

# Fauna Inventory Report: Kalkallo Common Grassland Reserve (Conservation Area 24)

Melbourne Strategic Assessment



OFFICIAL

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**Front cover photo**

Dorsal abdominal pattern of male Jumping Spider (Salticidae, *Maratus pavonis*) captured in a pitfall trap (Dave Bryant and Matt Bruce).

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# Contents

<b>Terms and abbreviations</b>	<b>2</b>
<hr/>	
<b>Introduction</b>	<b>3</b>
<hr/>	
The Reserves	3
Purpose and scope	3
Survey Area	4
Previous survey information	4
<b>Methods</b>	<b>6</b>
<hr/>	
Roof tile grids (general)	7
Diurnal and active search surveys (reptiles and amphibians)	7
Area search (Golden Sun Moth)	7
Vacuum sampling and pitfall traps	8
Incidental records	9
<b>Results</b>	<b>10</b>
<hr/>	
Roof tile grids	10
Diurnal and active search surveys (reptiles and amphibians)	11
Area search (Golden Sun Moth)	12
Vacuum sampling and invertebrate pitfall traps	12
Incidental observations	12
<b>Conclusion</b>	<b>14</b>
<hr/>	
Threatened species	14
Introduced species	14
<b>References</b>	<b>15</b>
<hr/>	
<b>Appendix 1: List of taxa recorded on Kalkallo Common Grassland Reserve</b>	<b>16</b>
<hr/>	

## Terms and abbreviations

DEPI	The former Victorian Department of Environment and Primary Industries (now DELWP)
DELWP	The Victorian Department of Environment, Land, Water and Planning
DSE	The former Victorian Department of Sustainability and Environment (now DELWP)
EPBC Act	The Federal Environment Protection and Biodiversity Conservation Act 1999
FFG Act	The Victorian Flora and Fauna Guarantee Act 1988
MNES	Matters of National Environmental Significance, as listed under the EPBC Act
MRF	Monitoring and Reporting Framework
MSA	Melbourne Strategic Assessment
VBA	Victorian Biodiversity Atlas

# Introduction

## The Reserves

The Victorian Government has committed to establish a series of Conservation Areas on the periphery of Melbourne for the conservation of threatened plants, animals and ecological communities (DEPI, 2013). They include a network of small areas within Melbourne's Urban Growth Boundary (NCR, Nature Conservation Reserves), as well as the larger Western Grassland Reserve (WGR, 15,000 ha) and the Grassy Eucalypt Woodland Reserve (approximately 1,200 ha).

The establishment of the reserves is the result of the Melbourne Strategic Assessment, which aims to mitigate environmental losses caused by the expansion of Melbourne's Urban Growth Boundary. This expansion will impact on 'Matters of National Environmental Significance (MNES)' listed under the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A 'Strategic Impact Assessment' conducted by the Victorian Government recommended ways of mitigating environmental impacts. The mitigation measures agreed to by the Victorian and Australian governments are outlined in the 'Program Report' and the 'Biodiversity Conservation Strategy (DSE, 2009; DEPI, 2013). The commitments include regular reporting on ecological outcomes. A Monitoring and Reporting Framework (MRF) provides the logic and basis for monitoring target species and communities (DELWP, 2015a). The MRF gives specific Key Performance Indicators (KPIs) for each listed species and vegetation community.

All Conservation Areas will be managed to achieve these management targets. The precise management strategy required to achieve the targets will, however, vary from place to place. Each area is different, and each supports a wide range of plant and animal species has different vegetation patterns, management issues, and other features. Detailed information about the type and distribution of assets and threats is required for each property that is protected. Much of that information will be contained in Fauna Inventory and Vegetation Inventory documents for each property.

## Purpose and scope

This Fauna Inventory Report forms part of the basic information required to start managing protected land. It should serve as a useful reference for managers, and also the logical basis of management actions. The specific purpose of this document is to:

- Identify any EPBC-listed animal species that are the targets of conservation measures under the MSA
- Provide enough information about the distribution of animals on the land to allow management planning to proceed
- Provide a qualitative baseline describing the fauna when the survey area is brought into the Reserve system.

This document does not:

- constitute a management plan
- describe the vegetation of the survey area (available in DELWP (2016))
- make any claims about the likely presence or absence of values not recorded.

## Survey Area

This report covers Conservation Area 24, Kalkallo Common Grassland Reserve at Kalkallo (Figure 1).

The Kalkallo Common Grassland is a 24.97 ha block of land encompassing Kalkallo Cemetery. The reserve can arbitrarily be divided into northern and southern sections, separated by the cemetery in the middle. The northern section is gilgai plain (an area of small depressions and mounds) with the southern section in a more modified grassland and stony knoll Shrubland. The Hume City Council is the Committee of Management for the majority of the site, with the Kalkallo Cemetery managed by the Donnybrook Cemetery Trust.

