# Eastern Pygmy-Possum Program Report 2024

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 nine 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 (2022) 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 2024 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.[2] 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.[1]

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[2]. 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 42 nest boxes are installed throughout Council reserves in the Ku-ring-gai LGA (Figure 2), with the number of sites gradually expanding each year since the program was established with 14 nest boxes in 2015. The majority of nest boxes were created using salvaged pieces of hollow tree limbs repurposed into nest boxes. In 2024, we began trialling artificial nest boxes (Figure 1) to supplement the program when natural salvaged hollows were unavailable. Two artificial boxes were installed this year, one at Surgeon White Reserve (NB 22) and one at St Ives Green Tip (NB 54).

Nest boxes were preferably 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[3] and to ensure suitable coverage from potential predator species. Nest boxes were installed on rough-barked native tree species, at a height of approximately 1-1.5m from the ground, with the entrance hole facing towards the host tree. Nest box attributes were recorded, noting the nest box type, internal and external dimensions, and host tree species.

[1] *Turner, J.M., Körtner, 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.*

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

[3] *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.

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. *Banksia ericifolia* spikes).

Nest box checks were conducted quarterly within the first week of the monitoring month, ie. 1st-7th 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 breeding was suspected and the number of EPPs could not be confirmed by a visual inspection, a camera would be placed facing the nest box to confirm numbers and observe their behaviour and activity. 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 fauna species sighted or heard during nest box inspections or in remote camera footage were also recorded.

**Figure 1. Nest boxes used in EPP monitoring program. Left: Artificial nest box. Right: Salvaged hollow design.**

# 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[4], 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 11 of 42 (26%) monitoring sites in the 2024 calendar year, down from 40% of sites in the previous year. The distribution of nest boxes and EPP records is provided in Figure 2. Of the unique sites/reserves in the LGA surveyed this year (Table 1), Eastern Pygmy-possum were detected at 6 out of 14 (43%) of the reserves. The peak detection of EPP activity, either via nest box checks, camera detection or 'signs of visitation' occurred during autumn and winter (Figure 3) with Pygmy-possums found to be actively nest building in March, through until winter whilst females were breeding and coinciding with the flowering of *Banksia ericifolia*. 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[5]. All sightings of EPP were in the natural salvaged hollow nest box style. There was no evidence of use in either of the two artificial nest boxes added to the program.

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 2024, EPP were detected at two of six reserves surveyed in the east of the LGA and four of five of the reserves to the north. Though no EPP were observed in the Ku-ring-gai Wildflower Gardens or McIntosh Park there was evidence of EPP nest building at both reserves in June. EPP were again not detected at Old She Oak Reserve where they have previously been recorded (in 2020). Governor Phillip Reserve has not previously been monitored for EPP; the eastern reaches of the reserve are separated from Garigal National Park by Eastern Arterial Road which is a significant barrier for EPP. Four new nest boxes were installed in Governor Phillip Reserve (East) in August in collaboration with Ryde TAFE to investigate whether EPP is present within the reserve.

The three reserves in the southwest 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. The nest box located in Blackbutt Creek Reserve was found to be occupied by a Brown Antechinus (*Antechinus stuartii*) in March 2024, a significant finding given this species has also not previously been recorded in this area.

A comparison of presence/absence data for all nine years of monitoring is summarised in Table 1.

