

# Threatened Species of the Northern Territory

## Atalaya breviaolata

Formerly known as *Atalaya* sp.  
Elizabeth River

### Conservation status

Australia: Critically Endangered

Northern Territory: Not listed



Photo: I Cowie

### Description

Suffruticose subshrub, aerial parts annual, to 45 cm tall, stems slender, to 21 cm, rootstock perennial, woody, 8–15 mm diam. Branchlets with short, mid-dense, straw coloured hairs 0.1–0.3 mm long. Leaves simple, sessile, alternate, linear, 65–410 mm long, 1.4–7.5 mm wide, concolorous. Inflorescence paniculate or sometimes corymbose, axillary, supra axillary or terminal, to 70 mm long. Fruit divaricately 3-lobed, separating into indehiscent, 1-seeded, dorsally-winged samaras. Samaras 3, brown when mature, oblong to ovate or broadly elliptic, 11–22 mm long, 7–12 mm wide, with short, curved, mid-dense hairs, base turgid, wing erect, 0–6 mm long, apex rounded, entire, irregular or erose. Seed 1, pale brown, obovoid, c. 8.5 mm long, 8 mm wide, surface uneven but otherwise more or less smooth.

In the field, the narrow, long foliage may result in the plant being confused with juvenile *Grevillea pteridifolia*, the herbs *Xyris complanata*, *Lomandra tropica*, and some grasses, but *Atalaya breviaolata* differs in having more prominent, reticulate venation as well as distinct floral and fruit differences. It may also be confused with other species of *Atalaya* but differs by the combination of a

reduced wing on the samara, the simple, linear leaves and the suffruticose growth habit (Cowie & Stuckey 2012; Reynolds 1981, 1985). All other NT species are trees, usually with compound leaves and have a prominent wing on the fruit. *A. variifolia* sometimes produces simple leaves below the inflorescence or on the juvenile regeneration but both the leaves and stems are more robust than in *A. breviaolata* and the juvenile regeneration appears to rarely produce flowers and fruit.

It can also be distinguished from *A. variifolia*, and *A. hemiglauca* by the smaller, sericeous petals with an attenuate base and the lack of lobing of the scales (Reynolds 1981, 1985). In *A. hemiglauca* and *A. salicifolia* the leaflets often dry darker above, are mostly opposite to subopposite with the sepals dark reddish brown with paler margins and in *A. hemiglauca*, usually hairy. *A. variifolia* and *A. breviaolata* have more or less concolorous leaves with the sepals mostly cream to pale brown and in *A. variifolia*, leaflets are frequently subopposite or alternate.

Flowering: October, November.

Fruiting: November.



Flowers (a) and fruit (b) of *Atalaya brevialata* (photos: I. Cowie)

### Distribution

*Atalaya brevialata* is endemic to the Northern Territory. The species is known from only five places near the Elizabeth River at Virginia and its tributary Amys Creek just to the south of Darwin, N.T.

*Conservation reserves where reported:*  
None

### Ecology

The species appears restricted to footslope sites with more open vegetation on deeper, coarser sandy soils mostly along a specific, distinct geological boundary. *Atalaya brevialata* grows in woodland with varying proportions of *Eucalyptus tectifica* and *Corymbia foelscheana* but also with *Xanthostemon paradoxus*, *Terminalia grandiflora* and *Acacia hemignosta* in the

overstorey with open layer of perennial grasses such as *Eriachne avenacea*. Usually it occurs on sandy soils in foot slope situations, often with a surface gravel layer. Sometimes it grows in the adjoining mixed *Melaleuca viridiflora*, *Grevillea pteridifolia* and *Acacia leptocarpa* low woodland in more poorly drained situations but on slight rises. Suitable habitat appears to often occur in a narrow band upslope of sandy, poorly drained flats dominated by the small tree *Grevillea pteridifolia* and *Dapsilathus spathaceus* (Restionaceae). In two locations, smaller populations occurred just upslope of the rear-mangrove community. While *A. brevialata* occurs in more open vegetation on deeper coarser sandy soils on foot slopes, it is absent from finer sandy soils or rocky soils in similar topographic situations where a naturally dense grass or shrub layer is present.

