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**Biodiversity Development Assessment Report  
(BDAR) Addendum**

Allambie Heights Village  
3 Martin Luther Place, Allambie Heights 2100

Total Earth Care Pty Ltd  
April 19



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<b>Revision/Version No.</b>	Rev A	<b>Date of revision</b>	3 April 2019
<b>Prepared by:</b>	TEC		
<b>Prepared for:</b>	Allambie Heights Village		
<b>TEC Job No.</b>	C10826		

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## Executive Summary

Northern Beaches Council has rejected the Development Application DA2018/1667 in its current form for the construction of a Seniors Housing Development at 181 Allambie Road, Allambie Heights. Among the concerns raised by council are concerns with the Biodiversity Development Assessment Reports. This addendum aims to address the feedback from Council. A final revision of BAM credit obligations will still be required pending decisions on issues identified in this report.

### Feedback from Council on BDAR.

Comments specific to the Biodiversity Development Assessment Report submitted are as follows.

- The BDAR was not finalised within 14 days of the submission of the development application.
- The maps should include other landscape features such as riparian zones, connectivity corridors and geological features (caves/cliffs etc). The extent of native vegetation across the site must be assessed and mapped based on the definition for native vegetation contained within the Local Land Services Act (Part 5A s60B).
- The area of each Plant Community Type (PCT) on the site, and the areas of each to be impacted is unclear. The areas within section 3.3 and Table 3-6 must be clarified.
- The use of likelihood of occurrence to discount predicted and candidate species is to be clarified where no habitat geographic limitations are contained within the database. Is the matrix set up in Table 4-2 applicable as a justification within the BAM?
- The VMP mentions possible records of Red-crowned Toadlet calls, however this species was not assessed in the BDAR.
- A species polygon is required for each species credit species.
- The extent of native vegetation vs weeds and urban exotics would need to be clarified at the interface of the development, again based on the definition contained in Part 5A of the LLS Act. The proposal includes the removal of 85 trees, many of which are native to NSW, and therefore should be assigned to a PCT and included in the biodiversity values of the site, assessed for impacts and any offsetting requirements determined for residual impacts.
- The extent of direct and indirect impacts on native vegetation and habitat requires review – a map of impacts is required. Possible impacts to native vegetation including trees within the construction zone, removal of riparian areas and changes as a result of the APZ proposed.
- The need for ongoing vegetation management for bushfire purposes is not supported, however if the action is justified it must be included as part of the development plans and clearly assessed under the application. The change in vegetation integrity that will result from any ongoing management of the native vegetation must be included as part of the BDAR, and potential offsets considered.
- Prescribed impacts have not been addressed.
- Additional detail regarding the future vegetation integrity scores used to measure change is required.

## **1 Landscape Features**

### **1.1 Connectivity**

The high value connectivity of the site is captured is well described in section 2.2.3. Within the BAM calculator connectivity value is capture by the fact that all vegetation zones are under considered connected with the neighbouring bushland and hence are all given the highest “Patch Size” rating of > 100ha.

### **1.2 Riparian zones.**

Office of Water hydro lines have been added to the location map. See Map 2.

#### **1.2.1 Other features:**

No significant karsts or caves are known in this areas

## Title: Location Map

Map No: 2

Site: 181 Allambie Rd


Client: Allambie Heights Village Ltd.


Date: June 2018


Project No: C10826

Author: K Askew

### Legend

 Creeks (hydrolines)

 Subject\_site

 1500m\_buffer

 Lot

 Native PCTs (OEH 2016)

### Non-native PCTs

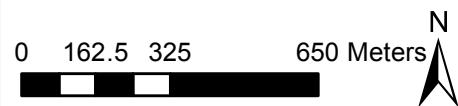
 Art\_WL: Artificial Wetland

 Cleared

 Urban\_E/N: Urban Exotic/Native

 Weed\_Ex: Weeds and Exotics

IBRA Bioregion: Sydney Basin Bioregion (SYB)  
IBRA Sub-region: Pittwater Sub-region (SYB07)



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Nearmap



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## 2 Native Vegetation

Feedback from Northern Beaches Council states that extent of native vegetation across the site, including in some weedy areas and remnant trees on the open lawn areas has not followed the definition of “Native Vegetation” under part 5A of the LLS Act, as is required in a BDAR.

New mapping has been produced that shows areas of native vegetation defined by remnant trees. **See Map: 5.2.** Trees have been mapped into native vegetation patches where their canopies fall within a distance of 3 times their diameter, as specified under the LLS Act. Also mapped are some areas of mixed weeds and native vegetation along the development boundary that was not previously identified as native PCTs. These have been assigned to the most suitable matching PCTs in keeping with BAM guidelines. Map 5.2 focuses on the boundary of bushland close to development boundary which was council’s primary areas of concern. PCTs west of this map’s extent have not been altered from those shown in the original BDAR. Exotic patches mapped such as the southern verge of the access as shown below in figure 2-1 show insufficient native cover to be considered as PCT.



**Figure 2-1 – Exotic dominant Zone in foreground.**

## Title: PCTs near development

Map No: 5.2

Site: 181 Allambie Rd

Client: Allambie Heights Village Ltd.








Date: 20/03/2019

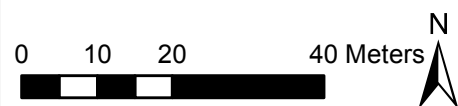
Project No: C10826

Author: G Goldin

### Legend

#### ZoneName

-  Exotic
-  PCT 1250 Mod Condition
-  PCT 1250 Poor Condition
-  PCT 1783 Mod Condition
-  PCT 1824 Mod Condition
-  PCT 1824 Poor Condion
-  PCT N/A



Data Source:  
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## Title: Impacts to PCTs

Map No: 6

Site: 181 Allambie Rd

Client: Allambie Heights Village Ltd.







Date: 20/03/2019

Project No: C10826

Author: G Goldin

### Legend

#### Impact Zone Name

-  PCT 1250 Mod Condition
-  PCT 1250 Poor Condition
-  PCT 1824 Mod Condition
-  PCT 1824 Poor Condition
-  PCT N/A 1
-  PCT N/A 2



Data Source:  
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**Title: Clearance Areas**

Map No: -

Site: 181 Allambie Rd

Client: Allambie Heights Village Ltd.

Date: 20/03/2019

Project No: C10826

Author: G Goldin

### Legend

**Mgmt\_Zone**



Data Source:  
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## 2.1 Assignment of PCT to newly mapped areas of native vegetation.

