

**A Survey and Habitat Assessment for Threatened Reptiles on
Wodonga Council Land**

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Report to Wodonga Council

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Background

Ecotone Wildlife and Habitat Assessments was engaged by Wodonga Council to undertake a survey and habitat assessment for threatened reptiles on a council managed land parcel in west Wodonga (e.g. Klings Hill and Rock'n Roller mountain bike trail), Victoria (Figure1).

The aim of the assessment was to:

- 1) Conduct preliminary surveys for threatened reptile species along the existing and proposed mountain bike trails, and across the entire land parcel;
- 2) Assess the likelihood of threatened reptile species occurring along the existing and proposed mountain bike trails, and across the entire land parcel;
- 3) Identify and map high-quality threatened reptile habitat;
- 4) Evaluate the impacts of bike trails on threatened reptile habitat.

This report assesses the likelihood of threatened reptile species occurring within the study area, documents the results of the fauna surveys, identifies potential threatened species habitat, and provides an assessment of the likely impact of existing mountain bike trails on threatened reptiles and their habitat within the reserve.

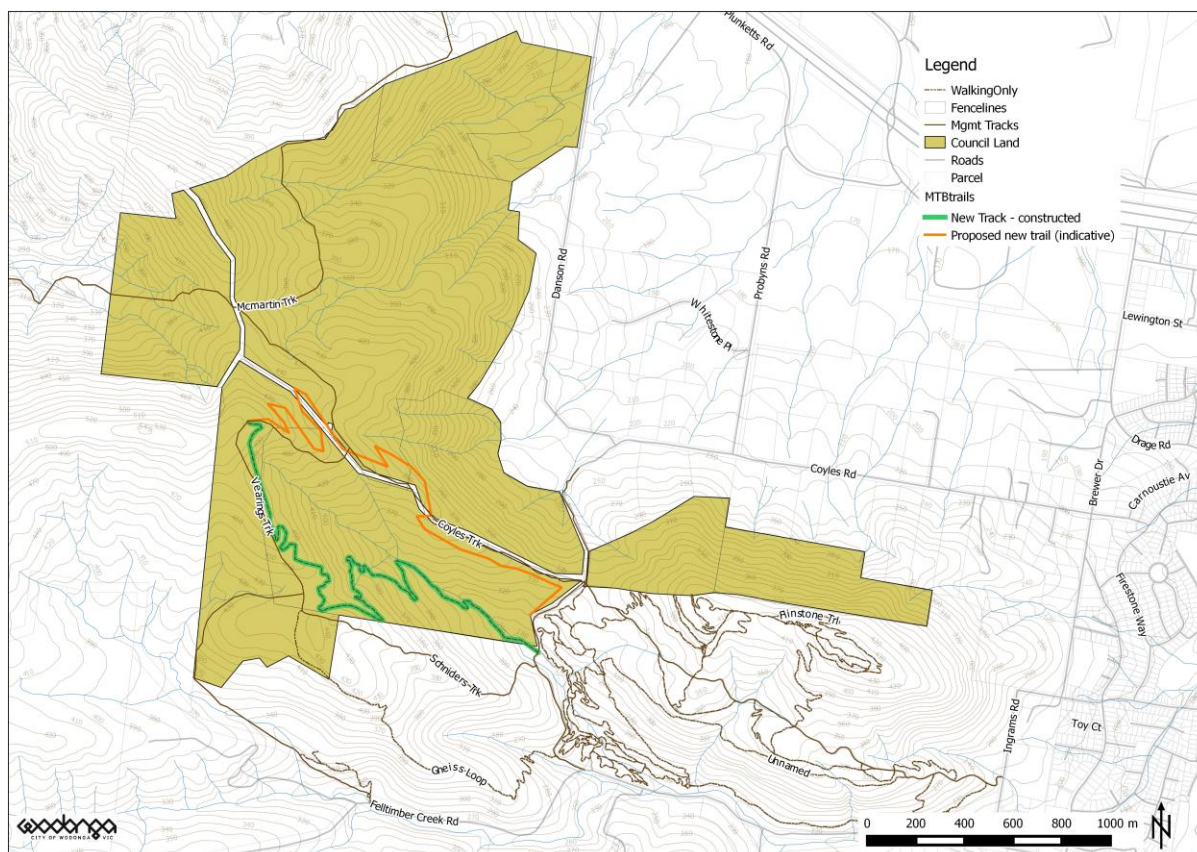


Figure 1. Location of the study area on council managed land in west Wodonga, Victoria (Map created and provided by Clare Coulson).

