

Gang-gang Citizen Nesting Ecology Citizen Science Research



Tom Tyrrell Cameron Tyrrell Jacky Fogarty David Cunningham Helen Cross
Roy McDowall Sam Nerrie Jonathan Steinbeck John Brundock

Gang-gangs 1st seen nesting on Red Hill in December 2017

Wondered how significant this was and how many other nesting sites were known



We could find very little information, and the fact that they occur implied that this was not be a nesting area

Usually breed within tall mature sclerophyll forest with dense shrubby understorey, often in secluded valleys

Higgins 1999 *Handbook of Australian, NZ and Antarctic Birds*



**In our area it breeds in the mountain forests...
In winter they feed in the heart of the city But
By September they have returned to the mountains
leaving behind only small parties of non-breeding birds**

Frith 1976 *Birds in the Australian High Country*



We sought advice from Chris Davey of the Canberra Ornithologist Group

Only 1 other nest known in Australia

What was known about Gang-gang nesting ecology was largely derived from the study of caged birds

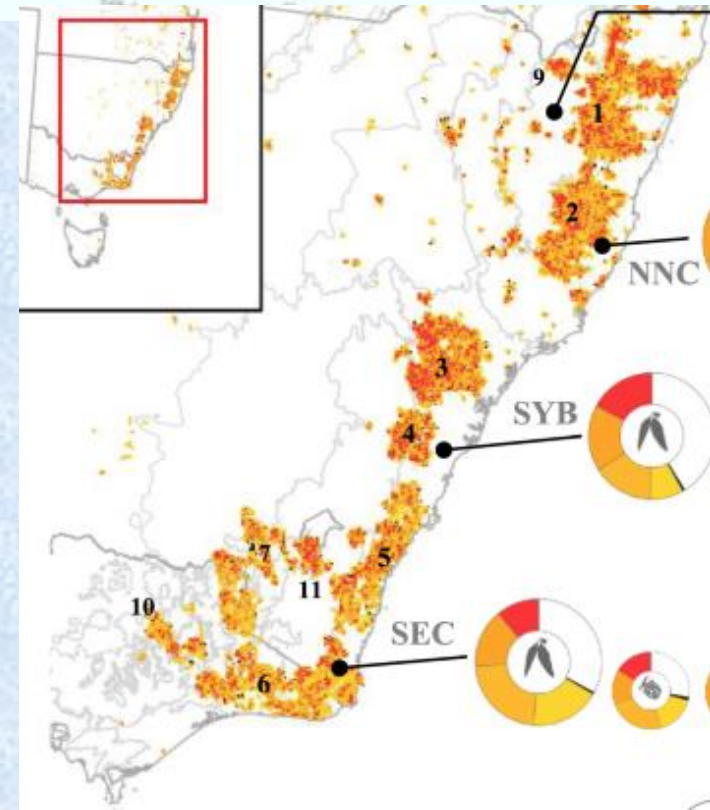
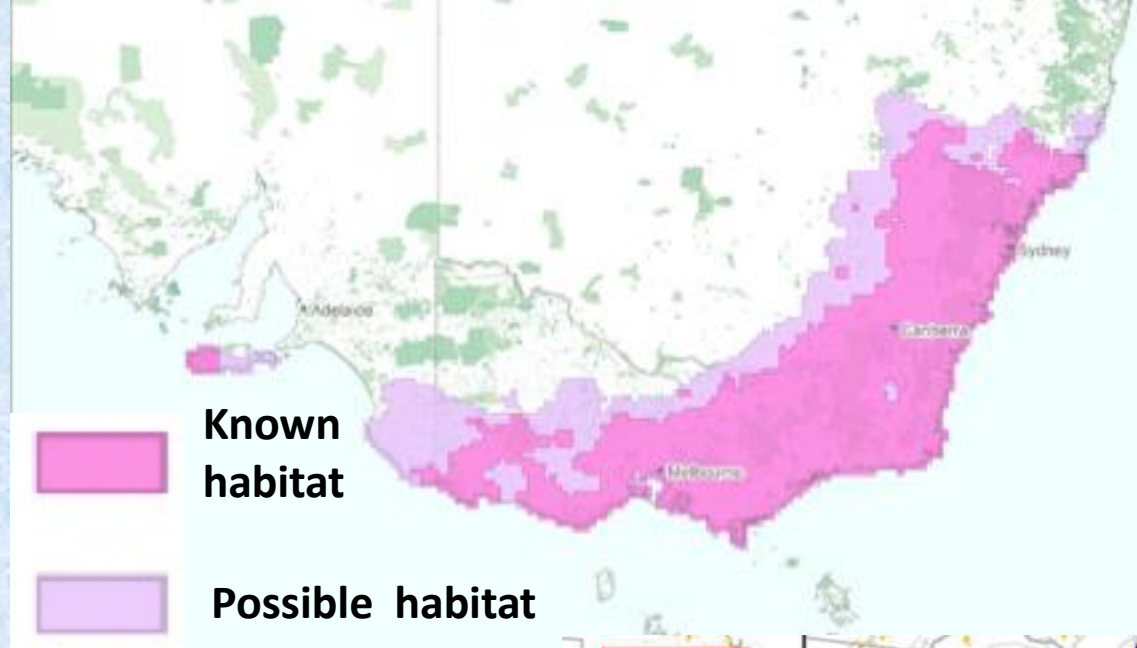
Only occurs in temperate Australia

Listed as vulnerable in NSW since 2005

Listed as endangered nationally in 2022 following 69% decline in reporting rates over 20 years.

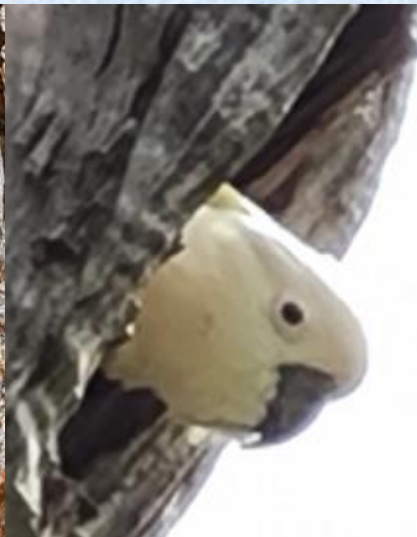
2019 -2020 fires burnt 30% of habitat and killed an estimated 10% of the population

ACT population seems to be steady or slightly increasing



Main threats are thought to be

- **Habitat loss (forestry, agriculture, urban encroachment)**
- **Wildfire and prescribed burns destroying hollow bearing trees**
- **Other Climate change factors (warmer temperature uneven rainfall)**
- **Competition from other hollow nesters**





