

Stringybark Solar Farm - Intersection upgrade BDAR addendum

Infinergy Pacific Pty Ltd



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Template 2.8.1

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
IBRA	Interim Biogeographic Regionalisation for Australia
NSW	New South Wales
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Stringybark Solar Farm Pty Ltd to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed development of the Stringybark Solar Farm (The Project) located at 597 Gara Road, Metz (the Development Site) in the Armidale Dumaresq Local Government Area (LGA). The BDAR was prepared to meet the requirements of the Biodiversity Assessment Method 2016 (BAM) established under Section 6.7 of the NSW *Biodiversity Conservation Act* (BC Act) 2016.

Within the BDAR, two road intersection upgrades were identified, however no biodiversity assessment was undertaken for these areas as the extent of works required was unknown. The two areas of upgrade are:

- Intersection 1 - upgrade of the existing intersection of Gara Road and Grafton Road; and
- Intersection 2 - upgrade of the existing intersection of the substation site access location and Grafton Road.

Since submission of the BDAR to Armidale Regional Council (ARC), further information regarding the extent of works required at each intersection upgrade has been made available allowing preliminary concept designs to be developed by Constructive Solutions Pty Ltd, as shown in Figure 1.

This report summarises the findings of additional biodiversity investigations at Intersection 1 and Intersection 2, and identifies where relevant, the additional biodiversity impacts that result from these intersection upgrades.

Based on the upgrade of Intersection 1, up to 0.03 ha of native vegetation, which is consistent with PCT510 will be impacted. This includes 0.03 ha which is consistent with White Box Yellow Box Blakely's Red Gum Woodland which is listed under the *Biodiversity Conservation Act 2016* (BC Act) as an Endangered Ecological Community (EEC). This also includes 0.03 ha which is consistent with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Critically Endangered Ecological Community (CEEC) White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands. Measures to reduce the extent of impacts at Intersection 1 have been previously proposed, including developing a Traffic Management Plan to reduce the requirement for road upgrades.

Based on the upgrade of Intersection 2, up to 0.01 ha of native vegetation, which is consistent with PCT568 will be impacted. This community is not listed under either the BC Act or EPBC Act. This vegetation does however provide habitat for native fauna, and any design changes that reduce the area of impact would be beneficial to biodiversity. The addition of these two intersections increases the biodiversity impact of the project as identified in Table 1 below.

Formal threatened species assessment has not been undertaken for all candidate species identified in the Biodiversity Assessment Method Calculator (BAMC). Where a species cannot be ruled out of the assessment due to survey, habitat requirements, geographic extent, or site degradation, they have been assumed present. This is particularly pertinent for the two intersection upgrades where no formal fauna survey has been undertaken.

Table 1 Total biodiversity impacts

Biodiversity value	Stringybark Solar Farm Array Area (ha)	Intersection 1	Intersection 2	Total
Native vegetation				
PCT 510 Woodland		0.03		0.03
PCT 510 Low condition grassland	45.2 h			45.2
PCT 568 Woodland			0.01	0.01
PCT 568 Low condition grassland	46.6			46.6
Threatened flora species				
<i>Dichanthium setosum</i>	0.5	0.03	0.01	0.54
<i>Picris evae</i>		0.03	0.01	0.04
<i>Thesium australe</i>		0.03	0.01	0.04
Threatened fauna species				
Tusked Frog population in the Nandewar and New England Tableland Bioregions		0.03		0.03
Bush Stone-curlew		0.03		0.04
Eastern Pygmy Possum		0.03	0.01	0.04
Pale-headed Snake		0.03		0.04
Glandular Frog		0.03		0.03
Southern Myotis		0.03		0.04
Squirrel Glider		0.03	0.01	0.04

This report is not a standalone BDAR, and should be read as an addendum to *Stringybark Solar Farm Biodiversity Development Assessment Report* (Eco Logical Australia, 2019).

1. Introduction

1.1 Purpose of this report

This report has been drafted as an addendum to *Stringybark Solar Farm Biodiversity Development Assessment Report* (Eco Logical Australia, 2019).

This report summarises the biodiversity impacts associated with the upgrades within the extent of works identified for two intersections, as detailed in Figure 1 and Figure 2:

- Intersection 1 - upgrade of the existing intersection of Gara Road and Grafton Road; and
- Intersection 2 - upgrade of the existing intersection of the substation site access location and Grafton Road.

This report is not intended to be a standalone BDAR, and only summarises the additional impacts relating to the area of works at each of the intersection upgrades.

1.2 Extent of assessment

1.2.1 Survey effort summary

The surveys presented within this report summarise a database review and two survey events carried out within each site during 2019.

The database review considered all threatened species recorded (as identified through a species sighting search on BioNet) within the 500m assessment area.

The first survey event is the collection of data at Plot 17 which is commensurate to the vegetation at Intersection 2. This data collection was carried out by ELA ecologists Alex Pursche and David Allworth in April 2019. This was conducted as part of the broader surveys of the array area of the Stringybark Solar Farm.

The second survey was a site inspection on 25 October 2019 by ecologist Alex Pursche (BAAS17021) to assess vegetation integrity at Intersection 1, and conduct threatened flora survey and habitat assessment at both intersections.

No targeted survey effort for threatened fauna was undertaken, beyond habitat assessment and incidental observations.

Where a species cannot be excluded from the assessment due to survey, habitat requirements, geographic extent, or site degradation, they have been assumed present.

1.2.2 Weather

Weather on 25 October 2019 during the assessment was clear with no rainfall. Temperate on the day of survey varied from 6 to 27 degrees.

The preceding year to the survey experienced significantly below average rainfall, leading to a natural regional suppression in biodiversity values. This is likely to influence the detectability of subterranean threatened flora species.

2. Gara Road and Grafton Road (Intersection 1)

The extent of works for the Gara Road and Grafton Road intersection (Intersection 1) is provided in Figure 1. The current road has been recently surfaced and is in good condition. All impacted vegetation is currently degraded by indirect impacts associated with the existing roadway.

Vegetation adjacent to this works area is in remnant condition. When compared to other examples of vegetation locally, that which occurs nearby to Intersection 1 is considered to be in good condition. The groundcover is nearly continuously native and the canopy consists of mature *Eucalyptus blakelyi*. The shrub layer is naturally sparse or absent.

Nearby to the extent of works, there are numerous hollow-bearing trees. There is a stick nest in the *Eucalyptus blakelyi* immediately next to the chevron sign in the photograph below. The size of the nest and stick choice indicates this is likely a corvid nest.

An unnamed creek flows through the extent of works, and is managed under the road by two culverts.

An example of the current condition of the site is shown in the photograph below.



Photograph 1 General condition of Intersection 1 – looking north along Gara Rd towards intersection

2.1 Landscape Assessment

The landscape assessment utilised the following inputs, as presented on Figure 3.

Landscape feature	Result
IBRA Region	New England Tablelands
IBRA Subregion	Armidale Plateau
NSW Landscape	Dingo Spur Meta-sediments
Native Vegetation Extent	53 ha native vegetation in 97 ha assessment area = 55%
Rivers and Streams	Unnamed creek passes under road
Wetlands	None present
Connectivity features	Native vegetation
Areas of geological significance and soil hazards	None present
Outstanding Areas of Biodiversity Value	None present

2.2 Native vegetation

All vegetation within the Intersection 1 extent of works is considered to be consistent with PCT510 Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion (Figure 5). This PCT is dominated by an overstorey of *E. blakelyii*, a sparse to absent shrub layer, and a ground layer consisting of native tussocks including, *Poa sieberiana* and *Themeda triandra*, as identified through floristic assessment (Figure 6).

Table 2 PCTs within Intersection 1

PCT Code	PCT Name	Condition class	Patch Size	Impacted area
510	Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Remnant	>101 ha	0.03

All other areas of within the extent of works are considered to be 'cleared land' being the existing road base and shoulder of both roads.

2.2.1 Threatened Ecological Communities

The broader vegetation patch is dominated by *E. blakelyii* with a native understorey, and there are numerous large trees, hollows, and natural regeneration.

All areas of PCT510 are consistent with White Box Yellow Box Blakely's Red Gum Woodland, which is listed under the NSW BC Act as an Endangered Ecological Community.

