Grantham Park Holdings Pty Limited Bungendore Sands Extension Project



# **Appendix 6**

# Biodiversity Development Assessment

## prepared by EnviroKey Pty Ltd

(Total No. of pages including blank pages = 100)



#### ENVIRONMENTAL IMPACT STATEMENT

Grantham Park Holdings Pty Limited Bungendore Sands Extension Project

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## Biodiversity Development Assessment Report

Proposed extension of Grantham Park Sand Quarry, Bungendore, NSW



A report prepared for RW Corkery on behalf of Grantham Park Holdings Pty Ltd

**MARCH 2020** 

Report No. 19.BDAR-090

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Proposed extension of Grantham Park Sand Quarry, Bungendore, NSW

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#### Definitions & Acronyms used within this report

Activity	The nature of the proposed activity, as described in section 1.2
BAM	Biodiversity Assessment Methodology
BC Act	NSW Biodiversity Conservation Act 2016
BC Reg	NSW Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
BCF	Biodiversity Conservation Fund
ВСТ	Biodiversity Conservation Trust
Development footprint	The footprint of the proposed activity, that is the area of direct impact
DoEE	Department of the Environment & Energy
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
IBRA	Interim Bioregionalisation of Australia
LGA	Local Government Area
Likely	taken to be a real chance or possibility
Locality	means the area within a 10 km radius of the proposed activity
migratory species	a species specified in the schedules of the EPBC Act
OEH	NSW Office of Environment & Heritage
PCT	Plant community type
Region the Interim Biogeographic located within the South Ea	means a biogeographical region that has been recognised and documented such as al Regions of Australia (IBRA) (Thackway and Creswell, 1995). The study area is astern Highlands Bioregion
Study area affected by the proposed a	includes the Development footprint and any additional areas that are likely to be activity, either directly or indirectly
Subject site proposed activity	the area to be directly affected by the proposed activity. That is, the footprint of the
TEC	threatened ecological community
threatened biota communities considered ki	means those threatened species, endangered populations or endangered ecological nown or likely to occur in the study area
threatened species	a species specified in the schedules of the BC Act or the EPBC Act

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## **1** INTRODUCTION

Grantham Park Holdings Pty Ltd (GPH) is seeking approval from Queanbeyan – Palerang Regional Council (QPRC) to develop a new sand extraction area on a section of Lot 1, DP 1167699, in order to increase the recoverable sand resource and extend the operational life of the existing extraction and processing operation ("the Quarry") conducted by Tobiway Crushing Pty Ltd ("Tobiway").

The development application is to facilitate continued operations at the Quarry that Tobiway has been operating under the conditions of a previous development consent. The proposed activity would be assessed as Designated Development under Part 4 of the *Environmental Planning & Assessment Act 1979*, and therefore assessed by Queanbeyan – Palerang Regional Council. As Designated Development for the purpose of extractive industry, the Quarry is also Regional Development under *State Environment Planning Policy (SEPP) (State and Regional Development) 2011* and therefore determination of the application will be by the Joint Regional Planning Panel.

**EnviroKey** were engaged by RW Corkery and Co Pty Ltd (RWC), to prepare a Biodiversity Development Assessment Report (BDAR) for a proposed development. This BDAR has been prepared by Mr Steven Sass, an Accredited Assessor (BAAS17047) under the NSW *Biodiversity Conservation Act 2016* (BC Act) and is consistent with the Biodiversity Assessment Methodology (BAM) (OEH, 2017). Details of all personnel involved in the field surveys or the preparation of this BDAR are provided in **Appendix 1**.

#### 1.1 PROPOSED ACTIVITY

The proposal would comprise the following:

- Ongoing extraction of sand and limited volumes of overburden and interburden (clay and silt) within the remainder of the Approved Extraction Area and a 77 hectare proposed Extraction Area, to a maximum depth of 10 metres, producing up to 400,000t of sand products per year for a period of 20 years.
- Continued on-site screening, classifying and stockpiling of extracted material to produce a range of sand products using the existing Sand Classification Plant.
- Continued transportation of sand products to the Operator's customers using a combination of rigid vehicles and truck and dog combinations and existing Quarry Access Road and public transportation routes.
- Continued management and settlement of fines and process water using the existing and proposed Fines Settling Cells and Process Water Ponds.
- Establishment of ancillary infrastructure, including bunds and water management structures.
- Construction and rehabilitation of a final landform that would be safe, stable, non-polluting, and suitable for a future land use of nature conservation and agriculture.



The proposed activity includes all existing infrastructure. For the purpose of this BDAR, only the proposed extraction area is considered, as all other infrastructure is approved and existing as part of the current operation. On that basis, the proposed extraction area includes the proposed Fines Settling Cells and Wetlands to be constructed following the completion of extraction operations.

#### 1.2 STUDY AREA

The study area is located about 31 kilometres northeast of Queanbeyan (**Map 1**). For the purpose of this BDAR, the study area is defined as the Development footprint (ie, the area of direct impact), surrounding areas that may be subject to indirect impacts, and existing operations (**Map 2**).

The study area is located within the South East Highlands Bioregion and Monaro IBRA subregion (Thackway and Creswell, 1995, NPWS, 2003), Queanbeyan - Palerang local government area (LGA) and Lake George Complex Mitchell Landscape ((Mitchell, 2002).

#### 1.3 BIODIVERSITY OFFSET SCHEME

The *Biodiversity Conservation Regulation 2017*, sets out thresholds for when the Biodiversity Offset Scheme (BOS) will be triggered. The threshold has three triggers:

- 1. Whether the amount of native vegetation being cleared exceeds a threshold based on minimum lot size associated with the property;
- 2. Whether the area cleared is mapped as 'sensitive' on the Biodiversity Values Map published by the NSW Office of Environment and Heritage; or
- 3. Whether a significant impact is likely according to a 'test of significance'.

Based on the Biodiversity Offset Scheme Entry Threshold (BOSET) Map provided in **Appendix 2**, the proposed activity exceeds the area clearing threshold of 1 hectare allocated to the subject lot. On this basis, the BOS is triggered and a BDAR is the appropriate assessment pathway.





Map 1: Regional location of the study area.





Map 2: The study area used for this BDAR.



## 2 LANDSCAPE CONTEXT

#### 2.1 IDENTIFY LANDSCAPE FEATURES

In accordance with the BAM, a number of features are assessed within and surrounding the subject site. This section provides details relating to the IBRA region and subregion and NSW landscape region (Mitchell Landscapes) (**Map 3**). Other landscape features such as rivers, streams, estuaries and wetlands, habitat connectivity, karst areas or areas of outstanding biodiversity value are considered where appropriate.

#### 2.1.1 IBRA bioregions and IBRA subregions

IBRA bioregions represent a landscape-based approach to the classification of land including geomorphology, landform, climate, lithology and characteristic flora and fauna. The proposed extraction area (development footprint) is located entirely within the South East Highlands IBRA region and Monaro IBRA subregion.

#### 2.1.2 NSW landscape regions (Mitchell Landscapes)

The proposed extraction area occurs within a single NSW Mitchell Landscape; 'Lake George Complex'. The Lake George Complex comprises closed drainage basins of Quaternary lakes and swamps set within block faulted ranges. They consist of extensive Tertiary quartz gravel, sand and mud overlying Silurian-Devonian gneissic granite and Silurian quartz sandstone and mudstone. The eastern margins have well developed sandy lunettes. The Mitchell landscape has wet tussock grasslands on lake margins, but they are now extensively altered by exotic flora (Mitchell, 2002).

#### 2.1.3 Other features

#### Wetlands

Lake George is located about 1 kilometre west of the proposed extraction area. This is an intermittent water body which appeared to be dry at the time of the field survey. The catchment area is relatively small being 950 km<sup>2</sup> with the lake itself occupying 16 percent of this area. Land use in the catchment is mainly grazing which accounts for 76 percent. The proposed activity is located within a highly disturbed portion of the Lake George catchment.

Several artificial wetlands also occur within the study area. These consist of farm-style dams that are relatively permanent to shallow, ephemeral wetlands (**Figure 2-1**). These provide habitat for a range of species including waterbirds and frogs.





Figure 2-1: An artificial wetland within the study area

#### **Rivers and streams**

Butmaroo Creek flanks the northern boundary of the study area, and at its closest point, is located about 800 metres north of the proposed extraction area.

Within the study area, Butmaroo Creek is a sixth order, highly modified drainage line that flows east to west. It is one of two creeks that enters Lake George at the southern end. Bank stability is likely to be affected by catchment land use being dominated by grazing and historical land clearing increasing water run-off and velocity.

The creek has high levels of bank erosion with highly incised channels and steep sides of around 3-4 metres in height. The channel width is about 10 metres wide.





Figure 2-2: Examples of Butmaroo Creek within the study area.

Water depth at the time of the field survey was no greater than about 1 metre, but this was not continuous likely an artifact of the drought conditions during the survey period. No native riparian vegetation was present, nor any fallen timber, although exotic flora cover was good with over 90% cover observed. This was consistent in the fringe vegetation where water was present, with about 90% coverage observed.

Instream habitats were observed to be mostly aquatic flora with emergent narrow and broad leaf habitat cover about 20% and about 1 metre tall. Other aquatic vegetation was observed at about 20% being submerged. No instream woody debris or riffle habitat was present. Small sandbars were exposed due to the low water levels. At the time of the survey, the creek was best described as a series of small pools. Observations of parts of Butmaroo Creek upstream indicate some willow species are present to the east of the study area, with some already becoming established within the study area.

While no water quality testing was carried out, water quality was considered to be relatively good. No obvious odor or discoloration from petrochemical spills was observed or noted. The water was slightly turbid.

Based on our field assessment, the waterway meets the classification of Class 2 Moderate Key Fish Habitat (DPI, 2013).

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Map 3: Landscape context of the study area and proposed extraction area.



#### Connectivity

The study area provides virtually no connectivity to surrounding areas, given the general lack of native vegetation. At best, Butmaroo Creek provides some connectivity from areas in the east to Lake George.

#### Areas of outstanding biodiversity value

No area of outstanding biodiversity value as identified by the BC Act occurs within the study area.

#### 2.2 DETERMINING SITE CONTEXT

#### 2.2.1 Assessing native vegetation cover

A layer of native vegetation cover is required for a 1,500 metre buffer around the study area to determine the context of the site. As there is no regional mapping held by the NSW Department of Planning, Industry and Environment (DPIE) or in the Sharing and Enabling Environmental Data (SEED) database, the extent of native vegetation within the 1,500 metre buffer was not able to be estimated through desktop analysis with the exception of air photograph interpretation. In the field, many portions of the buffer were not publicly accessible, so a 'best estimate' is made based on combination of minimal field observations and air photograph interpretation.

The total area of the 1,500 metre buffer around the study area is 2,626.44 hectares. The total estimate of native vegetation within the 1,500 metre buffer is 100 hectares. This is a native vegetation cover of 4%, which was entered into the BAM calculator (BAMC) as 4%.

#### 2.2.2 Assessing patch size

Patch size is defined by the BAM as 'an area of native vegetation that:

- Occurs on the development site or biodiversity stewardship site, and
- Includes native vegetation that has a gap of less than 100 metres from the next area of moderate to good condition native vegetation (or <30 metres for non-woody ecosystems).

Patch size can extend onto adjoining land that is not part of the development site or biodiversity stewardship site'.

Patch size was calculated using the field validated vegetation types and air photo interpretation. Patch size is required to be assessed as one of four classes per vegetation zone mapped. These being <5 hectares, 5-24 hectares, 25-100 hectares or >100 hectares.

Based upon vegetation mapping and air photo interpretation beyond the subject land, the total area of this patch was calculated at 100 hectares which was applied to the BAMC.



## **3 NATIVE VEGETATION**

## 3.1 PLANT COMMUNITY TYPES (PCTs) AND THREATENED ECOLOGICAL COMMUNITIES

#### 3.1.1 Review of existing vegetation mapping

The study area is within a single vegetation mapping dataset. This being the Palerang LLS Biometric\_F\_4209 vegetation dataset. The dataset contains a single attribute with no vegetation data contained within. No other vegetation mapping covers the study area or the 1,500m buffer. Given that, we were unable to review existing vegetation mapping.

In 2008, a previous flora and fauna report was prepared that encompasses the study area. Geoff Butler & Associates prepared correspondence which provides some background as to the previous condition of the study area which confirms that the land "has been widely and intensively cultivated and heavily grazed over a long period of time" (GBA, 2008)

#### 3.1.2 Species richness within the study area

A total of 28 flora species were recorded from the study area, comprising only five native species (one of which is planted). This confirms the previous work of GBA (2008) demonstrating the highly disturbed nature of the study area.

The species richness recorded, and the high ratio of exotic species present (including high threat exotic flora), is considered typical for the area in the context of the site.

A full flora list is detailed in **Appendix 4**.

#### 3.1.3 Plant community types

A field survey of the study area was carried out on 3-4 September 2019. The survey timing was chosen to target threatened flora species identified by the BAMC. Field surveys were undertaken using the following methods:

- 8 BAM plot/transects in accordance with the BAM
- Targeted threatened species surveys (transects across the study area)
- Random meanders across the study area

The study area is situated within a highly modified landscape comprising agricultural activity and current Quarry operations. The surrounding areas within the landscape are also highly modified. The vegetation of the study area is best considered as non-native vegetation (exotic grassland) given the dominance of exotic flora species and pasture grasses and a general paucity of native flora species.

However, native vegetation, as defined by the BC Act, has no definition, except that it has the same meanings as Part 5A of the *Local Land Services Act 2013* (LLS Act). For the purpose of Part 5A of the LLS Act, native vegetation means any of the following types of plants native to NSW:



- Trees
- Understory plants
- Ground covers
- Plants occurring in a wetland

The vegetation within the proposed extraction area, despite being dominated by exotic flora species as an exotic grassland, does have some native species present. While this is in a very low cover range (<5% at best), this BDAR adopts the precautionary principle and the definition of the LLS Act, and assumes native vegetation is present.

At the time of the field survey, vegetation in the study area mainly comprised sown (exotic dominated) pastures. All areas were being grazed by stock, other than the working Quarry sites. In the vicinity of the office/compound was rehabilitated land, comprising mixed plantings of native trees and shrubs. Exotic grasses dominated the groundcover, with a minimal cover of native grasses persisting. Occasional tree belts of *Pinus radiata* were also present.

The dams/artificial wetlands of the former Quarry sites mainly comprised shallow, open water, with a small number of native sedges and rushes along the shallow edges, while exotic grasses dominate the banks.

