

# NSW Threatened Species Scientific Committee

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## Conservation Assessment of *Egernia saxatilis saxatilis* Cogger 1960 (Scincidae)

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NSW Threatened Species Scientific Committee

### ***Egernia saxatilis saxatilis* Cogger 1960 (Scincidae)**

Distribution: Endemic to NSW

Current EPBC Act Status: Not listed

Current NSW BC Act Status: Not listed

Proposed listing on NSW BC Act: Not listed (as it is data deficient)

### **Conservation Advice: *Egernia saxatilis saxatilis***

#### **Summary of Conservation Assessment**

*Egernia saxatilis saxatilis* was found to be ineligible for listing as it is Data Deficient under all Criteria. Although understood to be relatively range restricted (with an EOO of 238 km<sup>2</sup> and AOO of 40 km<sup>2</sup>), its occurrence outside the core rocky habitat has not been determined. In addition, there is no information on threats to the population or habitat of this subspecies, and the majority of records occur within a reserve. There are no data available on population size or trends.

#### **Description and Taxonomy**

Cogger (1960) proposed that *Egernia saxatilis* be separated into two subspecies: *E. saxatilis saxatilis*, restricted to the Warrumbungle Ranges in New South Wales (NSW) and *E. saxatilis intermedia*, widely distributed throughout south-eastern Australia, from Grampians in Victoria to central NSW.

Cogger (1960) describes *Egernia saxatilis saxatilis* as:

“Head slightly distinct from neck; frontal and interparietal equal in length; width of the former two-thirds its length; interparietal twice as long as broad; two frontoparietals; prefrontals in contact; frontonasal in contact with the rostral; four supraoculars, the first two in contact with the frontal; six supraciliaries; lower eyelid scaly; a post-narial groove on both sides, almost dividing the nasal on the right side only; four spinose auricular lobules on each side; eight supralabials, the sixth and seventh subocular; eight infralabials. Three pairs of pluricarinate nuchals; dorsal scales on body and limbs bicarinate, tricarinate and quadricarinate, with occasional quinquecarinate scales (particularly on the nuchal region); carinations relatively strong (sufficient to make the skin rough to touch); ventral scales smooth, subequal in size to the laterals, which are smaller than the dorsals; 39 rows of scales around the middle of the body; 24 lamellae under the fourth toe; dorsal caudal scales pluricarinate; five pairs of mid-dorsal scales on basal portion of tail, remainder of tail with a single row of mid-dorsal scales; mid-ventral subcaudal scale row enlarged; basal portion of tail slightly compressed dorsoventrally, remainder more or less cylindrical.

Dorsal colour dark brown (almost black in life); many scales with a black bar longitudinally through their centres, these scales being irregularly placed over the dorsal surface; sparsely scattered small, white flecks anteriorly; each alternate scale in the dorsal caudal series with a black posterior edge. Lateral surfaces of body black, with scattered lighter brown scales. Auricular lobules and labials light brown or cream, variegated with darker brown. Gular region white, variegated with black. Ventral surface of body and tail white or cream (bright orange in life). Lower surfaces of feet and digits a shiny black.” Diagnosis: 36-41 mid-body scale rows; four spinose auricular lobules on each side, dorsal colour dark brown, without lighter, broad dorsolateral stripes. In *Egernia saxatilis intermedia* auricular lobules, though rugose, are rarely spinose, and may number as few as two on each side; 28-35 mid-body scale rows.”

Common name: Warrumbungles Black Rock Skink

# NSW Threatened Species Scientific Committee

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## Distribution and Abundance

*Egernia saxatilis saxatilis* is restricted to the outcropping basalt bluffs of the Warrumbungle Ranges on the north-west slopes of NSW, near the town of Coonabarabran (Cogger 2014). This subspecies appears to be confined to rock crevice habitats within the range, being excluded from timber crevices in the surrounding forests by the closely related sympatric *Egernia striolata* (G. Shea *in litt.* April 2018).

The majority of records for this species are located within Warrumbungle National Park. Several sightings have also been recorded around Siding Spring Observatory, located on the eastern boundary of the national park. The rest of the park is surrounded by rural properties, used for grazing of cattle and sheep, and cereal cropping (NSW NPWS 2012).

The population size of *Egernia saxatilis saxatilis* is unknown and is considered data deficient and requires investigation.