[4] *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*

[5] *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.*

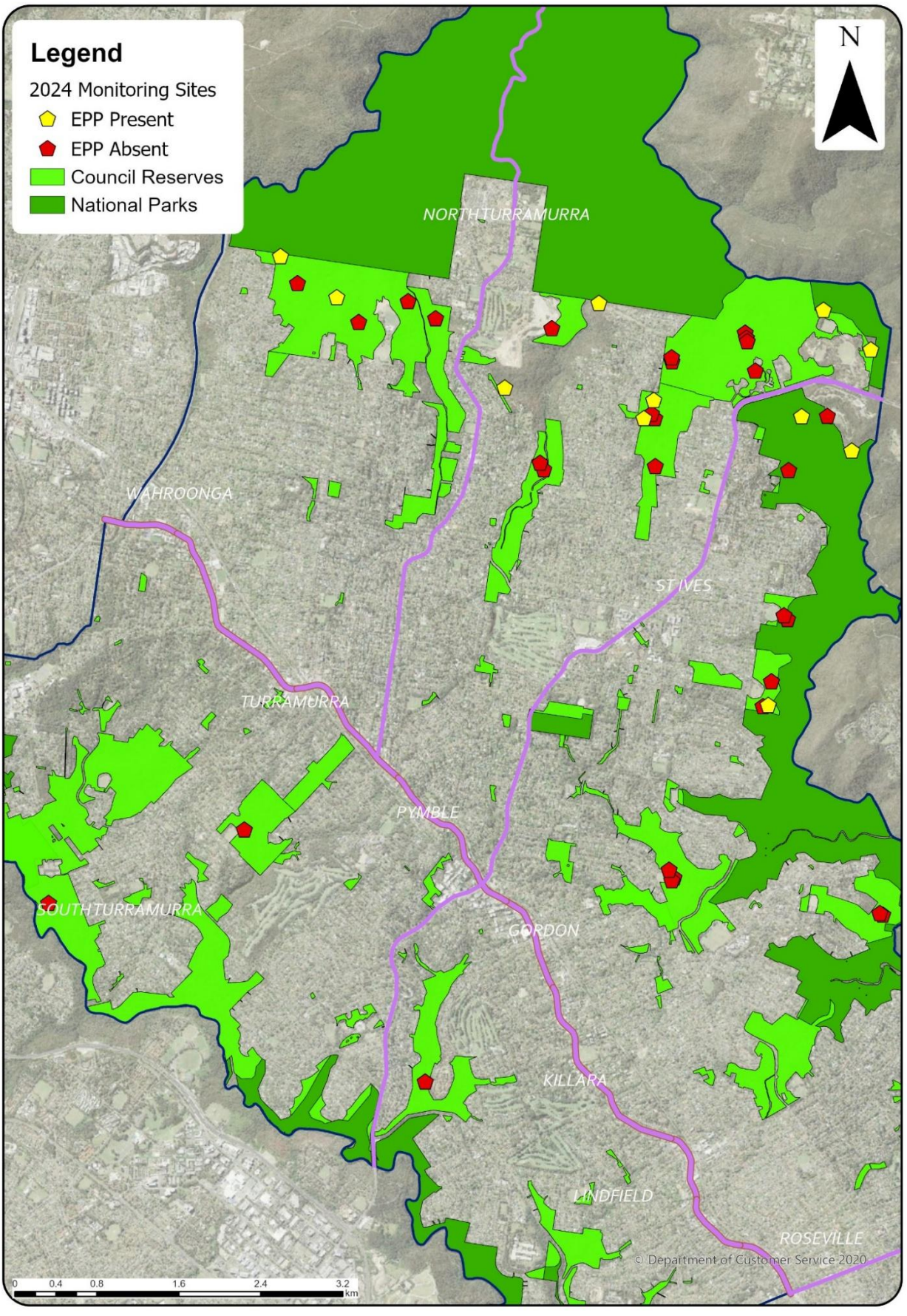



**Figure 2. 2024 Monitoring sites showing presence and absence of Eastern Pygmy-possum**

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

| Area/reserve name | Presence 2015-16 | Presence 2016-17 | Presence 2017-18 | Presence 2019 | Presence 2020 | Presence 2021 | Presence 2022 | Presence 2023 | Presence 2024 |
|---|---|---|---|---|---|---|---|---|---|
| North of LGA (connectivity to Ku-ring-gai NP) | | | | | | | | | |
| Cowan Creek Reserve | Yes | Yes | Yes | Yes | No* | Yes | Yes | Yes | Yes |
| Ku-ring-gai Creek Reserve/ Warrimoo | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Ku-ring-gai Wildflower Garden | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No |
| Lovers Jump Creek Reserve | Yes | Yes | No* | Yes | Yes | Yes | Yes | Yes | Yes |
| St Ives Showground | Yes | Yes | No | Yes | No | Yes | Yes | Yes | Yes |
| East of LGA (connectivity to Garigal NP) | | | | | | | | | |
| Douglas Street Reserve (Acron Oval) | Yes | No | Yes | No | No | Yes | Yes | Yes | No |
| Green Tip | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes |
| McIntosh Park | Not surveyed | Yes | No** | No | Yes | No | Yes | Yes | No |
| Old She Oak Reserve | Not surveyed | Not surveyed | No | No | Yes | No | No | No | No |
| Surgeon White Reserve | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Governor Phillip Reserve | Not surveyed | Not surveyed | Not surveyed | Not surveyed | Not surveyed | Not surveyed | Not surveyed | Not surveyed | No |
| South-west of LGA (connectivity to Lane Cove NP) | | | | | | | | | |
| Bradley Park | No | No | No | No | No | No | No | No | No |
| Rofe Park | No | 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 | Not surveyed |
| Twin Creek Reserve | Not surveyed | No | Not surveyed | 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 | 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