1 Gang-gang Cockatoo at Symonston, ACT

Edit Feature Significance



Location information

Coordinates	-35.354340	149.141850
Maps	Callum Bra...	
Places	Symonston, ACT	

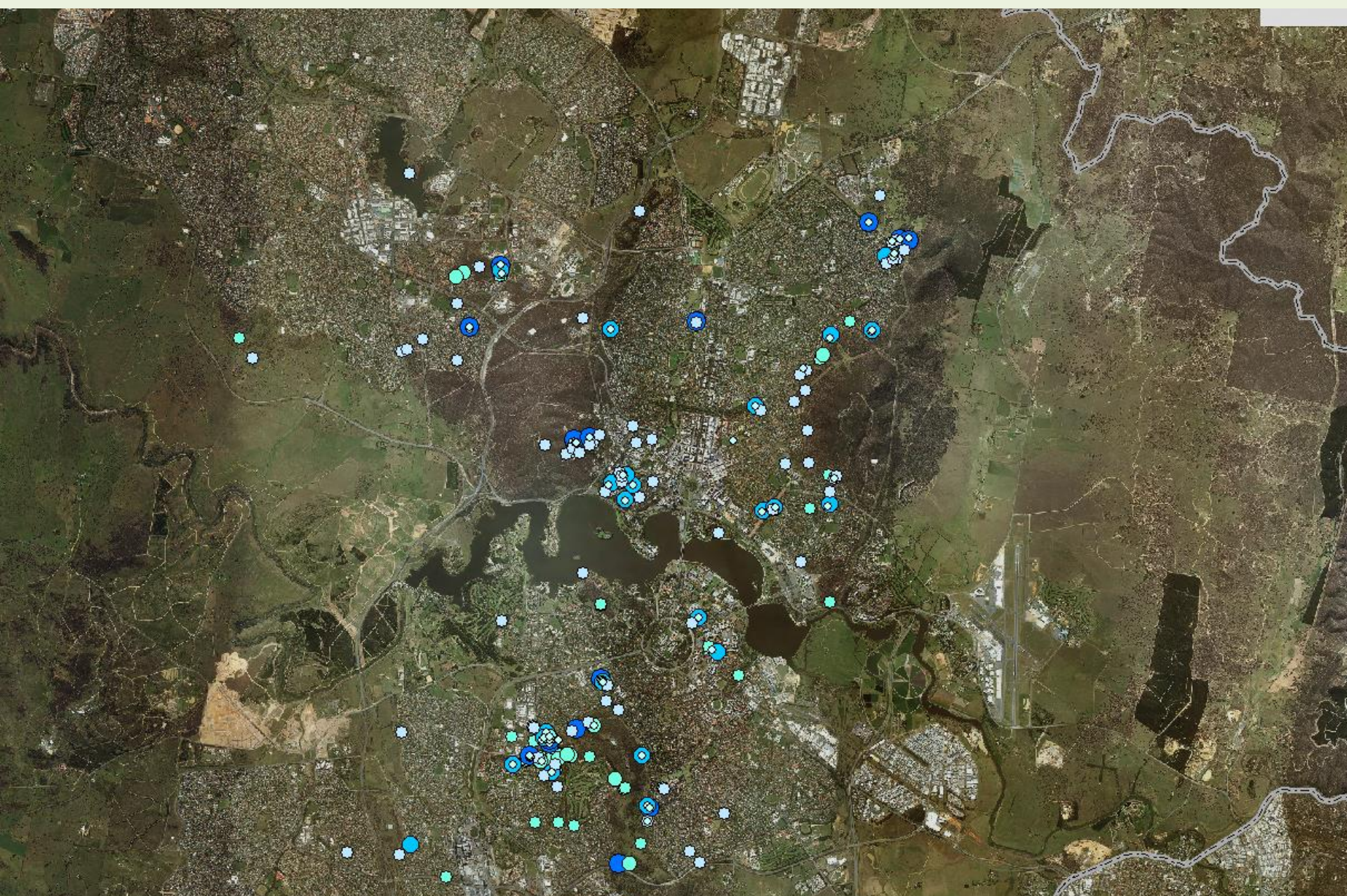
Species information

Sensitive	<input checked="" type="checkbox"/>
Very Rare / Threatened	<input checked="" type="checkbox"/>
Non-Invasive	<input checked="" type="checkbox"/>

Sighting information

**To help us find more nest trees
 We asked for people to report any Gang-gang
 nest activity on Canberra Nature Map or
 Inaturalist**

About 70 people repeatedly watched prioritized trees, or we surveyed with camera poles



**By end of 2021-22 season
Had 950 reported “activity
around hollow sightings”**

*** 700 ACT**

*** 250 elsewhere**

**Monitored over 400 of
these**



**52 nests in 49
trees**

**All within 250m
of urban edge**

**Three within
30m of houses**

**Most close to
Blue gum
plantings that
make up 1/3 of
Gang-gang diet**

**Tend to be in
Clusters**

**Only 1/3 of
nests used in
one year**

Monitoring for the Endangered Gang-gang Cockatoo (*Callocephalon fimbriatum*)

Research objective:

Estimate abundance and establish a long-term monitoring protocol for Gang-gang Cockatoos in Canberra

Difficult Bird Research Group

Stacey Taylor, supervised by Dr Dejan Stojanovic & Dr Fernanda Alves de Amorim

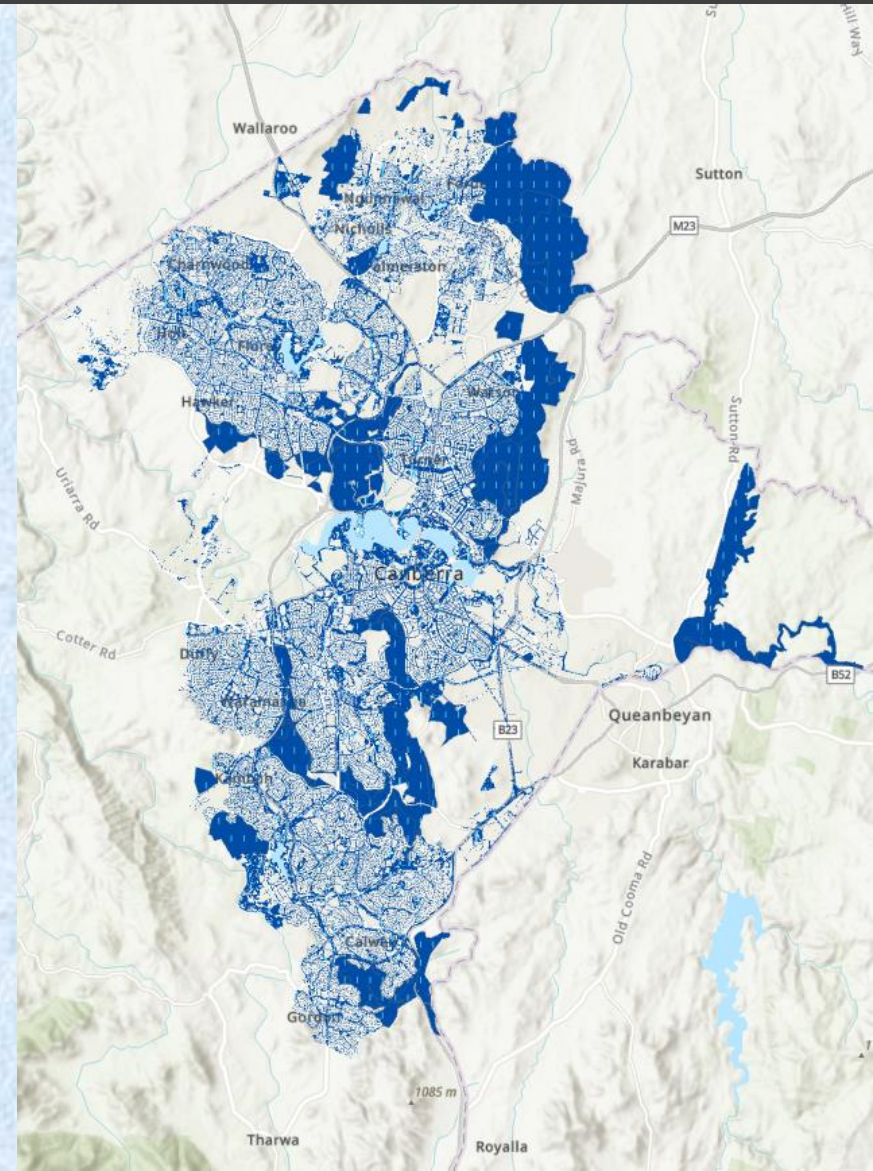


Australian
National
University



Field study

- Distance sampling surveys were conducted between September and October 2021.
- Study region (17650 hectares) included Canberra Nature Park reserves and urban habitat with canopy >6m.
- Line transects were laid across the region in a grid design.
- Each transect was surveyed once according to distance sampling protocol.



Field study Results

- Between 3-5 surveyors were engaged for 17 survey days.
- Approximately 87km of transect was surveyed across the study region.
- **35** individual Gang-gangs were detected during surveys.

	Group size				Total
	1	2	3	4	
Gang-gang detections	12	8	1	1	22
Females	2	7	2	2	13
Males	9	9	1	2	21
Undetermined	1	-	-	-	1



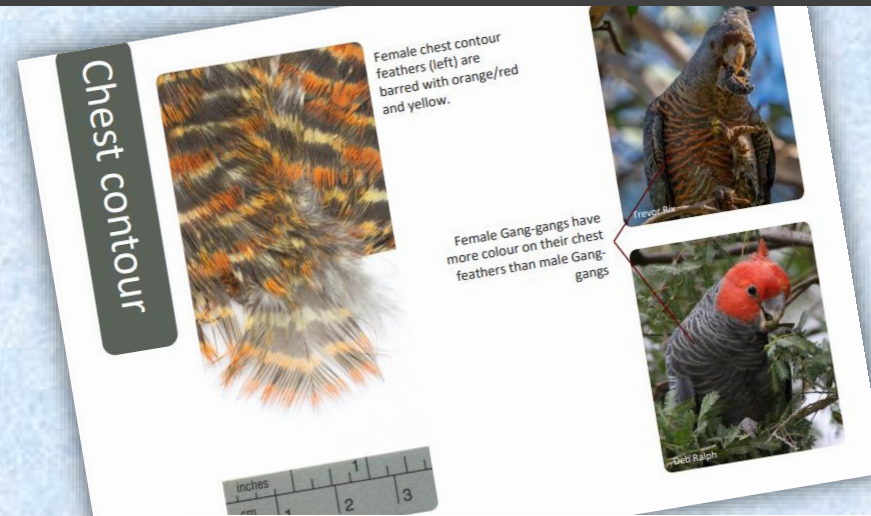
(Preliminary) conclusions

- Far fewer Gang-gangs in Canberra than we anticipated!
- Resource requirements may be prohibitively high to effectively monitor the abundance of Gang-gangs in the ACT and other areas.
- There is a need to look at other options to monitor the species while filling critical knowledge gaps.
- Undertaking genetic studies is one way to monitor Gang-gangs and understand their viability over time.



