


From monoliths to clusters:

transforming ALA's infrastructure

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18 October 2018

 **Atlas of Living Australia**
ala.org.au

Log in

Start exploring ▾ Search & analyse ▾ Participate ▾ Learn about the ALA ▾




The **Atlas of Living Australia** is a collaborative, national project that aggregates biodiversity data from multiple sources and makes it freely available and usable online.

Occurrence Records
78,235,179

Species
122,429

Data downloads
1,692,124

Registered users
42,427



Search for Ugly Chalkcap returned 16 results.

Related Searches

BHL Literature

Occurrence records (69)

Refine results

Section

Locality (7)

Common Name (5)

Species (4)

Taxonomic rank

Species (4)

Recorded in Australia

Yes (4)

Lifeforms

fungi (4)

Taxonomic status

Accepted (4)

Results per page 10 ▾

Sort by best match ▾

Sort order descending ▾

Download

species: *Russula acrolamellata* McNabb – Ugly Chalkcap

Kingdom: Fungi

Ugly Chalkcap

Record a sighting/share a photo Occurrences: 69

Common Name: Ugly Chalkcap

Ugly Chalkcap

species: *Russula miniata* McNabb – Pinky Chalkcap

Kingdom: Fungi

Pinky Chalkcap

Record a sighting/share a photo Occurrences: 1

species: *Russula griseoviridis* McNabb – Dreary Chalkcap

Kingdom: Fungi

Dreary Chalkcap

Record a sighting/share a photo Occurrences: 26

species: *Russula albolutescens* McNabb – Creamy Chalkcap

Enter your location or address:

Pullman Albert Park

Search

E.g. a street address, place name, postcode or GPS coordinates (as lat, long)

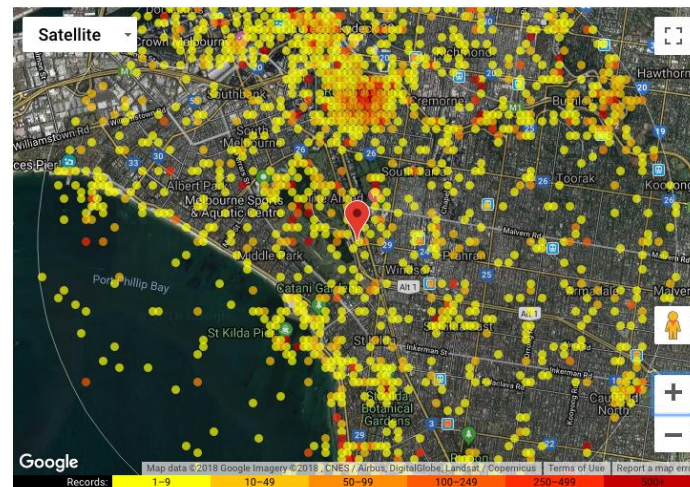
Showing records for: 65 Queens Rd, Albert Park VIC 3004, Australia

Display records in a km radius

View all records

Download

Group	Species	Species : Common Name	Records
All species	4528		
Animals	2281	1. <i>Abantiades magnificus</i>	1
Mammals	56	2. <i>Abantiades marcidus</i>	7
Birds	410	3. <i>Abethas varians</i>	1
Reptiles	35	4. <i>Abutilon fraseri subsp. diplotrichum</i>	1
Amphibians	15	5. <i>Abutilon grandifolium</i>	11
Fishes	156	6. <i>Abutilon megapotamicum</i>	1
Molluscs	135	7. <i>Acacia acinacea</i>	9
Arthropods	1380	8. <i>Acacia adunca</i> : Wallangarra Wattle	1
Crustaceans	81	9. <i>Acacia alpina</i> : Alpine Wattle	2
Insects	1230	10. <i>Acacia aspera</i>	1
Plants	1913	11. <i>Acacia baileyana</i> : Bailey's wattle	5
Bryophytes	94	12. <i>Acacia beckeri</i>	1
Gymnosperms	45	13. <i>Acacia binervata</i>	5
Ferns and Allies	35	14. <i>Acacia binervia</i> : Coast Myall	1
Angiosperms	1720	15. <i>Acacia boomani</i> : Snowy River Wattle	6
Monocots	390	16. <i>Acacia brownii</i>	2
Dicots	1330	17. <i>Acacia caesiella</i>	4
Fungi	219	18. <i>Acacia cardiophylla</i>	2
Chromista	8	19. <i>Acacia clunies-rossiae</i> : Kowmung Wattle	1
Protozoa	1	20. <i>Acacia cognata</i> : Narrow-leaved bower wattle	6
Bacteria	0	21. <i>Acacia consobrina</i>	1
Algae	15	22. <i>Acacia cultriformis</i>	4
		23. <i>Acacia dealbata subsp. dealbata</i>	1



Tips: you can fine-tune the location of the area by dragging the red marker icon



Knowledge Base

How to cite the ALA

Here are our guidelines on how to cite the Atlas of Living Australia (ALA).