Butmaroo Creek comprised a heavily grazed and degraded channel dominated by exotic pasture grass species and various agricultural weeds. Only two native species were recorded in the channel, *Juncus* sp. and Broadleaf Cumbungi (*Typha orientalis*).

The remainder of the site was mapped as cleared land (non-native), comprising heavily grazed mixed pasture species.

The highly invasive weed, Serrated Tussock (*Nassella trichotoma*) was scattered across much of the study area including the proposed extraction area, as was African Boxthorn (*Lycium ferocissimum*) to a lesser extent.

The flora species recorded within the study area is provided in **Appendix 4**.

Determining the plant community type (PCT) that would have once been present within the study area is difficult given the existing environment being dominated by exotic flora. However, a review of the BioNET Vegetation Classification System indicates that it was most likely PCT 896 Kangaroo Grass – Wallaby Grass – Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion (OEH, 2019b). Given this, and with consideration of the definition of native vegetation under the BC Act as outlined above, we have assumed the proposed extraction area to be PCT 896.

Only a single PCT is present and given that all are managed the same (ie highly degraded), only one vegetation zone is considered present. **Table 1** provides additional information on PCT 896 while the spatial extent is provided in **Map 4**. Photographs of BAM plot/transects are provided in **Figures 3-1 to 3-5**.

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Map 4: Plant community types. BAM plot/transects and targeted threatened species transects within the study area and proposed extraction area

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Table 1: Plant community types (and conservation state	us)
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Plant community type (PCT)	Vegetation Zones	Threatened ecological community	Area impacted (ha)	Local occurrence(ha)
Kangaroo Grass – Wallaby Grass – Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion (PCT 896)	1	No, not listed under BC Act	76.37	>100
		Total	76.37	



Figure 3-1: BAM plot/transect no. 1





Figure 3-2: BAM plot/transect no. 2



Figure 3-3: BAM plot/transect no. 8





Figure 3-4: BAM plot/transect no. 5



Figure 3-5: BAM plot/transect no. 4



#### 3.2 VEGETATION ZONES

#### 3.2.1 Condition classes, subcategories and areas

The PCT identified within the development site were classified into vegetation zones for the purpose of credit calculations. Given that all of the proposed extraction site is relatively homogenous, a single vegetation zone was adopted for the purpose of the BAMC.

#### 3.2.2 Vegetation integrity survey plots

Eight vegetation integrity survey plots (BAM plots) were completed on the 3-4 September 2019 within the proposed extraction area. The raw data sheets for all BAM plots are included in **Appendix 3**. The spatial location of the BAM plots is provided in **Map 4**.

#### 3.2.3 Current and future vegetation integrity scores

A vegetation integrity score (VIS) was calculated for the vegetation zone based on the 8 BAM plot/transects completed.

The VIS (before development) for Vegetation zone 1 was 1.6/100 (**Table 2**) confirming the very poor condition of the proposed extraction area. For this vegetation zone, the proposed activity would involve the complete removal of all vegetation within the development site. It is assumed that no ground cover would be retained so the score after development would be 0/100. This is a reduction of 1.6

Table 2: Vegetation integrity scores for the vegetation zone, before and after development.

Veg/Mngt zone No.	Plant Community Type	Condition	Area impacted	VIS – before development	VIS – after development
1	PCT 896	Low	76.37	1.6	0



## 4 THREATENED SPECIES

The BAM details the process for determining the habitat suitability for threatened species (section 6 of BAM). Under BAM, threatened species are separated into two categories; 'ecosystem' and 'species' credit species. Those threatened species where the likelihood of occurrence of a species or components of the species' habitat can be predicted by vegetation surrogates and landscape features, or for which a targeted survey has a low probability of detection, are identified as 'ecosystem' credit species. Targeted surveys are not required for ecosystem species and potential impacts to these species are assessed in conjunction with impacts to each PCT.

Threatened species where the likelihood of occurrence of a species or elements of suitable habitat for the species cannot be confidently predicted by landscape features or vegetation surrogates and can be reliably detected by survey are identified as 'species' credit species. A targeted survey or an expert report is required to confirm the presence or absence of these species on the subject land.

For some threatened species, they are identified as both ecosystem and species credit species, with different aspects of the habitat and life cycle representing different credit types. Commonly, threatened fauna species may have foraging habitat as an ecosystem credit, while their breeding habitat represents a species credit.

The following sections outline the process for determining the habitat suitability for threatened species within the subject site, and the results of targeted surveys for candidate threatened species.

#### 4.1 IDENTIFY THREATENED SPECIES FOR ASSESSMENT

Threatened species that require assessment are initially identified based on a specific set of criteria. These being:

- The distribution of the species includes the IBRA subregion of the subject land
- The study area has geographic constraints of the species distribution within the IBRA subregion
- The species is associated with the PCTs of the study area
- Native vegetation cover within a 1,500 metre buffer of the study area exceeds the minimum habitat required for the species
- Patch size exceeds the minimum required for the species
- The species is identified as an ecosystem or species credit species in the Threatened Biodiversity Data Collection.

The process for identifying threatened species which meet the criteria is determined by the BAM calculator (BAMC). The PCT identified within the study area, patch size and native vegetation cover (as detailed within section 3 of this BDAR) were entered into the BAMC. This resulted in a preliminary list of threatened species.



#### 4.1.1 Ecosystem credit species

The BAMC identified a range of ecosystem credit species predicted to occur within the proposed extraction area (**Table 3**). Some ecosystem credit species were removed from the list of predicted species on the basis that no habitat was present within the proposed extraction area. These were Speckled Warbler, Brown Treecreeper, Spotted-tailed Quoll and Hooded Robin.

For all other ecosystem credit species generated by BAMC, potential foraging habitat is considered present.

Common Name	Scientific Name	BC Act	EPBC Act
Dusky Woodswallow	Artamus cyanopterus	V	-
Flame Robin	Petroica phoenicea	V	-
Large Bent-winged Bat	Miniopterus orianae oceanensis	V	-
Scarlet Robin	Petroica boodang	V	-

 Table 3: Ecosystem credit species predicted within the proposed extraction area

\*V = Vulnerable,

#### 4.1.2 Species credit species

As with ecosystem credit species, species credit species are predicted in the BAMC following an assessment of geographic and habitat features which include the IBRA subregion, PCT, patch size and native vegetation cover in the landscape context.

This section includes further assessment of species credit species to confirm if they will become candidate species for this BDAR (**Table 4**).

Table 4. Assessment of habitat constraints and geographic inflitations.	Table 4: Assessment	of habitat	constraints a	and geogra	phic limitations.
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Common name	Habitat constraints / Geographic limitations	Response
Striped Legless Lizard		Habitat highly degraded, no records in the locality. However, is known from exotic grasslands.
Pink-tailed Legless Lizard	Rocky areas or within 50 metres of rocky areas	No rocky areas exist within 50 metres of the proposed extraction area
Rough Eyebright	Montane bogs or within 50 metres	No montane bogs present. Proposed extraction site highly degraded.
Southern Myotis	Bridges, caves or artificial structures	Habitat surrounding features is highly degraded. No breeding habitat present



Common name	Habitat constraints / Geographic limitations	Response
	within 200 metres of riparian zone. Hollow-bearing trees, Within 200 metres of riparian zone	
Large Bent-winged Bat (breeding habitat)	Caves, tunnels, mines, culverts or other structure known or suspected to be used	No such features occur within or adjacent to the proposed extraction area. Post-maternity cave known meeting place (Mt Fairy) is about 13kms east.
Button Wrinklewort	-	Natural Temperate Grassland does not exist in the proposed extraction area. As confirmed by the VIS of 1.6/100, site is highly degraded and species is unlikely to occur and it is highly sensitive to grazing. Very low potential to occur.
Austral Toadflax	-	Proposed extraction area highly modified and degraded. No native grassland present in the context of habitat for Austral Toadflax

#### 4.2 IDENTIFY CANDIDATE SPECIES CREDIT SPECIES FOR FURTHER ASSESSMENT

Section 6.4.1.17 of the BAM provides the opportunity to consider whether a predicted candidate species is unlikely to occur within the development site where habitat is substantially degraded to a point that they would be unlikely to utilise or where an expert report identifies that the species is unlikely to be present. A predicted candidate species credit species that is not considered to have suitable habitat present, does not require further assessment. However, the reasons for making these determinations must be documented.

To inform this assessment of how habitat degradation has impacted candidate threatened species, a search of the Atlas of NSW Wildlife (OEH, 2019a) was carried out for a 10 kilometre radius around the study area (**Maps 5-8**). Using these existing records, the likelihood of occurrence was assessed using the following methods:

- Species occurrence within the study area and locality
- Condition and extent of available habitats
- Application of the knowledge and experience of the EnviroKey Principal Ecologist



**Table 5** outlines the predicted candidate species (from the BAMC) and provides a justification for the decision by EnviroKey to either maintain or discard each species as a candidate species based on the presence of suitable habitat within the Study Area.

Table 5: Candidate species justification	۱.
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Common name	Habitat constraints / Geographic limitations	Response to BAMC	Maintained as candidate species
Striped Legless Lizard		Habitat highly degraded, no records in the locality. However, is known from exotic grasslands.	Yes
Pink-tailed Legless Lizard	Rocky areas or within 50 metres of rocky areas	No rocky areas exist within 50 metres of the proposed extraction area	No
Rough Eyebright	Montane bogs or within 50 metres	No montane bogs present. Proposed extraction site highly degraded. No	No
Southern Myotis	Bridges, caves or artificial structures within 200 metres of riparian zone. Hollow-bearing trees, Within 200 metres of riparian zone	Habitat surrounding features is highly degraded. No breeding habitat present	No
Large Bent-winged Bat (breeding habitat)	Caves, tunnels, mines, culverts or other structure known or suspected to be used	No such feature occurs within or adjacent to the proposed extraction area. Pre-maternity cave known meeting place (Mt Fairy) is about 13kms east.	No
Button Wrinklewort	-	Natural Temperate Grassland does not exist in the proposed extraction area. As confirmed by the VIS of 1.6/100, the site is highly degraded and the species is unlikely to occur and it is highly sensitive to grazing. Very low potential to occur.	Yes
Austral Toadflax	-	Proposed extraction area highly modified and degraded. No native grassland present in the context of habitat for Austral Toadflax	No



Based on the assessment of available habitat for predicted candidate species and the potential (albeit very minor) to occur within the study area, there are two species credit species of potential relevance to the BDAR. These being:

- Striped Legless Lizard
- Button Wrinklewort

Any confirmed candidate species would require field survey in accordance with the BAMC.

#### 4.3 STATE ENVIRONMENTAL PLANNING POLICY

State Environmental Planning Policy (SEPP) No. 44 encourages the conservation and management of natural vegetation areas that provide habitat for Koalas to ensure that permanent free-living populations will be maintained over their present range across 107 local government areas (LGA). Local councils listed under Schedule 1 of SEPP44 cannot approve development in an area affected by the policy without an investigation of core koala habitat. The policy provides the state-wide approach needed to enable appropriate development to continue, while ensuring there is ongoing protection of koalas and their habitat.

SEPP 44 aims to identify areas of *potential* and *core* Koala Habitat. These are described as follows:

- *Potential Koala Habitat* is defined as areas of native vegetation where the trees listed in Schedule 2 of SEPP 44 constitute at least 15 percent of the total number of trees in the upper or lower strata of the tree component
- *Core Koala Habitat* is defined as an area of Land with a resident population of koalas, evidenced by attributes such as breeding females, and recent and historical records of a population.

The former Yarrowlumla Local Government Area (LGA) is listed within Schedule 1 of SEPP 44 as land to which this planning instrument applies and in which the Project Site is located.

The Project Site cannot be considered Potential or Core Koala Habitat as listed by SEPP 44 as:

- It does not contain trees species listed within Schedule 2 being at least 15 percent of the total number of trees
- It does not contain a resident population of Koalas, or recent or historical records, due to lack of native overstorey species.





Map 5: Previous records of migratory birds in the locality

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Map 6: Previous records of threatened birds in the locality

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**EnviroKey** 



Map 7: Previous records of other threatened fauna in the locality





Map 8: Previous records of threatened flora species in the locality



## 4.4 DETERMINE PRESENCE OR ABSENCE OF A CANDIDATE SPECIES CREDIT SPECIES

Confirmed candidate species were assessed consistent with steps 4-6 of section 6.4 of BAM. The survey effort, timing and locations for threatened flora and fauna are outlined in the following sections.

#### 4.4.1 Target field surveys – flora

During the vegetation survey on the 3-4 September 2019, targeted threatened flora transects were carried out by an experienced ecologist over the proposed extraction area. The objective of the field survey was to locate any individual Button Wrinklewort. The field survey occurred within a suitable timing period (September) as identified by the BAMC. Survey transects were carried out over 6 person hours and their locations are identified on **Map 4**.

Despite extensive surveys during an appropriate time of the year, but not surprising given the highly modified nature of the proposed extraction area, no Button Wrinklewort were recorded, and none are considered to occur there. Subsequently, their presence within the proposed extraction area was selected as 'no'.

#### 4.4.2 Target field surveys – Striped Legless Lizard

Surveys were completed for Striped Legless Lizard, guided by the EPBC Act Survey Guidelines (SEWP&C, 2011), and the experience of the Principal Ecologist with herpetofauna. The proposed extraction area provides little in the way of potential habitat of this species, with the existing environment highly degraded and realistically, the species is unlikely to occur there. Nonetheless, two survey methods were employed to survey for the potential presence of this species.

Artificial shelter sites were employed at three locations within the proposed extraction area (**Figure 4-1**). These consisted of roof tiles placed in grids of 12 tiles by five tiles (60 tiles). Shelter sites were established three weeks prior to the first field survey, and while this is inside the recommended period within the guidelines, the author has detected Striped Legless Lizard within 14 days of establishment using roof tiles. Shelter sites were checked on four separate occasions on a weekly/fortnightly basis as recommended for spring surveys. Tiles were checked when ambient temperatures did not exceed 24 degrees Celsius.

Active searches were also employed around grass tussocks (Serrated Tussock), and while this method is not always successful, it is considered complimentary to the artificial shelter sites. Active searches were carried out in conjunction with the threatened flora transects. The locations of the tile grids are presented in **Map 9** and the search transects on **Map 4**.





Figure 4-1: One of the three tile grids within the proposed extraction area

#### 4.4.3 Target field surveys – Birds

While no bird species were identified as candidate species, diurnal bird surveys were conducted using the widely accepted 'standardised method' (Watson, 2003).