All areas of PCT510 are consistent with White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands, which is listed under the Commonwealth EPBC Act as a Critically Endangered Ecological Community.

2.3 Fauna habitats

Within and adjacent to the Intersection 1 extent of works fauna habitat is confined to grassy woodlands. Scattered throughout the vegetation are numerous hollow-bearing trees containing small (<5cm) hollows. No large hollows within or adjacent to the extent of works were observed. There are two culverts which underpass the existing roadway, which can be potential habitat for roosting microchiropteran bats. These culverts were inspected and appear to have been recently (<10 years) replaced. Both culverts are smooth and did not show any evidence of bat occupation. As such these are not considered to be breeding habitat for microchiropteran bats, and any impacts would not be considered a prescribed impact under the BAM. The current condition of the two culverts are shown in the photographs below.



Photograph 2 Culverts under Intersection 1



Photograph 3 Culvert 'RTA C4550' under Grafton Road



Photograph 4 Untagged culvert under Gara Rd

2.4 Predicted threatened species

Predicted species as identified by the BAMC are shown in the table below. There have been no changes to the predicted species list.

Table 3 Predicted species at Intersection 1

Common	Species	Habitat constraints	Geographic limitations	Sensitivity class	BC Act	EPBC Act
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>			Moderate	Vulnerable	Not Listed
Glossy Black-Cockatoo (Foraging)	<i>Calyptorhynchus lathami</i>	Presence of <i>Allocasuarina</i> and casuarina species		High	Vulnerable	Not Listed
Hoary Wattled Bat	<i>Chalinolobus nigrogriseus</i>			High	Vulnerable	Not Listed
Speckled Warbler	<i>Chthonicola sagittata</i>			High	Vulnerable	Not Listed
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>			High	Vulnerable	Not Listed
Varied Sittella	<i>Daphoenositta chrysoptera</i>			Moderate	Vulnerable	Not Listed
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>			High	Vulnerable	Endangered
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>			High	Vulnerable	Not Listed
Painted Honeyeater	<i>Grantiella picta</i>	Mistletoes present at a density of greater than five mistletoes per hectare		Moderate	Vulnerable	Vulnerable
White-bellied Sea-Eagle (Foraging)	<i>Haliaeetus leucogaster</i>	Within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines		High	Vulnerable	Not Listed
Little Eagle	<i>Hieraaetus morphnoides</i>			Moderate	Vulnerable	Not Listed
Swift Parrot (Foraging)	<i>Lathamus discolor</i>			Moderate	Endangered	Critically Endangered
Square-tailed Kite	<i>Lophoictinia isura</i>			Moderate	Vulnerable	Not Listed

Common	Species	Habitat constraints	Geographic limitations	Sensitivity class	BC Act	EPBC Act
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>			Moderate	Vulnerable	Not Listed
Large Bent-winged Bat (Foraging)	<i>Miniopterus orianae oceanensis</i>			High	Vulnerable	Not Listed
Barking Owl (Foraging)	<i>Ninox connivens</i>			High	Vulnerable	Not Listed
Powerful Owl (Foraging)	<i>Ninox strenua</i>		within 5 km of Macleay Gorges subregion	High	Vulnerable	Not Listed
Yellow-bellied Glider	<i>Petaurus australis</i>	Hollow bearing trees, Hollows > 25cm diameter		High	Vulnerable	Not Listed
Scarlet Robin	<i>Petroica boodang</i>			Moderate	Vulnerable	Not Listed
Flame Robin	<i>Petroica phoenicea</i>			Moderate	Vulnerable	Not Listed
Koala	<i>Phascolarctos cinereus</i>			High	Vulnerable	Vulnerable
Grey-headed Flying-fox (Foraging)	<i>Pteropus poliocephalus</i>			High	Vulnerable	Vulnerable
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>			High	Vulnerable	Not Listed
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>			High	Vulnerable	Not Listed
Diamond Firetail	<i>Stagonopleura guttata</i>			Moderate	Vulnerable	Not Listed
Masked Owl (Foraging)	<i>Tyto novaehollandiae</i>			High	Vulnerable	Not Listed

2.5 Candidate threatened species

Due to limitations on habitat or geographic constraints, the following candidate species have been excluded from further assessment:

- *Anthochaera phrygia* Regent Honeyeater (Breeding) – There are no mapped important areas within the assessment area.
- *Calyptorhynchus lathami* Glossy Black-cockatoo (Breeding) – There are no suitable hollow-bearing trees with hollows greater than 15cm diameter and greater than 5m above ground.

- *Chalinolobus dwyeri* Large-eared Pied Bat - The site is not within 2km of rocky areas containing caves, overhangs, escarpments, outcrops or crevices.
- *Haliaeetus leucogaster* White-bellied Sea-Eagle (Breeding) – There are no eyries present.
- *Hieraetus morphnoides* Little Eagle (Breeding) – There are no nest trees present.
- *Lathamus discolor* Swift Parrot (Breeding) – There are no mapped important areas within the assessment area.
- *Lophoictinia isura* Square-tailed Kite (Breeding) – There are no nest trees present.
- *Ninox connivens* Barking Owl (Breeding) – There are no suitable hollow-bearing trees present.
- *Ninox strenua* Powerful Owl (Breeding) – The site is not within 5km of Macleay Gorges IBRA subregion.
- *Miniopterus orianae oceanensis* Large Bent-winged Bat (Breeding) – There are no caves, tunnels, mines, culverts, suspected of being breeding habitat for this species.
- *Petrogale penicillata* Brush-tailed Rock-wallaby – The site is not within 1km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliffines.
- *Pteropus poliocephalus* Grey-headed Flying-fox (Breeding) – There are no breeding camps present.
- *Tyto novaehollandiae* Masked Owl (Breeding) – There are no suitable hollow-bearing trees present.

All other species were considered for further assessment as identified in the table below.

Table 4 Threatened flora survey timing– Intersection 1

Species	Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Chiloglottis platyptera</i>	Barrington Tops Ant Orchid										X		
<i>Dichanthium setosum</i>	Bluegrass	X	X	X	X	X						X	X
<i>Diuris pedunculata</i>	Small Snake Orchid									X	X		
<i>Eucalyptus magnificata</i>	Northern Blue Box	X	X	X	X	X	X	X	X	X	X	X	X
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	X	X	X	X	X	X	X	X	X	X	X	X
<i>Picris evae</i>	Hawkweed	X	X									X	X
<i>Swainsona sericea</i>	Silky Swainson- pea									X	X	X	
<i>Thesium australe</i>	Austral Toadflax	X	X									X	X

Table 5 Threatened fauna survey timing – Intersection 1

Species	Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Adelotus brevis</i> - endangered population	Tusked Frog population in the Nandewar and New England Tableland Bioregions	X	X								X	X	X
<i>Burhinus grallarius</i>	Bush Stone-curlew	X	X	X	X	X	X	X	X	X	X	X	X
<i>Cercartetus nanus</i>	Eastern Pygmy Possum	X	X	X							X	X	X
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	X	X	X								X	X
<i>Myotis macropus</i>	Southern Myotis	X	X	X							X	X	X
<i>Petaurus norfolcensis</i>	Squirrel Glider	X	X	X	X	X	X	X	X	X	X	X	X
<i>Phascolarctos cinereus</i>	Koala (breeding)	X	X	X	X	X	X	X	X	X	X	X	X

2.5.1 Species known or assumed present

Based on the result of the field surveys, the following species are either known or assumed to be present as described in the tables below:

Table 6 Threatened flora– Intersection 1

Species	Common Name	Known or likely to be present?	Area of habitat impacted
<i>Chiloglottis platyptera</i>	Barrington Tops Ant Orchid	Survey indicates the species is not present	n/a
<i>Dichanthium setosum</i>	Bluegrass	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.03
<i>Diuris pedunculata</i>	Small Snake Orchid	Survey indicates the species is not present	n/a
<i>Eucalyptus magnificata</i>	Northern Blue Box	Survey indicates the species is not present	n/a
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	Survey indicates the species is not present	n/a
<i>Picris evae</i>	Hawkweed	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.03
<i>Swainsona sericea</i>	Silky Swainson-pea	Survey indicates the species is not present	n/a

