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13SUTPLA-0007

14 August 2013

Dear Bob

Preliminary Biocertification Assessment - Ralston Road Subdivision, Belrose

Please find following our brief report on the findings of the preliminary Biodiversity Certification Assessment of the proposed Ralston Road Subdivision, Belrose

Background/Context

Urbis has submitted a planning proposal to rezone land owned by the Metropolitan Local Aboriginal Land Council (MLALC) located at the western end of Ralston Avenue, Belrose in the Warringah Local Government Area. The site is surrounded by Garigal National Park on three boundaries and is mostly vegetated with heath and woodland communities. The rezoning would allow future development for residential purposes on the ridge-top plateau and retain and manage a greater proportion of the land for its conservation values.

Matthews Civil Pty Ltd has commissioned Eco Logical Australia (ELA) to undertake a preliminary Biodiversity Certification Assessment in accordance with the Biodiversity Certification Assessment Methodology (BCAM) to determine whether an improve or maintain (IoM) outcome under the BCAM can be achieved for the proposed subdivision.

The assessment has been prepared in close consultation with Travers Bushfire and Ecology who have undertaken extensive biodiversity investigations of the land holdings since late 2011 and have mapped the vegetation, threatened species habitats and collected biometric plot data in accordance with the BCAM (Travers Bushfire and Ecology 2013). Travers Bushfire and Ecology and ELA are both accredited biodiversity certification assessors.

Matthews Civil has provided a boundary for the Biodiversity Certification Assessment Area (BCAA), the land to be certified (developed/cleared which includes an Asset Protection Zone (APZ)), lands subject to conservation measures or offsets.

Figure 1 shows the BCAA together with the lands to be certified lands subject to conservation measures. It is noted that the areas to be certified have been modified from earlier submissions to council.

Methods and Limitations

This is a preliminary assessment only and does not constitute the formal Biocertification Assessment Report or Biodiversity Certification Strategy which are required to submit a formal application to the NSW Minister for the Environment for biodiversity certification. This application must be made by a Planning Authority (i.e. Warringah Council or the Minister for Planning).

To carry out the assessment ELA has used the GIS shape files and flora and fauna survey data collected by Travers Bushfire & Ecology. The data used includes:

- vegetation mapping (including conversion of the vegetation map units to the best fit biometric vegetation type)
- stratification of vegetation mapping based on vegetation condition and biometric type
- vegetation plot and transect data
- results of targeted threatened species surveys

Four biometric vegetation types have been mapped in the BCAA. The total BCAA is 139.9 ha; most of the site comprises of native vegetation is in moderate to good condition with the exception of 8.63 ha of cleared/highly disturbed areas, weed plumes and existing roads/trails. A total of 22.24 ha of vegetation will be cleared for development and 108.99 ha of vegetation will be subject to conservation measures (an overall offset ratio of 4.9:1).

The four vegetation types have been further stratified into eight vegetation zones with each zone given an ancillary code based on vegetation structure e.g. tall or short canopy shrub species or habitat type e.g. gully or riparian.

Tables 1a and 1b shows the area of vegetation type to be impacted/conserved within the Ralston Road Belrose BCAA and corresponding vegetation zones.

To undertake credit calculations in accordance with the BCAM, the 'condition' of the vegetation to be impacted/protected needs to be assessed via biometric plots. Replicate plots are assessed in each vegetation zone (vegetation type in a homogenous condition state) measuring 10 site attributes in a 20x20 and 20x50m area including native plant species richness, canopy/mid/ground story cover, number of trees with hollows, length of fallen logs, proportion of regeneration and exotic plant cover.

The BCAM compares this data with benchmark data for each vegetation type to calculate a site condition score. If the vegetation is within benchmark condition, it receives a high site condition score and requires more credits when impacted than a site in low condition. The BCAM specifies a minimum number of plots based on vegetation zone area. The number of plots used by Travers Bushfire & Ecology to collect site attribute data significantly exceeds the minimum number specified in the BCAM (**Table 1b**).

Figure 2 shows the distribution of biometric vegetation zones and location of vegetation plots across the BCAA.

The number of credits generated depends on the condition of the vegetation to be protected and its capacity to be 'enhanced' or improved and the type of conservation measures proposed. Section 126L of the TSC Act provides a range of conservation measures that may be used in a Biocertification assessment and these are grouped into three categories:

- Areas that are managed and funded in perpetuity (i.e. Biobank sites or land transferred to national parks) – 100% credit entitlement
- Areas that are managed in perpetuity (e.g. NPW Act Conservation Agreements, adoption of Plan of Management under Division 2 of Part 6 of the Local Government Act, entering into a Planning Agreement under Section 93F of the EP&A Act) – 90% credit entitlement
- Areas that are secured through planning instrument (i.e. environmental zoning) – 25% credit entitlement

The aim is to generate more credits for each vegetation type and species than are required – if this is achieved, an 'improve or maintain' outcome has been met and the proposal is then eligible to be conferred biocertification status. Please note that in accordance with the biocertification methodology, all impact areas (urban and APZ) are counted as 100% loss even though the APZ is only partial loss).

