

NSW Threatened Species Scientific Committee

Conservation Assessment of *Saproscincus oriarus* Sadlier, 1998 (Scincidae)

C Bray, J Rowley, June 2019

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***Saproscincus oriarus* Sadlier, 1998 (Scincidae)**

Distribution: NSW and Qld

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: *Saproscincus oriarus*

Summary of Conservation Assessment

Saproscincus oriarus was found to be ineligible for listing as it is Data Deficient under all Criteria. Although understood to have a relatively restricted range (with an AOO of 48 km²), there is no information on threats to the population or habitat of this species, and insufficient survey effort has been undertaken to determine distribution. There are no data available on population size or trends.

Description and Taxonomy

Cogger (2014) describes *Saproscincus oriarus* as: "Brown to rich russet-brown above, with scattered darker flecks that sometimes tend to form a couple of fine, blackish longitudinal lines extending to base of tail; usually a darker upper lateral zone clearly delineated from the dorsum by a narrow line and bordered below by a narrow mid-lateral white stripe. Usually a short, narrow, pale streak edged above with dark brown from the hind corner of the eye and a pale orange to reddish dorso-lateral streak commencing above the rump and converging with its opposite number on the base of the tail. The upper surface of the tail usually a much brighter reddish or golden colour than the back. Ventral surfaces white to lemon -yellow, with dark markings, if present, usually aligned in longitudinal rows. 22-24 smooth mid-body scales rows. Suture between the rostral and the frontonasal about as broad as the frontal. Supraciliaries 6-7, usually six. Frontoparietals paired. Transparent disc of lower eyelid much smaller than eye, Subdigital lamellae smooth, 18-22 under the fourth toe. 45 mm (snout-vent). Limbs overlapping when adpressed."

Saproscincus oriarus is "distinguished from other members of the genus by the following combination of characters: adult size moderately small 34-43 mm; premaxillary teeth 11; post-sacral vertebrae 54; nuchal scales meet behind interparietal; supraciliaries usually 6; scale on top of fourth finger 9-11; lamellae beneath fourth finger 13/16; scales on top of fourth toe 11-13; lamellae beneath fourth toe 18-22; lateral surface of head and body with a fine white midlateral stripe; dark markings on the ventral surface (when present) arranged in regular longitudinal rows." (Sadlier 1998). This species is allopatric to other *Saproscincus* (Moussalli *et al.* 2005).

The common names for the species are Heath Shadenskink, Heath Shade-skink and Coastal Shadenskink.

Distribution and Abundance

Saproscincus oriarus is known to occur from the Myall Lakes area in central NSW to Byron Bay in the far north coast of NSW. An isolated subpopulation occurs on North Stradbroke Island in south east Queensland, around 130 km north of the subpopulation at Byron Bay (Cogger 2014; Hines *et al.* 2015). The maximum linear distance between all known sites is approximately 550 km².

The species is known to occur mostly on privately owned land but has been recorded in Limeburners Creek Nature Reserve, Yuraygir National Park and Myall Lakes National Park (Atlas of Living Australia).

Although it has an apparently broad distribution, only relatively few individuals of the species have been recorded at any location and the overall lack of records suggests a patchy distribution (Sadler 1998; Shea 2018). However, *Saproscincus oriarus* is generally secretive and difficult to detect (Shea 2018) and most records are opportunistic observations. The only known systematic survey for this species in NSW was in coastal habitat near Byron Bay around 20 years ago (R. Sadler *in litt.* October 2018).

Numerous non-targeted surveys for reptiles have been undertaken in the Myall Lakes area (including Australian Herpetology Society field trips and university studies) since *S. oriarus* was first recorded there in 1995, however, it has not been relocated in this area. It is unknown whether the record at Myall Lakes is spatially incorrect, the species is in very low abundance and/or cryptic, or it is no longer present there (S. Mahony *in litt.* September 2018).

An opportunistic sighting of over 20 individuals of this species was made during a *Crinia tinnula* survey in Yuraygir National Park, in known habitat of *Saproscincus oriarus* (S. Mahony *in litt.* September 2018).

Saproscincus oriarus was first observed in Queensland on North Stradbroke Island in 2000 when one individual was encountered opportunistically and subsequently identified from photographs. A targeted survey (over eight days) was made of the area in 2001, but no individuals were found. The species was recorded in the area again during opportunistic surveys in 2012, when seven individuals were located. Surrounding areas with similar habitat were searched but no more individuals were observed. Surveys in 2014 around the previous recorded sites failed to locate any *S. oriarus* (Hines *et al.* 2015).

It is possible that the species may be more common and widespread than current records suggest, given that reptiles are under-reported compared with other vertebrate taxa in wildlife databases (Lunney *et al.* 2017). The species can be confused with other more common heath-dwelling skinks such as *Lampropholis guichenoti* (Hines *et al.* 2015).

During opportunistic searches for this species within known locations it has been reported as relatively easy to locate and considered to be 'locally abundant' (G. Shea *in litt.* February 2018; Shea 2018). However, the population size of *Saproscincus oriarus* is unknown and requires investigation.

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Ecology

Habitat Requirements

Saproscincus oriarus is restricted to coastal lowlands (Moussalli *et al.* 2005). It has been recorded in swamp sclerophyll forest dominated by broad-leaved paperbark, shrubs and ferns; littoral rainforest and *Melaleuca* swamp; and coastal forest (Sadlier 1998; Newell and Goldingay 2004). It has also been recorded in a number of disturbed areas including an area of extensive mown grass that replaced native vegetation following clearing and a suburban allotment (Sadlier 1998), and in “dunal vegetation heavily disturbed by human activity associated with adjacent campground” (though within 50 m of extensive heath/sedgeland) on Stradbroke Island (Hines *et al.* 2015).