Species	Common Name	Known or likely to be present?	Area of habitat impacted
<i>Thesium australe</i>	Austral Toadflax	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.03

Table 7 Threatened fauna– Intersection 1

Species	Common Name	Known or likely to be present?	Area of habitat impacted
<i>Adelotus brevis</i> - endangered population	Tusked Frog population in the Nandewar and New England Tableland Bioregions	Species unlikely to be present, however survey not conducted, so species assumed present.	0.03
<i>Burhinus grallarius</i>	Bush Stone-curlew	Species unlikely to be present, however survey not conducted, so species assumed present.	0.03
<i>Cercartetus nanus</i>	Eastern Pygmy Possum	Species unlikely to be present, however survey not conducted, so species assumed present.	0.03
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	Species unlikely to be present, however survey not conducted, so species assumed present.	0.03
<i>Myotis macropus</i>	Southern Myotis	Species unlikely to be present, however survey not conducted, so species assumed present.	0.03
<i>Petaurus norfolcensis</i>	Squirrel Glider	Species unlikely to be present, however survey not conducted, so species assumed present.	0.03
<i>Phascolarctos cinereus</i>	Koala (breeding)	The site survey did not indicate that a breeding population was present, particularly within the extent of works. As such the survey as concluded that breeding habitat for Koala is not present.	0

2.6 Impact summary

The upgrade of intersection 1 will remove up to 0.03 ha of native vegetation which is consistent with PCT510 (Figure 7). All other areas of the development are cleared land and will not require assessment (Figure 8).

All areas of PCT510 are consistent with White Box Yellow Box Blakely's Red Gum Woodland, which is listed under the NSW BC Act as an Endangered Ecological Community. All areas of PCT510 are also consistent with White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands, which is listed under the Commonwealth EPBC Act as a Critically Endangered Ecological Community. A separate assessment of EPBC Act matters is provided in Chapter 4.

2.6.1 Serious and Irreversible Impacts

Impacts to White Box Yellow Box Blakely's Red Gum Woodland have the potential to be serious and irreversible impacts (SAIL) under the BAM. An assessment has been provided below to consider whether the impacts of the upgrade of Intersection 1 would constitute a SAIL.

Table 8 SAIL Assessment

Impact Assessment Provisions	Assessment
1. the area and condition of the TEC to be impacted directly and indirectly by the proposed development	Direct impacts will comprise of up to 0.03 ha of vegetation in moderate condition within the Gara TSR. Indirect impacts are unlikely to exacerbated, as the site currently contains a roadway.
2. the extent and overall condition of the TEC within an area of 1500 metres, and then 5000 metres, surrounding the proposed development footprint.	<p>There are no datasets available within the New England Tablelands Region.</p> <p>As such ELA has previously drafted a vegetation map of the extant vegetation within 5,000m of the stringybark development site and will assess the woodland component only.</p> <p>Based on the prevalence of Box Gum Grassy Woodland locally, it has been assumed that 80% of woodland vegetation observed through API is the EEC (and that 20% is non-threatened stringybark forest which is known to occur locally). The mapping of woodland communities is shown in Figure 3 of the BDAR. This assessment also discounts the extent of the grassland component of this EEC, which is likely to occur across a significant portion of the 9,760 ha not mapped as woodland vegetation.</p> <p>Based on this review, the extent of the ecological community within 1,500m of the development site is approximately 326 ha of woodland EEC, and within 5,000m there is approximately 2,663 ha of the woodland EEC. There is potentially more than 7,000 ha of the grassland component of this EEC within 5,000m of the development site.</p>

Impact Assessment Provisions	Assessment
3. an estimate of the extant area and overall condition of the TEC remaining before and after the impact of the proposed development has been taken into consideration	<p>The extant area of the EEC is difficult to distinguish, as it occurs widely across NSW. Whilst this community is severely reduced and fragmented in the south of NSW, it occurs widely across the New England Tableland and almost all vegetation is representative of this community.</p> <p>The overall condition of the TEC will be largely unchanged after the impact of the proposed upgrade as it forms part of a large patch of woodland along the Gara TSR.</p>
4. the development proposal's impact on:	
a. abiotic factors critical to the long-term survival of the TEC; for example, will the impact lead to a reduction of groundwater levels or substantial alteration of surface water patterns; will it alter natural disturbance regimes that the TEC depends upon, e.g. fire, flooding etc.?	The upgrade of the intersection will not have any impacts on abiotic factors critical to the long term survival of the TEC.
b. characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of under-storey species or harvesting of plants	The development will not impact any functionally important species.
c. the quality and integrity of an occurrence of the 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 TEC	<p>The development will permanently impact 0.03 ha of the TEC that occurs immediately next to the edge of the roadway. The quality or integrity of the patch will remain largely unchanged.</p> <p>The development site is unlikely to assist any invasive flora or fauna or introduce any fertilisers or herbicides.</p>
5. direct or indirect fragmentation and isolation of an area of the TEC	The TEC will remain intact outside of the development site.
6. the measures proposed to contribute to the recovery of the TEC in the IBRA subregion.	The TEC will be offset in accordance with the Biodiversity Offset Scheme under the BC Act which will deliver like for like offsets in NSW.
Conclusion	<p>The TEC is prevalent in the New England Tablelands, in a variety of condition states, with the best occurrences of the TEC being situated outside of the development site.</p> <p>The proposed development is likely to remove less than 0.01% of the woodland remaining within 5,000m of the development site.</p> <p>When considering the local extent of the TEC, the proposed intersection upgrade will not result in serious and irreversible impacts.</p>

3. Grafton Road Substation Entrance (Intersection 2)

The extent of works for the Substation Entrance and Grafton Road intersection (Intersection 2) is provided in Figure 2. The current road has been recently surfaced and is in good condition. All impacted vegetation is currently degraded by indirect impacts associated with the existing roadway.

Vegetation adjacent to this works area is in remnant condition. When compared to other examples of vegetation locally, that which occurs nearby to Intersection 2 is considered to be in good condition. The groundcover is nearly continuously native and the canopy consists of mature *Eucalyptus caliginosa*. The shrub layer consists of *Cassinia* sp.

Nearby to the extent of works, there are numerous hollow-bearing trees. There are no stick nests within or nearby to Intersection 2. There are no natural drainage lines, however surface water flow nearby to Grafton Road is managed under the road by one culvert to the east of the intersection upgrade. An example of the current condition of the site is shown in the photograph below.



Photograph 5 General condition of Intersection 2 – looking west along Grafton Road away from intersection

3.1 Landscape Assessment

The landscape assessment utilised the following inputs, as presented on Figure 3

Table 9 Landscape assessment for Intersection 2

IBRA Region	New England Tablelands
IBRA Subregion	Armidale Plateau
NSW Landscape	Dingo Spur Meta-sediments
Native Vegetation Extent	40 ha native vegetation in 94 ha assessment area = 42%
Rivers and Streams	None present
Wetlands	None present
Connectivity features	Native vegetation
Areas of geological significance and soil hazards	None present
Outstanding Areas of Biodiversity Value	None present

3.2 Native vegetation

All vegetation within the Intersection 1 extent of works is considered to be consistent with PCT568 Broad-leaved Stringybark shrub/grass open forest of the New England Tableland Bioregion (Figure 10). This PCT is dominated by an overstorey of *E. caliginosa*, a dense shrub layer with *Cassinia quinquefaria*, and a groundlayer consisting of native tussocks including, *Poa sieberiana* and *Themeda triandra*, as identified through floristic assessment (Figure 11).

PCT Code	PCT Name	Condition class	Patch Size	Impacted area
568	Broad-leaved Stringybark shrub/grass open forest of the New England Tableland Bioregion	Remnant	>101 ha	0.01

3.2.1 Threatened Ecological Communities

Vegetation within the works area of Intersection 2 is not considered to be a threatened ecological community under either the NSW BC Act nor Commonwealth EPBC Act.

