

Pink-tailed Worm-lizard *Aprasia parapulchella*

Action Plan

Implementation Progress Report 2022

Environment Planning and Sustainable Development Directorate - ACT Government



Yuma Dhawura Nguna Dhawura Ngunnawal Ngunnawalwari dhawurawari Nginggada Dindi yindumaralidjinyin Dhawura Ngunnawal yindumaralidjinyin

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Background

Species Distribution and Conservation Status

The Pink-tailed Worm-lizard – *Aprasia parapulchella*, hereafter PTWL, is a small (less than 24cm in length), greyish, worm-like, legless lizard with a slender body, a blunt head, and a long round-tipped pinkish tail. Maturity is reached between three to four years of age (Jones 1999). The species lives in ant burrows under rocks and can be difficult to find, even when known to be present at a site.

The PTWL is largely confined to open rocky landscapes. The species has a patchy distribution along the slopes of the Molonglo River, Murrumbidgee River, and Queanbeyan River corridors, and on adjacent outlying hills in the ACT and surrounding region of NSW. While many known locations are in nature reserves, there are also many sites that are in areas that are subject to current and future urban development, including in the Molonglo Valley, between the Molonglo River and Murrumbidgee River, at West Belconnen and in the Googong-Royalla area.

The PTWL is listed as Vulnerable under the Commonwealth <u>Environment Protection and Biodiversity Act 1999</u> (EPBC Act) and the ACT <u>Nature Conservation Act 2014</u> (NC Act). A <u>conservation advice</u> was prepared by the ACT Scientific Committee (2020) to inform the listing as required under the NC Act.

A current <u>Pink-tailed Worm-lizard Action Plan</u> (ACT Government 2017) is in force. This document is the five-yearly report on the implementation progress of the Action Plan.

Conservation

Objective

The main conservation objective of the action plan is to maintain viable, wild populations of the PTWL as a component of the indigenous biological resources of the ACT and as a contribution to the regional and national conservation of the species. This includes the need to maintain natural evolutionary processes.

This is to be achieved through specific objectives to:

- → conserve all populations in defined landscape corridors that comprise important linking habitat and all medium to large habitat areas outside these corridors
- → protect all other mapped habitat areas from unintended impacts (unintended impacts are those not already considered through an environmental assessment or other statutory process)
- ightarrow manage the species and its habitat to maintain the potential for evolutionary development in the wild
- → enhance the long-term viability of populations through management of buffer zones that surround occupied habitat and through rehabilitation of habitat in corridor areas that will increase connectivity between populations.

The primary way PTWL populations are managed in the ACT is through the management of habitat.

Priorities

The conservation of the PTWL in the ACT requires the protection of suitable rocky habitat. Of particular importance is habitat that forms linkages in the landscape throughout the species' range. In this context, large existing corridor areas that are a priority for conservation are the Murrumbidgee River Reserve and the Molonglo River Reserve. The Molonglo River Reserve has been extensively surveyed, while large areas of the Murrumbidgee River Corridor are a priority area for future survey efforts.

The presence of the species in some areas of identified suitable habitat is yet to be confirmed and it is commonly assumed that the species does not occur in areas where habitat is not currently considered typical (i.e. former pine plantations). Sightings in non-typical habitat have occurred in the ACT, therefore surveys in non-typical or lower quality habitat should still be encouraged prior to development.

Sites with high densities of PTWL are uncommon. Highest densities of PTWL are found where the vegetation state is dominated by the large tussock-forming species such as *Themeda* and *Aristida ramosa*, which are also indicative of low historical disturbance. The encounter rate during surveys is usually reasonably low, suggesting that population density is low across most of the species' range. Conservation of large areas supporting the species is therefore important to ensure populations are adequately protected. Outside of habitat corridors, larger populations of the species are likely to occur in moderate to large patches of habitat, particularly if the habitat is moderate to high quality and dominated by native grasses. Osborne and Wong (2015, 2016, 2017) define high and moderate quality habitat for the PTWL in the ACT.

A key research priority for the species is to gain a better understanding of habitat requirements, particularly vegetation structure, and the impacts of grazing and fire management on habitat quality. The effectiveness of current management programs in maintaining populations and habitat quality should be evaluated. A further recognised knowledge gap is the effect of recreational pressure on high quality habitat in conservation areas, particularly in areas adjacent to high density urban development.



