A survey of vertebrate fauna of Kurri Kurri Co-Op Wildlife Sanctuary, Naringal, south-western Victoria, May 2024.

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1. Summary

A survey of vertebrate fauna of Kurri Kurri Co-op Wildlife Sanctuary, Naringal in western Victoria was conducted in late May 2024. Several non-intrusive survey methods were used; no live-trapping took place. Thirty-three species of vertebrate fauna were recorded comprising 14 mammals, 15 birds, one reptile and three amphibians. One threatened species, Long-nosed Potoroo, was recorded. This species was also recorded as breeding. Agile Antechinus and Bush Rat were recorded in significant numbers. Ten species were recorded in the sanctuary for the first time, comprising Swamp Rat, Gould's Wattled Bat, Chocolate Wattled Bat, Large Forest Bat, Little Forest Bat, White-striped Freetail Bat, Forest Raven, McCoy's Skink, Southern Brown Tree Frog and Spotted Marsh Frog. Small numbers of Black Wallaby and Eastern Grey Kangaroo were recorded. One Red Fox was recorded in open habitat. No records of Long-nosed Bandicoot or Krefft's Glider were obtained. None of the distinctive conical feed holes usually produced by Long-nosed Bandicoots were seen in any part of the sanctuary. Common Froglet and Southern Brown Tree Frog were heard calling. Overall results of the survey add significantly to the biodiversity value of Kurri Kurri Co-Op Wildlife Sanctuary within an extensively cleared landscape.

2. Acknowledgements

The survey was conducted under the terms of research authorisation no. 10010085 issued by Department of Environment, Land, Water and Planning and approval no. 11/21 of the Wildlife and Small Institutions Animal Ethics Committee of the Department of Jobs, Precincts and Regions. Field assistance was provided by Maryrose Morgan, Colin Magilton, Kristy Roche, Paul Hartrick, Kevin Sparrow and Adam Merrick. Bat detector data was analysed by Rob Gration of EcoAriel Pty Ltd, Altona. John Sherwood provided much appreciated advice and guidance. Paul Hartrick and Peter Bolte provided useful information on past fauna records.

3. Background

The Kurri Kurri Co-Op Wildlife Sanctuary is a 32 ha privately owned conservation reserve located in Couch's Road, Naringal approximately 20kms east of Warrnambool in south-west Victoria (38°25.26S, 142°46.51E) (Fig. 1.). The property, which was previously part of a farming enterprise, became available for purchase in the mid-1980s. Following the formation of the Kurri Kurri Co-Operative Society Ltd a major public fund-raising exercise was launched and the bush block was purchased in September 1985. The sanctuary was formally covenanted with the Trust for Nature in May 1996. The sanctuary is managed by a committee of members of the society and a draft management plan has been completed (Kurri Kurri Management Plan, May 2019).

The property is an isolated bush block within an extensively cleared landscape, although the far south-west corner adjoins a much larger remnant area of Lowland Forest. The vegetation on the reserve is Lowland Forest (EVC 16) and is made up mostly of Messmate *Eucalyptus obliqua*, Swamp Gum *Eucalyptus ovata* and Manna Gum *Eucalyptus viminalis*. There are large expanses of very dense, sedge ground cover; however, understory and shrub cover are sparse. Several areas of ephemeral freshwater wetlands exist.

Numerous studies of vertebrate fauna, especially terrestrial mammals and insectivorous bats, have been conducted in the Naringal district since the early 1970s (Seebeck 1978; Bennett 1990, 1992, 1993; Holland and Bennett 2007; Holland and Bennett 2009; Homan 2019; Seebeck unpubl.data; Temby unpubl.data; Trust for Nature unpubl.data). Bennett (1990) included the Kurri Kurri block in his extensive mammal survey and recorded several species including Long-nosed Potoroo. Surveys by Holland and Bennett (2007, 2010) also included Kurri Kurri; however, detailed results for the block are unavailable. Other fauna surveys have been conducted in the sanctuary, however, very few details of methods used or results obtained are available. SW TAFE conducted a mammal survey with students in 2001; however, no report of this study is available at the time of writing. Other surveys of vertebrate fauna appear to have taken place (Kurri Kurri Management Plan, May 2019), however, no reports of these studies are available at the time of writing.

