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Biodiversity Development Assessment Report for the proposed seniors housing development on 1825 Pittwater Road & 52 Cabbage Tree Road, Bayview (Bayview Golf Club)

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1.0 Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared, at the request of Waterbrook Bayview Pty Ltd, to assess the impacts for the proposed senior housing and golf course upgrade on biodiversity. The proposed senior housing is located on the privately owned Bayview Golf Club (BGC) land. The BGC land is located in the former Pittwater Local Government Area (LGA), which is now part of the Northern Beaches LGA.

The credits and dollar value of the impacts of the proposed development on both the ecosystems and threatened species are objectively calculated using the biodiversity tools. The biodiversity gains from the proposed conservation works have not been calculated, but considered as ameliorative measure in the BDAR.

The proposed building footprint area for the senior housing is approximately 1.86 ha and is situated within the approximately 6.36 ha Part 1 DP662920 of the approximately 38.45 ha Bayview Golf Club (BGC) land (Figures B-1a, B-1b, B-2a, B-2b). The boundary of the proposed building footprint area is shown on the survey plan and site plan (Figures B-3a and B-3b).

The reconfiguration of the golf course associated with the upgrade shown on the masterplan (Figure B-3c) requiring tree removal is on the low-lying land south of Cabbage Tree Road (Figure B-9a).

1.1 Requirement for a Biodiversity Development Assessment Report

The *Biodiversity Conservation Act 2016* commenced on 25 August 2017. The Act is a key pillar of the NSW Government's framework for biodiversity assessment and management, together with the land management framework established in the *Local Land Services Act 2013* (as amended by the *Local Land Services Amendment Act 2016*) (OEH website (<https://www.environment.nsw.gov.au/biodiversity/offsetsscheme.htm> accessed 11 April 2019))

The *Biodiversity Conservation Act 2016*, together with the *Biodiversity Conservation Regulation 2017*, outlines the framework for addressing impacts on biodiversity from development and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS).

Under the BOS, if the proposed development exceeds the BOS threshold, a Biodiversity Assessment Method (BAM) must be applied and a BDAR prepared. In the case of this proposal, the threshold is exceeded as the Site is mapped on the Biodiversity Values Map (map available via the Department of Planning and Environment at <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap>)(Appendix 1, Figure B-4).

The BDAR is to be prepared by an accredited assessor to be submitted with the development application.

The assessor's details are:

Assessor name: Dr AnneMarie Clements
BBAM Assessor number: 0129
NSW BAM Accreditation: BAAS17088.

The potential impacts on biodiversity from development and clearing associated with the proposal are:

- for the seniors housing, the removal of 0.43 ha of 'between-fairway' vegetation associated with, and adjoining the existing Fairways 4 and 5; and
- for the golf course reconfiguration and upgrade, the removal of 750 linear metres of planted trees, including *Casuarina glauca*, non-local native *Casuarina cunninghamiana* and exotic trees, adjoining Fairways 1, 2, 13, 17, and 18.

Advice from the Office Environment and Heritage (OEH) regarding planted trees is as follows (email correspondence from OEH ROD LMBC Support Mailbox dated 31 August 2018, Appendix 2):

Where there is native vegetation on site that does not conform to a PCT OEH's advice is to apply the BAM and prepare a BDAR assessing it against the best-fit PCT. ...

Keep in mind that impacts on planted vegetation first need to be above the BOS threshold to trigger a BAM assessment. If impacts are above the threshold then legally the BAM must be applied and a BDAR prepared.

Yes, all vegetation that is being used by threatened species requires assessment as threatened species habitat. If the vegetation being used by the threatened species is exotic it should be assessed as a prescribed impact under the BAM (sections 6.7, 8.2, 9.2, 9.3.3 and 9.4 of the BAM).

The BAM is supported by the online BAM tool, which allows accredited assessors (typically ecological consultants) to enter field data and determine the number and class of biodiversity credits. The BAM tool will also assist in the preparation of standardised Biodiversity Assessment Reports for consent authorities to consider.

1.2 Sources of information used in the BDAR

The sources of information used in the BDAR include:

Survey plan, by Bee & Lethbridge, Drawing No 18990A-07 Revision 8, dated 8 January 2019.

Clements A, Rodd T, Webster G, Palsson R, Young M, and Radcliffe P. (2018) *Biodiversity Development Assessment Report for the proposed Seniors housing development on 1825 Pittwater Road & 52 Cabbage Tree Road, Bayview (Bayview Golf Club)*. Prepared for Waterbrook Bayview Pty Ltd. Dated 30 August 2018.

Hollow-bearing trees recorded on and adjoining the Bayview Golf Club land north of Cabbage Tree Road recorded by ecologists from Anne Clements & Associates on 10, 17, 21 May 2018 (in Appendix 3 of the report).

Bat survey report of Glenn Hoye of Fly By Night Bat Surveys Pty Ltd. Dated 3 December 2017 (in Appendix 16 of Clements *et al.* 2018).

Glen Hoye of Fly By Night Bat Surveys Pty Ltd Comments on potential

impacts to microbats at Bayview Golf Course, NSW, from proposed seniors living facility. dated 16 November 2018. (in Appendix 4 in this report).

Confirmation of location of nest tree 330 m from the proposed seniors living development area. Statement of Evidence of Dr Beth Mott dated 10 January 2019 (in Appendix 5 in this report)

Experimental design for Golf irrigation water treatment train prepared by Dr AnneMarie Clements, Madeline Young (ecologists) and Dr Margaret Donald (statistician)

Tree diameter from Arboricultural impact assessment – Waterbrook Bayview, Cabbage Tree Road, Bayview. Footprint Green Rev 9.5 dated 26 November 2018.

The *Native Vegetation of the Sydney Metropolitan Area* - Version 3.1 (OEH, 2016) VIS_ID 4489.

Nearmap aerial photographs dated 28 November 2018 (Figures B-2a, B-2b, B-6a, B-6b, B-9a)

BioNet Atlas at <http://www.bionet.nsw.gov.au/>

OEH (2017) *Biodiversity Assessment Methodology*. NSW Office of Environment and Heritage (NSW). August 2017.

Landscape Master Plan. (Site Design + Studios, Project: Waterbrook Bayview, Drawing No. 1031, Rev F, dated 10 January 2019).

Wetland treatment ponds (Site Design + Studios, Project: Waterbrook Bayview, Drawing No. 1031, Page LP09 Rev A, dated 17 December 2018).

Article by Rachel Fetherston (2016) *Striking out. Collisions with windows are a growing threat to bird populations. Can technology come to the rescue?* Australian Geographic . Dated 3 Jan 2019.

2.0 Landscape features

The proposal is in the Sydney Basin - Pittwater IBRA sub-region (Figure B-5).

The proposed building footprint area for the senior housing is not within 40 m of any mapped rivers, streams or estuaries (Figure B-1b). The BGC land has four ponds on the land south of Cabbage Tree Road joined by dug channels with stream orders given on Figure B-1c.

The site has no significant landscape features such as karst, caves, crevices, cliffs or areas of geological significance.

The BAM requirement in Sections 4.3.2 include:

In Section 4.3.2.3

Native vegetation cover is assessed on the subject land and within a 1500m buffer area surrounding the outside edge of the boundary of the subject site.

In Section 4.3.2.4

Native vegetation cover is assigned to a class, being 0–10%, >10–30%, >30–70% and >70% for the development proposal.

The current extent of native vegetation cover in the 1.5 km buffer area (shown on Figures B-6a, B-6b) was determined from the "The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 (VIS_ID 4489) mapping" (OEH 2016).

The total area proposed to be cleared is 0.51 ha (Figures B-9a and B-9b), comprising:

- 0.43 ha of 'between-fairway' vegetation for the seniors housing, and
- 0.08 ha of linear strips of planted trees, for the golf course reconfiguration

The native vegetation cover in the 1.5 km buffer area before and after the proposed development is given in Table A-1 and Table A-2 below.

Table A-1: Native Vegetation Cover prior to development

Buffer area	Approximate area of native vegetation	Percent native vegetation	Class
1500 m	334.6 ha	27.39%	>10–30%

Table A-2: Native Vegetation Cover post development

Buffer area	Approximate area of native vegetation	Percent native vegetation	Class
1500 m	335.1 ha (334.6 - 0.51 ha)	27.27%	>10–30%

3.0 Native vegetation

The native vegetation impacted is mainly located between fairways. It is modified and managed for playing golf with a mown understorey and trimmed canopy trees (data recorded in Plots 4, 5, 7, 9, 10, 13, 21, 22, 23, 24, 25).

On the proposed building footprint area, situated on the higher land of the BGC, there is approximately 0.43 ha of modified 'between fairway' vegetation to be cleared.

The golf course reconfiguration associated with its upgrade is occurring on the lower lying land where there is approximately 750 linear metres (0.08 ha) of planted 'between fairway' trees adjoining Fairways 1, 2, 13, 17, and 18, to be cleared. The planted trees include *Casuarina glauca* (Swamp Oak), the non-local native *Casuarina cunninghamiana* (River Oak) and exotic tree species.

3.1 Likely Plant Community Types (PCTs)

From application of the PCT tool in the Bionet Vegetation Classification database, (<https://www.environment.nsw.gov.au/NSWVCA20PRapp/search/keysearch.aspx>, accessed 26 March 2019), and the OEH (2016) mapping, the likely best fit PCTs were determined using the data recorded in the sampling Plots.

The likely PCTs on the site based on the OEH mapping and PCT vegetation descriptions (Figures B-6a and B-6b) are given in Table B-1.

Table B-1: Description of the best fit PCTs

PCT	Class	PCT Name	Associated TEC
1565	Northern Hinterland Wet Sclerophyll Forests	Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast	Not a TEC
1214	Southern Lowland Wet Sclerophyll forests	Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion	Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion
1795	Coastal Swamp Forests	Swamp Magogany / Cabbage Tree Palm Cheese Tree – Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney Basin	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Six Plots (Plots 4, 5, 7, 9, 10, and 13) fall within or close to the proposed senior housing footprint. Data recorded in a subset of these six Plots (Plots 4, 7, 9 and 13) were used to determine the best fit PCTs.

The number of species recorded that matched the OEH mapped PCTs was low and ranged from 1 to 7 (Table B-2). For Plots 4, 9, and 13, the best matches are PCT 1565 and PCT 1214. There was a poor match with the PCTs for Plot 7 due to the intense golf course management related disturbance and low species diversity between fairways 4 and 5.

Table B-2: Number of species matches for the best fit PCTs

	Plot 4	Plot 7	Plot 9	Plot 13
PCT 1565	6	3	7	5
PCT 1214	4	1	5	6
PCT 1795	3	1	6	3

The native vegetation on the low-lying land was mapped as PCT 1795. This PCT was adopted for the row of planted trees.

The floristic quadrat data of biodiversity plots were recorded with:

- Data in Tables 1a, 1b, and 2 of Clements *et al.* 2018;
- Photographs of sampling locations and site observation in Clements *et al.* (2018); and
- Location of biodiversity plots in Figures B-6a.

The species are classified into growth form groups (Tree = TG, Shrub = SG, Groundcover and other (GG= Grass & grasslike, FG= Forb, EG= Fern, OG = Other in Appendix 4 of the BAM).

Using the data recorded, the composition and structure in the plots is calculated (Table C) and entered into the BAM calculator. In Plot 7, there was intense golf course management related disturbance with 3 native tree species (27.5% cover), no native shrub species (0% cover), two native grass or grass-like species (0.3% cover), 4 native forb species (1.1% cover), no native fern species (0% cover) and no native

other species (0% cover) recorded. For all of the other plots (Plots 4, 5, 9, 10, 13, 21, 22, 23, 24, 25) the understorey cover and species diversity is generally low due to golf management under the canopy trees.

Table C: Composition and Structure values entered in the BAM calculator

Plot	Composition (number of trees, shrubs and groundcover species recorded in the plots)						Structure (summed percent cover for trees, shrubs and groundcover species recorded in the plots)					
	TG	SG	GG	FG	EG	OG	TG	SG	GG	FG	EG	OG
On higher land												
4	11	10	2	10	4	13	31.9	20.6	0.3	5.8	5.8	8.5
5	15	9	5	6	3	13	46.2	6.3	2.1	1.2	0.8	18.6
7	3	0	2	4	0	0	27.5	0	0.3	1.1	0	0
9	11	7	2	9	3	11	35.9	5.6	0.8	1.3	1.8	31.4
10	7	1	0	1	0	5	49.5	2.5	0	0.1	0	16
13	6	3	4	7	1	7	40.1	4.8	4.6	0.6	0.3	7.7
On low-lying land												
21	1	0	1	3	0	1	32.5	0	9	0.9	0	1.3
22	2	0	2	4	0	0	23.8	0	9.3	2.1	0	0
23	1	0	1	3	0	0	35	0	0.5	0.2	0	0
24	2	0	1	0	0	0	30.1	0	0.1	0	0	0
25	1	0	1	1	0	1	52.5	0	0.8	3.8	0	0.5

The BAM function values include the stem class Diameter at Breast Height (DBH), litter cover, length of fallen logs, Hollow bearing trees, and cover of High Threat Weeds.

Footprint Green (2018) and the surveyor recorded the tree location and tree numbers on plan for the seniors housing building footprint (Figures B-3a, B-7 and B-8), and tabulated the DBH, spread and height of the numbered trees. The dimensions of the recorded trees are given to one decimal point by Footprint Green and rounded by the surveyor. Comparing the number of trees recorded in the 20 m x 20 m floristic plots with those on the survey plan (Figures B-7, Table D), there is relative consistency between the two recordings of trees presences, with:

Table D: Comparison of tree data with surveyors records

Plot	No. of Native trees (>15 m) recorded in 20 m x 20 m floristic quadrat	No of trees recorded by surveyor in the area of the 20 m x 20 m floristic quadrat
4	10	10
5	13	14
7	10	10
9	13	12
10	9	8
13	13	11

Hollows were recorded for all trees north of Cabbage Tree Road (Appendix 3). The presence of hollows in trees in the Plots had been recorded and this data was used in the BAM calculator.

On the low-lying land, the DBHs and presence of hollows for the trees in the Plots 21, 22, 23, 24, 25 were recorded at time of survey.

For the BAM function values:

- The stem class (DBH) for the plots used in the BAM calculator are the data recorded by Footprint Green and the surveyor (see Table E).
- Litter cover was recorded on the field data sheets for each of the four 10 m x 10 m sub quadrats in the 20 x 20 floristic quadrat.
- Length of fallen timber was estimated from the photographic record of the floristic quadrats.
- the percent cover of High Threat Weed recorded were summed for each of the Plots by Comparing the High Threat Weeds list from the BAM calculator with the exotic species recorded in the 20 x 20 floristic quadrats.

Note: On the higher land on and close to the building footprint, the percent cover of High Threat Weed relates to extent of golf grasses . The lowest cover by High Threat Weeds was in the managed garden beds (sampled in Plot 10) and the highest cover on the between fairway with mown listed High Threat Weed mainly *Cenchrus clandestinus* (Kikuyu Grass) sampled in Plot 7.

Similarly on the low-lying land, the dominant golf grass were the listed High Threat Weed mainly *Cenchrus clandestinus* (Kikuyu Grass) and *Stenotaphrum secundatum* (Buffalo Grass) (between fairway vegetation sampled in Plots 21 to 25).

Table E: Function values entered in the BAM calculator

Table 2: Function values entered in the DBH calculator											
Plot	Litter cover	Length of fallen logs	Hollow bearing trees	Stem class DBH (cm)							Percent cover of High Threat Weeds
				<5	5-9	10-19	20-29	30-49	50-79	80+	
On the higher land											
4	28.7	0	0			x	x	x	x	1	11.4
5	40	0	0			x	x	x			35.9
7	2.4	0	0				x	x	x		50.8
9	40	3	0				x	x	x		26.6
10	50	0	1					x	x		8.1
13	20	0	3				x	x	x		21.1
On low-lying land											
21	10	0	1			x	x	x	x		77.5
22	5	0	3			x	x	x	x		80.5
23	5	0	0					x	x		85.2
24	12	0	1					x	x		93.8
25	10	0	6			x	x	x	x		50.8

Integrity scores were calculated for each of the plots within or close to the areas impacted by the proposal for the PCT 1565, PCT 1214 and PCT 1795 (Table F).

On the higher land, on and close to the proposed footprint, the integrity scores were highest for PCT 1565 in all plots (4, 5, 7, 9, 10, 13) with integrity scores of between 64.6 (sampled in Plot 4, mainly downslope of the proposed footprint) and 24.4 (sampled in Plot 7) for the PCT 1565.

On the low-lying land (sampled in Plots 21 to 25), the Integrity scores were higher for PCT 1795 than PCT 1565 and PCT 1214. The integrity scores were low. For PCT 1795, the integrity scores ranged from 11.9 (sampled in Plot 23) to 21.1 (sampled in Plot 22).

Table F: Integrity scores from the BAM calculator

Plot	PCT 1565	PCT 1214	PCT 1795
On the higher land			
4	64.6	55.6	49.2
5	46.9	45.3	44.2
7	24.4	21	22.6
9	43.7	40.6	42.2
10	30.4	30.1	26.1
13	35.4	34.2	34.6
On low-lying land			
21	13.2	13.1	18.2
22	14.5	14.5	21.1
23	10.6	10.4	13.6
24	8.5	8.5	11.9
25	10.4	10.4	12.1

Four vegetation zones were identified in the building footprint area (Table G, Figure B-9a and B-9b) and a fifth vegetation zone identified on the low-lying land. The plot with the highest integrity score (**shown in bold in Table G**) was used to characterise the vegetation zones.

Table G: vegetation zones and sampling locations

Vegetation zone		Sampled in
1	Modified between fairway vegetation on the higher land, with 40% canopy cover, some native midstorey and an irregularly mown understorey on south-west facing slope	Plot 13
2	Wet sclerophyll forest with eucalypt canopy and some rainforest elements in the understorey, downslope of fairway on south facing slope, with	Plots 4 , 5
3	Modified between-fairway vegetation on higher land with a strip of large canopy trees, no midstorey and a regularly mown understorey.	Plot 7
4	Modified vegetation with landscaped planting in the midstorey and understorey adjoining Cabbage Tree Road.	Plots 9 , 10
5	Single row of <i>Casuarinas</i> with no midstorey or understorey between fairways on the lower land	Plot 21, 22 , 23, 24, 25

Given the small area of the vegetation zones (0.08 – 0.16 ha) and the minimum entry size of a vegetation zone being 0.1 ha, the area of each zone was rounded up to one decimal point (Table H).

Table H: Vegetation zones and areas used in the BAM calculator.

Vegetation zone	Approximate area	Area entered in BAM calculator
1	1639 m ² (0.16 ha)	0.2 ha
2	866 m ² (0.09 ha)	0.1 ha
3	894 m ² (0.09 ha)	0.1 ha
4	949 m ² (0.09 ha)	0.1 ha
5	750 m ² (0.075 ha)	0.1 ha
	5098 m² (0.43 ha)	0.6 ha

4.0 Threatened species

4.1 Flora

Targeted searches for threatened flora species included:

- *Rhodamnia rubescens*, listed as critically endangered under the *NSW Biodiversity Conservation Act 2016*.
 - A total of six 3–4 m tall plants were recorded on 17 May 2018 (following above average rain in February and March) in undisturbed forest in the north west (Figure 7c-1 of Clements *et al.* 2018). Five of the six plants were infected by Myrtle Rust.
 - An additional healthy individual was recorded in targeted search on the proposed golf maintenance area in July 2018 outside the golf security fence, likely to be on the road reserve of Cabbage Tree Road.
- *Syzygium paniculatum*, listed as endangered under the *NSW Biodiversity Conservation Act 2016*.
 - One individual was recorded as a likely remnant. It was in poor health and was surrounded by golf course paths north of Cabbage Tree Road.

Neither of these two threatened species were recorded within the building footprint area nor the impacted area on the golf course.

Table I: Candidate threatened flora species for Species credits from the BAM calculator

PCT 1565	PCT 1241	PCT 1795	Scientific name	Common name	Confirmed on the impacted area?
x			<i>Cryptosylis hunteriana</i>	Leafless Tongue Orchid	No
	x		<i>Diuris bracteata</i>	Diuris bracteata	No
	x		<i>Genoplesium baueri</i>	Bauer's Midge Orchid	No
	x		<i>Hygrocybe aurantipes</i>	Hygrocybe aurantipes	No
		x	<i>Melaleuca groveana</i>	Grove's Paperbark	No
	x		<i>Tetratheca glandulosa</i>	Tetratheca glandulosa	No
	x		<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	No

4.2 Fauna

Fauna surveys identified the presence of nine threatened fauna species on the BGC land. These were:

- seven bat species (Grey-headed Flying-fox, Large-eared Pied Bat, Eastern Bentwing-bat, Southern Myotis (restricted to watercourse habitats), Little Bentwing-bat, Eastern False Pipistrelle, Eastern Freetail-bat) (details in Appendix 4).
- two bird species (Powerful Owl, Square-tailed Kite) were recorded .

Powerful Owl is known to occur in the remnant vegetation to north-west of the BGC land. Two juvenile Powerful Owls were photographed during the watercourse surveys on the BGC land on 17 November 2017. The pair of Powerful Owls are known to nest 330 m from the proposed building footprint area (details in Appendix 5).

Given the recorded presence of bats and Powerful Owl on the BGC land, all trees north of Cabbage Tree Road were assessed for hollows and potential fauna value. Large hollows are required for species such as the Powerful Owl. A total of 84 trees with hollows were recorded (details in Appendix 3 and Table J), with:

- 36 in the remnant vegetation in the north-west;
- 15 trees having large hollows (>300 mm diameter), of which 8 trees were recorded in the remnant vegetation in the north-west;
- no trees with large hollows were recorded on the proposed building footprint. :

Table J-1: Summary of hollow bearing trees North of Cabbage Tree Road

Location	Hollow opening size			Possible (un-confirmed)	Total	Number to be removed
	Large (>300mm)	Medium (b/w large and small)	Small (<60mm)			
On the proposed building footprint area - seniors housing	0	3 (+ 2 entrance)	7	1	13	13
East of proposed Fairway 6	1	0	0	2	3	0
East of proposed Fairway 4 and west of the fire trail on north-eastern boundary	2	2	6	1	11	0
West of proposed Fairway 4 and not on the proposed village site	2	0	0	0	2	0
NW remnant	8	11	14	3	36	0
SW corner	2	11	4	1	18	0
Adjoining Cabbage Tree Road	0	3	0	0	3	0
Totals	15	30	31	8	84	13
To be removed	0	5	7	1	13	13

On the low-lying land, the presence of hollows for the trees in Plots 21, 22, 23, 24, 25 were recorded (Table J-2) with a total of 11 hollows recorded and two possible hollows. No suitable large hollows were observed in the fairway vegetation of the lower lying land. The golf course fairways and associated vegetation are considered too open for species such as the Powerful Owl to breed.