Management of habitat should focus on maintaining appropriate biomass levels and managing high risk weed species, notably including African Lovegrass (*Eragrostis curvula*). Observationally, areas with higher biomass or high tussock height appear to support higher PTWL densities, however the required biomass levels for the species are still not well understood and should be the focus for further research.

A high priority area for additional research and management is the control of African Lovegrass (and other invasive perennial grasses) in PTWL habitat. This is for both improving techniques to control existing infestations and to prevent new incursions and reestablishment after treatment. African Lovegrass control is a substantial and difficult conservation challenge which needs to be tackled to prevent further habitat degradation.

Priority for future surveys should also be given to areas where potential habitat on farmland provides an essential element of the regional conservation corridors supporting the species (for example, adjacent to the Murrumbidgee River Reserve and Molonglo River Reserve). Areas adjacent to corridor populations could be used to augment protected areas along the river reserves, which are often geographically narrow. Considerable areas of potential habitat are likely to occur on agricultural lands, and the engagement of the broader rural community in the conservation of the species is important. Nutrient addition (i.e., from fertilizer) leading to changes in vegetation floristics, rock removal and habitat destruction are all risks of poor habitat management that could occur on agricultural land if managers are not engaged. Identification of possible refugia sites or restoration opportunities on rural lease lands should be a priority.

Finally, surveys should also be prioritised in areas that are not currently protected within the reserve estate and are under threat from urban development. Other surveys could be undertaken to determine the extent of populations in current reserves where surveying has been incomplete, and these may be designed to help increase understanding of management effectiveness and habitat requirements.

Summary

Under the current action plan key conservation efforts to protect the PTWL in the ACT have included:

- → The establishment of the Molonglo River Reserve in 2019 to offset impacts under the Molonglo Valley Strategic Assessment. The Molonglo River Reserve protects the largest known population of PTWL in Australia.
- → The establishment of the ACT portion (around 360 ha) of the Ginninderry conservation corridor which provides formal protection and management of large areas of PTWL habitat in the Murrumbidgee River corridor under the stewardship of the Ginninderry Conservation Trust (as guided by a plan of management (SMEC 2018) approved by the Conservator of Flora and Fauna and the Minister for the Environment (Ginninderry Conservation Trust and Woodlands and Wetlands Trust 2020). The 2020 surveys indicated a good population of PTWL are persisting in the conservation corridor.
- → Extensive restoration works to improve habitat connectivity and buffer future urban impacts. Approximately 6.5 ha of PTWL habitat has been created across the Molonglo River Reserve, including the placement of over 1.5 million habitat rocks (4,500 tonne).
- → Trial translocations to test the effectiveness of translocations as a conservation tool for the PTWL have commenced. Thirty animals were translocated from Denman Prospect and Ginninderry development areas to created habitat in the Gungahlin grassland reserves. Up to an additional 30 animals will be translocated in 2022.
- → Research was undertaken on the development of a low-impact monitoring method for the species that will allow for more frequent monitoring. The current monitoring method involves rolling habitat rocks, which can have a negative impact on the species if undertaken too frequently. Preliminary results indicate that artificial shelter surveys, using solid red house bricks, achieve similar detection rates as habitat rock rolling and have a minimal impact on the species in its natural habitat.
- → The Ginninderry Conservation Trust plans to lay permanent brick-based monitoring plots to avoid regularly disturbing surface rocks in the conservation corridor during monitoring surveys. Additional rock will also be placed throughout the corridor to improve the connectivity between habitat patches within the corridor. Monitoring in the corridor is required to be undertaken every two years as per the Offset Management Plan (SMEC 2018).
- → Population monitoring in the Molonglo River Reserve is undertaken every 5 years. Monitoring results across the 30 sites indicate population numbers are stable.
- → Habitat mapping and surveys have been completed in Wanniassa Hills, Tuggeranong Hill, McQuoids Hill and Farrer Ridge reserves, and Jarramlee offset area.

