

KAKADU THREATENED FLORA REPORT (Vol. 2)

Results of a threatened flora survey
2004



Raelee Kerrigan



Northern Territory Government

Department Infrastructure, Planning and Environment

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Cover Photograph: *Utricularia rhododactylos*

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Abstract

This report summarizes the results of a Threatened Flora Survey carried out in Kakadu National Park (KNP) and adjacent areas of Arnhem Land in March 2004.

The aim of this survey was to extend the work carried out in 2003 on threatened flora of KNP and this report is a supplement to the report published from that work. Data were collected on 8 threatened species (Table 1) within KNP to identify conservation priorities for Parks Australia North (PAN) and to establish monitoring plots to assist future research.

All species were successfully re-located. Data on estimated size of the population and extent of occurrence are presented for all species and data on the permanent plot established for *Boronia xanthastrum* is enclosed. A new species, *Acacia* D 19063 Graveside Gorge, is identified for which the status Critically Endangered is recommended and a range extension for *Utricularia rhododactylos* recorded. A recommendation to downgrade the conservation status of *Dubouzetia australiensis* from Endangered to Vulnerable is suggested. Specific recommendations for the species targeted in this survey are summarised in Table 1.

Table 1: Summary table of recommendations

	Pre-survey NT Status	Proposed NT Status	Recommendations
<i>Acacia</i> D19603 Graveside Gorge	NE	CR	Tag seedlings from population and monitor yearly.
<i>Boronia laxa</i>	NT	NT	Interrogate relevant Fire Plot data to identify changes in population density at time 1 and time 2. Re-survey monitoring plot in 2005/6.
<i>Boronia verecunda</i>	NT	NT	Interrogate relevant Fire Plot data to identify changes in population density at time 1 and time 2. Re-survey monitoring plot in 2005/6. Re-locate other populations to confirm similar persistence and extent.
<i>Boronia xanthastrum</i>	NT	NT	Tag seedlings from population near permanent plot and monitor yearly. Interrogate relevant Fire Plot data to identify changes in population density at time 1 and time 2. Re-survey monitoring plot in 2005/6. Re-locate other populations to confirm similar persistence and extent.
<i>Cryptandra</i> D19989 Jabiru	DD	LC	Downgrade status to Least Concern.
<i>Dichapetalum timoriense</i>	V	V	Further survey of populations and establishment of monitoring plot
<i>Dubouzetia australiensis</i>	EN	V	Further survey of populations and establishment of monitoring plot
<i>Hibiscus brennanii</i>	V	V	Tag seedlings in permanent plot and monitor yearly. Further survey to determine extent of population. Establish research projects to investigate biology of species.
<i>Lithomyrtus linariifolia</i>	V	V	Re-survey monitoring plot in 2005/6. Re-locate other populations to confirm similar persistence and extent.
<i>Sauropus filicinus</i>	DD	DD	Establish permanent monitoring plot., further survey, specimen collection and taxonomic research

Introduction and Methods

A survey of threatened flora of Kakadu National Park and adjoining Arnhem Land escarpment was carried out in 2003 and reported in Kerrigan (2003). As an extension of this work, a survey continued in 2004 following the same protocols and methods and this document should be seen as a part II to that report.

A total of eight plants with a threatened status at either the federal or territory level were targeted for survey (Table 2). Botanical expertise was provided by DIPE Botanists, Kym Brennan, Jenni Risler and Raelee Kerrigan. Data on the number of mature individuals in sub-populations and area of extent of occurrence were recorded for each species. Monitoring plots were established where required. This document is only an interim report and further survey is anticipated for a number of the species discussed. As a consequence there are some species where permanent plots have not yet been established.

Table 2: Conservation status of plant species surveyed in 2004. EN = endangered, V = vulnerable, NT = near threatened, DD = data deficient.

	Territory Status TPWC Act (2000)	Federal Status EPBC Act (1999)	NT Endemic
<i>Boronia laxa</i>	NT	V	yes
<i>Boronia verecunda</i>	NT	V	yes
<i>Boronia xanthastrum</i>	NT	V	yes
<i>Dichapetalum timoriense</i>	V		no
<i>Dubouzetia australiensis</i>	EN		yes
<i>Hibiscus brennanii</i>	V		yes
<i>Lithomyrtus linariifolia</i>	V		yes
<i>Sauropus filicinus</i>	DD	V	yes

Results and Discussion

Results and discussion of results of this survey are presented as information sheets for each species. Descriptions, data, rationale for coding and recommendation for future monitoring are presented. Relevant information pertaining to IUCN coding is available in Kerrigan (2003). An arcview project with all waypoint and track data as well as an MS Access database with floristic and structural data from permanent plots is provided on CD with this report. Permanent plot and potential seedling monitoring sites are recorded in Table 5 Appendix 1.

Boronia laxa

Description and habitat

Boronia laxa, in its broadest sense, is a small shrub, occasionally semi-prostrate, to 1.5 m high. In the surveyed populations most individuals were small and erect to approximately 50 cm. Leaves opposite, 10-45 mm long x 2.5-10 mm wide, and sparsely to moderately densely hairy. Flowers are white or mauve, usually < 1 cm wide and consist of 4 petals and 4 sepals.

This species may be confused with *B. prolixa* and *B. amplexans* but it is distinguished from them by its short flower stalk or peduncle of < 3 mm.

This species has been recorded from woodland communities and sandstone heath. Where surveyed, *B. laxa* was growing in *E. gigantangion*/*E. phoenicea* woodland with *Triodia microstachya* on sandstone scree. Individual plants grow in sand and loam between sandstone rubble.

Previous code and status information

This species is coded as Vulnerable federally and was classified as Near Threatened by PWSNT. A recommendation from the 2003 Kakadu Threatened Flora Report was to downgrade this species to Near Threatened federally. It is expected that a case for this downgrading will be submitted to Commonwealth authorities later this year.

2004 Survey results

A new population of *Boronia laxa* was encountered on the border of Kakadu and Arnhem Land in this survey. Counts from this border population surveyed were small. Only 4 mature individuals of *Boronia laxa* were counted along a transect of approximately 2 km through suitable habitat. The effective transect width was no greater than 1 m with dense cover of *Triodia* making detection of this species difficult.

Summary population data and revised status

A new locality was also recorded for this species in 2004 at Mount Brockman although the extent of occurrence remains the same as the 2003 survey.

The status of *B. laxa* is maintained at Near Threatened by PWSNT. The federal classification of Vulnerable still appears inappropriate for this NT endemic species

