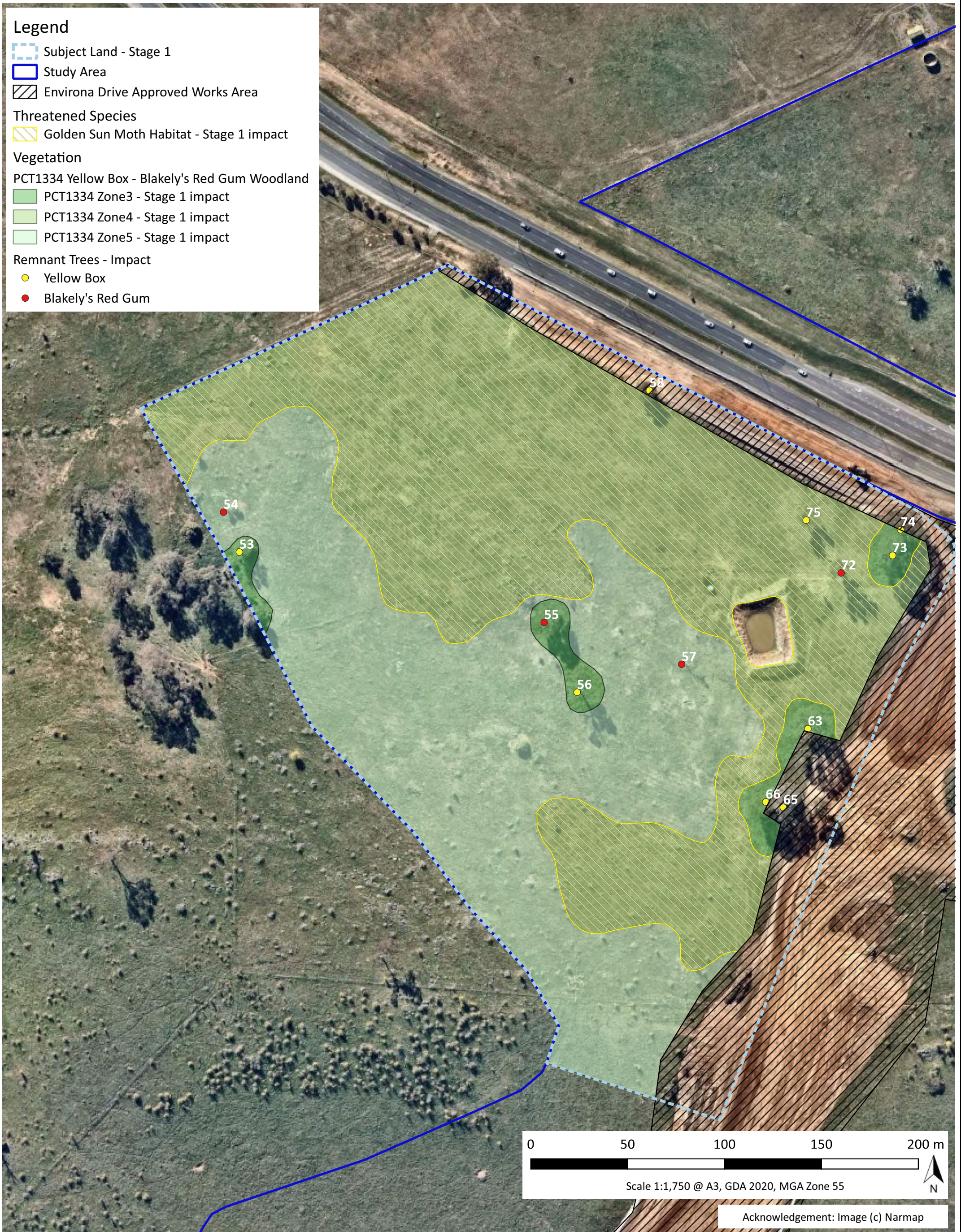


Figure 15. Residual Biodiversity Impacts of the Proposed Development

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:

- 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 prevent site run-off;
- noise, vibration, and dust control;
- flow controls;
- pollution and waste management;
- water treatment standards before release; and
- monitoring, reporting, and compliance requirements.

Trees to be cleared will be removed in accordance with the CEMP. At a minimum this will include pre-clearance surveys and fauna rescue procedures.

Best practice sediment and erosion control, such as the use of sediment traps, sediment interception ponds, silt fences and haybale fences, will be implemented as required during construction to minimise the flow of water and associated material into the surrounding areas and water sources.

The 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 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 Occupation

As mentioned in Section 3.1, the adjoining Poplars North and Poplars South BioBanking Sites will be protected and managed in accordance with the BioBanking Agreements. These agreements provide a formal, legally binding, and audited conservation focussed management regime for the portions of “The Poplars” property recognised as supporting significant biodiversity values. These agreements also stipulate a wide variety of management activities that are designed to protect and maintain the significant biodiversity values that these areas support. These management activities include the following.

- Retention of remnant native vegetation, regrowth, dead timber, and rocks.
- Replanting or supplementary planting where natural regeneration will not be sufficient (Poplars South BioBanking Site only).
- An integrated weed management plan, including weed control, monitoring, and inspection of existing and new weeds.
- Control of feral and overabundant native herbivores using a variety of methods (e.g. biocontrol, baiting, warren destruction, fumigation, shooting, trapping, harbour destruction), including monitoring and inspection requirements.
- Vertebrate pest management (foxes and other miscellaneous feral species) using a variety of methods (baiting, den destruction, shooting, trapping), including monitoring and inspections of existing and new vertebrate pests.
- A fire management plan, including prescribed ecological burns if required.
- Stock are not permitted to graze in any area of the Biobank Sites.
- Erosion control.
- Management of site drainage from urban stormwater catchments.
- Management of human disturbance, including fencing (to deter human and vehicular access) and signage, and restrictions on permitted activities.
- Monitoring, reporting, and record keeping requirements, including:
 - site inspection and monitoring, recording ground cover, stock numbers, condition of fencing and gates, human disturbance, erosion, and waste;
 - annual reporting, detailing the completed management actions and the results of any monitoring, inspections, or survey; and
 - Record keeping, including photographs, management actions, inspections, monitoring, and surveys.
- Adaptive management, including a review of management plans every 4 to 6 years. This process considers the effectiveness of the matters contained in the current plan.

3.3.3 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 and wider study area do 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 3.1.2, the two BioBanking Agreements include adaptive management strategies. As such, the adaptive management approach outlined in those two documents will act to address any potential unforeseen biodiversity impacts on the significant vegetation and habitat retained within the two BioBanking Sites.

3.4 Serious and irreversible impacts

The guidance to assist a decisionmaker to determine a serious and irreversible impact (NSW Government 2017b⁵¹) provides a list of threatened species and ecological communities which are likely to be the subject of serious and irreversible impacts (SAIL). The potential for a project to impact these SAIL entities must be assessed in the BDAR.

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

- Golden Sun Moth *Synemon plana*.
- PCT1334 – Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion ('BC Act Box-Gum Woodland').

The proposed development will result in the removal of a total of 4.58 ha of Golden Sun Moth habitat (located entirely within PCT1334 Zone 4) and a total of 4.90 ha of BC Act Box-Gum Woodland (comprised of 0.32 ha of PCT1334 Zone 3 and 4.58 ha of PCT1334 Zone 4). Discussions with the former Office of Environment and Heritage (Tobi Edmonds, Senior Conservation Planning Officer, 2018) indicate that a decision has been made not to develop entity specific thresholds for SAIL. 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 4.58 ha of Golden Sun Moth habitat or 4.90 ha of BC Act Box-Gum Woodland constitute a SAIL.

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 10 July 2020.
- ACT Government's ACTmapi *Significant Species, Vegetation Communities & Registered Trees*⁵² Golden Sun Moth habitat spatial data, accessed on 12 July 2020.
- NSW Government Saving Our Species (SOS) Golden Sun Moth species profile⁵³ and project report⁵⁴.
- NSW Government Office of Environment & Heritage Golden Sun Moth profile⁵⁵.
- *ACT native grassland conservation strategy and action plans* (ACT Government 2017⁵⁶).

⁵¹ 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

⁵² <http://app.actmapi.act.gov.au/actmapi/index.html?viewer=ssvcrt>

⁵³ <https://www.environment.nsw.gov.au/savingourspeciesapp/project.aspx?ProfileID=10791>

⁵⁴ <https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=839&ReportProfileID=10791>

⁵⁵ <https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10791>

⁵⁶ ACT Government (2017). *ACT native grassland conservation strategy and action plans*. Environment, Planning and Sustainable Development, Canberra.

- *Significant impact guidelines for the critically endangered golden sun moth (Synemon plana)* (Commonwealth of Australia 2009a⁵⁷).
- *Background paper to Significant impact guidelines for the critically endangered golden sun moth (Synemon plana)* (Commonwealth of Australia 2009b⁵⁸).
- *Approved Conservation Advice for Synemon plana (golden sun moth)* (Commonwealth of Australia 2013b⁵⁹).

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

The NSW Wildlife Atlas contains 657 Golden Sun Moth records. For the purposes of this SAIL 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 656 Golden Sun Moth records span from 1993 to 2019 and represent at least 2,286 individuals (Figure 16). 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 16). The EOO was calculated according to International Union for Conservation of Nature (IUCN) Standards and Petitions Subcommittee (2017)⁶⁰ 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 413,811 ha (Figure 16, Table 22). The EOO in Figure 16 agrees well with previous estimates that the species in the ACT/NSW is 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 2009b, 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.

⁵⁷ 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.

⁵⁸ 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.

⁵⁹ Commonwealth of Australia (2013b). *Approved Conservation Advice for Synemon plana (golden sun moth)*. Approved by the delegate of the Minister on 17 December 2013.

⁶⁰ 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>

As detailed in Table 22, the ACT accounts for 52,293 ha (12.64%) of the EOO. Within this area, there is 1,831 ha of Golden Sun Moth habitat (Figure 16). 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 14,487 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 km² (15,000 ha) (ACT Government 2017).
- The Murrumbateman IBRA subregion supports an estimated 9,913 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 22 are referred to throughout the following SAI assessment.

Table 22. Golden Sun Moth Extent of Occurrence (EOO) and estimated occupied habitat.

ID	Specific Matter	Area (ha)	Percent	Description
A	Golden Sun Moth EOO.	413,811	-	
B	ACT and EOO intersection.	52,293	12.64% (B/A)*100	The ACT accounts for 52,293 ha (12.64%) of the EOO.
C	Murrumbateman IBRA subregion and EOO intersection.	283,164	68.43% (C/A)*100	The Murrumbateman IBRA subregion accounts for 283,164 ha (68.43%) 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.	14,487 (A*0.035)	-	NSW supports an estimated 14,487 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.	9,913 (C*0.035)	-	The Murrumbateman IBRA subregion supports an estimated 9,913 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 – SAI additional information

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

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 where there are low or no biodiversity values.
- Locating the project where the native vegetation or threatened species habitat is in the poorest condition.

- 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 total, “The Poplars” property was estimated to support 105.88 ha of Golden Sun Moth habitat (22.40 ha across the study area plus 83.48 ha retained within the two BioBanking Sites). Of that, 3.33 ha has subsequently been removed by the construction of Environa Drive. The establishment of the two BioBanking Sites therefore avoids, protects, and manages 79% (83.48 ha) of the Golden Sun Moth habitat that occurred across “The Poplars” property (Figure 14). These large expanses of Golden Sun Moth habitat will be protected and managed in accordance with the BioBanking Agreements, which includes the following.

- Retention of remnant native vegetation, regrowth, dead timber, and rocks.
- Replanting or supplementary planting where natural regeneration will not be sufficient (Poplars South BioBanking Site only).
- An integrated weed management plan, including weed control, monitoring, and inspection of existing and new weeds.
- Control of feral and overabundant native herbivores using a variety of methods (e.g. biocontrol, baiting, warren destruction, fumigation, shooting, trapping, harbour destruction), including monitoring and inspection requirements.
- Vertebrate pest management (foxes and other miscellaneous feral species) using a variety of methods (baiting, den destruction, shooting, trapping), including monitoring and inspections of existing and new vertebrate pests.
- A fire management plan, including prescribed ecological burns if required.
- Stock are not permitted to graze in any area of the Biobank Sites.
- Erosion control.
- Management of site drainage from urban stormwater catchments.
- Management of human disturbance, including fencing (to deter human and vehicular access) and signage, and restrictions on permitted activities.
- Monitoring, reporting, and record keeping requirements, including:
 - site inspection and monitoring, recording ground cover, stock numbers, condition of fencing and gates, human disturbance, erosion, and waste;
 - annual reporting, detailing the completed management actions and the results of any monitoring, inspections, or survey; and
 - Record keeping, including photographs, management actions, inspections, monitoring, and surveys.
- Adaptive management, including a review of management plans every 4 to 6 years. This process considers the effectiveness of the matters contained in the current plan.

Potential indirect impacts, including indirect impacts to Golden Sun Moth habitat, will be minimised and mitigated by the measures outlined in Section 3.3. These measures include the following.

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

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 many 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 study area and adjoining BioBanking Sites therefore support a local population with the following characteristics.

- 105.88 ha of habitat, 3.33 ha of which has been removed by the construction of Environa Drive.
- Low abundance in the habitat that occurs in the subject land and in the south-eastern and south-western corners of the study area. The remaining patches of habitat support moderate to high abundance.
- With the exception of the three patches of habitat to the east of Environa Drive, all of the remaining patches of habitat are functionally connected to the 83.48 ha of known habitat in the BioBanking Sites.

The proposed development will directly impact 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat. Of the remaining habitat, 83.48 ha (79%) will be avoided, protected, and managed in the two BioBanking Sites. 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, discussions with the DPIE-BCD indicate 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.

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 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat. While the area impacted is directly connected to a large expanse of habitat in the South Poplars, it is not connected to any other patches of Golden Sun Moth habitat. As such, the proposed development is unlikely to increase habitat fragmentation in the subject land or immediate locality.

More widely, Golden Sun Moth are known to occur from the Queanbeyan district in the south-east to the Boorowa area in the north-west (Section 3.4.1, Figure 16). 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 (Section 3.4.1.1, Table 22). The impact to 4.58 ha of Golden Sun Moth habitat in the subject land will therefore reduce the available habitat in NSW by 0.032% and in the Murrumbateman IBRA subregion by 0.046%.

(iii). The proposed development will impact 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat. This patch of habitat supports a low abundance of moths and only represents a small proportion of the estimated habitat in the locality. The habitat in the subject land that will be impacted by the proposed development is therefore unlikely to be important 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 directly impact 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat. This patch of habitat supports a low abundance of moths and only represents a small proportion of the estimated habitat in the locality. Of the remaining habitat, 83.48 ha (79%) will be avoided, protected, and managed in the two BioBanking 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

The proposed development will directly impact 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat. This patch of habitat supports a low abundance of moths and only represents a small proportion of the estimated habitat in the locality. While the area impacted is directly connected to a large expanse of habitat in the South Poplars, it is not connected to any other patches of Golden Sun Moth habitat. As such, the proposed development is unlikely further 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 16). As shown in Figure 16, the local population in the subject land is located towards the southern extent of 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.

The proposed development will directly impact 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat. The area impacted is directly connected to a large expanse of habitat in the South Poplars, which will be avoided, protected, and managed in the Poplars South BioBanking Site.

Consideration of the above points indicates that the Golden Sun Moth habitat in the subject land is unlikely to have a wider importance to other populations in "The Poplars" property or wider locality 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 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 BDAR, the subject land and wider study area have been impacted by a number of these threats in the past as approximately 72% of the climax vegetation has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos. As a result, the majority of the subject land and wider study area have a disturbed soil profile, a groundstorey dominated by exotic perennial and annual pasture species, and is heavily grazed by stock and native herbivores.

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 will continue unchanged. This is likely to mean that the subject land will continue to experience impacts from agricultural activities. These activities, over time, are likely to further degrade or entirely destroy the remain patches of Golden Sun Moth habitat.

While the proposed development will directly impact 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat, 83.48 will be protected and managed in the two BioBanking Sites. The establishment of the two BioBanking Sites therefore avoids, protects, and manages 79% of the Golden Sun Moth habitat that occurred across "The Poplars" property (Figure 14). These large expanses of Golden Sun Moth habitat will be protected and managed in accordance with the BioBanking Agreements, which includes the following.

- Retention of remnant native vegetation, regrowth, dead timber, and rocks.
- Replanting or supplementary planting where natural regeneration will not be sufficient (Poplars South BioBanking Site only).

- An integrated weed management plan, including weed control, monitoring, and inspection of existing and new weeds.
- Control of feral and overabundant native herbivores using a variety of methods (e.g. biocontrol, baiting, warren destruction, fumigation, shooting, trapping, harbour destruction), including monitoring and inspection requirements.
- Vertebrate pest management (foxes and other miscellaneous feral species) using a variety of methods (baiting, den destruction, shooting, trapping), including monitoring and inspections of existing and new vertebrate pests.
- A fire management plan, including prescribed ecological burns if required.
- Stock are not permitted to graze in any area of the Biobank Sites.
- Erosion control.
- Management of site drainage from urban stormwater catchments.
- Management of human disturbance, including fencing (to deter human and vehicular access) and signage, and restrictions on permitted activities.
- Monitoring, reporting, and record keeping requirements, including:
 - site inspection and monitoring, recording ground cover, stock numbers, condition of fencing and gates, human disturbance, erosion, and waste;
 - annual reporting, detailing the completed management actions and the results of any monitoring, inspections, or survey; and
 - Record keeping, including photographs, management actions, inspections, monitoring, and surveys.
- Adaptive management, including a review of management plans every 4 to 6 years. This process considers the effectiveness of the matters contained in the current plan.

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 16), 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).
- Gorooyarroo 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 4.58 ha (4%) of the 105.88 ha of local Golden Sun Moth habitat, 83.48 will be protected and managed in the two BioBanking Sites. The establishment of the two BioBanking Sites therefore avoids, protects, and manages 79% of the Golden Sun Moth habitat that occurred across “The Poplars” property (Figure 14). These large expanses of Golden Sun Moth habitat will be protected and managed in accordance with the BioBanking Agreements, which includes the following.

- Retention of remnant native vegetation, regrowth, dead timber, and rocks.
- Replanting or supplementary planting where natural regeneration will not be sufficient (Poplars South BioBanking Site only).
- An integrated weed management plan, including weed control, monitoring, and inspection of existing and new weeds.
- Control of feral and overabundant native herbivores using a variety of methods (e.g. biocontrol, baiting, warren destruction, fumigation, shooting, trapping, harbour destruction), including monitoring and inspection requirements.
- Vertebrate pest management (foxes and other miscellaneous feral species) using a variety of methods (baiting, den destruction, shooting, trapping), including monitoring and inspections of existing and new vertebrate pests.

