BATHURST DISTRICT

Vegetation Survey

For:
National Parks and Wildlife Service - Bathurst District

June 1996
95260RP2

ERM Mitchell McCotter Pty Ltd. A.C.N. 002 773 248. A member of the Environmental Resources Management Group.

Approved by:	*Roberta Boden*
Position:	Project Director
Signed:	Roberta Boden
Date:	*27 June 1996*

Prepared by:	*Lisa Mitchell*
Position:	Project Manager
Signed:	Mitchell
Date:	*27 June 1996*

ERM Mitchell McCotter Quality System

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Roger Lembit prepared chapters describing survey methodology, vegetation communities and recommendations. Lisa Mitchell prepared the annotated bibliography, background information chapters, photographic supplement and, compilation and editing of the report.

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INTRODUCTION

1.1 BACKGROUND

The New South Wales National Parks and Wildlife Service has commissioned a vegetation survey of one nature reserve and three national parks in the Bathurst District as the first stage in preparing Fire Management Plans. The study area encompassed four reserves located across the Bathurst District which are shown in *Figure 1.* These are:

- Winburndale Nature Reserve;
- Nangar National Park;
- Conimbla National Park; and
- Weddin Mountains National Park.

The information obtained from this study will be used in conjunction with other studies relating to fauna, fire history, fire advantages and Service assets to prepare comprehensive plans for the reserves.

1.2 AIMS AND OBJECTIVES

The purpose of this report is to document previously known information on vegetation of the Central Western Slopes and Central Tablelands and results from the current survey. This includes community and species distribution, and conservationally significant communities or species on a local, regional, statewide or national scale.

Key study tasks were:

- to survey relevant literature describing vegetation communities in the reserves and surrounding region and, to compile an annotated bibliography;
- to survey the vegetation communities and describe their floristic composition;

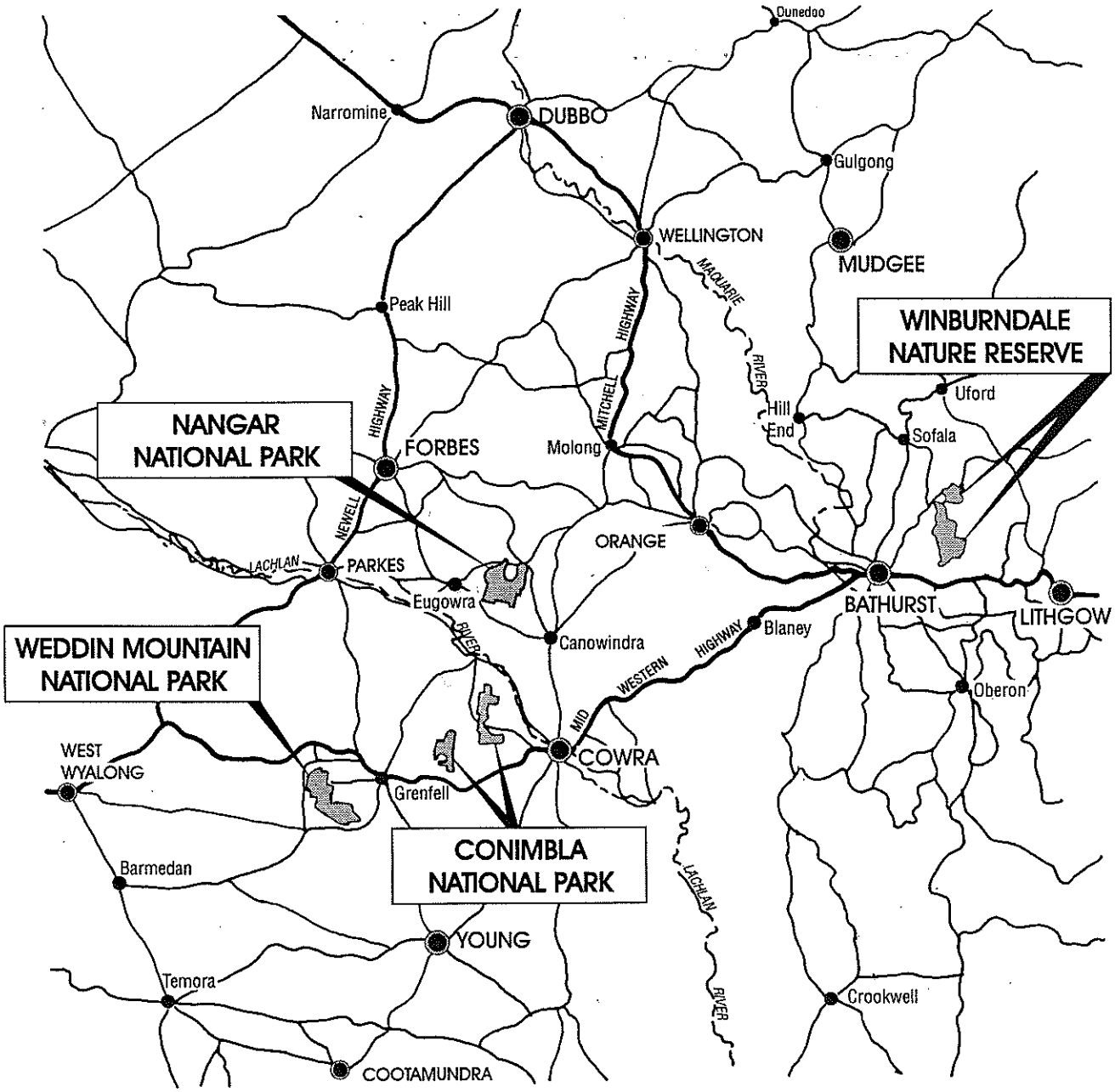

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Figure 1 LOCALITY PLAN

- to describe the location and conservation status of vegetation communities of particular botanical conservation importance; and
- to describe the process used to derive a description of the vegetation communities.

1.3 STUDY AREA

The study area is large and discontinuous, encompassing four reserves on the Central Western Slopes and Central Tablelands of New South Wales, dedicated under the National Parks and Wildlife. These are:

- Winburndale Nature Reserve;
- Nangar National Park;
- Conimbla National Park; and
- Weddin Mountains National Park.

1.3.1 Winburndale Nature Reserve

i. Location

Winburndale Nature Reserve is located on the Central Tablelands approximately 20 kilometres north-east of Bathurst as shown on *Figure 1*. It is surrounded by Turon and Sunny Corner State Forests to the east and south, and freehold land to the north and west.

ii. Area

Winburndale is the largest of the four reserves surveyed for this project, covering 10,050 hectares.

iii. Topography

The reserve is characterised by a series of plateaux and ridges rising to 1246 metres. An almost continuous north to south aligned escarpment of Conglomerate Cliffs is located in the centre of the reserve.

iv. Geology

The geology of Winburndale Nature Reserve is predominantly sedimentary of Upper Devonian age. Small areas of metasedimentary and sedimentary limestone geological types are found on the western boundary of the reserve. The area is part of the Capertee Rise. The Upper Devonian sediments give rise to intermediate to acid parent materials, except for limestone. Associated rock types include andesites, greywakes, shales and limestone (Kovac *et al.*, 1990).

v. Soils

Turonfels soil landscape is found on the higher parts of the reserve where local relief is 50 to 90 metres and slopes between 6 and 20 per cent. Lambie soil landscape dominates the reserve. This soil landscape is characterised by rolling to steep hills and mountains with local relief from 50 to 150 metres and slopes 6 to 30 per cent (Kovac, *et al.*, 1989).

vi. Broad Vegetation Types

Vegetation communities in Winburndale Nature Reserve were expected to be structurally diverse due to significant variations in topography, altitude and other environmental parameters. Broad communities from existing ERMS database maps are shown on *Figure* 2. Moist forests are found on sheltered slopes and gullies. Woodland and dry forests are present on the slopes and plateaux. Results of detailed vegetation surveys are provided in Chapter 3.

1.3.2 *Nangar National Park*

i. Location

Nangar National Park is located 50 kilometres south-west of Orange and 40 kilometres east of Forbes on the Central Western Slopes as shown on *Figure 1.*

ii. Area

Nangar National Park covers approximately 9,200 hectares. This includes the former Nangar State Forest addition to the southern park boundary .

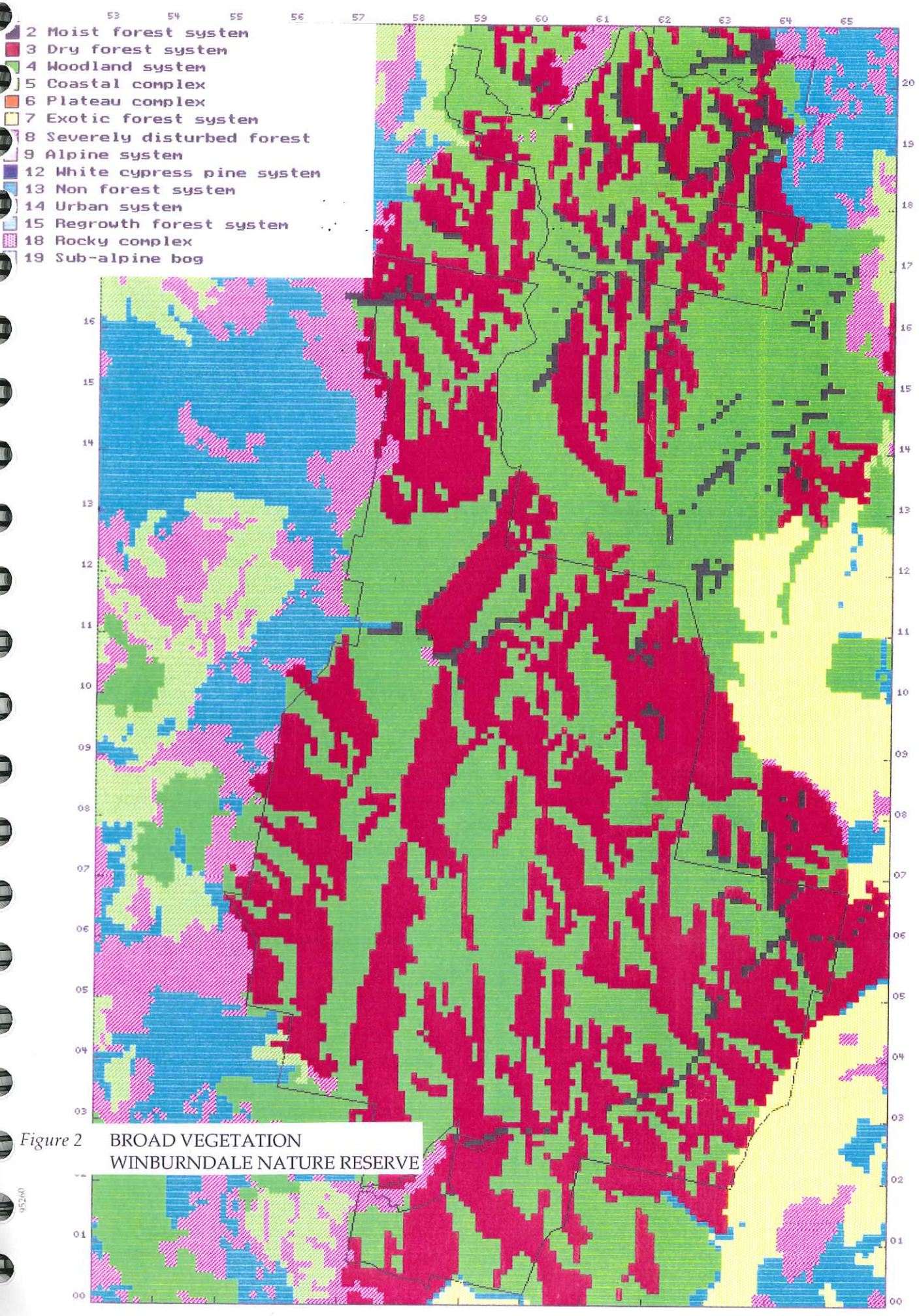

Figure 2 BROAD VEGETATION
WINBURNDALE NATURE RESERVE

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iii. Topography

Nangar is dominated by the headland portions of the Nangar-Murga mountain range. The park is characterised by low to rolling hills over much of the park with steep slopes on the northern boundary associated with the Nangar Ridge.

iv. Geology

The park is dominated by sedimentary geological types in Upper Devonian Alluvial Fan deposits which form prominent stony ridges on shallow soils. Small areas of granite are found in the north western sector. Rock types associated with this area include sandstone, conglomerate, shale and siltstone (Kovac *et al.*, 1990). These give rise to rugged escarpments which dominate the landscape.

v. Soils

The geological formations in the park give rise to the Nangar and Mandagery soil landscapes. Areas of Nangar soils are characterised by low rolling hills with slopes between 12 and 20 per cent. Non calcic brown soils are dominant on upper to mid-slopes with yellow and brown solodic soils in drainage lines (Kovac *et al*, 1990). Mandagery soils are found on rolling to steep hills, cliffs and escarpments with slopes between 25 and 50 per cent. Soils are shallow, skeletal sands and loams (Kovacs *et al*, 1990).

vi. Broad Vegetation Types

Existing ERMS database mapping (*Figure 3*) indicates that vegetation is uniform across Nangar National Park, comprised of a woodland complex with disturbed forests around the boundary. The park forms a vegetated island within an agricultural landscape. Results of detailed vegetation surveys are provided in Chapter 4.

1.3.3 Conimbla National Park

i. Location

Conimbla National Park is located on the Central Western Slopes between Grenfell and Cowra. There are two sections to this park, approximately seven kilometres apart, which were previously state forests. The eastern section was formerly Kangarooby State Forest and the western section, Yambira State Forest.

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Figure 3 BROAD VEGETATION
NANGAR NATIONAL PARK

ii. Area

Conimbla National Park occupies approximately 7,600 hectares in total with the eastern section slightly larger than the western section. It is the smallest of the four reserves surveyed.

iii. Topography

Conimbla National Park is characterised by a low to rolling hills and plateaux with a steep escarpment dominating the western boundary.

iv. Geology

Geology of the park is primarily sedimentary. Small areas of volcanic material is present along the eastern boundary of the western section. Parent material is comprised of sandstone, conglomerate, shale and siltstone.

v. Soils

The Nangar and Mandagery soil landscapes are present in the park. Characteristics of these landscapes are as for Nangar National Park.

vi. Broad Vegetation Types

Woodland communities dominate the vegetation of the park. ERMS database mapping indicates uniformly structured communities in Conimbla National Park as shown in *Figure 4*. Results of detailed vegetation surveys are provided in Chapter 5.

1.3.4 Weddin Mountains National Park

i. Location and Area

Weddin Mountains National Park is the western most of the reserves in the study area and is located 15 kilometres south-west of Grenfell. It occupies approximately 8,360 hectares and is bounded by Bimbi and Weddin State Forests to the west and south respectively. The location of the park is shown on *Figure 1*.

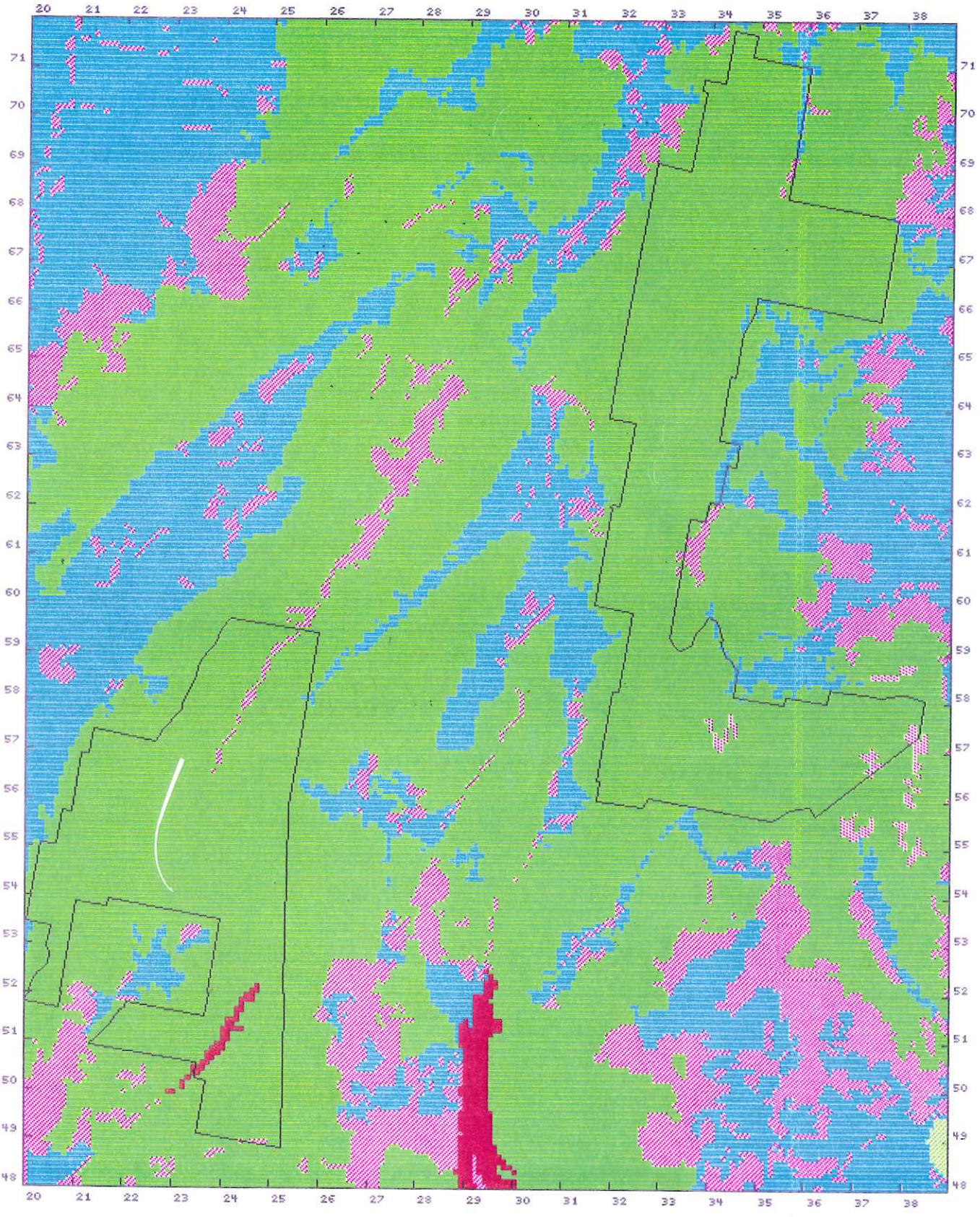


Figure 4 BROAD VEGETATION
CONIMBLA NATIONAL PARK

ii. Topography

The Weddin Mountains, after which the park is named rise to approximately 400 metres above the surrounding area. These rise steeply on the northern and eastern sides. More gentle slopes incised by gullies and creeks fall from the plateau to the west and south. The range is crescent-shaped and composed of sandstones, conglomerate, siltstone and shale.

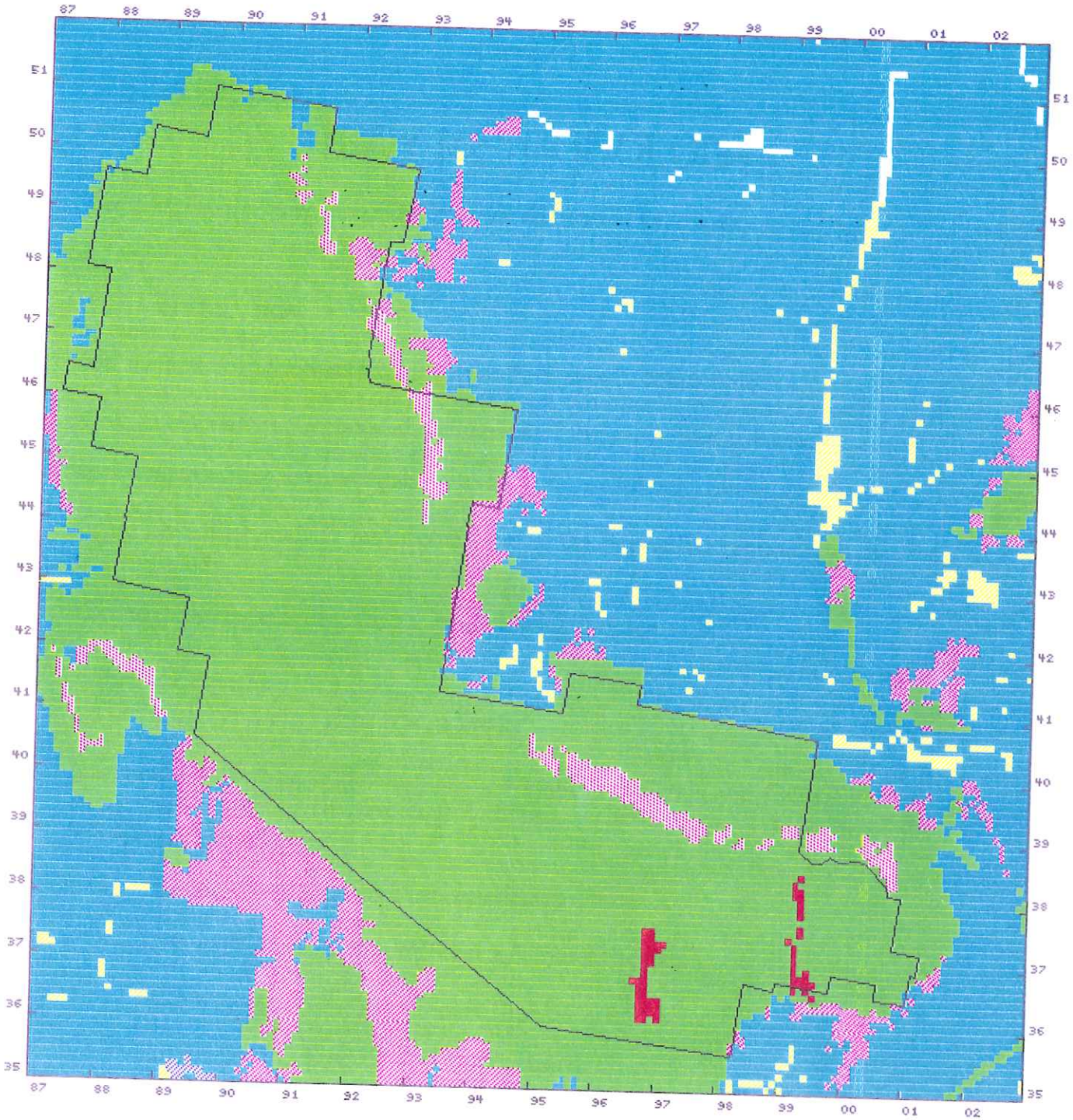
iii. Geology and Soils

Geology of the park has resulted from terrestrial sedimentation. Parent materials include sandstone, conglomerate, shale and siltstone with low sodium levels. Soil types present are similar to those described for Nangar and Conimbla National Parks.

iv. Broad Vegetation Types

Vegetation maps from the ERMS database indicate uniform vegetation across the park as shown in *Figure 5*. Communities of the woodland complex dominate, with small areas of regrowth and dry forest along the north eastern boundary. Detailed descriptions of vegetation communities identified during field survey and data analysis are provided in Chapter 6.

MAP : Broad Vegetation
Weddin Mountains NP [NPWS]
SCALE = 1:
TICKMARK INTERVAL = 1000 metres
— TENURE: Service Estate [5/96]



3 Dry forest system
4 Woodland system
5 Coastal complex
6 Plateau complex
7 Exotic forest system
8 Severely disturbed forest
9 Alpine system
12 White cypress pine system
13 Non forest system
14 Urban system
15 Regrowth forest system
18 Rocky complex
19 Sub-alpine bog

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Figure 5 BROAD VEGETATION
WEDDIN MOUNTAINS NATIONAL PARK

Chapter 2

STUDY METHODOLOGY

The three discrete components of the study are described in this chapter.

2.1 OVERVIEW

The methodology for this study involved three stages. These were:

- compilation of annotated bibliography from available information;
- field survey to collect data; and
- statistical analysis and description of the vegetation communities in each reserve.

Each of these stages is described in the following sections.

2.2 ANNOTATED BIBLIOGRAPHY

Information describing vegetation of the Central Tablelands and Central Western Slopes was sought from numerous locations. These included libraries of the following organisations:

- National Parks and Wildlife Service Head Office;
- National Parks and Wildlife Service Bathurst District;
- State Forests of New South Wales;
- Charles Sturt University (Bathurst Campus);
- Department of Land and Water Conservation; and
- local councils.

2.2.1 *Limitations and Findings of the Annotated Bibliography*

Overall it was found that little information exists on vegetation of the Central Tablelands and Central Western Slopes, and almost nothing on Conimbla, Nangar, and Weddin Mountains National Park and Winburndale Nature Reserve.

The information available on the Central Western Slopes and Central Tablelands provides broad vegetation descriptions and identification of plant species of regional and statewide conservation significance. Much of the information notes that, with the exception of reserves managed by the National Parks and Wildlife Service, 76 per cent of native vegetation has been cleared. More than 90 per cent of remaining vegetation is fragmented remnants of five square kilometres or less. As most of the land is freehold, there is little information which describes these remnants.

Conservation and management of White Box woodland communities which were originally the most extensive plant community in the region is the subject of several published papers.

The Annotated Bibliography is provided in Appendix A.

2.3 FIELD SURVEY

The vegetation field survey within the reserves was aimed at:

- obtaining an understanding of plant communities, structure and floristics;
- describing the location, distribution and status of plant communities of particular botanical conservation importance; and
- establishing a set of permanent sampling sites in each reserve .

2.3.1 *Site Selection*

Sample site locations were determined using a stratification of the various environmental parameters present in each reserve. The aim was to select sites across the range of environmental attributes including geology, soils, landform, aspect and elevation. At least two replicates for each attribute class were used, with three replicates of the most widespread attribute classes in Winburndale Nature Reserve. Further details of the stratification process and site attribute tables are presented in chapters describing each reserve.

2.3.2 *Survey Techniques*

Standard quadrats measuring 20 metres by 20 metres were laid out at each sampling site. The north western corner of each quadrat was marked with a length of galvanised iron pipe to which a tag identifying the site number was attached. This was to enable future relocation of the site for re-sampling.

A photograph of each site was taken from the north-west corner except where vegetation obscured a general view of the site. In these instances, the photograph was taken along the northern edge of the quadrat. A photographic supplement is provided in Appendix B.

Site characteristics were recorded on a standard recording form provided by the NPWS. Records were made of physiographic characteristics, location, fire history, disturbance, vegetation structure, floristics and estimated cover/abundance using a modified Braun-Blanquet scale. Notes were made of features relevant to reserve management, site re-location and fire management. Opportunistic records of uncommon species were also collected whilst travelling between survey sites.

The field survey was designed and conducted by Roger Lembit with the assistance of Megan Birmingham, Rachael Morse of ERM Mitchell McCotter, Amanda Bryant, Alex Wyatt and Jason Neville from the Bathurst District of the National Parks and Wildlife Service and volunteers, Bill Faulkner and Marcia Johnson.

Species unable to be identified in the field were collected for later identification. Roger Lembit was responsible for plant species identification, made with reference to botanical texts, particularly Harden (1990-93) and the Public Reference Collection at the Royal Botanic Gardens, Sydney. Difficult specimens were referred to the Royal Botanic Gardens, Sydney for confirmation or identification. Field collections of species were lodged in the National Parks and Wildlife Service Bathurst District Herbarium.

Completed forms were forwarded to the NPWS for input into the vegetation database for later analysis. Data obtained from the field survey were entered on the NPWS vegetation database.

2.3.3 *Survey Limitations*

Field survey took place from December 1995 to February 1996. Rainfall was approximately average over the survey period. Lower than average temperatures were experienced during the survey of Winburndale Nature Reserve. Prevailing cooler conditions may have resulted in fewer plants flowering than usual during December and January. Survey timing was not considered optimum for the

identification of numerous plant species. Difficulty was experienced in identifying orchids and daisies present due to a lack of suitable flowering material. Accordingly, the survey may have underestimated the diversity of some plant groups, such as lilies, daisies and orchids.

2.4 PATN ANALYSIS AND PLANT COMMUNITY CLASSIFICATION

Field data was entered into the NPWS vegetation database by Lisa Mitchell, Amanda Bryant, Brady Schmidt, Bill Faulkner and Ann Walton. Data was analysed by Amanda Bryant using the PATN Computer Software Package (Belbin, 1988) with assistance from Dominic Sivertsen. The Kulzinski measure of association was used in the analysis.

The PATN package allows grouping of sample sites which have the greatest degree of floristic similarity using hierarchical polythetic agglomerative clustering. Those sites with the greatest number of species in common are grouped together, taking into account cover abundance ratings. Species groups are also derived by hierarchical classification of all plant species in the data set. PATN produces a two-way table of the data matrix as well as dendrograms which graphically demonstrate the relationships between sample sites. Dendrograms and two-way tables resulting from the analysis for each reserve are included in Appendix C.

The dendrograms and two-way tables for each reserve, and field records of vegetation and site characteristics were used to identify plant communities. Where there was a moderate to high level of similarity between sites and no clear differentiation based on environmental parameters, a clear distinction could not be made on the basis of the PATN analysis. These sites were grouped into a vegetation complex. Further detailed study may reveal that several plant communities comprise these complex vegetation types.

2.5 ASSESSMENT OF CONSERVATION SIGNIFICANCE

Where possible the conservation status and significance of plant communities were described based on definitions by Benson (1989). The associations used by Benson (1989) are drawn from the alliances and sub-alliances described by Beadle (1981) with additional information drawn from local knowledge. Some interpretation is needed to place the vegetation types found during a local study into the broader alliances used by Beadle (1981).

Table 1 defines the codes used in describing vegetation community conservation status.

Table 1 CONSERVATION STATUS CODES

Conservation Code	Definition
E	Endangered - likely to become extinct within a few decades
V	Vulnerable - likely to become endangered within a few decades
N	Not threatened in the foreseeable future
1	Not conserved or only minuscule areas in reserves
2	Inadequately conserved - either small areas in reserves or not conserved over major parts of its geographical range
3	Adequately conserved
?	Uncertain relationship with Benson(1989) association

Source: Benson (1989)

Chapter 3

WINBURNDALE NATURE RESERVE

This chapter describes plant communities and significant plant species, and assesses the conservation status of communities in Winburndale Nature Reserve.

3.1 SITE STRATIFICATION

Site stratification for Winburndale Nature Reserve was based on three geological types, two altitude classes and six aspect/topographic position classes. Two replicates of each stratified group were selected, except for Lambie Group sediments above 1000 metres altitude, for which three replicates were used due to their widespread distribution in the reserve. Two replicates of an additional class, Conglomerate cliffs, were also surveyed due to their distinctive vegetation.

Table 2 shows the relationship between the environmental attributes at each site, dominant plant species and groupings identified by the PATN analysis.

3.2 FIELD SURVEY

Field survey work was undertaken from 6 December 1995 to 10 January 1996. Sites identified during the stratification process were surveyed. The locations of these are shown on *Figure 6*. Sampling revealed inaccuracies in geological mapping for the area. The boundaries between Lambie Group sediments and other geological types along the western side of the nature reserve are mapped further east than they are found in the field. The Limekiln group and Winburn Tuff geological types occur in a significantly smaller area than that indicated in available mapping. This has confounded the interpretation of the PATN analysis for the stratified sites.

