

**CASINO MANAGEMENT AREA EIS
SUPPORTING DOCUMENT No. 7**

**FLORA SURVEY REPORT
CASINO MANAGEMENT AREA
NORTHERN REGION
STATE FORESTS OF NEW SOUTH WALES**

by

Doug Binns

1995



EIS/CASI

FLORA SURVEY REPORT
CASINO MANAGEMENT AREA
NORTHERN REGION
STATE FORESTS OF NEW SOUTH WALES

by

Doug Binns

Research Division
State Forests of New South Wales

1995

© 1995 Forestry Commission of New South Wales

Published by State Forests of New South Wales
Building 2, 423 Pennant Hills Road, Pennant Hills NSW 2120, Australia.

Bibliography
ISBN 0 7310 6706 1

Available from State Forests of New South Wales Northern Regional Office Coffs Harbour,
Phone (066) 528 900 or the Casino District Office, Phone (066) 624 499.

This document has been printed on recycled paper.

CONTENTS

INTRODUCTION	1
METHODS	
1. <i>Data Collection</i>	2
2. <i>Information from other sources</i>	7
3. <i>Taxonomy and nomenclature</i>	7
4. <i>Assessment of conservation significance</i>	8
5. <i>Data analysis</i>	8
RESULTS	
1. <i>Floristic composition and communities</i>	10
2. <i>Forest overstorey communities</i>	20
3. <i>Floristic patterns in relation to environment and disturbance</i>	44
DISCUSSION	
1. <i>Significant plant species</i>	49
2. <i>Conservation status of Eucalypt overstorey communities</i>	64
3. <i>Conservation status of mapped forest types</i>	64
4. <i>Impact of logging</i>	66
5. <i>Impact of fire</i>	66
6. <i>Impact of grazing</i>	67
7. <i>Weeds</i>	67
RECOMMENDATIONS	
1. <i>Introduction</i>	68
2. <i>Nationally significant species</i>	68

3. <i>Species of regional significance</i>	72
4. <i>Reservation of communities</i>	73
5. <i>Summary of flora conservation area and reserve proposals</i>	76
6. <i>Fire management</i>	76
7. <i>Grazing</i>	77
ACKNOWLEDGEMENTS	78
REFERENCES	78
TABLES	
Table 1. Distribution of plots among mapped forest types (MFT). Area is calculated from GIS.	5
Table 2. Distribution of plots among geology, temperature and rainfall classes.	6
Table 3. Summary of floristic richness and main environmental characteristics of 41 floristic groups at 0.8 dissimilarity level.	12
Table 4. Summary of environmental characteristics of overstorey communities.	22
Table 5. Distribution of plots among mapped forest types and overstorey communities.	23
Table 6. Distribution of survey plots among overstorey and floristic communities.	25
Table 7. Comparison and conservation status of forest vegetation communities on the basis of overstorey composition.	26
Table 8. Conservation status of mapped forest types (rainforest excluded).	65
Table 9. Conservation status of mapped forest types in CMA and proportion in existing and proposed reserves.	75
FIGURES	
Figure 1. Plot location map	4

Figure 2. Dendrogram from floristic classification of percentage cover of all species, truncated at the 0.8 dissimilarity level.	11
Figure 3. Dendrogram from floristic classification of basal area of all woody species with stem diameter > 10cm, truncated at the 0.6 level of dissimilarity.	21
Figure 4. "Snipped" classification tree of floristic richness of native species in relation to environmental variables.	44
Figure 5. CCA ordination of all eucalypt forest plots, broad floristic group superimposed.	45
Figure 6. CCA ordination of habitat group defined by fire age < 5 years and rainfall > 1059 mm/yr, with logging categories superimposed.	46
Figure 7. CCA ordination of habitat group defined by fire age > 5 years and rainfall > 1116 mm/yr, with logging categories superimposed.	48
APPENDICES	
Appendix 1. Occurrence of vascular plant species by broad floristic group and logging category	80
Appendix 2. Summary of major site features of flora survey plots	105

INTRODUCTION

This report presents the results of recent surveys of vascular plant species undertaken in the State forests within Casino Management Area (herein referred to as CMA), in far north-eastern New South Wales, in the context of environmental assessment of proposed forestry activities. CMA is bounded by latitudes 28° 30' to 29° 30' S and longitudes 152° 15' to 153° 20' E and comprises approximately 140 000 ha of State forests. This area, its physical characteristics and management history are described by the Forestry Commission of New South Wales (1983a, 1983b).

The general aim of this study is to describe the vegetation in the context of management of the area for commercial forestry purposes. More specifically, the objectives are:

- i) to describe the terrestrial vascular flora of the area, particularly the vegetation types and distribution, habitat and abundance of plant species;
- ii) to relate vegetation types to Forest Type map units used for forest management purposes;
- iii) to identify vascular plant species of particular botanical or conservation significance;
- iv) to identify vegetation types or communities of botanical or conservation significance and suggest representative areas for reservation where considered necessary;
- v) to compare the flora of areas of various forest management histories and consider likely impacts of proposed forestry operations on flora.

METHODS

1. DATA COLLECTION

(a) Data Sources and Plot Location

Descriptions of vegetation and assessment of impact are based on a series of non-permanent flora survey plots established in the area. There are several sources and several periods of field work from which data for this report were derived, as follows:

Austeco Pty Ltd

Data were part of an initial survey of the combined Grafton and Casino MAs. Plots were stratified by broad forest type and management history over the two management areas combined, with four replicates in each combination. The design was primarily for assessing impacts of forest management on fauna, and plots were generally close to road access. Plots in Grafton MA have been described by Moore and Floyd (1994). Field work was undertaken during the period November 1991 to February 1992, by A. Floyd, D. Moore and A. Benwell. Forty plots were within the CMA general boundary, thirty nine in State Forest (the other in Washpool National Park).

NPWS NEFBS (North-east Forests Biodiversity Study)

Data were part of a regional survey (north-east NSW, north of Hunter River and east of New England Highway), with plot locations stratified by 'environmental domain' (combinations of classes of lithology, temperature and rainfall) on a regional basis (National Parks and Wildlife Service 1995). Field work was carried out during December 1992 to April 1993. Ninety-nine plots were surveyed within the general boundary of CMA, including State Forest, National Park and other Crown land. Eighty-seven of these were in State Forest.

Binns

Additional plots were surveyed specifically for the present report, to complement the previous two surveys, using stratification by mapped forest types (Forestry Commission of New South Wales, 1989) as the basic strategy. Composite types were combined under the major constituent for stratification purposes, but most variants were sampled by at least one plot. As an overall strategy, plots were allocated to each forest type group depending on the extent of the type, as follows:

Area of map unit	Minimum no. of plots
<200 ha	1
200-1000 ha	2
1000-5000 ha	3
5000-10000 ha	4
>10000 ha	4, or 1 per 5000 ha

Plots additional to those already surveyed by Austeco and NEFBS were located in map units to meet the above criteria overall. The additional plots were located to avoid existing plots and were not constrained by road access. Plots in more extensive types were randomly selected but constrained to be in areas which could be sampled *en route* to those in restricted or unusual habitat types. This strategy was designed to ensure efficient sampling of the full range of types and habitats while reducing unproductive travelling time as far as possible. Plot locations were initially marked on topographic maps and the locations objectively transferred to the field. A total of 57 additional plots were surveyed.

As a basic criterion, the advantages of using mapped forest types as the basis for sampling are as follows:

- i) They are broadly related to overstorey composition.
- ii) They act as a surrogate which integrates a range of physical environmental attributes, providing greater efficiency of sampling.
- iii) They are part of a standard management system, which facilitates translation of survey results to management options.
- iv) The use of forest type maps with a combination of survey results and broad area observations facilitates assessment of conservation adequacy and location of additional reserves.

During this supplementary survey, particular attention was also given to sampling or at least inspecting unusual or restricted habitats (e.g. rock outcrops, swamps, deep ravines).

A total of 196 plots were surveyed from the three sources combined, 183 of these in State forests in CMA. All plots were 50 m x 20 m rectangles. Approximate locations are shown in Figure 1 and grid references and other details are listed in Appendix 2. Distribution of plots among mapped forest types (MFT) is summarised in Table 1 and distribution among environmental classes is summarized in Table 2. Two MFTs were not sampled. MFT 7 was originally sampled as part of a combined strategy with Murwillumbah area, and was not sampled in CMA when it was decided to consider the areas separately. There are two patches of MFT 26, both of which were inspected but not sampled. One, in Washpool SF, was found to be not distinct from adjacent areas mapped as FT 23. The other, in Royal Camp SF, was a very extensive thicket of the exotic shrub *Lantana camara*, adjacent to a private property boundary and apparently resulting from previous clearing prior to dedication as State Forest.

(b) Floristic and vegetation structural data

For the three surveys, all vascular plant species which could be distinguished within a plot were recorded and identified as far as possible to species level. Plot searches were comprehensive, but inconspicuous species may have been overlooked in some cases. Vertical heights of vegetation strata were subjectively defined and recorded for each plot. Stratum limits of 0-1m, 1-6m, 6-20m and 20-35m and >35m were used as a guide for the coding of structural data, even though actual heights were recorded.

Cover codes, based on projected canopy cover, were estimated for each species. For the Austeco and Binns survey plots, a cover code for each species was also estimated within each vertical stratum. Codes are as follows:

Cover Code	Projected Canopy Cover
1	< 5%, few individuals
2	< 5%, any number of individuals
3	6-25%
4	26-50%
5	51-75%
6	> 75%

In the Austeco and Binns plots, for all trees with stem diameter at breast height (1.3m) greater than 10cm, the number of stems of each species was recorded by 10 cm diameter classes, up to 50 cm. Diameter was recorded for all stems over 50 cm. In the NEFBS plots, diameters and species were recorded for the nearest 12 trees of any species. These data were used to calculate an estimate of basal area by species for each plot. All stumps were similarly recorded and the data used to give a measure of logging intensity within the plot.

During the Binns survey, the locations of any occurrences of significant species noted while traversing the area, additional to those occurring in plots, were also recorded.

Figure 1
ENVIRONMENTAL IMPACT STATEMENT
CASINO MANAGEMENT AREA
FAUNA AND FLORA PLOT LOCATION

Scale 1:470 000



- Environmental Impact Statement Boundary
 - Management Area Boundary
 - Major Road
 - Railway
 - Drainage
 - State Forest
 - Hardwood Plantation
 - Softwood Plantation
 - Timber Reserve
 - National Park, Nature Reserve
 - Unoccupied or Reserved Crown Land
 - Leasehold Land
 - Virtually Freehold Land
 - Water
 - Built Up Area
-
- Location of Fauna and Flora Plot (AUSTECO 1994)
 - Additional Location of Flora Plots (BINNS 1995)

In producing this map, State Forests of NSW acknowledges the use of data supplied by NPWS.



Table 1. Distribution of plots among mapped forest types (MFT). Area is calculated from GIS. No. of plots: A=Austeco; N=NEFBS; B=Binns; T=total. Composition by constituent types are listed where types are aggregated for sampling. Five plots in State forests sampled by NEFBS did not have mapped forest types recorded and are excluded from the table.

Mapped FT	Area	No. of plots				Composition
		A	N	B	T	
1	1 413	1	-	2	3	1 (1), 1a (2)
2/3	1 500	-	-	3	3	
7	724	-	-	-	0	
11	975	1	-	1	2	
21	3 980	1	-	2	3	
23	1 815	-	-	3	3	23 (1), 23/26 (2)
26	143	-	-	-	0	
30	737	-	4	-	4	30/31 (1), 30/31/92 (3)
31	9 379	-	4	-	4	31 (2), 31/92 (2)
32	40	-	-	1	1	
36	1 610	1	3	-	4	
37	6 211	5	4	-	9	37a (8), 37b (1)
38	1 129	3	-	1	4	
39	619	-	2	1	3	39 (2), 39b (1)
40/41	1 876	-	1	2	3	
41	10 735	5	6	-	11	41 (7), 41/92 (2), 41/97 (2)
46	414	1	1	-	2	46 (1), 46a (1)
47	6 888	3	3	2	8	47 (2), 47a (3), 47b (3)
48	1 643	3	2	-	5	
49/53	120	-	-	1	1	
51	92	-	-	1	1	
53	5 372	2	3	-	5	53 (4), 53b (1)
60	2 615	-	-	3	3	
62	14 234	1	9	2	12	62 (2), 62a (2), 62b (3), 62/126 (2), 62/74a (2), 62/74b (1)
65	3 662	2	5	-	7	65 (2), 65/85 (1), 65/126 (2)
70/74	4 149	-	-	2	2	
71	7 177	2	6	-	8	71 (2), 71a /93/0, 71b (3)
72	14 156	1	5	-	6	72 (1), 72/74 (5)
74	20 339	5	4	-	9	74 (6), 74a (1), 74b (2)
76	405	1	1	-	2	
80	143	-	-	3	3	
82	126	-	-	1	1	
83	23	-	-	1	1	
84	1 994	-	2	2	4	84 (2), 84/119 (1), 84/125 (1)
85	363	-	2	1	3	
87	440	-	1	2	3	
92	2 514	1	5	-	6	92 (4), 92/126 (2)
97	1 248	-	1	2	3	
117	216	-	-	2	2	
119	585	-	2	-	2	
126	277	-	1	1	2	
128	424	-	-	1	1	
129	767	-	3	-	3	
130	189	-	2	1	3	
163	2 356	-	-	5	5	163 (2), 163a (1), 163b (2)
207	79	-	1	-	1	
231	?	-	-	2	2	
234	?	-	-	6	6	

Table 2. Distribution of plots among geology, temperature and rainfall classes.

Geology	Temperature	No. of plots		
		Rainfall (mm/yr)		
		Dry (900-1100)	Wet (1100-1400)	V. wet (>1400)
Basic igneous	Warm (15-17° C)	-	3	5
	Very warm (>17° C)	-	3	-
Sedimentary, low quartz	Cool (12-15° C)	-	-	1
	Warm (15-17° C)	1	3	-
Acid volcanic	Very warm (>17° C)	15	52	8
	Cool (12-15° C)	-	-	5
	Warm (15-17° C)	-	1	4
Granitic	Very warm (>17° C)	-	1	-
	Cool (12-15° C)	-	-	2
	Warm (15-17° C)	-	10	-
	Very warm (>17° C)	1	2	-
Sed., high quartz Sandstone	Very warm (>17° C)	-	-	4
	Warm (15-17° C)	-	1	1
	Very warm (>17° C)	3	39	-
Quat. alluvium	Very warm (>17° C)	8	12	-
Quat. sediment	Very warm (>17° C)	-	-	2

(c) *Environmental data*

At each plot, slope (in degrees), altitude, aspect, topographic position, drainage, percentage cover and particle size of surface rock and cover of outcropping bedrock were recorded. An assessment was made of previous disturbance by logging, fire and grazing, on the basis of any available visual evidence. An estimate of intensity and time since disturbance was recorded. Estimates for logging were checked against historical records. Any other unusual feature was also recorded.

The main variables used for ordination analyses described below in Section 5 were derived from environmental data as follows:

- a Elevation in metres, from 1:25 000 topographic map.
- top Topographic position, coded as 1=ridge crests, 2=upper slopes, 3=mid slopes, 4=lower slopes and alluvial flats, 5=riparian or swamp.
- exp Degree of topographic exposure derived from combined aspect and position on slope classes, coded as 1=exposed (all ridge crests, upper slopes with aspect 0-135° or 225-360°, mid slopes with aspect 270-360°, 0-45°); 2=intermediate exposure (upper slopes with aspect 135-225°, mid slopes with aspect 45-135° or 225-270°, lower slopes with aspect 0-90° or 225-360°); 3=sheltered slopes (mid slopes with aspect 135-225°, lower slopes with aspect 90-225°); 4=riparian.
- r Mean annual rainfall, provided by Simon Ferrier, NPWS, Armidale, estimated from climatic surface model from plot locations.

- t Mean annual temperature, estimated as for rainfall.
- ri Mean annual solar radiation, incorporating effects of cloud cover and topography, provided by Simon Ferrier, NPWS, Armidale.
- fi Estimated intensity of most recent fire, coded as 0=no evidence; 1=low; 2=moderate; 3=high.
- fa Estimated time since last fire, coded as 1=1-2 yr; 2=3-5 yr; 3=6-10 yr; 4=11-15 yr; 5=16-20 yr; 6=21-30 yr; 7=31-40 yr; 8=41-50 yr; 9=>50 yr.
- li Logging intensity, coded as for fire.
- la Time since logging, coded as for fire.
- g Parent material, derived from 1:250 000 geology series and provided by S. Ferrier from digitized maps, coded as 1=basic igneous, 2=sedimentary, low quartz, 3=acid volcanics, 4=granitic, 5=sedimentary high quartz, 6=sandstone, 7=quaternary alluvium, 8=quaternary sand.

2. INFORMATION FROM OTHER SOURCES

Additional records and information on plants of conservation significance were obtained from the NPWS ROTAP database, kindly provided by Tim Hager, and the Upper North East Significant Plants database, provided by Di Brown of the NPWS GIS unit, Armidale. In each case, records were obtained for rare or significant plants recorded within the rectangle bounded by latitude 28° 30' - 29° 30' S and longitude 152° 15' - 153° 20' E.

Rainforest was surveyed at low intensity relative to the complexity of rainforest communities in the area. Descriptions of rainforest communities were supplemented by descriptions of Floyd (1990). Other data were obtained from a register of herbarium specimens held at the State Forests herbarium at Coffs Harbour. Specimens were not examined and it is possible that some specimens in this collection may be misidentified.

3. TAXONOMY AND NOMENCLATURE

Taxonomy and nomenclature follow the National Herbarium of N.S.W. This is mostly as published in Harden (1990, 1991, 1992, 1993), except where taxonomic revisions have been published more recently.

Some taxa could not always be confidently determined to species level. Particular difficulties were experienced with the following species or groups, mostly due to lack of suitable material:

Angophora woodsiana / *A. floribunda* Some specimens from sandstone substrates in the coastal ranges had intermediate pedicel length and could not be unequivocally assigned to either species using this character. These doubtful cases were referred to *A. woodsiana*.

Austrosteenisia blackii / *Derris involuta* These may have been confused in some cases.

Eucalyptus intermedia / *E. gummifera* These may not have been consistently separated, in the absence of fruiting material.

Eucalyptus biturbinata / *E. propinqua* Some records may have been incorrectly assigned, where fruiting material was unavailable.

Eucalyptus sp. aff. *acmenoides* A population on sandstone ridges in Mount Marsh SF is possibly an undescribed taxon but requires further investigation (K. Hill, National Herbarium of NSW, pers. comm.)

Gonocarpus humilis / *G. tetragynus* The distinction between these two is sometimes unclear.

Opercularia diphylla / *O. aspera* These may have been confused in the absence of fruiting material.

4. ASSESSMENT OF CONSERVATION SIGNIFICANCE

Each taxon of national conservation significance listed by Briggs and Leigh (1988), including recent revisions of status (J. Briggs, June 1995, pers. comm.) was assessed for its potential to occur in the State forests of CMA, based on known distribution and habitat. Species were assessed for State or regional conservation significance from Sheringham and Westaway (1995). Conservation significance of overstorey communities was assessed from Hager and Benson (1994) for eucalypt forest and Floyd (1980) for rainforest.

5. DATA ANALYSIS

Floristic data were classified into vegetation communities by grouping floristically similar plots using a numerical hierarchical agglomerative classification process, using the Bray-Curtis association measure and a flexible UPGMA sorting strategy with $\beta = 0.0$ (FUSE module of the PATN package, Belbin 1994). Although the procedure provides a repeatable and explicit method of defining communities, there are a number of critical decisions required which are essentially subjective and which may substantially affect the final community composition. The most important of these are the choice of β and the choice of an appropriate level in the dendrogram to define communities. A β value of zero was chosen to yield a 'space-conserving' fusion strategy which does not exaggerate floristic differences between groups. Communities were defined at dissimilarity levels of 0.6 and 0.8. These levels provide consistency with other recent surveys and provide a reasonable reflection of what are perceived as plant communities in the field.

Any community analysis must be regarded as only a guide to the tendency of certain groups of species to co-occur. It is a convenient means of examining and describing vegetation patterns rather than a definitive statement of vegetation composition. In any stand of vegetation, there is some degree of vertical layering or stratification. The analysis of a full floristic data set, including all strata, implicitly assumes that the overstorey and the various understorey strata respond similarly to environmental factors, and at similar spatial and temporal scales. In fact, this is unlikely to be the case. For example, at the extreme, canopy trees respond to environmental factors at a much broader scale than herbs in the lowest understorey stratum and the latter are much more likely to reflect recent disturbance events (such as fire) to which canopy species are relatively insensitive. Thus an analysis of all strata combined may obscure spatial patterns relating to these variations in responses. However, it is difficult to define limits which realistically and consistently allow separate analyses of strata across a range of vegetation types, and any defined limits are essentially arbitrary. In practice, an analysis of all species combined tends to be dominated by the influence of lower strata species, which usually contribute more than the canopy species to the overall floristic characterisation of a plot. There is thus a high degree of similarity between a full floristic analysis and understorey analysis, and patterns of canopy species composition tend to be obscured in the former. To allow consideration of these interactions, and to allow an assessment of conservation status of overstorey assemblages, two separate analyses were performed:

1. Basal area of all stems >10cm dbhob was used to define overstorey communities. Due to the influence of lower vegetation strata on the results of a full floristic classification, this analysis was considered essential to allow comparisons with existing vegetation classification schemes which are based solely on canopy composition, and consequently for assessment of conservation status of overstorey communities.

2. Total cover of all species, including canopy species.

As only cover-abundance codes were recorded for understorey floristic data, these were converted to percentages for analysis 2, as the mid-point of the cover class for cover >5% and using 1% and 3% for codes 1 and 2 respectively.

For examination of logging impact, fire impact and the influence of other environmental factors on plant community floristic composition, the full data matrix was reduced by excluding floristically disparate plots in habitats not subject to logging, such as rainforest, swamps and steep, rocky habitats. Also, species which occurred in five or fewer plots were omitted, leaving a matrix of cover codes for 188 sites x 474 species for analysis. Cover codes, rather than mid-point percentages as used for classification, were used to give greater relative weight to the influence of less common species.

Classification tree analysis (Clark and Pregibon 1991) was used to investigate patterns of floristic richness and distribution of broad floristic classes in relation to environmental variables. It was also used to refine the analysis of floristic patterns in relation to logging and fire, by conducting separate analyses on subsets of the data defined from combinations of environmental variables.

A constrained ordination method (Canonical Correspondence Analysis (Ter Braak 1986, 1987), abbreviated as CCA) was used to investigate patterns of floristic composition in relation to environmental parameters. This method arranges species along environmental gradients by constructing linear combinations of environmental factors which result in maximal separation of species distributions in ordination species-space. Ter Braak (1986) fully describes the underlying assumptions and strengths of this method. The main assumption is that individual species response models are all similar and all of unimodal, Gaussian form. Although it is doubtful whether this assumption is reasonable for most species, CCA is considered to be robust to moderate violations of assumptions (ter Braak 1987) and is potentially very powerful in revealing patterns of floristic composition in relation to environmental factors. It also has the advantage that the results are unaffected by correlations among environmental variables. It is being increasingly and very effectively used in ecological investigations of this type (e.g. Borcard et al 1992, McIntyre and Lavorel 1994). In interpreting the ordination diagram, environmental variables are represented by arrows, the length representing the strength of correlation between the environmental variable and the ordination axes, and the direction representing the direction of maximum change of the variable. Analyses were performed using programs written in Splus. Classes of qualitative environmental variables (lithology, exposure, topographic position, logging category) were transformed to a series of dummy binary variables as recommended by ter Braak (1987). The hypothesis of significance of the contribution of a variable relative to a random variable was tested using the Monte Carlo test with 100 random permutations. Variables which were not significant at the equivalent of $p=0.10$ were excluded from final analyses and discussion.

RESULTS

1. FLORISTIC COMPOSITION AND COMMUNITIES

A total of 979 native vascular plant taxa and 36 naturalized taxa was recorded from the 183 plots assessed in CMA during the field survey. This represents a floristic diversity comparable to that of the adjacent Grafton MA of similar size (999 taxa in 182 plots, Moore and Floyd 1994). Appendix 1 lists the species recorded from CMA by family, with their frequency of occurrence by broad vegetation type and logging category, and their occurrence by State forest.

All plots, including those in other tenures within the general boundary of CMA, were included in classification analyses. Forty-three floristic communities were defined at the 0.8 level of dissimilarity. Two, each represented by a single plot, were floristically disparate communities which do not occur in SF and were subsequently excluded from further analysis and discussion. The two plots were NP7007, a littoral rainforest area in Bundjalung NP, and plot NP2080, a highly modified area in leasehold tenure with an usually high proportion of naturalized exotics, most of which are not recorded from SF. The dendrogram for the remaining 41 communities resulting from the classification is shown in Figure 2. The 41 floristic groups are briefly described below in six broad vegetation types, and diversity and main environmental features are summarized in Table 3. Species listed below are generally those which occur in at least 60% of plots in a group with a mean cover of at least 1, and are listed after each growth form in approximate order of abundance. In some cases, species which are locally abundant, but occur in fewer than 60% of plots are also included. Where a community is represented by a single plot, only a few of the most common species are listed.

A. HEATH FOREST AND WOODLAND

This is open forest, low open forest or woodland, with a moderate to dense, low (1-2 m) understorey of sclerophyllous shrubs. This broad group occurs extensively on high quartz substrates, mostly sandstone, throughout the forests of the lowlands and coastal ranges in the east of CMA. Several communities also occur to a limited extent on granitic substrates in Ewingar SF. Communities of this group typically occupy ridges and more exposed slopes. They are regularly burnt, and most plots were estimated to have been burnt within the past five years.

CASf 1

Plots: A00004, A00006

Overstorey trees: *Eucalyptus gummifera*, *Eucalyptus baileyana*, *Eucalyptus pyrocarpa*

Small trees/shrubs: *Acacia complanata*, *Ceratopetalum gummiferum*, *Banksia oblongifolia*, *Leptospermum trinervium*, *Lomatia silaifolia*, *Leucopogon lanceolatus*, *Monotoca scoparia*

Ground cover: *Entolasia stricta*, *Hibbertia aspera*, *Lomandra filiformis*, *Patersonia glabrata*, *Pteridium esculentum*, *Persoonia tenuifolia*

CASf 2

Plots: A00021, A00024, A0022A, A0022B, BAN001, BAN002, BEL002, BEL003, EWI007, GIB001, GIB002, NP1018, NP1019, NP1104, NP1110, NP1122, NP1123, ROY001, ROY003

Overstorey trees: *Angophora woodsiana*, *Eucalyptus pilularis*, *Eucalyptus gummifera*, *Eucalyptus planchoniana*

Small trees/shrubs: *Persoonia stradbokensis*, *Leptospermum trinervium*, *Platysace ericoides*, *Acacia complanata*

Ground cover: *Entolasia stricta*, *Phyllanthus thymoides*, *Themeda australis*, *Persoonia tenuifolia*, *Lepidosperma laterale*, *Dianella caerulea*, *Patersonia sericea*, *Xanthorrhoea latifolia*, *Daviesia umbellulata*

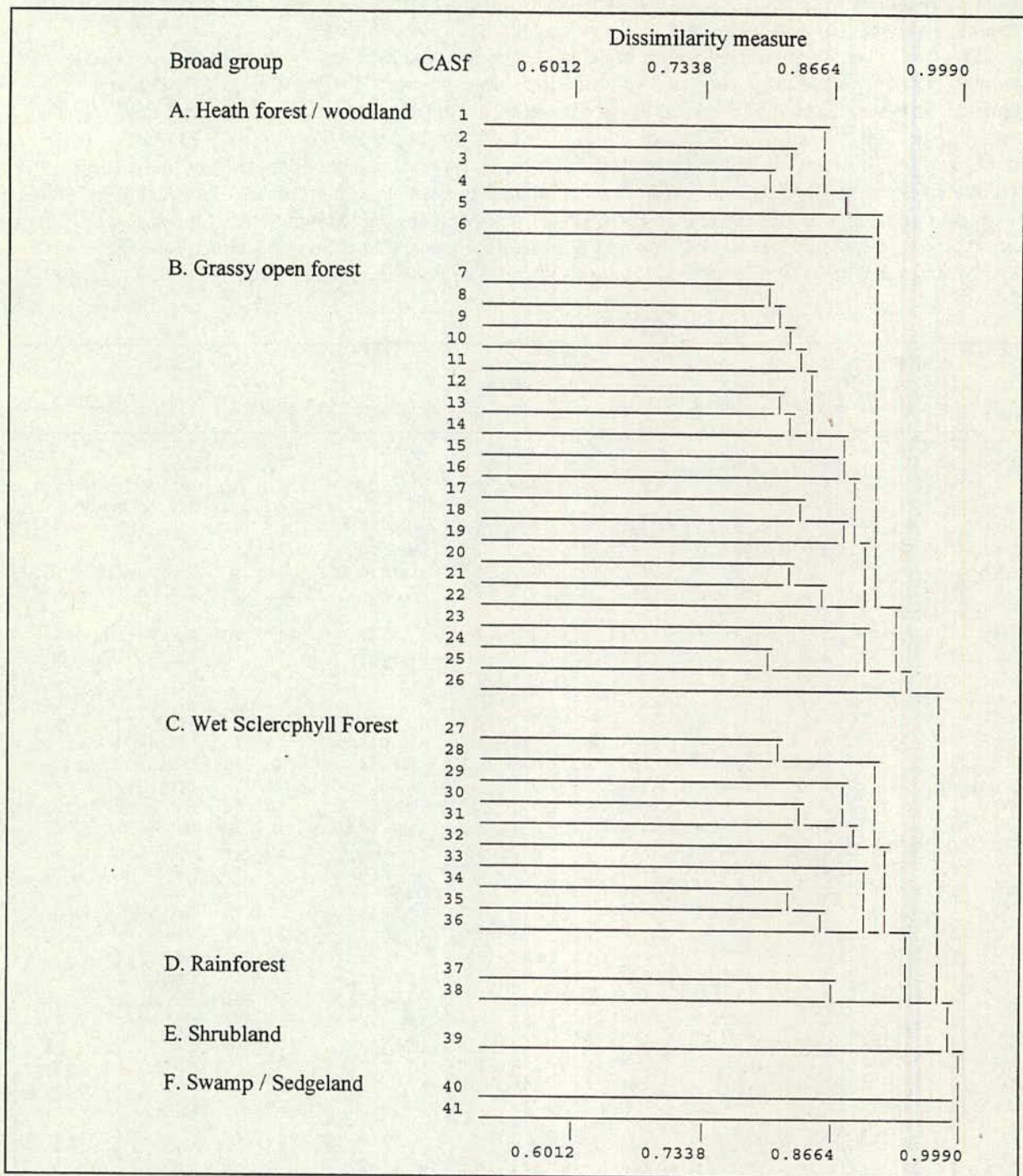


Figure 2. Dendrogram from floristic classification of percentage cover of all species, truncated at the 0.8 dissimilarity level.

CASf 3

Plots: NP1106, NP1107

Overstorey trees: *Angophora woodsiana*, *Eucalyptus bancroftii*, *Eucalyptus carnea*, *Eucalyptus resinifera*

Small trees/shrubs: *Allocasuarina torulosa*, *Dodonaea triquetra*, *Acacia concurrens*, *Alphitonia excelsa*,

Ground cover: *Lobelia gracilis*, *Cymbopogon refractus*, *Digitaria parviflora*, *Echinopogon caespitosus* var. *caespitosus*, *Fimbristylis cinnamometorum*, *Microlaena stipoides* var. *stipoides*, *Trachymene incisa* ssp. *incisa*, *Phyllanthus thymoides*, *Themeda australis*, *Dianella caerulea*, *Eustrephus latifolius*, *Glycine clandestina*, *Gompholobium pinnatum*

Table 3. Summary of floristic richness and main environmental characteristics of 41 floristic groups at 0.8 dissimilarity level.

n = number of plots; Richness N = number of native species per plot; Richness I = number of introduced species per plot; Lithology is coded as: Av = acid volcanic, Bi = Basic igneous, Gr = granitic, Qa = Quaternary alluvium, Sh = sedimentary, high quartz, Sl = sedimentary, low quartz, Sq = quartz sandstone; Fire is estimated time since last fire, coded as: 1 = 1-2 years, 2 = 3-5, 3 = 6-10, 4 = 11-15, 5 = 16-20, 6 = 21-30, 7 = 31-40, 8 = 41-50, 9 = 50+, shown as median and quartile range (q1-q3). State Forests are coded as Ban=Banyabba, Bel=Mount Belmore, Bil=Billilimbra, Bra=Braemar, Bun=Bungawalbin, Cam=Camira, Che=Cherry Tree, D=Devils Pulpit, Dou=Doubleduke, Ewi=Ewingar, Gib=Gibberagee, Mar=Mount Marsh, Mor=Mororo, Myr=Myrtle, Nev=Mount Neville, Pik=Mount Pikapene, Roy=Royal Camp, Sug=Sugarloaf, Tab=Tabbimoble, Was=Washpool, Whi=Whiporie; other lands are CL=leasehold, BNP=Bundjalung NP, NNR=Mount Neville NR.

CASf	Richness N		Richness I		Rainfall (mm/yr)		Temp (°C)		Rad. Ind. (mj/m2/yr)		Lithology	Fire		State Forest	
	n	mean	sd	mean	sd	mean	sd	mean	sd	mean		sd	med		q1-q3
A. Heath Forest															
1	2	29	11	.	.	1263	75	18.9	0.1	17.8	0.3	Sq	1.5	1-2	Dou
2	19	35	7	1	.	1260	77	17.9	0.9	17.8	0.7	Gr,Sq,Sl	1.0	1-2	Ban,Bel,Dev,Ewi Gib,Nev,Roy,NNR
3	2	48	9	.	.	1233	1	19.0	0.0	17.6	0.0	Sl	1.5	1-2	Ban
4	4	48	7	1	1	1090	28	18.7	0.3	18.2	0.5	Sq,Sl	2.5	2-3	Sug,Roy
5	5	38	6	1	0	1386	141	18.5	16.0	17.9	0.1	Qa,Gr,Sh,Sl	2.0	1-2	Ewi,Mor,Tab
6	3	28	9	.	.	1102	63	19.4	0.0	17.9	0.1	Qa,Sq	1.0	1-1	Dou,Whi
B. Grassy forest															
7	5	42	10	.	.	1292	40	17.6	1.2	17.5	0.2	Gr,Sq,Sl	2.0	1-2	Dou,Mar,Whi
8	32	36	8	2	2	1212	162	19.0	0.5	17.9	0.3	Gr,Sq,Sl	1.0	1-2	Ban,Bel,Bra,Bun,Dev, Dou,Gib,Mar,Mor,Myr
9	6	41	12	6	3	1151	71	18.8	0.3	18.1	0.2	Qa,Sq,Sh,Sl	1.5	1-2	Tab,BNP Gib,Mar,Nev,Sug
10	9	36	10	3	2	986	55	19.5	0.2	18.3	0.1	Qa,Sq,Sl	2.0	1-2	Bra,Bun,Ell,Myr,Roy
11	1	38	.	1	.	1088	.	19.6	.	18.2	.	Sl	1	.	Bun
12	11	36	13	2	1	1258	62	17.7	0.7	17.7	0.6	Sq,Sl	2.0	1-3	Bel,Gib,Mar,Ric,Was
13	9	43	15	4	3	1254	124	17.9	0.8	17.6	0.6	Bi,Av,Gr,Sq,Sl	2.0	2-3	Bel,Ewi,Ric,Sug
14	5	65	12	3	2	1358	63	15.7	1.4	17.3	0.9	Bi,Av,Sl	2.0	1-4	Bil,Ric,Was
15	2	48	18	6	3	1153	35	18.1	0.4	18.3	0.4	Gr	1.0	1-1	Ewi
16	2	23	8	1	.	1206	51	18.0	0.7	17.7	0.1	Sq,Sl	1.5	1-2	Mar
17	6	41	5	1	.	1280	159	19.2	0.2	17.9	0.2	Qa,Sq,Sh	2.0	1-2	Dev,Dou,CL
18	2	53	1	2	1	1524	56	19.2	0.0	17.8	0.0	Qs,Sl	2.0	2-3	Dou,BNP
19	1	22	.	.	.	1190	.	19.4	.	18.0	.	Qa	1.0	.	Dou
20	1	50	.	5	.	1200	.	19.4	.	18.0	.	Qa	2.0	.	Dou
21	2	46	4	2	.	1371	239	19.2	0.0	18.2	.	Sq,Sh	2.0	2-2	Gib,CL
22	1	38	.	1	.	1096	.	19.4	.	18.0	.	Qa	9.0	.	Dou,Tab
23	2	31	6	.	.	1175	38	19.3	0.1	18.3	0.1	Sq,Sl	2.0	2-2	Tab
24	1	39	.	.	.	1430	.	19.4	.	17.8	.	Qs	2.0	.	BNP
25	1	19	.	1	.	1190	.	19.4	.	18.0	.	Qa	1.0	.	Dou
26	1	32	.	.	.	1464	.	15.0	.	17.2	.	Av	2.0	.	Bil
C. Wet sclerophyll forest															
27	1	36	.	.	.	1214	.	18.2	.	17.6	.	Sl	1.0	.	Ric
28	4	59	5	1	0	1214	63	18.0	0.4	16.8	0.7	Sl	7.5	5-9	Bel,Pik,Was
29	9	40	7	1	1	1203	35	17.8	0.4	17.8	0.7	Bi,Sq,Sl	3.0	3-8	Bel,Che,Pik,Ric
30	1	54	.	2	.	1186	.	17.8	.	18.0	.	Sl	5.0	.	Was
31	1	43	.	1	.	1336	.	17.2	.	16.8	.	Sl	4.0	.	Was
32	1	54	.	10	.	1278	.	17.0	.	18.0	.	Sq	1.0	.	Che
33	4	47	16	2	1	1441	16	16.8	0.1	16.9	0.9	Bi,Sq	9.0	6-9	Ric
34	11	60	12	2	1	1392	87	15.5	0.9	17.7	0.7	Av,Gr,Sl	6.0	4-8	Bil,Ewi
35	4	59	5	2	0	1251	123	17.5	0.7	17.6	0.3	Bi,Sl	5.5-	4-6	Ric,Was
36	5	54	14	1	0	1204	38	18.4	0.8	18.0	0.3	Qa,Sq,Sl	2.0	1-2	Bel,Dou,Mar,NNR
D. Rainforest															
37	4	65	25	.	.	1361	141	17.1	0.6	17.6	0.6	Bi,Sl	9.0	7-9	Ric
38	8	60	12	1	.	1421	202	15.4	1.2	17.1	1.3	Bi,Av,Gr,Sl	9.0	9-9	Ewi,Ric,Was
E. Shrubland															
39	1	27	.	.	.	1362	.	17.0	.	18.4	.	Av	9.0	.	Mar
F. Sedgeland															
40	1	19	.	5	.	1336	.	17.2	.	17.4	.	Sl	9.0	.	Ric
41	1	6	.	.	.	1190	.	19.2	.	17.8	.	Qa	9.0	.	Dou

CASf 4

Plots: NP2001, NP2095, NP2096, ROY002

Overstorey trees: *Angophora woodsiana*, *Eucalyptus pilularis*, *Eucalyptus tindaliae*, *Eucalyptus maculata*,
Eucalyptus gummifera, *Syncarpia glomulifera*

Small trees/shrubs: *Acacia concurrens*, *Alphitonia excelsa*, *Allocasuarina torulosa*, *Breynia oblongifolia*,
Monotoca scoparia, *Persoonia stradbrokeensis*

Vines: *Eustrephus latifolius*, *Hardenbergia violacea*

Ground cover: *Lepidosperma laterale*, *Cymbopogon refractus*, *Laxmannia gracilis*, *Themeda australis*, *Vernonia*
cinerea var. *cinerea*, *Imperata cylindrica* var. *major*, *Melichrus urceolatus*, *Entolasia stricta*, *Panicum*
effusum, *Platysace ericoides*, *Aristida vagans*, *Dianella caerulea*, *Digitaria parviflora*, *Lomandra*
multiflora, *Macrozamia fawcettii*, *Phyllanthus thymoides*, *Pratia purpurascens*, *Cheilanthes sieberi* ssp.
sieberi, *Commelina cyanea*

CASf 5

Plots: MOR001, NP1012, NP1126, NP1128, NP2040

Overstorey trees: *Angophora woodsiana*,

Small trees/shrubs: *Allocasuarina littoralis*, *Persoonia stradbrokeensis*, *Leucopogon lanceolatus* var. *lanceolatus*,
Banksia oblongifolia, *Acacia myrtifolia*, *Melaleuca sieberi*, *Pultenaea retusa*, *Pimelea linifolia*
ssp. *linifolia*, *Banksia spinulosa* var. *collina*, *Mirbelia rubiifolia*, *Hakea salicifolia*

Ground cover: *Ptilothrix deusta*, *Entolasia stricta*, *Themeda australis*, *Dianella caerulea*, *Aristida warburgii*,
Gompholobium pinnatum, *Gonocarpus tetragynus*, *Imperata cylindrica* var. *major*, *Lepidosperma*
laterale, *Dampiera stricta*, *Lomandra longifolia*, *Patersonia sericea*

CASf 6

Plots: NP1115, WHP001, WHP002

Overstorey trees: *Eucalyptus signata*, *Angophora woodsiana*

Small trees/shrubs: *Leptospermum polygalifolium*, *Banksia oblongifolia*, *Leptospermum trinevium*, *Leucopogon*
lanceolatus var. *gracilis*, *Melaleuca sieberi*, *Acacia ulicifolia*, *Lissanthe* sp A, *Phyllocta phyllicoides*,
Leucopogon leptospermoides

Vines: *Cassytha glabella*

Ground cover: *Entolasia stricta*, *Patersonia sericea*

B. GRASSY OPEN FOREST

This broad group is characterised by a moderately dense to dense ground cover of grasses with usually a sparse shrub stratum. Communities in this group occur very extensively on a range of sedimentary substrates throughout CMA, but especially in the forests of the coastal lowlands and coastal ranges. Overall, this is the most extensive broad group in the area. This group and the Heath Forest and Woodland group overlap substantially in floristic composition and are not well separated by the environmental variables used in the analysis. Both broad groups tend to be associated with high temperatures, low rainfall, high radiation index and recent fires. Although the impression gained in the field is that the Heath Forest and Woodland group is less regularly burnt, this is not reflected in the summary of estimates of time since most recent fire, with both groups mostly having been burnt in the previous five years. The relative distribution of these two groups is probably mostly related to soil properties (which were not measured). Group B seems to be associated with soils of higher clay content, and often occurs in areas of generally flatter topography, or depositional parts of the catenary on high quartz parent materials.

