

Bushrock removal and the impacts on native wildlife



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The Pink-tailed Worm-lizard *Aprasia parapulchella* is a small, slender legless lizard that is threatened by bushrock removal in many parts of its geographical range. In some areas, landholders are fencing off rocky areas to protect these rare lizards from livestock grazing and rock disturbance. Photo: Damian Michael

What is bushrock

Bushrock is loose rock that is found on the surface of the soil or on other rock surfaces. Loose rocks are commonly found on the summits, slopes and bases of rocky outcrops, rock escarpments and other rock formations, but this habitat is also found in bushland and some agricultural landscapes.

How does bushrock form?

Bushrock forms when bedrock protrudes above the Earth's surface and is exposed to rain and sunlight. Heat, water and chemical reactions cause large rock formations to break into smaller blocks. Bushrock may take thousands of years to form, although some processes such as volcanism can disperse small rocks, and fire and ice may cause large rocks to crack and split into smaller pieces. Bushrock typically ranges in size from small 'football-sized' rocks to boulders over 1 m³.

Why is bushrock important?

Bushrock provides a wide range of native animals with shelter, protection from predators and refuge from fire or extreme weather conditions. Bushrock also provides animals such as geckos, skinks, dunnarts, spiders and scorpions with places to forage, lay their eggs or give birth to live young.

Bushrock provides habitat for mosses, lichens and ferns and serves an important ecosystem function by helping to maintain macro and micro environments by preserving soil moisture, stabilising slopes, and reducing soil erosion. Bushrock that is left in the landscape reduces the effects of fire and improves the germination rate of native seeds.



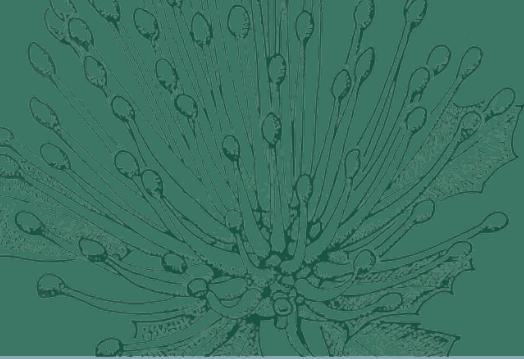
Basalt rocks that have been removed from grasslands in western Victoria and placed along fence lines. This environment was once the habitat of the Grassland Earless Dragon, a threatened species that is now considered extinct in Victoria due to the loss of its grassland habitat. Photo: Janet Michael



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Bushrock collection

Since European settlement, bushrock has been collected and used in landscaping and gardening to re-create natural bush settings, for building fences or retaining walls, and to create waterfalls and other rock features. A large number of new housing estates use locally sourced bushrock in the landscape designs.

Bushrock is generally sourced and obtained by licenced operators from quarries or from private property. However, in some cases, bushrock is illegally sourced from national parks and conservation reserves.

In some agricultural regions of Australia, bushrock has been removed from paddocks to create arable cropping land, increase pasture and improve crop yields. In recent times, new machinery has been developed to rip and crush surface rocks and bury them below the soil level.

In Western Australia, South Australia and Victoria, large machines such as the Reefinator are towed behind powerful tractors and are converting rocky paddocks and low rocky outcrops into arable land at a rate of one hr/ha. The Reefinator works like a cheese grater, ripping the rock but not allowing large chunks to come to the surface. The largest rocks that come up are about the size of a football, and are then crushed into gravel by the roller.

This image illustrates various rocks that have been flipped and not replaced back to their original positions. Many species shelter within the subterranean cavities that form beneath surface rocks. Disturbing embedded rocks impacts on a range of animals as once the rocks are displaced, they may become unsuitable shelter sites or expose sheltering wildlife to predators

Photo: Damian Michael

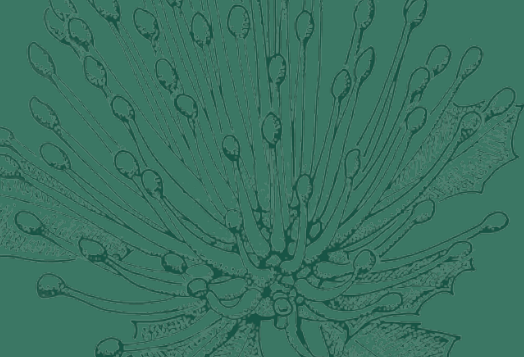
Other threatening processes

Several other activities and processes can adversely affect native animals that use bushrock.

- Rock rolling or flipping. Bushrock can be damaged by wildlife enthusiasts rolling or flipping rocks seeking to take photographs of frogs, reptiles and invertebrates such as scorpions. Bushrock that is flipped and not replaced back into the original soil cavity can impact native wildlife as the disturbed rocks may become unsuitable shelter sites, alter thermal conditions and create spaces that favour predators.
- Vandalism. In some regions, rocks that lie on bedrock are damaged by vandals attempting to dislodge and throw rocks over cliff edges or down steep slopes. Outcrops close to walking trails, picnic areas and camping grounds, and those on the outskirts of cities and rural towns are more likely to suffer from vandalism than outcrops in more remote parts of Australia.
- Illegal reptile collectors. Some rock-dwelling species are rare or attractive and as such these species are targeted by illegal reptile collectors. Collectors often use crow bars and jacks to prise open rock crevices in search of highly-prized species.
- Feral animals. Feral pigs and other hard-hoofed animals such as goats and cattle can cause substantial damage to surface rocks, especially loose rocks that lie in contact with the bedrock on sloping ground.
- Inappropriate fire regimes. High intensity fire can cause some rock types to explode and shatter into smaller pieces. Extreme heat can also cause loose rocks to flake away from large boulders and soot from the fire can damage artefacts and Indigenous rock art.

