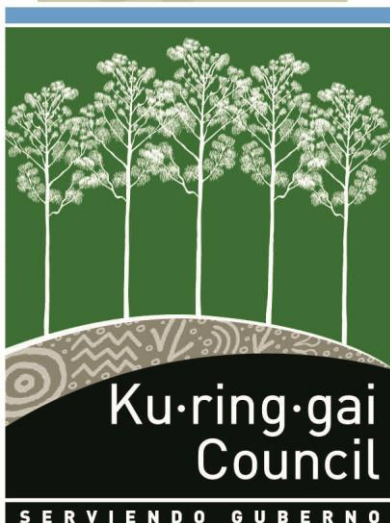




# **Eastern Pygmy-Possum Program Report 2023**

Ku-ring-gai Council



## 1. Acknowledgements

The Eastern Pygmy-possum Program relies on the input of a team of 16 volunteers to monitor nest boxes located throughout the Ku-ring-gai Local Government Area (LGA). This long-term threatened species monitoring program has been running for over eight years, during which time it has expanded and adapted to improve outcomes and efficiency. Council recognises the significant contribution by our team of volunteers, and we are grateful to members of Ku-ring-gai Men's Shed for producing nest boxes that are fundamental for the program to operate and expand.

## 2. Introduction

The Ku-ring-gai LGA is bound by Ku-ring-gai Chase National Park to the north, Garigal National Park to the east, Lane Cove National Park to the west and spans three major catchments (Middle Harbour, Lane Cove River and Cowan Creek). Ku-ring-gai's natural areas are associated with 24 vegetation communities, which provide habitat for more than 700 native plant species and over 300 vertebrate species, including many species listed as threatened under the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

One of the threatened species occurring in Ku-ring-gai is the Eastern Pygmy-possum (*Cercartetus nanus*) listed as vulnerable under the BC Act. The Eastern Pygmy-possum (EPP) is a small nocturnal marsupial, known to inhabit multiple vegetation types from heath to rainforest and is rarely observed outside formal surveys.

The Eastern Pygmy-possum Program is part of Ku-ring-gai Council's ongoing biodiversity monitoring program. The key aims of the EPP monitoring program are to:

- Improve our understanding of the:
  - distribution and abundance of EPP; and
  - habitat preference of EPP.
- Provide supplementary habitat for EPP in areas where appropriate hollows are scarce.
- Effectively engage the community and decision makers in biodiversity conservation.
- Promote better management of habitat, and the consideration of EPP in development, or other management/bushland management activities.
- Displaying best practice and providing guidance for other projects.

The program utilises remote cameras and nest boxes and is conducted under Scientific Licence number 100881. The program supports the objectives of Council's Biodiversity Policy (2021) and Fauna Management Policy (2021) and is aligned with tasks N2.1.1 and N2.1.2 of Council's Delivery Program 2022 - 2026 and Operational Plan 2023 - 2024.

This report summarises the key results from the program for the 2023 calendar year and provides recommendations for the future direction of the project.

### 3. Eastern Pygmy-possum (*Cercartetus nanus*)

Eastern Pygmy-possums are small diprotodont marsupials of the family *Burramyidae*. Eastern Pygmy-possum are native to south-eastern Australia, distributed from southern Queensland to eastern South Australia and Tasmania including Flinders and King Islands. In NSW, their distribution extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Eastern Pygmy-possum are associated with a broad range of habitats including temperate rainforest, sclerophyll forest, woodland and heath, but in most areas, where woodlands and heath are present they appear to be preferred habitat.

Eastern Pygmy-possums weigh 15 - 43 grams and have a head to body length of 70 - 110 millimetres with a tail length between 75 - 105 millimetres. They are light-brown on top, white underneath with an almost naked, prehensile tail. They have big, forward-facing ears, long whiskers, and large, bulging eyes.

Eastern Pygmy-possum feed primarily on nectar and pollen collected from banksias, eucalypts and bottlebrushes, making them important pollinators of heathland plants. When flowering is scarce, they supplement their diet with arthropods and soft fruit. Eastern Pygmy-possums shelter in a spherical nest of leaves in tree hollows or logs. They appear to be mainly solitary, each individual using several nests, with males having non-exclusive home ranges of about 0.68 hectares and females about 0.35 hectares.<sup>2</sup> Eastern Pygmy-possums can enter periods of torpor to reduce energy expenditure, particularly in winter, with their body curled, ears folded and internal temperature dropping to match their surroundings.<sup>1</sup>

Factors threatening the survival of the Eastern Pygmy-possum include habitat loss and fragmentation leading to isolated sub-populations with little opportunity for dispersal, inappropriate fire regimes that remove nectar-producing understorey plants, the loss of nest sites due to land clearing, and predation by foxes and cats<sup>2</sup>. Fires may include prescribed burns (hazard reduction and ecological burns) or wild fires. Within the LGA, prescribed burns for either ecological or hazard reduction purposes are generally restricted in their frequency (depending on the vegetation type and proximity to residential areas), intensity and size (to ensure fauna connectivity of habitat to unburnt areas), however in some circumstances actions determined necessary to protect life and property are unavoidable.