Two of the patches of native vegetation as defined by tree canopy cover cannot be reasonably assigned a PCT. These are:

### Avenue of trees along the access road.

This patch of trees consist of a row of trees, most likely planted, along the northern side of the access roadway in a linear fashion. The row consists of the species Swamp Mahogany (*Eucalyptus robusta*) and Bangalay (*Eucalyptus botriodes*) which are not a component of any of the plant community types identified on-site or in the neighbouring locality, and incompatible geography and elevation preclude such a determination. Both *E. robusta* and *E. botriodes* are typically components of low-land swamp or alluvial sandflat communities in this IBRA sub-region. The ground layer is an exotic mown lawn on shallow soil over sandstone. Compensation for the loss of these trees are not assessed under the offset scheme and although some replacement tree species are present under the landscaping plant, their removal could be considered part of the residual impact of the proposal.

### Trees adjacent to the existing building

Incorporating Trees 54 – 68 on the Tree Impact Assessment Report, this area of trees is dominated by a canopy of mature Sydney blue gums (*Eucalyptus saligna*), the largest of which is planned to be retained. *Eucalyptus saligna* is not a component of any of the PCTs found on the site or locality, or suiting geological requirements (e.g shale ridgetops for Blue gum high forest). These are most likely to have been planted. The majority of the other native canopy species here are also not locally indigenous including *Acacia parramattensis* and a *Lophostomon confertus*. Compensation for the loss of these trees are not assessed under the offset scheme and although some replacement tree species are present under the landscaping plant, their removal could be considered part of the residual impact of the proposal.

### Trees along north north-western edge of lawn area. (Zone PCT 1824 Poor)

Scattered trees on the lawn bordering the remnant bushland include Scribbly gums (*Eucalyptus haemastoma*), Red bloodwood (*Corymbia gummifera*) *Banksia serrata* and *Acacia parramattensis*. If a native PCT is to be assigned to these trees as has been requested, the most appropriate would be PCT 1824: Mallee - Banksia - Tea-tree – Hakea. The canopy species are appropriate, the location is geologically similar to the neighbouring areas of this PCT, with shallow soils over sandstone bedrock approximately 300mm depth as noted in the Tree Impact Assessment Report. Trees in this area show stunted form and tending to semi-malleed growth as seen in **Figure 2-2**. The impacts on this patch of native vegetation is to be combined with the neighbouring patch of native vegetation assessed on the values determined in BAM plot 1, see “**Development interface north of access road**” below.



**Figure 2-2. Remnant Bloodwood and Scribbly gum along lawn/bush edge**

**Development interface north of access road (Zone PCT 1824 Poor).**

This area was assigned the plant community mapped by OEH as Native/Exotic urban vegetation and was not assigned a PCT in the BDAR. This area clearly falls under the definition of native vegetation due to the cover of native species in several strata. Under councils request to better quantify impacts it is reasonable that a PCT can be applied to this area. PCT 1824: Mallee - Banksia - Tea-tree – Hakea again is the best fit given for the following reasons:

- the patch is continuous with the other assessed area of this community,
- Geographic conditions remain similar – i.e, shallow soils on rock shelf and relatively level aspect.
- Growth form of the community is that of a tall heath.
- Six positively diagnostic species were found in the BAM plot and no stronger evidence of other local PCT communities were seen through species matching.

Much the native component of the mid-story in this area consists of large senescent shrub species such as *Kunzea ambigua* further suggesting a heath community has historically been present but may be losing diversity through lack of fire and from weed encroachment or other disturbance. **See Figure2-3 below:** A BAM plot representative of this area was taken for the BDAR and can be used as the basis for assessing impacts in this area. This patch is continuous with the patch adjacent remnant trees discussed above of PCT 1824 Poor, and the two areas can be combined.



**Figure 2-3. Senescing shrubby vegetation near plot 1.**

#### **Development interface south of access road (Zone PC 1250 Mod)**

This zone along the western edge of the development footprint was given the vegetation community mapped by OEH of Native/Exotic Urban vegetation in the BDAR. Ground survey agreed on this PCT because of the approximately 80% exotic cover of the ground and mid-story, predominantly by *Lantana* (*Lantana camara*). **Figure 2-4 below.** However, because of the canopy cover of remnant trees in this area, this Zone is still considered native vegetation under part 5A of the LLS Act. The most appropriate PCT to apply to this is PCT 1250: Sydney Peppermint - Smooth-barked Apple - Red Bloodwood for the following reasons:

- Patch has a forest formation
- Appropriate canopy species for the PCT are present including *Angophora costata*, *Corymbia gummifera* and *Allocasuarina littoralis*.
- It is located adjacent to a patch of this community.
- It is located in a geographically suitable area of shallow gully south facing.



**Figure 2-4. Lantana dominant understory in PCT 1250 (Sandstone gully forest).**

No BAM plot had been performed on this zone under the original BDAR. Given the small size of this patch such an analysis would not be practical or cost effective. Considering this zone to be a part of PCT 1250 as assessed by plot 5, could be considered on the precautionary side of assessing the development impacts in this area.

**Table 2-1. BAM plot floristics compared with positive diagnostic (PD) species in each PCT**

PCT	OEH Veg Map Code	Total species required in 0.04 Ha	Total PD species required	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5
1824	HL08 PD	42	31	6	27	26	16	20
1250	DSF09 PD	45	32	6	18	26	13	22
1783	DSF 11 PD	41	27	6	22	25	14	17
	Total number of species			51	37	46	27	46
	Total number of native species			28	36	45	26	42
	Total number of introduced species			23	1	1	1	4

Plot PCT determined using all survey evidence.

## 2.2 Clarification of Impacts to Native PCTS

Clarification of the size of the impact areas on these vegetation zones is shown in Map 6.

Not all vegetation in the impact zones is to be completely cleared. Some are to be managed as APZs.

The draft landscape plan was overlaid on a map of PCTs and areas subject to complete clearance have been identified. **See Map 8.** The remaining impact areas are managed as APZ and the remainder of the PCT is preserved as native bushland under the VMP. Table 2-2 gives the breakdown of the management zone areas of the PCTs to be impacted.

**Table 2-2 Management zones within the PCT Zones impacted.**

Zone Name	Zone Area (Ha)	Management Zones(Ha)	Summary of Impact
<b>PCT 1250 Mod Condition</b>	0.8	APZ: 0.09 Clear: 0.03 VMP: 0.68	<b>APZ:</b> Thinning of mid stratum. Tree cover reduced to 15%. Retention of grasses/forbs. <b>Clear:</b> Complete removal. <b>VMP:</b> Weeding – no prescribed burning.
<b>PCT 1824 Mod Condition</b>	0.44	APZ: 0.01 VMP: 0.43	<b>APZ:</b> Thinning of mid stratum. Tree cover reduced to 15%. Retention of grasses/forbs. <b>Clear:</b> Complete removal
<b>PCT 1824 Poor Condition*</b>	0.510	APZ: 0.05 Clear: 0.250 VMP: 0.21	<b>APZ:</b> Thinning of mid stratum. Tree cover reduced to 15%. Retention of grasses/forbs. <b>Clear:</b> Complete removal <b>VMP:</b> Weeding – no prescribed burning.
<b>PCT N/A 1</b>	0.100	Clear	Complete removal
<b>PCT N/A 2</b>	0.054	Clear	Complete removal
<b>PCT 1783 Mod</b>	1.34	Maintain	<b>VMP:</b> Weeding – no prescribed burning.

