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Our Ref: 23022022_RtS_Biodiversity2022

23 February 2022

Marianne Gibbons
Development Manager – Environment & Approvals
Energy Markets
Origin Energy

Marianne.gibbons@originenergy.com.au

Dear Marianne

RE: Major Projects – Eraring Battery Energy Storage System (SSD-15950052)

I refer to the document dated 15 December 2021 entailing the recommendations from Biodiversity and Conservation Division (BCD), with our responses in italics as follows.

1. The proponent should either:

(i) consider Vegetation Zone 3 as 'not planted vegetation' and assess it appropriately under BAM 2020 to determine the biodiversity credit requirement, or

(ii) provide evidence that this zone was subject to revegetation, in the form of hard copy plans / reports, surveys, vehicle / machinery logs, invoices, photographs or monitoring reports (or similar).

Vegetation assessed as planted native vegetation.

Additional supporting documentation was provided by EPS to BCD on 24 January 2022 in the form of plans (Annual Reports from 2011 and 2012), invoices for tubestock and records of on-ground works beginning in 2011. It is Origin's understanding that the rehabilitation was undertaken broadly in accordance with a Rehabilitation, Vegetation and Landscape Management Plan. Umwelt acknowledges that swamp oak is not a 'usual' species in revegetation, however, importantly, swamp oak (Casuarina glauca) was one of the dominant species planted during revegetation works as shown on the invoices and records, plus Sydney golden wattle (Acacia longifolia), large-leaf hop bush (Dodonaea triquetra) and crimson bottlebrush (Callistemon citrinus), all of which are overwhelmingly the dominant species in the vegetation zone at present.

The invoices and records show that some Eucalyptus species were planted between 2010 and 2013. These Eucalypt species are no longer present within vegetation zone 3, except for isolated individuals that have survived. Given the very poor soil, with no

Umwelt (Australia) Pty Limited
ABN 18 059 519 041

T| 1300 793 267
E| info@umwelt.com.au

www.umwelt.com.au

topsoil present (see photos in BDAR), it is likely that swamp oak was one of the only canopy species hardy enough to survive.

The Project Approval (Major Project Application 06_238) for the original disturbance in the Development Footprint specifies in Clause 2.22 "As soon as practicable after the completion of construction works, the Proponent shall stabilise and rehabilitate disturbed areas associated with the attemperation reservoir and borrow pit using locally endemic native species". This explains why the vegetation within zone 3 cannot be assigned to a PCT, because the purpose of the vegetation was not to recreate a naturally occurring vegetation community but rather, it was for stabilisation and therefore the assemblage of species *were chosen based on ease of propagation and hardiness to survive in poor conditions, regardless of whether these species occur naturally together or not.*

Origin's understanding based on personal communications with those involved at the time, is that the rehabilitation was undertaken broadly in accordance with a Rehabilitation, Vegetation and Landscape Management Plan. It is also understood that the plan for the rehabilitation of the borrow-pit location was limited by lack of topsoil due to prior disturbance and that surplus topsoil from a disturbed pine plantation and non-native areas of the attemperation dam would be applied to the site followed by sterile cover crops and finally transitional shrubs and grassland native planting would be applied. While the plan does not specify swamp oak as a suggested species, the invoices and planting numbers supplied by EPS show that swamp oak was indeed one of the most commonly planted species for these works.

If the swamp oak has regenerated naturally via suckers as suggested by BCD, there would have to be mature swamp oak present in the immediate vicinity, of which there are none, and which discounts the swamp oak fringing Lake Eraring due to its distance of approximately one kilometre. Umwelt inspected the entire area surrounding the Development Footprint in 2020 in a constraints assessment (refer to BDAR), and no swamp oak community is present in the immediate surrounds (see Figure attached). The only area mapped as swamp oak is vegetation zone 3 in question, and a very minor portion on the western boundary of the area, which is approximately 300 metres away and therefore could not be the source of suckering due to distance. The area between vegetation zone 3 and this area of swamp oak vegetation is also heavily vegetated with prickly- leaved paperbark forest, and it is therefore highly unlikely that seed from the swamp oak would reach the Development Footprint via wind dispersal.