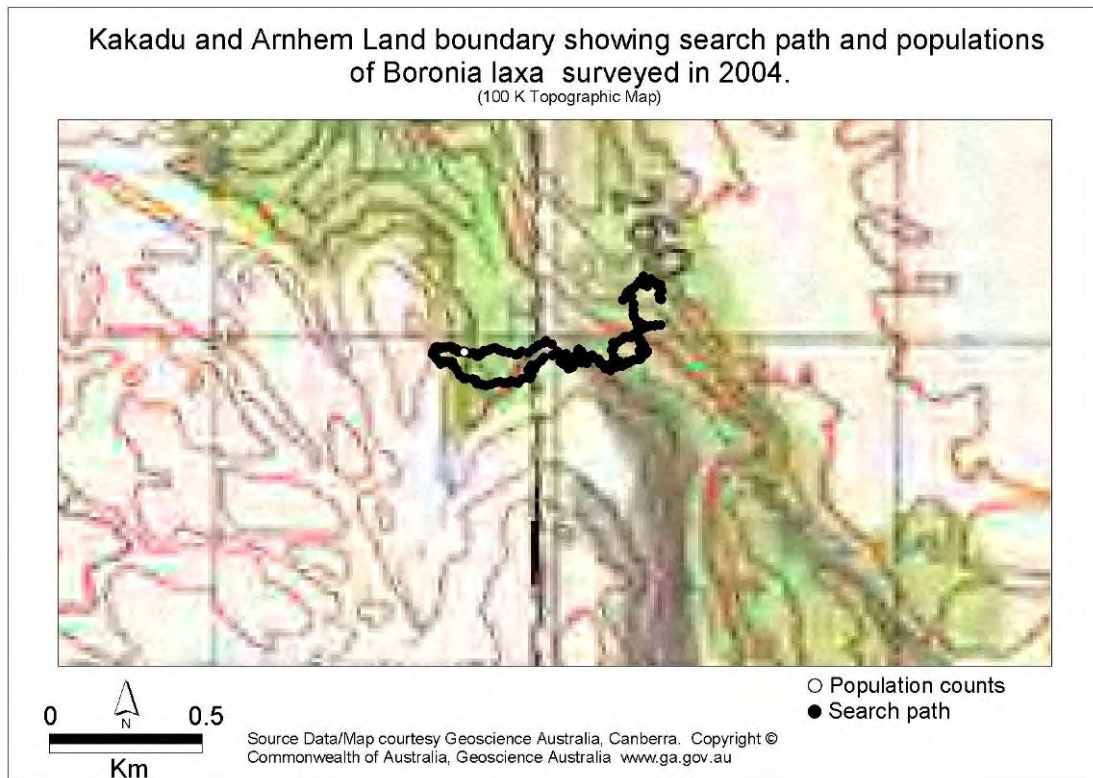
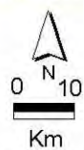
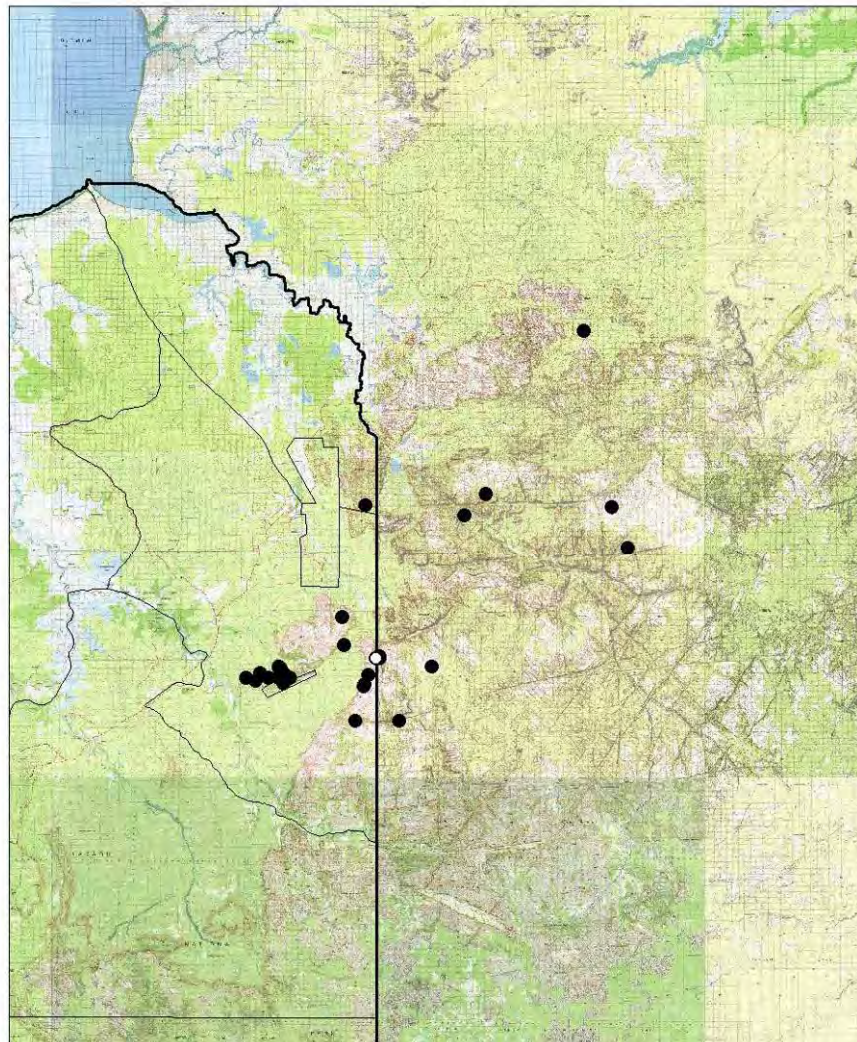


Fig 1: Map of Kakadu and Arnhem Land border in Magela Creek region showing search path (●) and plant localities (○) of *B. laxa* survey.

Locations of known *Boronia laxa* populations in Kakadu National Park and Arnhem Land

(100 K Topographic Map)



- Boundary of Kakadu National Park
- Pre-survey populations
- Surveyed population

Source Data/Map courtesy Geoscience Australia, Canberra. Copyright © Commonwealth of Australia, Geoscience Australia www.ga.gov.au

Fig 2: Map of all known *B. laxa sens. lat.* localities showing pre-survey localities (●) and survey localities (○) in Kakadu National Park and Western Arnhem Land.

Boronia verecunda

Additional population counts from the Fire Plot survey in 2004 reinforce the assumption made in the 2003 assessment that *Boronia verecunda* populations were of similar size. A survey of Fire Plot 133 resulted in a count of 116 mature individuals in an area of 3600 m².

Boronia xanthastrum

Previous code and status information

This species was coded as Near Threatened by PWSNT and is coded federally as vulnerable.

At the time Northern Territory species were coded (2002), this species was known from 8 populations throughout southern Kakadu, western Arnhem Land and Nitmiluk National Park. Duretto (1999) cited this species as rare based on its restricted distribution which at the time was only known from Kakadu. Although rare, the widespread distribution of these populations suggested it was likely that more populations existed. Although there was no population data available Data Deficient was considered an inappropriate category in this case, with both the jurisdiction and genus considered relatively well surveyed. The persistence of one population on Mount Basedow since first collected in 1973 to 1999 indicated this species was secure in the short term.



Fig 3a. Habit of *Boronia xanthastrum*.



Fig 3b. Habitat of *Boronia xanthastrum*



3c. Leaves of *B. xanthastrum*



Fig 3d. *B. xanthastrum* seedlings in burnt patches

2004 Survey results

The population size of *Boronia xanthastrum* at the Graveside Gorge locality was estimated to be 675 ± 214 seedlings in a 0.05 ha area with 9 mature adults and 1 seedling in a 20x20 m permanent quadrat (see Appendix 1 for waypoint data and CD for plot data). The 0.05 ha population had only recently been burnt and all individuals were seedlings. Monitoring of this population to determine the establishment rate of these seedlings to adulthood and determine the time it takes to reach reproductive maturity is recommended. No individuals were seen to resprout and it is likely that this species is an obligate seeder.

Additional populations at Fire Plot localities were surveyed in 2004 during the Fire Plot re-survey. At 76 on Mt Basedow 100 mature individuals were counted in a 1800 m² area. Individuals were growing in a rocky sandstone fire protected habitat. This population has persisted since 1973 when first collected by M. Lazarides. In contrast a population recorded for Fire Plot 140 in 1999 was revisited and no individuals were relocated. The population recorded SE of Jim Jim Falls was not successfully relocated.

Summary population data and revised status

No new localities were recorded for this species and two populations were considered lost. The extent of occurrence is 576 km². This species is now known from 6 populations and is estimated to have a population size of at least 700 individuals (from one population only), although the majority of these specimens are not mature. With the assumption that all populations are of similar size, the total population size of this species is estimated to be >1000 individuals.

The status of *B. xanthastrum* is maintained at Near Threatened by PWSNT but more regular monitoring is recommended in the short term (< 5 years). The germination response of this species after fire and the persistence of the population at Mt Basedow for 30 years indicate this species is secure; however, the loss of the populations at Fire Plot 140 and SE Jim Jim Falls is of concern. Tagging of seedlings within the Graveside Gorge population and

yearly monitoring are recommended to follow the establishment success of the 2004 cohort and the time taken to reach reproductive maturity.

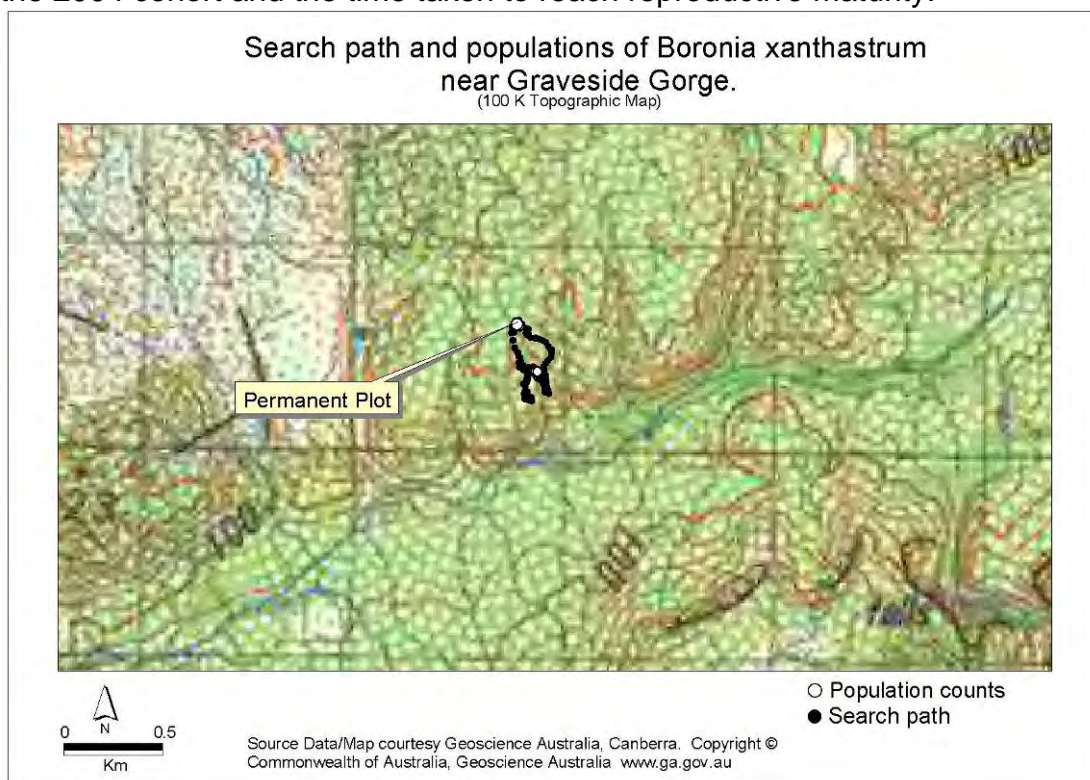


Fig 4. Map of *B. xanthastrum* survey showing search path (●) and plant localities (○) in the vicinity of Graveside Gorge

