Silver-headed Antechinus

Antechinus argentus Baker, Mutton & Hines, 2013

Dasyuridae

Conservation status

Critically Endangered (B1ab(iii)+2 ab(iii))

Justification

The Silver-headed Antechinus is known only from one very restricted area, with an extent of occurrence of substantially less than 100 km^2. The area of occupancy is also highly restricted and is probably less than 10 km^2. The sole account of its status (Baker *et al.* 2013) considered that it is exposed to some threats that are or may be detrimentally affecting the quality of its habitat.

There is no reliable information on population size or trends, but with more information, the species may also be eligible for threatened status under criterion C and possibly criterion A.

Current eligibility against IUCN Red List Criteria

IUCN Criterion	Criteria eligibility
A	Not applicable: population trends unknown
B	Critically Endangered: EOO <100 km^2, and AOO <10 km^2; one location; continuing decline in habitat quality
C	Not applicable: population size not reliably estimated but probably <10 000 mature individuals; population trends unknown; no extreme fluctuation
D	Vulnerable: AOO <20 km^2, and plausible that a future threat could drive the species to CR in a very short time
E	Not applicable: no population viability analysis undertaken

IUCN Red List assessment data

	Estimate	Reliability
Extent of occurrence	20 km^2 *	low
trend	stable	low
Area of occupancy	8 km^2	low
trend	stable	low
No. of mature individuals	1000	low
trend	stable	low
No. subpopulations	1	medium
No. locations	1	medium
Largest subpopulation	1000	low
Generation length	1 year	high
Global population share	100%	high

* note that EOO cannot be readily determined because a polygon cannot be drawn around the only two locational points

Retrospective status 2002

Critically Endangered (B1ab(iii)+2 ab(iii))

Retrospective status 1992

Critically Endangered (B1ab(iii)+2 ab(iii))

Previous Action Plan assessment

Not Evaluated, as not then recognised as a distinct species (Maxwell *et al.* 1996).

IUCN status (2012)

Not Evaluated

EPBC Act status (2012)

Not listed

Legal status in range State

State/Territory	*Status*
Queensland	not listed

Taxonomy

The first specimen of Silver-headed Antechinus was collected in 1992, and was attributed initially to *A. flavipes*, and subsequently to *A. mysticus* (Baker *et al.* 2012). However, with collection of further specimens, its specific status was recognised in 2013 (Baker *et al.* 2013). No subspecies are recognised.

Taxonomic distinctiveness: low (global); low (Australian)

Range

This species is known only from the plateau at the eastern escarpment of Kroombit Tops National Park, in south-eastern Queensland (Baker *et al.* 2013). Within this limited area, it has been recorded from only two sites, 5.5 km apart (Baker *et al.* 2013). Baker *et al.* (2013) noted that it was possible that its range extends to comparable habitats beyond Kroombit Tops, but that such sites had been relatively little sampled.

Abundance

There is no reliable estimate of population size, but the Silver-headed Antechinus probably occurs at low density in a very limited area. Baker *et al.* (2013) reported a total of 13 individuals were captured from only two sites from 5080 trap-nights over a 15 year period.

Monitoring

There is no formal monitoring program, but Baker *et al.* (2013) reported some repeat sampling of some sites.

Ecology

The ecology of the Silver-headed Antechinus is poorly known. The habitat at both sites where recorded comprises tall open eucalypt forest with a shrubby understorey on a plateau at elevation of c. 850-900 m asl (Baker *et al.* 2013).

The species is presumed to have annual male die-off, with a restricted breeding mating period in June-July (Baker *et al.* 2013).

Threats

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Inappropriate fire regimes	moderate	entire range	high intensity and/or extensive fires have been reported recently and may severely reduce shelter sites (Baker *et al.* 2013)
Habitat degradation associated with livestock and feral herbivores	moderate	entire range	feral cattle, pigs, and horses are present and are or may be reducing habitat quality (Baker *et al.* 2013)
Habitat degradation due to weeds	minor	entire range	some increase in the weed *Lantana camara* may be reducing habitat quality (Baker *et al.* 2013)
Habitat loss due to climate change	minor	entire range	projected climate change may exacerbate fire impacts (Baker *et al.* 2013)

Information required

Theme	Specific actions	Priority
Survey to better define distribution	expand targeted surveys throughout known and potential range	medium-high (current PhD project is considering this: A. Baker *pers. comm.*)
Assess impacts of threats on species	undertake autecological studies that better clarify relative impacts of putative threats	medium (current PhD project is considering this: A. Baker *pers. comm.*)
Establish or enhance monitoring program	design an integrated monitoring program	medium-high
Assess effectiveness of threat mitigation options	n/a	
Resolve taxonomic uncertainties	n/a	
Assess habitat requirements	identify critical habitat factors, particularly in relation to impacts of fire, feral animals and weeds	medium (current PhD project is considering this: A. Baker *pers. comm.*)
Assess diet, life history	identify key dietary items, life history and shelter requirements	low-medium (current PhD project is considering this: A. Baker *pers. comm.*)

Management actions required

Theme	Specific actions	Priority
Active mitigation of threats	implement fire management of infrequent, patchy, low-medium intensity fire	high
	reduce the abundance of feral pigs, cattle and horses	medium
Captive breeding	establish a captive breeding colony and maintain it at least until range and abundance are better understood	high
Quarantining isolated populations	n/a	
Translocation	n/a	
Monitoring	implement an integrated monitoring program	medium
Community engagement	n/a	

Recovery Plan

There is no recovery plan.

Current management

The entire range of this species lies within a conservation reserve, Kroombit Tops National Park (Baker *et al.* 2013). However, there is no specific management for this species.

Conservation objectives

1. Clarify range, abundance and threats.
2. Establish monitoring program, linked to management response if population and range continue to decline.
3. Establish and maintain a captive breeding colony.