Introduction

Thirty reptile species are listed under threatened species legislation in Victoria. Seven species were assessed in this report based on their presence within the Wodonga local government area (LGA) or within 100 km of the LGA (ALA 2017; VBA 2017). Four threatened reptile species have been recorded within 50 km of the study area (VBA 2017). These species are the Inland Carpet Python *Morelia spilota metcalfei*, Pink-tailed Worm-lizard *Aprasia parapulchella*, Bandy Bandy *Vermicella annulata* and Woodland Blind Snake *Anilius proximus*.

The Lace Monitor (Tree Goanna) *Varanus varius* and Woodland Blind Snake *A. proximus* are listed on the DSE advisory list of threatened species and are known to occur on adjoining crown land parcels (e.g. Swainsona Reserve and McFarlanes Hill) (VBA 2017).

Table 1. Terrestrial reptile species listed (L) under the Victorian (FFG Act) and Federal threatened species legislation (EPBC Act), and the likelihood of occurring on Wodonga council land.

Common Name	Scientific name	EPBC listed	FFG listed	Likelihood of occurrence
Inland Carpet Python	<i>Morelia spilota metcalfei</i>		L	Unlikely - nearest confirmed records are near Gerogery, NSW and Mount Granya, Wangaratta, Victoria.
Rosenberg's Goanna	<i>Varanus rosenbergi</i>		L	Unlikely - nearest records are near Mount Lawson State Park, Upper Murray, Victoria.
Striped Legless Lizard	<i>Delma impar</i>	VU	L	Unlikely - nearest records are near Wangaratta and Greta North, Victoria.
Pink-tailed Worm-lizard	<i>Aprasia parapulchella</i>	VU	L	Potentially - several records within 15 km of the study area in NSW.
Bandy Bandy	<i>Vermicella annulata</i>		L	Potentially - several records within 30 km of the study area in Victoria.
Lace Monitor	<i>Varanus varius</i>		Vulnerable, DSE Advisory List	Potentially - one confirmed atlas record adjoining the study area (McFarlanes Hill).
Woodland Blind Snake	<i>Anilius proximus</i>		Near threatened, DSE Advisory List	Potentially - several records within 10 km of the study area including a recent September 2017 record on Swainsona Reserve, Victoria.

Survey and Habitat Assessment Methodology

Existing trail (Rock'n Roller)

The entire length of the existing (Rock'n Roller) and proposed bike trails were walked and surveyed for the presence of threatened reptile species. Active searches (e.g. turning logs and rocks, raking leaf litter and tussock grass) were conducted where suitable habitat was present. Shallowly-embedded surface rocks within 20 metres either side of the existing trail were lifted and inspected for signs of threatened reptile species. All rocks were replaced as they were found, including all rocks that had been noticeably displaced by livestock or other people. A total of 9 hours survey effort was conducted along the trails between 0800 – 1700 hours on the 7th and 8th October 2017. Approximately 850 rocks were inspected for signs of threatened species (e.g. slough skins or live specimens).

Potential threatened reptile habitat within twenty metres of the trail was visually assessed and mapped according to habitat quality. The assessment focused on evaluating the suitability of surface rock habitat as this resource is used by three threatened species (*Aprasia parapulchella*, *Vermicella annulata* and *Aniolis proximus*). Habitat quality was classified as high, medium or low depending on the density of suitable (e.g. dinner-plate sized) surface rocks, aspect and ground cover condition. Areas that supported greater than 10 surface rocks / 20 m², had a northern aspect, good cover of native perennial grass species and an open canopy cover were classified as high-quality habitat. Poor quality habitat were areas that lacked surface rocks, located on sheltered or south facing aspects, or were dominated by exotic ground cover species.

