

ACT Bush Blitz

Squamate Reptile Group

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Nomenclature and taxonomy used in this report is consistent with:

The Australian Faunal Directory (AFD)

<http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home>

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List of contributors

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Abstract

Reptiles are one of the most diverse groups of living vertebrates. They occur in diverse environments and they range from being fossorial and terrestrial to aquatic and arboreal. As ectotherms, they are sensitive to climate variation in space and time. Australia is known for its high diversity of squamate reptiles, with most being endemic. The knowledge of reptile species distribution and diversity is important for understanding biodiversity patterns and for prioritising conservation efforts at local scales, especially in heterogenous environments such as the Australian Capital Territory (ACT). The southern part of the ACT, including Namadgi National Park, is very undersampled for reptiles. During this Bush Blitz we focused on this region, where we collected vouchers with tissues from 21 species of reptiles, including skinks, dragons and monitor lizards and a single snake species. This filled in a large sampling gap for the taxa, especially for tissues. Some specimens may belong to an as-yet-unnamed species of *Eulamprus*, although genetic testing is needed to confirm this.

1. Introduction

Lizards, snakes and amphisbaenians compose a monophyletic group named Squamata. Squamates are the most diverse group of living reptiles, with high diversity and reasonably well established alpha taxonomy and knowledge of wide species' distributions. They occur in various types of environment; from fossorial and terrestrial to aquatic and arboreal. As ectotherms, they are sensitive to climate variation in space and time. Lizards are relatively easy to sample in the wild compared to snakes, have short generation time and relatively limited mobility, which makes them good models for ecological, evolutionary and biogeographical studies. Australia is known to have the highest diversity of squamate reptiles of any country species in the world, with around 619 species of lizards and 192 species of snakes, with 89% of those being endemic. Major advances have been made in recent years to understand squamate reptile diversity, but there is still a lot to do. Many species have morphologically conserved features (known as cryptic species), making identification hard. To identify these new species we often rely on genetic studies.

The Australian Capital Territory (ACT), is a federal district enclaved within the state of New South Wales. It presents high elevation (650 meters) and hot dry summers and cold winters. Canberra, the only city in the territory, is known as the “Bush Capital”, with 50% of its land gazetted as parks and green spaces. However, most of the territory, including the well conserved Namadgi National Park and the southern part of the ACT is undersampled for reptiles, with few specimens with tissues in national collections. Of the specimens samples that exist, half were collected before 1980. This means that there is a large spatial and temporal sampling gap in the region. We aimed to improve knowledge of the diversity and distribution of

the squamate reptiles species of ACT, and so the correlates of biodiversity patterns and conservation priorities at local scales.

2. Methods

2.1 Site selection

Sites were targeted based on survey gaps, after a careful review of scientific national collections online databases and the Atlas of Living Australia website. We observed that most of the gaps were located at the south part of the federal territory, including the Namadgi National Park, where most of the sites were located. One site was chosen based on a recent paper of skink (*Eulamprus*) that highlighted for a potential unnamed species located in the park (Pepper et al. 2018). Specimens and tissue samples were needed to confirm this tentative new species, so the site was re-visited during Bush Blitz with the aim of collecting new specimens with tissues.

2.2 Survey techniques

Intensive active searching took place at each site. This included scanning for active reptiles and searching cover habitat for non-active reptiles (e.g. under rocks and logs). Capturing was done by hand. Nocturnal spotlighting was also carried out, targeting active geckoes and nocturnal reptiles.

2.2.1 Methods used at standard survey sites

Intensive active searching was carried out at the standard survey sites. While summer is a good time of the year for sampling reptiles, the weather conditions can impact the activity of specimens, with cold and cloudy or rainy days not ideal.

2.3 Identifying the collections

Specimens were identified using the most recent version of the field guide *A Complete Guide to Reptiles of Australia* (Wilson & Swan, 2018). When necessary, morphological measurements and scale counts were made based on the life specimens or photography.

3. Results and Discussion

Appendix 1 lists all reptiles recorded during the Bush Blitz.

3.1 Un-named or not formalised taxa

There were no unnamed reptile taxa recorded during the survey. However, due to the morphological conservatism of the genus which makes it difficult to identify in the field, several specimens of *Eulamprus tympanum* were collected which may belong to an unnamed species. Genetic testing is needed to confirm this.

3.2 Putative new species (new to science)

There were no putative new species recorded during the survey.

3.3 Exotic and pest species

There were no exotic reptile species recorded during the survey.