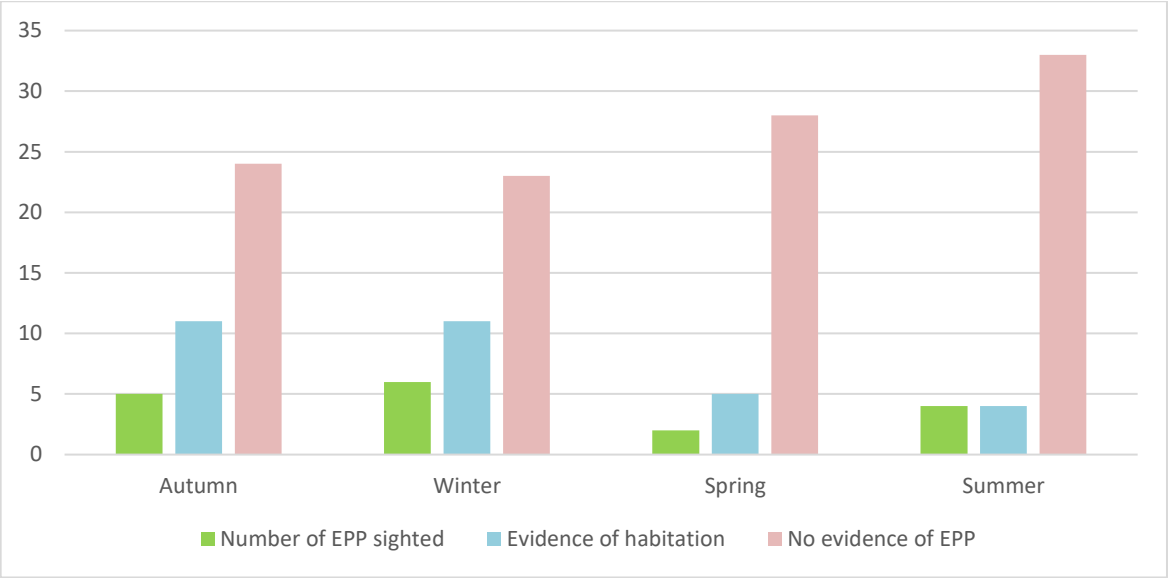



**Figure 3. Results of 2024 monitoring (camera records and nest box observations combined)**

## 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 surveyed vegetation communities. Camera monitoring was largely focused on detecting activity at nest boxes, however there was also success in capturing EPP activity focusing cameras on *Banksia ericifolia* and *Banksia serrata* spikes whilst in flower.

## Breeding records

Breeding was confirmed at two nest box sites. One female with two joeys were observed in nest box 5 in Ku-ring-gai Creek Reserve during June 2024 monitoring. The second sighting was an adult with a juvenile recorded via remote camera at nest box 35 in Cowan Creek Reserve during December 2024 monitoring. Photo monitoring of hollows indicated active nest building, including new foliage and changes in the size and complexity of nests. These observations may infer an evidence of breeding at the following sites: Ku-ring-gai Wildflower Gardens, St Ives Showground, Acron Oval, Lovers Jump Creek, St Ives Green Tip, Surgeon White Reserve and McIntosh Park.

There was also evidence of nesting Brown antechinus (*Antechinus stuartii*) in the EPP nest boxes in multiple reserves in the northern and eastern areas of the LGA. In addition, one was observed inhabiting a nest box in the southern area of the LGA in Blackbutt Creek Reserve. Antechinus were also frequently detected on remote cameras either occupying nest boxes for short periods or feeding on *banksia* species. This species is known to have similar den preferences to the EPP and naturally may compete with EPP for nesting sites[6].

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

[6] *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.*

## Nest box attributes

Nest box attribute data was collected to determine nest box preferences for EPP. Table 2 summarises the dimensions and box attributes associated with EPP presence in Ku-ring-gai.