Progress Against Intended Management Actions

Objective	Actions	Indicator	Progress
1. Conserve all populations that occur in large conservation corridors (Murrumbidgee and Molonglo River Reserves) and all habitat outside these corridors that is moderate to high quality or medium to large area.	1a. Apply formal measures to ensure all populations that occur in large conservation corridors and all habitat outside these corridors that is moderate to high quality or medium to large area, are protected.	1a. All populations that occur in large conservation corridors, and all habitat outside these corridors that is moderate to high quality or medium to large area, are protected by formal measures.	1a. As of June 2021, 2.34ha of high and moderate quality PTWL habitat has been cleared for urban development in the Molonglo Valley. The EPBC conditions of approval allow for a total impact of up to 27ha of high and moderate quality PTWL habitat. To offset these impacts, the Molonglo River Reserve was established in 2019 to protect significant populations of the PTWL. This new nature reserve is an aggregation of the former Molonglo River Reserve, Kama Nature Reserve and Lower Molonglo River Corridor Nature Reserve.
			Approximately 5.48 ha of high and moderate quality potential PTWL habitat is protected within The Pinnacle Nature Reserve and offset area.
			Approximately 4.7 ha of PTWL habitat, confirmed to support a small population, is protected within the Kinlyside offset area. This is the ACT's northernmost population of the species. Kinlyside offset area also contains 18.8 ha of potential PTWL habitat.
			Approximately 126 ha of high and moderate quality PTWL habitat is protected within the ACT portion of the 'Ginninderry conservation corridor' (Osborne and Wong 2013, Capital Ecology 2018, SMEC 2018). This includes part of the Woodstock Nature Reserve to the north-east of the Murrumbidgee River and an as yet, unnamed nature reserve in Belconnen that borders it.
			PTWL habitat is also formally protected within existing nature reserves including Mount Taylor Nature Reserve, Tuggeranong Hill Nature Reserve, Rob Roy Range Nature Reserve and the Murrumbidgee River Corridor.
Protect all other populations from unintended impacts (unintended impacts are those not already	1b. Protect all other populations from unintended impacts.	1b. All sites where other populations occur are protected by appropriate measures from unintended	1b. Appropriate management of populations and habitats within reserves, including weed control and fire management has been undertaken.
			Protection of habitat has occurred through prohibiting rock removal and minimising impacts of recreation in core habitat areas.

impacts.

considered through

an environmental assessment or other statutory process).

Objective	Actions	Indicator	Progress
2. Manage the species and its habitat to maintain the potential for evolutionary development in the wild	2a. Monitor abundance of key representative populations, together with the effects of management actions.	 2a. Trends in abundance are known for representative sites, management actions recorded. 	2a. The Molonglo River Reserve supports the largest known populations of PTWL in Australia. Monitoring is undertaken every 5 years across 30 sites.
			Populations in the Molonglo River Reserve appear to be stable. In 2014, 61 animals were detected and in 2019, 74 animals were detected.
vita.			The Ginninderry Conservation Trust and Woodlands and Wetlands Trust (2020) engaged volunteers to undertake surveys on 27 ha of moderate to high quality PTWL habitat between 28 September 2020 and 2 October 2020 and again on the 19 October 2020. During the whole survey period, 71 individuals and 10 skin sheds (sloughs) were recorded during the survey, all found under rocks indicating a good population of PTWL are persisting in the conservation corridor.
	2b. Develop site specific management guidelines for all reserves containing moderate to large areas of habitat, which are regularly reviewed on the basis of monitoring and research results.	2b. Management guidelines are developed.	2b. Ecological Management Guidelines have been established for the Molonglo River Reserve and offset areas (ACT Government 2015b). Operation Management Plans have been developed for all offset sites within the Molonglo Valley, including the Molonglo River Reserve and Kama Nature Reserve.
	2c. Implement management actions to conserve the species and its habitat, including an appropriate grazing/ fire/slashing regime for managing herbage biomass (recognising current imperfect knowledge).	2c. Habitat is managed to conserve the species (indicated by suitable vegetation structure and composition, the presence of suitable rocks and colonies of ants). Populations of the species are apparently stable or increasing (considering seasonal / annual fluctuations in abundance).	2c. Approximately 6.5 ha of PTWL habitat has been created across the Molonglo River Reserve, including the placement of over 1.5 million habitat rocks (4,500 tonne), planting of 100,000 grass tubestock and seeding of 100 kg of native grass and forb seed. This includes 1,500 tonnes of rock and 50 kg of native seed distributed at the newly established Namarag Special Purpose Reserve to establish 2 ha of PTWL habitat to improve connectivity. Extensive weed control has been undertaken across all PTWL habitat (<u>Invasive plants - Environment, Planning and Sustainable Development Directorate - Environment (act.gov.au)</u>). Vegetation structure has been managed using fire, grazing and brush-cutting. Six ecological burns have been implemented and ecological grazing is utilized annually across seven sites in the Molonglo Valley.