The adjoining Estuarine Swamp Paperbark Forest mapped by Bell is a monoculture of paperbarks including Melaleuca styphelioides, M. nodosa, M. linarifolia and M. sieberi with a native understorey. It is not the source of any mature Casuarina or suckers.

Furthermore, the swamp oak that is present within PCT 1716 within the Development Footprint is very young and therefore could not be the source of suckers. Rather, these young swamp oaks appear on the edge of this community where it borders the planted native vegetation.

It is more likely that the original swamp oaks planted ten years ago are now the source of copious suckers that have created a dense monoculture in vegetation zone 3, again because this is one of the few hardy species that can survive in such a poor substrate. This is also true of Acacia longifolia, Dodonaea triquetra and Callistemon citrinus, which are all very common revegetation species due to the ease of propagation and their hardiness to survive in unsuitable conditions.

Updated in BDAR in Section 3.2.2.

2. If resolution of recommendation 1 determines that the vegetation is planted, BCD recommends the accredited assessor provide appropriate justification as to why the planted vegetation would not be considered as functional given it is for soil erosion control and stabilisation purposes, and therefore require further assessment under Part D2 of Appendix D (Planted Vegetation) of the BAM.

BDAR has been updated to reflect the notion that the vegetation is functional for erosion control and stabilisation. The wording in the BAM is unclear on 'functional' and all the examples provided are for windbreaks, privacy, street trees, sporting fields etc. When considered in relation to erosion control, the planted vegetation would be considered functional and has been updated to reflect this. BDAR Table 3.2 has been updated to consider Part D2 of Appendix 4, with a summary below.

Consideration of Part D2

The presence of threatened flora in this vegetation zone is considered extremely unlikely. Given that the topsoil was completely removed in 2010, no surviving seedbank is likely to be present. Therefore, threatened species could only occur by regenerating close to areas in which they occur. The nearby individuals of black-eyed Susan (Tetratheca juncea) and small- flower grevillea (Grevillea parviflora subsp. parviflora) are considered highly unlikely to regenerate in this vegetation zone, given their location away from ecotones or edges. No other threatened flora were detected within the Development Footprint.

No use by threatened fauna species in this vegetation was observed during any surveys. It is not considered to provide any habitat for threatened fauna species, given the very young age and homogenous nature of the swamp oak, no hollows being present, no standing water available, a general paucity of logs and the only leaf litter being from swamp oak (i.e., needles that provide low functional value).

No scats or nests, from either threatened or non-threatened entities were detected, which is not surprising given the age and quality of the revegetation. The vegetation is not yet old or tall enough to support the nests of threatened raptors, and the dominant tree species, Casuarina glauca, does not support the foraging habits of small, threatened woodland birds. No habitat for frogs is present in this vegetation zone.

All survey techniques outlined in the BDAR were conducted within this vegetation zone. While a less intensive effort was placed in this vegetation zone, due to the far lower quality of habitat provided, the zone was nevertheless searched for threatened species during all seasons of survey.

Gliders were detected on camera within this vegetation zone, and the potential occurrence of the squirrel glider (Petaurus norfolcensis) was carefully considered. All the gliders detected were considered to be sugar gliders, a more generalist species of the two.

However, in accordance with the precautionary principle, should squirrel gliders infrequently utilise this vegetation zone, they are already being assumed present within the surrounding Development Footprint because they are known from the area. Therefore, in accordance with Section 8.4. of the BAM regarding mitigation and minimisation of impacts on this species, this has already been considered in Section 4.0. of the BDAR.

No other threatened species were considered likely to occur in this vegetation zone.

3. BCD recommends the accredited assessor submits the credit calculator via the NSW Biodiversity Accredited Assessor System prior to the submission of the response to submissions report.

BAM Calculator submitted 28 October 2021 and should have been available at time of BCD review. GIS files and copies of BAM data submitted to huntercentralcoast@environment.nsw.gov.au on 24 November 2021.

4. BCD recommends the accredited assessor includes the plot field data sheets in the Biodiversity Development Assessment Report (BDAR).

Field data sheets transcribed onto paper and appended to this letter.