**Table 2. Nest box attributes associated with EPP presence**

| Attribute description | Measurement |
|---|---|
| Construction material | Salvaged hollows (no EPP presence in artificial boxes during 2024 monitoring). |
| Internal diameter | Range = 50mm – 85mm; average of **65mm** |
| Internal box depth | Range = 235mm – 385mm; average of **302mm** |
| Entrance hole diameter | Range = 21mm – 38mm; average of 30mm |
| Nest box positioning | Entrance hole facing the host tree |
| Host tree species | *Banksia serrata*<br>*Corymbia gummifera*<br>*Stringybark sp.*<br>*Leptospermum trinervium*<br>*Persoonia levis* |

## Other species observations

A range of other native species were detected during surveys; two amphibians (including one threatened species), 17 bird species (one threatened), nine mammals and one reptile (Table 3). 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 4.

**Table 3. Other species detected during EPP monitoring**

| Scientific name | Common name | Observation type |
|---|---|---|
| *Amphibians* | | |
| *Litoria peroni* | Peron's Tree Frog | Heard call during nest box checks |
| *Pseudophryne australis*^ | Red-crowned Toadlet | Heard call during nest box checks |
| *Birds* | | |
| *Acanthiza pusilla* | Brown Thornbill | Heard call during nest box checks |
| *Acanthorhynchus tenuirostris* | Eastern Spinebill | Camera monitoring – near nest box |
| *Alectura lathami* | Australian Brushturkey | Observed nearby during nest box check |
| *Anthochaera carunculata* | Red Wattlebird | Camera monitoring – near nest box |
| *Anthochaera chrysoptera* | Little Wattlebird | Camera monitoring – near nest box |
| *Cacatua galerita* | Sulphur-crested Cockatoo | Observed nearby during nest box check |
| *Calyptorhynchus lathami*^ | Glossy Black-Cockatoo | Observed nearby during nest box check |
| *Dacelo novaeguineae* | Laughing Kookaburra | Heard call during nest box checks |
| *Gymnorhina tibicen* | Australian Magpie | Observed nearby during nest box check |
| *Lichenostomus chrysops* | Yellow-faced Honeyeater | Camera monitoring – near nest box |
| *Malurus lamberti* | Variegated Fairy Wren | Camera monitoring – near nest box |
| *Meliphaga lewinii* | Lewin's Honeyeater | Heard call during nest box checks |
| *Menura novaehollandiae* | Superb Lyrebird | Heard call during nest box checks |
| *Pachycephala pectoralis* | Golden Whistler | Heard call during nest box checks |
| *Psophodes olivaceus* | Eastern Whipbird | Heard call during nest box checks |
| *Trichoglossus moluccanus* | Rainbow Lorikeet | Observed nearby during nest box check |
| *Zanda funerea* | Yellow-tailed Black-cockatoo | Observed nearby during nest box check |
| *Mammals* | | |
| *Acrobates pygmaeus* | Feathertail Glider | Camera monitoring – near nest box |
| *Antechinus stuartii* | Brown Antechinus | Breeding within nest box |
| *Petaurus breviceps* | Sugar Glider | Camera monitoring – foraging near nest box |
| *Pseudocheirus peregrinus* | Common Ringtail Possum | Camera monitoring – near nest box |
| *Rattus fuscipes* | Bush Rat | Camera monitoring – near nest box |
| *Rattus rattus** | Black Rat | Camera monitoring – near nest box |
| *Trichosurus vulpecula* | Common Brushtail Possum | Camera monitoring – foraging near nest box |
| *Vulpes Vulpes** | Fox | Camera monitoring – near nest box |
| *Wallabia bicolor* | Swamp Wallaby | Camera monitoring – foraging on ground |
| *Reptiles* | | |
| *Varanus varius* | Lace Monitor | Observed nearby during nest box check |