Citing is giving credit to other researchers and acknowledging their ideas.

How to cite the ALA as a whole

To cite the ALA as a whole, use:

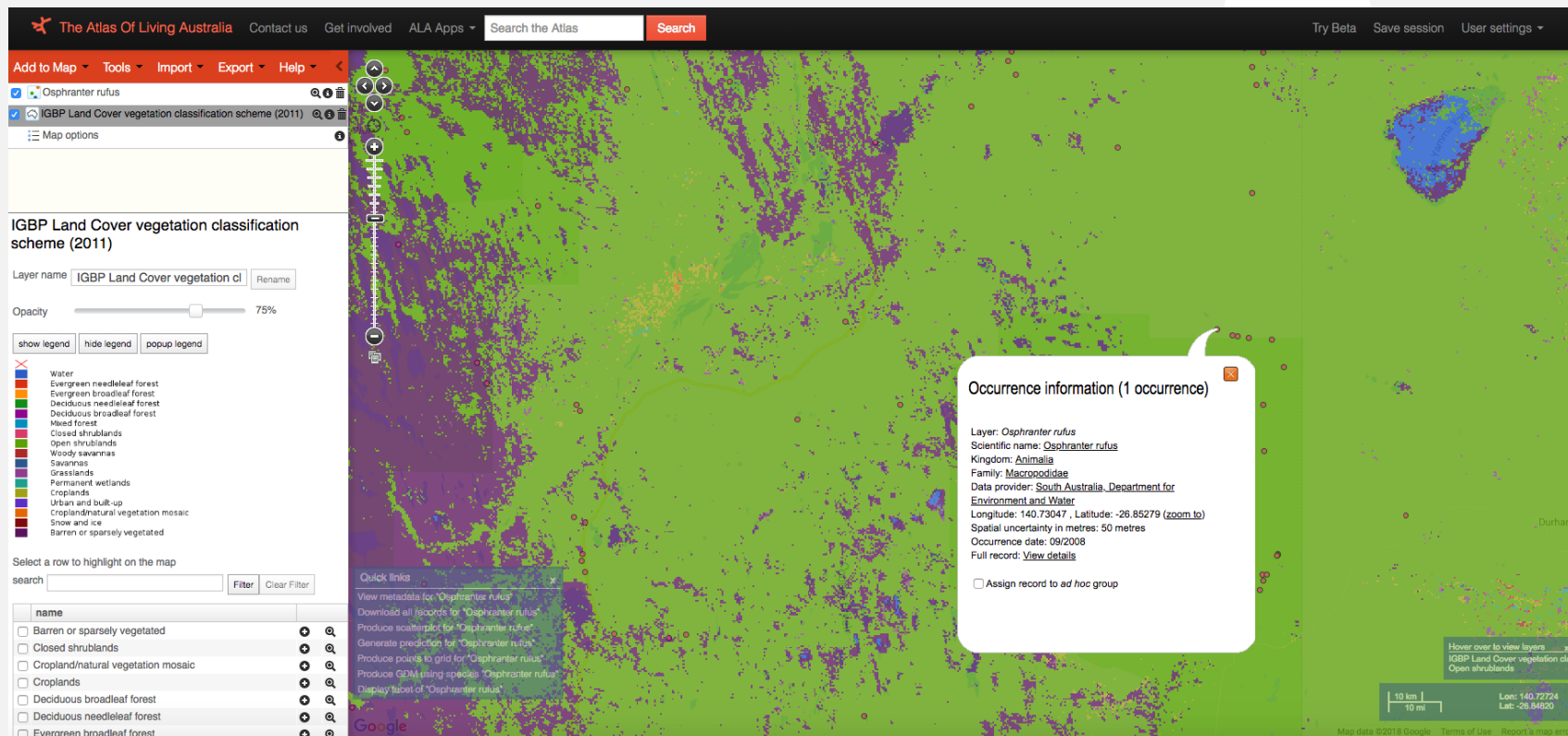
'Atlas of Living Australia website at <http://www.ala.org.au>. Accessed 29 October 2015.'

Page contents:

[How to cite the ALA as a whole](#)

[How to cite an ALA page](#)

[How to cite data downloads](#)



Page

Exercises: Foundation to Year 2

Before you begin

- Use the Atlas of Living Australia to see which birds have been recorded in the area surrounding your school. For instructions showing how to do this, see [ALA User Guide 1 – Finding the species located in your area](#).