5. BCD recommends the accredited assessor update Figure 3.1 in the BDAR to show the plots with their unique plot identifier against the Plant Community Types.

Addressed in BDAR Figure 3.1.

6. The accredited assessor needs to demonstrate what actions and measures they have undertaken to avoid the direct and indirect impact on swift parrot important habitat mapping. BCD recommends the development footprint is redesigned to cover the more disturbed areas of the site and avoid the important mapped areas for the swift parrot.

Addressed in BDAR Section 5.3 with additional wording and figure showing large area of swift parrot habitat avoided within EPS landholdings.

While a small area (3.1 ha) of swift parrot (Lathamus discolor) mapped important habitat is proposed to be removed, this represents a very minor area of important habitat mapped within the EPS landholdings, being a total of 306.3 ha (refer to Figure 5.1. of BDAR). The area to be removed therefore represents 1% of this mapped habitat and this is the habitat within EPS- owned land alone. Swift parrot important habitat mapping extends outside this area in the locality also, and therefore the total to be removed would be less than 1%.

If the Development Footprint was placed anywhere else on EPS- owned land, it would in fact remove more swift parrot habitat (refer to Figure 5.1.).

According to the National Recovery Plan for the Swift Parrot (Saunders and Tzaros, 2011), important foraging habitat in NSW includes woodland and forest with the following key tree species:

- *Mugga ironbark (Eucalyptus sideroxylon)*
- *Grey box (Eucalyptus microcarpa)*
- *White box (Eucalyptus albens)*
- *Yellow box (Eucalyptus melliodora)*
- *Swamp mahogany (Eucalyptus robusta)*
- *Forest red gum (Eucalyptus tereticornis)*
- *Blackbutt (Eucalyptus pilularis)*

- *Spotted gum (Corymbia maculata).*

The BESS project occurs in an area where the swift parrot important habitat mapping does not align with important foraging habitat according to the National Recovery Plan. Figure 5.1 attached shows a 2 km buffer of important habitat around a Bionet record from 2011 within Eraring- owned land. The surveyed habitat in the Project Area comprises the following PCTs and tree species:

- *1636 Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast moderate condition*
- *1716 Prickly-leaved Paperbark Forest on coastal lowlands of the Central Coast andLower North Coast low condition*
- *Planted native vegetation dominated by swamp oak (Casuarina glauca).*

None of the above listed tree species are considered by the recovery plan as forming important habitat for the swift parrot. The only important feed tree present in the vicinity of the Project Area is the swamp mahogany (Eucalyptus robusta), but this species has been excluded from the Development Footprint as part of the Swamp Sclerophyll Forest EEC on the east boundary, therefore further avoiding and minimising swift parrot habitat. No mature swamp mahoganies were observed to occur within PCT 1717 in the Development Footprint.

7. The additional actions should be added to the tree clearing protocols outlined in Section 4.2.2 of the BDAR.

Addressed in BDAR Section 4.2.1.

8. BCD recommends that the BDAR should provide a more detailed appraisal of what the potential impacts of any relocations / translocations of displaced fauna (particularly threatened species) may be on adjoining habitat and what measures (e.g. monitoring) will be employed to minimise any detrimental effects on existing faunal populations that utilise such areas.

Umwelt acknowledges the risks identified by the BCD in relation to moving displaced fauna species though the risk of injury or death. However, the only other alternative, that is leaving uninjured animals to relocate by themselves through a construction area, would be a profoundly greater risk to the individual and potentially the local population.

Moving displaced fauna is the last step in the pre-clearance/tree felling mitigation process identified in the BDAR and all the prior steps, clearing non-habitat trees, creating disturbance around habitat trees, pre-clearance inspections and lastly the shaking of the habitat tree prior to felling have all been included specifically to provide opportunity and incentive for fauna to relocate prior to the tree being felled. This method is widely utilised in the industry and, in our experience, reduces the likelihood that habitat remains occupied when it is eventually removed.