*^Threatened species*
**Introduced species*

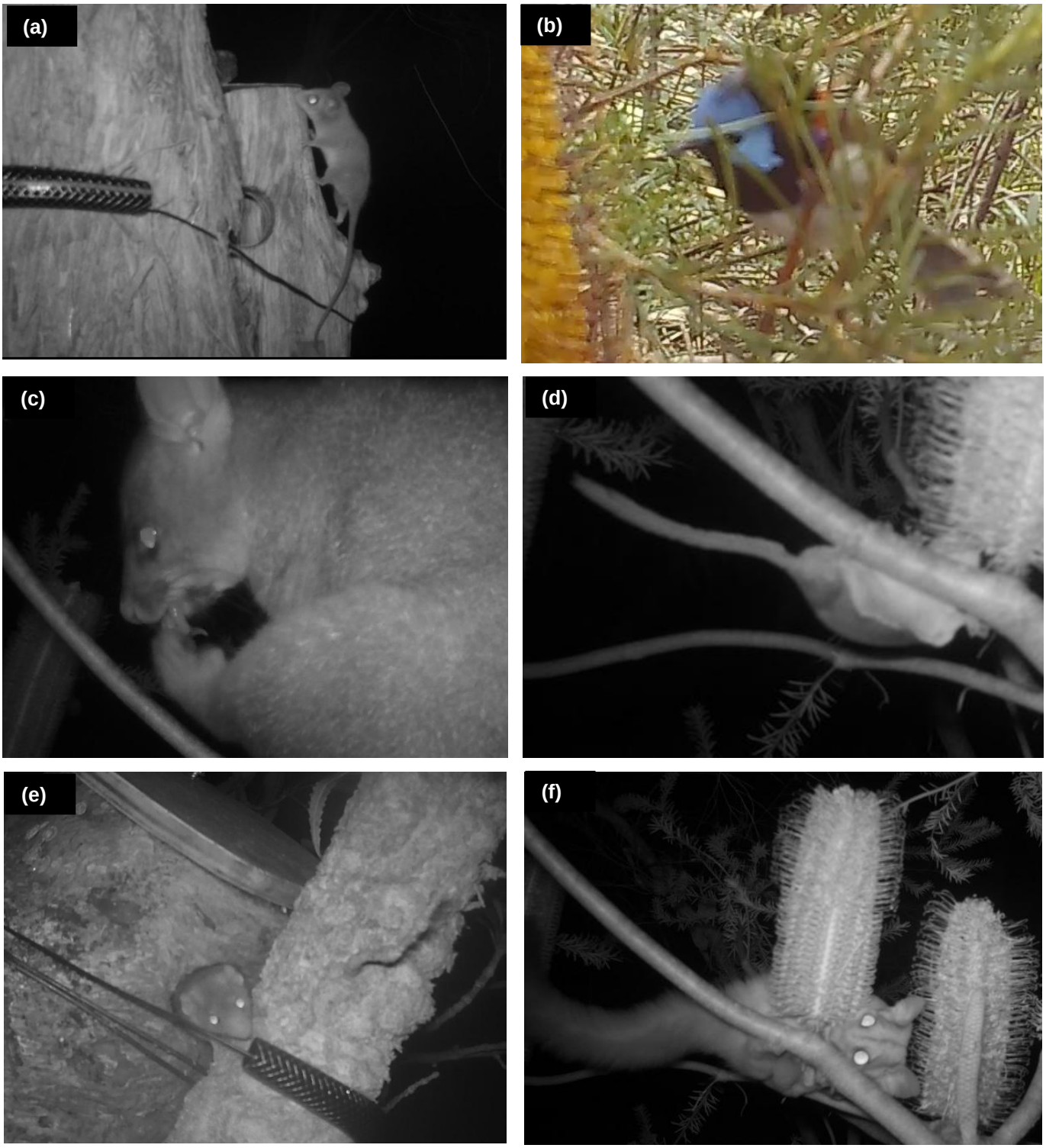



**Figure 4. Selection of remote camera footage during 2024: (a) Eastern Pygmy-possum, (b) Variegated Fairy Wren, (c) Common Brushtail Possum grooming, (d) Feathertail Glider, (e) Brown Antechinus, (f) Sugar Glider.**

# 7. Discussion and recommendations

There was an overall decrease in Eastern Pygmy-possum sightings in 2024 compared to 2023. There was presence in some of the known habitat areas throughout the reserves to the north and east of the LGA. However, notably this year there were no sightings at the Ku-ring-gai Wildflower Gardens, Douglas Street Reserve, Mcintosh Park or Old She Oak Reserve, all of which have historically had frequent sightings. There was however, evidence of nest box use at the Ku-ring-gai Wildflower Gardens, Douglas Street Reserve and Mcintosh Park with fresh leaves brought into nest boxes, indicating likely recent presence of EPP in these areas. These reserves will be targeted for camera monitoring in 2025. No additional sightings were recorded in adjacent National Parks for the Ku-ring-gai LGA external to Council records (NSW BioNet).