The threatened species that are ‘assumed’ to be present within the BCCA are shown in **Table 2** together with their Tg score (The Tg score is an offset multiplier based on the ability of the species to respond to management. A high Tg score gives a low offset ratio whilst a low Tg score requires a high offset ratio). The BCAM uses the ‘landscape’ or average Tg score to calculate offset requirements. It is possible to remove predicted species (and change the landscape Tg score) if appropriate justification can be provided to clearly demonstrate that the species is unlikely to be present in the BCAA. Each of the threatened species predicted to occur has either been recorded in the study area (Travers Bushfire and Ecology 2013) or is likely to occur. Accordingly, no application will be made to remove any of the predicted species.

Targeted threatened species surveys are required for all species that require ‘species credits’ (typically all threatened plants and approximately 50% of threatened fauna). There are a series of habitat filter questions (see **Table 3**) that are used to determine which species requiring species credits are likely to be within the BCAA (**Table 4**). These species require targeted survey. As with ecosystem credits, it is possible to remove species credits species if appropriate justification can be provided to clearly demonstrate that the species is unlikely to be present. Prior to making a formal application for biocertification, each of the species in **Table 4** will need to be specifically addressed.

Travers Bushfire & Ecology carried out detailed targeted surveys within the BCAA and identified two threatened flora species, *Grevillea caleyi* and *Tetradlea glandulosa* and habitat for one threatened goanna *Varanus rosenbergi* (Heath Monitor), and two threatened frog species *Pseudophryne australis* (Red-crowned Toadlet) and *Heleioporus australiacus* (Giant Burrowing Frog) (**Figures 4, 5 and 6**).

The aim of a biodiversity certification assessment is to avoid impacts to ‘red flag’ areas (EECs, vegetation types that are greater than 70% cleared in the CMA and threatened species that cannot withstand further loss in the CMA area) and generate more credits for each vegetation type and species than are required (either within or if necessary outside of the BCAA) – if this is achieved, an ‘improve or maintain’ outcome has been met and the proposal is then eligible to be conferred biocertification status by the Minister for the Environment.

If red flag areas cannot be avoided, an application may be made to the Minister to ‘vary’ the red flag on the basis that the area is not viable, is small, is in poor condition and/or their contribution to regional biodiversity is low. **Figure 3** shows the distribution of one vegetation type and two threatened species that are red flags within the BCAA. The red flag vegetation type (Needlebush – banksia wet heath on sandstone plateaux of the Sydney Basin which corresponds to the Coastal Upland Swamp endangered ecological community) is impacted by the APZ and urban footprint in the south-eastern section of the BCAA. There are also impacts to *Grevillea caleyi* (1 individual) and *Tetradlea glandulosa* (134 individuals) for which requests for red flag variations will be required. A further 5 individuals of *G. caleyi* were recorded within the proposed road reserve adjacent to the Transgrid substation, however these will be avoided and not impacted (**Figure 4**). The bushland surrounding the Transgrid substation is known to support large populations of *G. caleyi* and a further 38 specimens were recorded adjacent to the BCAA.

Results

Tables 5 and 6 provide a summary of the number of ecosystem and species credits required for impacts to each of the vegetation types and threatened species in the BCAA and the number of credits generated for the offset areas.

In summary, the lands to be certified requires 729 ecosystem credits for impacts and the land proposed for conservation will generate 1,272 credits (100% conservation measures) or 1,144 credits (90% conservation measures).

Whilst it appears that an IoM outcome has been achieved, not all impacted vegetation types have generated enough credits. Of the four biometric vegetation types, three have met an IoM outcome. The impacts to 9.17 ha of *Hairpin Banksia – Kunzea ambigua – Allocasuarina distyla heath on coastal, sandstone plateaux* (Tall and

Short Heath) requires 354 credits but only generates 188 or 169 credits (100% / 90% conservation measures respectively). A short fall of 166 credits or approximately 18.44 hectares of this vegetation type will need to be met (by further reduction to impacts, increases in offset area or via purchase of 166 credits from a registered biobank site) to achieve a full IoM outcome.

Conversely, three vegetation types have a surplus of credits (522, 161 and 26 for *Red Bloodwood –Scribbly gum heath*, *Sydney Peppermint – Smooth-barked Apple* and *Needlebush – banksia wet heath* respectively), which if registered as a biobank site could be sold to third parties.

The offset areas generate more credits than required for all threatened fauna species requiring species credits (Red-crowned Toadlet, Giant Burrowing Frog and Heath Monitor). Similar to ecosystem credits, these surplus credits could be sold to third parties if the offset areas was registered as a biobank site.