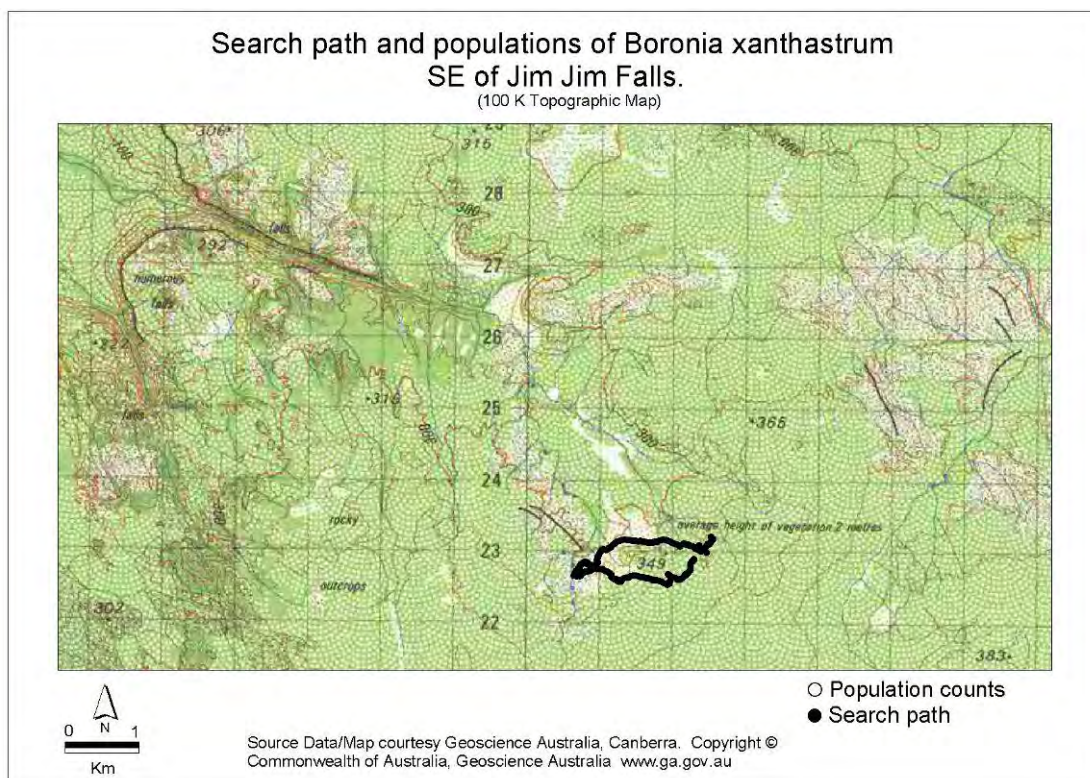
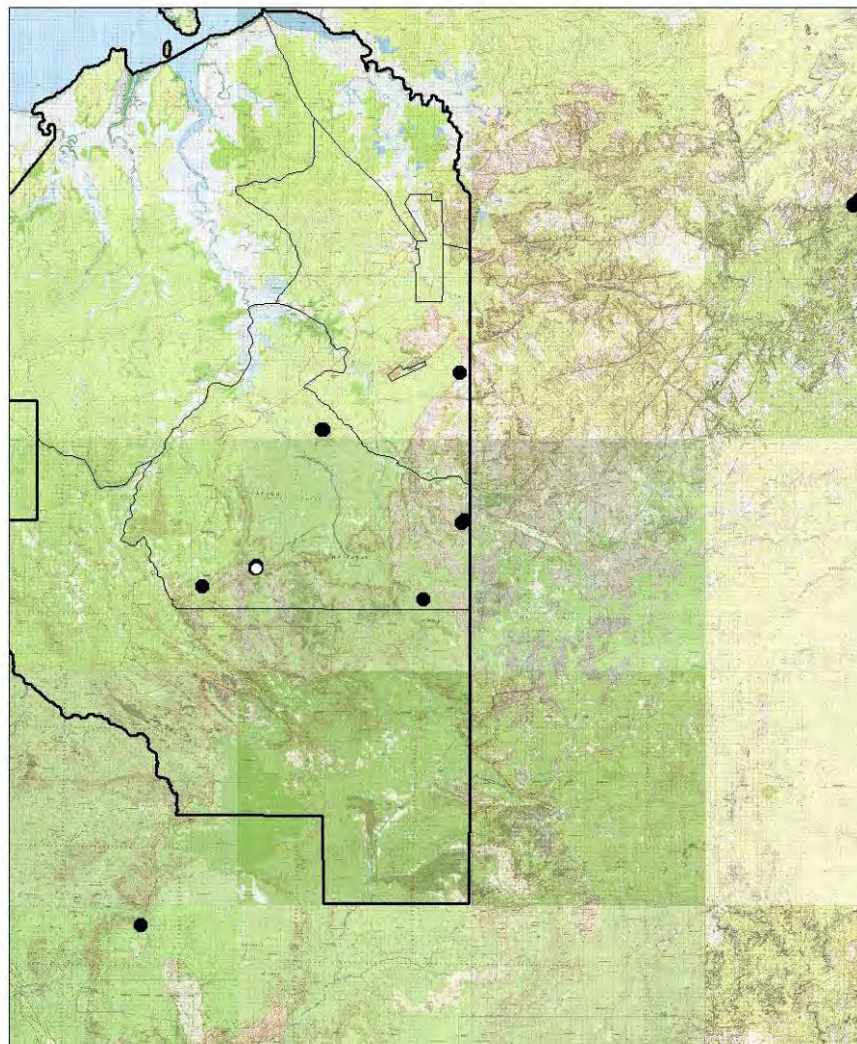


Fig 5. Map of *B. xanthastrum* survey showing search path (●) SE of Jim Jim Falls.

Locations of known *Boronia xanthastrum* populations in the Northern Territory

(100 K Topographic Map)



- Boundary of Kakadu National Park
- Pre-survey populations
- New populations

Source Data/Map courtesy Geoscience Australia, Canberra. Copyright © Commonwealth of Australia, Geoscience Australia www.ga.gov.au

Fig 6. Map of all known *B. xanthastrum* localities in the Northern Territory showing pre-survey localities (●) and surveyed localities (○).

Dichapetalum timoriense

Description and habitat

Dichapetalum timoriense is a climbing or creeping shrub, rarely a small tree up to 10m, found on rocky scree slopes and protected gorges of sandstone escarpments in *Allosyncarpia ternata* forests. It has large, often glossy or pubescent leaves 7-18 cm long by 3-10 cm wide. The fruit are globular to ovoid, pear shaped, velvety pubescent and golden brown when fresh. The plant has been recorded as fruiting during April and May.



Fig. 7. *Dichapetalum timoriense*. (Photo K. Brennan)

Previous code and status information

This species was coded as Vulnerable by the PWSNT and has no federal status.

This species was difficult to code. At the time of coding it was known from three broad localities in the Northern Territory, the Magela Creek Valley, Lightning Dreaming and the upper East Alligator. It is also known from Malaysia and Queensland. Multiple data points in the Magela Creek Valley were treated as one location due to uncertainty over georeferencing. Considering that there has been targeted survey effort throughout *Allosyncarpia* patches in both Kakadu National Park and Arnhem Land data deficient was not considered appropriate. Consequently, with a restricted distribution, an extent of occurrence of < 161 km² and an estimated population size of < 1000 mature individuals, this species qualified for Vulnerable.

2004 Survey results

A total of 40 individuals were recorded along a transect of approximately 500 m in a patch of *Allosyncarpia*. Although additional individuals may be present in nearby patches of forest the extent of the population at this patch was seen.

