

Draft Flora and Fauna Guarantee Action Statement

Pink-tailed Worm-lizard *Aprasia parapulchella*

Description

The Pink-tailed Worm-lizard (*Aprasia parapulchella* Kluge, 1974) is a member of the family Pygopodidae (flap-footed or legless lizards). Like its congeners, the Pink-tailed Worm-lizard is a small worm-like, burrowing legless lizard with poorly-developed hind-limb flaps. The snout and the tail are rounded and blunt. This cryptozoic lizard is predominantly grey-brown or pale grey in colour, apart from the head and nape, which are dark brown, and the distal portion of the tail, which is pinkish- or reddish-brown. There is a dark dash on each dorsal scale that together align to form narrow longitudinal stripes that often coalesce on the tail. The ventral surface is whitish in colour. Mean adult snout-vent length is 140 mm, and the tail is nearly as long as the body (Cogger 2000). The Pink-tailed Worm-lizard exhibits sexual dimorphism, with females attaining longer snout-vent lengths (SVL) than males (Jones 1999).

Distribution

The Pink-tailed Worm-lizard is patchily distributed across sloping, open woodland areas of the western foothills of the Great Dividing Range in south-eastern Australia, where it is typically associated with abundant surface rock, including granite, basalt and sandstone outcrops (Australian National University 2009; DECC 2007; DEWHA 2009; Jones 1992; Osborne *et al.* 1991; Robertson & Heard 2008).

In Victoria, it has only been found in the general Bendigo area, though its occurrence in woodland environments in south-central New South Wales, including Albury, and the Australian Capital Territory suggests that it may occur elsewhere in Victoria. To date, records of this worm-lizard have been collected from the Gunnedah, Bathurst, Tarcutta, West Wyalong, Walbundrie, Howlong, Holbrook and Albury localities of New South Wales, the general Canberra area in the Australian Capital Territory, and the general Bendigo area of central Victoria (Atlas of Victorian Wildlife, DSE; D. Michael pers. comm. 2009; Michael & Herring 2005; Osborne & Jones 1995; Osborne *et al.* 1991; Osborne & McKergow 1993; Robertson and Heard 2008).

Habitat

Like most pygopodids, little is known of the biology of this species. However, features that usually characterise the habitat of this pygopodid include native grasses, loose or partially embedded surface rock, and colonies of ants of the genus *Iridomyrmex*, which provide both a food source and tunnels for shelter (DECC 2007; Jones 1992; Michael and Herring 2005; Osborne *et al.* 1991; Robertson and Heard 2008; Wilson and Swan 2008). In the ACT, the Pink-tailed Worm-lizard is most abundant in areas which have not been pasture improved and that feature a moderate to extensive cover of native grasses, especially Kangaroo Grass *Themeda triandra* (Osborne & Jones 1995). Pink-tailed Worm-lizards prefer sites that have not been heavily grazed and rocks that receive some direct sunlight, since they are used for thermoregulation (Australian National University 2009). At a Pink-tailed Worm-lizard sites near Bendigo, the rocks under which Pink-tailed Worm-lizards are found are often relatively small (G. Brown pers. obs.); this echoes the findings of Osborne *et al.* (1991) who measured the basal area and embedded depth of Pink-tailed Worm-lizard stones at sites in the ACT.

Life history and ecology

Little is known of the ecology of the Pink-tailed Worm-lizard, including daily activity patterns, thermoregulation and movements (Robertson & Heard 2008). However, the Pink-tailed Worm-lizard is fossorial and mainly nocturnal; it spends the daylight hours hidden beneath rocks or inside ant tunnels.

It has a specialised diet comprised of the eggs and larvae of various ant species, notably of the genus *Iridomyrmex* which, if feeding patterns in other *Aprasia* species are any guide, are consumed in greatest volumes in spring and summer; there is no feeding in winter (Webb & Shine 1994).

The Pink-tailed Worm-lizard is oviparous and, like most geckos and pygopodids, produces only two eggs per clutch (Greer 1989). Mating probably occurs during spring, and gravid females have been recorded in late November and December (Osborne & Jones 1995; Robertson & Heard 2008).

According to Robertson & Heard (2008), the Pink-tailed Worm-lizard is likely to be relatively long-lived and probably reaches sexual maturity in the third or fourth year (greater than 96 cm SVL).