However, the offset areas for impacts to threatened flora do not meet an IoM outcome. These species are red flag species and will in addition to requiring a red flag variation request, will require additional offsets either by finding individuals in the offset area or additional offset areas with confirmed records. Finding additional *T. glandulosa* in the proposed offset area is considered likely and subject to regeneration following recent burns, a possibility for *G. caleyi*. An additional 340 *T. glandulosa* and 8 *G. caleyi* individuals would be required to meet the IoM outcome.

Conclusion

The preliminary biocertification assessment of the proposed subdivision has indicated that an IoM outcome in accordance with e BCAM can be achieved subject to the approval of a red flag variation request for impacts to *G. caleyi* and *T. glandulosa* and identifying and securing additional individuals of these species (8 and 340 respectively) and 166 credits for *Hairpin Banksia – Kunzea ambigua – Allocasuarina distyla heath on coastal, sandstone plateaux* either within or outside of the BCAA.

Should further surveys in spring 2013 not identify sufficient additional records/area of vegetation, it is advised that this could be obtained by identifying an additional parcel of MLALC land with the appropriate values or reviewing the biodiversity credits register on the Office of Environment and Heritage Biobanking web site to see if any credits are available.

We advise that a 10 ha registered biobank site as Belrose has 12 of the required ecosystem credits and a Baulkham Hills Shire Council biobank site has 367 *T. glandulosa* credits (62 individuals).

Should Matthews Civil and the MLALC decide to register the conservation area as a Biobank site (and thus obtain 100% benefit for the number of credits generated), the surplus credits (709 ecosystem, 281 Red-crowned Toadlet, 357 Giant Burrowing Frog and 33 Heath Monitor credits) could also be traded on the biodiversity credit market and supplement the management costs of the offset area and provide a land value return. ELA is aware of at least one proponent currently seeking around 400 ecosystem credits which the credit surplus of this assessment matches.

Should MLALC be considering transferring the offset land to the National Parks and Wildlife estate, rather than managing the area themselves, we advise that the land could still be transferred (as outlined in section 127ZZH of the TSC Act). In this circumstance, any credits not 'retired' to meet the requirements of the biocertification approval would still be owned by the MLALC as would any funds not held in Trust for management.



Robert Humphries
Manager, Biobanking and Biodiversity Offset Programs
Eco Logical Australia

References

Travers Bushfire and Ecology (2013) Ecological Survey and Offset Analysis: Planning proposal Ralston Avenue, Belrose.

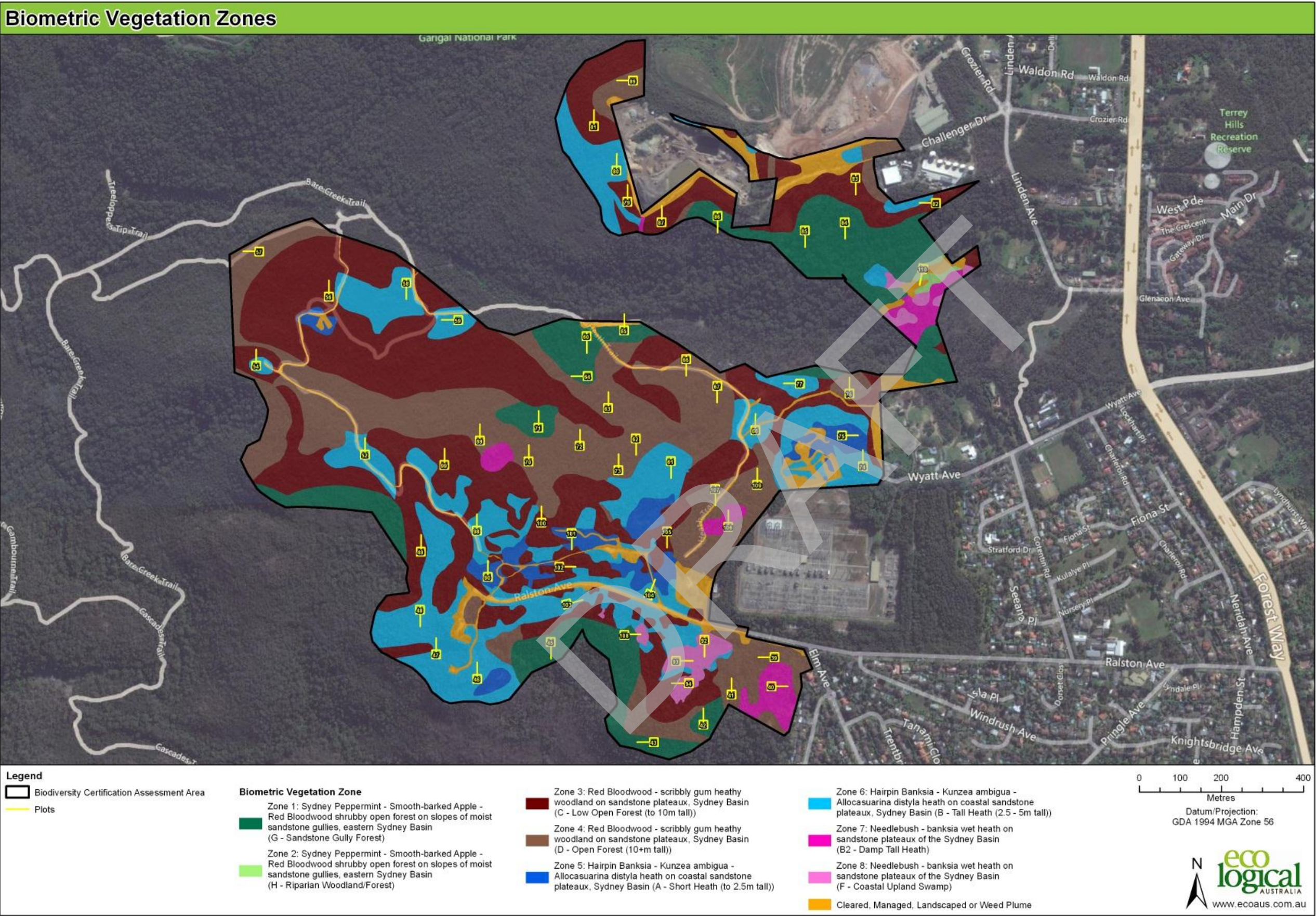
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Figure 1: Biocertification Assessment Area showing land to be certified and land subject to conservation measures