\*Considered to be one zone in conjunction with zone “PCT 1250 Mod Condition”.

Management zones areas used in the BAM calculator were derived from a Map 8 which overlaid the draft landscape plan with the areas of native plant community to be impacted to identify which areas would be considered totally cleared and which subject to APZ.

## 2.3 Clarification of Future Vegetation Integrity Scores.

Ecological and hazard reduction burning is no longer to be considered an activity under the BDAR and is to be removed from the VMP. Future vegetation integrity scores are calculated on the impacts within management zones based on the Quadrat data for each PCT zone. Future integrity score calculation method:

The following methods were used to calculate the impacts to the current vegetation integrity score by the proposal:

- **Clearing** – Full removal of PCT and its future vegetation integrity score
- **VMP** – Full retention of the PCTs integrity. The vegetation condition of bushland not directly impacted by the proposal and managed under the VMP is considered to retain its current integrity scores. Edge effects are not likely to increase and the weed removal management actions of the VMP should improve the future condition of the remnant bushland.
- **APZ** – Calculation of the APZ future integrity scores is based on estimates on the future conditions using typical APZ management practices. BAM composition score will reduce: in Gully forest Zone (PCT 1250 Mod) the number of tree species is reduced from 7 to 3 and shrubs from 28 to 10. In PCT 1824 Mod, the number of shrub species is reduced from 25 to 15. For the structure score in all APZ management zones, tree cover is reduced to 15% maximum, shrub cover to 20% maximum, and grasses, fern and other cover retained. The future functional score of the APZ zone removes the two lowest trunk size classes of trees, but retains regenerating stems, retains large trees, removes all coarse woody debris, removes high threat exotic weed cover and halves the litter cover. An

**Table 2-3 Summary of future vegetation integrity scores for management zones.**

Zone	Mgmt zone	Area (ha)	Composition score	Structure score	Function score	Veg integrity (VI) score	Change in VI score
1250_Mod	VMP	0.68	80.7	86.9	44.1	67.7	0
	APZ	0.09	48.8	33.1	26	34.8	-32.9
	Clear	0.03	0	0	0	0	-67.7
1824_Mod	VMP	0.43	81.3	20.9	59.5	46.6	0
	APZ	0.01	64.6	9.8	21.6	23.9	-22.7
	VMP	0.21	56	68.6	83.6	68.5	0
1824_Poor	Clear	0.25	0	0	0	0	-68.5
	APZ	0.05	56	29.4	43.5	41.5	-26.9

### 3 Threatened Species

#### 3.1 Ecosystem credit species

Ecosystem credit species are threatened species which can be predicted to occur by vegetation surrogates and landscape features. Targeted survey is not required for these species.

Some species which have specialised breeding requirements have dual credit classes to account for differences in foraging and breeding habitat. For example, Glossy Black Cockatoo foraging habitat can be reliably predicted through vegetation associations, however breeding habitat requires hollow-bearing trees with hollows greater than 15cm diameter and greater than 5m above the ground (OEH Bionet)

The BAM calculator produced a list of ecosystem credit species based on a number of attributes including Bioregion and subregion, patch size and the vegetation and habitat data collected in the field.

##### 3.1.1 List of Ecosystem species derived

Ecosystem credit species predicted on the development site within the geographic constraints, using the BAM calculator as at 12/07/2018/are shown in Table 3-1 below.

**Table 3-1. Ecosystem Credit Species Predicted by the BAM Calculator**

Common Name	Scientific Name	Associated Vegetation Types(s)
<b>Barking Owl</b>	<i>Ninox connivens</i>	PCT 1250
<b>Eastern Bentwing-bat</b>	<i>Miniopterus schreibersii oceanensis</i>	PCT 1824, PCT 1250

<b>Eastern False Pipistrelle</b>	<i>Falsistrellus tasmaniensis</i>	PCT 1250
<b>Eastern Freetail-bat</b>	<i>Mormopterus norfolkensis</i>	PCT 1824, PCT 1250
<b>Flame Robin</b>	<i>Petroica phoenicea</i>	PCT 1824, PCT 1250
<b>Gang-gang Cockatoo</b>	<i>Callocephalon fimbriatum</i>	PCT 1824, PCT 1250
<b>Glossy Black-Cockatoo</b>	<i>Calyptorhynchus lathami</i>	PCT 1824, PCT 1250
<b>Golden-tipped Bat</b>	<i>Kerivoula papuensis</i>	PCT 1250
<b>Greater Broad-nosed Bat</b>	<i>Scoteanax rueppellii</i>	PCT 1824, PCT 1250
<b>Grey-headed Flying-fox</b>	<i>Pteropus poliocephalus</i>	PCT 1824, PCT 1250
<b>Little Bentwing-bat</b>	<i>Miniopterus australis</i>	PCT 1824, PCT 1250
<b>Little Eagle</b>	<i>Hieraaetus morphnoides</i>	PCT 1824, PCT 1250
<b>Little Lorikeet</b>	<i>Glossopsitta pusilla</i>	PCT 1824, PCT 1250
<b>Masked Owl</b>	<i>Tyto novaehollandiae</i>	PCT 1824, PCT 1250
<b>Powerful Owl</b>	<i>Ninox strenua</i>	PCT 1250
<b>Regent Honeyeater</b>	<i>Anthochaera phrygia</i>	PCT 1824, PCT 1250
<b>Rosenberg's Goanna</b>	<i>Varanus rosenbergi</i>	PCT 1824, PCT 1250
<b>Scarlet Robin</b>	<i>Petroica boodang</i>	PCT 1824, PCT 1250
<b>Spotted Harrier</b>	<i>Circus assimilis</i>	PCT 1824
<b>Spotted-tailed Quoll</b>	<i>Dasyurus maculatus</i>	PCT 1824, PCT 1250
<b>Square-tailed Kite</b>	<i>Lophoictinia isura</i>	PCT 1824, PCT 1250
<b>Swift Parrot</b>	<i>Lathamus discolor</i>	PCT 1824, PCT 1250
<b>Turquoise Parrot</b>	<i>Neophema pulchella</i>	PCT 1824, PCT 1250
<b>Varied Sittella</b>	<i>Daphoenositta chrysoptera</i>	PCT 1824, PCT 1250
<b>White-bellied Sea-Eagle</b>	<i>Haliaeetus leucogaster</i>	PCT 1824, PCT 1250
<b>Yellow-bellied Sheath-tail-bat</b>	<i>Saccolaimus flaviventris</i>	PCT 1250

### 3.2 Species credit species

The consent authority has questioned the methodology used to determine candidate Species credit species for survey.