CASf 7

Plots: A00005, A00025, NP1021, NP1022, NP2039

Overstorey trees: *Angophora woodsiana*, *Eucalyptus pilularis*, *Eucalyptus gummifera*,

Small trees/shrubs: *Allocasuarina torulosa*, *Persoonia stradbrokeensis*, *Leucopogon lanceolatus* var. *lanceolatus*,
Breynia oblongifolia, *Trochocarpa laurina*, *Lomatia silaifolia*

Vines: *Hardenbergia violacea*, *Eustrephus latifolius*, *Smilax australis*,

Ground cover: *Imperata cylindrica* var. *major*, *Themeda australis*, *Pteridium esculentum*, *Dianella caerulea*, *Patersonia glabrata*, *Entolasia stricta*, *Vernonia cinerea* var. *cinerea*, *Glycine clandestina*, *Monotoca scoparia* var. *scoparia*, *Poranthera microphylla*, *Hybanthus stellarioides*

CASf 8

Plots: A00010, A0CL35, A0CL36, ABAN30, ABAN31, ABAN32, ABAR37, BUN003, BUN005, MYR002, NP1009, NP1010, NP1013, NP1096, NP1101, NP1102, NP1111, NP1113, NP1114, NP1119, NP1120, NP1124, NP1125, NP1127, NP1129, NP1130, NP1131, NP1132, NP7004, NP7005, NP7010, NP7014

Overstorey trees: *Eucalyptus intermedia*, *Eucalyptus henryi*

Small trees/shrubs: *Alphitonia excelsa*, *Allocasuarina torulosa*

Vines: *Eustrephus latifolius*

Ground cover: *Entolasia stricta*, *Imperata cylindrica* var. *major*, *Vernonia cinerea* var. *cinerea*, *Cymbopogon refractus*, *Themeda australis*, *Aristida vagans*, *Pratia purpurascens*, *Echinopogon caespitosus* var. *caespitosus*, *Glycine clandestina*, *Desmodium rhytidophyllum*, *Pteridium esculentum*

CASf 9

Plots: A00007, AWHP33, NP1112, NP2002, NP7015, NP7016

Overstorey trees: *Eucalyptus tereticornis*, *Angophora subvelutina*

Small trees/shrubs: *Lantana camara*, *Breynia oblongifolia*, *Alphitonia excelsa*, *Glochidion ferdinandi*,

Ground cover: *Imperata cylindrica* var. *major*, *Vernonia cinerea* var. *cinerea*, *Centella asiatica*, *Conyza* spp., *Themeda australis*, *Eragrostis leptostachya*, *Cymbopogon refractus*, *Desmodium varians*, *Hybanthus stellarioides*, *Pratia purpurascens*, *Glycine tabacina*, *Aristida vagans*

CASf 10

Plots: BRA001, BRA002, BUN001, BUN004, ELL001, MYR001, NP1097, NP1121, NP2079

Overstorey trees: *Eucalyptus moluccana*, *Eucalyptus siderophloia*, *Eucalyptus intermedia*, *Lophostemon suavolens*

Small trees/shrubs: *Alphitonia excelsa*,

Ground cover: *Imperata cylindrica* var. *major*, *Aristida vagans*, *Cymbopogon refractus*, *Themeda australis*, *Vernonia cinerea* var. *cinerea*, *Panicum simile*, *Phyllanthus virgatus*, *Brunoniella australis*, *Cheilanthes sieberi* ssp. *sieberi*, *Laxmannia gracilis*, *Entolasia stricta*, *Murdannia graminea*, *Lomandra filiformis*, *Alloteropsis semialata*, *Lomandra longifolia*, *Sporobolus diander*

CASf 11

Plot: BUN002

Canopy Trees: *Eucalyptus intermedia*, *Eucalyptus microcorys*, *Eucalyptus siderophloia*, *Eucalyptus signata*

Subcanopy Trees, Shrubs: *Acacia concurrens*, *Acacia leiocalyx*, *Allocasuarina torulosa*, *Alphitonia excelsa*, *Angophora woodsiana*, *Angophora paludosa*

Ground cover: *Entolasia marginata*, *Imperata cylindrica* var. *major*, *Lomandra laxa*, *Vernonia cinerea* var. *cinerea*, *Oplismenus imbecillus*

CASf 12

Plots: A00011, A00013, A00014, GIB003, NP1024, NP1025, NP1026, NP1103, NP2008, NP2027, WAS003

Overstorey trees: *Eucalyptus siderophloia*, *Eucalyptus maculata*, *Eucalyptus propinqua*, *Eucalyptus moluccana*

Small trees/shrubs: *Allocasuarina torulosa*, *Breynia oblongifolia*, *Trochocarpa laurina*,

Vines: *Eustrephus latifolius*, *Hardenbergia violacea*

Ground cover: *Imperata cylindrica* var. *major*, *Themeda australis*, *Entolasia stricta*, *Oplismenus aemulus* var. *aemulus*, *Vernonia cinerea* var. *cinerea*, *Dianella caerulea*, *Sorghum leiocladum*

CASf 13

Plots: A00018, EWI003, NP1105, NP2003, NP2009, NP2012, NP2035, NP2036, NP2037

Overstorey trees: *Eucalyptus propinqua*, *Eucalyptus tereticornis*, *Eucalyptus acmenioides*, *Eucalyptus maculata*

Small trees/shrubs: *Allocasuarina torulosa*, *Breynia oblongifolia*

Vines: *Desmodium rhytidophyllum*, *Eustrephus latifolius*,

Ground cover: *Themeda australis*, *Vernonia cinerea* var. *cinerea*, *Imperata cylindrica* var. *major*, *Sorghum leiocladum*, *Viola betonicifolia*, *Acacia melanoxylon*, *Glycine clandestina*, *Oplismenus aemulus* var. *aemulus*, *Sigesbeckia orientalis*, *Desmodium varians*, *Poa labillardieri* var. *labillardieri*, *Desmodium brachypodium*

CASf 14

Plots: BIL003, BIL004, BIL006, NP2081, WAS004

Overstorey trees: *Eucalyptus microcorys*, *Eucalyptus saligna*

Small trees/shrubs: *Allocasuarina torulosa*, *Acacia irrorata* ssp. *irrorata*, *Acacia maidenii*, *Solanum densevestitum*, *Trochocarpa laurina*, *Rapanea variabilis*, *Breynia oblongifolia*, *Polyscias elegans*, *Psychotria loniceroides*, *Citriobatus pauciflorus*

Vines: *Glycine tabacina*, *Desmodium varians*, *Hibbertia scandens*, *Cissus antarctica*, *Desmodium rhytidophyllum*, *Hardenbergia violacea*, *Eustrephus latifolius*, *Rubus parvifolius*

Ground cover: *Poa labillardieri* var. *labillardieri*, *Dianella caerulea*, *Imperata cylindrica* var. *major*, *Doodia aspera*, *Pratia purpurascens*, *Vernonia cinerea* var. *cinerea*, *Lomandra longifolia*, *Sorghum leiocladum*, *Viola betonicifolia*, *Dichondra repens*, *Entolasia stricta*, *Oxalis chnoodes*, *Microlaena stipoides* var. *stipoides*, *Hybanthus stellarioides*, *Hydrocotyle peduncularis*, *Lagenifera stipitata*, *Lepidosperma laterale*, *Oplismenus imbecillus*, *Plectranthus parviflorus*, *Gonocarpus humilis*, *Leucopogon lanceolatus* var. *lanceolatus*, *Lomandra multiflora*

CASf 15

NP2044, NP2045,

Overstorey trees: *Eucalyptus melanophloia*, *Eucalyptus umbra*, *Eucalyptus intermedia*, *Eucalyptus propinqua*

Small trees/shrubs: *Allocasuarina torulosa*

Ground cover: *Microlaena stipoides* var. *stipoides*, *Cymbopogon refractus*, *Aristida ramosa*, *Aristida vagans*, *Cheilanthes sieberi* ssp. *sieberi*, *Desmodium rhytidophyllum*, *Eragrostis leptostachya*, *Fimbristylis dichotoma*, *Glycine clandestina*, *Panicum effusum*, *Paspalum distichum*, *Vernonia cinerea* var. *cinerea*, *Bothriochloa decipiens*, *Chrysocephalum apiculatum*, *Commelina cyanea*

CASf 16

Plots: A00023, A00026

Overstorey trees: *Eucalyptus maculata*, *Eucalyptus tindaliae*, *Eucalyptus crebra*, *Eucalyptus moluccana*, *Eucalyptus tereticornis*, *Eucalyptus umbra*

Small trees/shrubs: *Alphitonia excelsa*, *Acacia concurrens*, *Allocasuarina littoralis*, *Jacksonia scoparia*

Ground cover: *Themeda australis*, *Eragrostis spartinoides*, *Aristida calycina*, *Cymbopogon refractus*, *Lomandra filiformis*, *Dianella caerulea*, *Lepidosperma laterale*, *Lomandra multiflora*

CASf 17

Plots: A00008, A00009, NP1016, NP1116, NP1117, NP7008

Overstorey trees: *Eucalyptus resinifera*, *Eucalyptus pilularis*, *Lophostemon suavolens*, *Syncarpia glomulifera*, *Eucalyptus intermedia*

Small trees/shrubs: *Leptospermum polygalifolium*, *Elaeocarpus reticulatus*, *Hakea salicifolia*, *Acacia concurrens*, *Breynia oblongifolia*, *Leucopogon lanceolatus* var. *lanceolatus*,

Vines: *Kennedia rubicunda*, *Pandorea pandorana*, *Smilax australis*, *Eustrephus latifolius*

Ground cover: *Pteridium esculentum*, *Entolasia stricta*, *Imperata cylindrica* var. *major*, *Restio tetraphyllus*, *Pomax umbellata*, *Pratia purpurascens*, *Lomandra longifolia*, *Dianella caerulea*, *Murdannia graminea*, *Vernonia cinerea* var. *cinerea*, *Gahnia clarkei*

CASf 18

Plots: NP7012, NP7013

Overstorey trees: *Eucalyptus robusta*, *Eucalyptus resinifera*, *Lophostemon suavolens*

Small trees/shrubs: *Melaleuca quinquenervia*, *Alphitonia excelsa*, *Persoonia stradbrokeensis*, *Lantana camara*

Vines: *Parsonia straminea*

Ground cover: *Imperata cylindrica* var. *major*, *Baumea juncea*, *Centella asiatica*, *Dianella caerulea*, *Geitonoplesium cymosum*, *Lomandra longifolia*, *Paspalum distichum*, *Vernonia cinerea* var. *cinerea*, *Gahnia clarkei*, *Isachne globosa*, *Panicum simile*, *Ptilothrix deusta*, *Themeda australis*

CASf 19

Plot: NP1118

Overstorey trees: *Eucalyptus seeana*

Small trees/shrubs: *Melaleuca sieberi*

Ground cover: *Gahnia sieberiana*, *Ischaemum australe*, *Panicum simile*, *Themeda australis*

CASf 20

Plot: DOU002

Canopy trees: *Casuarina glauca*, *Lophostemon suavolens*, *Melaleuca nodosa*

Small trees, Shrubs: *Acacia leiocalyx*, *Acmena smithii*, *Callistemon salignus*, *Persoonia stradbrogensis*

Ground cover: *Dichondra repens*, *Oplismenus imbecillus*, *Billardiera scandens*, *Centratherum punctatum*
ssp. australianum, *Dianella caerulea*, *Entolasia marginata*, *Imperata cylindrica* var. *major*, *Microlaena*
stipoides var. *stipoides*, *Oxalis exilis*, *Smilax australis*, *Vernonia cinerea* var. *cinerea*, *Viola hederacea*

CASf 21

NP7006, NP7011

Overstorey trees: *Eucalyptus robusta*

Small trees/shrubs: *Melaleuca nodosa*, *Leucopogon lanceolatus* var. *lanceolatus*, *Persoonia stradbrogensis*,
Alphitonia excelsa, *Austromyrtus dulcis*, *Leptospermum polygalifolium*

Vines: *Parsonsia straminea*, *Smilax australis*

Ground cover: *Themeda australis*, *Lomandra longifolia*, *Imperata cylindrica* var. *major*, *Lagenifera stipitata*,
Oplismenus aemulus var. *aemulus*, *Cymbopogon refractus*, *Dianella caerulea*, *Hypericum gramineum*,
Panicum simile, *Pratia purpurascens*, *Trachymene incisa* ssp. *incisa*

CASf 22

Plots: NP7009

Overstorey trees: *Eucalyptus grandis*, *Eucalyptus tereticornis*

Small trees/shrubs: *Alphitonia excelsa*, *Leptospermum brachyandrum*, *Lophostemon suavolens*, *Tristaniaopsis*
laurina

Vines: *Geitonoplesium cymosum*, *Morinda jasminoides*

Ground cover: *Cyperus exaltatus*, *Lomandra longifolia*, *Ottochloa gracillima*

CASf 23

Plots: DOU001, NP1014

Overstorey trees: *Eucalyptus fibrosa*, *Syncarpia glomulifera*, *Eucalyptus maculata*, *Eucalyptus henryi*,
Eucalyptus resinifera, *Eucalyptus umbra*

Small trees/shrubs: *Hakea salicifolia*, *Daviesia ulicifolia*, *Notelaea ovata*, *Pultenaea spinosa*, *Pultenaea villosa*

Vines: *Billardiera scandens*, *Cassytha glabella*

Ground cover: *Entolasia stricta*, *Lomandra filiformis*, *Lepidosperma laterale*, *Dianella caerulea*, *Patersonia*
glabrata, *Lomandra confertifolia* ssp. *pallida*

CASf 24

Plots: NP1011

Overstorey trees: *Lophostemon suavolens*, *Melaleuca quinquenervia*

Ground cover: *Themeda australis*, *Restio pallens*, *Leptocarpus tenax*, *Lepyrodea interrupta*, *Entolasia stricta*,
Schoenus melanostachys

CASf 25

Plots: NP1017

Overstorey trees: *Eucalyptus tereticornis*, *Lophostemon suavolens*

Small trees/shrubs: *Melaleuca styphelioides*

Ground cover: *Commelina cyanea*, *Entolasia stricta*, *Oplismenus aemulus*

CASf 26

Plot: BIL001

Canopy trees: *Eucalyptus campanulata*

Small trees, shrubs: *Acacia falciformis*, *Lomatia silaifolia*, *Eucalyptus scias* ssp. *apoda*

Vines: *Billardiera scandens*

Ground cover: *Calochlaena dubia*, *Dianella caerulea*, *Entolasia stricta*, *Eustrephus latifolius*, *Goodia lotifolia*, *Hardenbergia violacea*, *Hibbertia empetrifolia*, *Hibbertia scandens*, *Imperata cylindrica* var. *major*, *Lomandra filiformis*, *Pteridium esculentum*

C. WET SCLEROPHYLL FOREST

This floristically diverse group occurs extensively in the escarpment ranges, in Richmond Range, Ewingar, Washpool and Billilimbra SFs, and on more sheltered sites in the coastal forests. Communities in this group are associated with lower temperatures, lower radiation index, higher rainfall, less recent fire and parent materials with lower quartz content, than those of the Heath and Grassy groups. Most plots have an overstorey of eucalypts or *Lophostemon confertus*, but this group includes some rainforest stands which are floristically more similar to this group than the other rainforest communities of group D.

CASf 27

Plots: A00015

Overstorey trees: *Eucalyptus grandis*, *Lophostemon confertus*

Small trees/shrubs: *Callistemon salignus*, *Cupaniopsis parvifolia*, *Rhodamnia rubescens*, *Guioa semiglauca*

Vines: *Ripogonum album*, *Smilax australis*, *Cissus antarctica*, *Austrosteenisia blackii*

CASf 28

Plots: BEL001, PIK001, PIK002, WAS001

Overstorey trees: *Cupaniopsis parvifolia*, *Mallotus philippensis*, *Drypetes australasica*, *Diospyros australis*, *Siphonodon australe*, *Austromyrtus bidwillii*, *Elattostachys xylocarpa*, *Excoecaria dallachiana*, *Alstonia constricta*, *Araucaria cunninghamii*, *Diospyros pentamera*, *Croton insularis*, *Eucalyptus rummeryi*

Small trees/shrubs: *Citriobatus pauciflorus*, *Alyxia ruscifolia*, *Cassine australis*, *Alchornea ilicifolia*, *Maytenus bilocularis*, *Casearia multinervosa*, *Lantana camara*, *Maclura cochinchinensis*, *Canthium buxifolium*, *Cleistanthus cunninghamii*, *Scolopia braunii*, *Capparis arborea*, *Wikstroemia indica*

Vines: *Austrosteenisia blackii*, *Cissus antarctica*, *Rauwenhoffia leichhardtii*, *Secamone elliptica*, *Embelia australiana*, *Smilax australis*, *Geitonoplesium cymosum*

Epiphytes: *Dendrobium fairfaxii*, *Pyrrosia rupestris*

Ground cover: *Pellaea falcata* var. *nana*, *Pseuderanthemum variabile*

CASf 29

Plots: A00020, NP1098, NP1099, NP1100, NP2004, NP2005, NP2007, NP2010, NP2014

Overstorey trees: *Eucalyptus maculata*, *Eucalyptus propinqua*

Small trees/shrubs: *Lantana camara*, *Breynia oblongifolia*, *Maytenus bilocularis*, *Psychotria loniceroides*, *Acacia maidenii*

Vines: *Cissus antarctica*, *Pandorea pandorana*, *Geitonoplesium cymosum*

Ground cover: *Pseuderanthemum variabile*, *Gahnia aspera*, *Dianella caerulea*

CASf 30

Plots: A0031C

Overstorey trees: *Eucalyptus acmenioides*, *Eucalyptus siderophloia*

Small trees/shrubs: *Allocasuarina torulosa*, *Guioa semiglauca*, *Trochocarpa laurina*, *Lantana camara*, *Acacia maidenii*, *Psychotria loniceroides*, *Olearia nernstii*, *Livistona australis*

Vines: *Celastrus australis*

Ground cover: *Doodia aspera*, *Poa sieberiana*

CASf 31

Plot: WAS002

Canopy trees: *Eucalyptus acmenioides*, *Eucalyptus siderophloia*

Small trees, shrubs: *Acacia irrorata*, *Callistemon salignus*, *Citriobatus pauciflorus*, *Croton verreauxii*, *Austromyrtus* sp., *Guioa semiglauca*

Ground cover: *Commelina cyanea*, *Dianella caerulea*, *Lepidosperma laterale*, *Pseuderanthemum variabile*

CASf 32

Plots: NP2006

Overstorey trees: *Eucalyptus grandis*, *Eucalyptus microcorys*

Small trees/shrubs: *Lantana camara*, *Melia azedarach* var. *australasica*, *Melicope micrococca*

Ground cover: *Austrocynoglossum latifolium*, *Rubus rosifolius*, *Senecio bipinnatisectus*

CASf 33

Plots: A00017, A0012A, A0012B, RIC005

Overstorey trees: *Eucalyptus grandis*

Small trees/shrubs: *Synoum glandulosum*, *Dysoxylum fraseranum*, *Eupomatia laurina*, *Polyscias elegans*, *Rhodamnia rubescens*, *Dendrocnide excelsa*, *Daphnandra species A*, *Neolitsea australiensis*, *Dendrocnide photinophylla*, *Elattostachys nervosa*, *Arytera divaricata*, *Guioa semiglaucula*, *Mallotus philippensis*

Vines: *Cissus antarctica*, *Cissus hypoglaucula*, *Dioscorea transversa*, *Palmeria scandens*, *Ripogonum elseyanum*

Ground cover: *Diplazium australe*, *Alpinia caerulea*, *Lastreopsis microsora*

CASf 34

Plots: A00027, A00028, A00030, BIL002, BIL005, BIL007, EW1008, NP2038, NP2041, NP2042, NP2043

Overstorey trees: *Eucalyptus microcorys*, *Lophostemon confertus*, *Eucalyptus saligna*

Small trees/shrubs: *Synoum glandulosum*, *Psychotria loniceroides*, *Cryptocarya rigida*, *Trochocarpa laurina*, *Caldcluvia paniculosa*, *Eupomatia laurina*, *Cordyline stricta*, *Archontophoenix cunninghamiana*, *Livistona australis*, *Cyathea australis*, *Rhodamnia rubescens*, *Cordyline petiolaris*

Vines: *Geitonoplesium cymosum*, *Cissus antarctica*, *Smilax australis*, *Cissus hypoglaucula*, *Rubus* sp. (aff. *moorei*), *Parsonia induplicata*, *Palmeria scandens*,

Ground cover: *Blechnum cartilagineum*, *Lastreopsis decomposita*, *Platynerium bifurcatum* ssp. *bifurcatum*, *Lomandra longifolia*, *Viola hederacea*, *Dianella caerulea*, *Gahnia melanocarpa*, *Cryptocarya microneura*, *Asplenium australasicum*, *Davallia pyxidata*, *Rapanea variabilis*, *Celastrus subspicatus*, *Acacia irrorata* ssp. *irrorata*, *Cyperus disjunctus*, *Eucalyptus laevopinea*

CASf 35

Plots: A0031B, A0031D, NP2011, NP2013

Overstorey trees: *Lophostemon confertus*, *Eucalyptus saligna*,

Small trees/shrubs: *Croton verreauxii*, *Cryptocarya microneura*, *Rhodamnia rubescens*, *Synoum glandulosum*, *Citriobatus pauciflorus*, *Guioa semiglaucula*, *Neolitsea dealbata*, *Cordyline petiolaris*, *Eupomatia laurina*, *Psychotria loniceroides*, *Cryptocarya obovata*, *Mallotus philippensis*, *Drypetes australasica*, *Livistona australis*, *Diospyros australis*, *Alectryon subcinereus*

Vines: *Cissus antarctica*, *Embelia australiana*, *Smilax australis*, *Dioscorea transversa*, *Austrosteenisia blackii*

Epiphytes: *Platynerium bifurcatum* ssp. *bifurcatum*, *Dictymia brownii*

Ground cover: *Doodia aspera*, *Adiantum formosum*, *Alpinia caerulea*, *Pseuderanthemum variabile*, *Lastreopsis microsora*, *Blechnum cartilagineum*

CASf 36

Plots: BEL004, DOU003, NP1015, NP1020, NP1023

Overstorey trees: *Lophostemon confertus*, *Syncarpia glomulifera*, *Eucalyptus intermedia*

Small trees/shrubs: *Trochocarpa laurina*, *Allocasuarina torulosa*, *Breynia oblongifolia*, *Synoum glandulosum*

Vines: *Smilax australis*, *Geitonoplesium cymosum*, *Cissus hypoglaucula*, *Glycine clandestina*, *Eustrephus latifolius*, *Hibbertia dentata*

Ground cover: *Dianella caerulea*, *Pteridium esculentum*, *Viola hederacea*, *Calochlaena dubia*, *Entolasia stricta*, *Oplismenus aemulus*

D. SUBTROPICAL RAINFOREST

Mostly closed forest to tall closed forest. This group occurs only in the forests of the escarpment ranges, in Washpool, Ewingar and Richmond Range SFs, mostly on volcanic substrates, in areas of high rainfall and low radiation index. It is strongly characterized by being long unburnt (mostly at least 50 years).

CASf 37

Plots: A00016, A00019, RIC006, RIC007

Overstorey trees: *Baloghia inophylla*, *Diospyros pentamera*, *Heritiera actinophylla*, *Heritiera trifoliolata*, *Araucaria cunninghamii*, *Syzygium francisii*

Small trees/shrubs: *Anthocarapa nitidula*, *Cleistanthus cunninghamii*, *Actephila lindleyi*, *Mallotus philippensis*, *Capparis arborea*, *Citriobatus pauciflorus*, *Cryptocarya obovata*, *Arytera divaricata*, *Elatostachys nervosa*, *Linospadix monostachya*, *Daphnandra sp.A*, *Alectryon subcinereus*, *Austromyrtus bidwillii*, *Cordyline petiolaris*, *Cupaniopsis flagelliformis* var. *australis*, *Guioa semiglauca*, *Psychotria loniceroides*

Vines: *Arthropteris tenella*, *Rauwenhoffia leichhardtii*, *Melodinus australis*, *Morinda jasminoides*,

Ground cover: *Doodia aspera*, *Lastreopsis decomposita*, *Lomandra spicata*, *Lastreopsis microsora*

CASf 38

Plots: A00029, EWI001, EWI002, EWI004, EWI005, EWI006, RIC008, WAS005

Overstorey trees: *Syzygium corynanthum*, *Sloanea woollsii*, *Orites excelsa*, *Schizomeria ovata*, *Doryphora sassafras*, *Caldcluvia paniculosa*, *Cryptocarya erythroxylon*, *Polyosma cunninghamii*, *Dendrocnide excelsa*, *Diospyros pentamera*, *Dysoxylum fraserianum*, *Daphnandra sp.A*

Small trees/shrubs: *Linospadix monostachya*, *Tasmannia insipida*, *Cryptocarya obovata*, *Citriobatus pauciflorus*, *Cyathea leichhardtiana*, *Litsea reticulata*, *Pennantia cunninghamii*, *Guioa semiglauca*,

Vines: *Cephalalaria cephalobotrys*, *Melodinus australis*, *Microsorium scandens*, *Morinda jasminoides*, *Palmeria scandens*, *Cissus hypoglauca*, *Piper novae-hollandiae*,

Ripogonum elseyanum, *Arthropteris tenella*, *Embelia australiana*

Epiphytes: *Asplenium australasicum*, *Dictymia brownii*, *Asplenium polyodon*, *Platyserium bifurcatum* ssp. *bifurcatum*

Ground cover: *Lastreopsis microsora*, *Lomandra spicata*

E. SHRUBLAND

This very disparate group is represented by a single plot on a rock outcrop in Mount Marsh SF. No other floristically similar shrubland community is known from CMA. Other small patches of shrubland occur on sandstone outcrops in other forests, but these have floristic affinities with the Heath Forest group of communities. Small patches of open shrubland also occur on exposed, rocky ridges in Ewingar and Billilimbra SFs. These typically consist of a ground layer of *Themeda australis* and other grasses with scattered shrubs of *Leptospermum polygalifolium*.

CASf 39

Plot: MAR001

Shrubs: *Callistemon aff montanus*, *Leptospermum polyanthum*

Ground cover: *Aristida benthamii*, *Cheilanthes sieberi* ssp. *sieberi*, *Digitaria breviglumis*, *Entolasia stricta*, *Eragrostis brownii*, *Tripogon loliiformis*

F. SWAMP AND SEDGELAND

Areas dominated by sedges are restricted to permanently swampy depressions in several areas. Several extensive patches occur in forests of the coastal lowlands. One small patch was sampled on an elevated depression in Richmond Range SF.

CASf 40

Plot: RIC004

Typha sp., *Bolboschoenus fluviatilis*, *Hypolepis muelleri*, *Persicaria elatior*, *Persicaria strigosa*, *Persicaria subsessilis*

CASf 41

Plot: DOU004

Baumea rubiginosa, *Philydrum lanuginosum*, *Restio pallens*, *Baumea articulata*

2. FOREST OVERSTOREY COMMUNITIES

Fifty-nine forest overstorey communities were recognized at the 0.6 level of dissimilarity, in 40 groups at the 0.8 level. Figure 3 is the dendrogram resulting from the classification, truncated at the 0.6 level of dissimilarity. Logged and unlogged plots were analyzed as a single combined data set. Where a community consisted solely or mostly of logged plots, it was amalgamated with other similar communities if the differences were considered reasonably attributable to changes due to logging.

In many cases, communities represented by single plots or few plots doubtfully represent readily recognizable separate communities. These have generally been treated separately, but more sampling would be necessary to determine whether it is useful to recognize them as such. This particularly applies to rainforest, which was sampled at low intensity relative to the floristic variation of rainforest vegetation in the area, and some dry forest assemblages, which occur in a complex intergrading mosaic and would require a higher sampling intensity to clarify spatial relationships.

The forest overstorey communities are described below. Their environmental characteristics based on plot data are summarized in Table 4, and relationships with mapped forest types are summarized in Table 5. Discrepancies between overstorey community composition from plot data and nominal composition of mapped Forest Type are not uncommon. These are most often due to the differing scales of definition, with stands defined from plot data representing local variations in overstorey dominants at a scale which is impractical to map at a scale of 1:25 000. Less commonly, there appear to have been some errors of photograph interpretation or mapping, or minor displacement of type boundaries.

Relationships with floristic communities summarized in Table 6. Comparisons are made with Hager & Benson's (1994) associations and Forestry Commission of New South Wales (1989) Forest Types (for eucalypt forests) and Floyd's (1990) suballiances (for rainforests). These comparisons are summarized in Table 7. For rainforests, where overstorey composition data are not available from recent surveys, previously described rainforest communities are simply listed below with brief descriptions from Floyd (1990).

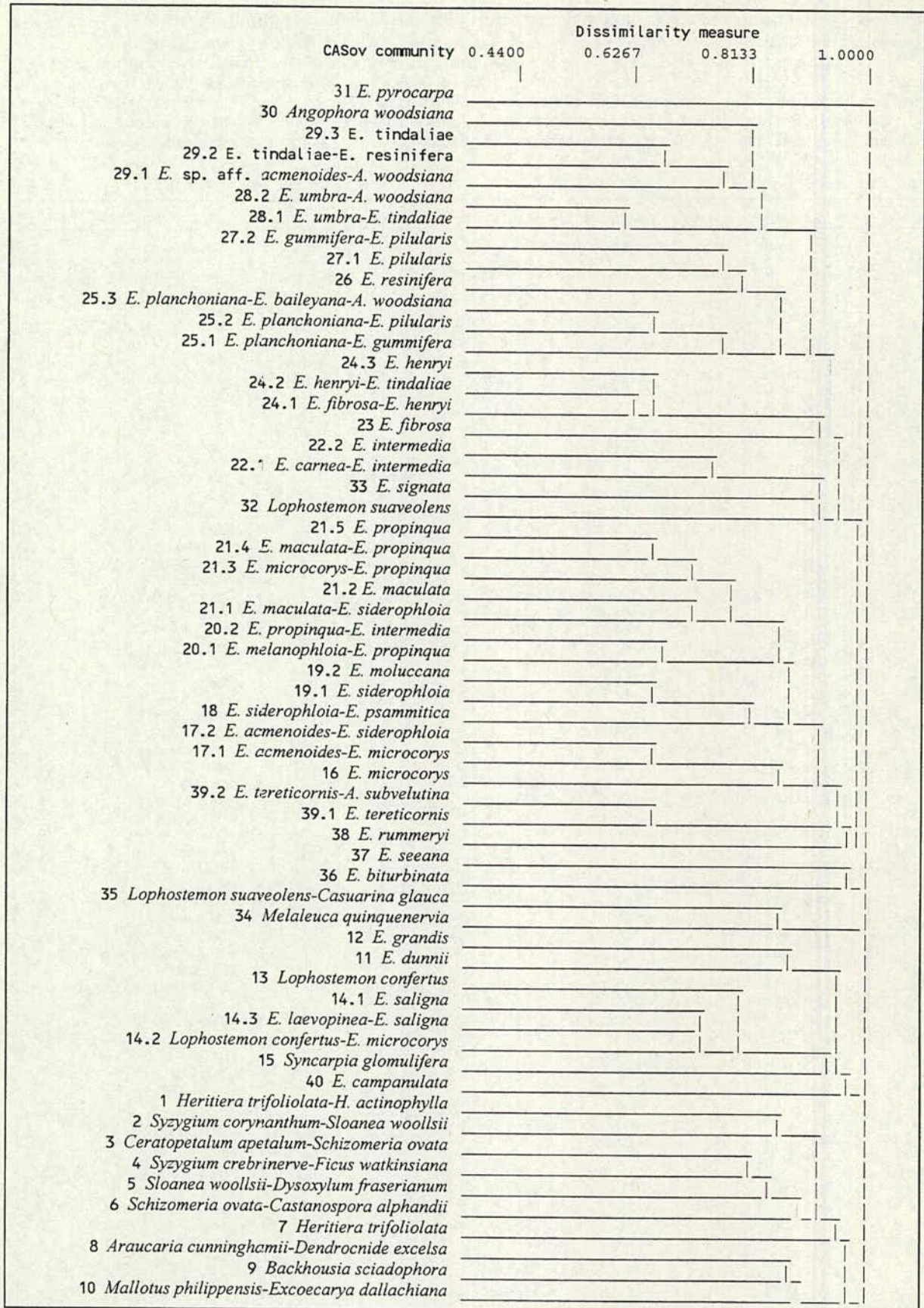


Figure 3. Dendrogram from floristic classification of basal area of all woody species with stem diameter > 10 cm, truncated at the 0.6 level of dissimilarity.

Table 4. Summary of environmental characteristics of overstorey communities.

n = number of plots; Lithology is coded as: Av = acid volcanic, Bi = Basic igneous, Gr = granitic, Qa = Quaternary alluvium, Sh = sedimentary, high quartz, Sl = sedimentary, low quartz, Sq = quartz sandstone; Fire is estimated time since last fire, coded as: 1 = 1-2 years, 2 = 3-5, 3 = 6-10, 4 = 11-15, 5 = 16-20, 6 = 21-30, 7 = 31-40, 8 = 41-50, 9 = 50+, shown as median and quartile range (q1-q3). State Forests are coded as Ban=Banyabba, Bel=Mount Belmore, Bil=Billilimbra, Bra=Braemar, Bun=Bungawalbin, Dev=Devils Pulpit, Dou=Doubleduke, Ewi=Ewingar, Gib=Gibberagee, Mar=Mount Marsh, Mor=Mororo, Myr=Myrtle, Nev=Mount Neville, Pik=Mount Pikapene, Roy=Royal Camp, Sug=Sugarloaf, Tab=Tabbimoble, Was=Washpool, Whi=Whiporie; other lands are CL=leasehold, BNP=Bundjalung NP, NNR=Mount Neville NR.

ov	n	Rainfall		Temp		Rad. Index		Alt		Topo		Fire		State Forests
		mean	sd	mean	sd	mean	sd	Mean	med	q1-q3	Geol	med	q1-q3	
1	1	1496	.	16.4	.	18.4	.	.	2	.	Bi	9	.	Ric
2	3	1348	19	16.6	0.5	17.0	1.6	487	4	3-5	Bi,Gr,Sl	9	9-9	Ewi,Ric,Was
3	2	1216	204	15.4	0.6	17.8	0.0	710	3	2-3	Gr,Sl	9	9-9	Ewi
4	1	1558	.	14.4	.	17.4	.	850	5	.	Gr	9	.	Ewi
5	1	1630	.	14.2	.	17.6	.	910	3	.	Gr	9	.	Ewi
6	1	1704	.	13.8	.	15.1	8.4	950	3	.	Av	9	.	Ric
7	2	1380	105	17.1	0.7	17.2	0.0	425	4	3-4	Bi,Sl	9	9-9	Ric
8	1	1188	.	17.6	.	17.6	.	.	2	.	Sl	6	.	Ric
9	1	1282	.	17.6	.	16.4	.	320	1	.	Sl	9	.	Was
10	1	1188	.	18.2	.	16.6	.	270	3	.	Sl	9	.	Pik
11	1	1424	.	16.8	.	18.2	.	490	2	.	Bi	4	.	Ric
12	4	1280	126	17.5	0.7	17.3	0.8	300	3	2-5	Sq,Sl	3	1-7	Che,Ric
13	7	1265	124	17.4	0.7	17.5	0.6	381	3	3-4	Bi,Gr,Sq,Sl	6	4-9	Bel,Cam,Ewi,Mar,Ric,Was
14.1	2	1378	48	15.6	0.3	18.0	0.3	.	2	2-2	Av,Gr	8	6-9	Ewi
14.2	2	1355	35	16.4	0.3	17.6	0.8	580	2	1-3	Sl	6	3-8	Ewi
14.3	5	1440	45	14.5	0.5	17.5	1.1	893	2	2-3	Av,Gr,Sl	4	4-6	Bil,Ewi
15.0	2	1216	31	18.4	1.1	18.0	0.0	135	4	3-5	Qa,Sq	2	1-2	Dou,Nev
16.0	3	1321	115	17.2	1.8	17.4	0.5	340	3	2-4	Qa,Gr,Sq	1	1-9	Duo,Ewi,Ric,
17.1	2	1366	62	16.3	1.0	17.6	0.6	580	3	2-3	Av,Sl	3	2-4	Ewi,Was
17.2	5	1250	110	17.4	1.5	17.4	0.8	383	2	2-3	Av,Sq,Sl	2	2-4	Bil,Bun,Ric,Was
18.0	1	1116	.	18.8	.	18.4	.	180	1	.	Sl	2	.	Mar
19.1	4	1096	193	18.8	1.3	18.0	0.6	124	4	3-4	Qa,Sl	2	1-3	Bun,El,Myr,Was
19.2	7	996	89	19.2	0.5	18.1	0.4	74	4	3-4	Qa,Sq,Sl	2	2-3	Bra,Bun,Pik,Roy
20.1	2	1153	35	18.1	0.4	18.3	0.4	260	2	1-3	Gr	1	1-1	Ewi
20.2	1	1176	.	19.2	.	17.8	.	60	3	.	Sl	2	.	Gib
21.1	5	1243	64	17.4	0.9	18.0	0.4	370	3	3-3	Av,Sq,Sl	2	1-2	Bel,Ewi,Mar,Ric
21.2	3	1196	45	18.1	1.0	18.2	0.6	233	1	1-3	Bi,Sl	3	2-8	Che,Ric,Tab
21.3	3	1331	101	17.8	1.0	17.3	0.4	277	3	3-3	Bi,Sq,Sl	1	1-3	Che,Mor,Ric
21.4	7	1202	62	18.0	0.4	18.1	0.4	281	3	2-4	Sl	2	1-3	Bel,Pik,Ric,Sug
21.5	5	1220	102	18.2	1.2	17.6	0.6	180	3	3-3	Qa,Bi,Sl	3	2-3	Dou,Gib,Ric
22.1	3	1245	119	17.9	0.6	17.9	0.1	243	3	2-4	Gr,Sl	2	2-2	Ewi,Gib
22.2	3	1244	300	18.9	0.6	17.7	0.3	25	4	3-4	Qa,Sq,Sh	1	1-2	Bel,Myr,Tab
23.0	1	1054	.	18.4	.	18.0	.	180	3	.	Sl	3	.	Sug
24.1	2	1217	21	19.2	0.3	18.2	0.3	60	2	1-3	Sq,Sl	2	1-2	Dou,Gib
24.2	5	1275	77	19.0	0.1	17.7	0.2	70	2	2-3	Sl	1	1-1	Ban,Mor
24.3	3	1107	148	19.4	0.2	17.9	0.1	65	3	2-4	Sl	1	1-3	Bun,Dev,Myr
25.1	2	1098	8	18.6	0.0	17.5	0.4	140	5	4-5	Sq	3	3-3	Roy
25.2	3	1308	68	17.6	0.6	17.7	0.5	333	1	1-3	Sq	1	1-2	Bel,Dev,Mar
25.3	4	1301	37	18.6	0.3	17.7	0.7	175	3	2-3	Sq	2	1-2	Dev,Gib
26.0	5	1300	169	19.2	0.2	18.0	0.3	30	3	3-4	Qa,Sq,Sh	2	1-2	Dev,Dou
27.1	15	1224	95	17.7	1.3	17.7	0.8	335	3	2-3	Qa,Gr,Sq,Sl	2	1-2	Bel,Bun,Dou,Ewi,Mar,Nev Roy,Tab
27.2	6	1245	67	18.0	1.0	17.9	0.2	247	3	3-3	Qa,Sq,Sl	2	1-2	Bel,Brl,Dev,Dou,Mar,Nev
28.1	2	1206	51	18.0	0.6	17.7	0.1	.	2	2-2	Sq,Sl	2	1-2	Mar
28.2	2	1241	10	18.1	1.0	17.8	0.0	140	2	2-2	Sq,Sl	4	1-6	Ban,Bel
29.1	1	1124	.	18.6	.	18.2	.	150	2	.	Sl	2	.	Roy
29.2	2	1203	160	18.7	0.4	17.9	0.1	170	3	2-3	Sq	2	1-2	Gib,Roy
29.3	2	1247	120	18.4	0.0	17.8	0.0	240	3	1-5	Sq,Sl	4	1-6	Gib,Mar
30.0	10	1248	128	19.2	0.2	17.9	0.3	44	3	3-3	Qa,Sq,Sl	2	1-2	Ban,Dou,Gib,Mor,Myr,Tab
31.0	1	1316	.	18.8	.	17.6	.	.	2	.	Sq	1	.	Dou
32.0	1	990	.	19.4	.	18.2	.	40	4	.	Sl	1	.	Myr
33.0	6	1333	214	19.2	0.2	17.9	0.2	23	2	1-4	Qa,Sh,Sl	2	1-2	Bun,Mor,Tab,Whi
34.0	1	1484	.	19.2	.	17.8	.	30	3	.	Sl	2	.	Dou
35.0	2	1192	11	19.3	0.1	18.0	0.0	10	5	4-5	Qa	2	1-2	Dou
36.0	2	1136	116	17.1	0.7	17.4	0.3	420	3	3-3	Gr	2	1-2	Ewi
37.0	1	1190	.	19.4	.	18.0	.	20	3	.	Qa	1	.	Dou
38.0	3	1204	38	18.0	0.3	17.4	0.9	267	3	1-3	Sl	6	5-9	Bel,Pik
38.1	1	1440	.	15.8	.	16.8	.	710	2	.	Av	6	.	Ewi
38.2	2	1467	1	14.8	0.3	17.9	1.0	870	1	.	Av	4	2-6	Bil
39.1	6	1121	99	19.2	0.3	18.2	0.22	56	4	4-5	Qa,Sq,Sl	2	1-2	Bra,Dou,Gib,Mar,Nev
39.2	5	1226	123	17.8	1.0	17.6	0.5	245	3	3-4	Bi,Sl	2	2-3	Che,Gib,Ric,Sug

Table 5. Distribution of plots among mapped forest types and overstorey communities. Composite types are amalgamated. Types 32, 51, 82, 83, 128 and 207, each of limited extent and represented by a single survey plot, are not included. Rainforest communities are also excluded.