Feather collection project

- This project aims to better understand the population genetics of Gang-gang Cockatoos in the region through non-invasive feather collection
- Genetic information extracted from feathers will provide insights into their:
 - ‘effective population size’
 - habitat use and mating systems
 - conservation status across their range
- Information will inform ongoing monitoring and conservation action for Gang-gangs
- **Please help by collecting feathers!**



scan



- 1 Primary
- 2 Secondary
- 3 Tail
- 4 Coverts
- 5 Contour
- 6 Head
- 7 Crest
- 8 Lesser coverts



Most Gang –gang feathers are predominately grey

Gang-gang Cockatoo feather identification handbook

Understanding our local Gang-gang
populations through genetic
analysis



Australian
National
University

Supported by



ACT
Government
Environment and
Sustainable Development



Larissa Dann

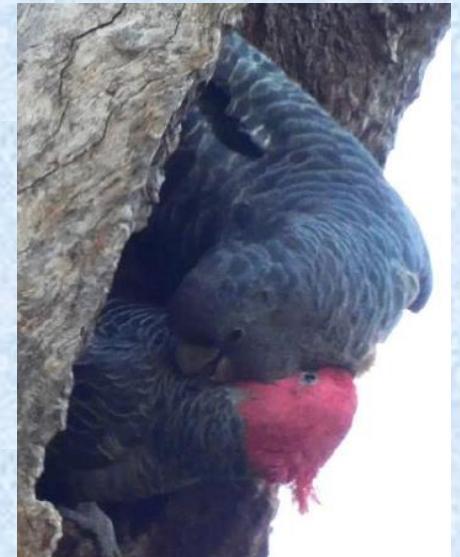


Red Box baby boy
Born 24/12/2019

Duck Down
2/3/2018

Duck Down
20/01/2019

- **Confirmed 4 week incubation + 6- 8 chick rearing times**
- **1- 3 eggs per nest, 2 the not common**
- **Fledge ratio 1 male:0.7 females**
- **Fledging rate per nest of 0.7**
- **Documented nesting behaviors**





**At least one adult and usually both are present at fledging
They encouraging the young to leave through calling, being close by, making repeated short flights from the hollow and if the young follow rewarding them with food.**

This process can take a number of days.



Gang-Gang nesting tell-tale behaviours ¶



¶ **Purpose** ¶

These guidelines detail Gang-gang behaviours associated with nesting. Their primary aim is to assist in the search and identification of nesting hollows. It is hoped that through finding and observing hollows across its range a better understanding of the Gang-gangs nesting ecology will emerge. ¶

¶ **Hollow Checking** ¶

Gang-gangs peer into hollows all year round and will enter hollows to access pooled water. A pair that had fledged chicks the day before were observed.

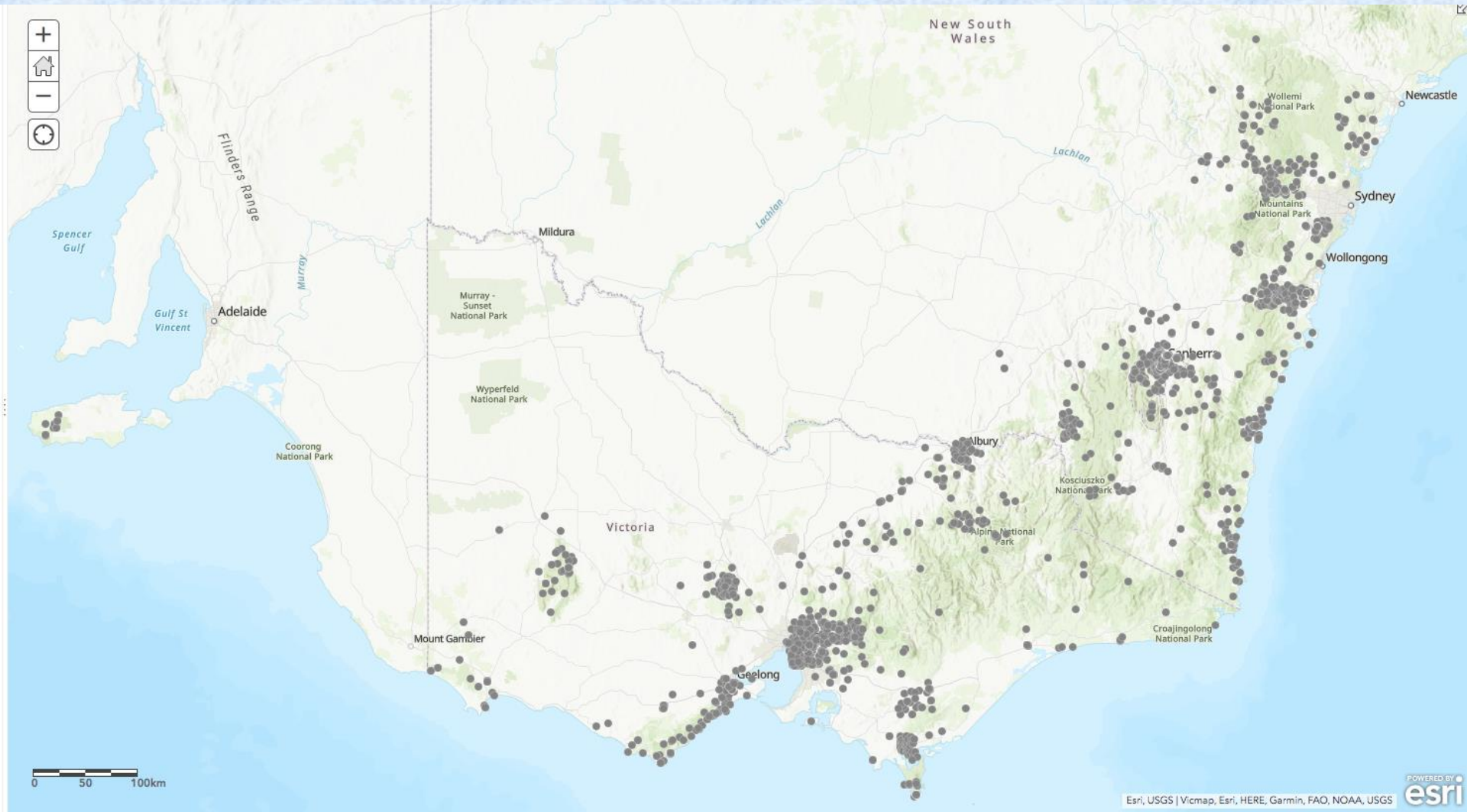
<http://redhillregenerators.org.au/wp-content/uploads/2022/07/Gang-gang-tell-tale-nesting-behaviours-Mulvaney-Tyrell-Davey-2022.pdf>



Wide diet of 5 main food groups but Blue Gum consists of 1/3 of feeding observations