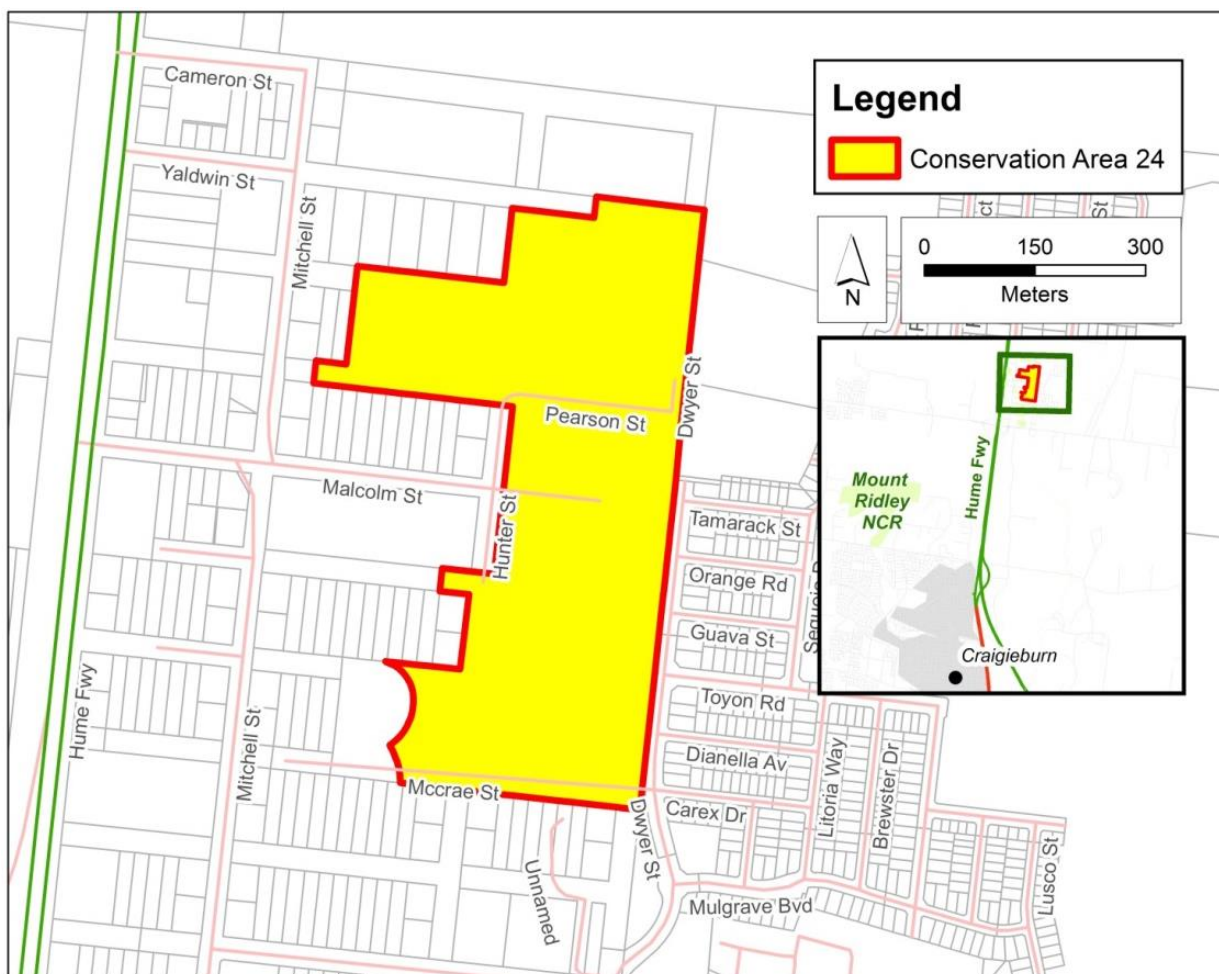


Figure 1. The survey area – Kalkallo Common Grassland.

## Previous survey information

Hume City Council contracted Biosis Pty Ltd to undertake a fauna survey of the Common over 2015-16. This survey used the following methods:

- Diurnal search (targeting birds)
- Roof tile grids (targeting reptiles and amphibians)
- Bat detectors
- Remote cameras (targeting terrestrial mammals)

- Nocturnal survey (targeting amphibians)
- Collection of incidental records.

The results from the Biosis survey are tabulated in Appendix 1. This area has not been the subject of any known formal fauna surveys prior to the 2015-16 Biosis survey.