CASov	Mapped Forest Type																																		
	30	31	36	37	38	39	40	41	46	47	48	49	53	60	62	65	70	71	72	74	76	80	84	85	87	92	97	117	119	126	129	130	163		
12 <i>E. grandis</i>											4																								
13 <i>Lophostemon confertus</i>									2		1	1	2		1																				
14.1 <i>E. saligna</i>										2																									
14.2 <i>E. saligna-E. microcorys</i> - <i>Lophostemon confertus</i>											1		1																						
14.2 <i>E. laevopinea-E. saligna</i>												2		1		1																		1	
15 <i>Syncarpia glomulifera</i>														1																					
16 <i>E. microcorys</i>				1	1					1																									
17.1 <i>E. acmenoides-E. microcorys</i>										1								1																	
17.2 <i>E. acmenoides-E. siderophloia</i>														1	2	1								1											
18 <i>E. siderophloia-E. psammitica</i>															1																				
19.1 <i>E. siderophloia-E. moluccana</i>																							1	1	1										
19.2 <i>E. moluccana</i>			1																		1		2		1										
20.1 <i>E. melanophloia-E. propinqua</i>															1																				
21.1 <i>E. maculata-E. siderophloia</i>	1														1				2		1														
21.2 <i>E. maculata</i>																			2		1														
21.3 <i>E. propinqua-E. microcorys</i>															1				1																
21.4 <i>E. maculata-E. propinqua</i>			1																2	2	1														
21.5 <i>E. propinqua</i>										1			1		1			1		1															
22.1 <i>E. carnea-E. intermedia</i>														1												1									
22.2 <i>E. intermedia</i>				1																													1	1	
23 <i>E. fibrosa</i>																				1															
24.1 <i>E. fibrosa-E. henryi</i>																				1															
24.2 <i>E. henryi-E. tindaliae</i>								2																											
24.3 <i>E. henryi</i>																		1		1		1													
25.1 <i>E. planchoniana-E. pyrocarpa</i>						1																													
25.2 <i>E. planchoniana-E. pilularis</i>					1						1																	1							
25.3 <i>E. planchoniana-E. baileyana</i>											1																	1							
26 <i>E. resinifera-E. pilularis</i>	1		1								2											1													
27.1 <i>E. pilularis</i>			1	4		1	1	4																											
27.2 <i>E. pilularis-E. gummifera</i>				2	1		1																												
28.1 <i>E. umbra-E. tindaliae</i>															1						1														
28.2 <i>E. umbra-Angophora woodsiana</i>											1																	1							

Table 7. Comparison and conservation status of forest vegetation communities on the basis of overstorey composition.

CASov floristic community is derived from numerical classification of survey data as described in the text. Map units in which a community is recorded are listed in decreasing frequency of occurrence. For simplicity, only aggregate types are listed. F.C. Forest Type is the nearest equivalent type as described in Forestry Commission of New South Wales (1989). For eucalypt forests, H&B Association is the nearest equivalent association as defined by Hager and Benson (1994). Associations are prefixed with RF, EF or OF.

Reservation status is listed as: status; extent reserved in north zone (which includes all of CMA). Codes are as follows:

1 = not or very poorly conserved; 2 = inadequately conserved across whole range; 3 = inadequately conserved in part of range; 4 = adequately conserved; LT1, LT5, LT10, LT25=less than 1, 5, 10, 25% reserved respectively; GT25= >25% reserved.

For rainforest, only those communities defined from overstorey data are included and the nearest equivalent Floyd (1990) suballiance is given. Status codes are from Floyd (1990): E=excellent, G=good, A=adequate, at least in Casino area, I=inadequate in Casino area.

CASov Floristic Community	No. plots	Map units	F.C. Forest Type	Floyd Suballiance or	Res. status
1 <i>Heritiera trifoliolata</i> - <i>H. actinophylla</i>	1	1	1. Booyong	1 <i>Argyrodendron trifoliolatum</i>	E
2 <i>Syzygium corynanthum</i> - <i>Sloanea woollsii</i>	3	1, 2/3 23/26	2. Yellow Carabenn	12 <i>Sloanea woollsii</i> - <i>Dysoxylum fraserianum</i> - <i>Argyrodendron actinophyllum</i> - <i>Caldcluvia</i>	E
3 <i>Ceratopetalum apetalum</i> - <i>Schizomeria ovata</i>	2	11	11. Coachwood-Crabapple	35 <i>Ceratopetalum</i> / <i>Schizomeria</i> - <i>Caldcluvia</i>	E
4 <i>Syzygium crebrinerve</i> - <i>Ficus watkinsiana</i>	1	2/3	-	11 <i>Caldcluvia</i> - <i>Cryptocarya erythroxylon</i> - <i>Orites</i> <i>Melicope octandra</i> - <i>Acmena ingens</i>	A
5 <i>Sloanea woollsii</i> - <i>Dysoxylum fraserianum</i>	1	2/3	2	12	E
6 <i>Schizomeria ovata</i> - <i>Castanospora alphanthii</i>	1	23/26	-	-	-
7 <i>Heritiera trifoliolata</i>	2	1, 21	1	1 <i>Argyrodendron trifoliolatum</i>	E
8 <i>Araucaria cunninghamii</i> - <i>Dendrocnide excelsa</i>	1	21	21. Hoop Pine	21 <i>Araucaria cunninghamii</i>	A
9 <i>Backhousia sctadophora</i>	1	23	23. Myrtle	28 <i>B. sciadophora</i> - <i>Dendrocnide</i> - <i>Drypetes</i>	A
10 <i>Mallotus philippensis</i> - <i>Excoecarya dallachiana</i>	1	21	?21	22 <i>Flindersia</i> spp.- <i>Araucaria</i>	A

Table 7. (cont.)

CASov Floristic Community	No. plots	Map units	F.C. Forest Type	H&B Association	Res. status
11 <i>E. dunnii</i>	1	51	51. Dunn's White Gum	EF013a <i>E. dunnii</i>	2; LT10
12 <i>E. grandis</i>	4	48	48. Flooded Gum	EF010a <i>E. grandis</i> EF010b <i>E. grandis-L. confertus-E. microcorys</i>	2; LT10 2, LT10
13 <i>Lophostemon confertus</i>	7	53, 46, 48, 49, 62	53. Brush Box	EF001a <i>L. confertus</i>	4, LT25
14.1 <i>E. saligna</i>	2	47	?46. Sydney Blue Gum	EF011b <i>E. saligna-E. microcorys</i>	4; LT25-GT25
14.2 <i>E. saligna-E. microcorys-Lophostemon confertus</i>	2	47, 53	?47. Tallowwood-Blue Gum	EF011b <i>E. saligna-E. microcorys</i>	4; LT25-GT25
14.3 <i>E. laevopinea-E. saligna</i>	5	47, 53, 62, 163	168. Silvertop Stringybark-Gum	EF479c <i>E. laevopinea-E. saligna</i> EF011e <i>E. saligna-E. laevopinea</i>	1, LT1 1, LT1
15 <i>Syncarpia glomulifera</i>	2	60	49. Turpentine	EF003a <i>Syncarpia glomulifera</i>	1; LT1
16 <i>E. microcorys</i>	3	36, 37, 47	?47	-	-
17.1 <i>E. acmenoides-E. microcorys</i>	2	47, 70	60. Narrowleaved White Mahogany	EF095a <i>E. acmenoides</i>	1, LT5
17.2 <i>E. acmenoides-E. siderophloia</i>	5	60, 62, 65, 84	60	EF095a <i>E. acmenoides</i> EF600b	1, LT5 4, LT25-GT25
18 <i>E. siderophloia-E. psammitica</i>	1	62/74	?62	-	na
19.1 <i>E. siderophloia-E. moluccana</i>	4	80, 83, 84, 85	80. Grey Ironbark-Grey Box	EF710d <i>E. moluccana-E. siderophloia</i>	1; LT1
19.2 <i>E. moluccana</i>	7	80, 82, 85 31/92, 72/74	82. Grey Box	EF710a <i>E. moluccana</i>	1; LT1
20.1 <i>E. melanophloia-E. propinqua</i>	2	62, 207	207. Silverleaved Ironbark	EF606a <i>E. melanophloia</i>	1, LT1

Table 7. (cont.)

CASov Floristic Community	No. plots	Map units	F.C. Forest Type	H&B Association	Res. status
21.1 <i>E. maculata-E. siderophloia</i>	5	71, 74, 62/74 30/31/92	74. Spotted Gum-Ironbark/ Grey Gum	EF040c <i>E. maculata-E. siderophloia</i>	2; LT1-LT5
21.2 <i>E. maculata</i>	3	71, 74	70. Spotted Gum ?74. Spotted Gum-Ironbark	EF040a <i>E. maculata</i>	1; LT1
21.3 <i>E. propinqua-E. microcorys</i>	3	71, 62/126	62	?EF075a <i>E. propinqua</i> ?EF040d <i>E. maculata-E. propinqua</i>	2; LT5-LT10 2; LT1-LT5
21.4 <i>E. maculata-E. propinqua</i>	7	71, 72, 74 36, 41/92	74	EF040d <i>E. maculata-E. propinqua</i>	2; LT1-LT5
21.5 <i>E. propinqua</i>	5	47, 53, 62 71, 74	62	EF075a <i>E. propinqua</i>	2; LT5-LT10
22.1 <i>E. carnea-E. intermedia</i>	3	60, 92/126, 163	?62	EF097a <i>E. carnea</i>	4
22.2 <i>E. intermedia</i>	3	37, 129,130	-	-	-
23 <i>E. fibrosa</i>	1	72/74	74. Spotted Gum-Ironbark	EF040e <i>E. maculata-E. fibrosa</i>	2; LT1-LT5
24.1 <i>E. fibrosa-E. henryi</i>	2	72/74, 128	74. Spotted Gum-Ironbark	EF040e <i>E. maculata-E. fibrosa</i>	2; LT1-LT5
24.2 <i>E. henryi-E. tindaliae</i>	5	74, 39	75. Spotted Gum-Stringybark	EF040e <i>E. maculata-E. fibrosa</i>	2; LT1-LT5
24.3 <i>E. henryi</i>	3	70, 72, 76	70. Spotted Gum	EF040a <i>E. maculata</i>	1; LT1
25.1 <i>E. planchoniana-E. pyrocarpa</i>	2	38	38. Largefruited Blackbutt	EF147a <i>E. pyrocarpa</i>	4; GT25
25.2 <i>E. planchoniana-E. pilularis</i>	3	37, 41/97, 97	37. Dry Blackbutt 97. Needlebark Stringybark	EF146j <i>E. pilularis-E. planchoniana-E. gummifera</i> EF261a <i>E. planchoniana</i>	4; LT25
25.3 <i>E. planchoniana-E. baileyana</i>	4	41/97, 97, 126, 234	97. Needlebark Stringybark	EF262b <i>E. planchoniana-E. baileyana</i> <i>-E. gummifera</i>	4; LT10-LT25

Table 7. (cont.)

CASov Floristic Community	No. plots	Map units	F.C. Forest Type	H&B Association	Res. status
26 <i>E. resinifera</i> - <i>E. pilularis</i>	5	41, 30/31 36, 74	36. Moist Blackbutt	EF145d <i>E. pilularis</i> - <i>E. resinifera</i>	2,4
27.1 <i>E. pilularis</i>	16	37, 41, 36 40/41, 41/92	37. Dry Blackbutt	EF145a <i>E. pilularis</i>	2,4
27.2 <i>E. pilularis</i> - <i>E. gummifera</i>	6	37, 38, 40/41	41. Blackbutt-Bloodwood	?EF145a <i>E. pilularis</i>	2,4
28.1 <i>E. umbra</i> - <i>E. tindaliae</i>	2	62, 74	126. Stringybark-Bloodwood	?EF260b <i>E. tindaliae</i> - <i>E. intermedia</i>	4, LT10-25
28.2 <i>E. umbra</i> - <i>Angophora woodsiana</i>	2	41, 97	126. Stringybark-Bloodwood	EF098a <i>E. umbra</i> ?EF260b <i>E. tindaliae</i> - <i>E. intermedia</i>	1 4, LT10-25
29.1 <i>E. sp. aff. acmenoides</i> - <i>Angophora woodsiana</i>	1	234	-	-	-
29.2 <i>E. tindaliae</i> - <i>E. resinifera</i>	2	84, 126	126	?EF260b <i>E. tindaliae</i> - <i>E. intermedia</i>	4, LT10-25
29.3 <i>E. tindaliae</i>	2	41, 84	126. Stringybark-Bloodwood	?EF260b <i>E. tindaliae</i> - <i>E. intermedia</i>	4, LT10-25
30 <i>Angophora woodsiana</i>	10	65/126, 129 38, 76, 130	129. Rough-barked Apples	?EF200a <i>Angophora floribunda</i>	1; LT1
31 <i>E. pyrocarpa</i>	1	38	38. Largefruited Blackbutt	EF147a <i>E. pyrocarpa</i>	4, GT25
32 <i>E. resinifera</i> - <i>Lophostemon suaveolens</i>	1	130	-	EF096a <i>E. resinifera</i>	1; LT1
33 <i>E. signata</i>	6	117, 119	117. Scribbly Gum	EF235a <i>E. signata</i>	4; GT25
34 <i>E. resinifera</i> - <i>Melaleuca quinquenervia</i>	1	31	31. Paperbark	WT002a <i>Melaleuca quinquenervia</i>	4, GT25
35 <i>Lophostemon suaveolens</i> - <i>Casuarina glauca</i>	2	32, 92	32. Swamp Oak	?EF002a <i>Lophostemon suaveolens</i>	nd

Table 7. (cont.)

CASov Floristic Community	No. plots	Map units	F.C. Forest Type	H&B Association	Res. status
36 <i>E. biturbinata</i>	2	62	62. Grey Gum-Grey Ironbark -White Mahogany	?EF076b <i>E. biturbinata</i> - <i>E. carnea</i>	2, LT5-10
37 <i>E. seeana</i>	1	92		EF054a <i>E. seeana</i>	
38 <i>E. rummeryi</i>	3	87	87. Steel Box	EF706a <i>E. rummeryi</i>	1; LT1
39.1 <i>E. tereticornis</i>	4	31/92, 85 92	92. Forest Red Gum	-	-
39.2 <i>E. tereticornis</i> - <i>Angophora subvelutina</i>	5	65, 92	92. Forest Red Gum	EF050d <i>E. tereticornis</i> - <i>Angophora subvelutina</i>	2, LT5-LT10
40 <i>E. campanulata</i>	6	163	163. New England Blackbutt	EF505a <i>E. campanulata</i>	4; LT25

CASov 1 *Heritiera trifoliolata*-*H. actinophylla*

Plot: A00016

Overstorey: *Heritiera trifoliolata* and *H. actinophylla* are dominant with other upper canopy species *Ficus macrophylla* and *Syzygium corynanthum*.

Subcanopy and understorey: Dense small tree/shrub stratum dominated by *Cleistanthus cunninghamii* and *Linospadix monostachya*, with sparse ground cover.

Conservation status: As for CASov 7.

Notes: This clearly has strong affinities to CASov 7 in upper canopy composition, although separated by the classification because of differences in composition of common subcanopy trees. The separation is probably a result of too few sample plots in these communities obscuring floristic relationships. This plot was mapped as FT 1.

CASov 2 *Syzygium corynanthum*-*Sloanea woollsii*

Plots: EW1004, RIC008, WAS005

Overstorey: Usually tall closed forest of very mixed composition with no clear dominant, but *S. corynanthum* is typically among the most common species. *S. woollsii* is sometimes locally dominant as tall, large-crowned individuals. Other frequent species are *Dendrocnide excelsa*, *Cryptocarya erythroxylon*, *Citronella moorei* and *Baloghia inophylla*.

Subcanopy and understorey: Dense small trees, shrubs, palms (*Linospadix monostachya*) and lianes (*Piper novae-hollandiae*, *Cissus antarctica*, *Ripogonum elseyanum*).

Conservation status: This community appears to be a variant of Floyd's suballiance 12 *Sloanea woollsii*-*Dysoxylum fraserianum*-*Argyrodendron actinophyllum*-*Caldcluvia*, although several of the characteristic species are absent from or rare in sample plots and typical lowland elements such as *S. corynanthum* and *D. excelsa* are prominent. The conservation status of suballiance 12 is assessed as excellent, and it is the major subtropical rainforest type in Washpool NP (Floyd 1990).

Notes: It occurs fairly extensively but mostly as small patches in gullies, in Washpool, Ewingar and Richmond Range SFs. The plots were in areas mapped variously as FT 1a, 2/3 and 23/26.

CASov 3 *Ceratopetalum apetalum*-*Schizomeria ovata*

Plots: A00029, EW1005

Overstorey: *C. apetalum* is clearly dominant, with *S. ovata* and *Caldcluvia paniculosa* as common associates. Other locally common species include *Syzygium corynanthum*, *Cryptocarya glaucescens* and *Orites excelsa*.

Subcanopy and understorey: The palm *Linospadix monostachya* is dominant in the dense shrub layer, with *Tasmannia insipida* and *Anopterus macleayanus*.

Conservation status: This community is equivalent to suballiance 35 *Ceratopetalum*/*Schizomeria*-*Caldcluvia*, which occurs fairly extensively at higher altitudes on the plateau in Ewingar, Billilimbra and Washpool SFs. Suballiance 35 is assessed as having excellent conservation status, and large areas are reserved in Washpool NP.

Notes: The related suballiances 33 *Ceratopetalum*/*Schizomeria*-*Argyrodendron*/*Sloanea* and 36 *Ceratopetalum*-*Doryphora* are also recorded for Washpool NP and are likely to occur in association with community CASov 4. Both plots were in areas mapped as FT 11, and this map unit appears to be floristically consistent in the area.

CASov 4 *Syzygium crebrinerve*-*Ficus watkinsiana*

Plot: EW1006

Overstorey: Tall closed forest (to 40 m) dominated by the two character species and *Cryptocarya erythroxylon* in the upper canopy, with *Orites excelsa*, *Diospyros pentamera* and *Caldcluvia paniculosa* as other common overstorey species.

Subcanopy and understorey: Dense small tree/shrub stratum of mixed composition, but with *Acradenia euodiiformis* as the most common species.

Conservation status: This is a variant of suballiance 11 *Caldcluvia-Cryptocarya erythroxyton-Orites-Melicope octandra-Acmena ingens*. Suballiance 11 is assessed as adequately reserved. A variant with composition very similar to that of community CASov 7 is described by Floyd (1990) from Weat Gully in Washpool NP.

Notes: The plot was mapped as FT 2/3.

CASov 5 *Sloanea woollsii-Dysoxylum fraserianum*

Plot: EW1001

Overstorey: Tall closed forest (to 40 m), with the two character species as the upper canopy dominants. Other common canopy species (over 20 m) are *Caldcluvia paniculosa*, *Orites excelsa*, *Schizomeria ovata*, *Doryphora sassafras*, *Syzygium crebrinerve* and *Polyosma cunninghamii*.

Subcanopy and understorey: Dense woody understorey of mixed composition. *Polyosma cunninghamii* is the most common small tree, and the palm *Linospadix monostachya* is dominant in the shrub stratum.

Conservation status: This is equivalent to Floyd's suballiance 12 *Sloanea woollsii-Dysoxylum fraserianum-Argyrodendron actinophyllum-Caldcluvia*, the conservation status of which is assessed as excellent as noted under CASov 2.

Notes: This plot was in an area mapped as Forest Type 2/3.

CASov 6 *Schizomeria ovata-Castanospora alphandii*

Plots: EW1002

Overstorey: Uneven canopy, mostly below 15 m high, of mainly *S. ovata*, *C. alphandii* and *Quintinia verdonii*, with scattered taller *S. ovata* and occasional large *Lophostemon confertus*.

Subcanopy and understorey: Dense small tree and shrub stratum not distinct from the canopy, of diverse composition. Common species include *Polyosma cunninghamii*, *Neolitsea australiensis*, *Abrophyllum ornans* and *Baloghia inophylla*.

Conservation status: This is an unusual community which is not readily related to any Floyd suballiance. The association of *Schizomeria*, a warm temperate element, with the distinctly subtropical *Castanospora* which mainly occurs on coastal lowlands in NSW, is of significance.

Notes: Apparently localized in the area of the survey plot, on a steep, rocky slope on the eastern escarpment of Ewingar SF. The plot was in an area mapped as FT 23/26.

CASov 7 *Heritiera trifoliolata*

Plots: RIC006, RIC007

Overstorey: *Heritiera trifoliolata* is usually clearly dominant, although several large *Ficus watkinsiana* were present in the upper canopy in plot RIC007. Associated canopy and upper subcanopy species include, variously, *Acmena ingens*, *Baloghia inophylla*, *Syzygium corynanthum*, *S. francisii*, *Gmelina leichhardtii* and *Endiandra pubens*.

Subcanopy and understorey: Dense small trees (*Cleistanthus cunninghamii*, *Actephila lindleyi*) and lianes (*Melodinus australis*, *Rauwenhoffia leichhardtii*, *Embelia australiana*), with sparse ground cover.

Conservation status: This community is clearly equivalent to Floyd's suballiance 1 *Argyrodendron (=Heritiera) trifoliolatum*, which he considers to have excellent conservation status. Floyd (1990) notes that stands of this suballiance along the main plateau have a higher than usual proportion of *H. actinophylla* and thus represent intermediates between suballiance 1 and suballiances dominated by *H. actinophylla*.

Notes: Confined to Richmond Range SF where it occurs extensively on basalt and basalt-enriched soils on sheltered slopes at mid altitudes. The most extensive unlogged stands are within Cambridge Plateau FR and Bungdoozle FR. Mostly mapped as FT 1 or 1a, but plot RIC006 in mapped as FT 21.

CASov 8 *Araucaria cunninghamii*-*Dendrocnide excelsa*

Plots: A00019

Overstorey: The two character species are most common, with occasional *Lophostemon confertus*, *Mallotus philippensis* and *Diospyros pentamera*.

Subcanopy and understorey: Dense woody understorey of mixed composition, with *Mallotus philippensis* and *Cleistanthus cunninghamii* as the most common small trees.

Conservation status: This matches suballiance 21 *Araucaria cunninghamii*, which in CMA occurs mostly in Richmond Range SF and Mount Pikapene SF. Its conservation status is assessed as adequate.

Notes: The plot was in an area mapped as FT 21.

CASov 9 *Backhousia sciadophora*

Plots: WAS001

Overstorey: Closed forest with main canopy to 25 m tall, clearly dominated by *Backhousia sciadophora*, with emergents of *Eucalyptus siderophloia*. Other common trees are *Siphonodon australe*, *Austromyrtus bidwillii*, *Croton insularis*, *Drypetes australasica* and *Cupaniopsis parvifolia*.

Subcanopy and understorey: Common species in the subcanopy and shrub strata tend to be smaller individuals of species which are common in the upper strata. There is a very sparse ground cover.

Conservation status: This community is equivalent to suballiance 28 *Backhousia sciadophora*-*Dendrocnide*-*Drypetes*. Suballiance 28 is regarded as adequately reserved in the north of its range which includes CMA.

Notes: The patch of about 130 ha sampled by plot WAS001 is the only area of this suballiance in CMA. This patch was regarded by Floyd (1990) as being of exceptional botanical interest because it is disjunct from other areas of this suballiance and because a number of tree species reach their southern limit of distribution here. The patch is mostly included within Burnt Down Creek FR. The plot was in an area mapped as FT 23.

CASov 10 *Mallotus philippensis*-*Excoecarya dallachiana*

Plots: PIK002

Overstorey: Clearly dominated by the three character species.

Conservation status: This community is included in the broadly defined suballiance 22 *Flindersia* spp.-*Araucaria*, even though neither of these species occurs in the sample plot. Suballiance 22 is assessed as adequately reserved. Within CMA an extensive patch is reserved in Mallangane FR.

Notes: Suballiance 22 is characterized by scattered emergent *A. cunninghamii* and *Flindersia* spp. (*F. collina*, *F. australis*, *F. xanthoxyla*) being locally common (Floyd 1990). It occurs extensively on the southern end of the Richmond Range, in Cherry Tree and Mount Pikapene SFs. At the scale of a 0.1 ha plot, the composition of this assemblage is very varied, with species other than those of *Flindersia* often locally dominant. Plot PIK002 represents one of many such variants. The sample plot was in an area mapped as FT 21. *Araucaria cunninghamii* is scattered through this general area at low density.

CASov 11 *E. dunnii*

Plot: RIC005

Overstorey: Tall (to 50 m) open forest dominated by *E. dunnii* with occasional *E. grandis*.

Subcanopy and understorey: Tall shrub / small tree stratum to 15 m of *Rhodamnia rubescens*, *Beilschmiedia elliptica* and *Synoum glandulosum*, with abundant lianes *Cissus antarctica*, *C. hypoglauca* and *Ripogonum elseyanum*.

Habitat and distribution within survey area: Conservation status: The equivalent EF013a is assessed as inadequately reserved (LT10).

Notes: Restricted to a few small patches in the Peacock Creek area of Richmond Range SF. The sampled stand had been recently selectively logged. The area around the sample plot is of interest because of the local abundance of *Tylophora benthamii*, a normally coastal lowland species. The plot was in an area mapped as FT 51. There are two other patches in CMA mapped as FT 51. One near the sampled area is dominated by *E. grandis* with only scattered *E. dunnii*. A larger patch along Peacock Creek is dominated by *E. dunnii*, but with lower density of overstorey trees and with a grassy understorey with numerous patches of blackberry and other weeds.

CASov 12 *E. grandis*

Plots: A0012A, A00015, NP2006, NP2013

Overstorey: Mostly clearly dominated by *E. grandis*. *Lophostemon confertus* is a frequent associate and is occasionally co-dominant, especially in more heavily logged plots. Other canopy species are infrequent and rare.

Subcanopy and understorey: Exclusively wet sclerophyll, with dense mesic small tree and shrub stratum.

Conservation status: Equivalent to EF010a *E. grandis* and perhaps similar to EF010b *E. grandis*-*Lophostemon confertus*-*E. microcorys*. Both are considered inadequately reserved in the north zone (LT10).

Notes: Widespread but mostly occurring in fairly small patches (10-100 ha) in sheltered sites at low to mid altitudes. This community occurs most extensively in State forests of Richmond Range, and less commonly on the coastal ranges. All plots are logged, often at high intensity. This community matches FT 48 Flooded Gum and all are in areas mapped as such.

CASov 13 *Lophostemon confertus*

Plots: A00017, A0031B, A0031D, BEL004, NP1023, NP2011, NP2041

Overstorey: *L. confertus* is usually clearly, and often solely, dominant. *E. microcorys* is common in plot NC2041, but is otherwise infrequent and rare. *E. maculata* is co-dominant in plot NP1023 and this may represent a separate community.

Subcanopy and understorey: Exclusively wet sclerophyll, with usually dense mesophyll small tree and shrub stratum. Common woody species include *Croton verreauxii*, *Cissus antarctica*, *Cryptocarya microneura*, *Rhodamnia rubescens* and *Synoum glandulosum*.

Conservation status: Clearly equivalent to EF001a *L. confertus*, assessed as adequately reserved.

Notes: Habitat and distribution within survey area: Occurs extensively throughout CMA in moderately sheltered sites, but especially in Richmond Range and escarpment forests. Equivalent to FT 53 Brush Box. Plots are mostly in areas mapped as FTs 46, 48 or 53.

CASov 14.1 *E. saligna*

Plots: A00027, A00030

Overstorey: Tall open forest dominated by *E. saligna*. Associates include *Lophostemon confertus*, *E. microcorys* and *E. campanulata*.

Subcanopy and understorey: Dense mesophyll shrubs, small trees and vines, including *Synoum glandulosum* and *Palmeria scandens*, with ground layer of ferns (*Lastreopsis microsora*, *Blechnum cartilagineum*) and sedges (*Gahnia melanocarpa*).

Conservation status: EF011a *E. saligna* is considered inadequately reserved. However, these plots occur as minor variations within a broader matrix of the adequately reserved EF011b *E. saligna*-*E. microcorys* and the conservation status is thus more realistically assessed as adequate.

Notes: This community is equivalent to FT 46, but both plots are in areas mapped as FT 47 and probably represent small patches of local dominance by *E. saligna* in a broader area in which *E. saligna* and *E. microcorys* are common. There is only a small area of FT 46 mapped for CMA. It was sampled by two plots, both of which were dominated by *Lophostemon confertus* and grouped under CASov 13.

CASov 14.2 *E. saligna*-*E. microcorys*-*Lophostemon confertus*

Plots: NP2042, NP2043

Overstorey: Tall open forest in which the three character species are consistently present, although *E. saligna* tends to be less abundant. Less frequent associates include *E. campanulata* and *E. laevopinea*.

Subcanopy and understorey: Dense mesophyll trees/shrubs (*Cryptocarya rigida*, *Caldcluvia paniculosa*) and lianes (*Cissus antarctica*, *Tetrastigma nitens*) with fern (*Blechnum cartilagineum*) and sedge (*Cyperus disjunctus*) ground cover.

Conservation status: Included within EF011b *E. saligna*-*E. microcorys* and similar to the EF001 group of associations characterized by *Lophostemon confertus*. Both groups of associations are adequately reserved in the north zone.

Notes: Equivalent to FT 47 Tallowwood-Blue Gum.

CASov 14.3 *E. laevopinea*-*E. saligna*

Plots: BIL002, BIL003, BIL004, BIL005, A28

Overstorey: The two character species are consistently present with *E. laevopinea* usually dominant. Frequent associates include *E. microcorys* and *L. confertus*, both of which are occasionally locally common. Plot BIL005 is clearly dominated by *E. microcorys* and could be recognized separately.

Subcanopy and understorey: Various dense mesophyll shrub understorey (*Cryptocarya rigida*, *Eupomatia laurina*, *Synoum glandulosum*) with fern (*Blechnum cartilagineum*) ground cover, or mixed shrub and grassy understorey (e.g. *Acacia irrorata*, *Poa labillardieri*), depending on fire history.

Conservation status: Equivalent to EF479e *E. laevopinea*-*E. saligna* or EF011e *E. saligna*-*E. laevopinea*, both of which are assessed as poorly reserved.

Notes: Restricted to higher altitudes in Ewingar and Billilimbra SFs, as patches associated with other communities, especially CASov 14.1 and CASov 38. Most plots are unlogged. This community matches FT 168 Silvertop Stringybark-Gum, but in CMA occurs mainly as patches of local abundance of *E. laevopinea* in areas generally dominated by other species. There is no FT 168 mapped for CMA.

CASov 15 *Syncarpia glomulifera*

Plots: DOU003, NP1020

Overstorey: These two plots are clearly dominated by *S. glomulifera*, with other canopy species rare.

Subcanopy and understorey: Mixed mesophyll shrubs (e.g. *Trochocarpa laurina*, *Breynia oblongifolia*) with ground cover of herbs and graminoids, such as *Dianella caerulea*, *Glycine clandestina*, *Goodenia heterophylla* and *Gymnostachys anceps*.

Conservation status: Most similar to EF003a *S. glomulifera*, assessed as poorly reserved. However, both plots have been heavily logged and it is likely that the relative abundance of this species has been artificially increased by logging.

Notes: Restricted to a few sheltered slopes and gullies in areas on sandstone and alluvium in forests of the coastal ranges.

CASov 16 *E. microcorys*

Plots: A0012B, NP1015, NP2039

Overstorey: Three plots in which the character species is dominant, but associated variously with *E. grandis*, *E. pilularis* or *Syncarpia glomulifera*. All are logged plots and would most likely have belonged to other communities prior to logging.

CASov 17.1 *E. acmenoides*-*E. microcorys*

Plots: NP2038, WAS004

Overstorey: The two character species are clearly dominant.

Conservation status: Probably included within the broadly-defined group EF095 *E. acmenoides*, assessed as poorly reserved, although CASov 17.1 may not be a natural community in CMA. *E. acmenoides* is very rarely clearly dominant in any stand and almost invariably occurs in association with a range of other species.

Notes: All plots are logged.

CASov 17.2 *E. acmenoides*-*E. siderophloia*

Plots: A00013, A0031C, BIL006, BUN002, WAS002

Overstorey: *E. acmenoides* and *E. siderophloia* are consistently present and usually codominant. *E. intermedia* is a frequent associate species but usually comprises a minor component of a stand. Grey gums (*E. propinqua* and *E. biturbinata*) are infrequent but may be locally common.

Subcanopy and understorey: Various grassy understorey, or mesophyll shrub understorey. There is no consistent association with any particular floristic group.

Conservation status: This community has affinities with EF600b, assessed as adequately reserved, and the EF095 *E. acmenoides* group, assessed as inadequately reserved.

Notes: Plot A00013 is logged and was separated by the analysis due to low basal area. Its composition is otherwise similar to the other plots.

CASov 18 *E. siderophloia*-*E. psammitica*

Plot: NP1102

Overstorey: The two character species are clearly co-dominant, with scattered *E. henryi*.

Subcanopy and understorey: Subcanopy of *Alphitonia excelsa* with dense grassy ground cover of *Imperata cylindrica*, *Panicum effusum*, *Alloteropsis semialata* and *Sorghum leiocladum*.

Conservation status: This community has no H&B equivalent and is of conservation significance due to the presence of the nationally rare species *E. psammitica*.

Notes: This community was recorded only in the vicinity of this sample plot in Mount Marsh SF. Its full extent in CMA is unknown.

CASov 19.1 *E. siderophloia*-*E. moluccana*

Plots: BUN001, ELL001, MYR001, WAS003

Overstorey: *E. siderophloia* is usually dominant with *E. moluccana* mostly present as a common associate. *E. intermedia* is a frequent associate, but usually only as a minor component of the stand and other species are infrequent and uncommon.

Understorey: Mostly a dense grassy ground cover (e.g. *Aristida vagans*, *Imperata cylindrica*, *Themeda australis*, *Cymbopogon refractus*) with scattered shrubs or small trees of *Lophostemon suaveolens* and *Alphitonia excelsa*.

Conservation status: This community matches EF710d *E. moluccana*-*E. siderophloia*, assessed as poorly reserved.

Notes: CASov 19.1 and 19.2 are mostly restricted to warm, dry sites at low altitudes in coastal forests, mainly on Quaternary alluvium.

CASov 19.2 *E. moluccana*

Plots: BRA001, BRA002, BUN004, NP2079

Overstorey: Open forest in which *E. moluccana* is clearly dominant, mostly associated with *E. siderophloia*. Other infrequent but sometimes locally common species are *E. glaucina* and *Lophostemon suaveolens*.

Understorey: Sparse to moderately dense shrub layer of *Alphitonia excelsa* with moderate to dense grassy ground cover, mainly *Imperata cylindrica*, *Cymbopogon refractus*, *Aristida vagans*, *Themeda australis* and *Sporobolus diander*.

Conservation status: This community matches EF710a *E. moluccana*, assessed as poorly reserved.

CASov 20.1 *E. melanophloia*-*E. propinqua*

Plots: NP2044, NP2045

Overstorey: *E. melanophloia* is usually dominant, with *E. propinqua* less common.

Subcanopy and understorey: Subcanopy *Allocasuarina torulosa* with dense grassy ground cover, of *Microlaena stipoides*, *Cymbopogon refractus*, *Aristida* spp. and *Eragrostis leptostachya*.

Conservation status: Equivalent to EF606a *E. melanophloia*, assessed as poorly reserved.

Notes: Within CMA, CASov 20.1 occurs only in a limited area near the eastern boundary of Ewingar SF, on warm, dry, exposed slopes on granite. This community was apparently previously much more widespread on adjacent private property which has since been largely cleared, judging by the scattered remnants in this area.

CASov 21.1 *E. maculata*-*E. siderophloia*

Plots: NP1026, NP1105, NP2014, NP2027, NP2037

Overstorey: The two character species are co-dominant, with *E. propinqua* and *E. carnea* as frequent and sometimes locally common associates.

Subcanopy and understorey: Subcanopy of *Allocasuarina torulosa* with grassy ground cover dominated by *Imperata cylindrica*, *Lomandra longifolia* and *Themeda australis*.

Conservation status: Matches EF040c, assessed as inadequately reserved.

CASov 21.2 *E. maculata*

Plots: NP1014, NP2007, NP2008

Overstorey: *E. maculata* is clearly dominant, with no other common associate.

Subcanopy and understorey: Various grassy or mesophyll shrubs, with no consistent associations.

Conservation status: Matches EF040a, assessed as poorly reserved.

CASov 21.3 *E. propinqua*-*E. microcorys*

Plots: NP1125, NP2004, NP2081

Overstorey: The two character species are co-dominant, with *E. maculata* less common but present in two of the three plots.

Subcanopy and understorey: As for CASov 21.2.

Conservation status: Probably a variant of the inadequately reserved *E. propinqua* group (EF075a), or possibly EF040d *E. maculata*-*E. propinqua*, also inadequately reserved.

CASov 21.4 *E. maculata*-*E. propinqua*

Plots: A00014, AWHP33, NP1024, NP1025, NP1099, NP1103, NP2003

Overstorey: *E. maculata* and *E. propinqua* are present in every plot and are usually the most common species. *E. moluccana* is the only frequent associate.

Subcanopy and understorey: Mostly subcanopy of *Allocasuarina torulosa* with grassy ground cover dominated by *Imperata cylindrica*, *Entolasia stricta*, *Glycine clandestina* and *Themeda australis*, but occasionally with a wet sclerophyll understorey.

Conservation status: Matches EF040d *E. maculata*-*E. propinqua*, assessed as inadequately reserved.

CASov 21.5 *E. propinqua*

Plots: A00011, NP2010, NP2012, NP1132, NP7010

Overstorey: *E. propinqua* is clearly dominant in all plots. The most common associates, some of which may be locally abundant, are *E. siderophloia*, *E. henryi* or *E. microcorys*.