### 4. Methods

A total of 43 nest boxes were installed throughout Council reserves in the Ku-ring-gai LGA (Figure 1), with the number of sites gradually expanding each year since the program was established with 14 nest boxes in 2015. Nest boxes were placed in areas with a dense mid storey including species from the Proteaceae family and with general heathy character where highest observation rates were expected.<sup>3</sup> Monitoring was conducted at all nest box locations throughout the LGA with presence or absence of EPP determined via direct nest box checks, supplemented by remote cameras focused on either the nest box entrance or a flowering species near the nest box (eg. *B. ericifolia* spikes).

Nest box checks were conducted quarterly within the first week of the monitoring month, ie. 1<sup>st</sup>-7<sup>th</sup> March, June, September and December, to be repeated annually to ensure consistency of the data. Indirect observations such as fresh nesting material in nest boxes were also recorded as evidence of habitation, though only direct observations (i.e. a photo/video of an EPP or an EPP directly observed in a nest box) have been reported as indicating presence. Where fresh nesting material was found, if available, a camera would be installed at the nest box in attempt to capture remote footage to confirm EPP presence. Additionally, if an EPP was observed during the check a camera would be placed facing the nest box to observe their behaviour and activity.

<sup>1</sup> Turner, J.M., Körtnner, G., Warnecke, L. & Geiser, F. (2012) Summer and winter torpor use by a free-ranging marsupial, *Comparative biochemistry and physiology. Part A, Molecular & integrative physiology*, **162** (3), 274-280.

<sup>2</sup> DCCEEW (2024) Eastern Pygmy Possum Profile, accessed online: <http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10155>

<sup>3</sup> Law, B., Chidel, M., Britton, A. & Brassil, A. T. (2012) Response of Eastern pygmy-possums, *Cercartetus nanus*, to selective logging in New South Wales: home range, habitat selection and den use, *Wildlife Research*, **40**, 470-481.

The period of time cameras were left in place varied between monitoring events based on numerous factors related to staff or volunteer availability, the success or failure of the monitoring location, weather, security of cameras and controlled burning, but generally were left for a minimum period of four weeks. In the event that a camera failed to trigger, or there was a technical error, it would be reinstalled at the site.

Other species sighted or heard during nest box inspections or in remote camera footage were also recorded.

## 5. Limitations

At various times throughout the year, some nest boxes were impacted by ant colonies, either requiring the lid to be left open for a short period to encourage dispersal, or significantly damaged boxes required replacing. Additionally, some boxes have suffered decay from prolonged water damage, requiring the boxes to be temporarily removed and allowed to dry out before reinstalling. In some cases, this may have impacted the detectability of EPP where the box was uninhabitable.

Where multiple nest boxes are considered to be within a typical home range for EPP<sup>4</sup>, or located within a single reserve, the nest boxes have been grouped into 'unique' sites to inform presence/absence data (Table 1). As is the case for all fauna monitoring, presence is confirmed by direct observation while absence is not confirmed through the lack of observation.

## 6. Results

### Distribution of EPP throughout the LGA

Eastern Pygmy-possums were detected at 17 of 43 (40%) monitoring sites in the 2023 calendar year, an increase since the previous year's detection of 30%. The distribution of nest boxes and EPP records is provided in Figure 1. Of the unique sites/reserves in the LGA surveyed this year (Table 1), Eastern Pygmy-possum were detected at 9 out of 13 (69%) of the reserves. The peak detection of EPP activity, either via nest box checks, camera detection or 'signs of visitation' occurred during summer (Figure 2) with Pygmy-possums found to be actively nest building, through until winter whilst females were breeding. Detectability of EPP was lowest in spring, consistent with previous studies finding that birth during autumn/winter is followed by a dispersal of adults and sub-adults in spring<sup>5</sup>.

The northern and eastern reserves in the LGA continues to act as a stronghold for Eastern Pygmy-possums. These reserves have connectivity to Ku-ring-gai National Park and Garigal National Park, and since monitoring commenced in 2015 there has been ongoing presence in this area. In 2023, EPP were detected at four of five reserves surveyed in the east of the LGA and all five of the reserves to the north. EPP were again not detected at Old She Oak Reserve where they have previously been recorded (in 2020).

The three reserves in the south west of the LGA continue to be surveyed as part of the program. However, no EPP have been detected in this area of the LGA to date. A comparison of presence/absence data for all seven years of monitoring is summarised in Table 1.

<sup>4</sup> Harris, J. M., Goldingay, R. L., Broome, L., Craven, P. & Maloney, K. S. (2007) Aspects of the Ecology of the Eastern Pygmy-Possum *Cercartetus Nanus* at Jervis Bay, New South Wales. *Australian Mammalogy* **29** (1), 39–46

<sup>5</sup> Goldingay, R. L., and Rueegger, N. (2018) Elevation induced variation in the breeding traits of a nectar-feeding non-flying mammal. *Ecological Research* **33**, 979–988.