Objective	Actions	Indicator	Progress
			Populations in the Molonglo River Reserve appear to be stable. In 2014, 61 animals were detected and in 2019, 74 animals were detected. Due to the cryptic nature of the species, low detection rates and frequency of monitoring, assessing management effectiveness is very difficult. Trials are currently being undertaken to develop a low impact monitoring method that will allow for more frequent monitoring. The current monitoring method involves rolling habitat rocks, which has a negative impact on habitat condition and also disturbs the homesites of other species that shelter under rocks if undertaken too frequently.
			2b/c. Offset management plans have been developed for The Pinnacle and the Kinlyside offset areas (ACT Government 2015a, 2016), based on reports and mapping undertaken by Osborne and Wong (2015, 2016). These prescribe that management actions must be implemented with minimal disturbance to known and potential PTWL habitat (e.g., undertaking fencing works manually without the use of vehicles or machinery, not planting trees or shrubs within PTWL potential habitat, limiting regeneration to 5% cover).
			The extent and condition of potential habitat for the PTWL in the Jarramlee offset area has also been mapped and assessed (Osborne and Wong 2017).
			A specific management plan for the PTWL was prepared in the Ginninderry offset management plan (SMEC 2018) and designated a PTWL Management Zone to direct any works. A five-yearly work plan must be developed to guide specific PTWL habitat restoration works and specific work plans must be developed for restoration actions prior to works commencing. Ongoing monitoring of impact on habitat to assess change in the extent and quality of PTWL habitat must occur every two years and be consistent with PTWL monitoring across the ACT (SMEC 2018).
3. Increase habitat area and connect populations within important corridor areas.	3. Rehabilitate habitat in suitable areas adjacent to occupied habitat to increase habitat area or habitat connectivity.	3. The condition of degraded habitat areas is improved (indicated by suitable vegetation structure and composition, the presence of <i>A. parapulchella</i> , suitable rocks and colonies of ants) and habitat	3. Approximately 6.5 ha of PTWL habitat has been restored across the Molonglo River Reserve, including the placement of over 1.5 million habitat rocks (4,500 tonne). Restoration works have concentrated on improving habitat connectivity and buffering future urban impacts. In 2014, 11 habitat islands (approximately 600 ton of habitat rock) were established across 1km to connect two fragmented populations. Seventy-six detections were recorded across nine of the sites in 2021, indicating that the two populations are now effectively connected. Extensive restoration works are currently underway to improve connectivity on the northern slopes of the Molonglo River in the new Namarag Special Purpose Reserve. These works include the restoration of approximately 2ha of PTWL habitat.
		within important corridors is linked.	In April 2020, Greening Australia delivered grassland restoration works (40x70m) in the Ginninderry conservation corridor using the 'scrape and sow' method and added rock, bricks and logs to create additional habitat elements for PTWL (Ginninderry Conservation Trust 2020)