Little information on age at sexual maturity, average life expectancy, natural mortality rates, and generation length are available. The fresh seed germinates readily and the size of seedlings and other young plants in the field suggests they may reach reproductive size in two to three years under good conditions. The species appears to be a moderately long-lived perennial (perhaps 10 or 20 years or more) and it seems unlikely to undergo extreme fluctuations, at least in this time scale.

The plant does not appear to be clonal. The thickened underground root system and apparently annual nature of the above ground parts in *Atalaya brevialata* is likely to afford resistance to fire under prevailing fire regimes. Individual plants appear to produce relatively few, large seeds (about the size of small peas) with these apparently germinating soon after falling from the plant. Seeds are be 'soft' and short-lived, apparently without dormancy mechanisms.

## Conservation assessment

*Atalaya brevialata* was previously listed as Data Deficient due to a lack of targeted survey and uncertainty as to the taxonomic distinctness of the species, with very few collections available for study.

It occurs within a restricted extent of occurrence, estimated with a high degree of confidence at 7.6 km<sup>2</sup>. The one degree grid cell on which the species occurs is the one of the most heavily surveyed areas in the N.T. with 167 plant records / 100 km<sup>2</sup> on Herbarium specimen and survey databases while the grid cell immediately to the west has 345 plant records / 100 km<sup>2</sup> (Cowie unpubl.). In addition to these figures, an extensive vegetation and flora survey of the proposed Weddell urban area was conducted over the 2010-11 wet season, but the species was not detected (Cuff & Brocklehurst 2011). It has also not been detected further afield during surveys of flora and fauna or in targeted searches of apparently suitable habitat in the Darwin rural area (e.g. Price *et al.* 2005) and near the Blackmore River over the 2011-14 period. The probability of finding additional subpopulations outside the Weddell area appears to be low. However, extensive survey targeted at apparently suitable habitat conducted in the Elizabeth River catchment in 2011-14 located some 11 subpopulations, some of only a few plants. Much apparently suitable habitat did not support the species.

There is insufficient information to assess the previous extent of occurrence. Until Nov. 2011, the species was known from one locality and the taxonomic status was unclear. It is possible that extent of occurrence has been reduced through settlement and clearing in Darwin rural area, near Virginia, although there are no data to quantify any such losses.

Area of occupancy for the population is estimated at 4.5 hectares, estimated using the sum of occupied 20 x 20 m grid cells. Some potentially suitable habitat in close proximity to the known occurrences is yet to be surveyed. While this may increase the estimate of area of occupancy and population size by a small amount it is unlikely to change the level of threat. Even in the event that additional small patches of *Atalaya* are located, the total area of occupancy would still be much less than 1 km<sup>2</sup>. It is likely that around 2 hectares have been lost due to construction of Jenkins Road in the 1980's and more recent upgrading. A further area may have been lost due to building of the ultralight airstrip at around this time or earlier. Without threat abatement, the area of occupancy is expected to decline dramatically over the next 20-40 years.

The current population estimate is 302,247 ± 15,088 mature plants occurring in 3 major and a number of minor subpopulations, some of just a few individuals. The southern-most subpopulations on Jenkins Road and Amys Creek appear to be by far the largest. A density estimate of 67,166 ± 3353 mature plants per hectare was derived by counting individuals on 15 randomly located 2 x 2 quadrats at two subpopulations

At the Jenkins Road site, good germination of seed was observed in December 2011, with an estimated 47,333 seedlings per hectare. At this time, no seedlings were observed at the site on the south side of the Elizabeth River. It is unclear how many seedlings survive the dry season, although some seedlings seemed to be from the previous year's recruitment (a record wet season with very consistent rainfall).

The known subpopulations occur on a mixture of private and NT Government owned land with around 75% of the known

population on one privately owned parcel. The subpopulation on the immediate south side of the Elizabeth River (estimated at 2,829 ± 293 plants) is all on NTG land. The subpopulation on the north side of the Elizabeth River is mostly on NTG land but is small, as are subpopulations on the road reserve along Jenkins Road.