Within the study area but predominantly within the proposed extraction area, ten 20 minute surveys were completed. Any species of bird observed or identified from call recognition, were recorded during the field survey period. Additionally any species observed outside of these survey periods were recorded as opportunistic observations. Surveys were completed across a range of environmental variables including morning and afternoon periods to encompass the range of avifaunal assemblages and their periods of activity. Locations of diurnal bird surveys are provided (**Map 9**),

#### 4.4.4 Target field surveys – Frogs

While no frog species were identified as candidate species, a general frog survey was carried out at two locations within the study area.

Calls of Yellow-spotted Tree Frog (*Litoria castanea*) and Green and Golden Bell Frog (*Litoria aurea*) were broadcast to elicit a response. Calls were played for 2 minutes duration, then a

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period of three minutes listening. Then the survey method was repeated. After this, an active search was carried out over 30 person-minutes. Each frog survey site was revisited during the day where active searches for active and basking frogs (as bell frogs often do). Tadpole surveys using dip nets were also completed at frog survey locations.

#### 4.4.5 Target field surveys – Nocturnal survey

Nocturnal fauna survey consisted of call playback and a nocturnal transect (for spotlighting and echolocation call recording using an ANABAT SD1 detector unit). Call playback consisted of transmitting a pre-recorded call of an individual species (Barking Owl and Masked Owl), with a two minute listening period between each call. The call was transmitted using an iPhone connected via Bluetooth to a portable speaker. Spotlighting surveys were conducted by traversing the site looking for eye shine and any moving nocturnal fauna. A powerful head torch with spotlight capability was used for the duration of the survey.

Echolocation calls recorded during the field survey were identified using AnalookW software by visually comparing call traits with those within 'The Bat Calls of NSW: Region based guide to the echolocation calls of microchiropteran bats' (Pennay et al., 2004) 'Australian Bats 2nd Edition' (Churchill, 2008) and a reference call collection held by EnviroKey.

Nocturnal surveys were carried out over one hour by two persons during one night at two sites (four person hours total). The location of these surveys is provided in **Map 9**.

#### 4.5 THREATENED SPECIES RECORDED

Two threatened species were detected during the field surveys. Both are ecosystem credit species; these being the Dusky Woodswallow and White-fronted Chat.

White-fronted Chat can be found across the southern half of Australia mostly within temperate and arid climates (Morcombe, 2004). In New South Wales they are mostly in the southern half of the state, occurring in damp open habitats along the coast, and near waterways in the western part of the state (Higgins et al., 2006). A single pair were recorded foraging directly adjacent to the northern boundary of the proposed extraction area. Given the similarities of the proposed extraction area to the area where the pair was recorded, it is likely that they would use these areas from time to time.

OEH (2019a) identify the following threats to this species:

- Reduction in habitat size and quality
- Human disturbances
- Habitat alteration from river modifications
- Predation from feral species including foxes and cats
- Mangrove encroachment and sea-level rise

The Dusky Woodswallow is often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in


shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests (Higgins et al., 2006). They are also seen in areas of non-native vegetation. Dusky Woodswallow were recorded on numerous occasions within the Radiata Pine windbreak that crosses the existing access road. At least five individuals were recorded. None were recorded within the proposed extraction area.

The NSW Scientific Committee lists the following threats for Dusky Woodswallow:

- Past and ongoing reductions in habitat quality
- Competitive exclusion by Noisy Miners (Manorina melanocephala)
- Nest predation by Currawongs, Magpies and Grey Butcherbirds
- Inappropriate fire regimes, excessive grazing and removal of coarse woody debris from the ground layer.

As no nesting activity was noted during the field survey or within the proposed extraction area, and given that both species are ecosystem credit species, no further analysis is required.

Despite targeted field surveys at an appropriate time of the year, no Striped Legless Lizard or Button Wrinklewort were detected. The absence of both of these species is not surprising given the absence of local records for both species, and the highly modified and extensively and heavily grazed habitats of the study area.





Map 9: Locations of fauna surveys and threatened species detected during the field survey.

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# 5 AVOIDING AND MINIMISE IMPACTS ON BIODIVERSITY VALUES

# 5.1 AVOIDING AND MINIMISING IMPACTS ON NATIVE VEGETATION AND HABITAT DURING PROJECT PLANNING

Across the study area, native vegetation is significantly degraded by exotic pasture species and does not comprise an endangered or critically endangered ecological community, and regardless of the location of the proposed extraction area, impacts would be identical to vegetation and habitat. Given this, the proposed extraction area has been largely designed to avoid impacts to an area of Aboriginal heritage significance, namely the Wood Duck Potential Archaeological Deposit (PAD).

# 5.2 AVOIDING AND MINIMISING PRESCRIBED BIODIVERSITY IMPACTS DURING PROJECT PLANNING

#### 5.2.1 Impacts to threatened species and non-native vegetation

Two threatened fauna species were recorded within the study area. These being White-fronted Chat (associated with highly degraded vegetation dominated by exotic flora) just north of the proposed extraction area, and Dusky Woodswallow (associated with non-native trees(conifers) along the existing access road. Both habitat types are not limiting within the study area, on adjacent land or in the general locality.

#### 5.2.2 Impacts to water quality and water bodies

The proposed activity is not likely to impact Lake George (located about 1 kilometre west of the proposed extraction area) or Butmaroo Creek (which flanks the northern boundary of the study area, and at its closest point, is located about 800 metres north of the proposed extraction area) and flows into Lake George. Given these distances from the proposed extraction area, no impacts to water bodies are likely.

The existing quarry operations do not appear to be negatively impacting water quality. While no water quality testing was carried out, water quality was considered to be relatively good at the time of the field survey. No obvious odor or discoloration from petrochemical spills was observed or noted, however the water was slightly turbid. This is most likely from the extensive grazing activity noted in the catchment of the creek, not the existing quarry operations. Given this, it is unlikely the proposed extraction area, provided adequate safeguards are in place regarding sediment control, would impact water quality in the adjacent and nearby water bodies.



## 5.3 PALERANG LOCAL ENVIRONMENTAL PLAN 2014

The Palerang Local Environmental Plan (LEP) 2014 identifies that the proposed extraction area is zoned E3 Environmental Management and RU1 – Primary Production.

Extractive industries are permissible with consent within zone RU1. Industries are generally prohibited within zone E3, however, as agriculture is permitted with consent in this zone, under Part 2, Clause 7(3a) of the NSW State Environmental Planning Policy (Mining, Petroleum and Extractive Industries), 2007, the Quarry is permissible, with consent. The existing Quarry Access Road is located within land zoned RU1, with the development of roads permissible with consent within this zone.

An additional local provision within the LEP is Part 5, Clause 6.5, Terrestrial Biodiversity. This provision is relevant to the subject land. The objective of this clause is to maintain terrestrial biodiversity by:

- Protecting native flora and fauna
- Protecting the ecological processes necessary for their continued existence
- Encouraging the conservation and recovery of native flora and fauna and their habitats

Part 6.3 (3) of the LEP states that 'before determining a development application for the development on land to which this clause applies, the consent authority must consider:

a) whether the development is likely to have:

- (i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land
- (ii) any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna
- (iii) any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land
- (iv) any adverse impact on the habitat elements providing connectivity on the land

b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

With consideration of 6.5 (3) (a), the proposed development would not have any adverse impacts on the matters listed in i to iv, as it:

- Is within an area of highly disturbed and modified vegetation confirmed by a very low vegetation integrity score (1.6/100)
- Would be carried out within an area of the land of least biodiversity value
- Would not affect any listed threatened ecological community
- Would not isolate or fragment other areas of habitats to the extent that wildlife connectivity would be affected
- Would not remove habitat that is of importance to the long-term viability of flora and fauna in the locality with consideration of the highly disturbed and modified nature of



the proposed extraction area and the remaining habitat that occurs across the locality that would remain unaffected by the proposal.

With consideration of 6.5 (3) (b), this BDAR (section 5) includes how impacts to biodiversity have been avoided and minimised through project planning and design. Section 6 of this BDAR includes appropriate measures to mitigate impacts to biodiversity while section 7 details the biodiversity offset required.



# 6 ASSESSING AND OFFSETTING IMPACTS

## 6.1 EPBC ACT REFERRAL

Given that the proposed extraction area is located within a highly modified and disturbed environment, the proposed activity is *unlikely* to have a '*significant effect*' on any EPBC Act listed biota and their habitats or other matters of National Environmental Significance. On this basis, the proposed activity would not require referral to the Commonwealth Minister.

### 6.2 ASSESSMENT OF IMPACTS

# 6.2.1 Assessing direct impact to native vegetation and habitat, threatened ecological communities and threatened species habitat

Impacts to native vegetation (with a very low VIS of 1.6/100) are anticipated through the direct clearing of about 77 hectares. None of this vegetation is consistent with a BC Act or EPBC Act listed threatened ecological community. The direct clearing and subsequent development of the proposed extraction area would represent a permanent impact, or loss, of this vegetation and habitat. At the end of life of the proposed extraction area, the site would be subject to the creation of artificial wetlands as detailed in a *Quarry Development and Rehabilitation Plan*.

Given that the proposed extraction area is located within a highly modified and disturbed environment with a VIS of 1.6/100, there will be no requirement for offsets as it is well below the offset threshold.

#### 6.2.2 Assessing indirect impact to native vegetation and habitat, threatened ecological communities and threatened species habitat

It is difficult to quantity indirect impacts associated with many projects, but in this instance, these may include impacts such as noise, and erosion and sediment control.

Given that the proposed extraction area is located directly adjacent to an existing Quarry operation and within a highly modified environment, it is unlikely that the proposed activity would have an adverse impact on adjacent areas of vegetation and habitat. It is also unlikely that the proposed activity would reduce the viability of any adjacent vegetation or habitat as a result from edge effects, noise, or dust.

### 6.3 ASSESSING PRESCRIBED BIODIVERSITY IMPACTS

As described in section 2.1.3, no prescribed biodiversity impacts are likely from the proposed activity.



# 6.4 MITIGATING AND MANAGING IMPACTS ON BIODIVERSITY VALUES

As demonstrated within this BDAR, the proposed activity has been located within a highly modified environment, avoiding impacts to biodiversity values. The vegetation that would be removed should the proposed activity proceed, is of extremely low condition (VIS 1.6/100) and impacts to this are not considered to affect any biodiversity value. Regardless, a range of measures are included within the BDAR to reduce impacts where possible.

#### 6.4.1 Erosion and Sediment Control Plan

To avoid potential indirect impacts to adjacent areas of vegetation and habitat, an appropriate Erosion and Sediment Control Plan (ESCP) would be prepared. This should follow best practice protocols and should be in place prior to any works commencing.

#### 6.4.2 Rehabilitation

At the end of life of the proposed extraction area, it is proposed that the site would be subject to the creation of artificial wetlands as detailed in a *Quarry Development and Rehabilitation Plan*. The artificial wetlands should consider the following components in their design:

- Wetlands should have a deep and shallow end. The shallow extreme should be about 10-15 cm in depth and the deep end, no greater than 1.8 m.
- Should trees be planted around the wetland, they should only be planted on the southern and western sides, to ensure that the water body is shade free.
- The incorporation of grassy areas adjacent to the wetland.
- The placement of rocks on the edge of the wetland (ranging in sizes from 100mm to 1m).
- Plantings of sedges, rushes and grasses.

### 6.5 ADAPTIVE MANAGEMENT FOR UNCERTAIN IMPACTS

Excluding the need for an ESCP and a Rehabilitation Plan, no additional adaptive management measures are proposed.

# 6.6 THRESHOLDS FOR THE ASSESMENT AND OFFSETTING OF IMPACTS OF DEVELOPMENT

#### 6.6.1 Serious and Irreversible impacts (SAII)

PCT 896 Kangaroo Grass – Wallaby Grass – Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion has not been identified as an SAII entity in the *Guidance to assist a decision-maker to determine a serious and irreversible impact* (DPIE, 2019) or within the BioNET database as an entity at risk of a SAII.



#### 6.6.2 Impacts that do require an offset

Impacts associated with any PCT generally require an offset under the BAM with the exception of any area mapped as non-native vegetation including exotic grassland or planted non-indigenous vegetation. Section 10.3.1 of the BAM describes where impacts on native vegetation (ecosystem credits) require offsetting.

For this BDAR and in accordance with section 10.3.1 of the BAM, as the VIS is below 17 and the PCT is associated with threatened species habitat (as represented by ecosystem credits), an offset is not required.



# 7 FINAL CREDIT CALCULATIONS

## 7.1 CREDIT CALCULATIONS AND CLASSES

#### 7.1.1 Ecosystem credits

Based on the preliminary footprint, and as described in section 6.4.2 of this BDAR, the VIS is below 17. In accordance with section 10.3.1 of the BAM, if the VIS is below 17, <u>an offset is not required</u>.

#### 7.1.2 Species credits

No species credit species are relevant to the proposed extraction area (as outlined in section 4 of this BDAR).

## 7.2 CREDIT COSTS

As no ecosystem credits or species credits are required for the proposed activity, there are no credit costs of relevance. BAMC reports are included within **Appendix 6**.



# 8 **REFERENCES**



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# **9 APPENDICES**



# APPENDIX 1 – QUALIFICATIONS AND EXPERIENCE OF PERSONNEL



Name and Qualifications	Experience
<b>Steve Sass</b> B.App.Sci (Env.Sci) (Hons), GradCert.CaptVertMngt (CSU)	Steve is a highly experienced Ecologist having undertaken hundreds of terrestrial and aquatic ecological surveys and assessments across Australia since 1992. He has an in-depth working knowledge of environmental and biodiversity legislation across all states and territories which allows him to
Director / Principal Ecologist	provide detailed and accurate assessments and formulate practical solutions to clients and specific projects on a case- by-case basis. He is a current NSW Biodiversity Accredited
Assessor (BAAS17047)	and Heritage.
Certified Environmental Practitioner, EIANZ	Steve is a past Councillor of the Ecological Consultants Association of NSW. Steve was appointed 'Expert' status for a
Member, Ecological Consultants Association of NSW	number of threatened species listed under the <i>Biodiversity Conservation Act 2016.</i>
	Previous and current research holds Steve in high regard within both the scientific and ecological consultants' community. To date, Steve has published, submitted or has in preparation, thirty-three manuscripts within peer-reviewed journals, many of which are related to threatened species survey, monitoring or management. Steve has extensive experience in NSW. Over the past 15 years, he has completed or provided specialist biodiversity advice to more than 1000 environmental assessments for projects such as residential and industrial developments, highway upgrades and telecommunications, water, sewerage, energy, mining and electricity network infrastructure projects. Steve was the senior author of this report and all BAM calculations. Steve lead the field surveys including BAM plot/transects, bird surveys, creek assessment and tile grid surveys.
<b>Mark Harris</b> B.App.Sci (Env Res Mgt) Senior Botanist / GIS Analyst	Mark is a highly experienced botanist having undertaken flora surveys across eastern and central Australia and he has more than 12 years' experience in Biodiversity Assessment and Planning. With Steve, he completed the BAM plot/transects and threatened flora surveys. Mark also completed the mapping and spatial analysis.
Harrison Warne	Harrison is a highly experienced ecologist despite graduating
B. Sc (Zoology and Ecology) Ecologist	from James Cook University in 2017. He has extensive field identification skills in reptiles, frogs, mammals and birds. He has completed numerous fauna surveys on major projects including the Nyngan Scandium Project, Thackaringa Cobalt Project and the Bowdens Silver Project.
	For this project, Harrison assisted with the fauna surveys including the tile surveys.