3.3 Fauna habitats

Within and adjacent to the Intersection 2 extent of works fauna habitat is confined to shrubby forest. Scattered throughout the vegetation are numerous hollow-bearing trees containing small (<5cm) hollows. No large hollows within or adjacent to the extent of works were observed. There is one culvert which underpasses the existing roadway just east of the works area, which may provide potential habitat for roosting microchiropteran bats. This culvert was inspected and appeared to have been recently (<10 years) replaced. The culvert is smooth and did not show any evidence of bat occupation. As such this culvert is not considered to be breeding habitat for microchiropteran bats, and any impacts would not be considered a prescribed impact under the BAM. The current condition of the culvert is shown in the photograph below.



Photograph 6 Culvert 'RTA C4830' under Grafton Road

3.4 Predicted threatened species

Predicted species as identified by the BAMC are shown in the table below. There have been no changes to the predicted species list.

Table 10 Predicted species at Intersection 2

Common	Species	Habitat constraints	Geographic limitations	Sensitivity class	BC Act	EPBC Act
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>			Moderate	Vulnerable	Not Listed
Glossy Black-Cockatoo (Foraging)	<i>Calyptorhynchus lathamii</i>	Presence of <i>Allocasuarina</i> and casuarina species		High	Vulnerable	Not Listed
Hoary Wattled Bat	<i>Chalinolobus nigrogriseus</i>			High	Vulnerable	Not Listed
Speckled Warbler	<i>Chthonicola sagittata</i>			High	Vulnerable	Not Listed
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>			High	Vulnerable	Not Listed

Common	Species	Habitat constraints	Geographic limitations	Sensitivity class	BC Act	EPBC Act
Varied Sittella	<i>Daphoenositta chrysoptera</i>			Moderate	Vulnerable	Not Listed
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>			High	Vulnerable	Endangered
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>			High	Vulnerable	Not Listed
Painted Honeyeater	<i>Grantiella picta</i>	Mistletoes present at a density of greater than five mistletoes per hectare		Moderate	Vulnerable	Vulnerable
White-bellied Sea-Eagle (Foraging)	<i>Haliaeetus leucogaster</i>	Within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines		High	Vulnerable	Not Listed
Little Eagle	<i>Hieraaetus morphnoides</i>			Moderate	Vulnerable	Not Listed
Swift Parrot (Foraging)	<i>Lathamus discolor</i>			Moderate	Endangered	Critically Endangered
Square-tailed Kite	<i>Lophoictinia isura</i>			Moderate	Vulnerable	Not Listed
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>			Moderate	Vulnerable	Not Listed
Large Bent-winged Bat (Foraging)	<i>Miniopterus orianae oceanensis</i>			High	Vulnerable	Not Listed
Barking Owl (Foraging)	<i>Ninox connivens</i>			High	Vulnerable	Not Listed
Powerful Owl (Foraging)	<i>Ninox strenua</i>		within 5 km buffer of Macleay Gorges subregion	High	Vulnerable	Not Listed
Yellow-bellied Glider	<i>Petaurus australis</i>	Hollow bearing trees, Hollows > 25cm diameter		High	Vulnerable	Not Listed
Scarlet Robin	<i>Petroica boodang</i>			Moderate	Vulnerable	Not Listed
Flame Robin	<i>Petroica phoenicea</i>			Moderate	Vulnerable	Not Listed

Common	Species	Habitat constraints	Geographic limitations	Sensitivity class	BC Act	EPBC Act
Koala	<i>Phascolarctos cinereus</i>			High	Vulnerable	Vulnerable
Grey-headed Flying-fox (Foraging)	<i>Pteropus poliocephalus</i>			High	Vulnerable	Vulnerable
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>			High	Vulnerable	Not Listed
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>			High	Vulnerable	Not Listed
Diamond Firetail	<i>Stagonopleura guttata</i>			Moderate	Vulnerable	Not Listed
Masked Owl (Foraging)	<i>Tyto novaehollandiae</i>			High	Vulnerable	Not Listed

3.5 Candidate threatened species

Due to limitations on habitat or geographic constraints, the following candidate species have been excluded from further assessment:

- *Calyptorhynchus lathami* Glossy Black-cockatoo (Breeding) – There are no suitable hollow-bearing trees with hollows greater than 15cm diameter and greater than 5m above ground.
- *Chalinolobus dwyeri* Large-eared Pied Bat - The site is not within 2km of rocky areas containing caves, overhangs, escarpments, outcrops or crevices.
- *Haliaeetus leucogaster* White-bellied Sea-Eagle (Breeding) – There are no eyries present.
- *Hieraetus morphnoides* Little Eagle (Breeding) – There are no nest trees present.
- *Lathamus discolor* Swift Parrot (Breeding) – There are no mapped important areas within the assessment area.
- *Lophoictinia isura* Square-tailed Kite (Breeding) – There are no nest trees present.
- *Miniopterus orianae oceanensis* Large Bent-winged Bat (Breeding) – There are no caves, tunnels, mines, culverts, suspected of being breeding habitat for this species.
- *Myotis macropus* Southern Myotis – There are no hollow-bearing trees within 200m of a watercourse present.
- *Ninox connivens* Barking Owl (Breeding) – There are no suitable hollow-bearing trees present.
- *Ninox strenua* Powerful Owl (Breeding) – The site is not within 5km of Macleay Gorges IBRA subregion.
- *Petrogale penicillata* Brush-tailed Rock-wallaby – The site is not within 1km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines.
- *Pteropus poliocephalus* Grey-headed Flying-fox (Breeding) – There are no breeding camps present.
- *Tyto novaehollandiae* Masked Owl (Breeding) – There are no suitable hollow-bearing trees present.

All other species were considered for further assessment as identified in the table below.

Table 11 Threatened flora survey timing– Intersection 2

Species	Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Chiloglottis platyptera</i>	Barrington Tops Ant Orchid										X		
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	X	X	X	X	X	X	X	X	X	X	X	X
<i>Haloragis exalta subsp. velutina</i>	Tall Velvet Sea-berry	X	X	X	X	X	X	X	X	X	X	X	X
<i>Picris evae</i>	Hawkweed	X	X									X	X
<i>Swainsona sericea</i>	Silky Swainson-pea									X	X	X	
<i>Thesium australe</i>	Austral Toadflax	X	X									X	X

Table 12 Threatened fauna survey timing – Intersection 2

Species	Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Cercartetus nanus</i>	Eastern Pygmy Possum	X	X	X							X	X	X
<i>Litoria subglandulosa</i>	Glandular Frog										X	X	X
<i>Petaurus norfolcensis</i>	Squirrel Glider	X	X	X	X	X	X	X	X	X	X	X	X
<i>Phascolarctos cinereus</i>	Koala (breeding)	X	X	X	X	X	X	X	X	X	X	X	X

3.5.1 Species known or assumed present

Based on the result of the field surveys, the following species are either known or assumed to be present as described in the tables below:

Table 13 Threatened flora– Intersection 2

Species	Common Name	Known or likely to be present?	Area of habitat impacted
<i>Chiloglottis platyptera</i>	Barrington Tops Ant Orchid	Survey indicates the species is not present	n/a
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	Survey indicates the species is not present	n/a
<i>Haloragis exalta subsp. velutina</i>	Tall Velvet Sea-berry	Survey indicates the species is not present	n/a
<i>Picris evae</i>	Hawkweed	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.01

Species	Common Name	Known or likely to be present?	Area of habitat impacted
<i>Swainsona sericea</i>	Silky Swainson-pea	Survey indicates the species is not present	n/a
<i>Thesium australe</i>	Austral Toadflax	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.01

Table 14 Threatened fauna– Intersection 2

Species	Common Name	Known or likely to be present?	Area of habitat impacted
<i>Cercartetus nanus</i>	Eastern Pygmy Possum	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.01
<i>Litoria subglandulosa</i>	Glandular Frog	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.01
<i>Petaurus norfolcensis</i>	Squirrel Glider	Species unlikely to be present, however survey not conducted in correct season, so species assumed present.	0.01
<i>Phascolarctos cinereus</i>	Koala (breeding)	The site survey did not indicate that a breeding population was present, particularly within the extent of works. As such the survey as concluded that breeding habitat for Koala is not present.	0

3.6 Impact summary

The upgrade of intersection 2 will remove up to 0.01 ha of native vegetation which is consistent with PCT568 (Figure 12). All other areas of the development are cleared land and will not require assessment (Figure 13).