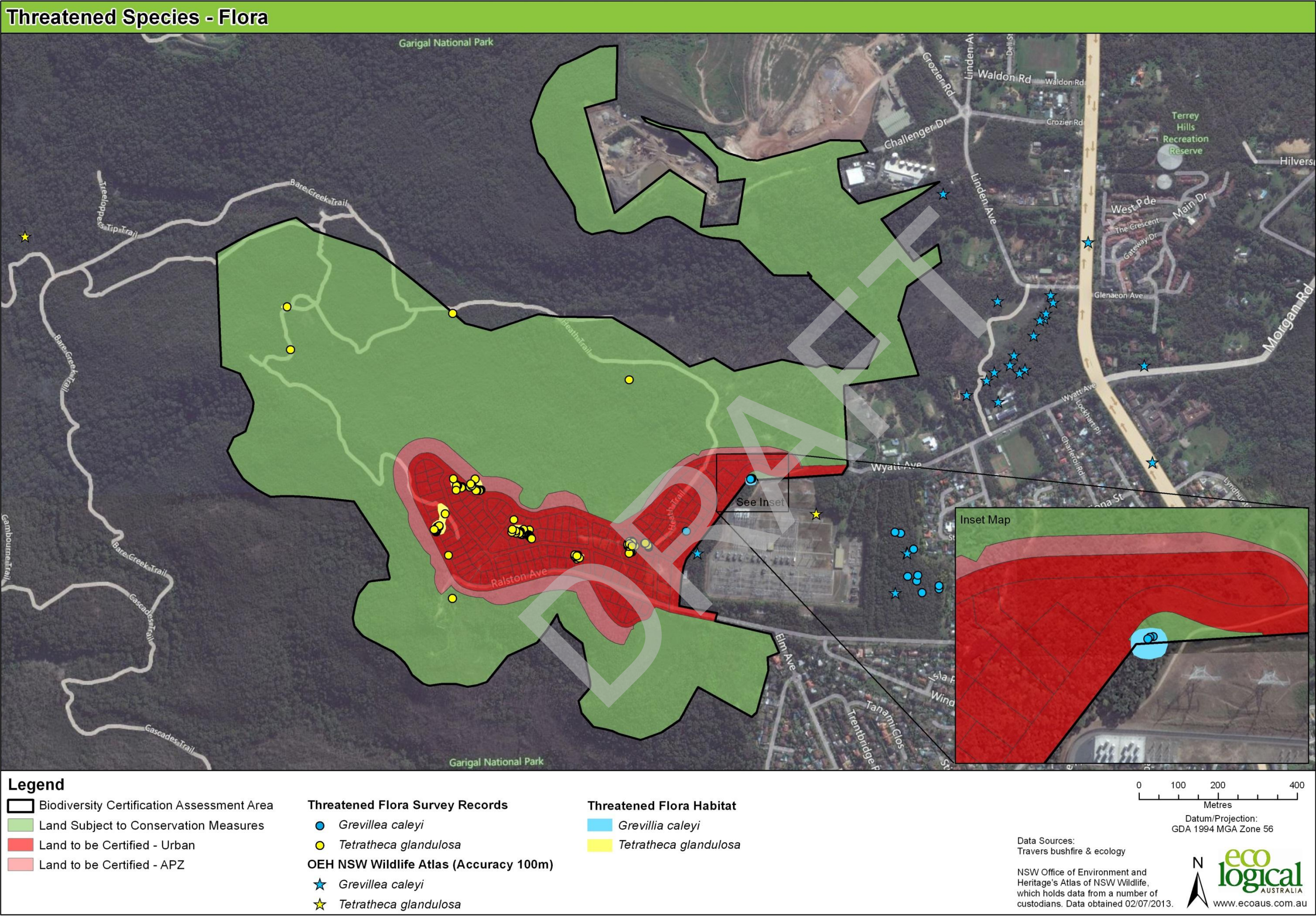
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Figure 2: Mapped vegetation zones and plot locations in the Biodiversity Certification Assessment Area



