

**THE DISTRIBUTION, HABITAT REQUIREMENTS AND
STATUS OF THE MULGARA (*Dasycercus cristicauda*,
Krefft)**

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Glossary of acronyms used in text

ANCA - Australian Nature Conservation Agency
ANZECC- Australian and New Zealand Environment and Conservation Council
ANZSES - Australian and New Zealand Scientific Exploration Society
AP - Anangu Pitjantjatjara Lands
AUSLIG - Australian Surveying and Information group
BIOCLIM - The Bioclimatic Prediction System
BRS - Biological Records scheme, Northern Territory Conservation Commission
CALM - Western Australian Department of Conservation and Land Management
CCNT - Conservation Commission of the Northern Territory
CSIRO - Commonwealth Scientific and Industrial Research Organisation
DENR - South Australian Department of Environment and Natural Resources
EBU - Evolutionary Biology Unit, South Australian Museum
ERIN - Environmental Resources Information Network
ESU - Endangered Species Unit, Australian Nature Conservation Agency
IUCN- International Union for Conservation of Nature and Natural Resources
MMAP- Marsupial and Monotreme Action Plan
NSW NPWS - New South Wales National Parks and Wildlife Service
SSC- Species Survival Commission
UNE - University of New England
UNP - Uluru / Kata Tjuta National Park

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SUMMARY

The loss and decline of the medium sized (Critical Weight Range, CWR) mammals in the arid zone has been well documented and is the subject of substantial conservation research and management effort. Mulgaras (*Dasyercus cristicauda*, Krefft) are one of the medium size mammals within this group which are the subject of conservation concern. This study assessed the changes in the distribution and abundance of contemporary populations relative to what was known of their historical distribution and abundance. BIOCLIM was used to predict the original distribution and Aboriginal knowledge, historical records and scientific survey data were used to assess the changes in status.

Molecular genetic techniques were used by the South Australian Museum Department of Evolutionary Biology to verify the status of the two sub-species, *D. cristicauda cristicauda* (Krefft) and *D. cristicauda hillieri* (Thomas). The results are preliminary in their findings but were surprising in determining that the sub-species warrant recognition as discrete species. These species have been proposed as mulgara (*Dasyercus cristicauda*) and amputa (*Dasyercus hillieri*). The two species appear to exist within the geographic ranges as known for the two sub-species. The name amputa is proposed as one of the Aboriginal names recorded historically for the animals collected as *D. c. hillieri* (subject to approval from the appropriate Aboriginal and scientific organisations).

Study sites were selected in Northern Territory, Western Australia and South Australia to examine broad habitat requirements and potential threats to populations across their geographical range. Despite broad scale topographical and habitat differences a number of habitat attributes were found to be in common across all sites and formed the basis of a preferred habitat model. This model included clayey sand and sandy loam soils, a preference for *Triodia basedowii*, except in the Tanami where a tall hummock-form of *T. pungens* replaced *T. basedowii*, the presence of a tree or shrub layer and the influence of a paleodrainage or surface drainage system. The form and spacing of spinifex hummocks were very important aspects which appeared to provide the basis for a preference for the *T. basedowii* or tall hummock-form *T. pungens*. This combination of appropriate soil, spinifex type and drainage influence appeared to provide a refuge or core habitat within large areas of superficially suitable spinifex communities.

Fire was identified as a critical factor in the maintenance of these core habitats and was the greatest threatening process identified. Inappropriate fire regimes ie. too frequent fire or infrequent wildfires threaten the viability of these refuge habitats by allowing the spinifex to become unsuitable for mulgaras through becoming senescent or by the entire refuge being potentially burnt by a single fire thus removing spinifex cover and therefore suitable habitat for at least several years.

The potential impact of introduced herbivores and predators was examined, however no substantial threats were identified within the study areas. It is likely that dingoes,

foxes and cats play a moderating role on the mulgara populations but are not limiting the mulgara populations survival. This role is likely to shift, however, in the event of the restriction or loss of core habitat through fire or protracted droughts at which time their impact may become much more critical.

Persistent populations of mulgaras were identified at Uluru National Park, Sangster's Bore and Kintore in the Northern Territory. No persistent populations were located in Western Australia, however, some populations were identified which warrant further study to determine their persistence. No mulgara populations were located in South Australia and their status in that state indicates that they may have become locally extinct. The IUCN/SSC Marsupial and Monotreme Action Plan (MMAP) recommendation of ranking mulgara as Vulnerable is supported by these findings. No persistent populations of ampurta were located during the study. The population/s in south-west Queensland were not included within my study area. Sign of ampurta were located at two sites in the Simpson Desert in the Northern Territory and South Australia, however, further research is required to determine the persistence, size and status of these populations. On available records the 1996 MMAP recommendation that this species be ranked as Endangered is supported.

Mulgaras (and ampurtas) appear to be dependent on refuge habitats which are patchily distributed within a broad spinifex landscape. One of the key factors that appears to influence the location of these refuge habitats is the influence of drainage systems, particularly paleodrainage systems. Techniques for locating areas of persistent greenness during droughts have been developed by researchers at CSIRO. These techniques could be used in conjunction with the habitat requirements identified in this study to overcome the difficulty of locating core populations of mulgara and ampurta across the vast area of the arid zone. Once located these core populations can provide the focus for management programs to promote the species and ultimately assist in their status of Vulnerable and Endangered being downgraded to less threatened categories.