Entire land parcel (west Wodonga Hills)

A vehicle was used to access the main fire trails. From the main fire trails, walking transects were conducted representing all aspects, vegetation communities and elevations across the reserve. Figure 2 shows the approximate location of all walking transects. Active searches of suitable habitat (e.g. turning logs and rocks, raking leaf litter and tussock grass) were conducted where suitable habitat was present. All rocks were replaced as they were found, including all rocks that had been noticeably displaced by livestock or others. A total of 22 hours of survey effort was conducted along all walking transects between 0800 – 1700 hours on the 14th, 22nd and 23rd October 2017. Approximately 2600 rocks were inspected for signs of threatened species (e.g. slough skins or live specimens).

Results

Threatened species survey along the trails

No EPBC or FFG listed threatened reptile species were detected along the existing or proposed bike trails during the spring 2017 survey.

Table 2 lists all incidental reptile species recorded along the trails. The most common reptile species recorded were the Eastern Striped Skink *Ctenotus spaldingi*, Copper-tailed Skink *Ctenotus taeniolatus*, South-eastern Slider *Lerista bougainvillii* and Southern Rainbow Skink *Carlia tetradactyla*. All individuals were recorded basking or sheltering beneath shallowly-embedded surface rocks within twenty meters of the trail.

Table 2. Total number of reptile species and number of observations along the existing trail (Rock'n Roller), proposed trail and the entire land parcel.

Common name	Species	Existing trail (Rock'n Roller)	Proposed Trail	Entire land parcel
Eastern Striped Skink	<i>Ctenotus spaldingi</i>	4	2	9
Copper-tailed Skink	<i>Ctenotus taeniolatus</i>	2	6	7
Southern Rainbow Skink	<i>Carlia tetradactyla</i>	5	2	15
Garden Skink	<i>Lampropholis guichenoti</i>	1	1	5
South-eastern Slider	<i>Lerista bougainvillii</i>	3	1	17
Boulenger's Skink	<i>Morethia boulengeri</i>	-	-	9
Eastern Blue-tongue	<i>Tiliqua scincoides</i>	-	1	-
Southern Marbled Gecko	<i>Christinus marmoratus</i>	-	3	-
Lace Monitor	<i>Varanus varius</i>	-	-	1



Image 1. Two common lizard species recorded along the existing trails on Wodonga council land, (left) Eastern Striped Skink and (right) South-eastern Slider.

Habitat assessment along the trails

Figure 2 shows a map of the existing and proposed bike trails and sections representing different habitat quality categories. A summary of the assessment and description of each section is provided in Table 3. Overall, the existing trail is unlikely to have had a significant impact on any threatened species, including the Pink-tailed Worm-lizard. However, the construction of the trail has resulted in the displacement of rocks along some sections of the trail and minor damage to a small rocky outcrop. Although no threatened species were recorded during the assessment, bike traffic over the rocky outcrop is likely to cause ongoing damage and erosion of the habitat, thus reducing its suitability as habitat for reptiles. This is discussed in more detail later in the report.