The peak detectability of EPP occurred during Autumn and winter, where Pygmy possums were found to be actively nest building in March, through till winter whilst females were breeding. This year there was evidence of two successful breeding events. One sighting was in June in the Ku-ring-gai Creek Reserve and the other was located on the Darri Track in Cowan Creek Reserve. Breeding occurs 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.

The monitoring program continues to contribute data on EPP distribution and abundance in the LGA. In addition, it also provides distribution data on other native pollinators, threatened species and pest species. Council utilises this information for future land management and conservation planning.

The EPP monitoring program will continue in 2025 with implementation of the following:

- Monitoring of nest boxes will continue on a quarterly basis (March, June, September and December 2025). 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. Remote cameras will be used to target areas that had no sightings in 2024 but have historically had EPP presence.
- Nest boxes impacted by ant colonies or water damage will continue to be monitored for deterioration and replaced or relocated if necessary. Deteriorated nest boxes will be replaced with salvaged tree hollows or artificial boxes. The program will continue to monitor the uptake of artificial nest boxes.
- 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 the mapping EPP habitat preferences to further refine monitoring site selection and land use planning.

## 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@krg.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/

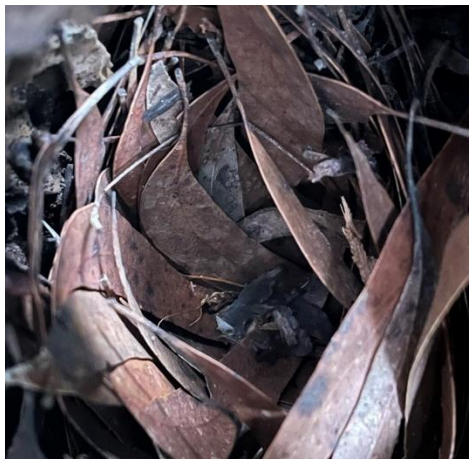
Goldingay, R. L., and Rueegger, N. (2018) Elevation induced variation in the breeding traits of a nectar-feeding non-flying mammal. *Ecological Research,* **33**, 979–988.

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.

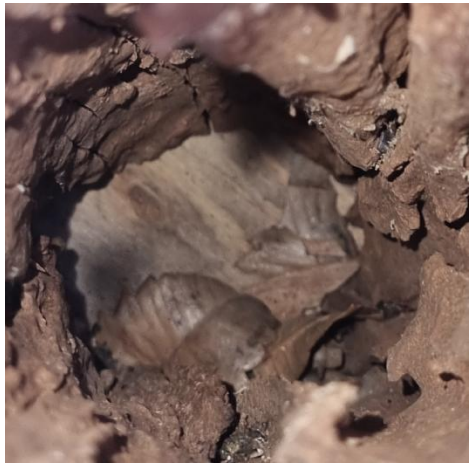
Rueegger, N. N., Goldingay, R. L., and Brooks, L. O. (2012) Does nest box design influence use by the eastern pygmy-possum? *Australian Journal of Zoology,* **60**, 372–380.

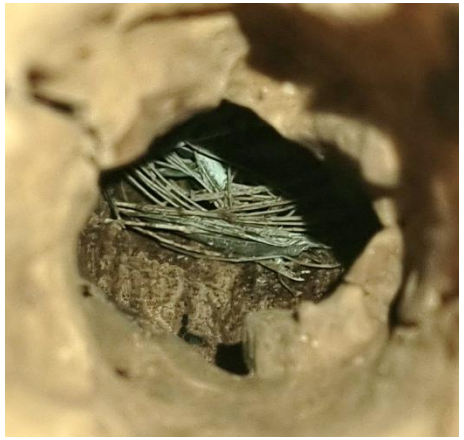
Turner, J. M., Körtner, G., Warnecke, L. and Geiser, F. (2012) Summer and winter torpor use by a free-ranging marsupial*, Comparative biochemistry and physiology*, **162** (3), 274-280.