# Methods

This site was surveyed using a subset of the techniques described in DELWP (2015b). That document describes inventory guidelines for properties under the MSA program and the rationale for choosing particular survey techniques and targeting particular faunal groups on a property. The methods employed by Biosis Pty Ltd in 2015-16 fulfilled the requirements of bat, bird, and mammal surveys. Additional surveys were required to supplement the Biosis surveys using roof tile grids (the Biosis surveys were not at sufficient intensity to meet the guidelines in DELWP (2015b)), diurnal and active search surveys for reptiles and amphibians (to increase survey intensity), area search for Golden Sun Moth (*Synemon plana*) and vacuum and pitfall surveys for spiders (the latter two methods not being used by Biosis). The location of the additional surveys within the reserve are shown in Figure 2. Records from the Biosis surveys are included in Appendix 1.

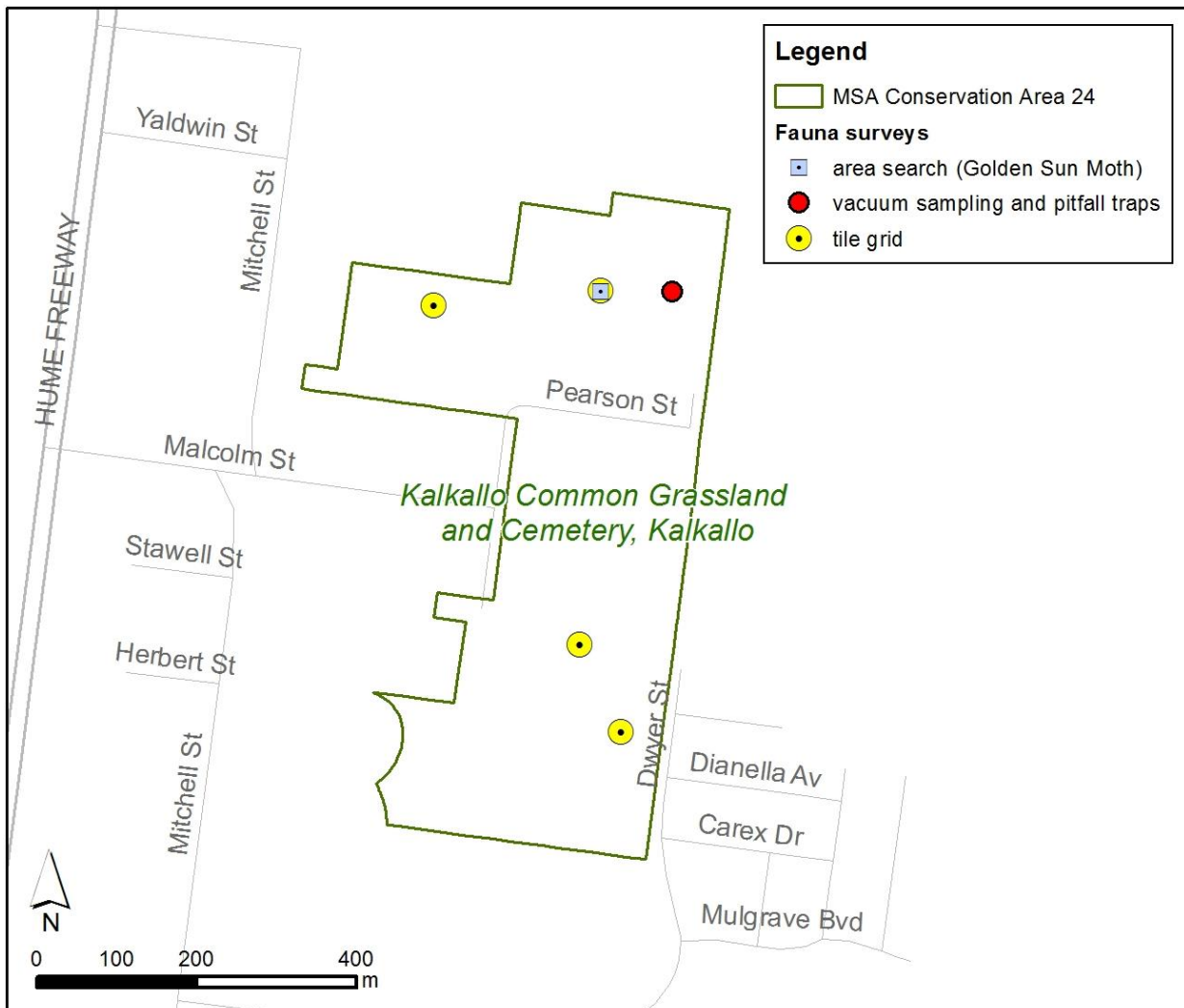


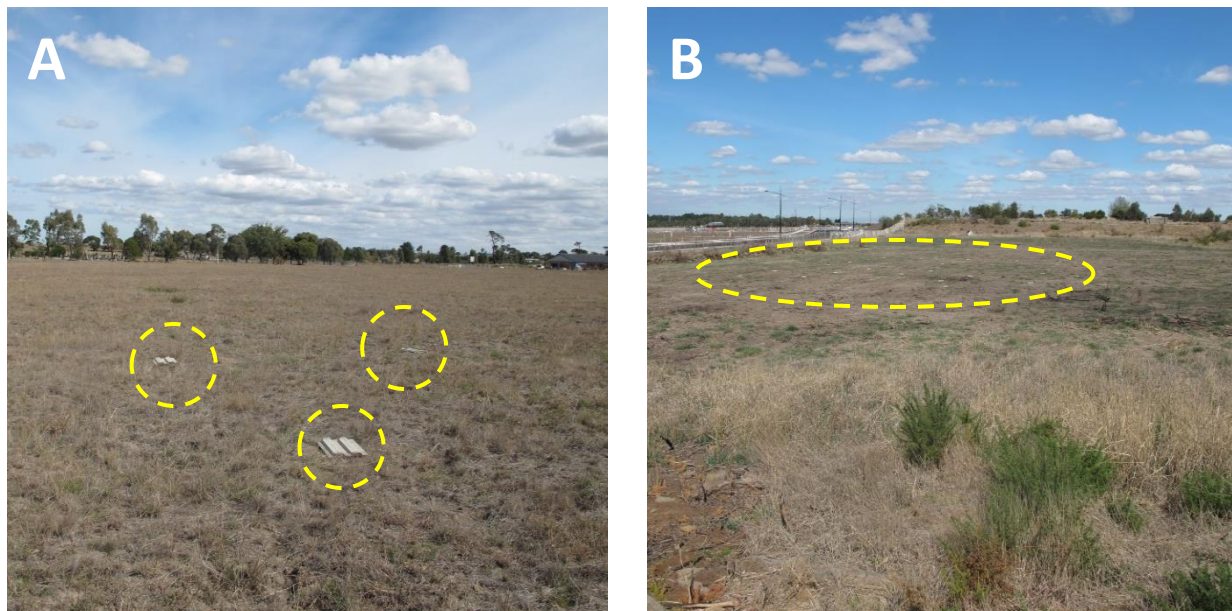
Figure 2. Survey locations on Kalkallo Common Grassland Reserve by survey type.



## Roof tile grids (general)

Biosis Pty Ltd installed two tile transects consisting of 10 tiles each spaced 10 m apart. Due to the difference in tile layout and intensity to that described in DELWP (2015b), an additional four tile grids conforming to the tile grid configuration described in DELWP (2015b) were installed on the 3<sup>rd</sup> September 2015 (Figure 2). Locations were chosen to represent the broad habitat types on the property (e.g. grassland, rocky rises (Figure 3)) and supplement habitat targeted by the Biosis tile transects.

