

Threatened Species of the Northern Territory

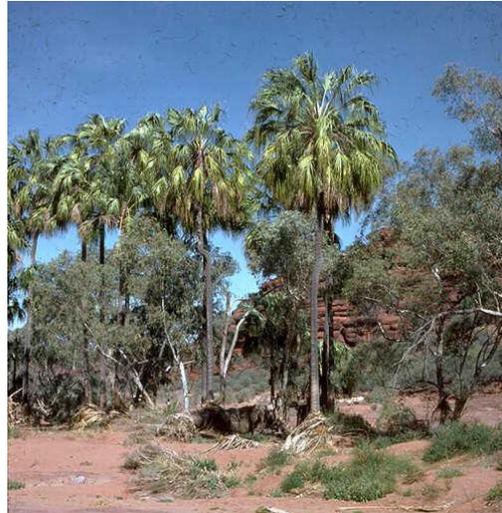
Livistona mariae F.Muell. (ARECACEAE)

PALM VALLEY PALM, RED CABBAGE PALM CENTRAL AUSTRALIAN CABBAGE PALM

Conservation status

Australia: Endangered

Northern Territory: Endangered



Description

Livistona mariae (Dowe & Jones 2004) is a tall fan palm to 25-30 m high.

The trunk is 30-40 cm diameter: the base having prominent petiole stubs and the upper parts being smooth grey. Leaves: 30-50 in a dense crown, glossy above and waxy below with marginal thorns. New juveniles leaves are tinged red. Flower spikes with sprigs of greenish-cream flowers. Fruit is black, globose and 1-seeded.

Flowering: May, September, May–December.

Fruiting: May–March.

Distribution

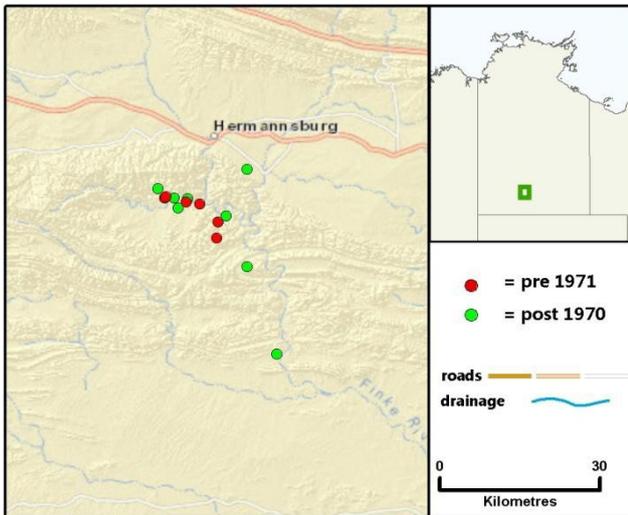
Livistona mariae is endemic to the southern region of the Northern Territory (NT). It is the only palm occurring in central Australia, and is separated by c. 1 000 km from any other member of the genus. This species has a highly restricted distribution and is

characterised by a few closely distributed, small populations.

This palm is wholly restricted to the MacDonnell Ranges Bioregion where it is confined to a small portion of the Finke River and its tributaries. The extent of occurrence is less than 60 km² and the area of occupancy is less than 50 ha. The latitudinal range is 35 km and the longitudinal range is 20 km.

Most of the population occurs within Finke Gorge National Park. There are three occurrences on neighbouring unreserved tenure: two are on Ntaria Aboriginal Land Trust (one to the north of and the other to the west of the park boundary) and the other is at Running Waters on Henbury pastoral station, south of the park.

Conservation reserves where reported:
Finke Gorge National Park.



Known locations of *Livistona mariae*

Ecology

Three specific habitat requirements are currently known for *L. mariae*:

- permanent ground water discharge;
- protection from flood water scouring; and
- infrequent fire exposure.

This species is concentrated along the Palm Valley gorge floors that are continuously fed by bicarbonate-rich spring waters. The shallow ground water originates from the vast supply of water moving slowly through the Hermannsburg Sandstone formation (Wischusen *et al.* 2004). The restriction of *L. mariae* to this habitat likely relates to its shallow fibrous root system, forcing its reliance on the presence of a permanent shallow water supply over a continuous area (Latz 1975). While this species also occurs along the sandy beds and banks of the Finke River, it is less closely associated with these habitats possibly because establishing plants are periodically removed by flood waters.