Conservation status

National conservation status

The Pink-tailed Worm-lizard has been listed as “vulnerable” under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Victorian conservation status

The Pink-tailed Worm-lizard has been listed as “threatened” under the *Flora and Fauna Guarantee Act 1988*.

The Pink-tailed Worm-lizard is considered “endangered” in Victoria according to DSE’s *Advisory List of Threatened Vertebrate Fauna in Victoria - 2007* (DSE 2007).

Threats

There are several apparent causes for the decline of the Pink-tailed Worm-lizard in parts of its range, some of which are still operating. The major threats to this worm-lizard are habitat loss, fragmentation and degradation, all of which are typically associated with agricultural development and urbanisation (DECC 2007; Osborne & Jones 1995; Robertson & Heard 2008). Specific threats include the removal or disturbance of rocks, invasion of habitat by weeds or escaped pasture species, habitat degradation through slashing for hazard reduction, altered fire regimes that result in changes to vegetation structure and composition, predation by introduced carnivores, recreational activities (e.g. fossicking, trail-bike riding) and, potentially, heavy grazing and trampling by stock (ACT Department of Territory and Municipal Services 2007; DECC 2005; Osborne & Jones 1995; Robertson & Heard 2008). The lack of ecological and distributional information for this taxon also has consequences for its effective management.

<i>Standard threat</i>	<i>Source Of Threat</i>	<i>Explanation</i>
Carnivory	Animals - cats Animals – dogs Animals - foxes	Feral carnivores are opportunistic predators of small vertebrates, including reptiles. Feral and domestic cats, along with other introduced predators, dogs and foxes, have been reported to injure small reptiles or take them as prey (Barratt 1997; Barratt 1998; DEWHA 2008; Dickman 1996; Lunney <i>et al.</i> 1990; May & Norton 1996; Read & Bowen 2001; Shine & Koenig 2001; Triggs <i>et al.</i> 1984). Given the proximity of Pink-tailed Worm-lizard populations to urban areas, the risk of attack or predation by feral and domestic predators is high, more so if the activities of pets are unrestricted.
Habitat damage or loss	Removal of rocks and/or soil	A major threat to the Pink-tailed Worm-lizard is disturbance to surface rock through recreational activities, such as fossicking, cycling, walking etc. These activities may alter the microhabitat characteristics that are most important for the Pink-tailed- Worm-lizard through the dislodgement of rocks, soil or ground-level vegetation.
Habitat damage or loss	Land use changes - residential / commercial development	An ongoing threat is the loss of or disturbance to habitat posed by the subdivision of private property.
Inappropriate fire regimes	Fire - season or time	The timing, frequency and intensity of planned burns needs careful consideration during Fire Operations Planning; this has implications for the Greater Bendigo National Park (NP) where fire is considered a major threat to both native habitat and property, especially at One Tree Hill, which is encircled by residential development and where the stronghold population of the Pink-tailed Worm-lizard is located, and Mount Sugarloaf Nature Conservation Reserve (NCR), which supports a significant satellite population of the Pink-tailed Worm-lizard.
Loss of important habitat features	Construction/maintenance - fuel breaks	The creation or maintenance of fuel breaks, usually for fire access vehicles, has the potential to disturb the microhabitat of the Pink-tailed Worm-lizard through the removal or disturbance of surface rocks and soil. Breaks are typically widened or cleared by machinery with little regard to the impacts of such disturbance. This type of impact is considered major at the One tree Hill location

		and moderate in the Mount Sugarloaf NCR. This action has habitat fragmentation implications in that it has the potential to disrupt the continuity of suitable habitat at the local scale (i.e. within-site), in so doing restricting the expansion or maintenance of the range of the Pink-tailed Worm-lizard.
Loss of important habitat features	Construction/maintenance - road, rail or utility	The construction or maintenance of roads and tracks has the potential to disturb the microhabitat of the Pink-tailed Worm-lizard through the removal or disturbance of surface rocks and soil. Tracks are typically widened or cleared by machinery with little regard to the impacts of such disturbance. This is considered a moderate threat in the Mount Sugarloaf NCR; it is probably less of a threat in the One Tree Hill NCR where the road network, including bitumen roads, is well-established. This action has habitat fragmentation implications in that it has the potential to disrupt the continuity of suitable habitat at the local scale (i.e. within-site), in so doing restricting the expansion or maintenance of the range of the Pink-tailed Worm-lizard.