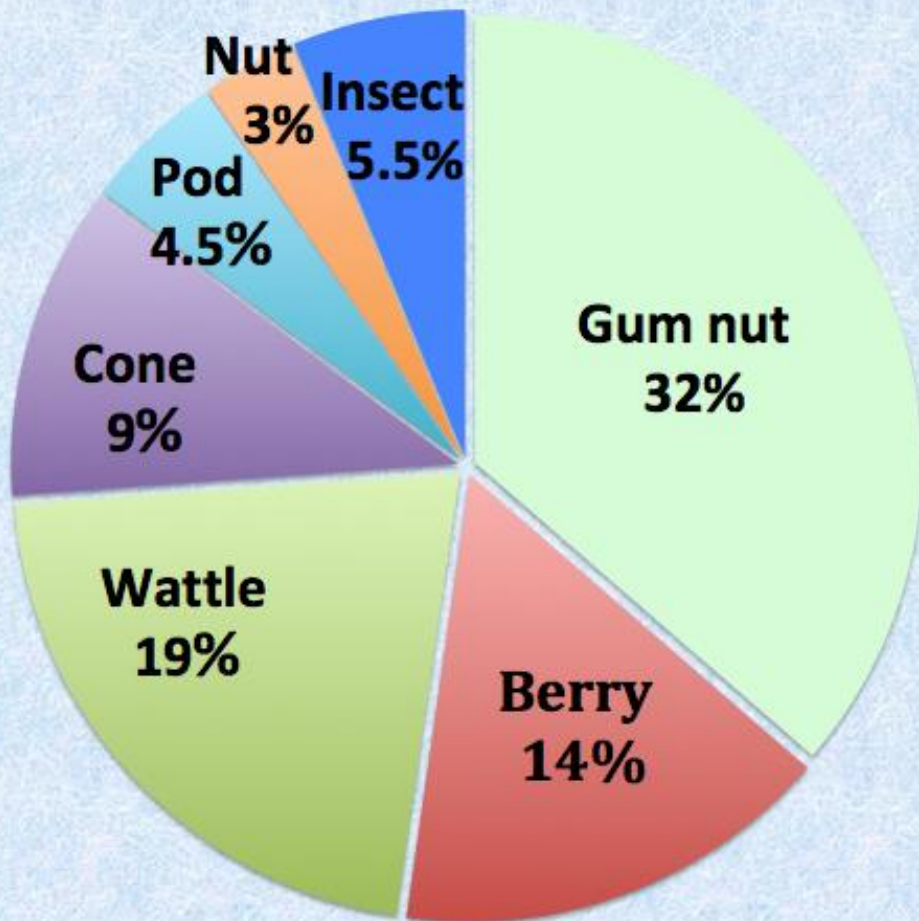


4111 sightings of feeding Gang-gangs
16798 feeding events (No of birds x days feeding)

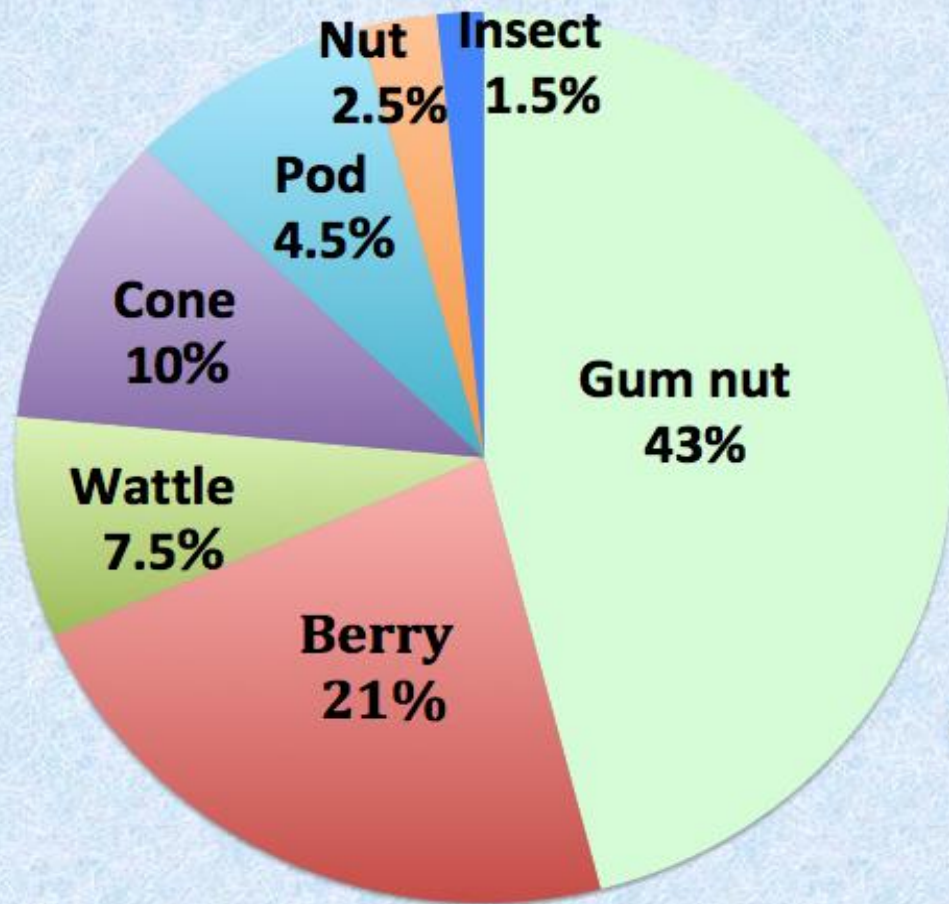


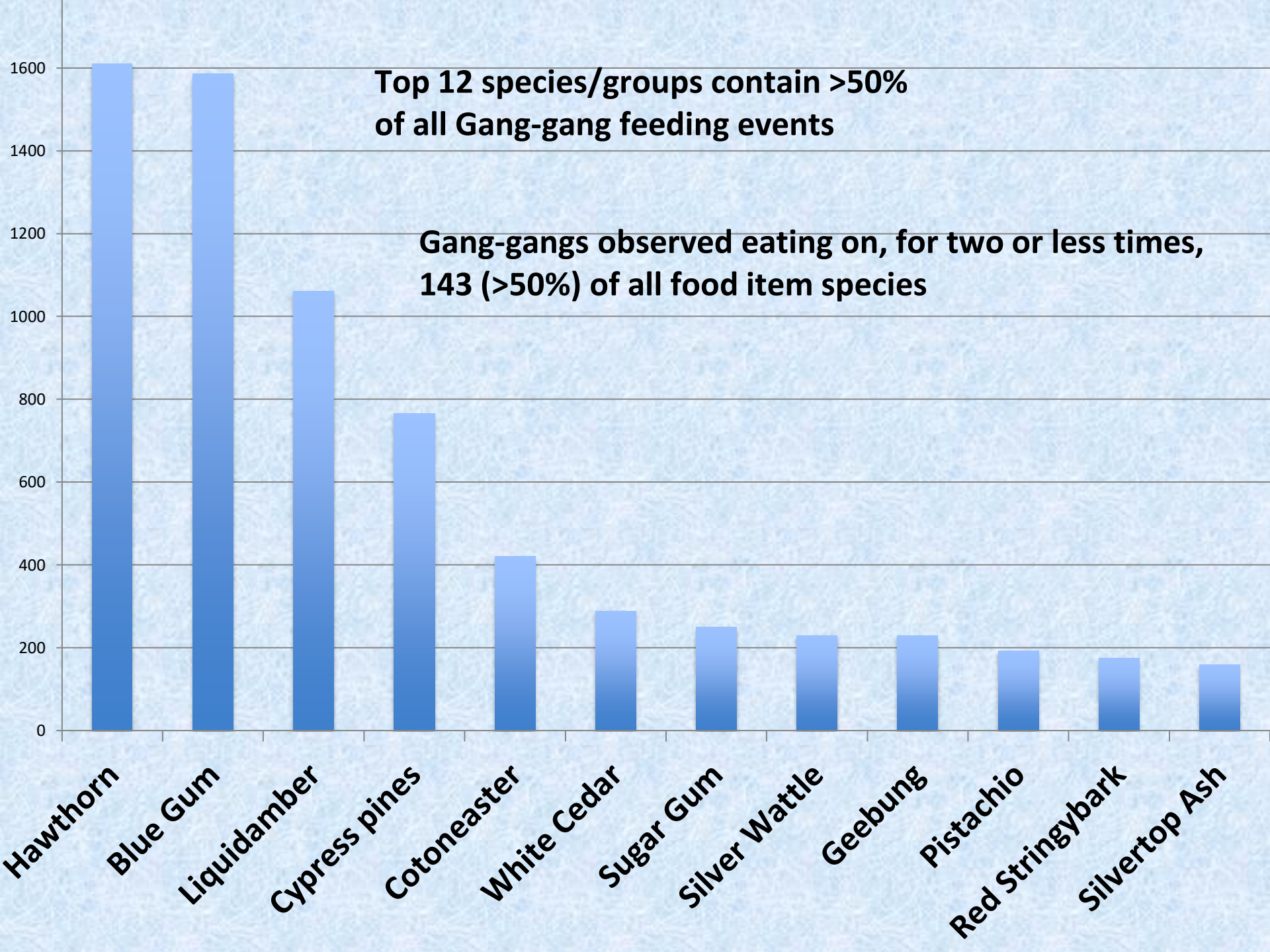
1262 sightings, 6893 feeding events in the ACT