Bibliography

Baker AM, Mutton TY, Hines HB (2013) A new dasyurid marsupial from Kroombit Tops, south-east Queensland, Australia: the Silver-headed Antechinus, *Antechinus argentus* sp. nov.(Marsupialia: Dasyuridae). *Zootaxa* **3746**, 201-239.

Baker AM, Mutton TY, Van Dyck S (2012) A new dasyurid marsupial from eastern Queensland, Australia: the Buff-footed Antechinus, *Antechinus mysticus* sp. nov. (Marsupialia: Dasyuridae). *Zootaxa* **3515**, 1-37.

Maxwell S, Burbidge AA, Morris K (1996) 'The 1996 action plan for Australian marsupials and monotremes.' Wildlife Australia, Canberra.

Comments received from

Andrew Baker

Black-tailed Antechinus

Antechinus arktos Baker, Mutton, Hines & Van Dyck, 2014

Dasyuridae

Conservation status

Endangered (B1ab(v)+2ab(v))

Justification

The Black-tailed Antechinus is known only from one restricted area (the Tweed Shield Volcano caldera on the Queensland-New South Wales border), with an extent of occurrence of substantially less than 5000 km^2. The area of occupancy is also highly restricted and is probably less than 50 km^2. The limited available information suggests a continuing decline in abundance. The available data are too limited to reliably estimate population size, or to indicate the rate of decline. With more information, the species may also be eligible for threatened status under criterion C and possibly criterion A.

Current eligibility against IUCN Red List Criteria

IUCN Criterion	Criteria eligibility
A	Not applicable: some decline reported, but insufficient information to assess the extent and rate of population decline; unlikely to be >30% over 10 years
B	Endangered: EOO <5000 km^2, and AOO <50 km^2; continuing decline in population size; one location
C	Not applicable: population size not reliably estimated but possibly <10 000 mature individuals; possibly declining but rate probably <10% in 10 years; no. of individuals in largest subpopulation probably >1000; no extreme fluctuation
D	Not applicable: population probably >1000 mature individuals
E	Not applicable: no population viability analysis undertaken

IUCN Red List assessment data

	Estimate	Reliability
Extent of occurrence trend	177 km^2 decreasing	medium low
Area of occupancy trend	32 km^2 decreasing	medium low-medium
No. of mature individuals trend	2000 decreasing	low low
No. subpopulations	1	medium
No. locations	1	medium
Largest subpopulation	2000	low
Generation length	1 year	high
Global population share	100%	high

Retrospective status 2002

Endangered (B1ab(v)+2ab(v))

Retrospective status 1992

Endangered (B1ab(v)+2ab(v))

Previous Action Plan assessment

Not Evaluated, as not then considered specifically distinct from *A. swainsonii* (Maxwell *et al.* 1996).

IUCN status (2012)

Not Evaluated

EPBC Act status (2012)

Not listed

Legal status in range State

State/Territory	*Status*
Queensland	not listed
New South Wales	not listed

Taxonomy

This species was formerly considered as a geographically isolated population of the relatively widespread subspecies *Antechinus swainsonii mimetes*, but its specific-level distinction was recognised recently (Baker *et al.* 2014). No subspecies are recognised.

Taxonomic distinctiveness: low (global); low (Australian)

Range

The Black-tailed Antechinus has one of the most restricted ranges of any mainland Australian mammal, with all known records from high rainfall and high altitude (>780 m) closed forest of parts of the Tweed Volcano Caldera around the border of south-eastern Queensland and north-eastern New South Wales. Within this limited range it has only been captured at a few sites (<10) (Baker *et al.* 2014).

Although the data are limited, and the first specimen was collected only relatively recently (1966), recent sampling has failed to record it at sites from which it was reported in the 1960s and 1970s (e.g. Binna Burra), with apparent contraction to highest altitude parts of its former range (Baker *et al.* 2014).

Abundance

There is no reliable estimate of population size, but the Black-footed Antechinus probably occurs at low density in a very limited area. There have been fewer than 20 confirmed records (Baker *et al.* 2014). Baker *et al.* (2014) provided some information on numbers caught per trapping effort, including one individual from 600 trap-nights targeting this species in May 2013 and no individuals from 675 trap-nights in September 2013. They also noted that 'since 1989, there have been thousands of Elliott trap/nights in the eastern section of the Border Ranges, including in areas where *A. arktos* was previously collected, as well as other parts of the Tweed caldera'.

Its population size is likely to be declining, given the absence of records from recent trapping at some sites from which it was reported in the 1960s and 1970s.

Monitoring

There is no formal monitoring program, but Baker *et al.* (2014) reported some repeat sampling of some sites.

Ecology

The ecology of the Black-tailed Antechinus is poorly known. Most records are from rainforests (mostly humid cool-subtropical and cool temperate rainforests on basalt), but it has also been reported from 'mountain mallee heath' (adjacent to rainforest) and tall eucalypt forest (Baker *et al.* 2014). The species is presumed to have annual male die-off, with a restricted breeding mating period in July-August (Baker *et al.* 2014).

Threats

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Habitat loss due to climate change	severe	entire range	Limited evidence, but probable recent disappearance from lower altitude parts of its limited range

Information required

Theme	Specific actions	Priority
Survey to better define distribution	expand targeted surveys throughout known and potential range	medium-high (current PhD project is considering this: A. Baker *pers. comm*.)
Assess impacts of threats on species	undertake autecological studies that may identify key threats	medium (current PhD project is considering this: A. Baker *pers. comm*.)
	clarify the extent of altitudinal range change	medium (current PhD project is considering this: A. Baker *pers. comm*.)
Establish or enhance monitoring program	design an integrated monitoring program	medium-high
	monitor extent, condition and suitability of rainforest habitat in response to climate change	medium
Assess effectiveness of threat mitigation options	n/a	
Resolve taxonomic uncertainties	n/a	
Assess habitat requirements	identify critical habitat factors, particularly in relation to likely climate change impacts on vegetation	low-medium (current PhD project is considering this: A. Baker *pers. comm*.)
Assess diet, life history	identify key dietary items, and their responses to climate change	low (current PhD project is considering this: A. Baker *pers. comm*.)