No threatened ecological communities will be impacted by the upgrade of Intersection 2.

4. Consistency with Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

One TEC listed under the EPBC Act occurs within the development site. Approximately 0.03 ha of this TEC would be permanently removed as part of the upgrade to Intersection 1.

The assessment of impacts to White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands has been undertaken below:

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

Reduce the extent of an ecological community?

The current extent of the ecological community occurs from south-east Queensland to Victoria. Approximately 82,000 ha of the ecological community occurs in the North East NSW CRA Region. The proposed development has sought to avoid all areas of the ecological community where possible. Remnants of the community outside the intersection upgrade will be retained. As such the extent of the ecological community will not be reduced.

Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines?

The proposed upgrade has been largely located in the existing roadway to minimise any impacts to woodland or forest vegetation. The proposed development will not further fragment or isolate any areas of native vegetation or any areas of TECs.

Adversely affect habitat critical to the survival of an ecological community?

Habitat critical to the survival of the TEC includes areas that are necessary for the long-term maintenance of the ecological community, necessary for maintaining genetic diversity, or necessary for the reintroduction of populations or the recovery of the species. The best areas of the TEC are located outside the works area of Intersection 1, and the proposed development is located in areas which already experience impacts from the adjacent road. The proposed development will not adversely affect habitat critical to the survival of the ecological community.

Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns?

The proposed development site will not affect abiotic factors for the ecological community (such as surface water or groundwater drainage).

Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting?

The species composition of the TEC locally will be unaffected as only 0.03 ha of the ecological community will be removed.

Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community?

The proposed upgrade of Intersection 1 is unlikely to result in any abiotic impacts beyond that which the road edge currently experiences.

Interfere with the recovery of an ecological community?

The proposal will not interfere with the recovery of Box Gum Woodland.

Conclusion

The impacts to 0.03 ha of Box Gum Woodland are unlikely to result in a significant impact.

5. Consistency with State Environment Planning Policy 44 – Koala Habitat Protection

The proposed upgrades of both intersections impact vegetation that is within the Armidale Regional Council LGA, which is identified in the State Environment Planning Policy (SEPP) 44 – Koala Habitat Protection. As such an assessment under this SEPP is required before Council can approve any development application. The assessment under SEPP44 must consider whether the site contains potential habitat (being that which contains appropriate feed species), and whether the site contains core habitat. Should an impact to core koala habitat be likely, a Koala Plan of Management (KPOM) must be drafted for that LGA.

The assessment below is consistent with Part 2 of SEPP44:

Is the land potential Koala Habitat?

Potential koala habitat means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

Table 15 Koala feed tree species (SEPP44 Schedule 2) assessment

Scientific Name	Common Name	Intersection 1	Intersection 2
<i>Eucalyptus tereticornis</i>	Forest Red Gum	Not present	Not present
<i>Eucalyptus microcorys</i>	Tallowwood	Not present	Not present
<i>Eucalyptus punctata</i>	Grey Gum	Not present	Not present
<i>Eucalyptus viminalis</i>	Ribbon or Manna gum	Not present	Not present
<i>Eucalyptus camaldulensis</i>	River Red Gum	Not present	Not present
<i>Eucalyptus haemastoma</i>	Broad-leaved Scribbly Gum	Not present	Not present
<i>Eucalyptus signata</i>	Scribbly Gum	Not present	Not present
<i>Eucalyptus albens</i>	White Box	Not present	Not present
<i>Eucalyptus populnea</i>	Bimble Box or Poplar Box	Not present	Not present
<i>Eucalyptus robusta</i>	Swamp Mahogany	Not present	Not present

Based on the review of the vegetation within both intersection upgrades, there will be no impact to any areas of potential koala habitat.

Is the land core Koala Habitat?

Core koala habitat means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.

The field assessment did not identify any recent evidence of Koala occupation. It is noted that there are scattered records (BioNet) throughout the Gara TSR of Koala sightings.

Given the limited extent of impacts, and lack of evidence of breeding female Koalas, the intersection upgrades are unlikely to impact Core Koala Habitat. As such a KPOM is not required for the Armidale Regional Council LGA.

6. Summary

The upgrades of Intersection 1 and Intersection 2 have been requested for inclusion within the Biodiversity Assessment Development Report (BDAR) for the Stringybark Solar Farm. This addendum seeks to provide additional information required for the assessments of each intersection.

Based on the inclusion of these two new areas to the assessment, the following impacts and credit requirements are presented in the table below. These credits are to be retired in accordance with the conditions of consent for the overall project (i.e. Stringybark Solar Farm). These credits can be retired via any method as specified in the *Biodiversity Conservation Regulation*.

Table 16 Total biodiversity impacts

Biodiversity value	Stringybark Solar Farm Array Area (ha)	Intersection 1	Intersection 2	Total	Total credit requirement
Native vegetation					
PCT 510 Woodland	--	0.03		0.03	1
PCT 510 Low condition grassland	45.2 h	--	--	45.2	0
PCT 568 Woodland	--	--	0.01	0.01	1
PCT 568 Low condition grassland	46.6	--	--	46.6	0
Threatened flora species					
<i>Dichanthium setosum</i>	0.5	0.03	0.01	0.54	4
<i>Picris evae</i>	--	0.03	0.01	0.04	1
<i>Thesium australe</i>	--	0.03	0.01	0.04	1
Threatened fauna species					
Tusked Frog population in the Nandewar and New England Tableland Bioregions	--	0.03	--	0.03	1
Bush Stone-curlew	--	0.03	--	0.03	1
Eastern Pygmy Possum	--	0.03	0.01	0.04	1
Pale-headed Snake	--	0.03	--	0.03	1
Glandular Frog	--	0.03	--	0.03	1
Southern Myotis	--	0.03	--	0.03	1
Squirrel Glider	--	0.03	0.01	0.04	1