Since 2010 unbaited surveillance cameras have been used in the sanctuary resulting in several confirmed records of vertebrate fauna including Short-beaked Echidna *Tachyglossus aculeatus* (24/1/2020), Koala *Phascolarctos cinereus* (25/1/2020), Laughing Kookaburra *Dacelo novaeguineae* (1/4/2020) Crimson Rosella *Platycercus elegans* & Eastern Rosella *Platycercus eximius* (13/4/2020), Long-nosed Potoroo *Potorous tridactylus* (17/9/2021) and Long-nosed Bandicoot *Perameles nasuta* (11/8/2022) (Kurri Kurri Facebook page, viewed 16/6/2024). Krefft's Glider, (previously known in Victoria as Sugar Glider), and Agile Antechinus (previously known in Victoria as Brown Antechinus) have been recorded as using nest boxes in the sanctuary on several occasions (P. Bolte, P. Hartrick unpubl.data). Members of the Co-Op have photographed some reptiles in the sanctuary including Common Blue-tongued Lizard *Tiliqua scincoides* (P. Hartrick, 14/10/2017) and Tiger Snake *Notechis scutatus* (K. Davis 3/4/2016) (Kurri Kurri Facebook page, viewed 16/6/2024). Lowland Copperhead *Austrelaps superbus* has also been seen in the sanctuary (P. Hartrick, pers. comm. 30/5/2024). An extensive bird list has been compiled for many years (P. Bolte unpubl.data).

Other records of fauna are documented in the Draft Management Plan, including White-lipped Snake *Drysdalia coronoides* (P. Hartrick, 2017), Pobblebonk Frog *Limnodynastes dumerilii* (J. Sherwood, 1998), Southern Smooth Froglet *Geocrinia laevis* (C. Draper 2006, 2007), Striped Marsh Frog *Limnodynastes peronii* (L. Prentice, 2017), Eastern Sign-bearing Frog (also called Plains Froglet) *Crinia parinsignifera* (P. Hartrick, 2017) and Common Froglet *Crinia signifera* (L. Prentice 2017, 2019).

4. Introduction

A survey of vertebrate fauna was conducted on Kurri Kurri Co-Op Wildlife Sanctuary, Naringal from 18/5/2024 to 26/5/2024. A preliminary visit occurred on 1/1/2024.

The purpose of the survey was to determine which species of vertebrate fauna currently inhabit the reserve, especially nocturnal mammals including Long-nosed Potoroo.

The survey was conducted by Peter Homan Fauna Consultancy.

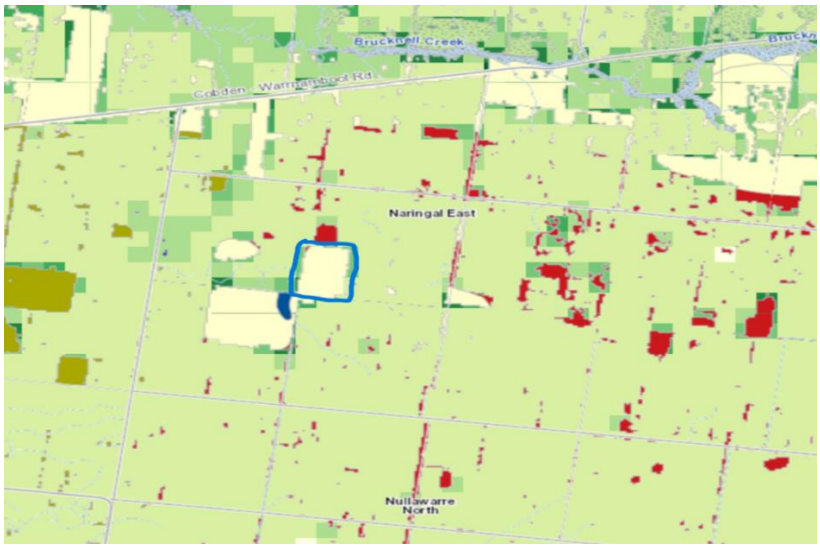

Fig. 1. Location of Kurri Kurri Co-Op Wildlife Sanctuary shown in blue outline.

5. Methods

Several methods were used to determine the presence of vertebrate fauna.
These included baited remote surveillance cameras (Faunatech Snaps, Faunatech, Rydalmere, NSW), bat detector (Anabat Express, Titley Scientific, Brendale, Qld), Song Meter (Song Meter Macro 2, Wildlife Acoustics Australia, Rydalmere, NSW), spotlighting on foot (Klarus FH10 Hunting torches), active herpetofauna searching (log rolling), bird count and general observation.