Important populations

<i>Location name</i>	<i>Land manager</i>	<i>Catchment</i>	<i>Bioregion</i>
One Tree Hill Nature Conservation Reserve	Parks Victoria	North Central	Goldfields
Mount Sugarloaf Nature Conservation Reserve	Parks Victoria	North Central	Goldfields
Private land near One Tree Hill	Private	North Central	Goldfields

Other smaller populations occur at Inglewood NCR and Greater Bendigo NP.

Past management actions

<i>Action</i>	<i>Result explanation</i>
Conduct survey to locate additional populations	The occurrence of the Pink-tailed Worm-lizard was confirmed at Mt Sugarloaf in 2003-04. Targeted surveys in 2003 of potential habitat in the Heathcote and Harcourt areas of north-central Victoria failed to locate any Pink-tailed Worm-lizards (Robertson & Heard 2003, 2004).
Conduct survey to determine abundance/extent	To date, surveys have revealed that the distribution of the Pink-tailed Worm-lizard in Victoria is centred on Bendigo where the worm-lizard is probably limited to several isolated locations, including the key locations of One Tree Hill NCR and Mt Sugarloaf NCR. Recent surveys (2008) at One Tree Hill NCR yielded 37 individuals (from six of seven transects), and at Mt Sugarloaf yielded 4 individuals from 2 transects (Brown 2009).
Assess threats	Risk and threat assessments of the Greater Bendigo NP are routinely done as part of the park planning process.
Negotiate voluntary acquisition or exchange of land	The recent threat of habitat loss in the One Tree Hill area due to the subdivision of adjacent private land was mitigated when the owner agreed to revert two parcels of land to the Crown for inclusion in One Tree Hill NCR. These sites support a significant component of the One Tree Hill population. Parks Victoria (PV) has agreed to the proposal, subject to conditions being negotiated.
Involve community groups and volunteers in recovery activities	Several sites at One Tree Hill were surveyed during October 2008 with the help of community volunteers (including Bendigo Regional Institute of Technical and Further Education, PV, DSE, Monash University and interested individuals). Community field days were conducted by DSE during 2003-05.
Undertake threat	In recent years, threat monitoring has been undertaken by Parks Victoria at Inglewood NCR as part of routine surveillance work. Parks Victoria also completed a partial risk

monitoring	assessment at One Tree Hill NCR in 2004-05.
Promote community involvement programs (e.g. Land for Wildlife, Botanic Guardians, Friends groups)	During 2005-07 several properties south of One Tree Hill (e.g. around Mandurang) have signed up to the Land for Wildlife (LFW) program or were assessed and applications for the LFW program received. An awareness of the presence of the Pink-tailed Worm-lizard was a characteristic of these applications.
Control introduced animals	Since 2004-05 the City of Greater Bendigo has administered a cat curfew around One Tree Hill. Parks Victoria and DSE have worked with local government to implement cat control (e.g. by promoting the concept at public forums); although to date there has been no assessment of the effectiveness of such control. There is ongoing liaison between these agencies.
Liaise with government agencies	The issue of cat control was partially addressed in 2005-06 by the liaison of DSE with the City of Greater Bendigo Natural Environment Advisory Committee.
Protect habitat from fire	It is very likely that ecological burns are not required to protect the habitat of the Pink-tailed Worm-lizard. In 2008-09 a planned burn was proposed for the One Tree Hill NCR. This was not conducted because alternative means of protection are being considered.
Map populations	The occurrence of the Pink-tailed Worm-lizard at One Tree Hill was confirmed and the number of known locations increased for the Mount Sugarloaf area during surveys in 2008. Further surveying is required in potentially suitable habitat at other locations in northern Victoria.
Undertake habitat monitoring	Select habitat characteristics were evaluated in 2008 as part of targeted surveys for the Pink-tailed Worm-lizard. Pink-tailed Worm-lizards were usually located under relatively small rocks and were most likely to be recorded on upper or mid-slopes. The habitat attributes of the Pink-tailed Worm-lizard collection points revealed a relatively consistent cover of litter, rock and bare ground (mean estimated cover = 50.4%, 20.4% and 26.5%, respectively) (Brown 2009).