Subcanopy and understorey: Mostly grassy understorey of *Imperata cylindrica* and *Cymbopogon refractus*, with scattered to moderately dense shrubs of *Alphitonia excelsa* and *Acacia concurrens*.

Conservation status: Matches EF075a *E. propinqua*, assessed as inadequately reserved.

CASov 22.1 *E. carnea*-*E. intermedia*

Plots: EWI003, GIB003, NP1113

Overstorey: The two character species are co-dominant, usually with a subcanopy of *Allocasuarina torulosa*. Other canopy species are infrequent and uncommon and include *E. biturbinata*, *E. propinqua*, *E. siderophloia* and *E. resinifera*.

Subcanopy and understorey: Grassy understorey, variously dominated by *Themeda australis* or *Imperata cylindrica*.

Conservation status: Probably a variant of the adequately reserved EF097a *E. carnea*.

CASov 22.2 *E. intermedia*

Plots: MYR002, A0CL36, NP1128

Overstorey: These plots are linked by the dominance of *E. intermedia*, but associated species vary. *Lophostemon suaveolens* is co-dominant in plot MYR002, while *E. biturbinata* is co-dominant in plot NP1128.

Subcanopy and understorey: Grassy understorey of *Imperata cylindrica* with fern *Pteridium esculentum* and shrubs *Alphitonia excelsa* and *Breynia oblongifolia*.

Conservation status: As indicated by the disparate range of associated species, this is probably not a distinct community, and most likely represents small patches of local dominance by the very widespread and frequent species *E. intermedia*, within other assemblages. H&B recognized a distinct *E. intermedia* community (EF330a), but were not able to assess its reservation status.

CASov 23 *E. fibrosa*

Plot: NP2001

Overstorey: *E. fibrosa* is clearly dominant, associated with *E. maculata*, *E. tindaliae* and *E. carnea*.

Subcanopy and understorey: Mixed grassy/graminoid understorey, with *Lepidosperma laterale* as the most common species.

Conservation status: This is best regarded as a local patch of *E. fibrosa* within a broader *E. maculata*-*E. fibrosa* assemblage. As such it is included within EF040e, assessed as inadequately reserved. There appear to be no extensive areas dominated exclusively by this species in CMA.

CASov 24.1 *E. fibrosa*-*E. henryi*

Plots: DOU001, NP1129

Overstorey: *E. fibrosa* is clearly dominant, with *E. henryi* less common.

Subcanopy and understorey: Grassy understorey, but with no consistent relationships.

Conservation status: Group CASov 24 is included within the *E. maculata* group (EF040) of H&B, assessed as poorly to inadequately reserved. H&B apparently do not recognize *E. henryi* as a separate species.

Notes: The three communities of group CASov 24 intergrade in a mosaic and occur extensively on relatively warm, dry sites at low altitudes on ridges and upper slopes. They occur almost exclusively on low quartz sedimentary substrates in forests of the coastal ranges.

CASov 24.2 *E. henryi*-*E. tindaliae*

Plots: ABAN30, ABAN31, ABAN32, BAN002, NP7004

Overstorey: The two character species are usually co-dominant, but *E. tindaliae* is occasionally absent. Common and frequent associates are variously *E. fibrosa*, *E. pilularis* and *Angophora woodsiana*.

Subcanopy and understorey: Grassy understorey of *Entolasia stricta*, *Aristida vagans*, *Imperata cylindrica*, *Themeda australis* and *Alloteropsis semialata*, with scattered shrubs of *Acacia concurrens*.

Conservation status: As for CASov 24.1.

CASov 24.3 *E. henryi*

Plots: A00010, BUN003, NP1121

Overstorey: *E. henryi* is dominant, associated variously with *E. propinqua*, *E. siderophloia*, *E. eugenioides* and *E. resinifera*.

Subcanopy and understorey: Similar to that of CASov 24.2.

Conservation status: As for CASov 24.1.

CASov 25.1 *E. planchoniana*-*E. pyrocarpa*

Plots: ROY001

Overstorey: Mixed overstorey with the two character species and *E. gummifera* as the most common.

Subcanopy and understorey: Heath understorey dominated by *Leptospermum trinervium* and *Xanthorrhoea latifolia*.

Conservation status: Probably a variant of EF147a *E. pyrocarpa*, assessed as adequately reserved.

CASov 25.2 *E. planchoniana*-*E. pilularis*

Plots: NP1022, NP1104, NP1123

Overstorey: *E. planchoniana* is clearly dominant, with a lower proportion of *E. pilularis*.

Subcanopy and understorey: Low sclerophyll understorey of heath shrubs and graminoids, including *Entolasia stricta*, *Leptospermum polygalifolium*, *Lomatia silaifolia* and *Monotoca scoparia*.

Conservation status: A variant of EF261a *E. planchoniana*, assessed as adequately reserved.

CASov 25.3 *E. planchoniana*-*E. baileyana*

Plots: GIB001, GIB002, NP1110, NP1122

Overstorey: The two character species are co-dominant in the upper canopy with a subcanopy of *Angophora woodsiana*.

Subcanopy and understorey: Low heath shrub understorey, common species including shrubs *Acacia complanata*, *Phyllanthus thymoides*, *Bossiaea rhombifolia*, *Persoonia stradbrokeensis* and graminoids *Entolasia stricta* and *Patersonia sericea*.

Conservation status: Similar to EF262b or EF261b, both assessed as adequately reserved.

Notes: Group CASov 25 occurs exclusively on sandstone substrates in the coastal ranges, mainly on warm ridges and upper slopes in areas of intermediate rainfall.

CASov 26 *E. resinifera*-*E. pilularis*

Plots: A00008, A00009, NP1116, NP1117, NP7008

Overstorey: *E. resinifera* and *E. pilularis* are usually the most common species, but either may be locally absent. *Syncarpia glomulifera* is also consistently present, but usually less common.

Subcanopy and understorey: Mixed shrub and herb understorey. Major species are *Pteridium esculentum*, *Entolasia stricta*, *Restio tetraphyllus*, *Imperata cylindrica* and *Leptospermum polygalifolium*.

Conservation status: Matches EF145d, assessed as adequately reserved.

Notes: Logged plot NCA9 has a relatively high proportion of *E. microcorys* and was separated at the 0.6 level of dissimilarity, but is otherwise similar to this community. This community occurs mainly on fairly exposed slopes in warm areas at low altitudes on sandstone or other high quartz substrates, in forests of the coastal ranges.

CASov 27.1 *E. pilularis*

Plots: BEL002, BUN005, EWI007, A00020, A0022A, ABAR37, ABAR38, ACL35, NP1013, NP1016, NP1019, NP1021, NP2040, NP2096, NP7017, NP7020

Overstorey: *E. pilularis* is clearly dominant with other species typically forming only a minor component of any stand. Associate species, all of which are infrequent but may be locally abundant, include *Syncarpia glomulifera*, *E. resinifera*, *E. intermedia* and *Angophora woodsiana*.

Subcanopy and understorey: Various heath or grassy understorey. The former commonly includes *Leptospermum trinervium*, *Entolasia stricta*, *Lomatia silaifolia* and *Phyllanthus thymoides*. Common grassy understorey species are *Imperata cylindrica*, *Pteridium esculentum*, *Entolasia stricta*, *Glycine clandestina* and *Cymbopogon refractus*.

Conservation status: Areas in drier forest types match EF145a, assessed as adequately reserved.

Notes: This is a very widespread community occurring in a range of habitats throughout the area, but mostly on mid to upper slopes.

CASov 27.2 *E. gummifera*-*E. pilularis*

Plots: BEL003, A00006, A0022B, A00025, NP1018, NP7005

Overstorey: Both character species are consistently present, with *E. gummifera* usually more common but *E. pilularis* taller. *Angophora woodsiana* is frequent but usually a minor component as a subcanopy.

Subcanopy and understorey: Mostly heath group understorey, common species including *Themeda australis*, *Persoonia stradbrokeensis*, *Phyllanthus thymoides*, *Notelaea ovata* and *Acacia complanata*.

Conservation status: As most sampled areas are mapped as FT 37, and as most plots are logged and the relative proportion of *E. pilularis* has probably been reduced, this is most likely included as a variant of EF145a *E. pilularis*, assessed as adequately reserved.

Notes: *E. gummifera* tends to occur with *E. pilularis* mainly on high quartz substrates.

CASov 28.1 *E. umbra*-*E. tindaliae*

Plots: A00023, A00026

Overstorey: The two character species are consistently present, with *E. crebra*, *E. moluccana* and *E. maculata* variously as locally abundant.

Subcanopy and understorey: *Alphitonia excelsa* with grassy ground cover (*Themeda australis*, *Aristida calycina*).

Conservation status: Due to the disparate associates, it is doubtful whether these two plots jointly represent a natural assemblage. They are best regarded as local variants of communities in which *E. tindaliae* is generally common, assessed as well conserved.

Notes: This group and group CASov 29 are part of a series of dry forest associations which occur in an intergrading mosaic and for which individual communities are difficult to satisfactorily and consistently define from plot data. They are also not satisfactorily treated by existing *a priori* classification schemes. Considerably more data is required to clarify relationships.

CASov 28.2 *E. umbra*-*Angophora woodsiana*

Plots: A00021, BAN001

Overstorey: Both plots are dominated by *E. umbra*, with a lower proportion of *A. woodsiana*. Plot BAN001 samples a transitional stand at the margin of a patch dominated by *A. woodsiana*.

Subcanopy and understorey: Heath group understorey, with *Daviesia umbellulata*, *Themeda australis*, *Entolasia stricta*, *Xanthorrhoea latifolia* and *Acacia complanata* as common species.

Conservation status: Possibly most similar to EF098a, *E. umbra*, assessed as poorly reserved.

CASov 29.1 *E. sp. aff. acmenoides*-*Angophora woodsiana*

Plot ROY003

Overstorey: Low woodland of the two character species with *E. tindaliae*.

Subcanopy and understorey: Heath group understorey of *Leptospermum trinervium*, *Themeda australis*, *Xanthorrhoea latifolia* and *Persoonia tenuifolia*.

Conservation status: There is no equivalent association recognized by Hager and Benson and this community is of potential significance.

Notes: This community is apparently restricted to limited areas on ridges and upper slopes on low quartz substrates in Mount Marsh SF. *E. sp. aff. acmenoides* appears to be morphologically distinct but its status is under investigation.

CASov 29.2 *E. tindaliae*-*E. resinifera*

Plots: NP1131, ROY002

Overstorey: The two character species are co-dominant. Locally common associates are *Angophora woodsiana* and *Syncarpia glomulifera*.

Subcanopy and understorey: Various grassy or heath understorey.

Conservation status: Probably a variant of EF260b *E. tindaliae*-*E. intermedia*, assessed as well conserved.

CASov 29.3 *E. tindaliae*

Plots: A00024, NP1130

Overstorey: *E. tindaliae* is clearly dominant, with associates variously *E. siderophloia*, *E. umbra* or *Angophora woodsiana*.

Subcanopy and understorey: Various grassy or heath understorey.

Conservation status: As for CASov 29.2.

CASov 30 *Angophora woodsiana*

Plots: A00005, MOR001, NP1012, NP1101, NP1106, NP1107, NP1114, NP1115, NP1119, NP1127

Overstorey: This community is clearly characterized by *A. woodsiana* which is usually dominant.

There are no consistent associated species, but the more frequent include *E. carnea* and *E. intermedia*.

Subcanopy and understorey: Various low heath shrub and graminoid (heath group) or grassy understorey, but usually with a subcanopy of *Allocasuarina torulosa*. Common species in the heath understory group include *Lobelia gracilis*, *Cymbopogon refractus*, *Digitaria parviflora* and *Ptilantheium deustum*. Common grassy understorey species are *Imperata cylindrica*, *Entolasia stricta*, *Aristida vagans*, *Cymbopogon refractus* and *Eragrostis leptostachya*.

Conservation status: Even though some plots are localized areas of dominance by *A. woodsiana*, more extensive areas also exist and this appears to be a fairly extensive community in CMA. There appears to be no H&B equivalent.

Notes: This community occurs extensively on warm, moderately exposed slopes in coastal forests, especially on high quartz sedimentary substrates.

CASov 31 *E. pyrocarpa*

Plot A00004

Overstorey: Open forest dominated by *E. pyrocarpa* with *E. gummifera* and *E. baileyana*.

Subcanopy and understorey: Sclerophyll shrub understorey dominated by *Banksia serrata*, *Ceratopetalum gummiferum* and *Acacia complanata*.

Conservation status: The equivalent EF147a is assessed as adequately reserved.

Notes: CASov 31 is of restricted occurrence on ridges and upper slopes in sandy soils on sandstone, in Doubleduke SF.

CASov 32 *E. resinifera*-*Lophostemon suaveolens*

Plots: NP7014

Overstorey: Open forest of the two character species with *Angophora floribunda* and *E. microcorys*.

Subcanopy and understorey: Small tree/shrub stratum of *Alphitonia excelsa* and *Acacia concurrens*, with dense grassy ground cover dominated by *Imperata cylindrica*.

Conservation status: Poorly conserved. Equivalent to EF096a *E. resinifera*.

Notes: Limited extent and restricted to heavy textured soils on warm, dry, seasonally swampy flats at low altitude.

CASov 33 *E. signata*

Plots: NP1009, NP1010, NP1124, NP1126, WHP001, WHP002

Overstorey: *E. signata* is present in every stand and usually clearly dominant. *E. resinifera*, *Angophora woodsiana* and *E. intermedia* are the only associate species which occur in more than two plots.

Subcanopy and understorey: Various heath group (e.g. *Leptospermum polygalifolium*, *L. trinervium*, *Banksia oblongifolia*, *Leucopogon lanceolatus*) or grassy (common species include *Imperata cylindrica*, *Entolasia stricta* and *Themeda australis*).

Conservation status: The equivalent EF235a is assessed as adequately reserved.

Notes: This well-defined community occurs fairly extensively in warm areas at low altitudes, usually on seasonally waterlogged flats. It occurs exclusively in areas mapped as FT 117 or 119. The latter is nominally Scribbly Gum-Bloodwood, and although sampled stands containing bloodwood (*E. intermedia*) were in this map type, bloodwood occurred as only a minor component of these stands and they were not separated by the classification. The two plots in Bundjalung NP (NP1009, NP1010) also contained bloodwood.

CASov 34 *E. resinifera*-*Melaleuca quinquinervia*

Plots: NP7013

Overstorey: Open forest of the two character species with *E. signata* and *E. carnea* as less common associates.

Subcanopy and understorey: Grassy ground cover of *Panicum simile*, *Themeda australis* and *Ptilothrix deusta*.

Conservation status: Probably a variant of the well conserved WT002a *M. quinquenervia*.

Notes: A community of restricted extent in CMA which occurs on very warm and moderately wet flats at low altitude.

CASov 35 *Lophostemon suaveolens*-*Casuarina glauca*

Plots: DOU002, A00007

Overstorey: The two character species are present in both plots, but *C. glauca* is rare in plot A00007.

Subcanopy and understorey: Plot A00007 has a dense subcanopy of *Melaleuca alternifolia*. There is a mixed grassy and herbaceous understorey.

Conservation status: This is closest to EF002a *Lophostemon suaveolens*, for which there was insufficient data to assess conservation status.

Notes: Restricted to small areas of Doubleduke SF, along minor drainage channels in undulating topography.

CASov 36 *E. biturbinata*

Plots: NP2035, NP2036

Overstorey: This is a mixed group of plots linked only by the presence of *E. biturbinata*.

Subcanopy and understorey: *Allocasuarina torulosa* with grassy ground cover of *Themeda australis*, *Imperata cylindrica* and *Sorghum leiocladum*.

Conservation status: This may not be a distinct community, but is probably included in EF076b *E. biturbinata*-*E. carnea*, assessed as inadequately reserved.

CASov 37 *E. seeana*

Plots: NP1118

Overstorey: Open forest in which *E. seeana* is clearly dominant, with scattered *E. intermedia* and *Angophora woodsiana*.

Subcanopy and understorey: Subcanopy of *Melaleuca sieberi* with grassy ground cover of *Ischmaeum australe*, *Themeda australis*, *Panicum simile* and *Gahnia sieberiana*.

Conservation status: The equivalent EF054a is regarded as inadequately reserved.

Notes: *E. seeana* occurs as scattered individuals in open forest on seasonally waterlogged sites at low altitudes, but seldom dominates.

CASov 38 *E. rummeryi*

Plots: BEL001, NP1100, PIK001

Overstorey: *E. rummeryi* is clearly dominant.

Subcanopy and understorey: Typically a dense shrub or small tree understorey of dry rainforest species such as *Casearia multinervosa*, *Cupaniopsis parvifolia*, *Alectryon subcinereus*, *Alyxia ruscifolia* and the lianes *Austrosteenisia blackii* and *Cissus antarctica*.

Conservation status: A generally well-defined community equivalent to EF706a, assessed as inadequately reserved.

Notes: CASov 38 is locally common but restricted to Mount Pikapene SF and nearby areas in the northern section of Mount Belmore SF.

CASov 39.1 *E. tereticornis*

Plots: NP1017, NP1096, NP7009, NP7011, NP7015, NP7016

Overstorey: Open forest or woodland in which *E. tereticornis* is consistently dominant. There is no associate species which occurs in more than two plots. Species which are occasionally locally common are *E. robusta*, *E. intermedia*, *E. siderophloia* and *E. maculata*.

Subcanopy and understorey: Mostly grassy and herbaceous ground layer with scattered shrubs. Common species include *Imperata cylindrica*, *Lantana camara*, *Desmodium varians* and *Pratia purpurascens*.

Conservation status: Included within EF050c, assessed as inadequately reserved.

CASov 39.2 *E. tereticornis*-*Angophora subvelutina*

Plots: A00018, NP1112, NP2002, NP2005, NP2009

Overstorey: *E. tereticornis* is clearly dominant, with a lower proportion of *A. subvelutina*, which is sometimes absent. *E. acmenoides*, *E. maculata* and *E. gummifera* are infrequent associates which may be locally common.

Subcanopy and understorey: Grassy ground cover of *Themeda australis*, *Imperata cylindrica*, *Cymbopogon refractus* and *Eragrostis leptostachya*, often with moderately dense shrub stratum of *Acacia concurrens*. Occasionally, in less frequently burnt sites, mesophyll shrubs may become more prominent.

Conservation status: Equivalent to EF050d, assessed as inadequately reserved.

CASov 40 *E. campanulata*

Plots: BIL001, BIL007, EWI008

Overstorey: Dominated by *E. campanulata*, with *E. microcorys* as a frequent associate.

Subcanopy and understorey: Various grassy or mesophyll shrub understorey, depending on fire history.

Conservation status: Equivalent to the adequately reserved EF481a *E. campanulata*.

Notes: This community is restricted to ridges and upper slopes in cool, wet sites at high altitudes on acid volcanic substrates.

3. FLORISTIC PATTERNS IN RELATION TO ENVIRONMENT AND DISTURBANCE

(a) Floristic richness

The classification tree analysis of floristic richness of native species in relation to all major environmental variables (logging age, temperature, radiation index, lithology, fire intensity, fire age, topographic position, observer), excluding rainforest plots, chose temperature as the primary split. If temperature is excluded from the model, fire age becomes the primary determinant of floristic richness. If both temperature and fire age are excluded, the tree is initially split on observer. The splits on temperature and/or fire age essentially divide the data into dry forest and wet sclerophyll groups. Within these groups defined by temperature or fire age, observer is the next most important variable in determining native species richness. Logging history parameters do not contribute in any way, relative to other variables. If the broad floristic group is included explicitly (Figure 4), there is a clearer split into the two broad groups. Observer remains the second most influential variable, clearly demonstrating the critical importance of observer bias in analyzing data from several different observers. For the dry forest groups (left side primary split), logging history has no apparent influence on native species floristic richness. For the wet sclerophyll group (right side split), of plots assessed by Austeco and NEFBS, recently logged plots (<10 years) have a higher native species richness (mean 64 species per plot over five plots) than older logged and unlogged plots (mean 50 species per plot). Otherwise, there is no apparent effect of logging age on floristic richness.

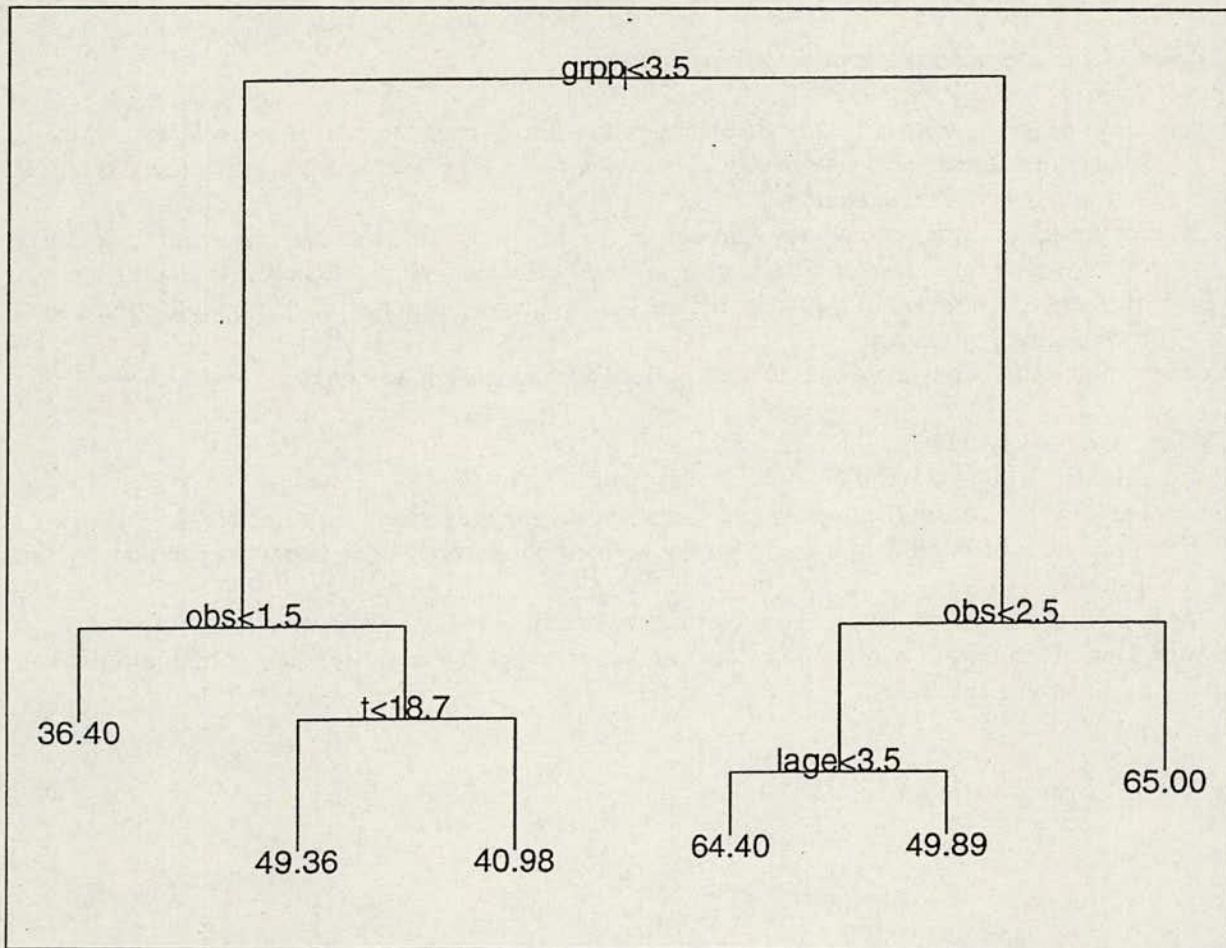


Figure 4. "Snipped" classification tree of floristic richness of native species in relation to environmental variables. Only the five major splits are shown. Variables are: grpp=broad floristic group, obs=observer, t=temperature, lage=logging age, all coded as described in Section 1(c). Broad groups 1-3 are dry forest, group 4 is wet sclerophyll forest.

For naturalized exotics only (tree not shown), the primary splits are on lithology and rainfall. There is a higher number of exotics (mean 3.5 species per plot over 8 plots) in plots on basic igneous lithology than any other (overall mean 1.2 species per plot over 168 plots). It may be inferred from this that exotics are most common in more fertile sites. On other substrates, the number of exotics is slightly higher (mean 1.7 over 81 plots) in lower rainfall areas, but logging history has no influence in the lower rainfall category. Logging history also contributes relatively little in the higher rainfall category. Based on relatively few sites, a larger number of exotics occurs in logged plots in more sheltered sites ($ri < 17.1$), and, in more exposed sites, on substrates of sandstone and Quaternary alluvium.

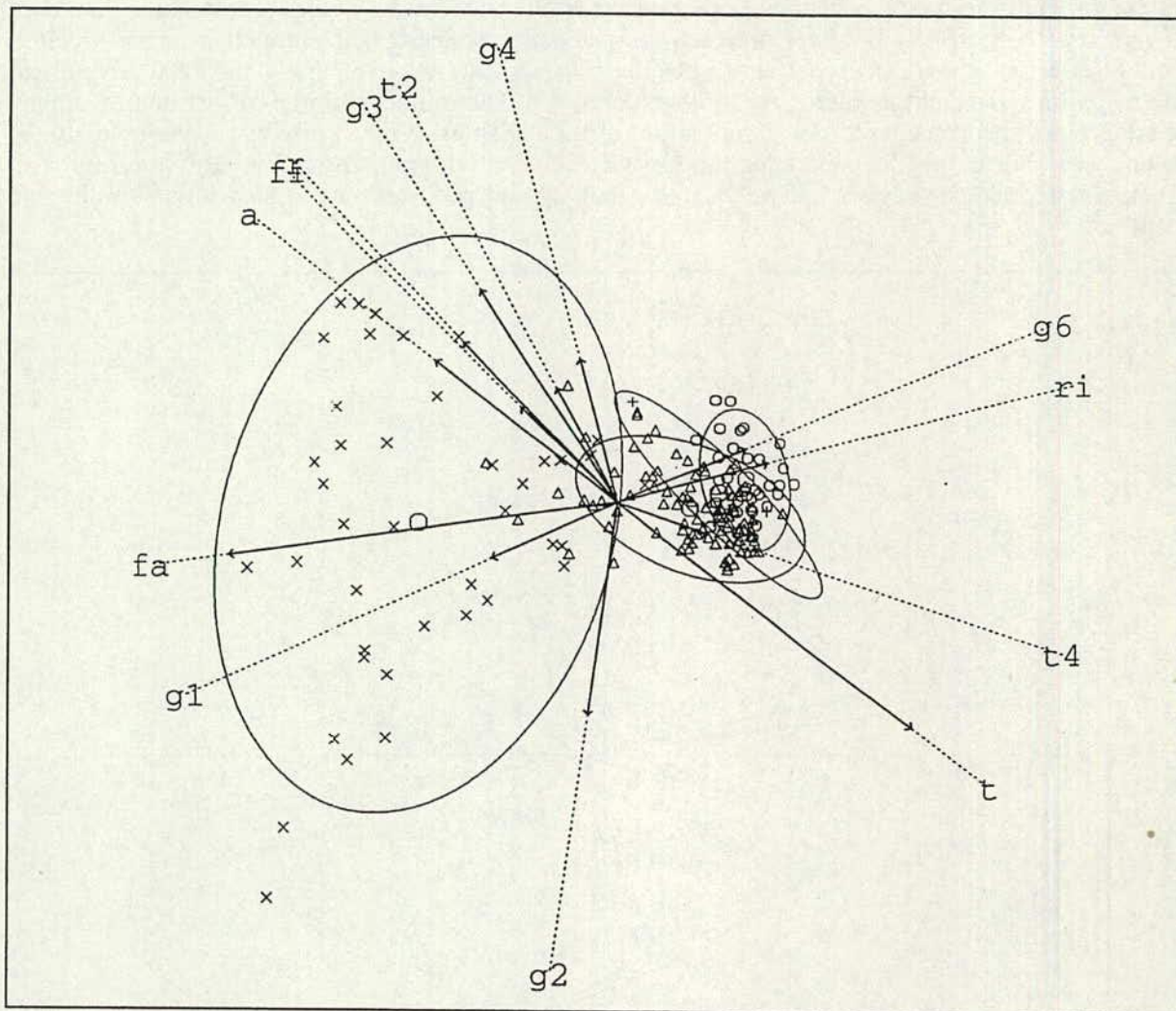


Figure 5. CCA ordination of all eucalypt forest plots, broad floristic group superimposed. Symbols are: O = heath forest (CASf 1-6), Δ = grassy forest (CASf 7-22), + = grassy forest (CASf 23-27), X = wet sclerophyll forest (CASf 28-37). Environmental variables are r = rainfall, t = temperature, ri = radiation index, fi = fire intensity, fa = fire age, a = altitude, g1 = basic igneous, g2 = low quartz sedimentary, g3 = acid volcanic, g4 = granitic, g6 = sandstone, t2 = upper slope, t4 = lower slope.

(b) Patterns of floristic composition

Figure 5 is the canonical correspondence analysis (CCA) ordination with respect to the major measured environmental variables defined in Section 1c, with three major broad floristic groups indicated. For the purpose of this analysis, several more extreme communities (CASf 23-27) in the

grassy forest group were plotted separately, and the rainforest group has been excluded to emphasize patterns in the eucalypt-dominated groups. This ordination broadly reflects the classification result in that the broad dry forest groups are well separated from the wet sclerophyll groups defined by the classification, but within the broad dry forest group, there is considerable floristic overlap between the heath forest and grassy forest groups. This is partly because the ordination uses cover code as a measure of abundance and thus gives greater relative weight to less abundant species compared to the classification. It is also partly a result of the ordination being constrained by environmental variables and suggests that the measured variables discriminate poorly between these two broad groups, a pattern which is also evident from Table 3. Of the measured variables, radiation index and geology class 6 (sandstone) are most strongly associated with discrimination between these groups. The heath forest group has a greater tendency to occur on sandstone and in areas of higher irradiation than does the grassy forest group. However, the poor discrimination suggests that some other factors, such as soil physical or chemical properties (probably clay content, water-retaining potential or nutrient status), which were not assessed, are most important in determining patterns of distribution among these groups. It is apparent from Figure 5 that of the variables assessed, fire age is very clearly the major determinant of the separation of the wet sclerophyll group from the dry forest groups. Temperature, and to a lesser extent, rainfall, geology and radiation index, also influence floristic patterns.

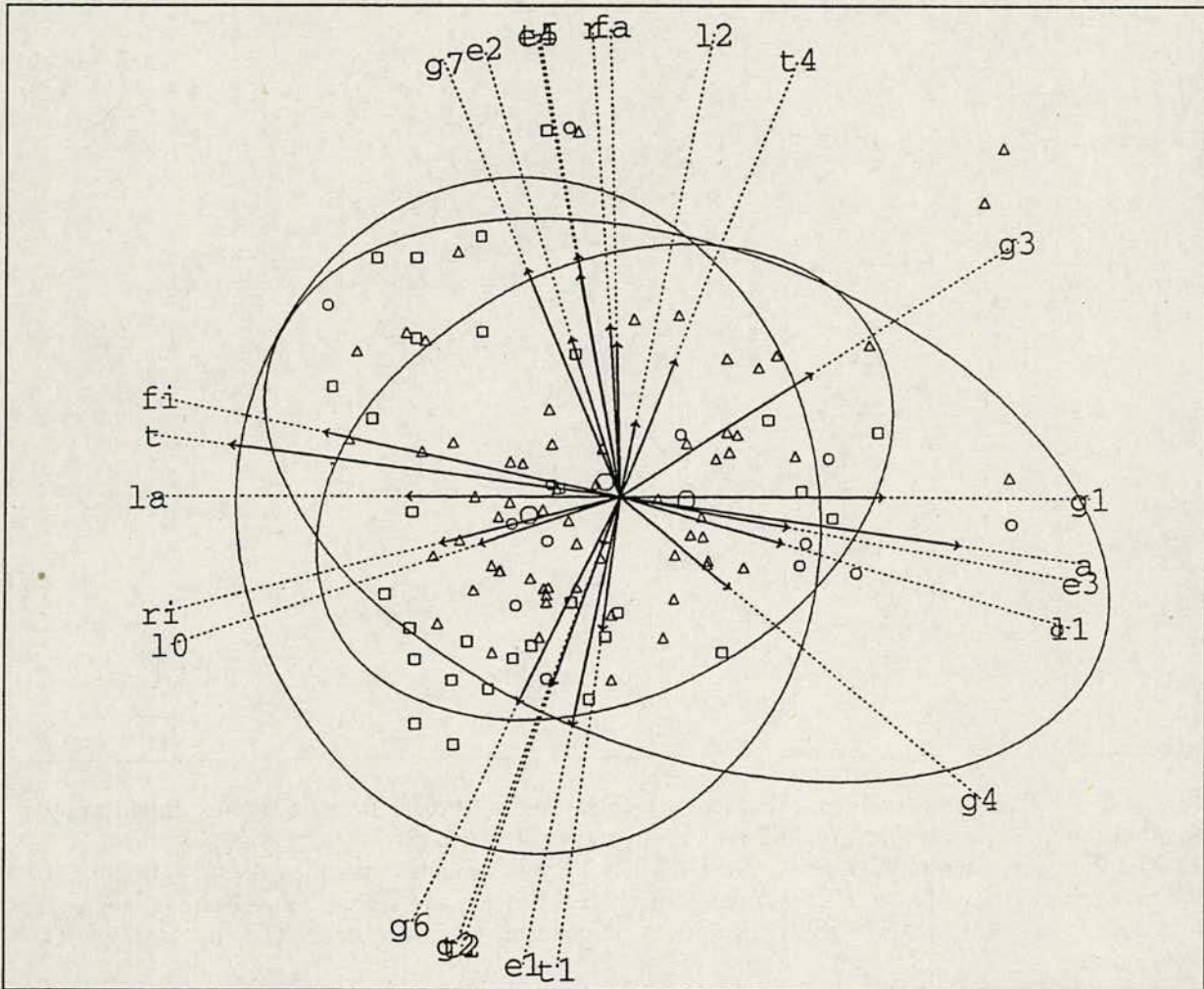


Figure 6. CCA ordination of habitat group defined by fire age < 5 yrs and rainfall > 1059, with logging categories superimposed.

Ellipses are 2sd around the centroid for each group. Symbols are: G = unlogged, O = logged < 10 yrs, Δ = logged > 10 yrs. Environmental variables are a = altitude, r = rainfall, t = temperature, ri = radiation index, fi = fire intensity, fa = fire age, la = logging age; l0, l1, l2 = unlogged, logged<10, logged>10; e1-e4 = exposure classes; g1-g7 = lithology classes: g1 = basic igneous, g2 = low quartz sedimentary, g3 = acid volcanic, g4 = granitic, g6 = sandstone, g7 = Quaternary alluvium; t1-t5 = topographic position: t1 = ridge, t2 = upper slope, t4 = lower slope, t5 = riparian.

To investigate patterns in more detail, separate ordination analyses were conducted on subgroups defined by a classification tree using the four floristic groups defined above as classes. The variables which best defined these floristic classes were fire age and rainfall. These were used to define two habitat subgroups. One was predominantly a dry forest group, defined by fire age less than five years and rainfall greater than 1059 mm and included 108 plots and 379 species. The other was predominantly a wet sclerophyll group, defined by fire age greater than five years and rainfall greater than 1116 mm, containing 40 plots and 327 species.

Figure 6 shows the ordination result for the dry forest group. Logging intensity and midslope position were not significant at the 0.1 level and are excluded. Temperature (inversely related to altitude) remains as a strong influence, but no other single factor stands out as predominant, and complex patterns are evident. The first two axes account for only 22% of floristic variation, suggesting that important variables have not been considered, or that floristic patterns are complex and have a large random component. Logging categories and logging age are closely correlated with other variables and there is no floristic element which can be readily attributed to a logging history effect. For example, the group of plots and species most strongly associated with the unlogged category (and thus high logging age) are those of heath forest on exposed upper slopes on sandstone. These are inferred to be the lowest fertility sites, and the apparent association with logging history is most likely due to these communities generally being avoided during logging because of low to non-existent commercial timber volume.

Fewer variables had a significant influence on patterns in the wet sclerophyll group (Figure 7) than was the case for the dry forest group. The first two ordination axes account for 42% of the floristic variation. Of the physical variables, rainfall, temperature and several lithology classes have the strongest influence on floristic patterns. Fire age also had a very strong influence. Species most strongly associated with more recently burnt plots were dry forest species such as *Ranunculus lappaceus*, *Poranthera microphylla*, *Picris angustifolia* and *Gonocarpus humilis*. Species which are inferred to be associated with less recently burnt areas are *Syzygium crebrinerve*, *Anthocarapa nitidula*, *Rhodammia argentea*, *Anopterus macleayanus* and *Lomandra spicata*. These are predominantly rainforest species. There was no statistically significant (at $p=0.01$) influence of any of the logging history variables (logging age, logging intensity, logging category). However, a weak gradient was evident, and although the majority of the more frequent species (at least 80% of those recorded in more than three plots) are apparently indifferent to logging history, there is a group of species which may favour unlogged plots, and a group which may favour recently logged plots. Those which were recorded mainly in unlogged plots included *Alstonia constricta*, *Scolopia braunii*, *Rauwenhoffia leichhardtii*, *Pellaea falcata* var. *nana*, *Elattostachys xylocarpa* and *Austrosteenisia blackii*. All of these occur mainly in rainforest. Their apparent preference for unlogged areas may reflect a low tolerance of disturbance, or may simply indicate that logging tends to avoid stands where rainforest understorey is more well-developed. Species which were associated with recently logged (<10 years) areas include *Adiantum silvaticum*, *Goodenia rotundifolia*, *Schizomeria ovata*, *Acacia melanoxylon*, *Acmena smithii*, *Neolitsea australiensis*, *Rubus rosifolius*, *Cyperus disjunctus*, *Rubus hillii* and *Palmeria scandens*. These are mostly species which are expected to readily colonize disturbed sites.

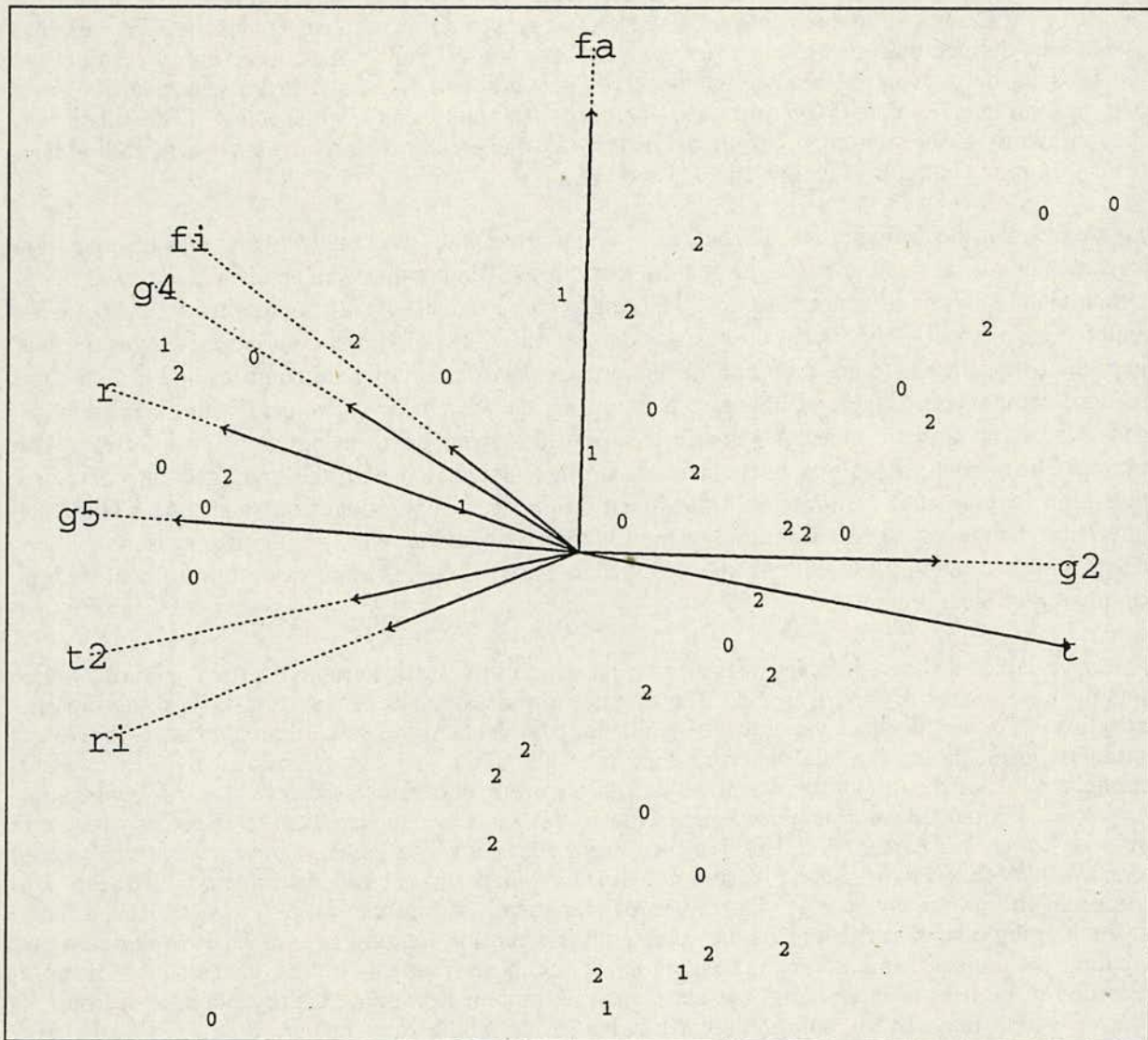


Figure 7. CCA ordination of habitat group defined by fire age > 5 yrs and rainfall > 1116 mm/yr, with logging categories superimposed. Ellipses are 2sd around the centroid for each group. Logging category codes are: 0 = unlogged, 1 = logged < 10 yrs, 2 = logged > 10 yrs. Only environmental variables which were significant at $p=0.1$ are shown, as: t = temperature, r = rainfall, fi = fire intensity, fa = fire age; g2-g5 = lithology classes: g2 = low quartz sedimentary, g4 = granitic, g5 = basic igneous; t2 = upper slope.