Species credit species are threatened species or elements of their habitat that cannot be confidently predicted by vegetation surrogates and landscape feature. Targeted survey is required for these species if the development site contains suitable habitat components and is within the predicted range of the species. Species credit species that have been derived from the BAM calculator are presented shown in **Table 3-4**

Species can be removed from the list of candidates if they do not fully meet any habitat or geographic constraints given by the BAM calculator or listed in the NSW Threatened Biodiversity Data Collection (TBDC). As pointed out by Council, the use of the likelihood table at this point is not a recognised part of the BAM methodology, even though it has been commonly accepted practice flora and fauna assessments. The revised list of candidate Species credit species is presented below in **Tables 3-2 and 3-3**

The correct survey methodology was performed on most species in the BDAR and the Likelihood Table can be considered to still hold value in the discussion of the survey results by providing additional analysis based on observations of habitat features as discussed in BAM 6.4.1.19.

There were two species that did not comply with prescribed survey dates listed under the TBDC, which is for the Thick Lip Spider Orchid that would be expected to flower Sept or October and the Green and Gold Bell frog which should be surveyed between November and March.

Evidence supplied by OEHs Bionet and Threatened species profile shows that the presence of the thick Lip Spider Orchid is extremely unlikely. The most recent sightings for the species in this region are from 1945 and preferred habitat is grassy woodlands.

Nocturnal amphibian surveys occurred in early April during warm weather. This is just outside of the prescribed months for the Green and Gold Bell Frog. Only one potential breeding site was located at the artificial pond documented in habitat surveys. This small semi-shaded water body is not seen as likely habitat for Green and Gold Bell frogs and the species has never been recorded by OEH data anywhere in the Manly Dam catchment.

If this is not considered sufficient evidence to exclude these species from consideration then the possible ways forward are:

- Targeted survey during the prescribed dates
- Obtain an experts report
- Assume presence.

### 3.2.1 *Red-Crowned Toadlet*

Council has expressed concern about the possible presence of Red-crowned Toadlets (RCT) on the subject site. Targeted nocturnal survey during including call-playback did not detect this species on the subject site during appropriate times of the year for survey. All of the native plant communities on site do offer potential foraging habitat for this species during wet weather. Breeding sites for this species are located in dense vegetation and debris besides ephemeral creeks and gutters. The steep channelized nature of the cut drainage line along the western edge of the development site is not considered a likely breeding site for RCT. Potential breeding habitat may be located in other parts of the site in areas where temporary soaks have been noted in wet weather (and surveyed). See **Figure 3-1**: These areas have been shown on the map of species polygons for completeness (**see Map 8**). None of these areas are to be impacted directly or indirectly by the proposal.



**Figure 1-1. Ephemeral soak targeted during amphibian survey**

**Table 3-2: Candidate Threatened Flora Species.**

Common Name	Scientific Name	Candidate Species for Survey	Survey Timing	Survey Requirements Met	Presence on site
<i>Acacia bynoeana</i>	Bynoe's Wattle	Yes	Sep - Jan	Yes	No
<i>Acacia prominens</i> - endangered population	Gosford Wattle, Hurstville and Kogarah LGA	Yes	-	Yes	No
<i>Acacia terminalis</i> subsp. <i>terminalis</i>	Sunshine Wattle	Yes	-	Yes	No
<i>Allocasuarina portuensis</i>	Nielsen Park She-oak	Yes	Jan - Aug	Yes	No
<i>Asterolasia elegans</i>	<i>Asterolasia elegans</i>	Yes	All Year	Yes	No
<i>Astrotricha crassifolia</i>	Thick-leaf Star-hair	Yes	All Year	Yes	No
<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	Yes	Sept, Oct	No	?
<i>Callistemon linearifolius</i>	Netted Bottle Brush	Yes	Sep - March	Yes	No
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	Yes	Nov - Feb	Yes	No
<i>Darwinia biflora</i>	<i>Darwinia biflora</i>	Yes	Sep - Jan	Yes	No
<i>Darwinia glaucophylla</i>	<i>Darwinia glaucophylla</i>	Yes	All year	Yes	No
<i>Darwinia peduncularis</i>	<i>Darwinia peduncularis</i>	Yes	All Year	Yes	No
<i>Genoplesium baueri</i>	Bauer's Midge Orchid	Yes	Feb - March	Yes	No
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	Yes	-	Yes	No
<i>Haloragodendron lucasii</i>	<i>Haloragodendron lucasii</i>	Yes	All Year	Yes	No
<i>Hibbertia puberula</i>	<i>Hibbertia puberula</i>	Yes	Sep - Feb	Yes	No
<i>Kunzea rupestris</i>	<i>Kunzea rupestris</i>	Yes	All year	Yes	No
<i>Micromyrtus blakelyi</i>	<i>Micromyrtus blakelyi</i>	Yes	All Year	Yes	No
<i>Persoonia hirsuta</i>	<i>Persoonia hirsuta</i>	Yes	Dec-May	Yes	No
<i>Persoonia mollis</i> subsp. <i>maxima</i>	<i>Persoonia mollis</i> subsp. <i>maxima</i>	Yes	All year	Yes	No
<i>Prostanthera junonis</i>	Somersby Mintbush	Yes	Sep - Nov	Yes	No

<i>Tetratheca glandulosa</i>	Tetratheca glandulosa	Yes	July - Nov	Yes	No
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Table 3-3. Candidate Threatened Fauna Species

Common Name	Scientific Name	Candidate for Survey	Species	Survey Timing	Survey Requirements Met	Presence on site
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	Yes		-	Yes	Yes
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Yes		Sep - May	Yes	No
<i>Isodon obesulus</i>	Southern Brown Bandicoot (eastern)	Yes		All year	Yes	No
<i>Litoria aurea</i>	Green and Golden Bell Frog	Yes		Nov-Mar	Yes	?
<i>Petaurus norfolcensis</i>	Squirrel Glider	Yes		-	Yes	No
<i>Pseudophryne australis</i>	Red-crowned Toadlet	Yes		All Year	Yes	No