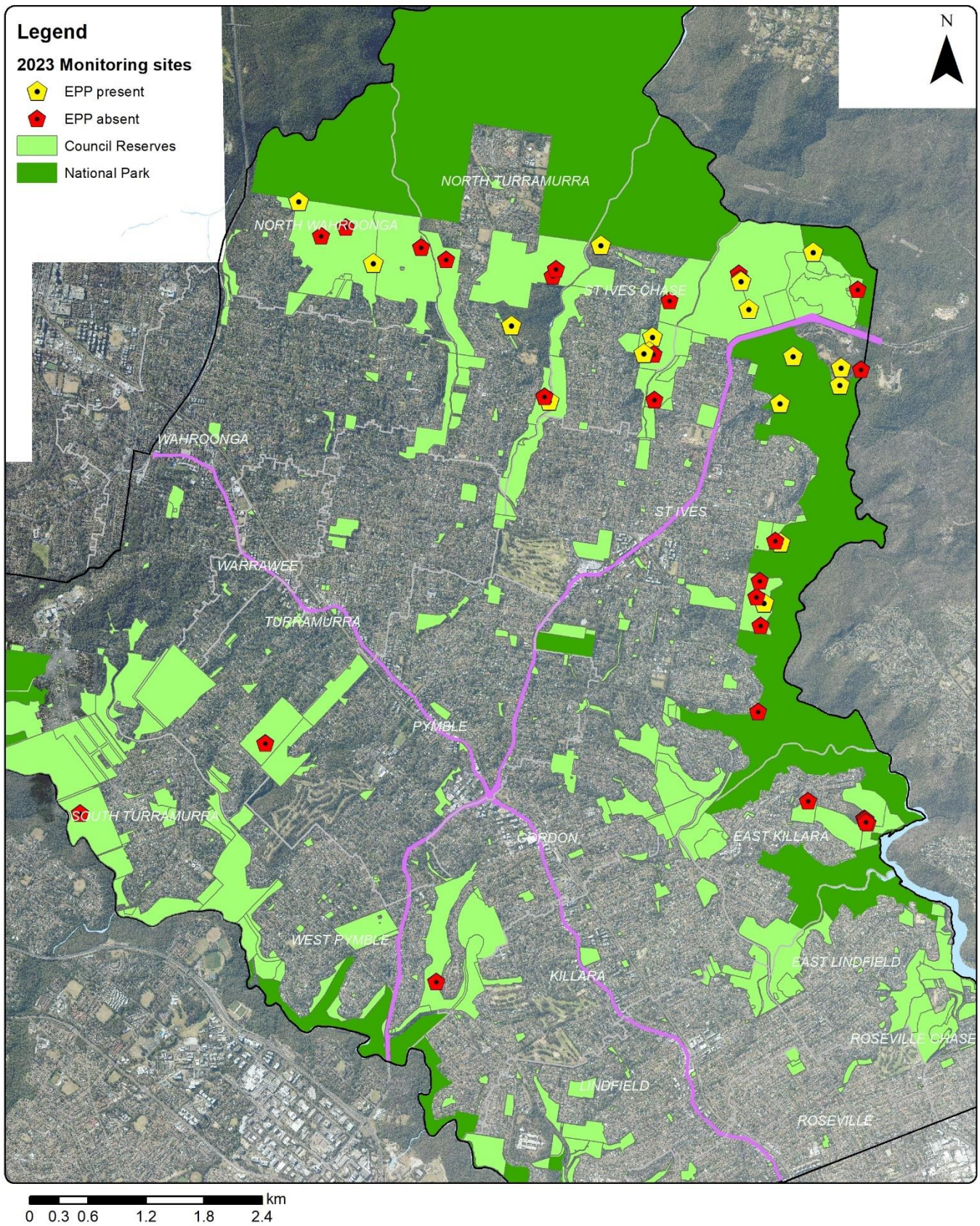


Figure 1 2023 Monitoring sites showing presence and absence of Eastern Pygmy-possum