Management actions required

Theme	Specific actions	Priority
Active mitigation of threats	n/a	
Captive breeding	identify monitoring thresholds that may justify establishment of a captive breeding population	medium
Quarantining isolated populations	n/a	
Captive breeding	establish a captive breeding colony and maintain it at least until range and abundance are better understood	high
Translocation	n/a	
Monitoring	implement an integrated monitoring program	medium
Community engagement	n/a	

Recovery Plan

There is no recovery plan.

Current management

Most of its distribution occurs within conservation reserves, including the Border Ranges, Lamington and Springbrook National Parks. However there is no specific management for this species.

Conservation objectives

1. Clarify range, abundance and threats.
2. Establish monitoring program, linked to management response if population and range continue to decline.
3. Establish and maintain a captive breeding colony.

Bibliography

Baker AM, Mutton TY, Hines HB, Van Dyck S (2014) The Black-tailed Antechinus, *Antechinus arktos* sp. nov.: a new species of carnivorous marsupial from montane regions of the Tweed Volcano caldera, eastern Australia. *Zootaxa* 3765, 100-133.

Maxwell S, Burbidge AA, Morris K (1996) 'The 1996 action plan for Australian marsupials and monotremes.' Wildlife Australia, Canberra.

Comments received from

Andrew Baker

Tasman Peninsula Dusky Antechinus

Antechinus vandycki Baker, Mutton, Mason & Gray, 2015

Dasyuridae

Conservation status

Endangered (B1ab(iii)+2ab(iii))

Justification

The Tasman Peninsula Dusky Antechinus is known only from one restricted area (the Tasman Peninsula, eastern Tasmania), with an extent of occurrence of substantially less than 1000 km^2. The area of occupancy is also highly restricted and is probably less than 50 km^2. There is no information on trends in abundance, but timber extraction and other activities may be leading to ongoing reduction in habitat quality. The available data are too limited to reliably estimate population size, or to indicate the rate of decline. With more information, the species may also be eligible for threatened status under criterion C.

Current eligibility against IUCN Red List Criteria

IUCN Criterion	Criteria eligibility
A	Not applicable: there is no information available about trends in population size
B	Endangered: EOO and AOO poorly resolved, but probably EOO <5000 km^2 and AOO <500 km^2; continuing decline in area and quality of habitat; one location
C	Not applicable: population size not reliably estimated but probably <10 000 mature individuals; possibly declining but rate unknown and probably <10% in 10 years; all individuals probably in single population; no extreme fluctuation
D	Not applicable: population probably >1000 mature individuals
E	Not applicable: no population viability analysis undertaken

IUCN Red List assessment data

	Estimate	Reliability
Extent of occurrence	660 km^2	low
trend	stable	low
Area of occupancy	40 km^2	low
trend	stable	low-medium
No. of mature individuals	2000	low
trend	stable	low
No. subpopulations	1	medium
No. locations	1	medium
Largest subpopulation	2000	low
Generation length	1 year	high
Global population share	100%	high

Retrospective status 2002

Endangered (B1ab(iii)+2ab(iii))

Retrospective status 1992

Endangered (B1ab(iii)+2ab(iii))

Previous Action Plan assessment

Not Evaluated, as not then considered specifically distinct from *A. swainsonii* (Maxwell *et al.* 1996).

IUCN status (2012)

Not evaluated

EPBC Act status (2012)

Not listed

Legal status in range State

State/Territory	*Status*
Tasmania	not listed

Taxonomy

This species was identified only recently as morphologically and genetically distinct from *Antechinus swainsonii* elsewhere in Tasmania (Baker *et al.* 2015). No subspecies are recognised.

Taxonomic distinctiveness: low (global); low (Australian)

Range

Given its very recent identification as a distinct species, the distribution of the Tasman Peninsula Dusky Antechinus is not yet well resolved. All known records with reliable locational data derive from a few sites within 'a forest block encompassing just 40 km^{2}' (Baker *et al.* 2015). The total area of the Tasman Peninsula is about 660 km^2, and of the adjacent Forestier Peninsula about 400 km^2. Habitat suitable for this species makes up a relatively small proportion of this area.

Genetic sampling elsewhere in Tasmania (including areas close to the Tasman Peninsula) has consistently attributed individuals to *Antechinus swainsonii* rather than *A. vandycki*, suggesting that this newly-described species may indeed be highly restricted (Baker *et al.* 2015).

Abundance

There is no reliable estimate of population size, but the Tasman Peninsula Dusky Antechinus probably occurs at low density in a very limited area. A recent targeted survey reported only six individuals from 5000 trap-nights (Baker *et al.* 2015), and a 2009-11 camera trap study (targeting other species) reported 37 separate images (as *A. swainsonii*) from about 1050 trap-nights in cool temperate forest on the Tasman Peninsula (Lazenby and Dickman 2013). As with the closely-related *A. swainsonii*, it is likely that the species occurs at low population density (Baker *et al.* 2015), and given the small extent of its suitable habitat within its very limited range, the total population size is probably very small.

Only one historical specimen attributable to this species is known, from a nineteenth century collection by John Gould (Baker *et al.* 2015). There is no information available on trends in abundance.

Suitable habitat is reported to be declining in extent and quality 'over the last twenty years', due to fire, fragmentation and logging (Baker *et al.* 2015).

Monitoring

There is no formal monitoring program.

Ecology

The ecology of the Tasman Peninsula Dusky Antechinus is poorly known. All records are from temperate rainforests, with or without emergent eucalypts, and with many fallen logs and a dense understorey.

As with closely-related species, the Tasman Peninsula Dusky Antechinus is presumed to have annual male die-off, with a restricted breeding mating period (Baker *et al.* 2014).