The stands are known to have experienced wildfire at least three times in recorded history, but at widely-spaced intervals. Prior to the introduction of Buffel Grass and Couch Grass, frond debris would have been the

principal fuel source and this would have been slow-to-accumulate. Existing data suggest high post-fire survivorship in adults and saplings, but seedling and juvenile responses are unknown. It is not known if this species is capable of surviving short-interval, high severity fire.

Population census data indicate that the population has increased in density between 1973 and 2008. These data also show, however, that stand density and structure is highly variable among subpopulations; with some experiencing severe limits on stand replacement.

Conservation assessment

This species is classified in the NT as **Endangered** (under criteria B1ab(iii) + B2ab(iii)) based on:

- The extent of occurrence is less than 60 km² and the area of occupancy is less than 50 ha;
- Subpopulations (<5 locations) are severely fragmented; and
- There is continuing decline in the (iii) quality of habitat of this species due to Buffel Grass and Couch Grass invasion.

Threatening processes

Resource competition from invasive grasses *Cenchrus ciliaris* (Buffel Grass) and *Cynodon dactylon* (Couch Grass) may result in palm recruitment failure. Both grasses form dense stands that dramatically alter microhabitat conditions. The Palm Valley site is badly infested with both Couch and Buffel Grass and the Running Waters site is infested with Couch Grass. Buffel Grass is present at the northern off-park sites.

Livistona mariae is threatened by increased fire risk as a result of the invasion of Buffel Grass and Couch Grass into its core habitat

areas. Both of these invasive species produce large amounts of plant biomass which, when dried, represents a significant increase in site fuel load. This shift may increase the frequency and intensity of fire regimes beyond threshold levels for palm persistence.

Feral horses are contributing to habitat degradation at the Running Waters population. The other off park populations are also potentially threatened by introduced large herbivores including horses, donkeys and camels.

Livistona mariae is a prime tourist attraction at Palm Valley and, under current arrangements, this population is directly exposed to visitor impacts. Seedling trampling and other aspects of site degradation such as rubbish, track erosion, and the spread of weeds and pathogens are potential threats.

Livistona mariae is potentially threatened by small-population effects such as inbreeding depression and genetic drift through disrupted gene flow.

Current ground water usage and small-scale future developments at Palm Valley are considered sustainable (Wischusen *et al.* 2004). However a more intensive water extraction program may threaten the palm and other groundwater-dependent species in the future.

Climate change represents a future threat given its potential to disrupt reproductive output and germination and to decrease adult vigour and survival. Additionally, climate change in Central Australia may cause more sporadic and heavier rainfall events. Severe flooding from these events poses a potential threat to *L. mariae* given that this species is unlikely be able to withstand the full force of flood waters.

It is possible that this palm may also be detrimentally affected by increasing aridity associated with global climate change.

Conservation objectives and management

Dramatic improvement to stand health and habitat quality has occurred since the establishment of the feral horse removal program in 1986 by the Territory Government. Threats associated with cattle production at the Running Waters stands will be removed with the upcoming conversion of Henbury Station to Conservation Reserve. A national recovery plan has been developed for this species (Nano 2008). The specific objectives are:

- i. maintain or increase habitat quality and extent;
- ii. understand critical biological attributes including the fire response, life history characteristics, flowering and fruiting phenology, and population dynamics;
- iii. implement exsitu conservation measures that ensure the long-term preservation of representative samples of this species' genetic diversity;
- iv. understand connectivity and mode of seed dispersal to guide seed collection protocols;
- v. indigenous people are actively engaged in the recovery planning process; and
- vi. inform and involve the community and stakeholders in the recovery plan process.

To date, population sampling has occurred on an irregular basis on four occasions: 1973, 1987, 1992 and 2008/2009. Control of Buffel Grass and Couch Grass in palm habitat is a high priority.

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[updated December 2012]

References

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