Conservation objectives

Long term objective

To ensure the Pink-tailed Worm-lizard can survive, flourish and retain its potential for evolutionary development in the wild.

Objectives of this Action Statement

- To improve condition of habitat
- To secure populations or habitat from potentially incompatible land use or catastrophic loss
- To increase knowledge of biology, ecology or management requirements
- To maintain or increase community awareness and support

Intended management actions

The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation (ABC) system. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.

<i>Standard objective</i>	<i>Targets</i>	
To improve condition of habitat.	<ul style="list-style-type: none"> • Introduced predators and weeds reduced to a level that allows population increase in Pink-tailed Worm-lizard. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Control introduced animals.	Undertake control measures as appropriate, including curfews on domestic pets and baiting of wild dogs and foxes.	DSE - Statewide Services - North West, Parks Victoria

Identify weed management priorities and develop detailed plan.	Develop a contingency plan to prevent or manage weed infestation of Pink-tailed Worm-lizard habitat.	DSE - Statewide Services - North West, Parks Victoria
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<i>Standard objective</i>	<i>Targets</i>	
To secure populations or habitat from potentially incompatible land use or catastrophic loss.	<ul style="list-style-type: none"> Fuel reduction burns and ecological burns excluded from habitat. No loss of habitat due to subdivision. Impacts of disturbance events, such as wildfires, minimised. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Protect habitat from fire.	Exclude planned burns from Pink-tailed Worm-lizard habitat and implement measures that minimise the impacts of wildfire on its habitat.	DSE - Statewide Services - North West, Parks Victoria
Negotiate voluntary acquisition or exchange of land.	Negotiate voluntary acquisition or exchange of land if subdivision of Pink-tailed Worm-lizard habitat is proposed.	DSE - Statewide Services - North West
Liaise with government agencies.	Liaise with government agencies about appropriate management of Pink-tailed Worm-lizard and its habitat, as required.	DSE - Statewide Services - North West

<i>Standard objective</i>	<i>Targets</i>	
To increase knowledge of biology, ecology or management requirements.	<ul style="list-style-type: none"> Knowledge of the ecology of and threats to Pink-tailed Worm-lizard increased to identify and prioritise management actions. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Assess threats.	Assess levels of likely threats to Pink-tailed Worm-lizard with Parks Victoria and review, as required. Determine park management priorities using Actions for Biodiversity Conservation information system.	DSE - Statewide Services - North West, Parks Victoria
Undertake periodic surveillance monitoring of populations.	Monitor known populations to track changes in conservation status.	DSE - Statewide Services - North West, DSE - Biodiversity and Ecosystem Services
Undertake habitat monitoring.	Monitor and report on condition and suitability of habitat for the species.	DSE - Biodiversity and Ecosystem Services
Undertake threat monitoring.	Monitor and report on impacts from activities that may negatively impact on the species. These activities include disturbance through prospecting and habitat loss and fragmentation through urban subdivision.	DSE - Statewide Services - North West, Parks Victoria
Conduct survey to determine abundance/extent.	Survey known habitat to determine the abundance and extent of the Pink-tailed Worm-lizard.	DSE- Biodiversity and Ecosystem Services
Conduct survey to locate additional populations.	Survey potential habitat to determine the abundance and extent of Pink-tailed Worm-lizard.	DSE- Biodiversity and Ecosystem Services
Map populations.	Generate a map of known Pink-tailed Worm-lizard distribution to assist management.	DSE- Biodiversity and Ecosystem Services

<i>Standard objective</i>	<i>Targets</i>	
To maintain or increase	<ul style="list-style-type: none"> Participation in community programs and activities such as Land for Wildlife, field 	

community awareness and support.	days and survey and monitoring increased so that the community understands and supports conservation measures undertaken for the Pink-tailed Worm-lizard.	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Promote community involvement programs (e.g. Land for Wildlife, Botanic Guardians, Friends groups).	Investigate Land For Wildlife opportunities with landholders.	DSE – Statewide Services – North West
Involve community groups and volunteers in recovery activities.	Conduct community field days and encourage the participation of interested stakeholders or individuals in survey and monitoring activities.	DSE – Statewide Services – North West

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Personal Observations

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