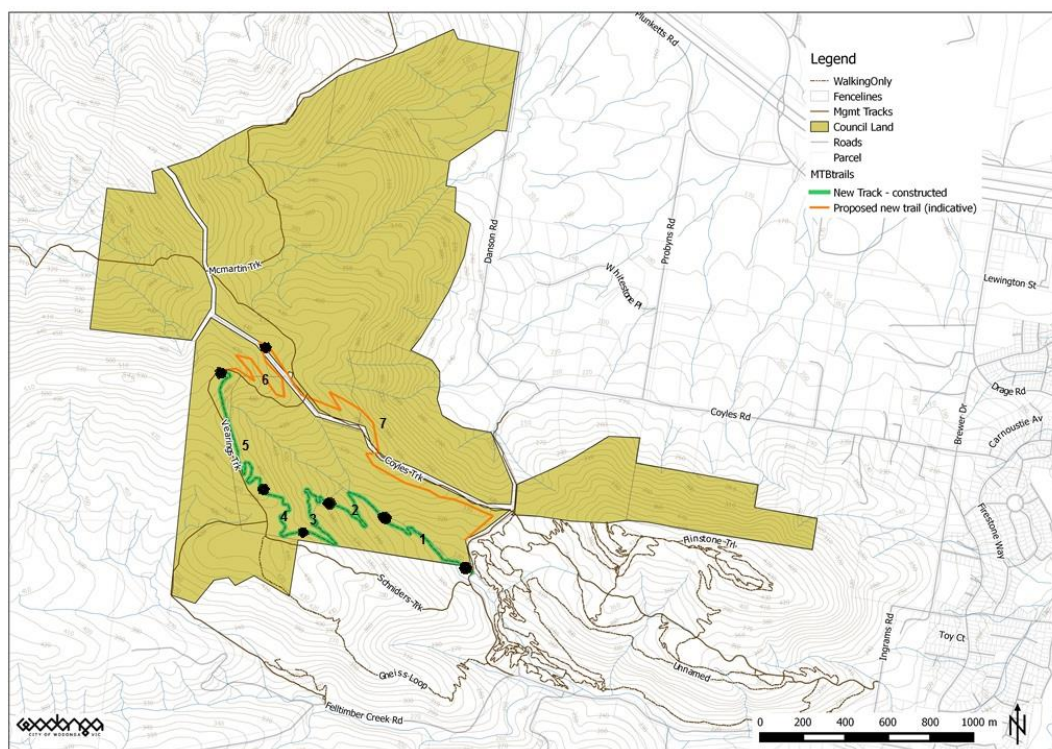


Figure 2. Map of existing and proposed bike trails with sections zoned according to potential threatened species habitat quality (see Table 3 for a full description of each section).

Table 3. Summary of the threatened species habitat assessment along the existing and proposed bike trails (Sections relate to the map in Figure 2).

Section	Starting coordinate	Habitat quality	Description of section	Trail impact on habitat	Management recommendation
1	36°07'22.2"S 146°48'30.0"E	Low	Few suitable rocks along the trail, one small outcrop, ground cover dominated by exotic grasses, open canopy cover.	A few small rock cairns have been created and trail crosses small outcrop.	Dismantle all small rock piles along the trail and redistribute 20 m upslope of the trail.
2	36°07'12.6"S 146°48'16.0"E	Low	Few suitable rocks along the trail, lots of fallen timber, open canopy cover.	Some rocks have been repositioned to control erosion and water flow.	None
3	36°07'11.5"S 146°48'09.2"E	High	Trails contours through remnant vegetation, high density of surface rocks along the trail, mixed native and exotic ground cover species, areas of open canopy cover.	Many rocks have been realigned as part of the trail construction.	Where possible, flat rocks located along the trail that are not being used to prevent erosion/runoff should be reposition away from the trail.
4	36°07'15.6"S 146°47'59.9"E	High	Trail exits remnant and crosses through a patch of <i>Themeda australis</i> grassland, high density of surface rocks, open canopy cover, trail crosses a small rocky outcrop	Many rocks displaced to construct trail verge and berms. High level of rock disturbance on the rocky outcrop (36°07'10.1"S 146°47'57.8"E)	Realign trail so that it avoids further damage to exfoliated surface rocks on the rock outcrop.
5	36°07'09.6"S 146°47'56.7"E	Low	Trail slowly contours to summit, low to medium density of rocks along the trail, many rocks displaced to construct trail verge and berms.	Many rocks displaced to construct trail verge and berms	Dismantle all small rock piles along the trail and redistribute 20 m from the trail
6	36°06'48.1"S 146°47'45.0"E	Medium	A few suitable surface rocks in this section with a small outcrop, mix of native and exotic grass, open canopy cover.	No trail exists, so impact was not assessed.	Proposed trail should avoid disturbance to surface rocks or the small outcrops.
7	36°06'46.1"S 146°47'52.9"E	Low	Mostly open grassy section with scattered occurrences of rocks and small outcrops.	No trail exists, so impact was not assessed.	Proposed trail should avoid disturbance to surface rocks or the small outcrops.

Lace Monitor *Varanus varius*

The Lace Monitor has been recorded within the adjoining Fell Timber Creek Nature Conservation Area (e.g. Hunchback Hill) (VBA 2017) and was recorded within council managed land during the October 2017 survey. This species has a large home range (over 50 ha) and requires multiple tree hollows and large hollow logs for shelter, nesting and foraging (Michael and Lindenmayer 2010). Several individuals are likely to occur within the land parcel, especially within the heavily timbered sections of the reserve.