In the unlikely event that the other measures aren't successful, the only likely threatened fauna species identified within the Development Footprint that could potentially be displaced during the clearing process is the squirrel glider (Petaurus norfolcensis). This species lives in groups which defend an average home range in coastal environments of 4-9 hectares and within this range the group can utilise up to 20 different hollow-bearing trees over a six-month period (NSW Scientific Committee 2008). Considering that approximately 4.6 hectares of potential habitat for this species will be removed it is considered unlikely this

would form a distinct territorial boundary for a population. Therefore, considering it is proposed that the displaced fauna is simply being assisted in moving away from harm, the risk in moving an individual, or multiple individuals, in relation to other individuals or groups in the adjoining areas, whether it be through competition for resources, introduction of potential disease or social disruption to other animals already utilising available habitat, must be lower than risk created by simply leaving the individual or group to relocate.

We note that BCD also discuss Translocation operational policy' (DPIE 2019) in their submission and incorporation of that policy into the mitigation section of the BDAR. Formal translocation has never been proposed and the action identified in the mitigation measure relates purely to moving uninjured animals out of harm's way. Upon review of the policy cited by the department we consider that the proposed approach, being the capture and release of animals at risk of harm, is not covered by that policy where, on page 3, it states that "This policy does not apply to the following actions, though a biodiversity conservation licence or other authority may be required to undertake them: …… intentional movement of animals to a nearby location for the purpose of moving them out of harm's way".

The policy mentions that a biodiversity conservation licence may be required for such activities, and this was considered in the proposed mitigation measures when it was documented that "tree felling supervision will be undertaken by an appropriately qualified and experienced person".

Based on the above, it is not considered necessary for any changes to this section in the BDAR.

9. BCD recommends that the accredited assessor update the BDAR to include measures proposed to address the offset obligations.

Addressed in BDAR in Section 6.4. EPS is likely to pay into the fund, however other options outlined in BDAR.

We trust this information meets with your current requirements. Please do not hesitate to contact me should you require clarification or further information.

Yours sincerely

Philippa Fagan
Senior Ecologist

Legend

Study Area

Plant Community Types

- 1627 Smooth-barked Apple - Turpentine - Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast
- 1636 Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
- 1636 Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast low condition
- 1638 Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
- 1638 Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast low condition
- 1716 Prickly-leaved Paperbark forest on coastal lowlands of the Central Coast and Lower North Coast
- 1716 Prickly-leaved Paperbark forest on coastal lowlands of the Central Coast and Lower North Coast low condition
- 1718 Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast
- 1727 Swamp Oak - Sea Rush - Baumea juncea swamp forest on coastal lowlands of the Central Coast and Lower North Coast
- 1727 Swamp Oak - Sea Rush - Baumea juncea swamp forest on coastal lowlands of the Central Coast and Lower North Coast low condition
- Planted koala feed trees

FIGURE 3.1

Plant Community Types

Image Source: Nearmap (Nov 2020) Data source: NSW DFSI (2020)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 4/5/2024	Eraring DESS	P01	PF

GF Code	*Top 3 native species in each growth form group: Full species name mandatory* *All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Acacia falcata		0.1	1		
	Andropogon virginicus		0.1	20		
	Breynia oblongifolia		0.1	3		
	Casuarina glauca		50	80		
	Centella asiatica		0.1	50		
	Cortaderia selloana		0.1	1		
	Davesia ulicifolia		0.1	2		
	Gahnia sieberiana		0.1	3		
	Hardenbergia violacea		0.1	15		
	Imperata cylindrica		0.1	50		
	Juncus spp.		0.1	1		
	Leptospermum polygalifolium		0.1	1		
	Levcopogon juniperinus		0.1	2		
	Mirbelia rubiifolia		0.1	3		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Ewing BESS	P01	PF

Date		IBRA region		Photo #	✓	Zone ID	
Zone	Datum						
Easting	Northing	Dimensions		Orientation of midline from the 0 m point.	58°		

		Confidence: H M L
Vegetation Class	Planted	
Plant Community Type	EEC:	Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	7
	Grasses etc.	2
	Forbs	1
	Ferns	0
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	50
	Shrubs	0.7
	Grasses etc.	0.2
	Forbs	0.1
	Ferns	0
	Other	0.1
High Threat Weed cover		0.2