### APPENDIX 2 – BIODIVERSITY OFFSET SCHEMENT ENTRY LEVEL THRESHOLD TEST







Legend

Biodiversity Values that have been mapped for more than 90 days



#### Notes

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# Biodiversity Values Map and Threshold Report

#### **Results Summary**

Date of Calculation	02/10/2019 9:	37 PM	BDAR Required*
Total Digitised Area	76.66	ha	
Minimum Lot Size Method	LEP		
Minimum Lot Size	80	ha	
Area Clearing Threshold	1	ha	
Area clearing trigger Area of native vegetation cleared	Unknown <sup>#</sup>		Unknown <sup>#</sup>
<b>Biodiversity values map trigger</b> Impact on biodiversity values map(not including values added within the last 90 days)?	no		no
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 <u>https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor</u> 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 will 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:_02/	'10/2019 09:37 PM
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### **APPENDIX 3 – BAM RAW FIELD DATA SHEETS**



	BAN	l Site – Field Surve	y Form	N	Site She	et no:	an an an an Albert
	4 5 49 7 4	Survey Name	Plot Ide	entifier	Rec	orders	
Date	3.9.2019	Grantham PK.	11		Mrt.	and and an and an	
Zone	Datum	IBRA region		Photo #	ipad	Zone ID	
Easting	Northing	Dimensions	20×50	*	Orientation of midline from the 0 m point	Ī	
Vegetation C	lass						Confidence:
Plant Commu	unity Type	?.896 mart	ied		E	EC:?	H M L Confidence: H M L

BAM	Attribute	Sum values	BAM A	ttribute (20 x 50	m plot)	# Tree Stem	s Count	Bonord number of
(400	m <sup>2</sup> plot)	Sum values	dbh		Euc*	/ Non Euc /	Hollows <sup>†</sup>	living eucalypt*
	Trees		large trees Euc* & No	s for 80 + on Euc cm		/		(Euc*) and living rative non-eucalypt (Non Euc) stoms
Count of	Grasses etc.			50 – 79 cm	. /			separately
Native Richness	Forbs		30 – 49	cm				of Eucalyptus, Corymbia,
	Ferns		20 - 29	cm			- ar this barrow as	Lophostemon and Syncamia
	Other		10 - 19	) cm	/			<sup>†</sup> Record total
	Trees		5-9		/ .			size class with bollows (including
Sum of Cover	Shrubs		3-3	/	·	/	/ 11/a	dead stems/trees)
of native vascular	Grasses etc.		< 5 0	:m /		/	<sup>/</sup> n/a	
plants by growth	Forbs		Length	of logs (m)			4	total
form group	Ferns		in length	) )				
	Other		Counts Estimate	must apply to each es can be used wh	size class whe	en the number of living of living tree stems withi	tree stems with n a class is > 10	in the size class is ≤ 10. ). Estimates should draw
High Threat	t Weed cover		from the For a m	number series: 10 ulti-stemmed tree	), 20, 30	), 200, 300 ast living stem is included	in the count/es	timale. For holiows
			count or 1 stem	nly the presence of per tree where tree	a stem contair is multi-stemn	ning hollows, not the counce. The hollow-bearing :	nt of hollows in stem may be a o	that stem. Only count as
BAM Attrib	ute (1 x 1 m plots	) Litter cov	'er (%)	Bare ground	cover (%)	Cryptogam cover	(%) Ro	ock cover (%)
Subpl	ot score (% in ea	ch) <b>[0</b> 10 3	2 20	50 30 60	50 5	0000	000	0000
Av	erage of the 5 subp	lots 9	<u></u>	40		0		0

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.

Phys	siography	r + site	features	s that may help in determining PCT and Management Zone (optional)
Morphological Type			_andiorm Element	Landform Pattern Microrelie:
Lithology			Soil Surface Texture	e Soil Soil Colour Depth
Slope	20.5		Aspect	Site Drainage Distance to nearest water and type
Plot Disturk	ance	Severity code	Age	Observational evidence
Clearing (inc.	logging)		-	
Cultivation (in	c. pasture)	3	R	Pholaris etc.
Soil erosion		. 1	R	stock bracks + denoral soil disturb by stock.
Firewood / CV	VD removal	[		

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

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

Form version 5 - designed March 2017

Printed 12 August 2017

400 m <sup>2</sup> j	olot: Sheet _ of _ Survey Name Plot Identifier		Recorde	rs		
Date	3: 9:2019 Grantham PK I MH					
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	Äbund	stratu m	vouch er
				1		
	Chloris truncada.			100		-
	Cynodon dactylon		<u> </u>	50		
					· · · · · · · · · · · · · · · · · · ·	
. <u></u>						
						ļ
					<u> </u>	
	4					
		-				
	Nassella trichotima	HTE	5	80		1
	Phalaris aquatica		20	1000		
	Acetogella vulga (sovrel)	HTE	2	1000		
	Lepidium afritanum		0.2	30		
	Eleusine Tristachya		15	2000		
	Carth lanatus	HIE	0.1	2		
	Onopordum sp.		0'5	50		
	Hypoch Fadicata	HTE	1 ALC	1000		
	Medizaran co.		2	1000		
	Trifolium so		0.1	100		
	Grass - non native.		0.2	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, ..., 1000, ...

	BAN	I Site – Field Survey	Form	Site Sh	eet no:		
		Survey Name	Plot Identifier	Rec	Recorders		
Date	3.9.2019	Grantham PK 2		MH			
Zone	Datum	IBRA region	Photo #	ipad	Zone ID		
Easting	Northing	Dimensions	· · · · · · · · · · · · · · · · · · ·	Orientation of midlin from the 0 m poin	e t.		
Vegetation C	lass				÷, ÷	Confidence:	
Plant Commu	u <b>nity Type</b>	896? Modifi	ed	E	EC: ?	H M L Confidence:	

BAM	Attribute	Sum values	BAM Attribute	(20 x 50 m plot)	# Tree Sten	ns Count	Demand as makes as (
(400	m² plot)	Sum values	dbh	Euc*	Non Euc	Hollows <sup>†</sup>	living eucalypt*
-	Trees		large trees for	80 +			(Euc*) and living native non-eucalypt
	Shrubs			cm		7	(Non Euc) stems
Count of	Grasses etc.		50 -	- 79 cm			* includes all species
Richness	Forbs		30 – 49 cm		1. 7	1	of Eucalyptus, Corymbia,
	Ferns		20 – 29 cm			1	Lophostemon and Syncamia
	Other		10 - 19  cm		1	-/	<sup>†</sup> Record total
	Trees			· / · · · /		-/	number of stems by size class with
Sum of	Shrubs		5 – 9 cm			n/a	hollows (including dead stems/trees)
of native	Grasses etc.		< 5 cm			n/a	
plants by	Forbs		Length of logs	; (m)			total
form group	Ferns		(≥10 cm diameter in length)	°, >50 cm			
	Other		Counts must app Estimates can be	ly to each size class v used when the numb	when the number of living	tree stems with	hin the size class is $\leq 10$ .
High Threat	t Weed cover		from the number For a multi-stem	med tree, only the lar	100, 200, 300 gest living stem is included	in the count/es	timate. For hollows
			1 stem per tree w	here tree is multi-ster	nmed. The hollow-bearing s	stem may be a o	that stem. Unly count as dead stem.
BAM Attribu	ute (1 x 1 m nlote)	l litter co	over (%) Rerea	wound envior (%)	Compage course	90 N Do	al aguar (9/ )

BAM Attribute (1 x 1 m plots)	Attribute (1 x 1 m plots) Litter cover (%) Bare		Cryptogam cover (%)	Rock cover (%)	
Subplot score (% in each)	551115	15 60 30 40 15	00000	00000	
Average of the 5 subplots	54				

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)

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Morphological	Landform	Landform	
Туре	Element	Pattern	Microrenet
Lithology	Soil Surface	Soil	Soil
LIGIOIOGY	Texture	Coloui	Depth
Slope	Aspect	Site Drainage	Distance to nearest
Diope		Sile Dialitage	water and type

Plot Disturbance	Severity code	Age code	Observational evidence	ЩСТ664 НИКТИЧИ «КОЛИ «МО-ДОЦИИ ДЛЯ «ЦИКУДИ ЩСТ664 НИКТИЧИ «КОЛИ «МО-ДОЦИИ ДЛЯ «ЦИКУДИ	na katina anaka antara na katina ana ana ana ana ana ana ana ana ana
Clearing (inc. logging)				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	na daga mang kasara ana sa
Cultivation (inc. pasture)	3	R	AS	prev.	
Soil erosion	1	R	<i>t</i> :	1.,	
Firewood / CWD removal					
Grazing (identify native/stock)	3	R	st .		
Fire damage					
Storm damage			1		
Weediness	3	R	lt.	11 -	
Other	1				

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

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

400 m <sup>2</sup>	plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders							
Date	3.9.2019	Grantham PK	2	MH	· · ·						
GF Code	Top 3 native species in All other native and exo	each growth form group: Full tic species: Full species name	species name mandatory 9 where practicable	N, E or HTE	Cover	Abund	stratu m	vouch er			
	Chloric ba	a c a ta		(k)	2	50					
								······			
		· · · · · · · · · · · · · · · · · · ·	·								
	• :										
			· · · · · · · · · · · · · · · · · · ·								
	2 ° .							-			
	1 <sup>11</sup>	······································	· · ·								
	1997 1972										
······································	Phalaris.	agua		E	30	2000					
	Elensine +	ritachya			20	2000					
	Nassella tri	cho			0.5	40					
in the second se	Acetosela	vulg.		HTE	<u> </u>	100					
	Lepia: atri	Canum -			0.2	30					
	Hypoc radio	<u>&gt;p.</u>			0.5	400					
	Onoportium	isp.			0.1	5	,				
	Lolium sp.	-dark purp a	o prev	×	3	2000					
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**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, ...

	BAI	<u> M Site – Field Surve</u>	y Form		Site Sheet no:					
		Survey Name	entifier	Recorders						
Date	319.19	Grantham PK	3		MH					
Zone	Datum	IBRA region	· · · · · · · · · · · · · · · · · · ·	Photo #	ipad	z	Zone ID			
Easting	Northing	Dimensions			Orientation of from the 0	midline n point.		<b>.</b>		
Vegetation C	lass							Confidence:		
Plant Commu	inity Type	896 - Medita	red,		· · ·	EEC	:	Confidence: H M L		

BAM	Attribute	Sum values	BAM Attribute (2	20 x 50 m	i plot)	# Tree Stem	s Count	Booord number of
(400	m <sup>2</sup> plot)	oun values	dbh	Eu	IC*	Non Euc	Hollows <sup>†</sup>	living eucalypt*
	Trees		large trees for	80 +				(Euc*) and living
	Shrubs		Euc* & Non Euc CI	m				(Non Euc) stems
Count of	Grasses etc		50 – 7	'9 cm				separately
Native Richness								<ul> <li>Includes all species</li> <li>of Eucalvotus.</li> </ul>
	Forbs		30 – 49 cm			and the second se		Corymbia,
	Ferns		20 – 29 cm		and the second se	for the second s		Angophora, Lophostemon and Svocamia
	Other		40 40					<sup>†</sup> Record total
	Trees		10 – 19 cm					number of stems by size class with
Sum of	Shrubs		5 – 9 cm	and a second line			n/a	hollows (including dead stems/trees)
of native	Grasses etc.		< 5 cm				n/a	
plants by	Forbs		Length of logs (r	m)		No other is a second	<u>i'</u>	total
growth form group	Ferns		(≥10 cm diameter, > in length)	50 cm		and the state of the		
	Other		Counts must apply to	o each siz	e class when	the number of living t	ree sterns with	in the size class is $\leq 10$ .
High Threat	Weed cover		From the number ser For a multi-stemme	ries: 10, 20 e <b>d tree</b> , or	ne nomber of 0. 30, 100, ily the largest	r living tree stems within 200, 300 t living stem is included	i a class is > 10	i. Estimates should draw timate. For holiows

count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as A stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem

					-														
BAM Attribute (1 x 1 m plots)	ute (1 x 1 m plots) Litter cover (%)		Bare ground cover (%)				Cryptogam cover (%)				Rock cover (%)			1					
Subplot score (% in each)	10 10	3	5	5	20	15	30	40	30	0	0	0	0	0	0	0	0	00	
Average of the 5 subplots		7				2	-7				•	0				ĉ	5		1

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, branchiets 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)

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Morphological	Landform	Landform	Adio acolia (
Туре	Element	Pattern	wiccolenei
Lithology	Soil Surface	Soil	Soil
LINDIOGY	Texture	Colour	Depth
Slope	Aspect	Site Drainage	Distance to nearest
Siope		Site Brainage	water and type

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)		a constructions and the	ane (we many examples is strong of the stron
Cultivation (inc. pasture)	3	R	AS prev.
Soil erosion	1	R	11
Firewood / CWD removal			
Grazing (identify native/stock)	3	R	tt
Fire damage			
Storm damage			
Weediness	3	R	۱,
Other			

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

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

400 m <sup>2</sup>	plot: Sheet _ of _ Survey Name Plot Identifier		Recorde	ers		
Date	3.19.19 Grantham Pk 3 1	4H, 55				
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	stratu m	vouch er
G	Panicum ethusum	N	1	200		
G	Chloris trunc		0.5	100		
R	Juneus sp	¥	0.1	2		
in meg		· · · · · · · · · · · · · · · · · · ·				
	Phalaris aqua Eleus trista	E	40	1000 2000		
5	Onopordumi sp.		15	4000		
	Nassella trichotoma Chondrilla juncia		0.3	10		
· · · · · · · · · · · · · · · · · · ·	Hypoc radicate Carthamus lanatus		0.5	200		
	herb mail spreading - Alternanklers?	НГЕ	0.2	100		<u>√</u> .
	Acetogella vul? Taraxicum offre		0.5	100		
			· · · ·			
						<u> </u>