	Species : Common Name	Records
1.	<i>Acanthorhynchus tenuirostris</i> : Eastern Spinebill	3
2.	<i>Accipiter (Leucospiza) fasciatus</i> : Australian Goshawk	1
3.	<i>Anthochaera (Anthochaera) carunculata</i> : Red Wattlebird	1

Search for projects here

Search



Participating and
Learning Together

Australian Citizen Science Project Finder

Getting started What is this?



Sort by Most recent Name Relevance Organisation Projects per page 20 50 100 500 Projects from Australia Global

Filter results

Refine Clear all

+ Status

- Tags

- ☐ Has Participation Cost (43)
- ☐ Has Teaching Materials (109)
- ☐ Data to ALA (66)

Showing 1 to 20 of 613 projects. Download

1 2 3 4 5 6 7 >



Atlas core services

- **BIE – species search, taxonomy**
- **Biocache – occurrences**
- **Collectory – natural history collections**
- **DOI – data downloads for publication**
- **Spatial portal – spatial analysis**
- **Species lists**
- **User authentication**

Core components

Atlas of Living Australia

Home page and general information about the ALA

Search the ALA

Search for species, datasets, regions, localities, layers and more

Occurrence records

Browse and search over 70 million species occurrence records

Australian species

Search or browse Australia's most recognisable species

Collections

Search or browse natural history collections and institutions

Datasets

Search or browse datasets that contribute data to the ALA

Species lists

User contributed lists of species with associated conservation status, trait or locality information

Community Hubs

Australia's Virtual Herbarium (AVH)

Search Australia's herbaria specimen collection of over seven million plant, algae and fungi records

Online Zoological Collections of Australian Museums (OZCAM)

Search Australia's zoological museums collection of over four million records

Australian microorganisms information (AMRiN)

Information on Australian microorganisms

Atlas of Prehistoric Australia (APA)

Search for occurrence records of organisms from Australia's prehistory

Australian Moths Online (AMO)

Browse thousands of photographs of Australian Moths species

Australian Seed Bank Partnership (ASBP)

An online resource for the review of conservation seed collections in Australia

Murray-Darling Basin Authority (MDBA)

MDBA Biodiversity Portal

Geospatial & mapping

Spatial portal

Google Earth-like tool for discovering and analysing biodiversity and environmental data

Explore your area

Discover what plants and animals are known to live near you

Regions

A map based biodiversity discovery tool to browse states, local government area, biogeographic regions, etc

Other ALA-developed tools

MERIT

Online reporting tool for the Department of the Environment and Energy

Sensitive Data Service

Data pre-processing service that removes or obfuscates location data for sensitive species


ZoaTrack

Calculate movement metrics and space use


Atlas usage

Over the last year:

- **1.1 million user sessions**
- **345,000 unique visitors**
- **85% from Australia**



Pull requestsIssuesMarketplaceExplore



Atlas of Living Australia

Free and open source IT infrastructure for the aggregation and delivery of biodiversity data. Funded by the Australian government via NCRIS and hosted by CSIRO

Australia <https://www.ala.org.au> support@ala.org.au

Repositories 196

People 64


Teams 17

Projects 4

Settings


Pinned repositories

Customize pinned repositories

**ALA4R**


Access data and resources hosted by the Atlas of Living Australia (ALA)

R ★ 27 🍴 6

**ala-install**


An Ansible configuration for installing the ALA components

HTML ★ 16 🍴 43

**ala-name-matching**


Atlas name matching API

Java ★ 4 🍴 9

**biocache-store**


Occurrence processing, indexing and batch processing

Scala ★ 5 🍴 14

**ecodata**

Data capture webservises

Java ★ 5 🍴 7

**biocache-service**

Occurrence & mapping webservises

Java ★ 3 🍴 13

Living Atlases

[Introduction](#)
[Documentation & Links](#)
[Participants](#)
[Contact](#)
[Events](#)

Living Atlases

Institution	Country	Language	Status
Atlas of Living Australia	Australia	English	Live
Canadensys	Canada	English & French	Live
CRBio	Costa Rica	Spanish & English	Live
GBIF Andorra	Andorra	Catalan	Live
GBIF France	France		Live
GBIF Spain	Spain	Spanish	Live
GBIF Sweden	Sweden	English & Swedish	Live
GBIF Portugal	Portugal	Portuguese	Live
Instituto Chico Mendes de Conservação de Biodiversidad	Brazil	Portuguese	Live
NBN Atlas	United Kingdom	English	Live
NBN Atlas Scotland	Scotland	English	Live
NBN Atlas Wales	Wales	English & Welsh	Live
NBN Atlas Isle of Man	Isle of Man	English	Live
Sistema Nacional de Datos Biologicos	Argentina	Spanish	Live

Occurrence records

- **An event: observation of a species**
- **Over 78 million in the ALA**
- **Typically ~1000 fields per record**
- **Over 120,000 species**