DISCUSSION

1. SIGNIFICANT PLANT SPECIES

Species listed by Briggs and Leigh (1988, updated as at June 1995) for which the known range overlaps or is close to CMA, and for which known habitats occur in State forests of CMA, are considered below, with a description of occurrence within the area where records exist, and an estimate of likelihood of occurrence based on known habitats, where there are no records.

Species which have been recorded from the area (Appendix 1) were assessed for State or regional conservation significance from Sheringham and Westaway (1995). Those in categories 1-6 are considered below. Species in categories 7-9 (disjunct, northern limit, southern limit of distribution, respectively) are not considered below. In addition, a few species which were recorded from NSW for the first time during survey are included as potentially significant. Where appropriate, risk codes are assigned according to the criteria of Briggs and Leigh (1988) or Sheringham and Westaway (1995). The latter are: 3 = rare in NSW, 4 = regionally uncommon, 5 = depleted or sparse, 6 = regionally endemic, 7 = disjunct population. General distributions for each species are taken from Harden (1991, 1992, 1993) except where another source is cited. Occurrences in reserves are taken from Briggs & Leigh (1988) or Sheringham and Westaway (1995) unless noted otherwise. Unless otherwise indicated, information on occurrence in CMA is from plot data and general observations made by Binns during recent survey.

Dodonaea megazyga and *Papillilabium beckleri* are not included on the list below, as they are no longer considered rare or threatened (J. Briggs, pers. comm.).

(a) Nationally significant species

Acianthus amplexicaulis 3RC-

Distribution: Eudlo (south-eastern Queensland) to O'Sullivan's Gap (New South Wales) (Jones, 1988).
Habitat: Rainforest and thick coastal scrub, very shaded habitats (Jones, 1991). Also wet sclerophyll forest and *Araucaria bidwillii* plantation (Binns *unpubl. obs.*).

Occurrence in reserves: Border Ranges NP, Lamington NP, Broken Head NR, Bundjalung NP, Dorrigo NP, Yuraygir NP

Occurrence in survey area: No records from SF, but probably sporadically distributed in rainforest and wet sclerophyll forest.

Response to disturbance: Capable of recolonising severely disturbed sites after several decades, but otherwise unknown.

Acomis acoma 3RC-

Distribution: North from Nambucca district, to Queensland.

Habitat: Forest margins and roadsides (Brown cited in Harden, 1992).

Occurrence in reserves: Border Ranges NP, Limpinwood NR, Maijala NP (Q), Mount Walsh NP (Q).

Occurrence in survey area: During recent survey this species was found to be locally abundant along roadsides in Ewingar SF, growing among weedy native and exotic herbs. The populations seldom extended beyond 20 m from the road verge, and no plants were seen remote from roads. The total population seen during recent survey is estimated as at least 2000 mature individuals.

Response to disturbance: Most records are from relatively open habitats which are subject to regular or recent soil disturbance. This suggests that *A. acoma* favours relatively sparse overhead vegetation and particular disturbance regimes involving recent and/or regular disturbance. It appears to be a short-lived species (maximum 2-3 years) which relies on continuing recruitment from seed to maintain actively growing populations. Soil-stored seed longevity is unknown. Unlike many Asteraceae, the seeds lack a pappus and thus are unlikely to be readily dispersed over long distances.

***Amorphospermum whitei* 3RCa**

Distribution: From Macleay River to Queensland, also reported from Port Macquarie district.

Habitat: Littoral and warm temperate rainforest (Harden, 1990); also wet sclerophyll forest (Binns and Chapman, 1993).

Occurrence in reserves: Broken Head NR, Brunswick Heads NR, Bruxner Park FR, Bundagen FR, Dorrigo NP, Minyon Falls FR, Mount Coramba FR, Mount Cougal NP (Q), Numinbah NR, Sherwood NR, Snows Gully NR, Waihou FR.

Occurrence in survey area: Not recorded from CMA although it is fairly common to the north and south. As this is a conspicuous and easily recognised tree, the lack of records for CMA may reflect a true absence of the species.

Response to disturbance: Recorded elsewhere from wet sclerophyll forest logged 20-30 yr previously, so can probably colonise disturbed areas within several decades. Individuals are probably fire-sensitive and may be sensitive to other physical damage.

***Angophora robur* 3RC**

Distribution: Endemic to north coastal NSW, in the sandstone belt between Glenreagh and Coaldale.

Habitat: Locally frequent in dry open forest on sandy soils.

Occurrence in reserves: Banyabba NR, Sherwood NR, Waihou FR.

Occurrence in survey area: Not recorded, but may occur in the south-western section of Banyabba SF.

Response to disturbance: Adult trees are expected to be resilient to damage and the species is likely to regenerate well from seed in disturbed sites.

***Arthraxon hispidus* 3VC-**

Distribution: In NSW, coastal and tablelands areas north of Gibraltar Range; also in Queensland and south east Asia.

Habitat: Rainforest.

Occurrence in reserves: Cooloola NP (Q), Noosa NP (Q); not known to be reserved in NSW.

Occurrence in survey area: No records. Although apparently widespread and recorded from rainforest generally, there are very few records and the precise habitat requirements of this species remain a mystery. Its occurrence is therefore difficult to predict and there is a remote possibility that it may be recorded from any area of rainforest in CMA.

***Austrobuxus swainii* 3RCa**

Distribution: Bellinger River to Springbrook (Q), but especially in the Dorrigo area.

Habitat: Rainforest on coastal ranges (James and Harden cited in Harden, 1990); also wet sclerophyll forest.

Occurrence in reserves: Big Scrub FR, Border Ranges NP, Dorrigo NP, Minyon Falls FR, Mount Cougal NP (Q), Nightcap NP, Numinbah NR, Warrie NP (Q).

Occurrence in survey area: Not recorded in CMA, although common in similar habitats to the north and south. Since it is usually locally abundant where it occurs, it is fairly unlikely that its occurrence in CMA has been overlooked, and the probability of occurrence is low despite the presence of broadly suitable habitats.

Response to disturbance: Short term response unknown, but it is unlikely to be adversely affected in the longer term, as it has been recorded from several logged areas in Dorrigo MA and has freely naturalized in Cumberland SF, a highly modified bushland remnant in suburban Sydney, where a few individuals were planted several decades previously. This species is often abundant where it occurs (e.g. Dorrigo area and Murwillumbah area) and is probably inappropriately classified as rare.

***Boronia chartacea* 3RC-**

Distribution: Restricted to disjunct populations in the Wauchope area and Grafton-Copmanhurst area; endemic in NSW.

Habitat: Moist gullies in granite or sandstone areas.

Occurrence in reserves: Banyabba NR.

Occurrence in survey area: During recent survey it was recorded only as scattered individuals near creeks in Banyabba SF and in gullies in Mount Belmore SF. Minimum population size is estimated as several hundred mature individuals.

Response to disturbance: Individuals may be sensitive to fire and other physical damage and probably rely on regeneration from seed. *B. chartacea* is locally abundant along roadsides in logged forest in Wauchope area, in areas logged 10-20 years previously, so populations are probably resilient to selective logging at cycles of several decades.

***Bosistoa floydii* 2RCi (2RCa with additional proposed reservation)**

Distribution: Nambucca River to Richmond River, endemic in NSW.

Habitat: Subtropical rainforest (Richards cited in Harden, 1991), also occasionally wet sclerophyll forest.

Occurrence in reserves: Dorrigo NP; also proposed FR in Mistake SF which contains over 1000 individuals.

Occurrence in survey area: No records. The nearest is near Toonumbar, and there is a slight probability it may occur in subtropical rainforest at lower altitudes in Richmond Range SF.

Response to disturbance: Has been recorded from heavily logged areas, so can persist or recolonise after several decades.

***Bothriochloa biloba* 3V**

Distribution: Widespread in the northern half of NSW and extending to Queensland; also naturalized in the Central Coast subdivision of NSW.

Habitat: Woodland on poorer soils.

Occurrence in reserves: Not known to be reserved.

Occurrence in survey area: Recorded by NPWS NEFBS in grassy forest in leasehold land along Malara Creek. It may occur in similar habitats nearby along the western boundary of Billilimbra SF.

Notes: Since this species is recorded mainly from open habitats with sparse trees, it is unlikely to be adversely affected by logging, and may even be favoured by selective logging. Its current rarity is most likely a result of past agricultural clearing of favoured habitats, although it is also potentially sensitive to adverse fire and grazing regimes.

***Brasenia schreberi* 3RC-**

Distribution: Known from scattered localities in the North Coast, Central Coast and South West Plains subdivisions in NSW; it also occurs in Queensland and Victoria, and outside Australia, in Africa, Asia and America.

Habitat: Aquatic in shallow water.

Occurrence in reserves: Crowdy Bay NP.

Occurrence in survey area: No records, but may occur in lagoons.

Response to disturbance: Unlikely to be affected by forest management activities, except where there is a direct impact on water supply.

***Bulbophyllum globuliforme* 3VC-**

Distribution: McPherson Range, north to near Gladstone in Queensland (Walsh).

Habitat: Epiphytic on rainforest trees, especially *Araucaria cunninghamii*.

Occurrence in reserves: Border Ranges NP, Bunya Mountains NP (Q), Lamington NP (Q), Noosa NP (Q).

Occurrence in survey area: No records. Although the survey area is just beyond the known range, this is an inconspicuous and easily overlooked species. It possibly occurs in CMA in rainforest in Richmond Range SF, in areas where *A. cunninghamii* is common.

Response to disturbance: Decline or local extinction where its host is removed, and it is probably sensitive to changes in canopy microhabitat.

***Bulbophyllum weinthalii* 3RCi**

Distribution: Dorrigo district to southern Queensland, 600-1000 m altitude. It has recently been recorded as far north as Gladstone area (Walsh).

Habitat: Apparently virtually exclusively occurring as an epiphyte on upper branches of *Araucaria cunninghamii* in rainforest (Jones, 1988), although rarely on other rainforest tree hosts.

Occurrence in reserves: Bunya Mountains NP (Q), Dorrigo NP, Lamington NP (Q).

Occurrence in survey area: No definite records, but it is likely to occur in rainforest in Richmond Range SF in areas where *A. cunninghamii* is common.

Response to disturbance: Decline if its host (*A. cunninghamii*) is removed, or upper canopy microhabitat is altered by removal of other upper canopy species. Probably unaffected by disturbance in lower vegetation strata.

***Callistemon acuminatus* 3RC-**

Distribution: Port Stephens to Clarence River, endemic in NSW.

Habitat: Rocky dry slopes of the coastal ranges (Spencer and Lumley, 1991).

Occurrence in reserves: ?Banyabba NR, Blicks River FR, Sherwood NR, Six-B FR, Waihou FR, Yuraygir NP.

Occurrence in survey area: Not recorded, but may occur on rocky slopes in Banyabba SF. The only record which may be in the vicinity of CMA is an old ROTAP record from "Clarence Valley".

Response to disturbance: *Callistemon* species in general appear to be fairly resilient to disturbance and regenerate freely from seed in disturbed areas.

***Callitris monticola* 3RC-**

Distribution: NT and NC subdivisions of NSW, from Gibraltar Range NP to Tenterfield; also in south-east Queensland.

Habitat: Mostly exposed habitats in granite areas, sometimes on sandstone.

Occurrence in reserves: Bald Rock NP, Gibraltar Range NP, Girraween NP (Q), Lamington NP (Q), Main Range NP (Q), Mount Barney NP (Q), Waihou FR.

Occurrence in survey area: No records, but may occur on exposed, rocky slopes anywhere in CMA.

Response to disturbance: Unknown. Individuals are probably sensitive to physical damage and the species may rely on regeneration from seed following severe disturbance.

***Clematis fawcettii* 3VC-**

Distribution: NC subdivision, north from Richmond River; also in south-east Queensland.

Habitat: Drier rainforest, often near streams.

Occurrence in reserves: Border Ranges NP, Lamington NP (Q), Limpinwood NR Mount Barney NP (Q).

Occurrence in survey area: Recorded during survey as locally abundant in rainforest in Richmond Range SF. The population included at least 500 mature individuals.

***Corchorus cunninghamii* 3E**

Distribution: Restricted to the area from Brisbane in Queensland to Lismore. This species is currently known from only four extant populations in total (Halford 1993), three near Brisbane and the only New South Wales population at Toonumbar plantation, Toonumbar SF, first recorded by Hayes in 1945.

Habitat: Apparently restricted to the ecotone between closed forest and open forest, on hillcrests or upper slopes with southerly or south-easterly aspects. It occurs between 140 and 430 m altitude and displays no particular preference for geological substrates (Halford 1993). It is invariably associated with the exotic weeds *Lantana camara* and *Ageratina adenophora*.

Occurrence in reserves: Not known from any reserve.

Occurrence in survey area: Not recorded, but may occur in Richmond Range SF.

Response to disturbance: Halford (1993) suggests that it would be readily killed by fire and would rely on seedling establishment from a soil-stored reserve. An appropriate fire regime would be more critical than absence of fire. He also found that most seedlings occur in areas where ground disturbance has occurred, and suggested that disturbance associated with thinning in the Toonumbar hoop pine plantation site, by removing weed competition, may have prevented *C. cunninghamii* being eliminated from that site. The major threats to this species were considered to be habitat loss (mainly from urbanization) and competition from weeds, with a minor factor possibly damage by cattle grazing, since the species appears to be quite palatable.

***Dendrobium schneiderae* 3RC-**

Distribution: North from Kyogle district in NSW, to Mackay area in Q.

Habitat: Epiphytic on the upper branches of rainforest trees.

Occurrence in reserves: Border Ranges NP, Eungella NP (Q), Lamington NP (Q), Maijala NP (Q), Main Range NP (Q).

Occurrence in survey area: Previously recorded in Richmond Range SF (D. Binns, *unpubl. obs.*), on upper branches of rainforest trees, especially *Heritiera actinophylla*.

Response to disturbance: Decline where its hosts are removed, and it is probably sensitive to changes in canopy microhabitat. It would be easily killed by fire and is absent from fire-prone habitats.

Notes: This species is locally very abundant in Urbenville MA (Binns 1995) and is widespread in Queensland. It is probably inappropriately listed as a rare plant.

***Desmodium acanthocladum* 2VC-**

Distribution: Endemic in coastal areas from Lismore to Grafton.

Habitat: Mainly along rivers, details otherwise unknown.

Occurrence in reserves: Boat Harbour NR, Johnston Scrub NR.

Occurrence in survey area: No records.

Response to disturbance: Unknown.

***Dodonaea hirsuta* 3RC-**

Distribution: Restricted to the Stanthorpe-Torrington and Copmanhurst districts in northern New South Wales and southern Queensland.

Habitat: Dry sclerophyll forest and heathland on granite and sandstone.

Occurrence in reserves: Banyabba NR, Boonoo Boonoo NP, Girraween NP.

Occurrence in survey area: No records, but may occur in rocky sites in Banyabba SF.

Response to disturbance: Unknown, but other species of *Dodonaea*, such as *D. triquetra*, freely colonize disturbed habitats. It is very unlikely to occur in areas subject to logging. It would probably be depleted or locally eliminated by fires at too frequent intervals (less than 5-8 years).

***Eucalyptus dorrigoensis* 2KC-**

Distribution: Upper Macleay River to east of Tenterfield; endemic in New South Wales.

Habitat: Grassy or shrubby woodland or forest on moderately to highly fertile soils (Hill 1991).

Occurrence in reserves: Boonoo Boonoo NP, Dorrigo NP, Guy Fawkes River NP.

Occurrence in survey area: No records, but may occur in Ewingar, Billilimbra or Washpool SFs.

Response to disturbance: Regenerates well after logging, but regular grazing and burning may inhibit long term recruitment.

Notes: This species was considered not at risk by Johnson and Hill (1990). It was included in the ROTAP list only because of concerns over susceptibility to dieback (J. Briggs, *pers. comm.*). There is little evidence of dieback of this species in populations in State forests in other MAs.

***Eucalyptus dunnii* 3RCa**

Distribution: Coastal ranges and escarpment, from near Coffs Harbour to McPherson Range.

Habitat: Valleys and lower slopes or on fertile ridges, usually on moderately to highly fertile soils.

Occurrence in reserves: Lamington NP, Main Range NP, Border Ranges NP, Mount Clunie FR, Tooloom Scrub FR.

Occurrence in survey area: Locally dominant in a few small patches in Richmond Range SF, in the vicinity of Peacock Creek. Benson and Hager (1993) estimate a total of 7700 trees in these patches.

Response to disturbance: Regenerates well after logging, but regular grazing and burning may inhibit long term recruitment.

***Eucalyptus fusiformis* 2RC-**

Distribution: Southern Queensland to Kempsey, coastal districts.

Habitat: Locally frequent in wet forest on deeper soils of higher fertility.

Occurrence in reserves: Banyabba NR, Guy Fawkes River NP, Lamington NP (Q).

Occurrence in survey area: Recorded in Mount Marsh SF and may occur in Mount Belmore or Banyabba SFs, and perhaps in other parts of CMA. Its distribution is poorly known due to past confusion with other species of ironbark.

Response to disturbance: Likely to regenerate well after soil disturbance.

***Eucalyptus psammitica* 3KC-**

Distribution: Confined to the Coffs Harbour and Grafton districts.

Habitat: Dry sclerophyll woodland in shallow infertile sandy soil on sandstone.

Occurrence in reserves: Banyabba NR.

Occurrence in survey area: Recorded by NPWS NEFBS in Mount Marsh SF. It may also occur in other SFs nearby on sandstone such as Mount Belmore SF and Banyabba SF.

***Eucalyptus scias* subsp. *apoda* 3K (2V-, Johnson and Hill 1990)**

Distribution: Restricted to ranges east of Tenterfield.

Habitat: Open forest and woodland on granite-derived soils.

Occurrence in reserves: Not known to be reserved.

Occurrence in survey area: Recorded during recent survey as a few scattered individuals on rock outcrops in Billilimbra SF, with a total population of less than 50 mature individuals. It may also occur sporadically in Washpool or Ewingar SFs in similar habitat, but as a predominantly eastern tablelands and escarpment species, it is unlikely to occur elsewhere in CMA.

Response to disturbance: Likely to regenerate well after disturbance. It was noted as being "sporadic and uncommon" and "possibly at some risk from forestry activities" by Johnson and Hill (1990). Presumably the latter comment referred to the possibility of depletion by selective removal of this species from mixed stands.

***Eucalyptus tetrapleura* 2VCa**

Distribution: Recorded as restricted to south of Grafton by Hill (1991), but there are ROTAP records from between Casino and Grafton, and from Girard SF.

Habitat: Localized, "in wet sclerophyll forest on moderately fertile soil" (Hill 1991), but most records actually appear to be from dry sclerophyll forest and woodland.

Occurrence in reserves: Glenugie Peak FR, Wells Crossing FR.

Occurrence in survey area: One record from Gibberagee SF.

Response to disturbance: Likely to regenerate well after soil disturbance.

***Eucalyptus rummeryi* 3RC-**

Distribution: Casino to Dorrigo, endemic in NSW.

Habitat: Wet or grassy forest on fertile soils (Hill, 1991).

Occurrence in reserves: Madmans Creek FR, Steel Box FR, Tulipwood FR.

Occurrence in survey area: Restricted to Mount Pikapene SF and adjacent northern part of Mount Belmore SF, but there locally dominant in some areas where it is often associated with an understorey of dry rainforest. The total population would be well in excess of 5000 mature trees.

Response to disturbance: Likely to regenerate well after soil disturbance, but regular grazing and burning may inhibit long term recruitment. Where a rainforest understorey is present, repeated low intensity logging which prevents recruitment due to excessive competition from residual understorey may cause long term decline.

***Goodenia fordiana* 2RC**

Distribution: Endemic in NSW; previously recorded from between Coffs Harbour and Bulahdelah, but recently recorded near Murwillumbah (D. Binns, *unpubl. obs.*).

Habitat: Sclerophyll forest on the lower escarpment ranges.

Occurrence in reserves: Rowleys Rock FR, Sugar Creek FR.

Occurrence in survey area: Not recorded, but likely to be widespread and scattered in wet sclerophyll and some dry sclerophyll forests.

Response to disturbance: *G. fordiana* has been observed to colonize road verges and is recorded from previously logged areas. It is unlikely to be adversely affected by disturbance due to selective logging. It is mostly recorded in areas which have remained unburnt for 10 years or more and may be sensitive to regular burning.

***Grevillea banyabba* 2VC-**

Distribution: Endemic to the NSW North Coast, in the Fortis Creek-Coaldale area north of Grafton (Olde and Marriott 1994).

Habitat: In well-drained sandy soil in open eucalypt forest, on or near ridge crests (Olde and Marriott 1994).

Occurrence in reserves: Banyabba NR, where recorded as locally frequent by Sheringham and Westaway (1995); Rocky Creek NR.

Occurrence in survey area: No records, but may occur in Banyabba SF.

Response to disturbance: Unknown. It is not recorded as lignotuberous, so may be sensitive to physical damage and rely on recruitment from seed following fire or other disturbance. If so, repeated disturbance at intervals of less than five years may deplete populations.

***Grevillea beadleana* 3ECi**

Distribution: Endemic in NSW, in scattered localities on the NT, but recently recorded from north of Grafton (Sheringham and Westaway 1995).

Habitat: Mostly in exposed areas on granite, but recent records from Grafton area are in dry open forest on sandstone.

Occurrence in reserves: Guy Fawkes River NP.

Occurrence in survey area: No records, but there is a remote possibility that it occurs in Banyabba SF.

Response to disturbance: Benson (1991).

***Grevillea masonii* 2E**

Distribution: Restricted to a few localities near Grafton (Olde and Marriott 1994).

Habitat: Eucalypt woodland at low elevations on gravelly loam soils, considered to now occupy only highly modified sites on degraded road verges and pastureland (Olde and Marriott 1994).

Occurrence in reserves: Not known to be reserved.

Occurrence in survey area: No records. Most recent records are just south of CMA boundary, but there are old records with vague locality data which may be within the general CMA boundary. This species appears to have occurred primarily in areas favoured for agriculture and since cleared for grazing. There is a very low probability of occurrence in State forests.

***Grevillea quadricauda* 3VC**

Distribution: Restricted to two localities, Helidon Hills-Murphys Creek in south-eastern Q and Mount Neville NR in northern NSW (Olde and Marriott 1994).

Habitat: Usually along creeks or drainage lines in eucalypt woodland, on gravelly loam or sand (Olde and Marriott 1994).

Occurrence in reserves: Mount Neville NR.

Occurrence in survey area: Locally common on rocky slopes, especially near gullies, in Mount Belmore SF.

***Hemisteptia lyrata* 3K**

Distribution: Coastal NSW north from Taree; also in Queensland, eastern Asia and India.

Habitat: Apparently poorly known and simply recorded as 'disturbed sites'.

Occurrence in reserves: Not known to be reserved.

Occurrence in survey area: No records, and extent of occurrence difficult to predict due to lack of detailed habitat knowledge.

Response to disturbance: An annual which probably colonizes recently disturbed sites. It is unlikely to be adversely affected by logging. Its current rarity is presumably because favoured habitats have been drastically altered by agriculture or urbanization.

***Keraudrenia corollata* var. *denticulata* 3RC-**

Distribution: Within NSW, previously only known from near Grafton and west of Sydney, but recently recorded from State Forests in Dorrigo and Urbenville M.A.s; also recorded from the Brisbane area in Queensland (Stanley and Ross, 1986).

Habitat: Recorded as mostly on sandstone (Harden 1990), but recent records are from rocky slopes on volcanic and metasedimentary substrates (Binns, in prep.).

Occurrence in reserves: Not known.

Occurrence in survey area: No records, but possibly occurs on rock outcrops or steep rocky sites.

Response to disturbance: Its occurrence in rocky sites, which usually offer some protection from frequent low intensity fire, suggests that it may be sensitive to frequent burning. The congeneric *K. hillii* has been observed to colonize freely from seed following a single high intensity fire in the Urbenville area (Binns 1995).

Comments: This taxon includes a range of disparate forms which are not satisfactorily accounted for by current nomenclature and which are currently under investigation.

***Leucopogon recurvisepalus* 3KC-**

Distribution: Coastal areas, north from Grafton district, to south-eastern Q.

Habitat: Dry sclerophyll forest and heath on sandy soil on sandstone, often rocky sites.

Occurrence in reserves: Banyabba NR, Mount Neville NR.

Occurrence in survey area: No records, but recorded within the general boundary of the area and may occur in Banyabba SF or Mount Belmore SF, on sandstone.

Response to disturbance: Unknown.

***Marsdenia liisae* 3RC-**

Distribution: Mainly eastern tableland and escarpment areas, from Hastings River to Nightcap Range; endemic in New South Wales.

Habitat: Wet sclerophyll forest and rainforest margins.

Occurrence in reserves: Banda Banda FR, Bruxner Park FR, Dorrigo NP, Guy Fawkes River NP, New England NP.

Occurrence in survey area: Known only from a few records from recent survey, in open forest near rainforest margins, in Billilimbra and Ewingar SFs. The total known population is fewer than 20 mature plants.

Response to disturbance: Many of the records are from roadsides. This could indicate that the species favours particular disturbance regimes, or could simply reflect the easier accessibility of roadsides.

***Marsdenia longiloba* 3RC-**

Distribution: Mainly coastal, north from Coffs Harbour, to south-eastern Queensland.

Habitat: Rainforest.

Occurrence in reserves: Lamington NP (Q).

Occurrence in survey area: A single specimen, without flowers, was collected during recent survey in Billilimbra SF (plot BIL007), in wet sclerophyll forest of *E. campanulata* and *E. microcorys* with understorey dominated by *Trochocarpa laurina* and *Cryptocarya rigida*, on a steep, rocky ridge. The specimen is an excellent match vegetatively with *M. longiloba*, but flowering material is desirable for confirmation. No other plants were seen in the vicinity.

Response to disturbance: Unknown.

***Melichrus species A* 2E**

Distribution: Endemic to the Glenreagh-Coaldale sandstone areas.

Habitat: Dry sclerophyll forest and heath on sandstone.

Occurrence in reserves: Banyabba NR.

Occurrence in survey area: No records, but may occur in Banyabba SF.

Response to disturbance: Unknown.

***Milletia australis* 3RC- +**

Distribution: North from Port Macquarie.

Habitat: Warmer rainforest on coast and adjacent ranges.

Occurrence in reserves: Border Ranges NP, Dorrigo NP, Lamington NP (Q), Mount Chinghee NP (Q), Mount Warning NP, Nightcap NP.

Occurrence in survey area: No records, but may occur in subtropical rainforest at low altitudes in Richmond Range SF.

Response to disturbance: Unknown.

***Muellerina myrtifolia* 3RC-**

Distribution: From McPherson Range (north from Legume) to Rockhampton district in central Queensland.

Habitat: Dry rainforest, parasitic on *Croton* spp., *Parsonia* spp. and *Pandorea* spp. (Stanley and Ross, 1983).

Occurrence in reserves: Coalstoun Lakes NP (Q), Main Range NP (Q); not known to be reserved in NSW.

Occurrence in survey area: Although CMA is south of the known range of this species, there are unconfirmed reports from the Dorrigo area and the species possibly occurs in dry rainforest in Mount Pikapene SF.

Response to disturbance: Unknown.

***Olearia stilwelliae* 3RCa**

Distribution: Coastal ranges from Woolgoolga to Banyabba NR.

Habitat: Dry sclerophyll forest on sandy soil.

Occurrence in reserves: Locally frequent in Banyabba NR, Sherwood NR and Waihou FR (Sheringham and Westaway 1995).

Occurrence in survey area: During recent survey a few plants (< 20) were recorded near the summit of Mount Marsh, in dry sclerophyll forest.

Response to disturbance: Other species of *Olearia* (e.g. *O. flocktoniae*, *O. tomentosa*) colonize recently disturbed sites from seed and *O. stilwelliae* probably behaves similarly. It was noted by Sheringham and Westaway (1995) to occur in recently burnt areas where it appeared to have regenerated from soil-stored seed. Populations would be depleted by fires which occur at a frequency which is too high to allow soil seed stores to accumulate, but the threshold frequency is unknown.

***Owenia cepiodora* 2VCi**

Distribution: Restricted to far north-eastern NSW and south-eastern Q, in the area from Bangalow to McPherson Range, with a record from Cherry Tree SF.

Habitat: Subtropical and dry rainforest.

Occurrence in reserves: Big Scrub FR, Boomerang Falls NR, Border Ranges NP, Hayters Hill NR, Lamington NP (Q), Mallanganee FR, Minyon FR, Mount Warning NP

Occurrence in survey area: A small population occurs in Mallanganee FR in Cherry Tree SF. A single isolated seedling was also recorded during recent survey in plot RIC006, Richmond Range SF, in rainforest.

Notes: The current rarity of this species is popularly attributed to heavy logging in the past which selectively removed this species, although the evidence appears to be lacking.

***Ozothamnus whitei* 3RC-**

Distribution: Gibraltar, McPherson, Tweed and Nightcap ranges.

Habitat: Rocky hillsides.

Occurrence in reserves: Border Ranges NP, Lamington NP (Q), New England NP; also Gibraltar Range NP.

Occurrence in survey area: None known. Nearest confirmed record is Gibraltar Range NP.

Response to disturbance: Unknown, but the closely related *O. obovatus* is sometimes common along roadside banks.

***Paspalidium grandispiculatum* 3V**

Distribution: Previously known only from a small area near Helidon in south eastern Queensland (Stanley and Ross 1989). Records from the current survey are the first for NSW and represent a significant extension of known range.

Habitat: In NSW recorded from grassy patches in canopy gaps in wet sclerophyll forest and from heath forest on sandstone.

Occurrence in reserves: Needlebark FR.

Occurrence in survey area: Recorded only from two survey plots of disparate habitat, in Gibberagee and Doubleduke SF, but probably more widespread throughout the coastal ranges on sandstone. At least several hundred plants were seen in total.

Response to disturbance: The stand in Doubleduke SF occurs in canopy gaps created by logging. The Gibberagee SF (Needlebark FR) stand is in unlogged heath woodland. It is probably resilient to logging disturbance, but is potentially sensitive to fire and grazing regimes. There was little evidence of recent grazing in either stand.

***Persicaria elatior* 3V**

Distribution: Occurs sporadically throughout coastal NSW and in Q.

Habitat: Recorded as growing in damp places, but details poorly known.

Occurrence in reserves: Not known to be reserved.

Occurrence in survey area: Recorded only in a swamp in the northern part of Richmond Range SF, where it is very localized but common, with at least several hundred mature plants.

Response to disturbance: Unknown.

***Plectranthus suaveolens* 3KC-**

Distribution: Coast and tablelands of northern NSW, north from Bulahdelah, to south-eastern Q.

Habitat: Exposed, rocky sites.

Occurrence in reserves: Banyabba NR, Boonoo Boonoo NP, Gibraltar Range NP, Girraween NP (Q), Queen Mary Falls NP (Q).

Occurrence in survey area: There are two records from the NEFBS, in plots 1103 and 1105, in grassy open forest of *E. maculata*.

Response to disturbance: The closely related, but much more abundant *P. parviflorus* freely colonizes disturbed areas, and often becomes weedy when cultivated (D. Binns *unpubl. obs.*).

Notes: The distinction between this species and *P. parviflorus* is not always clear. Specimens from rock outcrops are usually most distinct, while those from forest habitats are generally much more similar to *P. parviflorus*.

***Pteris comans* 3RC-+**

Distribution: Recorded from the NC and Central Tablelands subdivisions of NSW, and also from Queensland, Victoria, Tasmania, New Zealand and Pacific Islands.

Habitat: Wet places in rainforest or tall open forest.

Occurrence in reserves: Border Ranges NP, Guy Fawkes River NP, Mount Warning NP, New England NP, Numinbah NR.

Occurrence in survey area: Not recorded, but probably occurs sporadically along the escarpment forests in CMA. Likely occurrence is difficult to predict from available records, which are infrequent and widely scattered.

Response to disturbance: Unknown. Its congener, *P. tremula*, is a widespread weedy species which freely colonizes highly disturbed areas, but there is no evidence of *P. comans* occurring in such habitats.

***Pterostylis woollsii* 3RC-**

Distribution: Widespread but scattered, from Victoria to the granite belt in south Queensland, mostly along the ranges and western slopes.

Habitat: Among rocks on ridges and slopes and among grass in sclerophyll forest.

Occurrence in reserves: Girraween NP (Q), Mount Arthur Range NP.

Occurrence in survey area: No records in CMA, but previously recorded in a patch of open woodland in unimproved pasture adjacent to Richmond Range SF (D. Binns, *unpubl. obs.*). This is mainly a western slopes and tablelands species which is often associated with *Callitris* woodlands, and coastal records are rare. If it occurs in CMA it is likely to be rare and localized, and most likely in drier, open habitats.

Response to disturbance: The geophytic habit would confer a high degree of resilience to damage to above ground parts, but regular damage (e.g. by fire or grazing) may cause long term decline. It is probably sensitive to severe soil disturbance and because of specific mycorrhizal relationships is expected to be slow to recolonize where populations are depleted. It is most sensitive during the active growth phase, approximately May to December. Although high grazing intensity may be detrimental, some grazing in appropriate seasons is likely to be beneficial by removing competing vegetation.

Rapanea species A

Distribution: Restricted to the area from Coraki to Mount Warning.

Habitat: Subtropical rainforest.

Occurrence in reserves: Cambridge Plateau FR.

Occurrence in survey area: Known only from Cambridge Plateau FR, in rainforest (Sheringham and Westaway 1995).

***Sarcochilus fitzgeraldii* 3VC-**

Distribution: North from Macleay River, to Maleny (Q) (Jones, 1988).

Habitat: Lithophyte in shady places (Jones, 1988).

Occurrence in reserves: Dorrigo NP, Lamington NP (Q), Limpinwood NR, Main Range NP (Q), Mount Warning NP, Numinbah NR, ?Werrikimbe NP.

Occurrence in survey area: No records. Although CMA is within the extremes of the known range, this is well known to orchid enthusiasts and the lack of reliable records between the latitudes which bound CMA most likely indicates a true disjunction in distribution, rather than occurrences being overlooked.

Response to disturbance: Probably very sensitive to changes in microhabitat, but rocky habitats unlikely to be disturbed. Populations have declined drastically due to illegal commercial collecting for horticultural purposes.

***Sarcochilus aequalis* 3RC**

Distribution: Clarence to Manning Rivers, endemic in NSW (Jones, 1991)

Habitat: Lithophyte, usually in shady places.

Occurrence in reserves: Dorrigo NP, Werrikimbe NP.

Occurrence in survey area: No records. CMA lies between the ranges of *S. aequalis* and *S. hartmannii*, geographically separate taxa which were previously considered to belong to a single species. As for *S. fitzgeraldii*, this appears to be a real gap in distribution and the species probably does not occur in CMA.

Response to disturbance: Probably very sensitive to changes in microhabitat, but rocky habitats unlikely to be disturbed. Populations have declined drastically due to illegal commercial collecting for horticultural purposes, and this continues to be a major threat to the species.

***Sarcochilus weinthalii* 3VC-**

Distribution: Coastal ranges north from Richmond River, 400-600 m altitude, as far north as Toowoomba in Q.

Habitat: Epiphytic on rainforest trees.

Occurrence in reserves: Bunya Mountains NP (Q), Lamington NP (Q), Main Range NP (Q).

Occurrence in survey area: There are records from subtropical rainforest in Richmond Range SF, where it is probably localised and uncommon. It is unlikely to occur elsewhere in CMA.

Response to disturbance: Decline where vegetation structure is substantially modified, due to specific microhabitat and host substrate requirements.

***Schistotylus purpuratus* 3RCi**

Distribution: Mainly Lismore, Dorrigo and Walcha districts (Jones 1988) in NSW, and near Brisbane in south-eastern Q.

Habitat: Rainforest and swampy heath. Jones (1988) reports it as uncommon and occurring in cool temperate rainforest above 750m. It also occurs in wet sclerophyll forest (Binns and Chapman 1993).

Occurrence in reserves: Border Ranges NP, Deervale NR, Dorrigo NP, Werrikimbe NP.

Occurrence in survey area: No records, but it is an inconspicuous species which is easily overlooked. The most likely areas of occurrence in CMA are Richmond Range SF and Ewingar, Billilimbra and Washpool SFs. If it does occur in the area, it is probably localized and uncommon.

Response to disturbance: Decline in the short term where vegetation structure is substantially modified, due to specific microhabitat requirements, but probably capable of fairly rapid recolonisation of suitable habitat (Harrison 1981).

***Senna acclinis* 3RC-**

Distribution: Coastal areas, mostly north from Bulahdelah, to Queensland.

Habitat: Subtropical rainforest.

Occurrence in reserves: Broilga Park Reserve (Q), Toonumbar NP

Occurrence in survey area: No records, but may occur in or near rainforest in SFs on Richmond Range.

Response to disturbance: Unknown. Some other species of *Senna* germinate readily following soil disturbance or fire.

***Sophora fraseri* 3VC-**

Distribution: Coast north from Casino, to Queensland.

Habitat: Moist habitats, often near rainforest.

Occurrence in reserves: Lamington NP, Mount Mistake NP.

Occurrence in survey area: No records, but may occur in or near rainforest at lower altitudes.

***Tinospora tinoporoides* 3RC-**

Distribution: Coastal areas north from Richmond River.

Habitat: Wetter subtropical rainforest.

Occurrence in reserves: Boat Harbour NR, Burleigh Heads NP (Q), Davis Scrub NR, Johnstons Scrub NR, Minyon Falls FR, Mount Warning NP, Victoria Park NR.

Occurrence in survey area: No records, but it may occur in or near subtropical rainforest at low to mid altitudes. The most likely area of occurrence is Richmond Range SF. The nearest record to CMA SFs is from O'Donnells Creek, Toonumbar SF.

***Trichosanthes subvelutina* 3RC-**

Distribution: Coastal areas north from Richmond River to Queensland.

Habitat: Rainforest, rainforest margins and moist eucalypt forest.

Occurrence in reserves: Boat Harbour NR, Davis Scrub NR, Johnstons Scrub NR, Lamington NP (Q), Mount Warning NP, Victoria Park NR, Warrie NP (Q).

Occurrence in survey area: No records, but it may occur in or near subtropical rainforest at low to mid altitudes. The most likely area of occurrence is Richmond Range SF.

(b) Other species and records of significance

***Abildgaardia vaginata* (4 8S)**

Recorded as very abundant in parts of Royal Camp SF, in recently logged areas in heath forest, and recorded by Austeco in Doubleduke SF.

***Acacia juliflora* (4? 8S)**

Recorded only in a single NEFBS plot (NP1014) in Tabbimobile SF.

***Amyema conspicuum* (3 8S)**

In NSW recorded only from coastal areas north from Ballina, as a parasite commonly on *Alphitonia*, in rainforest and sclerophyll forest. In CMA non-flowering individuals which are probably this species were recorded during recent survey from Ellangowan SF.

***Aristida acuta* (4 8S)**

Recorded only at a single plot in Royal Camp SF.

***Arthrochilus prolixus* (4)**

Occasional in sandy soils in Mount Belmore SF.

***Astrotricha cordata* (3 7 8S)**

In NSW recorded only from the Mount Neville area, in dry sclerophyll communities, mainly on rocky slopes and near cliffs. In CMA it is locally common in sandy soil on roadsides and rocky slopes in Mount Belmore SF. During recent survey, individuals were noted to regrow vegetatively from low intensity fire, but would probably be killed by moderate intensity fire.