3.3 PLANT COMMUNITY DESCRIPTIONS

Nine plant communities were identified in Winburndale Nature Reserve ranging from open forest and woodland communities to cliff-top heaths. PATN analysis for Winburndale Nature Reserve revealed strong differentiation between moist and dry sites. Gullies and sites with sheltered aspects appear towards the top of the

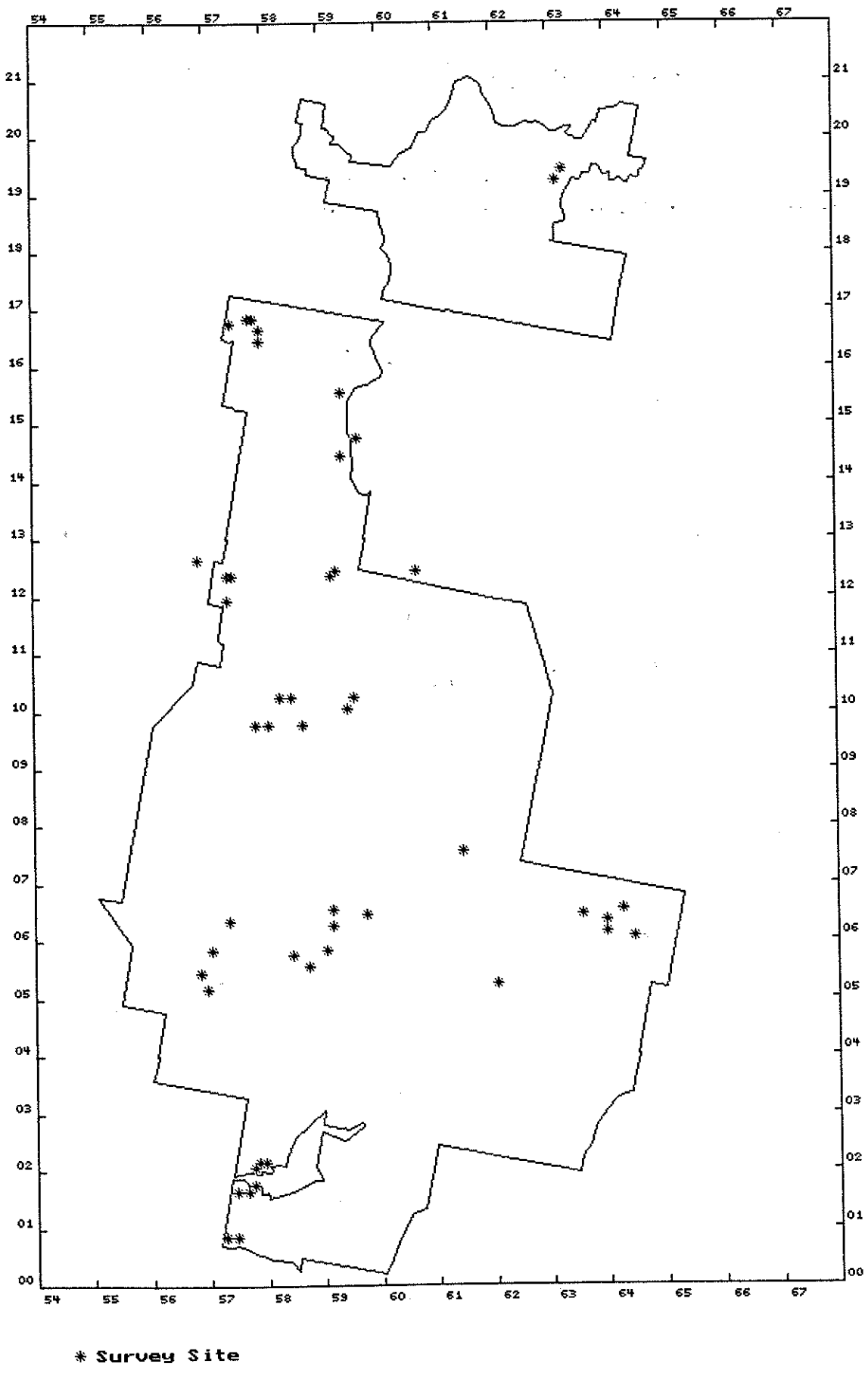

Figure 6 VEGETATION SURVEY SITES FOR WINBURNDALE NATURE RESERVE

Table 2 WINBURNDALE NATURE RESERVE SITE STRATIFICATION

Site	Geology[1]	Aspect/ Landform	Altitude	Dominant Species
001	LK	gully		*E. viminalis/E. macrorhyncha*
003	LK	S		*E. viminalis/E. macrorhyncha*
027	LB	gully	H	*E. viminalis*
036	LB	W	L	*E. viminalis/E. macrorhyncha*
014	LB	gully	L	*E. viminalis*
022	LB	W	L	*E. viminalis/E. bridgesiana*
037	LB	S	L	*E. viminalis*
002	LK	ridge		*E. macrorhyncha/E. goniocalyx*
008	LK	gully		*E. macrorhyncha/E. goniocalyx*
041	WN	gully	L	*E. macrorhyncha/E. goniocalyx*
017	LB	ridge	H	*E. dives/E. macrorhyncha*
023	LB	gully	H	*E. dalrympleana/E. macrorhyncha*
028	LB	gully	H	*E. pauciflora*
046	WN	N	H	*E. melliodora/E. goniocalyx*
047	WN	N	H	*E. rossii/E. goniocalyx*
012	LB	W	H	*E. mannifera - heath*
024	LB	S	H	*E. dalrympleana/E. dives*
025	LB	ridge	H	*E. dalrympleana*
004	LK	N		*E. rossii/E. macrorhyncha*
018	LB	N	H	*E. macrorhyncha/E. rossii/E. mannifera*
040	WN	S	L	*E. macrorhyncha/E. rossii*
015	LB	W	L	*E. rossii/E. macrorhyncha*
006	LK	W		*E. macrorhyncha/E.rossii/E. goniocalyx*
009	LK	S		*E. rossii/E. macrorhyncha*
030	LB	E	L	*E. macrorhyncha/E. bridgesiana*
029	LB	ridge	L	*E. macrorhyncha/E.rossii/E. goniocalyx*
031	LB	N	L	*E. macrorhyncha/E.rossii/E. goniocalyx*
007	LK	N		*E. macrorhyncha/E. rossii*
038	LB	ridge	L	*E. rossii/E. macrorhyncha/E. goniocalyx*
005	LK	W		*E. macrorhyncha/E. goniocalyx*
042	WN	S	L	*E. rossii/E. macrorhyncha/E. goniocalyx*
010	LB	ridge	H	*E. dalrympleana/E. dives*

Table 2 WINBURNDALE NATURE RESERVE SITE STRATIFICATION (Cont'd)

Site	Geology[1]	Aspect/ Landform	Altitude	Dominant Species
011	LB	E	H	*E. rossii/E. macrorhyncha*
026	LB	N	H	*E. macrorhyncha/E. mannifera*
019	LB	E	H	*E. dives/E. mannifera/E. dalrympleana*
039	LB	E	H	*E. dives/E. mannifera*
020	LB	W	H	*E. macrorhyncha/E. mannifera*
021	LB	S	H	*E. dives/E. mannifera*
035	LB	N	L	*E. macrorhyncha/E. rossii*
013	LB	N	H	*E. macroryhncha/E. rossii/E. mannifera*
034	LB	E	L	*E. macrorhyncha/E. rossii*
032	LB	gully	H	*E. macrorhyncha*
016	LB	S	H	*E. dives/E. macrorhyncha*
033	LB	S	L	*E. dives/E. mannifera*
043	WN	N	L	*E. macrorhyncha/E. goniocalyx*
045	WN	N	L	*E. rossii/E. goniocalyx/E. polyanthemos*
044	WN	gully	L	*E. goniocalyx/E. polyanthemos*
048	CC			*Callitris endlicheri*
049	CC			*Callitris endlicheri*

Notes: 1.

LK	*Limekiln Group sediments of the Lower Devonian age*
LB	*Lambie Group sediments of the Upper Devonian age*
WN	*Winburn Tuff geology of Lower Devonian age*
CC	*Conglomerate cliffs associated with the Winburndale Member of the Mount Horrible syncline*
H	*Greater than 1000 m altitude*
L	*Lower than 1000 m altitude*
N	*North*
S	*South*
E	*East*
W	*West*

dendrogram, whilst more exposed sites of north and western aspect tend to be grouped separately. Differentiation between the drier sites tends to be based on altitude, with some influence from soil moisture. Each community is described below.

2 *i. Mountain Gum-Broad-leaved Peppermint Forest*

An open forest or woodland community dominated by Mountain Gum (*Eucalyptus dalrympleana*) and Broad-leaved Peppermint (*E. dives*) occurs on level to gently inclined land at higher elevations in the nature reserve. Associated tree species include Snow Gum (*E. pauciflora*) and *Acacia falciformis*.

Flats with impeded drainage in the Big Flat area have a dense and shrubby understorey, and a medium density ground layer characterised by grasses and reeds. In these areas *Leptospermum grandifolium* is a common shrub species. Ground layer species include Common Reed (*Juncus usitatus*), Blue-leaved Snow Grass (*Poa sieberana* ssp. *cyanophylla*), Redanther Wallaby Grass (*Chionochloa pallida*) and *Lepidosperma tortuosum*.

Valleys support open forest communities where the most common trees are Mountain Gum, Snow Gum, Ribbon Gum (*E. viminalis*) and Red Stringybark (*E. macrorhyncha*). There is a shrub or small tree layer featuring Blackwood (*Acacia melanoxylon*). Patches of dense shrubs including *Coprosma quadrifida* and *Lomatia myricoides* also exist. The ground layer is dominated by Blue-leaved Snow Grass and Mat-rushes (*Lomandra* spp.).

3 *ii. River Oak Forest*

Alluvial flats along Winburndale Rivulet support open forest dominated by River Oak (*Casuarina cunninghamiana*). Associated tree species include Ribbon Gum (*E. viminalis*).

A low to medium density shrub layer and ground layer is present. Common shrub species include Tree Violet (*Hymenanthera dentata*) and Blackthorn (*Bursaria spinosa*). Ground layer species include Tussocky Poa (*Poa labillardieri*), Snow Grass (*Poa sieberana* ssp. *sieberana*), Forest Hedgehog Grass (*Echinopogon ovatus*), Spiny Mat-rush (*Lomandra longifolia*), *Senecio* sp. E and Weeping Meadow Grass (*Microlaena stipoides*).

4 *iii. Ribbon Gum Forest*

Sheltered valleys and south-facing slopes support an open forest or woodland community dominated by Ribbon Gum (*Eucalyptus viminalis*). Associated canopy species may include Mountain Gum (*E. dalrympleana*), Red Stringybark (*E. macrorhyncha*), Snow Gum (*E. pauciflora*) and Apple Box (*E. bridgesiana*). There is often a tall tree layer of *Acacia falciformis* and Blackwood (*Acacia melanoxylon*).

The shrub layer is of medium density with a medium to high density ground layer. Common shrub species include *Coprosma quadrifida*, Tree Violet (*Hymenanthera*

dentata), Blackthorn (*Bursaria spinosa*) and *Lomatia myricoides*. Ground layer species include Tussocky Poa (*Poa labillardieri*), Snow Grass (*Poa sieberana* ssp. *sieberana*), Forest Hedgehog Grass (*Echinopogon ovatus*), Spiny Mat-rush (*Lomandra longifolia*), *Senecio* sp. E, Weeping Meadow Grass (*Microlaena stipoides*), Bidgee Widgee (*Acaena novae-zelandiae*) and *Stellaria pungens*.

iv. Red Stringybark Forest

Upper slopes and plateaux on moderately inclined slopes and exposed plateaux support an open forest or woodland community dominated by Red Stringybark (*Eucalyptus macrorhyncha*), Mountain Gum (*E. dalrympleana*), Brittle Gum (*E. mannifera*) and Broad-leaved Peppermint (*E. dives*). Scribbly Gum (*E. rossii*) is another tree found within this vegetation unit.

There is generally a low density shrub layer and a medium density ground layer. Common shrub species include *Leucopogon microphyllus, Pultenaea microphylla, Monotoca scoparia*, Narrow-leaved Geebung (*Persoonia linearis*), *Daviesia leptophylla* and *Dillwynia phylcioides*.

Ground layer species include Redanther Wallaby Grass (*Chionochloa pallida*), *Aristida vagans*, Snow Grass (*Poa sieberana* ssp. *sieberana*), *Dianella revoluta* and *Lomandra filiformis*.

v. Black Pine Woodland

Shallow soils associated with conglomerate in the Middle Creek area support a woodland community dominated by Black Cypress Pine (*Callitris endlicheri*). Associated tree species include Long-leaved Box (*Eucalyptus goniocalyx*). The shrub layer is of low to medium density with a low density ground layer.

Common shrub species include *Mirbelia oxyloboides*, Fringe-myrtle (*Calytrix tetragona*), *Cassinia uncata, Melichrus urceolaris, Grevillea arenaria* and *Acacia penninervis*.

Ground layer plants include Redanther Wallaby Grass (*Chionochloa pallida*), Snow Grass (*Poa sieberana* ssp. *sieberana*), *Senecio* sp. E, Poison Rock Fern (*Cheilanthes sieberi*), *Luzula densiflora* and *Goodenia hederacea*.

vi. Red Stringybark-Scribbly Gum Woodland

Exposed slopes, with shallow, loamy soils generally below 1,000 metres elevation support a woodland community dominated by Red Stringybark (*Eucalyptus*

macrorhyncha) and Scribbly Gum (*E. rossii*). Associated tree species include Brittle Gum (*E. mannifera*), Apple Box (*E. bridgesiana*) and Long-leaved Box (*E. goniocalyx*).

There is a shrub layer of low to medium density and a ground layer of low to medium density.

Shrub species present include *Acacia penninervis, Acacia buxifolia,* Narrow-leaved Geebung (*Persoonia linearis*), *Bossiaea foliosa* and *Daviesia leptophylla.*

Ground layer species include Redanther Wallaby Grass (*Chionochloa pallida*), *Dianella revoluta, Wahlenbergia stricta* spp. *stricta, Stypandra glauca,* Plume Grass (*Dichelachne micrantha*) and Forest Hedgehog Grass (*Echinopogon ovatus*).

9a *vii. Ridgetop Woodland*

Rocky ridge crests and exposed sites below 1,000 metres support a woodland community dominated by Red Stringybark (*Eucalyptus macrorhyncha*), Long-leaved Box (*E. goniocalyx*) and Scribbly Gum (*E. rossii*). This community tends to occur on soils which are more shallow and rocky than that of Red Stringybark - Scribbly Gum Woodland. Apple Box (*E. bridgesiana*)is an associated tree species.

The shrub layer is generally of medium density with frequent patches of high density shrub growth. There is a low density ground layer. Common shrub species include *Cassinia uncata, Cassinia quinquefaria, Styphelia triflora,* Narrow-leaved Geebung (*Persoonia linearis*) and *Daviesia leptophylla.*

Ground layer species include Snow Grass (*Poa sieberana*), *Dichelachne micrantha, Stellaria pungens, Hardenbergia violacea* and *Hydrocotyle laxiflora.*

10 *viii. Western Foothills Woodland*

Slopes and gullies below 900 metres along the western edge of the reserve support woodland dominated by Red Box (*Eucalyptus polyanthemos*), Long-leaved Box (*E. goniocalyx*) and Scribbly Gum (*E. rossii*). Red Stringybark (*E. macrorhyncha*) is an associated tree species.

There is a very low density shrub layer and ground layer. Shrub species present include *Styphelia laeta,* Narrow-leaved Geebung (*Persoonia linearis*), *Acacia genistifolia, Acacia penninervis, Brachyloma daphnoides* and *Daviesia leptophylla.*

Ground layer species include *Lomandra filiformis,* Redanther Wallaby Grass (*Chionochloa pallida*), *Goodenia hederacea, Platysace ericoides* and Plume Grass (*Dichelachne micrantha*).

ix. Cliff-top Heath

Conglomerate cliffs south of Middle Creek and along Eskdale Road support heathland dominated by Fringe-myrtle (*Calytrix tetragona*). Associated shrub species include *Dillwynia phylicoides, Leucopogon ericoides* and *Acacia gunnii.* There are occasional emergent Brittle Gum (*Eucalyptus mannifera*) trees.

The ground layer is of medium density and includes grasses and herbs. Common ground layer species include *Brachycome ptychoclada,* Poison Rock Fern (*Cheilanthes sieberi*), Rock Isotome (*Isotoma axillaris*), *Danthonia monticola, Gnaphalium involucratum* and *Bracteantha bracteata.*

3.4 CONSERVATION ASSESSMENT

3.4.1 *Significant Plant Species*

One plant species listed as a Rare or Threatened Australian Plant (ROTAP) is included in the Service's ROTAP database for Winburndale Nature Reserve. This is Capertee Stringybark (*Eucalyptus cannonii*). The record is somewhat doubtful as Capertee Stringybark generally occurs on different geology to that found in the reserve. This species was not encountered in the reserve during field survey.

The reserve was found to support a range of plant species considered to be of conservation significance, as they are either uncommon in the region or at or near the known limit of their distribution. Details on these species are provided below.

i. Astrotricha ledifolia

Astrotricha ledifolia is a shrub to 1.5 metres in height with hairy branches (Harden, 1992). It is found in forests and woodlands in rocky areas at altitudes greater than 750 metres extending from the Central Tablelands through the Southern Tablelands to Victoria. It was found in Ribbon Gum Forest near Lagoon Creek in the reserve. This is close to the north-eastern limit of distribution for the species.

ii. Bossiaea foliosa

Bossiaea foliosa is a shrub to 1.5 metres tall which grows at high altitudes on hillsides, south from Mullions Range in the Orange District (Harden, 1991). It was found on a ridge to the south of Harpers Gully in Red Stringybark - Scribbly Gum Woodland,

where it is a dominant species in the shrub layer. This occurrence is believed to represent the north-eastern limit of distribution for the species.

iii. Brachycome ptychocarpa

Brachycome ptychocarpa is a small daisy to 16 centimetres in height which grows in moist areas. Harden (1992) notes that some plants from the Central Tablelands differ in having longer leaf lobes and larger flower heads. These could represent a new, closely related taxon. This plant form was found in Cliff-top Heath along Eskdale Road.

iv. Glyceria latispicea

Glyceria latispicea is a tufted perennial grass which may reach 1.1 metres high. It grows in wet areas in grasslands and adjacent to roads. Its range extends from the Central Coast to the Northern Tablelands and North Western Slopes. This grass was found in Ribbon Gum Forest on an alluvial flat along Dry Arm Creek. This location is the first record for this species in the Central Tablelands.

v. Leptospermum multicaule

Leptospermum multicaule is a shrub reaching two metres in height which grows on dry slopes in woodland, south from the Bathurst district (Harden, 1991). It was found in Ridgetop Woodland along the Dry Arm Creek Fire Trail, as an uncommon plant in the shrub layer. This location is believed to be the northern limit of distribution for the species.

vi. Schoenus turbinatus

Schoenus turbinatus is a tufted perennial sedge which grows in woodland and heath on sandy soils. Its range extends from Wooli on the North Coast and includes the Blue Mountains, Victoria and Tasmania (Harden, 1993). It was found in a patch of Ribbon Gum Forest in the catchment of Lagoon Creek. This is believed to be the western limit of distribution for the species.

3.4.2 *Conservation Status of Plant Communities*

The conservation status of plant communities present in Winburndale Nature Reserve is shown in *Table 3* and shows that:

- three plant communities: Mountain Gum - Broad-leaved Peppermint Forest, Red Stringybark Forest and Red Stringybark - Scribbly Gum Woodland are widespread and adequately conserved in New South Wales;
- two plant communities: River Oak Forest and Ribbon Gum Forest are widespread but inadequately conserved in part of their range; and
- one community: Western Foothills Woodland is considered vulnerable to extinction and inadequately conserved.

Table 3 CONSERVATION STATUS OF PLANT COMMUNITIES IN WINBURNDALE NATURE RESERVE

Community	Benson Association	NSW[1]
Mountain Gum - Broad-leaved Peppermint Forest	4. *E. radiata E. dives - E. dalrympleana*	N3
River Oak Forest	11. *Casuarina cunninghamiana*	N2
Ribbon Gum Forest	4. *E. viminalis*	N2
Red Stringybark Forest	4. *E. macrorhyncha - E. rossii*	N3
Black Pine Woodland	No related association	
Red Stringybark - Scribbly Gum Woodland	4. *E. macrorhyncha - E. rossii*	N3
Ridgetop Woodland	No clear relationship	
Western Foothills Woodland	4. *E. macrorhyncha - E. polyanthemos*	V2
Cliff-top Heath	No related association	

Key: 1. *See Table 1 for key to Conservation Code*

It was not possible to assign Ridgetop Woodland to a particular association as listed in Benson (1989). The other two communities, Black Pine Woodland and Cliff-top Heath are apparently restricted in range and are not discussed by Benson.

Black Pine Woodland is related to communities in which Black Cypress Pine is a co-dominant elsewhere in the Central Tablelands and Central Coast. These include communities on granite and sandstone in the Cox's River valley and the Wollondilly River valley respectively (Fisher, Ryan & Lembit, 1995). Cliff-top Heath occurs in small areas on cliffs in the Kanangra Walls area and around Cockerills Lookout in Kanangra-Boyd National Park. Both communities are considered restricted but adequately conserved.

Chapter 4

NANGAR NATIONAL PARK

This chapter describes the plant communities and significant plant species, and assesses the conservation status of communities in Nangar National Park.

4.1 SITE STRATIFICATION AND FIELD SURVEY

Nangar National Park includes areas of granite and sedimentary geology. Areas of granite geology occupy a small area of the park. Two replicates of flat and gully sites within the granite area were selected for sampling.

The sedimentary geology gives rise to two soil landscapes. These are Nangar, which is associated with low to rolling hills with slopes of 12 to 20 per cent; and Mandagery, which occurs on rolling to steep hills with slopes from 25 to 50 per cent. The Mandagery Soil Landscape is more widespread in the park. Replicated sites of five aspect/landform classes in the Mandagery Soil Landscape and three aspect/landform classes in the Nangar Soil Landscape were surveyed. Field survey was undertaken from 16 January to 19 January 1996.

Environmental attributes used in site stratification are provided in *Table 4. Figure 7* shows the survey site locations for this park.

4.2 PLANT COMMUNITY DESCRIPTIONS

PATN analysis identified four broad vegetation groups representing areas of granite geology, heathy woodland on Nangar Mountain, moist sites with deeper soils, and the remaining sites covering a range of attributes. These were classified into six woodland communities. Descriptions for each plant community follows.

i. Grey Box Woodland

A small area of Grey Box Woodland dominated by Grey Box (*Eucalyptus microcarpa*) occurs on a northerly aspect on granite geology, at the north-western corner of the park. Associated tree species include Blakely's Red Gum (*E. blakelyi*) and White Cypress Pine (*Callitris glaucophylla*).

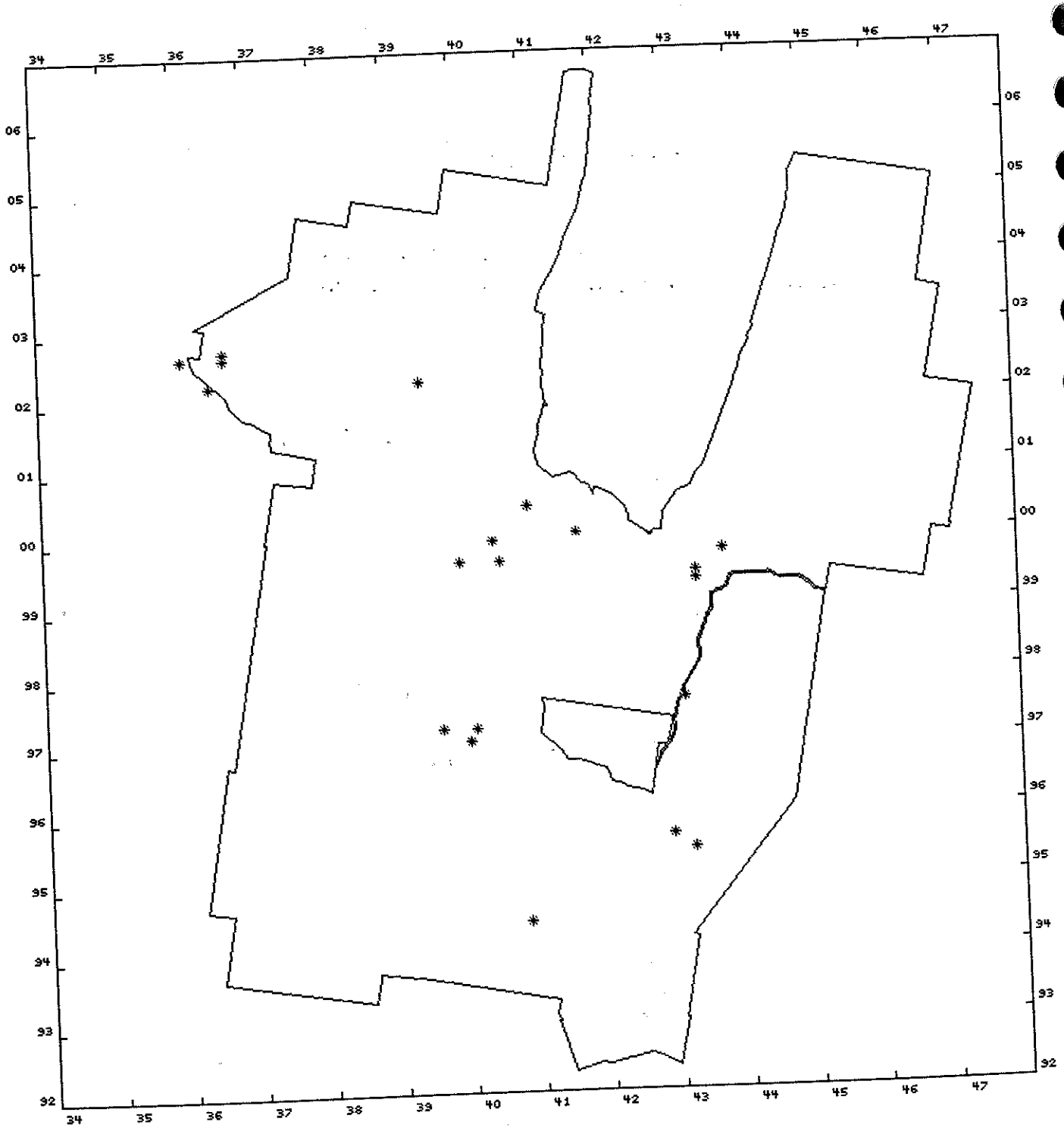

Figure 7 VEGETATION SURVEY SITES FOR NANGAR NATIONAL PARK

Table 4 NANGAR NATIONAL PARK SITE STRATIFICATION

Site	Geology	Soil landscape	Aspect/ Landform	Dominants
001	gran		flat	*E. microcarpa*
002	gran		flat	*E. dealbata/A.doratoxylon*
004	gran		gully	*Callitris glaucophylla/E. macrorhyncha*
003	gran		gully	*E. blakelyi/Callitris glaucophylla*
011	sed	mdg	N	*E. dealbata/A.doratoxylon*
005	sed	nan	N	*E. albens/Callitris endlicheri/E. sideroxylon*
014	sed	mdg	E	*E. albens/Callitris endlicheri*
009	sed	nan	gully	*E. sideroxylon/E. albens*
010	sed	nan	gully	*E. goniocalyx/E. polyanthemos*
006	sed	nan	N	*E. sideroxylon/E. macrorhyncha*
015	sed	mdg	S	*E. sideroxylon/E. macrorhyncha*
008	sed	nan	E/S	*E. sideroxylon/E. polyanthemos/E. macrorhyncha*
013	sed	mdg	E	*E. albens/Callitris endlicheri*
007	sed	nan	E/S	*E. goniocalyx/Callitris endlicheri*
012	sed	mdg	N	*E. rossii/Callitris endlicheri*
017	sed	mdg	flat	*E. macrorhyncha/E. rossii*
016	sed	mdg	S	*E. macrorhyncha/E. rossii*
019	sed	mdg	gully	*E. macrorhyncha*
018	sed	mdg	flat	*Callitris endlicheri*
020	sed	mdg	gully	*E. polyanthemos/E. macrorhyncha/Callitris endlicheri*

Notes:

GRAN	*granite*
SED	*sedimentary*
MDG	*Mandagery Soil Landscape*
NAN	*Nangar Soil Landscape*
N	*North*
E	*East*
S	*South*

There is a sparse layer of younger White Cypress Pine trees, a sparse shrub layer and a low density ground layer. The area has been affected by past grazing and timber extraction.

Shrub species present include *Acacia buxifolia* and *Acacia deanei.* Ground layer species include *Danthonia* sp., *Cheilanthes sieberi,* Weeping Meadow Grass (*Microlaena stipoides*) and *Phyllanthus hirtellus.*

ii. White Box Woodland

Low slope areas on Nangar Soil Landscape and moderately sloped sheltered areas on Mandagery Soil Landscape support White Box Woodland. Common tree species include White Box (*E. albens*), Mugga Ironbark (*E. sideroxylon*), Black Cypress Pine (*Callitris endlicheri*) and Tumbledown Gum (*E. dealbata*). In broader gullies with alluvial deposits Long-leaved Box (*E. goniocalyx*), Blakely's Red Gum (*E. blakelyi*) and Red Box (*E. polyanthemos*) are present.

The understorey is composed of a low density grassy ground layer, with few shrub species present.

Common ground layer species include Ringed Wallaby Grass (*Danthonia caespitosa*), Redanther Wallaby Grass (*Chionochloa pallida*), Snow Grass (*Poa sieberana* ssp. *sieberana*), *Scutellaria humilis*, *Cheilanthes sieberi*, Plume Grass (*Dichelachne micrantha*) and Sheep's Burr (*Acaena ovina*).

iii. Blakely's Red Gum - White Cypress Pine Woodland

Sheltered aspects and gullies on granite derived soils support a woodland community dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) and White Cypress Pine (*Callitris glaucophylla*). Associated tree species include Red Stringybark (*E. macrorhyncha*) and Kurrajong (*Brachychiton populneus*), and in areas of shallower, rocky soils, Tumbledown Gum (*E. dealbata*).

The understorey consists of a grassy ground layer of low to medium density. Only scattered shrubs are present. These include Currawang (*Acacia doratoxylon*), *Acacia buxifolia*, *Dampiera lanceolata* var. *lanceolata* and Kangaroo Thorn (*Acacia paradoxa*).

Ground layer species include Weeping Meadow Grass (*Microlaena stipoides*), Spear Grass (*Stipa scabra* ssp. *falcata*), Wallaby Grass (*Danthonia* sp.), Kidney Weed (*Dichondra repens*) and Plume Grass (*Dichelachne micrantha*).

iv. Red Stringybark - Scribbly Gum Woodland

Woodland dominated by Red Stringybark (*Eucalyptus macrorhyncha*) and Scribbly Gum (*E. rossii*) is widespread in the park occurring in areas of Mandagery and Nangar Soil Landscapes. This community is found on drier low slopes and tends to be less disturbed than areas of Mugga Ironbark Woodland.

Associated tree species include Black Cypress Pine (*Callitris endlicheri*), Mugga Ironbark (*E. sideroxylon*) and Long-leaved Box (*E. goniocalyx*). On sandy alluvial flats Red Box (*E. polyanthemos*) is also present.

The shrub layer and ground layers are sparse. Common shrub species include *Leucopogon attenuatus, Melichrus urceolaris, Monotoca scoparia, Styphelia triflora, Dillwynia phylicoides, Grevillea ramosissima, Grevillea floribunda* and *Phyllanthus hirtellus.*

The ground layer includes Redanther Wallaby Grass (*Chionochloa pallida*), *Pomax umbellata,* Snow Grass (*Poa sieberana* ssp. *sieberana*) and *Stypandra glauca.*

v. Mugga Ironbark - Red Stringybark Woodland

Woodland or open forest dominated by Mugga Ironbark (*Eucalyptus sideroxylon*) and Red Stringybark (*E. macrorhyncha*) is present on more sheltered slopes associated with Mandagery and Nangar Soil Landscapes. The sites tend to be disturbed by past logging operations, possibly reflecting their higher productivity than sites supporting Red Stringybark - Scribbly Gum Woodland. Associated tree species include Red Box (*E. polyanthemos*), White Box (*E. albens*) and Black Cypress Pine (*Callitris endlicheri*).

The shrub layer is of low to medium density and the ground layer is of low density. Common shrub species include *Acacia uncinata* and Native Cherry (*Exocarpos cupressiformis*). Ground layer species include Redanther Wallaby Grass (*Chionochloa pallida*), *Lomandra filiformis* and Weeping Meadow Grass (*Microlaena stipoides*).

vi. Tumbledown Gum Woodland

Tumbledown Gum Woodland occurs on rocky, exposed aspects in the park. The dominant species are Tumbledown Gum (*E. dealbata*) and Currawang (*Acacia doratoxylon*). Both woodland and low woodland forms are found within the park.

There is some variation in the shrub layer reflecting past land use, soil and aspect factors. There is a low shrub layer with a very sparse cover which includes regenerating White Cypress Pine (*Callitris glaucophylla*), *Phyllanthus hirtellus, Olearia ramulosa* and *Acacia buxifolia* in areas affected by high intensity grazing. Areas on Nangar Mountain support a moderately dense shrub layer. Common shrub species include *Philotheca salsolifolia,* Fringe-Myrtle (*Calytrix tetragona*) and *Platysace lanceolata.*

The ground layer is of low to medium density and dominated by grasses. Common species include Wallaby Grass (*Danthonia* sp.), Weeping Meadow Grass (*Microlaena stipoides*), *Stypandra glauca,* Burr Daisy (*Calotis cuneifolia*) and *Gonocarpus elatus.* In areas where shrub density is greater the ground layer is more sparse. In these areas common ground layer species include *Lepidosperma laterale, Gonocarpus elatus* and Plume Grass (*Dichelachne micrantha*).

4.3 CONSERVATION ASSESSMENT

4.3.1 *Significant Plant Species*

No Rare or Threatened Australian Plants (ROTAP) are included in the Service's ROTAP database for Nangar National Park. Similarly none of the plant species found in the park during the survey are ROTAPs, nor are any considered to be of particular conservation significance. This may reflect difficulties with species identification due to the timing of the survey and the climatic conditions prevailing at the time. Further searches for significant plant species should be undertaken in more favourable seasonal conditions. Particular habitats which should be searched include creeklines and the heathy woodland near the top of Nangar Mountain.

4.3.2 *Conservation Status of Plant Communities*

Whilst most plant communities could be assigned to one of the plant associations listed by Benson (1989), the Blakely's Red Gum - White Cypress Pine Woodland did not fall clearly within one of those associations.

Nangar National Park supports several communities considered to be vulnerable in New South Wales. These include Grey Box Woodland, White Box Woodland and Blakely's Red Gum - White Cypress Pine Woodland which occupy only small areas within the park, and Mugga Ironbark - Red Stringybark Woodland which occurs over much larger areas.

The conservation status of plant communities present in Nangar National Park is shown in *Table 5*. The table shows that:

- Grey Box Woodland and Blakely's Red Gum - White Cypress Pine Woodland are vulnerable, likely to become endangered with a few decades and are not conserved;
- White Box Woodland, Mugga Ironbark - Red Stringybark Woodland is inadequately conserved and vulnerable;
- Red Stringybark - Scribbly Gum Woodland is adequately conserved and not threatened in the foreseeable future; and
- Tumbledown Gum Woodland is not threatened in the foreseeable future but is inadequately conserved.

Table 5 CONSERVATION STATUS OF PLANT COMMUNITIES IN NANGAR NATIONAL PARK

Community	Benson Association	NSW[1]
Grey Box Woodland	6. *E. microcarpa - Callitris glaucophylla*	V1
White Box Woodland	6. *E. albens*	V2
Blakely's Red Gum - White Cypress Pine Woodland	? 6. *E. melliodora - E. blakelyi +/- Angophora floribunda*	V1
Red Stringybark - Scribbly Gum Woodland	4. *E. macrorhyncha - E. rossii*	N3
Mugga Ironbark - Red Stringybark Woodland	5. *E. sideroxylon*	V2
Tumbledown Gum Woodland	5. *E. sideroxylon - E. dealbata*	N2

Key: 1. *See Table 1 for key to Conservation Status*

? *Uncertain relationship with Benson (1989) associations*

Chapter 5

CONIMBLA NATIONAL PARK

This chapter describes the plant communities and significant plant species, and assesses the conservation status in Conimbla National Park.