These grids, principally targeting reptiles, were checked six times between 1<sup>st</sup> October 2015 and 1<sup>st</sup> April 2016 (Table 1) and any vertebrates encountered were recorded.



**Figure 3.** Roof tiles installed in A) northern section, and B) southern section of Kalkallo Common Grassland Reserve. Examples of roof tiles are indicated by dashed yellow circles.

**Table 1.** Details of roof tile grids (GDA 94, z55).

Grid No.	Easting	Northing	First survey date	Final survey date	No. of surveys
1	319290	5844499	01/10/15	01/04/2016	6
2	319082	5844476	01/10/15	01/04/2016	6
3	319327	5843948	01/10/15	01/04/2016	6
4	319274	5844056	01/10/15	01/04/2016	6

## Diurnal and active search surveys (reptiles and amphibians)

Diurnal surveys for reptiles and amphibians were conducted on the 26<sup>th</sup> October 2015 and the 8<sup>th</sup> April 2016 by a single observer. The surveys were conducted for three person hours in total.

## Area search (Golden Sun Moth)

A survey for the Golden Sun Moth (*Synemon plana*) was conducted across one search plot (Table 2) according to the protocol described in the MRF (DELWP, 2015a) on 19<sup>th</sup> November 2015.

**Table 2. 2015 Golden Sun Moth plot location (GDA 94, z55).**

Plot	Easting	Northing	Survey date
1	319291	5844498	19/11/2015

## Vacuum sampling and pitfall traps

Terrestrial arachnids were surveyed using pitfall traps and vacuum transects at one of the sites selected for grassland monitoring under the MRF (DELWP, 2015a) (Table 3, Figure 2).