BAM Attribute (20 x 50 m plot)			# Tree Stems Count	
dbh		Euc*	Non Euc	Hollows†
large trees for Euc* & Non Euc	80 + cm			
	50 – 79 cm			
30 – 49 cm				
20 – 29 cm				
10 – 19 cm		✓		
5 – 9 cm		✓		n/a
< 5 cm		✓		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)				total 1

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	56%			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 4/5/2020	Ewing DESI	P02	AF

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Acacia longifolia		15	50		
	Casuarina glauca		40	200		
	Centella asiatica		0.1	20		
	Cotula coronopifolia		0.1	1		
	Cynodon dactylon		10	500		
	Dillwynia retorta		0.1	5		
	Dodonaea triquetra		0.1	10		
	Eragrostis brownii		0.1	10		
	Eragrostis curvula		0.1	20		
	Gahnia sieberiana		1	10		
	Gonocarpus tetragynus		0.1	10		
	Hypolaena hirta		5	100		
	Imperata cylindrica		5	500		
	Kunzea ambigua		1	50		
	Leucopogon juniperinus		0.1	2		
	Melaleuca ericifolia		0.1	10		
	Paspalum dilitatum		0.1	10		
	Pultenaea paleacea		0.1	20		
	Schoenus apogon		0.1	10		
	Themeda triandra		0.1	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Eraring BESS	P02	PF

Date		Zone	Datum	IBRA region		Photo #	✓	Zone ID	

Easting	Northing	Dimensions		Orientation of midline from the 0 m point.	52°

Vegetation Class	Planted	Confidence: H M L
Plant Community Type		EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	6
	Grasses etc.	6
	Forbs	2
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	40
	Shrubs	16.4
	Grasses etc.	16.3
	Forbs	0.2
	Ferns	0
	Other	0
High Threat Weed cover		5.3

BAM Attribute (20 x 50 m plot)	Euc*	Non Euc	# Tree Stems Count Hollows†
dbh			
large trees for Euc* & Non Euc 80 + cm			
50 – 79 cm			
30 – 49 cm			
20 – 29 cm	✓		
10 – 19 cm	✓		
5 – 9 cm	✓		n/a
< 5 cm	✓		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total 3

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	17			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 4/5/2019	Goring BESS	P03	PF

GF Code	*Top 3 native species in each growth form group: Full species name mandatory* *All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Acacia longifolia		0.2	20		
	Acacia suaveolens		0.1	2		
	Ageratina adenophora		0.1	10		
	Angophora costata		0.1	1		
	Bidens pilosa		0.1	10		
	Casuarina glauca		60	100		
	Centella asiatica		0.1	20		
	Chloris gayana		50	3000		
	Dodonaea triquetra		0.2	20		
	Gahnia sieberiana		0.2	5		
	Hakea sericea		0.2	5		
	Hakea spp.		0.1	3		
	Hyparrhenia hirta		5	100		
	Kunzea ambigua		0.2	10		
	Lepto. poly.		0.1	2		
	Megathyrsus max.		0.1	10		
	Phragmites australis		0.2	50		
	Senna pendula		0.1	5		
	Setaria pumila		0.1	10		
	Solanum mauritianum		0.1	5		
	Sterotaphrum secundatum		5	100		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Erring DESS	P03	PF

Date		Zone	Datum	IBRA region		Photo #	✓	Zone ID	

Easting	Northing	Dimensions		Orientation of midline from the 0 m point.	294°

Vegetation Class	Planted	Confidence: H M L
Plant Community Type		EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	7
	Grasses etc.	2
	Forbs	1
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	60.1
	Shrubs	1.1
	Grasses etc.	0.4
	Forbs	0.1
	Ferns	0
	Other	0
High Threat Weed cover		60.3

BAM Attribute (20 x 50 m plot)	Euc*	Non Euc	Hollows†
dbh	# Tree Stems Count		
large trees for Euc* & Non Euc 80 + cm			
50 – 79 cm			
30 – 49 cm			
20 – 29 cm			
10 – 19 cm	✓		
5 – 9 cm	✓		n/a
< 5 cm	✓		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total 0