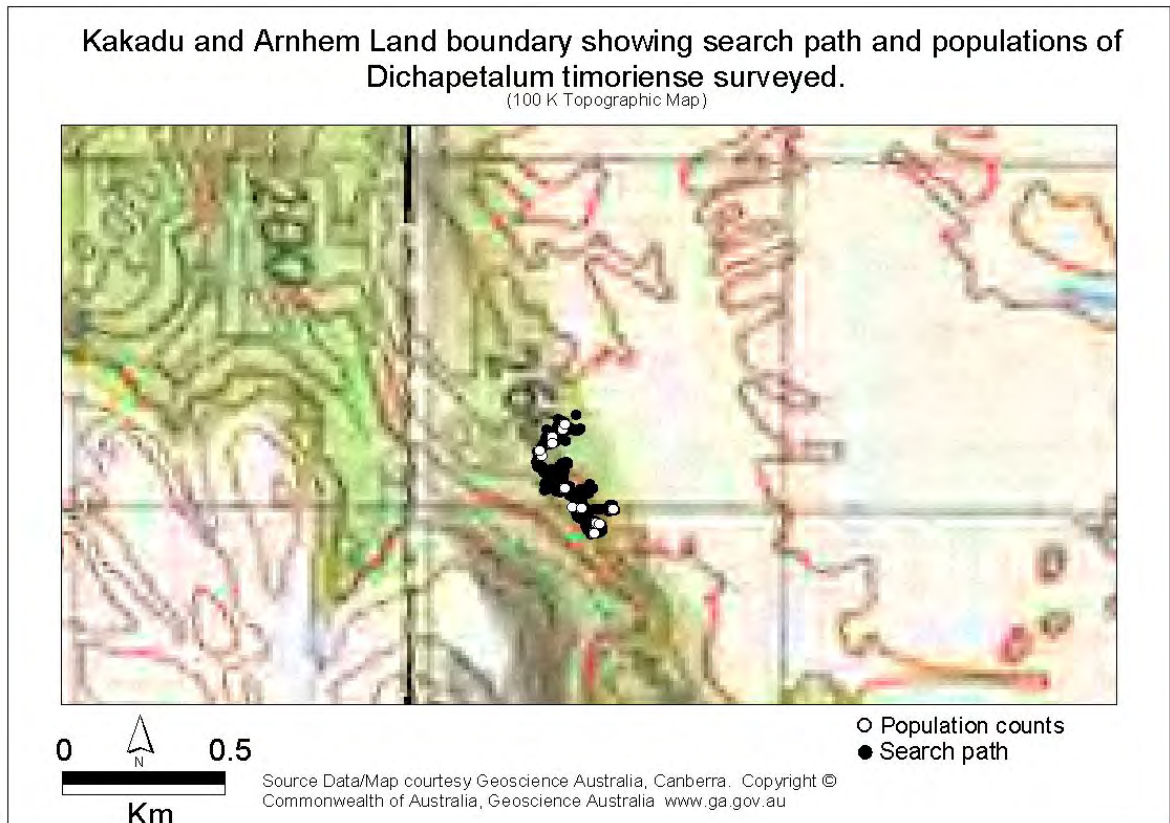


Fig 8. Map of *Dichapetalum timoriense* survey showing search path (●) and plant localities (○) near Magela Creek, border of KNP and Arnhem Land.

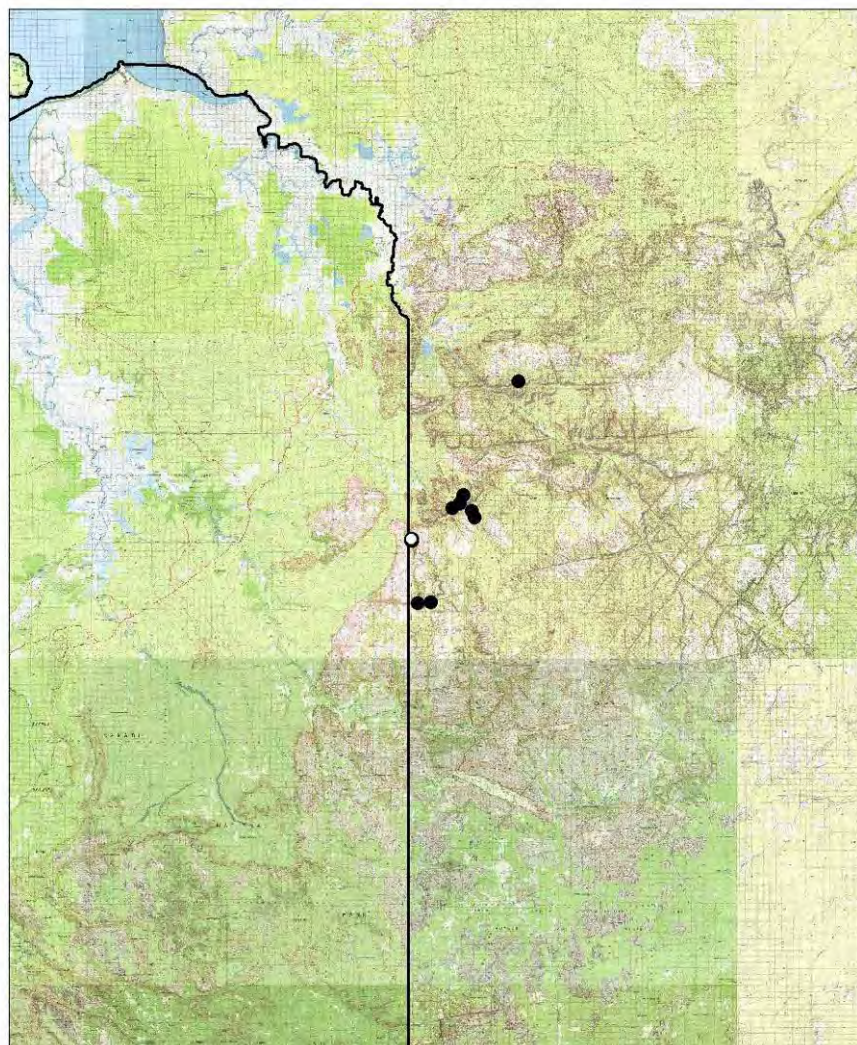
Summary population data and revised status

The status of this species is maintained at Vulnerable.

Further assessment of populations in Arnhem Land and the establishment of a permanent plot were scheduled for this survey but permits have yet to be granted. On the present data this species still qualifies as Vulnerable based on the assumption that other populations are of similar size.

Locations of known *Dichapetalum timoriense* populations in the Northern Territory

(100 K Topographic Map)



- Boundary of Kakadu National Park
- Pre-survey populations
- Survey populations

Source Data/Map courtesy Geoscience Australia, Canberra. Copyright © Commonwealth of Australia, Geoscience Australia www.ga.gov.au

Fig 9. Map of all known *D. timoriense* localities in the Northern Territory showing pre-survey localities (●) and survey localities (○).

Dubouzetia australiensis

Description and habitat

Dubouzetia australiensis is a sub-shrub growing horizontally or pendulously from sandstone cliff faces, often adjacent to Monsoon Vine Forest (MVF) or *Allosyncarpia* forest. This species is endemic to the Northern Territory. The twigs and leaves are velvety, with some leaves having an undulate leaf margin. The flowers are large, cream in colour and have a faint sweet smell. Flowering is recorded for January, May, September and October and fruiting in May, October and December.



Fig 10. *Dubouzetia australiensis* (Photo Kym Brennan)

Previous code and status information

This species was coded as Endangered by the PWSNT and is yet to be listed federally.

This species was difficult to code. At the time of coding it was known from 6 broad localities, predominantly in Arnhem Land with only one locality just within the border of Kakadu National Park. Multiple data points in the Magela Creek Valley were treated as one location due to uncertainty over georeferencing. Considering that there has been targeted survey effort throughout *Allosyncarpia* patches in both Kakadu National Park and Arnhem Land, data deficient was not considered appropriate for this species. Consequently, with a restricted distribution an extent of occurrence of < 311 km² and an estimated population size of < 1000 mature individuals, this species qualified for Vulnerable.

2004 Survey results

During survey for another species, individuals of *Dubouzetia australiensis* were counted in a patch of *Allosyncarpia* 500 m E of the Kakadu/Arnhem Land boundary

A total of 84 mature individuals were recorded along a transect of approximately 500 m. Additional individuals may be present in nearby patches of forest.

Summary population data and revised status

It is recommended that the status of this species be downgraded to Vulnerable.

Further assessment of populations in Arnhem Land and the establishment of a permanent plot were scheduled for this survey but permits have yet to be granted. On the present data this species qualifies for Vulnerable based on the assumption that other populations are of similar size.

