

# HABITAT AUGMENTATION – FALSE ROCKS FOR A REAL SNAKE



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Fieldwork was conducted by M. Andrews, G. Daly, J. Hinde, M. Smith and G. Thompson.

The content and recommendations in this report are the authors and do not necessarily reflect the views of Shoalhaven Landcare Association.

Cover image: Broad-headed Snake *Hoplocephalus bungaroides*. Image by G. Daly

## EXECUTIVE SUMMARY

The Broad-headed Snake *Hoplocephalus bungaroides* is listed in New South Wales as an endangered species under Schedule 1 of the *Biodiversity Conservation Act 2016*. At the national level, the species is listed as vulnerable under Schedule 1 Part 2 of the *Environment Protection and Biodiversity Conservation Act 1999*. *Hoplocephalus bungaroides* is known to occur in a narrow range of habitat types within a radius of 200 km of Sydney (DECC 2007). The highly restricted distribution and habitat preference are reasons for its listing on conservation schedules.

The species occupied sandstone ridgelines in the Shoalhaven and has been found along the Shoalhaven River escarpment from Kangaroo Valley to North Nowra (G. Daly unpub. data). The species has been seen at Bundanon (S. Fiery pers. comm.) and along the ridge above Riversdale (G. Daly pers. obs.). The species takes refuge under thin pieces of loose rocks along north-west facing ridgelines particularly during the cooler months but also is arboreal living in the hollows of eucalyptus (particularly Grey Gum *E. punctata*) during the hotter periods of summer.

Historically large amounts of loose sandstone rock was taken from the bush for landscaping purposes. This has led to a deficiency of this habitat for the snakes to use. Previous work (Croak et al 2012 and Croak et al 2013) found that snakes will occupy false rock, that is pieces of concrete that were laid along north-west facing cliff lines.

The current project has been funded by Local Lands Services (Grant Application ID: a0U6F00000krHihUAM) to provide artificial rocks (concrete rocks made for the previous work undertaken by Croak *et al.* 2010, sandstone tiles and ceramic tiles) for the Broad-headed Snake. False rocks have been made and placed at the known site at Bundanon where the snake was previously seen in June 2021. The rocks will be regularly checked to see 1) if snakes use them as habitat 2) how long it takes for the snakes to use the rocks 3) what other animals use the rocks and 4) if reptiles use various types of false rocks.

## 1 INTRODUCTION

### 1.1 Background

The Broad-headed Snake *Hoplocephalus bungaroides* is known to occur in a narrow range of habitat types within a radius of 200 km of Sydney (DECC 2007) and this highly restricted distribution and habitat preference are reasons for its listing on conservation schedules. The Shoalhaven local government area has been identified in the *H. bungaroides* draft Recovery Plan (DECC 2007) as supporting one of the remaining 'key populations'. A recent genetic study found this population has been separated from its northern counterpart for 755,000-850,000 yrs (Sumner *et al.* 2009).

The aim of this study was to assess the population size, habitat preference for various false rocks that have been placed at locations where the snake has previously been detected. The placement of rock (quarried, man made false or real) to restore or augment habitat for

the snake is an action supported by the Federal Government (DEC 2014). This report was commissioned by Shoalhaven Landcare Association (SLA). Garry Daly, (Director, Gaia Research Pty Ltd) undertook the fieldwork with assistance from M. Andrews, J. Hinde, M. Smith and G. Thompson. The work was carried out under NPWS Scientific Licence S10470 and Animal Ethics Committee approval 05/2371.

## 1.2 Project objectives

The objectives of the study were to:

- Construct false rocks from various materials and place them in locations away from the public where the snake has previously been found,
- Conduct surveys at sites where the rocks are to be placed to ascertain the density – presence of the snake prior to placement of the rocks,
- Review the use of the rocks by the Broad-headed Snake and other species of reptile such as the Lesueur's Velvet Gecko *Amalosia lesueurii*, and
- provide data from the surveys as required as a condition of the scientific licence issued by the Office of Environment and Heritage (OEH).

## 1.3 Location and description of the study area

### Study area

The site/s (Nowra 1:25,000 topographic map) are located in the Sydney basin, approximately 15 kilometres north-west of the town of Nowra within the Shoalhaven Local Government Area and the Sydney Basin IBRA Bioregion. The specific locations where the rocks have been placed have been censored to avoid unnecessary disturbance to the snake. The board locations were North Nowra, Lilly Pilly Lane Tapitallee, Bundanon and Kangaroo Valley. All sites are either where the snake had previously been seen or supported suitable habitat for the species. The sites were on freehold land and land managed by Bundanon Trust. Permission was given by landowners to place the rocks on their land.

### Geology and Soils

Geologically the area is predominantly Permian sandstones, siltstones and conglomerates (the Shoalhaven Group) of marine origin and is part of the southern-most extent of the Sydney Basin. The deeply eroded gullies and sandstone bluffs of the Shoalhaven River escarpment are prominent features in the landscape. The sandstone bluffs are derived from Nowra Sandstone (Hazelton 1993).

### Vegetation

The vegetation of the sites was Red Bloodwood - Grey Gum shrubby forest (SR593). The dominant species in this community are Red Bloodwood *Corymbia gummifera*, Grey Gum *Eucalyptus punctata* and Turpentine *Syncarpia glomulifera*. It has a diverse dry shrub understorey, including *Persoonia linearis*, *Banksia spinulosa*, *Acacia obtusifolia*, *Tetratheca thymifolia*, *Leucopogon lanceolatus*, *Lomatia ilicifolia*, *Acacia terminalis*, *Platysace lanceolata*, *Bossiaea obcordata*, *Macrozamia communis* and *Gompholobium latifolium*. This community occurred at altitudes between 100 - 600m AHD in Bugong NP,

Jerrawangala NP and Parma Creek NR and adjoining crown lands along the escarpment edge.

Other sites on Bundanon included had Red Bloodwood - Blackbutt - Spotted Gum shrubby open forest on coastal foothills, southern Sydney Basin (SR 592). This association had a canopy of Red Bloodwood and Spotted Gum *Corymbia maculata*, however Blackbutt was absent. The shrublayer consisted of Coastal Banksia *B. integrifolia*, Saw-toothed Banksia *B. serrata*, Black She-oak *Allocasuarina littoralis*, *Pimelea linifolia*, *Banksia spinulosa*, *Persoonia linearis* and *Lomatia ilicifolia*.

## 2 METHODS

### 2.1 False rocks

We used a variety of false rocks that included some cast from concrete, sandstone pavers and ceramic tiles. In addition thin sheets of sandstone that had exfoliated from the country rock were collected and placed on the top of the escarpment at one site in Kangaroo Valley. The false rocks had a layer of compressed foam stuck under them to provide space for the snakes. The rocks were placed on exposed sandstone outcrops that were generally north to north-west facing. The rocks were put out progressively from May 2021. They were checked for occupancy in June and July

The exception to this were the rocks that were placed in a rural subdivision in Lilly Pilly Lane, where the snakes had been seen by several parties, where the rocks were placed on a concrete water tank.



Figure 1 One of the concrete false rocks made by for the snake