- A fire management plan, including prescribed ecological burns if required.
- Stock are not permitted to graze in any area of the Biobank Sites.
- Erosion control.
- Management of site drainage from urban stormwater catchments.
- Management of human disturbance, including fencing (to deter human and vehicular access) and signage, and restrictions on permitted activities.
- Monitoring, reporting, and record keeping requirements, including:
 - site inspection and monitoring, recording ground cover, stock numbers, condition of fencing and gates, human disturbance, erosion, and waste;
 - annual reporting, detailing the completed management actions and the results of any monitoring, inspections, or survey; and
 - Record keeping, including photographs, management actions, inspections, monitoring, and surveys.
- Adaptive management, including a review of management plans every 4 to 6 years. This process considers the effectiveness of the matters contained in the current plan.

The proposed development will therefore contribute to the recovery of the species through the implementation of the above measures.

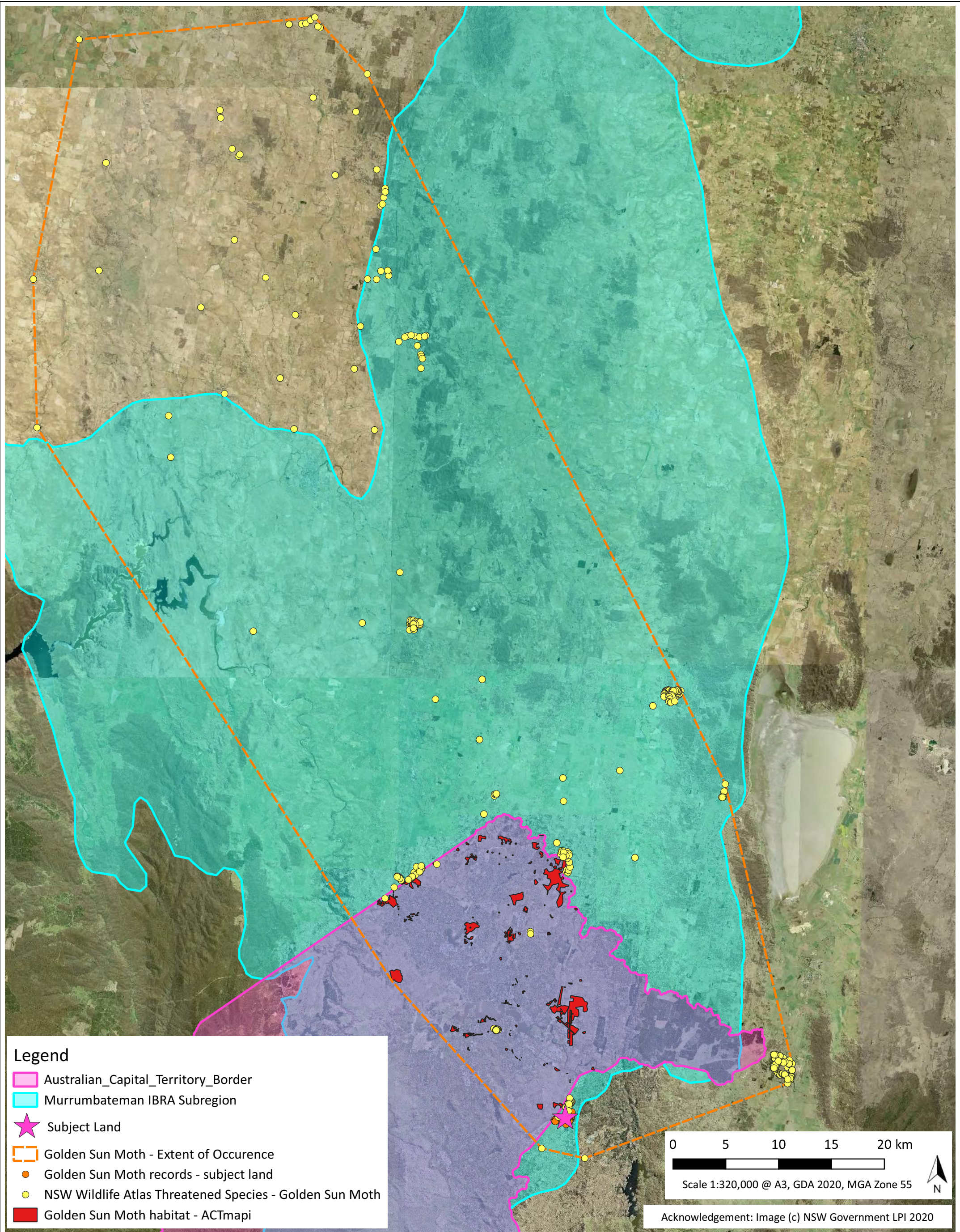


Figure 13. Golden Sun Moth Extent of Occurrence and Estimated Occupied Habitat

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*⁶¹ threatened woodland spatial data, accessed on 12 July 2020.
- *Species Impact Statement Ellerton Drive Extension* (NGH Environmental 2014⁶²).
- NSW Government Saving Our Species (SOS) profile⁶³, project report⁶⁴, and Googong-Burra Region priority management information⁶⁵.
- NSW Government Office of Environment & Heritage White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland profile⁶⁶.
- *ACT native woodland conservation strategy and action plans* (ACT Government 2019⁶⁷).
- *White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands listing advice and conservation advice*⁶⁸.
- *White box - Yellow box - Blakely's red gum grassy woodlands and derived native grasslands* (Commonwealth of Australia 2006⁶⁹).
- *National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (DECCW 2010⁷⁰).

3.4.2.1 Box-Gum Woodland – SAI additional information

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

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

- Locating the project where there are low or no biodiversity values.
- Locating the project where the native vegetation or threatened species habitat is in the poorest condition.

⁶¹ <http://app.actmapi.act.gov.au/actmapi/index.html?viewer=ssvcrt>

⁶² NGH Environmental (2014). *Species Impact Statement Ellerton Drive Extension*. June 2014, Final v1.2.

⁶³ <https://www.environment.nsw.gov.au/savingourspeciesapp/project.aspx?ProfileID=10837>

⁶⁴ <https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=988&ReportProfileID=10837>

⁶⁵ <https://www.environment.nsw.gov.au/savingourspeciesapp/ManagementSite.aspx?SiteID=3052>

⁶⁶ <https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10837>

⁶⁷ ACT Government (2019). *ACT native woodland conservation strategy and action plans*. Environment, Planning and Sustainable Development.

⁶⁸ <http://www.environment.gov.au/system/files/pages/dcad3aa6-2230-44cb-9a2f-5e1dca33db6b/files/box-gum.pdf>

⁶⁹ 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.

⁷⁰ 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

- 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 total, “The Poplars” property is estimated to support 28.98 ha of Box-Gum Woodland (18.33 ha across the study area in PCT1334 Zones 1 to 4, plus 10.65 ha retained within the two BioBanking Sites). The proposed development of the subject land will impact 4.90 ha (PCT1334 Zones 3 and 4), which is approximately 17% of that which occurs across “The Poplars” property. Of the remaining areas of Box-Gum Woodland, 10.65 ha will be protected in the two BioBanking Sites; this includes the vast majority of the higher quality Box-Gum Woodland, much of which is likely to meet the EPBC Act listing criteria. These areas of high-quality Box-Gum Woodland will be protected and managed in accordance with the BioBanking Agreements, which includes the following.

- Retention of remnant native vegetation, regrowth, dead timber, and rocks.
- Replanting or supplementary planting where natural regeneration will not be sufficient (Poplars South BioBanking Site only).
- An integrated weed management plan, including weed control, monitoring, and inspection of existing and new weeds.
- Control of feral and overabundant native herbivores using a variety of methods (e.g. biocontrol, baiting, warren destruction, fumigation, shooting, trapping, harbour destruction), including monitoring and inspection requirements.
- Vertebrate pest management (foxes and other miscellaneous feral species) using a variety of methods (baiting, den destruction, shooting, trapping), including monitoring and inspections of existing and new vertebrate pests.
- A fire management plan, including prescribed ecological burns if required.
- Stock are not permitted to graze in any area of the Biobank Sites.
- Erosion control.
- Management of site drainage from urban stormwater catchments.
- Management of human disturbance, including fencing (to deter human and vehicular access) and signage, and restrictions on permitted activities.
- Monitoring, reporting, and record keeping requirements, including:
 - site inspection and monitoring, recording ground cover, stock numbers, condition of fencing and gates, human disturbance, erosion, and waste;
 - annual reporting, detailing the completed management actions and the results of any monitoring, inspections, or survey; and
 - Record keeping, including photographs, management actions, inspections, monitoring, and surveys.

- Adaptive management, including a review of management plans every 4 to 6 years. This process considers the effectiveness of the matters contained in the current plan.

Potential indirect impacts, including indirect impacts to Box-Gum Woodland, will be minimised and mitigated by the measures outlined in Section 3.3. These measures include the following.

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

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

The proposed development will directly impact (i.e. remove) of a total of 4.90 ha of BC Act listed Box-Gum Woodland, comprised of the following two vegetation conditions zones.

- 0.32 ha of PCT1334 Zone 3. Vegetation Integrity Score of 30.3. As described in Table 13, this zone is characterised as ‘Canopy with components of the climax community, but there is evidence of historic thinning and the midstorey and shrubstorey are absent. Low diversity exotic groundlayer dominated by a variety of exotic grasses, notably *Phalaris*. Moderate to high density of significant weed species. Lightly grazed by Eastern Grey Kangaroos.’
- 4.58 ha of PCT1334 Zone 4. Vegetation Integrity Score of 8.3. As described in Table 14, this zone is characterised as ‘Overstorey and midstorey are absent. Low diversity native groundlayer dominated by disturbance tolerant native grasses, notably Tall Speargrass and Wallaby Grasses *Rhytidosperma* spp. Low to high density of significant weed species. Moderately to heavily grazed by Eastern Grey Kangaroos.’

As described above, these two zones of BC Act Box-Gum Woodland have been substantially degraded by historic and current agricultural activities and only meet the definition of the TEC in a moderately to highly modified form.

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

As described above, discussions with the former Office of Environment and Heritage (Tobi Edmonds, Senior Conservation Planning Officer, 2018) indicate that a decision has been made not to develop entity specific thresholds for SAI. Instead, 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

As the subject land is located immediately adjacent to the ACT, data from ACTmapi has been used to estimate the extent and condition of Box-Gum Woodland in the locality⁷¹. The extent and condition of TECs throughout the lowlands of the ACT has been refined over multiple years

⁷¹ <http://app.actmapi.act.gov.au/actmapi/index.html?viewer=ssvcr>

and surveys and so represents a reliable and accurate estimate of Box-Gum Woodland (see ACT Government 2019).

As shown in Figure 17, the extent and condition of Box-Gum Woodland in the immediate vicinity of the subject land was estimated in the following manner.

- A 10 km buffer was applied to the subject land (area = 35,283 ha).
- The land in NSW (area = 17,974 ha) was excluded from the 10 km buffer as no publicly available accurate mapping data was available.
- The residential/suburban areas in the ACT (area = 4,528 ha) were excluded from the 10 km buffer in order to determine the extent of Box-Gum Woodland in the vegetated portions of the 10 km buffer.
- Grassland PCTs (area = 6,334 ha), estimated based on Rehwinkel (1999⁷²), were excluded from the 10 km buffer in order to determine the extent of Box-Gum Woodland in the woodland/forest portions of the 10 km buffer.
- The extent of Box-Gum Woodland in the remaining woodland/forest PCTs (area = 6,446 ha) was obtained from ACTmapi.
- Condition was inferred from the classification of the TEC in ACTmapi. *Nature Conservation Act 2014* (NC Act) Box-Gum Woodland aligns with the definition of BC Act Box-Gum Woodland (i.e. it includes multiple condition states, from poor to good condition) and EPBC Act Box-Gum Woodland is assumed to be in moderate to good condition.

As shown in Figure 17, the 6,446 ha assessed area supports the following.

- 1,993 ha of Box-Gum Woodland (i.e. NC Act Box-Gum Woodland). Therefore, 30.9% of the woodland/forest areas in the locality support Box-Gum Woodland.
- 1,355 ha of moderate to good condition Box-Gum Woodland (i.e. EPBC Act Box-Gum Woodland). Therefore, 21.0% of the woodland/forest areas in the locality support moderate to good condition Box-Gum Woodland.

As shown in Figure 18, the extent of woodland/forest PCTs in the 1,000 ha and 10,000 ha surrounding the centre of the subject land was mapped via aerial imagery, excluding residential/suburban areas and land assumed to be a grassland PCT (based on Rehwinkel 1999).

Using all of the above information, the following estimations of the extent and overall condition of the TEC can be determined (refer to Figure 18).

- Extent and overall condition within 1,000 ha. There is 296 ha of woodland/forest within 1,000 ha of the centre of the subject land. There is therefore approximately 91 ha (30.9% of 296 ha) of BC Act Box-Gum Woodland within 1,000 ha, 62 ha (21.0% of 296 ha) of which is in moderate to good condition.

⁷² Rehwinkel (1999). *Natural Temperate Grassland of the Southern Tablelands: modelled distribution prior to European settlement*. Data as presented in Figure 1. of Environment ACT (2005). *National Recovery Plan for Natural Temperate Grassland of the Southern Tablelands (NSW and ACT): an endangered ecological community*. Environment ACT, Canberra.

The proposed impact of 4.90 ha therefore represents 5.4% of the 91 ha of Box-Gum Woodland that occurs within the 1,000 ha surrounding the centre of the subject land.

- Extent and overall condition within 10,000 ha. There is 5,582 ha of woodland/forest within 1,000 ha of the centre of the subject land. There is therefore approximately 1,725 ha (30.9% of 5,582 ha) of BC Act Box-Gum Woodland within 10,000 ha, 1,172 ha (21.0% of 5,582 ha) of which is in moderate to good condition.

The proposed impact of 4.90 ha therefore represents 0.3% of the 1,725 ha of Box-Gum Woodland that occurs within the 10,000 ha surrounding the centre of 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 Biodiversity Conservation Division (BCD) recommended (via email of 12 September 2019 from Luke Perkins, Team Planning Leader, QPRC) for a nearby BDAR 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 a SAII assessment. The Ellerton Drive Extension is approximately 5 km to the east 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 8,006.76 ha and 17,337.48 ha of Box-Gum Woodland before the impact of the proposed development has been taken into consideration; and
- between 8,001.86 ha and 17,329.58 ha of Box-Gum Woodland after the impact of the proposed development has been taken into consideration.

This proposed development therefore removes an estimated 0.028% to 0.061% 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 (which also falls within the Murrumbateman IBRA subregion). As detailed in ACT Government (2019), approximately 2,138 ha of Blakely's Red Gum – Yellow Box (\pm White Box) tall grassy woodland is in the reserve system 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 will occur 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 BioBanking Sites will be monitored and managed in accordance with the BioBanking Agreements.

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

As mentioned in previously, the ecological values of "The Poplars" property have been investigated since the early 1990s. One of the key outcomes of this work was the decision that any future development in "The Poplars" property would be designed around the existing ecological values of the land. As a result, the Poplars LEP allocated land to either conservation or development in a manner that protected the vast majority of the land supporting significant biodiversity conservation values. As shown in Figure 14, this land has since been formally conserved under two BioBanking Agreements

The establishment of the 'The Poplars North' and 'The Poplars South' BioBanking Sites protect approximately 50% (98.46 ha) of "The Poplars" property, including the vast majority of the identified significant biodiversity values. Protected values include:

- 87.42 ha of grassland vegetation (i.e. MR631/PCT1202 and PC686/PCT1289), the majority of which is likely to meet the listing criteria for EPBC Act listed NTG-SEH;
- 10.65 ha of woodland vegetation (i.e. MR648/PCT1330), the majority of which is likely to meet the listing criteria for EPBC Act and/or BC Act listed Box-Gum Woodland;
- 83.48 ha of Golden Sun Moth habitat;
- 61.86 ha of Grassland Earless Dragon habitat; and
- 18.63 ha of Pink-tailed Legless Lizard habitat.

In addition, the BioBanking Sites protect habitat for threatened flora (i.e. Button Wrinklewort and Hoary Sunray), threatened birds (i.e. Dusky Woodswallow, Gang-gang Cockatoo, Varied Sitella, Little Eagle, Scarlet Robin, Flame Robin, Speckled Warbler, Diamond Firetail, and the migratory White-throated Needletail and Rainbow Bee-eater), and ACT listed and 'rare and uncommon species' (i.e. Perunga Grasshopper, Canberra Raspy Cricket, and Key's Matchstick Grasshopper).

In contrast, approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5, Figure 14). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos. This includes the two zones that will be impacted by the proposed development, which have been substantially degraded by historic and current agricultural activities and only meet the definition of the TEC in a moderately to highly modified form.

Consideration of the above information indicates that the proposed development is largely located in an area that supports low-quality vegetation. As a result, the proposed development's impact on characteristic and functionally important species is likely to be limited.

In addition, 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.
- BioBanking Agreements over the two BioBanking Sites.

In summary, the degraded nature of the vegetation and habitat in the subject land combined with the avoidance, minimisation, and mitigation measures outlined in the BDAR ensure that the proposed development is unlikely to adversely alter the species composition of the Box-Gum Woodland which surrounds the 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 of the subject land to existing urban areas (i.e. Jerrabomberra Township). 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.
- BioBanking Agreements over the two BioBanking Sites.

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

As mentioned previously, approximately 72% of the climax vegetation across the study area has been historically cleared and is now entirely dominated by exotic grasses and weeds (i.e. 14.18 ha of PCT320 Zone 2 and 48.28 ha of PCT1334 Zone 5, Figure 14). The remaining 28% of the vegetation is moderately to highly disturbed, shows signs of historic cultivation and/or pasture improvement, supports a variety of weeds, has been heavily grazed over an extend period by stock, and is currently moderately to heavily grazed by Eastern Grey Kangaroos. This includes the two zones that will be impacted by the proposed development, which have been substantially degraded by historic and current agricultural activities and only meet the definition of the TEC in a moderately to highly modified form.

The proposed development will therefore impact 4.90 ha of low diversity, modified vegetation which meets the definition of BC Act Box-Gum Woodland. These areas of BC Act Box-Gum Woodland in the subject land do not constitute an important area of the TEC locality or wider region, and as such their removal is unlikely to further 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 establishment of the 'The Poplars North' and 'The Poplars South' BioBanking Sites protect approximately 50% (98.46 ha) of "The Poplars" property, including the vast majority of the identified significant biodiversity values. Protected values include:

- 87.42 ha of grassland vegetation (i.e. MR631/PCT1202 and PC686/PCT1289), the majority of which is likely to meet the listing criteria for EPBC Act listed NTG-SEH;
- 10.65 ha of woodland vegetation (i.e. MR648/PCT1330), the majority of which is likely to meet the listing criteria for EPBC Act and/or BC Act listed Box-Gum Woodland;
- 83.48 ha of Golden Sun Moth habitat;
- 61.86 ha of Grassland Earless Dragon habitat; and
- 18.63 ha of Pink-tailed Legless Lizard habitat.

