

Habitat use, population dynamics and species identification of mulgara, *Dasymercus blythi* and *D. cristicauda*, in a zone of sympatry in central Australia

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Arid Australia has sadly lost many of its unique mammal species since European settlement. The most likely reason for this alarmingly high rate of extinction is the sudden increase in predation pressure brought about by the introduction of the feral house cat and the European red fox. As part of these extinction events, the majority of medium-sized native mammal predators have either been lost from Australia's deserts (e.g. western quoll and red-tailed phascogale) or have suffered large range contractions (e.g. kowari). Given this loss of native predators and the continued presence of cats and foxes in arid Australia, we need to work out the best way of managing the remaining native predators in an effort to try and preserve the broader ecological health of our systems.

The marsupial species *Dasymercus cristicauda* and *Dasymercus blythi* are important medium-sized predators in arid Australia, and both species are threatened nationally, having suffered significant range contractions. Many factors including rainfall, food resources, burrow availability and fire age are thought to influence where these species occur, but there is still a high level of uncertainty. Available evidence alludes to the two species having differing habitat requirements, but a lot remains unclear. This makes it hard to predict where these species are likely to occur, and therefore hard to manage the potentially negative impacts of fire and land development. Further, until recently, there was a lack of clarity regarding the taxonomy of these species – specifically just how many species are we dealing with and how do we confidently tell them apart? This issue further hampered attempts to pin down the distribution and conservation status of these species. Thankfully, the issue has been effectively resolved from a naming point of view, but field-based habitat and distribution assessments are now needed to ensure the effective management of both species.

We investigated size differences, habitat use, and population dynamics of closely occurring populations of *Dasymercus* during a low rainfall period in central Australia and compared our results to the new taxonomic treatments. Our molecular analyses confirmed the presence of the two *Dasymercus* species in the same general locality, and showed that the new taxonomic descriptions allowed confident identification of the two species in the field. We captured 23 *D. cristicauda* and 55 *D. blythi* over 39 months on 20 monitoring plots and another 49 survey sites located in five habitat types within a 7000 km² area. Both species showed size differences between males and females, with males being significantly heavier. The species typically occupied non-overlapping habitat; *D. cristicauda* was restricted to sand ridges with an understorey dominated by spinifex (*Triodia*);



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whereas *D. blythi* occupied sand plain and gibber plain, the latter being a new habitat record for the species. Overall, our study produced a lot of new habitat information about both species; however we remain concerned that the relatively low abundance of each species, especially during low rainfall periods, makes them vulnerable to predation by cats and foxes.