### *Pitfall traps*

Thirty traps were established in two lines of five (traps 4 m apart) and two lines of ten (traps 2 m apart), one metre outside of the plot (Figure 4). Traps comprised two disposable plastic drinking cups (one placed inside the other, 200 ml volume, 65 mm diameter, 90 mm deep). The preservative propylene glycol was added to the cups to a depth of approximately 10 mm. Traps were left in place for four nights, after which the contents of each trap were collected and placed in a separate vial.

### *Vacuum sampling*

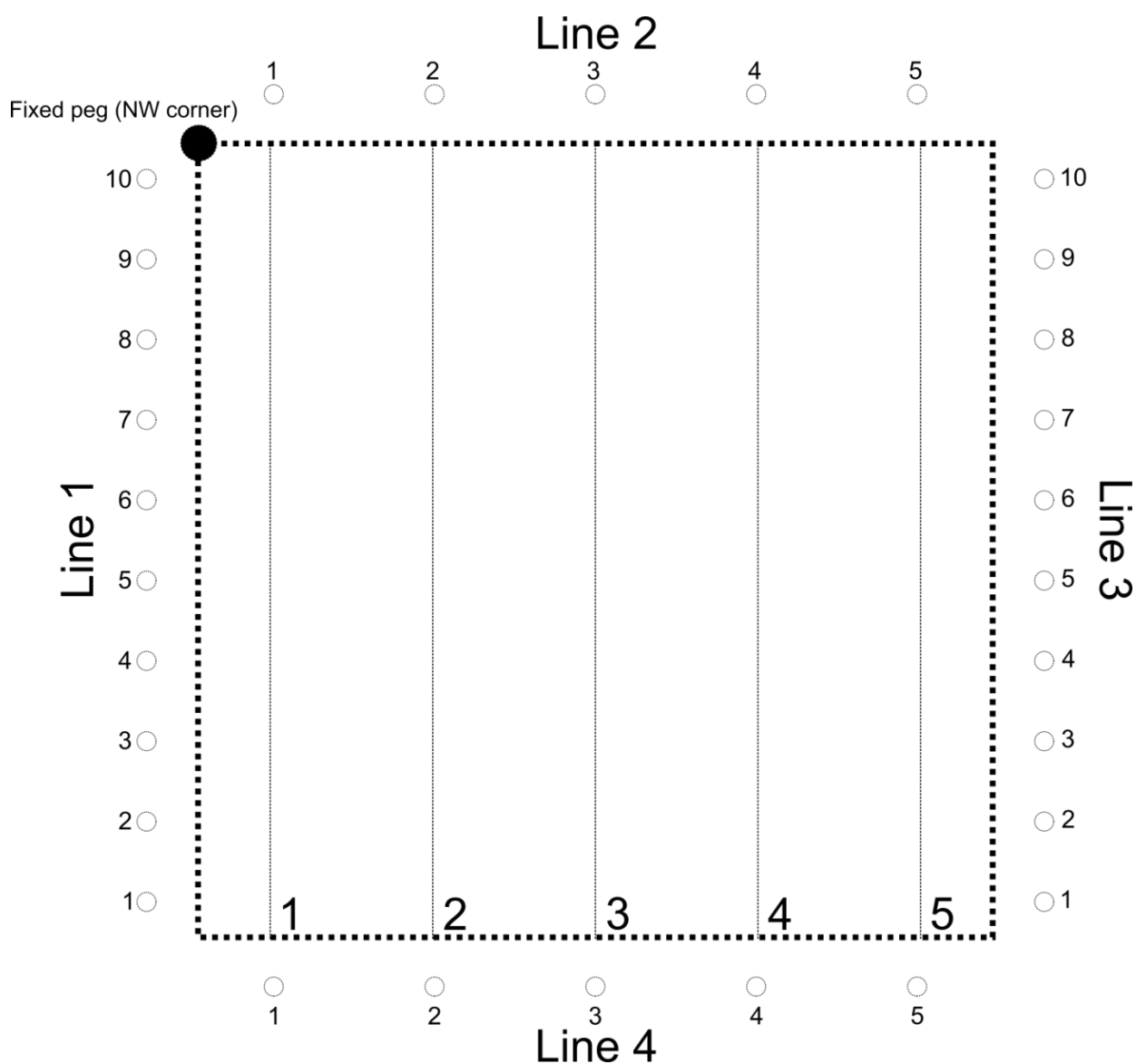
Five 20 m transects were established within the plot, running north-south, 4 m apart and 2 m from the edge of the plot (Figure 4). Specimens were collected using a hand-held vacuum sampler (Doxon et al., 2011), the opening covered by a mesh bag that retained the sample. Each transect was walked at a slow pace and samples were taken to ~50 cm either side of the transect. Samples from each transect were placed in a separate bag.