Table J-2: Summary of hollow bearing trees South of Cabbage Tree Road

Transects	Number of trees	Hollow opening size			Total
		Large (>300mm)	Medium (b/w large and small)	Small (<60mm)	
21	13	0	0	1	1
22	10 (+7 in same row)	0	1	2 (+2 possible)	3 (+ 2 possible)
23	11	0	0	0	0
24	8	0	0	1	1
25	29	1*	3	2	6
Total	78	1	4	6 (+2 possible)	11 (+2 possible)

The BAM calculator generates the predicted threatened species for ecosystem and species credits for PCT 1565 and PCT 1241 (Tables K and L).

Table K: Predicted threatened fauna species for ecosystem credits from the BAM calculator

PCT 1565	PCT 1241	PCT 1795	Scientific name	Common name	Confirmed on the impacted area?
	x	x	<i>Anthochaera phrygia</i>	Regent Honeyeater (Foraging)	No
x	x		<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo (Foraging)	No
x	x	x	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo (Foraging)	No
x	x	x	<i>Daphoenositta chrysoptera</i>	Varied Sittella	No
x	x	x	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	No
x	x	x	<i>Glossopsitta pusilla</i>	Little Lorikeet	No
		x	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	No
	x	x	<i>Hieraaetus morphnoides</i>	Little Eagle (Foraging)	No
		x	<i>Ixobrychus flavicollis</i>	Black Bittern	No
x		x	<i>Lathamus discolor</i>	Swift Parrot (Foraging)	No
x	x	x	<i>Lophoictinia isura</i>	Square-tailed Kite	Yes
x	x	x	<i>Miniopterus australis</i>	Little Bentwing-bat (Foraging)	Yes
x	x	x	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat (Foraging)	Yes

PCT 1565	PCT 1241	PCT 1795	Scientific name	Common name	Confirmed on the impacted area?
	x	x	<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	Yes
x	x	x	<i>Ninox connivens</i>	Barking Owl (Foraging)	No
x	x	x	<i>Ninox strenua</i>	Powerful Owl (Foraging)	Yes
	x	x	<i>Pandion cristatus</i>	Eastern Osprey (Foraging)	No
	x		<i>Petroica boodang</i>	Scarlet Robin	No
x	x	x	<i>Phascolarctos cinereus</i>	Koala (Foraging)	No
x	x	x	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Foraging)	Yes
x	x	x	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	No
x	x	x	<i>Tyto novaehollandiae</i>	Masked Owl (Foraging)	No
	x	x	<i>Varanus rosenbergi</i>	Rosenberg's Goanna	No

Table L: Candidate threatened fauna species for Species credits from the BAM calculator

PCT 1565	PCT 1241	PCT 1795	Scientific name	Common name	Confirmed on the impacted area?
	x	x	<i>Anthocera phrygia</i>	Regent Honeyeater (Foraging)	No
	x	x	<i>Burhinus grallarius</i>	Bush Stone-curlew	Yes
x	x		<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo (Foraging)	No
x	x	x	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo (Foraging)	No
	x	x	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	No
	x	x	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Yes
	x	x	<i>Hieraaetus morphnoides</i>	Little Eagle (Breeding)	No
x			<i>Hoplocephalus bitorquatus</i>	Pale – headed Snake	No
x	x	x	<i>Lathamus discolor</i>	Swift Parrot (Breeding)	No
		x	<i>Litoria aurea</i>	Green and Golden Bell Frog	No
		x	<i>Lophoictinia isura</i>	Square-tailed Kite	Yes
x	x		<i>Litoria brevipalmata</i>	Green-thighed Frog	No
x	x	x	<i>Miniopterus australis</i>	Little Bentwing-bat (Breeding)	Yes
x	x	x	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat (Breeding)	Yes

PCT 1565	PCT 1241	PCT 1795	Scientific name	Common name	Confirmed on the impacted area?
x			<i>Mixophyes iteratus</i>	Giant Barred Frog	No
x	x	x	<i>Myotis macropus</i>	Southern Myotis	Yes
x	x	x	<i>Ninox connivens</i>	Barking Owl (Breeding)	No
x	x	x	<i>Ninox strenua</i>	Powerful Owl (Breeding)	Yes
	x	x	<i>Pandion cristatus</i>	Eastern Osprey (Breeding)	No
x	x	x	<i>Petaurus norfolcensis</i>	Squirrel Glider	No
	x	x	<i>Petaurus norfolcensis - endangered population</i>	Squirrel Glider on Barrenjoey Peninsula, north of Bushrangers Hill	No
x	x	x	<i>Phascolarctos cinereus</i>	Koala (Breeding)	No
	x		<i>Phascolarctos cinereus - endangered population</i>	Koala in the Pittwater Local Government Area	No
	x		<i>Pseudophryne australis</i>	Red-crowned Toadlet	No
x	x	x	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Breeding)	Yes
	x		<i>Turnix maculosus</i>	Red-backed Button-quail	No
x	x	x	<i>Tyto novaehollandiae</i>	Masked Owl (Breeding)	No

5.0 Avoid and minimise impacts

5.1 On BGC land within the proposed senior housing platform

To meet the Council's Pittwater 21 Development Control Plan, within the landscape zone associated with the senior housing:

- 100% of canopy trees are to be local native and at least 60% of all other species will be local native (see species selection on Landscape Master Plan, Page L-05 F);
- All landscaped areas will be in the development zone and not in areas of existing bushland; and
- No environmental weeds will be planted.

Given the presence of several threatened bat species, and evidence of breeding colonies of at least three bat species in the vicinity of the proposal, as well as Powerful Owl likely hunting for prey on the BGC land, external lighting is designed to be subdued.

Within the proposed building footprint area, water features and garden beds have been designed to accommodate for native fauna such as providing reeds and rocks around the edge of water as shelter/basking habitat for frogs and water dragons.

5.2 On BGC land not within the proposed senior housing platform

A site-specific Vegetation / Conservation / Biodiversity Management Plan has been prepared (Appendix 4 of Clements *et al* 2018) to:

- address the recommendations in the Biodiversity Assessment (Clements *et al*. 2018)
- address the Objects and Principles of the NSW *Water Management Act 2000*, and
- meet the requirements of Northern Beaches Council's Pittwater Local Environmental Plan 2014 and Pittwater 21 Development Control Plan.

The proposed works are directed to provide enhanced habitat for biota including threatened and non-threatened species, threatened and non-threatened communities and their associated biotic and abiotic requirements. The outcome of the proposed Biodiversity Management Plan is to increase the 6.86 ha of fragmented and degraded wildlife corridors to more than 15 ha of intact and connected flora and fauna habitat.

The proposed habitat improvements will provide potential niches for re-establishing the local native plant diversity as well as fauna including frog, bat, and bird species and their populations. These improvements form part of the increased environmental sustainability of the BGC land (ESDSC 1992). Installation of nest boxes and artificial hollows with ongoing maintenance and monitoring have been planned as part of scientific studies.

As part of the ongoing golf course management, the landform on steep slopes is to be managed as 'sandstone garden beds' to mimic that of the natural stable rocky steep slopes of the north-west of the BGC land. Sandstone slabs will be added and ferns and rainforest components re-established to reduce golfers' use of the steep areas and to reduce erosion risk associated with the mapped Erina and Watagan soil landscapes. The sandstone slabs excavated from the proposed construction works will be available to be strategically placed on the slope.

With the sandstone slab placement, permanent or semi-permanent pooling sections can be created to provide additional fauna habitats, specifically for amphibians, reptiles and bats and potentially as a natural treatment train / plant for the golf irrigation water. Experiments have been designed, in consultation with the statistician Dr Margaret Donald, to test the effects of shading, native plants associated with the water bodies and overhanging shrubs on native fauna occurrences and the efficiency of nutrient removal from the irrigation water.

As the project represents 'best practice', the application of the proposed Biodiversity Management Plan is to be carefully monitored and reported in peer-reviewed journals and community presentations, including the following studies:

- The effects of the proposed habitat rehabilitation, enhancement and re-establishment works on the abundance of fauna in particular, prey species for the Powerful Owl, frogs and bats; and
- The effects of climatic fluctuation on the health of *Rhodamnia rubescens* and occurrence of Myrtle Rust.

6.0 Application of the BAM calculator

The calculated ecosystem and species credits are used to estimate the dollar value required to offset the impacts of the proposed development.

The best fit PCT of vegetation zones 1 to 4, within the housing footprint, is either:
PCT 1565 - Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast or
PCT 1214 - Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion.

The best fit PCT of vegetation zone 5 on the low-lying land is:
PCT 1795 - Swamp Mahogany / Cabbage Tree Palm – Cheese Tree – Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney Basin.

The BAM calculator has been run for two scenarios with:

- Scenario 1 allocating vegetation zone 1 to 4 to PCT 1565 (Appendix 6a); and
- Scenario 2 allocating vegetation zone 1 to 4 to PCT 1214 (Appendix 6b).

Both scenarios are run with Zone 5 as PCT 1795. The outcomes from the BAM calculator under Scenario 1 and Scenario 2 are similar.

The calculated number of ecosystem credits required for the impacted ecological communities was 9 for Scenario 1 and 10 for Scenario 2 (Tables M-1, M-2).

Table M-1: Scenario 1 - summary of Ecosystem credits for Plant Community Types, ecological communities and threatened species habitat

Vegetation zones	Sampled in	Current Integrity loss	Biodiversity risk weighting	Ecosystem credits for:	
				PCT 1565	PCT 1795
1	13	35.4	1.5	3	
2	4 (and 5)	64.6	1.5	2	
3	7	24.4	1.5	1	
4	9 (and 10)	43.7	1.5	2	
5	22 (and 21, 23, 24, 25)	21.1	2		1
			Total	9	

Table M-2: Scenario 2 - summary of Ecosystem credits for Plant Community Types, ecological communities and threatened species habitat

Vegetation zones	Sampled in	Current Integrity loss	Biodiversity risk weighting	Ecosystem credits for:	
				PCT 1214	PCT 1795
1	13	34.2	2	3	
2	4 (and 5)	55.6	2	2	
3	7	21	2	1	
4	9 (and 10)	40.6	2	2	
5	22 (and 21, 23, 24, 25)	21.1	2		1
			Total	10	

The calculated number of species credits required for the potential impacts on Large-eared Pied Bat, Square-tailed Kite, Little Bentwing-bat, Eastern Bentwing-bat, Southern Myotis, Powerful Owl and Grey-headed Flying-fox was 93 for Scenario 1 and 87 for Scenario 2.

The calculated number of species credits for each species under the two Scenarios varied by 1, except for the Square-tailed Kite which had the same number under both Scenarios) (Tables N-1, N-2).

Table N-1: Scenario 1 (PCT 1565 & PCT 1795)- summary of species credits for threatened species

Scientific Name	Common name	Biodiversity risk weighting	Area	Species credits
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	3	0.6	17
<i>Lophoictinia isura</i>	Square-tailed Kite	1.5	0.6	9
<i>Miniopterus australis</i>	Little Bentwing-bat	3	0.6	17
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	3	0.6	17
<i>Myotis macropus</i>	Southern Myotis	2	0.6	11
<i>Ninox strenua</i>	Powerful Owl	2	0.6	11
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	2	0.6	11
Total				93

Table N-2: Scenario 2 - (PCT 1214 & PCT 1795) summary of species credits for threatened species

Scientific Name	Common name	Biodiversity risk weighting	Area	Species credits
<i>Chalinolobus dwyeri</i>	Large- eared Pied Bat	3	0.6	16
<i>Lophoictinia isura</i>	Square-tailed Kite	1.5	0.6	9
<i>Miniopterus australis</i>	Little Bentwing-bat	3	0.6	16
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	3	0.6	16
<i>Myotis macropus</i>	Southern Myotis	2	0.6	10
<i>Ninox strenua</i>	Powerful Owl	2	0.6	10
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	2	0.6	10
Total				87

7.0 Biodiversity Credit Report

In the BAM calculator, the dollar value is calculated based on recent sales. For the two scenarios, the dollar value of the impacts from the proposal are as follows (Tables O-1 and O-2):

- \$107,107.83 including 10% GST for Scenario 1; and
- \$102,825.15 including 10% GST for Scenario 2.

Table O-1: Scenario 1 (PCT 1565 & PCT 1795) - Summary of credits and price

	Credits	Price (including 10% GST)
Ecosystem credits	9	\$16,007.70
Species credits	93	\$91,100.13
Total		\$107,107.83

Table O-2: Scenario 2 (PCT 1214 & PCT 1795) - Summary of credits and price

	Credits	Price (including 10% GST)
Ecosystem credits	10	\$17,786.32
Species credits	72	\$85,038.83
Total		\$102,825.15

7.1 Ecosystem credits

The calculated dollar value for the ecosystem credits required for the impacted ecological communities was \$16,007.70 including 10% GST for Scenario 1 and \$17,786.32 including 10% GST for Scenario 2 (Tables P-1, P-2).

Table P-1: Scenario 1 – summary of the dollar value for Ecosystem credits

Plant Community Type	Price per credit	No. of Ecosystem Credits	Final Credits price
<i>PCT1565 - Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast</i>	\$1,616.94	8	\$12,935.51
<i>PCT1795 – Swamp Mahogany / Cabbage Tree Palm – Cheese Tree – Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney Basin</i>	\$1,616.94	1	\$1,616.94
	Total	9	
		Subtotal (excl GST)	\$14,552.45
		GST	\$1,455.24
		Total Species Credits (incl. GST)	\$16,007.70

Table P-2: Scenario 2 – summary of the dollar value for Ecosystem credits

Plant Community Type	Price per credit	No. of Ecosystem Credits	Final Credits price
<i>PCT1214 - Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion</i>	\$1,616.94	9	\$14,552.44
<i>PCT1795 – Swamp Mahogany / Cabbage Tree Palm – Cheese Tree – Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney Basin</i>	\$1,616.94	1	\$1,616.94
	Total	10	

Plant Community Type	Price per credit	No. of Ecosystem Credits	Final Credits price
		Subtotal (excl GST)	\$16,169.38
		GST	\$1,616.94
		Total Species Credits (incl. GST)	\$17,786.32

The credit classes for like-for-like options are given in Tables Q-1 and Q-2.

Table Q-1: Credit classes for Scenario 1 include the following like-for-like options:

PCT	PCT classes	Containing hollow bearing trees	IBRA subregion
1565	<i>Northern Hinterland Wet Sclerophyll Forests (including PCTs 690, 697, 698, 755, 1092, 1262, 1267, 1268, 1281, 1385, 1548, 1549, 1550, 1556, 1557, 1558, 1564, 1565, 1580, 1582, 1584, 1585, 1845, 1846, 1847, 1914), and in the trading group Northern Hinterland Wet Sclerophyll Forests - < 50% cleared group (including Tier 7 or higher);</i>	Yes	<i>Pitwater, Cumberland, Sydney Cataract, Wyong and Yengo; or Any IBRA subregion that is within 100km of the outer edge of the impacted site</i>
1795	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (including PCT's 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798)	Yes	<i>Pitwater, Cumberland, Sydney Cataract, Wyong and Yengo; or Any IBRA subregion that is within 100km of the outer edge of the impacted site</i>

Table Q-2: Credit classes for Scenario 2 include the following like-for-like options:

PCT	PCT classes	Containing hollow bearing trees	IBRA subregion
1214	<i>Any PCT with the threatened ecological community <i>Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion (including PCT's 1214, 1589)</i></i>	Yes	<i>Pitwater, Cumberland, Sydney Cataract, Wyong and Yengo; or Any IBRA subregion that is within 100km of the outer edge of the impacted site</i>
1795	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (including PCT's 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798)	Yes	<i>Pitwater, Cumberland, Sydney Cataract, Wyong and Yengo; or Any IBRA subregion that is within 100km of the outer edge of the impacted site</i>

7.2 Species credits

The calculated dollar value for the Species credits required for impacts on Large-eared Pied Bat, Square-tailed Kite, Little Bentwing-bat, Eastern Bentwing-bat, Southern Myotis, Powerful Owl and Grey-headed Flying-fox was \$91,100.13 including 10% GST for Scenario 1 and \$85,038.83 including 10% GST for Scenario 2 (Tables R-1, R-2).

The calculated highest dollar value for Species credits was for the Large-eared Pied Bat and the Eastern Bentwing-bat (\$18,059.69 including 10% GST) in Scenario 1. In Scenario 2 the impact on these two bat species is valued as \$16,997.36 including 10% GST (Large-eared Pied Bat) and \$14,872.69 including 10% GST (Eastern Bentwing-bat)

Table R-1: Scenario 1 (PCT 1565 & PCT 1795) – summary of the dollar value of Species credits

Species	Common name	No. of species Credits	Final Credits price
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	17	\$18,059.69
<i>Lophoictinia isura</i>	Square-tailed Kite	9	\$5,674.27
<i>Miniopterus australis</i>	Little Bentwing-bat	17	\$10,718.07
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	17	\$18,059.69
<i>Myotis macropus</i>	Southern Myotis	11	\$11,685.68
<i>Ninox strenua</i>	Powerful Owl	11	\$6,935.22
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	11	\$11,685.68
		Total	93
		Subtotal (excl GST)	\$82,818.30
		GST	\$8,281.83
		Total Species Credits (incl. GST)	\$91,100.13

Table R-2: Scenario 2 (PCT 1214 & PCT 1795) – summary of the dollar value of Species credits

Species	Common name	No. of species Credits	Final Credits price
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	16	\$16,997.36
<i>Lophoictinia isura</i>	Square-tailed Kite	9	\$5,674.27
<i>Miniopterus australis</i>	Little Bentwing-bat	16	\$10,087.59
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	16	\$14,872.69
<i>Myotis macropus</i>	Southern Myotis	10	\$10,623.35
<i>Ninox strenua</i>	Powerful Owl	10	\$6,304.75
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	10	\$10,623.35
		Total	87

Species	Common name	No. of species Credits	Final Credits price
		Subtotal (excl GST)	\$77,308.03
		GST	\$7,730.8
		Total Species Credits (incl. GST)	\$85,038.83

8.0 Conclusions

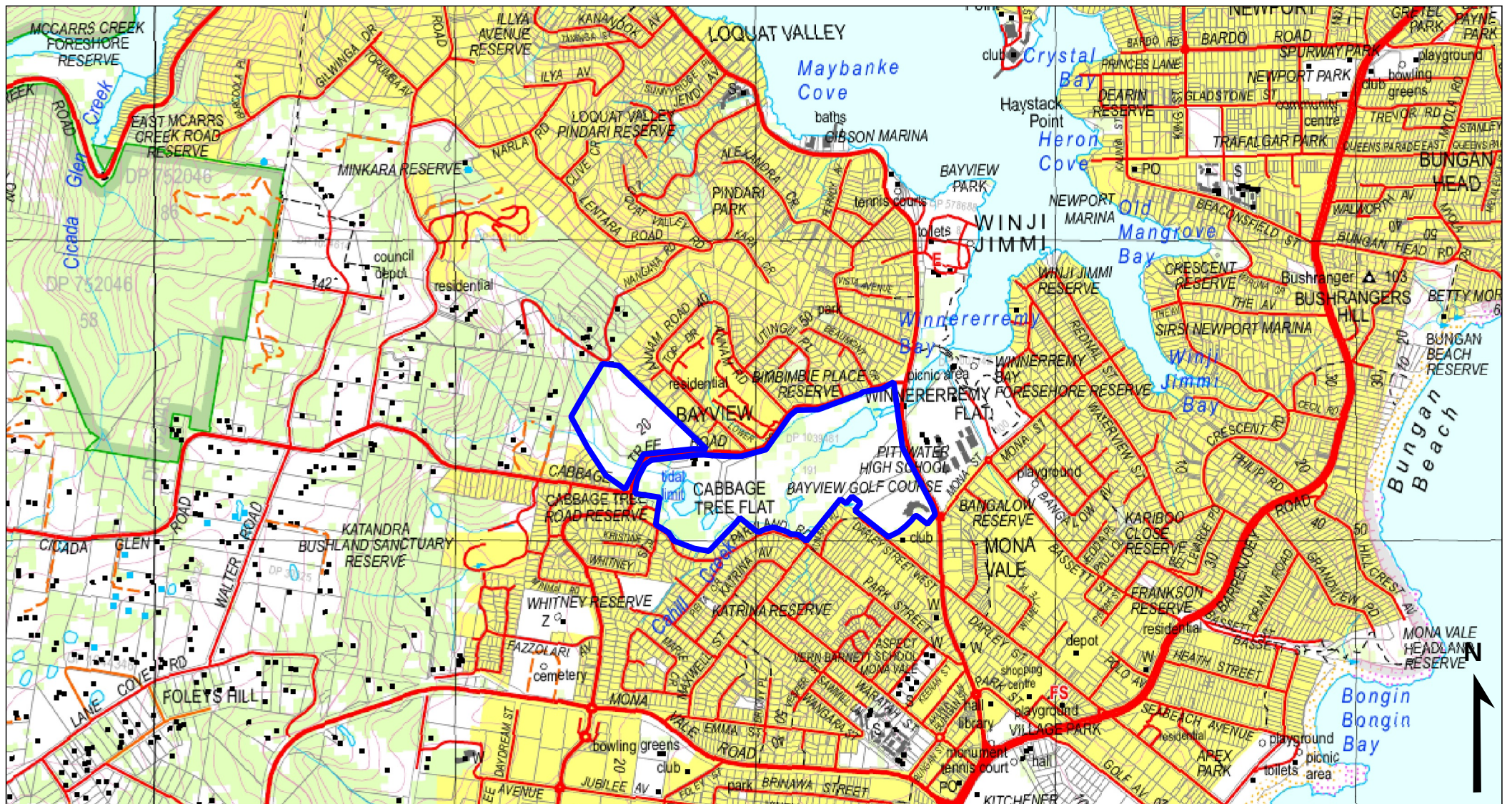
The BAM calculator has objectively calculated the credits and dollar value of the impacts of the proposal on both the ecosystem and on the threatened species.