| **NB1: Ku-ring-gai Wildflower Gardens** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB8: Ku-ring-gai Wildflower Garden** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 9: Ku-ring-gai Wildflower Garden** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 28: Ku-ring-gai Wildflower Garden** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB4: St Ives Showground** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 46: St Ives Showground** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 – *EPP present* |
|  |  |  |  |

| **NB 30: Green Tip /NB54 (Replaced June 2024 with artificial box)** | | | |
|---|---|---|---|
| March 2024 – *EPP present* | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 31: Green Tip – Moved Sept, away from HR** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 16: St Ives Green Tip** | | | |
|---|---|---|---|
| March 2024 | June 2024 – *EPP present* | September 2024 | December 2024 |
|  |  |  |  |
| **NB 25: McIntosh Park** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 10: Douglas Street Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 50: Douglas Street Reserve** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 22: Surgeon White Reserve (Replaced with artificial box)** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 23: Surgeon White Reserve** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 24: Surgeon White Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 (moved South) | December 2024 |
|  |  |  |  |
| **NB 27: Old She Oak Reserve** | | | |
| March 2024 | June 2024 | | |
|  | Nestbox Removed | | |

| **NB 49: Old She Oak Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | | |
|  | Nestbox Removed | | |
| **NB 44: Old She Oak Reserve** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  | Moved Nestbox location ~50m |  |  |

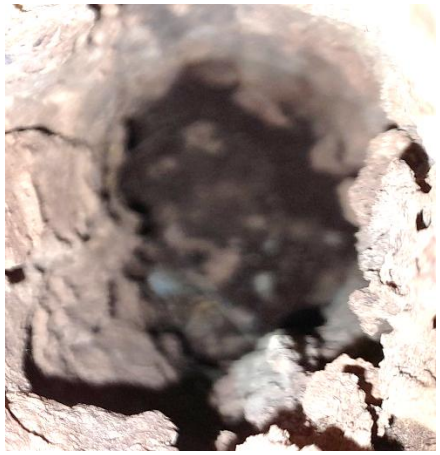
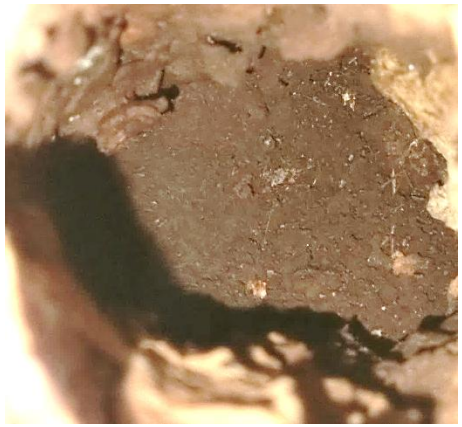
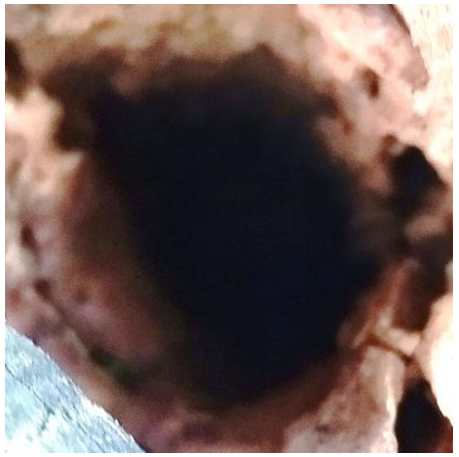
| **NB 47: Old She Oak Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | | |
|  | Nestbox Removed | | |
| **NB 48/53: Old She Oak Reserve** | | | |
| March 2024 | June 2024 | September 2024 (leaves placed in) | December 2024 |
|  | Nestbox replaced |  |  |

| **NB 33: Blackbutt Reserve** | | | |
|---|---|---|---|
| March 2024 - *Antechinus* | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 34: Step track** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 13: Rofe Park** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB3: Lovers Jump Creek Reserve** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 14: Lovers Jump Creek Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 (replaced NB) |
|  |  |  |  |
| **NB 15: Lovers Jump Creek Reserve** | | | |
| March 2024 – *EPP present* | June 2024 | September 2024 | December 2024 (Replaced, added leaves) |
|  |  |  |  |