**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 Na	ame	Plot Ide	entifier	Rec	orders	
Date	3.9.19	Grantham PK 4 MH						
Zone	Datum	IBRA region			Photo #		Zone ID	
Easting	Northing	Dim	ensions		2	Orientation of midling from the 0 m point	8	
Vegetation C	lass							Confidence:
Plant Commu	unity Type	896?				E	EC: ?	H M L Confidence: H M I

BAM	Attribute	Sum values	BAM Attribute	(20 x 50	m plot)	# Tree Sterr	# Tree Stems Count				
(400	m <sup>2</sup> plot)	Sum values	dbh		Euc*	Non Euc	Hollows <sup>†</sup>	Record number of living eucalypt*			
	Trees		large trees for	80 +			and the second sec	(Euc*) and living			
	Shrubs		Euc" & Non Euc	cm				(Non Euc) stems			
Count of	Grasses etc.		50	79 cm	•			separately * includes all species			
Richness	Forbs		30 – 49 cm			and the second se		of Eucalyptus, Corymbia, Accophore			
	Ferns		20 – 29 cm				N	Lophostemon and Syncarpia			
	Other		10 – 19 cm		and the second s	····		<sup>†</sup> Record total			
	Trees							number of stems by size class with			
Sum of	Shrubs		5 – 9 cm				n/a	hollows (including dead stems/trees)			
of native vascular	Grasses etc.		< 5 cm				n/a				
plants by	Forbs		Length of logs	(m)	T		<b>1</b>	total			
form group	Ferns		(≥10 cm diameter, in length)	>50 cm							
	Other		Counts must apply Estimates can be u	to each s used when	ize class when the number of	the number of living t living tree stems within	ree sterns with a class is > 10	in the size class is ≤ 10. . Estimates should draw			
High Threat	High Threat Weed cover		from the number s	eries: 10,	20. 30, 100,	200, 300					
L			For a multi-stemn count only the pres 1 stem per tree wh	ned tree. sence of a tere tree is	only the largest stem containir multi-stemme	living stem is included ig hollows, not the cour d. The hollow-bearing s	in the count/es at of hollows in t tem may be a c	timate. For holiows that stem. Only count as lead stem			

BAM Attribute (1 x 1 m plots)	1 m plots) Litter cover (%)			Bai	Bare ground cover (%)				Cryptogam cover (%)				(%)	Rock cover (%)						
Subplot score (% in each)	20	10	10	3	15.	3	5	10	6	0	0	0	0	0	00000				0	$\mathcal{O}$
Average of the 5 subplots		17	2					5					D	L	_ <del></del>		0	l		

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	Landform	Landform	A B C	มงจรรษต่างที่สมมาณสรามการพูดส์สอกร
Туре	Element	Pattern	Microreliet	
Lithology	Soil Surface	Soil	Soil	
Linbiogy	Texture	Colour	Depth	
Slope	Aspect	Site Orainado	Distance to nearest	
Ciupo	Ларсы	Site Brainage	water and type	

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)		201422-4024-4-0429-4-0429-4-	#### \$################################
Cultivation (inc. pasture)	3	R	As DRV.
Soil erosion	1	R	
Firewood / CWD removal			
Grazing (identify native/stock)	3	R	
Fire damage			
Storm damage			
Weediness	3	R	
Other			

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

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

400 m <sup>2</sup>	plot: Sheet _ of _	Survey Name	Plot Identifier		Record	ers		<u> </u>
Date	3.9.19	Grantham PK	4-	MH SS				
					1			I
GF Code	Top 3 native species in All other native and exc	each growth form group: Full s otic species: Full species name	species name mandatory where practicable	N, E or HTĘ	Cover	Abund	stratu m	er
R	JUNCUS SP	? USCIAPTUS.			5	30		
G	Chloris t	runc		N	0.2	5		
		i						
		·	·					
			· · · · · · · · · · · · · · · · · · ·					
	••							
	1+.							
	PHALARIS AQUA	TICA.		E	.5	70		
	BRASSICA.	sP -> Hirschfel	dia incana			400		
	LEPIDIUM.	africann		· · ·	0.1	10		
	Medicargo	5P .			l	1000		
	Lolium sp.	•			0.3	100		
	Nassella tu	i chotoma		HTE	0.1	5		
	Hypocar va	ndicatn			0.1	5		
	Onoporalium	5,0.			0.1	5		
	Capsella. >	ursa-past			0.1	3		
·	Elensine f	vista	•		10	400		ļ
	Grans - no	1D. not native	? 		20	4000		
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**GF Code:** see Growth Form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic F - 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, ...

	BAN	A Site – Field Survey	Site She	Site Sheet no:			
		Survey Name	Plot Identifier	Reco	rders		
Date	4 9 19	Grandhampk	5	MH			
Zone	Datum	IBRA region	Photo #		Zone ID		
Easting	Northing	Dimensions		Orientation of midline from the 0 m point.			
Vegetation C	lass				Confidence:		
Plant Commu	unity Type	(896?) - Mod	iifred.	EE	C: H M L Confidence: H M L		

BAM	Attribute	Sum values	BAM Attribute (20 x 50	) m plot)	# Tree Sten	ns Count	Denad
(400	m <sup>2</sup> plot)	Sum values	dbh	Euc*	Non Euc	Hollows <sup>†</sup>	living eucalypt*
	Trees		large trees for 80 +				(Euc*) and living
	Shrubs		Euc* & Non Euc cm	· · · ·			(Non Euc) stems
Count of Grass Native Richness Forbs Ferns Other	Grasses etc.		50 – 79 cm				* includes all species
	Forbs		30 – 49 cm				of Eucalyptus, Corymbia, Angeophere
	Ferns		20 – 29 cm		<u> </u>		Lophostemon and Syncamia
	Other		10 10 cm	- /-		1	<sup>†</sup> Record total
	Trees			1		-	number of stems by size class with
Sum of	Shrubs		5 – 9 cm			n/a	hollows (including dead stems/trees)
of native	Grasses etc.		< 5 cm			n/a	
plants by	Forbs		Length of logs (m)			<b></b>	total
form group Fern	Ferns		(≥10 cm diameter, >50 cm in length)		and the second sec		
	Other		Counts must apply to each	size class whe	n the number of living	tree stems wit	hin the size class is $\leq 10$ .
High Threat	Weed cover		from the number series. 10	, 20. 30, 100	or living tree stems withi , 200, 300	n a class is > 1	0. Estimates should draw
		<u></u>	For a multi-stemmed tree count only the presence of 1 stem per free where tree	only the larges a stem contain is multi-stemm	st living stem is included ing hollows, not the coul ed. The hollow-bearing :	i in the count/e nt of hollows in stem may be a	stimate. For hollows that stem. Only count as dead stem

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)	
Subplot score (% in each)	210535	30 5 40 20 20	00000	00000	
Average of the 5 subplots	5	23	0	O	

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)

generation and an	our real formation of the second s	CONTRACTOR AND ADDRESS OF A DECEMBER OF A		ie (opnoning
Morphological	Landform	Landform	this section	
Туре	Element	Pattern	Microseller	
Lithology	<ul> <li>Soil Surface</li> </ul>	Soil	Soil	
	Texture	Colour	Depth	
Slope	Aspect	Site Drainage	Distance to neares!	
	7.65666	one brainage	water and type	

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)			
Cultivation (inc. pasture)	3	R	۷ ۸
Soil erosion	1	R	As prev
Firewood / CWD removal			
Grazing (identify native/stock)	3	K	• •
Fire damage			3
Storm damage			
Weediness	3	R	• • •
Other			

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

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

400 m <sup>2</sup>	plot: Sheet _ of _	Survey Name	Plot Identifier			Record	ers		
Date	4 9/19	Grandham PK	5	MI	ofre				
GF Code	Top 3 native species in All other native and exc	each growth form group: Full spotic species: Full species name	pecies name mandatory where practicable	-	N, E or HTE	Cover	Abund	stratu m	vouch er
			·						
-									ļ
			· · · · · · · · · · · · · · · · · · ·						
		······································							
	A								
	Unoporoly.	<u>A 76.</u>			Ŀ	0.5	60		
	Phylloud 4	comerata				30	1003		
···	Manalla L	rection -			HTE	2	70		
	the ascas and	readm	<u></u>			-	200		
	Medicartos	<u>ج</u> م.			- The State	10	2000		
	Erodinus c	icutarium				0.1	2		
	Hirsch in	cana			We when any	015	100		
	Bromus 21	2			HTE	5	400		
	Lepidium a	frie	· .			0.5	50		
	127	· · · · · · · · · · · · · · · · · · ·	<u>terreterreterreterreterreterreterreter</u>		×	0.1	10		
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	.6.								

**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  $1.4 \times 1.4 m$ , and  $1\% = 2.0 \times 2.0 m$ ,  $5\% = 4 \times 5 m$ ,  $25\% = 10 \times 10 m$ **Abundance:** 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

	BA	Site Shee	Site Sheet no:			
· · · · ·		Survey Name	Plot Identifier	Recorders		
Date	4919	Grandham PK	6	MH		
Zone	Datum	IBRA region	Photo #		Zone ID	
Easting	Northing	Dimensions		Orientation of midline from the 0 m point.		
Vegetation C	lass				Confidence:	
Plant Commu	unity Type	896 - Mo	dified	EE	C: H M L H M L	

BAM	Attribute		В	AM Attrib	ute (20 x 50	m plot)	# Tree Stem	s Count	F
(400	m <sup>2</sup> plot)	Sum values		dbh		Fuc*	Non Fuc	Hollowet	Record number of
	Trees		iai	rge trees for	80 +			TIONOWS	(Euc*) and living native non-eucalypt
	Shrubs				- cm				(Non Euc) stems
Count of	Grasses etc.				50 – 79 cm				* includes all species
Richness	Forbs		3	0 – 49 cm					of Eucalyptus, Corymbia, Accorbore
Fe	Ferns		2	0 – 29 cm					Lophostemon and Syncamia
	Other		L.					/	*Record total
Trees				0 – 19 cm		<u> </u>			number of stems by size class with
Sum of	Shrubs			5 – 9 cm			· · ·	n/a	hollows (including dead stems/trees)
of native	Grasses etc.			< 5 cm	X			n/a	
plants by	Forbs			enoth of	loas (m)		<u>, , , , , , , , , , , , , , , , , , , </u>	/	total
growth form group	Ferns		(i ir	≥10 cm dian n length)	neter, >50 cm		V		
	Other		С	counts must	apply to each	size class wh	en the number of living	tree stems will	hin the size class is $\leq 10$ .
High Threat	Weed cover		E fr F	Istimates ca rom the num for a multi-s	in be used wh ober series 10 stemmed tree	en the number ), 20, 30 10 -, only the large	of living tree stems within 0, 200, 300 est living stem is included	n a class is > 10	3. Estimates should draw stumate. For holiows
			C 1	ount only the stem per tr	e presence of ree where tree	a stem contail is multi-stemn	ning hollows, not the cour ned. The hollow-bearing s	nt of hollows in stem may be a	that stem. Only count as dead stem.
BAM Attrib	ute (1 x 1 m plots	) Litter	cover (%)	) 8	are ground	cover (%)	Cryptogam cover	(%) Ro	ock cover (%)
1.								1	

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	201520515	2010151015	00000	00000
Average of the 5 subplots	15	14	Ō	0
			· · · · · · · · · · · · · · · · · · ·	

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 fea	itures that may help ir	determining PCT	and Management Zone (optional)	
The second state of the se	the state of the second s	A CARD AND A DISCHARGE AND A DISCHARGE AND A DISCHARGE A DISCHARGE AND A		

Morphological Type		Landform Element		Lanoform Pattern	Mic.oreliei ·	
Lithology		Soil Surface		Seil	Soil	
Slope		Aspect		Site Drainage	Distance to nearest water and type	CA EVERALMENT
Plot Disturbance	Severity code	Age Corie	Observational a	evidence	nen son ander stylenden. Het en die besite Austrik Austrik voor onterentersterenten (1916) verwersterenten aus	
Clearing (inc. logging)		200 November 200			a o channel, en la chuisteanna ann ann ann ann ann ann ann ann an	CALCUMUL ST.
Cultivation (inc. pasture)	3	R		/		
Soil erosion		R	KS	Drev. (ni	one heavily a pared	
Firewood / CWD removal						
Grazing (identify native/stock)	3	R		ų	no cites 1-4 (next	RA
Fire damage						
Storm damage	100574			ann a' anns ann tallananna an ann a' marta a' fairte a' stèine an ann ann ann ann ann ann ann ann an		}
Weediness	3	R				
Other					ann an an h-rinn an a	