5.1 SITE STRATIFICATION

Conimbla National Park includes areas of two soil landscapes, Nangar and Mandagery. Within each soil landscape replicates of four landform/aspect classes were surveyed. In the Nangar Soil landscape, replicates of northern and southern aspect creekline sites were surveyed. Field survey work was undertaken from 11th January to 2nd February 1996. Survey site stratification is shown in *Table 6* and locations on *Figure 8.*

5.2 PLANT COMMUNITY DESCRIPTIONS

PATN analysis identified four broad groups. The group towards the top of the dendrogram tended to include sites in the Yambira Mountain area and sheltered sites towards the east of the park. The middle group included predominantly drier sites in the eastern section of the park including sites dominated by Scribbly Gum (*E. rossii*) and White Cypress Pine (*Callitris endlicheri*) with a relatively diverse, heathy understorey. The two other groups represented different types of gully sites. These were classified into seven plant communities. The species composition and distribution of each community are described below.

i. Blakely's Red Gum - Box Woodland

Deeper alluvial soils along the bigger creeks support a woodland or tall woodland community dominated by Blakely's Red Gum (*Eucalyptus blakelyi*), Long-leaved Box (*E. goniocalyx*), Yellow Box (*E. melliodora*) and Apple Box (*E. bridgesiana*).There is a small tree layer which is dominated by Silver Wattle (*Acacia dealbata*) and Black Cypress Pine

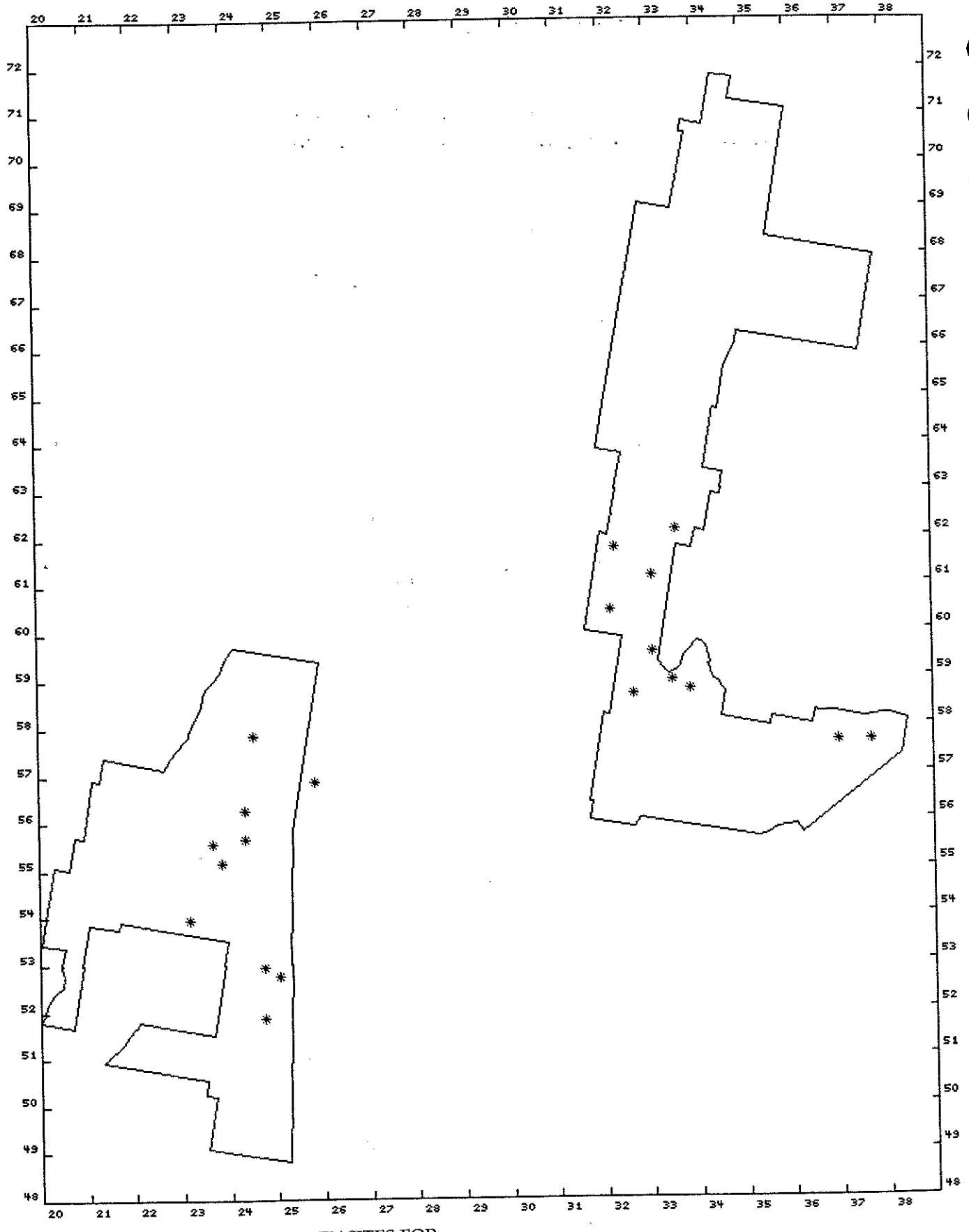

Figure 8 VEGETATION SURVEY SITES FOR CONIMBLA NATIONAL PARK

Table 6 CONIMBLA NATIONAL PARK SITE STRATIFICATION

Site	Soil Landscape	Aspect/ Landform	Dominant Species
001	mdg	W	*E. polyanthemos/Callitris endlicheri*
007	mdg	top	*E. goniocalyx*
003	mdg	E	*E. macrorhyncha/Callitris endlicheri*
004	mdg	E	*E. macrorhyncha/E. polyanthemos*
005	mdg	S	*E. macrorhyncha/E. goniocalyx*
014	nan	S	*E. rossii/E. macrorhyncha*
015	nan	flat	*E. rossii/E. macrorhyncha*
002	mdg	W	*E. macrorhyncha/E. dealbata/Callitris endlicheri*
008	mdg	top	*E. dealbata/Callitris endlicheri*
006	mdg	S	*E. rossii/Callitris endlicheri*
012	nan	E	*E. rossii/Callitris endlicheri*
013	nan	S	*E. rossii/Callitris endlicheri*
016	nan	flat	*E. rossii/Callitris endlicheri*
009	nan	N	*E. rossii/E. macrorhyncha*
010	nan	N	*E. rossii/Callitris endlicheri/E. dealbata*
011	nan	E	*E. dwyeri/Callitris endlicheri*
017		N gully	*E. polyanthemos/E. macrorhyncha*
018		N gully	*E. blakelyi/E. bridgesiana*
020		S gully	*E. blakelyi*
019		S gully	*E. goniocalyx/Callitris endlicheri*

Notes: *MDG* *Mandagery Soil Landscape*
NAN *Nangar Soil Landscape*
N *North*
S *South*
E *East*
W *West*

The ground layer is dense with species composition related to the height of the water table. The ground layer is dominated by *Carex appressa* in areas with a higher water table. Elsewhere, common ground layer species include Weeping Meadow Grass (*Microlaena stipoides*), *Geranium solanderi*, Hedgehog Grass (*Echinopogon ovatus*), *Cynoglossum* sp., Kidney Weed (*Dichondra repens*) and *Scutellaria humilis*.

ii. Conimbla Gully Woodland

Sheltered gullies in the eastern section of the park support a woodland community dominated by Red Box (*Eucalyptus polyanthemos*) and Red Stringybark (*E. macrorhyncha*). Associated tree species include Black Cypress Pine (*Callitris endlicheri*) and Mugga Ironbark (*E. sideroxylon*).

There is a low density shrub layer and a low to medium density ground layer. Shrub species present include *Pultenaea procumbens, Dillwynia phylicoides, Gompholobium huegelii* and Blackthorn (*Bursaria spinosa*).

Ground layer species include Redanther Wallaby Grass (*Chionochloa pallida*), *Opercularia hispida, Lepidosperma laterale, Veronica plebeia, Juncus remotiflorus* and *Cheilanthes sieberi.*

iii. Red Stringybark - Scribbly Gum Woodland

Low, sheltered slopes on Nangar Soil Landscape support woodland dominated by Red Stringybark (*Eucalyptus macrorhyncha*) and Scribbly Gum (*E. rossii*). Associated tree species include Black Cypress Pine (*Callitris endlicheri*) and Long-leaved Box (*E. goniocalyx*).

Black Cypress Pine is often present as a small tree layer of low to medium density. There is a medium density shrub layer and low density ground layer. Common shrub species include *Leucopogon virgatus, Persoonia rigida, Dillwynia phylicoides, Brachyloma daphnoides* and *Styphelia triflora.*

Ground layer species include Snow Grass (*Poa sieberana* ssp. *sieberiana*), *Lomandra filiformis, Lomandra multiflora, Wahlenbergia gracilis* and *Goodenia hederacea.*

iv. Conimbla Exposed Dry Woodland

Exposed sites with shallow rocky soils associated with the Mandagery Soil Landscape support a woodland community dominated by Tumbledown Gum (*Eucalyptus dealbata*) and Black Cypress Pine (*Callitris endlicheri*). Associated tree species include Scribbly Gum (*E. rossii*) and Long-leaved Box (*E. goniocalyx*).

The shrub and ground layers are of low density. Common shrub species include *Brachyloma daphnoides,* Fringe-myrtle (*Calytrix tetragona*), *Dodonaea viscosa* ssp. *spatulata, Persoonia rigida* and *Melichrus urceolaris.*

Ground layer species include Snow Grass, Redanther Wallaby Grass (*Chionochloa pallida*) and *Lomandra filiformis.*

v. Black Cypress Pine - Scribbly Gum Woodland

Soils associated with the Nangar Soil Landscape in the eastern section of the park support woodland dominated by Black Cypress Pine (*Callitris endlicheri*) and Scribbly Gum (*Eucalyptus rossii*). A wide range of tree species may be present and locally common. Associated tree species include Red Stringybark (*E. macrorhyncha*), Narrow-leaved Ironbark (*E. crebra*), Long-leaved Box (*E. goniocalyx*), Tumbledown Gum (*E. dealbata*), Mugga Ironbark (*E. sideroxylon*) and Dwyer's Red Gum (*E. dwyeri*).

A low to medium density shrub layer with occasional dense patches of *Allocasuarina diminuta* ssp. *diminuta*. The ground layer is typically very sparse. Other common shrub species include *Grevillea floribunda, Melichrus urceolaris,* Fringe-myrtle (*Calytrix tetragona*), *Monotoca scoparia* and *Dillwynia phylicoides*. Ground layer species include Redanther Wallaby Grass (*Chionochloa pallida*), *Lomandra filiformis, Lepidosperma laterale* and *Laxmannia gracilis*.

vi. Red Stringybark - Long-leaved Box Woodland

Sheltered south and east facing slopes on the side of Yambira Mountain support a woodland dominated by Red Stringybark (*Eucalyptus macrorhyncha*) and Long-leaved Box (*E. goniocalyx*). Associated tree species include Red Box (*E. polyanthemos*), Scribbly Gum (*E. rossii*) and Broad-leaved Ironbark (*E. fibrosa*).

There is a low density small tree layer featuring Black Cypress Pine (*Callitris endlicheri*), a low density shrub layer and a low to medium density ground layer.

Common shrub species include *Monotoca scoparia, Brachyloma daphnoides, Cassinia laevis, Dillwynia phylicoides, Styphelia triflora* and *Phyllanthus hirtellus*. Common ground layer species include Redanther Wallaby Grass (*Chionochloa pallida*), Snow Grass (*Poa sieberana*), *Helichrysum semipapposum, Derwentia perfoliata, Lomandra filiformis* and *Gonocarpus tetragynus*.

vii. Red Box - Red Stringybark Woodland

Shallower soils on steep slopes and exposed ridges of the Mandagery Soil Landscape at Yambira Mountain support a woodland dominated by Red Box (*Eucalyptus polyanthemos*), Red Stringybark (*E. macrorhyncha*) and Black Cypress Pine (*Callitris endlicheri*). Associated tree species include Long-leaved Box (*E. goniocalyx*) and Mugga Ironbark (*E. sideroxylon*).

There is a shrub layer of very low density and a low to medium density ground layer.

Common shrub species include *Brachyloma daphnoides, Monotoca scoparia, Melichrus urceolaris, Phyllanthus hirtellus* and *Styphelia triflora.* Common ground layer species include Redanther Wallaby Grass (*Chionochloa pallida*), Snow Grass (*Poa sieberana*), *Helichrysum semipapposum, Goodenia hederacea* and Plume Grass (*Dichelachne micrantha*).

5.3 CONSERVATION ASSESSMENT

5.3.1 Significant Plant Species

One plant species listed as a Rare or Threatened Australian Plant (ROTAP) is included in the Service's ROTAP database for Conimbla National Park. This is *Pseudanthus divaricatissimus,* which is recorded in the vicinity of Barryrenie Road, near the eastern edge of the park. Another population is recorded to the west of the park.

Pseudanthus divaricatissimus is a prostrate shrub with small green flowers. It is generally found in rocky sites at higher altitudes (Harden, 1990) in heath and woodland communities. It is found in the Central Tablelands, Central Western Slopes and Southern Tablelands to Victoria. Its risk code is 3RCa, and it is known from Blue Mountains, Budawang, Deua, Kanangra-Boyd and Morton national parks.

P. divaricatissimus was found on site CON010 during the field survey, close to the previous record on a rocky, north-facing slope in Scribbly Gum - Tumbledown Gum Woodland, where it was uncommon. Further assessment would be needed to determine population size within the park. In other locations it is found along fire trails and on borehole sites and appears reasonably resilient to disturbance. Observations by Roger Lembit in Blue Mountains National Park show that it resprouts from rootstock following fire.

Several other plant species considered to be of conservation significance were found in the park during the field survey. These species are discussed below.

i. Digger's Speedwell (Derwentia perfoliata)

Digger's Speedwell is an upright or sprawling woody herb or shrub which may reach over one metre tall. Its range extends south from the North Western Slopes and Central Tablelands through the slopes and tablelands to the South Coast and into Victoria. It generally occurs in drier sites than that of *Derwentia derwentiana* (Harden, 1992).

Digger's Speedwell was found on moderately steep slopes on the southern side of Yambira Mountain in Red Stringybark - Long-leaved Box Woodland in Conimbla National Park. This is thought to be the western limit of distribution for this species in the Central Western Slopes.

ii. Dichelachne sieberiana

Dichelachne sieberiana is a tufted annual or short-lived perennial grass which is widespread in woodland on fertile soils. Its range extends from the Northern Tablelands and North Western Slopes through coast and tablelands to Victoria. It was found in a sheltered valley in Red Box - Red Stringybark Woodland near the eastern edge of the park. This is the first record for the species in the Central Tablelands.

iii. Gratiola pedunculata

Gratiola pedunculata is an erect or sprawling herb to 50 centimetres tall, which grows on river, creek or lagoon banks and other damp places. It is widespread from coast to plains in New South Wales and also occurs in Queensland, Victoria and South Australia. It was found in Blakely's Red Gum - Box Woodland along Keewong Creek. This is the first record for the species in the Central Western Slopes.

iv. Hovea rosmarinifolia

Hovea rosmarinifolia is a shrub which reaches 1.5 metres tall. It occurs on poor sandy soils from Lithgow to Cowra and west to Gilgandra (Harden, 1991). It was found in Red Box - Red Stringybark Woodland on the steep eastern side of a gully. This location is close to the south-western limit of distribution for the species.

v. Indigofera coronillifolia

Indigofera coronillifolia is a shrub to 1.5 metres in height which occurs on ridges or rocky hillsides. Its range extends from Dubbo to Temora, including the Central Tablelands and Central Western Slopes. In Conimbla National Park, it was found on the western side of Yambira Mountain in Red Box - Red Stringybark Woodland. This is close to the southern limit of distribution for the species, which is less common towards the southern part of its range (Wilson, pers. comm.).

vi. Isolepis gaudichaudiana

Isolepis gaudichaudiana is a tufted annual sedge which occurs in moist open situations (Harden, 1993). Its range extends south from Armidale into Victoria and Tasmania. It was found in Blakely's Red Gum - Box Woodland along Keewong Creek. This is a new record for the species in the Central Western Slopes.

vii. Juncus fockei

Juncus fockei is a tufted perennial rush, which grows in damp situations across a wide range from Queensland to Victoria and Tasmania. It was found in Blakely's Red Gum - Box Woodland along Keewong Creek. This is the first record for the species in the Central Western Slopes.

viii. Persoonia sericea

Persoonia sericea is an erect or spreading shrub which grows in woodland communities. Its range extends north from Grenfell into Queensland. It was found in a sheltered valley in Red Box - Red Stringybark Woodland near the eastern edge of the park. This is close to the southern limit of distribution for the species.

5.3.2 *Conservation Status of Plant Communities*

The conservation status of the plant communities present in Conimbla National Park is shown in *Table 7.*

One plant community was difficult to assign to a plant association listed by Benson (1989). This was Blakely's Red Gum - Box Woodland.

Conimbla National Park supports two plant communities which are considered vulnerable to extinction in New South Wales. These are Conimbla Gully Woodland and Red Box - Red Stringybark Woodland.

Table 7 CONSERVATION STATUS OF PLANT COMMUNITIES IN CONIMBLA NATIONAL PARK

Community	Benson Association	NSW[1]
Blakely's Red Gum - Box Woodland	No clear relationship	
Conimbla Gully Woodland	4. *E. macrorhyncha - E. polyanthemos*	V2
Red Stringybark - Scribbly Gum Woodland	4. *E. macrorhyncha - E. rossii*	N3
Conimbla Exposed Dry Woodland	5. *E. sideroxylon - E. dealbata*	N2
Black Cypress Pine - Scribbly Gum Woodland	4. *E. macrorhyhcha - E. rossii*	N3
Red Stringybark - Long-leaved Box Woodland	4. *E. macrorhyncha - E. rossii*	N3
Red Box - Red Stringybark Woodland	4. *E. macrorhyncha - E. polyanthemos*	V2

Key: 1. *See Table 1 for key to conservation codes*

Chapter 6

WEDDIN MOUNTAINS NATIONAL PARK

This chapter describes the plant communities and significant plant species, and assesses the conservation status of communities in Weddin Mountains National Park.

6.1 SITE STRATIFICATION AND FIELD SURVEY

Two land system types were identified in Weddin Mountains National Park: the generally rocky, mountainous landform of the Weddin Range; and the footslopes area which support generally deeper colluvial soils. Within the footslopes land system, three replicates of ridge and gully classes were selected, distributed along eastern, western and southern aspects. Within the mountains land system replicates of seven landform/aspect classes were selected. Field survey work was undertaken from 16 to 19 January 1996. Survey sites are shown on *Figure 9*. Environmental attributes of sampling sites are described in *Table 8*.

6.2 PLANT COMMUNITY DESCRIPTIONS

PATN analysis differentiated the sites into four groups. The group at the top of the dendrogram represents exposed sites generally on the plateau. The next group includes a range of sites including sheltered and exposed sites. Further work is needed to clarify community relationships within this group. The third group represents sheltered, west facing gullies. The final group comprises gullies on the eastern and northern fall of the range. Five communities were classified from the analysis. The species composition and distribution of each community is described below.

i. Mugga Ironbark Woodland/Open-forest

Woodland or open forest dominated by Mugga Ironbark (*Eucalyptus sideroxylon*) is found on footslopes and deeper soils on the plateau, such as at Weddin Gap. Associated tree species include White Box (*E. albens*), Black Cypress Pine (*Callitris endlicheri*) and Blakely's Red Gum (*E. blakelyi*).

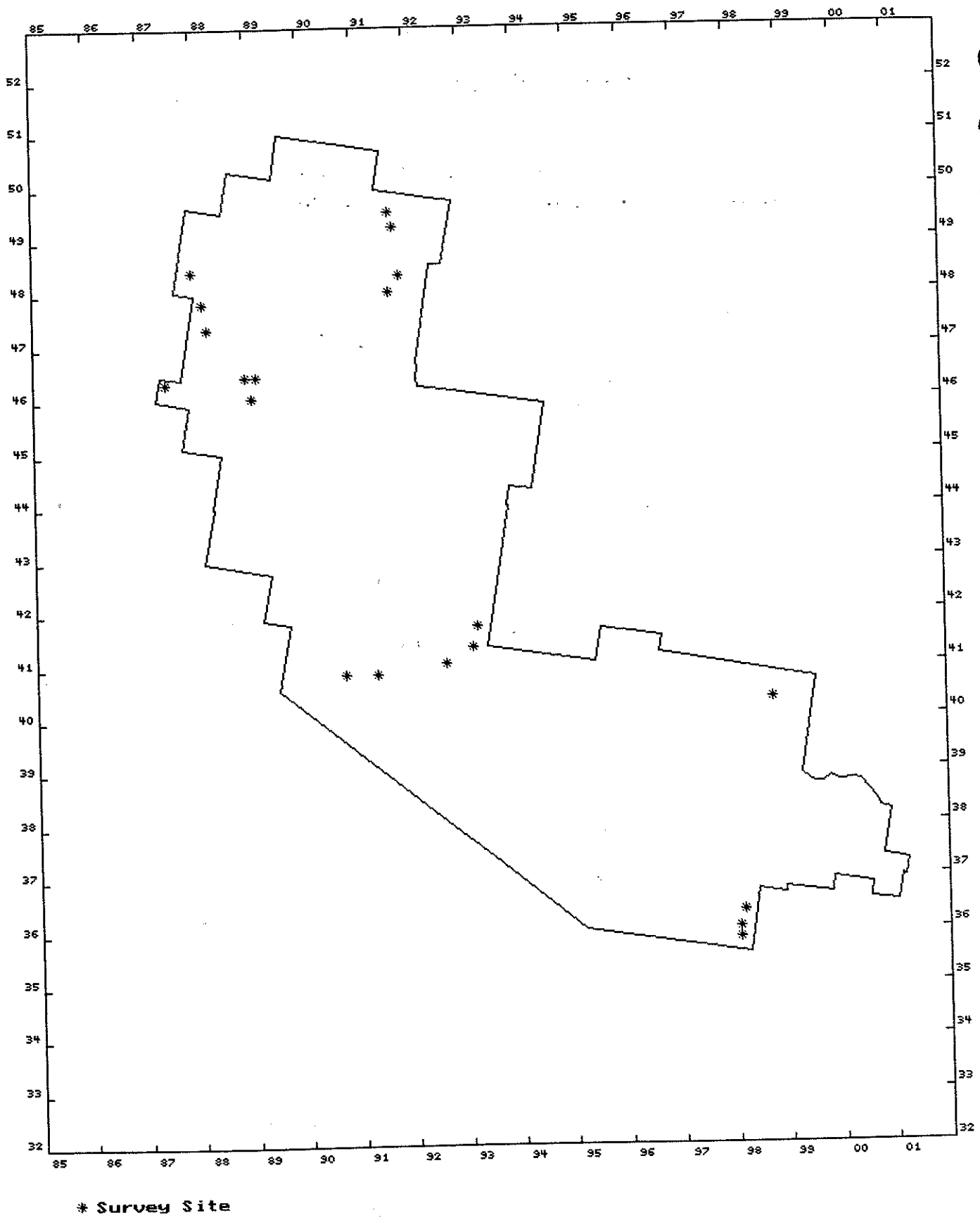

Figure 9 VEGETATION SURVEY SITES FOR WEDDIN MOUNTAINS NATIONAL PARK

Table 8 WEDDIN MOUNTAINS NATIONAL PARK SITE STRATIFICATION

Site	Geology	Aspect/ Landform	Slope	Dominant Species
001	sed	N/W	S2	*E. dwyeri/Acacia doratoxylon*
010	sed	flat		*E. dwyeri*
002	sed	N/W	S2	*E. dwyeri/Acacia doratoxylon*
011	sed	E	S	*E. dwyeri/Acacia doratoxylon*
015	fs	ridge		*E. sideroxylon*
003	sed	E	M	*E. sideroxylon/E.albens*
009	sed	flat		*E. sideroxylon/E. blakelyi*
018	fs	gully		*E. albens/E. sideroxylon*
019	fs	ridge		*E. sideroxylon/E. blakelyi*
020	fs	gully		*E. sideroxylon/E. blakelyi*
004	sed	E	M	*E. macrorhyncha*
005	sed	S		*E. macrorhyncha*
012	sed	E	S2	*E. rossii/E. macrorhyncha*
006	fs	gully		*E. dwyeri/Acacia doratoxylon*
014	sed	N/W	M	*E. fibrosa/Acacia doratoxylon*
007	sed	gully		*E. dwyeri/Acacia doratoxylon*
013	sed	N/W	M	*E. sideroxylon/Acacia doratoxylon*
008	sed	gully		*E. blakelyi*
016	fs	gully		*E. blakelyi*
017	fs	ridge		*E. albens*

Notes:

FS	*Footslope*
SED	*Sedimentary Geology of the Weddin Range*
N	*North*
S	*South*
E	*East*
W	*West*
M	*Moderate Slope*
S2	*Steep Slope*

The understorey includes a tall shrub or small tree layer of regenerating Black Cypress Pine and a low density ground layer dominated by grasses and lilies. At Weddin Gap there is a low to medium dense layer of shrubs to five metres. Shrub species present include Native Cherry (*Exocarpos cupressiformis*), *Acacia deanei* ssp. *paucijuga* and *Grevillea floribunda*.

Common ground layer species include Snow Grass (*Poa sieberana* ssp. *sieberana*), *Stypandra glauca, Gonocarpus elatus* and *Goodenia hederacea.*

ii. White Box Woodland

Woodland dominated by White Box (*Eucalyptus albens*) is found on east facing footslopes north of Euralderie Mountain. Associated tree species include Mugga Ironbark (*E. sideroxylon*) and Black Cypress Pine (*Callitris endlicheri*).

The understorey is composed of a medium density grassy ground layer, although there may be an intermediate layer of regenerating Black Cypress Pine and a very sparse shrub layer.

Shrub species present include *Cassinia laevis, Acacia penninervis* and Varnished Wattle (*Acacia verniciflua*).

Ground layer species include Ringed Wallaby Grass (*Danthonia caespitosa*), Spear Grass (*Stipa scabra* spp. *falcata*), *Bracteantha bracteata,* Wheat Grass (*Elymus scaber*), *Gonocarpus elatus* and Burr Daisy (*Calotis cuneifolia*).

iii. Blakely's Red Gum Woodland

Woodland dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) occurs in broader western gullies such as Black Gin Gully. On alluvial flats along Basin Gully there is an open forest dominated by Blakely's Red Gum. Associated tree species include White Cypress Pine (*Callitris glaucophylla*) and Kurrajong (*Brachychiton populneus*). The mistletoe, *Amyema miquelii,* is a common parasite of Blakely's Red Gum trees in this community.

There is a very low density shrub layer and medium to high density ground layer. Shrub species present include *Acacia penninervis,* Blackthorn (*Bursaria spinosa*) and *Indigofera adesmiifolia.*

Ground layer species include Weeping Meadow Grass (*Microlaena stipoides*), Ringed Wallaby Grass (*Danthonia caespitosa*), Kidney Weed (*Dichondra repens*) and *Geranium solanderi.* A range of exotic annuals are also found in the ground layer.

iv. Red Stringybark Woodland

Woodland dominated by Red Stringybark (*Eucalyptus macrorhyncha*) occurs on moderate slopes on south to eastern plateau aspects and on moderate to steep slopes on the side of the range. Black Cypress Pine (*Callitris endlicheri*) is an abundant

associated tree. Other tree species present include Long-leaved Box (*E. goniocalyx*) and Scribbly Gum (*E. rossii*).

There is a low density shrub layer and a low to medium density ground layer. Stands of regenerating Black Cypress Pine form a medium dense tall shrub or small tree layer. Common shrub species include *Daviesia leptophylla, Brachyloma daphnoides, Calytrix tetragona, Styphelia triflora, Grevillea floribunda* and *Persoonia rigida.*

Ground layer species include Snow Grass (*Poa sieberana* ssp. *sieberana*), *Lomandra filiformis, Dianella revoluta, Gonocarpus elatus, Stypandra glauca* and *Helichrysum semipapposum.*

v. Dwyer's Red Gum - Currawang Low Woodland

Low woodland, low open forest and tall shrubland formations on rocky, exposed plateau areas are dominated by Dwyer's Red Gum (*Eucalyptus dwyeri*) and Currawang (*Acacia doratoxylon*). Associated tree species may include Red Stringybark (*E. macrorhyncha*), Mugga Ironbark (*E. sideroxylon*), Scribbly Gum (*E. rossii*), Black Cypress Pine (*Callitris endlicheri*) and Broad-leaved Ironbark (*E. fibrosa*).

The shrub layer is low to highly dense with variation being related to aspect and soils depth. The ground layer density is usually low to very low. Common shrub species include *Cassinia laevis, Beyeria viscosa, Dodonaea viscosa* ssp. *spatulata, Lissanthe strigosa* and Fringe-myrtle (*Calytrix tetragona*).

Common ground layer plants include Snow Grass (*Poa sieberana*), Forest Hedgehog Grass (*Echinopogon ovatus*), Weeping Meadow Grass (*Microlaena stipoides*), *Stypandra glauca, Dianella revoluta, Lepidosperma laterale, Helichrysum semipappaosum* and *Cheilanthes sieberi.*

6.3 CONSERVATION ASSESSMENT

6.3.1 Significant Plant Species

No plant species listed as a Rare or Threatened Australian Plant (RoTAP) are included in the Service's RoTAP database for Weddin Mountains National Park. Similarly none of the plant species found in the park during the survey are RoTAPs. One species of conservation significance was found during the survey. Previous records indicate a further ten species which are at the limit of their distribution. These species are discussed below.

i. Pixie Caps (Acianthus collinus)

Acianthus collinus is a small orchid which grows in moist areas of low forest on hills and ranges between the Weddin Mountains and Warrabah national parks (Harden, 1993). It occurs from the Northern to Southern Tablelands and the Central and North Western Slopes. The Weddin Mountains National Park Draft Plan of Management incorrectly identifies this species as *Acianthus fornicatus* and records the park as being the western most location for the species. No location details are known.

ii. Garland Lily (Calostemma purpurea)

Garland Lily is a clump-forming lily whose flowering stems may reach 50 centimetres tall (Harden, 1993). It grows in woodland and shrubland along watercourses and clay flats. Its range extends westwards from Narrabri and Gilgandra into Queensland, South Australia and Victoria. The Weddin Mountains National Park Draft Plan of Management records the park as being the eastern most location for the species in the Central Western Slopes. During the field survey this species was found in the Seaton's Farm area.

iii. Dampiera purpurea

Dampiera purpurea is a low shrub to one metre tall which grows in forest and heath. It is widespread along the coast and ranges from Queensland into Victoria extending onto the Western Slopes in New South Wales. The Weddin Mountains National Park Draft Plan of Management records the park as being the western most location for the species in the Central Western Slopes. No location details are known.

iv. Autumn Wings (Eriochilus cucullatus)

Autumn Wings is a small orchid to 25 centimetres in height which is widespread in a variety of habitats and elevations from coast to subalpine environments (Harden, 1993). The park is the most inland occurrence of this species which is also found in coastal areas of South Australia. No location details are known.

v. Shrub Violet (Hybanthus floribundus)

Shrub Violet is a perennial woody herb or shrub which may reach 1.5 metres tall (Harden, 1990). It occurs on dunes in mallee communities or on rocky slopes. Its range extends from the New South Wales Central Western Slopes to Victoria, South Australia and Western Australia. The Weddin Mountains National Park Draft Plan

of Management records the park as being the eastern most location for the species in the Central Western Slopes. No location details are known.

vi. Lobelia gibbosa

Lobelia gibbosa is an upright herb to 65 centimetres which grows in woodland and forest communities on sandy soils (Harden, 1992). It is widespread in New South Wales and occurs in all other states. It was found in Mugga Ironbark Woodland on the north-eastern side of the park. This is the first record for the species in the Central Western Slopes.

vii. Small-leaf Daisy Bush (Olearia microphylla)

Small-leaf Daisy Bush is a shrub to two metres high which grows in forest and scrub communities. Its range extends north from Queanbeyan along the coast, tablelands and slopes into Queensland. The Weddin Mountains National Park Draft Plan of Management records the park as being the western most location for the species in the Central Western Slopes. No location details are known.

viii. Patersonia sericea

Patersonia sericea is a densely tufted herb which reaches 60 centimetres (Harden, 1993). It is found in forest, woodland and heath communities. It is widespread along the coast and ranges extending west to Dubbo and into Queensland and Victoria. The Weddin Mountains National Park Draft Plan of Management records the park as being the western most location for the species in the Central Western Slopes. No location details are known.

ix. Blunt Greenhood (Pterostylis curta)

Blunt Greenhood is a terrestrial orchid with green and brown flowers (Harden, 1993). It occurs in forest environments from the coast to the inland ranges and in Queensland, Victoria, Tasmania and South Australia. The park is the most inland occurrence of this species. No location details are known.

x. *Prostrate Bush Pea (Pultenaea procumbens)*

Prostrate Bush Pea is a sprawling or occasionally erect shrub which grows in forest, woodland and heath often on stony soils (Harden, 1991). Its range extends south from the Nandewar Range through tablelands and slopes into Victoria. The Weddin Mountains National Park Draft Plan of Management records the park as being the western most location for the species in the Central Western Slopes. No location details are known.

xi. *Tree Triggerplant (Stylidium laricifolium)*

Tree Triggerplant is a perennial small shrub which usually grows to 30 centimetres but may reach 150 centimetres in some situations. It grows in forest and heath usually in rocky places (Harden, 1992). It is widespread along the coast and ranges from Queensland into Victoria extending onto the Western Slopes in New South Wales. The Weddin Mountains National Park Draft Plan of Management records the park as being the western most location for the species in the Central Western Slopes. No location details are known.

6.3.2 *Conservation Status of Plant Communities*

The conservation status of the plant communities present in Weddin Mountains National Park is shown in *Table 9*.

Three plant communities found in Weddin Mountains National Park are representative of associations which are considered vulnerable to extinction in New South Wales. These are Mugga Ironbark Woodland, White Box Woodland and Blakely's Red Gum Woodland. Of these only Mugga Ironbark Woodland is widespread in the park.

Table 9 CONSERVATION STATUS OF PLANT COMMUNITIES IN WEDDIN MOUNTAINS NATIONAL PARK

Community	Benson Association	NSW
Mugga Ironbark Woodland	5. *E. sideroxylon*	V2
White Box Woodland	6. *E. albens*	V2
Blakely's Red Gum Woodland	6. *E. melliodora - E. blakelyi +/- Angophora floribunda*	V1
Red Stringybark Woodland	4. *E. macrorhyncha - E. rossii*	N3
Dwyer's Red Gum - Currawang Low Woodland	5. *E. sideroxylon - E. dealbata*	N2

Key: 1. *See.1 for key to conservation codes*

Chapter 7

RECOMMENDATIONS

This chapter documents recommendations for further survey work and data interpretation.

7.1 FUTURE SURVEY WORK

7.1.1 Plant Community Relationships

The overall clarity of plant community definition in the four reserves is good, however further work could assist in clarifying some plant community relationships. In particular, mapping of the vegetation patterns by aerial photograph interpretation is necessary. This will enable greater appreciation of the extent of each of the communities described in this report, identify communities of conservation significance due to restricted distribution, and provide necessary information for fire management planning.

Definition of plateau types in Weddin Mountains National Park requires further work. The field sampling and PATN analysis did not reveal clear patterns for the drier sites with shallow or skeletal soils where the impacts of the 1975 bushfire still appear to have major confounding influence. Location of additional sites in areas with a range of fire histories may clarify the complex vegetation patterns which exist in the area. Follow-up surveys of the plateau sites in future years should be considered a high priority.

Past timber extraction has had an impact on at least one plant community in Nangar National Park. Continued field sampling will assist in understanding recovery of the Mugga Ironbark - Red Stringybark Woodland which is the community which has been most affected by past logging operations. The dry conditions experienced during field survey probably had greatest impact on plant species identification in Nangar National Park. Further surveys should be conducted to determine whether any rare, threatened or significant plant species occur in this park. The heathy woodland near Nangar Mountain should be studied further as this area was not well sampled.

Plant community patterns in Conimbla National Park appear to be related to geographic location as well as soil landscape. Further work is needed to obtain a better understanding of dry woodland communities in this park.