For offsetting the impact of the proposal (both seniors' housing and the golf course upgrade), the dollar value is between \$102,825.15 and \$107,107.83 including GST depending on the Plant Community Types used in the BAM calculator, with:

- between \$16,007.70 and \$17,786.32 including GST for impacts on ecosystems; and
- between \$91,100.13 and \$85,038.83 including GST for impacts on threatened species, Large-eared Pied Bat, Square-tailed Kite, Little Bentwing-bat, Eastern Bentwing-bat, Southern Myotis, Powerful Owl and Grey-headed Flying-fox.
- The calculated highest dollar value for species credits was for the Large-eared Pied Bat and the Eastern Bentwing-bat (\$18,059.69 including 10% GST). The calculated highest dollar value for impacts on the Powerful Owl was \$6,935.22 including 10% GST.

The BDAR has not considered the biodiversity gains from the proposed conservation ameliorative works.

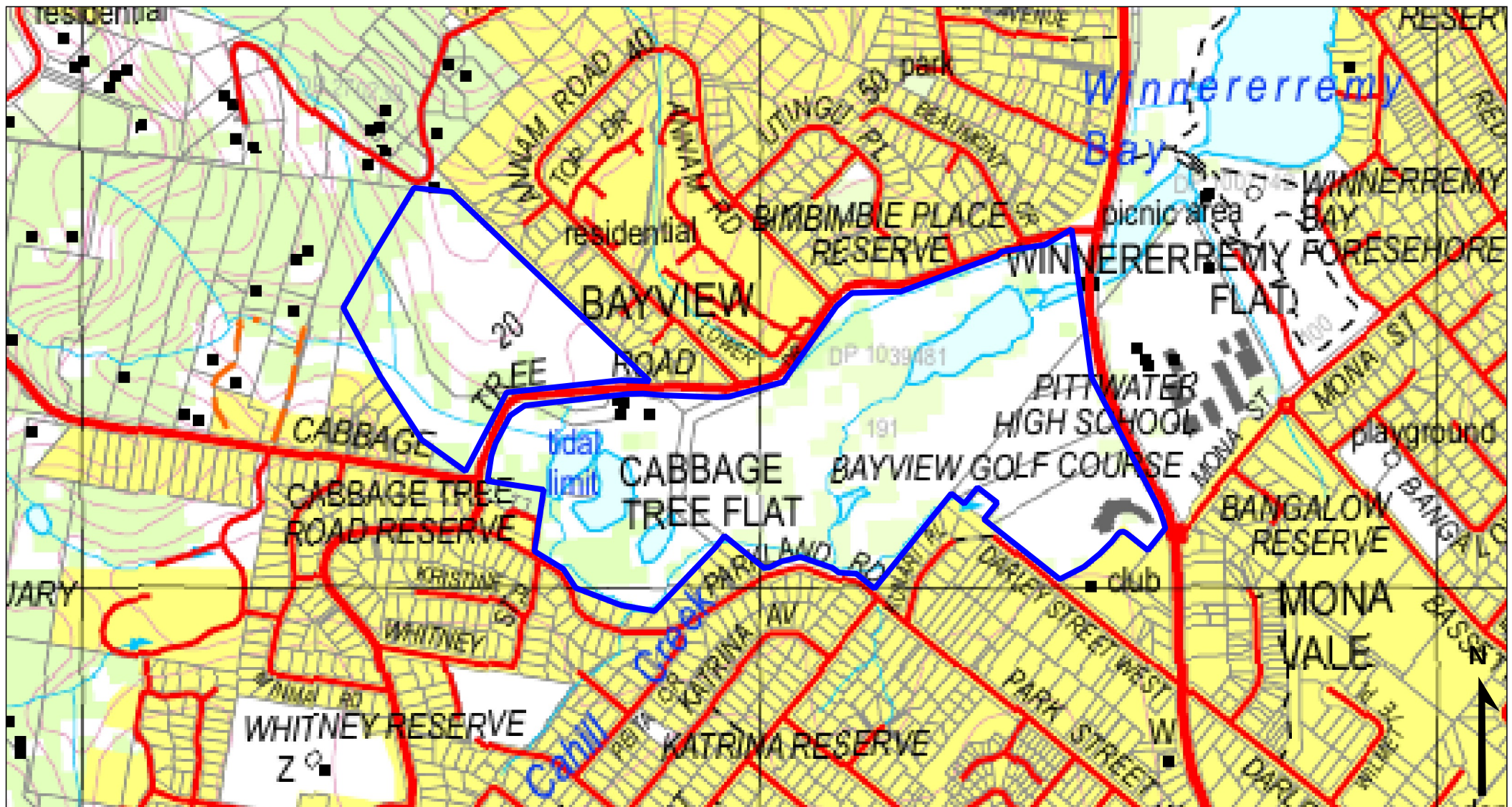
Figures



 Golf course boundary

0 400 800 m
Geocentric Datum of Australia 1994

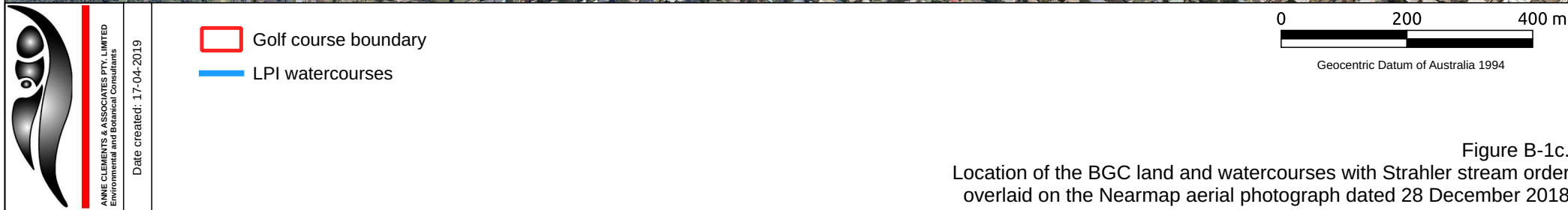
Figure B-1a.
Location of the BGC land overlaid on the Monavale 1:25 000 topographic map



 Golf course boundary

0 200 400 m
Geocentric Datum of Australia 1994

Figure B-1b.
Location of the BGC land overlaid on the Mona Vale 1:25 000 topographic map -detail





Date created: 17-04-2019

Golf course boundary

0 200 400 m
Geocentric Datum of Australia 1994

Figure B-2a.
Location of the BGC land overlaid on the Nearmap aerial photograph dated 28 December 2018



Winnererremy Bay
Foreshore Reserve



ANNE CLEMENTS & ASSOCIATES PTY. LIMITED
Environmental and Botanical Consultants

Date created: 17-04-2019

Golf course boundary

0 100 200 m
Geocentric Datum of Australia 1994

Figure B-2b.
Location of the BGC land overlaid on the Nearmap aerial photograph dated 28 December 2018 - detail

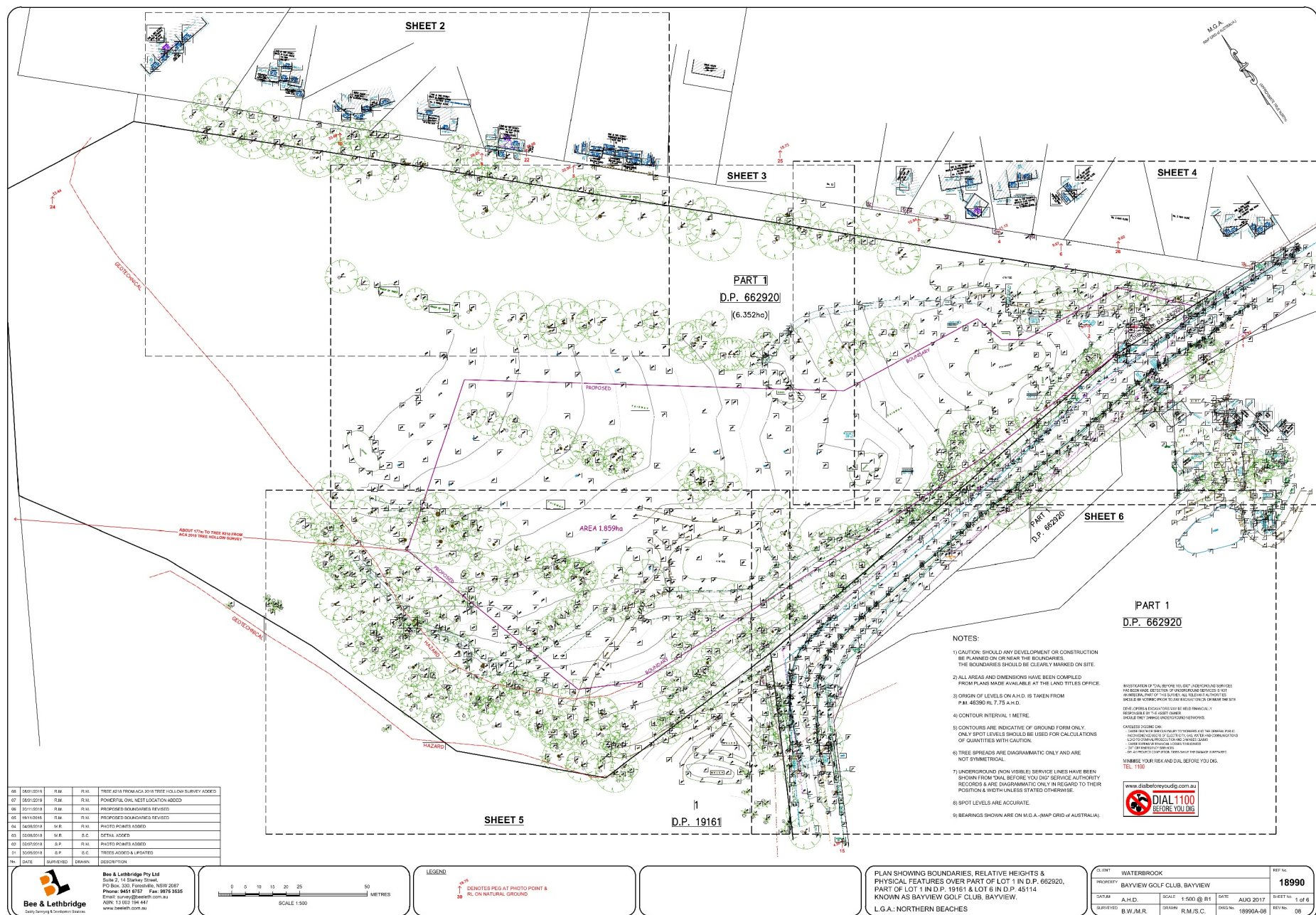


Figure B-3a.
Survey plan (Bee & Lethbridge, DWG No. 18990A-08, Rev 8, dated 8 January 2019)



<div>IMPORTANT NOTES: Do not scale from drawings. All dimensions to be checked on site before commencement of work. All dimensions to be brought to the attention of the Architect. Larger scale drawings and notes dimensions take precedence. This drawing is copyright and the property of the author, and must not be copied, copied or used without the express authority of MARCHESSE + PARTNERS INTERNATIONAL PTY LTD.</div> <div>DEVELOPMENT APPLICATION</div>	<div>REVISION DATE DESCRIPTION BY</div> <div>1 27/03/2019 DA1.06 DA</div>	<div>NOTES:</div> <div><ul style="list-style-type: none">For all outdoor and external design intent please refer Landscape Drawings.For tree and vegetation management plan please refer Arborist and Ecological report.For all external works, stonecrete and services refer Civil and Stormwater drawings.Coordinate system: Mapping Grid of Australia (MGA).Survey & map projection: GDA98, in map projection zone 86.Source and date of aerial imagery: 30 days prior to 14 August 2017.Source and date of aerial imagery: 30 days prior to 14 August 2017.</div>	<div>marchesepartners</div> <div>Marchese Partners International Pty Ltd Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia P +61 2 9922 4375 F +61 2 9929 5766 E info@marchesepartners.com www.marchesepartners.com</div> <div>Sydney • Brisbane • Canberra • Melbourne • Adelaide • Perth London • Kuala Lumpur • Auckland • Christchurch ABN 20 068 552 151</div>	<div>CLIENT WATERBROOK</div> <div>PROJECT WATERBROOK BAYVIEW CABBAGE TREE ROAD, BAYVIEW</div>	<div>DRAWING TITLE SITE PLAN - ROOF PLAN</div> <div>SCALE 1 : 500 @A1 DATE 27/03/2019 DRAWN PL CHECKED EBdC</div> <div>JOB 14023 DRAWING DA1.06 REVISION A</div>
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Figure B-3b.
Site plan – roof plan (Drawing DA1.06, Revision A, Marchese Partners dated 27 March 2019)



IMPORTANT NOTES: Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Landscape drawings are not to be used for construction purposes. This drawing is copyright and the property of the architect and must not be retained, copied or used without the express authority of MARCHESA PARTNERS INTERNATIONAL PTY LTD.	REVISION DATE DESCRIPTION A 27/03/2019 DA sub-use	REV 01	NOTES: For all exterior and external design interior please refer to Landform Overlay. For all road and vegetation management plans please refer to Address and Roadblock Overlay. For all water management plans please refer to the Water and Stormwater Overlay. Batter and road easement. Sydney Brisbane Canberra Melbourne Adelaide Perth London Kuala Lumpur Auckland Christchurch ABN 20 098 552 151	 marchesapartners Marchesa Partners International Pty Ltd Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia P +61 2 9922 4375 F +61 2 9929 5789 E info@marchesapartners.com www.marchesapartners.com	CLIENT WATERBROOK		DRAWING TITLE GOLF COURSE REDEVELOPMENT			
	PROJECT WATERBROOK BAYVIEW CABBAGE TREE ROAD, BAYVIEW	SCALE 1: 7500 @A1			DATE 27/03/2019		DRAWN PL	CHECKED EB&C		
DEVELOPMENT APPLICATION							JOB 14023	DRAWING DA1.02.4	REVISION A	

Figure B-3c.
Golf course redevelopment (Drawing DA1.02.4, Revision A, Marchesa Partners dated 27 March 2019)

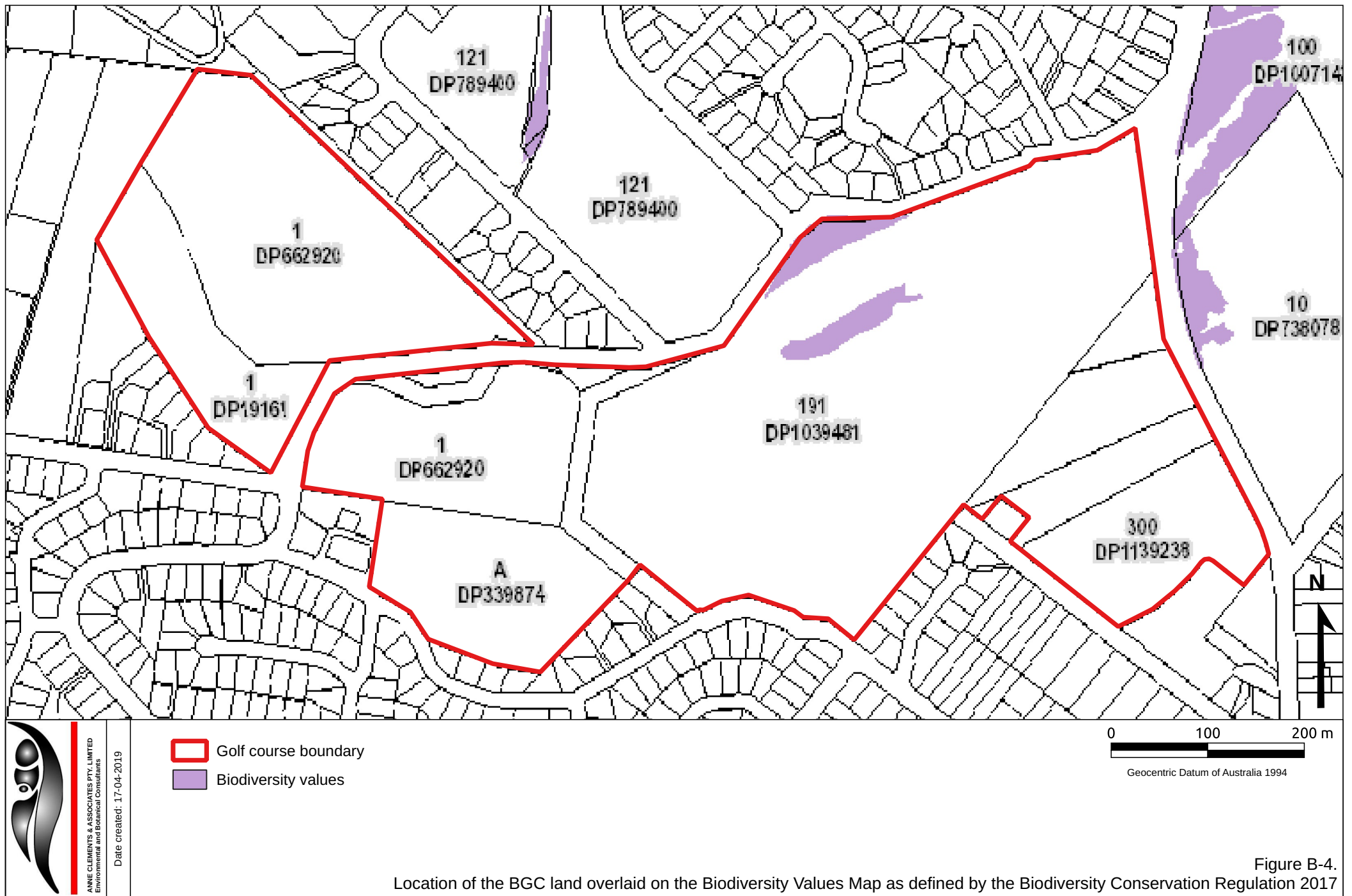


Figure B-4.
Location of the BGC land overlaid on the Biodiversity Values Map as defined by the Biodiversity Conservation Regulation 2017