In addition, the BioBanking Sites protect habitat for threatened flora (i.e. Button Wrinklewort and Hoary Sunray), threatened birds (i.e. Dusky Woodswallow, Gang-gang Cockatoo, Varied Sitella, Little Eagle, Scarlet Robin, Flame Robin, Speckled Warbler, Diamond Firetail, and the migratory White-throated Needletail and Rainbow Bee-eater), and ACT listed and 'rare and uncommon species' (i.e. Perunga Grasshopper, Canberra Raspy Cricket, and Key's Matchstick Grasshopper).

The 10.65 ha of Box-Gum Woodland within the two BioBanking Site, which includes the vast majority of the higher quality Box-Gum Woodland that occurs in "The Poplars" property, will be

protected and managed in accordance with the BioBanking Agreements, which includes the following.

- Retention of remnant native vegetation, regrowth, dead timber, and rocks.
- Replanting or supplementary planting where natural regeneration will not be sufficient (Poplars South BioBanking Site only).
- An integrated weed management plan, including weed control, monitoring, and inspection of existing and new weeds.
- Control of feral and overabundant native herbivores using a variety of methods (e.g. biocontrol, baiting, warren destruction, fumigation, shooting, trapping, harbour destruction), including monitoring and inspection requirements.
- Vertebrate pest management (foxes and other miscellaneous feral species) using a variety of methods (baiting, den destruction, shooting, trapping), including monitoring and inspections of existing and new vertebrate pests.
- A fire management plan, including prescribed ecological burns if required.
- Stock are not permitted to graze in any area of the Biobank Sites.
- Erosion control.
- Management of site drainage from urban stormwater catchments.
- Management of human disturbance, including fencing (to deter human and vehicular access) and signage, and restrictions on permitted activities.
- Monitoring, reporting, and record keeping requirements, including:
 - site inspection and monitoring, recording ground cover, stock numbers, condition of fencing and gates, human disturbance, erosion, and waste;
 - annual reporting, detailing the completed management actions and the results of any monitoring, inspections, or survey; and
 - Record keeping, including photographs, management actions, inspections, monitoring, and surveys.
- Adaptive management, including a review of management plans every 4 to 6 years. This process considers the effectiveness of the matters contained in the current plan.

The proposed development will therefore contribute to the recovery of BC Act Box-Gum Woodland through the implementation of the above measures.

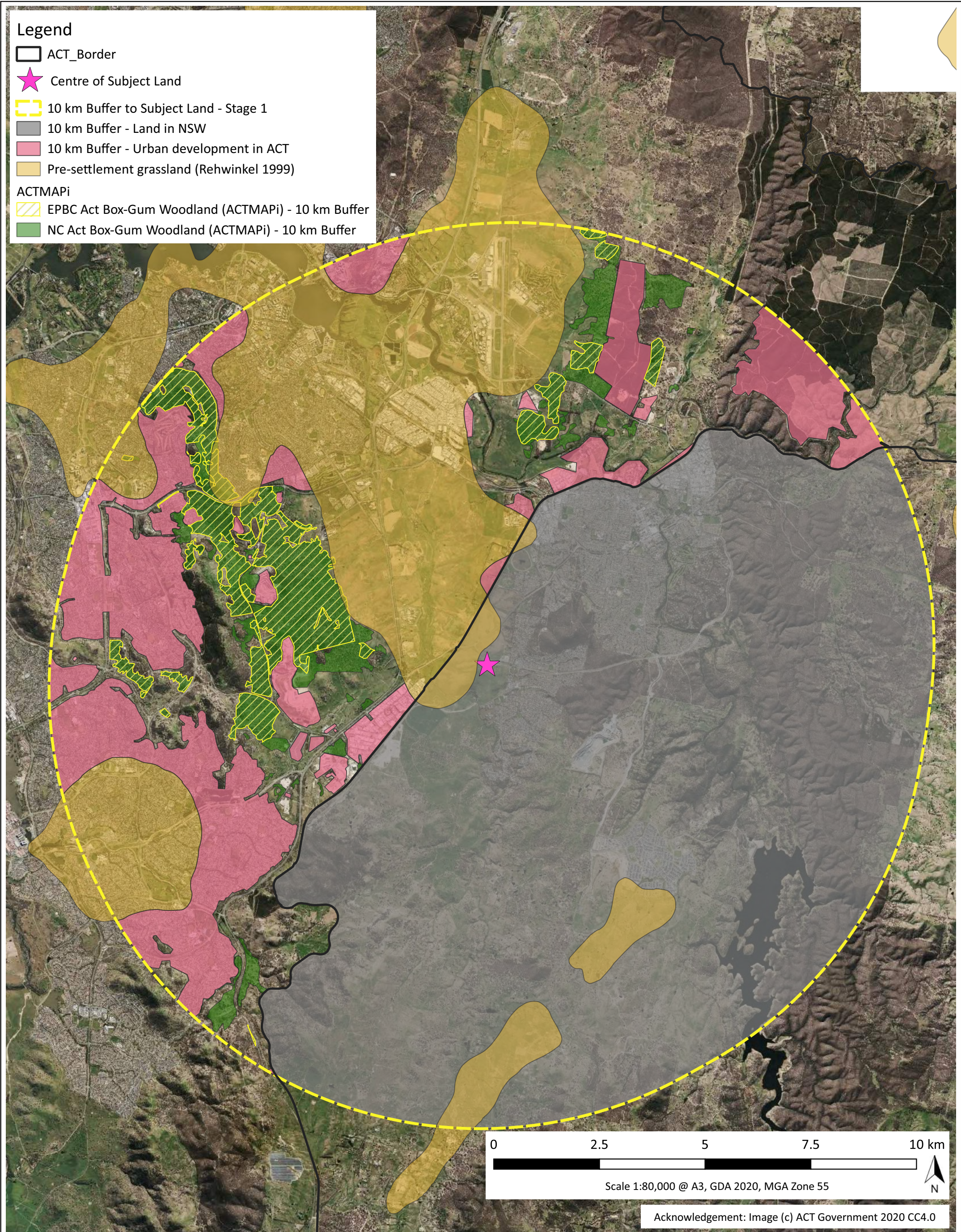


Figure 17. The Extent and Condition of Box-Gum Woodland in the Locality

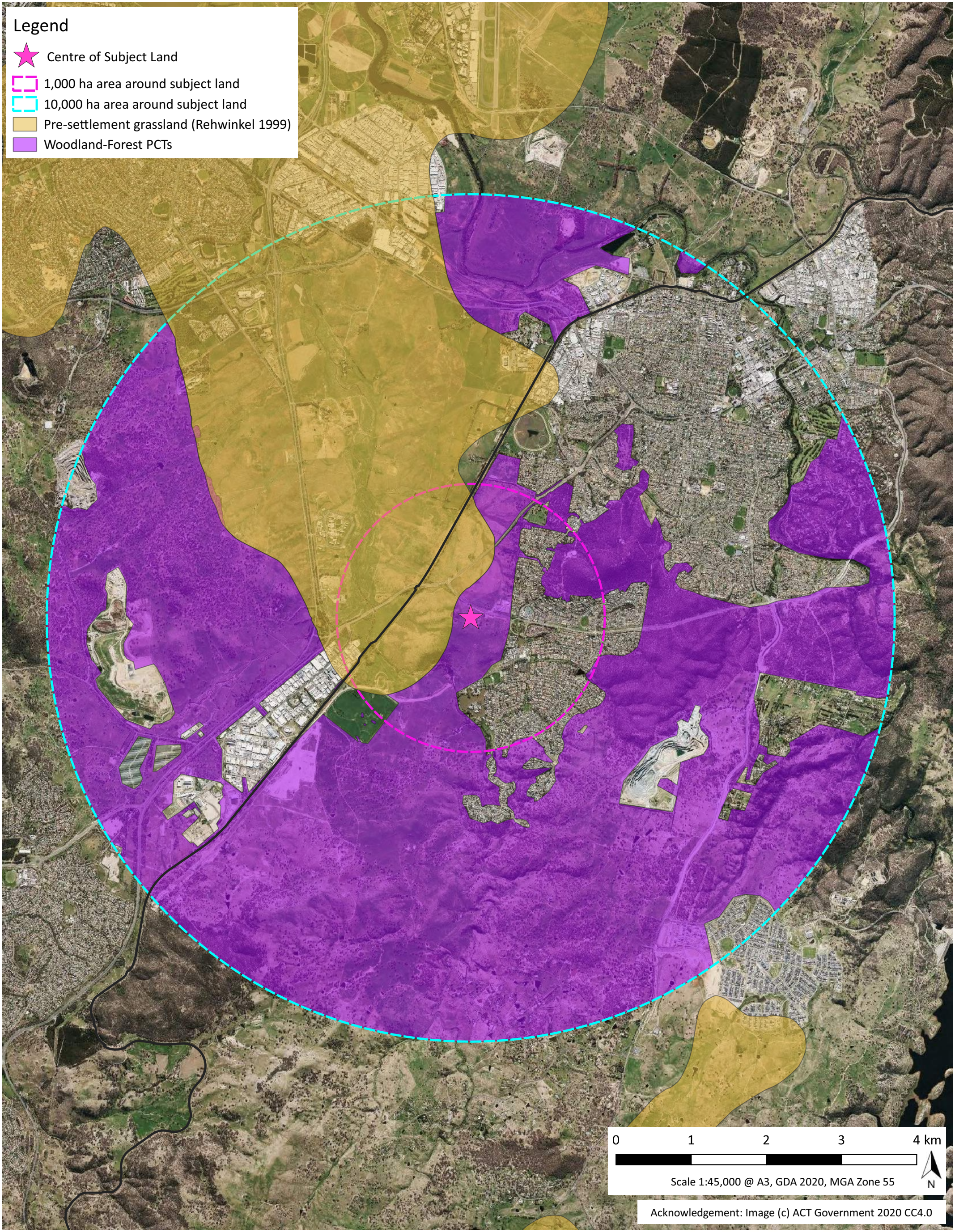


Figure 18. The Extent and Condition of Box-Gum Woodland in 1,000 ha and 10,000 ha

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 or ecological communities given the subject land does not:

- support any EPBC Act listed flora species; or
- support any EPBC Act listed ecological communities;

However, as detailed in Section 2.3.4, the proposed development will impact 4.58 ha of Golden Sun Moth habitat, a threatened species listed under the EPBC Act. As mentioned in Section 1, a separate report has been developed by Capital Ecology to assess the impact of the current and future stages of the Poplars development on MNES (Capital Ecology 2020a). This report will be the primary informing document for an EPBC Act referral and will ensure that the full impact of the entire Poplars development on MNES is appropriately assessed.

Given that the proposed development of the subject land is a component of the wider action of The Poplars development land (which will have a larger impact on Golden Sun Moth) referral of the larger action to the Commonwealth Minister for Agriculture, Water and the Environment is considered warranted and is recommended. Accordingly, Poplars Developments will refer the larger action in parallel with this BDAR.

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 F.

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.

- PCT1334 – Biodiversity risk rating of 2.00.
- *Synemon plana* Golden Sun Moth – Biodiversity risk rating of 3.00.

3.5.2.2 Ecosystem credit requirements

The results of the BAM ecosystem credit calculations completed for the proposed development are provided in Table 23. As shown in Table 23, only one of the vegetation zones in the subject land has a vegetation integrity score sufficient for its 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 does generate an ecosystem credit obligation.

Table 23. Ecosystem credit requirements.

PCT & Vegetation Zone	Vegetation Integrity Score	Proposed Clearance Area (ha)	Credits Required
PCT1334 Zone 3	30.3	0.32	5
PCT1334 Zone 4	8.3	4.58	0

3.5.2.3 Species credit requirements

The subject land supports habitat of potential significance to the Golden Sun Moth, which is species credit species. Accordingly, as detailed in Table 24, the proposed development does generate a species credit obligation.

Table 24. Species credit requirements.

Species	PCT & Vegetation Zone	Habitat Condition (Vegetation Integrity) Loss	Proposed Clearance Area (ha)	Credits Required
<i>Synemon plana</i> Golden Sun Moth	PCT1334 Zone 4	8.3	4.58	29

3.5.2.4 Credit obligation options

As detailed by the NSW Department of Planning, Industry and Environment⁷³, the proponent can address the estimated offset obligation outlined in the following two ways.

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.'

⁷³ <https://www.environment.nsw.gov.au/biodiversity/offsetsscheme.htm>

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. 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.

3.5.3 NSW Koala SEPP – Koala Habitat Protection Requirements

The *State Environmental Planning Policy (Koala Habitat Protection) 2019* (‘Koala Habitat Protection SEPP’) replaced the *SEPP 44 – Koala Habitat Protection (SEPP 44)* on 1 March 2020. The associated *Koala Habitat Protection Guidelines* (the ‘Guidelines’) aim to guide consent authorities, professionals, and the community to understand and implement the requirements of the Koala Habitat Protection SEPP.

With regard to the current application of the Koala Habitat Protection SEPP for the proposed development of the subject land, the following points are noted.

3. The subject land is located within the Queanbeyan-Palerang Local Government Area (LGA), an LGA which is listed in Schedule 1 of the Koala Habitat Protection SEPP.
4. There is no approved Koala Plan of Management which includes the subject land, and:
 - a. while no part of the subject land or wider study area is identified on the Koala Development Application Map, a small proportion of the canopy across the Poplars North BioBanking Site is (Figure 19); and
 - b. the subject land, which is under the same ownership as the North BioBanking Site, has an area of greater than 1 hectare.

As demonstrated by the above assessment, the development control provisions of the Koala Habitat Protection SEPP apply to the proposed development.

Therefore, pursuant to the Koala Habitat Protection SEPP, the proposed development must either:

1. demonstrate the subject land is not Koala habitat; or
2. consider the impact of the proposed development on Koalas in accordance with the Guidelines (i.e. according to the Tier 1 or Tier 2 process).

“The Poplars” property is bordered by major roads, urban development, and modified farmland. Before European occupation, the area would have been characterised by an open grassy woodland that merges with grassland lower in the landscape to the west. However, “The Poplars” property has been substantially modified by its current and past land use, which has primarily been grazing (sheep and cattle). Approximately 97% of the original woody vegetation (canopy, midstorey, and shrubstorey) has been historically cleared across the study area to promote the pastoral productivity of the land. The areas which retain some of the original canopy occur as isolated paddock trees or small, scattered patches of vegetation (Figure 6). As such, the majority of the woody vegetation is therefore characterised by an absent or low-density canopy of mature remnant eucalypts, and an absent midstorey and shrubstorey.

In addition, despite being conspicuous when present, no Koalas or signs of Koala presence were detected during the surveys conducted for this BDAR or by previous ecological surveys of “The Poplars” property (see Section 1.2). Indeed, “The Poplars” property is separated by over 6 km from the nearest Koala records, all of which occur in intact vegetation to the west (Figure 19); the intervening areas are characterised by urban development and include a substantial number of significant impediments to Koala movement (e.g. large roads, urban expanses, human disturbance).

In summary, “The Poplars” property is in an isolated peri-urban location that has largely been cleared of its natural woody vegetation. No Koalas or signs of Koala presence were detected during the surveys conducted for this BDAR or by previous ecological surveys of “The Poplars” property, and no Koalas have been recorded within 2.5 km in the past 18 years. As such, “The Poplars” property does not support Koala habitat and is therefore unlikely to constitute important or occupied Koala habitat now or in the future.

In accordance with the above, the application of the Koala SEPP should not constrain the proposed development of the subject land.

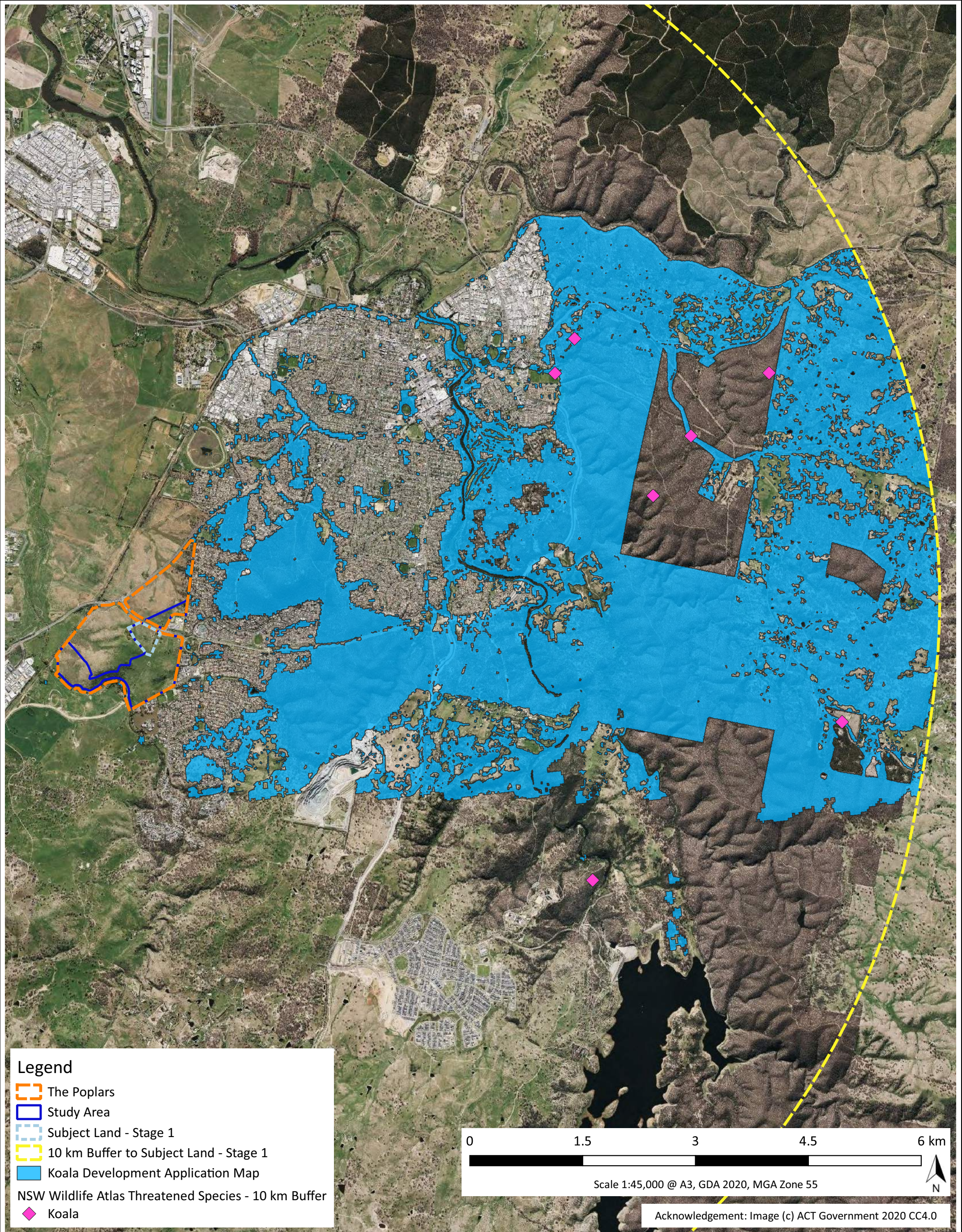


Figure 19. Koala Development Application Map

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Appendices

Appendix A. BAM Plot/Transect Scores

PCT code	Veg. Zone	Plot No.	Composition (species richness)					
			Tree	Shrub	Grass & grass like	Forb	Fern	Other
320	1	1	0	1	8	10	1	1
		2	0	0	6	3	0	0
		3	0	1	9	11	1	1
	2	1	0	0	7	1	0	0
		2	0	0	7	3	0	0
		3	0	0	6	4	0	1
1334	1	1	1	1	6	13	1	2
	2	1	1	0	5	1	0	1
	3	1	1	0	7	1	0	0
	4	1	0	0	4	0	0	0
		2	0	0	2	0	0	0
		3	0	0	5	3	0	0
	5	1	0	0	2	0	0	0
		2	0	0	4	2	0	0
		3	0	0	3	1	0	0
		4	0	0	0	1	0	0