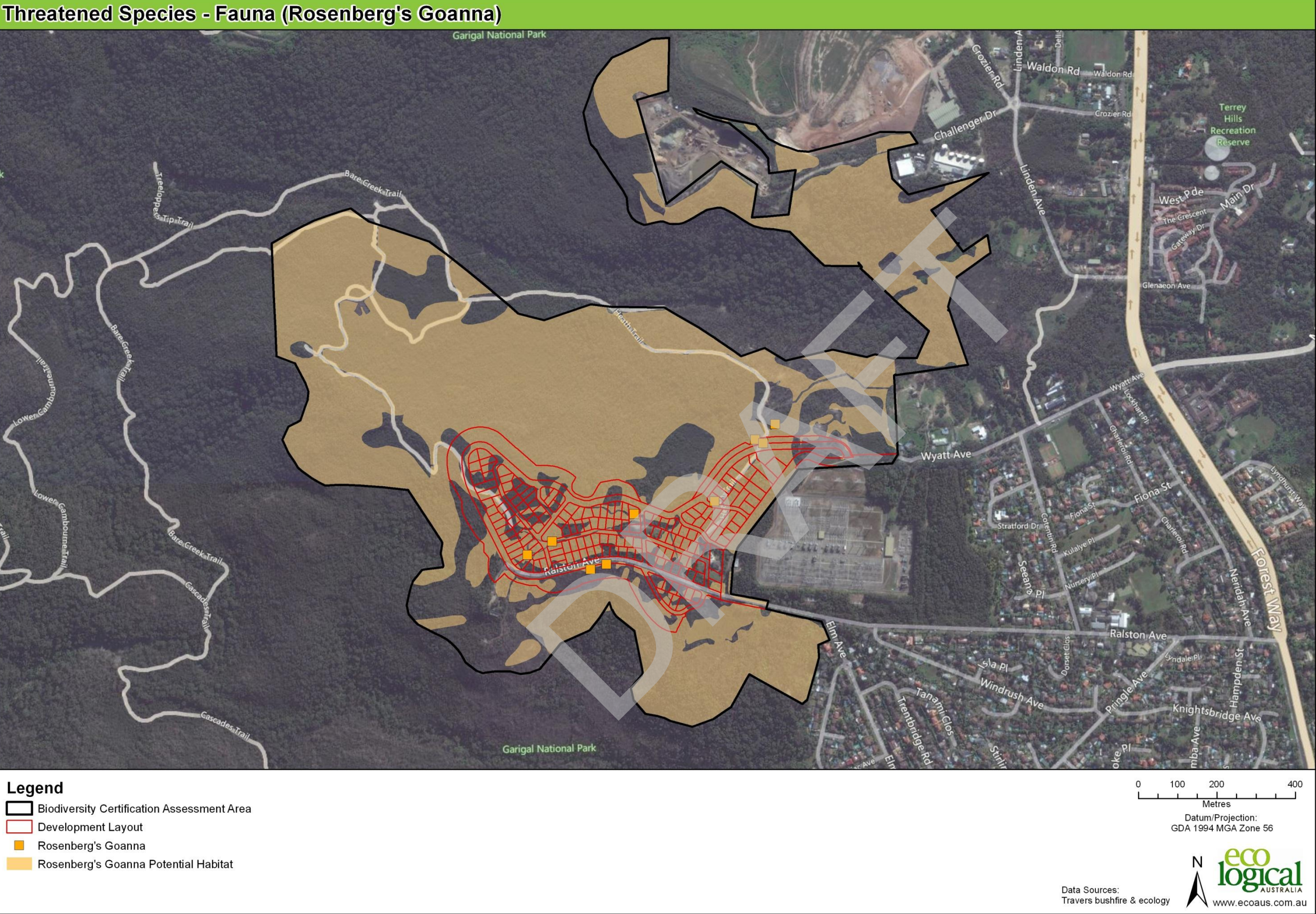
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Figure 3: Red Flag areas within Biodiversity Certification Assessment Area