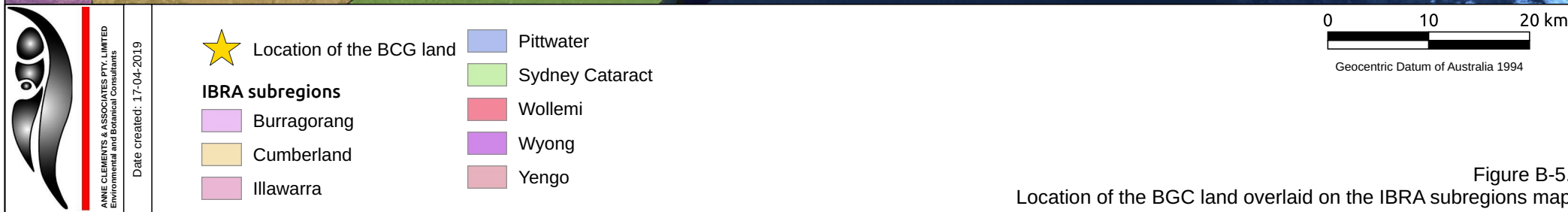
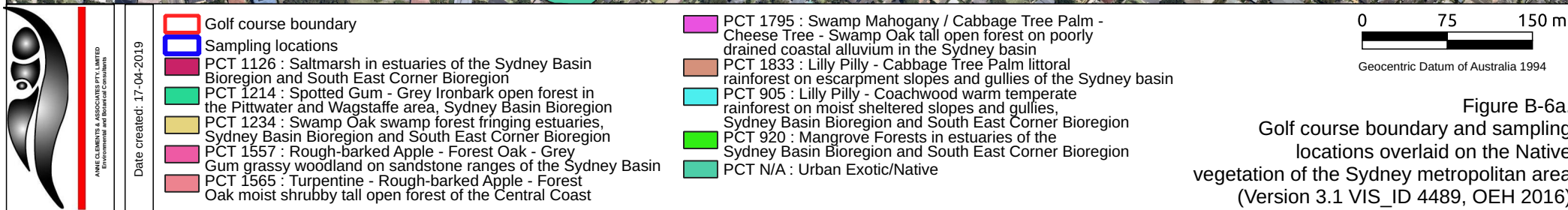
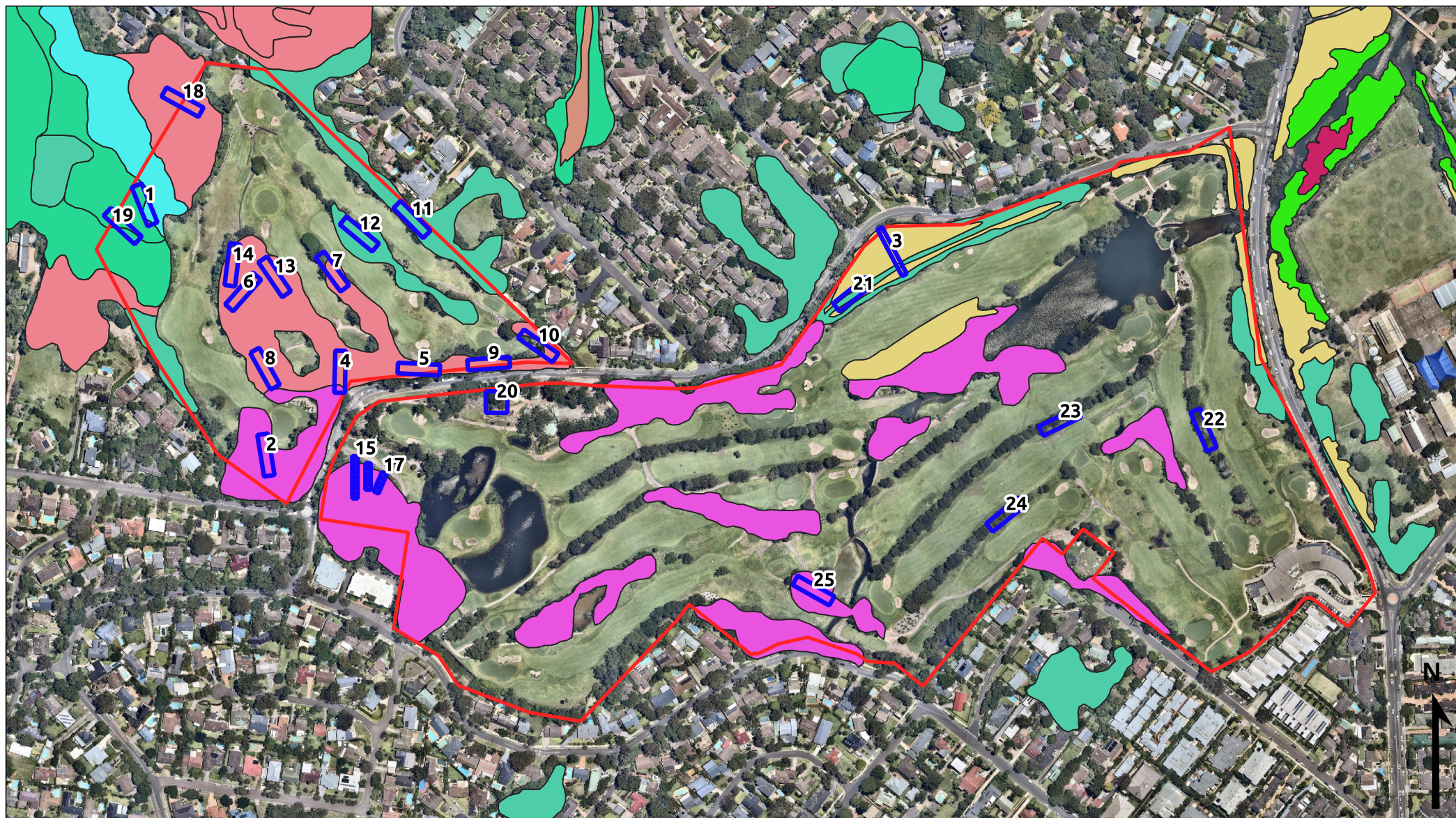
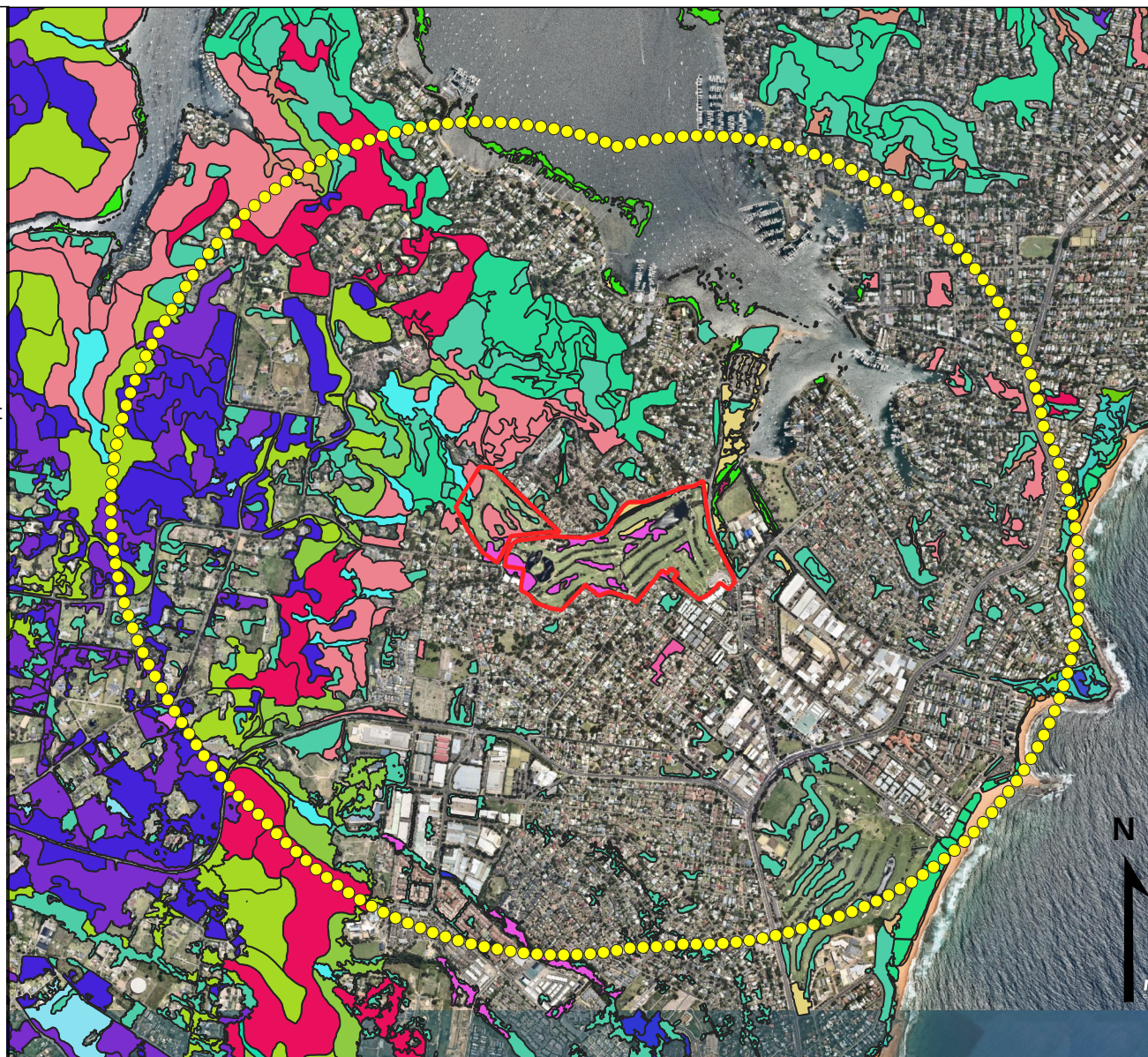


Figure B-5.
Location of the BGC land overlaid on the IBRA subregions map

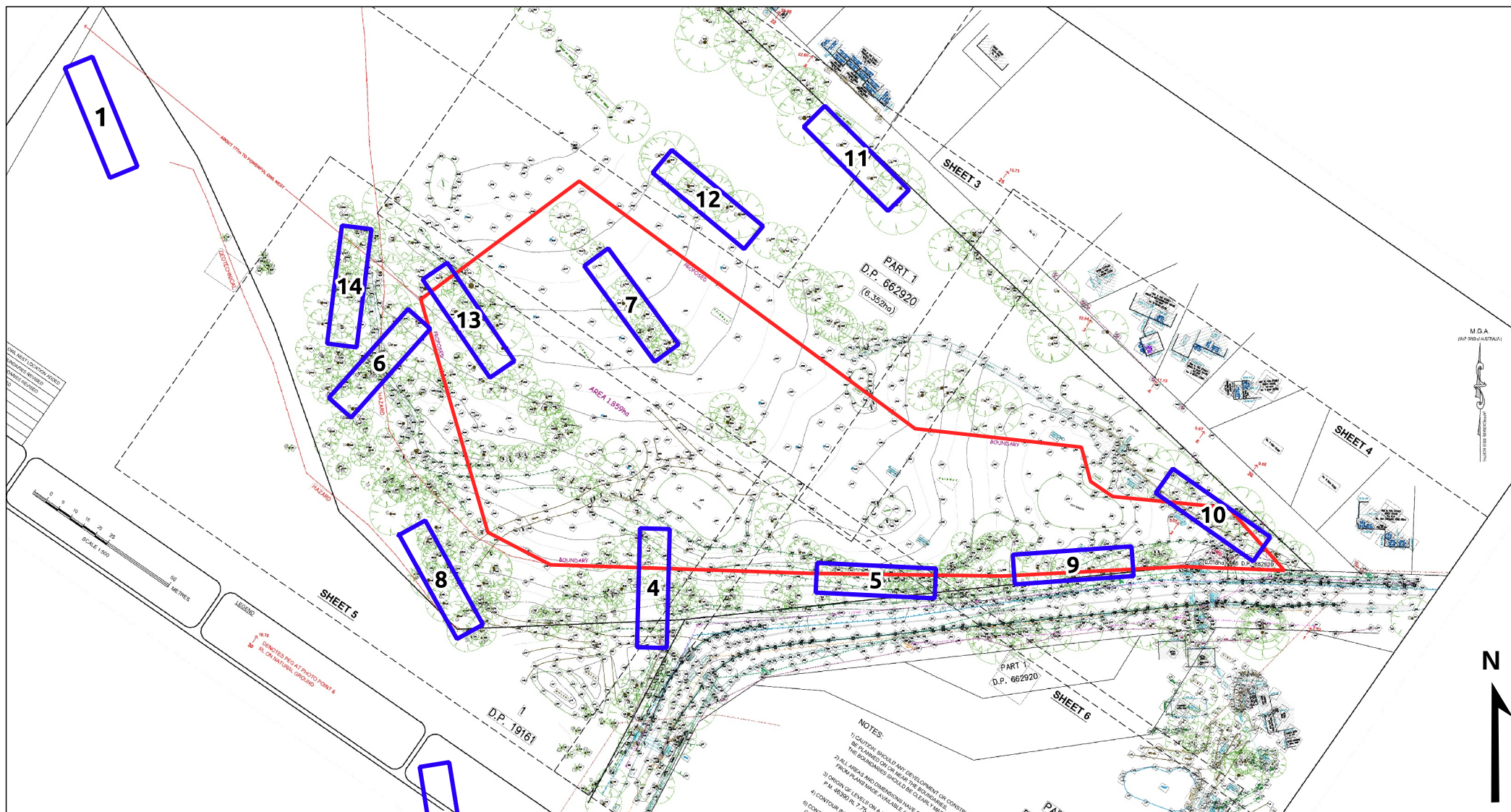




Date created: 17-04-2019

0 500 1000 m
Geocentric Datum of Australia 1994

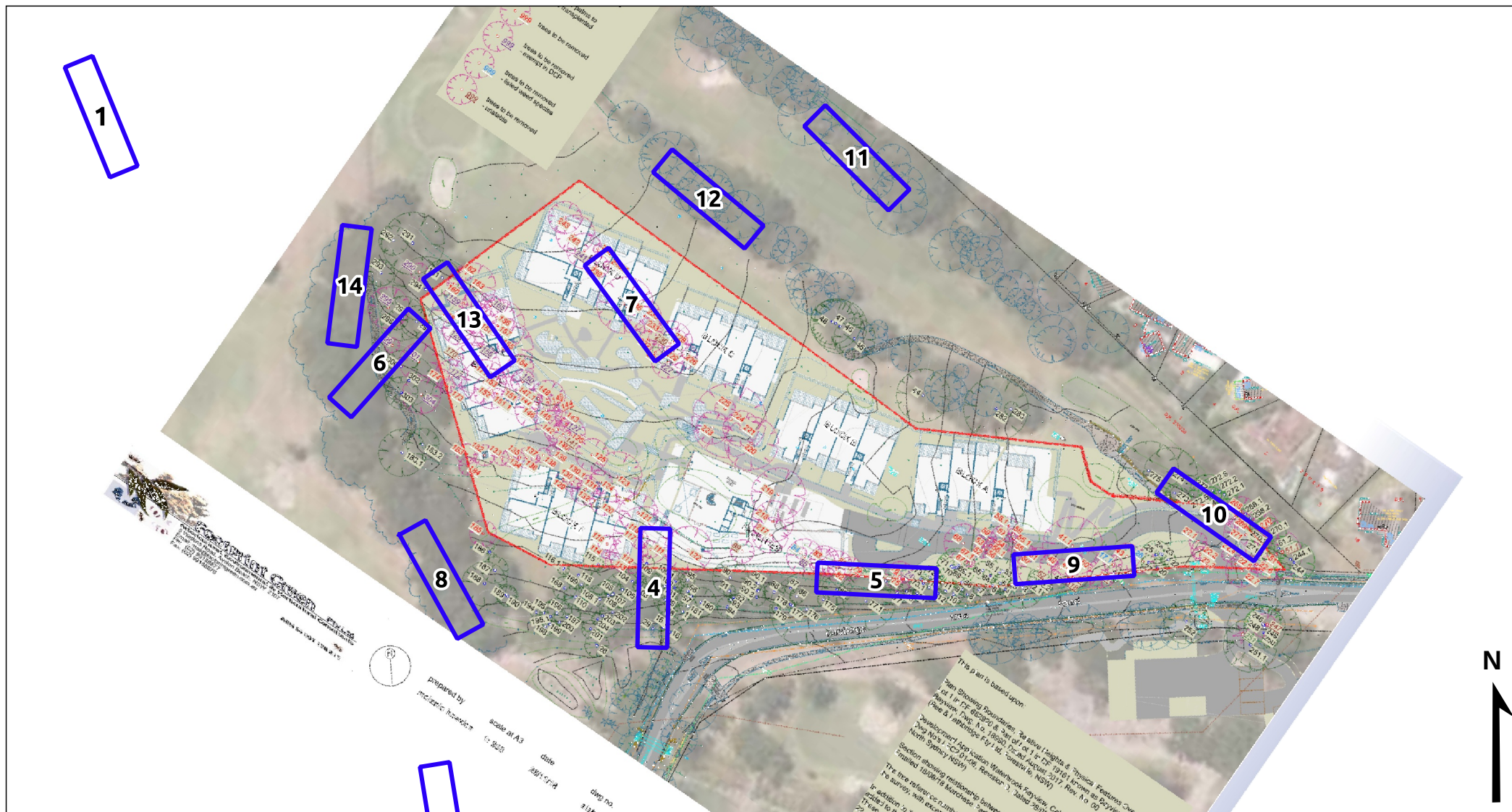
Figure B-6b.
Golf course boundary, 1500 m buffer area and the Native vegetation of the Sydney metropolitan area (Version 3.1 VIS_ID 4489, OEH 2016) overlaid on the Nearmap aerial photograph dated 29 December 2018



- Proposed building footprint area - seniors housing
- Sampling locations

0 50 100 m
Geocentric Datum of Australia 1994

Figure B-7.
Proposed building footprint area and sampling locations overlaid on the survey plan (Bee & Lethbridge, DWG No. 18990A-08, Rev 8, dated 8 January 2019)



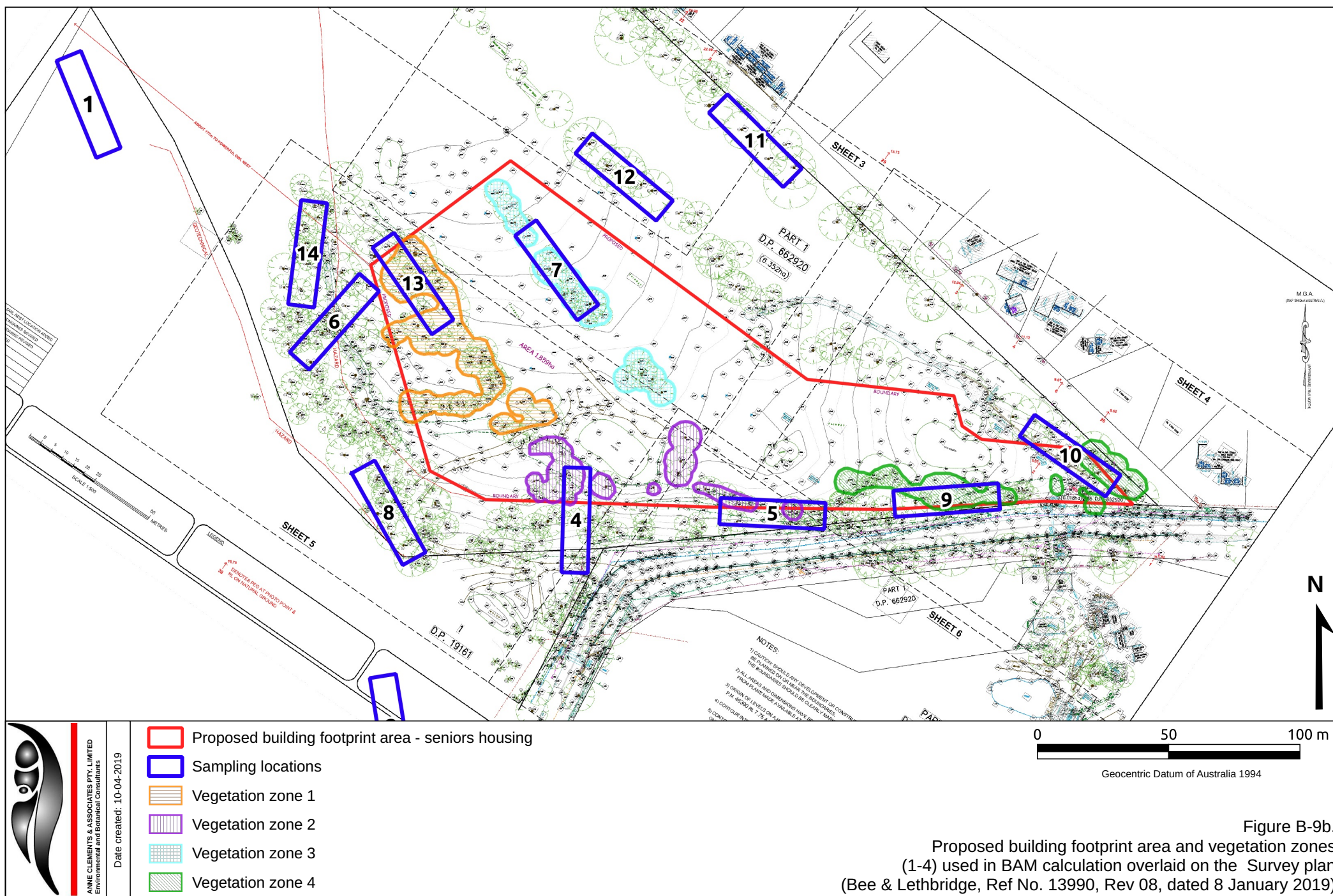
Date created: 10-04-2019

- Proposed building footprint area - seniors housing
- Sampling locations

0 50 100 m
Geocentric Datum of Australia 1994

Figure B-8.
Proposed building footprint area and sampling locations
overlaid on the proposed development – tree retention and
removal (Footprint Green, Rev 9.5, dated 26 November 2018)





Appendices

Appendix 1. Biodiversity Values Map threshold tool and map

Biodiversity Offset Scheme (BOS) Entry Threshold Map



0.5 0 0.27 0.5 Kilometers

GCS_GDA_1994

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

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NSW Environment & Heritage

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	08/04/2019 4:04 PM	BDAR Required*
Total Digitised Area	34.51 ha	
Minimum Lot Size Method	Lot size	
Minimum Lot Size	0.01 ha	
Area Clearing Threshold	0.25 ha	
Area clearing trigger Area of native vegetation cleared	Unknown [#]	Unknown [#]
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	yes	yes
Date of the 90 day Expiry	N/A	

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor> to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is "likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies with all aspects of the *Biodiversity Conservation Act 2016*.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature _____ Date: 08/04/2019 04:04 PM

Appendix 2. Advice from the Office Environment and Heritage (OEH) regarding planted trees



Anne Clements <acabotanic@gmail.com>

ECA Information Email: Classifying habitat for threatened species when little or no remnant veg is present

Amy Rowles <admin@ecansw.org.au>
To: mail@acabotanic.com

31 August 2018 at 20:00

Dear Members,

You may be interested in this question to OEH and their answer. Courtesy of Daniel McDonald.

Questions to OEH were:

I am undertaking a BDAR assessment and I have a few questions.

Context: Within the proposal site (Western Sydney) there are areas of planted vegetation which include several exotic and non-local native species not occurring in Cumberland Plain Woodland.

Several mature trees of E. moluccana and E. tereticornis comprise the remaining natural veg on the site. We will classify these areas as a form of Cumberland Plain Woodland.

In other areas the following native (NSW) species have been planted in several patches:

Eucalyptus microcorys

Melaleuca bracteata

Acacia binervata

Melia azederach

Eucalyptus saligna

Eucalyptus camaldulensis

Callistemon spp. (C. viminalis & related cv's)

Corymbia ficifolia (WA)

Corymbia calophylla (WA)

Grevillea Hybrid cultivars (various)

Myoporum debile (planted)

These species are native to NSW. How are these patches of vegetation classified? They are not (part) of a Plant Community Type that is representative of any natural community. Therefore they cannot be assigned a PCT. Is there a PCT number for this type of vegetation?

Many of the species above are habitat for threatened species e.g.: Grey-headed Flying Fox, thus I assume it must be included in the assessment. Please elaborate.

2. How are mixed planted areas to be treated ?

(native / non-local-native / exotic)

3. I have attached a screengrab of the import template for the BAM calculator (see below) and the original excel spreadsheet import template file.

The series of funTreeStem columns will only allow a value of 0 or 1. Yet the field sheet requires that the actual number of trees/stems for each size class is recorded.

Eg: A 20 x 50 plot may contain 12 trees in the 20 to 30 size class. However the excel spreadsheet will only accept a value of 0 or 1. What value is the correct input for the spreadsheet?

Z	AA	AB	AC	AD	AE
funTreeStem5to10	funTreeStem10to20	funTreeStem20to30	funTreeStem30to50	funTreeStem50to80	funTreeRegen
[0,1]	[0,1]	[0,1]	[0,1]	[0,1]	Number

Response from OEH ROD LMBC Support Mailbox:

Where there is native vegetation on site that does not conform to a PCT OEH's advice is to apply the BAM and prepare a BDAR assessing it against the best-fit PCT. OEH will look to provide some additional advice on this to assist assessors in the short term. In the medium term, it appears the best solution will be to include an

additional streamlined module in the BAM to assess planted vegetation and we hope to have this in place during the second half of 2018.

Keep in mind that impacts on planted vegetation first need to be above the BOS threshold to trigger a BAM assessment. If impacts are above the threshold then legally the BAM must be applied and a BDAR prepared.