Threats

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Inappropriate fire regimes	moderate	entire	Baker *et al.* (2015) reported decline in habitat quality and/or extent due in part to fire.
Predation by feral Cats	moderate	entire	Feral cats are reported to be common in the eastern Tasman Peninsula, and possibly increasing due to reduction in abundance of Tasmanian Devils (Baker *et al.* 2015).
Habitat loss and fragmentation	severe	moderate	Baker *et al.* (2015) reported that 'there are only limited stands (of suitable habitat) on Tasman Peninsula, which in many places has already been cleared'.
Logging	moderate	minor	Parts of the known range are in plantation or native forest areas managed for logging (Baker *et al.* 2015).

Recovery Plan

There is no recovery plan.

Current management

Part of its probable range occurs within Tasman National Park, but other parts occur within State Forest subject to timber harvesting operations. There is no specific management for this species.

Conservation objectives

1. Clarify range, abundance and threats.
2. Establish monitoring program.

Information required

Theme	Specific actions	Priority
Survey to better define distribution	expand targeted surveys throughout known and potential range	medium-high
Assess impacts of threats on species	undertake autecological studies that seek to identify key threats	medium
	assess trends in abundance of feral Cats in response to changes in abundance of Tasmanian Devils (research currently in place)	medium
Establish or enhance monitoring program	design an integrated monitoring program	medium-high
Assess effectiveness of threat mitigation options	n/a	
Resolve taxonomic uncertainties	n/a	
Assess habitat requirements	identify critical habitat factors, particularly in relation to fire and other disturbance	medium
Assess diet, life history	n/a	

Management actions required

Theme	Specific actions	Priority
Active mitigation of threats	protect known sites from clearing or intensive forestry activities	medium
	manage fire regimes to reduce impacts on habitat	medium
	implement control program for feral Cats	medium
Captive breeding	identify monitoring thresholds that may justify establishment of a captive breeding population	medium
Quarantining isolated populations	n/a	
Captive breeding	establish a captive breeding colony and maintain it at least until range and abundance are better understood	medium
Translocation	n/a	
Monitoring	implement an integrated monitoring program	medium
Community engagement	n/a	

Bibliography

Baker AM, Mutton TY, Hines HB, Van Dyck S (2014) The Black-tailed Antechinus, *Antechinus arktos* sp. nov.: a new species of carnivorous marsupial from montane regions of the Tweed Volcano caldera, eastern Australia. *Zootaxa* **3765**, 100-133.

Baker AM, Mutton TY, Mason ED, Gray EL (2015) A taxonomic assessment of the Australian Dusky Antechinus complex: a new species, the Tasman Peninsula Dusky Antechinus (*Antechinus vandycki* sp. nov.) and an elevation to species of the Mainland Dusky Antechinus (*Antechinus swainsonii mimetes* (Thomas)). *Memoirs of the Queensland Museum – Nature* **59**, 75-126.

Lazenby BT, Dickman CR (2013) Patterns of detection and capture are associated with cohabiting predators and prey. *PLoS ONE* **8**.

Maxwell S, Burbidge AA, Morris K (1996) 'The 1996 action plan for Australian marsupials and monotremes.' Wildlife Australia, Canberra.

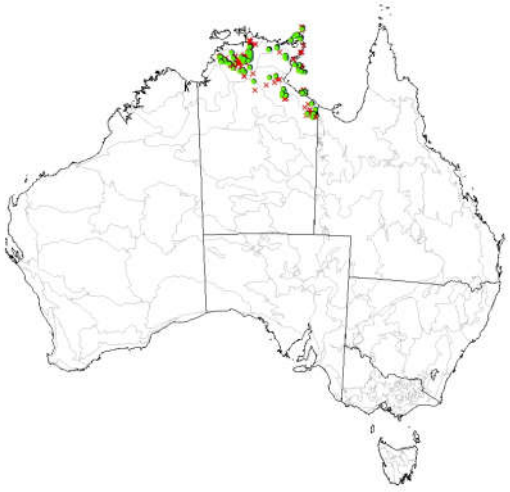
Comments received from:

Wilkin's Rock-wallaby

Petrogale wilkinsi Thomas, 1926

Macropodidae

Other common names: Eastern Short-eared Rock-wallaby



Conservation status

Near Threatened (approaches C2a(i))

Justification

Wilkin's Rock-wallaby has a population of not much more than 10 000 mature individuals, small subpopulations, and is subject to a continuing decline.

Current eligibility against IUCN Red List Criteria

IUCN Criterion	Criteria eligibility
A	Not applicable: population size trends unknown, but decline unlikely to be >30% in 15 years
B	Not applicable: EOO >20 000 km^2, AOO >2000 km^2
C	Near Threatened: population size poorly known but probably close to c. 10 000 individuals; small subpopulations; population trends unknown but probably declining
D	Not applicable: population >1 000 mature individuals; AOO> 20 km^2; number of locations >5
E	Not applicable: no population viability analysis undertaken.

IUCN Red List assessment data

	Estimate	Reliability
Extent of occurrence	40 000 km^2	low
trend	decreasing	low
Area of occupancy	>2000 km^2	low
trend	decreasing	low
No. of mature individuals	c. 10 000	low
trend	decreasing	low
No. sub-populations	>10	medium
No. locations	<10	low
Generation length	5 years	medium
Global population share	100%	medium

Retrospective status 2002

Least Concern

Retrospective status 1992

Least Concern

Previous Action Plan assessment

This taxon was not assessed in previous Action Plans. *Petrogale brachyotis* (Top End) was evaluated as Least Concern by Woinarski *et al*. (2014).

IUCN status (2012)

Not evaluated

EPBC Act status (2012)

Not listed

Legal status in range Territory

State/Territory	*Status*
Northern Territory	not listed

Taxonomy

Potter *et al*. (2014) have reviewed earlier studies (Telfer and Eldridge 2010, Potter *et al.* 2012a, b) and revised the taxonomy of *Petrogale brachyotis*, resurrecting *P. wilkinsi*, which had previously been synonymised with *P. brachyotis*. There is substantial genetic variation within the newly defined *P. wilkinsi*, with subpopulations on Groote Eylandt and the hinterland of the southern Gulf of Carpentaria being highly divergent and possibly representing additional taxa (Potter *et al*. 2014).