More ALA stats

- **Over 400 spatial layers**
- **Over 1 million images**
- **Over 1.5 million downloads**
- **Over 6000 datasets**
- **Over 40,000 users**

Atlas core services

- BIE – species search, taxonomy
- **Biocache – occurrences**
- Collectory – natural history collections
- DOI – data downloads for publication
- Spatial portal – spatial analysis
- Species lists
- User authentication

Search for records in Atlas of Living Australia

[Simple search](#)[Advanced search](#)[Batch taxon search](#)[Catalogue number search](#)[Spatial search](#)[Search](#)

Short-Beaked Echidna

Note: the simple search attempts to match a known **species/taxon** - by its scientific name or common name. If there are no name matches, a **full text** search will be performed on your query

Occurrence records

[Advanced search](#)

[Customise filters](#)

29,719 results for **SPECIES: Tachyglossus aculeatus** ▾

[Download](#)

Narrow your results

▸ Taxon

▸ Occurrence

▾ Location

State / Province

- ☐ Australian Capital Territory (321)
- ☐ New South Wales (18,246)
- ☐ Northern Territory (1,119)
- ☐ Queensland (1,432)
- ☐ South Australia (1 968)
- [choose more...](#)

▾ Record

Basis Of Record

- ☐ Fossil specimen (7)
- ☐ Human observation (26,659)
- ☐ Image (61)
- ☐ Machine observation (1)
- ☐ Material Sample (15)

[Records](#) [Map](#) [Charts](#) [Record images](#)

perpage: sort: order:

- Species: **Tachyglossus aculeatus** | Short-beaked Echidna Date: 2018-07-31 State: New South Wales
Data Resource: OEHL Atlas Of NSW Wildlife Basis Of Record: Human Observation Catalogue Number: BioNet Atlas Of NSW Wildlife:SPJGI5381420 [View record](#)
- Species: **Tachyglossus aculeatus** | Short-beaked Echidna Date: 2011-08-28 State: New South Wales
Data Resource: OEHL Atlas Of NSW Wildlife Basis Of Record: Human Observation Catalogue Number: BioNet Atlas Of NSW Wildlife:SMZS18090767 [View record](#)
- Species: **Tachyglossus aculeatus** | Short-beaked Echidna Date: 2018-10-03 State: New South Wales
Data Resource: OEHL Atlas Of NSW Wildlife Basis Of Record: Human Observation Catalogue Number: BioNet Atlas Of NSW Wildlife:SMZS1810052R [View record](#)
- Species: **Tachyglossus aculeatus** | Short-beaked Echidna Date: 2018-02-06 State: New South Wales
Data Resource: OEHL Atlas Of NSW Wildlife Basis Of Record: Human Observation Catalogue Number: BioNet Atlas Of NSW Wildlife:SJJSI0756956 [View record](#)
- Species: **Tachyglossus aculeatus** | Short-beaked Echidna Date: 2017-09-13 State: New South Wales
Data Resource: OEHL Atlas Of NSW Wildlife Basis Of Record: Human Observation Catalogue Number: BioNet Atlas Of NSW Wildlife:SMZS1809042F [View record](#)
- Species: **Tachyglossus aculeatus** | Short-beaked Echidna Date: 2012-08-10 State: New South Wales
Data Resource: OEHL Atlas Of NSW Wildlife Basis Of Record: Human Observation Catalogue Number: BioNet Atlas Of NSW Wildlife:SMZS1809075N [View record](#)
- Species: **Tachyglossus aculeatus** | Short-beaked Echidna Date: 2016-12-02 State: New South Wales
Data Resource: OEHL Atlas Of NSW Wildlife Basis Of Record: Human Observation Catalogue Number: BioNet Atlas Of NSW Wildlife:SJJSI0292696 [View record](#)

Occurrence records

[Advanced search](#)

[Customise filters](#)

321 results for **SPECIES: Tachyglossus aculeatus**
[Download](#)

Selected filters: **State/Territory: "Australian Capital Territory"**

Narrow your results

Selected filters

☒ **State/Territory: "Australian Capital Territory"**

Taxon

Occurrence

Record

Basis Of Record

- ☐ Human observation (98)
- ☐ Image (12)
- ☐ MaterialSample (6)
- ☐ Preserved specimen (19)
- ☐ Not sunnlied (186)
- [Choose more...](#)

Multimedia

- ☐ Image (35)
- ☐ Not supplied (286)

[Records](#) [Map](#) [Charts](#) [Record images](#)
[Alerts](#)

perpage: sort: order:

Species: **Tachyglossus aculeatus** | **Short-beaked Echidna** Date: 2018-08-02 State: **Australian Capital Territory**

Data Resource: **Questagame Weekly Feed** Basis Of Record: **Human Observation** [View record](#)

Species: **Tachyglossus aculeatus** | **Short-beaked Echidna** Date: 2016-12-08 State: **Australian Capital Territory**