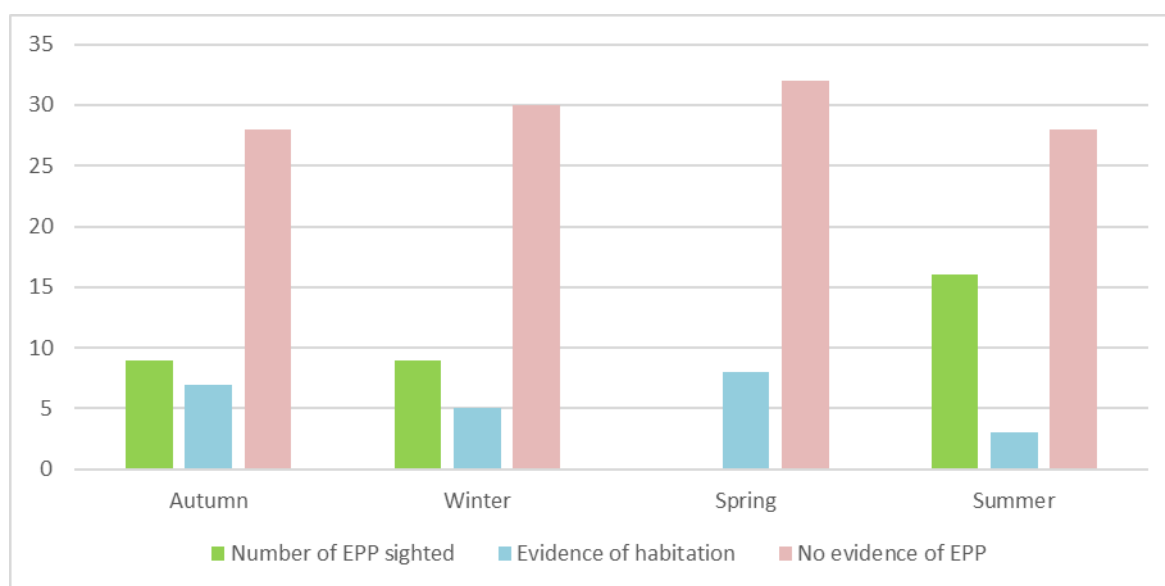


**Table 1. Distribution of EPP observations throughout the LGA, 2015-2023**

Area/reserve name	Presence 2015-2016	Presence 2016-2017	Presence 2017-2018	Presence 2019	Presence 2020	Presence 2021	Presence 2022	Presence 2023
<b>North of LGA (connectivity to Ku-ring-gai NP)</b>								
Cowan Creek Reserve	Yes	Yes	Yes	Yes	No*	Yes	Yes	Yes
Ku-ring-gai Creek Reserve/ Warrimoo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ku-ring-gai Wildflower Garden	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lovers Jump Creek Reserve	Yes	Yes	No*	Yes	Yes	Yes	Yes	Yes
St Ives Showground	Yes	Yes	No	Yes	No	Yes	Yes	Yes
<b>East of LGA (connectivity to Garigal NP)</b>								
Douglas Street Reserve (Acron Oval)	Yes	No	Yes	No	No	Yes	Yes	Yes
Green Tip	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
McIntosh Park	Not surveyed	Yes	No**	No	Yes	No	Yes	Yes
Old She Oak Reserve	Not surveyed	Not surveyed	No	No	Yes	No	No	No
Surgeon White Reserve	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>South-west of LGA (connectivity to Lane Cove NP)</b>								
Bradley Park	No	No	No	No	No	No	No	No
Rofo Park	No	No	No	No	No	No	No	No
Sir Phillip Game Reserve North	Not surveyed	No	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed
Twin Creek Reserve	Not surveyed	No	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed
Blackbutt Creek Reserve	Not surveyed	Not surveyed	No	No	No	No	No	No

\*NSW Atlas records show EPP presence north of the monitoring site

\*\*Nest box was removed due to risk of hazard burns in the area, inactive between March and June 2018



**Figure 2. Results of 2023 monitoring (camera records and nest box observations combined)**

## Vegetation communities surveyed

Monitoring sites were located in a range of vegetation communities, including:

- Coastal Upland Swamp\*
- Duffys Forest\*\*
- Sydney Sandstone Gully Forest
- Sydney Sandstone Ridgetop Woodland

\*Endangered ecological community under the state BC Act 2016.

\*\* Endangered ecological community under the state BC Act 2016 and federal EPBC Act 1999.

Eastern Pygmy-possums were recorded in all four vegetation communities. Camera monitoring was largely focused on detecting activity at the nest box, however there was also success in capturing EPP activity focusing cameras on *Banksia ericifolia* and *Banksia serrata* spikes whilst in flower.

## Breeding records

There was evidence of breeding spanning between late summer and winter of 2023, with a peak of births appearing to occur during autumn given the frequent sightings of mothers with dependent young in nest boxes during winter. Pygmy-possums were observed actively building nests (bringing fresh leaves into nest boxes) frequently during summer, and pygmy-possums with multiple young were observed occupying nest boxes installed in reserves to the north of the LGA (Warrimoo and Cowan Creek Reserve) and to the east (St Ives Green Tip, McIntosh Park, Acron Oval, and Surgeon White Reserve).

One nest box located in Ku-ring-gai Wildflower Garden was also found to be occupied by a nesting Brown antechinus (*Antechinus stuartii*), with one adult and multiple young found nesting in December 2023. This species is known to have similar den preferences to the EPP and naturally may compete with EPP for nesting sites<sup>6</sup>. Antechinus were frequently detected on remote cameras either occupying nest boxes for short periods or feeding on *banksia* species.

Appendix 1 provides a photographic record of nest development throughout the seasons.

## Other species observations

A range of other native species were detected during surveys; two amphibians (including one threatened species), 12 bird species (one threatened), eight mammals and one reptile (Table 2). Two introduced species, Black Rat and European Fox, were also detected near to a nest box via camera monitoring. Invertebrates (mostly ants and spiders) were often found utilising the nest boxes. A gallery of remote camera footage and other species observations is provided in Figure 3.

<sup>6</sup> Rueegger, N. N., Goldingay, R. L., and Brooks, L. O. (2012). Does nest box design influence use by the eastern pygmy-possum? *Australian Journal of Zoology* **60**, 372–380.

