Threatened species of the Northern Territory

MacDonnell Ranges cycad

Macrozamia macdonnellii

Conservation status

Australia: Vulnerable
Environment Protection and Biodiversity Conservation Act 1999

Northern Territory: Near Threatened
Territory Parks and Wildlife Conservation Act 1976

Description

Macrozamia macdonnellii is a distinctive cycad with large, frond-like, pinnate bluish-green leaves that radiate from the apex of the trunk. The trunk is procumbent to erect, to about 2 m (up to 4 m in very old individuals). The species has male and female reproductive cones on separate plants (dioecy). The female cones are much broader than the male cones, and they partially enclose the bright red egg-sized seeds.

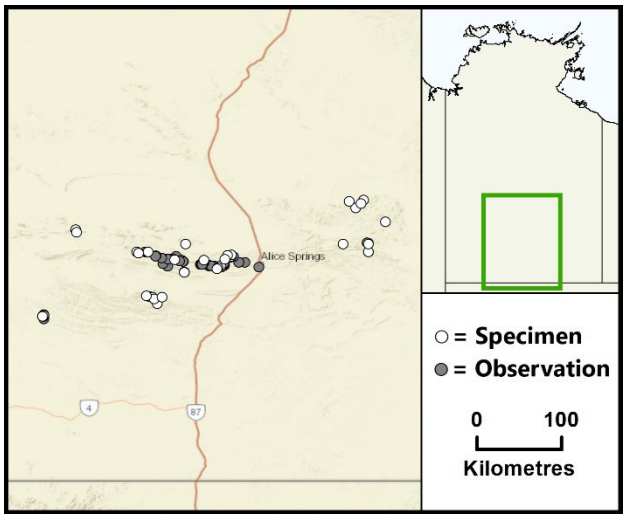
Fruiting: recorded for all months.

Caption: Female cone

Caption: Male cone

Distribution

Macrozamia macdonnellii is endemic to the Northern Territory[1]. This species occurs mainly as scattered stands across the MacDonnell Ranges. It is far more common in the western part its range than in the east, where the distribution is relatively disjunct. There is one confirmed population 10 km north, on Mount Hay in the Burt Plain Bioregion[1]. The latitudinal range is 140 km and the longitudinal range is 370 km.



Caption: Known locations of the MacDonnell Ranges cycad in the NT (nrmaps.nt.gov.au)

NT conservation reserves where reported: Alice Springs Telegraph Station Historic Reserve, Arltunga Historic Reserve, Finke Gorge National Park, Ruby Gap Nature Park, Watarrka National Park, West MacDonnell/Tjoritja National Park.

Ecology and life-history

M. macdonnellii occurs on rocky sites, predominantly in gorges and on steep sheltered shady slopes, but also occasionally on exposed hills or mountain ridges[2]. Fire protection is not a strong predictor of cycad occurrence[2], and observation suggests that the species is a strong resprouter. However, high frequency fire may limit seedling survival, and potentially reduce adult vigour[1].

Stand size is highly variable – some gorges and valleys have > 100 plants per hectare while other occurrences are sparse and small in number[2]. Older age classes dominate most stands, with seedlings being relatively rare. Seedling establishment probably only occurs during periods of exceptionally high rainfall[1].

Pollination is by a single host-specific species of thrip[3]. Informal germination trials, at the Alice Springs Desert Park, indicate the seeds remain viable for a short time only, being prone to desiccation.

Threatening processes

Increased frequency of hotter drought associated with climate change[4] is a serious threat to *M. macdonnellii*, given its preference for sheltered, mesic microhabitats[1]. Frequent, severe wildfire may lower survival rates and reduce vigour[1].

M. macdonnellii has an obligate mutualistic relationship with its insect pollinator *Cycadothrips albrechti*[3]. The disruption of this mutualism (e.g. from a hotter, drier climate) would preclude pollination and ultimately cause this species to go extinct. Cycads appear prone to poor seed dispersal due to loss of animal vectors[5]. Available data for *M. macdonnellii* suggest a high level of genetic diversity among different drainage systems, implying that restricted seed dispersal limits gene flow[6].

Buffel Grass (*Cenchrus ciliaris*) and Couch Grass (*Cynodon dactylon*) are threats to *M. macdonnellii* as they increase the risk of fire spreading from adjacent habitat[1]. The illegal collection of seed for the horticultural trade is a potential threat to accessible populations[1].

Conservation objectives and management

The national recovery plan for the McDonnell Ranges Cycad[1] has expired and a Conservation Advice Document is being prepared for this species.

Invasive grasses should be monitored and managed as required[1]. Fire management plans should be developed for the species. Commercial propagation using tissue culture could reduce pressure on wild populations[1]. Geographically isolated populations may need to be treated as separate conservation units, pending the outcome of further genetic research.

References

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[4] CSIRO and Bureau of Meteorology 2015. Climate Change in Australia Information for Australia's Natural Resource Management Regions: Technical Report, CSIRO and Bureau of Meteorology, Australia.

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[6] Ingham J.A., Forster P.I., Crisp M.D. and Cook L.G. 2013. Ancient relicts or recent dispersal: how long have cycads been in central Australia? *Diversity and distributions 19*, 307–316.