Objective Indicator Progress Actions 4. In 2014, the ACT Government, in collaboration with the Australian National University (ANU), 4. Improved 4. Undertake or 4 Research understanding of developed a technique for restoring PTWL habitat (McDougall et al. 2016). The outcomes of this facilitate research on undertaken and the species' ecology, research program have been used to guide large scale restoration works across the Molonglo River habitat requirements, reported and where habitat and threats. techniques to manage appropriate applied Reserve and elsewhere in the ACT. habitat, and aspects to conservation and The ACT Government, in collaboration with the University of Canberra are developing a lowof the species' ecology management of the impact monitoring method that will allow for more frequent monitoring of the species. The current directly relevant to its species. monitoring method involves rolling habitat rocks, which has a negative impact on the species if conservation. undertaken too frequently. The study commenced in 2014 and data collection finished in 2020. Results are currently being analysed and will be written up as a scientific manuscript in 2022. Preliminary results indicate that artificial shelter surveys, using solid red house bricks, achieve similar detection rates (one detection per 57 bricks) as habitat rock rolling (one detection per 90 rocks) and have a minimal impact on the species and its natural habitat. Research by the University of Canberra has shown that agricultural modification has led to the destruction or decline of approximately 20–25% of suitable PTWL habitat across the ACT (Wong et al. 2018). The research also showed that vegetation characteristics are the best predictor of PTWL abundance and that agricultural management or restoration strategies that promote ground-layer vegetation characteristic of low levels of modification will benefit the conservation of the PTWL (Wong et al. 2021). In the 2020 monitoring surveys the Ginninderry Conservation Trust and Woodlands and Wetlands Trust (2020) also found that areas with a higher density of native grasses proved to be preferable to PTWL than areas of introduced grasses. The ACT Government, in collaboration with the Australian National University and Ginninderry Conservation Trust are currently trialling the effectiveness of translocations as a conservation tool. They are also developing less invasive DNA sampling techniques to assist with future conservation genetic research programs The ACT Government, in collaboration with the University of Queensland have assessed the nontarget impacts of St John's Wort (Hypericum perforatum) control in Natural Temperate Grassland. St John's Wort is a significant weed species in PTWL habitat and the outcomes of this research guide management of PTWL habitat. The ACT Government, in collaboration with the University of Queensland, is assessing the invertebrate and ant community response to rock placement in Natural Temperate Grassland. The results will help evaluate the effectiveness of PTWL habitat restoration and habitat rock supplementation.

Objective	Actions	Indicator	Progress
5. Promote greater awareness of, and strengthen stakeholder and community engagement in, the conservation of the species.	5. Undertake or facilitate stakeholder and community engagement and awareness activities.	5. Engagement and awareness activities undertaken and reported.	5. Interpretive signage is provided throughout the Molonglo River Reserve. The signage strongly promotes the significance of the PTWL and the importance of the Molonglo River Reserve for the species.
			A 24m PTWL stone sculpture was created in 2021, in the new Namarag Special Purpose Reserve, to promote the significance of the PTWL.
			Numerous community plantings days are organised annually in the Molonglo River Reserve. The plantings days strengthen community engagement in the reserve and promote the ecological values of the reserve, including the PTWL.
			The ACT Government hosts regular university field trips in the Molonglo River Reserve. Students learn about the ecology and importance of the PTWL and the various PTWL research and restoration works being undertaken.
			The Ginninderry Conservation Trust is a community-focused organisation and harnesses community support for ecosystem management in the Ginniderry Conservation Corridor. The Ginninderry Conservation Trust and the Woodlands and Wetlands Trust worked together with community volunteers and students from the Canberra Institute of Technology to survey PTWL with results reported by the Trusts (Ginninderry Conservation Trust and the Woodlands Trust and the Woodlands Trust 2020).
			Presentations have been made to the ACT Scientific Committee, a range of community forums including to the Dhawura Ngunnawal Caring for Country Committee, Biodiversity Conservation Forum and Molonglo Community Council.

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Acknowledgements

This report was prepared by the ACT Conservator Flora and Fauna, Ian Walker, in accordance with the requirements of the <u>Nature Conservation Act 2014</u> that requires the Conservator to report to the Minister every five years on an action plan (s. 108 (3)). The Minister is required to make the progress reports publicly accessible (s. 108 (4)).

This report was written by Richard Milner. Karen Ikin, Robert Spiers, David Wong, Will Osborne, Renee Brawata, Stacey Taylor and Linden Chalmers provided constructive input. The photos are attributed to Darren LeRoux (restoration photos) and Richard Milner (PTWL photos).

This document should be cited as:

Conservator of Flora and Fauna 2022. *Pink-tailed Worm-lizard <u>Aprasia parapulchella</u> Action Plan—Implementation Progress Report 2022*. Environment, Planning and Sustainable Development Directorate, ACT Government, Canberra.