All surveillance cameras were set along the north-south walking track that runs through the sanctuary. Four cameras with bait were set in trees, two at the far-northern end of the track and two in the central area of the reserve. An additional ten cameras were set on the ground at various intervals along both sides of the track. All cameras were set to take two still images every five seconds between 1700hrs and 0800hrs for seven nights between 18/5/2024 and 25/5/2024. Baits consisted of a mixture of smooth peanut butter, quick oats and golden syrup.

One bat detector was set for seven nights near the eastern side of the reserve.
One Song Meter was set for one night in the northern section on 25/5/2024.
Spotlighting on foot took place on the night of 25/5/2024 by two investigators (PH & AM).

Overall, 106 trap-nights were completed. These comprised 98 camera-nights, seven bat detector-nights and one Song Meter-night. Three spotlight hours were completed.

6. Results

6.1 Mammals.

Thirty-three species of vertebrate fauna were recorded. These included 14 mammals of which six were marsupial and eight were eutherian. Thirteen species were native and one was introduced (Table 1.).

- Agile Antechinus was recorded on all surveillance cameras (Fig. 2). One was also seen at dawn on 26/5/2024 entering a nesting cavity in the shelter shed.
- One Koala was heard calling in the eastern part of the reserve during spotlighting on 25/5/2024.
- Numerous Common Ringtail Possums were seen during spotlighting.
- Two Long-nosed Potoroos, one adult and one sub-adult, were recorded by surveillance cameras (Fig. 3).
- Several Eastern Grey Kangaroos were seen.
- Two Black Wallabies were recorded by surveillance cameras and three were seen on the southern edge of the property.
- Chocolate Wattled Bat, Gould's Wattled Bat, Large Forest Bat, Little Forest Bat and White-striped Freetail Bat were recorded by bat detector.
- Many Bush Rats were recorded by surveillance cameras (Fig. 4).
- Five Swamp Rats were recorded by surveillance cameras (Fig. 5). Burrows, typical of those made by this species, were found on the eastern edge of the property.
- One Red Fox was recorded by a surveillance camera set in open vegetation at the southern end of the walking track.

Fig. 2. Agile Antechinus

Fig. 3. Long-nosed Potoroo

6.2 Birds.

Thirteen species of birds were recorded. All species were native (Table 2.).

- One raptor, Wedge-tailed Eagle, was recorded.
- One Forest Raven was recorded by Song Meter during the dawn chorus on 26/5/2024.
- Significant numbers of Superb Fairy-wren and Grey Fantail were recorded.
- The migratory Rufous Whistler was recorded during the preliminary visit.
- Other notable woodland species included Golden Whistler, White-throated Treecreeper, Eastern Yellow Robin, Spotted Pardalote, Grey Shrike-thrush and Brown Thornbill.

6.3 Reptiles & Amphibians.

One species of reptile, a skink, was recorded. Three species of amphibians, comprising one tree frog and two southern frogs, were recorded.

- One McCoy's Skink was found under a log near the eastern boundary (Fig. 6 & 7).
- Several Southern Brown Tree Frogs were heard calling at dusk on 25/5/2024.
- Several Common Froglets were heard calling at dusk on 25/5/2024.
- One Spotted Marsh Frog was found under a wooden seat during the preliminary visit (Fig. 8).

Fig. 4. Bush Rat

Fig. 5. Swamp Rat

Table 1. List of mammals and number recorded.
T indicates threatened species; **B** indicates breeding confirmed; E = estimated number.
Taxonomy and nomenclature follow Menkhorst and Knight 2011.

Common Name	Scientific Name	Number
Agile Antechinus	*Antechinus agilis*	26E
Koala	*Phascolarctos cinereus*	1
Common Ringtail Possum	*Pseudocheirus peregrinus*	10
Long-nosed Potoroo	*Potorous tridactylus,* **T, B**	2
Eastern Grey Kangaroo	*Macropus giganteus*	5
Black Wallaby	*Wallabia bicolor*	5
White-striped Freetail Bat	*Austronomous australis*	1
Gould's Wattled Bat	*Chalinolobus gouldii*	1
Chocolate Wattled Bat	*Chalinolobus morio*	1
Large Forest Bat	*Vespadelus darlingtoni*	1
Little Forest Bat	*Vespadelus vulturnus*	1
Swamp Rat	*Rattus lutreolus*	6E
Bush Rat	*Rattus fuscipes*	15E
Red Fox	*Vulpes vulpes*	1

Table 2. List of birds and number recorded.
E = estimated number.
Taxonomy and nomenclature follow Menkhorst et al 2017.

