

REPTILE POPULATIONS OF THE GUNNEDAH AND BOGGABRI
DISTRICTS, NEW SOUTH WALES, AUSTRALIA

by

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INTRODUCTION

In 1982, the author and an associate made a herpetological field trip to the Gunnedah (Lat. 31°3' Long. 150°20') and the adjoining Boggabri districts. The road between the cities of Tamworth and Narrabri runs through these districts, and all field work was carried out adjacent to this road.

The purpose of the field trip was to test the hypothesis that there is no difference in the total number of terrestrial and arboreal reptiles in two or more nearby habitats. As herpetologists, it seems almost too obvious that two different habitats could not have exactly the same herpetofauna, but when a species by species breakdown is carried out, the results are not always as obvious.

The area investigated is typical of the "Western Slopes" region of New South Wales (NSW). The dominant human activities are agricultural, with wheat production and livestock raising as the main forms of farming. The wheat fields are effectively sterile as far as herpetofauna is concerned.

The topography is varied, having both hilly and large flat areas. Water courses are few although the Namoi River (a large, permanent western flowing river) flows through the area.

The climate is dry, with little rain. Gunnedah averages 604 mm of rain annually, with most of the rain in the warmer months. Rain occurs 67 days a

year. Summers are hot, with average temperatures in the high 20's to low 30's (celsius) and minimum temperatures in the teens. Winters are cool to mild with average maximum temperatures in the high teens and minimums approaching 0°C..

Soils in the area are a combination of red granite and alluvial black soils. All rock and hills are composed of "pink granite." There is no virgin bush in the area - every inch of the district has been influenced and modified by humans in some way or another.

MATERIALS AND METHODS

Six areas were studied - four were rocky hill country and the remaining two were flat habitats. The classification of reptiles was that of Cogger (1979). The study took place from Aug 28-30, 1982. The weather on all three days was seasonally warm and sunny, with daytime highs in the mid 20's, celsius, and lows in the low teens.

The six sites were chosen by the fact that they were relatively undisturbed for the area. In each site, an area 0.5 km x 0.25 km was marked, providing a search area of 125,000 square meters. The area was searched as thoroughly as possible for reptiles. To avoid double counting of reptiles, all reptiles were retained when caught, and released only after a given area was counted.

The Six Study Areas

The six areas chosen for study are shown on the accompanying map (Fig 1), and are described below:

Site #1

Location: 65 km north of Quirindi on the Gunnedah Road.

Habitat: Flat woodland forest, dominated by acacia

trees and an occasional large eucalyptus. Fallen logs were present, but not overly plentiful.

Site #2

Location: 70 km north of Quirindi on the Gunnedah Road.

Habitat: Pink granite hill with a NW/SE aspect. This hill has no large trees, but contains some stunted eucalyptus and other tree growth.

Site #3 (Figure 2)

Location: 4 km north of Boggabri toward Narrabri, just east of the Manila Road turnoff.

Habitat: Pink granite hill with a W/NW aspect. Many trees present on the hill, especially wattle and stunted eucalyptus.

Site #4

Location: 6 km north of Boggabri on the Narrabri Road.

Habitat: Rocky pink granite hills, adjacent to the Namoi River. These hills had only wattle on them, and a north/south aspect.

Site #5 (Figure 3)

Location: 10 km east of the intersection of the Manila/Boggabri Road and the Boggabri/Narrabri Road, along the Manila Road.