3.4 Threatened species

Three species of reptiles (Grassland Earless Dragon, the Striped Legless Lizard, and Pink-tailed Worm Lizard) are listed on the Nature Conservation Act 2014 (ACT). These species were not recorded during the survey.

3.5 Range extensions

There were no range expansions for reptile taxa recorded during the survey. More fieldwork is recommended for this purpose.

3.6 Genetic information

Genetic samples – a combination of tail tips and livers – were taken from 80 individuals across all 21 taxa recorded. With many cryptic species and small number of genetic samples on scientific collections, the analysis of this genetic material is necessary for the evaluation and confirmation of the species sampled, and important for the understanding of the reptile diversity in the Australia.

4. Information on species lists

Most of the species recorded are skink, including the common Garden Sunskinks (genus *Lampropholis*), the rock specialist *Egernia saxatilis* and the Blotched Blue-Tongue (*Tiliqua nigrolutea*), found the latter dead on the Tindbinbilla road. We sampled three species of dragon, including the Jacky Lizard (*Amphibolurus muricatus*), the Bearded Dragon (*Pogona barbata*), and the Mountain Dragon (*Rankinia diemensis*). We didn't observe any species of geckos. Two samples (tail-tips only) of the Heath Monitor (*Varanus rosenbergi*) and one of the Blackish Blind Snake (*Anilius nigrescens*) were collected. The possible unnamed species of *Eulamprus* is listed as *Eulamprus tympanum* in Appendix 1, but, as mentioned in the previous section, genetic analysis is needed to distinguish these taxa.

5. Information for land managers

Wish most of our field sites located on a National Park, we have no information to report to land managers. We can only recommend the conservation of the surrounding area for the maintainance of the park.

6. Other significant findings

Although elapid snakes were not included in our licence, we observed three individuals of highland copperhead snake (*Austrelaps ramsayi*) on different Namadgi sites. Collecting *Anilius nigrescens* during the survey was unexpected. Although not rare it is rarely observed, with only 35 records across the ACT, and only seven in the last 20 years.

7. Conclusions

The 2018 ACT Bush Blitz allowed for a large sampling gap to be filled in, increasing our knowledge of the reptiles of the ACT. Even with bad weather (cold and cloudy/rainy days) during the first week, twenty-one species were recorded in total, as well as possible specimens of an unnamed species. These specimens are important for formally describing the taxa. More sampling and genetic analyses are recommended to improve the species distribution and diversity.

Acknowledgements

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References

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Wilson S, G Swan. 2017. A Complete Guide to Reptiles of Australia. New Holland publisher, 560 pages.

Appendices

Appendix 1. List of reptiles recorded in Namadgi National Park during the ACT Bush Blitz.

Family	Species	Common name	Putative new species	Threatened (EPBC Act)	Threatened (Territory Act)	Exotic/pest	Record type*	Namadgi National Park
AGAMIDAE	<i>Amphibolurus muricatus</i>	Jacky Lizard	No	No	No	No	G, S	Yes
AGAMIDAE	<i>Pogona barbata</i>	Bearded Dragon	No	No	No	No	G, S	Yes
AGAMIDAE	<i>Rankinia diemensis</i>	Mountain Dragon	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Acritoscincus duperreyi</i>	Eastern Three-Lined Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Acritoscincus platynotus</i>	Red-Throated Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Anepischetosia maccoyi</i>	Highlands Forest-Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Carinascincus coventryi</i>	Southern forest cool-skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Ctenotus taeniolatus</i>	Copper-Tailed Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Egernia cunninghami</i>	Cunningham's Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Egernia saxatilis</i>	Black Rock Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Eulamprus tympanum</i>	Southern Water-Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Hemiergis talbingoensis</i>	Eastern Three-toed Earless Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Lampropholis delicata</i>	Dark-Flecked Garden Sunskink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Lampropholis guichenoti</i>	Pale-Flecked Garden Sunskink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Liopholis whitii</i>	White's Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Pseudemoia entrecasteauxii</i>	Tussock Cool-Skink	No	No	No	No	G, S	Yes

SCINCIDAE	<i>Pseudemoia rawlinsoni</i>	Glossy Grass Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Pseudemoia spenceri</i>	Trunk-Climbing Cool-Skink	No	No	No	No	G, S	Yes
SCINCIDAE	<i>Tiliqua nigrolutea</i>	Blotched Blue-Tongue	No	No	No	No	G, S	Yes
TYPHLOPIDAE	<i>Anilius nigrescens</i>	Blackish Blind Snake	No	No	No	No	G, S	Yes
VARANIDAE	<i>Varanus rosenbergi</i>	Heath Monitor	No	No	No	No	G, S	Yes