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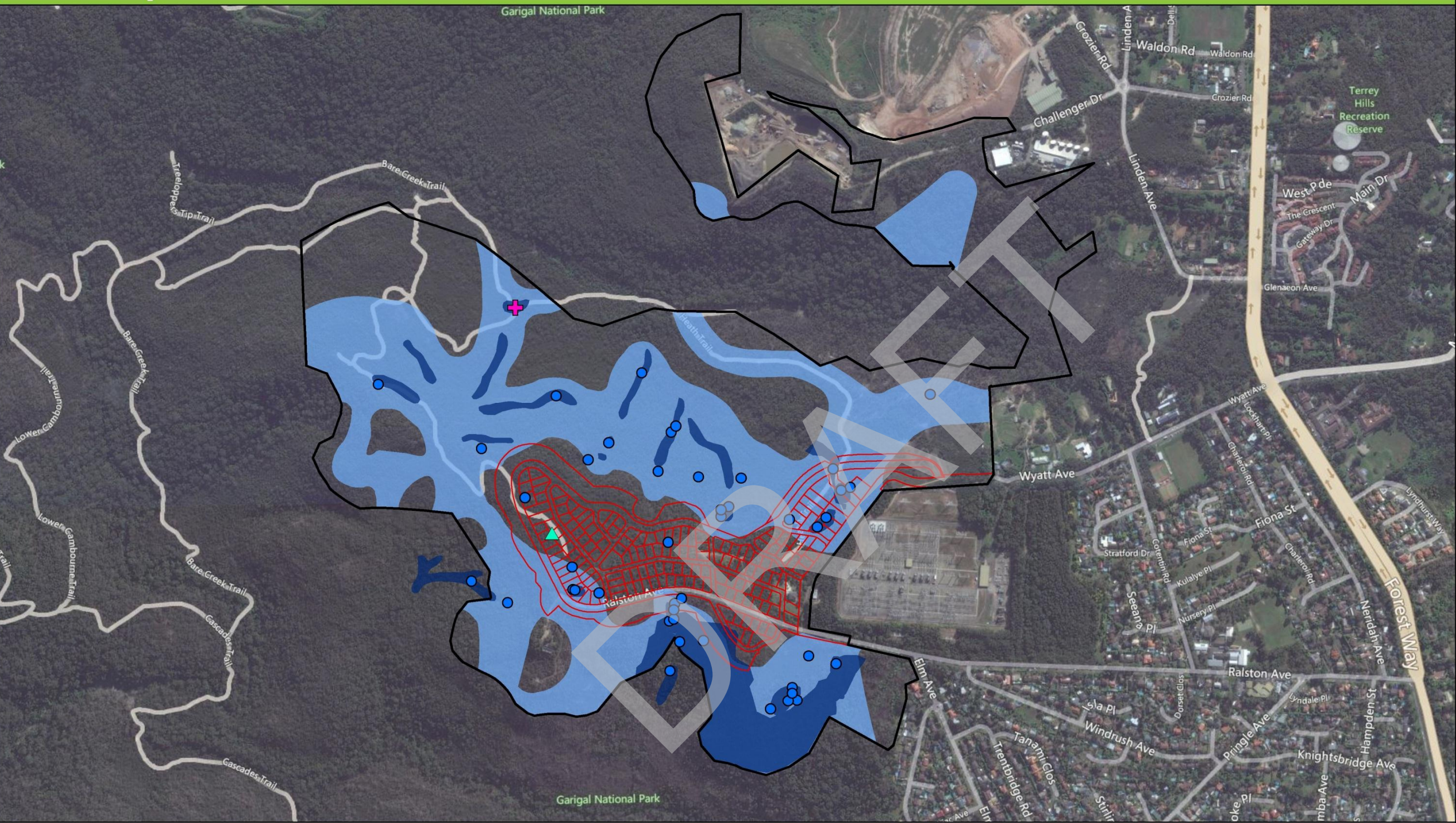
Figure 4: Threatened flora records



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Figure 5: Heath monitor records and area of mapped habitat

Threatened Species - Fauna



Legend

Biodiversity Certification Assessment Area

Development Layout

Threatened Fauna Survey Records

Giant Burrowing Frog

Red-crowned Toadlet

Eastern Pygmy Possum

Habitat

Red-crowned Toadlet Potential Habitat

Giant Burrowing Frog and Red-crowned Toadlet Critical Breeding Habitat

0 100 200 400

Metres

Datum/Projection:
GDA 1994 MGA Zone 56

www.ecoaus.com.au

Data Sources:
Travers bushfire & ecology

Date: 13/08/2013

Approved by: RH

Prepared by: VH

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Figure 6: Red-crowned Toadlet and Giant Burrowing Frog records and area of mapped habitat

Table 1a: Area of vegetation to be impacted/protected within the Ralston Road Belrose BCAA

Biometric Vegetation Type	Development	Conservation	Total
Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin	0.26	17.75	18.01
Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux, Sydney Basin	12.23	66.34	78.57
Hairpin Banksia - Kunzea ambigua - Allocasuarina distyla heath on coastal sandstone plateaux, Sydney Basin	9.17	20.41	29.58
Needlebush - banksia wet heath on sandstone plateaux of the Sydney Basin	0.58	4.49	5.07
Vegetation Total	22.24	108.99	131.23
Cleared	3.02	5.61	8.63
Vegetation + Cleared Total	25.26	114.60	139.86