National Food Group
Species n = 275



National Food Group
Feeding events n = 16798





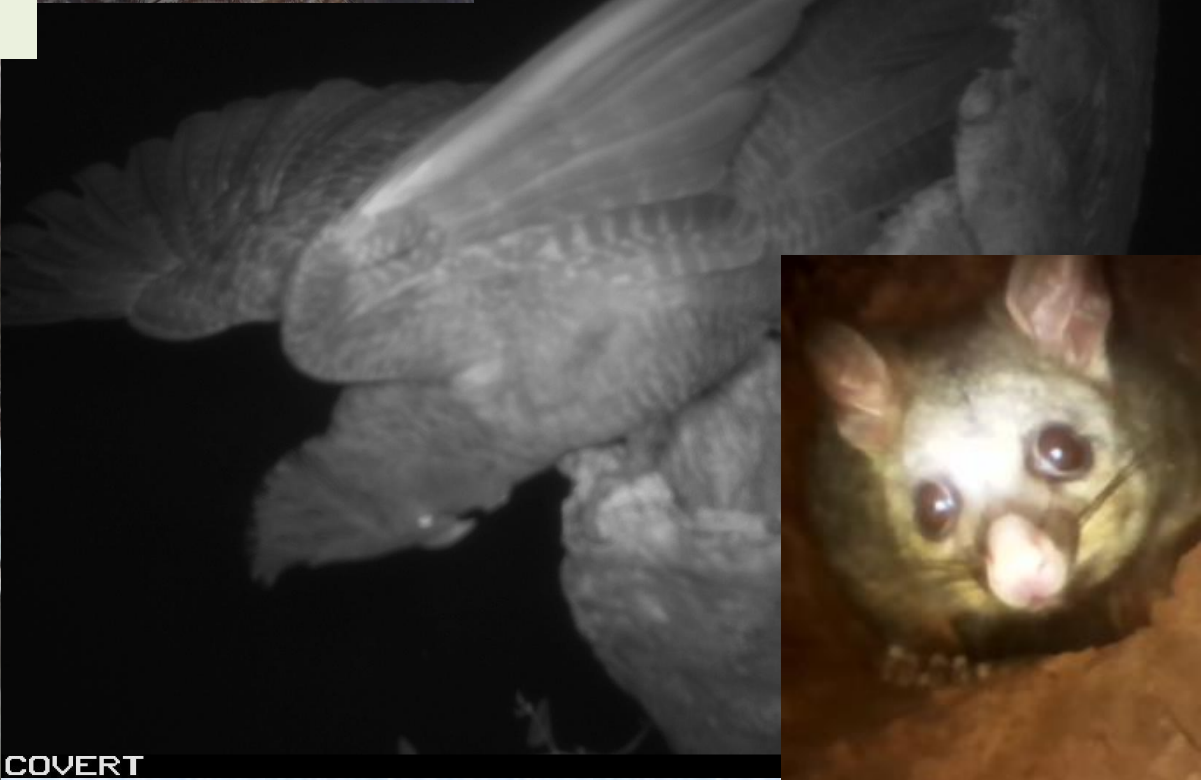
- Eucalyptus globulus
- Eucalyptus viminalis
- Eucalyptus bridgesiana
- Eucalyptus macrorhyncha
- Eucalyptus sp.
- Eucalyptus mannifera
- Eucalyptus rossii
- Eucalyptus cinerea
- Eucalyptus goniocalyx
- Eucalyptus melliodora
- Other



85% of feeding of eucalypt nuts in Acton is on Blue Gums



No evictions from nests by bird hollow competitors. A range of possible predators



COVERT



Probable possum predation of eggs, but second pair then successful in same hollow



8 Jan



9 Jan



Where was missing chick?



Kent Street Veterinary Clinic

January 9, 2020 · 🌐



We got a very special visit from this baby Gang-gang Cockatoo today, we checked him over and gave him some apple which he loved. He's now in the great care of ACT Wildlife. [#wildlife](#)
[#ganggangcockatoo](#)





Chick successfully returned to hollow and fledged



Chicks only fed at hollow rim 3-11 days prior to fledging – can sometimes fall prior to fully developing wing feathers



**All returns to hollows have resulted
in fledging success**

Hollow Characteristics (N=41)

- Average height above ground = 6.5m
- Height range 3m – 9.4m
- Average hollow depth = 55cm
- Hollow depth range 15cm – 129cm
- Average entrance height = 20.5cm
- Range in entrance width 7cm – 48cm
- Average entrance width = 15cm
- Range in entrance width 7cm – 32cm
- Average floor diameter = 20cm
- Range in floor diameter = 12 cm - 33cm



**Nest boxes,
based on
measurements
being trialed
by ACT
Government**

**No evidence
that Gang-gangs
use nest boxes
in the wild**





**Don't seem fussing about which species
of gum they nest in**

Planted
River
Peppermint 2

Planted
Sydney Blue
Gum 2

Native Trees
Blakey's Red Gum 15
Scribbly Gum 7
Brittle Gum 7
Yellow Box 5
Dead 6

Planted
Brittle Gum 1

17

191 of the Canberra hollow sightings poled/monitored for occupancy In 2021/2022 season

- 46% empty
- 9% Gang-gang nest hollow
- 10% empty but with chewed bark (GG activity)
- 12% Brush-tailed Possum
- 5% leaf-lined suggesting Possum or Galah use
- 9% Flooded (Gang-gang water source)
- 4% Bees
- 3% Wood-duck
- 3% Sulphur Crested Cockatoo
- 1% Galah
- 1% Crimson Rosella, Boobook Owl





Gangs-gangs prepare nest by lining base with woodchips

Some pairs prepare multiple nests

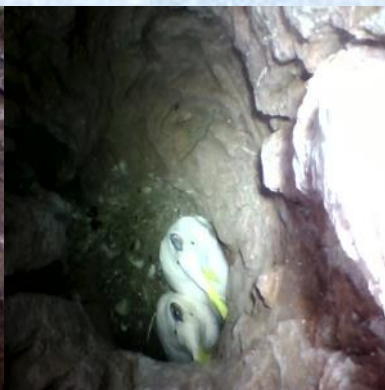
Some nests may be prepared by infertile couples

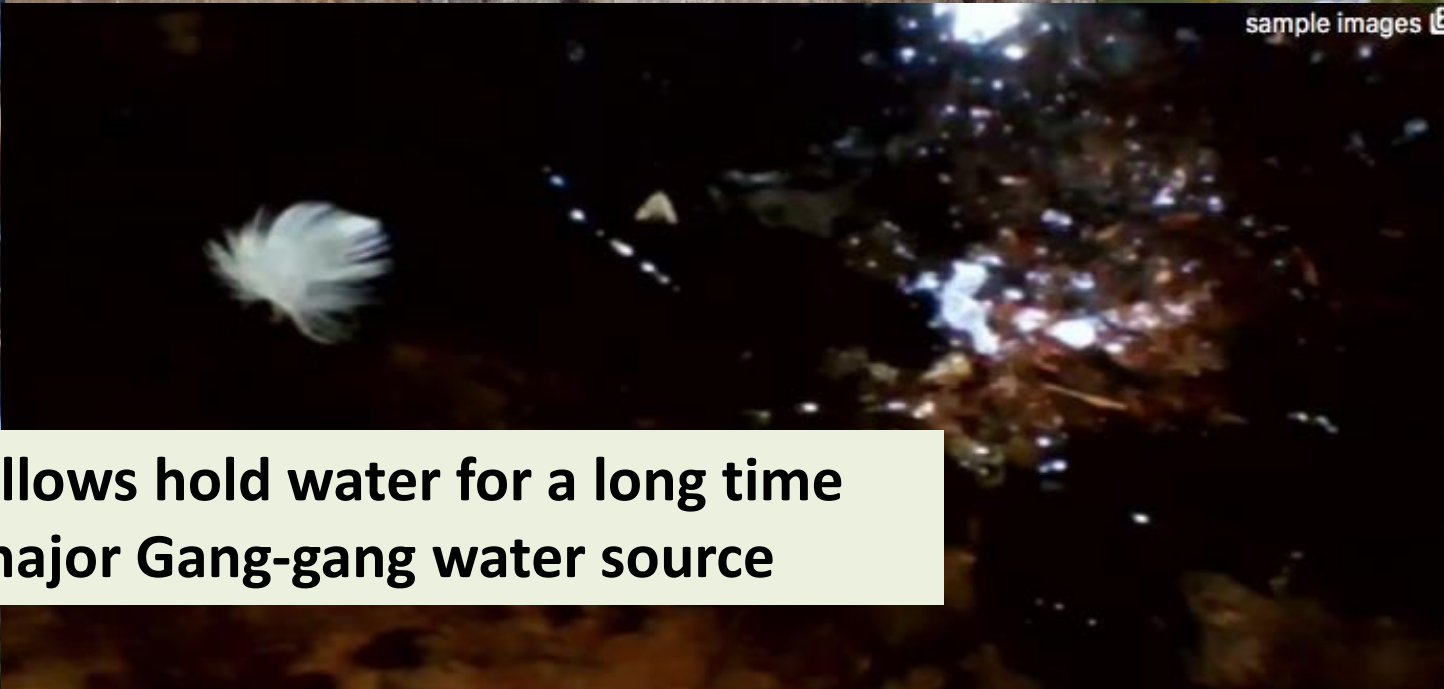
Some nests may have had eggs or chicks removed



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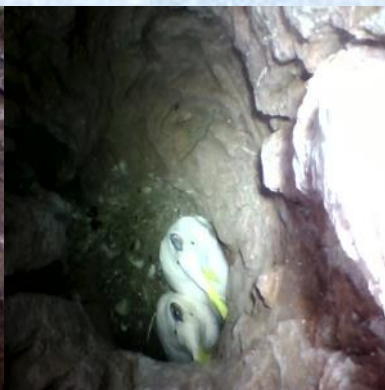


sample images

Flooded hollows hold water for a long time and are a major Gang-gang water source

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Climate and Hollow Selection

Seasons	2018-2020	Spring 2020-2022
Annual rainfall	532, 446 mm	850, 861 mm
Mean max temp	22°C, 22.6°C	20.4°C, 19.6°C
No of clutches	26	32
No of nest sites	24	29
No of clutches in dead trees	0	6
No of dead tree hollows	0	5

?





