

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Minister's delegate approved this conservation advice on 01/10/2015

Conservation Advice

Aprasia parapulchella

Pink-tailed worm-lizard

Conservation Status

Aprasia parapulchella Kluge, 1974 (pink-tailed worm-lizard) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as Vulnerable as, prior to the commencement of the EPBC Act, it was listed as Vulnerable under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The main reasons that the species is eligible for listing in the Vulnerable category are the restricted and highly fragmented nature of its distribution and the continuing loss, fragmentation and degradation of its habitat.

Description

The pink-tailed worm-lizard is a member of the family *Pygopodidae*. It is a small, legless and very slender lizard that lives underground, growing to about 25 cm in length, nearly half of which is tail. The snout and the tail are rounded and blunt. The presence of small hind-limb flaps distinguishes it from a juvenile snake. Colouration is predominantly grey-brown to pale grey, with a slightly darker head and nape and a paler underside. The end part of the tail is pinkish to reddish-brown. Each dorsal scale has a short dark mark, forming indistinct, broken, longitudinal stripes that often come together on the tail. There are no external ear openings (Description from Cogger 2000 and Wong et al. 2011).

Distribution

The pink-tailed worm-lizard occurs in New South Wales (NSW), Victoria and the Australian Capital Territory (ACT) where it is widely but patchily distributed along the foothills of the western slopes of the Great Dividing Range between Bendigo in Victoria and Gunnedah in NSW (Wong et al. 2011). The species' distribution is highly fragmented across this range (Department of the Environment 2013) and occurs on a variety of land tenures. In Victoria its distribution is not fully known, but it is centered around Bendigo and thought to encompass Big Hill Range to the south, Marong to the west and Sugarloaf Range to the east (Robertson and Heard 2008; Wong et al. 2011). In NSW the species is only known from the Central and Southern Tablelands and the South Western Slopes, where sites are widespread, but highly isolated from each other (Wong et al. 2011; NSW OEH 2014). The species is known from many sites in the ACT, mainly distributed along the Murrumbidgee and Molonglo River corridors as well as some of the hills within Canberra Nature Park (Osborne and Jones 1995; Wong et al. 2011). The species has a wide altitudinal range, from 180 m near Bendigo to 815 m in the ACT (Wong et al. 2011).

The pink-tailed worm-lizard's habitat includes primary and secondary grassland, grassy woodland and woodland communities, and the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks (Robertson and Heard 2008; Wong et al. 2011). These rocky habitats tend to be well-drained mid-slope or ridge-top sites with loosely embedded rocks on soil substrate with ant galleries present (Osborne and Jones 1995; Robertson and Heard 2008). Individuals are most commonly found sheltering under these rocks and spend considerable time in ant burrows below these rocks, which are considered important foraging and shelter sites (Wong et al 2011; Department of the Environment 2013; NSW OEH 2014). Microhabitat attributes, such as rockiness and the presence of ground-layer species, especially native grasses, are the principal determinants of occurrence (Department of the Environment 2013). A cover of predominantly native grasses, particularly kangaroo grass *Themeda australis*, characterises the majority of sites (Jones 1992; 1999), although vegetation affiliations in Victoria are less clear (Robertson and Heard 2008).

Relevant Biology / Ecology

Due to the cryptic and fossorial nature of the pink-tailed worm-lizard, observations of activity patterns are limited. The species is thought to be diurnal (Wong et al. 2011). Although the majority of time is spent below the surface the species has been observed undertaking different behaviours, such as travelling, above ground during the day in both the field and the laboratory (Wong et al. 2011). This occasional movement above the ground is also indicated by the collection of the species in pitfall traps (Jones 1999). It is thought that the pink-tailed worm-lizard uses thigmothermy as a strategy for thermoregulation whereby heat is drawn from the underside of surface rocks (Wong et al. 2011). Ant burrows are also thought to provide a thermally stable environment (Wong et al. 2011).

The pink-tailed worm-lizard is a dietary specialist which feeds mainly on the eggs and larvae of ants (Jones 1992). The species is oviparous and has a clutch size of two (Osborne & Jones 1995), which it most likely lays inside the ant nests (NSW OEH 2014). Although there are no specific records of hatching, it is thought to occur in mid to late summer (Wong et al. 2011). Sexual maturity is thought to be approximately three years for males and four years for females. This late maturation suggests the species may be relatively long-lived (Jones 1999), however no estimates of maximum age exist.

The pink-tailed worm-lizard can be found throughout the year by searching under rocks (Department of the Environment 2014). While the method of rock rolling is currently the most commonly employed survey technique for this species, it inevitably results in disturbance to the microhabitat (Brown 2010). Search success, and therefore likely peak seasonal activity, is highest in spring and early summer during warm, but not overly dry or hot, conditions (Osborne et al 1991; Department of the Environment 2014). The species is more difficult to detect during hot dry periods and is rarely recorded when the temperature exceeds 25 degrees Celsius (Osborne et al 1991; Jones 1999). Survey results suggest that as well as temperature, moisture levels appear to have an important influence on the activity and location of the pink-tailed worm-lizard (Jones 1999), with detection possibly dependant in some areas on recent rainfall events (Wong et al 2011). One possible explanation for the difficulty in detection during summer is that the species descends deeper into the ant burrows during periods of hot and dry weather (Jones 1999).

Threats

Due to the lack of information about the pink-tailed worm-lizard and its population decline, a detailed assessment of the current threats to the survival of this species is difficult. Habitat loss, fragmentation and degradation are considered here as known threats to the pink-tailed worm lizard, with potential threats discussed following these known threats.