### *Sample identification*

Arachnid samples were sorted from other material and preserved in vials containing 70% ethanol. Any vertebrates captured were also recorded and retained. For this report spiders were identified to family according to the taxonomy in Davies (1996) and Raven et al. (2002). Common names of spider families follow Framenau et al. (2014).

**Table 3. Details of Arachnid sampling sites (GDA 94, z55).** Site numbers correspond to vegetation monitoring plots on this property. The state is: HG – herb-rich grassland (DELWP, 2016).

Site	State of Natural Temperate Grassland	Easting	Northing	Pitfall start	Pitfall end	Vacuum
89	HG	319380	5844499	27/11/2015	1/12/2015	27/11/2015



**Figure 4. Arrangement of arachnid pitfall traps and vacuum sampling transects.** Lines (1 to 4) indicate lines of pitfall traps (open circles), the solid lines (1 to 5) are the vacuum transects and the dashed lines are the 20 m x 20 m perimeter of the vegetation monitoring plot.

### Incidental records

Incidental records of vertebrates not previously recorded as part of this study were collected from Kalkallo Common Grassland Reserve during the visits to the site for formal surveys, usually while staff were in transit or outside of the times dedicated to standardised surveys.

# Results

## Roof tile grids

Four vertebrate species were recorded during the roof tile grid survey; two skinks from the Family Scincidae and two snakes from the Family Elapidae (Table 4, Figure 5).

**Table 4. Vertebrate records from roof tile grid surveys of Kalkallo Common Grassland Reserve between 1st October 2015 and 1st April 2016.**

Common name	Scientific name	Number of records
Lowlands Copperhead	<i>Austrelaps superbis</i>	7
Bougainville's Skink	<i>Lerista bougainvillii</i>	9
Little Whip Snake	<i>Parasuta flagellum</i>	3
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	142



Figure 5. (A) Lowland Copperhead (*Austrelaps superbus*), (B) Little Whip Snake (*Parasuta flagellum*), (C) Bougainville's Skink (*Lerista bougainvillii*) and (D) Tussock Skink (*Pseudemoia pagenstecheri*) recorded under roof tiles on Kalkallo Common Grassland Reserve

### Diurnal and active search surveys (reptiles and amphibians)

Four person hours were spent searching the Kalkallo Common Grassland Reserve resulting in three skink species being recorded (Table 5), including one species (Eastern Striped Skink, *Ctenotus robustus*) that had not been recorded under the roof tiles.

Table 5. Reptiles detected during diurnal and active search surveys on the 26<sup>th</sup> October 2015 and the 8<sup>th</sup> April 2016 on Kalkallo Common Grassland Reserve.

Common name	Scientific name	No. of records
Large Striped Skink	<i>Ctenotus robustus</i>	3
Bougainville's Skink	<i>Lerista bougainvillii</i>	1
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	5

## Area search (Golden Sun Moth)

No Golden Sun Moths were detected during the survey. Sixty three minutes were spent searching for Golden Sun Moth over the entire 8 hectare plot.

## Vacuum sampling and invertebrate pitfall traps

Spider surveys yielded 106 specimens from 12 families (Table 6). Thirteen (12%) specimens could not be identified to family level. Unidentified spiders were mostly juveniles with features that were not developed enough for identification. This was particularly the case for the vacuum sample from which over 40% of specimens could not be identified. Two families, Lycosidae (Wolf Spiders) and Zodariidae (Ant Spiders), were common recorded and collected from all pitfall traplines at the sampling site. Three families, Amaurobiidae (Hackled-mesh Weavers), Oonopidae (Goblin Spiders) and Theridiidae (Comb-footed Spiders) were represented by single specimens.

**Table 6. Spider families recorded from pitfall and vacuum sampling Kalkallo Common between 27<sup>th</sup> November and 1<sup>st</sup> December 2015.**

Common name	Family	Pitfall	Vacuum	Total
Hackled-mesh Weavers	Amaurobiidae	1		1
Orb-weaving Spiders	Araneidae		4	4
Mesh-web Spiders	Dictynidae	3	1	4
Ground Spiders	Gnaphosidae	11		11
Sheet-web Spiders	Linyphidae		3	3
Wolf Spiders	Lycosidae	23	1	24
Prowling Spiders	Miturgidae	12		12
Goblin Spiders	Oonopidae	1		1
Jumping Spiders	Salticidae	9		9
Comb-footed Spiders	Theridiidae		1	1
Crab Spiders	Thomisidae	2	1	3
Ant Spiders	Zodariidae	20		20
Unidentified		5	8	13
<b>Total</b>		<b>87</b>	<b>19</b>	<b>106</b>

## Incidental observations

Six vertebrate species were recorded incidentally during fauna surveys of Kalkallo Common Grassland Reserve. Four of the six are generally widespread native species; two are widespread introduced species (Table 7).