Several large hollow-bearing trees were located adjacent to the existing trail. However, if present, the existing and proposed trails are unlikely to have a significant impact on this species due to its large home range and arboreal nature.

Carpet Python *Morelia spilota metcalfei*

The Carpet Python has been recorded within 50 km of the study area (ALA 2017). The closest records to the study area are from Tabletop Mountain, Gerogery Range and Burrumbuttock in New South Wales (Michael and Lindenmayer 2008). In north-east Victoria, Carpet Pythons are found along the upper Murray River and on north-facing slopes of Granitic Hills Woodland ecological vegetation community, east of Mount Granya and west of Wangaratta (Michael and Alexander 2015; VBA 2017). Critical habitat for this species includes large hollow-bearing trees, hollow logs and north-facing slopes with large rocky outcrops (Michael and Alexander 2015).

Several large hollow-bearing trees and small rocky outcrops occur along the existing trail. However, if present, the existing and proposed trails are unlikely to have a significant impact on this species due to its large home range (> 20 ha), and arboreal/rock-dwelling habit.

Bandy Bandy *Vermicella annulata*

The Bandy Bandy has been recorded within 50 km of the study area. The closest records are from Chiltern Mount Pilot National Park and an isolated record on the Beechworth-Wodonga Road, 2 km north-east of Indigo Creek Road (VBA 2017). In north-east Victoria, the Bandy Bandy is found in Box-Ironbark forest and Granitic Hills Woodland ecological vegetation community. This species spends much of its time below ground, sequestered within ant nests or sheltering beneath deeply embedded logs or rocks (Michael and Lindenmayer 2010).

This species is extremely cryptic and difficult to detect in temperate parts of south-eastern Australia using active searches as a survey method (e.g. turning logs and rocks). Potential habitat (and prey) for the Bandy Bandy exists within the study area (e.g. embedded rocks,

logs and records of blind snake species nearby). However, none of the mountain bike trails assessed are likely to have a significant impact on this species due to its fossorial (subterranean) behaviour.

Woodland Blind Snake *Anilius proximus*

The Woodland Blind Snake has been recorded adjacent to the study area (Swainsona Reserve, D. Michael pers. obs 2017). During September 2017, two adult Woodland Blind Snakes were recorded in an open grassy clearing near the summit of Swainsona Reserve. In north-east Victoria, the Woodland Blind Snake is found in a wide range of vegetation types. It spends much of the time below ground, sequestered within ant nests or sheltering beneath deeply embedded logs or rocks (Michael and Lindenmayer 2010).

Given the presence of this species in the adjoining reserve, large areas of suitable habitat for the Woodland Blind Snake exist throughout the study area, especially on the rocky upper slopes. The construction of the existing trail may have caused some impact to this habitat, as a significant amount of earth and rock has been displaced and repositioned along the trail. The Woodland Blind Snake has been recorded within the tunnels and brood chambers of the ant *Rhytidoponera maryl*. These ants were detected along the trail as well as across the entire study area.

The Pink-tailed Worm-lizard *Aprasia parapulchella*

The Pink-tailed Worm-lizard has been recorded within 15 km of the study area on Nail Can Hill, New South Wales (ALA 2017). It is a nocturnal species that gains heat by sheltering beneath flat surface rocks. In Albury, this species is found with the brood chambers and tunnels of dolicherine ant species (*Iridomyrmex* spp.), beneath shallowly-embedded (schist-type) surface rocks and within the endangered White Box-Yellow Box-Blakely's Red Gum Woodland (Michael 2004; Michael and Herring 2005). The species is predominantly found on sites with a gentle slope and northern or westerly aspect. Across the species known geographical range, most records are from areas with low tree cover, or in open grassy areas within woodland and dry forest vegetation communities (Wong *et al.* 2011).