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	21			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 14/5/2020	Eraring BESS	P04	PF

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	Acacia longifolia		0.1	2		
	Allocasuarina torulosa		0.2	1		
	Anisopogon avenaceus		30	1000		
	Banksia oblongifolia		0.1	5		
	Billardiera scandens		0.1	5		
	Cassytha glabella		0.1	1		
	Corymbia gummifera		15	8		
	Cyathochaeta diandra		30	1000		
	Dampiera purpurea		0.1	10		
	Dianella longifolia		0.1	5		
	Dillwynia retorta		0.1	2		
	Dodonaea triquetra		10	20		
	Entolasia stricta		1	500		
	E. capitellata		5	2		
	E. haemostoma		5	3		
	Gahnia sieberiana		0.1	1		
	Glochidion ferdinandi		0.1	1		
	Glycine tab.		0.1	10		
	Gompholobium lat.		0.1	1		
	Hakea dactyloides		0.1	3		
	Hakea sp.		0.1	3		
	Hibbertia aspera		0.1	10		
	Imperata cylindrica		0.1	50		
	Kunzea ambigua		0.2	5		
	Lambertia formosa		2	3		
	Lepidosperma lat.		0.1	500		
	Lepto. poly.		10	3		
	Lepto. trinervium		0.1	5		
	Lomandra obliqua		0.2	20		
	Melaleuca nodosa		~~0.15~~	10		
	Opercularia aspera		~~0~~ 0.1	10		
	Parsonsia straminea		0.1	2		
	Persoonia levis		0.1	2		
	Polyscias sambucifolia		0.2	20		
	Pratia purp.		0.1	20		
	Pteridium esculentum		20	100		
	Themeda triandra		0.2	50		
	Xanthorrhoea latifolia		0.2	7		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Erring BESS	P04	PF

Date		IBRA region		Photo #	✓	Zone ID	
Zone	Datum						
Easting	Northing	Dimensions		Orientation of midline from the 0 m point.	183°		

		Confidence: H M L
Vegetation Class	1636	
Plant Community Type	EEC:	Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	5
	Shrubs	15
	Grasses etc.	8
	Forbs	4
	Ferns	1
	Other	5
Sum of Cover of native vascular plants by growth form group	Trees	25.3
	Shrubs	18.4
	Grasses etc.	71.6
	Forbs	0.4
	Ferns	20
	Other	0.6
High Threat Weed cover		0

BAM Attribute (20 x 50 m plot)		# Tree Stems Count		
dbh	Euc*	Non Euc	Hollows†	
large trees for Euc* & Non Euc 80 + cm				Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately
50 – 79 cm	3			
30 – 49 cm	✓			* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*
20 – 29 cm	✓			
10 – 19 cm	✓			† Record total number of stems by size class with hollows (including dead stems/trees)
5 – 9 cm	✓		n/a	
< 5 cm	✓		n/a	
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total 11	

Counts must apply to each size class when the number of living tree stems within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	58			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 4/5/2020	Ecoing QESS	P05	PF

GF Code	*Top 3 native species in each growth form group: Full species name mandatory* *All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Acacia longifolia		5	15		
	Acrotriche divaricata		0.1	1		
	Allocasuarina littoralis		0.1	2		
	Angophora costata		10	2		
	Anstida vagans		1	500		
	Billardiera scandens		0.1	10		
	Daviesia ulicifolia		0.2	10		
	Dianella longifolia		0.1	5		
	Echinopogon caesp.		0.1	10		
	Entolasia stricta		15	1000		
	Epacris pulchella		0.2	50		
	E. haemastoma		30	7		
	Geranio. lat.		0.1	1		
	Hardenbergia viol		0.1	1		
	Hibbertia aspera		0.1	10		
	Hyparrhenia hirta		30	1000		
	Imperata cylindrica		0.2	50		
	Kunzea ambigua		0.1	1500		
	Lepidosperma lat.		0.2	50		
	Leucopogon junp.		0.1	3		
	Lobelia purp.		0.1	10		
	Lomandra glauca		0.1	10		
	Mirbelia rubifolia		0.1	10		
	Panicum simile		5	500		
	Patersonia sericea		0.1	5		
	Pteridium esculentum		30	1000		
	Pultenaea pal.		0.1	20		
	Themeda triandra		0.2	20		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Erang BESS	P05	PF