Yes, all vegetation that is being used by threatened species requires assessment as threatened species habitat. If the vegetation being used by the threatened species is exotic it should be assessed as a prescribed impact under the BAM (sections 6.7, 8.2, 9.2, 9.3.3 and 9.4 of the BAM).

In the BAM calculator all size classes are recorded as present or absent except for large trees which are recorded as an actual count (note: large tree size varies between PCTs), therefore if a size class is present you should add 1 into the spreadsheet and if the size class is absent you should add 0. In your example below you would add a 1. Recording actual numbers on the field sheet is a only guide but is recommended as best practice, especially for stewardship sites as the information may be useful when considering management options for the site.

The content of this email is for information of ECA members only. If the information originates from outside the ECA, it does not necessarily represent the views of the ECA or its members.

Members who wish to be removed from the ECA Information Email List should contact the ECA Administrative Assistant at admin@ecansw.org.au.

Amy Rowles

ECA Administrative Assistant

admin@ecansw.org.au

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415 Parishes Rd, Hilldale, NSW 2420

www.ecansw.org.au



**Appendix 3. Hollow-bearing trees recorded on and adjoining the Bayview Golf Club land
north of Cabbage Tree Road recorded by ecologists from Anne Clements & Associates
on 10, 17, 21 May 2018**

Hollow-bearing trees recorded on 10 May 2018

Tree no	Tree species	Easting	Northing	GPS error	Ht (m)	DBH (cm)	Comments from Footprint Green	Comments/observations	Potential Habitat?	Within development	Proposed to remove/retain (Footprint Green 2018)
51	<i>Eucalyptus robusta</i>	341821	6273310	3m	18	76	Upper branches have been pruned for o/head wires on the southern side. The tree has predominately epicormic growth and Parsonsia vine throughout the canopy. The tree has a trunk hollow on the western side at 6m and there is evidence of previous limb failures.	Fauna scratch marks on trunk. Hollow on stump at 6m. 30 cm x 5cm.	Yes	Adjacent	Remove
107	<i>Allocasuarina torulosa</i>	341598	6273301	4m	13	30	The tree appears to be suppressed by the adjacent vegetation and a section of the tree has failed at 4m where a hollow is evident.	Hollow goes straight through as trunk has split. Open fissure / chimney @ 4m.	Yes	Adjacent	Retain
112	<i>Angophora floribunda</i>	341624	6273310		16	42 & 24	N/A. (No reference to hollows)	Three hollows, 1. on branch in collar junction @ 7m ~7cm diam. 2. on trunk @ 5m ~5cm diam. 3. potential hollow in failed branch @ 9m.	Yes	Yes	Remove
130.1	<i>Angophora floribunda</i>	341586	6273335	3m	8	30	The tree has a sparse canopy with reduced leaf size and hollows at 2.5m.	1. top of branch upwards facing fissure 30x5cm @ 2.5m. 2. 3cm diam probably shallow in junction of branch@3m. 3. possible branch scar 4cm diam @4m. Photos 3575-79.	Yes	Yes	Remove
125 (Spot Q)	<i>Angophora floribunda</i>	341395	6273346	3m	19	54 & 50	N/A. (No reference to hollows)	1 small hollow on branch @ 6m depth unknown.	Yes	Yes	Remove
144	<i>Angophora</i>	341586	6273363	3m	10	34	The central leader has failed	1 central leader failed – up to	Yes	Yes	Remove

Tree no	Tree species	Easting	Northing	GPS error	Ht (m)	DBH (cm)	Comments from Footprint Green	Comments/observations	Potential Habitat?	Within development	Proposed to remove/retain (Footprint Green 2018)
	<i>floribunda</i>						at 10m and only has suckering branches at 2.5m alive. There is a hollow on the western side in the main trunk and the tree appears to have a history of limb failure.	5cm diameter. Potential hollow on top of central leader @ 5m			
146	<i>Eucalyptus paniculata</i>	341573	6273353	3m	20	56	The tree appears to be suppressed by the adjacent vegetation. The tree has a shallow hollow on the southern side of the trunk at 4m where a limb has failed.	Very shallow , not considered to be viable habitat	no	Yes	Remove
149	<i>Angophora floribunda</i>	341578	6273359		16	40	N/A. (No reference to hollows)	Hollow on dead branch at 4m	Yes	Yes	Remove
151	<i>Angophora floribunda</i>	341567	6273366		18	43	The tree has an extensive basal hollow that extends into the trunk on the southern side. There is evidence of termite activity.	1 basal hollow – very deep with lorikeet feathers @ base of hollow indicating use.	Yes	Yes	Remove
158	<i>Eucalyptus umbra</i> (ID'd by FPG as <i>E. scias</i>)	341556	6273391	3m	22	80	The tree has an extensive basal hollow and is carrying large sections of dead wood. Parsonsia vine is growing on the tree.	1 basal hollow not considered usable for habitat – too shallow	no	Yes	Remove
164	<i>Angophora floribunda</i>	341560	6273390	3m	17	72 & 40	N/A. (No reference to hollows)	Dead tree. Termite nest with hollow in it at 8m.	Yes	Yes	Remove
166	<i>Angophora floribunda</i>	341364	6273390	3m	18	35 & 40	The southern leader has failed at 8m where a hollow has developed and there are signs of decay and termites. epicormic growth is evident	Southern branch has failed. Chimney @ 6m	Yes	Yes	Remove

Tree no	Tree species	Easting	Northing	GPS error	Ht (m)	DBH (cm)	Comments from Footprint Green	Comments/observations	Potential Habitat?	Within development	Proposed to remove/retain (Footprint Green 2018)
							through the tree.				
170	<i>Angophora floribunda</i>	341553	6273378		6	28 & 18	N/A. (No reference to hollows)	Central trunk failed, large hollow @ 5m.	Yes	Yes	Remove
188 (ACA Spot R)	<i>Eucalyptus paniculata</i>	341557	6273298		22	80	The tree has a large trunk wound where a leader has failed at 9m-10m. The tree has a swelling of the trunk at 4m where there is a hollow with Termites on the southern side.	Possible small 'fissure' type hollow. It is not clear whether there is an actual opening into the tree here or if the bark is just heavily exfoliated and exposing dead wood. A female wood duck (a hollow breeding species) was observed investigating the fissure however it did not enter or exit the tree.	Possible	No	Retain
244	<i>Eucalyptus robusta</i>	341830	6273309	4m	17	54 & 50	The tree has predominately epicormic growth and a Parsonsia vine is growing in the tree. There is evidence of previous limb failures and the tree has a trunk hollow at 6m.	Hollow on stump at 3m	Yes	Adjacent	Retain
252	<i>Eucalyptus robusta</i>	341794	6273282	4m	15	68	The tree has a trunk hollows at 4m and at 5m on the northern side.	Two hollows: 1 on main trunk 10 x 5cm @ 6m; one well used with scratched entrance hole ~5cm diam @ 5m.	Yes	Within road reserve	Retain with Designed & General Tree Protection Measures
ACA Spot L	<i>Eucalyptus scias</i>						N/A. (Not assessed by Footprint Green)	Medium sized hollow in one of the main limbs. Hollow apparently being utilised by a pair of Galahs which were observed exiting the hollow.	Yes	No	N/A. (Not assessed by Footprint Green)

Tree no	Tree species	Easting	Northing	GPS error	Ht (m)	DBH (cm)	Comments from Footprint Green	Comments/observations	Potential Habitat?	Within development	Proposed to remove/retain (Footprint Green 2018)
Spot N	<i>Syncarpia glomulifera</i>						N/A. (Not assessed by Footprint Green)	A large 'chimney' type hollow. The tree was completely hollowed out at the base with an apparent opening in the top. Suitable for microbats.	Yes	No	N/A. (Not assessed by Footprint Green)
Spot P	<i>Eucalyptus paniculata</i>	341618	6273382		-	-	N/A. (No reference to hollows)	Possible 'fissure' type hollow. It is not clear whether there is an actual opening into the tree here or if the bark is just heavily exfoliated.	Possible	Yes	Remove
Spot S	<i>Angophora floribunda</i>						N/A. (Not assessed by Footprint Green)	Medium-large size hollow in the trunk of an <i>Angophora floribunda</i> , Spot S. A hollow of this size is suitable for large parrots and potentially even owls.	Yes	No	N/A. (Not assessed by Footprint Green)
Spot T	<i>Eucalyptus paniculata</i>						N/A. (Not assessed by Footprint Green)	A large fissure type hollow in mature tree Suitable for microbats	Yes	No	N/A. (Not assessed by Footprint Green)

Hollow-bearing trees recorded on 17, 21 May 2018

Tree #	Tree species	Easting	Northing	Height (m)	DBH (cm)	Comment	Size	Potential Fauna Habitat?
191	<i>Eucalyptus scias</i>	341491	6273578	20	86	Two hollows. 1. A W facing basal hollow on main trunk at 2 m (photo 2140, 2141) 2. A NE facing hollow, a fissure on main trunk from 8 to 15 m (obstructed by leaves in photos 2133, 2134)	1. Large 2. Medium	Microbat potential in hollow 2
192	<i>Eucalyptus paniculata</i>	341512	6273555	28	95	Three hollows 1. Dead branch with hollow entry on end facing N (photo 2131) 2. Small hollow on SE branch on scar where limb has failed at 12 m facing W 3. Fissure on SW branch at 22 m facing N	1. Small 2. Small 3. Medium	Possible, 1 and 3 could support a microbat roost
193	Large hollow log on ground	341485	6273577	-	-	Large hollowed log on the ground with medium hollow in centre	Medium	Invertebrate fauna only
194	<i>Allocasuarina torulosa</i>	341470	6273569	5	20	Dead tree with Chimney hollow forming from the ground with a second entry on the opposite side of trunk	Small	Potential microbat, unsure of depth
195	<i>Allocasuarina torulosa</i>	341484	6273348	5	23	Dead tree from 3 m to top with 'chimney'	Small	Potential microbat, unsure of depth
196	<i>Allocasuarina torulosa</i>	341489	6273546	11	21 & 22	Two trunks both dead, fissure with potential for hollowed out trunk	Medium	Decent microbat roost potential
197	Dead stag	341462 Hollow	6273542	12	96	Two main limbs have failed, the remaining stags could be hollow, however no visual confirmation could be made	Possible	Unsure
199	<i>Eucalyptus scias</i>	341443	6273564	18	36	Two hollows 1. Main trunk (still alive), fissure at 15 m approximately 2 m long and 10 cm wide facing N 2. Failed second trunk, mostly dead wood with multiple entries	1. Medium 2. Medium	Decent microbat roost potential
200	<i>Eucalyptus scias</i>	341444	6273568	20	47	Fissure on main trunk at 8 m facing N, unsure of depth	Medium	Dependent on depth, could provide microbat

Tree #	Tree species	Easting	Northing	Height (m)	DBH (cm)	Comment	Size	Potential Fauna Habitat?
								habitat
201	<i>Angophora floribunda</i>	341442	6273548	23	32	Dead branch at 17 m facing E	Small	Potential
202	<i>Angophora floribunda</i> (dead)	341440	6273536	10	37	Dead trunk split down the middle with a large entrance	Medium	No signs of fauna use
203	Dead stag	341455	6273519	13	53	Potential chimney (no visual confirmation), with large fissures down the trunk	Medium	Dependent on depth of hollow, could be good bird habitat
204	<i>Allocasuarina torulosa</i> (dead)	341476	6273525	6	23	Loose bark with a possible chimney and small fissure from top of trunk	Small	Possible microbat habitat in bark.
205	<i>Angophora floribunda</i>	341479	6273509	24	67	Large hollow on dead branch at 22 m	Medium	Medium sized bird habitat
206	<i>Allocasuarina torulosa</i> (dead)	341484	6273503	5	19	Fissure on main truck	Small	Potential microbat
207	<i>Eucalyptus paniculata</i>	341486	6273513	3	30	Dead stag with open bark facing S	Medium	Bird nesting potential
208	<i>Angophora floribunda</i>	341489	6273486	24	56	2 hollows 1. Dead branch with small opening at 12 m facing W 2. Dead branch with small opening at 14 m facing E	Small	Possible
209	<i>Eucalyptus scias</i>	341472	6273486	27	69	Knob on main trunk at 7 m facing NW	Small	Possible for small microbats
211	<i>Eucalyptus scias</i>	341471	6273493	24	53	Knob on W trunk at 8 m facing NW	Small	Possible for small microbats
212	Dead stag	341464	6273495	3	18	Completely hollow stump forming a 'chimney' hollow	Medium	Yes
213	Dead stag	341468	6273506	17	63	Possible branch hollow, not very deep	Small	Unlikely
214	Dead rainforest tree	341444	6273491	6	7	Dead rainforest tree, hollows on main trunk with multiple entries	Small	Possible

Tree #	Tree species	Easting	Northing	Height (m)	DBH (cm)	Comment	Size	Potential Fauna Habitat?
215	Dead wood	341444	6273491	2	11	Dead wood (potential vine) small hollow in the trunk with multiple entries	Small	Possible microbat
216	<i>Eucalyptus scias</i>	341454	6273469	17	57	Basal hollow with small entry facing S	Small	Unlikely
217	Dead stag	341430	6273506	19	82	Potential chimney hollow, unable to confirm	Possible	Possible
218	<i>Eucalyptus scias</i>	341396	6273509	30	208	Two hollows 1. Very large hollow at 12 m facing N 2. On second trunk another large hollow at 20 m facing NW	Large	Yes, Likely Powerful Owl hollow
219	<i>Eucalyptus scias</i>	341420	6273485	23	60	Basal hollow	Small	No
220	<i>Angophora floribunda</i>	341428	6273489	20	49	Basal hollow on main trunk facing SW with a large entrance on the other side of trunk	Large	Yes
221	<i>Allocasuarina torulosa</i>	341432	6273427	19	78	Two hollows 1. A large basal hollow 2. A fissure main trunk	1. Large 2. Large	Yes
222	<i>Eucalyptus robusta</i>	341618	6273272	25	74 & 22	Two hollows 1. Potential chimney hollow on failed main trunk at 21 m 2. on E branch on scar facing N @ 22m	1. Potential 2. Medium	Unlikely
223	Dead stag	341615	6273280	27	40	One hollow, chimney on the main trunk, with a second entry a few metres below a facing NW	Small	Possible microbat habitat if the hollow is deep
224	<i>Eucalyptus robusta</i>	341597	6273279	19	54	2 Potential hollows 1. Potential hollow with juvenile fig tree growing out of fork in tree 2. Potential hollow at 5 m facing W	1. Small 2. Small	Possible
225	<i>Eucalyptus robusta</i>	341610	6273254	27	89	3 Hollows 1. On main trunk, a fissure approximately 20 cm x 1 m, facing NW at 18 m 2. On SW broken branch, small potential chimney at 12 m 3. Chimney on broken NE branch, facing NW at 16 m	1. Medium 2. Small 3. Small	Yes, in hollow 1
226	Dead stag	341603	6273242	2	90	Stump with large hole in centre	Medium	Unlikely

Tree #	Tree species	Easting	Northing	Height (m)	DBH (cm)	Comment	Size	Potential Fauna Habitat?
227	Dead stag	341575	6273214	18	93	Multiple hollows or one large hollow with multiple entries. Chimney at 18 m, potentially continues down to a large additional entry at 14 m facing NW. Another possible 2 'chimney' hollows on failed limbs, facing S	Large	Yes, large birds could in habitat this hollow
228	Dead stag	341586	6273192	9	55	Failed limb, forming a chimney	Medium	Unknown
229	<i>Angophora floribunda</i>	341564	6273184	21	28	Chimney where limb has failed, facing N at 16 m	Possible	-
230	<i>Angophora floribunda</i>	341556	6273182	21	28	4 Hollows 1. Hole in termite nest at 10 m facing S 2. On branch from base at 2 m, limb has failed, forming a chimney, facing NW 3. Basal hollow at 0.5 m, facing W	1. Small 2. Small 3. Small	Unlikely
231	Dead stag on ground	341524	6273198	-	-	Dead log on ground with medium size hollow	Medium	Possible
232	Dead stag	341521	6273193	12	96	Large hollow on main trunk 3 m x 25 cm, facing SE at 1 m (height). Potential for hollow to continue to top of trunk (chimney)	Large	Good fauna habitat
233	Dead stag	341510	6273206	8	30	Chimney at 8 m with second branch dead and potentially hollow	Medium	Potential good fauna habitat is the hollow is deep
234	<i>Eucalyptus robusta</i>	341536	6273243	23	78	3 Hollows 1. On trunk scar at 6 m, approximately 10 cm in diameter. Visible scratches on opening indicating use by fauna 2. On N side of tree, bottom of branch at 18 m facing W 3. Broken limb on SW side forming a chimney at 12 m	1. Small 2. Medium 3. Small	Yes, visible signs of use
235	<i>Eucalyptus robusta</i>	341537	6273245	21	77	3 Hollows 1. At 9 m facing S in vertices of two branches 2. On trunk scar at 10 m on main trunk, facing SW	1. Small 2. Small 3. Medium	Yes, scratch marks indicating use by fauna

Tree #	Tree species	Easting	Northing	Height (m)	DBH (cm)	Comment	Size	Potential Fauna Habitat?
						3. at 9 m on NW side of tree with signs of fauna use		
236	<i>Eucalyptus robusta</i>	341527	6273255	20	76	3 Hollows 1. Basal hollow, very deep with small opening on N side on main trunk 2. Basal hollow on E side on main trunk 3. on main trunk at 3 m facing NW	1. Small 2. Small 3. Small	Yes, scratch marks on hollow entry
237	<i>Eucalyptus robusta</i>	341530	6273239	10	45	Main trunk has failed and formed a chimney	Medium	Possible
238	<i>Eucalyptus robusta</i>	341522	6273233	24	86	Failed limb at 12 m, facing SE with scratch marks on limbs and main trunk	Medium	Yes, indication of fauna
239	<i>Eucalyptus scias</i>	341407	6273471	19	62	Small hollow on S branch at 5 m, facing W	Small	Possible, unable to determine depth of hollow
240	<i>Angophora floribunda</i>	341421	6273486	18	57	Basal hollow with secondary large entry at 5 m facing S	Large	Yes, could support large birds
241	<i>Angophora floribunda</i>	341436	6273430	20	51	Potential for a chimney hollow on dead branch	Potential	Unable to confirm depth of hollow
242	<i>Angophora floribunda</i>	341447	6273424	17	44	2 Hollows 1. Large hollow on main trunk with scratch marks facing SW 2. Potential failed limb chimney	1. Large 2. Potential	Yes, scratch marks indicating fauna use
243	<i>Angophora floribunda</i>	341445	6273422	12	40	Branch has failed at 12 m forming chimney, facing NE	Medium	Possible
244	Dead stag	341439	6273412	7	27	Large entry on trunk scar at 4 m continuing to a chimney	Large	Yes
245	<i>Angophora floribunda</i>	341418	6273387	14		Basal hollow on NE with second entrance on SW side on main trunk at 2 m	Large	Possible
246	<i>Eucalyptus paniculata</i>	341757	6273380	25	85	3 possible hollows 1. Potential hollow on failed limb at 7 m facing NW 2. Potential hollow on failed limb at 12 m , facing W 3. Potential hollow on failed limb at 15 m, facing W	1. Possible 2. Possible 3. Possible	Unable to determine depth of hollow

Tree #	Tree species	Easting	Northing	Height (m)	DBH (cm)	Comment	Size	Potential Fauna Habitat?
247	<i>Eucalyptus scias</i>	341725	6273414	22	78	Fissure on main trunk at at 5 to 8 m, facing W	Large	Visible scratch marks indicating use by fauna
248	<i>Eucalyptus paniculata</i>	341724	6273420	23	89	Failed limb at 6 m, facing N, 10cm diameter	Small	Possible
249	<i>Eucalyptus paniculata</i>	341696	6273430	26	98	Possible hollow in dead wood at 16 m	Possible	Unable to determine depth of hollow
250	<i>Eucalyptus paniculata</i>	341697	6273429	24	73	Failed limb at 19 m, facing N	Small	Possible for microbats
251	<i>Eucalyptus scias</i>	341669	6273455	23	121	Numerous small hollows (at least 5). at least one in use with scratch marks at 18 m	Medium	Yes, visible signs of fauna use
253	<i>Eucalyptus scias</i>	341628	6273486	25	112	One hollow on trunk scar at end of broken limb at 15 m, facing N	Small	Possible
254	Dead stag	341620	6273511	8	66	Termite nest in intersection of two limbs with a medium sized hole in the nest at 8 m, facing S	Medium	Possible
255	<i>Eucalyptus scias</i>	341590	6273538	23	72	Small hollow in dead wood at 3 m, facing E	Small	Possible if deep
256	<i>Corymbia gummifera</i>	341578	6273554	24	89	2 Hollows 1. On main trunk, N facing at 3 m 2. On N branch at 14 m	1. Small 2. Small	Possible
257	Dead stag	341564	6273566	9	47	Hole in termite nest at 8 m	Small	Possible
258	Dead stag	341552	6273581	2	43	Large stump with chimney hollow at 2 m	Large	Unlikely

Appendix 4. Glen Hoyer of Fly By Night Bat Surveys Pty Ltd, Comments on potential impacts to microbats at Bayview Golf Course, NSW, from proposed seniors living facility. Letter dated 16 November 2018.

Glenn Hoyer
Fly By Night Bat Surveys Pty Ltd
PO Box 271
BELMONT NSW 2280
Tel. (02) 4947 7794

to:

Anne Clements
Anne Clements & Associates Pty Ltd
Office 2/3 Harbourview Crescent
MILSONS POINT NSW 2061
Tel. (02) 9955 9733

16th November 2018

Dear Anne

Following our telephone conversation on 15th November 2018, I wish to clarify some issues relating to microbats occurring on the proposed seniors living facility (PSLF) at the Bayview Golf Course, Bayview, New South Wales. In July 2017 I was requested by Anne Clements & Associates to undertake a summer microbat survey of the area proposed for a seniors living facility on Bayview Golf Course. The survey was to provide baseline data for a monitoring report and augment microbat surveys of the site undertaken during April and May of 2014 by Footprint Green (Footprint Green 2014). I did not undertake surveys or assessment pertinent to the Golf Course upgrade.