Common Name	Scientific Name	Number
Wedge-tailed Eagle	*Aquila audax*	1
Laughing Kookaburra	*Dacelo novaeguineae*	2
White-browed Scrubwren	*Sericornis frontalis*	6E
Brown Thornbill	*Acanthiza pusilla*	4
Spotted Pardalote	*Pardalotus punctatus*	3
Superb Fairy-wren	*Malurus cyaneus*	12E
White-throated Treecreeper	*Cormobates leucophaea*	5
Grey Butcherbird	*Cracticus torquatus*	2
Australian Magpie	*Cracticus tibicen*	6E
Forest Raven	*Corvus tasmanicus*	1
Grey Fantail	*Rhipidura albiscapa*	8E
Eastern Yellow Robin	*Eopsaltria australis*	6
Rufous Whistler	*Pachycephala rufiventris*	1
Golden Whistler	*Pachycephala pectoralis*	1
Grey Shrike-thrush	*Colluricincla harmonica*	2

Table 3. List of reptiles and amphibians and number recorded.
Taxonomy and nomenclature for reptiles follow Robertson and Coventry 2019 and for amphibians follow Clemann and Swan 2023.

Common Name	**Scientific Name**	**Number**
McCoy's Skink	*Anepischetosia maccoyi*	1
Southern Brown Tree Frog	*Litoria ewingi*	3
Common Froglet	*Crinia signifera*	2
Spotted Marsh Frog	*Limnodynastes tasmaniensis*	1

Fig. 6. McCoy's Skink dorsal view

Fig. 7. McCoy's Skink ventral view.

Fig. 8. Spotted Marsh Frog

7. Discussion

The Long-nosed Potoroo is a small member for the Potoroidae family weighing up to 1600 g (Menkhorst and Knight 2011). The species usually inhabits areas with a dense ground cover such as that found in wet gullies, Heathy Woodland and Lowland Forest. Long-nosed Potoroos dig distinctive feed holes in top soil and create small runway-tunnels through dense ground and shrub cover (Menkhorst 1995). The Long-nosed Potoroo has been found in numerous locations in south-west Victoria (Menkhorst 1995); however, many populations are isolated in relatively small areas of suitable habitat and therefore the species is categorised as vulnerable under the Victorian *Flora and Fauna Guarantee Act 1988* (DEECA 2024).

Long-nosed Potoroos are still common in forested area throughout the Otway Ranges especially in dense gullies (Homan 2023). The species was previously common in forested areas and road-side verges throughout the Naringal district on the Otway Plain east of Warrnambool (Bennett 1990, 1993). One of the strongholds for the species was Ralph Illidge Sanctuary at Naringal East (Menkhorst 1995); however, an intensive study at that sanctuary in 2019 failed to record the species (Homan 2019).

The recording of two individual Long-nosed Potoroos during the current survey are the first available, confirmed records of this threatened species since September 2021 and confirms an on-going presence at the sanctuary. One of these individuals was a sub-adult, confirming breeding for the species. This breeding record of a threatened species is especially noteworthy.

The Agile Antechinus is probably the most common small terrestrial marsupial in Victoria (Menkhorst 1995). The species inhabits all types of natural areas including wet and dry forests, woodlands and heathlands providing some natural hollows exist. In areas with few hollows, Agile Antechinus will readily use artificial nest-boxes. Indeed, the species has been recorded as using nest boxes at the sanctuary (P. Bolte, 6/4/2019). At the nearby Ralph Illidge Sanctuary, large numbers of Agile Antechinus were captured during live-trapping and many were recorded by surveillance camera during a fauna survey in November 2019 (Homan 2019). Bennett (1990) captured significant numbers of this species during live-trapping at Kurri Kurri. During the current study Agile Antechinus was recorded in significant numbers by all cameras including those set in trees and on the ground.

The Bush Rat is probably the most common terrestrial native eutherian mammal in southern Victoria (Menkhorst 1995). The species is especially common in lowland and wet forests with significant areas of dense, sedgy vegetation. Bush Rats also require relatively soft soils where burrows can be constructed. Fortunately, this habitat structure covers very large areas of the sanctuary providing ideal habitat for the Bush Rat. During the current study, all cameras set on the ground recorded this species. Bennett (1990) captured large numbers of Bush Rats at Kurri Kurri during his extensive study.