No targeted surveys (only opportunistic) have been undertaken in the area for this subspecies and information is limited (G. Shea *in litt.* April 2018).

## Ecology

### Habitat Requirements

*Egernia saxatilis* is a rock-dwelling lizard found in crevices beneath boulders and exfoliations on rocky outcrops (Cogger 2014). Cogger (1960) found *E. saxatilis saxatilis* to be exclusively saxatile (living amongst rocks) in its habit as it is excluded from more arboreal habitat by *E. striolata*. In contrast, *E. s. intermedia*, though mainly saxatile, is occasionally found within habitat in trees when *E. striolata* is absent.

This lizard is diurnal, with peaks in activity during the morning and late afternoon. Individuals spend most of their time in rock crevices, emerging during warm weather to forage and to interact socially (O'Connor and Shine 2003). *Egernia saxatilis* show a strong preference for a permanent home site (such as in a rock crevice), with the majority of basking and foraging occurring in the immediate area this site (O'Connor and Shine 2004).

No information is available on the species ability to disperse, but habitat availability is likely to be the limiting factor restricting dispersal for this subspecies (G. Shea *in litt.* April 2018).

The diet of *E. s. saxatilis* is unknown, but likely to be similar to *E. s. intermedia*, consisting predominantly of invertebrates, including beetles, ants, grasshoppers and cockroaches, although they also consume significant amounts of plant food during some seasons (Brown 1991; O'Connor and Shine 2003).

### Life cycle/Reproduction

There have been limited detailed behavioural or ecological studies on this subspecies. *Egernia saxatilis* is viviparous, giving birth to one to four young each year in late February to early March (O'Connor and Shine 2003).

*Egernia saxatilis* has a "nuclear family" structure, composed of an adult pair and their offspring and appear to exhibit long-term monogamy (O'Connor and Shine 2003). They are highly aggressive towards unfamiliar individuals, with adult pairs vigorously defending their home range, and when present, their offspring (Chapple 2003; Langkilde *et al.* 2007).

No information is available on generation length for this species, but similar sized *Egernia* species (e.g., *E. striolata*, *E. coventryi*, *E. whitii*, *E. modesta*) take around two to three years to mature and may live for up to 10 years (O'Connor and Shine 2003).

## Threats

There are no documented threats to *Egernia saxatilis saxatilis*, and much of its range is protected within Warrumbungle National Park. Threats to the species are likely to be those that affect habitat and food source,

# NSW Threatened Species Scientific Committee

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however little is known regarding species biology to fully understand its preferred habitat (R. Sadler *in litt.* May 2018).

The impact of fire on this subspecies is unknown. It was observed to be present not long after Warrumbungle National Park was extensively burnt by a major bushfire in 2013 (G. Shea *in litt.* April 2018), suggesting that a single fire may not pose a threat to the species. However, fire could pose a significant threat to habitat through the loss of surrounding vegetation and exposing the rock habitat to increased temperatures or resulting in a loss of invertebrates that are part of its diet, particularly if a fire event occurred during an extended El Niño period (R. Sadler *in litt.* May 2018).

Other potential threats include predation by introduced species including cats and foxes, habitat disturbance (e.g. goats), habitat loss and degradation (especially for off reserve sites), and climate change.

## **Assessment against IUCN Red List criteria**

For this assessment it is considered that previous surveys of *Egernia saxatilis saxatilis* have been inadequate and therefore there is insufficient scientific evidence to support any listing outcome.

### *Criterion A Population Size reduction*

Assessment Outcome: Data Deficient.

Justification: To be listed as threatened under Criterion A, the species must have experienced a population reduction of  $\geq 30\%$  (VU threshold) over three generations or 10 years (whichever is longer). No quantifiable data is available on the population size or dynamics of this animal and there are no data on population declines over any relevant time frames (10 years or 3 generations). Therefore, there are insufficient data to assess *Egernia saxatilis saxatilis* against this criterion.

### *Criterion B Geographic range*

Assessment Outcome: Data Deficient.

Justification: *Egernia saxatilis saxatilis* is restricted to the outcropping basalt bluffs and ranges of the Warrumbungle Ranges on the north-west slopes of New South Wales. Its extent of occurrence (EOO) was estimated to be 238 km<sup>2</sup>, based on a minimum convex polygon enclosing all mapped occurrences of the species, the method of assessment recommended by IUCN (2017). A species with an EOO of less than 5,000 km<sup>2</sup> qualifies under the Endangered threshold. The area of occupancy (AOO) was estimated to be 40 km<sup>2</sup>, based on 2 x 2 km grid cells, the scale recommended for assessing area of occupancy by IUCN (2017). A species with an AOO of less than 500 km<sup>2</sup> qualifies under the Endangered threshold.