Its occurrence in areas altered by some human activities indicates that it can persist in disturbed habitat, and these urban regrowth areas are likely to still provide the species with its essential habitat requirements, i.e. dense cover of vegetation and moisture. However, it is unlikely that other more severe disturbance activities such as sand mining will provide the necessary microhabitat for this species (R. Sadlier *in litt.* October 2018).

This secretive species is mostly found in ground litter but has been encountered in trees in well-vegetated coastal paperbark thickets (Shea 2018; Wilson and Swan 2013). In Queensland, it was recorded sheltering inside upright apical hollows in *Gahnia sieberiana* stems (Hines *et al.* 2015).

No information is available on the species' ability to disperse.

Life cycle/Reproduction

There have been no detailed behavioural or ecological studies on this species. It is crepuscular and nocturnal (Cogger 2014; Sadlier 1998). All *Saproscincus* species are believed to be oviparous (Cogger 2014). No information is available on generation length for this species.

Threats

There are no documented threats to *Saproscincus oriarus*. It is known to occur in coastal wallum heath swamps, which are impacted by agriculture, resort and residential development and sand mining (S. Mahony *in litt.* March 2017; Meyer *et al.* 2006). The coastal habitats of this species are potentially vulnerable to climate change as a result of sea level rise, erosion, saline intrusion and increased fire intensity and frequency, exacerbated by growth in human population (OEH 2010).

Coastal development and agriculture, changes to hydrology and water quality to wetlands and severe fires may all result in loss and fragmentation of this species' habitat (H. Hines *in litt.* February 2019).

Assessment against IUCN Red List criteria

For this assessment it is considered that previous surveys of *Saproscincus oriarus* 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

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there are no data on population declines over any relevant time frames (10 years or 3 generations). Therefore, there are insufficient data to assess *Saproscincus oriarus* against this criterion.

Criterion B Geographic range

Assessment Outcome: Data deficient.

Justification: *Saproscincus oriarus* is restricted to coastal lowlands. From known records its extent of occurrence (EOO) is estimated to be 12,560 km², based on a minimum convex polygon enclosing all mapped occurrences of the species, the method of assessment recommended by IUCN (2017). Excluding the Myall Lakes record, the EOO is 6,194 km². A species with an EOO of less than 20,000 km² qualifies under the Vulnerable threshold. A species with an EOO of less than 5,000 km² qualifies under the Endangered threshold.

The area of occupancy (AOO) was estimated to be 48 km², based on 2 km x 2 km grid cells, the scale recommended for assessing area of occupancy by IUCN (2017). Excluding the Myall Lakes, the AOO is 44 km². A species with an AOO of less than 500 km² 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), ≤5 (EN) or ≤ 10 (VU).

Assessment Outcome: Data deficient.

Justification: There are insufficient data to assess whether *Saproscincus oriarus* is severely fragmented in population or habitat or determine the number of locations under this subclause.

- 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 species from 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 are no available data to assess the likelihood of extreme fluctuations in population size or geographic distribution of *Saproscincus oriarus*.

Criterion C Small population size and decline

Assessment Outcome: Data deficient.

Justification: Currently there are no available census data to assess the population size or likelihood of decline in *Saproscincus oriarus*. Therefore, there is insufficient information to assess this species under Criterion C.

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

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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 *Saproscincus oriarus* 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 *Saproscincus oriarus* to enable the trajectory of the population size to be determined.

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

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

Assessment Outcome: Data Deficient.

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

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 are insufficient data to assess *Saproscincus oriarus* against this subcriterion.

b. Extreme fluctuations in the number of mature individuals

Assessment Outcome: Data deficient.

Justification: There are no available data to assess the likelihood of extreme fluctuations in population size or geographic distribution of *Saproscincus oriarus*.

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 *Saproscincus oriarus* and there are no documented threats to this species. It is restricted to subtropical coastal lowlands in northern NSW and southern Queensland. The area of occupancy (AOO) was estimated to be 48 km², 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 km²).

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Criterion E Quantitative Analysis

Assessment Outcome: Data deficient.

Justification: There are insufficient data available to undertake a quantitative analysis to determine the extinction probability of *Saproscincus oriarus*.

Conservation and Management Actions

A comprehensive survey of *Saproscincus oriarus* should be undertaken to properly assess biology, population numbers and distribution and to better assess any threats to the species.

References

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Expert Communications

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APPENDIX

Assessment against BC Act criteria

Clause 4.2 – Reduction in population size of species

(Equivalent to IUCN criterion A)

Assessment Outcome: Data deficient

(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:			
	(a)	for critically endangered species	a very large reduction in population size, or
	(b)	for endangered species	a large reduction in population size, or
	(c)	for vulnerable species	a moderate reduction in population size.
(2) - The determination of that criteria is to be based on any of the following:			
	(a)	direct observation,	
	(b)	an index of abundance appropriate to the taxon,	
	(c)	a decline in the geographic distribution or habitat quality,	
	(d)	the actual or potential levels of exploitation of the species,	
	(e)	the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.	

Clause 4.3 - Restricted geographic distribution of species and other conditions

(Equivalent to IUCN criterion B)

Assessment Outcome: Data deficient

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

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Clause 4.4 - Low numbers of mature individuals of species and other conditions
(Equivalent to IUCN criterion C)

Assessment Outcome: Data deficient

The estimated total number of mature individuals of the species is:			
	(a)	for critically endangered species	very low, or
	(b)	for endangered species	low, or
	(c)	for vulnerable species	moderately low,
and either of the following 2 conditions apply:			
	(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

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

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Clause 4.6 - Quantitative analysis of extinction probability

(Equivalent to IUCN criterion E)

Assessment Outcome: Data deficient

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

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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Overall Assessment Outcome: Not listed (Data deficient).