I undertook harp trapping at two sites within the PSLF and a third site located along a drainage line to the southwest. Three lactating Southern Myotis (*Myotis macropus*) were Captured at the site along the drainage line together with lactating females of two non-threatened microbat species, Gould's Long-eared Bat (*Nyctophilus gouldi*) and the Little Forest Bat (*Vespadelus vulturnus*). Two additional female Gould's Long-eared Bats were captured at harp trap sites within the site of the PSLF. Microbat echolocation call survey was undertaken at seven sites within the footprint of the PSLF as well as an additional site along the drainage line to the southwest.

While I was commissioned to undertake a microbat survey and not undertake an impact assessment of the proposal on microbat populations at the site, I did recommend some measures in my short report to minimise impacts on microbat populations. This included the reduction of artificial lighting associated with the proposal and its direction downward to minimise impacts on microbat prey populations in the vicinity. I also recommended the examination of any potential roost trees within the footprint of the PSLF for use by any threatened microbat species as well as clearing of necessary trees within the footprint at times of the year when the target species do not have dependent young or are likely to be in torpor. I am confident that if these measures are adopted, impacts on both threatened and protected microbat species utilising the vicinity of the PSLF should be minor.

With regard to the Southern Myotis, foraging by this species would occur predominantly over permanent water bodies along drainage lines surrounding the site. Some foraging may be undertaken over water traps and dams within the golf course but this would form a small part of the dietary intake of populations occurring in the vicinity. Permanent creek lines, lagoons and estuarine bays within ten kilometres of the site would be expected to provide the bulk of foraging habitat for populations in this area. This species will roost in manmade structures such as drains, culverts, bridges, tunnels and

November 2018

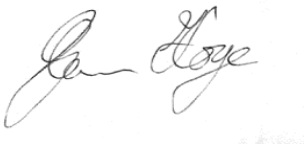


Fly By Night Bat Surveys Pty Ltd

mines as well as natural caves and tree hollows. In my experience the bulk of roosts occur either over water or in very close proximity. This was also the case in a radiotracking study of this species undertaken in Victoria where all 17 tree roosts located were within one hundred metres of water (Campbell 2009). While some roosts occur well away from permanent water bodies, these are exceptions. In the unlikely event that a roost tree for this species exists within the footprint of the PSLF, inspection of potential roosts trees within this area and falling of any habitat trees outside the breeding season and when bats would be expected to be in torpor as recommended in my report should reduce the risk of impact to this species to acceptable levels. I therefore do not believe that Species Impact Statement for this species is warranted. My background with this species dates back to the mid 1980's, since that time I have captured in excess of one thousand individuals and undertaken banding studies and radiotracking surveys at several sites. During 1996 I was involved in the exclusion of a colony from a timber bridge in the Morisset area and its subsequent successful reestablishment in a new concrete bridge (Hoye & Hoye 1999). I was awarded the inaugural Bat Conservation International Award for the best conservation paper at the 1998 Australasian Bat Society Conference (ABS 1998).

With regard to the East Coast Freetail Bat (*Microsomus norfolkensis*), this species predominantly roosts within tree hollows (Hoye *et al* 2008). I did not undertake a survey of potential roosts within the footprint of the PSLF as this was outside my brief. Footprint Green (2014, p. 23) do note that only small hollows are present in less than 10 potential habitat trees within the footprint. They also note that most of the hollows are utilised by Rainbow Lorikeets for at least part of the year (p.70). I concur with their assessment that the East Coast Freetail Bat is unlikely to be significantly impacted by the proposed PSLF. If the additional measures of inspection of potential roosts trees within this area and falling of any habitat trees outside the breeding season and when bats would be expected to be in torpor as recommended in my report are adopted impacts on this species should be minimal. The PSLF proposal would remove only a very small area (<2 hectares) of potential foraging habitat for this species. My personal knowledge of this species was gained conducting population dynamics and roost box trials at a site in the Hunter Valley from 1995 until 2008. I have co-authored the species account for this species in the dominant text on Australian mammals from 1995 until the upcoming 4th Edition due for publication in the near future.

Best wishes



Glenn Hoye

References

- Australasian Bat Society (ABS) (1998) The Bat Conservation International Award for Best Conservation Paper. *Australasian Bat Society Newsletter*. 11 p.6 October 1998.
- Campbell, S. (2009) So long as it's near water: variable roosting behaviour of the large-footed Myotis (*Myotis macropus*). *Aust. J. Zool.* 57:89-98.
- Footprint Green (2014) *Flora & Fauna Assessment, Waterbrook Bayview, Bayview Golf Course Cabbage Tree Road, Bayview*. July 2014.
- Hoye, G.A. and Hoye, M.M. (1999) Home Sweet Bridge. Incorporating timbers from an old bridge into a new one brings Australian large-footed bats back home to roost. *BATS. Bat Conservation International*. Summer 1999. 17(2):14-15.
- Hoye, G.A. Law, B.S. and Allison, F.R. (2008) East-coast Free-tailed Bat (*Mormopterus norfolkensis*) in Van Dyck, S. & Strahan, R. ed. *The Mammals of Australia*. Third Edition. Reed New Holland, Chatswood. p.491-492.
- Fly By Night Bat Surveys (FBN)(2017) *Results of microbat survey Bayview Golf Course, NSW, for Anne Clements & Associates Pty Ltd*. December 2017.



**Appendix 5. Confirmation of location of the nearest nest tree for the Powerful Owl being
330 m from the proposed seniors housing.**

AFFIDAVIT OF DR BETH MOTT

COURT DETAILS

Court	Land and Environment Court of New South Wales
Class	1
Case number	2018/257108

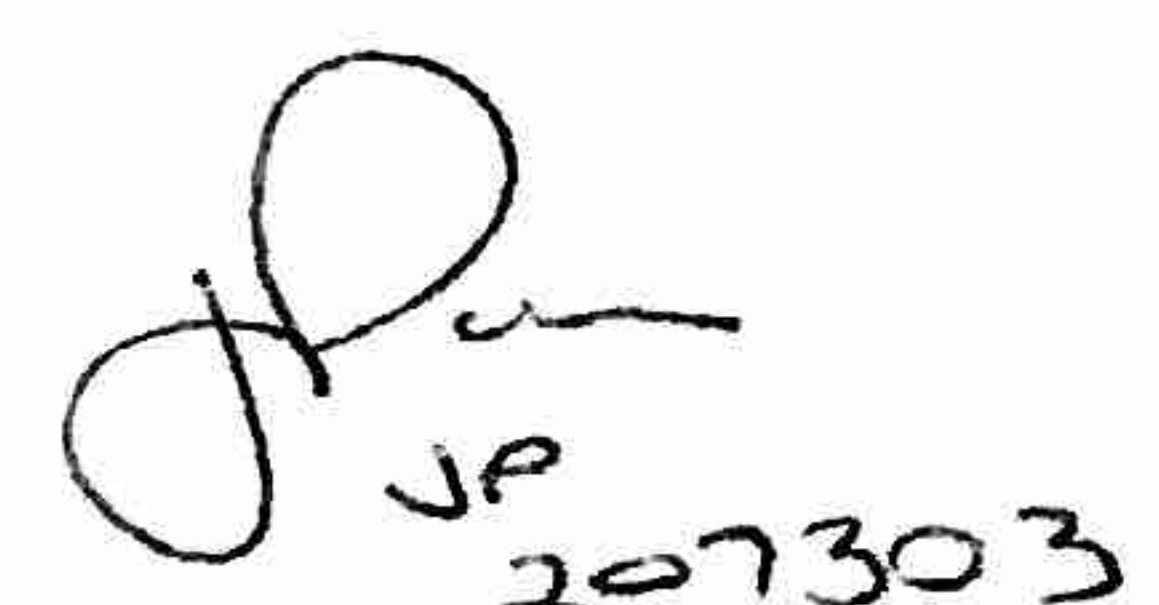
TITLE OF PROCEEDINGS

Applicant	Waterbrook Bayview Pty Ltd
Respondent	Northern Beaches Council

FILING DETAILS

Filed for	Northern Beaches Council, Respondent
Legal representative	Debra Townsend, King and Wood Mallesons
Legal representative reference	DST:CC 602-0036871
Contact name and telephone	Christina Crossman, 02 9296 2266
Contact email	Christina.crossman@au.kwm.com




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AFFIDAVIT

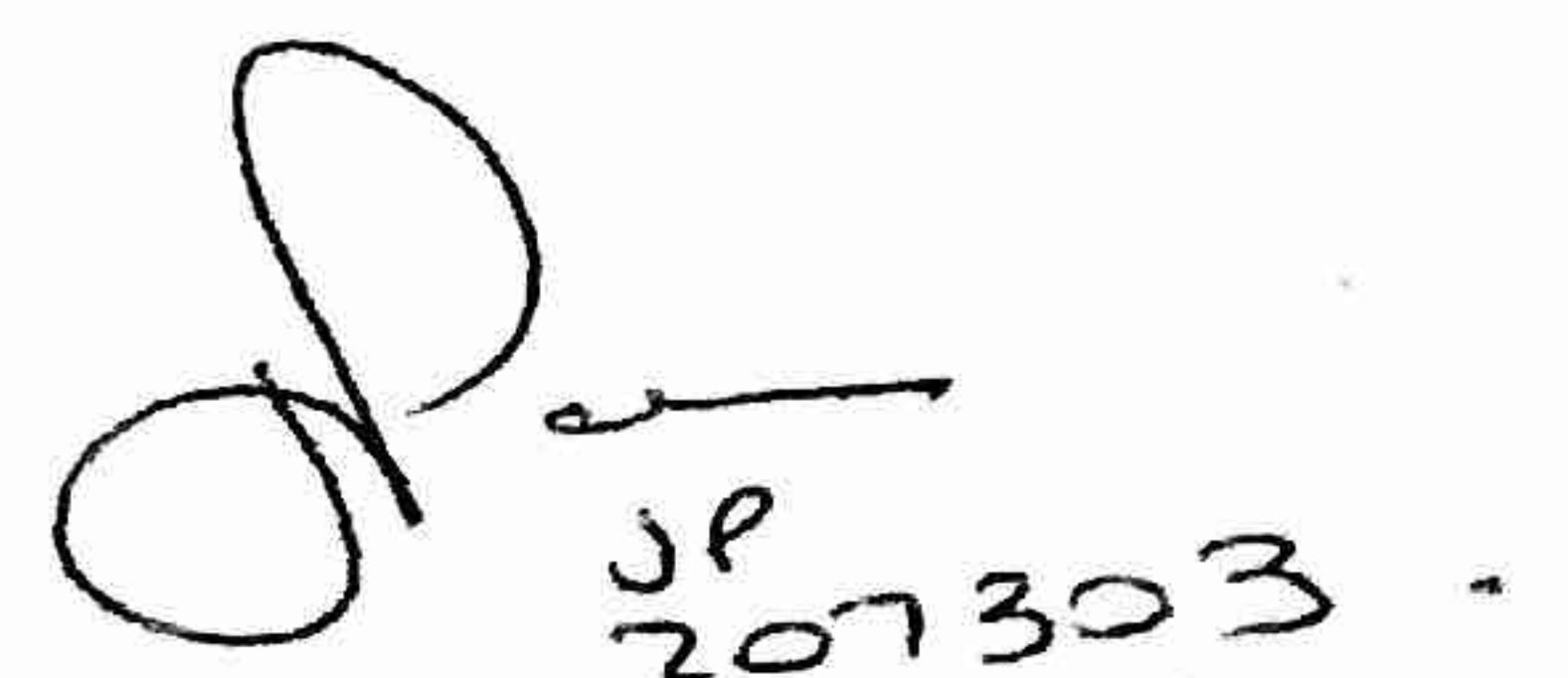
Name Dr Beth Mott
 Address Discovery Centre, 1 Jamieson St, Sydney Olympic Park NSW 2127
 Occupation Powerful Owl Project – Project Officer
 Date 10/01/2019

I, Beth Mott:

- 1 I am the Project Officer for BirdLife Australia's Powerful Owl Project.
- 2 I hold a PhD in Conservation Biology/Community Ecology and have been the Project Officer for Birdlife Australia's Powerful Owl Project between 2016-2019. I previously worked as consultant ecologist working with all nocturnal birds including Powerful Owls from 1996-2001 in QLD.
- 3 One submission was made to the Waterbrook Bayview Appeal regarding impacts of the proposed development on the Powerful Owls breeding north and south west of the proposed site of development.
- 4 Citizen scientists associated with The Powerful Owl Project, members of the public and I have documented Powerful Owls frequenting the area within and directly adjacent to the site of the proposed development at Bayview Golf Course consistently from 2016 to 2019. A pair of Powerful Owls has bred annually on the Northern border of the golf course since 2009, with the nest tree located 330m from the proposed site of works. Fledglings and their parent birds move away from the nest tree each year and roost habitually in riparian patch 250m from the north-eastern border of the proposed site of development. As of January 2019, two parent Powerful Owls and their two fledglings from the 2018 breeding season are still resident at this location. This patch is particularly important for Powerful Owls in the local area, as is the riparian strip bordering the Western side of the golf course.

 In September-December 2017 one juvenile Powerful Owl and early December 2018 a two juvenile Powerful Owls have been documented roosting directly on the Northern margin of the golf course 140m from the site of the proposed development at location -33.6672220 151.2897220 (photographic evidence available).

 In November 2017 an adult Powerful Owl was sighted roosting on the Western margin of the golf course in the riparian strip at location -33.6667590 151.2898410. An adult bird was again sighted in early December 2018 at location -33.6672220 151.2897220 70m from the proposed site of development. The signs under this

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roosting area and repeated use of the same location suggests this roost location important and is habitually used, rather than only occasionally used by Powerful Owls.

A second pair of Powerful Owls breeding to the South of the site, has successfully produced fledglings in 2015, 2017 and 2018. In mid-December 2018 one Powerful Owl fledgling and two parent birds (likely to be this Southern owl family) were sighted moving across the golf course, presumably to hunt. On this occasion the fledgling was sighted perching in trees in the proposed site of development at location -33.6681612 151.2906995 for 10 minutes, before it moved further North.

In late November 2017 two chicks were reported calling in the suburbs 330m South of the proposed site of development and for three nights in mid-December were heard calling from within the boundary of the golf course to the north-east of 64 Cabbage Tree Rd, Bayview. These chicks are presumed to have been perching within the proposed site of development within 20m of location -33.6682773 151.2907210 but were not sighted there directly. The location of the observers recording that sighting record was within 70m of southern side of the proposed site of development.

#SWORN #AFFIRMED at

Signature of deponent

Name of witness

Address of witness Jodie Parsons
393 Princes Highway Woomera 2517.

Capacity of witness JP NSW [#Justice of the peace #Solicitor #Barrister #Commissioner for
207303 affidavits #Notary public]

And as a witness, I certify the following matters concerning the person who made this affidavit (the **deponent**):

- 1 #I saw the face of the deponent. [OR, delete whichever option is inapplicable]
#I did not see the face of the deponent because the deponent was wearing a face covering, but I am satisfied that the deponent had a special justification for not removing the covering.*
- 2 #I have known the deponent for at least 12 months. [OR, delete whichever option is inapplicable]
#I have confirmed the deponent's identity using the following identification document:

NSW D/L 11558036

Identification document relied on (may be original or certified copy)*

Signature of witness

Jodie Parsons

A Justice of the Peace in and for
the State of New South Wales
Reg No. 207303

Note: The deponent and witness must sign each page of the affidavit. See UCPR 35.7B.

[* The only "special justification" for not removing a face covering is a legitimate medical reason (at April 2012).]

[† "Identification documents" include current driver licence, proof of age card, Medicare card, credit card, Centrelink pension card, Veterans Affairs entitlement card, student identity card, citizenship certificate, birth certificate, passport or see Oaths Regulation 2011 or refer to the guidelines in the NSW Department of Attorney General and Justice's "Justices of the Peace Handbook" section 2.3 "Witnessing an affidavit" at the following address: <http://www.jp.nsw.gov.au/Documents/jp%20handbook%202014.pdf>]

Appendix 6a. Screenshots from the BAM calculator PCT 1565



BAM Calculator

App last updated: 21/02/2019 (Version: 1.2.6.00)
BAM data last updated *: 4/01/2019 (Version: 6) * **Disclaimer**

OPEN

SAVE

SAVE AS NEW VERSION

CANCEL

DELETE

FINALISE

PRINT

LOGOUT

00014973/BAAS17088/19/00014974 / Revision: 2

1. Assessment details
2. Site context
3. Vegetation
4. Habitat suitability
5. Habitat survey
6. Credits
7. Credit classes
8. Price

All fields marked with an asterisk (*) are mandatory

Message!

You have selected 'Part 4 Developments (General)' as the 'Assessment Type' so we now have enough information to proceed to the 'Site Context'.

Assessment type *	Part 4 Developments (General)
Proposal name	Bayview 2019
Assessment ID	00014973/BAAS17088/19/00014974
Assessment Revision	2

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1. Assessment details
2. Site context
3. Vegetation
4. Habitat suitability
5. Habitat survey
6. Credits
7. Credit classes
8. Price

All fields marked with an asterisk (*) are mandatory

Message!

You have selected 'Sydney Basin' as the 'IBRA Region' so we now have enough information to proceed.

Interim Biogeographic Regionalisation for Australia (IBRA) *

Sydney Basin

IBRA Sub Region *

Pittwater

NSW Landscape

% Native vegetation cover *

27.4

Linear Development

☐

Landscape features

Feature *	Name *	Part of development footprint	Action
		<input type="checkbox"/>	

Add another landscape feature


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00014973/BAAS17088/19/00014974 / Revision: 2

1. Assessment details2. Site context3. Vegetation4. Habitat suitability5. Habitat survey6. Credits7. Credit classes8. Price

All fields marked with an asterisk (*) are mandatory

Plant community types (PCT) & ecological communities

Formation *	Class *	Plant community type *	PCT % cleared	Associated TEC *	Listing status	Action	Delete
Forested Wetlands	Coastal Swamp Forests	1795 - Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	50	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Endangered Ecological Community	<div>ADD VEG ZONE</div> <div>Modify default benchmarks</div>	<div>×</div>
Wet Sclerophyll Forests (Grassy sub-formation)	Northern Hinterland Wet Sclerophyll Forests	1565 - Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast	16	Not a TEC		<div>ADD VEG ZONE</div> <div>Modify default benchmarks</div>	<div>×</div>

ADD ANOTHER PCT

SEARCH PCT OUTSIDE IBRA

IMPORT SITE

Vegetation zones (Current vegetation integrity score)

#	Import	PCT code	Condition class *	Vegetation zone name	Patch Size*	Area (ha)*	Location	Composition condition score	Structure condition score	Function condition score	Current vegetation integrity score	Management zones	Delete
1	<div></div>	1565	Plot_7	1565_Plot_7	107	0.1	<div></div>	14.1	21.1	48.8	24.4	<div></div>	<div>×</div>

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#	Import	PCT code	Condition class *	Vegetation zone name	Patch Size*	Area (ha)*	Location	Composition condition score	Structure condition score	Function condition score	Current vegetation integrity score	Management zones	Delete
1		1565	Plot_7	1565_Plot_7	107	0.1		14.1	21.1	48.8	24.4		
2		1565	Plot_9	1565_Plot_9	107	0.1		75.7	40.3	27.3	43.7		
3		1565	Plot_13	1565_Plot_13	107	0.2		59.3	42.4	17.6	35.4		
4		1565	Plot_4	1565_Plot_4	107	0.1		83	56.2	57.8	64.6		
5		1795	Plot_22	1795_Plot_22	107	0.1		24.1	27.7	14.1	21.1		

Vegetation zones (Future vegetation integrity score)

#	PCT code	Condition class	Vegetation zone name	Patch Size	Management zone	Area (ha)	Composition condition score	Structure condition score	Function condition score	Vegetation integrity (VI) score	Change in VI score	Total Change in VI score
1	1565	Plot_7	1565_Plot_7	107		0.1	0	0	0	0	-24.4	-24.4
2	1565	Plot_9	1565_Plot_9	107		0.1	0	0	0	0	-43.7	-43.7
3	1565	Plot_13	1565_Plot_13	107		0.2	0	0	0	0	-35.4	-35.4
4	1565	Plot_4	1565_Plot_4	107		0.1	0	0	0	0	-64.6	-64.6
5	1795	Plot_22	1795_Plot_22	107		0.1	0	0	0	0	-21.1	-21.1

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1. Assessment details
2. Site context
3. Vegetation
4. Habitat suitability
5. Habitat survey
6. Credits
7. Credit classes
8. Price

Predicted threatened species (Ecosystem credits)

Species ⓘ	Habitat constraints	Geographic limitations	Veg Zone - Confirmed predicted species * ⓘ		Sensitivity to gain class ⓘ	NSW listing status	National listing status.
<i>Anthochaera phrygia</i> Regent Honeyeater (Foraging)	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Critically Endangered	Critically Endangered
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Foraging)	--	--	1565_Plot_7	<div>No</div>	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_9	<div>No</div>			
			1565_Plot_13	<div>No</div>			
			1565_Plot_4	<div>No</div>			
<i>Calyptrorhynchus lathamii</i> Glossy Black-Cockatoo (Foraging)	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	<div>No</div>			
			1565_Plot_9	<div>No</div>			
			1565_Plot_13	<div>No</div>			
			1565_Plot_4	<div>No</div>			
<i>Daphoenositta chrysoptera</i> Varied Sittella	--	--	1795_Plot_22	<div>No</div>	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	<div>No</div>			
			1565_Plot_9	<div>No</div>			
			1565_Plot_13	<div>No</div>			
			1565_Plot_4	<div>No</div>			