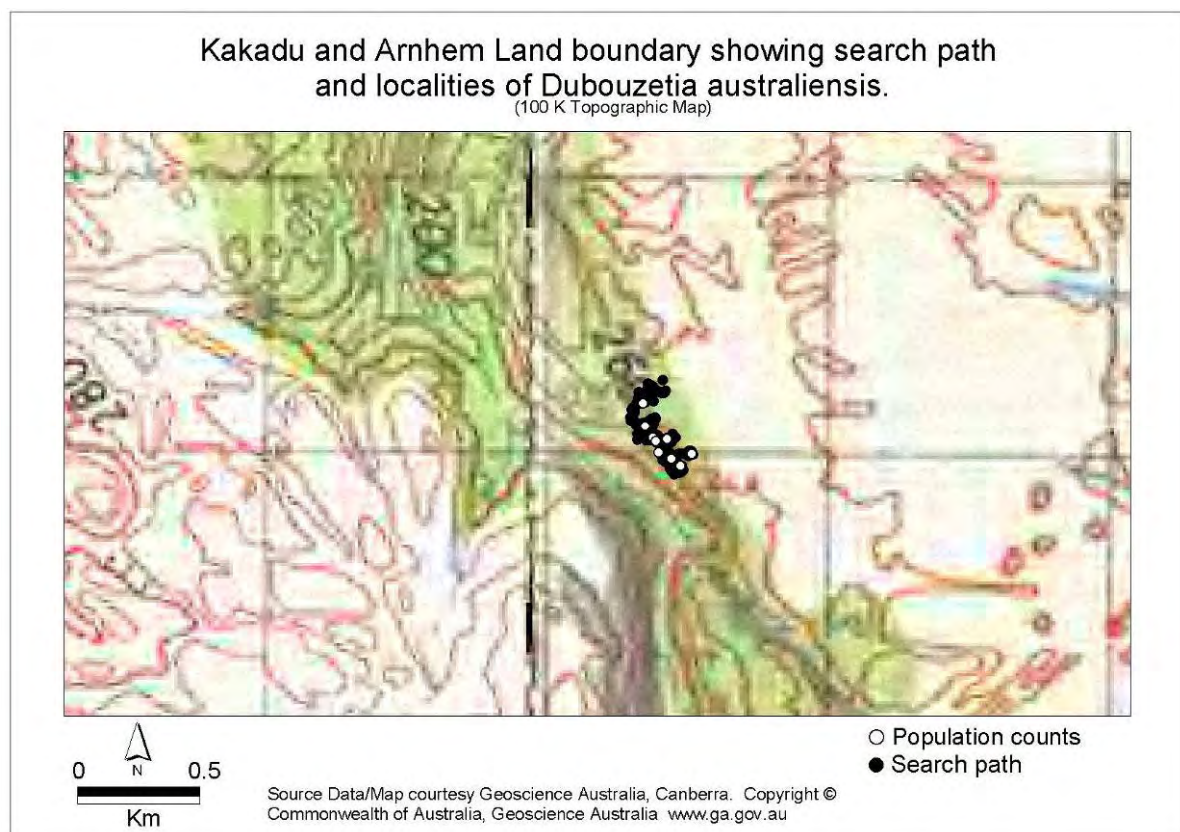
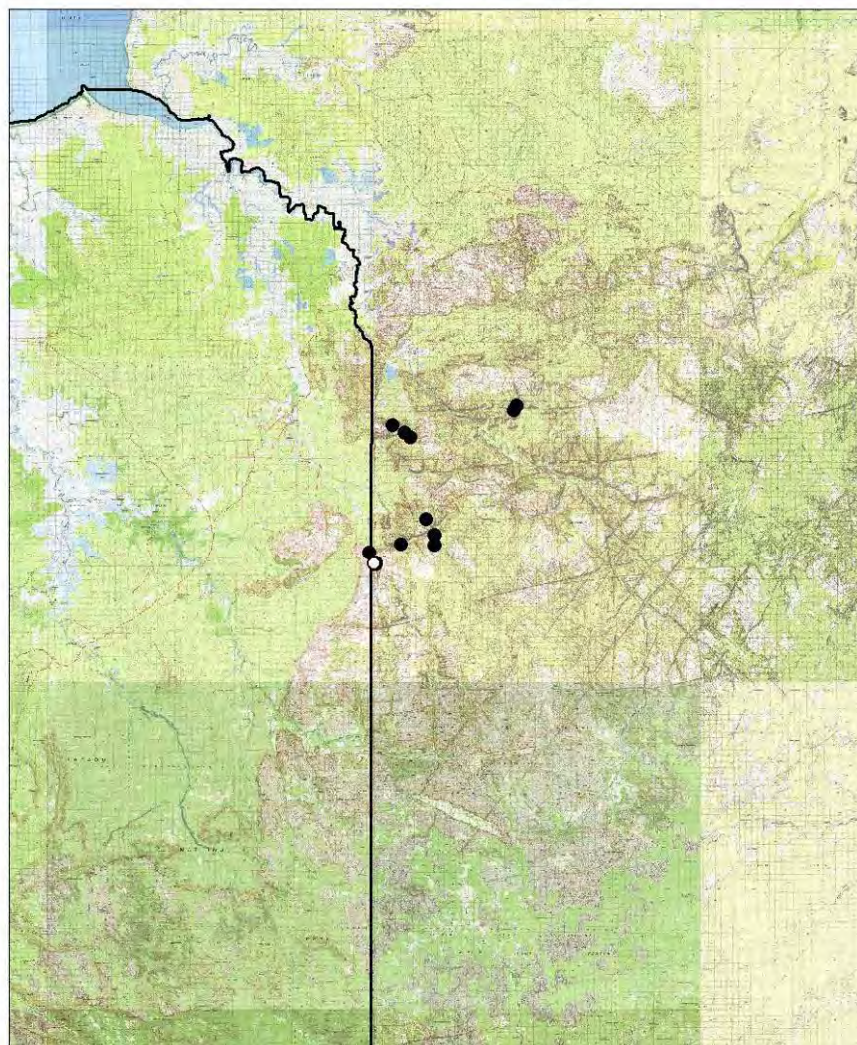


Fig 11. Map of *Dubouzetia australiensis* survey showing search path (●) and plant localities (○) off Magela Creek at the boundary of Kakadu and Arnhem Land.

Locations of known *Dubouzetia australiensis* populations in Kakadu National Park and Arnhem Land

(100 K Topographic Map)



- Boundary of Kakadu National Park
- Pre-survey populations
- Survey populations

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Fig 12. Map of all known *D. australiensis* localities showing pre-survey localities (●) and survey localities (○).

Hibiscus brennanii

Description and habitat

Hibiscus brennanii is an erect woody shrub to 3 m tall with pink flowers. Superficially, this species is difficult to distinguish from many common *Hibiscus*. Diagnostic characters include velvety grey/green leaves (Fig. 40a) with leaves, bracteoles and sepals (Fig. 40b) lacking the prickly hairs of many species. It is considered a short lived perennial.

Hibiscus brennanii grows on sandstone cliffs, in gullies and on broken sandstone pavements. Individuals are recorded growing with *Symplectrodia lanosa*, *Pandanus basedowii*, *Micraira pungens* and *Eriachne* spp. with *Acacia* D141145 Baroalba and *A. scopulorum*.



Fig 13 Seedlings of *Hibiscus brennanii*

Fig 14a. Flower bud *H. brennanii*Fig 14b. Closed flower of *H. brennanii*Fig 14c. Open flower of *H. brennanii*Fig 14d. Habit of *H. brennanii*

Previous code and status information

This species was coded as Vulnerable by PWSNT based on criteria D1 (a population size of < 1000 individuals) and D2 (a restricted area of occupancy). Federally this species is listed as Vulnerable.

Craven (1993) reported several hundred plants from Baroalba Creek, Mt Brockman. Kym Brennan, an original collector, estimated the area of occupancy of the population to be approximately 2 km². At the time of assessment (NT coding 2002) the species was known from five collections from Mt Brockman representing an extent of occurrence of 4.99 km². Results from 2003 indicated that this species should remain coded as Vulnerable, with a population estimate of 432 individuals and an extent of occurrence of 72 ha, although potential habitat was identified to the NW. There was some recruitment in the area but it was considered quite low with only nine juveniles identified. All individuals in the permanent plot were recorded as flowering or fruiting.

2004 Survey results

Further survey of habitat to the NW resulted in 9 more mature individuals located and 87 seedlings along a survey transect of approximately 2 km. Further monitoring of these seedlings in the short term is recommended to determine establishment rate for this species and time to reach reproductive maturity. Most seedlings in the area were about 10 cm tall but some individuals were up to 50 cm tall. Re-survey of the permanent plot showed that recruitment was successful this year and 12 juveniles were recorded where none were recorded last year.

Summary population data and revised status

The status of this species is maintained at Vulnerable. It is appropriate that this NT endemic be listed as Vulnerable federally.

This species is still only known from one population at Baroalba Creek, Mt Brockman, with a small increase in extent of occurrence to 1.5 km². The estimated total population size for this population is now 441 mature individuals.

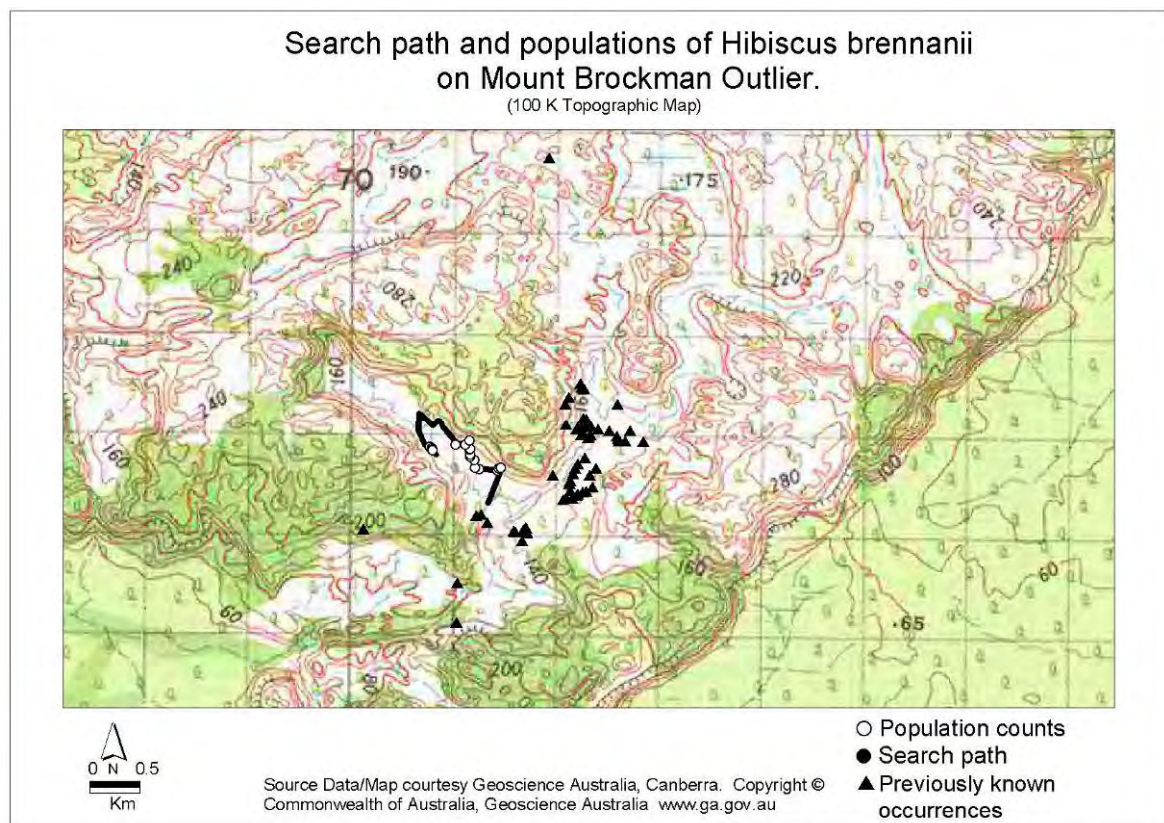


Fig 15. Map of *H. brennanii* survey showing search path (●), plant localities (○) and previously known occurrences (▲) in the Mt Brockman area.

