

Threatened Species of the Northern Territory

Acacia undoolyana G.J. Leach (MIMOSACEAE)

SICKLE-LEAF WATTLE, UNDOOLYA WATTLE

Conservation status

Australia: Vulnerable

Northern Territory: Vulnerable



Description

Acacia undoolyana is a small tree to 8-11 m. It is slow-growing and long-lived. The leaves (phyllodes) are strongly curved and silvery when fresh. The flowers are in dense rod-like spikes, and the pods are linear.

Flowering: June–September.

Fruiting: August–October.



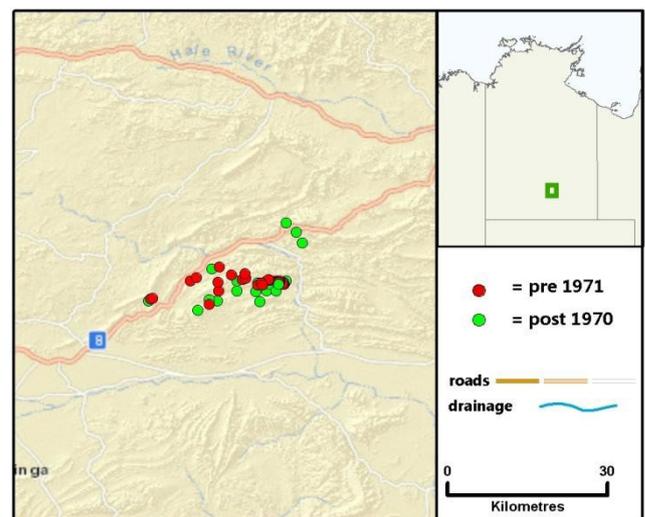
Acacia undoolyana (foliage and flowers)

Distribution

Acacia undoolyana is endemic to a small area in the East MacDonnell Ranges (White *et al.*

2000), Northern Territory (NT). The extent of occurrence (minimum convex polygon) is 195 km², and the estimated area of occupancy is 16 km², within which the distribution is patchy (Duguid and Schunke 1998).

Conservation reserves where reported:
N'Dhala Gorge Nature Park.



Known locations of *Acacia undoolyana*

Ecology

This species is confined to sandstone and quartzite ranges where it is closely associated with steep, southfacing outcropping slopes and gullies. It also occurs in low density on

ridges, plateaus, gently sloping north facing slopes and alluvial flats.

Acacia undoolyana occurs mainly as small, discrete, single-species stands; generally with a low density of *Triodia* (*Spinifex*) in the understorey. These stands are situated within a broader matrix of highly-flammable *Triodia* grassland. This makes them vulnerable to fire incursion from neighboring habitat when prolonged high rainfall leads to increased fuel connectivity.

Non-uniform fire exposure has resulted in a high degree of structural variation among stands (Nano et al. 2008). Canopy development is greatest in the most fire-protected sites that are characteristically south-facing with a high amount of outcropping.

The species occasionally occurs in association with Mulga (*Acacia aneura*) and Cypress Pine (*Callitris glaucophylla*) and rarely with Hill Mulga (*Acacia macdonnellensis*).

Repeated sampling of the population in 1987 and 2008 demonstrated that there has been effectively no change in population density in recent decades (c. 280 plants ha⁻¹) (Latz et al. 1989; Nano et al. 2008). Existing data also suggest a slight increase in the density of medium-large trees from 101 ha⁻¹ to 117 ha⁻¹ over the 21 year period (Nano et al. 2008).

Data relating to the 2002 fire event indicate that *A. undoolyana* has moderate fire survivorship (c. 54 per cent) and that resprouting ability increases with stem size (small plants 48 per cent, saplings 55 per cent and adults 64 per cent) (Nano et al. 2008). Importantly, there is no information on survivorship thresholds in relation to flame severity, burn season or age by fire frequency interactions.

In the wild, seed set is extremely rare and field observation suggests that the population is highly clonal. Seed bank dynamics are unknown, but laboratory-stored seed maintains viability over long time periods (i.e. >10 years). The species is easy to propagate from seed, and cultivated plants under irrigation regularly produce seed.

Conservation assessment

Acacia undoolyana is classified in the NT as **Vulnerable** (under criterion D2) based on:

- a restricted population, with <5 known locations and AOO and <20 km²; and
- a plausible threat of future fire-driven decline.

Threatening processes

Acacia undoolyana faces a plausible future threat of fire-driven decline via increased rates of standing plant mortality. Predicted changes to rainfall patterns associated with climate change could result in shorter fire return intervals than presently experienced. This prediction is based on the expected boost to summer growing C₄ grasses if rainfall becomes more concentrated in the warmer months. Slow canopy recovery rates of >30 years duration (Nano et al. 2008) compound this risk of decline. Fire management effort is highly variable, and a high proportion of the population is presently vulnerable to wildfire due to the exceptional surrounding fuel loads.

Threats associated with exotic grass invasion (particularly increased fire) are presently low but will likely increase with time. Stands in the immediate N'Dhala Gorge area are most susceptible given the higher level of disturbance associated with tourist access and the high abundance of Buffel Grass along the creekline.

Acacia undoolyana is inherently vulnerable to decline from stochastic events by virtue of its small population size and restricted and fragmented distribution. Altered rainfall patterns associated with climate change may also affect adult survival rates and increase the rarity of recruitment events.

Conservation objectives and management

This species has been comprehensively surveyed and mapped (Pitts *et al.* 1995; Duguid and Schunke 1998). It is included in the live collection at the Olive Pink Botanic Garden and the Alice Springs Desert Park, and it is also grown in private gardens.

Over the past two decades, management has aimed to minimize the risk of wildfire incursion into *A. undoolyana* stands (Duguid 1999). Unfortunately, many of the fire breaks created from 1987 to 2000 failed to protect targeted stands from a large wildfire in 2002. This has led to a shift towards the use of wider, non-linear breaks (G. Horne pers. comm. 2008). The efficacy of the fire management of this species needs to be continually reappraised.

A national recovery plan for threatened arid zone acacias has been prepared by the Territory Government together with other state agencies (Nano *et al.* 2007). The plan covers *A. undoolyana*.

Actions 3 and 8 of the National Recovery Plan for this species have been implemented (Nano *et al.* 2007, 2008). A monitoring programme has been established to quantify population and threat-level trends. Indigenous ecological knowledge has been documented. Indigenous involvement in the conservation of this species should be facilitated.

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References

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- Nano, C., Harris, M., and Pavey, C. R. (2007). *Recovery plan for threatened Acacias and Ricinocarpos gloria-medii in central Australia, 2006-2011*. (NT Department of Natural Resources Environment and the Arts, Alice Springs.)
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