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

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

Bate     Image: Participant Participant Participants     N. E or Muture       GF     Top 3 native species in each growth form group. Full species name where practicable     N. E or Cover Auno on Muture Participants       G     Chloris Arman     0.5     20       G     Ausbros Line a.g.     0.1     1       Acetosella vulgaris     (sorrel)     5     500       Phallants ague a.g.     5     20       Namella Arischo     HTE     5     20       Namella Arischo     HTE     100     100       Toustella Arischo     HTE     2     300       Valaris ague a.g.     HTE     100     100       Namella Arischo     HTE     2     300       Valaris ague a.g.     Interview and ague a.	400 m <sup>2</sup>	olot: Sheet _ of _	Survey Name	Plot Identifier		<u>- 1.8</u>	Recorde	rs		<u> </u>
OF     Top 3 native species in each growth form group: Full species name mandatory     N. E or     Cover     Aune     Water       G     Chloris Arran     0.5     20       G     Austrostynse 2p     0.1     1       G     Chloris Arran     0.5     20       G     Austrostynse 2p     0.1     1       Acetosella vulgaris (sorrel)     5     20       Puellaeris ague     5     20       Namella tricko     HTE     5       Trashue species in a species full species name where practicable     5       Acetosella vulgaris (sorrel)     5     20       Puellaeris ague     5     20       Namella tricko     HTE     100       Trashue as yeev.     Groepardi sp     3       Boo     2     300       Wedtcarro 3:     2     300       Wedtcarro 3:     2     300       Elouine 3:     2     3       Elouine 3: <t< td=""><td>Date</td><td>4-19/19 6</td><td>anthan PK</td><td>6</td><td>MH</td><td></td><td></td><td>·····</td><td></td><td></td></t<>	Date	4-19/19 6	anthan PK	6	MH			·····		
Gr     Top 3 nalve species name hore practicable     N. E or     Cover     About species name hore practicable       G     Chloris true     0.5     20       G     Austrustry true species name hore practicable     0.5     20       G     Austrustry true     0.5     20       Austrustry true     0.5     20       Acetosetta vulgeris     (sored)     5     60       Phatters and the construction     5     500       Phatters and true     5     500       Phatters and true     5     500       Phatters and true     5     20       Nameta article     50     20       Phatters and true     10     10       Phatters and true     10     10       Phatters and true     10										
G Chloris Irm 0.5 20 G Austrostype sp. 0.1 1 Acetosetta vulgeris (sorrel) 5 500 Phalleri agua 75 20 Phalleri agua 75 20 Phalleri agua 75 20 Phalleri agua 75 20 Phalleri 200 Tustu as prev. Orogodi sp. 3 400 Tustu as prev. Orogodi sp. 100 Tustu as prev. Orogod	GF Code	Top 3 native species in each All other native and exotic s	n growth form group: Full pecies: Full species name	species name mandatory e where practicable		N, E or HTE	Cover	Abund	m	er
G Chloris friend 0.5 20 G Austrostripe sp. 0.1 1 Acetosella vulgeris (sorrel) 5500 Phallaris aqua 520 Narella tricho HTE 5 100 Thirth as prev. Orreptl sp 3 400 Ethium planta 10 2 50 Roro mus sp. HTE 2 500 Nidelrearis 12 Lolium 50 Etensive fristed 10 200 1 0 200										
G Austrostyre sp. Acetosella vulgeris (rorrel) Acetosella vulgeris (rorrel) Acetosella vulgeris (rorrel) Phallers agua Namella Arricho Thurthe as grev. Orogati sp Sob Fishium planta Horo romo sp. Horo romo sp. HTE 2 300 Construction HTE 2 300 Construction HTE 2 300 Construction	G	Chlorie Lon	A	·····			0.5	20		
Acebosella vulgaris (sorrel) Acebosella vulgaris (sorrel) Phallarrs aqua Namella tricho Thatte as user. Orrepetli sp Einium planta HTE 5 100 Thatte as user. Orrepetli sp Einium planta 0°2 50 Promus sp. HTE 2 300 Promus sp. HTE 2 300 E 200 10 lium sp. 10 lium sp.	G	Andrehae	<u>د م</u>				0.1	1		
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Acetosella vulgaris (sorred) Phallars aqua Namella tricho Thatta expression Fibium planta Boo Fibium planta Boo Fibium planta Cromus sp. Nedrearno sp. Nedrearno sp. Nedrearno sp. Latium sp. Eleunice tristad Comparison		:								
Acetosella vulgeris (sorrel) 5 500 Phellarri aqua 5 20 Nassella tricho HTE 5 100 Tractu as grev. Oropoti sp 2 3400 sihium planta Molcus Insetus 0.2 50 Revenus sp. HTE 2 300 Nedecarno sp. HTE 2 300 Lolium 20 Eleunice tristach 10 2000		-		· · · ·						
Acetosella vulgavis (sorrel) 5 500 Phollariz aqua 5 20 Nanella Aricho HTE 5 100 Turcha as prev. Onoprili sp 3 400 Ethium planta 2 300 Holcus Lanetue 0.2 50 Nedrearno 5? 42 800 Lolium 5p 2 2 800 Eleunine Aristrah 10 2000										
Acetosella vulgaris (sorrel) Phallarris aquía Namella tricho Turstu as prev. errepeti sp Echium planta 100 100 100 100 100 100 100 10		•								
Acetosella vulgaris (sorrel) 5 500 Phallaris aquia 5 20 Nanella tricho HTE 5 100 Trustu as piev. Oregardi sp 2 300 Ethium planta 0°2 50 Holcus Lanatus 0°2 50 Revernus sp. HTE 2 300 Lolium 50 Eleusive tristad 10 2000 U		•								
Accetosella vulgaris (sorrel)     S     500       Phallaris aqua     5     20       Namella Aricho     HTE     5     20       Tinstu as prev. Orregardi sp     3     400       Eihium planta     0:2     50       Actor of the spin of the s										
Phallarity Namella Arcicho $5$ $20$ Namella ArcichoHTE $5$ $100$ Trastlu as prev. Echium planta $2$ $300$ Brommus sp. $0.2$ $50$ Brommus sp.HTE $2$ Nedrearno $52$ $22$ $200$ Eleusive Fristad $10$ $10$ Eleusive Fristad		Acetosella vu	Igaris (so	mel).			5	500		
Namelia trichoHTE $5$ 100Turstu as pier. $One parti sp$ 3400Echium planta $2$ $300$ Holcus Lanatus $0.2$ $50$ Grommus sp.HTE $2$ $300$ I column sp. $2$ $800$ I column sp. $2$ $800$ E leusine tristed. $10$ $2000$ I $10$ $10$ I </td <td></td> <td>Phallaris ag.</td> <td><u>u</u>a</td> <td>· · · · · · · · · · · · · · · · · · ·</td> <td></td> <td></td> <td>5</td> <td>20</td> <td></td> <td></td>		Phallaris ag.	<u>u</u> a	· · · · · · · · · · · · · · · · · · ·			5	20		
Turstu as prev.Oregardi sp $3 400$ Echium planda $2 300$ Holcus lanatus $0.2 50$ Groomus sp.HTE 2 300Nedercarno sp. $2 800$ Lalium sp. $2 800$ Eleusine dristad $10 2000$ II <td></td> <td>Namella tri</td> <td>cho</td> <td>·</td> <td></td> <td>HTE</td> <td>5</td> <td>100</td> <td></td> <td></td>		Namella tri	cho	·		HTE	5	100		
Eihium planka     2     3eo       Holcus lanatus     0.2     50       Gromus sp.     HTE     2     3oc       Nledrcarno sp.     2     800       Lolium 2p.     2     800       Eleusine     HTE     2       10     2000       10     2000       10     2000       11		Trustle as	prev. Onopor	di sp			3	400		<u> </u>
Holcus (anatus     0.2     50       Gromus sp.     HTE     2     300       Nedicarno sp.     2     800       Lolium 5p.     2     800       Eleusine tristadi     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10       1     <		Echium plan	ta				2	300		<b>_</b>
Bro muss sp.     HTE     2     300       Medicarno sp.     2     800       Eleusine Aristada     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10     10       1     10       1     10		Holcus Iana	Ares				0.2	50		<u> </u>
$Nedrcarno 5!^2$ 3 800         Lolium 5:p:       2 800         Eleunine 4rristach       10 8000         U		Bromus sp.		· · · · · · · · · · · · · · · · · · ·		HTE	2	300		<u> </u>
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Nedreamo.	5 12			,	3	800		1
Eleusine     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     2000       1     10     10       1     10		Lolium 3p.					2	800	<u> </u>	<u> </u>
		Eleusine tr	istach				10	2000	<u> </u>	<u></u>
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GF Code: see Growth Form definitions in Appendix 1N: native, E: exotic, HTE: high threat exoticGF - 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  $63 \times 63$  cm or a circle about 71 cm across, 0.5% cover represents an area of approximately  $1.4 \times 1.4$  m, and  $1\% = 2.0 \times 2.0$  m,  $5\% = 4 \times 5$  m,  $25\% = 10 \times 10$  mAbundance:1, 2, 3, ..., 10, 20, 30, ..., 1000, ...

BAI	A Site – Field Surv	vey Form	Site She	et no:
	Survey Name	Plot Identifier	Reco	orders
4 9 19	Granshan PK	< 7	MH	
Datum	IBRA region	Photo #		Zone ID
Northing	Dimension	is	Orientation of midline from the 0 m point.	
ass				Confidence:
nity Type	896 Modif	red	EE	C: H M L Confidence:
	BAN <u>4919</u> Datum Northing ass nity Type	BAM Site – Field Survey Name Survey Name 4 9 19 Gran Shan Pk Datum IBRA region Northing Dimension ass nity Type & & Modif	BAM Site – Field Survey Form         Survey Name       Plot Identifier         4       9       19       Gram Sham PK       7         Datum       IBRA region       Photo #         Northing       Dimensions       ass         nity Type       29.6       Modified	BAM Site – Field Survey Form     Site She       Survey Name     Plot Identifier     Record       4     9     19     Granshan PK     7     MH       Datum     IBRA region     Photo #     0       Northing     Dimensions     Orientation of midline from the 0 m point.       ass     nity Type     %6     Modified

BAM	Attribute	<u> </u>		BAM A	ttribute (20 x 50	m plot)	# Tree Sten	ns Count	1
(400	m <sup>2</sup> plot)	Sumv	alues	dbh		Euc*	Non Euc	Hollows <sup>†</sup>	Record number of living eucalypt*
	Trees		1	large tree	s for 80 +				(Euc*) and living
	Shrubs				on Euc cm				(Non Euc) stems
Count of	Grasses etc.				50 – 79 cm	•		1	* includes all species
Native Richness	Forbs			30 – 49	cm			•	of Eucalyptus, Corymbia,
	Ferns			20 – 29	) cm				Lophostemon and Syncamia
	Other			10 - 19	) cm				<sup>†</sup> Record total
	Trees			5-9	cm	<u> </u>		nlo	size class with
Sum of Cover	Shrubs							11/d	dead stems/trees)
of native vascular	Grasses etc.			< 5 c	xm			n/a	
plants by	Forbs			Length	of logs (m)				total
form group	Ferns			(≥10 cm in length	diameter, >50 cm I)				
	Other			Counts i	must apply to each :	size class wh	en the number of living	tree stems wi	thin the size class is $\leq 10$ .
High Threat	t Weed cover			from the	number series: 10,	20, 30 10	0, 200, 300	n a class is 2	IO. ESIMBLES SHOULD GRAW
		<u> </u>		For a m count or 1 stem p	uni-stemmed tree. hly the presence of a per free where tree i	only the large stem contail s multi-stemn	est living stem is included ning hollows, not the cou ned. The hollow-béanna	i in the count/E nt of hollows ir stem may be a	stimale. For holiows I that stem. Only count as I dead stem.
BAM Attribu	ute (1 x 1 m plots	)	Litter co	ver (%)	Bare ground c	over (%)	Cryptogam cover	(%) R	ock cover (%)
Subpl	ot score (% in ea	ch) 25	10 2	0 In 10	5 15 30	15 20	0000	00	0000
Ave	erage of the 5 subpl	ots	15	······	17		Ð	•	0
Litter cover the location 1 m x 1 m contribute	r is assessed as the a ns 5, 15, 25, 35, and plots assessors may to assessment score	average p 45 m alor also reco s, they ho	ercentage g ng the midlin rd the cover Id potential	round cover of e. Litter cover ir of rock, bare gr value for future	litter recorded from Includes leaves, see round and cryptogar vegetation integrity	ive 1 m x 1 n ls. twigs, bra n soil crusts assessment a	I plots located on alterna nchlets and branches (le Collection of these data attributes and benchmark	te sides and 5 ss than 10 cm is optional - the is, and for enh	m from the plot midline at in diameter). Within these adata do not currently ancing PCT description
P	hysiography	+ site	features	s that may	help in dete	mining (	PCT and Manag	ement Zo	one (optional)
Morphologi Type	cal	F	andform	NARATIN TUMPINING AND DUTING AND DUTING AND	Landfor	וו	Micro	relief	ระการเหลงคราห์การสำนักของกันเรามา 
Lithology			Soil Surface		Seil		Soll		
Slope		4	\spect		Site Dra	inage	Dista wate	nce to neares! r and type	
Plot Dist	urbance [	Severity	Age	Observational	l evidence	₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	anna shekara a ka	nan an	त्र त्र त्र त्र त्र त्र व्याप्त के भाष्ट्र स्थानकार के प्राप्त क्या के स्थान के प्राप्त के प्राप्त के प्राप्त क स्थान के प्राप्त के प्राप्त के प्राप्त स्थानकार के प्राप्त क्या के स्थानकार के प्राप्त क्या के स्थानकार के प्राप स्थान के प्राप्त के प्राप्त के प्राप्त के प्राप्त के स्थानकार के प्राप्त क्या के स्थानकार के स्थानकार के प्राप्त
Clearing (	inc, logging)		CUUC Antoninanteristan		\$	£128-79-8-98-677-8-88-9-76-6	anna ann ann an an Ann an San Ann, Staitheanna Santaire an a' a	******************************	an again an an an ann an ann an ann an an ann an a

FIOL DISLUIDANCE	code	code		
Clearing (inc. logging)				ina da canteria te incluita indicata incluir da tetta marz Bachar da la potentizzante estatuteren da canteren d National
Cultivation (inc. pasture)	3	R		
Soil erosion	3	R	AS Prev.	
Firewood / CWD removal				
Grazing (identify native/stock)	3	R	4	
Fire damage	at months	1		
Storm damage				
Weediness	3	R	••	
Other		1		

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

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

400 m <sup>2</sup>	plot: Sheet _ of _	Survey Name	Plot Identifier			Recorde	ers		<u> </u>
Date	4 9 19 6.	antham PK	7	MI	ł				
GF Code	Top 3 native species in each All other native and exotic sp	growth form group: Full becies: Full species name	species name mandatory e where practicable		N, E or HTE	Cover	Abund	stratu m	vouch er
					4		1		and a second s
		•					ی این ا		
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-	·		· · · · · · · · · · · · · · · · · · ·						
			<u></u>		·····				
	Onopordium	SP.			E	4	400	<u> </u>	1
	Fredium cir.	storium				2	100		
	Trifolium SF	>				1	.40		
	Bronus 50	-leaft 1	-olium Eaft.			20	4000	\$	
	Bromus sp.	• ?	······································		HTE	40	5000	+	
	Nassella tri	Co			HTE	0.5	10		ļ
	Phallaris aqua					2	40	· ·	
	Lepidrum afric	anum			V	0.1	5		
		· · · · · · · · · · · · · · · · · · ·	·						
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**GF Code:** see Growth Form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic F - 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, ...