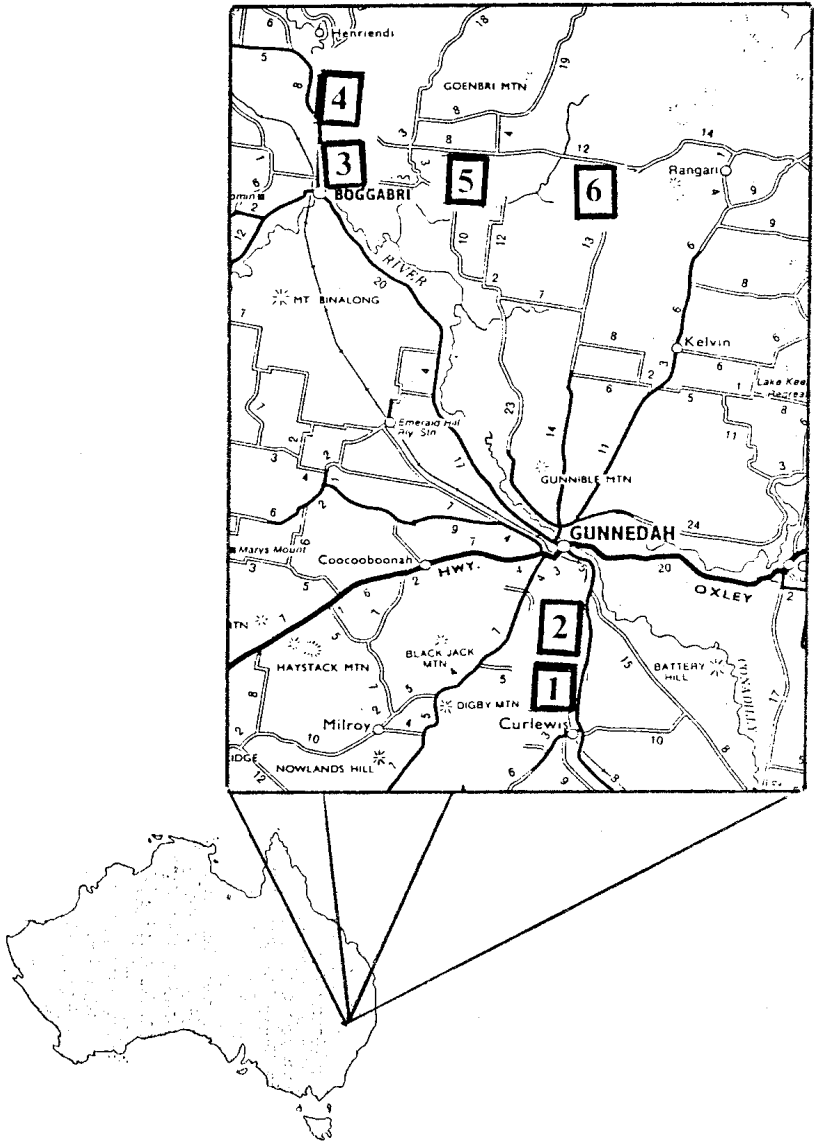
Habitat: Flat, open mulga woodland with large gum trees.

Site #6

Location: 20 km northeast of Boggabri on the Manila Road.

Habitat: Low pink granite hill, few trees, very long grass.

Figure 1



Map of the collecting sites visited. See text for descriptions.

Figure 2



Site #3. Typical granite hill habitat.

Figure 3



Site #5. Typical flat plain habitat.

Table 1
Reptiles Found at the Six Sites Investigated

| Species | Number found at each site | | | | | | Total |
|--|---------------------------|----|----|----|----|----|-------|
| | Site# 1 | 2 | 3 | 4 | 5 | 6 | |
| <i>Anomolopus</i> sp. (Legless Skink) | - | 8 | 6 | 3 | - | 4 | 21 |
| <i>Cryptoblepharus plagiocephalus</i> (Snake-eyed Skink) | - | 1 | 4 | 1 | 1 | 9 | 16 |
| <i>Ctenotus leseurii</i> (Striped Skink) | - | 44 | 21 | - | - | - | 65 |
| <i>Egernia striolata</i> (Tree Skink) | 2 | - | - | 9 | 1 | 2 | 14 |
| <i>Lerista muelleri</i> (Mueller's Legless Skink) | - | - | - | 4 | - | 1 | 5 |
| <i>Morethia bouleengeri</i> (Boulenger's Skink) | 50 | - | - | - | 97 | - | 147 |
| <i>Sphenomorphus quoyii</i> (E. Water Skink) | - | - | - | 7 | - | - | 7 |
| <i>Tiliqua scincoides</i> (Blue-tongued Skink) | 1 | 2 | 2 | - | 7 | - | 12 |
| <i>Diplodactylus williamsi</i> (S. Spiny-tailed Gecko) | - | - | 5 | 3 | - | 16 | 24 |
| <i>Gehyra variegata</i> (Dtella) | - | 9 | 2 | 10 | 55 | - | 76 |
| <i>Heteronotia binocoi</i> (Binoes Gecko) | - | - | 11 | - | - | 23 | 34 |
| <i>Underwoodisaurus millii</i> (Barking Gecko) | - | - | 6 | 9 | - | 6 | 21 |
| <i>Varanus varius</i> (Lace Monitor) | 1 | - | - | - | - | - | 1 |

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| | | | | | | |
|--|---|---|---|---|---|---|
| <i>Delma tincta</i> (Legless Lizard) | - | - | - | - | - | 4 |
| <i>Lialis burtonis</i> (Burton's Legless Lizard) | - | - | 1 | - | - | 1 |
| **** | | | | | | |
| <i>Liasis childreni</i> (Children's Python) | - | - | 2 | 1 | - | 3 |
| <i>Pseudechis porphyriacus</i> (Red-bellied Black Snake) | 1 | - | - | 3 | 1 | 5 |
| <i>Pseudonaja nuchalis</i> (W. Brown Snake) | - | - | - | 1 | 1 | 2 |
| <i>Pseudonaja textilis</i> (E. Brown Snake) | 1 | - | - | - | - | 1 |
| <i>Suta suta</i> (Myall Snake) | - | - | - | - | 1 | 2 |
| <i>Unechis gouldi</i> (Gould's Snake) | - | - | - | - | 1 | 1 |

| | |
|----------------|-----|
| Total Lizards | 448 |
| Total Snakes | 14 |
| Total Reptiles | 462 |

DISCUSSION

Table 1 is a list of the numbers and species of animals found at the six sites investigated. Considering that only three days were spent collecting in the six sites, the wide range of species and numbers of animals collected (21 species, 462 reptiles) was remarkable. All of the species found are well known in eastern Australia, and none could be described as rare or endangered.