**Table 7. Additional species recorded incidentally from Kalkallo Common Grassland Reserve during visits October 2015 to April 2016. (\*) indicates introduced taxon.**

Common name	Scientific name
<i>Mammals</i>	
Brown Hare*	<i>Lepus europaeus</i>
Eastern Grey Kangaroo	<i>Macropus giganteus</i>
European Rabbit*	<i>Oryctolagus cuniculus</i>
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>
<i>Reptiles</i>	
Tiger Snake	<i>Notechis scutatus</i>
Common Blue-tongued Lizard	<i>Tiliqua scincoides</i>

## Conclusion

A total of 58 terrestrial vertebrate species were recorded from both this and the Biosis Pty Ltd 2015-2016 survey of the Kalkallo Common Grassland Reserve. This was comprised of seven mammal species, 40 bird species, seven reptile species and four amphibian species. A list of species recorded from both studies is provided in Appendix 1. The bat detector unit deployed by Biosis Pty Ltd on the Kalkallo Common Grassland Reserve failed to record any bat calls, due to a fault in the unit, resulting in no records of bat species for this property.

Twelve spider families were recorded. These families are principally hunting spiders (Gnaphosidae, Lycosidae, Miturgidae and Salticidae). The ant and termite specialist spider family Zodariidea was also prevalent in samples. The results from pitfall and vacuum sampling suggest that there is considerable diversity in the arachnid fauna on Kalkallo Grassland with representatives from 15% of the spider families known from Australia (Framenau et al. 2014).

### Threatened species

The Spotted Harrier (*Circus assimilis*) is listed as 'Near Threatened' in the 'Advisory List of Threatened Vertebrate Fauna in Victoria' (DSE, 2013). While found across mainland Australia and Indonesia, it is sparsely distributed in open wooded country in tropical and temperate Australia, being more prevalent in arid and semi-arid areas (Olsen et al. 1993).

The Tussock Skink (*Pseudemoia pagenstecheri*) is listed as 'Vulnerable' in the 'Advisory List of Threatened Vertebrate Fauna in Victoria' (DSE, 2013). The Tussock Skink is a medium sized ground dwelling skink, occurring in grassland and grassy woodland, through the basalt plains of Victoria, usually associated with grasses (Museum Victoria website). Within the Kalkallo Common Grassland Reserve, particularly in the northern section, it was found to be abundant.

While not recorded in the work reported here, there are recent records in the Victorian Biodiversity Atlas (VBA) of Golden Sun Moth close to the reserve. The closest and most recent record is less than 100 meters from the southwestern edge of the reserve, recorded in 2009. There are also multiple records between 1 and 2 kilometers northwest of the reserve from 2008.

No recent records of Striped Legless Lizard (*Delma impar*) have been reported in the vicinity of the Kalkallo Common Grassland Reserve but there are historical records south of the reserve from 1991 and 1998, 2.5 kilometers and 8.5 kilometers respectively.

### Introduced species

Four introduced mammal species and 8 introduced bird species were recorded.



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# Appendix 1: List of taxa recorded on Kalkallo Common Grassland Reserve

The list below presents all species of terrestrial vertebrates, ordered alphabetically by genus then species within each vertebrate Class, recorded from the Kalkallo Common Grassland Reserve during this and the Biosis Pty Ltd surveys. Introduced species are indicated with an asterisk (\*). Records from this study are indicated in black (✓), Biosis Pty Ltd records in red (✓).

The conservation status of any threatened species encountered is identified in the table below. Conservation status in lower case refers to species listed on the Advisory List of Threatened Vertebrate Fauna in Victoria (DSE, 2013)

Common name	Scientific name	Roof tile grids	Remote cameras	Diurnal and Active search surveys (reptiles and amphibians)	Diurnal survey (birds)	Bat detectors	Area search (GSM)	Spider surveys – pitfall and/or vacuum	Additional spp. from Incidental Records	Nocturnal survey	Conservation status
<b>Mammals</b>											
Cat*	<i>Felis catus</i>									✓	
Brown Hare*	<i>Lepus europaeus</i>								✓		
Eastern Grey Kangaroo	<i>Macropus giganteus</i>		✓						✓	✓	
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>								✓		
European Rabbit*	<i>Oryctolagus cuniculus</i>		✓						✓	✓	
Red Fox*	<i>Vulpes vulpes</i>								✓		
Black Wallaby	<i>Wallabia bicolor</i>		✓								
<b>Birds</b>											
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>				✓						
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>				✓						
Yellow Thornbill	<i>Acanthiza nana</i>				✓						
European Skylark*	<i>Alauda arvensis</i>				✓						
Red Wattlebird	<i>Anthochaera carunculata</i>				✓						
Australasian Pipit	<i>Anthus novaeseelandiae</i>				✓						
Long-billed Corella	<i>Cacatua tenuirostris</i>				✓						
European Goldfinch*	<i>Carduelis carduelis</i>				✓						
European Greenfinch*	<i>Carduelis chloris</i>				✓						
Horsfield's Bronze-Cuckoo	<i>Chalcites basalis</i>				✓						
Shining Bronze-Cuckoo	<i>Chalcites lucidus</i>				✓						
Spotted Harrier	<i>Circus assimilis</i>				✓						nt