Data Resource: **OEHL Atlas Of NSW Wildlife** Basis Of Record: **Human Observation** Catalogue Number: **BioNet Atlas Of NSW Wildlife:SJJSI0478486** [View record](#)

Species: **Tachyglossus aculeatus** | **Short-beaked Echidna** Date: 2017-01-25 State: **Australian Capital Territory**

Data Resource: **OEHL Atlas Of NSW Wildlife** Basis Of Record: **Human Observation** Catalogue Number: **BioNet Atlas Of NSW Wildlife:SJJSI0483429** [View record](#)

Species: **Tachyglossus aculeatus** | **Short-beaked Echidna** Date: 2013-08-08 State: **Australian Capital Territory**

Data Resource: **OEHL Atlas Of NSW Wildlife** Basis Of Record: **Human Observation** Catalogue Number: **BioNet Atlas Of NSW Wildlife:SJJSI0479995** [View record](#)

Species: **Tachyglossus aculeatus** | **Short-beaked Echidna** Date: 2016-11-05 State: **Australian Capital Territory**

Data Resource: **OEHL Atlas Of NSW Wildlife** Basis Of Record: **Human Observation** Catalogue Number: **BioNet Atlas Of NSW Wildlife:SJJSI0475487** [View record](#)

Species: **Tachyglossus aculeatus** | **Short-beaked Echidna** Date: 2014-10-25 State: **Australian Capital Territory**

Data Resource: **OEHL Atlas Of NSW Wildlife** Basis Of Record: **Human Observation** Catalogue Number: **BioNet Atlas Of NSW Wildlife:SJJSI0477961** [View record](#)

Occurrence records

Advanced search

Quick search

Customise filters

321 results for SPECIES: *Tachyglossus aculeatus*

Download

Selected filters: State/Territory: "Australian Capital Territory" x

Narrow your results

Selected filters

☒ State/Territory: "Australian Capital Territory"

Taxon

Occurrence

Record

Basis Of Record

- ☐ Human observation (98)
- ☐ Image (12)
- ☐ MaterialSample (6)
- ☐ Preserved specimen (19)
- ☐ Not supplied (186)
- ☒ choose more...

Multimedia

- ☐ Image (35)
- ☐ Not supplied (286)
- ☒ choose more...

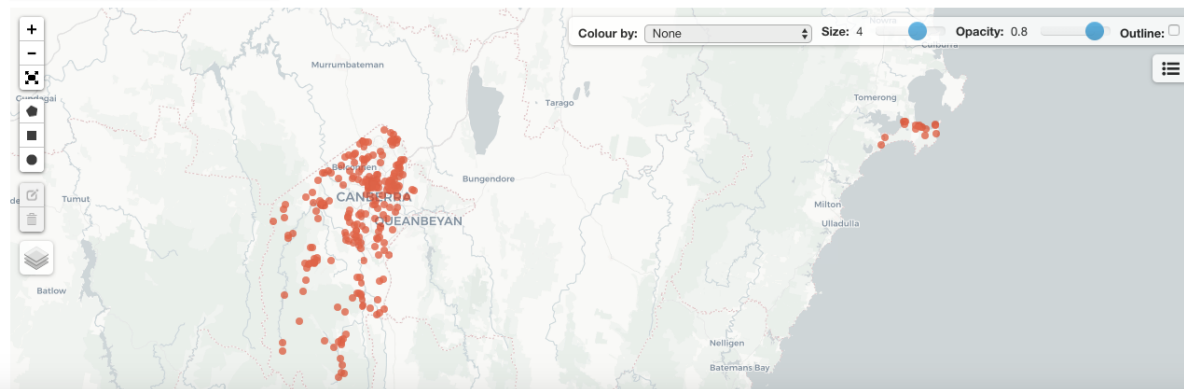
Occurrence status

- ☐ present (321)

Assertions

Records Map Charts Record images

View in spatial portal Download map



Occurrence records

Advanced search

Quick search

Customise filters

321 results for SPECIES: *Tachyglossus aculeatus*

Download

Selected filters: State/Territory: "Australian Capital Territory" ✕

Records Map Charts Record images

Narrow your results

Selected filters

State/Territory: "Australian Capital Territory"

Taxon

Occurrence

Record

Basis Of Record

- ☐ Human observation (98)
- ☐ Image (12)
- ☐ MaterialSample (6)
- ☐ Preserved specimen (19)
- ☐ Not sunnlied (186)
- ☒ choose more...

Multimedia

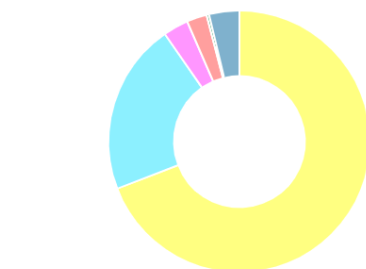
- ☐ Image (35)
- ☐ Not supplied (286)
- ☒ choose more...