PCT code	Veg. Zone	Plot No.	Structure (% cover)					
			Tree	Shrub	Grass & grass like	Forb	Fern	Other
320	1	1	0	0.1	33.5	11.6	0.2	0.1
		2	0	0	35.3	0.3	0	0
		3	0	0.1	34.5	3.7	0.1	0.1
	2	1	0	0	4.3	0.1	0	0
		2	0	0	16.4	0.3	0	0
		3	0	0	20.3	0.4	0	0.1
1334	1	1	2	0.1	27.2	4.1	0.1	0.2
	2	1	25	0	26.4	0.2	0	0.1
	3	1	20	0	2.8	0.1	0	0
	4	1	0	0	33.5	0	0	0
		2	0	0	30.1	0	0	0
		3	0	0	29.6	0.3	0	0
	5	1	0	0	2.2	0	0	0
		2	0	0	6.3	0.6	0	0
		3	0	0	0.3	0.1	0	0
		4	0	0	0	0.1	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						
320	1	1	-	-	-	-	-	0	0	1.4	0	3.3	
		2	-	-	-	-	-	0	0	4.4	0	15.3	
		3	-	-	-	-	-	0	0	7	0	3.7	
	2	1	-	-	-	-	-	0	0	46	0	65.7	
		2	-	-	-	-	-	0	0	31	0	61.5	
		3	-	-	-	-	-	0	0	27	0	49.5	
1334	1	1	Y	Y	Y	-	-	1	0	6.8	1	1.4	
		2	-	Y	-	-	-	2	1	37	8	1.2	
	3	1	Y	Y	Y	Y	Y	1	0	8.2	5	2.2	
		4	1	-	-	-	-	-	0	0	13	0	1.8
			2	-	-	-	-	-	0	0	2.6	0	0.5
	5	3	-	-	-	-	-	0	0	13	0	1.3	
		1	-	-	-	-	-	0	0	2	0	0.4	
		2	-	-	-	-	-	0	0	19	0	1.8	
		3	-	-	-	-	-	0	0	22	0	1	
		4	-	-	-	-	-	0	0	18	2	10.7	

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

Species List	Common Name	320.1.1	320.1.2	320.1.3	320.2.1	320.2.2	320.2.3	1334.1.1	1334.2.1	1334.3.1	1334.4.1	1334.4.2	1334.4.3	1334.5.1	1334.5.2	1334.5.3	1334.5.4	Recorded elsewhere in the study area
Exotic																		
<i>Acetosella vulgaris</i>	Sheep's Sorrel	0.1											1.0		0.1			
<i>Aira sp.</i>	Hair-grass	0.1			0.1			0.1										
<i>Ailanthus altissima</i>	Tree of Heaven						0.2											
<i>Avena sp.</i>	Wild Oats										0.1	0.5			0.1	0.2	5.0	
<i>Briza maxima</i>	Greater Quaking-grass				0.1			1.0										
<i>Briza minor</i>	Lesser Quaking-grass									0.1								
<i>Bromus sp.</i>	Brome Grass		0.1		0.1	0.1	0.1		0.2	2.0		0.1	0.1	0.2	0.1	0.2	5.0	
<i>Capsella bursa-pastoris</i>	Shepherd's Purse																	X
<i>Carthamus lanatus</i>	Saffron Thistle			0.1	0.1	0.1	0.1				0.1	0.2	0.2		0.5	0.2	0.2	
<i>Centaurium sp.</i>	Common Centaury			0.1														
<i>Chondrilla juncea</i>	Rush Skeleton-weed																	X
<i>Conyza sp.</i>	Fleabane																	X
<i>Crataegus monogyna</i>	Common Hawthorn					0.1	3.0											X
<i>Cyperus eragrostis</i>	Tall Flat-sedge									0.1								
<i>Dactylis glomerata</i>	Cock's Foot															0.1		
<i>Echium plantagineum</i>	Paterson's Curse				0.1	0.1			0.1	0.2	0.1		0.1	0.1		0.1	1.0	
<i>Eleusine tristachya</i>	Goose Grass									0.1								
<i>Eragrostis curvula</i>	African Lovegrass		0.1					1.0			0.1			0.2				
<i>Erodium botrys</i>	Long Stocks-bill								0.1			0.5						
<i>Erodium cicutarium</i>	Common Stork's-bill													0.1				
<i>Erodium sp.</i>	Stork's-bill										0.2							
<i>Festuca arundinacea</i>	Tall Fescue										5.0							
<i>Gnaphalium americanum</i>	Purple Cudweed										0.1							
<i>Hirschfeldia incana</i>	Buchan Weed				0.1	0.1			0.5			0.5	0.1	0.1	1.0	1.0	0.2	
<i>Holcus lanatus</i>	Yorkshire Fog							0.1		2.0								
<i>Hordeum sp.</i>	Barley Grass													0.2				
<i>Hypericum perforatum</i>	St John's Wort	0.2	0.2	0.5	0.2	0.2	0.2	0.1		0.1	0.1			0.1	0.1	0.2	0.5	
<i>Hypochaeris glabra</i>	Smooth Cats-ear																	X
<i>Hypochaeris radicata</i>	Flatweed	0.1		0.1	0.2	0.1	0.1	0.1	1.0		0.1							
<i>Lactuca serriola</i>	Prickly Lettuce					0.1								0.1				
<i>Lepidium africanum</i>	Exotic Peppergrass								0.1			0.1	0.1		0.1	0.1	2.0	
<i>Lolium perenne</i>	Perennial Ryegrass								0.1									
<i>Lycium ferocissimum</i>	African Boxthorn		5.0			0.1	3.0		0.1									
<i>Malva sp.</i>	Mallow / Marshmallow Weed														0.1	0.1	0.2	
<i>Marrubium vulgare</i>	White Horehound									0.1		0.1		0.2	0.1	0.1		
<i>Nassella trichotoma</i>	Serrated Tussock	3.0	10.0	3.0	65.0	60.0	40.0	0.2	0.5	2.0	0.5	0.2	0.1	0.1	0.1	0.1		
<i>Oenothera stricta</i>	Common Evening Primrose					0.1												
<i>Onopordum acanthium</i>	Scotch Thistle												0.1	0.1	15.0	5.0	5.0	
<i>Paronychia brasiliensis</i>	Brazilian Whitlow								0.1				0.1			0.2		
<i>Paspalum dilatatum</i>	Paspalum Grass								0.1									
<i>Petrorhagia nanteuillii</i>	Proliferous Pink	0.1			0.1	0.1						0.1	0.1				0.2	
<i>Phalaris aquatica</i>	Phalaris				1.0					55.0	1.0	2.0	3.0	70.0	25.0	35.0	20.0	

Species List	Common Name	320.1.1	320.1.2	320.1.3	320.2.1	320.2.2	320.2.3	1334.1.1	1334.2.1	1334.3.1	1334.4.1	1334.4.2	1334.4.3	1334.5.1	1334.5.2	1334.5.3	1334.5.4	Recorded elsewhere in the study area
<i>Plantago lanceolata</i>	Plantain / Lamb's Tongue		0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.5	0.2	0.2	0.2		0.5	0.1		
<i>Portulaca oleracea</i>	Pigweed									0.1								
<i>Prunus sp.</i>	Plum															0.1	1.0	
<i>Rosa rubiginosa</i>	Briar Rose			0.1	0.4	1.0	2.0	0.1	0.5		1.0	0.1			1.0	0.5	10.0	
<i>Rubus fruticosus</i>	Blackberry						1.0											X
<i>Salix sp.</i>	Willow																	X
<i>Salvia verbenaca</i>	Wild Sage											0.2	0.1					
<i>Sonchus sp.</i>	Milk/Sow Thistle									0.1								
<i>Taraxacum officinale</i>	Common Dandelion								0.1					0.1				
<i>Tolpis umbellata</i>	Yellow Hawkweed	0.1		0.1														
<i>Tragopogon dubius</i>	Yellow Salsify				0.1													
<i>Trifolium sp.</i>	Clover	0.1	0.1	0.1	0.1	0.1	2.0		0.5		0.2	0.5	2.0	1.0	0.5	0.2	5.0	
<i>Verbascum thapsus</i>	Common Mullein				0.1								0.1					
<i>Vulpia sp.</i>	Rat's Tail Fescue				0.1		0.1		1.0	0.2	0.5		0.1					
Native																		
<i>Acacia baileyana</i>	Cootamundra Wattle							0.1										
<i>Acaena ovina</i>	Sheep's Burr																	X
<i>Amyema sp.</i>	Box Mistletoe																	X
<i>Aristida ramosa</i>	Purple Wiregrass	1.0	0.2	0.1		0.1		2.0										
<i>Austrostipa bigeniculata</i>	Tall Speargrass		5.0	2.0	1.0	5.0	5.0	10.0	25.0		30.0	30.0	25.0	0.2	5.0	0.1		
<i>Austrostipa scabra</i>	Rough Spear-grass	1.0	5.0	2.0	1.0	1.0		0.1		1.0			2.0					
<i>Bothriochloa macra</i>	Red-leg Grass	10.0	15.0	10.0	1.0	5.0	5.0	5.0	1.0	0.2	1.0							
<i>Calocephalus citreus</i>	Lemon Beauty-heads							1.0										
<i>Carex inversa</i>	Knob Sedge			0.1			0.1		0.2			0.1			1.0	0.1		
<i>Cheilanthes sieberi</i>	Rock Fern	0.2		0.1				0.1										
<i>Chloris truncata</i>	Windmill Grass																	X
<i>Chrysocephalum apiculatum</i>	Common Everlasting	10.0	0.1	2.0			0.1	2.0		0.1								
<i>Convolvulus erubescens</i>	Australian Bindweed			0.1			0.1	0.1										
<i>Crassula sieberiana</i>	Austral Stonecrop	0.2		0.1			0.1						0.1		0.5			
<i>Desmodium varians</i>	Slender Tick-trefoil	0.1						0.1	0.1									
<i>Einadia nutans</i>	Climbing Saltbush								0.2				0.1				0.1	
<i>Eleocharis acuta</i>	Common Spikerush									0.1								
<i>Elymus scaber</i>	Common Wheat Grass	0.2	0.1			0.1			0.1									
<i>Eryngium ovinum</i>	Blue Devil							0.1										
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum							2.0		20.0								
<i>Eucalyptus bridgesiana</i>	Apple Box																	X
<i>Eucalyptus melliodora</i>	Yellow Box								25.0									
<i>Euchiton sp.</i>	Cudweed				0.1													
<i>Gonocarpus tetragynus</i>	Common Raspwort			0.1														
<i>Goodenia hederacea</i>	Ivy Goodenia			0.1				0.1										
<i>Goodenia pinnatifida</i>	Cut-Leaved Goodenia	0.2	0.1					0.1										
<i>Hypericum gramineum</i>	Native St John's Wort			0.1														
<i>Juncus australis</i>	Austral Rush				0.1				0.1									
<i>Juncus filicaulis</i>	Pinrush				0.1					0.1								

Species List	Common Name	320.1.1	320.1.2	320.1.3	320.2.1	320.2.2	320.2.3	1334.1.1	1334.2.1	1334.3.1	1334.4.1	1334.4.2	1334.4.3	1334.5.1	1334.5.2	1334.5.3	1334.5.4	Recorded elsewhere in the study area
<i>Leptorhynchus squamatus</i>	Scaly Buttons			0.3														
<i>Leucochrysum albicans</i>	Hoary Sunray							0.1										
<i>Lomandra coriacea</i>	Wattle Mat-rush	0.2		0.2			0.1	0.1					0.1		0.1			
<i>Lomandra multiflora</i>	Many-flowered Mat-rush			0.1														
<i>Melichrus urceolatus</i>	Urn Heath	0.1		0.1														
<i>Microtis unifolia</i>	Common Onion Orchid							0.1										
<i>Oxalis perennans</i>	Woody-Root Oxalis	0.1				0.1												
<i>Panicum effusum</i>	Hairy Panic	1.0			0.1	0.2	0.1			0.2	0.5		0.5					
<i>Plantago varia</i>	Variable Plantain	0.5						0.1										
<i>Rumex brownii</i>	Swamp Dock	0.1		0.1			0.1						0.1		0.1	0.1		
<i>Rytidosperma carphoides</i>	Short Wallaby Grass									1.0								
<i>Rytidosperma laeve</i>	Smooth Wallaby-Grass									0.2								
<i>Rytidosperma sp.</i>	Wallaby Grass	20.0	10.0	10.0	1.0	5.0	10.0	10.0			2.0		2.0	2.0	0.2	0.1		
<i>Solenogyne dominii</i>	Smooth Solenogyne							0.1										
<i>Stackhousia monogyna</i>	Creamy Candles			0.2														
<i>Themeda triandra</i>	Kangaroo Grass	0.1		10.0														
<i>Tricoryne elatior</i>	Yellow Rush-lily	0.2						0.1										
<i>Vittadinia muelleri</i>	Narrow-leaved New Holland Daisy	0.1		0.5				0.1										
<i>Wahlenbergia communis</i>	Native Bluebell	0.1	0.1	0.1		0.1	0.1	0.1										
<i>Wahlenbergia luteola</i>	Yellowish Bluebell	0.1		0.1		0.1		0.1										
Number of Species		29	16	32	23	25	26	33	24	25	17	16	24	16	21	22	15	
Number of Native Species		21	9	23	8	10	11	24	8	9	4	2	8	2	6	4	1	
No. Native Non-grass Species		15	4	18	4	4	8	19	5	4	1	2	5	1	5	3	2	
No. of Native Indicator Species (Rehwinkel 2015)		9	2	10	0	0	2	-	-	-	-	-	-	-	-	-	-	
Number of Exotic Species		8	7	9	15	15	15	9	16	16	13	14	16	14	15	18	14	
% Native Ground Cover		92.3	76.9	90.4	6.1	21.4	32.6	92.1	85.3	4.1	91.3	85.3	79.9	2.9	13.7	0.9	0.2	

Appendix C. Tree Survey Results

Tree number	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/ Dead	Notes
					S	M	L		
1	<i>E. melliodora</i>	Yellow Box	57	5.5				A	
2	<i>E. bridgesiana</i>	Apple Box	152	10	2			A	Mistletoe x 1.
3	<i>E. sp.</i>	Unidentified	60	5	2	1		Dead	
4	<i>E. bridgesiana</i>	Apple Box	124	11	2			A	Beehive in hollow.
5	<i>E. bridgesiana</i>	Apple Box	37	10				A	
6	<i>E. blakelyi</i>	Blakely's Red Gum	55	7				A	
7	<i>E. melliodora</i>	Yellow Box	98	13				A	
8	<i>E. melliodora</i>	Yellow Box	113	9				A	
9	<i>E. melliodora</i>	Yellow Box	105	10				A	Beehive in base of tree.
10	<i>E. blakelyi</i>	Blakely's Red Gum	46	5				A	
11	<i>E. melliodora</i>	Yellow Box	78	10				A	
12	<i>E. blakelyi</i>	Blakely's Red Gum	75	7				A	
13	<i>E. sp.</i>	Unidentified	66	9				A	
14	<i>E. melliodora</i>	Yellow Box	45	6				A	
15	<i>E. blakelyi</i>	Blakely's Red Gum	54	7				A	
16	<i>E. blakelyi</i>	Blakely's Red Gum	104	10				A	
17	<i>E. blakelyi</i>	Blakely's Red Gum	64	9				A	
18	<i>E. blakelyi</i>	Blakely's Red Gum	74	10				A	
19	<i>E. blakelyi</i>	Blakely's Red Gum	33	8				A	
20	<i>E. blakelyi</i>	Blakely's Red Gum	42	8				A	Mistletoe x 2.
21	<i>E. blakelyi</i>	Blakely's Red Gum	42	8				A	
22	<i>E. bridgesiana</i>	Apple Box	50	8				A	
23	<i>E. blakelyi</i>	Blakely's Red Gum	29	9				A	

Tree number	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/Dead	Notes
					S	M	L		
24	<i>E. blakelyi</i>	Blakely's Red Gum	34	9				A	
25	<i>E. blakelyi</i>	Blakely's Red Gum	40	9				A	
26	<i>E. blakelyi</i>	Blakely's Red Gum	56	7				A	2 large hollows very low to ground, likely not functional.
27	<i>E. blakelyi</i>	Blakely's Red Gum	36	8				A	
28	<i>E. blakelyi</i>	Blakely's Red Gum	41	7				A	
29	<i>E. blakelyi</i>	Blakely's Red Gum	42	9				A	
30	<i>E. blakelyi</i>	Blakely's Red Gum	160	9				A	Tree comprised of 3 large trunks.
31	<i>E. blakelyi</i>	Blakely's Red Gum	59	9				A	
32	<i>E. blakelyi</i>	Blakely's Red Gum	50	9				A	
33	<i>E. blakelyi</i>	Blakely's Red Gum	70	10.5				A	
34	<i>E. blakelyi</i>	Blakely's Red Gum	45	7				A	
35	<i>E. melliodora</i>	Yellow Box	93	10				A	Mistletoe x 5.
36	<i>E. blakelyi</i>	Blakely's Red Gum	29	6				A	
37	<i>E. blakelyi</i>	Blakely's Red Gum	28	7				A	
38	<i>E. bridgesiana</i>	Apple Box	65	12				A	
39	<i>E. blakelyi</i>	Blakely's Red Gum	40	6				A	
40	<i>E. blakelyi</i>	Blakely's Red Gum	65	10				A	
41	<i>E. blakelyi</i>	Blakely's Red Gum	32	8				A	
42	<i>E. blakelyi</i>	Blakely's Red Gum	75	10				A	Mud nest.
43	<i>E. blakelyi</i>	Blakely's Red Gum	40	9				A	
44	<i>E. blakelyi</i>	Blakely's Red Gum	35	7				A	
45	<i>E. blakelyi</i>	Blakely's Red Gum	50	8	1			A	
46	<i>E. blakelyi</i>	Blakely's Red Gum	80	7	1			A	Beehive in hollow.
47	<i>E. blakelyi</i>	Blakely's Red Gum	84	9		2		A	Eastern Rosella nest in hollow.
48	<i>E. blakelyi</i>	Blakely's Red Gum	86	9				A	