When Canberra experienced 40°C+ days two chicks die of heat exhaustion

**Three of four chicks found
on ground during very hot
smoky days**



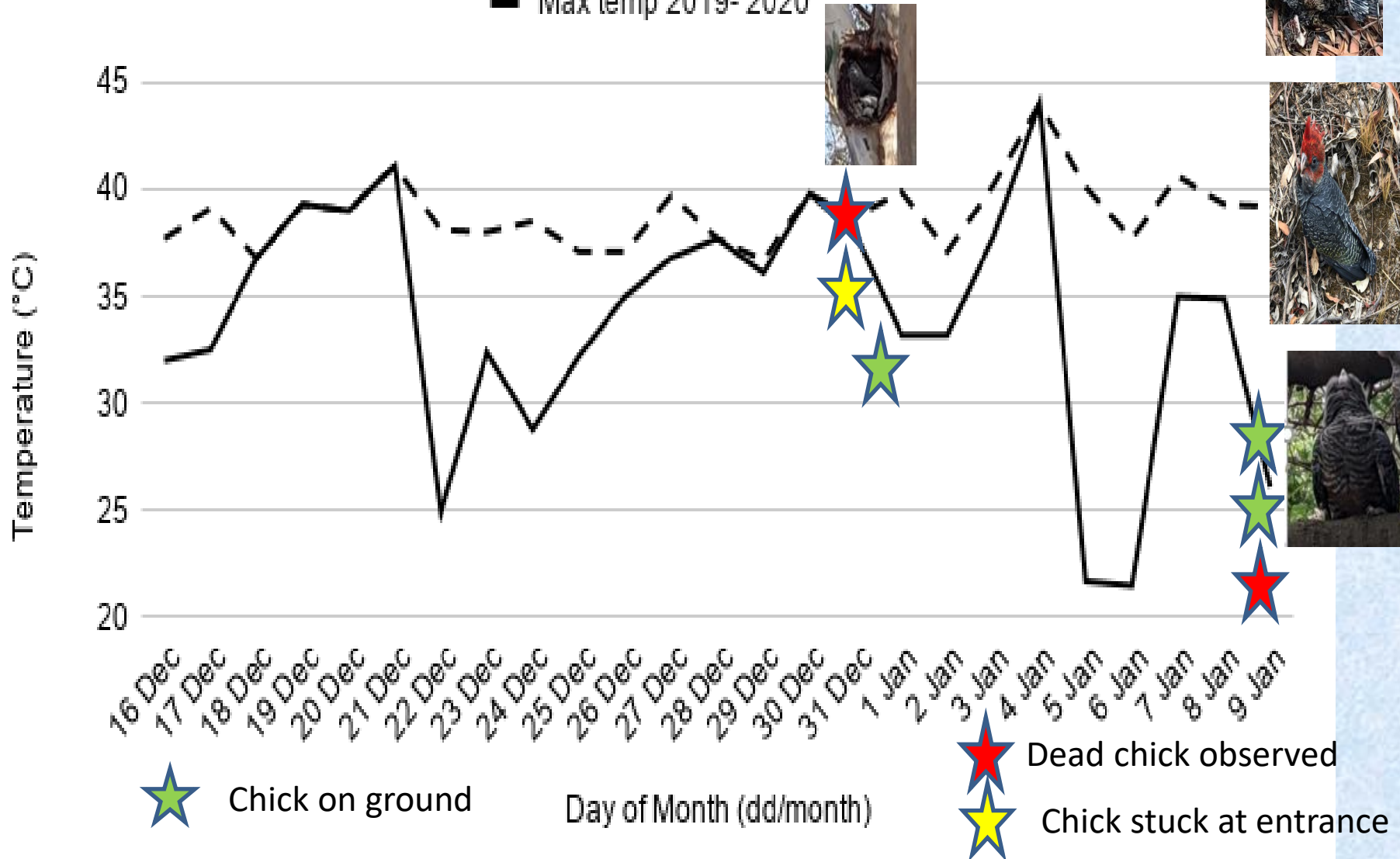


**One chick also stuck at
hollow entrance**

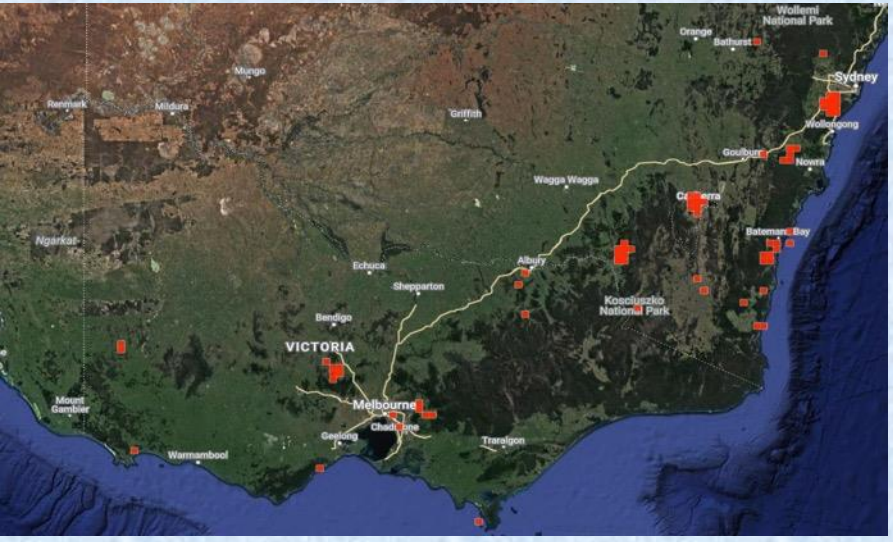
Maximum Temperature (°C) for the days 6th Dec- 9th Jan

— Highest recorded temperatures over 16th Dec- 9th Jan since 1921

— Max temp 2019- 2020



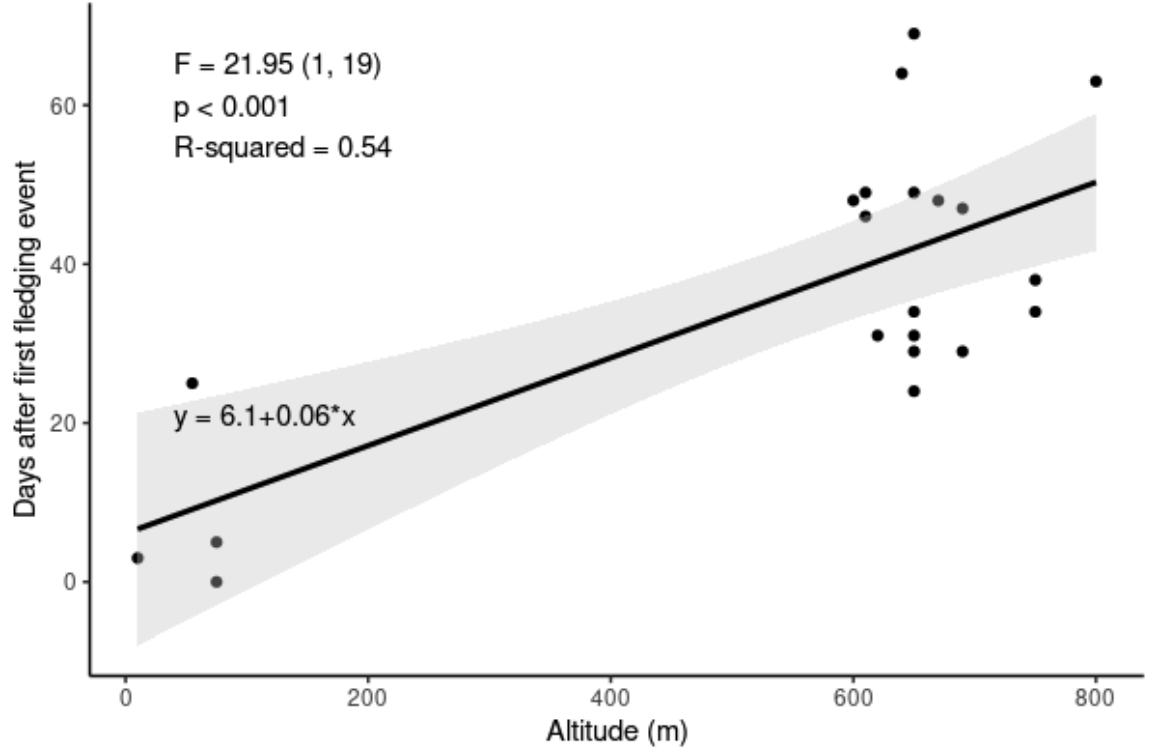
Location of 950 hollow activity sightings