Occurrence status

- ☐ present (321)

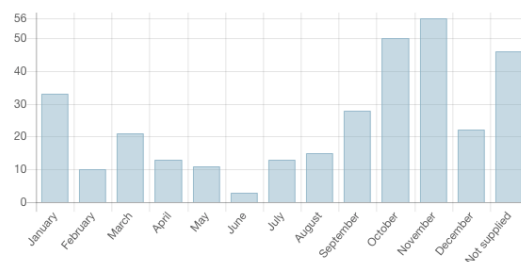
Assertions

By licence



CC-BY
CC-BY 4.0 (Int)
CC-BY-NC
CC-BY-NC-Int

By month



Occurrence records

Advanced search

Quick search

Customise filters

321 results for SPECIES: *Tachyglossus aculeatus* ▾

Selected filters: State/Territory: "Australian Capital Territory" ×

Download

Narrow your results

Selected filters

☒ State/Territory: "Australian Capital Territory"

Taxon

Occurrence

Record

Basis Of Record

- ☐ Human observation (98)
- ☐ Image (12)
- ☐ MaterialSample (6)
- ☐ Preserved specimen (19)
- ☐ Not sunniled (186)
- ☐ choose more...

Multimedia

- ☐ Image (35)
- ☐ Not supplied (286)
- ☐ choose more...

Occurrence status

- ☐ present (321)

Records Map Charts Record images

Images from occurrence records



Tachyglossus aculeatus



Tachyglossus aculeatus



Tachyglossus aculeatus



Tachyglossus aculeatus



Tachyglossus aculeatus (Shaw, 1792)



Tachyglossus aculeatus



Tachyglossus aculeatus



Tachyglossus aculeatus
(Short-Beaked Echidna)



Tachyglossus aculeatus



Tachyglossus aculeatus

Occurrence record: BioNet Atlas of NSW Wildlife:SJJSI0478486

HumanObservation of *Tachyglossus aculeatus* | Short-beaked Echidna recorded on 2016-12-08

[Club View](#)
[Back to search results](#)
[Flag an issue](#) [Contact curator](#)
[Compare "original vs processed" values](#)
[Dataset](#)
[Event](#)
[Taxonomy](#)
[Geospatial](#)
[Additional properties](#)
[Data quality tests \(2 !\[\]\(c1168d6a8b365d11e842ece304635fa7_img.jpg\), 2 !\[\]\(821e2adbc4e694c5a65f45cf90787bff_img.jpg\), 37 !\[\]\(a379c93c259bb90edf5293abf22f698d_img.jpg\), 8 !\[\]\(f27aa16edf0262e8c20cc3e88e6863e7_img.jpg\), 37 !\[\]\(bce1d958053cefcbbc37316797068065_img.jpg\)\)](#)
[Additional political boundaries information](#)
[Environmental sampling for this location](#)


Dataset

Data partner	Office of Environment and Heritage, Department of Premier and Cabinet representing the State of New South Wales
Data resource	OEH Atlas of NSW Wildlife
Institution code	Supplied institution code "NSW Office of Environment and Heritage"
Catalog number	SJJSI0478486
Occurrence ID	urn:catalog:NSW Office of Environment and Heritage:BioNet Atlas of NSW Wildlife:SJJSI0478486
Basis of record	Human observation
Observer	OWJS96120300
License	CC-BY 4.0 (Int)
Owner institution code	NSW National Parks and Wildlife Service
State conservation	Australian Capital Territory: Not Listed Supplied as Not Listed
Data generalizations	The observer name has been changed to a unique User ID
Dataset name	OEH Data from Scientific Licences dataset

Event

Record date	2016-12-08 <i>Supplied date "2016-12-08/2016-12-08"</i>
Date precision	Day
Event time	06:00:00/08:20:00

Taxonomy

Scientific name	<i>Tachyglossus aculeatus</i>
Taxon rank	Species
Common name	Short-beaked Echidna
Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Monotremata
Family	Tachyglossidae
Genus	<i>Tachyglossus</i>
Species	<i>Tachyglossus aculeatus</i>
Taxonomic issue	No issues
Name match metric	Exact match The supplied name matched the name exactly.
Name parse type	wellformed

Geospatial

Country	Australia
State / Province	Australian Capital Territory <i>Supplied as: "ACT"</i>
Locality	Unincorporated ACT
Locality	locality withheld
Latitude	-35.222150414
Longitude	149.176642326
Geodetic datum	GDA94
Location remarks	locationRemarks withheld
Coordinate precision	0.000000001
Coordinate uncertainty in meters	1000.0
Georeference protocol	GPS
Location ID	LJJSI0088098
Easting	698100
Northing	6100150
County	N/A
Biome	Terrestrial
Country code	AU
Zone	55