Tree number	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/Dead	Notes
					S	M	L		
49	<i>E. blakelyi</i>	Blakely's Red Gum	50	7		1		A	Starling nest in hollow.
50	<i>E. blakelyi</i>	Blakely's Red Gum	72	7				A	
51	<i>E. melliodora</i>	Yellow Box	30	5		1		A	
52	<i>E. melliodora</i>	Yellow Box	45	8	1	2		A	
53	<i>E. melliodora</i>	Yellow Box	55	8				A	
54	<i>E. blakelyi</i>	Blakely's Red Gum	40	3				A	
55	<i>E. blakelyi</i>	Blakely's Red Gum	75	12				A	1 x small stick nest.
56	<i>E. melliodora</i>	Yellow Box	55	15	1			A	1 x small old stick nest.
57	<i>E. blakelyi</i>	Blakely's Red Gum	35	6				A	
58	<i>E. melliodora</i>	Yellow Box	65	9				A	
59	<i>E. melliodora</i>	Yellow Box	110	13				A	
60	<i>E. blakelyi</i>	Blakely's Red Gum	61	-				A	Assessed by Kevin Mills and Associates EIA (2015). Removed by Environa Drive.
61	<i>E. blakelyi</i>	Blakely's Red Gum	62	-				A	Assessed by Kevin Mills and Associates EIA (2015). Removed by Environa Drive.
62	<i>E. melliodora</i>	Yellow Box	77	-				A	Assessed by Kevin Mills and Associates EIA (2015). Removed by Environa Drive.
63	<i>E. melliodora</i>	Yellow Box	144	-	2	2		A	Assessed by Kevin Mills and Associates EIA (2015).
64	<i>E. melliodora</i>	Yellow Box	54	-				A	Assessed by Kevin Mills and Associates EIA (2015). Removed by Environa Drive.
65	<i>E. melliodora</i>	Yellow Box	91	-				A	Assessed by Kevin Mills and Associates EIA (2015).
66	<i>E. melliodora</i>	Yellow Box	94	-				A	Assessed by Kevin Mills and Associates EIA (2015).
67	<i>E. melliodora</i>	Yellow Box	75	16				A	1 x small stick nest. Removed by Environa Drive.
68	<i>E. melliodora</i>	Yellow Box	79	17				A	Removed by Environa Drive.
69	<i>E. melliodora</i>	Yellow Box	86	17				A	Removed by Environa Drive.
70	<i>E. melliodora</i>	Yellow Box	118	16				A	Mistletoe x 1. Removed by Environa Drive.
71	<i>E. blakelyi</i>	Blakely's Red Gum	88	10				A	Removed by Environa Drive.
72	<i>E. blakelyi</i>	Blakely's Red Gum	76	9				A	Removed by Environa Drive.
73	<i>E. melliodora</i>	Yellow Box	98	14		2		A	

Tree number	Species Name	Common Name	DBH (cm)	Height (m)	Hollows			Alive/Dead	Notes
					S	M	L		
74	<i>E. melliodora</i>	Yellow Box	109	16				A	
75	<i>E. melliodora</i>	Yellow Box	45	9				A	
76	<i>E. blakelyi</i>	Blakely's Red Gum	47	7				A	Removed by Environa Drive.
77	<i>E. blakelyi</i>	Blakely's Red Gum	91	18				A	2 x small stick nests. Removed by Environa Drive.

Appendix D. Fauna Species Recorded

Classification	Scientific Name	Common Name	BC Status	EPBC Status
Amphibia	<i>Crinia parinsignifera</i>	Eastern Sign-bearing Froglet	Protected	-
Amphibia	<i>Crinia signifera</i>	Common Eastern Froglet	Protected	-
Amphibia	<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog	Protected	-
Aves	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Protected	-
Aves	<i>Acridotheres tristis</i>	Indian Myna	Protected	-
Aves	<i>Anas gracilis</i>	Grey Teal	Protected	-
Aves	<i>Anas superciliosa</i>	Pacific Black Duck	Protected	-
Aves	<i>Anthochaera carunculata</i>	Red Wattlebird	Protected	-
Aves	<i>Aquila audax</i>	Wedge-tail Eagle	Protected	-
Aves	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Protected	-
Aves	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-cockatoo	Protected	-
Aves	<i>Carduelis carduelis</i>	European Goldfinch	Protected	-
Aves	<i>Chenonetta jubata</i>	Australian Wood Duck	Protected	-
Aves	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Protected	-
Aves	<i>Corvus coronoides</i>	Australian Raven	Protected	-
Aves	<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Protected	-
Aves	<i>Eolophus roseicapilla</i>	Galah	Protected	-
Aves	<i>Falco berigora</i>	Brown Falcon	Protected	-
Aves	<i>Grallina cyanoleuca</i>	Magpie-lark	Protected	-
Aves	<i>Gymnorhina tibicen</i>	Australian Magpie	Protected	-
Aves	<i>Hirundo neoxena</i>	Welcome Swallow	Protected	-
Aves	<i>Lalage sueurii</i>	White-winged Triller	Protected	-
Aves	<i>Malurus cyaneus</i>	Superb Fairy-wren	Protected	-
Aves	<i>Nesoptilotis leucotis</i>	White-eared Honeyeater	Protected	-
Aves	<i>Ocyphaps lophotes</i>	Crested Pigeon	Protected	-
Aves	<i>Pachycephala rufiventris</i>	Rufous Whistler	Protected	-
Aves	<i>Phalacrocorax varius</i>	Pied Cormorant	Protected	-
Aves	<i>Phaps chalcoptera</i>	Common Bronzewing	Protected	-
Aves	<i>Platycercus elegans</i>	Crimson Rosella	Protected	-
Aves	<i>Platycercus eximius</i>	Eastern Rosella	Protected	-
Aves	<i>Porphyrio porphyrio</i>	Purple Swamphen	Protected	-
Aves	<i>Psephotus haematonotus</i>	Red-rumped Parrot	Protected	-
Aves	<i>Rhipidura albiscapa</i>	Grey Fantail	Protected	-
Aves	<i>Rhipidura leucophrys</i>	Willy Wagtail	Protected	-
Aves	<i>Smicrornis brevirostris</i>	Weebill	Protected	-
Aves	<i>Sturnus vulgaris</i>	Common Starling	-	-
Aves	<i>Turdus merula</i>	European Blackbird	-	-
Aves	<i>Vanellus miles</i>	Masked Lapwing	Protected	-
Insecta	<i>Synemon plana</i>	Golden Sun Moth	E1	CE
Mammalia	<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Protected	-

Classification	Scientific Name	Common Name	BC Status	EPBC Status
Mammalia	<i>Vombatus ursinus</i>	Common Wombat	Protected	-
Mammalia	<i>Vulpes vulpes</i>	Red Fox	-	-
Reptilia	<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard	V1	V
Reptilia	<i>Carlia tetradactyla</i>	Southern Rainbow Skink	Protected	-
Reptilia	<i>Lampropholis delicata</i>	Delicate Skink	Protected	-
Reptilia	<i>Menetia greyii</i>	Common Dwarf Skink	Protected	-
Reptilia	<i>Morethia boulengeri</i>	Boulenger's Skink	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	27/09/2019	8:15:00 AM	10:30:00 AM	8	15	Fine	slight breeze	10	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	2	
								11	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	3	
								7	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	2	
2	3/10/2019	7:45:00 AM	9:50:00 AM	11	18	Fine	none	10	-	-	-	-	-	Unidentified Skink	Individual	2	
								11	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
3	10/10/2019	8:55:00 AM	11:15:00 AM	8	14	Fine	slight breeze	10	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	2	
								11	-	-	-	-	-	Unidentified Skink	Individual	2	
								4	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
								9	-	-	-	-	-	Unidentified Skink	Individual	3	
4	17/11/2019	9:10:00 AM	10:10:00 AM	14	14	5/8	slight breeze	10	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	5	
								3	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
								2	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
								2	-	-	-	-	-	Unidentified Skink	Individual	1	
								1	-	-	-	-	-	Unidentified Skink	Individual	2	
5	22/10/2019	7:55:00 AM	9:05:00 AM	11	15	Fine	none	10	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	2	
								11	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	2	
								7	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
6	28/10/2019	8:05:00 AM	9:40:00 AM	8	12	Fine	none	10	-	-	-	-	<i>Menetia greyii</i>	Common Dwarf Skink	Individual	1	
								10	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	4	
								11	-	-	-	-	<i>Morethia boulengeri</i>	Boulenger's Skink	Individual	1	
								11	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	3	
								5	-	-	-	-	-	Unidentified Skink	Individual	2	
7	5/11/2019	8:30:00 AM	9:30:00 AM	10	11	3/8	light wind	10	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	6	
								11	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
								11	-	-	-	-	-	Unidentified Skink	Individual	1	
8	13/11/2019	7:45:00 AM	10:15:00 AM	9.7	14.1	Fine	slight breeze	10	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
								10	-	-	-	-	<i>Carlia tetradactyla</i>	Rainbow Skink	Individual	1	
9	22/11/2019	8:30:00 AM	10:00:00 AM	26.1	28.1	Fine	none	5	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
								9	-	-	-	-	<i>Lampropholis delicata</i>	Delicate Skink	Individual	1	
10	29/11/2019	8:00:00 AM	9:20:00 AM	16.3	20.5	Fine	none	9	-	-	-	-	-	Unidentified Skink	Individual	1	

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

Appendix F. BAM Summary Reports

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00021172/BAAS20006/20/00021173	Poplars Innovation Park - BDAR for Stage 1	18/06/2020
Assessor Name	Report Created	BAM Data version *
Samuel F Reid	12/08/2020	29
Assessor Number	Assessment Type	BAM Case Status
BAAS20006	Part 4 Developments (General)	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.	Assessment Revision	Date Finalised
	0	12/08/2020

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	1334_Zone_3	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion	Zone_3	0.32	1	
2	1334_Zone_4	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion	Zone_4	4.58	2	

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00021172/BAAS20006/20/00021173	Poplars Innovation Park - BDAR for Stage 1	18/06/2020
Assessor Name	Report Created	BAM Data version *
Samuel F Reid	12/08/2020	29
Assessor Number	Assessment Type	BAM Case Status
BAAS20006	Part 4 Developments (General)	Finalised
	Assessment Revision	Date Finalised
	0	12/08/2020

* 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)
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Diamond Firetail	Stagonopleura guttata	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Flame Robin	Petroica phoenicea	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Gang-gang Cockatoo	Callocephalon fimbriatum	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion

Koala	<i>Phascolarctos cinereus</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Little Eagle	<i>Hieraetus morphnoides</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Little Lorikeet	<i>Glossopsitta pusilla</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Regent Honeyeater	<i>Anthochaera phrygia</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Scarlet Robin	<i>Petroica boodang</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Speckled Warbler	<i>Chthonicola sagittata</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Spotted Harrier	<i>Circus assimilis</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Square-tailed Kite	<i>Lophoictinia isura</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Turquoise Parrot	<i>Neophema pulchella</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion
Varied Sittella	<i>Daphoenositta chrysoptera</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion

Threatened species not within the area of these PCT's



BAM Predicted Species Report

Common Name	Scientific Name	Vegetation Types(s)
Painted Honeyeater	<i>Grantiella picta</i>	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion

Proposal Details

Assessment Id 00021172/BAAS20006/20/00021173	Proposal Name Poplars Innovation Park - BDAR for Stage 1	BAM data last updated * 18/06/2020
Assessor Name Samuel F Reid	Report Created 12/08/2020	BAM Data version * 29
Assessor Number BAAS20006	Assessment Type Part 4 Developments (General)	BAM Case Status Finalised
	Assessment Revision 0	Date Finalised 12/08/2020

* 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												
<i>Aprasia parapulchella</i> Pink-tailed Legless Lizard	No (surveyed)	<table border="0"> <tr> <td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td> </tr> <tr> <td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td> </tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	Feb	Mar	Apr	May	Jun									
Jul	Aug	Sep	Oct	Nov	Dec									
<i>Lophoictinia isura</i> Square-tailed Kite	No (surveyed)	<table border="0"> <tr> <td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td> </tr> <tr> <td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td> </tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	Feb	Mar	Apr	May	Jun									
Jul	Aug	Sep	Oct	Nov	Dec									
<i>Synemon plana</i> Golden Sun Moth	Yes (surveyed)	<table border="0"> <tr> <td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td> </tr> <tr> <td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td> </tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	Feb	Mar	Apr	May	Jun									
Jul	Aug	Sep	Oct	Nov	Dec									
<i>Hieraetus morphnoides</i> Little Eagle	No (surveyed)	<table border="0"> <tr> <td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td> </tr> <tr> <td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td> </tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	Feb	Mar	Apr	May	Jun									
Jul	Aug	Sep	Oct	Nov	Dec									
<i>Delma impar</i> Striped Legless Lizard	No (surveyed)	<table border="0"> <tr> <td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td> </tr> <tr> <td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td> </tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	Feb	Mar	Apr	May	Jun									
Jul	Aug	Sep	Oct	Nov	Dec									

BAM Candidate Species Report

<p><i>Callocephalon fimbriatum</i> Gang-gang Cockatoo</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td> </tr> <tr> <td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td> </tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	Feb	Mar	Apr	May	Jun									
Jul	Aug	Sep	Oct	Nov	Dec									
<p><i>Rutidosis leptorrhynchoides</i> Button Wrinklewort</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td> </tr> <tr> <td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td> </tr> </table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	Feb	Mar	Apr	May	Jun									
Jul	Aug	Sep	Oct	Nov	Dec									

List of Species Not On Site

Name
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat
<i>Myotis macropus</i> Southern Myotis
<i>Phascolarctos cinereus</i> Koala
<i>Swainsona recta</i> Small Purple-pea
<i>Swainsona sericea</i> Silky Swainson-pea
<i>Anthochaera phrygia</i> Regent Honeyeater



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00021172/BAAS20006/20/00021173	Poplars Innovation Park - BDAR for Stage 1	18/06/2020
Assessor Name	Report Created	BAM Data version *
Samuel F Reid	12/08/2020	29
Assessor Number	BAM Case Status	Date Finalised
BAAS20006	Finalised	12/08/2020
Assessment Revision	Assessment Type	
0	Part 4 Developments (General)	

* 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	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion								
1	1334_Zone_3	30.3	0.3	0.25	High Sensitivity to Potential Gain	2.00	TRUE	5



BAM Credit Summary Report

2	1334_Zone_4	8.3	4.6	0.25	High Sensitivity to Potential Gain	2.00	TRUE	0
							Subtotal	5
							Total	5

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAll	Species credits	
<i>Synemon plana / Golden Sun Moth (Fauna)</i>							
1334_Zone_4	8.3	4.58	0.25	3	True	29	
						Subtotal	29



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00021172/BAAS20006/20/00021173	Poplars Innovation Park - BDAR for Stage 1	18/06/2020
Assessor Name	Assessor Number	BAM Data version *
Samuel F Reid	BAAS20006	29
Proponent Names	Report Created	BAM Case Status
	12/08/2020	Finalised
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	12/08/2020

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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 Woodland	Endangered Ecological Community	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion

Species

Synemon plana / Golden Sun Moth

Additional Information for Approval

PCTs With Customized Benchmarks

Assessment Id	Proposal Name
00021172/BAAS20006/20/00021173	Poplars Innovation Park - BDAR for Stage 1



BAM Biodiversity Credit Report (Like for like)

No Changes

Predicted Threatened Species Not On Site

Name

Grantiella picta / Painted Honeyeater

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	Number of credits to be retired
1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	4.9	5.00

1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	HBT	IBRA region



BAM Biodiversity Credit Report (Like for like)

	<p>White Box Yellow Box Blakely's Red Gum - Woodland This includes PCT's: 2, 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, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 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, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698</p>	-	Yes	<p>Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains.</p> <p>or</p> <p>Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>
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Species Credit Summary

Species	Area	Credits
Synemon plana / Golden Sun Moth	4.6	29.00



BAM Biodiversity Credit Report (Like for like)

Synemon plana/ Golden Sun Moth	1334_Zone_4	Like-for-like credit retirement options	
		Spp	IBRA region
		Synemon plana/Golden Sun Moth	Any in NSW



BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00021172/BAAS20006/20/00021173	Poplars Innovation Park - BDAR for Stage 1	18/06/2020
Assessor Name	Assessor Number	BAM Data version *
Samuel F Reid	BAAS20006	29
Proponent Name(s)	Report Created	BAM Case Status
	12/08/2020	Finalised
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	12/08/2020

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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 Woodland	Endangered Ecological Community	1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion

Species

Synemon plana / Golden Sun Moth

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Predicted Threatened Species Not On Site

Name

Grantiella picta / Painted Honeyeater

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	Number of credits to be retired
1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	4.9	5.00

1334-Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	HBT	IBRA region

BAM Biodiversity Credit Report (Variations)

	<p>White Box Yellow Box Blakely's Red Gum Woodland -</p> <p>This includes PCT's:</p> <p>2, 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, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 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, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698</p>		Yes	<p>Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains.</p> <p style="text-align: center;">or</p> <p>Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>
Variation options				
	Formation	Trading group	HBT	IBRA region
	Grassy Woodlands	Tier 2 or higher	Yes (including artificial)	<p>IBRA Region: South Eastern Highlands,</p> <p style="text-align: center;">or</p> <p>Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>



BAM Biodiversity Credit Report (Variations)

Species Credit Summary

Species	Area	Credits
Synemon plana / Golden Sun Moth	4.6	29.00

Synemon plana / Golden Sun Moth	1334_Zone_4	Like-for-like options		
		Spp		IBRA region
		Synemon plana /Golden Sun Moth		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	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
00021172/BAAS20006/20/00021173	68	0	12/08/2020
Assessor Name	Assessor Number	Proposal Name	BAM Case Status
Samuel F Reid	BAAS20006	Poplars Innovation Park - BDAR for Stage 1	Finalised
	Assessment Type	Date Finalised	
	Part 4 Developments (General)	12/08/2020	

PCT list

Price calculated	PCT common name	Credits
Yes	1334 - Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion	5

Species list

Price calculated	Species	Credits
Yes	<i>Synemon plana</i> (Golden Sun Moth)	29

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat



Biodiversity payment summary report

Assessment Id

00021172/BAAS20006/20/00021173

Proposal Name

Poplars Innovation Park - BDAR for Stage 1

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Biodiversity payment summary report

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	1334 - Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion	Yes	White Box Yellow Box Blakely's Red Gum Woodland	15.97%	\$279.14	2.0667	\$8,372.13	5	\$41,860.65
								Subtotal (excl. GST)	\$41,860.65
								GST	\$4,186.06
								Total ecosystem credits (incl. GST)	\$46,046.72

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
10791	<i>Synemon plana</i> (Golden Sun Moth)	Endangered	\$5,974.37	20.6900%	\$238.97	29	\$216,033.82
						Subtotal (excl. GST)	\$216,033.82
						GST	\$21,603.38
						Total species credits (incl. GST)	\$237,637.20



Biodiversity payment summary report

Assessment Id

00021172/BAAS20006/20/00021173

Proposal Name

Poplars Innovation Park - BDAR for Stage 1

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Biodiversity payment summary report

Grand total **\$283,683.92**



Biodiversity payment summary report

Assessment Id

00021172/BAAS20006/20/00021173

Proposal Name

Poplars Innovation Park - BDAR for Stage 1

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Attachment B – Estate Development Consent

3 August 2021

Capital Region Planning
5/32 Lonsdale Street
BRADDON ACT 2612

Dear Sir/Madam

Council is pleased to advise that your Development Application DA.2020.1427 relating to Lot 1 DP 1263364, No. 300 Lanyon Drive JERRABOMBERRA NSW 2619 has been approved. The 'Notice of Determination' is attached.