Common name	Scientific name	Roof tile grids	Remote cameras	Diurnal and Active search surveys (reptiles and amphibians)	Diurnal survey (birds)	Bat detectors	Area search (GSM)	Spider surveys – pitfall and/or vacuum	Additional spp. from Incidental Records	Nocturnal survey	Conservation status
Golden-headed Cisticola	<i>Cisticola exilis</i>				✓						
Black-faced Cuckoo-Shrike	<i>Coracina novaehollandiae</i>				✓						
Australian Raven	<i>Corvus coronoides</i>				✓						
Little Raven	<i>Corvus mellori</i>				✓						
Brown Quail	<i>Coturnix ypsilophora</i>				✓						
Australian Magpie	<i>Cracticus tibicen</i>				✓						
Grey Butcherbird	<i>Cracticus torquatus</i>				✓						
White-faced Heron	<i>Egretta novaehollandiae</i>				✓						
Black-shouldered Kite	<i>Elanus axillaris</i>				✓						
Galah	<i>Eolophus roseicapillus</i>				✓						
Brown Falcon	<i>Falco berigora</i>				✓						
Nankeen Kestrel	<i>Falco cenchroides</i>				✓						
Magpie-lark	<i>Grallina cyanoleuca</i>				✓						
Welcome Swallow	<i>Hirundo neoxena</i>				✓						
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>				✓						
Superb Fairy-wren	<i>Malurus cyaneus</i>		✓		✓						
Crested Pigeon	<i>Ocyphaps lophotes</i>				✓						
House Sparrow*	<i>Passer domesticus</i>				✓						
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>				✓						
Eastern Rosella	<i>Platycercus eximius</i>				✓						
Red-rumped Parrot	<i>Psephotus haematonotus</i>				✓						
Grey Fantail	<i>Rhipidura albiscapa</i>				✓						
Spotted Turtle-Dove*	<i>Streptopelia chinensis</i>				✓						
Common Myna*	<i>Sturnus tristis</i>				✓						
Common Starling*	<i>Sturnus vulgaris</i>				✓						
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>				✓						
Common Blackbird*	<i>Turdus merula</i>				✓						
Masked Lapwing	<i>Vanellus miles</i>				✓						

Common name	Scientific name	Roof tile grids	Remote cameras	Diurnal and active search surveys (reptiles and amphibians)	Diurnal survey (birds)	Bat detectors	Area search - GSM	Spider surveys – pitfall and/or vacuum	Additional spp. from Incidental Records	Nocturnal survey	Conservation status
<b>Reptiles</b>											
Lowlands Copperhead	<i>Austrelaps superbus</i>	✓		✓							
Large Striped Skink	<i>Ctenotus robustus</i>			✓							
Bougainville's Skink	<i>Lerista bougainvillii</i>	✓ ✓		✓ ✓							
Tiger Snake	<i>Notechis scutatus</i>								✓		
Little Whip Snake	<i>Parasuta flagellum</i>	✓		✓							
Tussock Skink	<i>Pseudemoia pagenstecheri</i>	✓ ✓		✓ ✓							v
Common Blue-tongued Lizard	<i>Tiliqua scincoides</i>		✓	✓					✓		
<b>Amphibians</b>											
Common Froglet	<i>Crinia signifera</i>								✓		
Pobblebonk Frog	<i>Limnodynastes dumerilii dumerilii</i>									✓	
Spotted Marsh Frog	<i>Limnodynastes tasmaniensi</i>									✓	
Peron's Tree Frog	<i>Litoria peronii</i>			✓							
<b>Spiders</b>											
<b>Family</b>											
Hackled-mesh Weavers	Amaurobiidae							✓			
Orb-weaving Spiders	Araneidae							✓			
Mesh-web Spiders	Dictynidae							✓			
Ground Spiders	Gnaphosidae							✓			
Sheet-web Spiders	Linyphidae							✓			
Wolf Spiders	Lycosidae							✓			
Prowling Spiders	Miturgidae							✓			
Goblin Spiders	Oonopidae							✓			
Jumping Spiders	Salticidae							✓			
Comb-footed Spiders	Theridiidae							✓			
Crab Spiders	Thomisidae							✓			
Ant Spiders	Zodariidae							✓			

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