<i>Dasyurus maculatus</i> Spotted-tailed Quoll	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Vulnerable	Endangered
			1565_Plot_7	<div>No</div>			
			1565_Plot_9	<div>No</div>			
			1565_Plot_13	<div>No</div>			
			1565_Plot_4	<div>No</div>			
<i>Glossopsitta pusilla</i> Little Lorikeet	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	<div>No</div>			
			1565_Plot_9	<div>No</div>			
			1565_Plot_13	<div>No</div>			
			1565_Plot_4	<div>No</div>			
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle (Foraging)	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Hieraaetus morphnoides</i> Little Eagle (Foraging)	--	--	1795_Plot_22	<div>No</div>	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Ixobrychus flavicollis</i> Black Bittern	<div><div>Select All</div><div>Deselect All</div></div> <div>1795_Plot_22 <input checked="" type="checkbox"/> Waterbodies <input checked="" type="checkbox"/> Land within 40 m of freshwater and estuarine wetlands, in areas of permanent water and dense vegetation</div>	--	1795_Plot_22	<div>No</div>	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed

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<i>Lathamus discolor</i> Swift Parrot (Foraging)	--	--	1795_Plot_22	<div>No</div>	Moderate Sensitivity to Potential Gain	Endangered	Critically Endangered
			1565_Plot_7	<div>No</div>			
			1565_Plot_9	<div>No</div>			
			1565_Plot_13	<div>No</div>			
			1565_Plot_4	<div>No</div>			
<i>Lophoictinia isura</i> Square-tailed Kite (Foraging)	--	--	1795_Plot_22	<div>Yes</div>	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	<div>Yes</div>			
			1565_Plot_9	<div>Yes</div>			
			1565_Plot_13	<div>Yes</div>			
			1565_Plot_4	<div>Yes</div>			
<i>Miniopterus australis</i> Little Bentwing-bat (Foraging)	--	--	1795_Plot_22	<div>Yes</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	<div>Yes</div>			
			1565_Plot_9	<div>Yes</div>			
			1565_Plot_13	<div>Yes</div>			
			1565_Plot_4	<div>Yes</div>			
<i>Miniopterus schreibersii oceanensis</i> Eastern Bentwing-bat (Foraging)	--	--	1795_Plot_22	<div>Yes</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	<div>Yes</div>			
			1565_Plot_9	<div>Yes</div>			
			1565_Plot_13	<div>Yes</div>			
			1565_Plot_4	<div>Yes</div>			

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<i>Mormopterus norfolkensis</i> Eastern Freetail-bat	--	--	1795_Plot_22	Yes	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	Yes			
			1565_Plot_9	Yes			
			1565_Plot_13	Yes			
			1565_Plot_4	Yes			
<i>Ninox connivens</i> Barking Owl (Foraging)	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	No			
			1565_Plot_9	No			
			1565_Plot_13	No			
			1565_Plot_4	No			
<i>Ninox strenua</i> Powerful Owl (Foraging)	--	--	1795_Plot_22	Yes	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	Yes			
			1565_Plot_9	Yes			
			1565_Plot_13	Yes			
			1565_Plot_4	Yes			
<i>Pandion cristatus</i> Eastern Osprey (Foraging)	--	--	1795_Plot_22	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Phascolarctos cinereus</i> Koala (Foraging)	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
			1565_Plot_7	No			
			1565_Plot_9	No			
			1565_Plot_13	No			

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<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Foraging)	--	--	1795_Plot_22	Yes	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
			1565_Plot_7	Yes			
			1565_Plot_9	Yes			
			1565_Plot_13	Yes			
			1565_Plot_4	Yes			
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheathtail-bat	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	No			
			1565_Plot_9	No			
			1565_Plot_13	No			
			1565_Plot_4	No			
<i>Tyto novaehollandiae</i> Masked Owl (Foraging)	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1565_Plot_7	No			
			1565_Plot_9	No			
			1565_Plot_13	No			
			1565_Plot_4	No			
<i>Varanus rosenbergi</i> Rosenberg's Goanna	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed

SEARCH PREDICTED SPECIES

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Candidate threatened species (Species credits)						
Species	Habitat constraints	Geographic limitations	Confirmed candidate species ⓘ	Sensitivity to gain class	NSW listing status	National listing status.
<i>Anthochaera phrygia</i> Regent Honeyeater (Breeding)	--	--	No	High Sensitivity to Potential Gain	Critically Endangered	Critically Endangered
<i>Burhinus grallarius</i> Bush Stone-curlew	<input checked="" type="checkbox"/> Fallen/standing dead timber including logs	--	No	High Sensitivity to Potential Gain	Endangered	Not Listed
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Calyptorhynchus lathami</i> Glossy Black-Cockatoo (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Cercartetus nanus</i> Eastern Pygmy-possum	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	<input checked="" type="checkbox"/> Cliffs <input checked="" type="checkbox"/> Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels. N/A	--	Yes	Very High Sensitivity to Potential Gain	Vulnerable	Vulnerable
★ <i>Cryptostylis hunteriana</i> Leafless Tongue Orchid	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed

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<i>Hieraaetus morphnoides</i> Little Eagle (Breeding)	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
★ <i>Hoplocephalus bitorquatus</i> Pale-headed Snake	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Lathamus discolor</i> Swift Parrot (Breeding)	--	--	No	Moderate Sensitivity to Potential Gain	Endangered	Critically Endangered
<i>Litoria aurea</i> Green and Golden Bell Frog	<input checked="" type="checkbox"/> Semi-permanent/ephemeral wet areas <input checked="" type="checkbox"/> Within 1km of wet areas Swamps <input checked="" type="checkbox"/> Within 1km of swamp Waterbodies <input checked="" type="checkbox"/> Within 1km of waterbody	--	No	High Sensitivity to Potential Gain	Endangered	Vulnerable
<i>Litoria brevipalmata</i> Green-thighed Frog	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Lophoictinia isura</i> Square-tailed Kite (Breeding)	--	--	Yes	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
★ <i>Melaleuca groveana</i> Grove's Paperbark	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Miniopterus australis</i> Little Bentwing-bat (Breeding)	--	--	Yes	Very High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Miniopterus schreibersii oceanensis</i> Eastern Bentwing-bat (Breeding)	--	--	Yes	Very High Sensitivity to Potential Gain	Vulnerable	Not Listed
★ <i>Mixophyes iteratus</i> Giant Barred Frog	<input checked="" type="checkbox"/> Other <input checked="" type="checkbox"/> Land within 50m of semi permanent and permanent drainages	--	No	Moderate Sensitivity to Potential Gain	Endangered	Endangered

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<i>Myotis macropus</i> Southern Myotis	<input checked="" type="checkbox"/> Hollow bearing trees <input checked="" type="checkbox"/> Within 200 m of riparian zone Other <input checked="" type="checkbox"/> Bridges, caves or artificial structures within 200 m of riparian zone	--	Yes	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Ninox connivens</i> Barking Owl (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Ninox strenua</i> Powerful Owl (Breeding)	--	--	Yes	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Pandion cristatus</i> Eastern Osprey (Breeding)	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Petaurus norfolcensis</i> Squirrel Glider	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Petaurus norfolcensis - endangered population</i> Squirrel Glider on Barrenjoey Peninsula, north of Bushrangers Hill	--	<input checked="" type="checkbox"/> Barrenjoey Peninsula	No	High Sensitivity to Potential Gain	Endangered Population	Not Listed
<i>Phascolarctos cinereus</i> Koala (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
<i>Phascolarctos cinereus - endangered population</i> Koala in the Pittwater Local Government Area	--	<input checked="" type="checkbox"/> Pittwater LGA	No	High Sensitivity to Potential Gain	Endangered Population	Not Listed
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Breeding)	--	--	Yes	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
<i>Tyto novaehollandiae</i> Masked Owl (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed

All fields marked with an asterisk (*) are mandatory

Message!

If Species presence 'Yes' and not 'assumed present' or 'No' and 'surveyed' , Please select the survey of month, for particular species.

Candidate threatened species (Species credits)

Species	Species presence	Survey timetable	UOM	Veg Zone & Value	Biodiversity risk	Biodiversity risk weighting
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	Yes (expert report)	<div><div>Jan</div><div>Feb</div><div>Mar</div><div>Apr</div><div>May</div><div>Jun</div><div>Jul</div><div>Aug</div><div>Sep</div><div>Oct</div><div>Nov</div><div>Dec</div></div>	Area (ha)	<div><div><input checked="" type="checkbox"/> 1565_Plot_7</div><div><div>•</div><div>0.1</div><div></div></div><div><input checked="" type="checkbox"/> 1565_Plot_9</div><div><div>•</div><div>0.1</div><div></div></div><div><input checked="" type="checkbox"/> 1565_Plot_13</div><div><div>•</div><div>0.2</div><div></div></div><div><input checked="" type="checkbox"/> 1565_Plot_4</div><div><div>•</div><div>0.1</div><div></div></div><div><input checked="" type="checkbox"/> 1795_Plot_22</div><div><div>•</div><div>0.1</div><div></div></div></div>	Very High	3

Lophoictinia isura
Square-tailed Kite

Yes (assumed present)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

- ☒ 1565_Plot_7
-
- ☒ 1565_Plot_9
-
- ☒ 1565_Plot_13
-
- ☒ 1565_Plot_4
-
- ☒ 1795_Plot_22
-

Moderate

1.5

Miniopterus australis
Little Bentwing-bat

Yes (expert report)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

- ☒ 1565_Plot_7
-
- ☒ 1565_Plot_9
-
- ☒ 1565_Plot_13
-
- ☒ 1565_Plot_4
-
- ☒ 1795_Plot_22
-

Very High

3

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Miniopterus schreibersii oceanensis

Eastern Bentwing-bat

Yes (expert report)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

☒ 1565_Plot_7

Very High

3

☒ 1565_Plot_9

0.1

☒ 1565_Plot_13

0.2

☒ 1565_Plot_4

0.1

☒ 1795_Plot_22

0.1

Myotis macropus

Southern Myotis

Yes (expert report)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

☒ 1565_Plot_7

High

2

☒ 1565_Plot_9

0.1

☒ 1565_Plot_13

0.2

☒ 1565_Plot_4

0.1

☒ 1795_Plot_22

0.1



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App last updated: 21/02/2019 (Version: 1.2.6.00)
BAM data last updated *: 4/01/2019 (Version: 6) * Disclaimer

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- 1. Assessment details
 - 2. Site context
 - 3. Vegetation
 - 4. Habitat suitability
 - 5. Habitat survey
 - 6. Credits
 - 7. Credit classes
 - 8. Price

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

Zone	Vegetation zone name	Vegetation integrity loss	Area	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Candidate SAI	Ecosystem credits
Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin							
5	1795_Plot_22	21.1	0.1 hectares	High Sensitivity to Potential Gain	2		1
							Subtotal: 1
Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast							
1	1565_Plot_7	24.4	0.1 hectares	High Sensitivity to Potential Gain	1.5		1
2	1565_Plot_9	43.7	0.1 hectares	High Sensitivity to Potential Gain	1.5		2
3	1565_Plot_13	35.4	0.2 hectares	High Sensitivity to Potential Gain	1.5		3
4	1565_Plot_4	64.6	0.1 hectares	High Sensitivity to Potential Gain	1.5		2
							Subtotal: 8
							Total: 9

Species credits for threatened species					
Vegetation zone name	Habitat condition (vegetation integrity) loss	Area / Count	Biodiversity risk weighting	Candidate SAI	Species credits
Chalinolobus dwyeri / Large-eared Pied Bat (Fauna)					
1565_Plot_13	35.4	0.2 hectares	3	True	5
1565_Plot_4	64.6	0.1 hectares	3	True	5
1565_Plot_7	24.4	0.1 hectares	3	True	2
1565_Plot_9	43.7	0.1 hectares	3	True	3
1795_Plot_22	21.1	0.1 hectares	3	True	2
					Subtotal: 17
Lophoictinia isura / Square-tailed Kite (Fauna)					
1565_Plot_13	35.4	0.2 hectares	1.5	N/A	3
1565_Plot_4	64.6	0.1 hectares	1.5	N/A	2
1565_Plot_7	24.4	0.1 hectares	1.5	N/A	1
1565_Plot_9	43.7	0.1 hectares	1.5	N/A	2
1795_Plot_22	21.1	0.1 hectares	1.5	N/A	1
					Subtotal: 9

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Miniopterus australis / Little Bentwing-bat (Fauna)						
1565_Plot_13	35.4	0.2 hectares	3	True	5	
1565_Plot_4	64.6	0.1 hectares	3	True	5	
1565_Plot_7	24.4	0.1 hectares	3	True	2	
1565_Plot_9	43.7	0.1 hectares	3	True	3	
1795_Plot_22	21.1	0.1 hectares	3	True	2	
					Subtotal: 17	
Miniopterus schreibersii oceanensis / Eastern Bentwing-bat (Fauna)						
1565_Plot_13	35.4	0.2 hectares	3	True	5	
1565_Plot_4	64.6	0.1 hectares	3	True	5	
1565_Plot_7	24.4	0.1 hectares	3	True	2	
1565_Plot_9	43.7	0.1 hectares	3	True	3	
1795_Plot_22	21.1	0.1 hectares	3	True	2	
					Subtotal: 17	
Myotis macropus / Southern Myotis (Fauna)						
1565_Plot_13	35.4	0.2 hectares	2	False	4	
1565_Plot_4	64.6	0.1 hectares	2	False	3	
1565_Plot_7	24.4	0.1 hectares	2	False	1	
1565_Plot_9	43.7	0.1 hectares	2	False	2	
1795_Plot_22	21.1	0.1 hectares	2	False	1	
					Subtotal: 11	

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Most Visited Court timetable for P... Fwd: Not natural - aca... BAM Calculator Getting Started PlantNET - NSW Flora... BAM Calculator						
1565_Plot_13	35.4	0.2 hectares	2	False		4
1565_Plot_4	64.6	0.1 hectares	2	False		3
1565_Plot_7	24.4	0.1 hectares	2	False		1
1565_Plot_9	43.7	0.1 hectares	2	False		2
1795_Plot_22	21.1	0.1 hectares	2	False		1
Subtotal: 11						
Ninox strenua / Powerful Owl (Fauna)						
1565_Plot_13	35.4	0.2 hectares	2	N/A		4
1565_Plot_4	64.6	0.1 hectares	2	N/A		3
1565_Plot_7	24.4	0.1 hectares	2	N/A		1
1565_Plot_9	43.7	0.1 hectares	2	N/A		2
1795_Plot_22	21.1	0.1 hectares	2	N/A		1
Subtotal: 11						
Pteropus poliocephalus / Grey-headed Flying-fox (Fauna)						
1565_Plot_13	35.4	0.2 hectares	2	N/A		4
1565_Plot_4	64.6	0.1 hectares	2	N/A		3
1565_Plot_7	24.4	0.1 hectares	2	N/A		1
1565_Plot_9	43.7	0.1 hectares	2	N/A		2
1795_Plot_22	21.1	0.1 hectares	2	N/A		1
Subtotal: 11						

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8. Price

Ecosystem credit classes

Ecosystem credit summary

PCT	TEC	Area	Credits
1565-Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast	Not a TEC	0.5	8
1795-Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.1	1

Credit classes for 1565

Like-for-like options

Any PCT in the below class	And in any of below trading groups	Containing HBT	In the below IBRA subregions
Northern Hinterland Wet Sclerophyll Forests (including PCT's 690, 697, 698, 755, 1092, 1262, 1267, 1268, 1281, 1385, 1548, 1549, 1550, 1556, 1557, 1558, 1564, 1565, 1580, 1582, 1584, 1585, 1845, 1846, 1847, 1914)	Northern Hinterland Wet Sclerophyll Forests - < 50% cleared group (including Tier 7 or higher).	Yes	Pittwater ,Cumberland, Sydney Cataract, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Credit classes for 1795

Like-for-like options

Any PCT with the below TEC	Containing HBT	In the below IBRA subregions
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (including PCT's 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798)	Yes	Pittwater ,Cumberland, Sydney Cataract, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (including PCT's 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798)

Yes

Pittwater ,Cumberland, Sydney Cataract, Wyong and Yengo.
or
Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species credit classes

Species credit summary

Species	Area	Credits
<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	0.6	17
<i>Lophoictinia isura</i> / Square-tailed Kite	0.6	9
<i>Miniopterus australis</i> / Little Bentwing-bat	0.6	17
<i>Miniopterus schreibersii oceanensis</i> / Eastern Bentwing-bat	0.6	17
<i>Myotis macropus</i> / Southern Myotis	0.6	11
<i>Ninox strenua</i> / Powerful Owl	0.6	11
<i>Pteropus poliocephalus</i> / Grey-headed Flying-fox	0.6	11

Chalinolobus dwyeri / Large-eared Pied Bat (1795_Plot_22)

Like-for-like options

Only the below Spp	In the below IBRA subregions
<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	Any in NSW

Message!

If you would like to meet your offset obligation by making a payment to the Biodiversity Conservation Fund, please contact the BCT team at bct@environment.nsw.gov.au

IBRA subregion: Pittwater

PCT list

Include	PCT common name	Credit
<input checked="" type="checkbox"/>	1565 - Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast	8
<input checked="" type="checkbox"/>	1795 - Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	1

Species list

Include	Species	Credit
<input checked="" type="checkbox"/>	<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	17
<input checked="" type="checkbox"/>	<i>Lophoictinia isura</i> (Square-tailed Kite)	9
<input checked="" type="checkbox"/>	<i>Miniopterus australis</i> (Little Bentwing-bat)	17
<input checked="" type="checkbox"/>	<i>Miniopterus schreibersii oceanensis</i> (Eastern Bentwing-bat)	17
<input checked="" type="checkbox"/>	<i>Myotis macropus</i> (Southern Myotis)	11
<input checked="" type="checkbox"/>	<i>Ninox strenua</i> (Powerful Owl)	11
<input checked="" type="checkbox"/>	<i>Pteropus poliocephalus</i> (Grey-headed Flying-fox)	11

IBRA sub region	PCT common name	Baseline price per credit	Dynamic coefficient	Market coefficient	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Pittwater	1565 - Turpentine - Rough-barked Apple - Forest Oak moist shrubby tall open forest of the Central Coast <i>Warning: This PCT has NO trades recorded</i>	\$1,325.37			20.49%	\$20.00	1.0000	\$1,616.94	8	\$12,935.51
Pittwater	1795 - Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin <i>Warning: This PCT has NO trades recorded</i>	\$1,325.37			20.49%	\$20.00	1.0000	\$1,616.94	1	\$1,616.94
Subtotal (excl. GST)										\$14,552.45
GST										\$1,455.24
Total ecosystem credits (incl. GST)										\$16,007.70

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price
10157	<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	Vulnerable	\$865.08	20.4900%	\$20.00	17	\$18,059.69
10495	<i>Lophoictinia isura</i> (Square-tailed Kite)	Vulnerable	\$506.66	20.4900%	\$20.00	9	\$5,674.27
10533	<i>Miniopterus australis</i> (Little Bentwing-bat)	Vulnerable	\$506.66	20.4900%	\$20.00	17	\$10,718.07
10534	<i>Miniopterus schreibersii oceanensis</i> (Eastern Bentwing-bat)	Vulnerable	\$865.08	20.4900%	\$20.00	17	\$18,059.69
10549	<i>Myotis macropus</i> (Southern Myotis)	Vulnerable	\$865.08	20.4900%	\$20.00	11	\$11,685.68
10562	<i>Ninox strenua</i> (Powerful Owl)	Vulnerable	\$506.66	20.4900%	\$20.00	11	\$6,935.22
10697	<i>Pteropus poliocephalus</i> (Grey-headed Flying-fox)	Vulnerable	\$865.08	20.4900%	\$20.00	11	\$11,685.68
						Subtotal (excl. GST)	\$82,818.30
						GST	\$8,281.83
						Total species credits (incl. GST)	\$91,100.13
Calculated as on: 12-04-2019 13:12:16						Grand total	\$107,107.83

Appendix 6b. Screenshots from the BAM calculator PCT 1214



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SAVE

SAVE AS NEW VERSION

CANCEL

DELETE

FINALISE

PRINT

LOGOUT

00014973/BAAS17088/19/00014974 / Revision: 2

1. Assessment details

2. Site context

3. Vegetation

4. Habitat suitability

5. Habitat survey

6. Credits

7. Credit classes

8. Price

All fields marked with an asterisk (*) are mandatory

Message!

You have selected 'Part 4 Developments (General)' as the 'Assessment Type' so we now have enough information to proceed to the 'Site Context'.

Assessment type *	Part 4 Developments (General)
Proposal name	Bayview 2019
Assessment ID	00014973/BAAS17088/19/00014974
Assessment Revision	2

NEXT



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💾 SAVE

💾 SAVE AS NEW VERSION

✖ CANCEL

✖ DELETE

✔ FINALISE

🖨 PRINT ▾

➡ LOGOUT

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📘

1. Assessment details [↗](#)

2. Site context [↗](#)

3. Vegetation [↗](#)

4. Habitat suitability [↗](#)

5. Habitat survey [↗](#)

6. Credits [↗](#)

7. Credit classes [↗](#)

8. Price [↗](#)

All fields marked with an asterisk (*) are mandatory

Message!

You have selected 'Sydney Basin' as the 'IBRA Region' so we now have enough information to proceed.