In addition to these thresholds, at least two of three other conditions must be met. These conditions are:

- a) The population or habitat is observed or inferred to be severely fragmented or number of locations = 1 (CR),  $\leq 5$  (EN) or  $\leq 10$  (VU).

Assessment Outcome: Data Deficient.

Justification: There is insufficient data to assess whether *Egernia saxatilis saxatilis* is severely fragmented in population or habitat. Additionally, there are no documented threats to determine the number of locations.

# NSW Threatened Species Scientific Committee

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- b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals

Assessment Outcome: Data Deficient.

Justification: There are no documented threats to this subspecies for which to determine whether or not there is a continuing decline in population size, geographic distribution or habitat quality.

- c) Extreme fluctuations.

Assessment Outcome: Data Deficient.

Justification: There is no available data to assess the likelihood of extreme fluctuations in population size or geographic distribution of *Egernia saxatilis saxatilis*.

## Criterion C *Small population size and decline*

Assessment Outcome: Data Deficient.

Justification: Currently there is no available census data to assess the population size or decline in *Egernia saxatilis saxatilis*. Therefore, there is insufficient information to assess this subspecies under Criterion C.

At least one of two additional conditions must be met. These are:

- C1. An observed, estimated or projected continuing decline of at least 25% in 3 years or 1 generation (up to a max. of 100 years in future).

Assessment Outcome: Data Deficient.

Justification: There are no documented threats to *Egernia saxatilis saxatilis* and no data on population declines over any relevant time frames to determine whether or not there is a continuing decline in population size.

- C2. An observed, estimated, projected or inferred continuing decline

Assessment Outcome: Data Deficient.

Justification: There are no documented threats to *Egernia saxatilis saxatilis* for which to determine whether or not there is a continuing decline in population size.

In addition, at least 1 of the following 3 conditions:

- a (i). Number of mature individuals in each subpopulation  $\leq 50$  (CR),  $\leq 250$  (EN) or  $\leq 1000$  (VU).

Assessment Outcome: Data Deficient.

Justification: There is no available census data to assess number of mature adults per subpopulation of *Egernia saxatilis saxatilis*.

- a (ii). % of mature individuals in one subpopulation = 90-100% (CR), 95-100% (EN), 100% (VU).

Assessment Outcome: Data Deficient.

Justification: The percentage of mature adults per subpopulation is unknown. There is insufficient data to assess *Egernia saxatilis saxatilis* against this subcriterion.

- b. Extreme fluctuations in the number of mature individuals

# NSW Threatened Species Scientific Committee

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Assessment Outcome: Data Deficient.

Justification: There is no available data to assess the likelihood of extreme fluctuations in population size or geographic distribution of *Egernia saxatilis saxatilis*.

*Criterion D*      *Very small or restricted population*

Assessment Outcome: Data Deficient

Justification: Currently there is no available census data to assess the population size of *Egernia saxatilis saxatilis* and there are no documented threats to this subspecies. It is restricted to the Warrumbungle Ranges in New South Wales. The area of occupancy (AOO) was estimated to be 40 km<sup>2</sup>, based on 2 x 2 km grid cells, the scale recommended for assessing area of occupancy by IUCN (2017). This species AOO does not qualify to meet sub criterion D2 (<20 km<sup>2</sup>).

*Criterion E*      *Quantitative Analysis*

Assessment Outcome: Data Deficient.

Justification: There is insufficient data available to undertake a quantitative analysis to determine the extinction probability of *Egernia saxatilis saxatilis*.