The other two major lineages of *Petrogale brachyotis* described in Potter *et al*. (2012a, 2014):

P. brachyotis brachyotis is Least Concern;
P. brachyotis victoriae is Near Threatened (approaches B1ab(iii); C1) (Woinarski *et al*. 2014)

Taxonomic distinctiveness: low (global); low (Australian)

Range

Wilkin's Rock-wallaby occurs in suitable rocky habitat of the Top End of the Northern Territory from east of the Daly River to Wollogorang near the NT/Qld border, north of the 600-mm rainfall isohyet. It also occurs on Groote Eylandt, Bickerton Island, and islands of the Sir Edward Pellew group (Vanderlin, North and Centre: Woinarski *et al*. 2011) and Wessel and English Company Groups (including Marchinbar, Wigram, Raragala, 'South' and three small un-named islands: Woinarski *et al*. 1999).

Abundance

There has been no robust estimate of the population size of this taxon. This species may be locally common: for example, about 30 individuals were trapped by W. Telfer and colleagues in three days on one small outcrops near the East Alligator River (M. Eldridge *pers. comm*.).

Monitoring

No effective monitoring. This species is included in broad biodiversity monitoring of Kakadu, Litchfield and Nitmiluk National Parks, but its incidence in monitoring sites is too low to reliably detect trends in abundance (Woinarski et al. 2004, 2010; Russell-Smith et al. 2014).

Ecology

Wilkin's Rock-wallaby is associated with rocky areas supporting caves and other shelter, and with grassy areas (Telfer *et al*. 2008). The species is considered primarily a browser (Sanson 1989), but dietary studies and habitat associations indicate the diet includes a seasonally-varying mix of herbs, forbs, seeds, fruit, bulbs and grass (Telfer and Bowman 2006; Telfer and Garde 2006; Telfer *et al*. 2008). Small-scale fires may enhance food availability and habitat suitability (Telfer and Bowman 2006; Telfer and Garde 2006), but the now more prevalent regime of extensive and frequent fires is likely to reduce habitat quality (Yates and Russell-Smith 2003). From one radio-tracking study of ten individuals at Litchfield, mean home range size was 18 ha, with no significant differences between sexes and with substantial overlap amongst individuals in areas used (Telfer and Griffiths 2006). Individuals change shelter sites frequently.

Spencer (1991) observed feral Cats eating young *Petrogale assimilis* (up to 4 kg in weight as adults) in tropical Queensland and believed that feral cats had a role in limiting recruitment. Feral cats are considered to be a potential threat to rock-wallabies (DEWHA 2008c). *Petrogale wilkinsi* has an adult body weight of 2.6-3.5 kg (Potter *et al*. 2014), smaller than *P. brachyotis*, and both adults and juveniles are within the prey range of feral Cats.

Rock-wallabies breed at about 1 year and longevity is about 10-12 years (Jones *et al*. 2009; AnAge 2012). Generation length is therefore c. 5 years.

Recovery Plans

Wilkin's Rock-wallaby was included, as part of *P. brachyotis*, in Pearson (2013). Actions relevant to *P. wilkinsi* are:

1. Assess the conservation status of poorly surveyed taxa
   - 1.1 Survey of the distribution, conservation status and genetic diversity of tropical rock wallabies; *P. concinna*, *P. burbidgei* and *P. brachyotis*
4. Maintain and enhance biosecurity actions for islands to prevent the introduction of feral predators, competitors, weeds or disease
   - 4.1 Prepare and disseminate biosecurity protocols
   - 4.2 Install signage at boat ramps
   - 4.3 Build networks with government agencies and public to improve surveillance of islands
   - 4.4 Plan emergency responses to incursion of predators, competitors, weeds and diseases on islands
6. Monitor populations and review the efficacy of management actions
   - 6.2 Monitor island populations of rock wallabies and their habitats to maintain biosecurity of islands and to enable rapid intervention if an exotic introduction is detected
7. Manage habitat to maintain or improve its carrying capacity for rock wallabies and to permit successful breeding and dispersal
   - 7.3 Minimise the impacts of fire
8. Undertake research to improve understanding of species biology, management and monitoring techniques
   - 8.7 Ascertain the factors preventing successful recruitment and dispersal
9. Communication and community education.

Current management

There is no current targeted management for Wilkin's Rock-wallaby. Part of its range lies within the large Kakaku National Park, which is subject to some regional fire management.

Conservation objectives

1. Maintain existing range and abundance

Threats

Threat factor	Consequence rating	Extent over which threat may operate	Evidence base
Inappropriate fire regimes	medium	mainland part of range; fire on islands less frequent	current fire regime is typified by frequent, extensive, hot fires (Yates and Russell-Smith 2003) and this is likely to reduce habitat suitability
Predation by feral Cats	medium	moderate, cats occur on Groote Eylandt and Vanderlin Island, others are cat-free	not demonstrated but plausible, especially noting that *P. wilkinsi* is smaller (2.6-3.5 kg) than *P. brachyotis* (3.9-4.5 kg); predation probably ameliorated by rugged nature of habitat, which Cats may tend to avoid

Information required

Theme	Specific actions	Priority
Survey to better define distribution	undertake targeted survey of all potentially suitable areas within possible range	medium
	assess population size (or relative abundance) for all sub-populations	medium
Assess impacts of threats on species	quantify the relative impacts upon population of a range of current fire regimes, and the mechanisms by which those fire regimes have impacts on this species	medium
	assess impact of feral Cats	high
Establish or enhance monitoring program	design a monitoring program, integrated across sub-populations	medium
Assess effectiveness of threat mitigation options	assess changes in population parameters when feral Cats are controlled and under different fire regimes	medium
Resolve taxonomic uncertainties	n/a	
Assess habitat requirements	n/a	
Assess diet, life history	identify key dietary items, and impacts of fire upon these	low-medium
Undertake research to develop new or enhance existing management mechanisms	develop broad-scale, targeted feral Cat control technology	medium

