

Targeted surveys for two threatened, short-range endemic land snails in the southern MacDonnell Ranges, Northern Territory

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ABSTRACT. The MacDonnell Ranges bioregion in the southern Northern Territory is a centre of land snail endemism in arid Australia, and a high proportion of species are listed as threatened under Northern Territory legislation. We sought to locate extant populations of two endemic and threatened land snails, each known only from a single location. We recorded the first live individuals of *Tateropa aemula* (Charopidae, Stylommatophora) at Penny Springs in Watarrka National Park since the type material was collected 131 years ago. We did not detect this species at other spring sites in this national park. We also located *Divellomelon hillieri* (Camaenidae, Stylommatophora) alive at one of two sites where it was previously recorded in Palm Valley, Finke Gorge National Park. The total area of occupancy at this site was ~0.6 hectares. Excluding wildfire from the habitat of both species through strategic fire breaks is a high priority, as well as removal of invasive buffel grass (*Cenchrus ciliaris*) at the *D. hillieri* site. We recommend that an updated conservation assessment is undertaken for *T. aemula* based on current knowledge of its distribution and threats. Further targeted survey should be undertaken for *D. hillieri* before undertaking a revised conservation assessment. We also report on other land snail species recorded during our surveys at both national parks.

Introduction

Extensive areas of arid upland terrain can function as centres of persistence and diversification, and thus harbor distinctive endemic biotas (Eliás & Aagesen, 2016; McDonald *et al.*, 2021; Noroozi *et al.*, 2018). The MacDonnell Ranges bioregion (Thackway & Cresswell 1995) in the Northern Territory is an ancient upland in the centre of the Australian arid zone. This elevated region (315–1531 m. a.s.l.) produces a cooler and wetter climate than the lower surrounding plains, while the complex topography and geological diversity provide unique microhabitats and a refuge from landscape disturbance processes (e.g. wildfire) not afforded in the flat and relatively homogenous sandy deserts (McDonald *et al.*, 2021; 2024). These factors underpin the status of the MacDonnell Ranges as an evolutionary refugium for plants,

aquatic invertebrates, land snails, and vertebrates, with the region supporting lineages of these taxonomic guilds through periods of aridification at least dating back to the mid-Miocene (Christidis *et al.*, 2010; Oliver *et al.*, 2010, 2014; Ingham *et al.*, 2013; Pepper *et al.*, 2013; Criscione & Köhler, 2016; Oliver & McDonald, 2016; Cardillo *et al.*, 2017; Razeng *et al.*, 2017; Ashman *et al.*, 2018). The region is particularly notable as an arid zone hotspot for land snail species richness and endemism (Slatyer *et al.*, 2007), as well for the high proportion of snail species that are listed as threatened (McDonald *et al.*, 2021).

Historically, the first major contribution to knowledge of the MacDonnell Ranges land snail fauna was made by the 1894 Horn Expedition. This scientific expedition conducted targeted zoological collections across the region for the first time and increased the number of land snail species known

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