7.1.2 *Significant Plant Species*

Information on the rare, threatened and significant plants in the four reserves is relatively scarce. The current survey revealed the presence of several plant species at distributional limits and resulted in several new records for the Central Tableland and Central Western Slopes Botanical Subdivisions. The location for one ROTAP species, *Pseudanthus divaricatissimus* was also confirmed. Further research is needed to gain an adequate profile of the rare, threatened and significant plants in the four reserves. In particular, the location and abundance of rare, threatened and significant plant species, their population sizes, and response to fire are not well understood

The discovery of several new records for the Central Western Slopes in creek systems in Conimbla National Park is of particular interest. These creeks should be targeted in future survey work.

7.2 CONCLUSION

The study incorporated literature review, field survey and data analysis for four reserves to describe the vegetation communities in each. Winburndale Nature Reserve was found to have the greatest species diversity with 276 species identified in nine plant communities.

Fewest species were recorded in Nangar National Park where 114 species were identified in six communities. Seven plant communities and 161 species, and five communities and 132 species were identified in Conimbla and Weddin Mountains National Park respectively.

Nine communities identified are included in vegetation associations considered vulnerable, based on the work of Benson (1989). *Pesudanthus divaricatissimus*, the only Rare Or Threatened Australian Plant (ROTAP) located in the reserves during the survey was recorded in Conimbla National Park. An additional 23 species considered regionally significant were identified across the reserves. However overall, information on ROTAPs and conservationally significant species is scarce.

Further work is recommended to map the plant community distributions in the reserves and provide more information on rare or threatened species distribution. Additional surveys may also provide information which will enable differentiation of vegetation complexes described.

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APPENDICES

Appendix A

ANNOTATED BIBLIOGRAPHY

Twenty reports and publications were reviewed to obtain background information on the plant communities of the Central Western Slopes and Central Tablelands. These are listed below and a summary of the information obtained from each follows.

1 FCNSW (1967). Forest Types of the New South Wales Cypress Pine Zone. Technical Paper 8.

The various forest types found within the Cypress Pine zone are described. The Cypress Pine zone is the area within which Cypress Pine occurs in the Central Division including most of the North Western Plains (NWP), Central Western Plains, Riverina and parts of the South and Central Western Slopes (SWC/CWS) and most of the North Western Slopes.

Cypress Pine is found to occur in association with mixed eucalypt stands. Species which it commonly occurs with include White Box (*Eucalyptus albens*), Bimblebox (*E. populnea*), Mugga Ironbark (*E. sideroxylon*) and Red Gum (*E. dealbata*) .

2 Sivertsen, D. (1993). Conservation of remnant vegetation in the box and ironbark lands of New South Wales. *The Victorian Naturalist,* **110**(1).

This study explores the clearing of box and ironbark communities which once covered up to 90 per cent of New South Wales. Included are the processes of change, effects on biodiversity and the implications for conservation of box and ironbark lands in New South Wales. The greatest threats were found to be clearing and grazing.

3 Sivertsen, D. (1995). Habitat loss - its nature and effects (including case studies from New South Wales). In, Bradstock, R.A., Auld, T.D., Keith, D.A., Kingsford, R.T., Lunney, D. and Sivertsen, D.P. (Eds.). *Conserving Biodiversity: Threats and Solutions.*

This study discusses habitat loss by region including the Central West. Findings of this study conclude that 76 per cent of native vegetation in the Central West has been cleared. Up to 3,500 separate remnants remain although more than 90 per cent are less than five kilometres squared in area. Also discussed are the implications for biodiversity including ecosystem population, genetic and species diversity.

4 Sivertsen, D. and Metcalfe, L. (in press). Natural Vegetation of the Southern Wheatbelt (Forbes and Cargelligo 1:250,000 map sheets). For publication in *Cunninghamia.*

Twenty different vegetation units were mapped based on vegetation delineation, preliminary classification and sampling stratification from aerial photograph

interpretation. A total of 582 vascular plants were recorded including 117 exotic and three nationally rare and endangered species.

- *Eucalyptus camaldulensis/E. largiflorens* on floodplains;
- *Eucalyptus populnea/E. microcarpa/E. conica/E. intertexta* on heavier peneplain soils;
- *Eucalyptus socialis/E. gracilis/E. dumosa/E. oleosa* on lighter peneplain soils;
- *Eucalyptus dwyeri/E. sideroxylon* in hills and footslopes remnants;
- White Cypress Pine found throughout the area.

5 National Parks Association (1994). *Hervey Curumbenya Ranges Study. Proposal for Wiradjuri National Park.*

Eight vegetation communities were identified. These were:

- Mugga-Ironbark-Black Cypress Pine, distributed throughout the area;
- Gum and Box associations along larger creeks and flats;
- Grey Box (*Eucalyptus microcarpa*) on flatter ground;
- White Box (*Eucalyptus albens*) on poor rocky ground above 500 metres ASL and after fire;
- White Gum (*E. rossii*) above 400 metres ASL;
- Red Stringybark (*E. macrorhyncha*) restricted in distribution on ridges in exposed locations;
- Tumbledown Gum/Dwyer's Red Gum (*E. dealbata/dwyeri*); and
- heath restricted to ridgetops on rocky outcrops at lower altitudes.

Four species of conservation significance were identified. These were:

- *Eriostemon ericifolius;*
- *Eucalyptus viridus;*
- *Melaleuca uncinata;* and
- *Olearia passerinoides.*

6 Howard, R. (1993). *Summary of the State Forests Found Within the Western Slopes and Southern Tablelands of New South Wales, Australia.*

Three state forests located with the district were described. These were Weddin, Bendick Murell and Keverstone state forests. Weddin State forest is adjacent to Weddin Mountains National Park. The area is described as flat to slightly undulating and extensively logged and grazed towards its western boundary.

In the western section the canopy consists of Cypress Pine and ironbarks. Shrubs increase towards the east. The distinction between the national park and state forest is obvious due to the large amount of regrowth in the national park.

7 Fisher, A. (undated). *Effects of Landscape Fragmentation and Land Management Practices on Birds and Bats in the Bathurst Region. Implications for Conservation and Sustainable Agriculture.*

A number of key vegetation types were identified in the area from Sunny Corner across the Macquarie Basin. These were:

- *Eucalyptus dalrympleana* forest;
- *E. pauciflora* woodland;
- *E. fastigata;*
- *E. rossii - E. dives - E. dalrympleana;*
- *E. rossii - E. manifera;*
- *E. viminalis;*
- *E. macrorhyncha - E. polyanthernas;*
- *E. goniocalyx;*
- *E. melliodora - E. blakelyi;*
- *E. albens;*
- *Casuarina cunninghamiana;* and
- *Angophora floribunda.*

8 Goldney, D.G. and Bowle, I.J.S. (1990). *Some Management Implications for the Conservation of Vegetation Remnants and Associated Fauna in the Central Western Region of New South Wales.*

This study considered three climate-based ecological regions, reflecting variations in climate, geology and soils. In the Lithgow - Bathurst area the vegetation was found to range from open forest to open shrub communities dominated by *Angophora, Eucalyptus* and *Allocasuarina* species. Pockets of rainforest and various heath species also occur.

Twelve major alliances ranging from open forest to mallee woodland dominate the tablelands, slopes and plains. Changes to sandstone complex communities in recent times are thought to relate to fire. Restricted communities occupy swamps and cliff faces which are significant for the occurrence of rare species.

On tablelands, *Casuarina cunninghamiana* alliances have undergone a high degree of disturbance. Other alliances occurring on the tablelands include:

- *Eucalyptus fastigata/E. viminalis* alliance on most favourable sites;
- *E. macrorhyncha/E. rossii* alliance on less favourable sites;
- *E. melliodora/E. blakelyi* and *E. albens.*
- White Cypress Pine alliances occur on the slopes to plains. These alliances are less disturbed than others due to their importance to the forestry industry.

Grevillea divaricata and *Euphrasia arguta* are considered extinct in the district. Up to 95 species considered rare or threatened have been identified, with approximately 56 per cent conserved in national parks on the eastern border of the region. The remaining 44 per cent are found elsewhere but may not be adequately conserved.

9 Prober, S.M. (undated). *Conservation of the Grassy White Box Woodlands. Implications of Rangewide Floristic Variation for Reserve Design.*

The box woodlands are considered amongst the most poorly conserved ecosystems. Reserves of White Box woodlands are few and are not representative of natural variation. Most existing reserves occur on soils of poor capability. The best opportunities for conservation of these woodlands on high quality soils are in cemetery remnants, rail easements, travelling stock routes and roadsides.

10 Denholm, R. (1986). *Remnant Areas and Conservation Themes in the Central West.*

This review found that the box woodlands once constituted the most extensive ecosystem in New South Wales, and that the Central West encompasses approximately 20 remnant ecosystems with only seven per cent in areas greater than 500 hectares. These comprise the following alliances:

- Tableland alliance - Red Gum, White Gum (wet sclerophyll and dry sclerophyll forest; and Ribbon Gum;
- Ironbark alliance - ironbark, black pine dry sclerophyll forests, and stringybark; and
- box woodland alliance - box, white pine woodlands, and mallee.

11 Bower, C.C. (1986). *Rare and Endangered Plants and Animals of the Central West.*

This paper identified seven flora species occurring in the Central West which are considered rare and endangered. A brief description of each is provided.

Lepidium aschersonii - This species occurs on the edge of saltmarshes and was formerly widespread in New South Wales (including the Western Slopes), Victoria and Western Australia. It is possibly now extinct in New South Wales. Small threatened populations in Victoria have been reduced by clearing and grazing by stock and rabbits.

Lepidium hyssopifoluim - This species was formerly widespread in grassy woodlands of New South Wales, Victoria and Tasmania. It occurs on better soils and is now considered very rare with its entire range being farmed. Clearing and grazing have reduced the population to dangerously low levels.

Phyllota humifusa - *P. humifusa* is a prostrate shrubby pea thought to have always been restricted in distribution. Only two populations are known from Mittagong and Penrose, some distance from the locations of the reserves considered in this project.

Swainsona plagistropis - This species was once widespread throughout inland New South Wales and Victoria but is now restricted to roadsides and railway reserves in Victoria.

S. plagiotropis is susceptible to grazing and appears to require fire for seed germination. Identified threats include herbicides, roadworks, lack of fire and weed competition.

Swainsona recta - This is a species of grassy woodlands found on the Western Slopes of New South Wales and Victoria. It is threatened by grazing, clearing and lack of fire.

Prostanthera stricta - It is considered that this species would have been uncommon prior to European settlement and is now only known from Mt Vincent near Alford on sandstone at a basalt flow junction.

Euphrasia arguta - Fourteen collections, including one near Bathurst have been made but this species has not been seen for 75 years. It was found in meadows and was probably always rare. *E. arguta* is now considered extinct in the region.

12 Turner, R.J. (1986). *Effect of Fire on Birds - Weddin Mountain.*

A brief description of the topography, soils and vegetation are provided. Those identified are:

- White Cypress Pine on flat country of the foothills;
- *Eucalyptus melliodora/E. woollsiana/E. albens/E. conica/ E. blakelyi* on deep sandy soils;
- Black Cypress Pine - *Eucalyptus sideroxylon* and *E. dwyeri* on upslopes in shallower soils; and
- *Eucalyptus macrorhyncha - E. rossii* on sideslopes

13 National Parks Association (1986). *Natural Regions of New South Wales and their Major Vegetation Communities.*

The Central Western Slopes are defined as the undulating to hilly slopes of the Great Dividing Range. These are dominated by White Box (*Eucalyptus albens*) woodlands. Open forests dominate the hills where *E. macrorhyncha* communities dominate in the east and *E. sideroxylon - E. dealbata* occur elsewhere. The western and northern woodland areas are dominated by *E. woollsiana* with limited areas of mallee.

The information provided above gives the background to the vegetation communities which might be found within the reserves. However it does highlight that much of the native vegetation in the region has been cleared and that little is known of the remaining natural areas.

14 Schrader, N. (1987). Plants of the Parkes Shire. In, Schrader, N. (Ed.). *The Flora and Fauna of the Parkes Shire*. Parkes Naturalist Group.

An annotated checklist of all plant species identified in the Parkes Shire is provided from field surveys. Over 440 plant species have occurred within the shire boundaries. Two broad vegetation types are known from the shire. These are dry sclerophyll woodland and sub-humid woodland. The study discusses environmental parameters influencing the distribution and composition of these vegetation communities.

Dry sclerophyll woodland includes the following communities:

- White Gum woodland on ridgetops in the east on rocky soil above 500 metres ASL;
- Red Stringybark woodland on ridgetops and slopes in the east above 400 metres ASL;
- Red Ironbark woodland in a continuous strip along the eastern ranges above 350 metres ASL; and
- Tumbledown Gum / Dwyer's Gum along most ridges.

Five vegetation communities have been identified associated with sub-humid woodland:

- White Box woodland as isolated stands in ranges;
- Grey Box woodland reduced to stands along roads or stock routes;
- Fuzzy Box woodland along watercourses or more fertile land;
- Bimble Box woodland on lower floodplains or along watercourses; and
- River Red Gum along all watercourses or swamps.

15 Bower, C.C. and Semple, W.S. (1993). *A Guide to the Eucalypts of the Central West of New South Wales.* CaLM Technical Report No. 30.

This extract lists the vegetation alliances and associations in the Central West. Alliances identified were:

- *Eucalyptus fastigata - E. viminalis* (Brown Barrel - White Gum) open forest in high altitude areas above 900 metres ASL;

- *Casuarina cunninghamiana* (River She-oak) open forest along major rivers and creeks at lower altitudes or tablelands and slopes below 700 metres ASL;
- *E. macrorhyncha - E. rossii* (Red Stringybark - Inland Scribbly Gum) open forest and woodland on dry ridges at about 1000 metres to low hills at 250 metres;
- *E. dealbata - E. sideroxlyon* (Tumbledown Red Gum - Mugga Ironbark) open forest and woodland on slopes of dry hills on poorer soils;
- *E. microcarpa* (Western Grey Box) woodland on lower Central Western Slopes on gently sloping or flat areas;
- *E. pauciflora - E. stellulata* (Snow Gum - Black Sally) woodland at higher altitudes above 800 metres;
- *E melliodora - E. blakelyi* (Yellow Box - Blakely's Red Gum) woodland on agricultural lands on western slopes;
- *E. albens* (White Box) woodland on upper Western Slopes; and
- *E. camaldulensis* (River Red Gum) woodland on riverine floodplains.

16 Anon (undated). *Disappearing Islands : The Proceedings of a Seminar on Conservation and Co-operation in the Central West.*

This report lists 12 extinct or endangered plant species and 89 rare plant species, including localities, in the Central Western Botanical Division of New South Wales. It also lists 24 species of special significance in the Central West.

17 Prober, S.M. and Thiele, K.R. (1991). The ecology and genetics of remnant grassy white box woodlands in relation to their conservation. *The Victorian Naturalist,* **110**(1):30-6.

White Box dominated woodlands with a grassy understorey originally covered vast areas of the wheatbelt from northern Victoria to southern Queensland. Today they are one of the most poorly conserved ecosystems in Australia. Only three small sites with natural tree cover and unmodified understorey have been found. This report summarises the distribution, ecology, history and current status of White Box woodlands and presents preliminary results and recommendations from research directed towards a conservation strategy of these woodlands.

18 Prober, S.M. and Thiele, K.R. (1995, in press). *Conservation of the Grassy White Box Woodlands: Relative Contributions of Size and Disturbance to Floristic Composition and Diversity of Remnants.* Centre for Plant Biodiversity Research.

This study examined and compared the effects of fragmentation and disturbance on the understorey vegetation of grassy White Box woodland remnants, surveying remnants of varying size, grazing history and tree clearing. Results found that the least-grazed remnants are most representative of pre-European White Box woodland understoreys and should be central to any conservation plan for the woodlands.

19 Cardale, S. (1987). Vegetation. In, Goldney, D.C. and Bowie, I.J.S. (Eds.). *Vegetation in the National Trust of Australia (NSW). Scenic and Scientific Survey of the Central Western Region.* A report to the Australian Heritage Commission Vol. 1.

This report considers the factors causing changes in vegetation alliances on an east - west transect through the Central Western region. Changes include vegetation structure and species composition of vegetation types. The significance of flora of the Central West region is discussed.

Vegetation types of the region fall into three main categories. These are :

- sandstone complex with the western boundary in the Lithgow area;
- vegetation of the Orange - Bathurst - Carcoar - Portland district west of the sandstone boundary on the Central Tablelands; and
- vegetation of the Central Western Slopes and Plains, and Western Plains sub-region.

20 Beukers, M. (1995). *Options for Conserving Biodiversity in Bathurst District (DRAFT).*

This report discusses the results of the Bathurst District Biodiveristy Project. It provides information on soils, vegetation communities including remnant communities, corridors, scattered vegetation, biodiversity, conservation value and management.

Broad vegetation systems, native ecosystems / vegetation alliances and those of conservation concern, flora and fauna species diversity and species of conservation concern are discussed.

Vegetation alliances of conservation concern are:

- forest alliances - *Eucalyptus fastigata / E. viminalis* and *E. dealbata / E. sideroxylon;*
- grassy woodland - *E. melliodora / E. blakelyi, E. albens, E. microcarpa* and *E. populnea / Callitris* spp.;
- riverine alliances - *Casuarina cunninghamiana* and *E. camaldulensis* communities; and
- wetland alliances - floodplain mosaics and *Lignum* spp. shrublands.

Sixteen RoTAP species have been recorded for Bathurst district with another four species identified as being rare and of some conservation concern in the Central Western region. Twenty one species have become extinct in the Central Western region, 38 species are identified as regionally endangered and 52 regarded as rare.

Appendix B

PHOTOGRAPHIC SUPPLEMENT

PLATE B1: WIN001

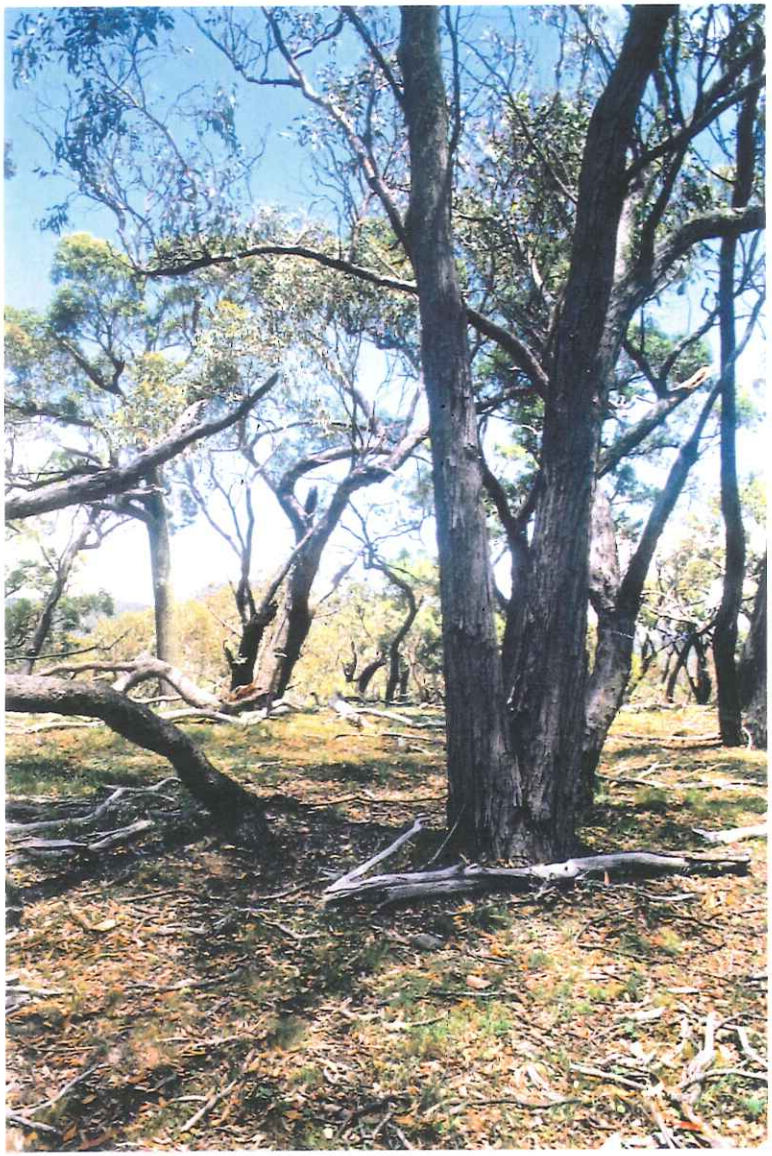


PLATE B2: WIN002

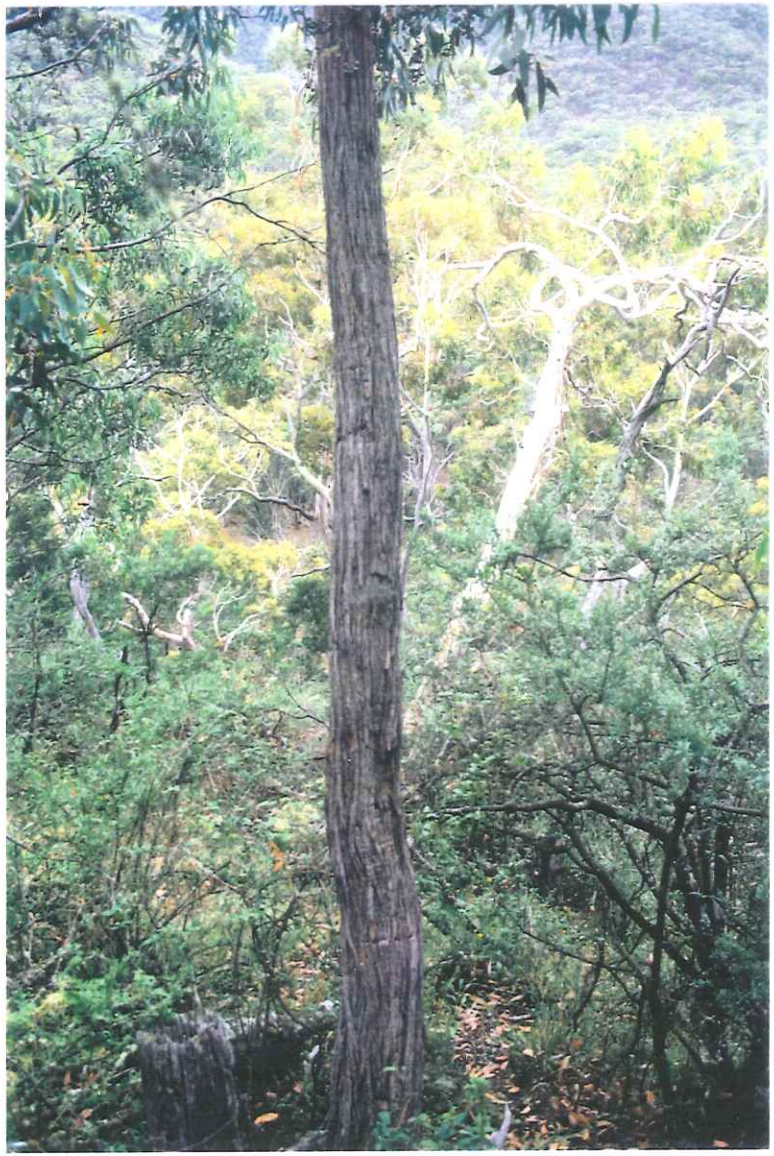


PLATE B3: WIN003

PLATE B4: WIN004

PLATE B5: WIN005

PLATE B6: WIN006

PLATE B7: WIN007

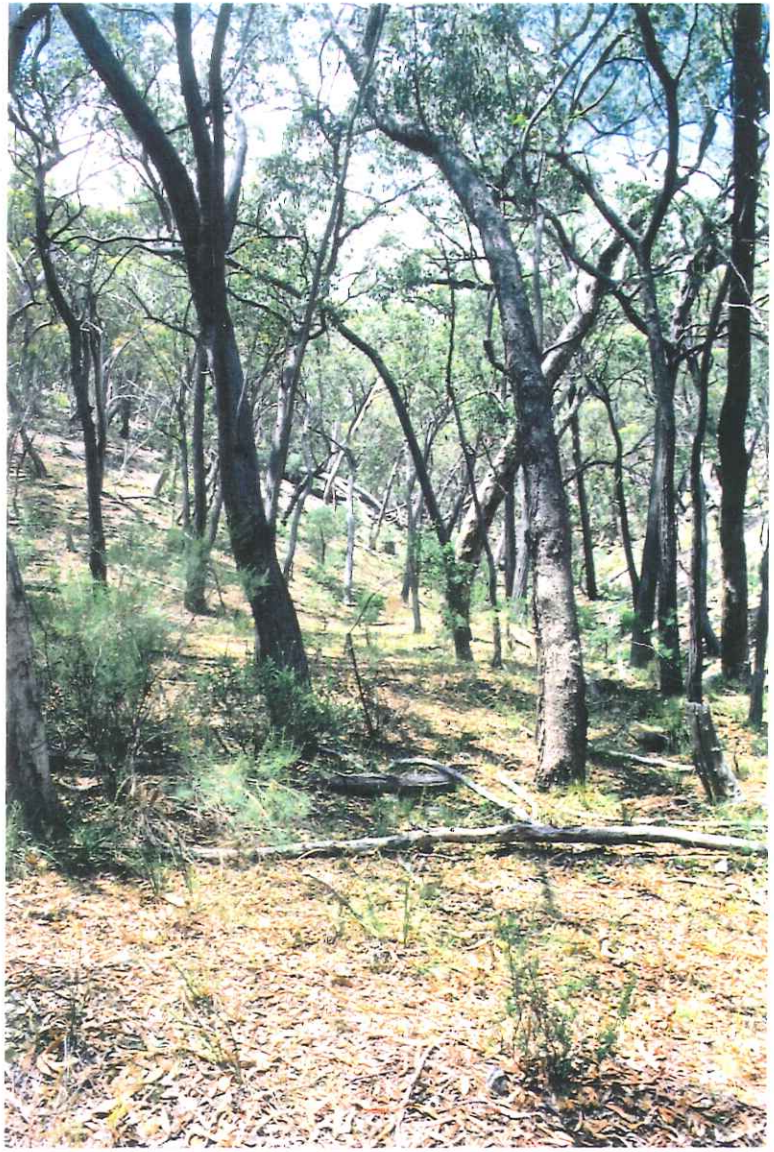


PLATE B8: WIN008

PLATE B9: WIN009

PLATE B10: WIN010

PLATE B11: WIN011

PLATE B12: WIN012

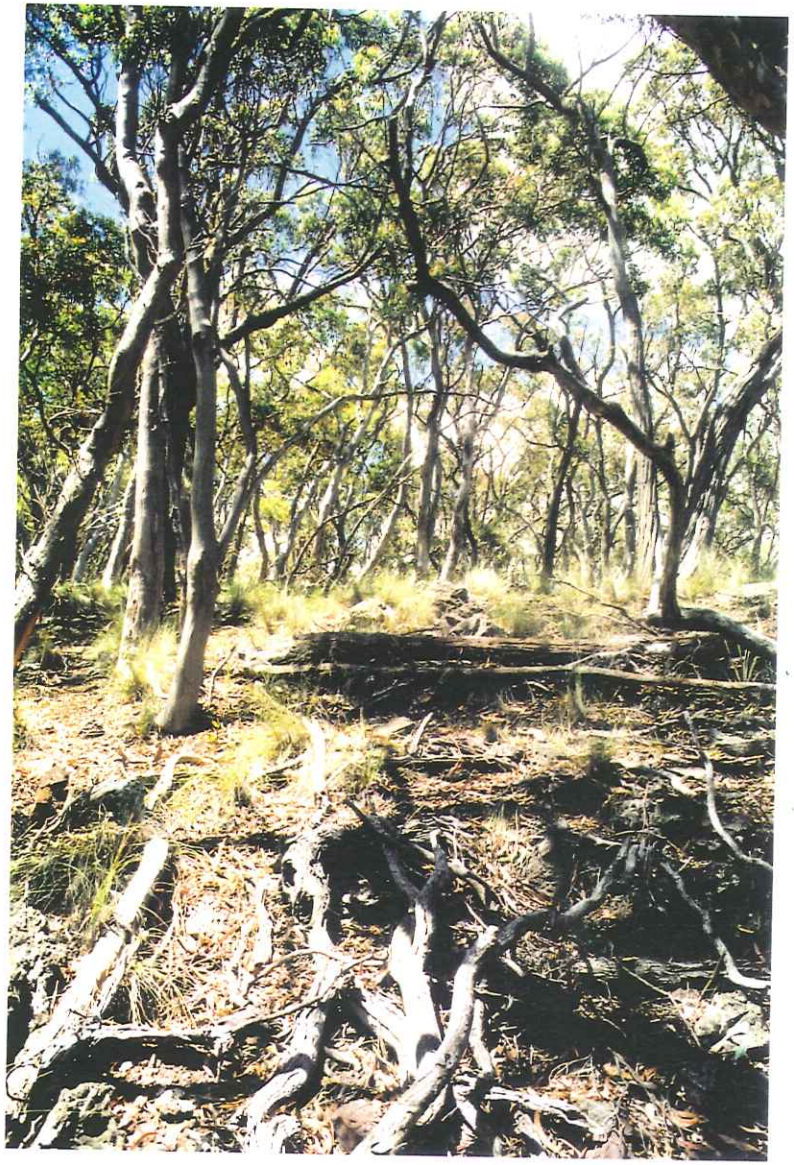
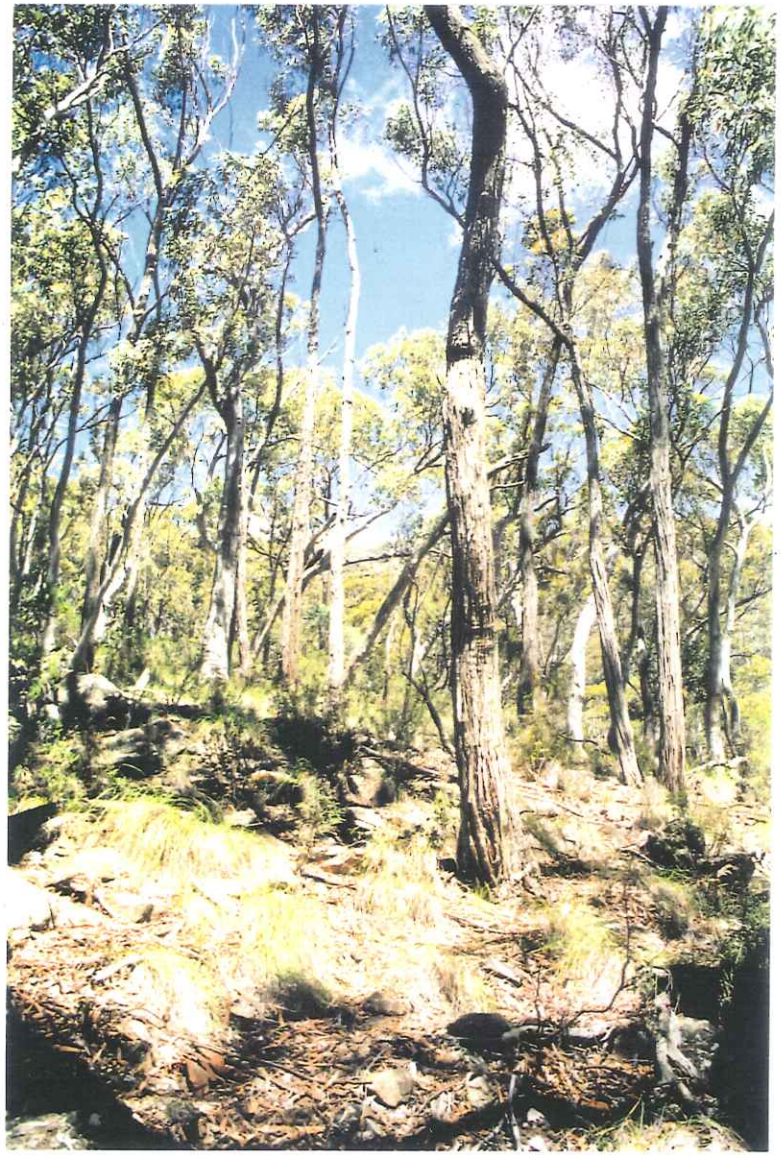


PLATE B13: WIN013

PLATE B14: WIN014



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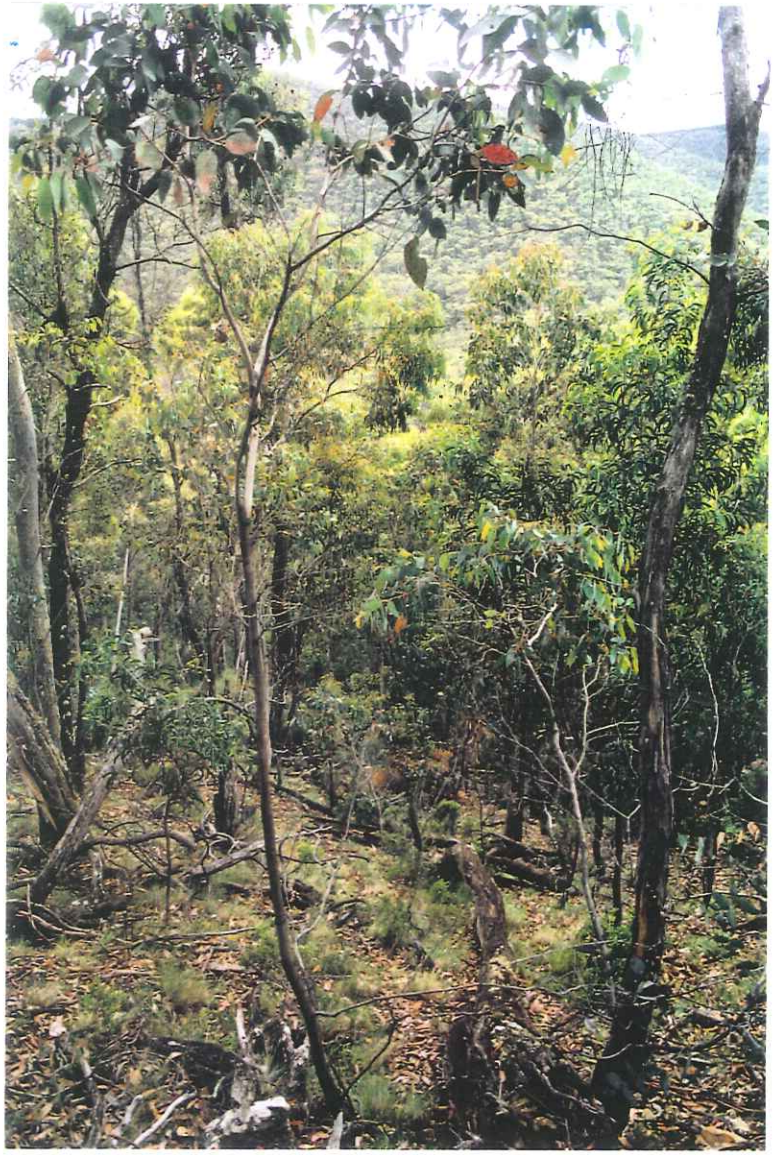