A1 Figures

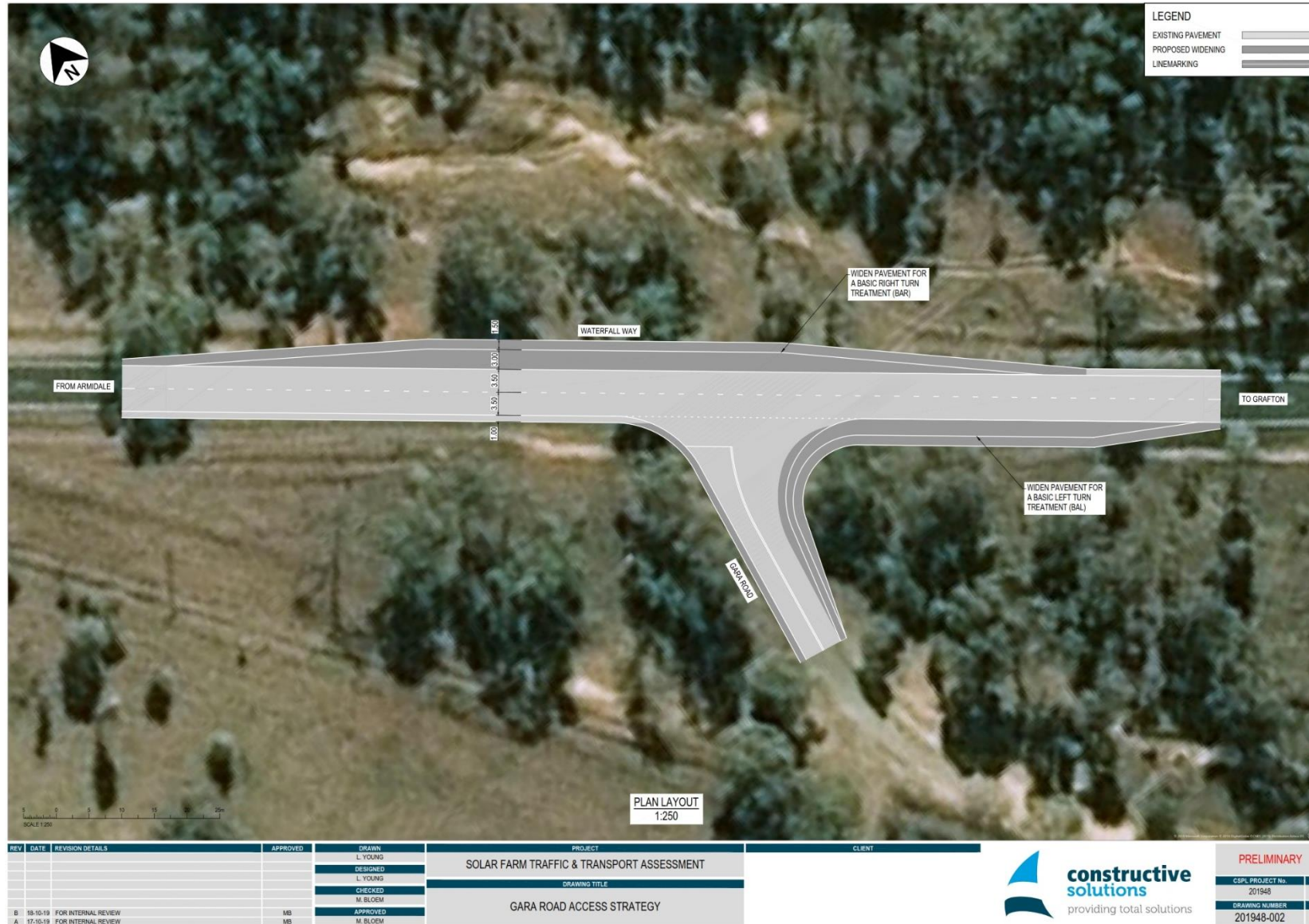


Figure 1 Proposed upgrades to Waterfall Way intersection with Gara Road



Figure 2 Proposed upgrades to Waterfall Way and substation access

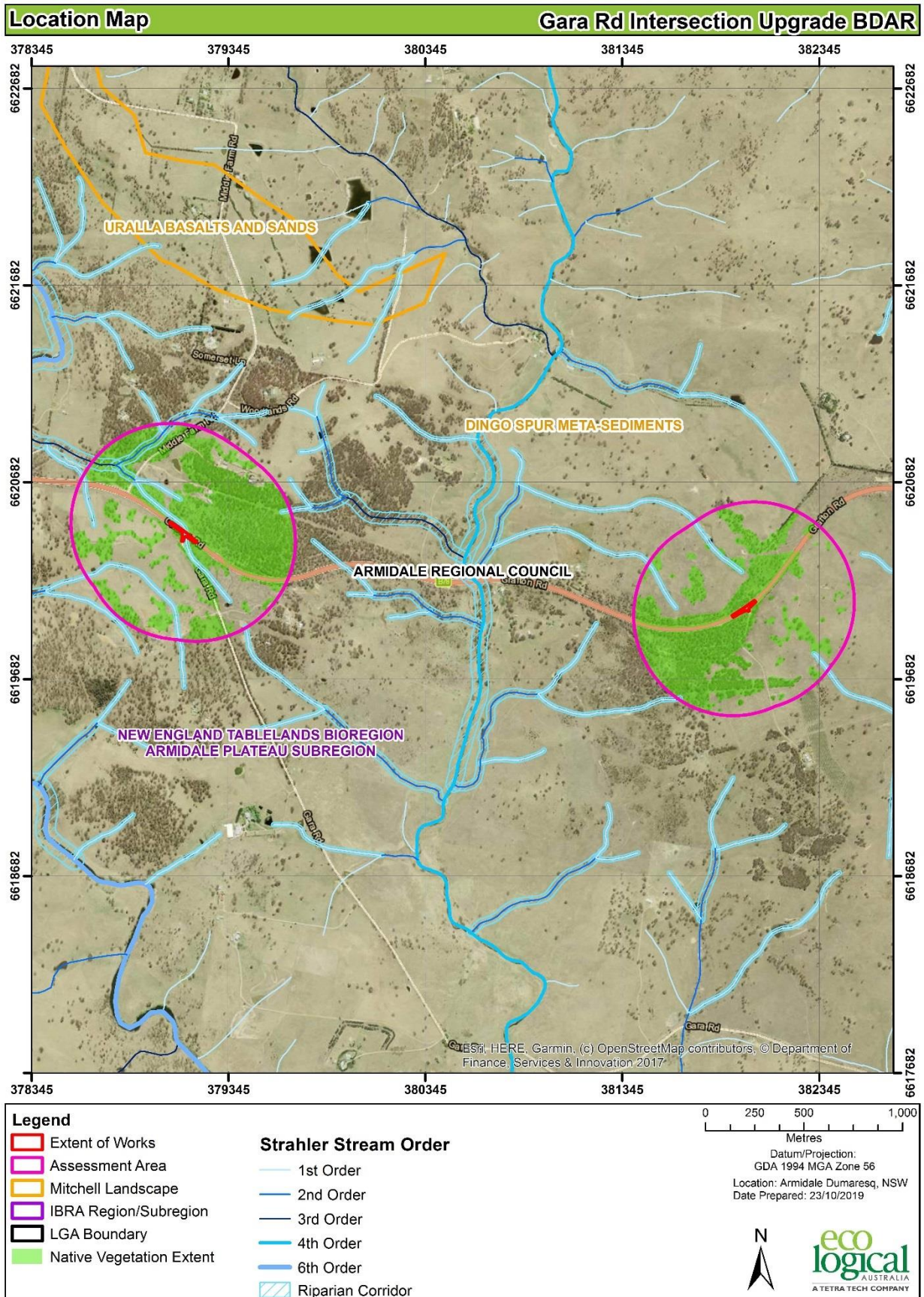


Figure 3 Landscape map

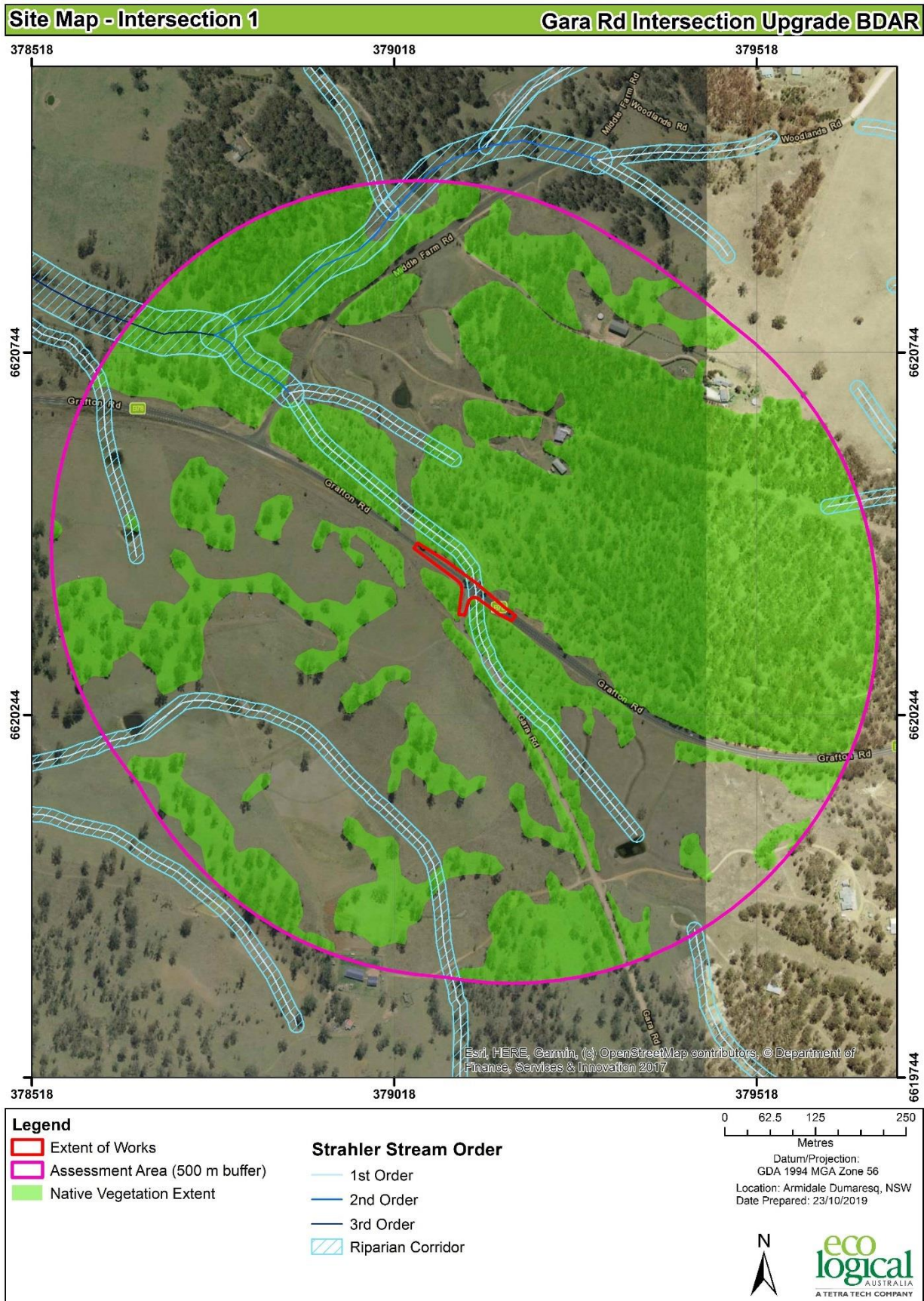