### List of species credit species derived on the development site

Table 3-4. Species credit species

Common Name	Scientific Name	BC ACT	EPB C ACT	Meets Habitat Constraint	Geographic Requirements met	Candidate Species for Survey	Survey Timing
<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	Yes	Yes	Yes	Sep - Jan
<i>Acacia prominens</i> - endangered population	Gosford Wattle, Hurstville and Kogarah LGA	EP	-	Yes	Yes	Yes	-
<i>Acacia terminalis</i> subsp. <i>terminalis</i>	Sunshine Wattle	E	E	Yes	Yes	Yes	-
<i>Allocasuarina portuensis</i>	Nielsen Park She-oak	E	E	Yes	Yes	Yes	Jan -Aug
<i>Anthochaera Phrygia</i> (breeding)	Regent Honeyeater	CE	CE	Yes	No – mapped area	No	N/A
<i>Asterolasia elegans</i>	Asterolasia elegans	E	E	Yes	Yes	Yes	All Year
<i>Astrotricha crassifolia</i>	Thick-leaf Star-hair	V	V	Yes	Yes	Yes	All Year

Common Name	Scientific Name	BC ACT	EPB C ACT	Meets Habitat Constraint	Geographic Requirements met	Candidate Species for Survey	Survey Timing
<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	E	V	Yes	Yes	Yes	Sept, Oct
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V	-	Yes	Yes	Yes	Sep - March
<i>Callocephalon fimbriatum</i> (breeding)	Gang-gang Cockatoo	V	-	Hollow bearing trees greater than 9 cm diameter	Yes	No	-
<i>Callocephalon fimbriatum</i> - endangered population	Gang-gang Cockatoo population in the Hornsby and Kuring-gai LGA	EP	-	Yes	No – Hornsby and Kuringai LGA only	No	-
<i>Calyptorhynchus lathamii</i> (breeding)	Glossy Black-Cockatoo	V	-	No - Living or dead tree with hollows greater than 15cm diameter and greater than 5m above ground.	No	No	March - Aug
<i>Camarophyllopsis kearneyi</i>	Camarophyllopsis kearneyi	E	-	Yes	No - Lane Cove only	No	-
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	Yes	Yes	Yes	-
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Yes	Yes		-
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	V	Yes	Yes	Yes	Nov - Feb
<i>Darwinia biflora</i>	Darwinia biflora	V	V	Yes	Yes	Yes	Sep - Jan

Common Name	Scientific Name	BC ACT	EPB C ACT	Meets Habitat Constraint	Geographic Requirements met	Candidate Species for Survey	Survey Timing
<i>Darwinia glaucophylla</i>	Darwinia glaucophylla	V	-	Yes	Yes	Yes	All year
<i>Darwinia peduncularis</i>	Darwinia peduncularis	V	-	Yes	Yes	Yes	All Year
<i>Diuris bracteata</i>	Diuris bracteata	E	Extinct	Yes	Yes.	No	-
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V	V	No	Yes	No	-
<i>Genoplesium baueri</i>	Bauer's Midge Orchid	CE	E	Yes	Yes	Yes	Feb - March
<i>Genoplesium plumosum</i>	Tallong Midge Orchid	CE	E	Yes	No - Around Kurnell	No	-
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	E	-	Yes	Yes	Yes	-
<i>Grevillea shiressii</i>	Grevillea shiressii	V	V	Yes	No - within Brisbane Water National Park	No	-
<i>Haliaeetus leucogaster</i> (breeding)	White-bellied Sea-Eagle	V	-	No - Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines	Yes	No	July - Dec
<i>Haloragodendron lucasii</i>	Haloragodendron lucasii	E	E	Yes	Yes	Yes	All Year
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	Yes	Yes	Yes	Sep - May

Common Name	Scientific Name	BC ACT	EPB C ACT	Meets Habitat Constraint	Geographic Requirements met	Candidate Species for Survey	Survey Timing
<i>Hibbertia procumbens</i>	Spreading Guinea Flower	E	-	Yes	No- North of Hawkesbury River	No	Dec- March
<i>Hibbertia puberula</i>	Hibbertia puberula	E	-	Yes	Yes	Yes	Sep - Feb
<i>Hibbertia spanantha</i>	Julian's Hibbertia	CE	CE	No – requires light clay on shale sandstone transition		No	-
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-			Yes -	Aug – Oct
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E	V	Yes	No – North extent of this subregion	No	-
<i>Hygrocybe anomala</i> var. <i>ianthinomarginata</i>	<i>Hygrocybe anomala</i> var. <i>ianthinomarginata</i>			Yes	No - Lane Cove Bushland Park	No	-
<i>Hygrocybe aurantipes</i>	<i>Hygrocybe aurantipes</i>			Yes	No - Lane Cove Bushland Park	No	-
<i>Hygrocybe austropratensis</i>	<i>Hygrocybe austropratensis</i>			Yes	No - Lane Cove Bushland Park	No	-
<i>Hygrocybe collucera</i>	<i>Hygrocybe collucera</i>			Yes	No - Lane Cove Bushland Park	No	-
<i>Hygrocybe griseoramosa</i>	<i>Hygrocybe griseoramosa</i>			Yes	No - Lane Cove Bushland Park	No	-
<i>Hygrocybe lanecovens</i>	<i>Hygrocybe lanecovens</i>			Yes	No - Lane Cove Bushland Park	No	-

Common Name	Scientific Name	BC ACT	EPB C ACT	Meets Habitat Constraint	Geographic Requirements met	Candidate Species for Survey	Survey Timing
<i>Hygrocybe reesia</i>	<i>Hygrocybe reesia</i>			Yes	No - Lane Cove Bushland Park	No	-
<i>Hygrocybe rubronivea</i>	<i>Hygrocybe rubronivea</i>			Yes	No - Lane Cove Bushland Park	No	-
<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)			Yes	Yes – dense ground cover.	Yes	All year
<i>Kunzea rupestris</i>	<i>Kunzea rupestris</i>		Yes	Yes – Sandstone outcrops	Yes	Yes	All year
<i>Lasiopetalum joyceae</i>	<i>Lasiopetalum joyceae</i>		Yes	No – lateritic to shaley ridgetops	Yes	No	All year
<i>Lathamus discolor (breeding)</i>	Swift Parrot		Yes	Yes	No - As per mapped areas	No	Sep to April out of breeding
<i>Leptospermum deanei</i>	<i>Leptospermum deanei</i>			No		No	All Year
<i>Litoria aurea</i>	Green and Golden Bell Frog			Yes – within 1km of wet areas.	Yes	Yes	Nov-Mar
<i>Lophoictinia isura (breeding)</i>	Square-tailed Kite			Not preferred breeding habitat		Yes	Sept - Jan
<i>Melaleuca deanei</i>	Deane's Paperbark			Yes	Yes	No	Dec - Feb
<i>Melaleuca groveana</i>	Grove's Paperbark			Yes	Yes	No	All Year
<i>Micromyrtus blakelyi</i>	<i>Micromyrtus blakelyi</i>			Yes	Yes	Yes	All Year