***Bulbophyllum bracteatum* (2 8S)**

Occurs in North Coast and Northern Tablelands subdivisions, north from Gibraltar Range, to south east Q, mainly as an epiphyte in rainforest but sometimes on rocks. It is common in several flora reserves in Urbenville MA and in Boonoo Boonoo NP, and almost certainly Border Ranges NP. It is also recorded from Dorrigo and Cathedral Rocks NP. In CMA it is locally common in the upper canopy of rainforest in Richmond Range SF.

***Chiloglottis diphylla* (4 8N)**

Regarded as extinct in the area by Sheringham and Westaway (1995), but recorded commonly during recent survey in a range of habitats on sandstone, in Mount Belmore SF, Doubleduke SF and Gibberagee SF. It was found to be especially abundant in logged wet sclerophyll forest. It no doubt has been previously overlooked or confused with *C. reflexa* s. lat.

***Corybas barbarae* (3)**

Occurs on sheltered slopes in coastal areas, north from Hornsby. Recorded during recent survey only on a steep slope in wet sclerophyll forest in Billilimbra SF, but probably more widespread.

***Curculigo ensifolia* (4)**

Fairly common on seasonally swampy flats in Braemar and Gibberagee SFs. It is also recorded from Bundjalung NP (Sheringham and Westaway 1995).

***Dichanthium setosum* (4)**

Recorded only in a single NEFBS plot in grassy forest in Ewingar SF.

Digitaria* sp. aff. *oraria

In CMA, only scattered individuals of this taxon were recorded on sandy soils in grassy forest in Bungawalbin SF. Its taxonomic status is uncertain. It is closest to *D. oraria*, which is recorded from Queensland and Northern Territory, but has not previously been recorded from NSW.

***Enneapogon nigricans* (4)**

Recorded at a single NEFBS plot in grassy forest in Ewingar SF, growing with other significant species *Dichanthium setosum* and *Pterocaulon redolens*. It also occurs in Bald Rock NP.

Enteropogon unispiceus

This species appears to be widespread in south-eastern Queensland (Stanley and Ross 1989) but has not previously been recorded from NSW. During the current survey it was recorded as locally common in Braemar and Ellangowan SF, to the extent of being the dominant ground cover in some areas. It was not listed by Sheringham and Westaway (1995).

***Eragrostis benthamii* (4)**

Although listed as regionally uncommon, this species was found to be widespread and often locally abundant during recent survey. It is also recorded from five NPWS reserves in the Upper North East. It should not be considered of regional significance.

***Eragrostis leptocarpa* (4)**

Recorded only in two logged NEFBS plots in Sugarloaf SF. It is also recorded from Mann River NP.

***Eragrostis trachycarpa* (5?)**

Recorded only at a single Austeco plot in Mount Belmore SF.

***Eriachne glabrata* (4)**

During recent survey, found to be locally common in several areas in Mororo and Whiporie SFs, in patches of impeded drainage among *Ptilothrix deusta* in *E. signata* woodland. It is reserved in Moonee Beach NP.

***Galactia species B* (3 8N)**

Recorded from sclerophyll forest, near watercourses, north from Grafton district, to Queensland. In CMA it is known only from a single Austeco plot in Mount Belmore SF.

***Hibbertia acuminata* (6)**

This species is locally common in heath forest and woodland, on rocky slopes on sandstone, in Gibberagee and Mount Belmore SFs. It also occurs in Banyabba NR.

***Hibbertia marginata* (6)**

Widespread and often locally abundant on sandstone, especially in heath forest and woodland on rocky ridge crests and slopes. It mostly occurs in areas subject to little or no logging activity. Although endemic to the subcoastal sandstone ranges of the Clarence and Richmond valleys, it is sufficiently widespread and common within the region that it need not be considered of particular conservation significance in a forest management context. It is reserved in Mount Neville NR.

***Hoya oligotricha* (5 7)**

This species is fairly common in Mount Pikapene SF and nearby areas, where it appears to be largely restricted to dry rainforest. It is recorded from Border Ranges and Bundjalung NPs and Brunswick Heads and Ukerebagh NRs.

***Hygrophila angustifolia* (3 8S)**

Widely distributed in northern and north-eastern Australia, but in NSW occurring only in coastal lowlands north from Casino, in swamps and along creek banks. During recent survey it was recorded as locally common in Braemar SF.

***Iphigenia indica* (3 7 8S)**

Although only recently recorded in NSW (Binns 1995), during recent survey this species was found to be locally abundant in grassy forest, especially among *Imperata cylindrica*, in several localities in CMA, especially Mount Marsh SF and Mount Belmore SF. It also was recently found to be very abundant in Ramornie SF in Grafton MA during a brief inspection (D. Binns, *unpubl. obs.*, March 1995). It appears that *I. indica* is actually quite common in north-eastern NSW and has simply been previously overlooked. It should not be considered of conservation significance.

***Isopogon mnoraifolius* (6)**

In CMA it is locally common in low *E. signata* woodland in Whiporie SF. It is reserved in Bundjalung and Yuragir NPs and Banyabba NR.

***Isotoma fluviatilis* (4? 7?)**

There is a single record of this species from Austeco plot A00007, in Doubleduke SF. As this species is otherwise recorded only from high altitude bogs in northern NSW, this record requires confirmation.

Leptospermum polyanthum

Locally dominant in shrubland on a rock outcrop in Mount Marsh SF. This species was not listed by Sheringham and Westaway (1995) because it apparently had not previously been recorded for their study area.

Keraudrenia* sp. aff. *hillii

Recorded only from shrubland on a rock outcrop in Mount Marsh SF.

***Macrozamia fawcettii* (6)**

Although assessed as a regional endemic, this species is very widespread and often common throughout the sandstone areas of the subcoastal ranges and was recorded from a total of 17 survey plots in CMA. It is not considered of particular conservation significance in a forest management context. It occurs in Washpool and Yuragir NPs and Mount Neville and Sherwood NRs.

***Melaleuca tamariscina* subsp. *irbyana* (3 8S)**

Occurs in open eucalypt forest on poorly drained sites, north from Casino. Recorded from a single NEFBS plot in Braemar SF, and also known from Selection Flat FR.

***Mirbelia speciosa* subsp. *ringrosei* (4 8S)**

Locally common on rocky sandstone ridges and slopes in Mount Belmore SF.

***Notothixos incanus* (5)**

Locally common as a parasite on species of *Melaleuca* in Tabbimoble and Braemar SFs. It is reserved in Yuragir NP.

***Prostanthera melissifolia* (4 7 8N)**

Specimens which appear to match this species were recorded as locally common on a steep, rocky slope in Billilimbra SF.

***Pseudanthus orientalis* (4)**

A single record from a swampy sedgeland in Whiporie SF. It is reserved in Broadwater, Bundjalung and Yuragir NPs.

***Pterostylis daintreana* (4)**

A small population was recorded during recent survey on a rock outcrop in Mount Marsh SF.

***Pterocaulon redolens* (4 8S)**

Recorded at a single NEFBS plot in grassy forest in Ewingar SF. It is reserved in Nymboida NP.

***Rulingia* species (1)**

This species has not previously been recorded from NSW and thus was not listed by Sheringham and Westaway (1995). It was recorded only as a small population (less than 50 individuals) in recently burnt patches of shrubland on a rock outcrop in Mount Marsh SF. It is apparently not uncommon in the Darling Downs district of south east Queensland (Stanley and Ross 1986).

***Sarcophilus spathulatus* (5)**

Recorded as locally common in wet sclerophyll forest in Billilimbra SF. This species appears to be frequently overlooked or confused with other species of *Sarcophilus* when not flowering, and is much more common than usually thought (D. Binns, *unpubl. obs.*). It is doubtfully of regional conservation significance. It is known from Border Ranges NP and Limpinwood NR, but almost certainly is much more widespread in reserves.

***Sauropus* species A (3 8S)**

In NSW, this species is known only from grassland and grassy forest in the Grafton and Casino areas. During recent survey it was found to be widespread and often common in most SFs in low-lying coastal areas, such as Braemar, Ellangowan and Myrtle SFs. It may be deciduous, with shoots being renewed each season from woody rootstocks, and appears to have been largely overlooked previously. It is doubtfully of regional conservation significance.

***Schoenoplectus validus* (5)**

Recorded only in a single swamp in Richmond Range SF. This swamp appears to be floristically unique in CMA and also supports the rare species *Persicaria elatior*. *S. validus* is reserved in Mann River NP.

***Senna odorata* (4?)**

Recorded at a single NEFBS plot in recently logged wet sclerophyll forest in Cherry Tree SF.

***Tephrosia brachyodon* (4? 7)**

Recorded from CMA only in grassy forests in Ewingar SF.

***Tricoryne anceps* subsp. *pteroaulon* (3 8S)**

This species occurs in coastal areas north from Coffs Harbour, in sclerophyll forest and sometimes swampy areas, in lateritic, quartzitic and sandy soils derived from sandstone. In CMA it occurs sporadically, but is sometimes locally abundant, in Doubleduke SF (Austeco) and Gibberagee SF (Binns), usually in heath forest. It is reserved in Banyabba NR.

***Tylophora benthamii* (4?)**

This is normally a species of rainforest on coastal lowlands in NSW. The only record for CMA is an apparently disjunct population recorded during recent survey in wet sclerophyll forest in Richmond Range SF. The species was noted to be common over an area of at least ten hectares, and was freely regenerating, apparently vegetatively, in a recently logged patch. *T. benthamii* is reserved in Border Ranges and Yuragir NPs and Iluka NR.

***Vetiveria filipes* (3? 7)**

Occurs in Northern Territory, Queensland and the NC and North Western Plains subdivisions of NSW, on river banks and floodplains. The only record from CMA is a small population along roadsides in Ellangowan SF, but it was also recorded in a NEFBS plot on leasehold land.

2. CONSERVATION STATUS OF EUCALYPT OVERSTOREY COMMUNITIES

Hager & Benson (1994) have summarized conservation status of overstorey associations in north-eastern NSW. This provides a reasonable basis for conservation assessment, but there are considerable difficulties due to the lack of adequate site-specific data for the existing reserve system state-wide. There is also a problem with the arbitrary nature of the 10% minimum required for adequate reservation, which although widely accepted, has no scientific basis and is not necessarily appropriate in a managed forest context. There is a further problem with the very subjective nature of the community definitions which cannot be related to a consistent data base. Some associations clearly need more investigation and as currently defined appear to include a range of species assemblages, or do not adequately reflect assemblages as they occur in the field. This is particularly so for the complex of dry and 'mixed' forest communities in which species such as *E. siderophloia*, *E. carnea*, *E. tindaliae*, *E. acmenoides* or *E. intermedia* are common. Despite these problems, Hager and Benson's assessment is used here to identify communities of potential conservation significance.

Conservation status of overstorey communities has been summarized in Table 7 above. Communities 14.1, 15.1, 15.2, 25.1, 25.2, 25.3, 29, 32, 35 and 40 are clearly related or equivalent to associations assessed as adequately reserved, at least in the north zone which includes Casino MA. Most other communities are related to inadequately reserved associations as indicated in Table 7.

3. CONSERVATION STATUS OF MAPPED FOREST TYPES

Since Forest Types have been consistently mapped across the whole CMA, conservation status of mapped types is assessed on the basis of overstorey composition as sampled. Site quality subclasses, and composite subtypes, where mapped, are aggregated for this purpose, except where the overstorey composition appears to be floristically distinct. Table 8 summarizes this assessment, allowing for minor discrepancies resulting from differences of scale between sample plots and mappable units, and bearing in mind that Hager and Benson's associations are broadly defined. Thus, if over 50% of sample plots match adequately reserved associations, and the nominal composition of the mapped type matches an adequately reserved association, the type is assessed as adequately reserved. Mapped types 37, 38, 41, 53, 97, 117 and 126 clearly meet these criteria. Map types 47 and 163 meet the criteria in most of CMA, but stands in the unlogged southwest portion of Billilimbra SF have a high proportion of *E. laevopinea* and more closely match inadequately reserved associations. They are assessed as inadequately reserved despite their nominal status as adequate. Both plots in map type 46 were classified with the adequately reserved CASov 15.1 but there may be patches of this type which are more clearly dominated by *E. saligna* and thus more appropriately assessed as inadequate. Even

though map type 119 nominally matches the inadequately reserved EF235c, the three sample plots in this type were clearly dominated by *E. signata* and classified with the adequately reserved CASov 29. Map unit 128, nominally *E. piperita*, is mistyped or a result of a typographical error, since *E. piperita* does not occur in CMA. The patch inspected was dominated by *E. planchoniana* and thus assessed as EF261a, although the survey plot was in an atypical area at the edge of the stand.

Table 8. Conservation status of mapped forest types (rainforest excluded).

Species listed in parentheses occur in less than 75% of plots but are common in some plots. H&B is the most similar association defined by Hager and Benson (1994), based on plot data, or where plot data are very variable, their assessment of FCNSW Forest Types. Where plot data are very variable and substantial discrepancies exist, the map type is assumed to be inadequately reserved. na = not assessed by Hager and Benson (1994). Map type 47 in Billilimbra SF included areas of community 14.2, assessed as inadequately reserved.

Map type	No.	aggregate plots	Main species in survey plots	Main communities	H&B Cons. status
30	2		<i>E. resinifera</i> , <i>E. robusta</i>	21.1, 34	?EF099 2
31	4		<i>E. resinifera</i> , <i>Melaleuca quinquenervia</i> , <i>E. propinqua</i> , <i>E. siderophloia</i> , <i>E. intermedia</i>	19.2, 39.1	? 2?
32	1		<i>Lophostemon suaveolens</i> , <i>Casuarina glauca</i>	35	EF002a na
36	13		<i>E. pilularis</i> , (<i>Syncarpia glomulifera</i> , <i>Lophostemon confertus</i>)	21.4, 26, 27.1	EF145a 2
37	10		<i>E. pilularis</i>	27.1, 27.2	EF145a 4
38	4		<i>E. pyrocarpa</i> , <i>E. gummifera</i>	25.1, 27.2, 30, 31	EF147a 4
39	4		<i>E. pilularis</i> , (<i>E. henryi</i>)	24.2, 27.1	EF040e 2
40	10		(<i>E. pilularis</i> , <i>E. resinifera</i>)	27.1, 27.2, 30	? 2?
41	4		<i>E. planchoniana</i> , <i>E. intermedia</i>	27.1, 26	EF145a, d 4
46	2		<i>Lophostemon confertus</i> , <i>E. saligna</i>	13	EF001a, 2011a 2
47	8		<i>E. microcorys</i> , <i>E. saligna</i>	group 14	EF011b, 479e 4, 2
48	8		<i>E. grandis</i>	12	EF010a 2
49	2		<i>L. confertus</i> , <i>Syncarpia glomulifera</i>	13	EF001a, 2003a 4, 1
51	1		<i>E. dunnii</i>	11	EF013a 2
53	7		<i>Lophostemon confertus</i>	13, 14.2, 14.3, 21.5	EF001a 4
60	5		<i>E. intermedia</i> , <i>E. microcorys</i>	15, 17.2, 22.1	?EF095a 1
62	?		various	various	?group EF075 2
65	7		<i>E. tereticornis</i> , <i>Angophora woodsiana</i>	39.2	EF050d 2
70	2		<i>E. intermedia</i> , (<i>E. henryi</i>)	17.1, 24.3	EF040a 1
71	8		<i>E. maculata</i>	group 21	group EF040 1-2
72	?		<i>E. maculata</i> , <i>E. henryi</i>	groups 21, 24	group EF040 1-2
74	9		(<i>E. henryi</i> , <i>E. tindaliae</i> , <i>E. maculata</i>)	groups 21, 24	group EF040 1-2
76	2		various	24.3, 30	EF040a 1
80	3		<i>E. siderophloia</i> , (<i>E. moluccana</i>)	19.2, 19.1	EF710a, 710d 1
82	1		<i>E. moluccana</i>	19.2	EF710a 1
83	1		<i>E. siderophloia</i> , <i>E. intermedia</i>	19.1	EF710d 1
84	4		<i>E. tindaliae</i> , <i>E. siderophloia</i>	17.2, 19.1, 29.2, 29.3	? 1-4
85	3		various	19.1, 19.2, 39.1	group EF710 1
87	3		<i>E. rummeryi</i>	38	EF706a 1
92	6		<i>E. tereticornis</i>	various	?group EF050 2
97	3		(<i>E. planchoniana</i>)	25.2, 25.3, 28.2	EF261a, 262b 4
117	2		<i>E. signata</i>	33	EF235a 4
119	4		<i>E. signata</i>	33	EF235a 4
126	2		<i>Angophora woodsiana</i>	29.2, 25.3	EF260b 4
128	1		-		EF261a 4
129	3		<i>Angophora woodsiana</i>	30	EF200a 1
130	3		<i>Lophostemon suaveolens</i>	22.2, 30, 32	? 2?
163	4		<i>E. campanulata</i> , <i>E. microcorys</i>	40	EF505a 4
207	1		<i>E. propinqua</i> , <i>E. melanophloia</i>	20.1	EF606a 1

4. IMPACT OF LOGGING

As described under Results, logging impact was assessed by comparing plots which were unlogged but potentially able to be logged, with logged plots of different logging histories. Plots in rainforest or non-forest communities (shrubland, sedgeland) were excluded from this analysis. Since no pre-logging data were available for these plots, such a comparison actually only measures differences between sites. The extent to which these site differences may be attributed to logging impact needs to be cautiously interpreted relative to other factors likely to contribute to variation in vegetation. This is a very well-recognized problem associated with any 'retrospective' survey of this kind, but the constrained ordination method used is potentially a powerful tool for separating possible logging impacts from floristic patterns associated with other measured environmental features. An alternative would be to predict logging impact on the basis of known ecology and expected responses of individual species. Since the ecology of very few species is known sufficiently to make reasonable predictions, and because responses will vary according to environmental conditions and interactions with other species, such an approach will yield even less reliable inferences than a comparison of plots of different histories. Thus, despite the problems, a retrospective approach seems the far better alternative within the time constraints for this survey.

If logging impact on floristic composition was major relative to variation due to other factors, such that logging history had an overriding influence of floristic patterns, the ordination could be expected to show clear separation due to logging history. In fact, it is clear from the ordination results that, at a broad scale, logging history has little effect on floristic composition relative to the influence of other environmental factors, and the data do not suggest any clear successional patterns in relation to logging. The ability of the survey to detect logging impact is constrained by the lack of pre-logging data at individual sites as mentioned above and by interactions between logging history and other factors. For the purpose of detecting impacts, the sampling intensity is low relative to floristic heterogeneity throughout the area, and more subtle impacts of logging would be masked by the overall high level of floristic heterogeneity. Higher sampling intensity may allow detection of more subtle impacts, but interactions of logging with other factors will confound interpretation of apparent impacts. The historical distribution of logging in respect of environment (e.g. the tendency for most unlogged wet sclerophyll forest to occur at higher altitudes in escarpment forests) is such that it is not possible to adequately control for other environmental variables.

The data strongly suggest that there is no adverse impact of logging on floristic richness of native species at a local or broader scale, at least within a broad vegetation group. However, a large proportion of species is recorded at low frequency (e.g. 56% of all species are recorded at fewer than five plots). Some of these are not recorded from logged areas. For these, which are most likely to include the species of greatest potential conservation concern, there is insufficient information to confidently predict logging impact. A major research effort, involving detailed monitoring, will be necessary to determine response to logging for most species, and to determine whether the apparent absence of some species from logged areas is real or due to other factors unrelated to logging. Further survey of reserves and areas which will otherwise remain unlogged will be necessary to determine the broader significance of any adverse logging impact. In the absence of this information, it is important to ensure that samples of the full range of forest growth stages, including unlogged areas, representing the range of communities, is maintained.

5. IMPACT OF FIRE

Even using a single very crude measure of fire history (estimated time since most recent fire), which is only loosely related to fire frequency, the results of analyses described above are very striking, with fire age being the variable of single greatest importance in relation to broad floristic patterns. To a considerable extent, it appears to override the effect of other environmental factors such as temperature and rainfall, although there are clearly interactions between these factors which probably tend to reinforce differences due to fire regime.

The role of fire management in regulating the relative distribution of heath and grassy forests compared to wet sclerophyll forests is clear in broad terms. The more subtle impact of particular fire regimes in dry forests is much less clear. It is well recognized that shrubs which are fire sensitive and which rely on regeneration from seed will be depleted by fires which recur at intervals of less than the maturation period of the species. A high fire frequency also has the potential to deplete the capacity for vegetative regeneration of those species which are resilient to a single event. It might be expected from this that a heath shrub understorey would be converted to grassy understorey with frequent fire. However, survey data from CMA suggests that the patterns are more complex and subtle than this, and that the major structural and floristic features of heath forest are maintained even at what are inferred to be high fire frequencies (3-5 year intervals), due to the high proportion of shrubs which are fire resistant. Adverse impacts of frequent fire in dry forests is most likely to be on less frequent species whose contribution to overall floristic patterns is too subtle to detect with existing data. These are also the species of greatest conservation concern, but too little detail of their individual ecology is known to confidently predict which particular species are likely to be most sensitive to adverse fire regimes.

Frequent fires in areas where *Melaleuca* species are common as mature trees are of particular potential concern, because the bark is highly flammable and even relatively low intensity fires appear to burn a large proportion of the outer bark. While the trees recover, there is some evidence that in the absence of such fires, these communities would support a distinctive epiphyte flora, possibly including significant species such as *Oberonia titania*.

6. IMPACT OF GRAZING

No attempt was made to analyze grazing impacts from survey data, because of the difficulty of estimating grazing history at any one site, and the difficulty of separating browsing by domestic stock from browsing by native herbivores. Domestic grazing has the potential to change vegetation structure and floristic composition by trampling and selective browsing. Trampling and browsing is potentially a serious problem in small, heavily used areas, such as along watercourses or in favoured camp sites. In such areas, species which are sensitive to physical damage are likely to be reduced in abundance or eliminated, and weedy exotics may colonize severely disturbed sites. Due to the low stocking rate overall (estimated at 1 beast per 20 ha), these impacts would be generally very minor except in such areas. The most likely adverse impact of grazing overall is possible reduction in populations of highly palatable or otherwise selectively grazed species. Because domestic grazing has been practised in most of the grassy forests of the area for at least 150 years, and because the plant species most affected are herbaceous species with short reproductive cycles, there is a high probability that any adverse impact of grazing is likely to have already occurred, and the risk of further deleterious impact from continuing current practises is probably low. However, it is possible that domestic grazing is responsible for some less common species maintaining low population levels, with detrimental longer term consequences.

7. WEEDS

Weed species (naturalised exotics) form a relatively small proportion (less than 4%) of the overall flora of the area. Most are a minor component of the vegetation generally and most are recorded at low frequency, with very few species recorded at more than five percent of survey plots. Some, such as *Bidens pilosa*, *Cirsium vulgare*, *Hypochoeris radicata*, *Sigesbeckia orientalis* and *Conyza* spp. are fairly widespread and occasionally locally abundant. These are short lived herbs which tend to colonize recently disturbed areas and die out in the absence of further disturbance. *Sigesbeckia orientalis* in particular is often locally abundant in grassy forest in the first 1-2 years after fire. *Lantana camara* is potentially the most serious weed in the area from a flora conservation perspective, as it often occurs in very dense thickets in which the abundance of native species may be reduced. The greatest numbers of weed species often occur in severely and chronically disturbed areas, such as roadsides, partially cleared areas which have been heavily grazed, or along the more accessible parts of larger creeks, due to a combination of grazing and regular flood scouring.

RECOMMENDATIONS

1. INTRODUCTION

From a forest management perspective, the major issue in relation to flora conservation is logging, because of the potential commercial impact of modification of logging to meet flora conservation objectives. Logging clearly changes vegetation structure and has some impact on floristic composition. Although there is no evidence of any species becoming locally extinct, and very few suffering substantial population declines due to logging, very little is actually known of the response to logging for the vast majority of plant species. Evidence from the subject survey and other recent surveys suggests that most of the more widespread and common species are unaffected, although a few may be reduced in abundance, at least temporarily, and there is potentially a suite of less common species which may be adversely affected. The current lack of detailed knowledge of responses of individual species to disturbance prevents management for particular species or assemblages of species. It is also currently not possible to confidently determine, for the majority of species, which species are sensitive to logging or other management practices and thus need particular attention. This is especially true for those which are less common and thus likely to be of greatest conservation interest, although the small subset of such species of recognised national significance can often be simply accommodated by ensuring known populations are excluded from logging. Refined management for flora conservation will be possible only with much more information on disturbance response of individual species. This requires a long-term, well-planned monitoring system.

Although logging impact on flora is relatively benign in the sense that for most species it is unlikely to lead to drastic long term population depletion, the lack of detailed knowledge means that appropriate reservation of representative communities in as little-disturbed state as possible is the major strategy currently practical to ensure maintenance of floristic biodiversity and other flora conservation values. As a general principle this is clearly a desirable and well accepted precautionary strategy.

2. NATIONALLY SIGNIFICANT SPECIES

In assessing the need for mitigation measures, the following general principles were applied in respect of nationally significant species.

1. Known occurrences of a species in SF, or at least a substantial proportion for species which are locally common and known from several areas, should generally be excluded from logging unless there are specific features of habitat or biology which suggest that other actions are more appropriate.
2. It is not necessary to conduct further surveys or to formally reserve species which are known to occur exclusively in rainforest.
3. It is not necessary to conduct further surveys for species which occur mostly on rocky slopes or other habitats not affected by harvesting, but known populations will be reserved.
4. It is not cost-effective to survey for species which have a low probability of occurrence in CMA and for which likely areas of occurrence are difficult to predict due to poorly known habitat requirements or sporadic occurrence in extensive habitats over a wide geographical range.

5. For species which are recorded generally within the boundary of CMA, but for which habitat requirements are known only in general terms, further survey is proposed only if a known record is within 5 km of a State forest boundary.

Each nationally significant species was considered in relation to these principles and its likely individual requirements and ameliorative measures proposed accordingly. These are summarized below, including specific proposals (listed below) to fully cover points 1 and 3 where appropriate.

(a) The following species are considered to have a low probability of occurrence in State forests of CMA, because they are conspicuous and would be expected to have been recorded if present. No further action is proposed for these. All are either adequately represented in existing reserves, or occur predominantly in rainforest or other habitats not directly affected by logging.

Amorphospermum whitei 3RCa
Austrobuxus swainii 3RCa
Bosistoa floydii 2RCi
Sarcochilus fitzgeraldii 3VC-
Sarcochilus aequalis 3RC-

(b) Species which may occur in State forests of CMA and which are generally widespread outside the area, but for which habitat requirements are poorly circumscribed, except in general terms. The most likely areas of occurrence are difficult to predict with accuracy, and general pre-logging surveys will have a low probability of success. No particular proposals or surveys are suggested for these, but they should be considered during pre-logging surveys for other species.

Acianthus amplexicaulis 3RC-
Arthraxon hispidus 3VC-
Goodenia fordiana 2RC
Hemisteptia lyrata 3K
Pteris comans 3RC-+
Pterostylis woollsii 3RC-
Senna acclinis 3RC-
Sophora fraseri 3VC-

(c) Species which may occur in CMA, but which occur elsewhere predominantly on rocky slopes, and which will not be affected by logging. They may benefit from general reductions in fire frequency in dry forest, but no specific action for further survey or management is proposed.

Callistemon acuminatus 3RC-
Callitris monticola 3RC-
Dodonaea hirsuta 3RC-
Grevillea beadleana 3ECi
Keraudrenia corollata 3RC-
Ozothamnus whitei 3RC-

Proposed action for other species:

Acomis acoma 3RC-

All known populations in CMA are on road verges. Roadside grading and other maintenance should be excluded from known stands, but should be continued in adjacent areas to encourage spread of the species. There should be no roadside spraying with weedicides in the vicinity of known populations.

Angophora robur 3RC

Pre-logging surveys in dry forest on sandy soils in Banyabba SF. Any populations found should be excluded from logging.

Boronia chartacea 3RC-

In CMA, this species is largely restricted to gullies in areas of rocky slopes and low commercial timber value. Logging is not expected to pose a threat, and stands occur in microhabitats which are protected from frequent fires and probably only burn during occasional high intensity wildfires. No specific action is suggested, but less frequent burning in dry forest may allow the species to expand upslope into more fire prone habitats.

Bothriochloa biloba 3V

Surveys should be undertaken in compartments 81, 82 and 83 in Billilimbra SF, during late summer and autumn.

Brasenia schreberi 3RC-

No specific proposal, but all lagoons should be managed for flora conservation.

Bulbophyllum globuliforme 3VC-

No specific action proposed. The only likely area of occurrence is rainforest in Richmond Range SF, and the species will not be affected by logging.

Bulbophyllum weinthalii 3RCi

There should be no logging of hoop pine in wet sclerophyll forest. This species occurs almost exclusively in rainforest and will not otherwise be affected by logging.

Clematis fawcettii 3VC-

No specific action proposed. Recorded only from rainforest.

Corchorus cunninghamii 3E

This species is unlikely to be adversely affected by logging, but it is preferable that any population which exists be located and managed specifically. This is a conspicuous species when in flower, and the most cost-effective way of locating new populations is to make field staff aware of its appearance, as suggested by Halford (1993).

Dendrobium schneiderae 3RC-

No specific action proposed. The only likely area of occurrence is rainforest in Richmond Range SF, and the species will not be affected by logging.

Eucalyptus dorrigoensis 2KC-

Due to lack of records and low risk, no specific survey is warranted.

Eucalyptus dunnii 3RCa

Most of population is included in proposal P8 and in an informal reserve along Peacock Creek. Recently logged areas in P8 should be inspected for extent of regeneration of *E. dunnii*, and, if necessary, supplementary planting of local provenance should be carried out.

Eucalyptus fusiformis 2RC-

Reports of occurrence in Mount Marsh SF should be checked and stands reserved if found.

Eucalyptus psammitica 3KC-

Known stand in Mount Marsh SF included in proposal P18.

Eucalyptus scias subsp. *apoda* 3K

Known stand in Billilimbra SF included within proposal P21.

Eucalyptus tetrapleura 2VCa

Known stands in Gibberagee SF included within proposal P19.

Eucalyptus rummeryi 3RC-

One of several stands in Mount Pikapene SF is reserved. Additional stands are proposed for reservation in proposal P12.

Grevillea banyabba 2VC-

No specific action proposed. It is well reserved in Banyabba NR. The most likely area of occurrence in Banyabba SF is in proposed reserve P7.

Grevillea masonii 2E

No specific measures suggested due to very low probability of occurrence in SF in CMA.

Grevillea quadricauda 3VC

Unlikely to be affected by logging. Modify fire management in cpts 421, 422 Mount Belmore SF to ensure some patches remain unburnt for at least 8-12 years.

Leucopogon recurvisepalus 3KC-

Mostly occurs in habitats which are not affected by logging. The most likely area of occurrence in CMA is included in proposal P7.

Marsdenia liisae 3RC-

All known populations in CMA are within excluded wilderness section of Billilimbra SF and in proposal P21.

Marsdenia longiloba 3RC-

The only known area of occurrence is in the withdrawn wilderness areas of Billilimbra and Washpool SFs. No further action proposed.

Melichrus species A 2E

Mostly occurs in habitats which are not affected by logging. The most likely area of occurrence in CMA is included in proposal P7.

Milletia australis 3RC-+

No specific action proposed. This species is known elsewhere only from lowland subtropical rainforest. If it occurs in CMA it will be restricted to areas excluded from logging.

Muellerina myrtifolia 3RC-

No specific action proposed. Any occurrence would be in dry rainforest.

Olearia stilwelliae 3RCa

Since the species is regarded as adequately reserved and is likely to be resilient to logging, no specific survey or additional reservation is proposed. However, occurrences of this species should be noted during any further survey in dry sclerophyll forest in Banyabba SF and Mount Marsh SF, and it should be considered high priority for monitoring with respect to fire impact.

Owenia cepiodora 2VCi

Recorded only from rainforest. Manage known populations in accordance with recovery plan when available.

Paspalidium grandispiculatum 3V

One of two known populations is within the existing Needlebark FR. The other is included within proposal P2.

Persicaria elatior 3V

Known stand should be reserved (proposal P20, Richmond Range SF).

Plectranthus suaveolens 3KC-

No specific action proposed until taxonomic uncertainties are resolved. The form recorded from open forest in CMA is doubtfully rare.

Rapanea species A

No specific action proposed. Recorded only from rainforest in existing Cambridge Plateau FR.

Sarcochilus weinthalii 3VC-

No specific action proposed. The only likely area of occurrence is rainforest in Richmond Range SF.

Schistotylus purpuratus 3RCi

Probably mostly occurs along creeks or in rainforest, but may occur in wet sclerophyll forest. A search of representative areas of likely habitats (wet sclerophyll forest between 600 and 1000 m altitude) should be conducted during late September-early October to clarify the habitat requirements and conservation status. This would be best carried out as part of a statewide program to clarify the distribution, habitat and status of this species.

Tinospora tinosporoides 3RC-

No specific action proposed. There is no record within 5 km of SF in CMA. Elsewhere it occurs mainly in rainforest at lower altitudes.

Trichosanthes subvelutina 3RC-

No specific action proposed. There is no record within 5 km of SF in CMA. Elsewhere it occurs mainly in rainforest at lower altitudes.

3. SPECIES OF REGIONAL SIGNIFICANCE

Isotoma fluviatilis is not included below because the record is unlikely and requires confirmation. As a general principle, species recorded only in recently (< 5 years) logged areas are proposed to be given high priority for further investigation and monitoring, but no other specific measures are considered necessary at this stage.

Species	Proposed action
<i>Abildgaardia vaginata</i> (4 8S)	No specific measures proposed, because the species regenerates prolifically in logged areas and occurs in habitats where logging intensity is low.
<i>Acacia juliflora</i> (4? 8S)	Single known occurrence in proposal P21.
<i>Amyema conspicuum</i> (3 8S)	Confirm that a population occurs in reserve proposal P10; if not, cpt 28.
<i>Aristida acuta</i> (4 8S)	No specific measures proposed, because the species was recorded only in a recently logged area.
<i>Arthrochilus prolixus</i> (4)	Populations mostly in areas not affected by logging.
<i>Astrotricha cordata</i> (3 7 8S)	Mostly in disturbed areas or on rocky slopes not affected by logging. Modify fire management in cpts ?? Mount Belmore SF.
<i>Bulbophyllum bracteatum</i> (2 8S)	Nil. Restricted to rainforest in CMA.
<i>Chiloglottis diphylla</i> (4 8N)	Dense populations (well in excess of 1000 individuals) are included in proposals P2 and P17.
<i>Corybas barbarae</i> (3)	Known population in excluded wilderness area.
<i>Curculigo ensifolia</i> (4)	Confirm that a population occurs in reserve proposal P10.
<i>Dichanthium setosum</i> (4)	Only known population in P13.
<i>Digitaria</i> sp. aff. <i>oraria</i>	Small population in proposal P11a.
<i>Enneapogon nigricans</i> (4)	Only known population in P13.
<i>Enteropogon unispiceus</i>	Confirm that a population occurs in reserve proposal P10.
<i>Eragrostis benthamii</i> (4)	Nil. Should not be regarded as significant.
<i>Eragrostis leptocarpa</i> (4)	Apparently favours disturbed areas. No specific action proposed.
<i>Eragrostis trachycarpa</i> (5?)	Known population included in proposal P22.
<i>Eriachne glabrata</i> (4)	No specific measures. Known populations are restricted to low woodlands of <i>E. signata</i> which are not affected by logging.
<i>Galactia</i> species B (3 8N)	Known population included in proposal P22.

<i>Hibbertia acuminata</i> (6)	Nil. Occurs in the existing Needlebark FR, and major habitats are otherwise unaffected by logging, due to low commercial timber volume.
<i>Hibbertia marginata</i> (6)	Nil. Not considered of conservation significance.
<i>Hoya oligotricha</i> (5 7)	Nil. Restricted to dry rainforest, excluded from logging.
<i>Hygrophila angustifolia</i> (3 8S)	An extensive population occurs in the existing Selection Flat FR.
<i>Iphigenia indica</i> (3 7 8S)	Nil. Not considered of conservation significance.
<i>Isopogon mnoraifolius</i> (6)	No specific measures. Known populations are restricted to low woodlands of <i>E. signata</i> which are not affected by logging.
<i>Leptospermum polyanthum</i>	Total known population in CMA in proposal P4.
<i>Keraudrenia</i> sp. aff. <i>hillii</i>	Total known population in CMA in proposal P4.
<i>Macrozamia fawcettii</i> (6)	Nil. Not considered of conservation significance.
<i>Melaleuca tamariscina</i>	
subsp. <i>irbyana</i> (3 8S)	Included in existing Selection Flat FR.
<i>Mirbelia speciosa</i>	
subsp. <i>ringrosei</i> (4 8S)	Mostly on rocky slopes not affected by logging, but possibly affected by fire at too frequent intervals. It is proposed to modify fire management in cpts 421 and 422 in Mount Belmore SF, to ensure that some patches remain unburnt for at least 8-12 years.
<i>Notothixos incanus</i> (5)	Confirm that a population occurs in reserve proposal P10.
<i>Prostanthera melissifolia</i> (4 7 8N)	Nil. Restricted to "wilderness" exclusion areas.
<i>Pseudanthus orientalis</i> (4)	No specific measures. Known populations are restricted to low woodlands of <i>E. signata</i> which support negligible commercial timber volume and are not affected by logging.
<i>Pterostylis daintreana</i> (4)	Total known population in CMA in proposal P4.
<i>Pterocaulon redolens</i> (4? 8S)	Only known population in P13.
<i>Rulingia</i> species 1	Total known population in CMA in proposal P4.
<i>Sarcochilus spathulatus</i> (5)	Known population in "wilderness" exclusion areas.
<i>Sauropus</i> species A (3 8S)	Extensive population within existing Selection Flat FR.
<i>Schoenoplectus validus</i> (5)	Only known population in CMA in proposal P20
<i>Senna odorata</i> (4?)	No specific action. Recorded only from a recently logged area.
<i>Tephrosia brachyodon</i> (4? 7)	No specific action. Recorded only from a recently logged area.
<i>Tricoryne anceps</i>	
subsp. <i>pterocaulon</i> (3 8S)	Nil. Occurs in the existing Needlebark FR, and major habitats are otherwise unaffected by logging, due to low commercial timber volume.
<i>Tripogon loliiformis</i>	Total known population in CMA in proposal P4.
<i>Tylophora benthamii</i> (4?)	Known population almost wholly within proposal P8.
<i>Vetiveria filipes</i> (3? 7)	Nil. Known population is in disturbed area along roadside.

4. RESERVATION OF COMMUNITIES

As described above, appropriate reservation of representative communities in as little-disturbed state as possible is, as a general principle, a desirable and well accepted precautionary strategy. In practice, the extent of reservation is unavoidably a highly subjective issue. From a purely flora conservation perspective, more is generally better, but socially a compromise is obviously necessary to satisfy competing landuse requirements. Using arbitrary areal targets for reservation such as specifying a 10% minimum rule is appealing because it conveys the impression of objectivity and is simple to apply. It is currently a commonly accepted basis for assessing adequacy of reservation. However, such arbitrary targets, by themselves, lack any clear scientific basis, with no evidence that they are either sufficient or necessary. It is currently practical to make assessments only for overstorey communities, which are then used as surrogates for flora conservation generally. This strategy will succeed only to the extent that a relationship exists between overstorey and other components of the plant community. Where there is not a consistent relationship, more heterogeneous communities will be relatively under-represented in reserves while homogeneous communities will be relatively over-represented. It is also well recognised (REF) that reservation of

communities is a "coarse filter" approach, which may in any case miss species which are uncommon but not recognised as rare or threatened. Appropriate management is the best option for such species, but much more ecological information is necessary to ensure success.

Despite the limitations, current assessments of reservation status by Hager and Benson (1994) are used in developing a conservation strategy, as the best available. Following from the discussion above under Sections 2 and 3 of the Discussion, the following principles have been used in developing a vegetation community conservation strategy for CMA (percentages are of the total extent of map units or communities in the study area).

1. For map units which may be consistently related to overstorey communities and associations assessed as adequately reserved in the north zone defined by Hager and Benson (1994), no additional conservation measures are proposed.
2. For inadequately reserved communities or map units (Hager and Benson category 2), or those which appear to not readily relate to Hager and Benson associations, any known areas which have been little-disturbed by logging are proposed to be reserved, such that at least 10% of the estimated extent of such communities in CMA is reserved. If insufficient or no such areas exist, a representative example of previously logged forest, to give a combined area of approximately 10% of the estimated extent in the MA, is proposed to be managed primarily for flora conservation. In the short term, further logging would be excluded from these latter areas. In the longer term, management would be guided by results of a planned flora monitoring program. Provided the results could be demonstrated with sufficient confidence, this would not necessarily exclude timber harvest and may require only minor modification of harvesting proposals. In some cases, it may require management designed to accelerate development of old growth characteristics as far as possible, through appropriate silvicultural and fire regimes. Such regimes may exclude further logging, or may require low intensity selective thinning.
3. For poorly reserved communities (Hager and Benson category 1), or those which clearly do not match any association and which appear distinct and of potentially high significance, a higher minimum proportion should be reserved or classified as flora conservation priority.