25 nest hollows (17 Canberra, 2 Campbelltown, 2 Wombat SF, Melbourne, Tumbarumba, Cooma + Moruya)



24 fledglings



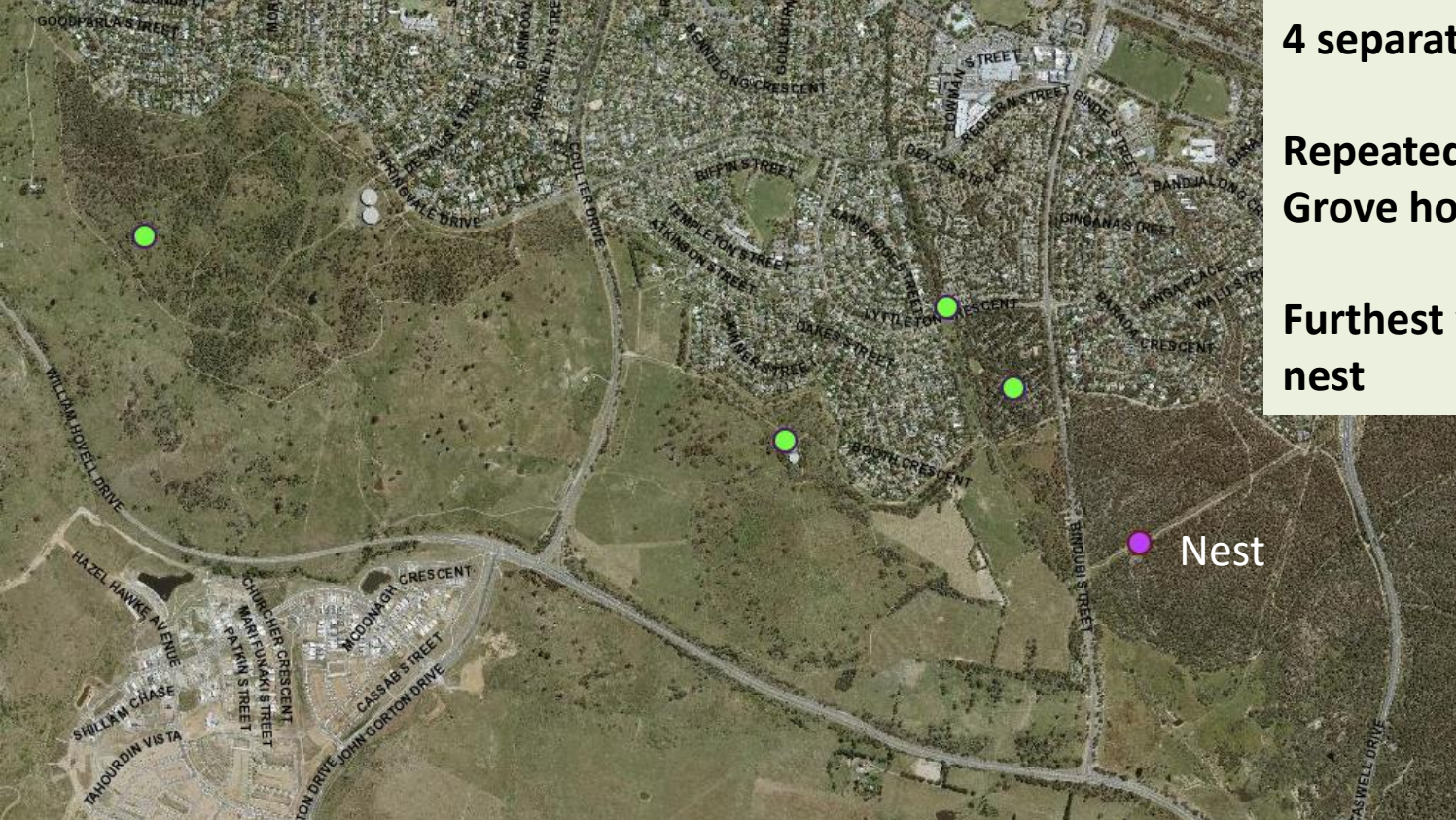
Significant relationship between time of fledgling and altitude and some high temperature parameters



22 December

North of Berry - 350m altitude

What year do you think



4 separate foraging locations

Repeated visits to Wybalena Grove house

Furthest was 3.89Km from nest



Daily visits to feed on
Sunflower seeds





Sunflower seed is the Macdonald's of the Gang-gang world

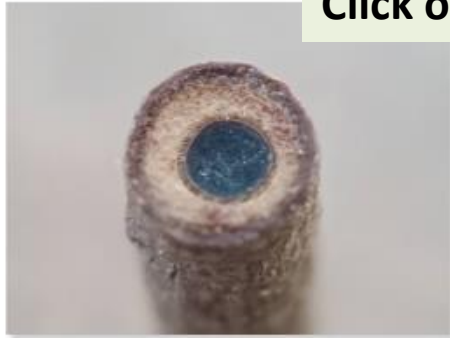
- **high fat content (>50%) that fills birds up quickly**
- **Low in Vitamin A**
- **Leads to problems in reproduction, sight, bone formation, blood clotting, slower growth, more susceptible to disease.**



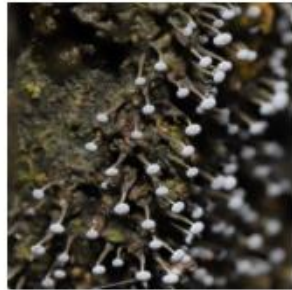
**Canberra Naturemap
coverage**

<https://canberra.naturemapr.org>

Click on Add a sighting



Latest sightings



It's easy to contribute

Upload your sightings [via the web](#) or via the NatureMapr smartphone app:



See our [How to guide](#) for more tips to help you get started.

Announcements

📣 [Bluetts Block \(we need your help\)](#)

4 Feb 2022

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To upload a sighting, please complete the following form or see our [How To guide](#) for help.

Media

JPG image format (.jpg), MPEG4 audio format (.m4a), MP3 audio format (.mp3) | filesize < 10MB

Tip: Uploading multiple media files capturing different features of the plant or animal makes it easier to identify.

Note: Apple iOS prevents GPS and date information from being uploaded with your images for privacy reasons. Upload via the [NatureMapr iOS App](#) instead.

Location

Map

Point of interest

Coordinates

The system will automatically obtain a GPS location and date from your image(s).



Click in grey box and follow prompts to jpeg image file

Or drag image file from desktop into grey box



Remove file

If needed add date and location by clicking location on map or adding coordinates directly

Note: Apple iOS prevents GPS and date information from being uploaded with your images for privacy reasons. Use the [NatureMapr iOS App](#) instead.