## References

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- Cogger HG (1960) The ecology, morphology, distribution and speciation of a new species and subspecies of the genus *Egernia* (Lacertilia: Scincidae). *Records of the Australian Museum* **25**, 95–105.
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## Expert Communications

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- Jodi Rowley, NSW Threatened Species Scientific Committee & Curator of Amphibian & Reptile Conservation Biology, Australian Museum & UNSW Sydney.
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# NSW Threatened Species Scientific Committee

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## Biodiversity Conservation Regulations 2017

### Clause 4.2 – Reduction in population size of species

(Equivalent to IUCN criterion A)

Assessment Outcome: Data deficient

<del>(1) The species has undergone or is likely to undergo within a time frame appropriate to the life cycle and habitat characteristics of the taxon:</del>			
	(a)	<del>for critically endangered species</del>	<del>a very large reduction in population size, or</del>
	(b)	<del>for endangered species</del>	<del>a large reduction in population size, or</del>
	(c)	<del>for vulnerable species</del>	<del>a moderate reduction in population size.</del>
<del>(2) The determination of that criteria is to be based on any of the following:</del>			
	(a)	<del>direct observation,</del>	
	(b)	<del>an index of abundance appropriate to the taxon,</del>	
	(c)	<del>a decline in the geographic distribution or habitat quality,</del>	
	(d)	<del>the actual or potential levels of exploitation of the species,</del>	
	(e)	<del>the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.</del>	

### Clause 4.3 - Restricted geographic distribution of species and other conditions

(Equivalent to IUCN criterion B)

Assessment Outcome: Data deficient

<b>The geographic distribution of the species is:</b>			
	(a)	<del>for critically endangered species</del>	<del>very highly restricted, or</del>
	(b)	<del>for endangered species</del>	<del>highly restricted, or</del>
	(c)	<del>for vulnerable species</del>	<del>moderately restricted,</del>
<b>and at least 2 of the following 3 conditions apply:</b>			
	(d)	<del>the population or habitat of the species is severely fragmented or nearly all the mature individuals of the species occur within a small number of locations,</del>	
	(e)	<del>there is a projected or continuing decline in any of the following:</del>	
		(i)	<del>an index of abundance appropriate to the taxon,</del>
		(ii)	<del>the geographic distribution of the species,</del>
		(iii)	<del>habitat area, extent or quality,</del>
		(iv)	<del>the number of locations in which the species occurs or of populations of the species,</del>
	(f)	<del>extreme fluctuations occur in any of the following:</del>	
		(i)	<del>an index of abundance appropriate to the taxon,</del>
		(ii)	<del>the geographic distribution of the species,</del>
		(iii)	<del>the number of locations in which the species occur or of populations of the species.</del>

# NSW Threatened Species Scientific Committee

**Clause 4.4 - Low numbers of mature individuals of species and other conditions**

(Equivalent to IUCN criterion C)

Assessment Outcome: Data deficient

<b>The estimated total number of mature individuals of the species is:</b>					
	(a)	for critically endangered species	very low, or		
	(b)	for endangered species	low, or		
	(c)	for vulnerable species	moderately low,		
<b>and either of the following 2 conditions apply:</b>					
	(d)	a continuing decline in the number of mature individuals that is (according to an index of abundance appropriate to the species):			
		(i)	for critically endangered species	very large, or	
		(ii)	for endangered species	large, or	
		(iii)	for vulnerable species	moderate,	
	(e)	both of the following apply:			
		(i)	a continuing decline in the number of mature individuals (according to an index of abundance appropriate to the species), and		
		(ii)	at least one of the following applies:		
		(A)	the number of individuals in each population of the species is:		
			(i)	for critically endangered species	extremely low, or
			(ii)	for endangered species	very low, or
			(iii)	for vulnerable species	low,
		(B)	all or nearly all mature individuals of the species occur within one population,		
		(C)	extreme fluctuations occur in an index of abundance appropriate to the species.		

**Clause 4.5 - Low total numbers of mature individuals of species**

(Equivalent to IUCN criterion D)

Assessment Outcome: Data deficient

<b>The total number of mature individuals of the species is:</b>			
	(a)	for critically endangered species	extremely low, or
	(b)	for endangered species	very low, or
	(c)	for vulnerable species	low.

**Clause 4.6 - Quantitative analysis of extinction probability**

(Equivalent to IUCN criterion E)

Assessment Outcome: Data deficient

<b>The probability of extinction of the species is estimated to be:</b>			
	(a)	for critically endangered species	extremely high, or
	(b)	for endangered species	very high, or
	(c)	for vulnerable species	high.

# NSW Threatened Species Scientific Committee

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## Clause 4.7 - Very highly restricted geographic distribution of species—vulnerable species

(Equivalent to IUCN criterion D2)

Assessment Outcome: Data deficient

For vulnerable species,	the geographic distribution of the species or the number of locations of the species is very highly restricted such that the species is prone to the effects of human activities or stochastic events within a very short time period.
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