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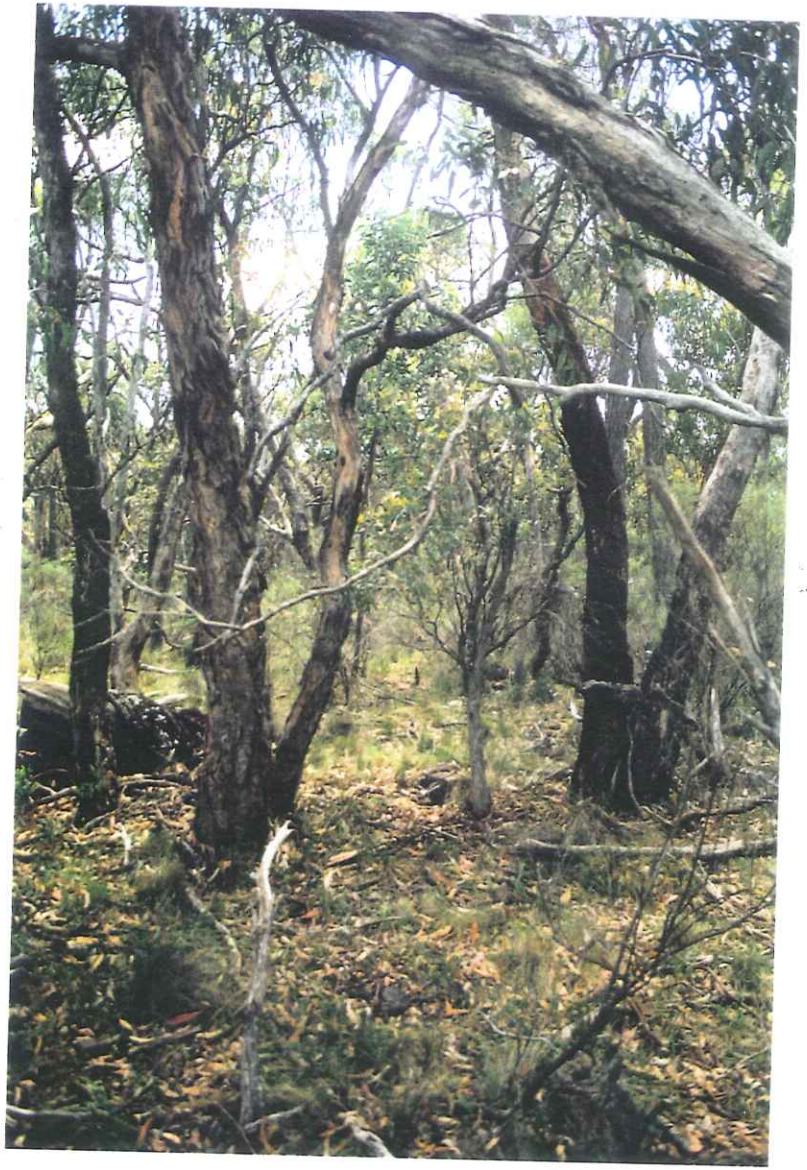

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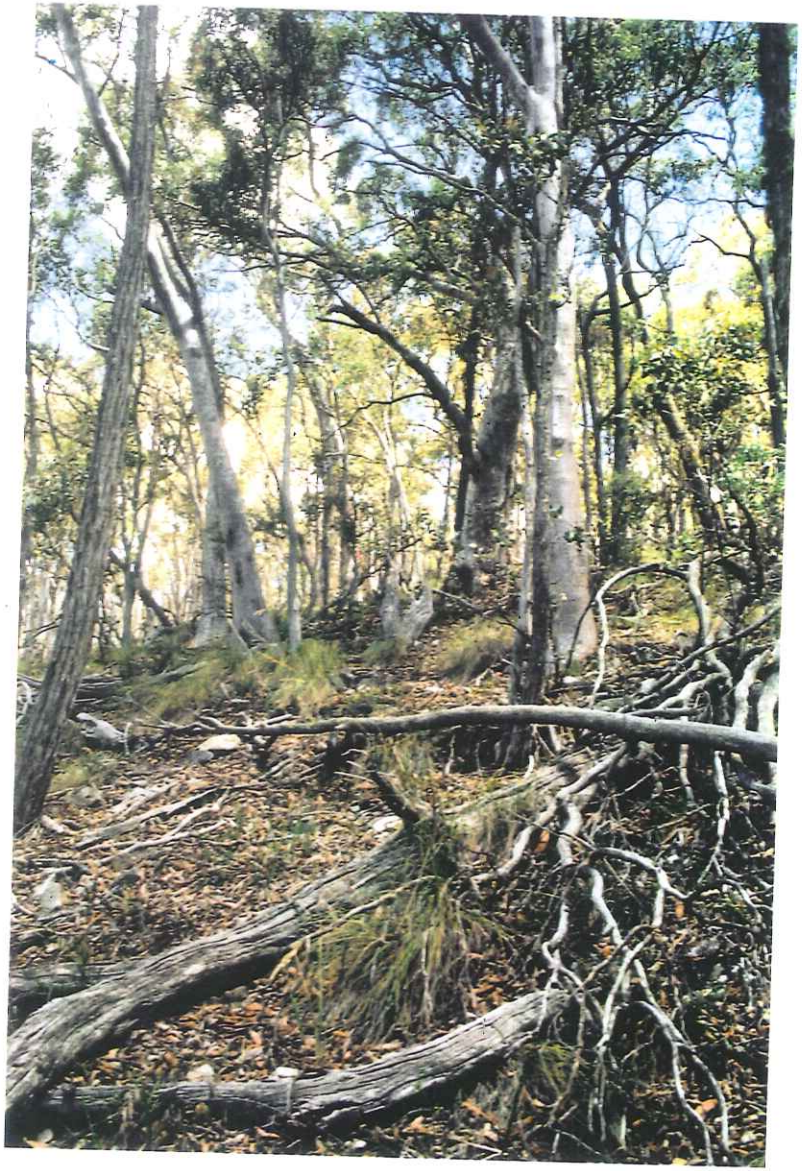
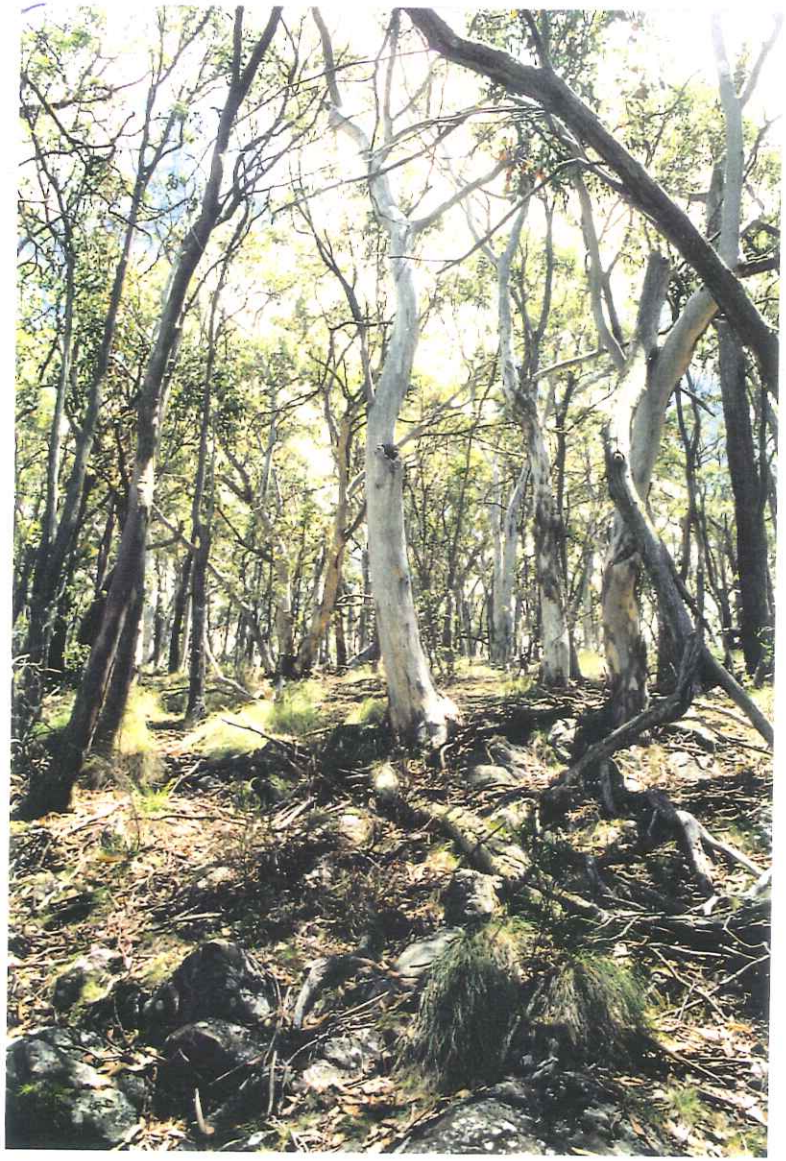


PLATE B18: WIN018

PLATE B19: WIN019

PLATE B20: WIN020



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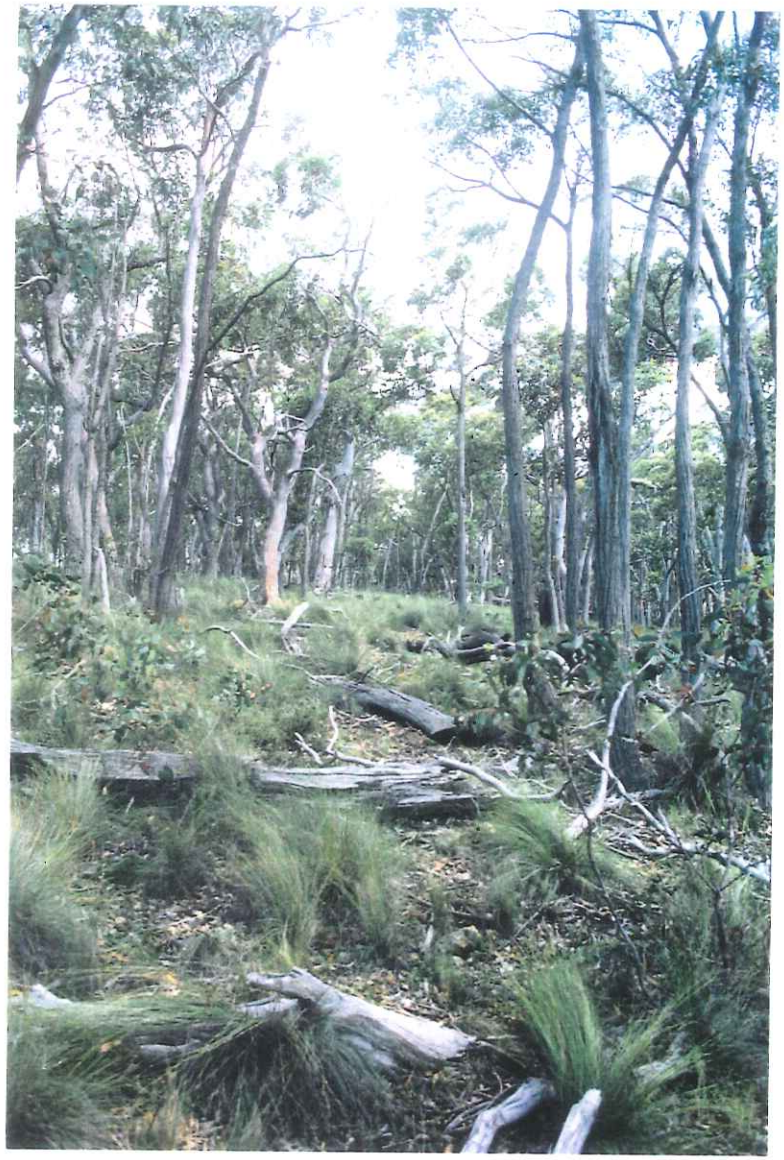


PLATE B22: WIN022

PLATE B23: WIN023

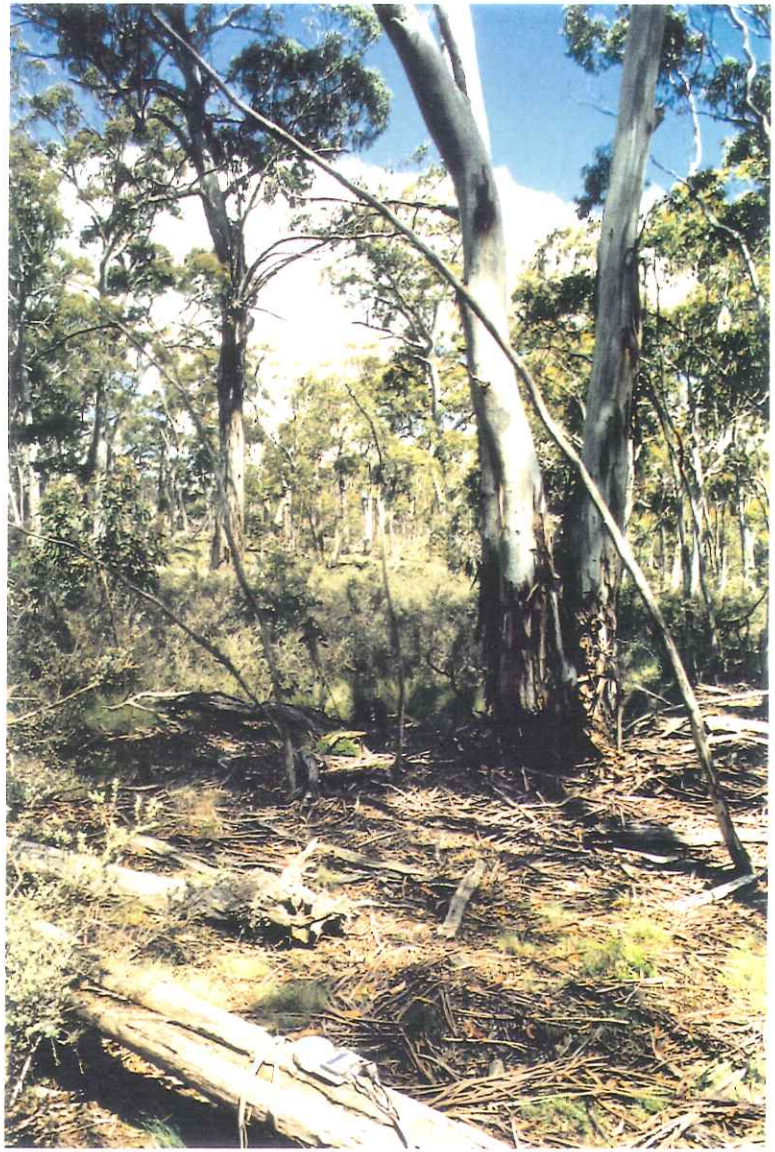


PLATE B24 WIN024

PLATE B25: WIN025

PLATE B26: WIN026

PLATE B27: WIN027

PLATE B28: WIN028

PLATE B29: WIN029

PLATE B30: WIN030

PLATE B87: WED001

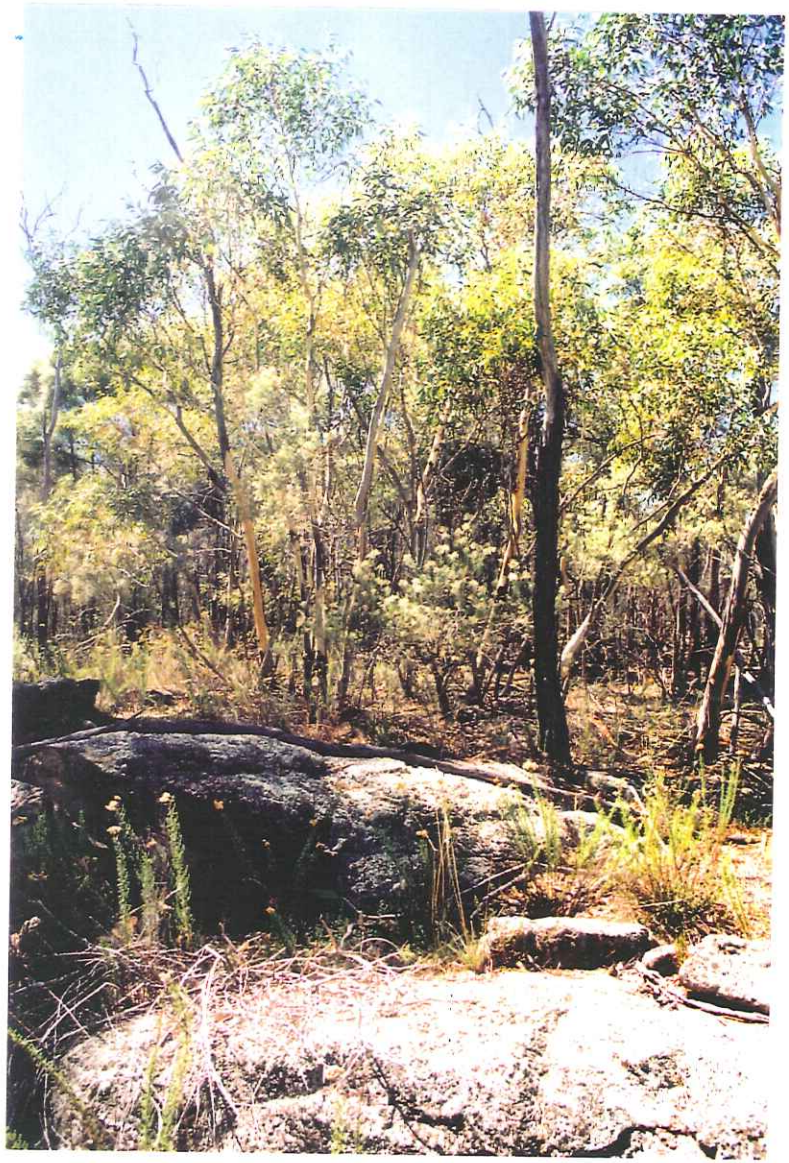
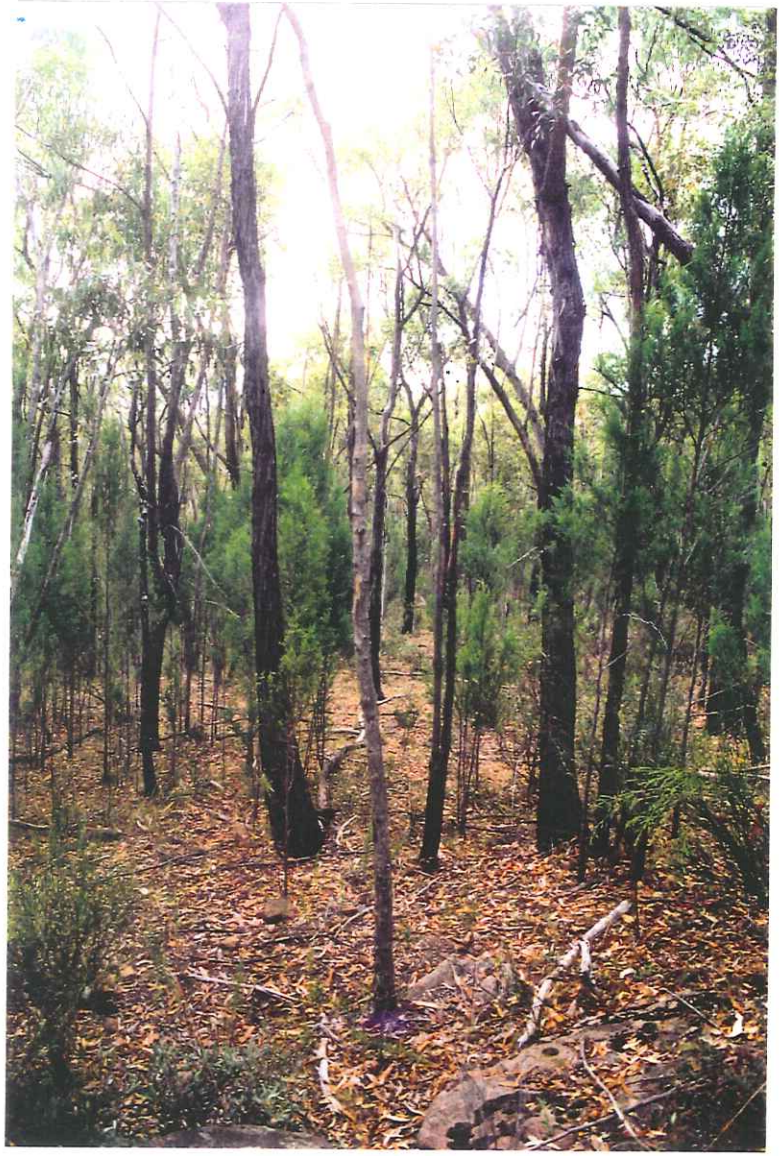


PLATE B88: WED002

PLATE B89: WED003



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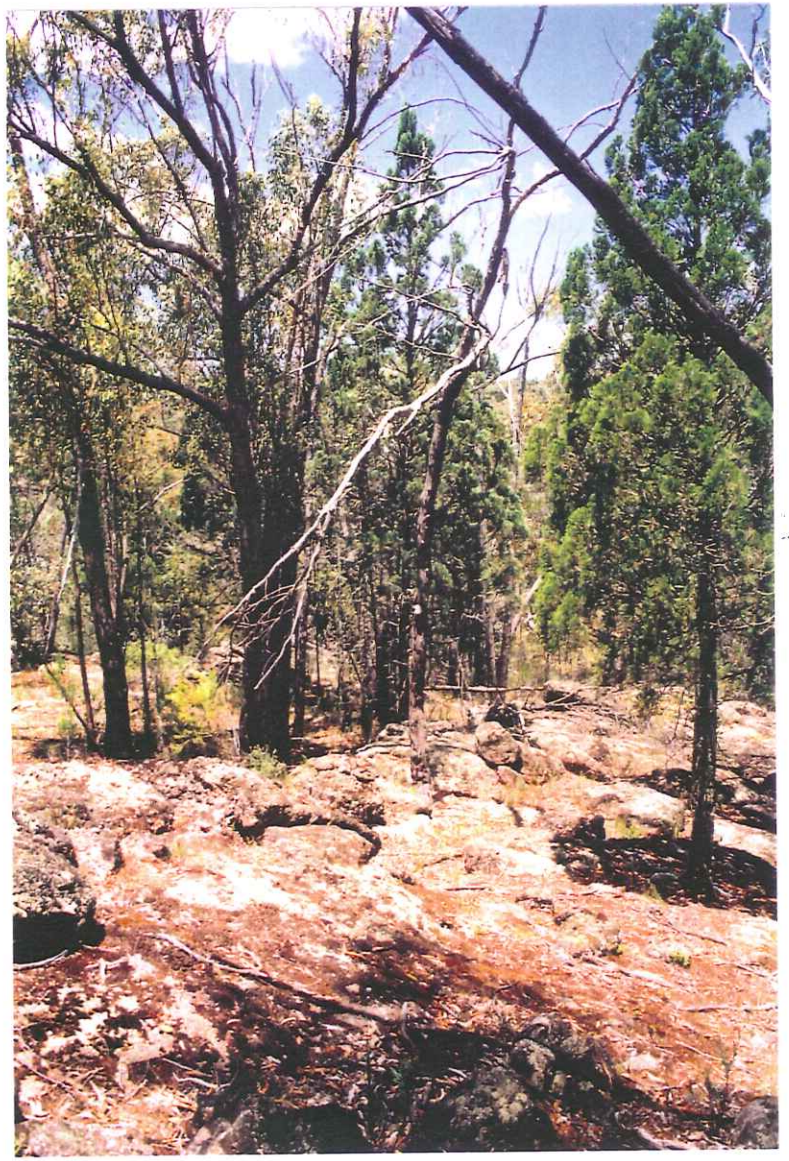
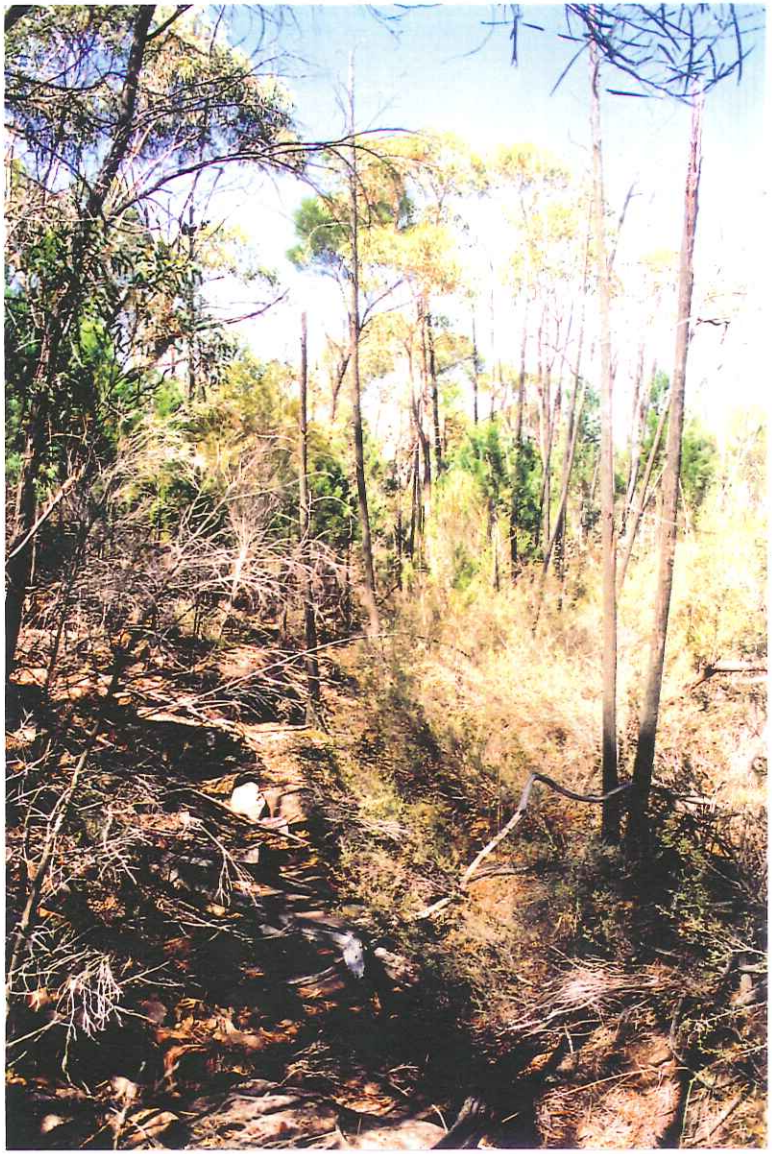


PLATE B91: WED005

PLATE B92: WED006



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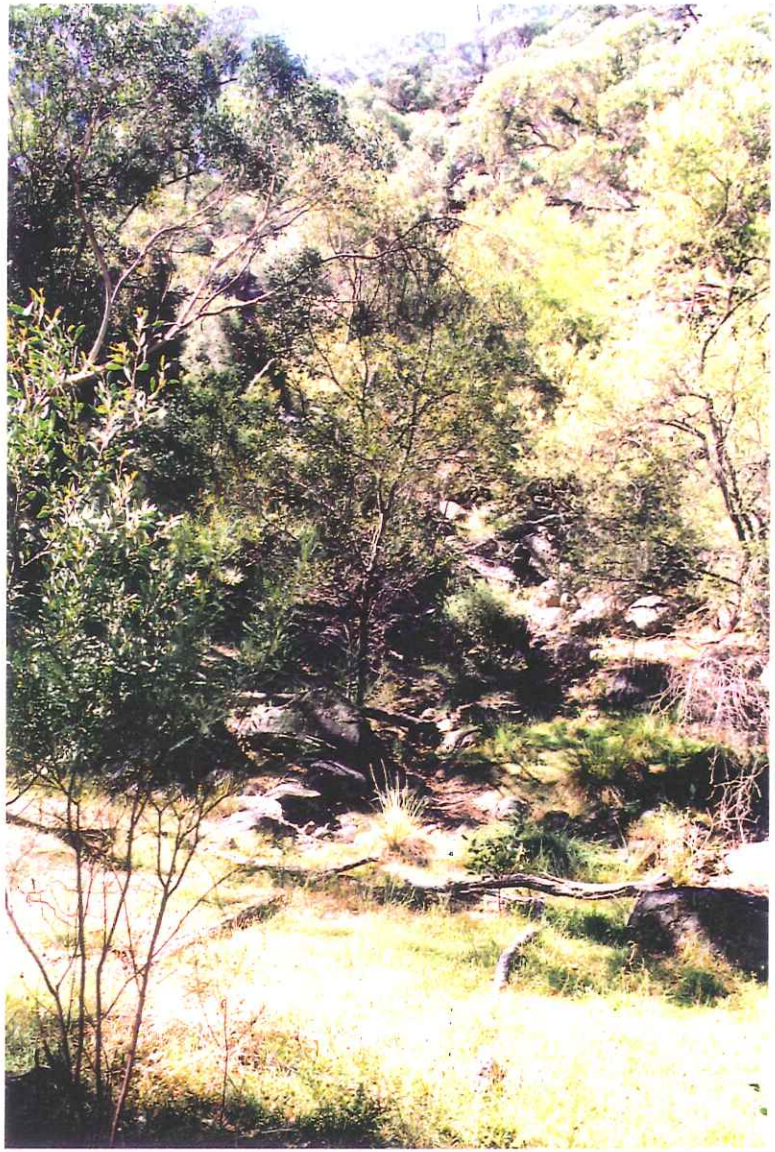