Common Name	Scientific Name	BC ACT	EPB C ACT	Meets Habitat Constraint	Geographic Requirements met	Candidate Species for Survey	Survey Timing
<i>Miniopterus australis</i> (breeding)	Little Bentwing-bat			No - Caves	Yes	Yes	Dec - Feb
<i>Miniopterus schreibersii oceanensis</i> (breeding)	Eastern Bentwing-bat			No - Caves	Yes	No	Dec - Feb
<i>Myotis macropus</i> (breeding)	Southern Myotis			No – Hollow bearing trees within 200m of riparian zone	Yes	No	Nov - Mar
<i>Ninox connivens</i> (breeding)	Barking Owl			No – requires large hollows >4m above ground.	Yes	No	May – Dec Breeding
<i>Ninox strenua</i> (breeding)	Powerful Owl			No – Requires >200m hollows	Yes	No	May – Aug Breeding
<i>Pandion cristatus</i> (breeding)	Eastern Osprey			No – Not sufficient proximity to floodplain	Yes	No	-
<i>Perameles nasuta</i> - endangered population	Long-nosed Bandicoot, North Head			No - Site out of range	No	No	-
<i>Persoonia hirsuta</i>	Persoonia hirsuta			Yes	Yes	Yes	Dec-May
<i>Persoonia mollis</i> subsp. <i>maxima</i>	Persoonia mollis subsp. <i>maxima</i>			Yes	Yes	Yes	All year
<i>Petaurus norfolcensis</i>	Squirrel Glider			Yes	Yes	Yes	-

Common Name	Scientific Name	BC ACT	EPB C ACT	Meets Habitat Constraint	Geographic Requirements met	Candidate Species for Survey	Survey Timing
<i>Petaurus norfolcensis</i> - endangered population	Squirrel Glider on Barrenjoey Peninsula, north of Bushrangers Hill			Yes	No – Out of population range	No	-
<i>Phascolarctos cinereus</i>	Koala			Yes	No – no recent local sightings	No	-
<i>Phascolarctos cinereus</i> - endangered population	Koala in the Pittwater Local Government Area			Yes	No – out of range	No	-
<i>Pommerhelix duralensis</i>	Dural Woodland Snail			No	Yes	No	-
<i>Prostanthera junonis</i>	Somersby Mintbush			Yes	Yes	Yes	Sep - Nov
<i>Pseudophryne australis</i>	Red-crowned Toadlet			Yes	Yes	Yes	All Year
<i>Pteropus poliocephalus</i> (Breeding)	Grey-headed Flying-fox			No – not a breeding camp	Yes	No	-
<i>Tetratheca glandulosa</i>	Tetratheca glandulosa			Yes	Yes	Yes	July - Nov
<i>Tyto novaehollandiae</i> (Breeding)	Masked Owl			No – trees with hollows >20cm	Yes	No	-
<i>Wahlenbergia multicaulis</i> - endangered population	Tadgell's Bluebell in the local government areas of Auburn, Bankstown			Yes	No - Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	No	-

## Title: Species Polygons

Map No: 9

Site: 181 Allambie Rd

Client: Allambie Heights Village Ltd.


Date: 20/03/2019

Project No: C10826

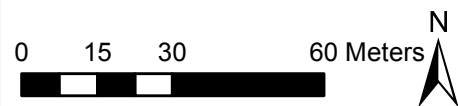
Author: -

### Legend

#### Species

 Red-Crowned Toadlet(Possible)