**Table 2. Other species detected during EPP monitoring**

Scientific name	Common name	Observation type
<b>Amphibians</b>		
<i>Litoria peroni</i>	Peron's Tree Frog	Heard call during nest box checks
<i>Pseudophryne australis</i> <sup>^</sup>	Red-crowned Toadlet	Heard call during nest box checks
<b>Birds</b>		
<i>Acanthiza pusilla</i>	Brown Thornbill	Heard call during nest box checks
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	Camera monitoring – near nest box
<i>Alectura lathamii</i>	Australian Brushturkey	Observed nearby during nest box check
<i>Anthochaera carunculata</i>	Red Wattlebird	Camera monitoring – near nest box
<i>Calyptrorhynchus lathamii</i> <sup>^</sup>	Glossy Black-Cockatoo	Observed nearby during nest box check
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Heard call during nest box checks
<i>Gymnorhina tibicen</i>	Australian Magpie	Observed nearby during nest box check
<i>Meliphaga lewinii</i>	Lewin's Honeyeater	Heard call during nest box checks
<i>Menura novaehollandiae</i>	Superb Lyrebird	Heard call during nest box checks
<i>Pachycephala pectoralis</i>	Golden Whistler	Heard call during nest box checks
<i>Psophodes olivaceus</i>	Eastern Whipbird	Heard call during nest box checks
<i>Trichoglossus moluccanus</i>	Rainbow Lorikeet	Camera monitoring – near nest box
<b>Mammals</b>		
<i>Acrobates pygmaeus</i>	Feathertail Glider	Camera monitoring – near nest box
<i>Antechinus stuartii</i>	Brown Antechinus	Breeding within nest box
<i>Petaurus breviceps</i>	Sugar Glider	Camera monitoring – foraging near nest box
<i>Rattus fuscipes</i>	Bush Rat	Camera monitoring – near nest box
<i>Rattus rattus</i> <sup>*</sup>	Black Rat	Camera monitoring – near nest box
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	Observed nearby during nest box check
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Camera monitoring – foraging near nest box
<i>Wallabia bicolor</i>	Swamp Wallaby	Camera monitoring – foraging on ground
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	Camera monitoring – near nest box
<i>Vulpes Vulpes</i> <sup>*</sup>	Fox	Camera monitoring – near nest box
<b>Reptiles</b>		
<i>Varanus varius</i>	Lace Monitor	Observed nearby during nest box check