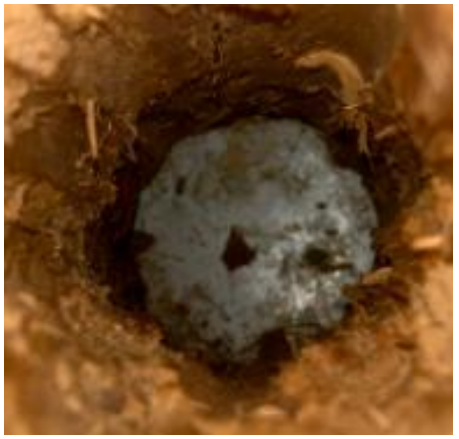
| **NB 17: Lovers Jump Creek Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 20: Lovers Jump Creek Reserve** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

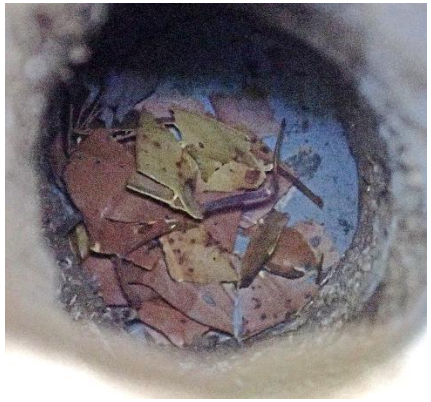
| **NB 29: Lovers Jump Creek Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 35: Darri track** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

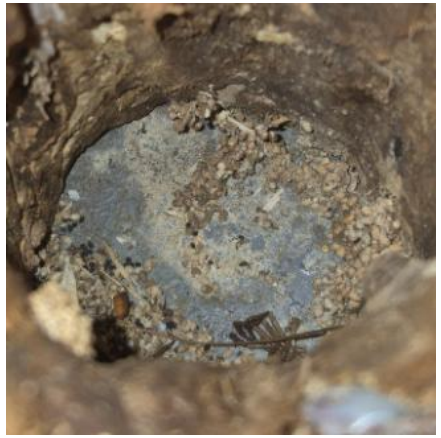
| **NB 19: Cowan Creek Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 – *EPP present* | December 2024 |
|  |  |  |  |
| **NB 21: Cowan Creek Reserve** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

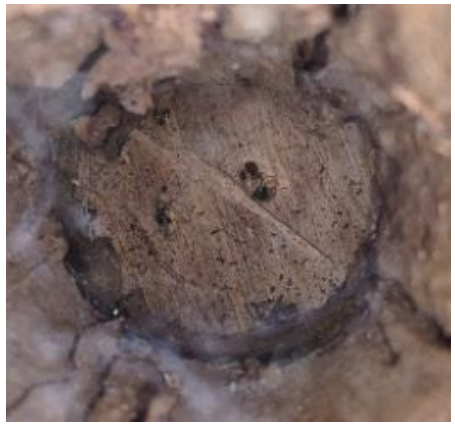
| **NB 39: Cowan Creek Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 52: Cowan Creek Reserve (NTRA)** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB5: Ku-ring-gai Creek Reserve (Warrimoo)** | | | |
|---|---|---|---|
| March 2024 | June 2024 – *multiple EPP present* | September 2024 | December 2024 |
|  |  |  |  |
| **NB6: Ku-ring-gai Creek Reserve (Warrimoo)** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB45: Ku-ring-gai Creek Reserve (Warrimoo)** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB51: Ku-ring-gai Creek Reserve (Warrimoo)** | | | |
| March 2024 | June 2024 – Moved and cleaned | September 2024 | December 2024 |
|  |  |  |  |

| **NB 12: Ku-ring-gai Creek Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |
| **NB 18: Ku-ring-gai Creek Reserve** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
|  |  |  |  |

| **NB 57: Ku-ring-gai Creek Reserve** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
| - | - | Installed September |  |
| **NB 27: Governor Phillip Reserve - East Gordon Park** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
| - | - | Installed September |  |

| **NB 42: Governor Phillip Reserve - East Gordon Park** | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
| | | Installed September |  |
| **NB 43: Governor Phillip Reserve - East Gordon Park** | | | |
| March 2024 | June 2024 | September 2024 | December 2024 |
| | | Installed September |  |

| NB 55: Governor Phillip Reserve - East Gordon Park | | | |
|---|---|---|---|
| March 2024 | June 2024 | September 2024 | December 2024 |
| | | Added August |  |