It is important that you carefully read the notice and the accompanying notes, and that any requirements and rights are fully understood before proceeding with the development.

Should you have any further enquiries please contact Alex Glouftsis of Council's Natural and Built Character Section on 6285 6244.

Yours faithfully



M J Thompson
Portfolio General Manager
Natural And Built Character

Per:G. Harlor.....



Notice of Determination of Development Application

Issued under Section 4.18 of the Environmental Planning and Assessment Act 1979

Development Application No.	DA.2020.1427
Land to be developed	Lot 1 DP 1263364, 300 Lanyon Drive JERRABOMBERRA NSW 2619
Description of Proposed development	Six lot Torrens title subdivision and construction of new road
Applicant's Details	Capital Region Planning 5/32 Lonsdale Street BRADDON ACT 2612
Date of Determination	28 July 2021
Consent <u>granted</u> subject to the conditions in the attached schedule of conditions and in accordance with approved plans.	
Date from which Consent operates	28 July 2021
Date on which Consent expires	28 July 2026
Information attached to this determination	<input checked="" type="checkbox"/> Conditions of the consent listed in schedule of conditions
Approvals granted under the Local Government Act 1993	Nil.

Signed by Consent Authority

Date of this Notice: 3 August 2021

M J Thompson
Portfolio General Manager
Natural and Built Character
Per.....G. Harlor.....

REASONS FOR DECISION

1. The development was found to be consistent with the provisions of the relevant State Environmental Planning Policies,
2. The development was found to be consistent with the relevant provisions of the *Queanbeyan Local Environmental Plan (West Jerrabomberra) 2013*,
3. The development is consistent with the relevant provisions of the South Jerrabomberra Development Control Plan 2015,
4. The development was found to be unlikely to result in any adverse environmental, social, or economic impacts in the locality,
5. The subject site was found to be suitable for development, and
6. The development was found to be in the public interest.

COMMUNITY CONSULTATION

7. The application was notified in accordance with the QPRC Community Engagement and Participation Plan for a period of 14 days on 3 separate occasions from the 10/09/2020 to the 28/09/2020, the 27/05/2021 to the 14/06/2021 and the 02/07/2021 to the 20/07/2021 due to Council receiving a submission of amended plans, with 3 submissions received in total. Two submissions did not raise an objection to the proposal. The third submission raised concerns regarding electricity supply. It is noted that the five development lots proposed under this subdivision would be able to be serviced by electricity. However, the concerns with electricity supply relate to potential future development. One lot has been reserved for a substation in consideration of this issue. It is noted potential future electricity supply needs to be addressed by the developer but is not a reason to refuse the subdivision in its current state.

RIGHT OF APPEAL BY APPLICANT

If you are dissatisfied with this decision Section 8.7 of the *Environmental Planning and Assessment Act 1979* gives you the right to appeal to the NSW Land and Environment Court within six (6) months after the date on which you receive this notice in accordance with the regulations.

** Section 8.7 of the Environmental Planning and Assessment Act 1979 does not apply to the determination of a development application for local development that has been the subject of a Commission of Inquiry.*

REQUEST FOR REVIEW OF DETERMINATION BY APPLICANT

Division 8.2 of the *Environmental Planning and Assessment Act 1979* provides that an applicant may request the Council to review a determination of their application. A request for review must be received within six (6) months of the date of determination. In reviewing the determination Council may confirm or change its determination. A fee applies to all applications for review. Review provisions do not apply to:

- (a) a determination to issue or refuse to issue a complying development certificate, or
- (b) a determination in respect of designated development, or
- (c) a determination in respect of integrated development, or
- (d) a determination made by the Council under Division 4 in respect of an application by the Crown.

CONDITIONS OF CONSENT
DA.2020.1427

APPROVED DEVELOPMENT AND PLANS

1. Plans and Specifications

The development referred to in the application is to be carried out in accordance with the approved plans and documents including the following:

Title / Description	Prepared by	Issue/Revision & Date	Date received by Council
Plans	Place Logic	29.06.2021 & 13.08.2020	29.06.2021
Biodiversity Development Assessment Report (BDAR)	Capital Ecology	01.08.2020	31.08.2020
BDAR Addendum	Capital Ecology	12.02.2021	16.02.2021
Bushfire Assessment Report	Ecological Australia	13.05.2020	31.08.2020
Draft Deposited Plan	David Ambrose Stone	25.06.2021	29.06.2021
Draft Deposited Plan Super Lot	David Ambrose Stone	27.07.2021	27.07.2021

Except as modified by any of the following conditions of consent.

Reason: Development is undertaken in accordance with this consent & is used for the approved purpose only.

SPECIAL CONDITIONS

2. Unexpected Finds Protocol

Prior to release of any Subdivision Works Certificate an unexpected finds protocol must be submitted to, and endorsed by, Council. The unexpected finds protocol must address the recommendations made in *Additional Phase 2 Environmental Site Assessment - South Poplars Development, Jerrabomberra, NSW* by Coffey Services Australia, dated 3 December 2018 (ref. no. 754-CBREN223644_R01).

The endorsed unexpected finds protocol must be implemented during the development of the site.

Reason: To ensure that all recommendations made in contaminated land assessments are implemented

3. Species Credit Retirement

Prior to issue of Subdivision Certificate, the class and number of species credits in Table 1 must be retired to offset the residual biodiversity impacts of the development.

Reason: To comply with Biodiversity Conservation Act 2016.

4. Payment of Credits

The requirement to retire credits outlined may be satisfied by payment to the Biodiversity Conservation Fund of an amount equivalent to the class and number of species credits, as calculated by the Biodiversity Offsets Payment Calculator.

Reason: To comply with Biodiversity Conservation Act 2016.

5. Evidence of Retirement of Credits

Evidence of the retirement of credits or payment to the Biodiversity Conservation Fund in satisfaction of Table 1 requirements must be provided to the consent authority prior to issue of Subdivision Certificate.

Reason: To comply with Biodiversity Conservation Act 2016.

Table 1 – Ecosystem and Species Credits Required to be Retired

Impacted Species	Species/Credit	Number of Species Credits	PCT & Vegetation Zone
Box-Gum Woodland		5	PCT1334 Zone 3
Box-Gum Woodland		0	PCT1334 Zone 4
Synemon plana Golden Sun Moth		34	PCT1334 Zone 4

6. Biodiversity Management Plan

Prior to issue of Subdivision Certificate, a Biodiversity Management Plan must be prepared to the satisfaction of the consent authority. Biodiversity Management Plan must identify the development site as per the Biodiversity Development Assessment Report. Impacts must be restricted to the development site and must not encroach into areas of retained native vegetation and habitat.

Reason: To comply with Biodiversity Conservation Act 2016.

Note: The Biodiversity Management Plan must identify all measures proposed in the Biodiversity Development Assessment Report to mitigate and manage impacts on biodiversity as outlined in Table 8.1 Mitigation measures of the Biodiversity Development Assessment Report in the approved documents

7. Super Lot – Release of Staged Subdivision Certificates

The release of a Subdivision Certificate to create the super lot on the plan prepared by David Ambrose Stone (dated 27.07.2021) and labelled as 'Draft Deposited Plan Super Lot' in Condition 1. Is not subject to compliance with Conditions 30 through to 52 prior to issue by Queanbeyan-Palerang Regional Council.

Reason: To allow for a staged release of Subdivision Certificates associated with the approved plan of subdivision.

GENERAL CONDITIONS

8. Copy to Owner

A copy of this consent is to be provided to the owner.

Reason: To ensure the owner is aware of the requirements imposed under the consent.

9. Batters

No batter is to have a gradient greater than 1:4. Batters greater than 1:4 must be retained.

Reason: Prevent soil erosion, water pollution and the discharge of loose sediment on surrounding land.

10. Imported Fill

All fill delivered to site has to be certified Virgin Excavated Natural Material (VENM).

Reason: Only clean and non-contaminated fill is used on site.

11. Inspection of Hollow Bearing Trees

Any hollow sections of the tree should be inspected for native fauna prior to work commencing and animals removed by a suitably qualified wildlife handler, when practical and safe to do so. Any hollow sections of the tree should be removed and lowered to the ground with care to be inspected by a suitably qualified wildlife handler. Any native fauna found should be appropriately relocated under supervision of a suitably qualified wildlife handler.

Reason: the tree may have hollows that contain native fauna, including threatened species recorded as occurring in the surrounding region.

12. Work on Adjoining Land is Limited

The verge and other adjoining lands must not be used for storage of materials or disturbed by construction activities except for:

- a) Installation of a temporary, stabilised construction access across the verge.
- b) Installation of services.
- c) Construction of an approved permanent verge crossing.

Reason: To minimise interference with the verge and its accessibility by pedestrians.

CONDITIONS TO BE SATISFIED PRIOR TO ISSUE OF SUBDIVISION WORKS CERTIFICATE

13. Water & Sewer Compliance Certificate - Design

Prior to the release of a Section 68 application for development works or a Subdivision Works Certificate a certificate of compliance in accordance with the *Water Management Act 2000* must be obtained from Council.

A water and sewer compliance certificate is to be applied for in conjunction with a Section 68 application or Subdivision Works Certificate.

Reason: To ensure that the hydraulic design is in accordance with the relevant Design and Construction specifications.

14. Subdivision Works Certificate

The Subdivision Works Certificate or Section 68 Development Works Application and accompanying engineering design plans and Certification Report must be submitted to Council prior to the commencement of any works for a subdivision stage.

The engineering plans must comply with the requirements of Council's Design and Construction Specifications and include the following where applicable to a subdivision stage -

- a) A Certification Report in accordance with Council's DQS Quality Assurance Design Specification, Clause DQS.04:
- b) This general note - All work must be constructed in accordance with the requirements of Council's QPRC Design and Construction Specifications
- c) Detailed Pavement design conforming to the procedures set out in Council's Design and Construction Specifications and/or relevant RMS specifications.

Reason: To provide design certification of the subdivision works.

15. Submit a Construction Management Plan

Prior to release of any Construction Certificate (Building) a Construction Management Plan for the management of soil, water, vegetation, waste, noise, vibration, dust, hazards and risk for the construction works must be submitted to, and endorsed by, Council. The plan must:

- a) describe the proposed construction works and construction program and,
- b) set standards and performance criteria to be met by the construction works and,
- c) describe the procedures to be implemented to ensure that the works comply with the standards and performance criteria and,
- d) identify procedures to receive, register, report and respond to complaints and,
- e) nominate and provide contact details for the persons responsible for implementing and monitoring compliance with the plans

Reason: To ensure that satisfactory measures are in place to provide for environmental management of the construction works.

CONDITIONS TO BE SATISFIED PRIOR TO COMMENCEMENT OF WORKS

16. Site Identification

The site where building work, subdivision work, or demolition work are proposed to be carried out shall be identified by a sign sited in a visually prominent position containing the following information:

- the development application number,
- name, address, and telephone number of the principal certifying authority,
- name of the principal contractor (if any) and 24-hour contact telephone number, and
- a statement that “unauthorised entry to the work site is prohibited”.

Reason: To satisfy the provisions of Clause 136B and 227A of the Environmental Planning and Assessment Regulation 2000.

17. Traffic Management

Prior to undertaking any works within a public road reserve or affecting the road reserve, a traffic management plan is to be submitted to and approved by Queanbeyan-Palerang Regional Council under Section 138 of the *Roads Act 1993*. Where occupancy of the road reserve is required, a Section 138 application shall accompany the Traffic Management Plan for Local Roads or an approved ROL from the RMS for State Roads.

Reason: To ensure that works carried out comply with the Roads Act.

18. Sediment and Erosion Control

A Sediment and Erosion Control Plan (S&ECP) for all site works, including road works and access, is to be approved by the principal certifying authority prior to work commencing. The plan is to cover all measures to control erosion and sediment transport in accordance with the NSW Landcom publication *Managing Urban Stormwater -Soils and Construction* (4th Edition 2004- "Blue Book").

Erosion and sediment controls are to be in place before the disturbance of any soils on the site, and are to be maintained during the works and for as long as necessary after the completion to prevent sediment and dirty water leaving the site and/or entering the surface water system outside of the site as follows:

- (a) divert uncontaminated run-off around cleared or disturbed areas,
- (b) erect a silt fence to prevent debris escaping into drainage systems or waterways,
- (c) prevent tracking of sediment by vehicles on roads, and
- (d) stockpile topsoil, excavated material, construction and landscaping supplies and debris within the site.

Reason: To minimise environmental impact associated with any works & to prevent soil erosion/water pollution.

19. Submit Notice of Commencement of Subdivision Work

A notice to Commence Subdivision Works must be submitted to Council at least two days prior to commencing any subdivision works and nominating Council as the Principal Certifying Authority for the subdivision works.

CONDITIONS TO BE SATISFIED DURING WORKS

20. Hours of Operation for Works

All works associated with the construction and/or demolition of this development must be carried out between the following hours unless Queanbeyan-Palerang Regional Council agrees in writing. A written application shall be made to Queanbeyan-Palerang Regional Council if a variation of hours is required.

Weekdays:	7.00am to 6.00pm
Saturdays:	8.00am to 4.00pm
Sundays and Public Holidays:	NIL

Reason: To reduce the chance of offensive noise being created and to minimise the impacts of the development in its locality.

21. Approval Documents

Keep a copy of all stamped approved plans, specifications, and documents on site while work is being undertaken.

Reason: Relevant documentation is available for perusal on site by a council officer, for compliance check.

22. Construction Facilities

Toilet facilities are to be provided at or in the close vicinity of the work site on which work involved in the erection or demolition of a building is being carried out.

Reason: To provide adequate facilities to the work site.

23. Unexpected Finds

The development is to proceed with caution. If any Aboriginal objects are found, works should stop and DECCW notified. If human remains are found work is to stop, the site is to be secured and the NSW Police and NSW Office of Environment and Heritage are to be notified.

Reason: To ensure objects discovered during construction are protected and notified in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales.

24. All Works to Be Confined to the Site

All demolition, excavation, backfilling, construction, and other activities associated with the development must:

- a) Be carried out entirely within the allotment boundaries unless otherwise approved by Council.
- b) Comply with the requirements of AS 2601-2001 - The demolition of structures.
- c) If within one metre of the verge, the site must be protected by a hoarding which must be erected prior to the commencement of the demolition works.
- d) Be kept clear of stormwater, sewer manholes and service easements on the site.
- e) Any gates must be installed so they do not open onto any footpath or adjoining land.

Reason: To ensure that all development activity associated with the development does not pose a hazard to life or property and that the effectiveness of public services is not impaired.

25. Construction Waste Management

All waste materials generated on-site during construction are to be stored in enclosed containers and deposited in an approved landfill at regular periods.

Reason: To ensure adequate waste management practices are in place during the construction phase.

26. Maintenance of Erosion Control Measures

All measures to control erosion and sediment transport are to be maintained during the works in accordance with the NSW Landcom publication *Managing Urban Stormwater - Soils and Construction* (4th Edition 2004- "Blue Book") and for as long as necessary after the completion to prevent sediment and dirty water leaving the site and/or entering the surface water system outside of the site.

Reason: To minimise environmental impact associated with any works & to prevent soil erosion/water pollution.

27. Works Sites to be Fenced

A hoarding or fence must be erected between the development site and public places before commencement of any other work.

Reason: To ensure that an effective barrier is provided to preserve the safety of people and property in public places.

28. Temporary Vehicle Access

Temporary vehicle access to the site must be stabilised to prevent the tracking of sediment onto the roads and footpath. Soil, earth, mud, or similar materials must be removed from the roadway by sweeping, shovelling, or a means other than washing, on a daily basis or as required. Soil washings from wheels must be collected and disposed of in a manner that does not pollute waters.

Reason: To minimise transfer of soil from the site onto the road pavement.

29. Protection of Works on Public Roads

Lighting, fencing, traffic control advanced warning signs must be provided for the protection of works and for the safety and convenience of the public, in accordance with Council's Queanbeyan Design and Construction Specifications (Version 3.2, dated January 2013) / Googong Design and Construction Specifications (Version 1, dated June 2011).

Traffic movement in both directions on public roads and vehicular access to private properties must be maintained at all times, during the currency of the works.

Reason: To ensure an adequate level of public safety and convenience during construction.

CONDITIONS TO BE SATISFIED PRIOR TO ISSUE OF A SUBDIVISION CERTIFICATE

30. Development Contributions

Prior to the issue of a Subdivision Certificate the contribution charges specified in Schedule 1 of this consent must be paid to Council under the provisions of Section 7.11 of the Environmental Planning and Assessment Act 1979, Section 64 of the Local Government Act 1993 and Division 5 of Part 2 of Chapter 6 of the Water Management Act 2000.

Reason: To provide for the funding of augmentation and provision of services and community facilities.

31. Stormwater Disposal Requirements

All stormwater from the site must be trapped and piped to stormwater pits to limit the discharge from the site to the pre-development rate in accordance with Council's D5 Development Design Specification.

Reason: To provide satisfactory stormwater disposal.

32. Driveway Requirements

The development must include the construction of a commercial type driveway over Council's footway at the location shown on the approved plans. The driveway must be:

- a) Constructed using plain concrete.
- b) Constructed with a 2% grade falling to the gutter.
- c) At minimum distance of one metre away from any electrical, Telstra, post box installation, other service or tree within the footway area.
- d) Constructed to the width of the existing Vehicle Kerb Crossing.
- e) On a modified layback kerb the driveway shall be a minimum of 3.0m for a single car garage or up to 6m for a double garage.
- f) In accordance with Council's Development Design Specification D13.

Reason: To ensure the construction of the driveway on public lands meets Council's requirements.

33. Driveway Location from Water Meter

The driveway within the property must maintain a clearance not less than half a metre from the water service or the water service must be relocated by Council at no cost to Council.

Reason: To ensure such service is not damaged by vehicle movements.

34. Repair Damaged Public Property

All damage caused to public property during the establishment of the development must be repaired or reinstated prior to the issue of any Occupation Certificate.

Reason: To ensure that all public property in the vicinity of the development is maintained in its pre-development condition.

35. Street Numbering

Prior to lodgement of a Subdivision Certificate, apply to Queanbeyan-Palerang Regional Council to determine the street addressing of each lot and display the approved street number in accordance with Council's requirements.

Reason: Adequate property identification for the public and for emergency services.

36. Landscaping Works Completed by an Accredited Contractor

All landscaping must be completed by a Council accredited Category 1 landscape contractor in accordance with approved landscape plan bearing the Council approval stamp.

Reason: To help ensure a high standard of landscape works.