<sup>^</sup>Threatened species

<sup>\*</sup>Introduced species



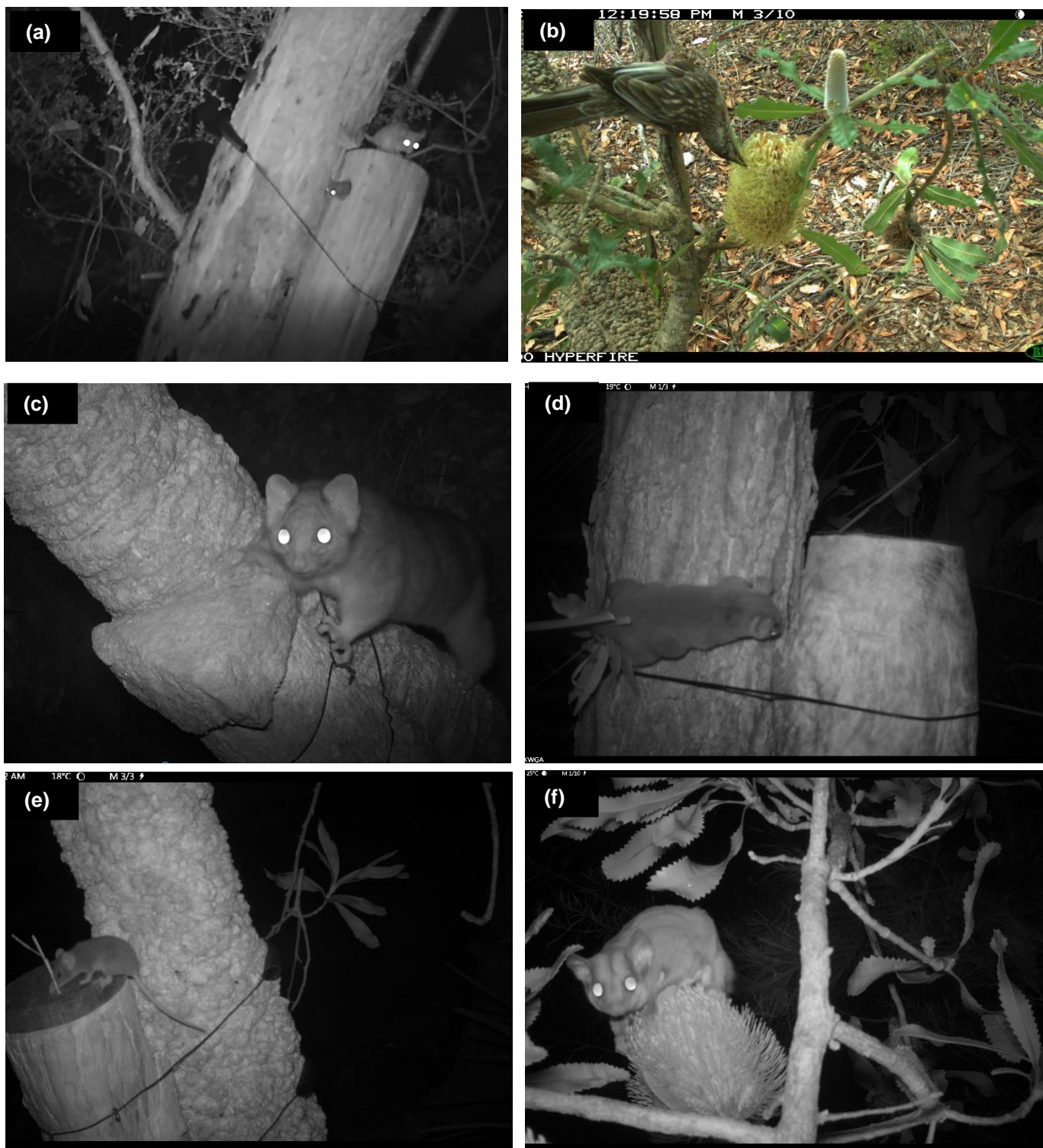


Figure 3. Selection of remote camera footage during 2023: (a) Eastern Pygmy-possum with young in nest, (b) Red Wattlebird, (c) Ringtail possum, (d) Eastern Pygmy-possum nest building with leaves curled in tail, (e) Brown antechinus, (f) Sugar glider.

## 7. Discussion and recommendations

There was an increase in Eastern Pygmy-possum sightings in 2023 compared to 2022, with widespread presence in known habitat areas throughout reserves to the north and east of the LGA. The peak detectability of EPP occurred during the summer season, when there were frequent camera records of active nest building with EPP carrying fresh leaves into nest boxes. This year there were successful breeding events in multiple reserves in the north and east of the LGA, with breeding occurring from late summer through until early winter, with births peaking in autumn, coinciding with the flowering of *Banksia ericifolia* which is known to be a preferred feed tree species. Eastern Pygmy-possums appear to disperse following the breeding season, with detectability consistently remaining low during spring months.

Again in 2023 there were no sightings of EPP south of the reserves in St Ives, where previously they have been recorded occupying Old She Oak Reserve in the south-east of the LGA (in 2020). This area will be targeted with remote cameras during the winter flowering of *Banksia* species in 2024 to investigate presence of EPP in this area.

The size of the entrance hole to the nest box appears to have a strong correlation with nest box occupancy, with EPP preferring nest boxes with a small entrance size of <30mm. Entrance size is an important attribute for the selection of roosting/nesting sites by hollow-dwelling mammals to avoid entry by larger predators and potential competitors. Additionally, the internal diameter and depth of the nest box appear to be important attributes, which will be further investigated in 2024 to determine whether any nest boxes require removal and replacement to suit the preferred smaller box size.

Foxes are a key threatening factor for the survival of EPP, which are particularly vulnerable to predation given their nesting preference being low to the ground. The detection of a fox during remote camera survey near one of the EPP nest boxes will be used to inform feral species control within this area and will continue to be monitored.

In 2023, a nest box condition assessment was undertaken to inform future maintenance to be completed in 2024. A number of nest boxes required reattaching using tree friendly techniques to allow tree growth, and many nest boxes continue to be impacted by ant colonies, which may require to be replaced by new boxes.

The EPP monitoring program will continue in 2024 with implementation of the following:

- Monitoring of nest boxes will continue on a quarterly basis (March, June, September and December 2024). Where there is clear evidence of recent EPP activity, a second visit within a couple of days of the initial nest box inspection may be undertaken. This second visit is optional only, depending on the volunteer's availability.
- Council staff will continue the use of remote cameras at nest box sites to capture EPP activity outside of the quarterly monitoring events. Cameras may be made available on request by volunteers for monitoring within proximity of an assigned nest box for a specific site.
- Nest boxes impacted by ant colonies or water damage will continue to be monitored for deterioration and replaced or relocated if necessary.
- Data will continue to be collected via Council's data collection application, accessed via smart phones.
- All records will continue to be uploaded to relevant databases quarterly as per data licence agreements.
- Council will investigate undertaking an occupancy analysis given the long-term dataset which will provide valuable insight into the abundance and population of EPP in KRG.

## 8. Conclusion

Bushland reserves with woodland, open forest and heathland vegetation communities occurring in the north and east of the LGA with connectivity to Ku-ring-gai Chase National Park and Garigal National Park continue to support populations of Eastern Pygmy-possums in Ku-ring-gai. The detectability of EPP peaks between late summer and early winter whilst nest building and breeding occurs, with births coinciding with the autumn-winter flowering of *Banksia ericifolia*.

This long-term monitoring program continues to provide valuable insights into the distribution and ecology of pygmy-possums, as well as the behaviour of other native pollinators and threatened species in Ku-ring-gai. The program has benefited enormously from the team of volunteers involved, providing local knowledge and increasing community awareness of this unique threatened species.