Table 1b: No. of plots required for each vegetation zone

Veg Zone	Biometric Vegetation Type	Condition	Ancillary	Development	Conservation	Total	Plots Required	Plots Used
1	Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin	M/G	Gully	0.00	17.67	17.67	2	10
2	Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin	M/G	Riparian	0.00	0.34	0.34	1	1
3	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux, Sydney Basin	M/G	Low Open Forest	7.83	39.32	47.15	3	11
4	Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux, Sydney Basin	M/G	Open Forest	3.77	27.64	31.41	3	15
5	Hairpin Banksia - Kunzea ambigua - Allocasuarina distyla heath on coastal sandstone plateaux, Sydney Basin	M/G	Short	2.22	2.29	4.51	1	3
6	Hairpin Banksia - Kunzea ambigua - Allocasuarina distyla heath on coastal sandstone plateaux, Sydney Basin	M/G	Tall	5.87	19.21	25.08	3	14
7	Needlebush - banksia wet heath on sandstone plateaux of the Sydney Basin	M/G	Damp	0.44	2.67	3.11	1	2
8	Needlebush - banksia wet heath on sandstone plateaux of the Sydney Basin	M/G	Coastal	0.00	1.95	1.95	1	3
				20.13	111.09	131.22	15	59

Table 2: Predicted species (assumed to be present) in Ecosystem Credits (Targeted survey not required)

Vegetation Type	Common Name	Scientific Name	Tg Score
Hairpin Banksia - Kunzea ambigua - Allocasuarina distyla heath on coastal sandstone plateaux, Sydney Basin	Eastern Bentwing-bat	Miniopterus schreibersii oceanensis	0.75
	Eastern Freetail-bat	Mormopterus norfolkensis	0.45
	Eastern Pygmy-possum	Cercartetus nanus	0.5
	Orange-bellied Parrot	Neophema chrysogaster	0.75
	Spotted-tailed Quoll	Dasyurus maculatus	0.35
Landscape Tg			0.56
Needlebush - banksia wet on sandstone plateaux of the Sydney Basin	Eastern Bentwing-bat	Miniopterus schreibersii oceanensis	0.75
	Eastern Freetail-bat	Mormopterus norfolkensis	0.45
	Eastern Pygmy-possum	Cercartetus nanus	0.5
	Large-footed Myotis	Myotis macropus (formally Myotis adversus)	0.4
	Spotted-tailed Quoll	Dasyurus maculatus	0.35
Landscape Tg			0.55
Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux, Sydney Basin	Eastern Bentwing-bat	Miniopterus schreibersii oceanensis	0.75
	Eastern Freetail-bat	Mormopterus norfolkensis	0.45
	Eastern Pygmy-possum	Cercartetus nanus	0.5
	Greater Broad-nosed Bat	Scoteanax rueppellii	0.45
	Grey-headed Flying-fox	Pteropus poliocephalus	0.93
	Koala	Phascolarctos cinereus	0.83
	Masked Owl	Tyto novaehollandiae	0.33
	Powerful Owl	Ninox strenua	0.33
	Scarlet Robin	Petroica boodang	0.6
	Spotted-tailed Quoll	Dasyurus maculatus	0.35
Landscape Tg			0.55
Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin	Eastern Bentwing-bat	Miniopterus schreibersii oceanensis	0.75
	Eastern Freetail-bat	Mormopterus norfolkensis	0.45
	Eastern Pygmy-possum	Cercartetus nanus	0.5
	Greater Broad-nosed Bat	Scoteanax rueppellii	0.45
	Grey-headed Flying-fox	Pteropus poliocephalus	0.93
	Koala	Phascolarctos cinereus	0.83
	Masked Owl	Tyto novaehollandiae	0.33
	Powerful Owl	Ninox strenua	0.33
	Scarlet Robin	Petroica boodang	0.6
	Spotted-tailed Quoll	Dasyurus maculatus	0.35
Landscape Tg			0.49

Table 3: Habitat filter questions for species credits (requiring survey)

Habitat Question	Answer
land within 40 m of rainforest, coastal scrub, riparian or estuarine communities	Yes
Dense (>80% projected cover) heath, unburnt for 3 or more years	Yes
gallery warm temperate forests on sandy soils	No
Hollow-bearing trees, bridges, caves or artificial structures within 200 m of riparian zone	Yes
land containing caves or similar structures	Yes
land situated in damp, disturbed sites	Yes
land within 100 m of emergent aquatic or riparian vegetation	Yes
land within 250 m of termite mounds or rock outcrops	Yes
Confined to Lane Cove Bushland Park	No
land within 40 m of heath, woodland or forest with sandy or friable soils	Yes
Restricted to North Head in the Manly Local Government Area	No
land within Blue Mountains National Park in Wollemi CMA subregion	No
land within Blue Mountains National Park, Hazelbrook in Wollemi CMA subregion	No
land within Blue Mountains National Park, Mt Wilson & Hazelbrook in Wollemi CMA subregion	No
land within Pittwater LGA in Pittwater CMA subregion	No
moist heath	Yes
open forest on laterite soils located on ridgetops	Yes
Restricted to Lane Cove Bushland Park	No
land within 40 m of eucalypt forests and woodlands	Yes