Habitat loss and fragmentation

Habitat has been lost from many parts of the pink-tailed worm-lizard's range through urban development, forestry and agriculture (Osborne and Jones 1995; Jones 1999; Robertson and Heard 2008; Department of the Environment 2013). This habitat loss increases the level of habitat fragmentation that may have serious implications for dispersal and gene flow.

Habitat degradation

Several activities lead to the modification and degradation of the habitat of the pink-tailed worm-lizard in both rural and semi-urban locations. These activities include livestock grazing and trampling, and agricultural activities such as pasture improvement and cropping which reduce the cover of native grasses (Osborne and Jones 1995; Department of the Environment 2013; NSW OEH 2014). The modification of the pink-tailed worm-lizard's habitat can also occur via the invasion of weeds. On agricultural land this is facilitated through the increased nutrification of the soil from livestock dung, however pastures species that escape and tree planting in native grasslands can also degrade habitat (Jones 1992; Osborne and Jones 1995; Jones 1999; NSW OEH 2014). Other management techniques such as slashing for fire hazard reduction and rock disturbance (including for pink-tailed worm-lizard survey and monitoring) can also modify the species' habitat. (Department of the Environment 2013; NSW OEH 2014). Recreational activities can be a significant pressure on pink-tailed worm-lizard habitat, particularly in peri-urban areas, including activities such as fossicking, trail and mountain bike riding and rock climbing, which can result in disturbance to the microhabitat requirements of the species.

Removal of rocks

The removal of rocks from the pink-tailed worm-lizard's habitat occurs for various reasons, such as pasture improvement, the creation of fire breaks or landscaping activities. Rocks are important for the pink-tailed worm-lizard as they provide shelter, foraging opportunities and help with thermoregulation. Therefore the removal of rocks likely has a significant negative impact on the pink-tailed worm-lizard (Department of the Environment 2013; NSW OEH 2014).

Inappropriate fire regimes

The impacts of fire on the pink-tailed worm-lizard are unknown. Given the species' tendency to shelter under rocks and within ant burrows (Wong et al. 2011), it may not be directly negatively affected by fire. However, the indirect impacts on the species, such as changes to vegetation structure allowing establishment of other plant species, may be a threat (Osborne and Jones 1995; NSW OEH 2014).

Predators

Little information is available on the prevalence or impact of feral predation on the pink-tailed worm-lizard. Feral cats and red foxes are recognised as predators of the species in NSW (NSW OEH 2014) and therefore may be throughout the rest of the species' range. However the relative level of threat to the species is unknown and warrants further investigation.

Conservation Actions

Conservation and Management Actions

Habitat loss, disturbance and modifications

- Identify sites not protected in conservation reserves and seek to secure the protection and conservation management of sites on which long-term conservation relies.
- Identify and implement approaches to avoid/reduce the removal of rocks in order to preserve habitat integrity (e.g. erect signage, manage access to habitat).
- Implement management actions that reduce the modification of vegetation (e.g. prohibit slashing, ploughing and pasture improvement).
- Ensure that the disturbance of habitat by recreational activities is minimised through a combination of education, on-site advisory signs, and the restriction of certain activities.

Invasive species

- Develop and implement predator control programmes in line with the Department of the Environment's *Threat abatement plan for predation by feral cats* (Department of the Environment 2015) and the *Threat abatement plan for predation by European red fox* (DEWHA 2008). Programmes should address feral animal control on and adjacent to known sites and responsible pet ownership. Programmes should consider the potential for an amplified rate of predation from these species following fire.
- Implement or improve weed control, including for escaped pasture species.

Impact of domestic species

- If livestock grazing occurs in the area, ensure land owners/managers use an appropriate management regime and density that does not detrimentally affect this species and manage total grazing pressure at important sites through exclusion fencing or other barriers.

Fire

- If, as a result of research, fire and certain fire regimes are found to be a threat, incorporate this information into fire management plans across the species' range.

Stakeholder engagement

- Ensure land managers are aware of the species' occurrence and encourage implementation of threat reduction measures.
- Provide landholders with information on minimising adverse impacts as a result of grazing and reducing the modification of native vegetation.
- Promote community understanding and support through public education and the provision of advice.

Survey and Monitoring priorities

- Following their development, trial low-impact monitoring protocols.
- Implement low-impact monitoring at key locations to evaluate the effectiveness of management regimes.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Information and research priorities

- More precisely assess population size, distribution and ecological requirements by undertaking targeted surveys within the known distribution of the species and in seasons when lizards are most likely to be encountered.

- Undertake mapping and habitat modelling (predictive modelling) to identify potential habitat and distribution and undertake surveys in any identified areas to determine the species presence.
- Develop low-impact survey and monitoring protocols (e.g. refuge surveys using thermally suitable artificial habitat or scat analysis).
- Using monitoring information and expert advice, assess the relative impacts of the following known and potential threats:
 - habitat loss and fragmentation;
 - habitat degradation;
 - removal of rocks;
 - predation by introduced species; and
 - inappropriate fire regimes.
- Investigate the impacts of different fire-regimes, especially in grassland sites. Monitor vegetation and species response to burns (if burning is recommended) as well as the level of predation from introduced species following fire.
- Determine genetic relationships of current known populations, with a view to identifying management units and investigating the effects of habitat fragmentation.
- Investigate options for linking, enhancing or establishing additional populations.

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