Management actions required

Theme	Specific actions	Priority
Active mitigation of threats	implement appropriate fire regimes	medium
	develop and apply feral cat control technology; experimentally control feral Cats and assess response	medium
Captive breeding	n/a	
Quarantining isolated populations	prepare and implement biosecurity for islands on which the species occurs	medium
Translocation	n/a	
Monitoring	implement integrated monitoring program linked to assessment of management effectiveness	medium
	monitor the incidence of fire within the species' range	medium
Community engagement	work cooperatively with Indigenous ranger groups within range area	high

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Comments received from

Mark Eldridge

Liverpool Plains Striped Bandicoot

Perameles fasciata J.E. Gray, 1841

Peramelidae

Other common names: New South Wales Striped Bandicoot, Striped-backed Bandicoot, Banded Bandicoot

Conservation status

Extinct

Justification

Known only from specimens collected in the 1840s

Last known collection

1846 (Thomas Mitchell's Fourth Expedition: K. Travouillon *pers. comm*.)

Presumed decade of extinction

Unknown, probably mid-nineteenth century. Dickman *et al.* (1993) list the last known NSW record of *P. bougainville* (presumably including the now-recognised species *P. fasciata, P. notina* and *P. eremiana*) as from 1866.

Status 2002

Extinct

Status 1992

Extinct

Previous Action Plan assessment

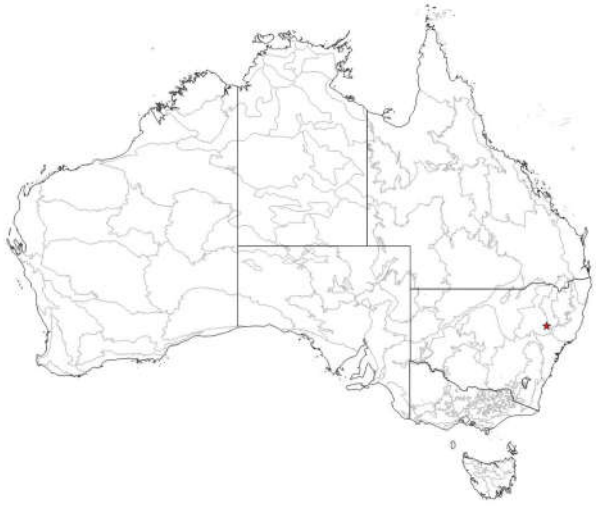
Not evaluated (Maxwell *et al.* 1996)

IUCN status (2012)

Not evaluated

EPBC Act status (2012)

Not listed



Legal status in range States/Territory

State/Territory	*Status*
New South Wales	Presumed Extinct (as *P. b. fasciata*

Taxonomy

Formerly included within *P. bougainville* (Mahoney and Richardson 1988; Jackson and Groves 2015), with specific status re-established by Travouillon and Phillips (2018). No subspecies are recognised.

Taxonomic distinctiveness: medium (global); high (Australian)

Former Range

The Liverpool Plains Striped Bandicoot is known only from records in the Liverpool Plains area of New South Wales (Mahoney and Richardson 1988; Travouillon and Phillips 2018), but may have had a more extensive distribution. Presumably in reference to this taxon, Gould (1845-1863) noted that 'the stony ranges which branch off from the ranges towards the rivers Darling and Namoi, are localities in which it may always be found'.

Former Abundance

No detailed information, but Gould's comment on distribution suggests it may have been locally abundant.

Ecology

No detailed information. Presumably as for other *Perameles* species, a terrestrial omnivore that sheltered by day in or under vegetation, making it particularly susceptible to predation by the introduced feral Cat and Red Fox.

Reasons for extinction

Causal factor	Consequence rating	Extent over which threat operated	Evidence base
Predation by feral Cats	catastrophic	entire	feral Cats were established in inland north-eastern Australia between about the 1840s and 1860s (Abbott 2008)
Predation by Red Foxes	catastrophic	uncertain	Red Foxes probably did not arrive in inland NSW until the late nineteenth century (Dickman *et al.* 1993), which was probably subsequent to the decline and loss of this species
Habitat degradation due to livestock	severe	large	agricultural development of the Liverpool Plains area started in the 1820s and developed expansively over subsequent decades, resulting in marked habitat loss and degradation

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Comments received from

Chris Dickman, Kenny Travouillon

Nullarbor Barred Bandicoot

Perameles papillon Travouillon & Phillips, 2018

Peramelidae

Other common names: Butterfly Bandicoot, Zebra Rat

Conservation status

Extinct

Justification

Known only from specimens collected prior to 1930 and from subfossils in caves on the Nullarbor Plain and adjacent Roe Plain.

Last known collection

1928

Presumed decade of extinction

Unknown, probably by the late 1930s, after the arrival of feral Cats and Red Foxes.