This species qualifies as **Critically Endangered** (under criterion 2):

- Its geographic distribution is precarious for the survival of the species and is very restricted, or restricted or limited.

### Threatening processes

*Atalaya brevialata* occurs within Darwin rural area, and as such is under threat of habitat loss largely due to clearing and other developments for proposed urban expansion. The extent of occurrence is expected to decline dramatically over the next 20-40 years as almost the entire population is within the footprint of proposed urban areas for the greater Darwin area, at Weddell. Head works development in the area has begun, although stage one development has been put back for some years. The Virginia - Elizabeth subpopulations lie within the footprint of the proposed Elizabeth River recreation dam, in the same general area. The species currently has no legal protection at any site.

Additional threats include the spread of introduced perennial grass species. Gamba Grass is now established and common some kilometres to the east with scattered stands already in the general area. The effect of invasive introduced grass on *Atalaya brevialata* have not been recorded but Gamba and Mission Grasses form taller, denser stands that cure later in the Dry season in comparison to native grass species. This results in substantial changes to savanna fire regimes. In the case of Gamba Grass, fuel

loads can dramatically increase from the 2–4 tonnes/ha typical for native grasses to 11–15 tonnes/ha or sometimes even 30 tonnes/ha, resulting in later, more intense fires that can kill or reduce the vigour of tree species (Rossiter *et al.* 2003; Ferdinands *et al.* 2006). Gamba Grass can also out-compete native woody species both by grossly altering the availability of nitrogen to native plant species and by using larger amounts of water than native grasses (Rossiter *et al.* 2004; Rossiter-Rachor *et al.* 2009). Also, dense swards of large robust perennial grasses are likely to simply 'shade out' smaller species such as *Atalaya brevialata*.

Selective, preferential grazing of some subpopulations by feral horses has been observed during the wet season. While plants appear to readily survive the immediate grazing, the long term effect of repeated grazing is likely to be a decline in vigor and competitiveness.

### Conservation objectives and management

A good level of protection could be provided by reserving a substantial part of the population and protecting it from development and inappropriate uses. However, adequate buffering from adjoining land use activities and ongoing management will be required. Gamba Grass and other invasive weeds (especially perennial grasses) should be controlled and managed at the known sites. This would both prevent the development of excessive fuel loads that will inevitably result in high intensity fires that pose a threat of loss or decline and reduce direct competition from these species.

Targeted survey of potentially suitable habitat in the Darwin region is a priority for this species. Further investigation into the size, extent and current status of known populations is required as well as an improved

understanding of population biology, reproductive biology and response to grassy weed invasion. Survey of the Blackmore River area and additional potential habitat in the Berry Creek catchment (Livingston Road) and further afield (Townend Road- Elizabeth Valley) is recommended. This would increase certainty of the estimated extent of occurrence and area of occupancy with any increases potentially improving options for conservation.

Survey is best conducted when plants are most easily detected such as in late October to December or January when plants are flowering and other ground layer species are still short. As the grass layer becomes taller with the progressing wet season, plants become more difficult to detect. Once plants have finished flowering they may be difficult to identify without prior knowledge of the species. The dry season months (June through to the start of the build-up storms) are likely to be a poor choice for survey as plants have annual aerial parts and dry season fires will often remove these in any case. Potentially suitable habitat may be identified using geological and topographic mapping, satellite imagery and radiometric (potassium) data. Radiometric data has been found to be a useful tool for differentiating substrates in NT (Cruse & Hempe 2005) and was found to be valuable in this instance.

As the fresh seed germinates readily, establishment of further exsitu populations is likely to be relatively easy. The species has been introduced to cultivation at the George Brown Darwin Botanic Gardens and elsewhere prior to being nominated for listing under EPBC or TPWCA. However, the 'soft', apparently short-lived seed may not be amenable to long term storage under seed-bank conditions.

In summary, specific research and management actions include:

- i. undertake surveys to better quantify the extent of occurrence, area of occupancy, population size and map its distribution;
- ii. undertake research on habitat parameters and biology;
- iii. undertake threat abatement actions to minimise the impacts of future urban development;
- iv. raise community awareness of this species; and
- v. establish further exsitu populations.

### Complied by

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