In the present study, the locations of proposed additional reserves have been chosen subjectively on the basis of mapped forest types, survey plot data and where appropriate, more extensive observations made during the field survey, giving preference to the least disturbed examples of communities as determined from a combination of field observations and recorded disturbance histories. Although the survey area was extensively traversed, the survey does represent only a sample of the total area and in some cases a better (more "representative" or less disturbed) alternative reserve location may exist. Since only flora conservation values were considered in selecting areas, the specific area proposed in each case should be regarded as indicative and does not necessarily represent the optimum choice in the broader management context. In any case, the proposed flora conservation strategy clearly represents only one of many flora conservation options for the area. It could be regarded as a moderately precautionary option in the context of the extent of likely logging impact on floristic composition as described above, but considering that response to logging of the relatively many infrequent species, and more subtle or long-term impacts, are unknown. Ultimately, it is not possible to base reservation or other management decisions on purely biological considerations, and a socially acceptable solution will be necessary. Considering the potential deficiencies in the conservation strategy described above, a progressive, long-term monitoring system needs to be implemented to allow the success of the conservation strategy to be continually assessed and management adjusted as necessary.

Table 8 summarises the relationship between map units and overstorey composition as defined from sample plots. This provides a basis for defining proposals for additional reserves or flora conservation areas. These proposals are summarized below in Section 5. The percentage of each map unit conserved in total in CMA, included existing reserves, areas excluded from logging by management prescription and areas in new proposals, has been estimated from GIS data and is summarized in Table 9.

Table 9 Conservation status of mapped Forest Types in CMA and proportion in existing and proposed reserves.

H&B is the most similar association defined by Hager and Benson (1994), based on plot data, or where plot data are very variable, their assessment of FCNSW Forest Types. Where plot data are very variable and substantial discrepancies exist, the map type is assumed to be inadequately reserved. na = not assessed by Hager and Benson (1994). Map unit 128, nominally *E. piperita*, is mistyped or a result of a typographical error, since *E. piperita* does not occur in CMA. The patch inspected was dominated by *E. planchoniana* and thus assessed as EF261a, although the survey plot was in an atypical area at the edge of the stand. Map type 47 in Billilimbra SF included areas of community 14.2, assessed as inadequately reserved. These are wholly within the excluded "wilderness" area. Locations of proposed flora conservation priority areas (FCPA) are described in Section 5. Percentage conserved also includes area excluded from logging for other purposes.

Map			Cons.	Prop.	Area	% Cons.	
FT	CASov	H&B	status	FCPA	CMA	exist.	tot.
30	21.1, 34	?EF099	2	P2	737	100	100
31	19.2, 39.1	?	?2	P2, P9, P11a,b	9 379	4.3	14.8
32	35	EF002a	na	-	40	100	100
36	21.4, 26, 27.1	EF145a	2	P2	1 610	6.3	10.4
37	27.1, 27.2	EF145a	4	-	6 211	-	-
38	25.1, 27.2, 30, 31	EF147a	4	-	1 129	-	-
39	24.2, 27.1	EF040e	2	P7	619	5.8	20.4
40	27.1, 27.2, 30	?	?2	P11a,b	1 876	0.3	11.7
41	27.1, 26	EF145a, EF145d	4	-	10 735	-	-
46	13	EF001a, ?EF011a	2	P8, P16	414	7.5	18.6
47	group 14	EF011b, EF479e	4, 2	-	6 888	40.7	41.2
48	12	EF010a	2	P2, P8, P9, P16	1 643	10.1	19.3
49	13	EF001a, ?EF003a	4, 1	P17	120	41.7	41.7
51	11	EF013a	2	P8	92	44.1	80.3
53	13, 14.2, 14.3, 21.5	EF001a	4	-	5 372	-	-
60	15, 17.2, 22.1	?EF095a	1	P2, P9, P11a, P16	2 615	4.3	14.9
62	various	?group EF075	2	P3, P4	14 234	23.9	25.1
65	39.2	EF050d	2	P7, P10, P16	3 662	7.4	16.7
70	17.1, 24.3	EF040a	1	P2, P5, P11a,b	4 149	0.1	9.5
71	group 21	group EF040	1-2	P1, P8, P12	7 177	5.7	12.5
72	groups 21, 24	group EF040	1-2	P9, P10, P12	14 156	1.3	9.3
74	groups 21, 24	group EF040	1-2	P2, P7, P15	20 339	3.6	9.0
76	24.3, 30	EF040a	1	P14	405	2.3	8.5
80	19.2, 19.1	EF710a, 710d	1	P11a	143	0.1	18.4
82	19.2	EF710a	1	P5, P6, P10	126	0	24.7
83	19.1	EF710d	1	-	23	28.0	28.0
84	17.2, 19.1, 29.2, 29.3	?	1-4	P11a,b	1 994	0	10.3
85	19.1, 19.2, 39.1	group EF710	1	P10	363	0.7	20.0
87	38	EF706a	1	P6, P12	440	1.7	18.4
92	various	?group EF050	2	P2	2 514	4.6	10.6
97	25.2, 25.3, 28.2	EF261a, 262b	4	-	1 248	-	-
117	33	EF235a	4	-	216	-	-
119	33	EF235a	4	-	585	-	-
126	29.2, 25.3	EF260b	4	-	277	-	-
128	-	EF261a	4	-	424	-	-
129	30	EF200a	1	P7, P15	767	4.3	21.7
130	22.2, 30, 32	?	?4	-	189	-	-
163	40	EF505a	4	-	2 356	-	-
207	20.1	EF606a	1	P13	79	0	73.8

5. SUMMARY OF FLORA CONSERVATION AREA AND RESERVE PROPOSALS

P1	Richmond Range SF, cpt 353	FT 71 (329 ha)
P2	Doubleduke SF, cpts 148,149	FTs 30/31 (123 ha), 30/31/92 (93 ha), 31 (707 ha), 36 (66 ha), 48 (10 ha), 60 (93 ha), 70 (89 ha), 74 (64 ha), 92 (142 ha); rare plants <i>Paspalidium grandispiculatum</i> (3V), <i>Chiloglottis diphylla</i> (4 8N),
P3	Mount Marsh SF, cpt 428	FT 62/74 (138 ha).
P4	Mount Marsh SF, cpt 434	FT 62/74 (30 ha) and rare plant <i>Rulingia</i> species 1 (?3V).
P5	Carwong SF, cpt 21	FT 70 (55 ha), 82 (6 ha)
P6	Mount Belmore SF, cpt 398	FT 87 (28 ha), 82 (4 ha)
P7	Banyabba SF, cpt 99	FTs 39 (91 ha), 65 (254 ha), 74 (87 ha), 129 (103 ha)
P8	Richmond Range SF, cpt 326	FTs 46 (36 ha), 48 (31 ha), 51 (33 ha), 71 (151 ha), best population of rare tree <i>E. dunnii</i> (3RCa), only population of rare plant <i>Tylophora benthamii</i> (4?).
P9	Royal Camp SF, cpts 14, 15	FTs 31 (33 ha), 48 (90 ha), 60 (121 ha), 72 (785 ha)
P10	Braemar SF, cpt 24	FTs 65 (19 ha), 72 (44 ha), 72/74 (263 ha), 82 (21 ha), 85 (70 ha); probably rare plants <i>Amyema conspicuum</i> (3 8S) <i>Curculigo ensifolia</i> (4), <i>Enteropogon unispiceus</i> , <i>Hygrophila angustifolia</i> (3 8S), <i>Notothixos incanus</i> (5) (all need checking).
P11a	Bungawalbin SF, cpt 43	FTs 31 (236 ha), 40 (195 ha), 60 (17 ha), 70 (58 ha), 80 (26 ha), 84 (190 ha)
P11b	Bungawalbin SF, cpt 48	FTs 31 (11 ha), 40 (18 ha), 70 (188 ha), 84 (15 ha)
P12	Mount Pikapene SF, cpt 372	71 (4 ha), 72 (37 ha), 87 (46 ha); rare plant <i>Eucalyptus rummeryi</i> (3RC-).
P13	Ewingar SF, cpts 658, 659	FT 207 (about 58 ha, 73% of extent); rare plants <i>Dichanthium setosum</i> (4), <i>Enneapogon nigricans</i> (4) and <i>Pterocaulon redolens</i> (4? 8S)
P14	Banyabba SF, cpt 97	FT 76 (25 ha)
P15	Keybarbin SF, cpts 395, 396, 397	FTs 74 (942 ha), 129 (31 ha)
P16	Richmond Range SF, cpt 340, 347	FTs 46 (10 ha), 48 (17 ha), 60 (45 ha), 65 (61 ha)
P17	Mount Belmore SF	FT 49/53, rare plants <i>Boronia chartacea</i> (3RC-) and <i>Chiloglottis diphylla</i> (4 8N).
P18	Mount Marsh SF, cpt 430	Rare plant <i>Eucalyptus psammitica</i> (3KC-)
P19	Gibberagee SF, cpt 101	Rare tree <i>Eucalyptus tetrapleura</i> (2VCa)
P20	Richmond Range SF, cpt 315	Rare plants <i>Persicaria elatior</i> (3V), <i>Schoenoplectus validus</i> (5).
P21	Tabbimoble SF, cpts 164, 166	Rare plant <i>Acacia juliflora</i> (4? 8S)

6. FIRE MANAGEMENT

More positive fire management is desirable, which recognizes the flora conservation values and particular requirements of reserved areas. In practice, it is currently difficult to suggest specific guidelines because details of species responses to fire are lacking. Because of the potentially adverse impact of frequent fire, the main requirement is for greater variability of fire frequency in dry forests (heath forest and grassy forest), so that at least some patches remain unburnt for at least 8-12 years. This is most easily achieved by frequent burning in surrounding forests. It should still be possible to achieve fire control objectives. For example, some core areas of about 30-100 ha could be maintained at lower fire frequency with protection by frequently-burnt (3-5 yr) perimeter buffers. Specific areas of dry forest which are proposed as flora conservation priority areas (proposals detailed in Section 10.4.7) and for which this regime is proposed are: Braemar SF (proposal P10), Carwong SF (proposal P5), Banyabba SF (proposals P7 and P14), Bungawalbin SF (P11a, P11b) and Doubleduke SF (proposal P2). In particular, proposals P11a and P2 are to protect from fire core areas of low forest and woodland where *Melaleuca* species are common. In addition, modified fuel management, which

requires some patches to remain unburnt for minimum intervals of at least 8-12 years, is proposed for cpts. 421 and 422 in Mount Belmore SF to ensure populations of several regionally significant species (*Astrotricha cordata*, *Grevillea quadricauda*, *Hibbertia acuminata*, *Hibbertia marginata* and *Mirbelia speciosa* subsp. *ringrosei*) are maintained.

7. GRAZING

Because of the uncertainties of past grazing impacts in grassy forests generally, there should be no increase in grazing intensity by domestic stock until more detailed information is available on the impact of grazing on native plants in forests. Due to the long history of past grazing, and generally low stocking rates, if grazing is continued at current levels, there is only a low risk of further deleterious effects on flora conservation values. There is no clear justification for large scale exclusion of grazing. However, there are some specific exceptions mentioned below, and as a precaution, domestic grazing should be preferably excluded, or at least minimized, in at least some parts of reserves and PMP flora conservation areas. The major need is to establish some areas where grazing is excluded to obtain information on grazing impact and provide a more informed basis for future decisions on grazing management. These exclusion areas would be best placed as part of flora conservation areas and reserves.

ACKNOWLEDGEMENTS

I thank the National Parks and Wildlife Service of NSW GIS unit, Armidale, especially Di Brown, for provision of data for the NEFBS survey plots, and David Moore, formerly of Austeco Pty Ltd, for data from the Austeco plots. I sincerely thank Traacey Brassil for assistance with field work and for assistance with data analysis and preparation of figures. I am grateful to Glen Meade of Casino District Forest Office and Megan Pilkington, Regional Planning Section, Northern Region for advice and general assistance with regard to forest management in Casino MA.

REFERENCES

- Benson, J. (1991) Species Recovery Plan *Grevillea beadleana*. Australian National parks and Wildlife Service Endangered Species Program Project no. ESP 155
- Belbin, L. (1994). PATN Pattern Analysis Package Reference Manual. CSIRO Division of Wildlife and Rangelands Research. 289 pp.
- Benson, J.S. and Hager, T.C. (1993). The distribution, abundance and habitat of *Eucalyptus dunnii* (Myrtaceae) (Dunn's White Gum) in New South Wales. *Cunninghamia* 3: 123-145.
- Borcard, D., Legendre, P. and Drapeau, P. (1992). Partialling out the spatial component of ecological variation. *Ecology* 73: 1045-1055.
- Binns, D.L. (1995). Flora Survey, Tenterfield Management Area, Northern Region, New South Wales Forest Resource Series No. 30. State Forests of NSW.
- Binns, D. L. and Chapman, W. M. (1993) Flora Survey, Kempsey and Wauchope Management Areas, Central Region, New South Wales Forest Resource Series No. 24, Research Division. Forestry Commission of NSW.
- Briggs, J.D. and Leigh, J.H. (1988). Rare or Threatened Australian Plants. Aust. Nat. Parks Wildl. Serv. Special Publication No. 14. 278 pp.
- Clark, L.A. and Pregibon, D. (1991). Tree based models. In: Statistical models in S. pp. 377-417. J.M. Chambers and T.J. Hastie (ed). Wadsworth and Brooks. California. 608 pp.
- Faith, D.P., Minchin, P.R. and Belbin, L. (1987). Compositional dissimilarity as a robust measure of ecological distance: A theoretical model and computer simulations. *Vegetatio* 69: 57-68.
- Floyd, A.G. (1990). Australian Rainforests in New South Wales. Volume 2. Surrey Beatty & Sons Pty Ltd. Sydney.
- Forestry Commission of N.S.W. (1983a). Management Plan for Casino Management Area. For. Comm. N.S.W. pp.
- Forestry Commission of N.S.W. (1983b). Management Plan for Casino West Management Area. For. Comm. N.S.W. pp.
- Forestry Commission of N.S.W. (1989). Forest Types in New South Wales. Research Note No. 17 For. Comm. N.S.W.
- Hager, T.C. and Benson, J.S. (1994). Review of the conservation status of forest plant communities in north-eastern New South Wales. Final Report to the Australian Heritage Commission. 86 pp.

- Halford, D.A. (1993). *Corchorus cunninghamii* (Tiliaceae) A conservation assessment. Report to ANCA. ESP project No. 317.
- Harden, G.J. (ed.) (1990). Flora of New South Wales. Volume 1. New South Wales University Press. Sydney. 717 pp.
- Harden, G.J. (ed.) (1991). Flora of New South Wales. Volume 2. New South Wales University Press. Sydney. 574 pp.
- Harden, G.J. (ed.) (1992). Flora of New South Wales. Volume 3. New South Wales University Press. Sydney. 601 pp.
- Harden, G.J. (ed.) (1993). Flora of New South Wales. Volume 4. New South Wales University Press. Sydney. 775 pp.
- Harrison, M. (1981) In search of *Schistotylus purpuratus* (Rupp) Dockr. *The Orchadian* 6: 265-266.
- Hill, K. (1991) Eucalyptus. *In* Flora of New South Wales. Volume 1. G. Harden (ed.) pp. 76-142. New South Wales University Press. 574 pp.
- Jones, D.L. (1988). Native Orchids of Australia. Reed. 656 pp.
- Johnson, L.A.S. and Hill, K. (1990) New taxa and combinations in *Eucalyptus* and *Angophora* (Myrtaceae). *Telopea* 4: 37-108.
- Jones, D.L. (1991). A new species of *Sarcochilus* R. Br. (Orchidaceae) from Australia. *Phytologia* 71(4) 322-325.
- McIntyre, S. and Lavorel, S. (1994). How environmental and disturbance factors influence species composition in temperate Australian grasslands. *Journal of Vegetation Science* 5: 373-384.
- Moore, D. M. and Floyd, A. G. (1994). A description of the flora and an assessment of impacts of the proposed forestry operations in the Grafton Forest Management Area. Unpubl. report to State Forests of NSW. 79 pp.
- National Parks and Wildlife Service. (1995). Flora of north-east NSW. North-east Forests Biodiversity Study Report No. 4. NSW NPWS unpublished report.
- Olde, P.M. and Marriott, N.R. (1994). A taxonomic revision of *Grevillea arenaria* and *Grevillea obtusiflora* (Proteaceae: Grevilleoideae). *Telopea* 5: 711-733.
- Sheringham, P. and Westaway, J. (1995). Significant vascular plants of upper north-eastern New South Wales. Unpubl. NPWS report to NRAC.
- Stanley, T.D. and Ross, E.M. (1983). Flora of South-eastern Queensland. Vol. 1. Qld. Dept. Primary Industries..
- Stanley, T.D. and Ross, E.M. (1986). Flora of South-eastern Queensland. Vol. 2. Qld. Dept. Primary Industries. 545 pp.
- Stanley, T.D. and Ross, E.M. (1989). Flora of South-eastern Queensland. Vol. 3. Qld. Dept. Primary Industries. 532 pp.
- ter Braak, C.J.F. (1986). Canonical correspondence analysis: a new eigenvector technique for multivariate direct gradient analysis. *Ecology* 67: 1167-1179.
- ter Braak, C.J.F. (1987). The analysis of vegetation-environment relationships by canonical correspondence analysis. *Vegetatio* 69: 69-77.

APPENDIX 1

OCCURRENCE OF VASCULAR PLANT SPECIES BY BROAD FLORISTIC GROUP AND LOGGING CATEGORY

Species are listed alphabetically by family within classes, and nomenclature follows the National Herbarium of New South Wales. Frequency of occurrence is shown for each species, as a percentage of the total number of plots in each broad floristic group (indicated beneath the heading). There is an overall total of 181 plots (understorey floristic data was not available for an additional two plots described in the text). Floristic groups are derived from classification of all species as indicated below and described in the text.

- . species not recorded in that group.
- + species recorded in that group but not in a survey plot
- * naturalized species
- H specimen from CMA retained at State Forests herbarium, Research Division, West Pennant Hills

Broad Floristic Group: (refer to text)

Rf=Rainforest (CASov 1-10)

Gf=Grassy Forest (CASf 7-26)

Sh=Shrubland (CASf 39)

Ws=Wet Sclerophyll Forest (CASov 11-40 / CASf 27-36)

Hf=Heath forest and woodland (CASf 1-6)

Sw=Swamp and sedgeland (CASf 40-41)

Logging category:

L1=logged <=10yr

L2=logged >10 yr

UL=unlogged

Obs: A=Austeco, N=NEFBS, B=Binns

State Forests:

A=Banyabba, B=Mount Belmore, D=Doubleduke, E=Ewingar, F=Braemar, G=Gibberagee, H=Whiporie, K=Camira, I=Billilimbra, J=Cherry Tree, L=Ellangowan, M=Mount Marsh, O=Mororo, N=Mount Neville, P=Mount Pikapene, Q=Royal Camp, R=Richmond Range, S=Sugarloaf, T=Tabbimoble, U=Bungawalbin, V=Devils Pulpit, W=Washpool, Y=Myrtle

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
Class FILICOPSIDA												
ADIANTACEAE												
<i>Adiantum aethiopicum</i>	11	.	11	7	.	.	.	6	8	4	ANB	BEFGMNR
<i>Adiantum formosum</i>	11	15	24	.	.	.	.	9	5	6	ANB	EIKRW
<i>Adiantum hispidulum</i>	7	8	13	1	.	.	.	.	3	7	NB	BEIPRW
<i>Adiantum silvaticum</i>	3	.	8	.	.	.	.	6	.	2	A	ERW
<i>Cheilanthes distans</i>	1	.	.	1	.	.	.	.	.	2	N	E
<i>Cheilanthes sieberi</i>	38	.	.	31	24	100	.	31	20	17	ANB	ABDEFGMLMOQSUVY
ASPENIACEAE												
<i>Asplenium australasicum</i>	24	62	39	1	.	.	.	6	12	20	ANB	BEIMRW
<i>Asplenium flabellifolium</i>	2	8	.	1	.	.	.	.	1	2	NB	EM
<i>Asplenium polyodon</i>	7	38	3	1	.	.	.	.	3	7	AB	ERW
ATHYRIACEAE												
<i>Diplazium assimile</i>	1	8	.	.	.	.	.	.	.	2	B	E
<i>Diplazium australe</i>	12	23	24	.	.	.	.	9	7	6	AB	ERW
BLECHNACEAE												
<i>Blechnum cartilagineum</i>	20	8	39	4	.	.	.	17	8	13	ANB	BDEIVW
<i>Blechnum indicum</i>	H 1	.	.	.	.	.	.	.	.	2	B	R
<i>Doodia aspera</i>	26	31	39	7	.	.	.	14	11	20	ANB	DEIJKMPRW
<i>Doodia caudata</i> var. <i>caudata</i>	2	.	.	2	.	.	.	.	1	2	AN	BM
<i>Doodia media</i> ssp. <i>media</i>	1	.	3	.	.	.	.	.	1	.	B	B

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
CYATHEACEAE												
<i>Cyathea australis</i>	9	.	21	1	.	.	.	3	3	9	ANB	EIN
<i>Cyathea leichhardtiana</i>	6	38	3	.	.	.	.	.	2	7	AB	EW
DAVALLIACEAE												
<i>Arthropteris beckleri</i>	H 2	8	3	.	.	.	.	.	1	2	B	E
<i>Arthropteris tenella</i>	13	69	11	.	.	.	.	.	7	13	ANB	ERW
<i>Davallia pyxidata</i>	14	15	26	2	.	.	.	9	4	13	ANB	BEIRW
DENNSTAEDTIACEAE												
<i>Dennstaedtia davallioides</i>	2	.	5	.	.	.	.	3	1	.	A	BR
<i>Hypolepis glandulifera</i>	3	.	5	1	.	.	.	3	2	.	AN	ER
<i>Hypolepis muelleri</i>	2	.	.	1	.	.	50	.	1	2	B	DR
<i>Pteridium esculentum</i>	55	.	18	43	24	.	.	31	36	20	ANB	
BDEGIMNORTUVWY												
DICKSONIACEAE												
<i>Calochlaena dubia</i>	17	.	24	9	.	.	.	3	13	7	ANB	BDEIMNO
DRYOPTERIDACEAE												
<i>Arachniodes aristata</i>	4	.	11	.	.	.	.	.	3	2	AN	EKRW
<i>Lastreopsis acuminata</i>	2	8	3	.	.	.	.	.	2	.	AN	KR
<i>Lastreopsis decomposita</i>	16	38	29	.	.	.	.	11	5	13	ANB	EIPR
<i>Lastreopsis marginans</i>	1	8	.	.	.	.	.	.	1	.	A	R
<i>Lastreopsis microsora</i>	16	62	21	.	.	.	.	9	5	15	AB	EIRW
<i>Lastreopsis munita</i>	2	15	.	.	.	.	.	.	.	4	B	RW
<i>Lastreopsis silvestris</i>	H 1	8	.	.	.	.	.	.	1	.	B	R
GLEICHENIACEAE												
<i>Sticherus flabellatus</i>	2	.	5	.	.	.	.	.	2	.	N	DM
GRAMMITACEAE												
<i>Grammitis billardieri</i>	3	15	3	.	.	.	.	.	1	4	AB	EW
HYMENOPHYLLACEAE												
<i>Macroglena caudata</i>	H 1	.	3	.	.	.	.	.	1	.	B	E
LINDSAEACEAE												
<i>Lindsaea linearis</i>	1	.	.	.	3	.	.	3	.	.	N	E
<i>Lindsaea microphylla</i>	4	.	.	1	9	.	.	6	1	2	AN	BM
OPHIOGLOSSACEAE												
<i>Ophioglossum reticulatum</i>	H 1	.	.	1	.	.	.	.	.	2	B	W
POLYPODIACEAE												
<i>Dictymia brownii</i>	11	38	13	1	.	.	.	.	4	13	ANB	EIRW
<i>Microsorium scandens</i>	8	46	5	.	.	.	.	.	2	11	AB	EIW
<i>Platynerium bifurcatum</i>	28	38	39	9	.	.	.	14	11	24	ANB	BDEGIKMRW
<i>Platynerium superbum</i>	8	38	8	.	.	.	.	.	3	9	ANB	MRW
<i>Pyrrosia confluens</i>	7	31	5	1	.	.	.	.	1	11	B	EIPRW
<i>Pyrrosia rupestris</i>	20	46	26	4	.	.	.	3	9	20	ANB	BEGIMPRW
PTERIDACEAE												
<i>Pteris tremula</i>	7	.	8	4	.	.	.	6	4	2	ANB	EGRW
<i>Pteris umbrosa</i>	2	15	.	.	.	.	.	.	.	4	B	EW
SCHIZAEACEAE												
<i>Schizaea bifida</i>	11	.	.	.	33	.	.	.	5	11	NB	ABEGOV
SINOPTERIDACEAE												
<i>Pellaea falcata</i> var. <i>falcata</i>	3	.	8	.	.	.	.	.	1	4	N	EJ
<i>Pellaea falcata</i> var. <i>nana</i>	10	54	8	.	.	.	.	.	2	15	B	BEPRW
<i>Pellaea paradoxa</i>	3	.	8	.	.	.	.	.	2	2	ANB	BE
Class CYCADOPSIDA												
ZAMIACEAE												
<i>Macrozamia fawcettii</i>	H 15	.	3	9	18	.	.	11	7	9	ANB	ABDEMQRW

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
Class CONIFEROPSIDA												
ARAUCARIACEAE												
<i>Araucaria cunninghamii</i>	9	31	13	.	.	.	.	4	9		ANB	BJPR
PINACEAE												
* <i>Pinus elliottii</i>	1	.	.	.	3	.	.	.	2		N	T
PODOCARPACEAE												
<i>Podocarpus elatus</i>	1	8	.	.	.	.	.	1	.		A	R
Class MAGNOLIOPSIDA - MAGNOLIIDAE												
ACANTHACEAE												
<i>Brunoniella australis</i>	37	.	8	34	6	.	.	32	17	18	ANB	
ABDEFGILMQRSUVWY												
<i>Brunoniella pumilio</i>	3	.	.	3	.	.	.	2	2		N	DM
<i>Hygrophila angustifolia</i>	H 1	.	.	1	.	.	.	.	2		B	F
<i>Pseuderanthemum variabile</i>	H 41	31	66	12	3	.	.	20	21	28	ANB	BDEGIJNOPRVWY
AKANIACEAE												
<i>Akania bidwillii</i>	1	.	3	.	.	.	.	1	.		A	R
ALANGIACEAE												
<i>Alangium villosum</i>												
ssp. <i>polyosmoides</i>	5	15	8	.	.	.	.	4	2		AB	PR
AMARANTHACEAE												
<i>Alternanthera denticulata</i>	H 2	.	.	1	.	.	50	3	.	2	NB	R
<i>Nyssanthes diffusa</i>	1	8	.	.	.	.	.	.	2		B	W
ANACARDIACEAE												
<i>Euroschinus falcata</i>	14	8	29	2	.	.	.	11	8	6	ANB	BEJPRW
<i>Rhodospaera rhodanthema</i>	4	.	11	.	.	.	.	3	2		N	JR
ANNONACEAE												
<i>Rauwenhoffia leichhardtii</i>	9	54	5	.	.	.	.	2	13		ANB	JPRW
APIACEAE												
<i>Daucus glochidiatus</i>	2	.	.	2	.	.	.	3	1	.	N	EM
<i>Centella asiatica</i>	15	.	3	15	.	.	.	11	8	7	ANB	DEGMNRUW
<i>Eryngium expansum</i>	1	.	3	.	.	.	.	3	.	.	N	J
<i>Hydrocotyle acutiloba</i>	4	.	.	4	.	.	.	3	1	4	NB	EGIN
<i>Hydrocotyle pedicellosa</i>	5	8	11	.	.	.	.	3	2	4	ANB	EI
<i>Hydrocotyle peduncularis</i>	10	.	3	10	.	.	.	17	3	2	ANB	DEIJRSW
<i>Platysace ericoides</i>	19	.	.	3	48	.	.	11	7	17	ANB	ABEGMQSV
<i>Trachymene incisa</i>	20	.	.	9	36	.	.	17	10	9	ANB	ABDEGMOQ
<i>Xanthosia pilosa</i>	6	.	.	3	9	.	.	3	3	4	ANB	BGM
APOCYNACEAE												
<i>Alstonia constricta</i>	7	15	11	.	3	.	.	3	2	7	ANB	BJPQRW
<i>Alyxia ruscifolia</i>	14	38	21	1	.	.	.	3	7	13	ANB	BEIPRW
<i>Ervatamia angustisepala</i>	3	.	8	.	.	.	.	3	2	.	A	BE
<i>Melodinus acutiflorus</i>	H 1	8	.	.	.	.	.	.	.	2	B	R
<i>Melodinus australis</i>	12	69	8	.	.	.	.	.	7	11	ANB	ER
<i>Parsonsia fulva</i>	H 5	31	3	.	.	.	.	.	2	6	B	ER
<i>Parsonsia induplicata</i>	H 13	31	24	.	.	.	.	6	4	13	ANB	EIR
<i>Parsonsia lanceolata</i>	H 2	.	5	.	.	.	.	3	.	2	NB	DJ
<i>Parsonsia rotata</i>	3	15	3	.	.	.	.	.	1	4	B	PRW
<i>Parsonsia straminea</i>	31	23	32	14	9	.	.	9	20	19	ANB	BDEFGIMORTVWY
<i>Parsonsia velutina</i>	5	15	5	1	.	.	.	.	1	7	NB	EJR
<i>Parsonsia ventricosa</i>	H 2	15	.	.	.	.	.	.	1	2	B	R
<i>Tabernaemontana pandacaqui</i>	5	8	8	1	.	.	.	3	3	2	NB	EKRS

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
ARALIACEAE												
<i>Astrotricha cordata</i>	1	.	.	.	3	.	.	.	1	.	N	B
<i>Cephalalaria cephalobotrys</i>	17	54	21	2	.	.	.	9	4	19	ANB	EIRW
<i>Polyscias elegans</i>	28	38	42	7	.	.	.	20	13	17	ANB	BEIJKPRW
<i>Polyscias murrayi</i>	1	.	3	.	.	.	.	3	.	.	N	E
<i>Polyscias sambucifolia</i>	6	.	8	3	.	.	.	6	3	2	ANB	DEIM
ASCLEPIADACEAE												
* <i>Asclepias curassavica</i>	2	.	.	1	.	.	50	3	.	2	NB	R
* <i>Gomphocarpus fruticosus</i>	8	.	5	6	.	.	.	11	3	2	ANB	BIMNRW
* <i>Gomphocarpus physocarpa</i>	7	.	3	5	.	.	50	9	3	2	NB	GMQR
<i>Hoya oligotricha</i>	1	8	.	.	.	.	.	.	.	2	B	P
<i>Marsdenia flavescens</i>	2	15	.	.	.	.	.	.	.	4	B	R
<i>Marsdenia fraseri</i>	3	.	.	.	9	.	.	.	2	2	A	BD
<i>Marsdenia liisae</i>	H 1	.	.	1	.	.	.	.	1	.	B	I
<i>Marsdenia lloydii</i>	4	8	5	1	.	.	.	.	1	6	B	BW
<i>Marsdenia longiloba</i>	1	.	3	.	.	.	.	.	.	2	B	I
<i>Marsdenia rostrata</i>	2	8	3	.	.	.	.	3	1	.	AB	R
<i>Secamone elliptica</i>	H 6	8	11	1	.	.	.	.	4	4	NB	BDP
<i>Tylophora benthamii</i>	H 1	.	3	.	.	.	.	3	.	.	B	R
<i>Tylophora grandiflora</i>	1	.	3	.	.	.	.	.	1	.	N	D
<i>Tylophora paniculata</i>	H 12	8	24	2	.	.	.	9	4	9	ANB	BDEIIPRW
ASTERACEAE												
<i>Acomis acoma</i>	H +	.	+	+	.	.	.	.	+	.	B	E
<i>Acmella grandiflora</i>												
var. <i>brachyglossa</i>	H 2	.	.	2	.	.	.	3	.	2	AB	DF
* <i>Ageratina adenophora</i>	H 4	.	.	2	3	.	50	.	3	2	ANB	BMOR
* <i>Ageratina riparia</i>	2	.	3	1	.	.	.	3	1	.	N	JR
* <i>Ambrosia tenuifolia</i>	1	.	.	1	.	.	.	.	1	.	A	B
* <i>Baccharis halimifolia</i>	1	.	.	1	.	.	.	3	.	.	A	D
* <i>Bidens pilosa</i>	10	.	.	11	.	.	.	14	4	2	AN	BEGMNRS
<i>Brachycome microcarpa</i>	2	.	.	2	.	.	.	.	2	.	AN	AM
<i>Bracteantha bracteata</i>	2	.	.	2	.	.	.	3	.	2	B	EI
* <i>Carpesium cernuum</i>	1	.	.	1	.	.	.	.	.	2	N	E
<i>Cassinia quinquefaria</i>	1	.	.	1	.	.	.	.	1	.	N	R
<i>Centratherum punctatum</i>												
subsp. <i>australianum</i>	H 8	.	3	7	.	.	.	9	3	4	ANB	DMORSW
<i>Chrysocephalum apiculatum</i>	12	.	.	10	6	.	.	9	8	4	ANB	ABDEMQ
<i>Chrysocephalum semipapposum</i>	5	.	.	4	3	.	.	6	3	.	N	ABGM
* <i>Cirsium vulgare</i>	10	.	5	9	.	.	.	17	2	4	ANB	EGIJRY
* <i>Conyza albida</i>	5	.	.	4	3	.	.	.	4	2	ANB	BGIMV
* <i>Conyza bonariensis</i>	13	.	3	13	.	.	.	11	5	7	N	BDEGJMNQRSY
* <i>Conyza parviflora</i>	1	.	.	1	.	.	.	3	.	.	N	S
<i>Conyza canadensis</i>	H 1	.	.	.	3	.	.	3	.	.	B	Q
<i>Craspedia variabilis</i>	1	.	.	1	.	.	.	.	.	2	B	I
* <i>Crassocephalum crepidioides</i>	2	.	.	2	.	.	.	.	2	.	A	B
<i>Eclipta platyglossa</i>	1	.	.	1	.	.	.	3	.	.	A	D
<i>Enydra fluctuans</i>	1	.	.	1	.	.	.	.	1	.	N	G
<i>Epaltes australis</i>	7	.	.	7	.	.	.	9	2	4	N	DGMQSY
* <i>Erechtites valerianifolia</i>	1	.	.	.	.	50	.	.	.	2	B	R
<i>Glossogyne tannensis</i>	2	.	.	2	.	.	.	6	.	.	N	EQ

Species	Freq.	Broad floristic group						Logging			Obs	State Forests
		Tot.	Rf	Ws	Gf	Hf	Sh	Sw	L1	L2			UL
<i>Gnaphalium gymnocephalum</i>	3	.	.	3	.	.	.	.	2	2	NB	BIR
<i>Gnaphalium involucreatum</i>	1	.	.	1	.	.	.	3	.	.	B	E
<i>Gnaphalium sphaericum</i>	5	.	3	4	.	.	.	11	1	.	N	EJMQ
<i>Helichrysum elatum</i>	1	.	.	1	.	.	.	.	1	.	B	I
<i>Helichrysum scorpioides</i>	2	.	.	2	.	.	.	.	1	2	AB	BI
* <i>Hypochoeris radicata</i>	10	.	.	11	.	.	.	9	7	2	ANB	BDGIMRS
<i>Lagenifera gracilis</i>	H 2	.	.	2	.	.	.	.	1	2	B	DW
<i>Lagenifera stipitata</i>	13	.	3	13	.	.	.	11	4	9	NB	BDEGIMORSU
<i>Olearia nernstii</i>	2	.	5	.	.	.	.	3	.	2	AB	DW
<i>Olearia stilwelliae</i>	+	.	.	.	+	.	.	.	.	+	B	M
<i>Ozothamnus diosmifolius</i>	2	.	3	1	.	.	.	3	1	.	AB	EI
<i>Ozothamnus ferrugineus</i>	1	.	3	.	.	.	.	.	1	.	N	J
<i>Picris angustifolia</i>	H 5	.	3	4	.	.	.	6	.	6	ANB	DEIJ
<i>Pterocaulon redolens</i>	2	.	.	2	.	.	.	3	.	2	N	EQ
<i>Senecio amygdalifolius</i>	2	.	3	1	.	.	.	.	.	4	B	I
<i>Senecio bipinnatisectus</i>	2	.	3	.	.	.	50	3	.	2	NB	JR
<i>Senecio hispidulus</i>												
var. <i>hispidulus</i>	2	.	.	2	.	.	.	.	1	2	AB	BI
<i>Senecio lautus</i>	9	.	.	7	6	.	.	14	2	4	N	DMNQRS
<i>Senecio minimus</i>	2	.	.	1	3	.	.	3	1	.	AN	BE
* <i>Senecio madagascariensis</i>	4	.	.	4	.	.	.	6	1	2	B	EFUY
<i>Senecio species E</i>	2	.	.	2	.	.	.	.	.	4	B	I
* <i>Sigesbeckia orientalis</i>	16	.	3	16	.	.	.	17	8	6	ANB	BDEGIJNRW
* <i>Tagetes minuta</i>	1	.	.	1	.	.	.	.	.	2	N	E
* <i>Taraxacum officinale</i>	1	.	.	1	.	.	.	.	1	.	N	M
<i>Vernonia cinerea</i> var. <i>cinerea</i>	81	.	5	78	18	.	.	69	47	26	ANB	ABDEFGILMNOQRSTUUVWY
<i>Youngia japonica</i>	2	.	3	1	.	.	.	3	1	.	N	JR
ATHEROSPERMATACEAE												
<i>Doryphora sassafras</i>	6	38	3	.	.	.	.	.	2	7	AB	EW
BIGNONIACEAE												
<i>Pandorea jasminoides</i>	2	15	.	.	.	.	.	.	.	4	B	PR
<i>Pandorea pandorana</i>	30	38	32	11	9	.	.	9	22	13	ANB	DEFJKMPSRV
BORAGINACEAE												
<i>Austrocynoglossum latifolium</i>	1	.	3	.	.	.	.	3	.	.	N	J
<i>Ehretia acuminata</i>	6	15	11	.	.	.	.	6	2	4	ANB	ELJR
CAMPANULACEAE												
<i>Wahlenbergia communis</i>	4	.	.	4	.	.	.	9	1	.	N	EMQR
<i>Wahlenbergia gracilentia</i>	H 6	.	.	6	.	.	.	9	2	2	ANB	BGIQS
<i>Wahlenbergia planiflora</i>	1	.	.	1	.	.	.	.	.	2	N	Y
<i>Wahlenbergia stricta</i>	1	.	.	1	.	.	.	.	.	2	B	I
CAPPARIDACEAE												
<i>Capparis arborea</i>	12	54	13	.	.	.	.	.	5	13	ANB	JPRW
CAPRIFOLIACEAE												
<i>Sambucus australasica</i>	H 1	.	3	.	.	.	.	.	1	.	B	E
CASUARINACEAE												
<i>Allocasuarina littoralis</i>	11	.	.	4	21	.	.	11	3	7	ANB	BEIMOTVY
<i>Allocasuarina torulosa</i>	73	.	26	56	30	.	.	57	43	24	ANB	ABDEFGIJLMOPQRSUVWY
<i>Casuarina glauca</i>	2	.	.	2	.	.	.	3	1	.	AB	D
CELASTRACEAE												
<i>Cassine australis</i>	12	23	24	.	.	.	.	3	5	11	ANB	BJPRW
<i>Celastrus australis</i>	2	8	3	.	.	.	.	.	.	4	AB	W
<i>Celastrus subspicatus</i>	24	23	45	4	.	.	.	14	15	9	ANB	BEJKPRW