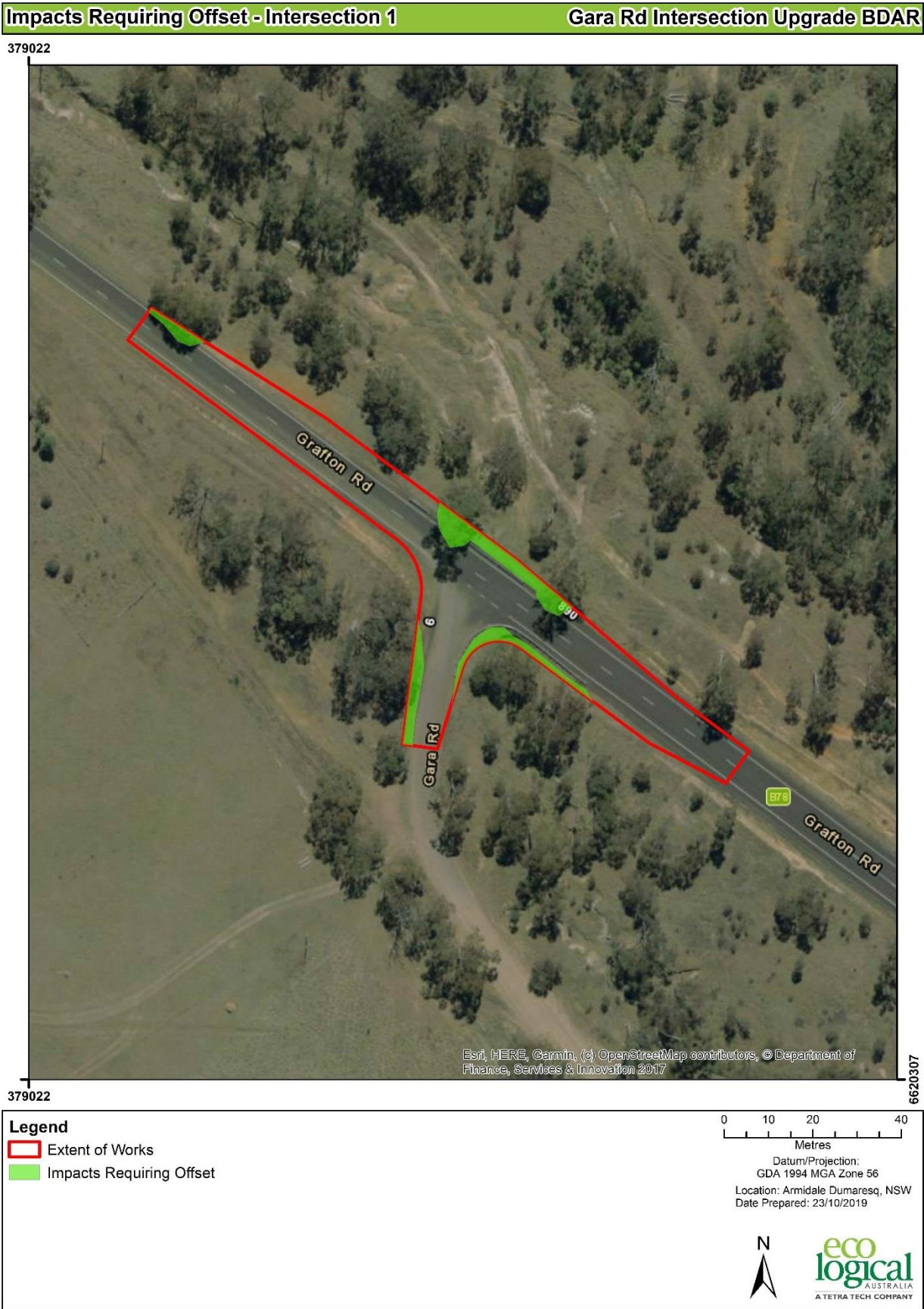
Figure 4 Intersection 1 Site map



Figure 5 Intersection 1 Plant Community Types



Figure 6 Intersection 1 Survey effort and culvert locations



Impacts Not Requiring Assessment - Intersection 1 Gara Rd Intersection Upgrade BDAR