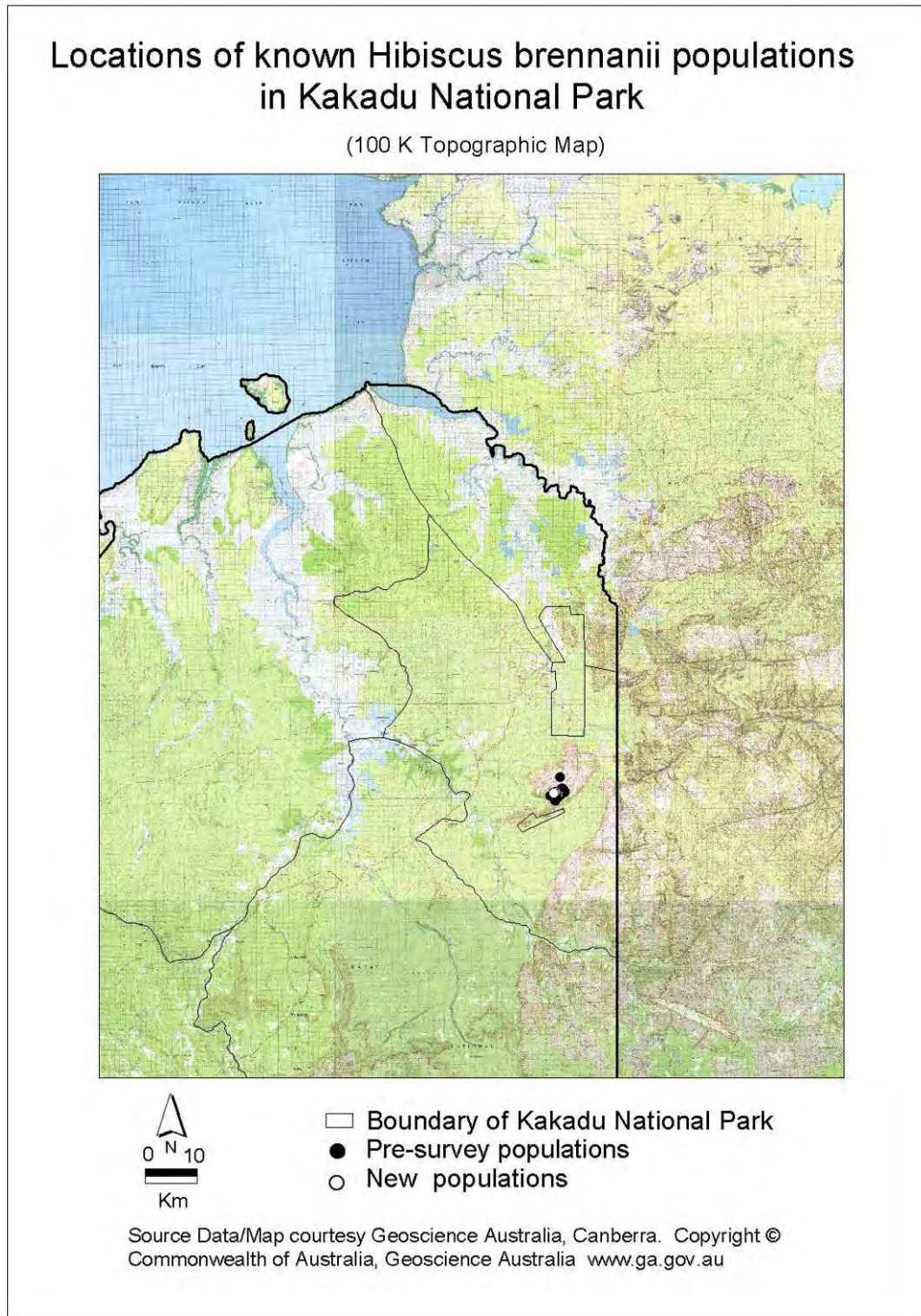


Fig 16. Map of all known *H. brennanii* localities showing pre-survey localities (●) and survey localities (○).

Lithomyrtus linariifolia

Description and habitat

Lithomyrtus linariifolia is mostly a low spreading plant 10 – 20 cm tall, sprawling over sandstone boulders and rubble or rarely erect and up to 1 m tall. The narrow leaves and mostly ground hugging form make this species distinct. The flowers are pink with showy stamens and fruit are yellow-green in colour.

Care should be taken in identification, however, as the erect form can be readily confused with narrow leaf extremes of *Lithomyrtus dunlopii*. Snow and Guymer (1999) cite the dense pubescence or hairiness on the lower surface of the leaf of *L. dunlopii* as diagnostic but this can be difficult to see.

Lithomyrtus linariifolia has generally longer and narrower flower stalks or peduncles (R. Kerrigan *pers.obs*).

This species is found in heaths or eucalypt woodland on sandstone, in sandy or skeletal soils, often found along margins of *Allosyncarpia ternata* and almost always growing amongst *Triodia microstachya*.

Previous code and status information

This species was classified as Vulnerable by PWSNT and Snow and Guymer (1999) based on criterion D1 (a small population size estimated to be <1000 individuals). Federally it is listed as Vulnerable.

At the time of coding in 2002 it was known from only 5 localities from seven collections in the Northern Territory. Anecdotal evidence from collectors suggested this species was sparse where found. Three populations of *L. linariifolia* were visited in 2003. At the end of the 2003 survey it was known from 12 collections and approximately 10 localities. However, some localities, which are close together, may represent the same population.

In summary, the extent of occurrence has increased from 885 km² to 8285 km² and the population is known to consist of at least 132 mature individuals, as a result of 2002/03 surveys.

2004 Survey results

The aim of the 2004 survey was to re-visit additional localities of *Lithomyrtus linariifolia* to verify the hypothesis that the species occurred at similar abundance to those surveyed in 2003. Closer inspection at a number of these localities showed that a previous collector had misidentified specimens and that a number of these localities were actually *L. dunlopii* populations. Fortunately all populations collected from the 2003 threatened flora survey were *L. linariifolia* and population estimates and permanent monitoring plot from that survey are still valid. The now confirmed localities of populations of *L. linariifolia* are shown in Fig. 17. The number of individuals recorded from

one locality on the Northern outliers was approximately 100 mature individuals.

Lithomyrtus linariifolia is now known from 14 localities with an area of extent of occurrence of 3411 km² and a population size of at least 200 mature individuals. However, some of these collections were made during the 2004 Fire Plot re-survey and with specimens databased but still not processed in the Herbarium, confirmation of identification cannot be made.

Summary population data and revised status

The status of *Lithomyrtus linariifolia* is maintained at Vulnerable by PWSNT. It is appropriate that this NT endemic be listed as Vulnerable federally.