Lizards were, without doubt, the dominant herpetofauna in all habitats investigated. Although no snakes were found in two sites, that fact should not be taken to mean that there were no snakes in the areas - just none found.

The study suggests that the hypothesis "there is no difference between the reptile populations in two different local habitats" is incorrect. To the best of the author's knowledge, this study is the only one of its kind to be carried out in this area to date. Although much reptile collecting has taken place in all parts of NSW, no survey of comparative reptile populations in different habitats on the Northwest slopes and plains have been conducted.

The data in Table 1 indicate that the reptile species and populations differ greatly between the granite hills and the flat plains. With the exception of Boulenger's skink (*Morethia boulengeri*) and the Dtella gecko (*Gehyra variegata*), all species of reptiles found in this study are apparently more abundant on the granite hills than on the flats. It should be noted that it would have been easier to miss well hidden reptiles on the hills than on the flats. The reason for the reptiles being more abundant on the hills is probably a combination of less habitat modification, and the presence of a more favorable habitat. A number of species found on the hills are generally

only found in rocky habitats in this part of NSW. Some examples are the Binoe's gecko (*Heteronotia binoei*), the barking gecko (*Underwoodisaurus milli*), and the Children's python (*Liasis childreni*). These species were not expected in the flat habitats studied. Children's pythons have never been recorded from the Gunnedah/Boggabri area, so the finding of these three specimens represented an important range extension of about 50 km. Other species such as the blue-tongued skink (*Tiliqua scincoides*) and the Myall snake (*Suta suta*) were expected in all areas as they are not habitat specific.

A number of reptile species known from the Gunnedah/Boggabri area were not found. These included all four tortoise species known from the Namoi River, Gould's monitor (*Varanus gouldi*), the king brown snake (*Pseudechis australis*) and the blue-bellied black snake (*Pseudechis guttatus*). That they were not found cannot be construed to mean that these species are rare or endangered. Few species of reptiles occur everywhere in a district. The study areas may not have been sites where they occur, or the hunting techniques may have missed them.

On a previous field trip, the Gunnedah rubbish dump and the adjoining grassy, hilly forest country was investigated. Among the reptiles found were *Simoselaps australis* (coral snake), *Furina diadema* (red-naped snake), and *Vermicella annulata* (bandy bandy). Although none of these species were found at the six sites analyzed, they are all believed to be widespread and common throughout most parts of NSW.

Little new development of any kind or further habitat destruction in the area is likely. Reptile populations in the area appear to be secure. Species on the flats probably suffer the greatest long-term threat if intensive wheat, cotton, or other farming becomes more prominent in the district than it is

now.

Fire (as opposed to clearing) has apparently not had a drastic effect on the present reptile populations of the hills. This was expected, as the hills had few large trees and plenty of places for reptiles to hide and avoid the fire and predators after a fire. The lack of species diversity on the flats may in part be due to the combined effects of fires and clearing. The most common on the flats such as *Morethia boulengeri* (Boulenger's skink) are probably those most able to recover after fires and clearing, and may represent a form of "herpetological succession." Fyfe (1980) records the adverse effects of fires on the species diversity of centralian sand deserts.

Species such as *Acanthophis antarcticus* (death adder), which may have occurred in the area when it was virgin bush, cannot be successfully introduced to the area at present due to lack of original habitat, namely hilly forest country with leaf litter covering the ground and no cattle grazing. Death adders are now not found anywhere close to Gunnedah/Boggabri.

North facing slopes had no more reptiles than slopes facing other directions. This could be due to a number of factors, such as the fact that most hills in the area are relatively small and of light gradient. Most parts of the hills received sunlight at all times of the day, thus negating the need to be on only one side of the hill. In this study, no investigation was made of directions of burrows. In other studies, the author (unpublished data) and Webber (1979) found that the burrows of lizards tended to point in a northerly direction to take advantage of the sun.

CONCLUSION

This investigation has suggested that different habitats contain different herpetological populations.

This means that environmental planners should ensure protection of adequate reserves of all types of habitat, not just those that are aesthetically pleasing, as appears to be the current practice. In the Gunnedah/Boggabri area the habitats and reptiles are not presently endangered. Elsewhere in Australia, such is not the case.

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