Figure 8 Intersection 1 Areas not requiring assessment

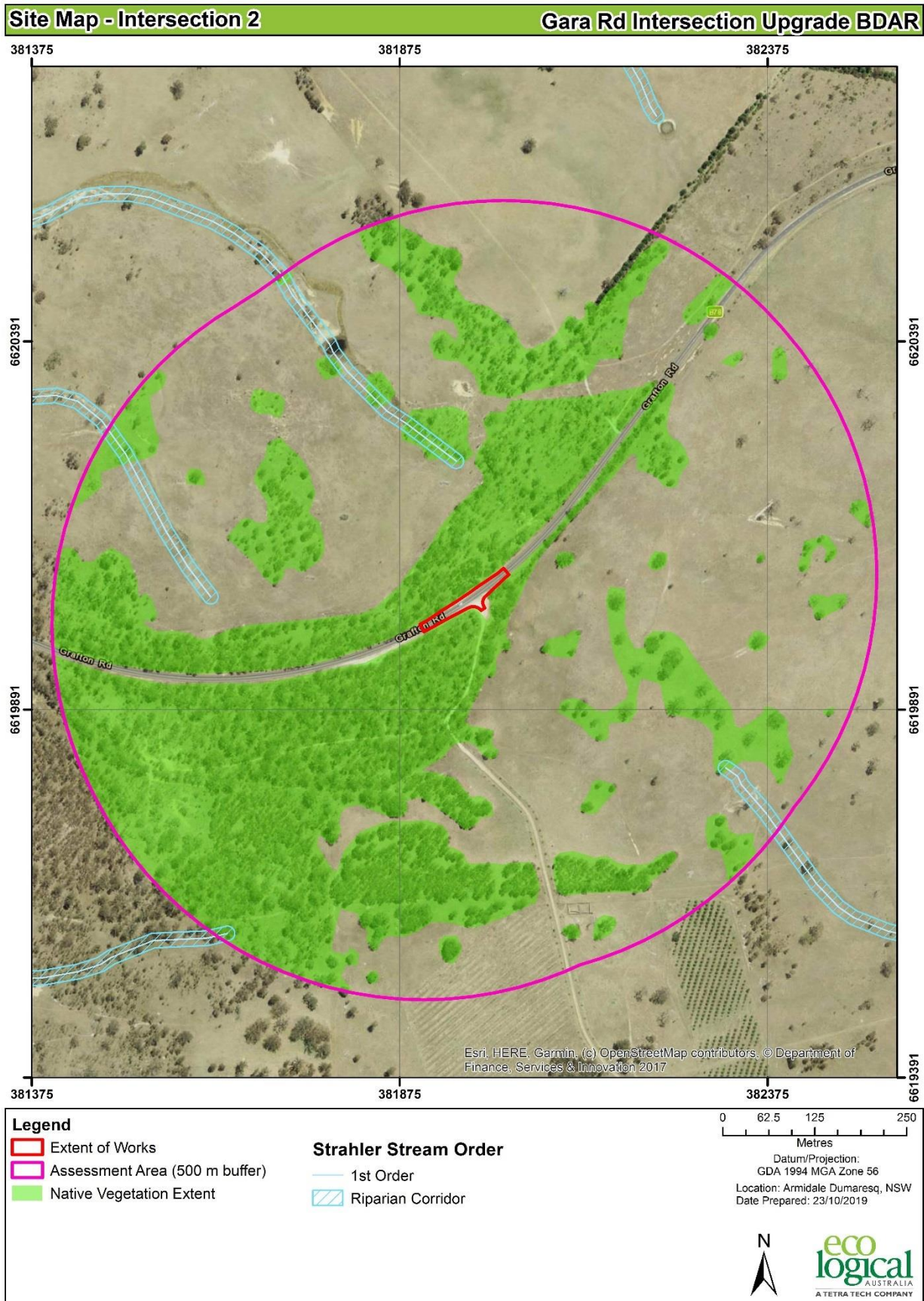


Figure 9 Intersection 2 Site Map



Figure 10 Intersection 2 Plant Community Types



Figure 11 Intersection 2 Survey effort and culvert location



Figure 12 Intersection 2 Impacts requiring offset

Impacts Not Requiring Assessment - Intersection 2 Gara Rd Intersection Upgrade BDAR



Figure 13 Intersection 2 Areas not requiring assessment

A2 Floristic and vegetation integrity data

Table 17 Composition data

Plot	Tree	Shrub	Grass	Forb	Fern	Other
Plot 17	2	4	8	8	1	3
Plot 18	2	1	8	3	1	0

Table 18 Structure data

Plot	Tree	Shrub	Grass	Forb	Fern	Other
Plot 17	30.0	1.7	35.5	0.8	0.1	0.3
Plot 18	25.0	0.1	50.5	0.3	0.1	0.0

Table 19 Function data

Plot	Large Tree	Hollow trees	Litter cover	Fallen Logs	Trees (5-10)	Trees (10-20)	Tree (20-30)	Tree (30-50)	Tree (50-80)	Regeneration	High threat exotic
Plot 17	2	2	50	23	1	1	1	1	1	1	0.0
Plot 18	1	0	45	2	0	0	1	1	1	1	0.0

Table 20 Floristic quadrat data

Family	Species	Common Name	Listing	Status	ROTAP	Exotic	High Threat Weed	Growth Form	Plot 17			Plot 18		
									S	C	A	S	C	A
Myrtaceae	<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	,					Tree (TG)	0	0	0	U	15	2
Myrtaceae	<i>Eucalyptus bridgesiana</i>	Apple Box	,					Tree (TG)	u	15	20	0	0	0
Myrtaceae	<i>Eucalyptus caliginosa</i>	Broad-leaved Stringybark	,					Tree (TG)	u	15	20	U	10	3
Fabaceae (Mimosoideae)	<i>Acacia spp.</i>	Wattle	,					Shrub (SG)	m	0.5	10	0	0	0
Asteraceae	<i>Cassinia quinquefaria</i>	--	,					Shrub (SG)	m	1	20	0	0	0
Fabaceae (Faboideae)	<i>Indigofera australis</i>	Australian Indigo	,					Shrub (SG)	m	0.1	5	0	0	0
Ericaceae	<i>Lissanthe strigosa</i>	Peach Heath	,					Shrub (SG)	g	0.1	5	0	0	0
Fabaceae (Faboideae)	<i>Pultenaea foliolosa</i>	A Bush Pea	,					Shrub (SG)	0	0	0	g	0.1	5
Fabaceae (Faboideae)	<i>Glycine clandestina</i>	Twining glycine	,					Other (OG)	g	0.1	5	0	0	0
Fabaceae (Faboideae)	<i>Glycine tabacina</i>	Variable Glycine	,					Other (OG)	g	0.1	5	0	0	0
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>	False Sarsaparilla	,					Other (OG)	g	0.1	20	0	0	0
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	,					Grass & grasslike (GG)	g	0.1	20	G	0.1	5
Poaceae	<i>Dichelachne micrantha</i>	Shorthair Plumegrass	,					Grass & grasslike (GG)	g	5	500	0	0	0
Poaceae	<i>Eragrostis leptostachya</i>	Paddock Lovegrass	,					Grass & grasslike (GG)	0	0	0	G	0.1	20

Family	Species	Common Name	Listing	Status	ROTAP	Exotic	High Threat Weed	Growth Form	Plot 17			Plot 18		
									S	C	A	S	C	A
Poaceae	<i>Eragrostis spp.</i>	A Lovegrass	,					Grass & grasslike (GG)	0	0	0	G	0.1	5
Juncaceae	<i>Juncus usitatus</i>	--	,					Grass & grasslike (GG)	g	0.1	5	G	0.1	5
Lomandraceae	<i>Lomandra filiformis</i>	Wattle Matt-rush	,					Grass & grasslike (GG)	g	0.1	5	G	0.1	5
Lomandraceae	<i>Lomandra multiflora subsp. multiflora</i>	Many-flowered Mat-rush	,					Grass & grasslike (GG)	g	0.1	5	0	0	0
Poaceae	<i>Poa labillardierei var. labillardierei</i>	Tussock	,					Grass & grasslike (GG)	0	0	0	G	20	100
Poaceae	<i>Poa sieberiana</i>	Snowgrass	,					Grass & grasslike (GG)	g	10	500	G	20	100
Poaceae	<i>Rytidosperma spp.</i>	--	,					Grass & grasslike (GG)	g	0.1	5	0	0	0
Poaceae	<i>Themeda triandra</i>	--	,					Grass & grasslike (GG)	g	20	1000	G	10	50
Poaceae	<i>Poaceae spp.</i>	--	,					Grass & grasslike (GG)	g	0.5	20	0	0	0
Rubiaceae	<i>Asperula conferta</i>	Common Woodruff	,					Forb (FG)	0	0	0	G	0.1	5
Asteraceae	<i>Calotis cuneifolia</i>	Purple Burr-Daisy	,					Forb (FG)	g	0.1	5	0	0	0
Asteraceae	<i>Chrysocephalum apiculatum</i>	Common Everlasting	,					Forb (FG)	g	0.1	5	0	0	0
Phormiaceae	<i>Dianella caerulea</i>	Blue Flax-lily	,					Forb (FG)	g	0.1	5	G	0.1	20

Family	Species	Common Name	Listing	Status	ROTAP	Exotic	High Threat Weed	Growth Form	Plot 17			Plot 18		
									S	C	A	S	C	A
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed	,					Forb (FG)	g	0.1	5	0	0	0
Onagraceae	<i>Epilobium spp.</i>	--	,					Forb (FG)	m	0.1	1	0	0	0
Anthericaceae	<i>Laxmannia gracilis</i>	Slender Wire Lily	,					Forb (FG)	g	0.1	1	0	0	0
Polygonaceae	<i>Rumex brownii</i>	Swamp Dock	,					Forb (FG)	g	0.1	5	G	0.1	3
Asteraceae	<i>Vittadinia cuneata</i>	A Fuzzweed	,					Forb (FG)	g	0.1	5	0	0	0
Pteridaceae	<i>Cheilanthes sieberi</i>	Rock Fern	,					Fern (EG)	g	0.1	5	G	0.1	20
Plantaginaceae	<i>Plantago lanceolata</i>	Lamb's Tongues	,			*			g	0.1	5	G	0.1	20
Rosaceae	<i>Rosa spp.</i>	--	,			*			0	0	0	G	0.1	1
Fabaceae (Faboideae)	<i>Trifolium spp.</i>	A Clover	,			*			g	0.1	5	0	0	0
Verbenaceae	<i>Verbena rigida var. rigida</i>	Veined Verbena	,			*			0	0	0	G	0.1	20

A3 Site Photographs

6.1.1 Plot 18 Photographs – (Start portrait, start landscape, end portrait, end landscape)





6.1.2 Plot 17 Photographs – (Start portrait, start landscape, end portrait, end landscape)





A4 Biodiversity Assessment Method Calculator Credit Report