 Eastern Pygmy-possum

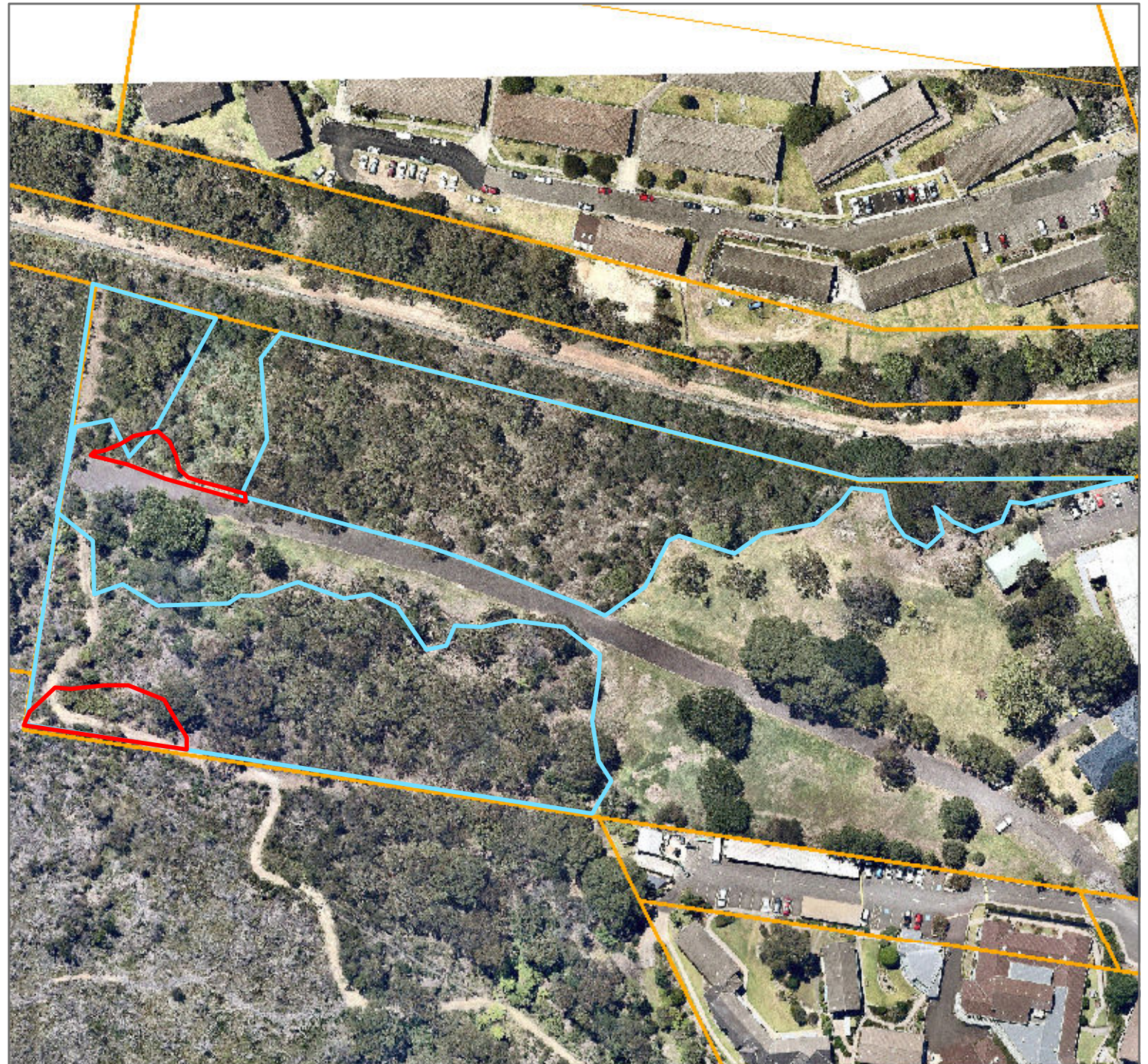


Data Source:  
Total Earth Care  
Nearmap



total earth care

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Tel: 02 9913 1432 Fax: 02 9913 1434



# BAM Credit Summary Report

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00014907/BAAS18170/19/00014908	Allambie Heights Village	04/01/2019
Assessor Name	Report Created	BAM Data version *
Gregg Z Goldin	02/04/2019	6
Assessor Number	* 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.	
BAAS18170		

## 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	Candidate SAI	Ecosystem credits
<b>Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin</b>								
2	1824_Mod	0.5	0.4	0.25	High Sensitivity to Potential Gain	1.50		1
3	1824_Poor	36.2	0.5	0.25	High Sensitivity to Potential Gain	1.50		7
							<b>Subtotal</b>	<b>8</b>

## BAM Credit Summary Report

### Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion

1	1250_Mod	6.2	0.8	0.25	High Sensitivity to Potential Gain	1.50		2
							<b>Subtotal</b>	<b>2</b>
							<b>Total</b>	<b>10</b>

### Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Candidate SAI	Species credits
<b><i>Cercartetus nanus</i> / Eastern Pygmy-possum ( Fauna )</b>						
1250_Mod	6.2	0.12	0.25	2	False	0
1824_Mod	0.5	0.01	0.25	2	False	0
1824_Poor	36.2	0.3	0.25	2	False	5
					<b>Subtotal</b>	<b>5</b>

**total earth care****Job No. C10754**

Total Earth Care Pty Ltd  
5/1 Vuko Place  
Warriewood, NSW 2102  
Phone: (02) 9913 1432  
consulting@totalearthcare.com.au  
ABN: 14 043 484 770

Date: 27/06/19  
Rep: Andrew McGahey

To	Care of	Site Location
Ciarán Foley Allambie Heights Village Ltd		Lot 2615 DP 752038 181 Allambie Rd Allambie Road Allambie Heights NSW 2100

**Re: DA 2018/1667 BDAR**

Dear Ciaran,

In updating the proposed APZs a small modification was required to the calculations used to calculate biodiversity offset credits as calculated under the Biodiversity Assessment Methodology. A map of the new area for consideration and a provisional credit report attached.

Andrew McGahey | Director

Total Earth Care Pty. Ltd. | [www.totalearthcare.com.au](http://www.totalearthcare.com.au)

Unit 5, 1 Vuko Place Warriewood NSW 2102

T: (02) 9913 1432 | M: 0413 702 861 | F: (02) 9913 1434 | E: [AMcGahey@totalearthcare.com.au](mailto:AMcGahey@totalearthcare.com.au)

## **Additional APZ area for Offset Calculations**

An additional 0.09 Ha of APZ within Sandstone Gully Forest (PCT 1250 was added) to the original proposal assessed under the BAM.