Date		IBRA region		Photo #	✓	Zone ID	
Zone	Datum						
Easting	Northing	Dimensions		Orientation of midline from the 0 m point.	359°		

		Confidence: H M L
Vegetation Class	1636	
Plant Community Type	EEC:	Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	3
	Shrubs	10
	Grasses etc.	8
	Forbs	3
	Ferns	1
	Other	2
Sum of Cover of native vascular plants by growth form group	Trees	40.1
	Shrubs	6.1
	Grasses etc.	21.8
	Forbs	0.3
	Ferns	30
	Other	0.2
High Threat Weed cover		30

BAM Attribute (20 x 50 m plot)		# Tree Stems Count		
dbh	Euc*		Non Euc	Hollows†
large trees for Euc* & Non Euc 80 + cm				
50 – 79 cm	2			
30 – 49 cm	✓			
20 – 29 cm	✓			
10 – 19 cm	✓			
5 – 9 cm	✓			n/a
< 5 cm	✓			n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)				total 2

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	67			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 14/5/2024	Eraring DESS	P06	PF

GF Code	*Top 3 native species in each growth form group: Full species name mandatory* *All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Adiantum aethiopicum		0.2	50		
	Angophora costata		2	1		
	Breynia oblongifolia		0.1	3		
	Cinnamomum camphora		0.1	1		
	Dianella caerulea		0.1	5		
	Entolasia stricta		0.1	10		
	E. haemostoma		5	2		
	E. resinifera		20	11		
	Gahnia sieberiana		10	20		
	Gladidion ferd.		20	50		
	Imperata cylindrica		0.1	20		
	lantana		1	10		
	Ligustrum sinense		0.1	5		
	Livistona australis		0.1	1		
	Lobelia purpurascens		0.1	5		
	Melaleuca lin.		5	20		
	Melaleuca nodosa		45	200		
	Microlaena stipoides		0.1	20		
	Oplismenus imbecilis		3	1000		
	Parsonsia straminea		1	3		
	Pittosporum undulatum		2	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Erring BESS	P06	PF

Date		Zone	Datum	IBRA region		Photo #	✓	Zone ID	
		__							
Easting	Northing			Dimensions		Orientation of midline from the 0 m point.	352°		
_ _ _ _ _ _	_ _ _ _ _ _ _								

Vegetation Class	1716		Confidence: H M L
Plant Community Type		**EEC:**	Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	**Trees**	4
	Shrubs	4
	Grasses etc.	5
	Forbs	2
	Ferns	1
	Other	2
Sum of **Cover** of native vascular plants by growth form group	**Trees**	47
	Shrubs	52.1
	Grasses etc.	13.3
	Forbs	0.2
	Ferns	0.2
	Other	1.1
High Threat Weed cover		1.2

BAM Attribute (20 x 50 m plot)		# Tree Stems Count	
dbh	Euc*	Non Euc	Hollows†
large trees for Euc* & Non Euc **80 + cm**			
50 – 79 cm	1		
30 – 49 cm	✓		
20 – 29 cm	✓		
10 – 19 cm	✓		
5 – 9 cm	✓		n/a
< 5 cm	✓		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total 37

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a multi-stemmed tree, only the largest living stem is included in the count/estimate. For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	75			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 4/5/2024	Erasing BESS	P07	PF

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	1 Acacia longifolia		1	10		
	2 Acrotriche divaricata		0.1	2		
	3 Anisopogon avenaceus		0.1	3		
	4 Aristida vagans		0.1	10		
	5 Daviesia ulicifolia		0.1	5		
	6 Dianella caerulea		0.1	5		
	7 Dodonaea triquetra		25	200		
	8 Entolasia stricta		5	500		
	9 E. capitellata		10	2		
	10 E. haemostoma		30	30		
	11 Gahnia sieberiana		0.2	5		
	12 Glycine tab.		0.1	5		
	13 Hardenbergia viol.		0.1	2		
	14 Hyparrhenia hirta		5	200		
	15 Imperata cylindrica		15	100		
	16 Leucopogon juniperinus		0.1	2		
	17 Lomandra glauca		0.1	5		
	18 Lomandra obliqua		0.1	5		
	19 Mirbelia rubifolia		0.1	3		
	20 Opercularia aspera		0.1	10		
	21 Phyllanthus hirtellus		0.1	20		
	22 Pinus radiata		1	1		
	23 Pittosporum undulatum		0.2	20		
	24 Polyscias sambuciifolia		0.1	3		
	25 Themeda triandra		0.2	20		
	26 Xantho. lat.		0.2	5		
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of