Whilst the Bush Rat is only able to persist in natural areas, the Swamp Rat is more adaptable and is commonly found in weed-infested areas along roadside verges and ungrazed areas along creek-lines on farms, especially in the western district. In natural areas, Swamp Rats are most abundant in coastal heathland. Swamp Rats construct distinctive “towns” with obvious runways through dense grasses or sedges and mounds of soil above burrows. At Kurri Kurri a typical Swamp Rat “town” was found on the eastern edge of the sanctuary. During the current survey Swamp Rats were recorded on five cameras set on the ground. However, Bennett (1990) did not record Swamp Rats at Kurri Kurri. Therefore, these current records are the first available, confirmed records of this common native rodent at Kurri Kurri Wildlife Sanctuary.

The insectivorous bats are the only group of native mammals in south-eastern Australia that have not suffered any extinctions since European settlement. Seven species of microbats are common and widespread throughout Victoria and inhabit all environments including cities, towns, farms and natural areas (Churchill 2008). Several surveys of insectivorous bats have been conducted in the Naringal district, especially in the Ralph Illidge Sanctuary (Bennett 1992; Homan 2019, Bennett unpubl.data; Temby unpubl.data). During the SW TAFE survey at Kurri Kurri in 2001, harp traps were used to survey bats (P. Hartrick pers. comm. 25/5/2024); however, no results are available at the time of writing.

During the current survey a bat detector produced records of White-striped Freetail Bat, Large Forest Bat, Little Forest Bat, Chocolate Wattled Bat and Gould's Wattled Bat. Virtually all bat activity was recorded on the first night of the study. These five species are all common across southern Victoria, but are the first available, confirmed records for Kurri Kurri Wildlife Sanctuary.

Krefft's Glider and Long-nosed Bandicoot were not recorded during the current study; however, previous confirmed records of these species at Kurri Kurri are available. None of the usual conical feed holes produced by Bandicoots were seen during the study. However, absence of records does not necessarily mean absence of species. There is little doubt that future targeted surveys would almost certainly produce further records of Long-nosed Bandicoot.

The Forest Raven is a common member of the Corvidae family. The sub-species *Corvus tasmanicus tasmanicus* is found in coastal southern Victoria and in all environments throughout Tasmania (Menkhorst et al. 2017). The species is common throughout the Otway Ranges and Otway Plain and has been recorded in significant numbers in Ralph Illidge Sanctuary (Homan 2019). Identification of the Corvids can be difficult and usually relies on hearing the calls (Menkhorst et al. 2017). During the current survey at Kurri Kurri one Forest Raven was recorded by Song Meter during the dawn chorus on 26/5/2024. This is the first available, confirmed record for this species at Kurri Kurri Wildlife Sanctuary.

McCoy's Skink is a common, small, worm-like lizard with small limbs and five tiny fingers and toes. The species is found over a wide area of Victoria where it mostly inhabits cool, moist microenvironments in Wet and Damp Sclerophyll ecosystems (Robertson and Coventry 2019). McCoy's Skinks shelter in moist soil under fallen logs and can be overlooked during active searching. Despite extensive active searching at Ralph Illidge Sanctuary in 2019, no McCoy's Skinks were found (Homan 2019). During the current survey at Kurri Kurri many fallen logs were rolled (active searching) resulting in the capture of one McCoy's Skink. This is the first record of this species at Kurri Kurri and may be the first available, confirmed record for the general Naringal district.

The Spotted Marsh Frog and Southern Brown Tree Frog are two of the most common amphibians in southern Victoria (Clemann and Swan 2023). Both species are found in a wide range of habitats including natural areas, weed-infested sites and disturbed areas such as farms and artificial ponds. During times of inactivity the Spotted Marsh Frog can be found sheltering under a range of natural and unnatural structures including logs, rocks, old sheets of galvanised iron and other human-made debris. During the current survey one Spotted Marsh Frog was found under a wooden seat at the shelter shed. The call of the Southern Brown Tree Frog is described as a pulsing and whirring "reeeeee ree ree ree" (Clemann and Swan 2023). The species is known to call even when temperatures are low. Indeed, several Southern Brown Tree Frogs were heard calling from vegetation beside the shelter shed at dusk on the 25/5/2024. The recording of Spotted Marsh Frog and Southern Brown Tree Frog during the current survey brings to seven, the number of amphibians known to inhabit Kurri Kurri Wildlife Sanctuary.

Overall, even though all new species recorded are widespread and common, nevertheless, the results of this survey add significantly to the biodiversity value of Kurri Kurri Co-Op Wildlife Sanctuary. The confirmation of an on-going breeding population of Long-nosed Potoroo is especially noteworthy. The results also show the importance of preserving and managing small areas of high-quality habitat in a landscape that has been extensively cleared.

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