PLATE B94: WED008

PLATE B95: WED009

PLATE B96: WED010

PLATE B97: WED011

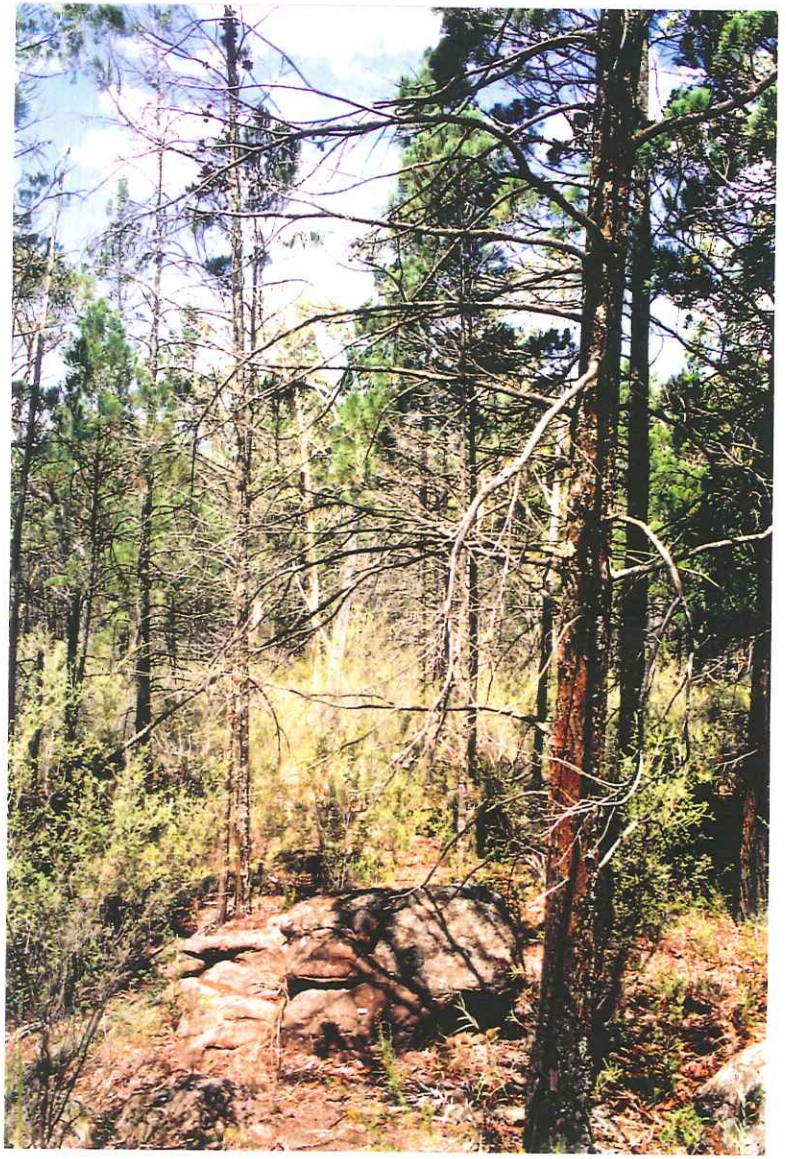


PLATE B98: WED012

PLATE B99: WED013

PLATE B100: WED014

PLATE B101: WED015

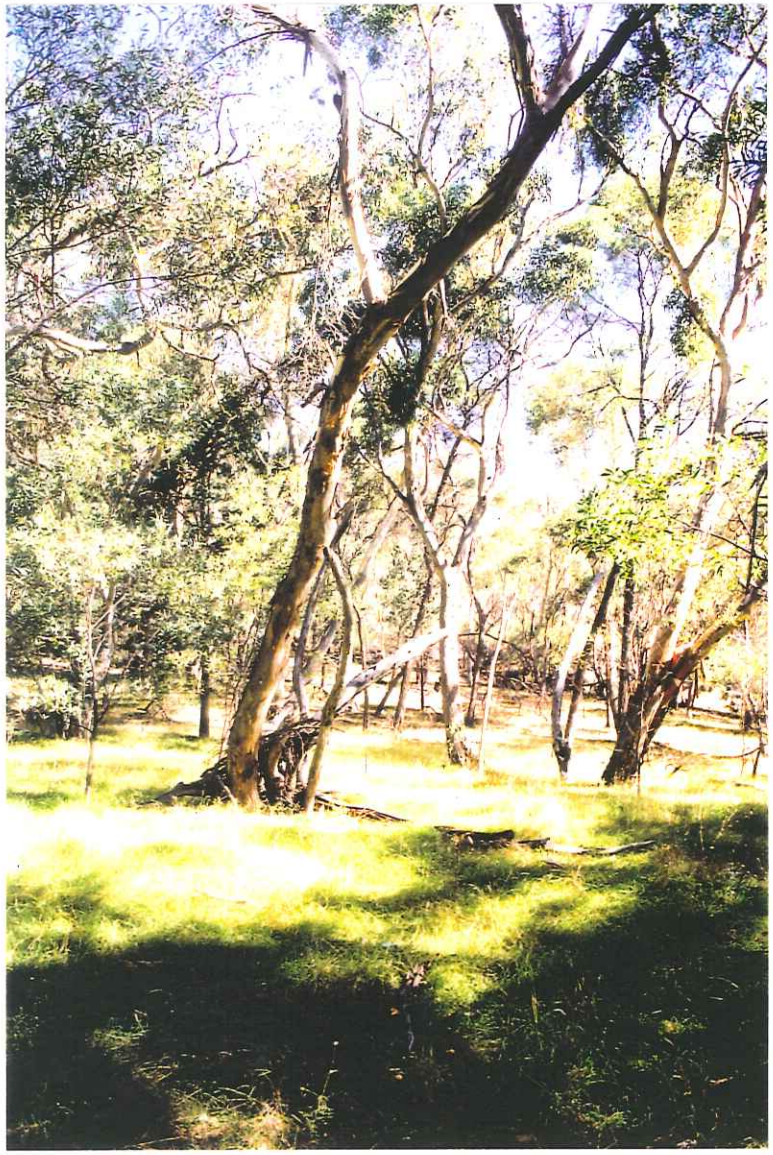


PLATE B102: WED016

PLATE B103: WED017

PLATE B104: WED018

PLATE B105: WED019

PLATE B106: WED020

PLATE B51: NAN002

PLATE B52: NAN003

PLATE B53: NAN004

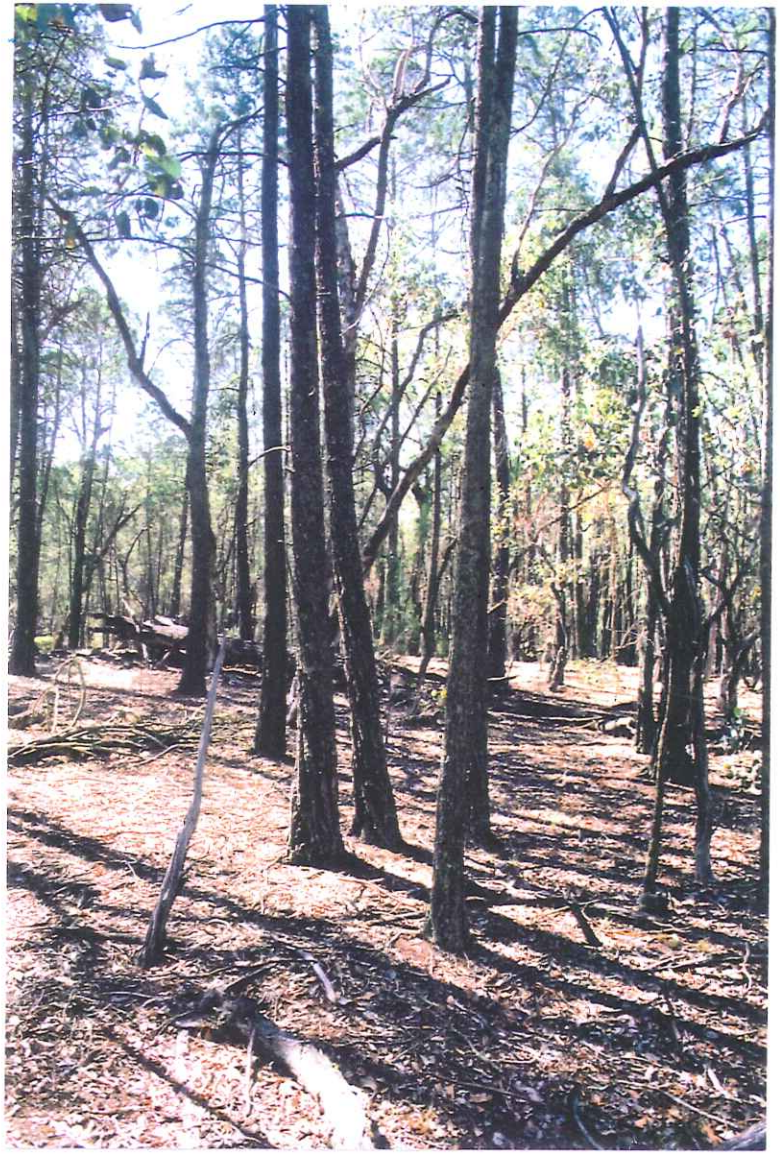


PLATE B54: NAN005

PLATE B55: NAN006

PLATE B56: NAN007

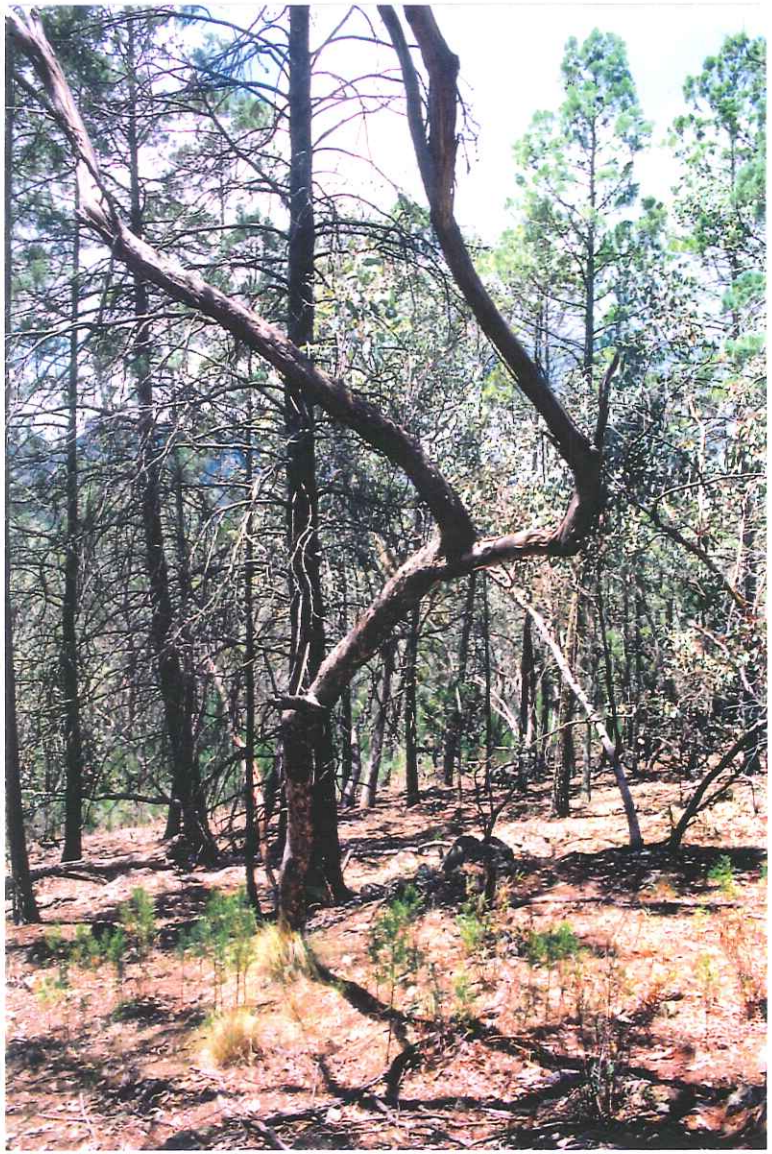
PLATE B57: NAN008

PLATE B58: NAN009

PLATE B59: NAN010

PLATE B60: NAN011

PLATE B61: NAN012



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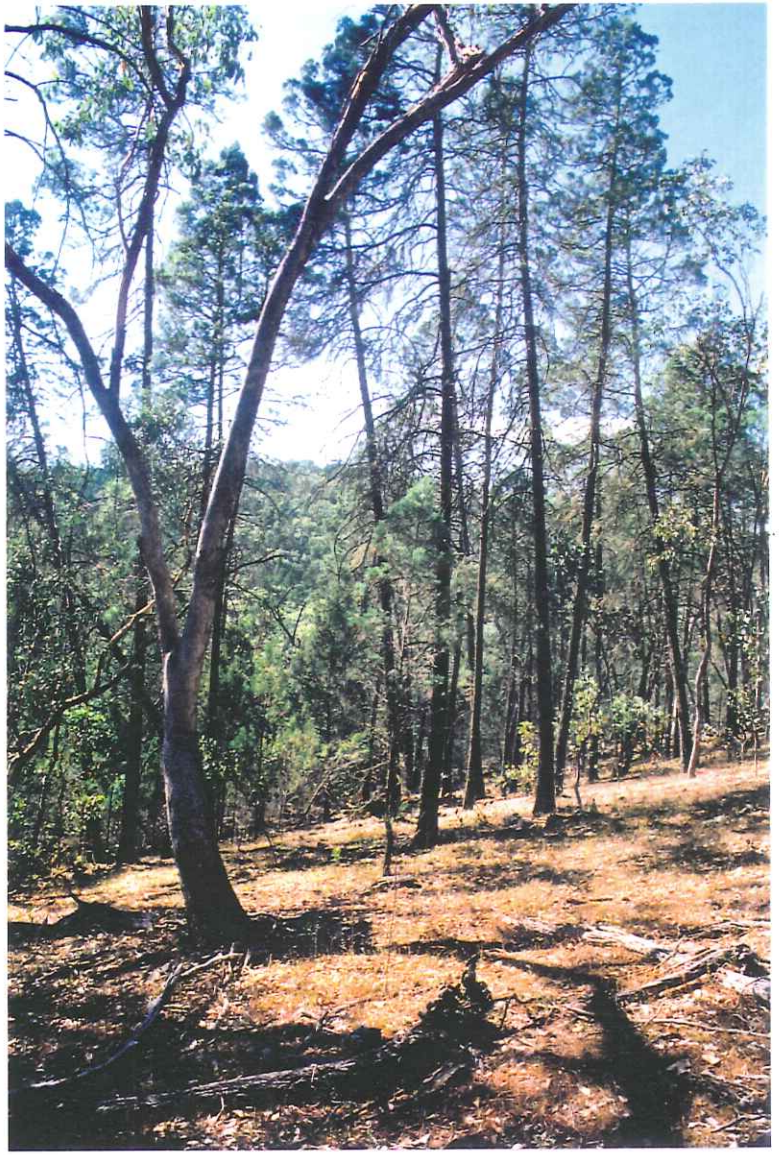


PLATE B63: NAN014

PLATE B64: NAN015

PLATE B65: NAN016

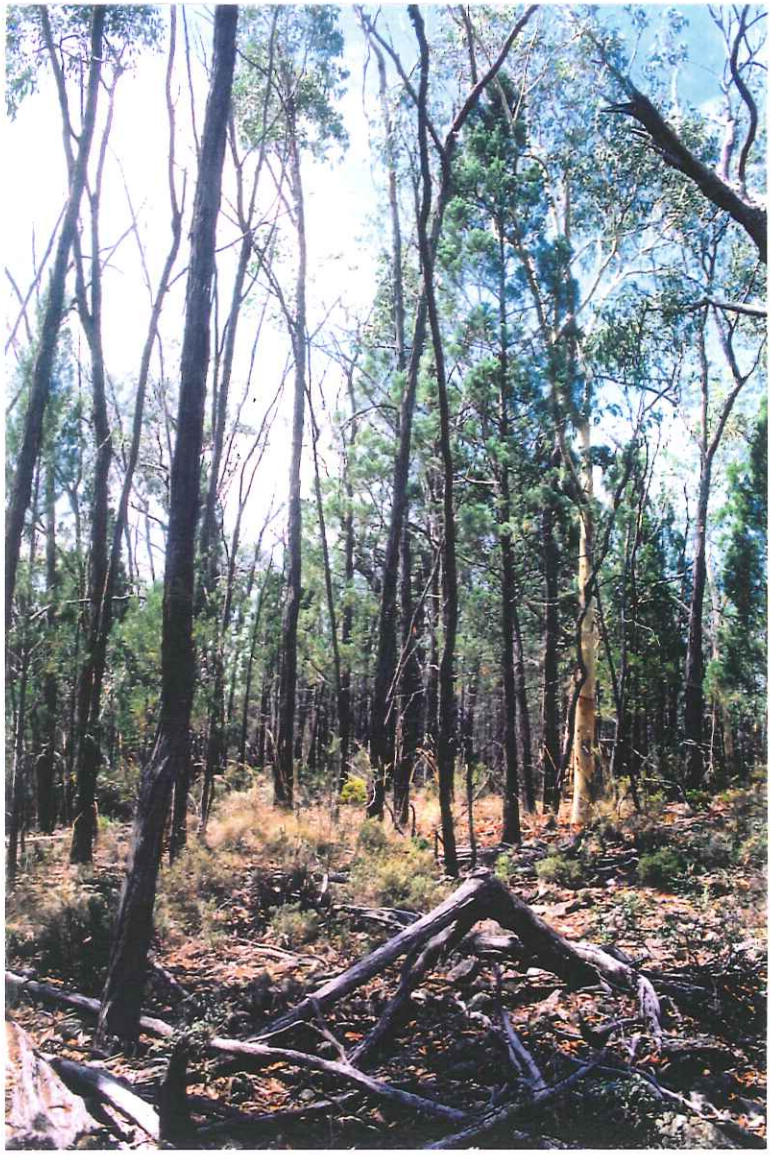


PLATE B66: NAN017

PLATE B67: NAN018

PLATE B68: NAN019

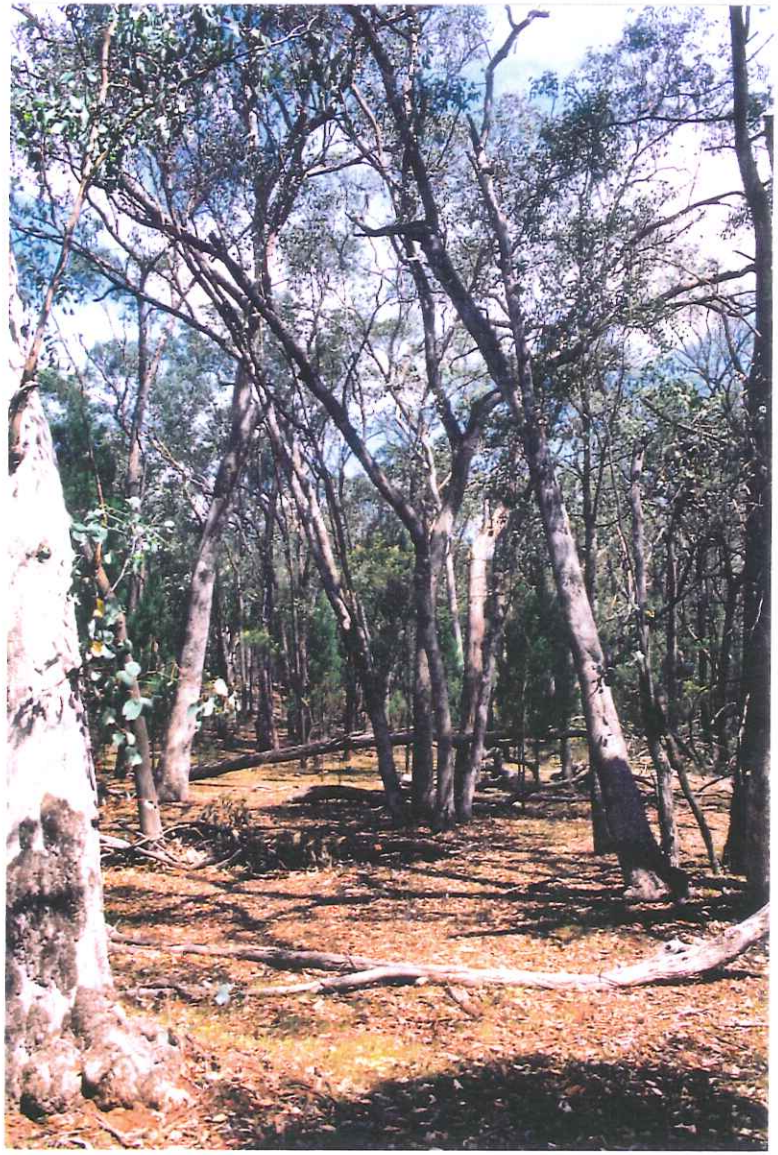


PLATE B69: NAN020

PLATE B70: CON001

PLATE B31: WIN031

PLATE B32: WIN032

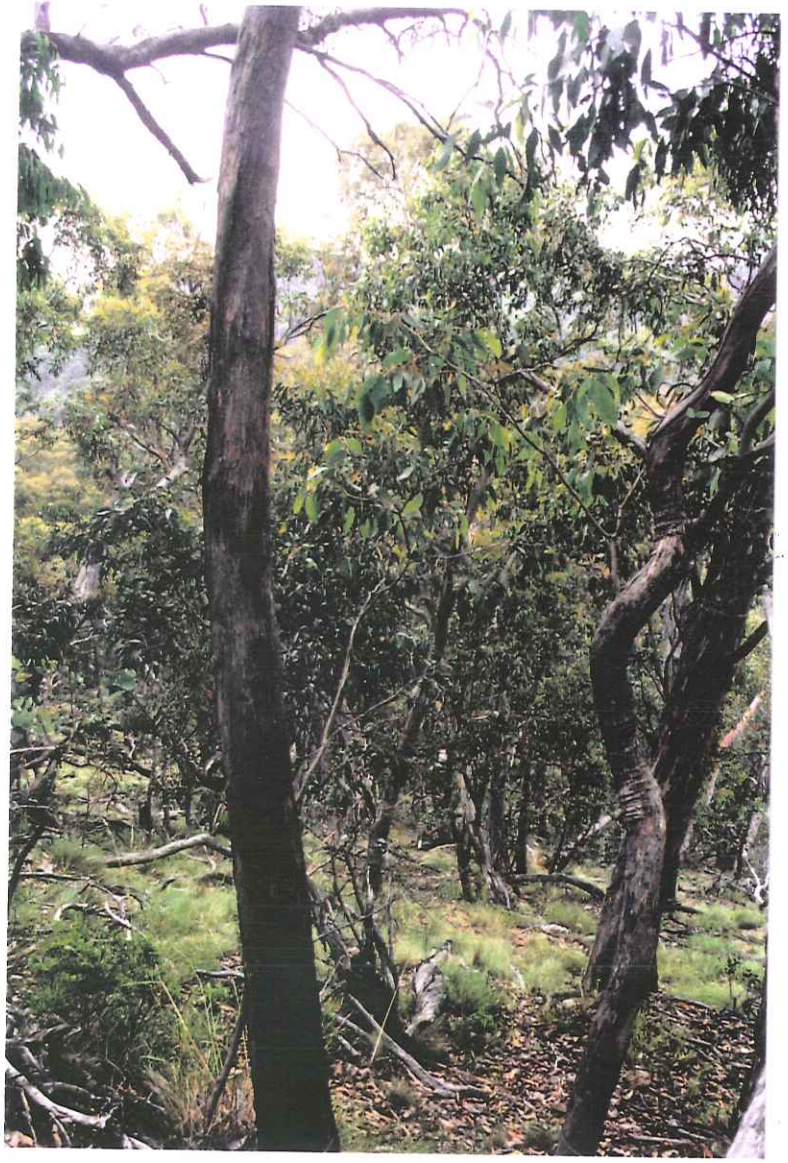
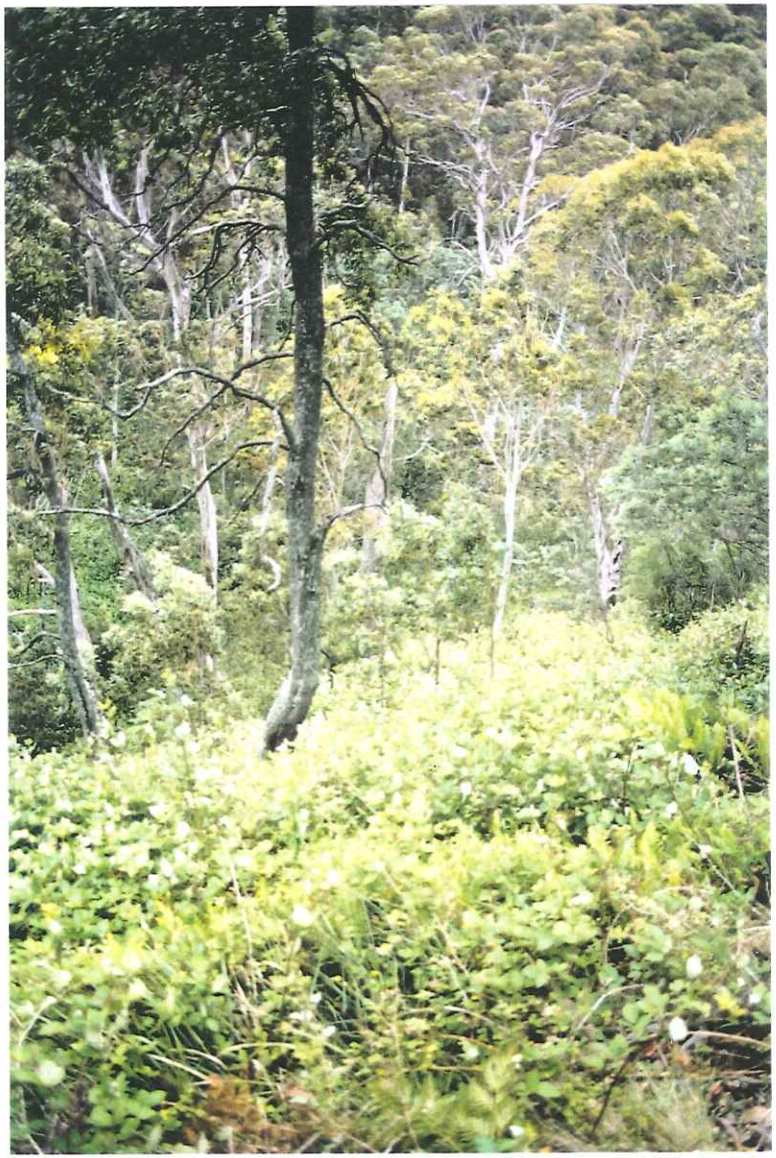


PLATE B33: WIN033

PLATE B34: WIN034

PLATE B35: WIN035

PLATE B36: WIN036



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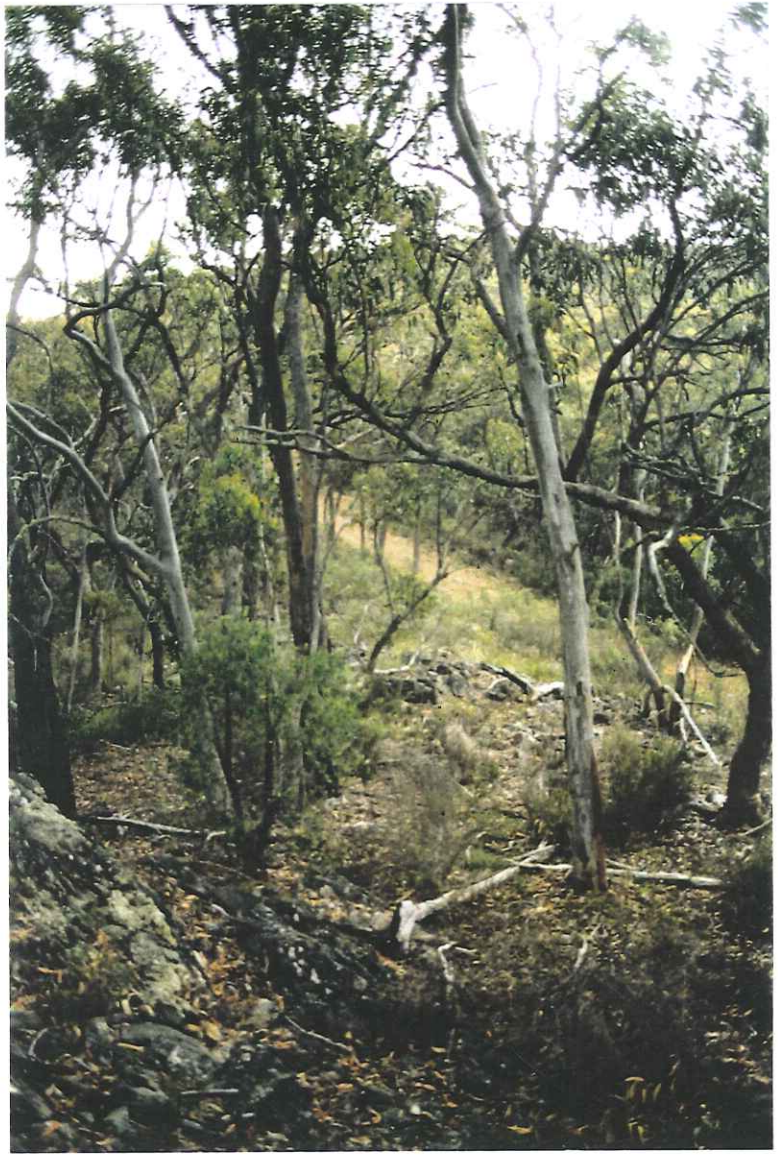