If you would like to find out more about the program, please contact Council's Natural Areas Officer, on (02) 9424 0000 or [naturalareas@krq.nsw.gov.au](mailto:naturalareas@krq.nsw.gov.au).



## 9. References

- DCCEEW (2024) Eastern Pygmy Possum Profile, Department of Climate Change, Energy, the Environment and Water, accessed online: <https://threatenedspecies.bionet.nsw.gov.au/>
- DCCEEW (2024) NSW BioNet Atlas of NSW Wildlife, Department of Climate Change, Energy, the Environment and Water, accessed online: <https://www.environment.nsw.gov.au/>
- Goldingay, R. L., and Rueegger, N. (2018) Elevation induced variation in the breeding traits of a nectar-feeding non-flying mammal. *Ecological Research*, **33**, 979–988.
- Harris, J. M., Goldingay, R. L., Broome, L., Craven, P. and Maloney, K. S. (2007) Aspects of the Ecology of the Eastern Pygmy-Possum *Cercartetus Nanus* at Jervis Bay, New South Wales. *Australian Mammalogy*, **29** (1), 39–46.
- Law, B., Chidel, M., Britton, A. and Brassil, A. T. (2012) Response of Eastern pygmy-possums, *Cercartetus nanus*, to selective logging in New South Wales: home range, habitat selection and den use, *Wildlife Research*, **40**, 470–481.
- Rueegger, N. N., Goldingay, R. L., and Brooks, L. O. (2012) Does nest box design influence use by the eastern pygmy-possum? *Australian Journal of Zoology*, **60**, 372–380.
- Turner, J. M., Körtner, G., Warnecke, L. and Geiser, F. (2012) Summer and winter torpor use by a free-ranging marsupial, *Comparative biochemistry and physiology*, **162** (3), 274-280.

## Appendix 1 – Nest development throughout the seasons

NB1: Ku-ring-gai Wildflower Gardens			
March 2023	June 2023	September 2023	December 2023 <i>nesting antechinus</i>
			
NB8: Ku-ring-gai Wildflower Garden			
March 2023	June 2023	September 2023	December 2023
			