Interim Biogeographic Regionalisation for Australia (IBRA) *

Sydney Basin

IBRA Sub Region *

Pittwater

NSW Landscape

% Native vegetation cover *

27.4

Linear Development

☐

Landscape features

Feature *	Name *	Part of development footprint	Action
<div></div>	<div></div>	<input type="checkbox"/>	


Add another landscape feature

NEXT

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NSW GOVERNMENT

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1. Assessment details2. Site context3. Vegetation4. Habitat suitability5. Habitat survey6. Credits7. Credit classes8. Price

All fields marked with an asterisk (*) are mandatory

Plant community types (PCT) & ecological communities

Formation *	Class *	Plant community type *	PCT % cleared	Associated TEC *	Listing status	Action	Delete
Forested Wetlands	Coastal Swamp Forests	1795 - Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	50	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Endangered Ecological Community	<div>ADD VEG ZONE</div> <div>Modify default benchmarks</div>	<div>×</div>
Wet Sclerophyll Forests (Grassy sub-formation)	Southern Lowland Wet Sclerophyll forests	1214 - Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion	71	Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion	Endangered Ecological Community	<div>ADD VEG ZONE</div> <div>Modify default benchmarks</div>	<div>×</div>

ADD ANOTHER PCT

SEARCH PCT OUTSIDE IBRA

IMPORT SITE

Vegetation zones (Current vegetation integrity score)

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No

<i>Dasyurus maculatus</i> Spotted-tailed Quoll	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Endangered
			1214_Plot_7	No			
			1214_Plot_9	No			
			1214_Plot_13	No			
			1214_Plot_4	No			

<i>Glossopsitta pusilla</i> Little Lorikeet	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	No			
			1214_Plot_9	No			
			1214_Plot_13	No			
			1214_Plot_4	No			

<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle (Foraging)	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
---	----	----	--------------	----	------------------------------------	------------	------------

<i>Hieraaetus morphnoides</i> Little Eagle (Foraging)	--	--	1795_Plot_22	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	No			
			1214_Plot_9	No			
			1214_Plot_13	No			
			1214_Plot_4	No			

<i>Ixobrychus flavicollis</i> Black Bittern	<div>Select All Deselect All</div>	--	1795_Plot_22	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
	<div>1795_Plot_22</div> <div><input checked="" type="checkbox"/> Waterbodies</div> <div><input checked="" type="checkbox"/> Land within 40 m of freshwater and estuarine wetlands in areas of</div>						

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Lathamus discolor Swift Parrot (Foraging)	--	--	1795_Plot_22	<div>No</div>	Moderate Sensitivity to Potential Gain	Endangered	Critically Endangered
			1214_Plot_7	<div>No</div>			
			1214_Plot_9	<div>No</div>			
			1214_Plot_13	<div>No</div>			
			1214_Plot_4	<div>No</div>			
Lophoictinia isura Square-tailed Kite (Foraging)	--	--	1795_Plot_22	<div>Yes</div>	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
Miniopterus australis Little Bentwing-bat (Foraging)	--	--	1795_Plot_22	<div>Yes</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	<div>Yes</div>			
			1214_Plot_9	<div>Yes</div>			
			1214_Plot_13	<div>Yes</div>			
			1214_Plot_4	<div>Yes</div>			
Miniopterus schreibersii oceanensis Eastern Bentwing-bat (Foraging)	--	--	1795_Plot_22	<div>Yes</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	<div>Yes</div>			
			1214_Plot_9	<div>Yes</div>			
			1214_Plot_13	<div>Yes</div>			
			1214_Plot_4	<div>Yes</div>			
Mormopterus norfolkensis Eastern Freetail-bat	--	--	1795_Plot_22	<div>Yes</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	<div>Yes</div>			
			1214_Plot_9	<div>Yes</div>			
			1214_Plot_13	<div>Yes</div>			
			1214_Plot_4	<div></div>			

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			1214_Plot_4	Yes			
<i>Ninox connivens</i> Barking Owl (Foraging)	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	No			
			1214_Plot_9	No			
			1214_Plot_13	No			
			1214_Plot_4	No			
<i>Ninox strenua</i> Powerful Owl (Foraging)	--	--	1795_Plot_22	Yes	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	Yes			
			1214_Plot_9	Yes			
			1214_Plot_13	Yes			
			1214_Plot_4	Yes			
<i>Pandion cristatus</i> Eastern Osprey (Foraging)	--	--	1795_Plot_22	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	No			
			1214_Plot_9	No			
			1214_Plot_13	No			
			1214_Plot_4	No			
★ <i>Petroica boodang</i> Scarlet Robin	--	--	1214_Plot_7	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_9	No			
			1214_Plot_13	No			
			1214_Plot_4	No			

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Phascolarctos cinereus Koala (Foraging)	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
			1214_Plot_7	<div>No</div>			
			1214_Plot_9	<div>No</div>			
			1214_Plot_13	<div>No</div>			
			1214_Plot_4	<div>No</div>			
Pteropus poliocephalus Grey-headed Flying-fox (Foraging)	--	--	1795_Plot_22	<div>Yes</div>	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
			1214_Plot_7	<div>Yes</div>			
			1214_Plot_9	<div>Yes</div>			
			1214_Plot_13	<div>Yes</div>			
			1214_Plot_4	<div>Yes</div>			
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	<div>No</div>			
			1214_Plot_9	<div>No</div>			
			1214_Plot_13	<div>No</div>			
			1214_Plot_4	<div>No</div>			
Tyto novaehollandiae Masked Owl (Foraging)	--	--	1795_Plot_22	<div>No</div>	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	<div>No</div>			
			1214_Plot_9	<div>No</div>			
			1214_Plot_13	<div>No</div>			
			1214_Plot_4	<div>No</div>			

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Varanus rosenbergi Rosenberg's Goanna	--	--	1795_Plot_22	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
			1214_Plot_7	No			
			1214_Plot_9	No			
			1214_Plot_13	No			
			1214_Plot_4	No			

SEARCH PREDICTED SPECIES

Candidate threatened species (Species credits)

Species	Habitat constraints	Geographic limitations	Confirmed candidate species ⓘ	Sensitivity to gain class	NSW listing status	National listing status.
Anthochaera phrygia Regent Honeyeater (Breeding)	--	--	No	High Sensitivity to Potential Gain	Critically Endangered	Critically Endangered
Burhinus grallarius Bush Stone-curlew	<input checked="" type="checkbox"/> Fallen/standing dead timber including logs	--	No	High Sensitivity to Potential Gain	Endangered	Not Listed
Callocephalon fimbriatum Gang-gang Cockatoo (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Calyptorhynchus lathamii Glossy Black-Cockatoo (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Cercartetus nanus Eastern Pygmy-possum	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
Chalinolobus dwyeri Large-eared Pied Bat	<input checked="" type="checkbox"/> Cliffs <input checked="" type="checkbox"/> Within two kilometres of rocky areas containing caves, overhangs, ...	--	Yes	Very High Sensitivity to Potential Gain	Vulnerable	Vulnerable

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★	Diuris bracteata Diuris bracteata	--	--	No	High Sensitivity to Potential Gain	Endangered	Extinct
★	Genoplesium baueri Bauer's Midge Orchid	--	--	No	Moderate Sensitivity to Potential Gain	Endangered	Endangered
	Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
	Hieraaetus morphnoides Little Eagle (Breeding)	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
★	Hygrocybe aurantipes Hygrocybe aurantipes	--	<input checked="" type="checkbox"/> Lane Cove Bushland Park	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
	Lathamus discolor Swift Parrot (Breeding)	--	--	No	Moderate Sensitivity to Potential Gain	Endangered	Critically Endangered
	Litoria aurea Green and Golden Bell Frog	<input checked="" type="checkbox"/> Semi-permanent/ephemeral wet areas <input checked="" type="checkbox"/> Within 1km of wet areas Swamps <input checked="" type="checkbox"/> Within 1km of swamp Waterbodies <input checked="" type="checkbox"/> Within 1km of waterbody	--	No	High Sensitivity to Potential Gain	Endangered	Vulnerable
	Litoria brevipalmata Green-thighed Frog	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
	Lophoictinia isura Square-tailed Kite (Breeding)	--	--	Yes	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
	Miniopterus australis Little Bentwing-bat (Breeding)	--	--	Yes	Very High Sensitivity to Potential Gain	Vulnerable	Not Listed
	Miniopterus schreibersii oceanensis Eastern Bentwing-bat (Breeding)	--	--	Yes	Very High Sensitivity to Potential Gain	Vulnerable	Not Listed

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(Breeding)						
<i>Myotis macropus</i> Southern Myotis	<input checked="" type="checkbox"/> Hollow bearing trees <input checked="" type="checkbox"/> Within 200 m of riparian zone Other <input checked="" type="checkbox"/> Bridges, caves or artificial structures within 200 m of riparian zone	--	Yes	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Ninox connivens</i> Barking Owl (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Ninox strenua</i> Powerful Owl (Breeding)	--	--	Yes	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Pandion cristatus</i> Eastern Osprey (Breeding)	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Petaurus norfolcensis</i> Squirrel Glider	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Petaurus norfolcensis - endangered population</i> Squirrel Glider on Barrenjoey Peninsula, north of Bushrangers Hill	--	<input checked="" type="checkbox"/> Barrenjoey Peninsula	No	High Sensitivity to Potential Gain	Endangered Population	Not Listed
<i>Phascolarctos cinereus</i> Koala (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
<i>Phascolarctos cinereus - endangered population</i> Koala in the Pittwater Local Government Area	--	<input checked="" type="checkbox"/> Pittwater LGA	No	High Sensitivity to Potential Gain	Endangered Population	Not Listed
★ <i>Pseudophryne australis</i> Red-crowned Toadlet	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Breeding)	--	--	Yes	High Sensitivity to Potential Gain	Vulnerable	Vulnerable

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(Breeding)						
<i>Petaurus norfolcensis</i> Squirrel Glider	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Petaurus norfolcensis - endangered population</i> Squirrel Glider on Barrenjoey Peninsula, north of Bushrangers Hill	--	<input checked="" type="checkbox"/> Barrenjoey Peninsula	No	High Sensitivity to Potential Gain	Endangered Population	Not Listed
<i>Phascolarctos cinereus</i> Koala (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
<i>Phascolarctos cinereus - endangered population</i> Koala in the Pittwater Local Government Area	--	<input checked="" type="checkbox"/> Pittwater LGA	No	High Sensitivity to Potential Gain	Endangered Population	Not Listed
★ <i>Pseudophryne australis</i> Red-crowned Toadlet	--	--	No	Moderate Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Breeding)	--	--	Yes	High Sensitivity to Potential Gain	Vulnerable	Vulnerable
★ <i>Syzygium paniculatum</i> Magenta Lilly Pilly	--	--	No	Moderate Sensitivity to Potential Gain	Endangered	Vulnerable
★ <i>Tetratheca glandulosa</i> Tetratheca glandulosa	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
★ <i>Turnix maculosus</i> Red-backed Button-quail	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed
<i>Tyto novaehollandiae</i> Masked Owl (Breeding)	--	--	No	High Sensitivity to Potential Gain	Vulnerable	Not Listed

SEARCH CANDIDATE SPECIES

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Candidate threatened species (Species credits)

Species	Species presence ⓘ	Survey timetable	UOM	Veg Zone & Value ⓘ	Biodiversity risk	Biodiversity risk weighting												
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	Yes (expert report)	<table><tr><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td></tr><tr><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td></tr><tr><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td></tr></table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Area (ha)	<div><input checked="" type="checkbox"/> 1214_Plot_7</div> <div>* 0.1</div> <div><input checked="" type="checkbox"/> 1214_Plot_9</div> <div>* 0.1</div> <div><input checked="" type="checkbox"/> 1214_Plot_13</div> <div>* 0.2</div> <div><input checked="" type="checkbox"/> 1214_Plot_4</div> <div>* 0.1</div> <div><input checked="" type="checkbox"/> 1795_Plot_22</div> <div>* 0.1</div>	Very High	3
Jan	Feb	Mar	Apr															
May	Jun	Jul	Aug															
Sep	Oct	Nov	Dec															
<i>Lophoictinia isura</i> Square-tailed Kite	Yes (assumed present)	<table><tr><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td></tr><tr><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td></tr><tr><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td></tr></table>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Area (ha)	<div><input checked="" type="checkbox"/> 1214_Plot_7</div> <div>* 0.1</div> <div><input checked="" type="checkbox"/> 1214_Plot_9</div> <div>* 0.1</div> <div><input checked="" type="checkbox"/> 1214_Plot_13</div> <div>* 0.2</div> <div><input checked="" type="checkbox"/> 1214_Plot_4</div> <div>* 0.1</div> <div><input checked="" type="checkbox"/> 1795_Plot_22</div> <div>* 0.1</div>	Moderate	1.5
Jan	Feb	Mar	Apr															
May	Jun	Jul	Aug															
Sep	Oct	Nov	Dec															

Little Bentwing-bat

Yes (expert report)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

☒ 1214_Plot_7

Very High

3

* 0.1

☒ 1214_Plot_9☒ 1214_Plot_13☒ 1214_Plot_4☒ 1795_Plot_22

★ 0.1

Eastern Bentwing-bat

Yes (expert report)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

☒ 1214_Plot_7

Very High

3

★ 0.1

☒ 1214_Plot_9☒ 1214_Plot_13☒ 1214_Plot_4☒ 1795_Plot_22

* 0.1

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Myotis macropus

Southern Myotis

Yes (expert report)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

1214_Plot_7

0.1

1214_Plot_9

0.1

1214_Plot_13

0.2

1214_Plot_4

0.1

1795_Plot_22

0.1

High

2

Ninox strenua

Powerful Owl

Yes (assumed present)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

1214_Plot_7

0.1

1214_Plot_9

0.1

1214_Plot_13

0.2

1214_Plot_4

0.1

1795_Plot_22

0.1

High

2

Pteropus poliocephalus
Grey-headed Flying-fox

Yes (assumed present)

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

Area (ha)

☒ 1214_Plot_7

* 0.1

☒ 1214_Plot_9

* 0.1

☒ 1214_Plot_13

* 0.2

☒ 1214_Plot_4

* 0.1

☒ 1795_Plot_22

* 0.1

High

2


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BAM Calculator

App last updated: 21/02/2019 (Version: 1.2.6.00)
BAM data last updated *: 4/01/2019 (Version: 6) * **Disclaimer**

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00014973/BAAS17088/19/00014974 / Revision: 2

1. Assessment details 2. Site context 3. Vegetation 4. Habitat suitability 5. Habitat survey 6. Credits 7. Credit classes 8. Price

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

Zone	Vegetation zone name	Vegetation integrity loss	Area	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Candidate SAI	Ecosystem credits
Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion							
1	1214_Plot_7	21	0.1 hectares	High Sensitivity to Potential Gain	2	TRUE	1
2	1214_Plot_9	40.6	0.1 hectares	High Sensitivity to Potential Gain	2	TRUE	2
3	1214_Plot_13	34.2	0.2 hectares	High Sensitivity to Potential Gain	2	TRUE	3
4	1214_Plot_4	55.6	0.1 hectares	High Sensitivity to Potential Gain	2	TRUE	3
Subtotal:							9
Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin							
5	1795_Plot_22	21.1	0.1 hectares	High Sensitivity to Potential Gain	2		1
Subtotal:							1
Total:							10

Species credits for threatened species					
Vegetation zone name	Habitat condition (vegetation integrity) loss	Area / Count	Biodiversity risk weighting	Candidate SAI	Species credits
Chalinolobus dwyeri / Large-eared Pied Bat (Fauna)					
1214_Plot_13	34.2	0.2 hectares	3	True	5
1214_Plot_4	55.6	0.1 hectares	3	True	4
1214_Plot_7	21	0.1 hectares	3	True	2
1214_Plot_9	40.6	0.1 hectares	3	True	3
1795_Plot_22	21.1	0.1 hectares	3	True	2
					Subtotal: 16
Lophoictinia isura / Square-tailed Kite (Fauna)					
1214_Plot_13	34.2	0.2 hectares	1.5	N/A	3
1214_Plot_4	55.6	0.1 hectares	1.5	N/A	2
1214_Plot_7	21	0.1 hectares	1.5	N/A	1
1214_Plot_9	40.6	0.1 hectares	1.5	N/A	2
1795_Plot_22	21.1	0.1 hectares	1.5	N/A	1
					Subtotal: 9

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Miniopterus australis / Little Bentwing-bat (Fauna)						
1214_Plot_13	34.2	0.2 hectares	3	True		5
1214_Plot_4	55.6	0.1 hectares	3	True		4
1214_Plot_7	21	0.1 hectares	3	True		2
1214_Plot_9	40.6	0.1 hectares	3	True		3
1795_Plot_22	21.1	0.1 hectares	3	True		2
Subtotal: 16						
Miniopterus schreibersii oceanensis / Eastern Bentwing-bat (Fauna)						
1214_Plot_13	34.2	0.2 hectares	3	True		5
1214_Plot_4	55.6	0.1 hectares	3	True		4
1214_Plot_7	21	0.1 hectares	3	True		2
1214_Plot_9	40.6	0.1 hectares	3	True		3
1795_Plot_22	21.1	0.1 hectares	3	True		2
Subtotal: 16						
Myotis macropus / Southern Myotis (Fauna)						
1214_Plot_13	34.2	0.2 hectares	2	False		3
1214_Plot_4	55.6	0.1 hectares	2	False		3
1214_Plot_7	21	0.1 hectares	2	False		1
1214_Plot_9	40.6	0.1 hectares	2	False		2
1795_Plot_22	21.1	0.1 hectares	2	False		1
Subtotal: 10						

Ninox strenua / Powerful Owl (Fauna)					
1214_Plot_13	34.2	0.2 hectares	2	N/A	3
1214_Plot_4	55.6	0.1 hectares	2	N/A	3
1214_Plot_7	21	0.1 hectares	2	N/A	1
1214_Plot_9	40.6	0.1 hectares	2	N/A	2
1795_Plot_22	21.1	0.1 hectares	2	N/A	1
					Subtotal: 10
Pteropus poliocephalus / Grey-headed Flying-fox (Fauna)					
1214_Plot_13	34.2	0.2 hectares	2	N/A	3
1214_Plot_4	55.6	0.1 hectares	2	N/A	3
1214_Plot_7	21	0.1 hectares	2	N/A	1
1214_Plot_9	40.6	0.1 hectares	2	N/A	2
1795_Plot_22	21.1	0.1 hectares	2	N/A	1
					Subtotal: 10

Ecosystem credit classes

Ecosystem credit summary

PCT	TEC	Area	Credits
1214-Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion	Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion	0.5	9
1795-Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.1	1

Credit classes for 1214

Like-for-like options

Any PCT with the below TEC	Containing HBT	In the below IBRA subregions
Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion (including PCT's 1214, 1589)	Yes	Pittwater ,Cumberland, Sydney Cataract, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Credit classes for 1795

Like-for-like options

Any PCT with the below TEC	Containing HBT	In the below IBRA subregions
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (including PCT's 837, 839, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798)	Yes	Pittwater ,Cumberland, Sydney Cataract, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species credit classes

Species credit summary

Species	Area	Credits
<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	0.6	16
<i>Lophoictinia isura</i> / Square-tailed Kite	0.6	9
<i>Miniopterus australis</i> / Little Bentwing-bat	0.6	16
<i>Miniopterus schreibersii oceanensis</i> / Eastern Bentwing-bat	0.6	16
<i>Myotis macropus</i> / Southern Myotis	0.6	10
<i>Ninox strenua</i> / Powerful Owl	0.6	10
<i>Pteropus poliocephalus</i> / Grey-headed Flying-fox	0.6	10

Chalinolobus dwyeri / Large-eared Pied Bat (1795_Plot_22)

Like-for-like options

Only the below Spp	In the below IBRA subregions
<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	Any in NSW

Chalinolobus dwyeri / Large-eared Pied Bat (1214_Plot_7)

Like-for-like options

Only the below Spp	In the below IBRA subregions
<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	Any in NSW

Chalinolobus dwyeri / Large-eared Pied Bat (1214_Plot_9)

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8. Price

Message!

If you would like to meet your offset obligation by making a payment to the Biodiversity Conservation Fund, please contact the BCT team at bct@environment.nsw.gov.au

IBRA subregion: Pittwater

PCT list

Include	PCT common name	Credit
<input checked="" type="checkbox"/>	1214 - Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion	9
<input checked="" type="checkbox"/>	1795 - Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin	1

Species list

Include	Species	Credit
<input checked="" type="checkbox"/>	<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	16
<input checked="" type="checkbox"/>	<i>Lophoictinia isura</i> (Square-tailed Kite)	9
<input checked="" type="checkbox"/>	<i>Miniopterus australis</i> (Little Bentwing-bat)	16
<input checked="" type="checkbox"/>	<i>Miniopterus schreibersii oceanensis</i> (Eastern Bentwing-bat)	16
<input checked="" type="checkbox"/>	<i>Myotis macropus</i> (Southern Myotis)	10
<input checked="" type="checkbox"/>	<i>Ninox strenua</i> (Powerful Owl)	10
<input checked="" type="checkbox"/>	<i>Pteropus poliocephalus</i> (Grey-headed Flying-fox)	10

CALCULATE

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

IBRA sub region	PCT common name	Baseline price per credit	Dynamic coefficient	Market coefficient	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Pittwater	1214 - Spotted Gum - Grey Ironbark open forest in the Pittwater and Wagstaffe area, Sydney Basin Bioregion <i>Warning: This PCT has NO trades recorded</i>	\$1,325.37			20.49%	\$20.00	1.0000	\$1,616.94	9	\$14,552.44
Pittwater	1795 - Swamp Mahogany / Cabbage Tree Palm - Cheese Tree - Swamp Oak tall open forest on poorly drained coastal alluvium in the Sydney basin <i>Warning: This PCT has NO trades recorded</i>	\$1,325.37			20.49%	\$20.00	1.0000	\$1,616.94	1	\$1,616.94
Subtotal (excl. GST)										\$16,169.38
GST										\$1,616.94
Total ecosystem credits (incl. GST)										\$17,786.32

Species credits for threatened species

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price	
10157	<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	Vulnerable	\$865.08	20.4900%	\$20.00	16	\$16,997.36	
10495	<i>Lophoictinia isura</i> (Square-tailed Kite)	Vulnerable	\$506.66	20.4900%	\$20.00	9	\$5,674.27	
10533	<i>Miniopterus australis</i> (Little Bentwing-bat)	Vulnerable	\$506.66	20.4900%	\$20.00	16	\$10,087.59	
10534	<i>Miniopterus schreibersii oceanensis</i> (Eastern Bentwing-bat)	Vulnerable	\$865.08	20.4900%	\$20.00	16	\$16,997.36	
10549	<i>Myotis macropus</i> (Southern Myotis)	Vulnerable	\$865.08	20.4900%	\$20.00	10	\$10,623.35	
10562	<i>Ninox strenua</i> (Powerful Owl)	Vulnerable	\$506.66	20.4900%	\$20.00	10	\$6,304.75	
10697	<i>Pteropus poliocephalus</i> (Grey-headed Flying-fox)	Vulnerable	\$865.08	20.4900%	\$20.00	10	\$10,623.35	
						Subtotal (excl. GST)	\$77,308.03	
						GST	\$7,730.80	
						Total species credits (incl. GST)	\$85,038.83	
Calculated as on: 12-04-2019 13:21:19							Grand total	\$102,825.15