Disturbing bushrock can also be harmful to humans as many venomous snakes, scorpions, bull ants, centipedes and wasps shelter beneath loose surface rocks.





What species are threatened by bushrock removal?

Bushrock removal has been implicated in the decline of several threatened reptile species, including the Grassland Earless Dragon *Tympanocryptis pinguicolla*, Striped Legless Lizard *Delma impar*, Pink-tailed Worm-lizard

Aprasia parapulchella, Broad-headed Snake *Hoplocephalus bungaroides*, Red-crowned Toadlet *Pseudophryne australis*, Little Whip Snake *Parasuta flagellum* and Border Thick-tailed Gecko *Uvidicolus sphyrurus*. Several plant species are also adversely

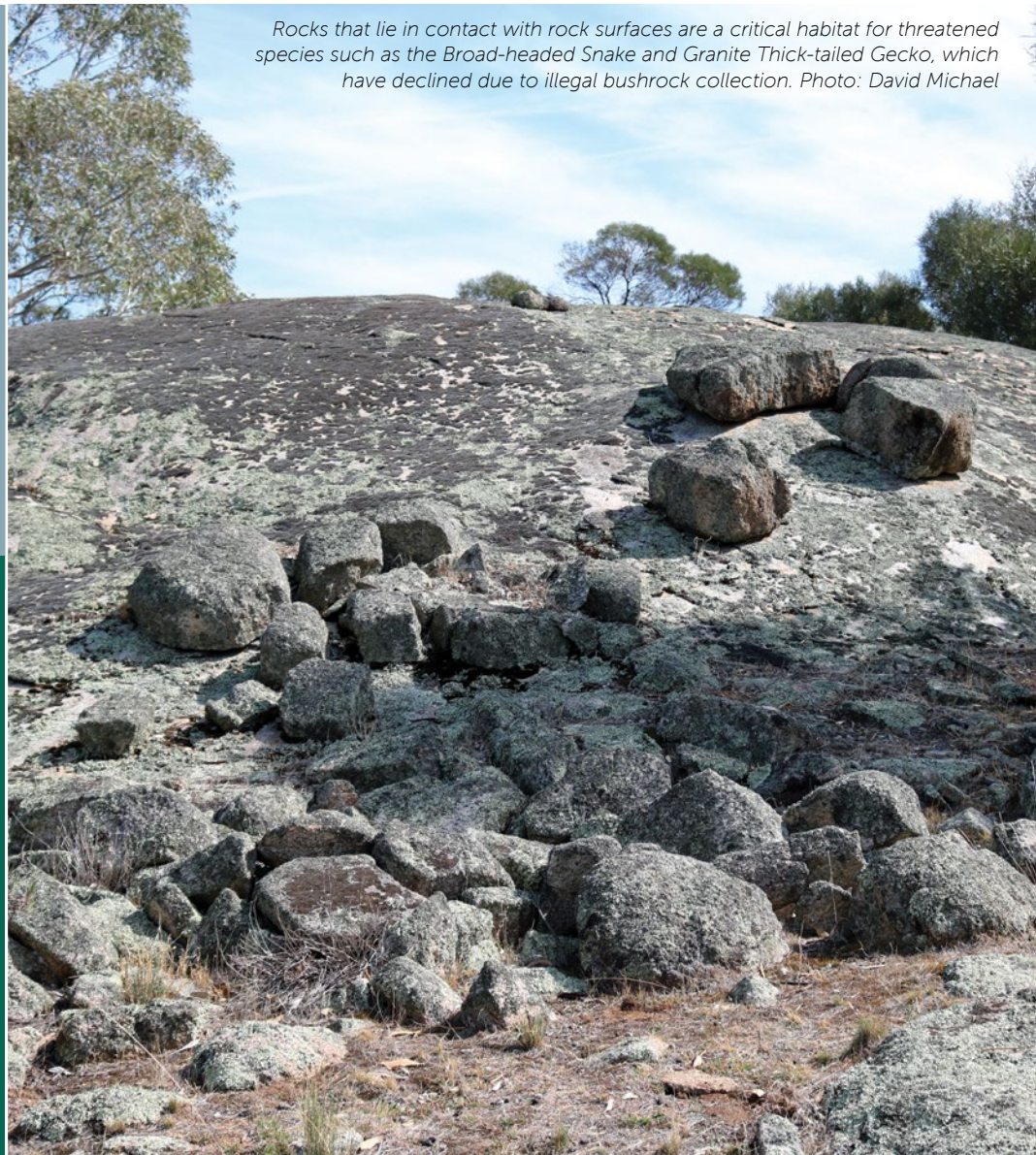
affected by bushrock removal, including Granite Boronia *Boronia granitica* and Hairy Geebung *Persoonia hirsute*. The actual number of plants and animals that are affected by bushrock removal in different parts of Australia is considerably higher.

Bushrock removal has been implicated in the decline of many threatened reptile species.

Further Information

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For more information on Research Project 1.2.1.6 Enhancing critical habitat for the Pink-tailed Worm-lizard in agricultural landscapes see the TSR Hub website.



Rocks that lie in contact with rock surfaces are a critical habitat for threatened species such as the Broad-headed Snake and Granite Thick-tailed Gecko, which have declined due to illegal bushrock collection. Photo: David Michael



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This project is supported through funding from the Australian Government's National Environmental Science Programme.