Based on several topographical features (gentle slopes and northerly aspect), the presence of suitable rocks (shallowly-embedded 'dinner plate-sized' rocks), host ant species (*Iridomyrmex* spp.) and swards of tussock forming native grass, several areas of high and medium quality habitat occur along the existing and proposed trails. The construction of the existing trail may have caused some impact to this species habitat, as a significant amount of earth and rock has been displaced and repositioned along the trail. Further surveys and monitoring stations using roofing tiles should be used to determine if this species is present.

Survey and habitat assessment of the entire land parcel

No EPBC or FFG listed threatened species were detected within the land parcel during the spring 2017 survey. However, an adult Lace Monitor *Varanus varius* was recorded in the heavily timbered northern section of the land parcel (0482141 E, 6004360 N, 338 meters above sea level). This species is listed on the DSE advisory list of threatened species. Table 2 lists all incidental reptile species recorded within the land parcel. Figure 3 shows the location of walking transects and areas of high, medium and low quality threatened species habitat.

Three areas supporting high-quality potential threatened reptile species habitat were identified. These areas contained high density of rocks and native ground cover species, and featured an open canopy cover on a suitable aspect. They also supported a higher abundance of lizard species than more sheltered sites with few rocks. These three areas support a large amount of suitable rock habitat and future surveys should target these areas for threatened reptile species. Small family groups of goats were also recorded in each of these high quality habitat areas.

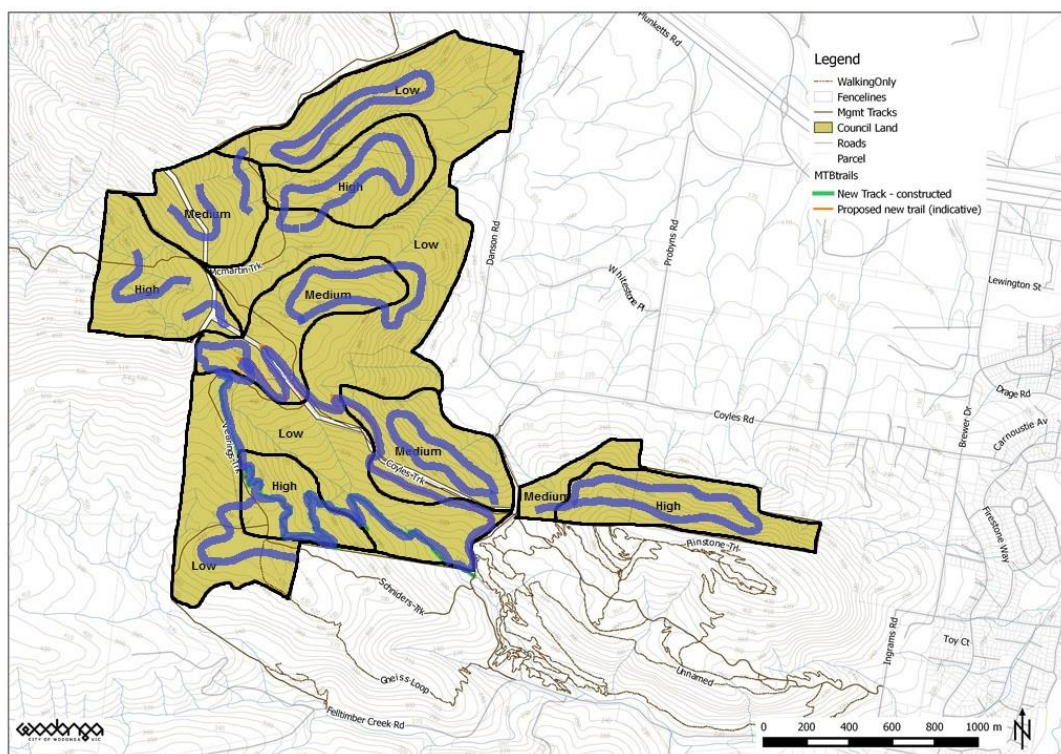


Figure 3. Location of walking transects used to survey and assess threatened reptile species habitat quality across the reserve.