37. Statement of Completed Landscape Works

A "Statement of Completed Landscaped Works" form signed by the landscape plan designer and the landscape contractor must be submitted to Council prior to the issue of the Final Occupation Certificate.

Reason: To help ensure a high standard of landscape works.

38. Application and Final Survey

An application to obtain a Subdivision Certificate must be made to Council. This must be accompanied by the following documentation:

- a) A final Survey Plan of Subdivision
- b) Any s88B instruments required by these conditions of consent
- c) A letter outlining how compliance with each condition of this development consent has been achieved; and
- d) Engineering Construction Certificate Report in accordance with specifications.

Reason: To enable registration of the subdivision and to ensure compliance with conditions of consent. To provide sufficient signed copies of the subdivision plan for Council, the applicant and the NSW Land and Property Information.

39. Statement from Surveyor

Upon the completion of subdivision works and prior to the issue of any Subdivision Certificate a statement prepared by a registered surveyor, must be submitted to the Principal Certifying Authority stating that all water, sewer and stormwater pipelines are completely located within their easements.

Reason: To ensure works are completed in accordance with Council's requirements.

40. Water and Sewer Compliance Certificate - Service

Prior to the release of a Subdivision Certificate, a certificate of compliance in accordance with the Water Management Act 2000 must be obtained from Council.

Reason: To ensure compliance with S6.14 of the Environmental Planning and Assessment Act 1979.

Note: *This certificate is required regardless of any other water and sewer compliance certificate previously obtained, and regardless of whether the development involved alterations to Council's infrastructure.*

41. Electricity Supply

Prior to Council issuing a subdivision certificate, a Notice of Arrangement (NOA) shall be requested from the electricity authority which states that satisfactory supply arrangements have been made for the provision of electricity to the proposed development.

Reason: Ensures that satisfactory supply arrangements have been made and that all of the lots in the subdivision are suitably serviced.

42. Subdivision Works Defects Liability Period - Bond

The completed subdivision works are subject to a six-month defects liability from the date of the issue of the relevant Subdivision Certificate.

The Subdivider must:

- a) Lodge a cash bond with Council with regard to the defects liability period in an amount as calculated from fees set by Council's Management Plan and current at the time of issue of the Subdivision Certificate; and
- b) Submit written authorisation that in the event of any defect not being rectified to the standards specified in Council's Design and Construction Specifications (Version 3.2, dated January 2013) / Googong Design and Construction Specifications (Version 1, dated June 2011), Council may enter the subject land and undertake rectification work and deduct the cost thereof from such Bond monies held by Council and to refund the balance, if any, to the Subdivider.

During the defects liability period the Subdivider will be liable for any part of the subdivision works which fail to perform in the manner outlined in Council's Design and Construction Specifications (or as would reasonably be expected under the design conditions).

Reason: To ensure works are completed in accordance with Council's requirements.

43. Separate Connections & Services

A separate sewer connection, stormwater drainage connection, water service, electricity supply and communication service must be provided to each allotment within the subdivision at the Subdivider's expense.

Note: The Subdivider may, at their own expense, provide a gas connection to such allotment within the subdivision subject to its availability.

Note: The Subdivider is responsible for all public utilities and services in the area of work and as such must notify all relevant Authorities and bear all costs associated with any repairs and/or adjustments as those Authorities deem necessary.

Reason: To provide access to services for each allotment.

44. Inspections - Water & Sewer Authority

Inspections must be performed by the Water and Sewer Authority (Council) when works reach the following stages:

- a) immediately prior to connection of new sewer pipes to the existing sewerage system,
- b) immediately prior to connection of new water pipes to the existing water reticulation,
- c) immediately prior to the backfilling of sewer drainage trenches, and
- d) immediately after installation of any on-site stormwater management system.

Council's Environment, Planning and Development section must be given 24-hours notice of the need for these inspections.

Note: Any inspections carried out by Council do not imply Council approval or acceptance of the works, and do not relieve the Developer from the requirements to provide an Engineering Construction Certificate Report in accordance with Council's Design and Construction Specifications.

Reason: To ensure that hydraulic services are constructed in accordance with Council requirements.

45. Power Supply

Easements for electricity supply shall be created on the final plan of subdivision in favour of Essential Energy. Such easements shall be 10 m wide (or such other width as agreed to by Essential Energy) shall be centred on:

- (a) all existing power lines which cross the subdivision and where that part of a subdivision will involve freshly surveyed boundaries; and
- (b) all proposed power lines that will be constructed to provide electricity to the lots within the subdivision; and
- (c) all proposed power lines within the subdivision for which the developer is not required to make a capital contribution, but which would be required to be constructed in the future to provide power to the boundary of each lot.

Reason: To ensure power supply to the proposed lots.

46. Submission from Service Authority

Prior to the issue of any Subdivision Certificate written evidence from the relevant service authority or a suitably accredited person that satisfactory arrangements have been made for the supply of reticulated electricity and telephone services to each lot must be submitted to Council.

Reason: To satisfy relevant utility authority requirements.

47. Covenant on the Land

Apply covenants under section 88B of the *Conveyancing Act 1919* to the new lots incorporating the restrictions listed below. Queanbeyan-Palerang Regional Council shall be nominated as the sole party with the power to vary or remove the required covenants.

- a) All requisite sewerage easements.
- b) Drainage easements shall be created over all existing and proposed drainage lines including inter-allotment drainage.
- c) All easements specified below and contained in the subdivision must benefit Council as well as affected lots:
 - i. easements to drain water,
 - ii. easements to drain sewer,
 - iii. easements for water supply,
 - iv. easements which Council may require to provide or maintain other services and
- d) Nominating Council as the name of the person/authority empowered to release, vary, or modify restriction or positive covenant numbered in the plan.

Reason: To ensure public utility services, access and restrictions are legalised over the land.

48. Dedication to Council

All drainage reserves, roads, reservoir sites, reserves, sewerage pump station sites must be dedicated to Council and shown as such on the Subdivision Survey Plan.

Reason: To permit Council to adequately manage reserves, drainage, and utility services, and to provide legal access to lots.

49. Subdivision PCA Inspections

The applicant shall engage the services of a suitably qualified Superintendent to supervise the construction of the Subdivision in accordance with Councils CQS - Contract Quality System Requirements Specification.

The following inspections and/or Hold Points (in accordance with the Council's referenced Construction Specification) shall be undertaken and released by Council (as the Principal Certifying Authority) during the construction of the Subdivision. Works shall not proceed beyond the inspection indicated until Council is satisfied that the requirements of the relevant specification have been met:

Reason: To ensure that all subdivision infrastructure is constructed in accordance with Councils Construction Specifications.

50. Battle Axe Lots - Driveway Construction

A commercial concrete driveway allowing the passing of two vehicles (6m wide) must be constructed between the front boundary of the site and the main body of the proposed battle axe lot within the battle-axe handle, and including its construction over the adjacent Council footway. A design for this must be supplied at subdivision works certificate stage.

Reason: To provide adequate vehicular access for each allotment.

51. Work in Accordance with Engineering Specifications

All construction and restoration work must be carried out strictly in accordance with the approved drawings and Council's Design and Construction Specifications.

Reason: To ensure construction and restoration work is in accordance with Council's requirements.

52. Submission of Traffic Control Devices Plan

A Traffic Control Devices Plan (TCD) must be submitted to Council for approval by the Local Traffic Committee prior to the installation of any traffic control devices. It must include line-marking and signposting.

Reason: To authorise traffic control devices.

Please Note:

Dial Before You Dig

Underground assets may exist in the area that is subject to your application. In the interests of health and safety and in order to protect damage to third party assets please contact Dial before you dig at www.1100.com.au or telephone on 1100 before excavating or erecting structures (This is the law in NSW). If alterations are required to the configuration, size, form or design of the development upon contacting the Dial before You Dig service, an amendment to the development consent (or a new development application) may be necessary. Individuals owe asset owners a duty of care that must be observed when working in the vicinity of plant or assets. It is the individual's responsibility to anticipate and request the nominal location of plant or assets on the relevant property via contacting the Dial before you dig service in advance of any construction or planning activities.

Telecommunications Act 1997 (Commonwealth)

Telstra (and its authorized contractors) are the only companies that are permitted to conduct works on Telstra's network and assets. Any person interfering with a facility or installation owned by Telstra is committing an offence under the Criminal Code Act 1995 (Cth) and is liable for prosecution. Furthermore, damage to Telstra's infrastructure may result in interruption to the provision of essential services and significant costs. If you are aware of any works or proposed works which may affect or impact on Telstra's assets in any way, you are required to contact: Telstra's Network Integrity Team on Phone Number 1800810443.

SCHEDULE 1

NOTICE OF CONTRIBUTIONS & CHARGES ASSOCIATED WITH DEVELOPMENT

PROJECT ADDRESS	300 LANYON DRIVE JERRABOMBERRA NSW 2619 Lot 1 DP 1263364
PROJECT DESCRIPTION	Subdivision - Six Lot Torrens title subdivision and construction of new road
APPLICATION NO	DA.2020.1427
NAME OF APPLICANT	Capital Region Planning

Important

The following contribution rates are those that apply at the date of issue of this consent. Rates are reviewed quarterly. Contributions will only be accepted at the rate applying at the date of payment. Council's Natural and Built Character section should be contacted to receive a current contribution notice of charges.

Fee Description	Fee Due
<i>South Jerrabomberra Local Contribution Plan</i> South Poplars (charge based on 9.255 Ha)	\$499,899.30
<i>Contribution Plan</i> Sewer - West	\$205,832.50
Water – Jerrabomberra	\$1,283,357.64
<i>Total Contributions Payable</i>	<i>\$1,989,089.44</i>

Relevant Criteria on which these calculations were made:

One (1) equivalent tenements have been credited to this development for water and sewer contributions charges. The calculation of Section 7.11 contributions are charged solely against the total development area, which in this instance is 9.255 Hectares.

Date Generated: 28 July 2021

Attachment C – Commonwealth EPBC Act Approval



APPROVAL

The Poplars, Jerrabomberra, NSW (EPBC 2020/8801)

This decision is made under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (the EPBC Act). Note that section 134(1A) of the EPBC Act applies to this approval, which provides in general terms that if the approval holder authorises another person to undertake any part of the action, the approval holder must take all reasonable steps to ensure that the other person is informed of any conditions attached to this approval, and that the other person complies with any such condition.

Details

Person to whom the approval is granted (approval holder)	Poplars Developments Pty Ltd
ACN of approval holder	128 465 887
Action	A mixed-use commercial development at The Poplars Jerrabomberra, NSW [See EPBC Act referral 2020/8801, subject to the variation request accepted on 19 November 2020]

Approval decision

My decision on whether or not to approve the taking of the action for the purposes of the controlling provision for the action is as follows.

Controlling Provisions

Listed Threatened Species and Communities	
Section 18	Approve
Section 18A	Approve

Period for which the approval has effect

This approval has effect until 31 December 2060

Decision-maker

<i>Name and position</i>	Kate Gowland, Acting Assistant Secretary, Environment Assessments (NSW, ACT) Branch
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<i>Signature</i>	
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<i>Date of decision</i>	13/9/2021
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Conditions of approval

This approval is subject to the conditions under the EPBC Act as set out in ANNEXURE A.

ANNEXURE A – CONDITIONS OF APPROVAL

Part A – Conditions specific to the action

1. The approval holder must not **clear** outside the **development footprint**.
2. The approval holder must not **clear** inside the **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area**.
3. Within the **development footprint**, the approval holder must not **clear** more than:
 - a. 13.51 hectares of **Golden Sun Moth habitat**; and
 - b. 0.42 hectares of **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland**.

Mitigation and management measures

4. For the protection of the **protected matters** in areas adjacent to the **development footprint**, the approval holder must submit, prior to the **commencement of the action**, a Construction Environmental Management Plan (CEMP) for the **Minister's** written approval. The approval holder must not **commence the action** unless the CEMP has been approved in writing by the **Minister**.
5. The approval holder must implement the CEMP approved by the **Minister** within the **development footprint**.
6. For the protection of the **protected matters** in areas adjacent to the **development footprint**, the CEMP must prevent **impacts** of the action on adjacent areas and be consistent with the **Department's Environmental Management Plan Guidelines 2014**, and must specify full details of:
 - a. Signage, consistent with signage for the **North Poplars BioBanking Agreement**, including to be placed in or adjacent to the **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area** to prohibit public access and inform the public of the presence of the **protected matters**;
 - b. Methods, effort, timing and reporting of pre-clearance surveys;
 - c. Procedures to report and address unexpected finds of **protected matters** including a procedure to determine if **credits** should be **retired** in respect of the **protected matter(s)**, if so how many **credits**, and how the **Department** will be assured that this has happened;
 - d. Proposed management methods, effort and timing to exclude, control or eliminate **weeds** and pathogens;
 - e. Proposed management methods, effort and timing to prevent and address existing erosion and prevent sediments entering watercourses;
 - f. Proposed management methods, effort and timing to prevent surface water flows enabling the spread of harmful pollutants and excessive ponding of water in the **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area**;
 - g. The site induction program to ensure that all persons implementing the action or on the site of the action are aware of the need and how to avoid and protect the **protected matters**.

7. For the protection of the **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area** the approval holder must undertake on-ground management activities throughout the **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area** consistent with those specified in the **North Poplars BioBanking Agreement**.

Compensation measures

8. To compensate for the clearance of **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland** and **Golden Sun Moth habitat**, prior to the **commencement** of each **development stage** the approval holder must provide the **Department** with written **evidence** that it has **retired** the number of **credits** below in respect of that **development stage**:
 - a. 34 species **credits** for **Golden Sun Moth** for **Stage 1 of the Innovation Precinct**;
 - b. 9 species **credits** for **Golden Sun Moth** for the **Jerrabomberra High School**;
 - c. 33 species **credits** for **Golden Sun Moth** for the **remainder of the North Poplars development footprint**;
 - d. 26 species **credits** for **Golden Sun Moth** for the **remainder of the South Poplars development footprint**; and
 - e. 10 ecosystem **credits** for **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland** for the **remainder of the North Poplars development footprint**.

Part B – Standard administrative conditions

Notification of date of commencement of the action

9. The approval holder must notify the **Department** in writing of the date of **commencement of the action** within **10 business days** after the date of **commencement of the action**. The approval holder must notify the **Department** in writing of the date of **commencement** of each **development stage** within **10 business days** after the date of **commencement** of each commenced **development stage**.
10. If the **commencement of the action** does not occur within 5 years from the date of this approval, then the approval holder must not **commence the action** without the prior written agreement of the **Minister**.

Compliance records

11. The approval holder must maintain accurate and complete **compliance records**.
12. If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request.

Note: **Compliance records** may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department's** website or through the general media.

Submission and publication of plans

13. The approval holder must:
 - a. submit **plans** electronically to the **Department** for approval by the **Minister**;
 - b. publish each **plan** on the **website** within **20 business days** of the date the **plan** is approved by the **Minister** or of the date a revised action management plan is submitted to the **Minister** or the **Department**, unless otherwise agreed to in writing by the **Minister**;

- c. exclude or redact **sensitive ecological data** from **plans** published on the **website** or provided to a member of the public; and
 - d. keep **plans** published on the **website** until the end date of this approval.
14. The approval holder must ensure that any **monitoring data** (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under conditions of this approval, is prepared in accordance with the **Department's Guidelines for biological survey and mapped data** (2018) and submitted electronically to the **Department**.

Annual compliance reporting

15. The approval holder must prepare a **compliance report** for each 12 month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:
- a. publish each **compliance report** on the **website** within 60 **business days** following the relevant 12 month period;
 - b. notify the **Department** by email that a **compliance report** has been published on the **website** and provide the weblink for the **compliance report** within 5 **business days** of the date of publication;
 - c. keep all **compliance reports** publicly available on the **website** until this approval expires;
 - d. exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**;
 - e. where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within 5 **business days** of publication.

Note: **Compliance reports** may be published on the **Department's** website.

Reporting non-compliance

16. The approval holder must notify the **Department** in writing of any: **incident**; non-compliance with the conditions; or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than two **business days** after becoming aware of the **incident** or non-compliance. The notification must specify:
- a. any condition which is or may be in breach;
 - b. a short description of the **incident** and/or non-compliance; and
 - c. the location (including co-ordinates), date, and time of the **incident** and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.
17. The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than 10 **business days** after becoming aware of the **incident** or non-compliance, specifying:
- a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;
 - b. the potential impacts of the **incident** or non-compliance; and
 - c. the method and timing of any remedial action that will be undertaken by the approval holder.

Independent audit

18. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted as requested in writing by the **Minister**.
19. For each **independent audit**, the approval holder must:

- a. provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**;
 - b. only commence the **independent audit** once the audit criteria have been approved in writing by the **Department**; and
 - c. submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.
20. The approval holder must publish the audit report on the **website** within 10 **business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval, or an earlier date agreed to by the **Department** in writing.

Revision of action management plans

21. The approval holder may, at any time, apply to the **Minister** for a variation to an action management plan approved by the **Minister** under condition 4, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the **EPBC Act**. If the **Minister** approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.
22. The approval holder may choose to revise an action management plan approved by the **Minister** under condition 4, or as subsequently revised in accordance with these conditions, without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the RAMP would not be likely to have a **new or increased impact**.
23. If the approval holder makes the choice under condition 22 to revise an action management plan without submitting it for approval, the approval holder must:
- a. notify the **Department** in writing that the approved action management plan has been revised and provide the **Department** with:
 - i. an electronic copy of the RAMP;
 - ii. an electronic copy of the RAMP marked up with track changes to show the differences between the approved action management plan and the RAMP;
 - iii. an explanation of the differences between the approved action management plan and the RAMP;
 - iv. the reasons the approval holder considers that taking the action in accordance with the RAMP would not be likely to have a **new or increased impact**; and
 - v. written notice of the date on which the approval holder will implement the RAMP (RAMP implementation date), being at least 20 **business days** after the date of providing notice of the revision of the action management plan, or a date agreed to in writing with the **Department**.
 - b. subject to condition 25, implement the RAMP from the RAMP implementation date.
24. The approval holder may revoke their choice to implement a RAMP under condition 22 at any time by giving written notice to the **Department**. If the approval holder revokes the choice under condition 22, the approval holder must implement the action management plan in force immediately prior to the revision undertaken under condition 22.
25. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the RAMP would be likely to have a **new or increased impact**, then:
- a. condition 22 does not apply, or ceases to apply, in relation to the RAMP; and
 - b. the approval holder must implement the action management plan specified by the **Minister** in the notice.

26. At the time of giving the notice under condition 25, the **Minister** may also notify that for a specified period of time, condition 22 does not apply for one or more specified action management plans.

Note: conditions 22, 23, 24 and 25 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised action management plan, at any time, to the **Minister** for approval.

Completion of the action

27. Within 20 **business days** after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.

Part C - Definitions

In these conditions, except where contrary intention is expressed, the following definitions are used:

Business day means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

Clear/Clearing/Cleared means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including **weeds**).