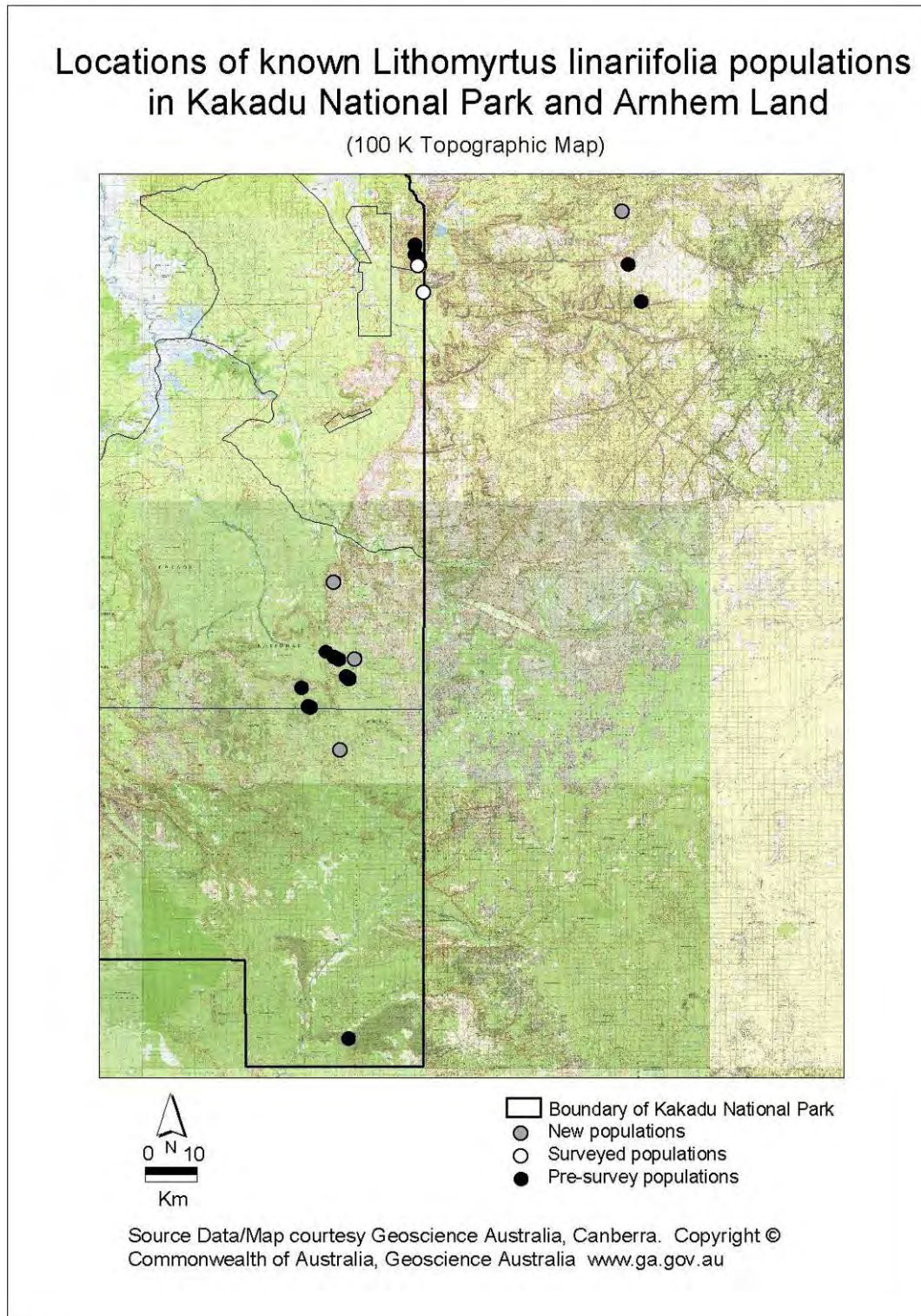


Fig 17. Map of all known *L. linariifolia* localities showing pre-survey localities (●), survey localities (○) and new populations (◉).

Sauropus filicinus

Description and habitat

Sauropus filicinus is a short pendulous shrub growing from sandstone cliff faces. It is quite similar to *S. rimophilus* and the morphological discontinuities between the two species need to be examined. It differs from *S. rimophilus* by its more stunted habit, shorter floral parts and free styles. The species is dioecious, i.e. has separate male and female plants. The specific epithet "*filicinus*" refers to its fern-like appearance and habitat (Hunter and Bruhl 1999).



Fig. 18. *Sauropus filicinus* plants

Previous code

Hunter and Bruhl (1999) classified this species as Endangered. Federally the species is classified as Vulnerable. *Sauropus rimophilus* is also classified as Endangered by Hunter and Bruhl (1999) and yet this has no threatened status nationally.

At the time of coding the NT Herbarium recognised both these species as Data Deficient.

Results from the 2003 survey were inconclusive, specimens from the permanent plot locality represent a mixed collection of both species and population counts are likely to include both taxa.

2004 Survey Results

Survey in 2004 and collection of better material allowed clearer differentiation of the two entities *S. rimophilus* & *S. filicinus*. *Sauropus filicinus* is known from 7 localities in Kakadu National Park and Arnhem Land. A total of 66 mature individuals were recorded along transects of approximately 3.5 km. It has an area of extent of occurrence of 229 km². The permanent plot established in the 2003 survey needs to be revisited to recount individuals.

Summary population data and revised status

The status of this species is maintained at Data Deficient.

This species is both easily overlooked and difficult to collect. It is sparsely distributed where seen; however, it grows in a relatively well protected habitat. Recruitment was not observed and successful dispersal and establishment is expected to be low.

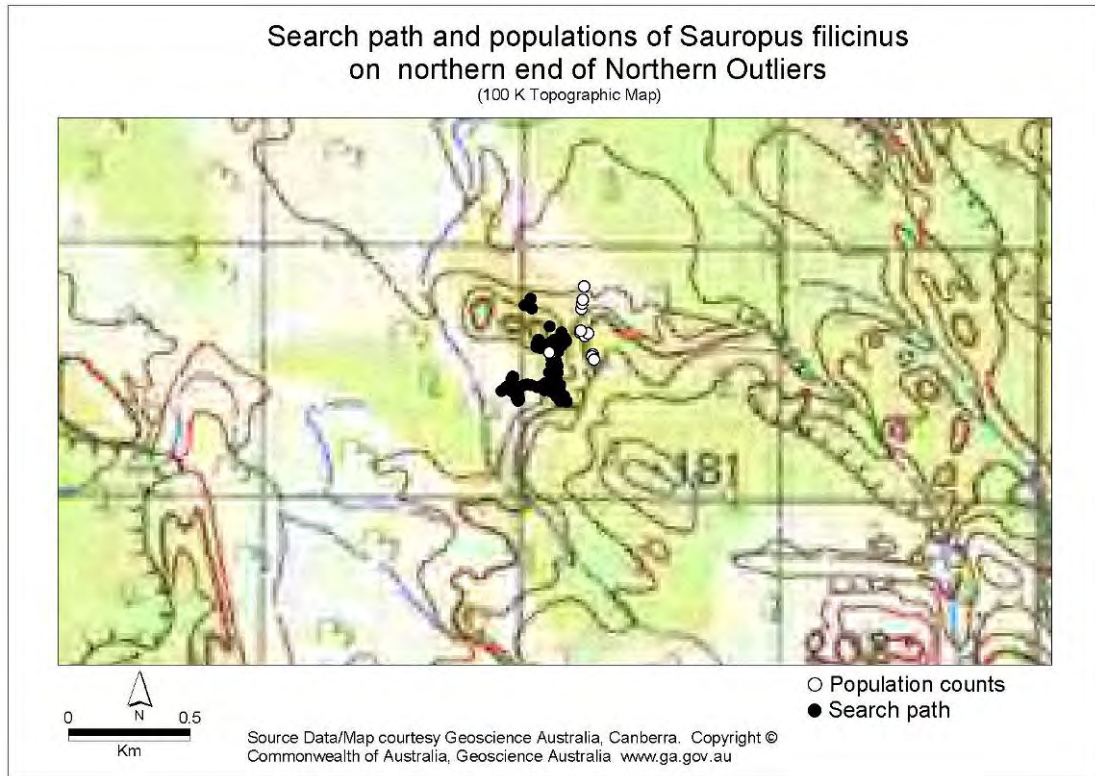


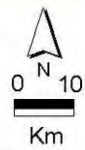
Fig 19. Map of *Sauropus filicinus* survey showing search path (●) and plant localities (○) at the northern end of Northern Outliers.



Fig 20. Map of *Sauropus filicinus* survey showing search path (●) and plant localities (○) at the southern end of Northern Outliers.

Locations of known *Sauropus filicinus* populations in Kakadu National Park and Arnhem Land

(100 K Topographic Map)



- Boundary of Kakadu National Park
- Pre-survey populations
- Surveyed populations

Source Data/Map courtesy Geoscience Australia, Canberra. Copyright © Commonwealth of Australia, Geoscience Australia www.ga.gov.au

Fig. 21. Map of all known *S. filicinus* localities showing pre-survey localities (●) and survey localities (○).

Other Plants of conservation interest encountered during the 2004 survey

Three significant collections were made during the 2004 survey.

***Acacia* D19063 Graveside Gorge**

Acacia D19063 Graveside Gorge was previously collected in Kakadu National Park in 1981. At that time it was mis-identified as *Acacia hippuroides*, a Western Australian species, to which it is closely related. Vague locality details and the lack of additional collections in the following years led botanists at the NT Herbarium to doubt the validity of this collection.

Acacia D19063 Graveside Gorge is a very distinct species immediately obvious in the field although vegetatively similar to *Drummondita calida*. Leaves are narrow and needle like and arranged in whorls around the stem, it is grey-green in appearance and distinctly hairy. The inflorescence is globular and the pods short.



Fig 22. Adult plant of *Acacia* D19063 Graveside Gorge

Whether the 2004 collection made by Kym Brennan is the relocation of the 1981 population or another locality is unknown. It is found growing on the rocky slope at the top of a cliff line near the *Boronia xanthastrum* permanent plot. A single adult plant was found. About 30 dead stems were located nearby which had been burnt the previous season. Approximately 20 small seedlings around 10cm tall were located within a 20 m x 20 m plot. No other plants were seen in the area.

This species qualifies for Critically Endangered and regular monitoring in the short term to establish the persistence of seedlings and time taken to reproductive maturity are recommended.

Utricularia rhododactylos

Utricularia rhododactylos is a pink flowered bladderwort with five distinctly ridged lower lobes that give the flower a hand like appearance. It is only known from 4 collections in Kakadu and Arnhem Land collected between 1977 and 2004 and is always recorded from shallow sand depressions on sandstone pavement. This collection is the northern most collection for the species.



Fig 23. *Utricularia rhododactylos*.

This species can be easily confused with *U. cheiranthos* which has a longer upper lip and lacks the distinct ridges at the base of the lower lip.