Impact of mountain bike trails on threatened reptile species habitat

The existing trail (Rock'n Roller) is unlikely to have had a significant impact on any threatened reptile species present within the land parcel. Although the construction of the trail has resulted in the displacement and repositioning of surface rocks, there is adequate undisturbed rock cover along the trails and over the entire reserve. In other regions of the Riverina where the Pink-tailed Worm-lizard occurs, this species leaves discarded slough skins beneath well-used rocks, suggesting long-term residency. No evidence of slough skins were detected along the existing or proposed trails, or across the entire land parcel, despite potential habitat occurring in the reserve. The surveys were conducted during a period when the species was active beneath surface rocks in Albury and other parts of southern NSW. However, the species can be extremely cryptic and when population size is small, it may be present on site and not detected. In some cases, Pink-tailed Worm-lizard has been detected on sites after 15 years of surveys.

Management recommendations

Dismantle small rock piles along the existing trail

Many lizard species bask near surface rocks, and as such, are at risk of being run over or crushed along sections of the trail that are lined with rocks. To reduce the risk of collisions, all rock piles that have been created during the trail construction process should be deconstructed and repositioned so that the top layers of rock are placed in contact with the soil, in open areas, away from the canopy of overstorey trees and at least 20 m away from existing trails (see image 2). Rocks should be moved during the spring or summer months when reptiles are active and able to colonise the repositioned rocks. Many lizards were recorded sheltering beneath rocks directly on the trail edge during this survey.



Image 2. These images show rocks used to line the existing trail. Any rocks that are not needed to prevent erosion should be relocated away from the trail

Minimise disturbance to rocky outcrops

Small rocky outcrops provide refuge and shelter for a wide range of wildlife. Microhabitat such as rock that lies in contact with rock surfaces are important shelter sites for many small lizard species (Michael *et al.* 2010). In cleared landscapes, small outcrops are extremely important reptile habitat as other shelters such as fallen timber are often scarce. Substantial damage to flaking rock microhabitat was noted on one rocky outcrop (see image 3). Although, no threatened species were recorded using this outcrop it supported several lizard species. Disturbance to rock flakes is likely to affect the habitat value of the outcrop. Implementing measures to avoid ongoing disturbance to this outcrop is recommended. This may require blocking off and realigning the trail away from the outcrop. This outcrop would also benefit from fencing from livestock and revegetating with native grasses, forbs and shrubs.



Image 3. (Left) Rock flakes (exfoliations) that have been broken and moved to create a smooth trail surface. (Right) rock flakes that have been destroyed leaving behind a visible scar. This damage looks more like vandalism than bike traffic.

Proposed trail construction

The proposed new trail is unlikely to have a significant impact on any threatened reptile species in the reserve providing the course avoids crossing rock platforms or disturbance to surface rocks. Berms and ramps should be constructed using manufactured materials rather than surface rocks that are sourced from on site.

Revegetation

Any revegetation planned along the trails or within the reserve should be designed to ensure trees or shrubs are not planted too close or in high density near rocky outcrops or areas with high density of surface rocks. High density plantings in areas that support swards of Kangaroo Grass *Themeda australis* and rocks should be avoided.

Interpretation and education

During the assessment, a large number of surface rocks were found to have been flipped and rolled in areas far from any trails (see image 4). I have seen this level of disturbance to rocks in many places in Australia, especially in peri-urban reserves. Damage of this kind is usually caused by people looking for reptiles or invertebrates, primarily to photograph animals but in some cases, to illegally collect specimens for sale on the black market. Rocks that are flipped and not placed back into their original soil cavities often become unsuitable shelter sites. Interpretation signs that educate walkers and user groups on the negative impacts of this illegal activity may deter such behaviour. Educating user groups to look out individuals engaging in this activity may also be an effective deterrent.



Image 4. Rocks that have been flipped by people looking for lizards or invertebrates and have not been placed back into the original soil cavity.

Monitoring

Further surveys for the Pink-tailed Worm-lizard, Bandy Bandy and Woodland Blind Snake are recommended. Surveys should be conducted between August and November. Pitfall traps and funnel traps, in conjunction with active searches, are appropriate surveys methods for detecting these species. However, a more cost-effective and passive approach to surveying and monitoring terrestrial reptiles is to use roofing tiles or sheets of corrugated iron (artificial covers) (Michael *et al.* 2012). Grids of tiles can be placed in different areas within the reserve and monitored on a regular basis.

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