Status 2002

Extinct

Status 1992

Extinct

Previous Action Plan assessment

Not evaluated (Maxwell *et al.* 1996)

IUCN status (2017)

Not evaluated

EPBC Act status (2017)

Not listed

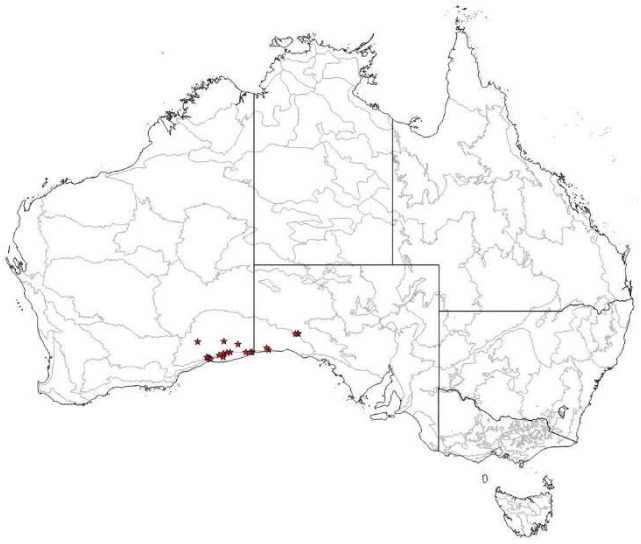
Legal status in range States/Territory

State/Territory	*Status*
Western Australia	Not listed
South Australia	Not listed

Taxonomy

The Nullarbor Barred Bandicoot was considered to be *P. bougainville*, with specific status established by Travouillon and Phillips (2018). No subspecies are recognised.

Taxonomic distinctiveness: medium (global); high (Australian)



Former Range

The Nullarbor Barred Bandicoot occurred on the Nullarbor Plain and the adjacent Roe Plain (Hampton IBRA) of Western and South Australia.

Former Abundance

Based on its abundance in subfossil deposits and the comments of Wood Jones (1924), the Nullarbor Barred Bandicoot was apparently once fairly common.

Ecology

The Nullarbor Plain (Nullarbor IBRA) consists of a central, treeless plain, vegetated largely with chenopods and grasses, surrounded by areas influenced by adjacent regions, with scattered small *Acacia* trees in some areas. Most records are from the southern Nullarbor. The Roe Plain (Hampton IBRA) has denser vegetation with south west floral elements. *Perameles* species are omnivorous eating mainly invertebrates, including termites, and seeds, bulbs, fruits and hypogeal fungi. Wood Jones (1924) discussed this species and *P. notina* under *P. myosura* (now *P. myosuros*, known to occur only in Western Australia). For animals now included in *P. papillon* he noted 'Its present habitat is the open plains, the level stretches of which are broken only by sandhills and outcrops of limestone; and for vegetation, the blue bush (*Kochia sedifolia*) [now *Mairena sedifolia*], the saltbush (*Atriplex vesicurium*) [now *A. vesicaria*], and the various stunted desert acacias. On the plains it makes a nest, under a saltbush, similar to those of the Short-nosed Bandicoots, save that it is more given to excavating hollows in which to accumulate its nesting materials. It is mainly insectivorous in diet, and crepuscular or nocturnal in its habits. It is an animal of astonishing activity, its powers of jumping being all the more remarkable from its habit of rising vertically into the air. When alarmed on its evening excursions it will pause, and then, in an instant, spring into the air and vanish in the most remarkable manner.' Wood Jones

remarked on the aggressiveness of animals to others of their species and noted that the breeding season 'is in May and June, and two young are usually born at a time, but I have come across one litter of three' (p. 150). Some other *Perameles* species occupy/ied a variety of fairly open vegetation, making them particularly susceptible to predation by the introduced feral Cat and Red Fox and most species of this genus are either extinct or threatened.

Reasons for extinction

Causal factor	Consequence rating	Extent over which threat operated	Evidence base
Predation by feral Cats	catastrophic	entire	feral Cats were established throughout the Nullarbor by the 1890s (Abbott 2002; Abbott 2008b)
Predation by Red Foxes	catastrophic	entire	Red Foxes arrived on the Nullarbor by the 1910s (Abbott 2008a)
Habitat degradation due to livestock and feral herbivores	severe	large	in many parts of the Nullarbor, habitat quality was severely degraded by a combination of Sheep grazing at unsustainable densities and feral European Rabbits

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Comments received from

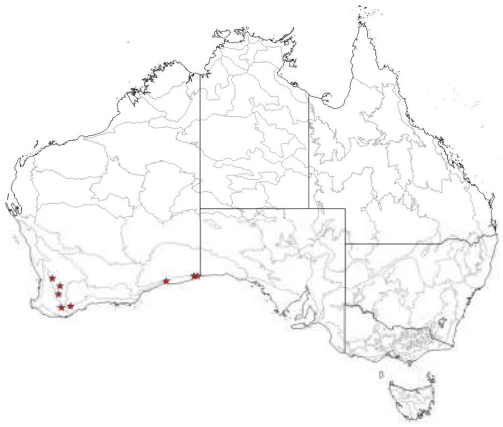
Kenny Travouillon

Marl

Perameles myosuros Wagner, 1841

Peramelidae

Other common name: Nymal (Noongar(Abbott 2001)), Saddle-backed Perameles (Gould 1845-1863)



Conservation status
Extinct

Justification
Formerly locally abundant, but no records known for ca. 100 years.

Last known collection
1906

Presumed decade of extinction
1900-1910. (Abbott 2008a) provides details of its decline in south-western Australia, noting that it 'disappeared rapidly from the 1890s', and quotes Tunney as stating that 'it was numerous around Gracefield in c. 1887 but he could not obtain any specimens in 1900). Aborigines informed him that a few still occurred at that time near the Stirling Range'. However, Shortridge obtained a specimen in 1906 and a Tunney specimen was lodged in the Natural History Museum in 1907. The timing of its decline and loss on the Nullarbor and Roe Plains is less well resolved, at least partly because of some spatial overlap with the similar *P. papillon* (Travouillon and Phillips 2018).

Status 2002
Extinct

Status 1992
Extinct

Previous Action Plan assessment
Not evaluated (Maxwell *et al.* 1996)

IUCN status (2017)
Not evaluated (*Perameles bougainville* is Vulnerable)

EPBC Act status (2017)

Not listed

Legal status in range States/Territory

State/Territory	*Status*
Western Australia	not listed
South Australia	not listed (*P. bougainville* is listed as Endangered)

Taxonomy
Formerly included within *P. bougainville* (Jackson and Groves 2015; Mahoney and Richardson 1988), with specific status re-established by Travouillon and Phillips (2018). No subspecies are recognised.