At present this species is coded by the PWSNT as data deficient. It is likely this species is more common but is poorly collected as a result of its restriction to remote terrain and limited flowering time at the height of the wet season.

***Cryptandra* D19989 Jabiru**

Cryptandra D19989 Jabiru is a non-descript dense grey shrub to approximately 1 m, currently coded by PWSNT as data deficient. At the time of coding it was only known from two collections in Kakadu and Nitmiluk spread over a 20 year period. However, it is easily confused with *Hibbertia oblongata* var. *brevifolia* and recent curation of the NT Herbarium collection has identified additional specimens. It is clear that this species is regularly overlooked in the field and is much more common than collections indicate.

In the 2004 survey 231 mature individuals were counted along a 1 km transect. More recent collections also record it as locally common where found. The vigorous resprouting after fire and the widespread and abundant distribution of this taxon are strong indications that this species is secure and it is suggested this species be downgraded to Least Concern.



Fig 24 a. Habit of *Cryptandra* D19989 Jabiru



Fig 24 b. *Cryptandra* D19989 Jabiru showing resprouting and Old burn scars.

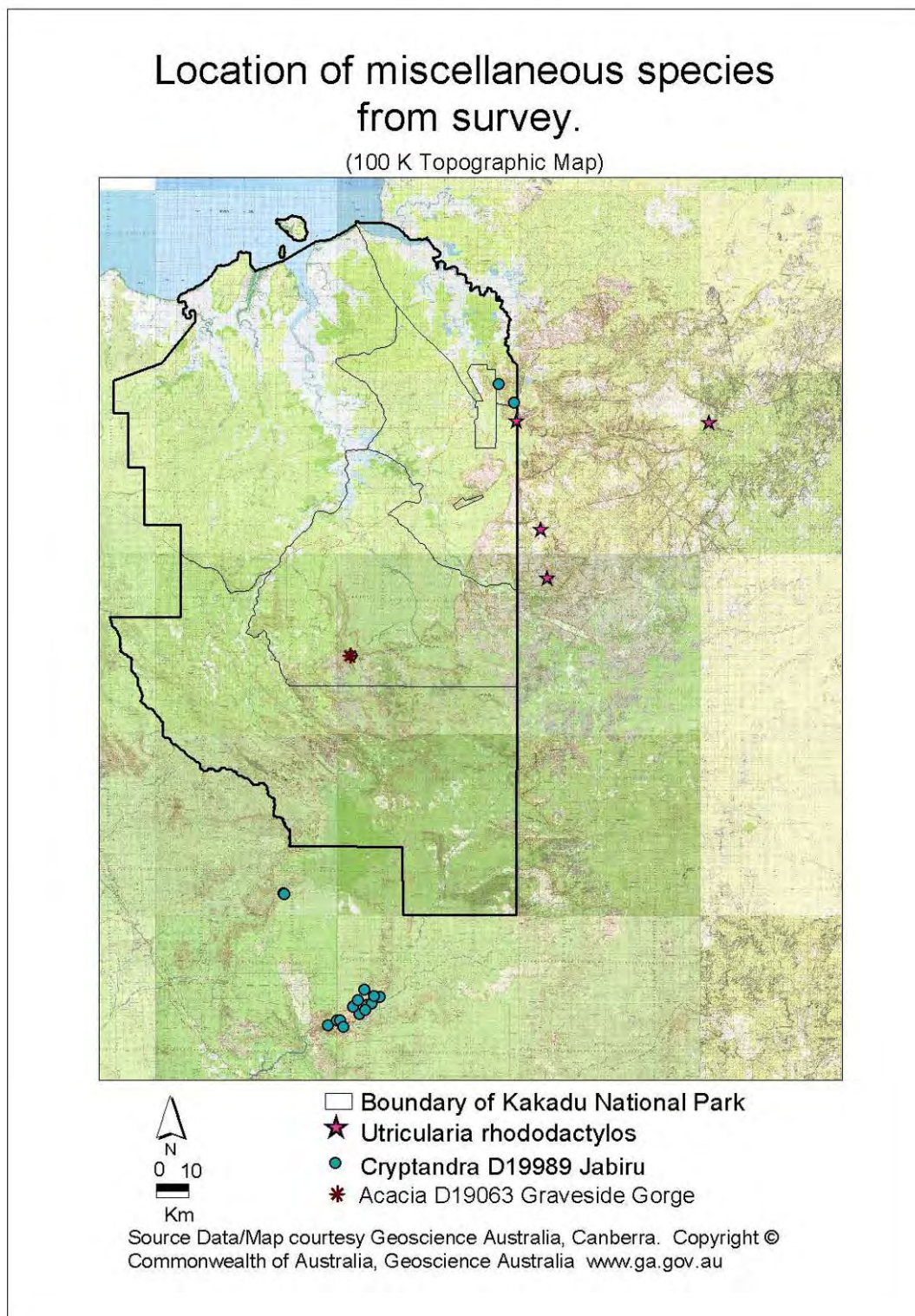


Fig 25. Map showing localities of *Acacia* D19063 Graveside Gorge, *Cryptandra* D 19989 Jabiru and *Utricularia rhododactylos*.

Conclusions and Recommendations

Results from this survey have provided us with more accurate data to reassess the conservation status of 7 species. Recommendations to change the status of threatened species, at either the Territory or Federal level, are summarised in Table 3.

As a result of this survey the following priorities are suggested.

In the short term the following species *Acacia* D19603 Graveside Gorge, *Hibiscus brennanii*, and *Boronia xanthastrum* need monitoring yearly. All three populations have 2004 cohorts of seedlings that provide a great opportunity to monitor seedling survival and length of time to reproductive maturity. Tagging of individual seedlings would prove useful for long term monitoring.

Further survey and the establishment of permanent plots for *Sauropus filicinus*, *Dichapetalum timoriense* and *Dubouzetia australiensis* are required and will be completed once permits from the Northern Land Council become available. The 2003 recommendations to monitor *Boronia verecunda* and *Lithomyrtus linariifolia* in 2005/06 and to survey all known populations is carried over.

Table 3: Summary table of species surveyed and suggested changes to conservation status.

	Pre-survey NT Status	Recommendation to change NT Status	Pre –survey Federal Status	Recommendation to change Federal Status
<i>Acacia</i> D19603 Graveside Gorge	NE	CR	NE	CR
<i>Boronia laxa</i>	NT	NT	V	Downgrade from Vulnerable
<i>Boronia verecunda</i>	NT	NT	V	Downgrade from Vulnerable
<i>Boronia xanthastrum</i>	NT	NT	V	Downgrade from Vulnerable
<i>Cryptandra</i> D19989 Jabiru	DD	LC		
<i>Dichapetalum timoriense</i>	V	V		V
<i>Dubouzetia australiensis</i>	EN	V		V
<i>Hibiscus brennanii</i>	V	V		V
<i>Lithomyrtus linariifolia</i>	V	V		V
<i>Sauropus filicinus</i>	DD	DD	V	DD

Table 4: Summary table of recommendations

	NT Status	Proposed NT Status	Recommendations
<i>Acacia</i> D19603 Graveside Gorge	NE	CR	Tag seedlings from population and monitor yearly.
<i>Boronia laxa</i>	NT	NT	Interrogate Fire Plot data where species is recorded to identify changes in population density at time 1 and time 2. Re-survey monitoring plot in 2005/6.
<i>Boronia verecunda</i>	NT	NT	Interrogate Fire Plot data where species is recorded to identify changes in population density at time 1 and time 2. Re-survey monitoring plot in 2005/6. Re-locate other populations to confirm similar persistence and extent.
<i>Boronia xanthastrum</i>	NT	NT	Tag seedlings from population near permanent plot and monitor yearly. Interrogate Fire Plot data where species is recorded to identify changes in population density at time 1 and time 2. Re-survey monitoring plot in 2005/6. Re-locate other populations to confirm similar persistence and extent.
<i>Cryptandra</i> D19989 Jabiru	DD	LC	Downgrade status to Least Concern.
<i>Dichapetalum timoriense</i>	V	V	Further survey of populations and establishment of monitoring plot
<i>Dubouzetia australiensis</i>	EN	V	Further survey of populations and establishment of monitoring plot
<i>Hibiscus brennanii</i>	V	V	Tag seedlings in permanent plot and monitor yearly. Further survey to determine extent of population. Establish research projects to investigate biology of species.
<i>Lithomyrtus linariifolia</i>	V	V	Re-survey monitoring plot in 2005/6. Re-locate other populations to confirm similar persistence & extent
<i>Sauropus filicinus</i>	DD	DD	Establish permanent monitoring plot.

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Appendix 1

Table 5. Waypoint data for *Boronia xanthastrum* and waypoint data for *Hibiscus brennanii*, *Acacia* D19063 Graveside Gorge and *Boronia xanthastrum* potential seedling monitoring plots. (Datum WGS 84)

Species	Dec Latitude	Dec Longitude
<i>Acacia</i> D19603 Graveside Gorge	13.28310	132.54240
<i>Boronia xanthastrum</i> Permanent plot	13.2782	132.5442
<i>Boronia xanthastrum</i> potential seedling locality	13.280427	132.54518
<i>Hibiscus brennanii</i> permanent plot (12 seedlings 2004)	12.80753	132.9026