PLATE B38: WIN038

PLATE B39: WIN039

PLATE B40: WIN040

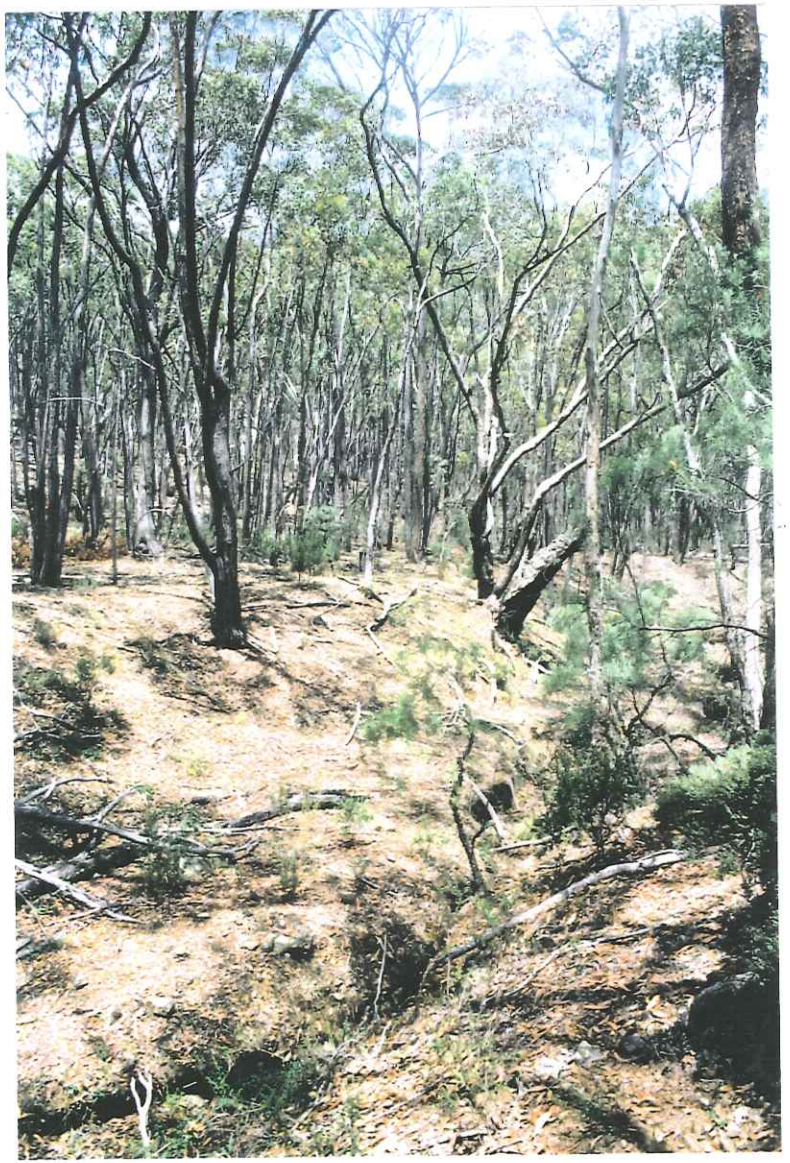

PLATE B41: WIN041

PLATE B42: WIN042

PLATE B43: WIN043

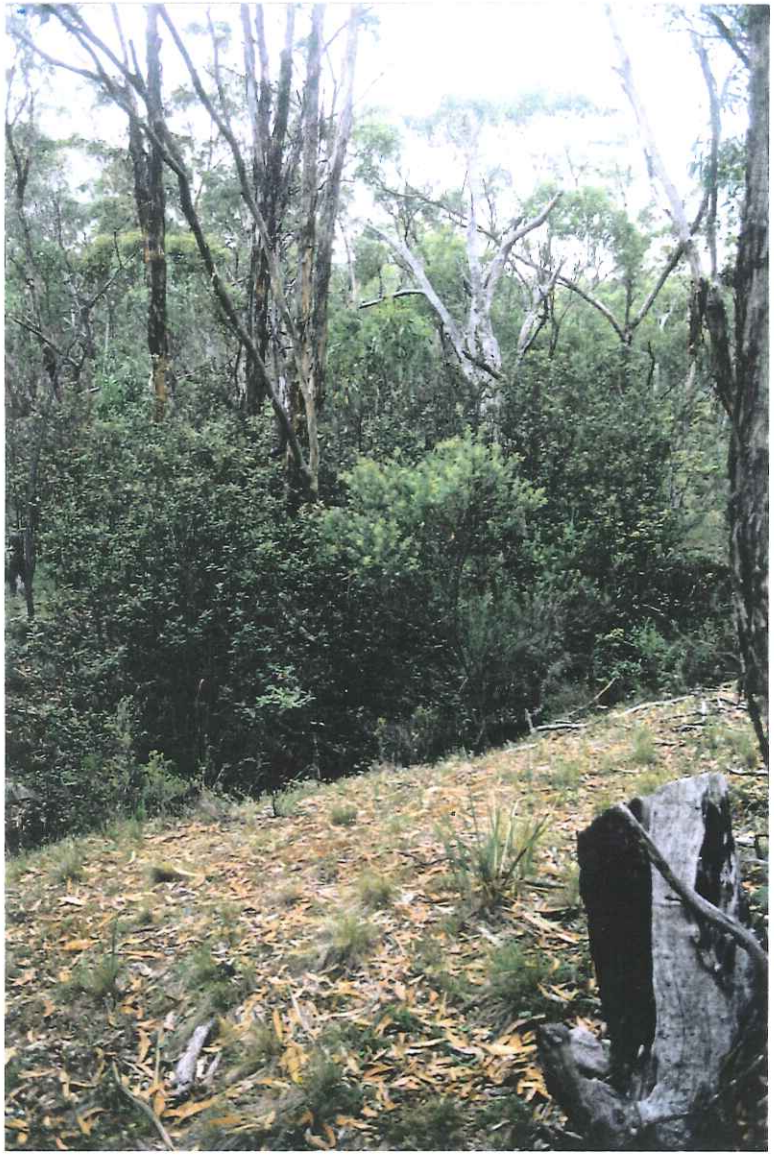

PLATE B44: WIN044

PLATE B45: WIN045

PLATE B46: WIN046

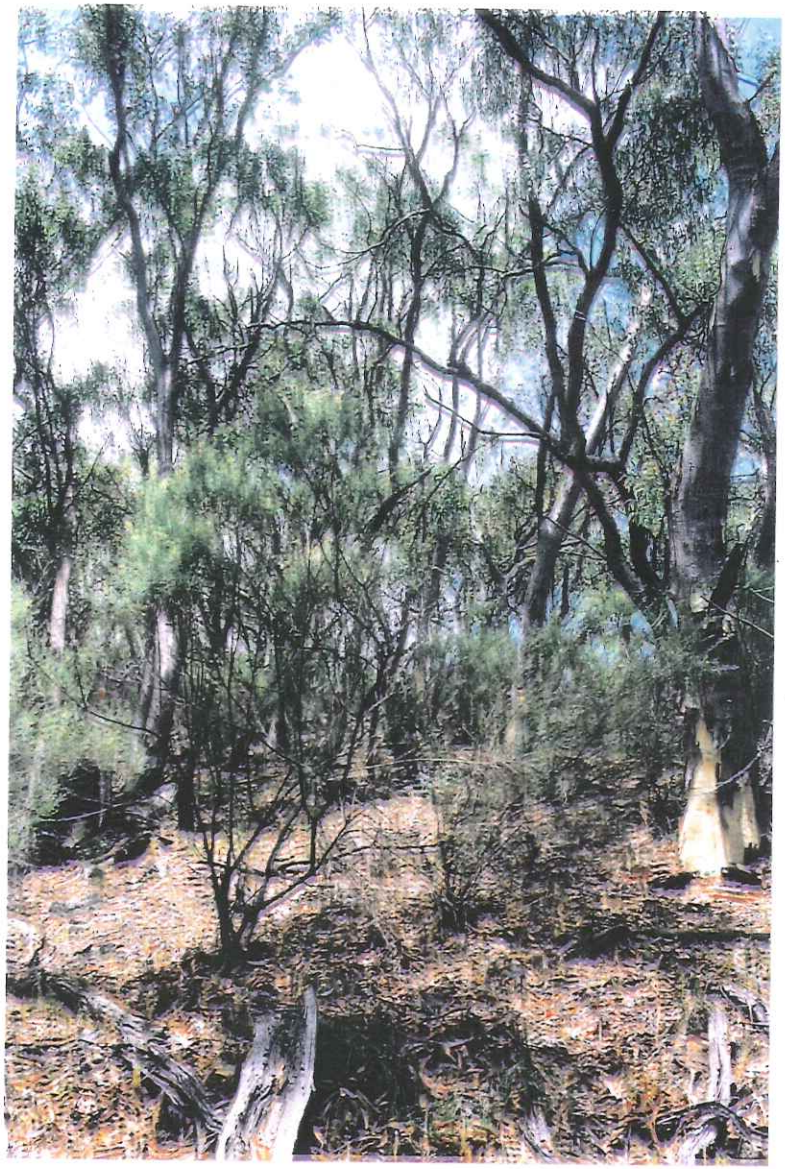

PLATE B47: WIN047

PLATE B48: WIN048

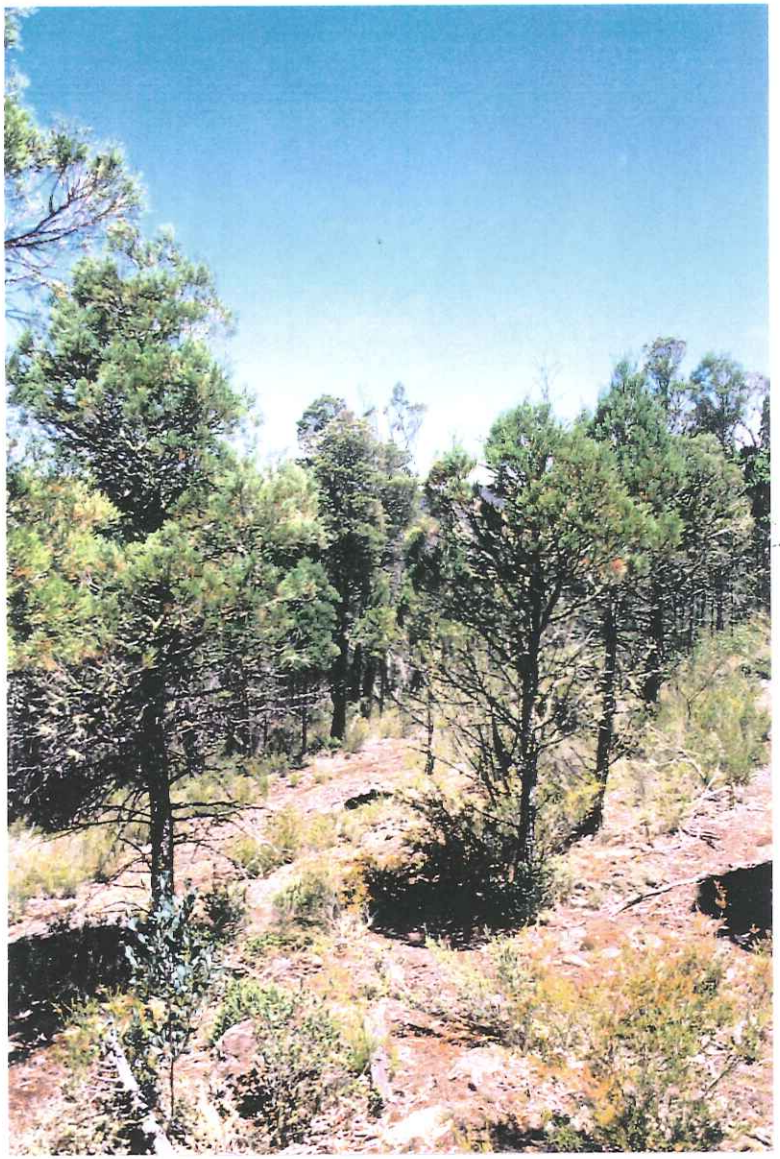

PLATE B49: WIN049

PLATE B50: NAN001

Appendix C

RESULTS OF PATN ANALYSIS

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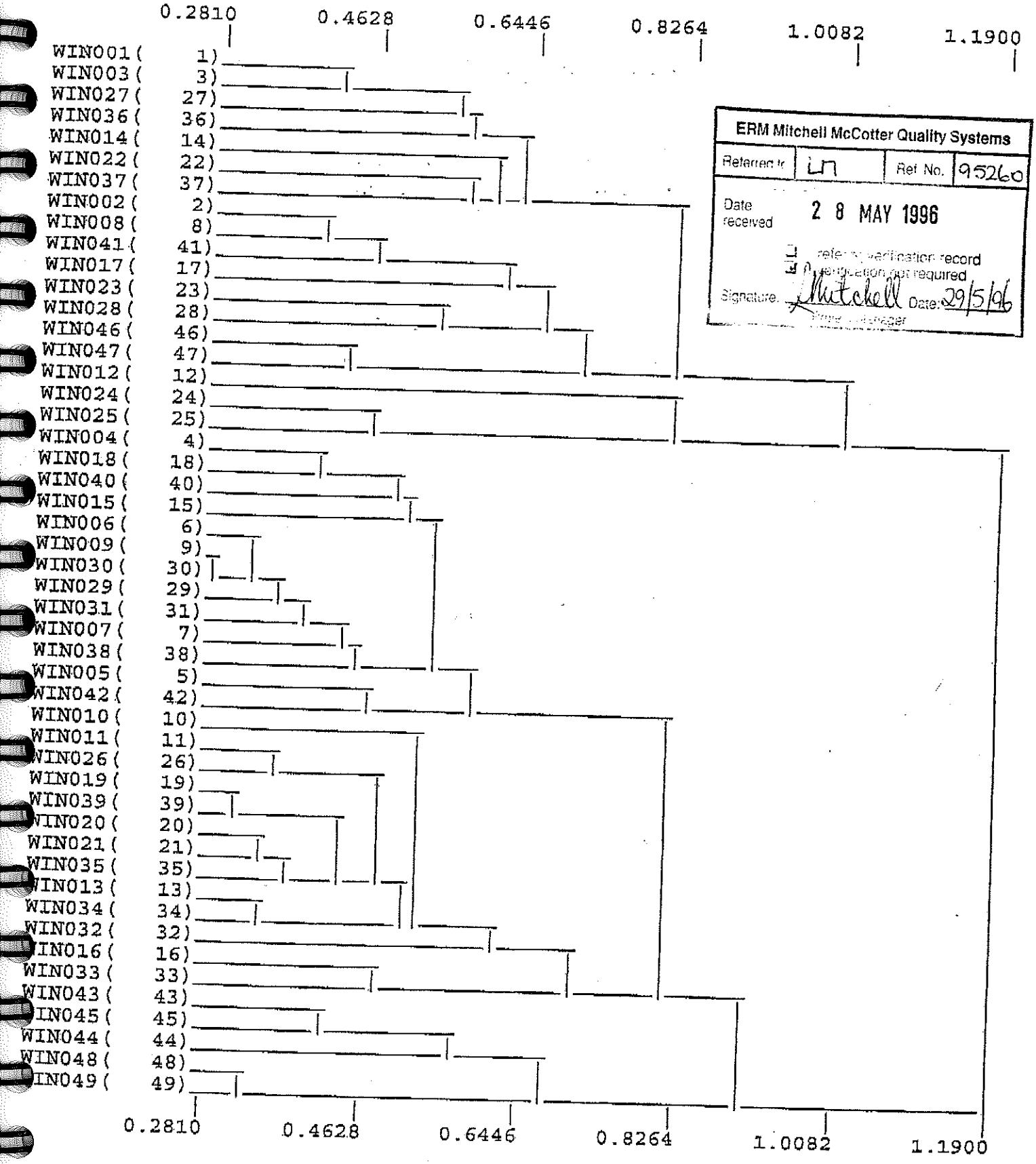

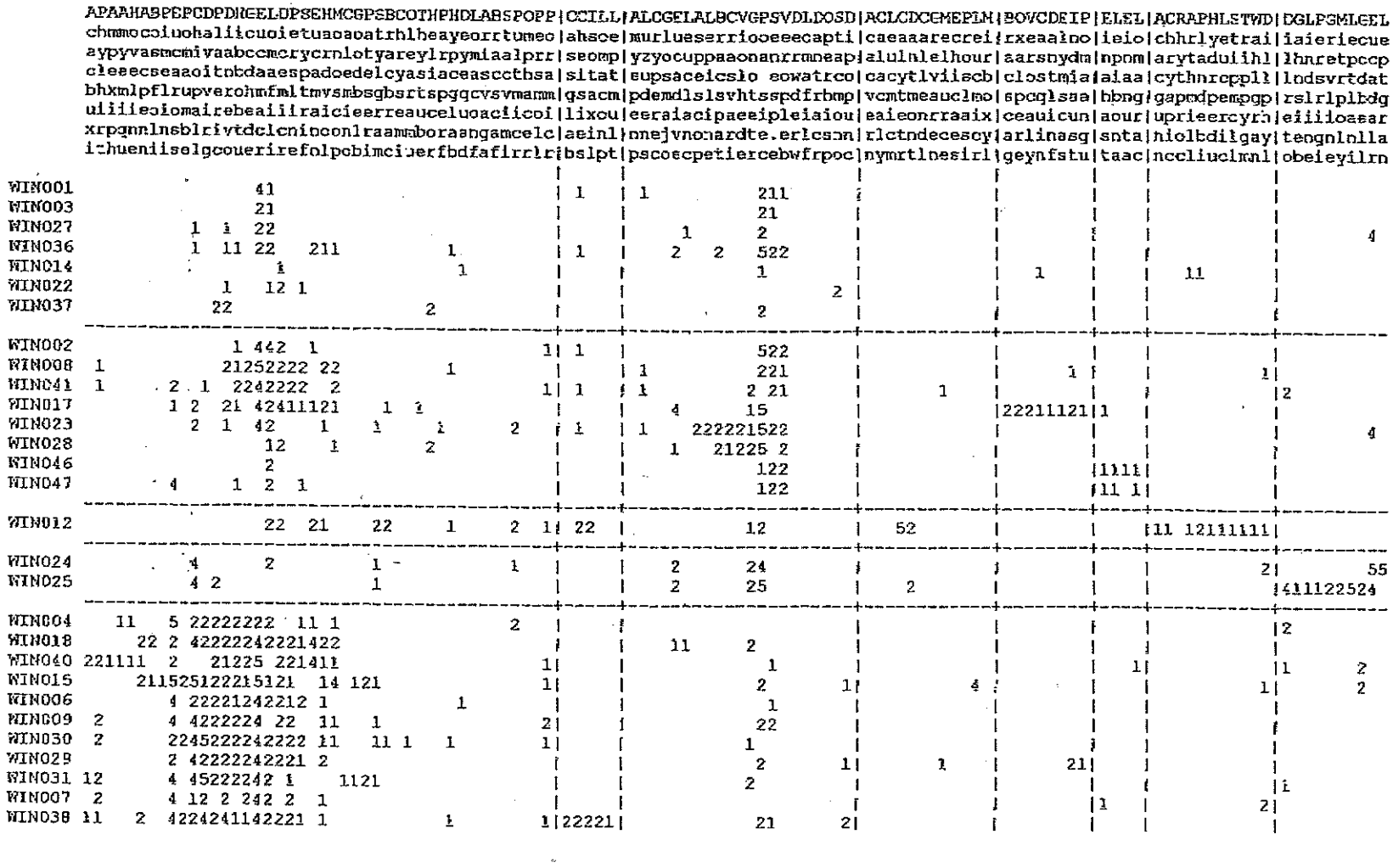

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	uiiiieoiomairebeaiiiraicieerreauceluoaciicoi	lixou	eeraiacipaeeipleiaiou	eaieonrraaix	ceauicun	aour	uprieercyrh	eiiiioaaar
	xrpqnnlnsblrivtdclcninconlraammboraangamcelc	aeinl	nnejvnonardte.erlcsnn	rlctndecescy	arlinasg	snta	hiolbdilgay	teognlnlla
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WIN027	1 1 22		1 2					4
WIN036	1 11 22 211 1	1	2 2 522					
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WIN028	12 1 2		1 21225 2					
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WIN024	4 2 1 1		2 24				2	55
WIN025	4 2 1		2 25	2				4111225 24
WIN004	11 5 22222222 11 1 2							
WIN018	22 2 422222422214 22		11 2				2	
WIN040	221111 2 21225 221411 1		1			1	1	2
WIN015	211525122215121 14 121 1		2 1	4			1	2
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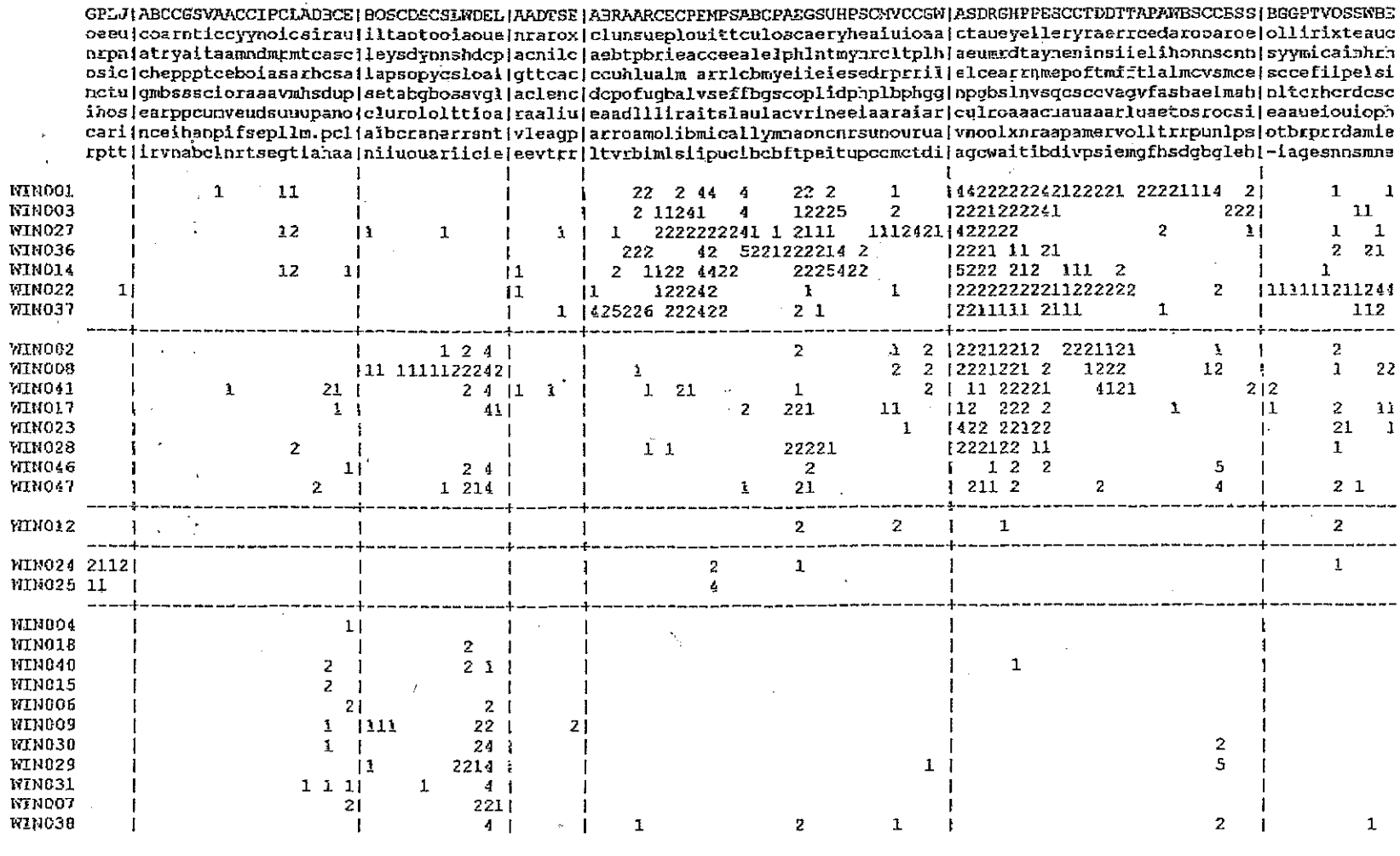
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WIN027 | 12 | 1 1 | 1 2222222241 1 2111 1112421 | 422222 2 1 | 1 1
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WIN022 1 | 1 | 1 122242 1 1 | 22222222211222222 2 | 1111112112441
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WIN041 1 21 | 2 4 | 1 1 | 1 21 1 2 | 11 22221 4121 2 | 2
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WIN046 1 | 2 4 | 2 | 1 2 2 5 |
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WIN012 | 2 2 | 1 | 2
WIN024 2112 | 2 1 | 1
WIN025 11 | 4
WIN004 1 | |
WIN018 | 2 | |
WIN040 2 | 2 1 | 1 |
WIN015 2 | | |
WIN006 2 | 2 | |
WIN009 1 | 111 22 | 2 | |
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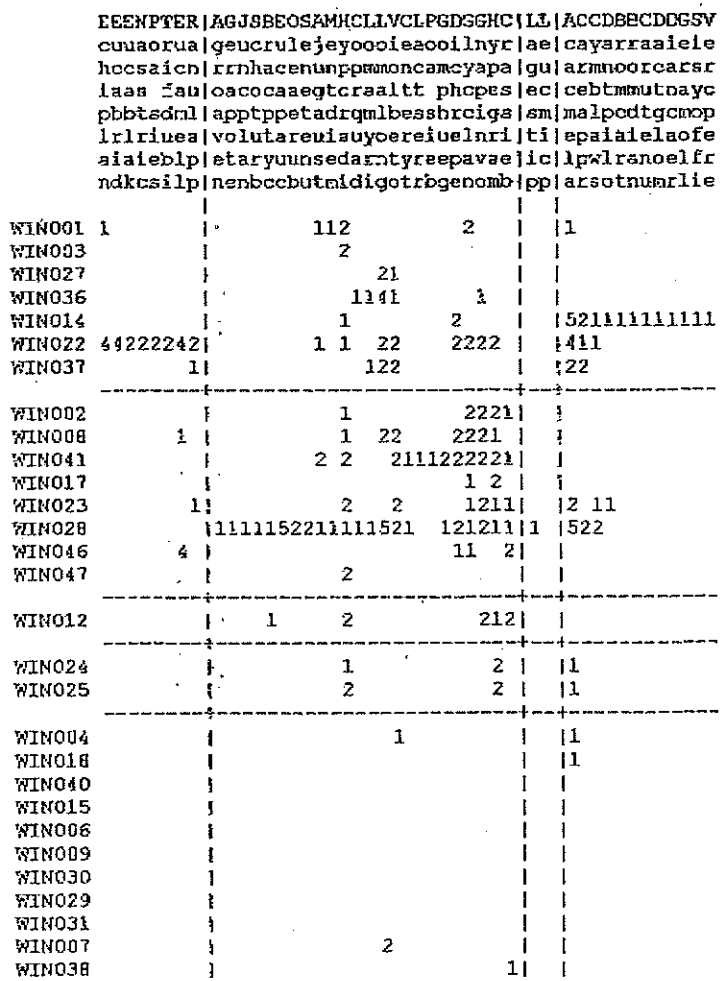
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pbbtsdnl|apptppetadrqmlbessbrciga|sm|malpodtgcmop
lrlriuea|volutareuiauyoereiuelnri|ti|epaiaielaofe
aiaieblp|etaryuunsedarntyreepavae|ic|lpwlranoelfr
ndkcsilp|nenbccbutmidigotrbgenomb|pp|arsotnumrlie
WIN001
WIN003
WIN027
WIN036
WIN014
WIN022
WIN037
WIN002
WIN008
WIN041
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WIN028
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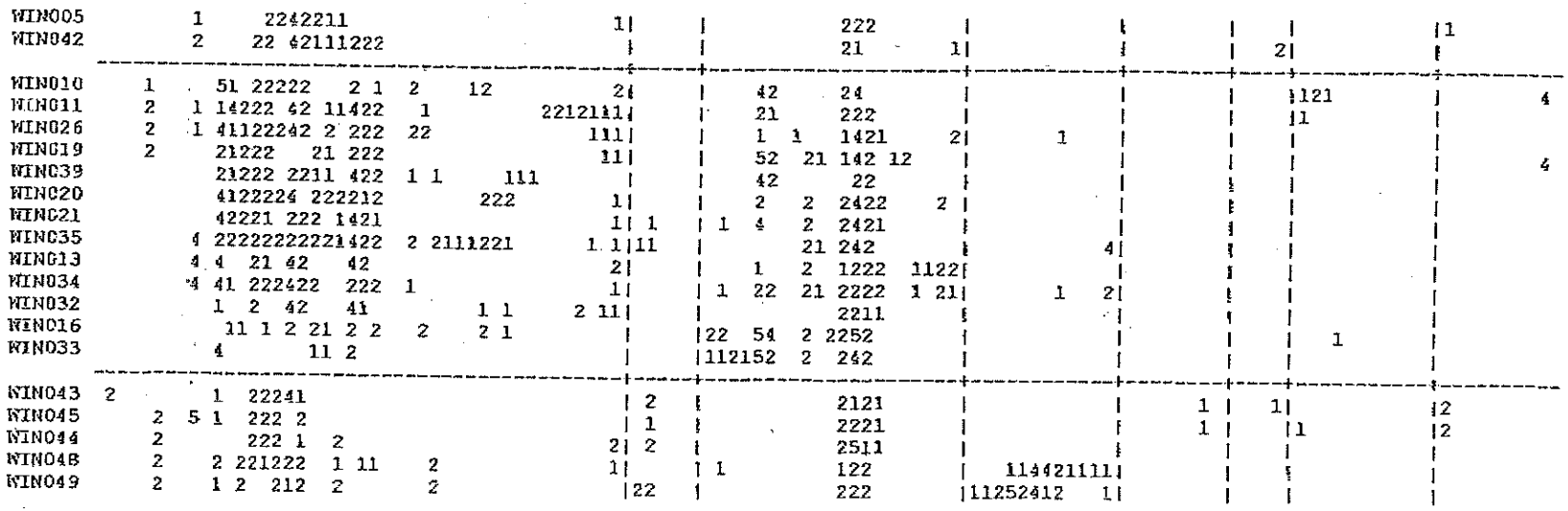
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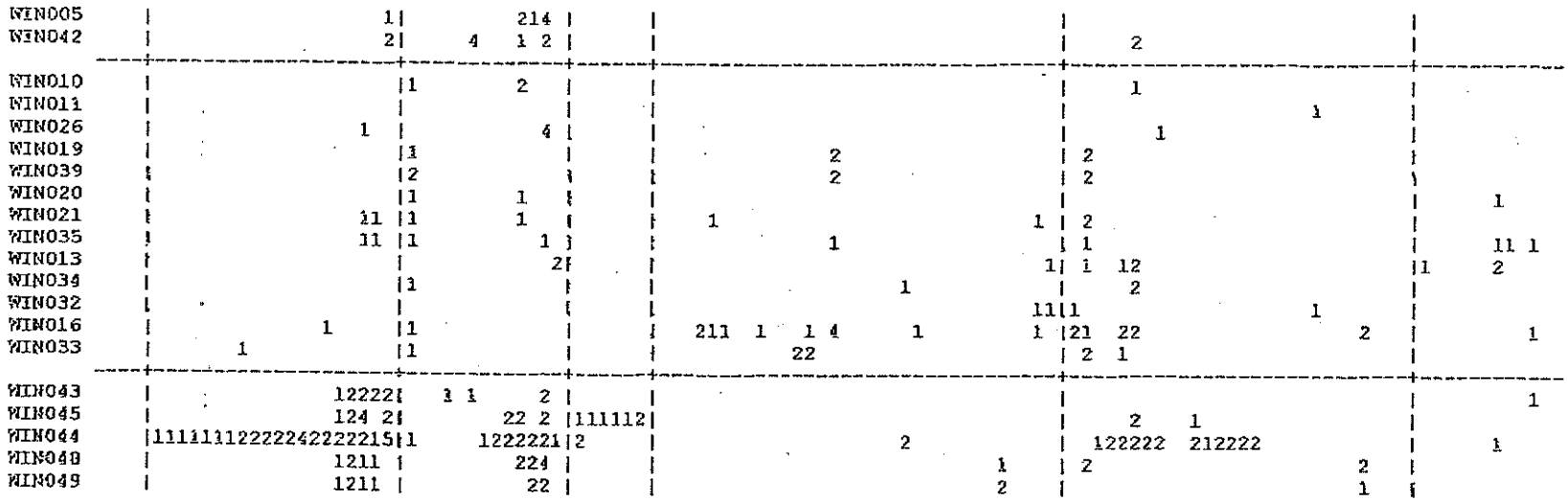
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WIN026         |                        |  |
WIN019         |                        |  |
WIN039         |                        |  |1
WIN020         |                        |  |
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WIN013         |              2         |  |
WIN034        1|          1         1   |  |1
WIN032         |                        |22|
WIN016         |           1211      1  |  |
WIN033         |      1   1  21         |  |
       --------+------------------------+--+-------------
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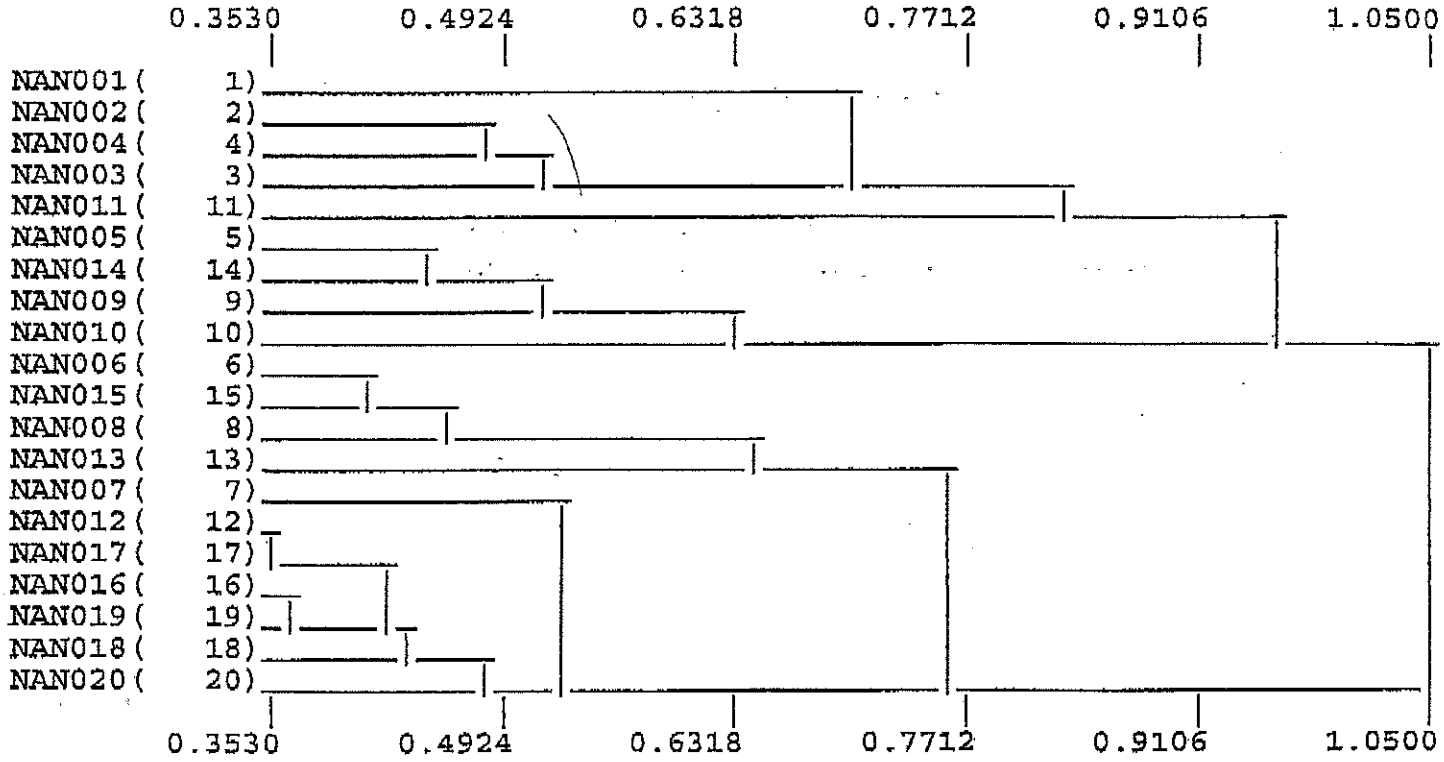

05/17/96 17:46:25.50 TWAY Nangar Vegetation Database

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	iuntansi	crfi	auidtkiba	acuiiuetowrsnsp	naeelt	rsc	itec	ntemaiecagntietei	ielirullceutoeiutcrxsrufrtihrseoouli	gpmctcei	ni
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NAN004	1			111114222222224	122			1	4 1		
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NAN011		4		1	222	452	2		1 1 1122		
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NAN018	1				1			2	22222154 11 22 22 22 2 22111		
NAN020				1 22		1		14	22212 4422111222212 2 2		22

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	pgr
NAN001	
NAN002	
NAN004	
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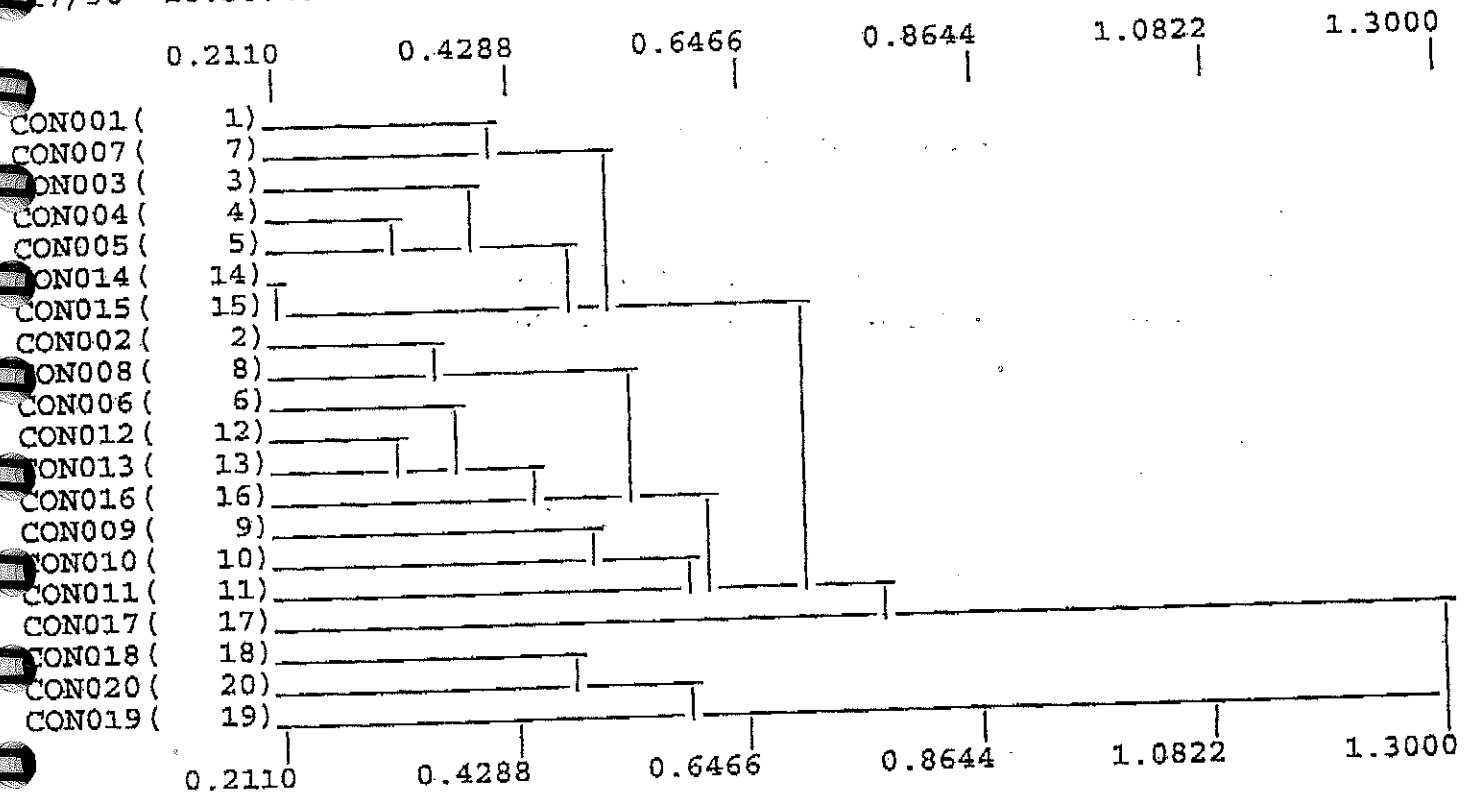

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CON011	4 22 221 5211		1		1114	1 22		2			
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CON020		1				2				2 1	4222222222
CON019	1 22 11	22 1				22					4422222222

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	eiovtueillveoleolrai	aoinarsuian	vacetocuiieellprer
	ncrailplaaennocteonp	wlnglipbgmc	erahrnapnrldoaovta
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CON007	1		1
CON003			
CON004			
CON005			
CON014			
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CON012			
CON013			
CON016			
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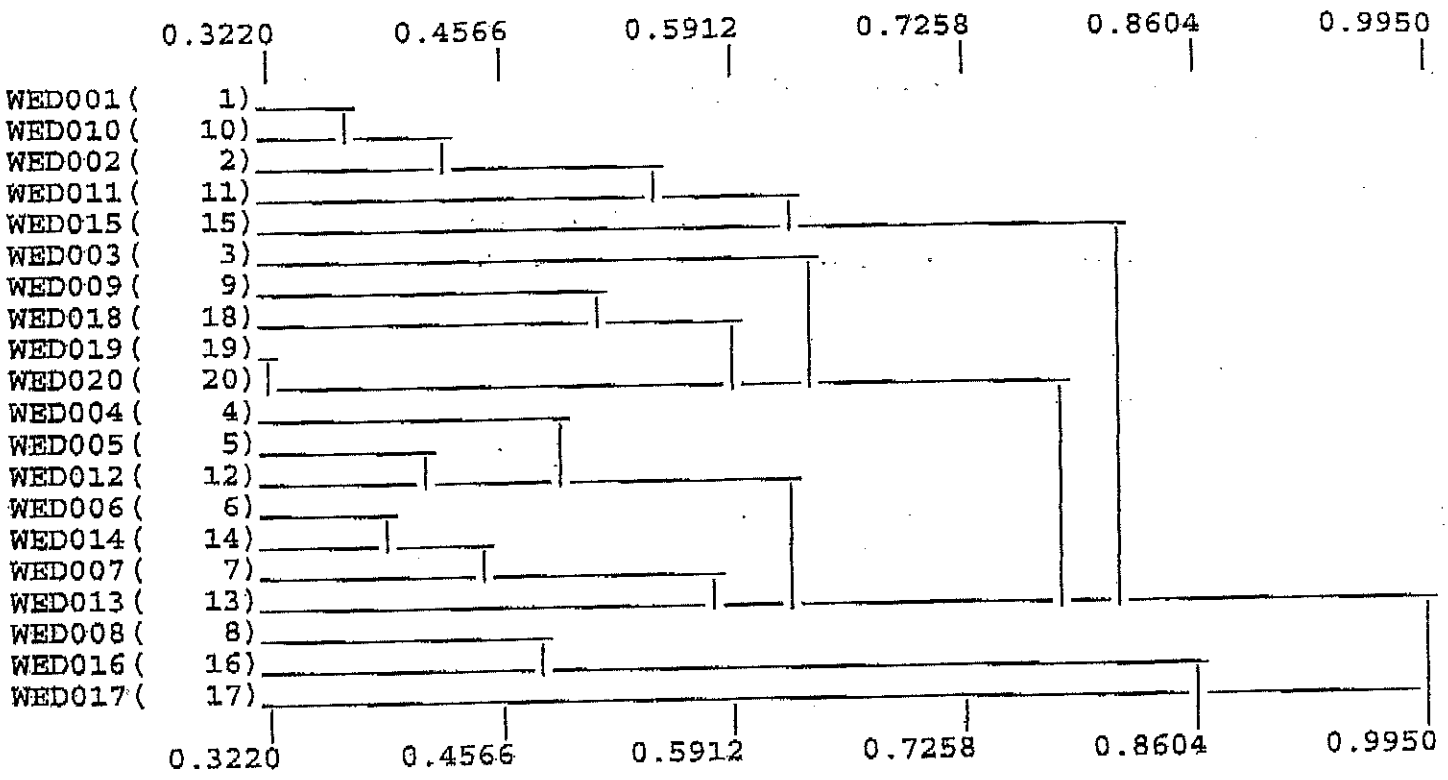