Taxonomic distinctiveness: medium (global); high (Australian)

Former Range
As considered by Travouillon and Phillips (2018), the Marl was known from south-western Australia and near-coastal areas of the Nullarbor Plain. Its former distribution in south-western Australia was described as 'south-west WA east of a line joining Geraldton, Toodyay, Katanning, Cranbrook and Bremer Bay' (Abbott 2008a). Gould (1845-1863) noted that 'it inhabits the whole line of coast of the Swan River colony'. The eastern portion of its range overlapped with the Nullarbor Barred Bandicoot *Perameles papillon*.

Former Abundance

At least locally abundant (Abbott 2008a).

Ecology
Gould (1845-1863) noted that it 'resides in the densest scrub, thickets of seedling *Casuarinae* being its favourite resort… it makes a compact nest in a hollow on the ground', and that it flees 'to hollow trunks of fallen trees' when seeking to escape predators. It was omnivorous.

Reasons for extinction

Causal factor	Consequence rating	Extent over which threat operated	Evidence base
Predation by feral Cats	catastrophic	entire	feral Cats were established in south-western Australian between the 1850s and 1870s, and 1-2 decades later in the Nullarbor (Abbott 2008b)
Predation by Red Foxes	catastrophic	entire	Red Foxes became established around the Nullarbor area by about 1910, and colonised south-western Australia between 1910 and 1920 (Abbott 2008a); this spread may have post-dated the decline and loss of the Marl
Disease	catastrophic	uncertain	(Abbott 2006) considered the extinction of this species, and the decline of many others to have been caused by disease

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Comments received from

Kenny Travouillon

South-eastern Striped Bandicoot

Perameles notina Thomas, 1922

Peramelidae

Other common name: South Australian Striped Bandicoot (Travouillon and Phillips 2018)

Conservation status

Extinct

Justification

Known only from collections from the 1800s, no records since.

Last known collection

1857, on the Blandowski expedition.

Presumed decade of extinction

Unknown

Status 2002

Extinct

Status 1992

Extinct

Previous Action Plan assessment

Not evaluated (Maxwell *et al.* 1996)

IUCN status (2017)

Not evaluated

EPBC Act status (2017)

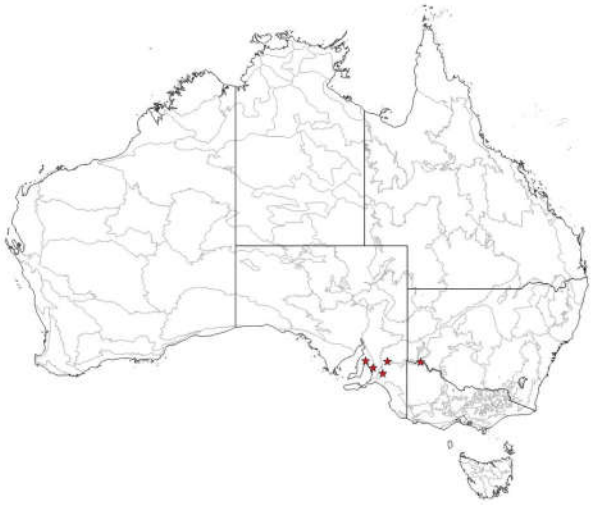
Not listed

Legal status in range States/Territory

State/Territory	*Status*
New South Wales	Not listed
Victoria	Not listed
South Australia	Not listed

Taxonomy

Originally described as *Perameles myosura notina* by Thomas (1922). Formerly included within *P. bougainville* (Mahoney and Richardson 1988; Wakefield 1963), with specific status re-established by



Travouillon and Phillips (2018). No subspecies are recognised.

Taxonomic distinctiveness: medium (global); high (Australian)

Former Range

The South-eastern Striped Bandicoot is known from south-eastern South Australia and near the Murray River of Victoria and New South Wales (Travouillon and Phillips 2018). From the 1857 Blandowski Expedition, Krefft (1866) noted (for the then more broadly defined *Perameles fasciata*) that this species was 'common on all parts of the Murray River, and is also found in Victoria, in South Australia …'.

Former Abundance

The species was common and probably widespread in north-western Victoria until the mid to late 1800s when pastoral and then agricultural development was rapidly spreading (Menkhorst 1995).

Ecology

Krefft (1865; Krefft 1866) recorded 'Though provided with strong claws it seldom burrows, except in search of its food, which consists of insects, bulbous roots, various herbs, etc. Nocturnal and social in its habits, the striped (so called) "Bandicoot" seeks shelter, during the day time, in hollow logs, or under stones, although sometimes it constructs a sort of nest like the Chaeropus.' He also noted that it was adept at killing mice: 'I have seen a single individual kill as many as twenty mice in a very short time, breaking their bones successively, after which it would begin to satisfy its hunger'. The open habitat would have made it particularly susceptible to predation by the introduced feral Cat and Red Fox. Krefft also recorded that 'During the months of May, June, July, and August, female specimens provided with 8 teats, and containing 2 to 4 young were captured by the natives. Those obtained in August, had grown to the size of a

young rat; fur, cream coloured, without the markings upon the haunches, which appear at a more mature age.'

Reasons for extinction

Causal factor	Consequence rating	Extent over which threat operated	Evidence base
Predation by feral Cats	catastrophic	entire	feral Cats were established in north-western Victoria and adjacent areas of New South Wales by the 1850s and in south-eastern South Australia in the 1840s and 1850s (Abbott 2008)
Predation by Red Foxes	catastrophic	uncertain	Red Foxes probably did not arrive in inland NSW and south-eastern South Australia until the late nineteenth century (Dickman *et al.* 1993), which was probably subsequent to the decline and loss of this species.
Habitat degradation due to livestock	severe	large	pastoral and agricultural development of north-eastern Victoria along the Murray River started in mid to late 1800s and developed expansively over subsequent decades, resulting in marked habitat loss and degradation

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Comments received from

Kenny Travouillon