Date		Survey Name	Plot Identifier	Recorders
		Ecoing DESS	P07	PF

Zone	Datum	IBRA region		Photo #	✓	Zone ID	
Easting	Northing	Dimensions	m	Orientation of midline from the 0 m point.	87° Magnetic		

Vegetation Class	1636	Confidence: H M L
Plant Community Type		EEC: / Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	12
	Shrubs	9
	Grasses etc.	8
	Forbs	2
	Ferns	0
	Other	3
Sum of **Cover** of native vascular plants by growth form group	Trees	40
	Shrubs	26.8
	Grasses etc.	20.8
	Forbs	0.2
	Ferns	0
	Other	0.4
High Threat Weed cover		6

BAM Attribute (20 x 50 m plot)		# Tree Stems Count		
dbh	Euc*	Non Euc	Hollows†	
large trees for Euc* & Non Euc **80 + cm**				Record number of **living** eucalypt* (Euc*) and **living native** non-eucalypt (Non Euc) stems separately
50 – 79 cm	4		1	
30 – 49 cm	✓			* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*
20 – 29 cm	✓			
10 – 19 cm				† Record total number of stems by size class with hollows (including dead stems/trees)
5 – 9 cm	✓		n/a	
< 5 cm	✓		n/a	
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total 9	

Counts must apply to each size class when the **number of living tree stems** within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. For **hollows** count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	81			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/11/2020	Eraring DESS	P08	PF

GF Code	*Top 3 native species in each growth form group: Full species name mandatory* *All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Cassinia glauca		9	50		
	Chloris gayana		0.1	5		
	Cortaderia selloana		0.1	1		
	E. capitellata		0.2	1		
	Gahnia sieb.		25	50		
	Goodenia paniculata		0.1	10		
	Homalanthus pop.		0.1	1		
	Kunzea ambigua		0.5	10		
	Lantana		0.1	10		
	Melaleuca lin.		1	10		
	Melaleuca nodosa		50	100		
	Melaleuca sieberi		0.2	10		
	Microlaena stipoides		0.1	1		
	Onopordum acanthium		0.1	5		
	Parsonsia straminea		0.1	2		
	Paspalidium spp.		0.2	50		
	Senecio mad.		0.1	5		
	Solanum mauritianum.		0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, …, 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, …, 10, 20, 30, … 100, 200, …, 1000, …

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
Eraring BESS	P08	PF

Date		Zone	Datum	Easting	Northing

IBRA region		Photo #	✓	Zone ID	
Dimensions		**Orientation of midline from the 0 m point.**	21°		

Vegetation Class	1716		Confidence: H M L
Plant Community Type		**EEC:**	Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	Trees	2
	Shrubs	5
	Grasses etc.	3
	Forbs	1
	Ferns	0
	Other	1
Sum of **Cover** of native vascular plants by growth form group	Trees	9.2
	Shrubs	51.8
	Grasses etc.	25.3
	Forbs	0.1
	Ferns	0
	Other	0.1
High Threat Weed cover		0.6

BAM Attribute (20 x 50 m plot)	# Tree Stems Count		
dbh	Euc*	Non Euc	Hollows†
large trees for Euc* & Non Euc **80 + cm**			
50 – 79 cm			
30 – 49 cm			
20 – 29 cm	✓		
10 – 19 cm	✓		
5 – 9 cm	✓		n/a
< 5 cm	✓		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total 2

Record number of living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the number of living tree stems within the size class is ≤10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. For **hollows** count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots	36			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

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