05/20/96 13:34:59.12 TWAY Weddin Mtns NP Vegetation Database

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WED020	222 221122 2	1 2	2	2	222 22222 2222 2			3	1	2 1
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WED005	222 222 21 2		21113121		1 2 2 2122 11					
WED012	1 322122222112 12 2 4		222 1	22	2 22 1 2					
WED006	2 21212122 2 22		1 2	33 2	3 2 2 22					
WED014	2 121 221221		21	4 2222	2 1 2					
WED007	1 2 122221111321 31	22222	11	3 22	1221 2					
WED013	2141 1121 12 12	11 1	1 11	3	1 2			3		1
WED008			11	1 1 1	112422 22 2	2			1	222221 22222
WED016					522	1			122	32224222221
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        rana|vcipnaenspnsomt
        nuan|ernrgbsgtuatcii
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Appendix D

FLORA SPECIES LISTS

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Adiantaceae	
Adiantum aethiopicum	Common Maidenhair
Anthericaceae	
Arthropodium milleflorum	Vanilla Lily
Thysanotus tuberosus	Common Fringe Lily
Tricoryne elatior	Yellow Autumn-lily
Apiaceae	
Daucus glochidiatus	Native Carrot
Hydrocotyle laxiflora	Stinking Pennywort
Hydrocotyle peduncularis	
Platysace ericoides	
Araliaceae	
Astrotricha ledifolia	
Polyscias sambucifolia	Elderberry Panax
Asphodeliaceae	
Bulbine bulbosa	Bulbine Lily
Aspleniaceae	
Asplenium flabellifolium	Necklace Fern
Asteraceae	
Arctotheca calendula	Capeweed
Brachycome ptychocarpa	
Brachycome scapiformis	
Brachycome scapigera	
Brachycome spathulata	
Bracteantha bracteata	
Carduus tenuiflorus	Winged Slender Thistle
Cassinia arcuata	Sifton Bush
Cassinia longifolia	
Cassinia quinquefaria	
Cassinia uncata	
Chrysocephalum apiculatum	Common Everlasting
Helichrysum semipapposum	Clustered Everlasting

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Cirsium vulgare	Spear Thistle
Conyza bonariensis	Flaxleaf Fleabane
Craspedia variabilis	
Crepis capillaris	Smooth Hawksbeard
Cymbonotus lawsonianus	Bears-ear
Gnaphalium involucratum	
Gnaphalium sphaericum	
Helichrysum scorpioides	Button Everlasting
Hypochaeris glabra	Smooth Catsear
Hypochaeris radicata	Catsear
Lactuca serriola	Prickly Lettuce
Lagenifera stipitata	Blue Bottle-daisy
Microseris lanceolata	
Olearia elliptica	Sticky Daisy Bush
Olearia erubescens	Silky Daisy Bush
Olearia ramulosa	
Senecio diaschides	
Senecio hispidulus	Hill Fireweed
Senecio hispidulus var. *hispidulus*	
Senecio linearifolius	
Senecio quadridentatus	Cotton Fireweed
Senecio species E	
Senecio tenuiflorus	
Sonchus asper	Prickly Sowthistle
Sonchus asper ssp. *glaucescens*	
Sonchus oleraceus	Common Sowthistle
Triptilodiscus pygmaeus	
Vittadinia cuneata var. *cuneata*	Fuzzweed
Blechnaceae	
Blechnum cartilagineum	Gristle Fern

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Boraginaceae	
Cynoglossum australe	
Cynoglossum suaveolens	
Echium plantagineum	Paterson's Curse
Brassicaceae	
Cardamine paucijuga	
Lepidium bonariense	
Sisymbrium officinale	Hedge Mustard
Campanulaceae	
Isotoma axillaris	Rock Isotome
Wahlenbergia communis	Tufted Bluebell
Wahlenbergia gracilis	Sprawling Bluebell
Wahlenbergia graniticola	Granite Bluebell
Wahlenbergia stricta	
Wahlenbergia stricta ssp. *stricta*	
Caryophyllaceae	
Cerastium glomeratum	Mouse-eared Chickweed
Petrorhagia nanteuilii	
Stellaria flaccida	
Stellaria pungens	
Chenopodiaceae	
Einadia hastata	Berry Saltbush
Einadia nutans	Climbing Saltbush
Clusiaceae	
Hypericum gramineum	Small St John's Wort
Convolvulaceae	
Convolvulus erubescens	
Dichondra repens	Kidney Weed
Crassulaceae	
Crassula sieberiana	Australian Stonecrop
Cupressaceae	
Callitris endlicheri	Black Cypress Pine

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Cyperaceae	
Carex appressa	
Carex breviculmis	
Gahnia sieberiana	
Lepidosperma laterale	
Lepidosperma lineare	
Lepidosperma tortuosum	
Schoenus turbinatus	
Dennstaedtiacea	
Pteridium esculentum	Bracken
Dilleniaceae	
Hibbertia obtusifolia	
Epacridaceae	
Astroloma humifusum	Native Cranberry
Brachyloma daphnoides	
Leucopogon ericoides	
Leucopogon lanceolatus	
Leucopogon microphyllus	
Leucopogon microphyllus var. *microphyllus*	
Leucopogon microphyllus var. *pilibundus*	
Lissanthe strigosa	
Melichrus urceolatus	
Monotoca scoparia	
Styphelia triflora	
Styphelia tubiflora	
Euphorbiaceae	
Amperea xiphoclada	
Phyllanthus hirtellus	
Poranthera microphylla	
Fabaceae	
Bossiaea foliosa	
Bossiaea neo-anglica	

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Daviesia virgata	
Desmodium varians	Slender Tick-trèfoil
Dillwynia phylicoides	
Dillwynia retorta	
Glycine clandestina	
Glycine tabacina	
Gompholobium huegelii	Pale Wedge Pea
Hardenbergia violacea	
Hovea linearis	
Indigofera adesmiifolia	
Indigofera australis	
Mirbelia oxylobioides	
Pultenaea microphylla	
Trifolium arvense	Haresfoot Clover
Trifolium campestre	Hop Clover
Trifolium dubium	Yellow Suckling Clover
Trifolium glomeratum	Clustered Clover
Trifolium repens	White Clover
Vicia hirsuta	Hairy Vetch
Gentianaceae	
Centaurium erythraea	Common Centaury
Geraniaceae	
Geranium molle	Cranesbill Geranium
Geranium potentilloides	
Geranium solanderi	
Goodeniaceae	
Goodenia bellidifolia	
Goodenia bellidifolia ssp. *bellidifolia*	
Goodenia hederacea	
Haloragaceae	
Gonocarpus micranthus	
Gonocarpus tetragynus	

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Iridaceae	
Patersonia sericea	
Juncaceae	
Juncus planifolius	
Juncus usitatus	Common Reed
Luzula densiflora	
Lamiaceae	
Ajuga australis	Austral Bugle
Mentha diemenica	Slender Mint
Prostanthera lasianthos	Victorian Christmas Bush
Lauraceae	
Cassytha glabella	
Lindsaeaceae	
Lindsaea linearis	Screw Fern
Loganiaceae	
Mitrasacme polymorpha	
Lomandraceae	
Lomandra confertifolia	
Lomandra confertifolia ssp. *pallida*	
Lomandra filiformis	
Lomandra filiformis ssp. *filiformis*	
Lomandra gracilis	
Lomandra longifolia	Spiny Mat-rush
Lomandra multiflora	
Loranthaceae	
Amyema miquelii	
Amyema pendulum ssp. *pendulum*	
Mimosaceae	
Acacia buxifolia	Box-leaved Wattle
Acacia dealbata	Silver Wattle
Acacia falciformis	
Acacia genistifolia	

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Acacia gunnii	
Acacia implexa	Hickory Wattle
Acacia melanoxylon	Blackwood
Acacia penninervis	
Acacia verniciflua	Varnished Wattle
Myrtaceae	
Calytrix tetragona	Fringe Myrtle
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus bridgesiana	Apple Box
Eucalyptus dalrympleana	Mountain Gum
Eucalyptus dives	Broad-leaved Peppermint
Eucalyptus goniocalyx	Long-leaved Box
Eucalyptus macrorhyncha	Red Stringybark
Eucalyptus mannifera	Brittle Gum
Eucalyptus melliodora	Yellow Box
Eucalyptus pauciflora	Snow Gum
Eucalyptus polyanthemos	Red Box
Eucalyptus rossii	Scribbly Gum
Eucalyptus viminalis	Ribbon Gum
Leptospermum grandifolium	
Leptospermum lanigerum	Woolly Teatree
Leptospermum multicaule	
Onagraceae	
Epilobium billardierianum	
Orchidaceae	
Caleana minor	Small Duck Orchid
Cryptostylis erecta	Tartan Tongue Orchid
Dipodium punctatum	
Glossodia major	Waxlip Orchid
Oxalidaceae	
Oxalis corniculata	Creeping Oxalis
Oxalis perennans	

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Phormiaceae	
Dianella caerulea	
Dianella revoluta	
Stypandra glauca	
Pittosporaceae	
Billardiera scandens	Appleberry
Bursaria spinosa	Blackthorn
Citriobatus pauciflorus	Orange Thorn
Rhytidosporum procumbens	
Plantaginaceae	
Plantago debilis	
Plantago varia	
Poaceae	
Agrostis avenacea	
Anthoxanthum odoratum	Sweet Vernal Grass
Aristida vagans	Three Awn Speargrass
Bothriochloa macra	Red Grass
Bromus cartharticus	Prairie Grass
Bromus diandrus	Great Brome
Bromus hordeaceus	Soft Brome
Bromus molliformis	Soft Brome
Chionochloa pallida	Redanther Wallaby Grass
Cymbopogon refractus	Barbed Wire Grass
Dactylis glomerata	Cocksfoot
Danthonia caespitosa	Ringed Wallaby Grass
Danthonia laevis	
Danthonia linkii var. fulva	
Danthonia monticola	
Danthonia pilosa	Smooth-flowered Wallaby Grass
Danthonia racemosa var. racemosa	
Deyeuxia quadriseta	
Dichelachne micrantha	Plume Grass

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Echinopogon caespitosus	
Echinopogon cheelii	Long-flowered Hedgehog Grass
Echinopogon ovatus	Forest Hedgehog Grass
Elymus scaber	Wheat Grass
Elymus scaber var. scaber	
Glyceria latispicea	
Microlaena stipoides	Weeping Meadow Grass
Nassella trichotoma	Serrated Tussock
Poa labillardieri	Tussocky Poa
Poa sieberiana	
Poa sieberiana var. *cyanophylla*	Blue-leaved Snow Grass
Poa sieberiana var. *sieberiana*	Snow Grass
Stipa mollis	Speargrass
Stipa rudis ssp. *nervosa*	
Stipa scabra	Speargrass
Vulpia bromoides	Squirrel Tail Fescue
Polygonaceae	
Acetosella vulgaris	Sorrel
Rumex brownii	Swamp Dock
Portulacaceae	
Calandrinia calyptrata	
Primulaceae	
Anagallis arvensis	Scarlet Pimpernel
Proteaceae	
Grevillea arenaria	
Grevillea linearifolia	
Lomatia myricoides	
Persoonia chamaepeuce	
Persoonia linearis	Narrow-leaved Geebung
Persoonia mollis	
Persoonia rigida	

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Ranunculaceae	
Clematis aristata	
Clematis glycinoides	Headached Vine
Ranunculus lappaceus	Common Buttercup
Rhamnaceae	
Cryptandra spinescens	
Pomaderris angustifolia	
Pomaderris aspera	Hazel Pomaderris
Rosaceae	
Acaena novae-zelandiae	Bidgee Widgee
Acaena ovina	
Rubus parvifolius	Native Raspberry
Rubus ulmifolius	Blackberry
Rubiaceae	
Asperula conferta	Common Woodruff
Asperula scoparia	Prickly Woodruff
Coprosma hirtella	
Coprosma quadrifida	Prickly Currant Buch
Galium gaudichaudii	Rough Bedstraw
Galium propinquum	
Opercularia hispida	Hairy Stinkweed
Pomax umbellata	
Santalaceae	
Exocarpos cupressiformis	Native Cherry
Omphacomeria acerba	
Sapindaceae	
Dodonaea boroniifolia	
Dodonaea viscosa	
Scrophulariacea	
Derwentia derwentiana	
Derwentia perfoliata	Diggers Speedwell
Veronica calycina	Hairy Speedwell

Table D1 FLORA SPECIES LIST FOR WINBURNDALE NATURE RESERVE

Scientific Name	Common Name
Veronica peregrina	Wandering Speedwell
Veronica plebeia	Trailing Speedwell
Sinopteridaceae	
Cheilanthes sieberi ssp. *sieberi*	Poison Rock Fern
Pellaea falcata var. *falcata*	
Solanaceae	
Physalis peruviana	Cape Gooseberry
Solanum nigrum	Black-berry Nightshade
Stackhousiaceae	
Stackhousia monogyna	Creamy Candles
Stackhousia viminea	Slender Stackhousia
Stylidiaceae	
Stylidium graminifolium	Grass Triggerplant
Thymelaeaceae	
Pimelea curviflora var. *gracilis*	
Pimelea linifolia	
Urticaceae	
Urtica incisa	Stinging Nettle
Violaceae	
Hymenanthera dentata	Tree Violet
Viola betonicifolia	
Viola hederacea	Ivy-leaved Violet

Table D2 FLORA SPECIES LIST FOR NANGAR NATIONAL PARK

Scientific Name	Common Name
Anthericaceae	
Laxmannia gracilis	
Tricoryne elatior	Yellow Autumn Lily
Apiaceae	
Hydrocotyle laxiflora	Stinking Pennywort
Platysace ericoides	
Platysace lanceolata	
Asteraceae	
Bracteantha bracteata	
Calotis cuneifolia	Burr Daisy
Cassinia arcuata	Sifton Bush
Helichrysum semipapposum	Clustered Everlasting
Cirsium vulgare	Spear Thistle
Olearia ramulosa	
Senecio species E	
Bignoniaceae	
Pandorea pandorana	Wonga Wonga Vine
Campanulaceae	
Wahlenbergia gracilis	
Caryophyllaceae	
Petrorhagia nanteuilii	
Stellaria pungens	Prickly Starwort
Chenopodiaceae	
Einadia hastata	Berry Saltbush
Einadia nutans	Climbing Saltbush
Einadia nutans ssp. nutans	
Clusiaceae	
Hypericum gramineum	Small St John's Wort
Convolvulaceae	
Dichondra repens	Kidney Weed
Cupressaceae	

Table D2 FLORA SPECIES LIST FOR NANGAR NATIONAL PARK

Scientific Name	Common Name
Callitris endlicheri	Black Cypress Pine
Callitris glaucophylla	White Cypress Pine
Cyperaceae	
Carex appressa	
Lepidosperma laterale	
Dilleniaceae	
Hibbertia obtusifolia	
Hibbertia stricta	
Epacridaceae	
Acrotriche rigida	
Brachyloma daphnoides	
Leucopogon attenuatus	
Leucopogon microphyllus	
Lissanthe strigosa	
Melichrus urceolatus	
Monotoca scoparia	
Styphelia triflora	
Euphorbiaceae	
Phyllanthus hirtellus	
Fabaceae	
Daviesia virgata	
Desmodium varians	Slender Tick-trefoil
Dillwynia juniperina	
Dillwynia phylicoides	
Glycine clandestina	
Glycine tabacina	
Hardenbergia violacea	
Hovea linearis	
Indigofera australis	
Platylobium formosum	
Pultenaea microphylla	
Pultenaea procumbens	
Trifolium arvense	Haresfoot Clover

Table D2 FLORA SPECIES LIST FOR NANGAR NATIONAL PARK

Scientific Name	Common Name
Geraniaceae	
Geranium solanderi	
Goodeniaceae	
Dampiera lanceolata var. *lanceolata*	
Goodenia hederacea	
Haloragaceae	
Gonocarpus elatus	
Gonocarpus tetragynus	
Iridaceae	
Patersonia sericea	
Lamiaceae	
Ajuga australis	Austral Bugle
Scutellaria humilis	
Lomandraceae	
Lomandra filiformis	
Lomandra multiflora	
Loranthaceae	
Amyema miquelii	
Mimosaceae	
Acacia buxifolia	Box-leaved Wattle
Acacia deanei	Green Wattle
Acacia doratoxylon	Currawang
Acacia paradoxa	Kangaroo Thorn
Acacia penninervis	
Acacia uncinata	
Acacia verniciflua	Varnished Wattle
Acacia venulosa	
Myrtaceae	
Calytrix tetragona	Fringe Myrtle
Eucalyptus albens	White Box
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus dealbata	Tumbledown Gum

Table D2 FLORA SPECIES LIST FOR NANGAR NATIONAL PARK

Scientific Name	Common Name
Eucalyptus goniocalyx	Long-leaved Box
Eucalyptus macrorhyncha	Red Stringybark
Eucalyptus microcarpa	Western Grey Box
Eucalyptus polyanthemos	Red Box
Eucalyptus rossii	Scribbly Gum
Eucalyptus sideroxylon	Mugga Ironbark
Oxalidaceae	
Oxalis corniculata	Creeping Oxalis
Phormiaceae	
Dianella revoluta	
Stypandra glauca	Nodding Blue Lily
Pittosporaceae	
Rhytidosporum procumbens	
Plantaginaceae	
Plantago varia	
Poaceae	
Chionochloa pallida	Redanther Wallaby Grass
Danthonia caespitosa	Ringed Wallaby Grass
Danthonia racemosa	
Dichelachne micrantha	Plume Grass
Echinopogon ovatus	Forest Hedgehog Grass
Elymus scaber	
Eragrostis leptostachya	Paddock Lovegrass
Microlaena stipoides	Weeping Meadow Grass
Poa sieberiana var. *cyanophylla*	Blue-leaved Snow Grass
Poa sieberiana var. *sieberiana*	Snow Grass
Stipa scabra ssp. *falcata*	Spear Thistle
Polygonaceae	
Rumex brownii	Swamp Dock
Primulaceae	
Anagallis arvensis	Scarlet Pimpernel
Proteaceae	
Grevillea floribunda	

Table D2 FLORA SPECIES LIST FOR NANGAR NATIONAL PARK

Scientific Name	Common Name
Grevillea ramosissima	
Grevillea triternata	
Persoonia rigida	
Rosaceae	
Acaena ovina	Sheep's Burr
Rubiaceae	
Opercularia aspera	Coarse Stinkweed
Opercularia hispida	Hairy Stinkweed
Pomax umbellata	
Rutaceae	
Philotheca salsolifolia	
Santalaceae	
Exocarpos cupressiformis	Native Cherry
Sapindaceae	
Dodonaea viscosa	
Sinopteridaceae	
Cheilanthes distans	Bristly Cloak Fern
Cheilanthes sieberi ssp. sieberi	
Stackhousiaceae	
Stackhousia viminea	Slender Stackhousia
Sterculiaceae	
Brachychiton populneus	Kurrajong
Thymelaeaceae	
Pimelea linifolia ssp. linifolia	
Violaceae	
Hybanthus monopetalus	Slender Violet-bush
Xanthorrhoeacea	
Xanthorrhoea australis	
Zamiaceae	
Macrozamia secunda	

Table D3 SPECIES LIST FOR CONIMBLA NATIONAL PARK

Scientific Name	Common Name
Amaranthaceae	
Alternanthera denticulata	Lesser Joyweed
Anthericaceae	
Laxmannia gracilis	
Apiaceae	
Actinotus helianthi	Flannel Flower
Daucus glochidiatus	Native Carrot
Hydrocotyle laxiflora	Stinking Pennywort
Platysace ericoides	
Asteraceae	
Bracteantha bracteata	
Cassinia laevis	
Helichrysum apiculatum	
Helichrysum semipapposum	Clustered Everlasting
Cirsium vulgare	Spear Thistle
Conyza bonariensis	Flaxleaf Fleabane
Cymbonotus lawsonianus	Bears-ear
Gnaphalium sphaericum	
Helichrysum rutidolepis	Pale Everlasting
Helichrysum scorpioides	Button Everlasting
Hypochaeris glabra	Smooth Catsear
Olearia microphylla	
Senecio bipinnatisectus	
Senecio species E	
Sonchus asper	Prickly Sowthistle
Sonchus oleraceus	Common Sowthistle
Boraginaceae	
Cynoglossum sp.	
Campanulaceae	
Wahlenbergia gracilis	
Wahlenbergia stricta	Tall Bluebell

Table D3 SPECIES LIST FOR CONIMBLA NATIONAL PARK

Scientific Name	Common Name
Wahlenbergia stricta ssp. *stricta*	
Caryophyllaceae	
Petrorhagia nanteuilii	
Stellaria angustifolia	Swamp Starwort
Casuarinaceae	
Allocasuarina diminuta ssp. *diminuta*	
Clusiaceae	
Hypericum gramineum	Small St John's Wort
Convolvulaceae	
Dichondra repens	Kidney Weed
Cupressaceae	
Callitris endlicheri	Black Cypress Pine
Callitris glaucophylla	White Cypress Pine
Cyperaceae	
Carex appressa	
Gahnia aspera	
Isolepis gaudichaudiana	
Lepidosperma laterale	
Schoenus apogon	
Dilleniaceae	
Hibbertia obtusifolia	
Hibbertia serpyllifolia	
Hibbertia stricta	
Epacridaceae	
Acrotriche rigida	
Astroloma humifusum	Native Cranberry
Brachyloma daphnoides	
Leucopogon microphyllus	
Leucopogon virgatus	
Melichrus urceolatus	
Monotoca scoparia	
Styphelia triflora	

Table D3 SPECIES LIST FOR CONIMBLA NATIONAL PARK

Scientific Name	Common Name
Euphorbiaceae	
Phyllanthus hirtellus	
Poranthera microphylla	
Fabaceae	
Daviesia latifolia	
Daviesia virgata	
Desmodium varians	Slender Tick-trefoil
Dillwynia phylicoides	
Glycine clandestina	
Gompholobium huegelii	
Hardenbergia violacea	
Hovea linearis	
Hovea rosmarinifolia	
Indigofera australis	
Indigofera coronillifolia	
Mirbelia pungens	
Pultenaea cunninghamii	
Pultenaea procumbens	
Swainsona galegifolia	Smooth Darling Pea
Trifolium arvense	Haresfoot Clover
Trifolium campestre	Hop Clover
Gentianaceae	
Centaurium tenuiflorum	
Geraniaceae	
Geranium potentilloides	
Geranium solanderi	
Goodeniaceae	
Dampiera purpurea	
Goodenia bellidifolia	
Goodenia hederacea	
Haloragaceae	
Gonocarpus elatus	
Gonocarpus tetragynus	

Table D3 SPECIES LIST FOR CONIMBLA NATIONAL PARK

Scientific Name	Common Name
Haloragis heterophylla	
Iridaceae	
Patersonia sericea	
Juncaceae	
Juncus fockei	
Juncus planifolius	
Juncus remotiflorus	
Lamiaceae	
Scutellaria humilis	
Lauraceae	
Cassytha pubescens	
Lomandraceae	
Lomandra filiformis	
Lomandra multiflora	
Mimosaceae	
Acacia buxifolia	Box-leaved Wattle
Acacia dealbata	Silver Wattle
Acacia doratoxylon	Currawang
Acacia genistifolia	
Acacia gladiiformis	Sword-leaved Wattle
Acacia hakeoides	Hakea Wattle
Acacia paradoxa	Kangaroo Thorn
Acacia penninervis	
Acacia venulosa	
Myrtaceae	
Baeckea cunninghamii	
Calytrix tetragona	Fringe Myrtle
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus bridgesiana	Apple Box
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus dealbata	Tumbledown Gum
Eucalyptus dwyeri	Dwyer's Red Gum
Eucalyptus fibrosa	Broad-leaved Ironbark

Table D3 SPECIES LIST FOR CONIMBLA NATIONAL PARK

Scientific Name	Common Name
Eucalyptus goniocalyx	Long-leaved Box
Eucalyptus macrorhyncha	Red Stringybark
Eucalyptus melliodora	Yellow Box
Eucalyptus polyanthemos	Red Box
Eucalyptus rossii	Scribbly Gum
Eucalyptus sideroxylon	Mugga Ironbark
Leptospermum continentale	Prickly Teatree
Leptospermum multicaule	
Micromyrtus ciliata	
Onagraceae	
Epilobium billardierianum	
Epilobium hirtigerum	
Orobanchaceae	
Orobanche minor	
Oxalidaceae	
Oxalis corniculata	Creeping Oxalis
Phormiaceae	
Dianella revoluta	
Stypandra glauca	Nodding Blue Lily
Pittosporaceae	
Bursaria spinosa	Blackthorn
Poaceae	
Agrostis avenacea	
Agrostis avenacea var. *avenacea*	
Aira cupaniana	Silvery Grass
Aristida jerichoensis var. *subspinulifera*	
Briza minor	Shivery Grass
Chionochloa pallida	Redanther Wallaby Grass
Danthonia caespitosa	Ringed Wallaby Grass
Danthonia pilosa	Smooth-flowered Wallaby Grass
Dichelachne micrantha	Plume Grass
Dichelachne sieberiana	
Echinopogon ovatus	Forest Hedgehog Grass

Table D3 SPECIES LIST FOR CONIMBLA NATIONAL PARK

Scientific Name	Common Name
Elymus scaber	
Eragrostis benthamii	
Microlaena stipoides	Weeping Meadow Grass
Poa sieberiana var. *sieberiana*	Snow Grass
Stipa scabra	Speargrass
Tetrarrhena juncea	Wiry Ricegrass
Vulpia bromoides	Squirrel Tail Fescue
Polygonaceae	
Persicaria decipiens	Slender Knotweed
Rumex brownii	Swamp Dock
Primulaceae	
Anagallis arvensis	
Proteaceae	
Grevillea floribunda	
Grevillea polybractea	
Grevillea ramosissima	
Grevillea triternata	
Persoonia mollis	
Persoonia rigida	
Persoonia sericea	
Rhamnaceae	
Cryptandra amara var. *amara*	
Cryptandra amara var. *floribunda*	
Rosaceae	
Acaena ovina	
Rosa rubiginosa	Sweet Briar
Rubiaceae	
Galium gaudichaudii	Rough Red Straw
Opercularia hispida	
Pomax umbellata	
Rutaceae	
Crowea exalata	

Table D3 SPECIES LIST FOR CONIMBLA NATIONAL PARK

Scientific Name	Common Name
Philotheca salsolifolia	
Sapindaceae	
Dodonaea viscosa ssp. *spatulata*	
Scrophulariaceae	
Gratiola pedunculata	
Derwentia perfoliata	Digger's Speedwell
Veronica plebeia	
Sinopteridaceae	
Cheilanthes sieberi ssp. *sieberi*	
Solanaceae	
Solanum nigrum	Black-berry Nightshade
Stylidiaceae	
Stylidium graminifolium	Grass Triggerplant
Urticaceae	
Urtica incisa	Stinging Nettle
Xanthorrhoeacea	
Xanthorrhoea australis	
Zamiaceae	
Macrozamia secunda	

Table D4 FLORA SPECIES LIST FOR WEDDIN MOUNTAINS NATIONAL PARK

Scientific Name	Common Name
Amaranthaceae	
Alternanthera denticulata	Lesser Joyweed
Anthericaceae	
Laxmannia gracilis	
Tricoryne elatior	Yellow Autumn Lily
Apiaceae	
Daucus glochidiatus	Native Carrot
Hydrocotyle laxiflora	Stinking Pennywort
Platysace lanceolata	
Asteraceae	
Bracteantha bracteata	
Calotis cuneifolia	Burr Daisy
Carthamus lanatus	Saffron Thistle
Cassinia laevis	
Helichrysum semipapposum	Clustered Everlasting
Cirsium vulgare	Spear Thistle
Conyza bonariensis	Flaxleaf Fleabane
Gnaphalium sphaericum	
Helichrysum scorpioides	Button Everlasting
Hypochaeris glabra	Smooth Catsear
Hypochaeris radicata	Catsear
Olearia microphylla	Small-leaf Daisy Bush
Olearia ramosissima	
Olearia ramulosa	
Senecio hispidulus	Hill Fireweed
Senecio lautus ssp. *dissectifolius*	
Senecio quadridentatus	Cotton Fireweed
Senecio species E	
Sigesbeckia australiensis	
Sigesbeckia orientalis	Indian Weed
	Common Sowthistle

Table D4 FLORA SPECIES LIST FOR WEDDIN MOUNTAINS NATIONAL PARK

Scientific Name	Common Name
Sonchus oleraceus	
Boraginaceae	
Cynoglossum australe	
Echium plantagineum	Paterson's Curse
Campanulaceae	
Wahlenbergia communis	Tufted Bluebell
Wahlenbergia gracilis	Sprawling Bluebell
Caryophyllaceae	
Petrorhagia nanteuilii	
Casuarinaceae	
Allocasuarina diminuta ssp. *diminuta*	
Chenopodiaceae	
Einadia nutans	Climbing Saltbush
Convolvulaceae	
Dichondra repens	Kidney Weed
Cupressaceae	
Callitris endlicheri	Black Cypress Pine
Callitris glaucophylla	White Cypress Pine
Cyperaceae	
Carex appressa	
Lepidosperma laterale	
Schoenus apogon	
Dilleniaceae	
Hibbertia obtusifolia	
Hibbertia serpyllifolia	
Hibbertia stricta	
Epacridaceae	
Astroloma humifusum	Native Cranberry
Brachyloma daphnoides	
Leucopogon attenuatus	
Lissanthe strigosa	
Styphelia triflora	

Table D4 FLORA SPECIES LIST FOR WEDDIN MOUNTAINS NATIONAL PARK

Scientific Name	Common Name
Euphorbiaceae	
Beyeria viscosa	
Phyllanthus hirtellus	
Poranthera microphylla	
Fabaceae	
Daviesia leptophylla	
Daviesia virgata	
Daviesia virgata	
Dillwynia juniperina	
Dillwynia phylicoides	
Glycine clandestina	
Glycine tabacina	
Hardenbergia violacea	
Indigofera adesmiifolia	
Indigofera australis	
Pultenaea microphylla	
Pultenaea procumbens	Prostrate Bush Pea
Trifolium glomeratum	Clustered Clover
Geraniaceae	
Geranium solanderi	
Pelargonium australe	Native Stoksbill
Goodeniaceae	
Dampiera purpurea	
Goodenia hederacea	
Goodenia macbarronii	
Haloragaceae	
Gonocarpus elatus	
Iridaceae	
Patersonia sericea	
Juncaceae	
Juncus remotiflorus	

Table D4 FLORA SPECIES LIST FOR WEDDIN MOUNTAINS NATIONAL PARK

Scientific Name	Common Name
Lamiaceae	
Scutellaria humilis	
Lauraceae	
Cassytha pubescens	
Lobeliaceae	
Lobelia gibbosa	
Lomandraceae	
Lomandra filiformis	
Lomandra longifolia	Spiny Mat-rush
Lomandra multiflora	
Loranthaceae	
Amyema miquelii	
Mimosaceae	
Acacia buxifolia	Box leaved Wattle
Acacia deanei	Green Wattle
Acacia deanei ssp. *paucijuga*	
Acacia doratoxylon	Currawang
Acacia penninervis	
Acacia verniciflua	Varnished Wattle
Myoporaceae	
Myoporum montanum	Western Boobialla
Myrtaceae	
Calytrix tetragona	Fringe Myrtle
Eucalyptus albens	White Box
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus dealbata	Tumbledown Gum
Eucalyptus dwyeri	Dwyer's Red Gum
Eucalyptus fibrosa	Broad-leaved Ironbark
Eucalyptus goniocalyx	Long-leaved Box
Eucalyptus macrorhyncha	Red Stringybark
Eucalyptus rossii	Scribbly Gum
Eucalyptus siderophloia	Grey Ironbark

Table D4 FLORA SPECIES LIST FOR WEDDIN MOUNTAINS NATIONAL PARK

Scientific Name	Common Name
Eucalyptus sideroxylon	Mugga Ironbark
Oxalidaceae	
Oxalis corniculata	Creeping Oxalis
Oxalis perennans	
Phormiaceae	
Dianella longifolia	
Dianella revoluta	
Stypandra glauca	
Pittosporaceae	
Bursaria spinosa	Blackthorn
Poaceae	
Aristida ramosa var. *scaberula*	
Chionochloa pallida	Redanther Wallaby Grass
Chloris truncata	Windmill Grass
Danthonia caespitosa	Ringed Wallaby Grass
Danthonia racemosa var. *racemosa*	
Danthonia setacea	Small-flowered Wallaby Grass
Dichelachne micrantha	Plume Grass
Echinopogon ovatus	Forest Hedgehog Grass
Elymus scaber	Wheat Grass
Elymus scaber var. *scaber*	
Microlaena stipoides	Weeping Meadow Grass
Poa sieberiana var. *cyanophylla*	Blue-leaved Snow Grass
Poa sieberiana var. *sieberiana*	Snow Grass
Stipa scabra var. *falcata*	Speargrass
Polygonaceae	
Rumex brownii	Swamp Dock
Primulaceae	
Anagallis arvensis	Scarlet Pimpernel
Proteaceae	
Grevillea floribunda	
Grevillea ramosissima	

Table D4 FLORA SPECIES LIST FOR WEDDIN MOUNTAINS NATIONAL PARK

Scientific Name	Common Name
Persoonia rigida	
Rhamnaceae	
Cryptandra amara var. *floribunda*	
Rubiaceae	
Asperula conferta	Comm Woodruff
Galium gaudichaudii	Rough Red Straw
Opercularia aspera	Coarse Stinkweed
Pomax umbellata	
Rutaceae	
Zieria cytisoides	Downy Zieria
Santalaceae	
Exocarpos cupressiformis	Native Cherry
Sapindaceae	
Dodonaea viscosa	
Sinopteridaceae	
Cheilanthes sieberi ssp. *sieberi*	
Stackhousiaceae	
Stackhousia monogyna	Creamy Candles
Stackhousia viminea	Slender Stackhousia
Sterculiaceae	
Brachychiton populneus	Kurrajong
Stylidiaceae	
Stylidium laricifolium	Tree Triggerplant
Violaceae	
Hybanthus monopetalus	Slender Violet-bush
Hybanthus floribundus	
Xanthorrhoeaceae	
Xanthorrhoea australis	
Zamiaceae	
Macrozamia secunda	