**NB 9: Ku-ring-gai Wildflower Garden**

March 2023



June 2023



September 2023



December 2023



**NB 28: Ku-ring-gai Wildflower Garden**

March 2023



June 2023



September 2023



December 2023 – leaves added





**NB4: St Ives Showground**

March 2023 *EPP*



June 2023 *EPP*



September 2023



December 2023



**NB 46: St Ives Showground**

March 2023



June 2023



September 2023



December 2023





**NB 30: Green Tip**

March 2023 *EPP*



June 2023



September 2023

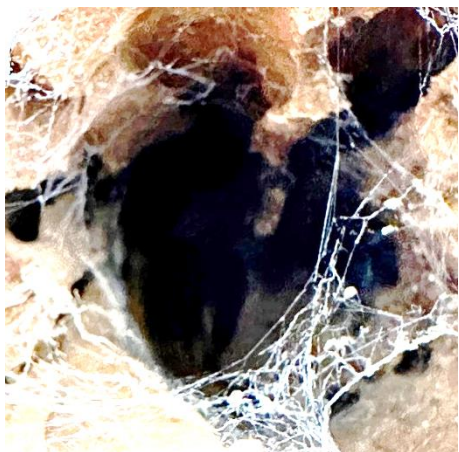


December 2023

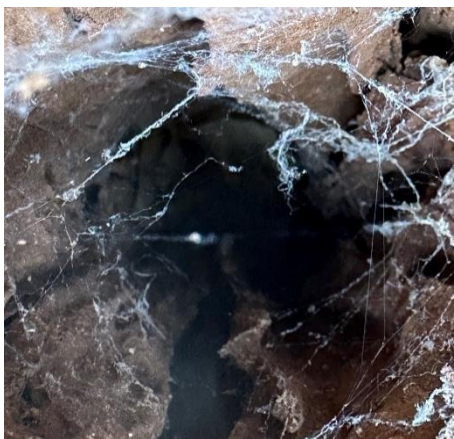


**NB 31: Green Tip**

March 2023



June 2023



September 2023



December 2023 *EPP*





**NB 32: Green Tip**

March 2023



June 2023



September 2023



December 2023



**NB 16: St Ives Green Tip**

March 2023



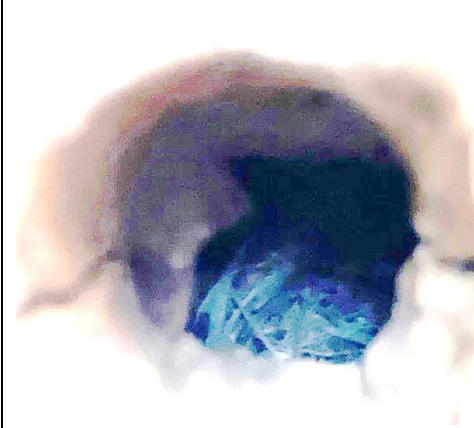
June 2023



September 2023



December 2023





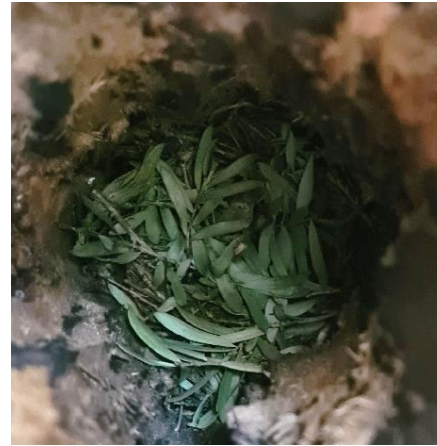
**NB 25: McIntosh Park**

March 2023 *Family of EPP*

June 2023

September 2023

December 2023



**NB 10: Douglas Street Reserve**

March 2023

June 2023

September 2023

December 2023





**NB 50: Douglas Street Reserve**

March 2023



June 2023



September 2023



December 2023



**NB 22: Surgeon White Reserve**

March 2023



June 2023










September 2023



December 2023



NB 23: Surgeon White Reserve			
March 2023	June 2023 <i>Family of EPP</i>	September 2023	December 2023
			
NB 24: Surgeon White Reserve			
March 2023	June 2023	September 2023	December 2023
			Relocated back into post-burn area – no monitoring this month



**NB 36: Surgeon White Reserve**

March 2023



June 2023



September 2023



December 2023

**NB 37: Bungaroo Track**

March 2023



June 2023



September 2023



December 2023



**NB 27: Old She Oak Reserve**

March 2023



June 2023



September 2023



December 2023

**NB 49: Old She Oak Reserve**

March 2023



June 2023



September 2023



December 2023





**NB 44: Old She Oak Reserve**

March 2023



June 2023



September 2023

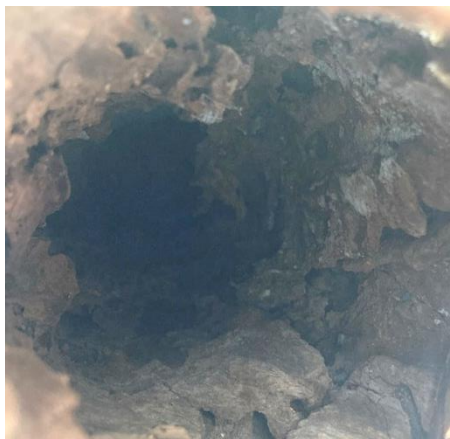


December 2023



**NB 47: Old She Oak Reserve**

March 2023



June 2023



September 2023



December 2023



**NB 48: Old She Oak Reserve**

March 2023



June 2023



September 2023



December 2023

**NB 33: Blackbutt Reserve**

March 2023

No photo

June 2023



September 2023



December 2023





**NB 34: Step track**

March 2023



June 2023



September 2023



December 2023



**NB 13: Rofe Park**

March 2023



June 2023



September 2023



December 2023

No photo

**NB3: Lovers Jump Creek Reserve**

March 2023



June 2023



September 2023



December 2023



**NB 14: Lovers Jump Creek Reserve**

March 2023



June 2023



September 2023



December 2023



**NB 15: Lovers Jump Creek Reserve**

March 2023

June 2023

September 2023

December 2023

No photo



**NB 17: Lovers Jump Creek Reserve**

March 2023

June 2023

September 2023

December 2023 *EPP*



**NB 20: Lovers Jump Creek Reserve**

March 2023



June 2023

No photo

September 2023



December 2023



**NB 29: Lovers Jump Creek Reserve**

March 2023



June 2023



September 2023



December 2023





**NB 35: Darri track**

March 2023 *EPP nest*



June 2023



September 2023



December 2023



**NB 19: Cowan Creek Reserve**

March 2023



June 2023



September 2023



December 2023 *EPP*



**NB 21: Cowan Creek Reserve**

March 2023



June 2023



September 2023



December 2023

**NB 39: Cowan Creek Reserve**

March 2023



June 2023



September 2023

Checked, no photo

December 2023



**NB 41: Cowan Creek Reserve (NTRA)**

March 2023

June 2023



Box fail, removed from program

**NB 52: Cowan Creek Reserve (NTRA)**

March 2023

June 2023

September 2023

December 2023



No photo



**NB5: Ku-ring-gai Creek Reserve (Warrimoo)**

March 2023



June 2023



September 2023

Removed due to HR burn

December 2023



**NB6: Ku-ring-gai Creek Reserve (Warrimoo)**

March 2023



June 2023



September 2023

No photo

December 2023





**NB45: Ku-ring-gai Creek Reserve (Warrimoo)**

March 2023



June 2023



September 2023



December 2023



**NB51: Ku-ring-gai Creek Reserve (Warrimoo)**

March 2023



June 2023



September 2023



December 2023



**NB 12: Ku-ring-gai Creek Reserve**

March 2023



June 2023



September 2023



December 2023



**NB 18: Ku-ring-gai Creek Reserve**

March 2023



June 2023



September 2023



December 2023