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	BAI	M Site – Field Surv	ey Form	ana ang ang ang ang ang ang ang ang ang	Site Sh	eet no:	
· · ·	••••••••••••••••••••••••••••••••••••••	Survey Name	Plot lo	lentifier	Rec	orders	
Date	4/9/19	Gransham Ple	4	8	MH	FRANCES Robert	en el constant de la constant en el constant de la constant de la constant el constant de la cons
Zone	Datum	IBRA region		Photo #	and a start of the second start	Zone ID	
Easting	Northing	Dimension	s		Orientation of midlin from the 0 m point	e   t.	.1
Vegetation C	lass						Confidence:
Plant Commu	unity Type	896 Mod	ified		E	EC:	<u>HML</u> Confidence: HML

BAM	Attribute	Sum values	BAM Attribute	(20 x 50	m plot)	# Tree Ste	ms Count	Dormand as makes and
(400	m² plot)	Sulli values	dbh		Euc*	Non Euc	Hollows <sup>†</sup>	living eucalypt*
	Trees		large trees for	80 +				(Euc*) and living native non-eucalypt
	Shrubs		EUC & NON EUC	cm				(Non Euc) stems
Count of	Grasses etc.		50 -	- 79 cm			and the second	<ul> <li>includes all species</li> </ul>
Native Richness	Forbs		30 – 49 cm			· · · · · · · · · · · · · · · · · · ·		of Eucalyptus, Corymbia, Appendere
	Ferns		20 – 29 cm		فمعمر			Lophostemon and Syncamia
	Other		10 - 19  cm			· · · · · ·		<sup>†</sup> Record total
	Trees							number of stems by size class with
Sum of	Shrubs		5 – 9 cm		/	at and the second second	n/a	hollows (including dead stems/trees)
of native	Grasses etc.		< 5 cm				n/a	
plants by	Forbs		Length of logs	s (m)		1		total
form group	Ferns		(≥10 cm diamete in length)	r, >50 cm			ж. С.	
	Other		Counts must app Estimates can be	ly to each	size class who	en the number of livin	g tree stems wi	Thin the size class is $\leq 10$ .
High Threat	Weed cover		from the number For a multi-sterr	series 10	. 20. 30 100	0, 200, 300 est living stem is include	ed in the count/s	stimale Forholiows

	1 stem j	per tree where tree is multi-stemi	med. The hollow-bearing stem m	ay be a dead stem
BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	1020 10 10 15	3 15 5 3 2	and the same start of the second	All and the sector of the language for all the states of a sector of the
Average of the 5 subplots	13	6		

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)

Physiograph	$iy \neq site$	reatures	s that may neip	in determini	ng PC i an	a Nanagement Zor	19 (optional)
Morphological Type		Landform Element		Lanoform Pattern		Mic.orelie!	*
Lithology		Soil Surface Texture		Seil Coloui		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	
Plot Disturbance	Severity code	Age corie	Observational evidenc	1994 - 1997 -	ten ente transmana indetensy ordene geden	n fra sen a la secala de la constructiva de la construcción de la construcción de la construcción de la constru	a lan an anti-annan an marannan.
Clearing (inc. logging)						and designed and a state of a state of a state of the sta	
Cultivation (inc. pasture)	3	R	,	/			
Soil erosion	1	R	AG	prev.		-	
Firewood / CWD remova	l		an a	T			
Grazing (identify native/stock	3	R	•	/	The Control of States and an annual of States in a		
Fire damage	et tracet						
Storm damage							
Weediness	3	R	**				
Other							

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

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

400 m <sup>2</sup> j	plot: Sheet _ of _	Survey Name	Plot Identifier		Recorde	ers		
Date	4/9/19	Grantham PK	8	MH				
GF	Top 3 native species	in each growth form group: Full s	species name mandatory	N, E or	Cover	Abund	stratu m	vouch er
COULE						· .	:	11 A.
			· · · · · · · · · · · · · · · · · · ·					
		······································	<u>, , , , , , , , , , , , , , , , , , , </u>			·		
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		· · · · · · · · · · · · · · · · · · ·	·					
		<u>^</u> .				<u> </u>	<u>                                      </u>	
	Lolium.	- solt		<u></u>	60	5000	++	
·	Sysimbrin	m officinale	(Hedge Mushard	2	0.1	3		<b>  </b>
	Phallaris	aqua			5	20		
	Dactylis a	glomerata			2	50		<u> </u>
	capsella	bursh - pastor	······································		0.1	5		
	Repiainm	atri			5	500		
	DADON SP					20		
	Avena	SP			1 X	100		
	7.0 -	<u> </u>				100	1	1
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**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, ... 1000, ....

		BAM	Site -	Field	d Surv	ey Fo	orm			Site	She	et no:	
			Sur	vey N	ame		Hot Ide	itifier	T		Reco	rders	
Dat	e 4 9	19	Grand	the	im f	AL C	reak	(9)	) 1	14.			
Zone	Datun	n l	IBRA re	gion		····	-	Photo #				Zone ID	)
Easting	Northin	g		Dim	nension	s	i		Or	entation of mid	lline		
Vegetation	Class			~ (	000			1	<u> </u>	from the 0 m p	oint.		Confidence:
Plant Com	munity Type				of 1	<u> </u>	<u>ts ris</u>	Lie			EE	C:	H M L Confidence:
Record easi Dimensions	ing and northing (Shape) of 0.04	from the ha base	plot marker. plot inside 0.	If applic 1 ha FA	cable, orier	nt picket s	o that perf tified, mag	orated rib p netic bearin	oints alc ng taken	ng direction of mic along midline.	iline.	NO	HML
BAM	Attribute	Su	m values		BAM A	ttribute	(20 x 50	m plot)		# Tree Ster	ns Co	ount	Record number of
(+00	Trees				dbh			Euc*	<u> </u>	Non Euc	Ho	ollows <sup>†</sup>	living eucalypt*
	Trees				large tree Euc* & N	es for on Euc	80 + cm			,		Mare .	native non-eucalyp
	Shrubs					E0	70						(Non Euc) stems separately
Count of	Grasses etc.		8 A.			- 00	- /9 cm						* includes all specie
Richness	Forbs				30 - 49	) cm				a far			of Eucalyptus, Corymbia,
	Ferns					· · ·			$\neq$		+		Angophora, Lophostemon and
•	Other				20 - 29	o cm							Syncamia
10 – 19 cm <sup>†</sup> Record toial number of stems by													
	Trees size class with bollows (including												
Sum of Cover	Shrubs		5-5							n/a	dead stems/trees)		
of native	Grasses etc.				< 5 cm		1					n/a	
plants by	Forbs				Length	of logs	; (m)	T					total
form group	Ferns				(≥10 cm in length	diameter 1)	, >50 cm			and a statement		19-10 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	terore and the second sec
	Other				Counts	must appl	y to each :	size class v	vhen the	number of living	tree s	tems withi	n the size class is ≤ 10
High Threat	Weed cover				from the	es can be number :	used whe series: 10,	n the numb 20, 30, 1	er of livir 100, 200,	ig tree stems withi 300	n a cla	ise is > 10.	Estimates should drav
	· · · · · · · · · · · · · · · · · · ·				For a <b>m</b> count or	ulti-stem	med tree. esence of a	only the lar stem cont	gest livir aining ho	ig stem is included	f in the nt of h	count/esti ollows in th	mate. For hollows hat stem. Only count as
BAM Attribu	te (1 x 1 m plo	its)	Litter	cover	1 stem p	er tree w	here tree i	s multi-ster	nmed. Ti	ne hollow-bearing	stem m	hay be a di	ead stem
Subplo	t score (% in e	each)				Daic				plogan cover	( 70)		R COVER (%)
Aver	age of the 5 sut	poiots	> 10	6	55	10 2	12	40 10			<u> </u>		
Litter cover i the locations 1 m x 1 m pl contribute to	s assessed as th 55, 15, 25, 35, ar ots assessors ma assessment sco	e averag nd 45 m a ay also re pres, they	e percentage along the mid ecord the cov hold potentia	e ground line. Litt er of roo al value	d cover of l ter cover ir ck, bare gr for future	itter recor icludes le ound and vegetation	ded from f aves, seed cryptogan h integrity :	ive 1 m x 1 ls, twigs, bi assessmen	m plots ranchlets s Collect t attribute	located on alterna and branches (lea ion of these data i as and benchmark	te sida ss than s optio s, and	s and 5 m 10 cm in nal - the di for enhand	from the plot midline at diameter). Within these ata do not currently cing PCT description
Morphologica	iysiograph ii	y ⁊ sh	Landform	s tha	at may	neip I	Landforr	<u>rnining</u> n T	PCI	and Manag	eme	ent Zon	e (optional)
Туре			Element Soil Surface	e			Pattern Soil			Micro	relief		
Lithology			Texture	-			Colour			Dept			
Slope			Aspect		and the second second second	a ton and the second second	Site Drai	nage	Part and the Ball production and	Water	and ty	nearesi pe	
Plot Distu	rbance	Severi code	ty Age code	Obs	servational	evidence	4964778/21889/910-10,19,19,196 <sub>10</sub>	CLARGE COMMENDATION COMMEND	10 Martin (1997) (19	ROM 27, CRIMIN WIRK (2020) CLUTCH INFORMATION	902 - 445 - 477 Q	995 - 997 Abril Hand Barg y L Bally -	10-19 almine methodological analysis and a second
Clearing (ir	c. logging)												
Cultivation	(inc. pasture)	3	R					-					
Firewood //		1 3	IK.		Seve	rel	sank	eros	non	+ reep	MC	chanr	relised.
Grazing	ntify nalive/stock)	2	R										
Fire damag	e												s contra
Storm dam	age	E CONTRACTOR OF						· · · · · · · · · · · · · · · · · · ·					
Weediness		3	R					· · ·		*****			
Other											The company set	alle anna an A	
Severity	0=no evidence.	1=light, 2	?=moderate,	3=sevei	re Ie	149-14955.0247-149659.07	an an Indonesia (ny faritana galerana)	1994) 1200 - 2012 - 2012 - 2012 - 2013 - 2014 1	Age. R=r	ecent (<3yrs), NR	=not re	cent (3-10	ivrs), O=old (>10yrs)

400 m <sup>2</sup> j	olot: Sheet _ of _ Survey Name Plot Identifier	Recorders				
Date	4/9/2019 Grantham PK Creek (9)	MH.				
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	stratu m	vouch er
	Juncus sp.	N				
	Typha orientalis					
	Cynodon dacty lon	Ľ.				
	and and a second se		······			
· · · · ·						
	Portto (Echinim plantas)	E				
	Huppea radreata	1				
	onepordum sp.				-	
	Bronus \$p.					
	Elevone tristach					
	Nancella trichstonia					
· · · · ·	Plantago lance					
	Bragi careae sp- > Hirschfeldig incana					
	Annual grass					
	Datura stramonium					
	Midiciana Ca					
· · .	1 - an chigo 20.					
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**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				
Date	4 9 2019	Grantham PK	Tree (10) Planting (10)	MH				
Zone	Datum	IBRA region	Photo	¥	Zone ID			
Easting	Northing	Dimensions		Orientation of midlin from the 0 m poin	e  t.			
Vegetation Class					Confidence:			
Plant Community Type		Tree Alanting -rehab		o near office E	EC: 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 m <sup>2</sup> plot)		Sum values	BAM Attr
		Trees		large trees fo
		Shrubs		
	Count of	Grasses etc.		·
	Richness	Forbs		30 <b>-</b> 49 ci
	~	Ferns		20 – 29 ci
		Other		
		Trees		10 – 19 ci
	Sum of	Shrubs		5 – 9 cm
	of native	Grasses etc.		< 5 cm
	plants by growth form group	Forbs		Length of
		Ferns		(≥10 cm dia in length)
		Other		Counts mu
	High Threat	Weed cover		from the nu

BAM Attribute (20 x 50 m plot)		# Tree Ste	# Tree Stems Count	
dbh	Euc*	Non Euc	Hollows <sup>†</sup>	living eucalypt*
large trees for Euc* & Non Euc	80 + cm			(Euc*) and living native non-eucalypt (Non Euc) stems
50 —	79 cm			
30 – 49 cm		· · · · · · · · · · · · · · · · · · ·		of Eucalyptus, Corymbia,
20 – 29 cm				Lophostemon and Syncamia
10 – 19 cm				<sup>†</sup> Record total number of stems by
5 – 9 cm			n/a	hollows (including dead stems/trees)
< 5 cm			n/a	
Length of logs (≥10 cm diameter, in length)	(m) >50 cm			total

Counts must apply to each size class when the number of living tree stems within the size class is  $\leq$  10. Estimates can be used when the number of living tree stems within a class is  $\geq$  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

			5	
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				l

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)

a water the state of the state	The second s	SHERE'S CAMES FROM CONTRACTOR AND	
Morphological	Landform	Landform	t fin a solici
Туре	Element	Pattern	Microreiter
Lithology	Soil Surface	Seil	Soil
	Texture	Coloui	Depth
Slope	Aspect	Site Drainage	Distance to nearest
ыорь	Aspect	Site Drainage	water and type

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)	3	0	was mined now rehab tree planting.
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness	3	R	
Other			

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

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

	· · ·				esti	mate: enera	s act	ross	
400 m <sup>2</sup>	plot: Sheet _ of _	Survey Name	Plot Identifier			Recorde	ers		
Date	4 9 2019	Grantham PK	Tree Planting	MH.		- /			
·									
GF Code	Top 3 native species in All other native and ex	in each growth form group: Fu kotic species: Full species nai	ull species name mandatory me where practicable		N, E or HTE	♥ Cover	Abund	stratu m	vouch
	Vacone da	del treas							
	various pla	prod 11 ces -	-						
	Euc. sp	<i>(</i> ) )				15			
	1+caling	> / / .				15			
	R a li	1 0208							
	+ Maara	ma price				0)			
	D. ] -	- 61							
	+ voplar	- Inver.	· · · · · · · · · · · · · · · · · · ·			10			
	- L-3 Å								
	+ Willo	w				5			
	: "E		· · · · · · · · · · · · · · · · · · ·						
		•							
	Ground	covers							
	Phaha	is aquatica			E	20			
	lock	stoot. Dactyl	ty glomerates		ł	20			
	hoose	grass Eleusio	ne tristachya			15			
	Brom	vo cathartia	, 		V	10			
			·		· <b>X</b>				
	Austros	tipa sp			N	3			
	Ryind	ocolling Sp.			N	3			
	chlor	To truncator			N	2			
	EVACAD	et anala			E	-			
-	Plata	an la collata			E	0.7			
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**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, ..., 1000, ...