Commencement in relation to commencement of a **development stage**, means the first instance of any specified activity associated with the action, and including **clearing** and **construction**, undertaken within that **development stage**. **Commencement**, in relation to commencement of a **development stage**, does not include minor physical disturbance necessary to:

- i. undertake pre-clearance surveys or monitoring programs in that **development stage**;
- ii. undertake geotechnical investigations or similar tests in that **development stage**;
- iii. install signage and /or temporary fencing to prevent unapproved use of that **development stage**;
- iv. protect environmental and property assets within that **development stage** from fire, **weeds** and feral animals, including installation of temporary fencing, and use of existing surface access tracks;
- v. install temporary site facilities for persons undertaking pre-commencement activities within that **development stage** so long as these are located where they have no impact on the **protected matters**.

Commencement of the action means the first instance of any specified activity associated with the action, and including **clearing** and **construction**.

Commencement of the action does not include minor physical disturbance necessary to:

- i. undertake pre-clearance surveys or monitoring programs;
- ii. undertake geotechnical investigations or similar tests;
- iii. install signage and /or temporary fencing to prevent unapproved use of the **development footprint**;
- iv. protect environmental and property assets from fire, **weeds** and feral animals, including installation of temporary fencing, and use of existing surface access tracks;
- v. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **protected matters**.

Commencement of the development stage for the remainder of the North Poplars development footprint means the first instance of any specified activity associated with the **remainder of the North Poplars development footprint**, including **clearing** and **construction**, and does not include minor physical disturbances as described in the definition for **Commencement of the action**.

Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The **Department's** preferred spatial data format is **shapefile**.

Completion of the action means the date on which all specified activities associated with the action have permanently ceased.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

- i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**;
- ii. consistent with the **Department's Annual Compliance Report Guidelines (2014)**;
- iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period; and
- iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Credits means biodiversity credits under the *Biodiversity Conservation Act 2016 (NSW)*.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of temporary fences and signage.

Department means the Australian Government agency responsible for administering the **EPBC Act**.

Development footprint means the 52.77 hectare area represented as the solid pink area and defined as the 'Proposed Action Area - Disturbance Footprint' in the legend of Attachment 1. The **development footprint** also includes the area within the yellow boundary line and defined as the 'Open Space Area' in the legend of Attachment 3 but with the exclusion of the **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area**.

Development stage means any work associated with one of the following specified stages of the action that will be undertaken sequentially, or concurrently: **Stage 1 of the Innovation Precinct**, the **Jerrabomberra High School**, the **remainder of the North Poplars development footprint** and the **remainder of the South Poplars development footprint**.

EPBC Act means the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*.

Evidence means written certified documentation from the relevant authority.

Golden Sun Moth means the Golden Sun Moth (*Synemon plana*) listed as critically endangered under the **EPBC Act**.

Golden Sun Moth habitat means the areas represented by the shapes with yellow hatching in Attachment 4, described in the legend as 'Golden Sun Moth habitat'.

Hoary Sunray habitat means the 700m² area covering the area represented by star shapes and described in the legend as 'Hoary Sunray' in Attachment 3.

Impact means any measurable direct or indirect disturbance or harmful change as a result of any activity associated with the action.

Incident(s) means any event which has the potential to, or does, impact on one or more **protected matter(s)** other than as authorised under this approval.

Independent audit: means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines (2019)*.

Jerrabomberra High School means the 3.25 hectare area within the **development footprint** where the Jerrabomberra High School will be built, enclosed by the light blue line in Attachment 2, identified in the legend as 'Jerrabomberra High School'.

Monitoring data means the data required to be recorded under the conditions of this approval.

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

New or increased impact means a new or increased environmental impact or risk relating to any **protected matter**, when compared to the likely impact of implementing the action management plan that has been approved by the **Minister** under condition 4, including any subsequent revisions approved by the **Minister**, as outlined in the *Guidance on 'New or Increased Impact' relating to changes to approved management plans under EPBC Act environmental approvals (2017)*.

North Poplars BioBanking Agreement means the BioBanking Agreement ID number BA 310 for Poplars North BioBanking Site, for Robin Pty Ltd, made with the NSW Office of Environment and Heritage.

North Poplars Biobanking Site means the area coloured dark green in Attachment 1 and identified in the legend as 'North Poplars BioBanking Site'.

Plan(s) means any of the documents required to be prepared, approved by the **Minister**, implemented by the approval holder and/or published on the **website** in accordance with these conditions (includes action management plans).

Protected matter(s) means a matter protected under a controlling provision in Part 3 of the **EPBC Act** for which this approval has effect. Protected matters include **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland** ecological community, Hoary Sunray (*Leucochrysum albicans* subsp. *tricolor*), and **Golden Sun Moth**.

Remainder of the North Poplars development footprint means the 8.71 hectare area of land in North Poplars represented by the solid blue shaded area in Attachment 2 described in the legend as 'Remainder of Development Footprint - North Poplars'.

Remainder of the South Poplars development footprint means the 31.56 hectare area in South Poplars represented by the pink shaded area in Attachment 2 described in the legend as the 'Remainder of Development Footprint - South Poplars'.

Retired means retirement of biodiversity credits under the *Biodiversity Conservation Act 2016 (NSW)*.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0*.

Shapefile means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx', '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes.

South Poplars BioBanking Agreement means the BioBanking Agreement ID number BA 309 for Poplars South BioBanking Site, for Robin Pty Ltd, made with the NSW Office of Environment and Heritage.

South Poplars BioBanking Site means the area coloured light green in Attachment 1 identified in the legend as 'Poplars South BioBanking Site'.

Stage 1 of the Innovation Precinct means the 8.91 ha area enclosed by the yellow line identified in the legend as 'Stage 1 of the Innovation Precinct' in Attachment 2.

Suitably qualified person means a person who has professional qualifications, training, skills and/or experience related to the nominated subject matter and can give authoritative independent assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature.

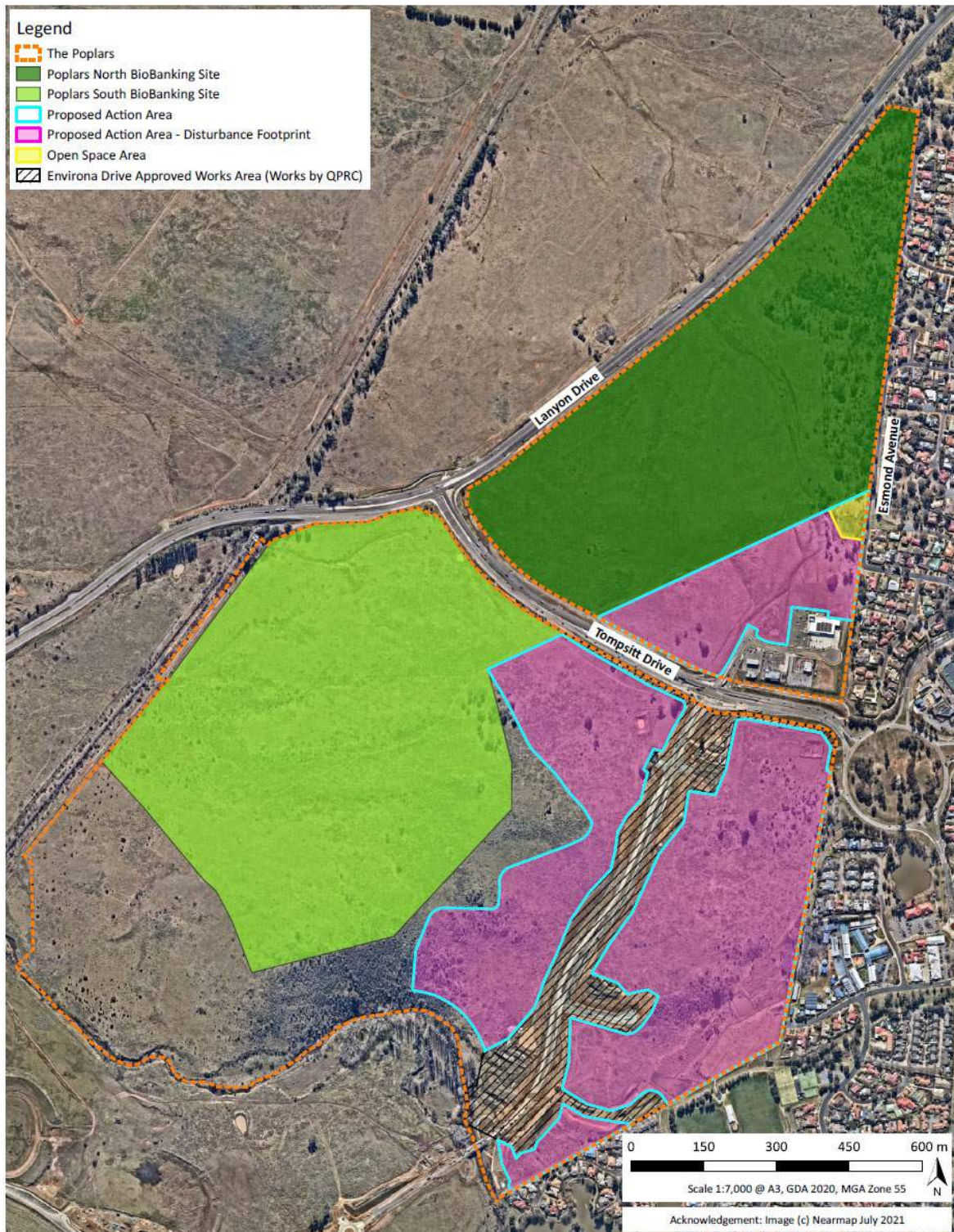
Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.

Weed(s) means weed as defined in the *Australian weeds strategy 2017 to 2027*.

White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland is the critically endangered threatened ecological community of that name listed under the **EPBC Act** as represented by the two patches of blue hatching shown in Attachment 5 and described in the legend as 'EPBC Act Box-Gum Woodland'.

White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area means the 0.18 hectares of land containing **White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland**, **Hoary Sunray habitat** and **Golden Sun Moth habitat** represented by the area north of the existing dam with blue hatching and green shading shown in Attachment 3, and described in the legend as 'PCT1334 Zone1 - Canopy - Regen - NativeDom - Mod-HighDiversity (EPBC Act BGW)', 'Golden Sun Moth Habitat' and 'Hoary Sunray'.

Attachment 1. The Poplars action area/development footprint, the White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area, biobanking sites, and surrounds.

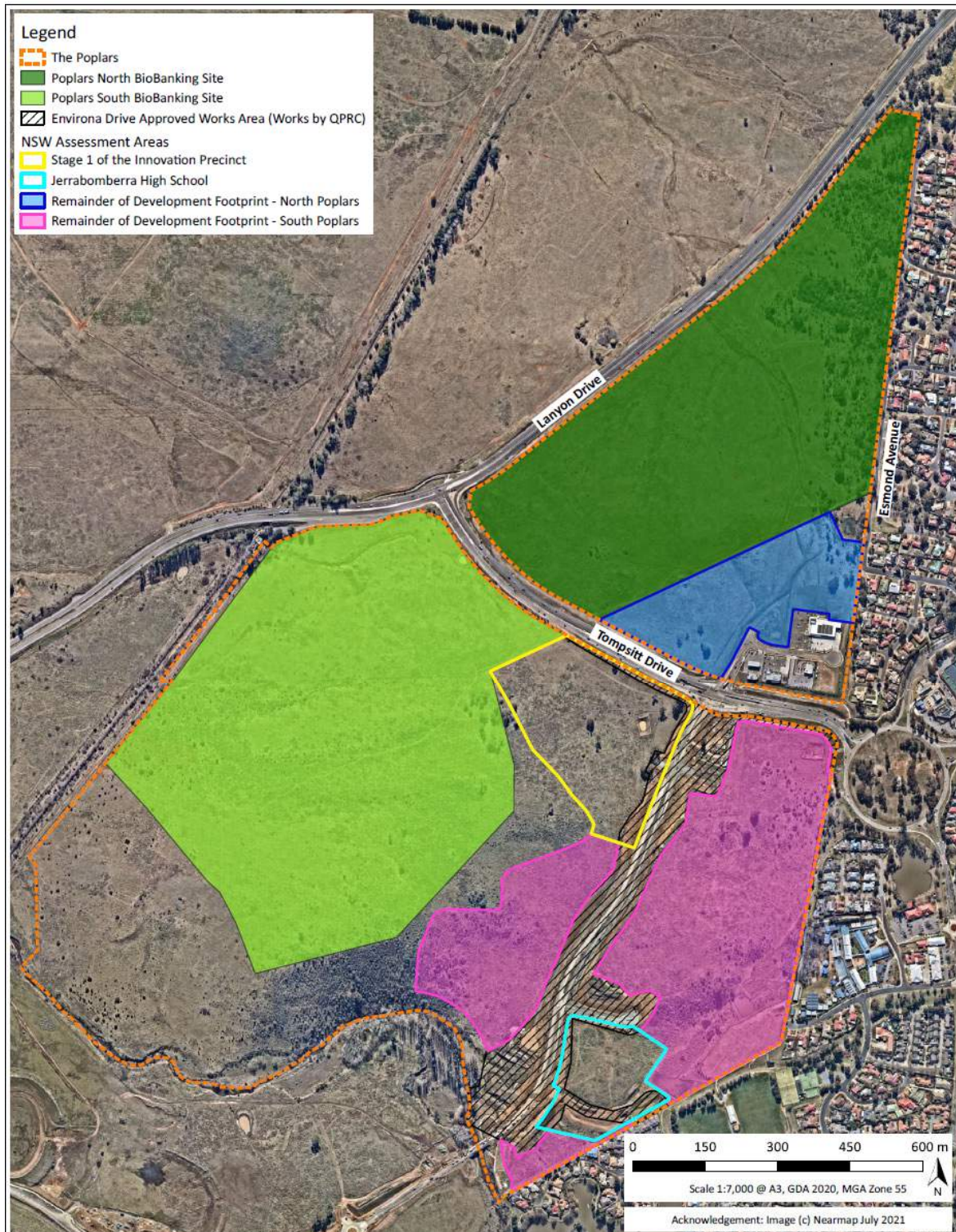


EPBC Act Conditions Figure 1. "The Poplars", Proposed Action Area, and BioBanking Sites

Capital Ecology Project No: 3027
 Drawn by: R. speirs
 Date: 27 August 2021



Attachment 2. Location of the development stages; Jerrabomberra High School, Stage 1 of Innovation Precinct, the remainder of the North Poplars development footprint, the remainder of the South Poplars development footprint.



EPBC Act Conditions Figure 2. NSW Assessment Areas

Capital Ecology Project No: 3027
 Drawn by: R. Speirs
 Date: 27 August 2021



Attachment 3. Location of the White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area, Hoary Sunray, Golden Sun Moth habitat and the White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland.



EPBC Act Conditions Figure 3. Retained MNES

Capital Ecology Project No: 3027
 Drawn by: R. Speirs
 Date: 27 August 2021



Attachment 4. Golden Sun Moth Habitat in the Development Footprint, and the White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area.

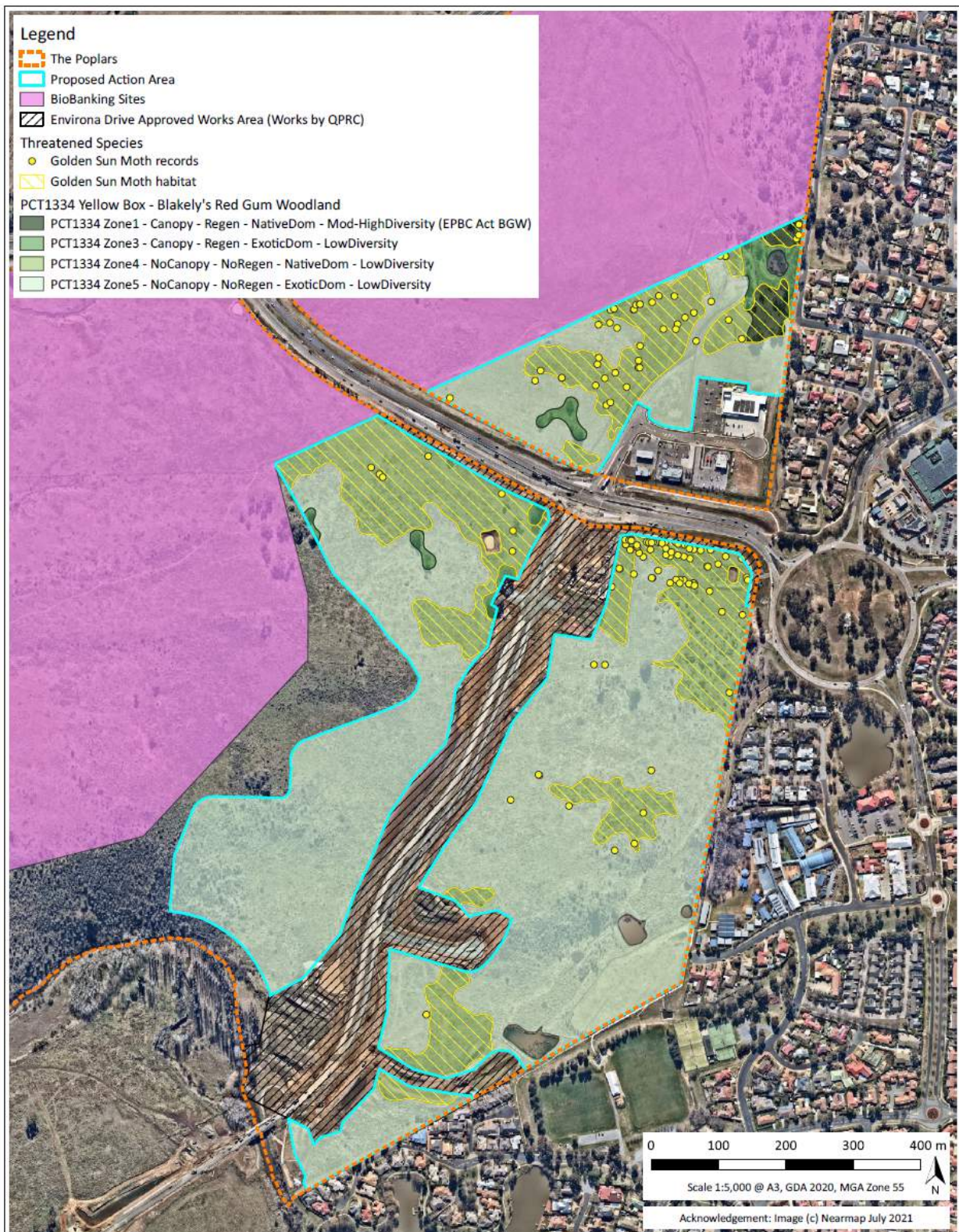


Figure 8. Golden Sun Moth Habitat in the Proposed Action Area

Capital Ecology Project No: 3027
 Drawn by: R. Speirs
 Date: 27 August 2021



Attachment 5. White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland in the Development Footprint, and the White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland retained area.



Figure 8. EPBC Act Box-Gum Woodland and Hoary Sunray Habitat in the Proposed Action Area

Capital Ecology Project No: 3027
 Drawn by: S. Reid
 Date: 26 March 2021