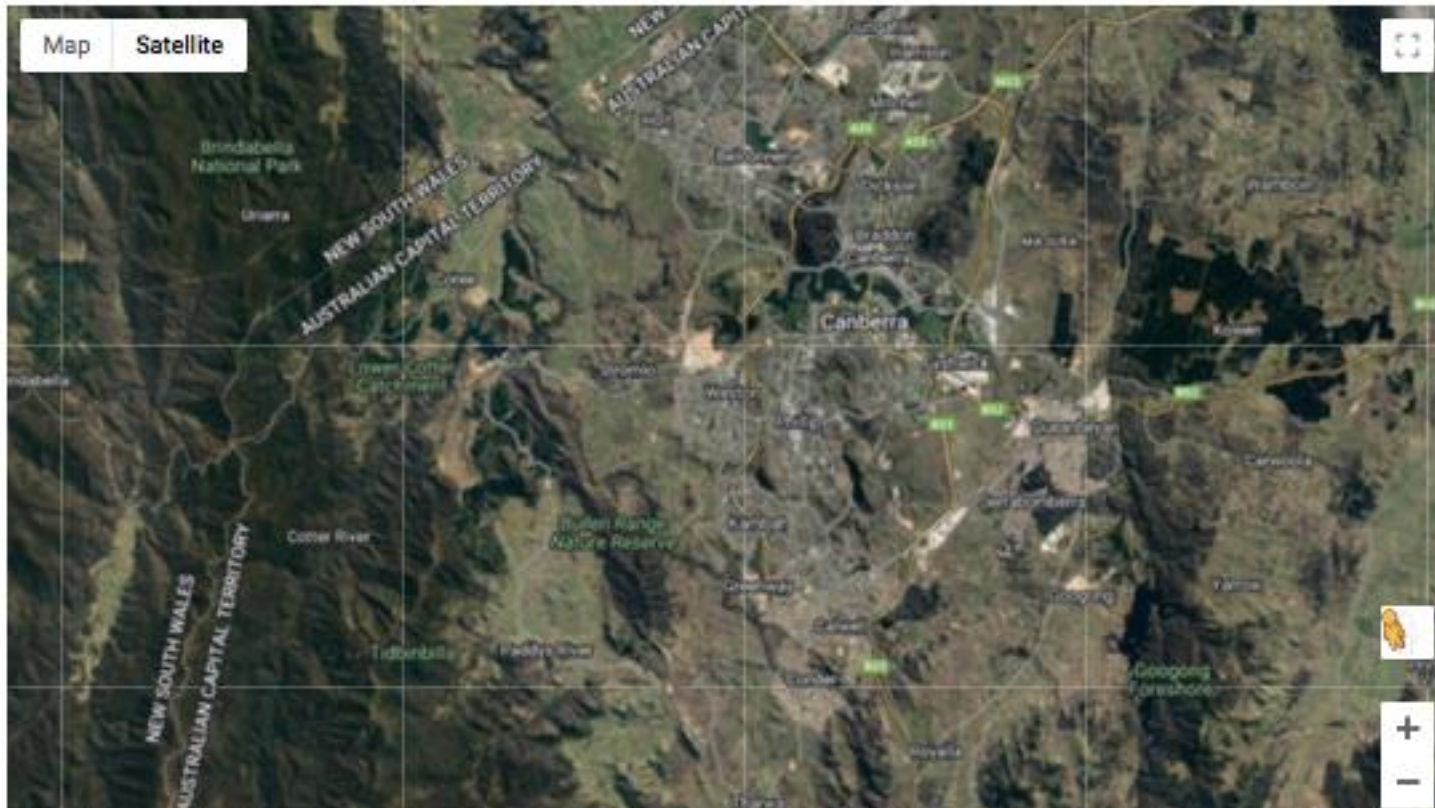
Location

✓ Date: 12 Jan 2021 7:32 AM

Map

Point of interest

Coordinates



Location

Location: -35.333152, 149.114926

Date: 12 Jan 2021 7:32 AM

Map

Point of interest

Coordinates

Latitude (decimal)

-35.333152

Longitude (decimal)

149.114926

Altitude (decimal)

E.g. 600.2

Other formats

Easting

E.g. 685725

Northing

E.g. 6079146

UTM zone

UTM Zone E.g. 55

Latitude (degrees)

E.g. -37

Latitude (minutes)

E.g. 3

Latitude (seconds)

E.g. 48.3

Longitude (degrees)

E.g. 149

Longitude (minutes)

E.g. 21

Longitude (seconds)

E.g. 8.4

Private property

Suppress the location of this sighting from public view?

Select abundance category from drop down menu

Select wildlife category - extra questions will appear when you select Gang-gang

Abundance

Abundance (range)

Abundance (value)

Identification

Category 1

Category 2

Species

Found a species we don't have?

Override workflow and confirm immediately?

Additional information

Nesting site

Was this a nesting or breeding site?

What is Gang-gang eating

Please record to species or lowest taxonomic level that you can, and include pictures of food items in sighting

Gender

What was the gender?

Behaviour

What is the animal doing at the hollow?

Additional information

Nesting site

Was this a nesting or breeding site?

What is Gang-gang eating

What is Gang-gang eating

Please record to species or lowest taxonomic level that you can, and include pictures of food items in sighting

Repeat Observation

Is this a repeat observation at this location

Description

Description (private)

Enter some notes that only you can see

Gender

Male

What was the gender?

Behaviour

Is perched in or near the ho

What is the animal doing at the hollow?

[Report this sighting](#)

Answer relevant questions

Click on Report this sighting



Canberra Nature Map

About -

Locations -

Species -

Add a sighting -



Quick Search

- Maps
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- Places
- Distribution map
- Project boundary



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kasiaaus 🏆 🏆 5.2K

Maps = All Reserves, state forest and Queanbeyan Palerang Council

Places = Google maps place names

Queanbeyan-Palerang Regional Council

Page 1 of 123 - image sightings only

12247

73

103944

View distribution

Polygons

- Queanbeyan West, NSW
- Queanbeyan East, NSW
- Queanbeyan, NSW
- Bicentennial Park Queanbeyan
- Queanbeyan Nature Reserve
- Queanbeyan-Palerang Regional Council



Queanbeyan-Palerang Regional Council (QPRC) is located in the south east and tablelands region.

Home → Maps → Queanbeyan-Palerang Regional Council → Queanbeyan-Palerang Regional Council [field guide | sightings | surveys]

Queanbeyan-Palerang Regional Council

Overview

Queanbeyan-Palerang Regional Council (QPRC) is located in the south east and tablelands region. The council has an area of 5,319 square kilometres and lies between the eastern boundary of the ACT and the coastal escarpment on both sides of the Great Dividing Range.

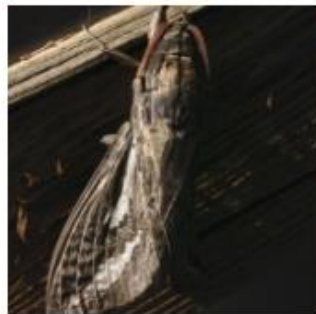
More information: [QPRC Homepage](#) or [Visit the QPRC region](#)

3185 species

 *Aaaaba nodosus*    (a Jewel beetle)



 *Abantiades atripalpis*    (Bardee grub/moth, Rain Moth)



 *Abantiades* sp. (genus)    (A Swift or Ghost moth)



 View distribution

 Edit

 Export

 Polygons

Conservation Level

All conservation levels (change?)

Invasiveness

All invasiveness levels (change?)

Categories


 Uncategorized species

 Plants

 Birds

 Fungi

 Fossils & Geological Features

 Marine Algae & Seaweeds

 Mammals

 Mosses, Lichens, Liverworts, etc

 Reptiles and Frogs

 Insects

 Other Arthropods

 Other Invertebrates

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20 species

 *Agapornis roseicollis*    (Rosy-faced Lovebird)

 *Alisterus scapularis*    (Australian King-Parrot)



 *Cacatua galerita*    (Sulphur-crested Cockatoo)





 *Cacatua sanguinea*    (Little Corella)



 *Callocephalon fimbriatum*    (Gang-gang Cockatoo)



 [View distribution](#)  [Edit](#)

 [Export](#)  [Polygons](#)

Conservation Level

All conservation levels ([change?](#))


Invasiveness

All invasiveness levels ([change?](#))

Moderators


 Neville

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ACT Most Wanted!

Birds To Look Out For

Namadgi Sub-alpine Plants need help

Nasty Weeds, Please Report

Unidentified sightings

Uncategorised species

Plants

Birds

Fungi

Fossils & Geological Features

Marine Algae & Seaweeds

Mammals

Mosses, Lichens, Liverworts, etc

Reptiles and Frogs

Insects

Other Arthropods

Other Invertebrates

Fish



Latest sightings



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kasiaaus 🏆🏆 5.2K

jb2602 🏆🏆 4K

CathB 🏆🏆 3.6K

Tapirlord 🏆🏆 3.5K

Bristle Flies (Tachinidae)

43 species

🔗 *Amphibolia (Amphibolia) ignorata* 📍 📅 📍 (A bristle fly)



🔗 *Amphibolia (Amphibolia) sp. (genus & subgenus)* 📍 📅 📍 (A Bristle fly)



🔗 *Amphitropesa elegans* 📍 📅 📍 (Bristle fly)



🔗 *Chaetophthalmus sp. (genus)* 📍 📅 📍 (A bristle fly)

🔗 *Chetogaster sp.* 📍 📅 📍 (Bristle fly)



[📄 Edit](#) [➕ Add species](#)

[📄 Export](#)

Conservation Level

All conservation levels ([change?](#))

Invasiveness

All invasiveness levels ([change?](#))

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