Additional properties

Bfmc	N/A
Botanical division	Southern Tablelands
Dcterms bibliographic citation	BioNet Atlas of NSW Wildlife 4/09/2018 1:00 AM +10:00
Dcterms language	en
Dcterms modified	2017-11-15T12:44:08.06+11:00
Dcterms rights	Unknown
Dcterms rights holder	NSW National Parks and Wildlife Service
Dcterms type	Event
Flora reserve	N/A
Geog extent	N/A
IBRA 7 Regions	South Eastern Highlands (ACT)
Map sheet number	8727 - CANBERRA
Mechanical hazard reduction description	N/A
Observation type	Scat
Potential impact	N/A
Profile id	N/A
Protected in nsw	true
Reserve	N/A
Source dataset name	OEH Data from Scientific Licences dataset

Data quality tests

Test name	Result
Collection code not recognised ?	✗ Failed
Institution code not recognised ?	✗ Failed
Data are generalised ?	⚠ Warning
Coordinates converted to WGS84 ?	⚠ Warning
Basis of record not supplied ?	✓ Passed
Basis of record badly formed ?	✓ Passed
Invalid collection date ?	✓ Passed
Incomplete collection date ?	✓ Passed
First of the month ?	✓ Passed
Cultivated / escapee ?	✓ Passed
Collector name unparseable ?	✓ Passed
Missing catalogue number ?	✓ Passed
Missing taxonomic rank ?	✓ Passed
Name not supplied ?	✓ Passed
Kingdom not recognised ?	✓ Passed
Name not recognised ?	✓ Passed
Invalid scientific name ?	✓ Passed
Name not in national checklists ?	✓ Passed

Additional political boundaries information

Area Management	
ACT TAMS Reserves	MOUNT MAJURA NATURE RESERVE
CAPAD 2012 Terrestrial	Mt Majura
CAPAD 2014 Terrestrial	Mt Majura
Collaborative Australian Protected Areas Database (CAPAD) 2010	Mt Majura
Fallow practice - dominant (area)	No cereal producers
Fallow practice - dominant (number)	No cereal producers
GER Kosciuszko to Coast	GER Kosciuszko to Coast
GER National Corridor	GER National Corridor
GER Standard Boundary	GER Standard Boundary
Global 200 priority ecoregions - Freshwater	Eastern Australia Rivers & Streams
Global 200 priority ecoregions - Terrestrial	Eastern Australia Temperate Forests
Great Eastern Ranges Initiative	GER Great Eastern Ranges Initiative
Important Bird Areas (IBA) Australia	South-west Slopes of NSW IBA
Irrigation practice - dominant	No irrigation
Land use	Plantations
Murray Darling Basin Authority Water Quality Zones	Upland
Murray-Darling Basin Boundary	Murray-Darling Basin Boundary
Murray-Darling Basin Ground Water Plan Areas	GW1

Environmental sampling for this location

Area Management	
Beef numbers	5414.0 dse
Dairy numbers	0.0 dse
Natural resource management expenditure	2094150.0 \$
Natural resource management expenditure - additional	1.0 \$/ha
Sheep numbers	5032.0 dse
Biodiversity	
Acacia – Miller et al 2012 - 0.5 degree	4.6961
Amphibians (global) – Pyron & Wiens 2011 - 0.5 degree	3.381
Endemism	0.07149399
Endemism (Non-marine)	0.0813456
Mammals – Fritz et al 2009 - 0.5 degree	0.6197
Migratory species (2008)	5.0 frequency
Occurrence Density	2456.716 frequency
Shannon Diversity (H)	3.8230948 index
Species Richness	6.740741 frequency
Threatened communities (2008)	1.0 frequency
Threatened species (2008)	8.0 frequency

Climate	
2030A1BMk35M: Aridity index - annual mean	0.5146562
2030A1BMk35M: Aridity index - month max	1.0274676
2030A1BMk35M: Aridity index - month min	0.22283153
2030A1BMk35M: Evaporation - annual mean	123.169586 mm
2030A1BMk35M: Evaporation - month max	225.89 mm
2030A1BMk35M: Evaporation - month min	41.36 mm
2030A1BMk35M: Growth index C3 macrotherm plants - annual mean	0.07 index
2030A1BMk35M: Growth index C3 mesotherm plants - annual mean	0.23 index
2030A1BMk35M: Growth index C4 megatherm plants - annual mean	0.05 index
2030A1BMk35M: Humidity - annual mean relative 3pm	68.596695 %
2030A1BMk35M: Humidity - month max relative 3pm	80.652405 %
2030A1BMk35M: Humidity - month min relative 3pm	57.366062 %
2030A1BMk35M: Precipitation - annual mean	48.629166 mm
2030A1BMk35M: Precipitation - driest month	38.32 mm
2030A1BMk35M: Precipitation - equinox seasonality ratio	1.182357
2030A1BMk35M: Precipitation - max difference between successive months	0.48290327 mm/day
2030A1BMk35M: Precipitation - min difference between successive months	-0.4990968 mm/day
2030A1BMk35M: Precipitation - solstice seasonality ratio	1.3194355
2030A1BMk35M: Precipitation - spring or autumn season	0.18099916
2030A1BMk35M: Precipitation - summer or winter season	0.31692347