Table 4: Species requiring targeted survey and survey months allowed

Scientific Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Acacia bynoeana</i>	Y	Y	Y						Y	Y	Y	Y
<i>Acacia pubescens</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Acacia terminalis</i> subsp. <i>terminalis</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Allocasuarina portuensis</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Caladenia tessellata</i>									Y	Y		
<i>Callistemon linearifolius</i>	Y	Y	Y						Y	Y	Y	Y
<i>Callocephalon fimbriatum</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Callocephalon fimbriatum</i> population in the Hornsby and Ku-ring-gai LGAs	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Darwinia biflora</i>	Y	Y							Y	Y	Y	Y
<i>Dasyornis brachypterus</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Epacris purpurascens</i> var. <i>purpurascens</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Eucalyptus camfieldii</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Grevillea caleyi</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Haloragodendron lucasii</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Heleiorporus australiacus</i>	Y	Y	Y	Y	Y				Y	Y	Y	Y
<i>Hibbertia puberula</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Hieraaetus morphnoides</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Hygrocybe rubronivea</i>					Y	Y	Y	Y				
<i>Leptospermum deanei</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Litoria aurea</i>	Y	Y	Y					Y	Y	Y	Y	
<i>Melaleuca deanei</i>	Y	Y										Y
<i>Miniopterus schreibersii</i> <i>oceanensis</i> (Breeding habitat)	Y	Y	Y	Y	Y				Y	Y	Y	Y
<i>Myotis macropus</i> (formally <i>Myotis adversus</i>) Breeding habitat in riparian areas)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Persoonia hirsuta</i>	Y	Y	Y	Y	Y							Y
<i>Prasophyllum fuscum</i>									Y	Y	Y	Y
<i>Pteropus poliocephalus</i> (Breeding habitat)	Y	Y	Y	Y	Y				Y	Y	Y	Y
<i>Pterostylis</i> sp. Botany Bay								Y	Y			
<i>Tetratheca glandulosa</i>							Y	Y	Y	Y	Y	
<i>Varanus rosenbergi</i>	Y	Y									Y	Y
<i>Wahlenbergia multicaulis</i> - endangered population	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Highlights denotes species predicted by biocertification credit calculator that do not occur with the study area.

Table 5: Number of credits required/generated for each vegetation type, class and formation

Vegetation Type	Vegetation Class / Formation	Red Flag	Area of vegetation type certified	No. Credits required per ha of impact	Number of credits required	Area of vegetation type offset	No. Credits generated per ha of protection	Number of credits created (funded/managed)	Number of credits created (managed)	Number of credits created (PI)
ME008 Hairpin Banksia - Kunzea ambigua - Allocasuarina distyla heath on coastal sandstone plateaux, Sydney Basin	Biometric Vegetation Types		9.17	39	354	20.41	9	188	169	47
ME012 Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin			0.26	38	10	17.75	10	171	154	43
ME014 Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux, Sydney Basin			12.23	28	345	66.34	13	867	780	217
ME015 Needlebush - banksia wet heath on sandstone plateaux of the Sydney Basin		Yes (part)	0.58	34	20	4.49	10	46	41	12
Total			22.24	32.78	729	108.99	11.67	1272	1144	319
Coastal Heath Swamps	Vegetation Classes		0.58		20	4.49		46	41	12
Sydney Coastal Dry Sclerophyll Forests			12.49		355	84.09		1038	934	260
Sydney Coastal Heaths			9.17		354	20.41		188	169	47
Total			22.24		729	108.99		1272	1144	319
Dry sclerophyll forests (shrubby sub-formation)	Vegetation Formations		12.49		355	84.09		1038	934	260
Freshwater wetlands			0.58		20	4.49		46	41	12
Heathlands			9.17		354	20.41		188	169	47
Total			22.24		729	108.99		1272	1144	319

Table 6: Number of credits required/generated for species requiring species credits

Species	Unit	Red Flag	No. Ind impacted	Area of habitat impacted	Number of credits required	No. Individuals/Area habitat required	No. Ind /Area of habitat in offset area	Number of credits created (funded/managed)	Number of credits created (managed)	Number of credits created (PI)
Grevillea caleyi	No. of Individuals	Yes	1	N/A	77	13 Ind	5	30	27	8
Tetratheca glandulosa	No. of Individuals	Yes (Negligible loss = 5)	134	N/A	2127	355 Ind	15	90	81	23
Red-crowned Toadlet	Area (ha)	No	N/A	7.00	93	15.5 ha	62.37 ha	374	337	94
Giant Burrowing Frog	Area (ha)	No	N/A	22.24	297	49.5 ha	108.99	654	589	163
Heath Monitor	Area (ha)	No	N/A	11.11	370	85.3 ha	90.80	545	490	136

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