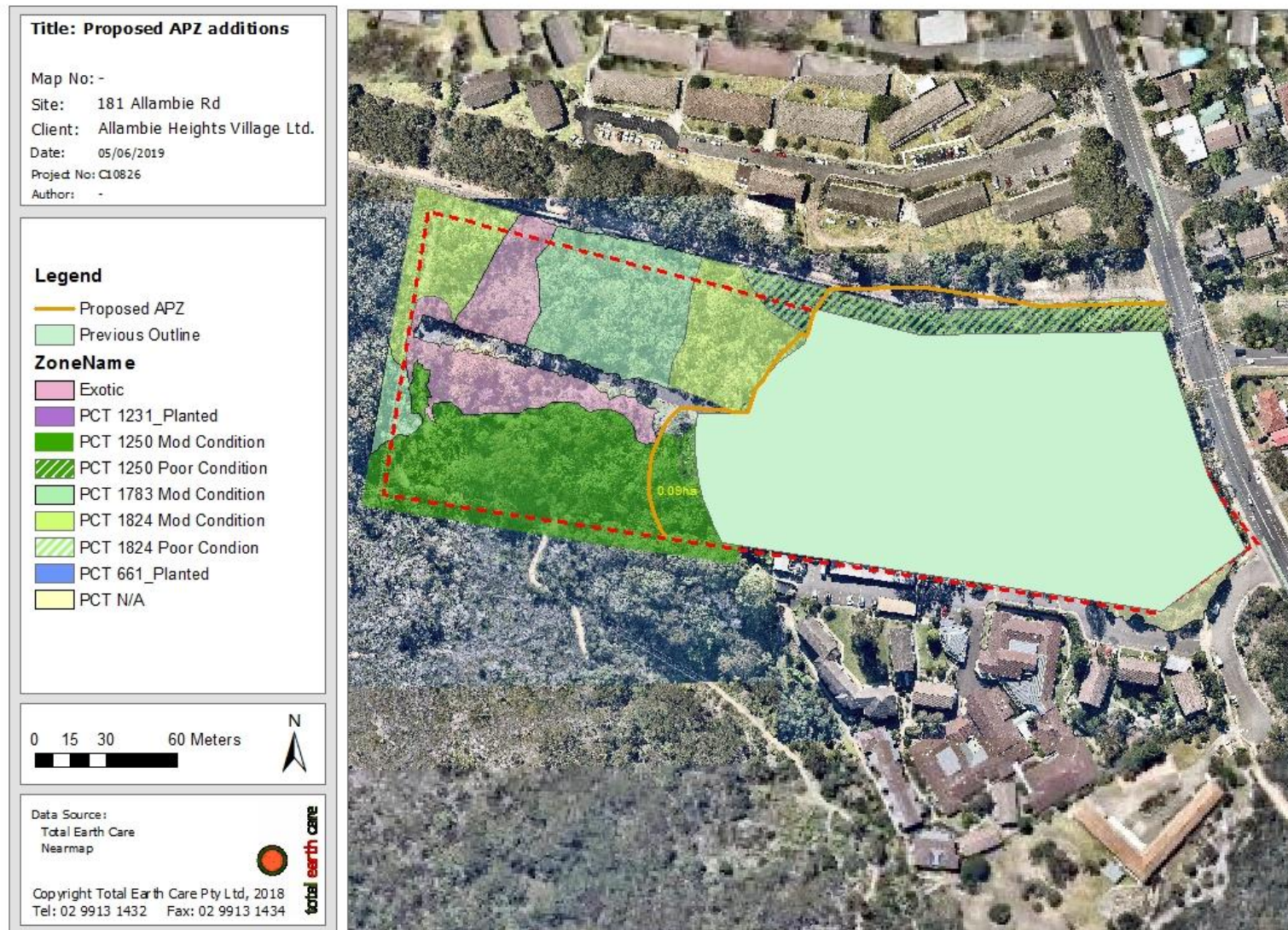


Figure 1. Additional 0.09 Ha of APZ in Sandstone Gully Forest



# BAM Vegetation Zones Report

## Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00014907/BAAS18170/19/00014908	Allambie Heights Village	12/06/2019
Assessor Name	Report Created	BAM Data version *
Gregg Z Goldin	27/06/2019	11
Assessor Number	* 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.	
BAAS18170		

## Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	1250_Mod	1250-Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	Mod	0.8	1	VMP (0.62 ha) APZ (0.18 ha)

## BAM Vegetation Zones Report

2	1824_Mod	1824-Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin	Mod	0.44	1	APZ (0.01 ha) VMP (0.43 ha)
3	1824_Poor	1824-Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin	Poor	0.51	1	Clear (0.25 ha) APZ (0.05 ha) VMP (0.21 ha)
4	661_Planted	661-Bangalay - Smooth-barked Apple - Swamp Mahogany low open forest of southern Sydney, Sydney Basin Bioregion	Planted	0.13	1	Cleared (0.12 ha) Retained (0.01 ha)
5	1841_Planted	1841-Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region	Planted	0.07	1	Cleared (0.03 ha) Retained (0.04 ha)

# BAM Credit Summary Report

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00014907/BAAS18170/19/00014908	Allambie Heights Village	12/06/2019
Assessor Name	Report Created	BAM Data version *
Gregg Z Goldin	27/06/2019	11
Assessor Number	* 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.	
BAAS18170		
Revision No		
0		

## 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
<b>Bangalay - Smooth-barked Apple - Swamp Mahogany low open forest of southern Sydney, Sydney Basin Bioregion</b>								
4	661_Planted	11.9	0.1	0.25	High Sensitivity to Potential Gain	1.75		0
							<b>Subtotal</b>	<b>0</b>

## BAM Credit Summary Report

Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin							
2	1824_Mod	0.5	0.4	0.25	High Sensitivity to Potential Gain	1.50	1
3	1824_Poor	36.2	0.5	0.25	High Sensitivity to Potential Gain	1.50	7
						<b>Subtotal</b>	<b>8</b>
Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region							
5	1841_Planted	14.6	0.1	0.25	High Sensitivity to Potential Gain	1.75	1
						<b>Subtotal</b>	<b>1</b>
Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion							
1	1250_Mod	9.2	0.8	0.25	High Sensitivity to Potential Gain	1.50	3
						<b>Subtotal</b>	<b>3</b>
						<b>Total</b>	<b>12</b>

### Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAI	Species credits
<i>Cercartetus nanus</i> / Eastern Pygmy-possum ( Fauna )						
1250_Mod	9.2	0.12	0.25	2 False		1
1824_Mod	0.5	0.01	0.25	2 False		0



## BAM Credit Summary Report

1824_Poor	36.2	0.3	0.25	2	False	5
					<b>Subtotal</b>	<b>6</b>

# BAM Credit Summary Report

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
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Assessor Name	Report Created	BAM Data version *
Gregg Z Goldin	27/06/2019	11
Assessor Number	* 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.	
BAAS18170		
Revision No		
0		

## 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
<b>Bangalay - Smooth-barked Apple - Swamp Mahogany low open forest of southern Sydney, Sydney Basin Bioregion</b>								
4	661_Planted	11.9	0.1	0.25	High Sensitivity to Potential Gain	1.75		0
							<b>Subtotal</b>	<b>0</b>

## BAM Credit Summary Report

Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin							
2	1824_Mod	0.5	0.4	0.25	High Sensitivity to Potential Gain	1.50	1
3	1824_Poor	36.2	0.5	0.25	High Sensitivity to Potential Gain	1.50	7
						<b>Subtotal</b>	<b>8</b>
Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region							
5	1841_Planted	14.6	0.1	0.25	High Sensitivity to Potential Gain	1.75	1
						<b>Subtotal</b>	<b>1</b>
Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion							
1	1250_Mod	9.2	0.8	0.25	High Sensitivity to Potential Gain	1.50	3
						<b>Subtotal</b>	<b>3</b>
						<b>Total</b>	<b>12</b>

### Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAI	Species credits
<i>Cercartetus nanus</i> / Eastern Pygmy-possum ( Fauna )						
1250_Mod	9.2	0.12	0.25	2 False		1
1824_Mod	0.5	0.01	0.25	2 False		0



## BAM Credit Summary Report

1824_Poor	36.2	0.3	0.25	2	False	5
					<b>Subtotal</b>	<b>6</b>



# BAM Vegetation Zones Report

## Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00014907/BAAS18170/19/00014908	Allambie Heights Village	12/06/2019
Assessor Name	Report Created	BAM Data version *
Gregg Z Goldin	27/06/2019	11
Assessor Number	* 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.	
BAAS18170		

## Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	1250_Mod	1250-Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	Mod	0.8	1	VMP (0.62 ha) APZ (0.18 ha)

## BAM Vegetation Zones Report

2	1824_Mod	1824-Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin	Mod	0.44	1	APZ (0.01 ha) VMP (0.43 ha)
3	1824_Poor	1824-Mallee - Banksia - Tea-tree - Hakea heath-woodland of the coastal sandstone plateaus of the Sydney basin	Poor	0.51	1	Clear (0.25 ha) APZ (0.05 ha) VMP (0.21 ha)
4	661_Planted	661-Bangalay - Smooth-barked Apple - Swamp Mahogany low open forest of southern Sydney, Sydney Basin Bioregion	Planted	0.13	1	Cleared (0.12 ha) Retained (0.01 ha)
5	1841_Planted	1841-Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region	Planted	0.07	1	Cleared (0.03 ha) Retained (0.04 ha)