Downloads

Did you know the Atlas of Living Australia provides a number of pre-generated downloads for common search queries (e.g. all plants, × mammals, birds, insects, etc.)? [View all pre-generated downloads.](#)

Step 1

Select your download type below, and then progress to step 2.



Occurrence records

A ZIP archive containing a comma separated values (CSV) file which includes a subset of location, taxon and event information.

SELECT



Species checklist

A comma separated values (CSV) file, listing the distinct species in the occurrence records result set.

SELECT



Species field-guide

A PDF document containing species profile information (including photos and maps) for the list of distinct species in the occurrence record set.

SELECT

Step 2

Select your download reason and then click the "Next" button.



*Industry/application

Select a reason ...

This field is mandatory. Choose the best "use type" from the drop-down menu above.

NEXT >

Biocache

- data store: Apache Cassandra
- search: Apache Solr
- biocache applications



Biocache

- data store: Apache Cassandra
- search: Apache Solr
- **biocache applications:**
 - biocache-hub: front end (browsers)
 - biocache-service: web services
 - biocache-store: data handling

Old biocache

- one Cassandra server
- one Solr server
- one biocache-hub server
- a pair of servers for biocache-service
- biocache-store with Cassandra

Data cycle

- data quality checks
- initial import into Cassandra
- processing
- environmental sampling
- fully processed records in Cassandra
- generate indexes for Solr

Old biocache

- any maintenance caused downtime
- any server issue caused downtime
- reaching hard limits on data size
- data cycle extremely slow and brittle

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- **data cycle extremely slow and brittle:**
- processing and sampling: six days
- indexing: 24 hours

Old biocache

- any maintenance caused downtime
- any server issue caused downtime
- reaching hard limits on data size
- data cycle extremely slow and brittle:
- processing and sampling: 6 days
- indexing: 24 hours
- no scalability

Designing a solution

Designing a solution

- latest versions of Cassandra and Solr
- Cassandra cluster
- Solr Cloud cluster
- applications in load balanced pools

IO improvements

- **Cassandra from 1 to 4 nodes**

IO improvements

- **Cassandra from 1 to 4 nodes**
- **biocache-store to 4 separate servers**

Building the solution

- **Cassandra: single-node version 1 to clustered version 3**
- **Solr: single-node version 4 to clustered version 6**

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people about the natural world

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Initial UK version

- **Cassandra: four nodes**
- **Solr: eight nodes**
- **Fast, fault-tolerant data ingestion**
- **Larger number of occurrences, but much smaller width (number of fields)**

AU version development

- Around 18 months elapsed, 2-5 developers
- Fewer occurrence records, but much wider data (more fields)
- Needed to maintain backwards compatibility for most types of request

AU version development

- Around 18 months elapsed, 2-5 developers
- Fewer occurrence records, but much wider data (more fields)
- Needed to maintain backwards compatibility for most types of request
- Iterative configuration testing in multiple components

AU version development

- Performance initially much lower than legacy
- Eventually got performance to similar level
- Costs slightly higher
- Switched to new version in July 2018

Data cycle changes

- **Processing and sampling:**
- **Old system - 6 days, often repeated due to low fault tolerance**

Data cycle changes

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- **New system – 11 hours, highly fault tolerant**

Data cycle changes

- **Processing and sampling:**
 - Old system - 6 days, often repeated due to low fault tolerance
 - New system – 11 hours, highly fault tolerant
- **Indexing:**
 - Old system – 24 hours

Data cycle changes

- **Processing and sampling:**
 - Old system - 6 days, often repeated due to low fault tolerance
 - New system – 11 hours, highly fault tolerant
- **Indexing:**
 - Old system – 24 hours
 - New system – 3.5 hours
 - Now indexing every few days

Robustness

- clustered Cassandra and Solr can now tolerate having a node go down
- biocache applications (biocache-hub and biocache-service) now pooled behind load balancers, can tolerate a server going down

Scalability

- **expanding Cassandra or Solr capacity is relatively straightforward**
- **expecting to be able to handle future major expansion of data width (species traits)**

Biocache

- data store: Apache Cassandra
- search: Apache Solr
- biocache applications



Thank you

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