### **APPENDIX 4 – FLORA RECORDED WITHIN THE STUDY AREA**



Scientific Name	Common Name
NATIVE	
Austrostipa sp.	A Speargrass
Chloris truncata	Windmill Grass
Cynodon dactylon	Common Couch
Juncus sp.	A Rush
Schoenus apogon	Common Bog-rush
Typha orientalis	Broadleaf Cumbungi
EXOTIC	
Acetosella vulgaris	Sheep Sorrel
Bromus catharticus	Praire Grass
Capsella bursa-pastoris	Shepherd's Purse
Carthamus lanatus	Saffron Thistle
Cirsium vulgare	Spear Thistle
Cyperus eragrostis	Umbrella Sedge
Dactylis glomerata	Cocksfoot
Datura stramonium	Common Thornapple
Echium plantagineum	Patterson's Curse
Eleusine tristachya	Goose Grass
Eragrostis curvula	African Lovegrass
Erodium cicutarium	Common Crowfoot
Hirschfeldia incana	Hairy Brassica
Holcus lanatus	Yorkshire Fog
Hypochaeris radicata	Catsear
Lepidium africanum	Common Peppercress
Lycium ferocissimum	African Boxthorn
Medicago sp.	A Medic
Nassella trichotoma	Serrated Tussock
Onopordum illyricum	Illyrian Thistle
Phalaris aquatica	Phalaris
Pinus radiata	Radiata Pine
Plantago lanceolata	Lamb's Tongues
Poaceae exotic 1	Grass 1 (non-native)



Scientific Name	Common Name
Poaceae exotic 2	Grass 2 (non-native)
Trifolium sp.	A Clover

### **APPENDIX 5 – FAUNA RECORDED WITHIN THE STUDY AREA**



Таха	Scientific Name	Common Name
Amphibia	Limnodynastes tasmaniensis	Spotted Marsh Frog
Amphibia	Crinia signifera	Clicking Froglet
Amphibia	Litoria verreauxii	Whistling Tree Frog
Amphibia	Litoria peronii	Emerald-spotted Tree Frog
Amphibia	Uperoleia laevigata	Smooth Gungan
Aves	Corvus coronoides	Australian Raven
Aves	Alauda arvensis	Eurasian Skylark
Aves	Artamus cyanopterus	Dusky Woodswallow
Aves	Cracticus tibicen	Australian Magpie
Aves	Epthianura albifrons	White-fronted Chat
Aves	Aquila audax	Wedge-tailed Eagle
Aves	Lichenostomus penicillatus	White-plumed Honeyeater
Aves	Grallina cyanoleuca	Magpie-lark
Aves	Hirundo neoxena	Welcome Swallow
Aves	Malurus cyaneus	Superb Fairy-wren
Aves	Fulica atra	Eurasian Coot
Aves	Falco cenchroides	Nankeen Kestrel
Aves	Anthus novaeseelandiae	Australasian Pipit
Aves	Sturnus vulgaris	Common Starling
Aves	Eolophus roseicapillus	Galah
Aves	Vanellus miles	Masked Lapwing
Aves	Acanthiza chrysorrhoa	Yellow-rumped Thornbill
Aves	Cisticola exilis	Golden-headed Cisticola
Aves	Elseyornis melanops	Black-fronted Dotterel
Aves	Himantopus himantopus	Black-winged Stilt
Aves	Porphyrio porphyrio	Purple Swamphen
Aves	Anas superciliosa	Pacific Black Duck
Aves	Recurvirostra novaehollandiae	Red-necked Avocet
Aves	Ocyphaps lophotes	Crested Pigeon
Aves	Coracina novaehollandiae	Black-faced Cuckoo-shrike
Aves	Anthochaera carunculata	Red Wattlebird
Aves	Strepera graculina	Pied Currawong



Таха	Scientific Name	Common Name
Aves	Sericornis frontalis	White-browed Scrubwren
Aves	Passer domesticus	House Sparrow
Aves	Rhipidura leucophrys	Willie Wagtail
Aves	Falco berigora	Brown Falcon
Aves	Psephotus haematonotus	Red-rumped Parrot
Aves	Cincloramphus cruralis	Brown Songlark
Aves	Tadorna tadornoides	Australian Shelduck
Aves	Pelecanus conspicillatus	Australian Pelican
Aves	Phalacrocorax varius	Pied Cormorant
Aves	Biziura lobata	Musk Duck
Aves	Acanthiza nana	Yellow Thornbill
Aves	Carduelis carduelis	European Goldfinch
Mammalia	Vulpes vulpes	Fox
Mammalia	Oryctolagus cuniculus	Rabbit
Mammalia	Lepus capensis	Brown Hare
Mammalia	Vombatus ursinus	Common Wombat
Mammalia	Macropus giganteus	Eastern Grey Kangaroo
Reptilia	Tiliqua scincoides	Common Blue-tongued Skink
Reptilia	Pseudemoia pagenstecheri	Tussock Skink
Reptilia	Hemiergis talbingoensis	Eastern Three-toed Earless Skink



#### **APPENDIX 6 – BAM CACULATOR REPORTS**





Assessment Id		Payment data version	Assessment Revision	Report created	
00017795/BAAS17047/19/000177 96		61	0	17/03/2020	
Assessor Name		Assessor Number	Proposal Name	BAM Case State	US
			Grantham Park Sand Quarry Extension	Open	
		Assessment Type	Date Finalised		
PCT list		Part 4 Developments (General)	To be finalised		
Price calculated	PCT common name				Credits
Yes	<b>896 -</b> Kangaroo Grass - W regions of the South Easter	/allaby Grass - Snow Grass moist tussock grassl ern Highlands Bioregion and NSW South Wester	and in the Monaro and the Southern Tablel n Slopes Bioregion	ands	0
Species list					
Price calculated	Species				Credits

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

Assessment Id

Proposal Name

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IBRA sub region	PCT common name	Threat status	Offset trading group	Risk premiu m	Administ rative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
Monaro	<b>896 -</b> Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion <b>Warning: This</b> <b>PCT has NO trades recorded</b>	No		19.99%	\$20.00	1.0000	\$2,178.86	0	\$0.00
						Subt	otal (excl. G	ST)	\$0.00
							(	GST	\$0.00

Total ecosystem credits (incl. GST) \$0.00

### Species credits for threatened species

Species profile	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species	Final credits price
ID						credits	

#### No species available

Assessment Id

Proposal Name

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Assessment Id

Proposal Name

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Grand total Contact BCT for pricing

Assessment Id

Proposal Name

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Assessment Id

Proposal Name

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**Proposal Details** 

# **BAM Biodiversity Credit Report (Variations)**

#### Assessment Id **Proposal Name** BAM data last updated \* 00017795/BAAS17047/19/00017796 Grantham Park Sand Quarry Extension 27/09/2019 Assessor Name Assessor Number BAM Data version \* 15 Proponent Name(s) **Report Created BAM Case Status** 17/03/2020 Open Assessment Revision Assessment Type Date Finalised Part 4 Developments (General) 0 To be finalised \* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM **Potential Serious and Irreversible Impacts** calculator database. BAM calculator database may not be completely aligned with Bionet.

Nil

Nil

#### Additional Information for Approval

PCTs With Customized Benchmarks No Changes

Assessment Id

Proposal Name

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Grantham Park Sand Quarry Extension

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# **BAM Biodiversity Credit Report (Variations)**

#### Predicted Threatened Species Not On Site

Name
Climacteris picumnus victoriae / Brown Treecreeper (eastern subspecies)
Dasyurus maculatus / Spotted-tailed Quoll
Melanodryas cucullata cucullata / Hooded Robin (south-eastern form)
Chthonicola sagittata / Speckled Warbler

#### Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
896-Kangaroo Grass - Wallaby Grass - Snow Grass moist	Not a TEC	76.4	0.00
tussock grassland in the Monaro and the Southern Tablelands			
regions of the South Eastern Highlands Bioregion and NSW			
South Western Slopes Bioregion			

896-Kangaroo Grass -	Like-for-like credit retirement options				
Wallaby Grass - Snow Grass	Class	Trading group	НВТ	IBRA region	
moist tussock grassland in the				J. J	
Monaro and the Southern					
Tablelands regions of the					
South Eastern Highlands					
<b>Bioregion and NSW South</b>					
Western Slopes Bioregion					

Assessment Id

Proposal Name



# **BAM Biodiversity Credit Report (Variations)**

Temperate Montane Grasslands This includes PCT's: 894, 895, 896, 1110, 1288, 1298	Temperate Montane Grasslands - ≥ 90% cleared group (including Tier 2 or higher).	No	Monaro,Bungonia, Crookwell, Kybeyan- Gourock, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Variation options			
Formation	Trading group	НВТ	IBRA region
Grasslands	Tier 2 or higher	No	IBRA Region: South Eastern Highlands, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary No Species Credit Data

Assessment Id

Proposal Name

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Grantham Park Sand Quarry Extension

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# **BAM Biodiversity Credit Report (Like for like)**

#### **Proposal Details**

Assessment Id	Proposal Name	BAM data last updated *
00017795/BAAS17047/19/00017796	Grantham Park Sand Quarry Extension	27/09/2019
Assessor Name	Assessor Number	BAM Data version *
		15
Proponent Names	Report Created	BAM Case Status
	17/03/2020	Open
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	To be finalised
* Disclaimer: BA	M data last updated may indicate either complete or partial upo	date of the BAM

#### Potential Serious and Irreversible Impacts Nil

\* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

#### Nil

#### Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Assessment Id

Proposal Name

00017795/BAAS17047/19/00017796

Grantham Park Sand Quarry Extension

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# **BAM Biodiversity Credit Report (Like for like)**

#### Predicted Threatened Species Not On Site

Name
Climacteris picumnus victoriae / Brown Treecreeper (eastern subspecies)
Dasyurus maculatus / Spotted-tailed Quoll
Melanodryas cucullata cucullata / Hooded Robin (south-eastern form)
Chthonicola sagittata / Speckled Warbler

#### Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
896-Kangaroo Grass - Wallaby Grass - Snow Grass moist	Not a TEC	76.4	0.00
tussock grassland in the Monaro and the Southern Tablelands			
regions of the South Eastern Highlands Bioregion and NSW			
South Western Slopes Bioregion			

896-Kangaroo Grass -	Like-for-like credit retirement options				
Wallaby Grass - Snow Grass	Class	Trading group	HBT	IBRA region	
moist tussock grassland in the					
Monaro and the Southern					
South Fastern Highlands					
Bioregion and NSW South					
Western Slopes Bioregion					
1					

Assessment Id

Proposal Name

00017795/BAAS17047/19/00017796

Grantham Park Sand Quarry Extension



# **BAM Biodiversity Credit Report (Like for like)**

	Temperate Montane Grasslands This includes PCT's: 894, 895, 896, 1110, 1288, 1298	Temperate Montane Grasslands - ≥ 90% cleared group (including Tier 2 or higher).	No	Monaro, Bungonia, Crookwell, Kybeyan-Gourock, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary No Species Credit Data

Assessment Id

Proposal Name

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# **BAM Vegetation Zones Report**

#### **Proposal Details**

Assessment Id	Assessment name	BAM data last updated *
00017795/BAAS17047/19/00017796	Grantham Park Sand Quarry Extension	27/09/2019
Assessor Name	Report Created	BAM Data version *
	17/03/2020	15
Assessor Number	Assessment Type	BAM Case Status
	Part 4 Developments (General)	Open
* Disclaimer: BAM data last updated may indicate either	Assessment Revision	Date Finalised
BAM calculator database may not be completely aligned	0	To be finalised
with Bionet.		

#### Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	896_Low	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion	Low	76.37	5	

Assessment Id

Proposal Name

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# **BAM Predicted Species Report**

#### **Proposal Details**

Assessment Id	Proposal Name	BAM data last updated *
00017795/BAAS17047/19/00017796	Grantham Park Sand Quarry Extension	27/09/2019
Assessor Name	Report Created	BAM Data version *
	17/03/2020	15
Assessor Number	Assessment Type	BAM Case Status
	Part 4 Developments (General)	Open
	Assessment Revision	Date Finalised
	0	To be finalised
	* Disclaimer: BAM data last updat complete or partial update of the BAM calculator database may not	ed may indicate either BAM calculator database. be completely aligned with

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Bionet.

Common Name	Scientific Name	Vegetation Types(s)
Dusky Woodswallow	Artamus cyanopterus cyanopterus	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion
Flame Robin	Petroica phoenicea	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion
Scarlet Robin	Petroica boodang	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion

Proposal Name

#### Threatened species not within the area of these PCT's

Assessment Id



# **BAM Predicted Species Report**

Common Name	Scientific Name	Vegetation Types(s)
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion
Speckled Warbler	Chthonicola sagittata	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	896-Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion



# **BAM Candidate Species Report**

### **Proposal Details**

Assessment Id	Proposal Name	BAM data last updated *		
00017795/BAAS17047/19/0001779 6	Grantham Park Sand Quarry Extension	27/09/2019		
Assessor Name	Report Created	BAM Data version *		
	17/03/2020	15		
Assessor Number	Assessment Type	BAM Case Status		
	Part 4 Developments (General)	Open		
	Assessment Revision	Date Finalised		
	0	To be finalised		

\* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

### List of Species Requiring Survey

Name	Presence	Survey Months			
<b>Delma impar</b> Striped Legless Lizard	No (surveyed)	Jan Feb Mar Apr May Jun			
		Jul Aug Sep Oct Nov Dec			
<b>Rutidosis leptorrhynchoides</b> Button Wrinklewort	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec			

#### List of Species Not On Site

Name							
Aprasia parapulchella Pink-tailed Legless Lizard							
<i>Euphrasia scabra</i> Rough Eyebright							
Myotis macropus Southern Myotis							
Miniopterus orianae oceanensis Large Bent-winged Bat							
<i>Thesium australe</i> Austral Toadflax							



# **BAM Credit Summary Report**

### **Proposal Details**

Assessment Id	Proposal Name	BAM data last updated *			
00017795/BAAS17047/19/00017796	Grantham Park Sand Quarry Extension	27/09/2019			
Assessor Name	Report Created 17/03/2020	BAM Data version * 15			
Assessor Number	BAM Case Status Open	Date Finalised To be finalised			
Assessment Revision 0	Assessment Type Part 4 Developments (General)				
	* Disclaimer: BAM data last updated may indi- the BAM calculator database. BAM calculator with Bionet.	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.			
Ecosystem credits for plant communities type	s (PCT) ecological communities & threatened sr	acies habitat			

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

Zone	Vegetation zone	Vegetation	Area (ha)	Constant	Species sensitivity to gain class (for	Biodiversity risk	Potential SAII	Ecosystem
	name	integrity loss /			BRW)	weighting		credits
		gain						

Assessment Id

Proposal Name

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# **BAM Credit Summary Report**

Kangaroo Grass - Wallaby Grass - Snow Grass moist tussock grassland in the Monaro and the Southern Tablelands regions of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion							
1 896_Low	0.1	76.4	0.25 High Sensitivity to Potential Gain	2.50		0	
					Subtotal	0	
					Total	0	
					Subtotal Total		

### Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits
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Assessment Id

Proposal Name

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