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Denhamia celastroides</i>	16	46	21	2	.	.	.	9	15		ANB	BEIJKMPRW
<i>Maytenus bilocularis</i>	H 21	15	37	5	.	.	.	9	10	17	ANB	BDEIJPRW
<i>Maytenus silvestris</i>	13	.	16	6	3	.	.	17	5	4	ANB	BDEIMPRSW
<i>Siphonodon australe</i>	7	8	16	.	.	.	.	.	4	6	ANB	BJPRW
CHENOPODIACEAE												
<i>Chenopodium pumilio</i>	1	.	.	1	.	.	.	.	1	.	A	B
<i>Einadia hastata</i>	2	.	5	.	.	.	.	3	1	.	N	J
CHLOANTHACEAE												
<i>Chloanthes parviflora</i>	4	.	.	.	12	.	.	.	3	2	NB	DGV
<i>Spartothamnella juncea</i>	3	.	8	.	.	.	.	.	2	2	NB	BPW
CONVOLVULACEAE												
<i>Dichondra repens</i>	30	.	13	26	3	.	.	11	16	20	ANB	DEFGIJMORTUW
<i>Calystegia marginata</i>	5	.	.	4	3	.	.	.	4	2	AN	BDT
<i>Convolvulus erubescens</i>	1	.	.	1	.	.	.	3	.	.	N	R
<i>Polymeria calycina</i>	H 9	.	.	9	100	.	.	3	5	6	NB	DFGMOVY
CUCURBITACEAE												
<i>Diplocyclos palmatus</i>	H 1	.	.	1	.	.	.	.	.	2	B	G
<i>Zehneria cunninghamii</i>	9	8	16	2	.	.	.	9	5	2	ANB	EJR
CUNONIACEAE												
<i>Aphanopetalum resinosum</i>	6	.	5	3	3	.	.	.	7	.	N	DMPV
<i>Caldcluvia paniculosa</i>	16	31	29	1	.	.	.	9	4	17	ANB	EIW
<i>Callicoma serratifolia</i>	2	.	5	.	.	.	.	3	.	2	AB	E
<i>Ceratopetalum apetalum</i>	3	15	3	.	.	.	.	3	1	2	AB	E
<i>Ceratopetalum gummiferum</i>	6	.	3	1	12	.	.	.	5	2	AN	BDMV
<i>Schizomeria ovata</i>	15	38	24	1	.	.	.	9	7	11	ANB	DEIMW
DILLENIACEAE												
<i>Hibbertia acuminata</i>	H 1	.	.	.	3	.	.	.	.	2	B	G
<i>Hibbertia aspera</i>	13	.	.	10	12	.	.	11	8	4	ANB	DEGOSTUV
<i>Hibbertia dentata</i>	11	.	21	3	.	.	.	9	7	4	ANB	BDEIM
<i>Hibbertia diffusa</i>	H 12	.	3	10	6	.	.	6	9	4	NB	ADMQTUY
<i>Hibbertia empetrifolia</i>	6	.	3	5	.	.	.	3	2	6	AB	DIU
<i>Hibbertia aff. linearis</i>	H 1	.	3	.	.	.	.	3	.	.	B	D
<i>Hibbertia marginata</i>	7	.	3	3	9	.	.	.	7	2	NB	DGMV
<i>Hibbertia monogyna</i>	1	.	.	1	.	.	.	.	1	.	N	G
<i>Hibbertia obtusifolia</i>	23	.	.	17	21	.	.	17	11	13	ANB	ABDEGMQSVY
<i>Hibbertia riparia</i>	H 6	.	.	1	15	.	.	3	1	7	AB	BMQ
<i>Hibbertia scandens</i>	27	.	21	19	3	.	.	20	11	19	ANB	DEGIORUVW
<i>Hibbertia sericea</i>	2	.	.	.	6	.	.	.	.	4	B	GH
<i>Hibbertia vestita</i>	H 14	.	.	15	.	.	.	6	10	6	ANB	ADGMOTUY
EBENACEAE												
<i>Diospyros australis</i>	14	23	26	1	.	.	.	.	7	15	ANB	BEIJPRW
<i>Diospyros pentamera</i>	17	77	13	2	.	.	.	3	8	17	ANB	EPRW
ELAEOCARPACEAE												
<i>Elaeocarpus kirtonii</i>	H 4	8	8	.	.	.	.	.	2	4	NB	E
<i>Elaeocarpus obovatus</i>	1	8	.	.	.	.	.	.	.	2	B	R
<i>Elaeocarpus reticulatus</i>	13	8	18	5	.	.	.	6	9	6	ANB	BDEIV
<i>Sloanea australis</i>	2	8	3	.	.	.	.	3	1	.	AB	R
<i>Sloanea woollsii</i>	12	54	13	.	.	.	.	3	7	9	ANB	EKRW

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
EPACRIDACEAE												
<i>Brachyloma daphnoides</i>	1	.	.	.	3	.	.	.	.	2	B	Q
<i>Epacris pulchella</i>	4	.	.	.	12	.	.	3	.	6	NB	ABG
<i>Leucopogon biflorus</i>	1	.	.	.	3	.	.	.	.	2	N	Q
<i>Leucopogon ericoides</i>	4	.	.	.	12	.	.	.	.	7	B	BGQ
<i>Leucopogon juniperinus</i>	3	.	.	2	3	.	.	.	1	4	AB	IM
<i>Leucopogon lanceolatus</i> var. <i>gracilis</i>	H 6	.	3	2	9	.	.	6	2	4	NB	DHY
<i>Leucopogon lanceolatus</i> var. <i>lanceolatus</i>	H 39	.	5	27	36	.	.	17	23	22	ANB	BDEGIMOTVWY
<i>Leucopogon leptospermoides</i>	6	.	3	3	6	.	.	.	5	2	NB	DHPT
<i>Leucopogon margarodes</i>	H 2	.	3	1	.	.	.	3	1	.	NB	D
<i>Leucopogon neo-anglicus</i>	H 1	.	.	.	100	.	.	.	2	B	M	
<i>Lissanthe species A</i>	H 2	.	.	.	6	.	.	.	.	4	B	H
<i>Lissanthe species B</i>	H 2	.	.	1	3	.	.	.	.	4	B	DH
<i>Melichrus procumbens</i>	H 6	.	.	2	12	.	.	.	2	7	ANB	AGM
<i>Melichrus urceolatus</i>	16	.	.	6	30	.	.	14	8	7	ANB	ABEMQS
<i>Monotoca scoparia</i>	25	.	.	6	58	.	.	17	11	17	ANB	BDEGMQTV
<i>Styphelia viridis</i> var. <i>breviflora</i>	3	.	1	6	.	.	.	2	2	ANB	AB	
<i>Trochocarpa laurina</i>	45	8	47	23	12	.	.	31	25	20	ANB	BDEGIMQRVWY
ESCALLONIACEAE												
<i>Abrophyllum ornans</i>	H 2	8	3	.	.	.	.	.	1	2	B	BE
<i>Anopterus macleayanus</i>	5	23	5	.	.	.	.	3	1	6	ANB	E
<i>Cutisia viburnea</i>	H 2	8	3	.	.	.	.	.	.	4	B	IW
<i>Polyosma cunninghamii</i>	6	31	5	.	.	.	.	.	3	6	AB	E
<i>Quintinia sieberi</i>	1	.	3	.	.	.	.	.	1	.	B	E
<i>Quintinia verdonii</i>	H 2	8	3	.	.	.	.	.	.	4	B	EI
EUPHORBIACEAE												
<i>Acalypha nemorum</i>	1	.	3	.	.	.	.	.	1	.	N	R
<i>Actephila lindleyi</i>	7	46	3	.	.	.	.	.	4	6	AB	PR
<i>Alchornea ilicifolia</i>	7	23	11	.	.	.	.	.	3	7	ANB	BJPRW
<i>Baloghia inophylla</i>	8	62	.	.	.	.	.	.	3	9	AB	ERW
<i>Breynia oblongifolia</i>	67	.	45	49	12	.	.	49	39	26	ANB	
ABDEFGHIJKMNOPQRSUVWY												
<i>Bridelia exaltata</i>	7	8	16	.	.	.	.	3	4	4	ANB	BDPRW
<i>Claoxylon australe</i>	4	8	5	1	.	.	.	3	1	4	ANB	EJW
<i>Cleistanthus cunninghamii</i>	9	62	3	.	.	.	.	.	4	9	AB	BPRW
<i>Croton insularis</i>	3	15	3	.	.	.	.	.	.	6	NB	JPW
<i>Croton stigmatosus</i>	3	15	3	.	.	.	.	.	1	4	NB	PR
<i>Croton verreauxii</i>	13	15	26	1	.	.	.	6	5	11	ANB	BGKPRW
<i>Drypetes australasica</i>	13	31	24	.	.	.	.	.	10	7	ANB	BKPRW
<i>Excoecaria dallachiana</i>	3	8	5	.	.	.	.	.	1	4	B	BP
<i>Glochidion ferdinandi</i>	32	.	16	27	3	.	.	17	23	9	ANB	
ABDEFGMNOPRSUVWY												
<i>Glochidion sumatranum</i>	5	.	.	5	.	.	.	3	4	.	N	FTY
<i>Mallotus discolor</i>	1	.	3	.	.	.	.	.	1	.	A	R
<i>Mallotus philippensis</i>	19	54	29	1	.	.	.	9	10	13	ANB	BKPRSW
<i>Micranthemum hexandrum</i>	3	.	.	3	.	.	.	6	1	.	N	R
<i>Omаланthus populifolius</i>	5	.	13	.	.	.	.	9	2	.	AN	EJP
<i>Petalostigma pubescens</i>	H 1	8	.	.	.	.	.	.	.	2	B	P
<i>Petalostigma triloculare</i>	1	.	.	1	.	.	.	.	.	2	B	G
<i>Phyllanthus gasstroemii</i>	3	.	.	2	3	.	.	.	2	2	AN	BMQ
<i>Phyllanthus gunnii</i>	2	.	3	1	.	.	.	3	.	2	N	ER
<i>Phyllanthus similis</i>	3	.	.	3	.	.	.	3	2	.	N	G
<i>Phyllanthus thymoides</i>	32	.	.	9	73	.	.	14	16	22	ANB	ABDEGHMOQTUV

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Phyllanthus virgatus</i>	H 24	.	3	22	6	.	.	11	16	9	ANB	ABDFJLMQSUWY
<i>Poranthera ericifolia</i>	1	.	.	.	3	.	.	.	.	2	B	G
<i>Poranthera microphylla</i>	19	.	3	14	15	.	.	14	8	13	ANB	ABDEIMQVY
<i>Pseudanthus orientalis</i>	H 1	.	.	.	3	.	.	.	.	2	B	H
<i>Ricinocarpus pinifolius</i>	2	.	.	.	6	.	.	.	.	2	N	GV
<i>Sauropus species A</i>	H 5	.	.	5	.	.	.	.	4	2	AB	FLMY
<i>Tragia novae-hollandiae</i>	H 2	.	5	.	.	.	.	.	1	2	NB	RW
EUPOMATIACEAE												
<i>Eupomatia bennettii</i>	3	15	3	.	.	.	.	.	1	4	NB	KR
<i>Eupomatia laurina</i>	20	15	45	1	.	.	.	14	9	13	ANB	BDEGIKRW
FABACEAE-CAESALPINIOIDE												
* <i>Chamaecrista mimosoides</i>	1	.	.	1	.	.	.	.	1	.	A	B
<i>Senna barclayana</i>	2	.	5	.	.	.	.	.	1	2	N	JP
<i>Senna odorata</i>	1	.	3	.	.	.	.	3	.	.	N	J
FABACEAE-FABOIDEAE												
<i>Austrostenisia blackii</i>	10	23	16	1	.	.	.	.	5	9	ANB	BKPRW
<i>Bossiaea heterophylla</i>	3	.	.	1	6	.	.	.	2	2	NB	HTV
<i>Bossiaea prostrata</i>	1	.	.	1	.	.	.	3	.	.	N	E
<i>Bossiaea rhombifolia</i> subsp. <i>rhombifolia</i>	5	.	.	.	15	.	.	.	2	6	NB	AGV
<i>Chorizema parviflorum</i>	5	.	.	3	6	.	.	6	2	2	AN	ADQV
<i>Crotalaria montana</i>	H 11	.	.	11	3	.	.	11	5	4	ANB	BEGMQUY
<i>Daviesia acicularis</i>	2	.	.	1	3	.	.	.	1	2	NB	EO
<i>Daviesia genistifolia</i>	11	.	.	10	6	.	.	9	8	2	ANB	ABEFGMORVY
<i>Daviesia ulicifolia</i>	6	.	.	6	.	.	.	3	4	2	ANB	ADTU
<i>Daviesia umbellulata</i>	14	.	.	5	27	.	.	6	8	9	ANB	ABEGMOQT
<i>Daviesia villifera</i>	H 6	.	.	1	15	.	.	3	3	4	NB	BQT
<i>Daviesia wyattiana</i>	3	.	.	1	6	.	.	.	1	4	AB	AB
<i>Derris involuta</i>	5	8	11	.	.	.	.	.	3	4	NB	EJR
<i>Desmodium brachypodum</i>	H 16	.	3	15	3	.	.	14	5	11	ANB	BEIMQRWY
<i>Desmodium nemorosum</i>	H 3	.	5	1	.	.	.	.	2	2	NB	BEW
<i>Desmodium rhytidophyllum</i>	59	.	11	53	15	.	.	46	32	26	ANB	ABDEFGJLMOPQRSTUWVY
<i>Desmodium varians</i>	43	.	18	36	6	.	.	40	18	22	ANB	ABDEFGJLMNQRSUWY
<i>Dillwynia retorta</i>	2	.	.	1	3	.	.	.	2	.	N	TV
<i>Erythrina vespertilio</i>	2	8	.	1	.	.	.	3	.	2	NB	RW
<i>Galactia species B</i>	H 2	.	.	2	.	.	.	.	2	.	AB	B
<i>Glycine clandestina</i>	H 68	.	21	54	27	.	.	49	45	19	ANB	ABDEFGJLMOPQRSTUWVY
<i>Glycine microphylla</i>	H 1	.	.	1	.	.	.	.	1	.	B	U
<i>Glycine tabacina</i>	H 26	.	.	28	.	.	.	9	15	17	ANB	BDFGILMNORUY
<i>Glycine tomentella</i>	H 4	.	.	3	3	.	.	3	2	2	ANB	BQUY
<i>Glycine 'strigosa'</i>	H 2	.	3	1	.	.	.	.	1	2	B	UW
<i>Gompholobium huegelii</i>	H 1	.	.	.	3	.	.	.	.	2	B	E
<i>Gompholobium latifolium</i>	9	.	.	2	21	.	.	3	5	6	ANB	BDEGMQV
<i>Gompholobium pinnatum</i>	19	.	.	6	39	.	.	9	9	15	ANB	ABDGHMOQTV
<i>Gompholobium virgatum</i> var. <i>aspalathoides</i>	H 1	.	.	.	3	.	.	.	.	2	B	H
<i>Goodia lotifolia</i>	1	.	.	1	.	.	.	.	1	.	B	I
<i>Hardenbergia violacea</i>	56	.	5	44	39	.	.	37	36	19	ANB	ABDEGMOPQRSTUWVY
<i>Hovea linearis</i>	5	.	.	3	6	.	.	6	2	2	AN	AEQT
<i>Indigofera australis</i>	6	.	3	5	.	.	.	.	4	4	ANB	BIP
<i>Jacksonia scoparia</i>	20	.	.	15	18	.	.	11	10	13	ANB	ABDEGMQRSTU

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Kennedia prostrata</i>	1	.	.	1	.	.	.	.	.	2	N	D
<i>Kennedia rubicunda</i>	18	.	8	16	.	.	.	6	14	6	ANB	BDEGIMORVW
<i>Lespedeza juncea</i>												
subsp. <i>sericea</i>	4	.	.	4	.	.	.	3	2	2	AB	MRUW
<i>Millettia megasperma</i>	3	15	3	.	.	.	.	3	.	4	AB	R
<i>Mirbelia rubiifolia</i>	3	.	.	.	9	.	.	3	2	.	NB	OT
<i>Mirbelia speciosa</i>												
subsp. <i>ringrosei</i>	H +	.	.	.	+	.	.	.	.	+	B	B
<i>Oxylobium ilicifolium</i>	5	.	.	2	9	.	.	9	1	2	NB	BE
<i>Oxylobium robustum</i>	2	.	.	1	3	.	.	.	2	.	N	D
<i>Oxylobium scandens</i>	3	.	.	1	6	.	.	.	3	.	AN	V
<i>Phyllota phyllicoides</i>	H 3	.	.	.	9	.	.	.	1	4	NB	HV
<i>Platylobium formosum</i>	4	.	3	2	3	.	.	.	3	2	AN	DM
<i>Pultenaea euchila</i>	3	.	3	1	3	.	.	3	2	.	N	PSY
<i>Pultenaea flexilis</i>	1	.	3	.	.	.	.	.	1	.	N	P
<i>Pultenaea linophylla</i>	1	.	.	.	3	.	.	3	.	.	N	E
<i>Pultenaea myrtoides</i>	H 9	.	.	6	9	.	.	3	5	6	NB	DHOTUY
<i>Pultenaea petiolaris</i>	H 9	8	.	.	24	.	.	3	4	7	ANB	BEGOQ
<i>Pultenaea retusa</i>	9	.	.	5	12	.	.	3	7	4	ANB	AMOTV
<i>Pultenaea species A</i>	H 1	.	.	.	3	.	.	.	.	2	B	G
<i>Pultenaea spinosa</i>	H 3	.	.	3	.	.	.	3	2	.	NB	GTU
<i>Pultenaea villosa</i>	16	.	.	5	33	.	.	6	11	7	ANB	ABDGOQV
<i>Swainsonia galegifolia</i>	6	.	5	4	.	.	.	6	2	4	AN	DJR
<i>Tephrosia brachyodon</i>	H 1	.	.	1	.	.	.	3	.	.	B	E
<i>Zornia dyctiocarpa</i>	9	.	.	9	3	.	.	9	3	6	AN	DEMQRS
FABACEAE-MIMOSOIDEAE												
<i>Acacia aulacocarpa</i>	16	.	3	14	6	.	.	9	9	8	NB	DFGLOUVY
<i>Acacia blakei</i>	1	.	.	1	.	.	.	.	1	.	N	F
<i>Acacia baeuerlenii</i>	1	.	.	.	3	.	.	.	.	2	B	Q
<i>Acacia binervia</i>	1	.	.	1	.	.	.	.	1	.	N	O
<i>Acacia complanata</i>	16	.	3	2	39	.	.	3	9	13	ANB	ABDGMQUV
<i>Acacia concurrens</i>	52	.	.	41	39	.	.	31	33	20	ANB	ABDEFGMLMOQSTUVY
<i>Acacia diphylla</i>	1	.	.	1	.	.	.	.	.	2	N	D
<i>Acacia falcata</i>	6	.	.	6	.	.	.	6	3	2	ANB	AEMU
<i>Acacia falciformis</i>	H 1	.	.	1	.	.	.	.	1	.	B	I
<i>Acacia fimbriata</i>	5	.	3	4	.	.	.	3	4	.	AN	BMNS
<i>Acacia floribunda</i>	1	.	3	.	.	.	.	.	1	.	B	B
<i>Acacia hispidula</i>	3	.	.	.	9	.	.	.	2	2	AB	BQ
<i>Acacia implexa</i>	7	.	.	5	6	.	.	9	2	4	ANB	BEMY
<i>Acacia irrorata</i>	16	.	18	10	.	.	.	6	5	17	ANB	BEFGIRW
<i>Acacia juliflora</i>	1	.	.	1	.	.	.	.	1	.	N	T
<i>Acacia longifolia</i>	2	.	.	2	.	.	.	.	2	.	N	MO
<i>Acacia maidenii</i>	26	.	34	13	3	.	.	14	15	13	ANB	BDEGIJOPRW
<i>Acacia melanoxylon</i>	14	.	11	10	3	.	.	20	4	6	ANB	BDEIQRS
<i>Acacia myrtifolia</i>	3	.	.	.	9	.	.	3	2	.	NB	EO
<i>Acacia obtusifolia</i>	1	.	.	.	3	.	.	3	.	.	N	E
<i>Acacia stricta</i>	1	.	.	.	3	.	.	.	.	2	B	E
<i>Acacia suaveolens</i>	1	.	.	.	3	.	.	.	1	.	N	V
<i>Acacia ulicifolia</i>	7	.	.	2	15	.	.	3	5	2	NB	BDEHO
<i>Acacia viscidula</i>	1	.	.	.	100	.	.	.	.	2	B	M
<i>Pararchidendron pruinatum</i>	1	8	.	.	.	.	.	.	.	2	B	R

Species	Freq.	Broad floristic group						Logging			Obs	State Forests	
		Tot.	Rf	Ws	Gf	Hf	Sh	Sw	L1	L2			UL
FLACOURTIACEAE													
<i>Casearia multinervosa</i>	H 3	8	5	.	.	.	.	.	1	4	B	BP	
<i>Scolopia braunii</i>	7	15	13	.	.	.	.	.	2	9	ANB	BJPRW	
GENTIANACEAE													
* <i>Centaurium tenuiflorum</i>	2	.	.	2	.	.	.	.	1	2	N	ER	
GERANIACEAE													
<i>Geranium homeanum</i>	1	.	.	1	.	.	.	.	3	.	B	E	
<i>Geranium potentilloides</i>	H 3	.	.	3	.	.	.	.	1	4	B	IW	
<i>Geranium solanderi</i>	12	.	5	11	.	.	.	.	14	8	AN	BEGJMR	
GESNERIACEAE													
<i>Fieldia australis</i>	1	.	3	.	.	.	.	.	1	.	B	E	
GOODENIACEAE													
<i>Dampiera stricta</i>	7	.	.	2	15	.	.	.	3	4	4	NB	BDOTV
<i>Goodenia bellidifolia</i>	1	.	.	.	3	.	.	.	1	.	.	N	O
<i>Goodenia heterophylla</i>	21	.	3	17	12	.	.	.	11	16	4	AN	ABDEFMVY
<i>Goodenia heterophylla</i> subsp. <i>eglandulosa</i>	H 1	.	3	.	.	.	.	.	3	.	.	B	D
<i>Goodenia paniculata</i>	5	.	.	4	3	.	.	.	3	4	.	AN	AD
<i>Goodenia rotundifolia</i>	H 17	.	.	12	18	.	.	.	14	5	13	NB	ABDEFMOSUY
<i>Scaevola ramosissima</i>	1	.	.	1	.	.	.	.	1	.	.	A	B
<i>Velleia paradoxa</i>	2	.	.	1	3	.	.	.	3	1	.	N	AE
<i>Velleia spathulata</i>	1	.	.	1	.	.	.	.	1	.	.	N	A
HALORAGACEAE													
<i>Gonocarpus humilis</i>	4	.	.	4	.	.	.	.	1	6	.	NB	DI
<i>Gonocarpus micranthus</i>	1	.	.	1	.	.	.	.	1	.	.	N	A
<i>Gonocarpus tetragynus</i>	10	.	3	5	12	.	.	.	17	2	4	ANB	DEOT
<i>Gonocarpus teucrioides</i>	4	.	.	3	3	.	.	.	3	3	.	N	BM
HYPERICACEAE													
<i>Hypericum gramineum</i>	19	.	.	19	3	.	.	.	20	7	11	ANB	BDECMRSTVWY
<i>Hypericum japonicum</i>	2	.	.	1	3	.	.	.	2	.	.	N	A
ICACINACEAE													
<i>Citronella moorei</i>	3	23	.	.	.	.	.	.	.	.	6	B	ER
<i>Pennantia cunninghamii</i>	7	31	5	1	.	.	.	.	2	9	.	B	EIW
LAMIACEAE													
<i>Ajuga australis</i>	17	.	8	15	.	.	.	.	14	8	9	ANB	BDEIJMPRUWY
<i>Mentha diemenica</i>	H 3	.	.	3	.	.	.	.	3	1	2	NB	IR
<i>Plectranthus apreptus</i>	1	.	.	1	.	.	.	.	1	.	.	N	M
<i>Plectranthus graveolens</i>	3	.	.	2	100	.	.	.	1	4	.	NB	EM
<i>Plectranthus parviflorus</i>	19	.	8	16	3	.	.	.	26	7	7	ANB	EGIJMRSWY
<i>Plectranthus suaveolens</i>	2	.	.	2	.	.	.	.	2	.	.	N	B
<i>Prostanthera lanceolata</i>	H 1	.	3	.	.	.	.	.	1	.	.	B	B
<i>Prostanthera melissifolia</i>	H 1	.	3	.	.	.	.	.	.	2	.	B	I
<i>Teucrium corymbosum</i>	1	.	3	.	.	.	.	.	3	.	.	N	E
LAURACEAE													
<i>Beilschmiedia elliptica</i>	H 1	.	3	.	.	.	.	.	3	.	.	B	R
<i>Beilschmiedia obtusifolia</i>	2	15	.	.	.	.	.	.	1	2	.	AB	R
<i>Cassytha filiformis</i>	2	.	.	1	3	.	.	.	3	1	.	N	O
<i>Cassytha glabella</i>	H 10	.	.	1	24	100	.	.	3	4	9	NB	DGHMOQV
<i>Cassytha pubescens</i>	1	.	.	1	.	.	.	.	3	.	.	N	V
<i>Cassytha racemosa</i>	1	.	.	.	3	.	.	.	3	.	.	N	E
<i>Cinnamomum oliveri</i>	5	8	11	.	.	.	.	.	3	3	2	ANB	KRW
<i>Cinnamomum virens</i>	5	38	.	.	.	.	.	.	1	7	.	B	ER

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Cryptocarya bidwillii</i>	1	.	3	.	.	.	.	.	1	.	A	R
<i>Cryptocarya erythroxylon</i>	10	38	13	.	.	.	.	3	4	9	ANB	EKRW
<i>Cryptocarya foveolata</i>	2	8	3	.	.	.	.	.	1	2	B	E
<i>Cryptocarya glaucescens</i>	10	15	21	.	.	.	.	9	4	6	ANB	EIK
<i>Cryptocarya meissneriana</i>	3	15	3	.	.	.	.	.	1	4	B	E
<i>Cryptocarya microneura</i>	14	.	32	2	.	.	.	11	5	9	ANB	BEGIKRW
<i>Cryptocarya obovata</i>	17	77	13	2	.	.	.	.	8	19	ANB	EIKRW
<i>Cryptocarya rigida</i>	12	.	26	2	.	.	.	6	4	11	ANB	EI
<i>Cryptocarya triplinervis</i> var. <i>pubens</i>	2	16	.	.	.	.	.	.	1	2	AB	R
<i>Cryptocarya</i> aff. <i>glaucescens</i>	1	.	3	.	.	.	.	3	.	.	B	R
<i>Endiandra muelleri</i> subsp. <i>muelleri</i>	7	23	8	1	.	.	.	.	5	4	AB	ERW
<i>Endiandra pubens</i>	H 1	8	.	.	.	.	.	.	.	2	B	R
<i>Endiandra sieberi</i>	7	8	16	.	.	.	.	3	2	7	ANB	EI
<i>Endiandra virens</i>	4	.	11	.	.	.	.	.	4	.	AN	KR
<i>Litsea reticulata</i>	11	38	13	1	.	.	.	3	3	13	ANB	EIR
<i>Neolitsea australiensis</i>	8	39	8	.	.	.	.	6	3	6	AB	ER
<i>Neolitsea dealbata</i>	15	38	21	2	.	.	.	6	8	11	ANB	BEIKRW
LOBELIACEAE												
<i>Lobelia dentata</i>	1	.	.	.	3	.	.	3	.	.	N	
<i>Lobelia gracilis</i>	14	.	3	4	24	100	.	3	11	6	NB	ABDGMQV
<i>Lobelia trigonocaulis</i>	5	8	11	.	.	.	.	3	2	4	ANB	BEKR
<i>Pratia pedunculata</i>	1	.	.	1	.	.	.	.	1	.	N	R
<i>Pratia purpurascens</i>	67	.	18	59	15	.	.	60	37	22	ANB	ABDEFGIJMNOQRSUVWY
LOGANIACEAE												
<i>Logania pusilla</i>	H 4	.	.	1	9	.	.	6	1	2	ANB	BDE
<i>Mitrasacme alsinoides</i>	H 1	.	.	.	100	.	.	.	.	2	B	M
<i>Mitrasacme polymorpha</i>	3	.	.	2	3	.	.	.	3	.	N	AD
LORANTHACEAE												
<i>Amyema conspicuum</i> ssp. <i>conspicuum</i>	H 1	.	.	1	.	.	.	.	1	.	B	L
<i>Amyema congener</i>	4	.	3	2	3	.	.	3	1	4	AN	RTW
<i>Amyema congener</i> subsp. <i>rotundifolium</i>	1	.	3	.	.	.	.	.	1	.	N	J
<i>Amyema pendulum</i>	1	.	3	.	.	.	.	3	.	.	N	E
<i>Amylothea dictyophleba</i>	1	.	3	.	.	.	.	.	1	.	B	E
<i>Dendrophthoe vitellina</i>	H 1	.	.	.	100	.	.	.	.	2	B	M
<i>Muellerina celastroides</i>	6	.	.	5	3	.	.	11	1	2	NB	EMR
<i>Muellerina eucalyptoides</i>	H 3	.	.	2	3	.	.	.	.	6	B	EI
LYTHRACEAE												
<i>Lythrum salicaria</i>	1	.	.	1	.	.	.	3	.	.	A	D
MALVACEAE												
<i>Abutilon oxycarpum</i>	2	.	5	.	.	.	.	3	1	.	N	JR
<i>Hibiscus heterophyllus</i>	6	8	11	1	.	.	.	6	2	4	ANB	BJRW
<i>Hibiscus splendens</i>	1	.	3	.	.	.	.	.	1	.	N	M
<i>Malvastrum coromandelianum</i>	1	.	.	1	.	.	.	.	.	2	N	E
* <i>Sida rhombifolia</i>	4	.	.	4	.	.	.	.	4	.	ANB	BFGU
MELASTOMATACEAE												
<i>Melastoma affine</i>	1	.	.	1	.	.	.	.	1	.	A	V

Species	Tot.	Broad floristic group						Logging			Obs	State Forests	
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL			
MELIACEAE													
<i>Anthocarapa nitidula</i>		6	38	3	.	.	.	.	4	4	AB	R	
<i>Dysoxylum fraserianum</i>		17	54	26	.	.	.	.	6	5	19	ANB	EIPRW
<i>Dysoxylum muelleri</i>		1	.	3	.	.	.	.	1	.	.	A	R
<i>Dysoxylum rufum</i>		6	23	8	.	.	.	.	3	6	.	ANB	EJPRW
<i>Melia azedarach</i>													
var. <i>australasica</i>		5	.	11	1	.	.	.	6	.	6	AN	JRW
<i>Owenia cepiodora</i>	H	1	8	.	.	.	.	.	.	.	2	B	R
<i>Synoum glandulosum</i>		25	8	55	3	.	.	.	17	12	15	ANB	BDEIKMRW
<i>Toona ciliata</i>		5	15	8	.	.	.	.	3	2	4	NB	ER
MENISPERMACEAE													
<i>Sarcopetalum harveyanum</i>		4	8	3	2	.	.	.	1	6	.	NB	EIN
<i>Stephania aculeata</i>		8	.	5	5	3	.	.	3	5	4	ANB	DGNUV
<i>Stephania japonica</i>													
var. <i>discolor</i>		16	.	21	9	.	.	.	9	12	4	ANB	BDEGJMPR
MENYANTHACEAE													
<i>Villarsia exaltata</i>	H	2	.	.	1	.	.	50	3	.	2	AB	D
MONIMIACEAE													
<i>Hedycarya angustifolia</i>		3	.	8	.	.	.	.	6	.	2	ANB	EI
<i>Palmeria scandens</i>		17	46	29	.	.	.	.	9	8	13	ANB	EIR
<i>Wilkiea huegeliana</i>		10	38	13	.	.	.	.	3	5	7	ANB	EKRW
MONIMIACEAE													
<i>Daphnandra species A</i>		15	54	21	.	.	.	.	6	8	9	ANB	EKR
MORACEAE													
<i>Ficus coronata</i>		6	23	8	.	.	.	.	3	6	.	ANB	BERW
<i>Ficus fraseri</i>		1	8	.	.	.	.	.	1	.	.	A	R
<i>Ficus macrophylla</i>		2	8	3	.	.	.	.	2	.	.	A	R
<i>Ficus rubiginosa</i>		2	.	3	1	.	.	.	1	2	.	NB	BE
<i>Ficus watkinsiana</i>		6	38	3	.	.	.	.	1	9	.	NB	EKRW
<i>Maclura cochinchinensis</i>		11	23	18	1	.	.	.	3	7	7	ANB	BJPR
<i>Malaisia scandens</i>		4	23	3	.	.	.	.	1	6	.	NB	EPR
<i>Streblus brunonianus</i>		4	23	3	.	.	.	.	1	6	.	AB	PR
MYOPORACEAE													
<i>Eremophila debilis</i>		7	.	.	7	.	.	.	3	5	2	ANB	BFLMSU
<i>Myoporum montanum</i>		4	.	8	1	.	.	.	.	3	2	AN	JR
MYRSINACEAE													
<i>Embelia australiana</i>		18	62	26	.	.	.	.	3	8	19	ANB	EJKPRW
<i>Rapanea howittiana</i>		2	.	3	1	.	.	.	1	2	.	AB	PR
<i>Rapanea subsessilis</i>		3	15	3	.	.	.	.	3	.	.	AB	R
<i>Rapanea variabilis</i>		24	.	45	7	.	.	.	9	15	13	ANB	BDEGIKMPRVW
MYRTACEAE													
<i>Acmena ingens</i>		5	23	5	.	.	.	.	3	2	4	AB	ER
<i>Acmena smithii</i>		16	23	24	4	.	.	.	9	11	6	ANB	BDEIMNRV
<i>Angophora costata</i>		2	.	.	2	.	.	.	.	2	.	A	BR
<i>Angophora floribunda</i>		2	.	.	2	.	.	.	1	2	.	N	DY
<i>Angophora paludosa</i>	H	4	.	.	4	.	.	.	3	2	2	NB	DTU
<i>Angophora subvelutina</i>		24	.	26	15	.	.	.	29	13	4	AN	BEFGJMNPRS
<i>Angophora woodsiana</i>		39	.	.	17	70	.	.	17	21	26	ANB	ABDGHMOQTUVY
<i>Archirhodomyrtus beckleri</i>	H	9	.	24	.	.	.	.	3	5	6	ANB	BDEI
<i>Austromyrtus acmenioides</i>		1	8	.	.	.	.	.	.	2	.	B	R
<i>Austromyrtus bidwillii</i>		6	38	3	.	.	.	.	2	7	.	AB	BPRW

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Austromyrtus dulcis</i>	5	.	3	3	3	.	.	3	3	2	NB	D
<i>Austromyrtus hillii</i>	2	8	3	.	.	.	.	.	2	.	A	R
<i>Backhousia myrtifolia</i>	1	.	3	.	.	.	.	.	1	.	N	D
<i>Backhousia sciadophora</i>	1	8	.	.	.	.	.	.	.	2	B	W
<i>Baectea densifolia</i>	H 1	.	.	.	3	.	.	.	.	2	B	H
<i>Baectea diosmifolia</i>	H 1	.	.	.	3	.	.	.	.	2	B	H
<i>Baectea stenophylla</i>	1	.	.	.	3	.	.	.	1	.	N	D
<i>Baectea virgata</i>	H 3	.	.	2	3	.	.	.	.	6	NB	FGT
<i>Callistemon aff. montanus</i>	H 1	.	.	.	.	100	.	.	.	2	B	M
<i>Callistemon pachyphyllus</i>	1	.	.	1	.	.	.	.	.	2	N	D
<i>Callistemon salignus</i>	15	8	16	9	.	.	.	3	11	7	ANB	BDFGJNRW
<i>Eucalyptus acmenoides</i>	14	.	13	10	.	.	.	17	3	9	ANB	DEIRW
<i>Eucalyptus aff. acmenoides</i>	H 1	.	.	.	3	.	.	.	.	2	B	Q
<i>Eucalyptus baileyana</i>	9	.	.	1	24	.	.	.	4	9	ANB	ADGV
<i>Eucalyptus bancroftii</i>	1	.	.	.	3	.	.	.	1	.	N	A
<i>Eucalyptus biturbinata</i>	4	.	.	4	.	.	.	3	1	4	NB	EI
<i>Eucalyptus brunnea</i>	1	.	.	1	.	.	.	.	.	2	B	I
<i>Eucalyptus campanulata</i>	8	.	8	5	.	.	.	6	1	9	ANB	EIM
<i>Eucalyptus carnea</i>	H 21	.	5	15	15	.	.	26	8	9	NB	ABDEGIMOQRSTVW
<i>Eucalyptus crebra</i>	H 4	.	.	4	.	.	.	6	1	2	ANB	GLMQ
<i>Eucalyptus dunnii</i>	1	.	3	.	.	.	.	3	.	.	B	R
<i>Eucalyptus eugenoides</i>	H 3	.	.	3	.	.	.	3	2	.	AB	UV
<i>Eucalyptus fibrosa</i>	10	.	.	9	6	.	.	6	7	4	ANB	ABDGOST
<i>Eucalyptus glaucina</i>	H 2	.	.	2	.	.	.	.	2	.	B	FY
<i>Eucalyptus globoidea</i>	1	.	.	1	.	.	.	3	.	.	N	V
<i>Eucalyptus grandis</i>	8	.	18	1	.	.	.	9	4	2	ANB	GJR
<i>Eucalyptus gummifera</i>	19	.	.	7	36	.	.	20	9	7	ANB	BDEGMOQRSTV
<i>Eucalyptus henryi</i>	21	.	.	19	9	.	.	9	15	7	ANB	ABDFGMOQUVY
<i>Eucalyptus intermedia</i>	51	.	16	38	27	.	.	31	34	17	ANB	ABDEFGJLMOQRSTUVWY
<i>Eucalyptus laevopinea</i>	8	.	13	3	.	.	.	6	1	9	ANB	EI
<i>Eucalyptus maculata</i>	35	.	26	24	6	.	.	29	22	9	ANB	BDEJMPRSTVW
<i>Eucalyptus melanophloia</i>	2	.	.	2	.	.	.	3	.	2	N	E
<i>Eucalyptus melliodora</i>	2	.	.	2	.	.	.	3	.	2	NB	EI
<i>Eucalyptus microcorys</i>	39	.	45	22	3	.	.	29	16	26	ANB	BDEGIJMOPRUVWY
<i>Eucalyptus moluccana</i>	23	.	11	20	.	.	.	9	17	7	ANB	AFJLMPQRSUWY
<i>Eucalyptus pilularis</i>	34	.	5	20	39	.	.	17	22	15	ANB	ABDEGMOQTUV
<i>Eucalyptus planchoniana</i>	11	.	.	1	30	.	.	.	9	6	ANB	BDGMOQV
<i>Eucalyptus propinqua</i>	34	.	18	27	6	.	.	20	26	6	ANB	BDEFGIJMOPRSVY
<i>Eucalyptus psammitica</i>	1	.	.	1	.	.	.	.	1	.	N	M
<i>Eucalyptus pyrocarpa</i>	4	.	.	1	9	.	.	.	2	4	AB	DQ
<i>Eucalyptus resinifera</i>	25	.	3	20	15	.	.	20	14	9	ANB	ADEGHMOQRTVY
<i>Eucalyptus robusta</i>	1	.	.	1	.	.	.	.	.	2	N	D
<i>Eucalyptus rummeryi</i>	5	.	13	.	.	.	.	.	4	2	NB	BP
<i>Eucalyptus saligna</i>	15	.	26	4	3	.	.	6	7	13	ANB	DEIKRW
<i>Eucalyptus scias</i> subsp. <i>apoda</i>	H 1	.	.	1	.	.	.	.	1	.	B	I
<i>Eucalyptus seeana</i>	H 4	.	.	4	.	.	.	.	4	.	NB	DU
<i>Eucalyptus siderophloia</i>	H 48	8	18	41	3	.	.	23	30	22	ANB	ABDFGJLMOPRSUVWY
<i>Eucalyptus signata</i>	8	.	.	4	12	.	.	.	4	7	NB	DHOTU
<i>Eucalyptus tereticornis</i>	H 22	.	5	21	.	.	.	20	12	7	ANB	DEFGJLMNQRS
<i>Eucalyptus tindaliae</i>	17	.	.	11	21	.	.	20	5	9	ANB	ABEGMQS

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Eucalyptus umbra</i>	13	.	.	7	18	.	.	6	5	11	ANB	ABEEMQR
<i>Leptospermum brachyandrum</i>	1	.	.	1	.	.	.	.	.	2	N	G
<i>Leptospermum petersonii</i>	1	.	3	.	.	.	.	.	1	.	N	D
<i>Leptospermum polyanthum</i>	H 1	.	.	.	.	100	.	.	.	2	B	M
<i>Leptospermum polygalifolium</i>	H 22	.	3	9	39	.	.	3	17	9	ANB	ABDGHMOTV
<i>Leptospermum trinervium</i>	19	.	.	1	55	.	.	9	8	17	ANB	ABDEGHMQV
<i>Leptospermum variabile</i>	H +	.	.	.	.	.	.	.	.	+	B	W
<i>Lophostemon confertus</i>	37	15	58	10	12	.	.	23	21	19	ANB	BDEIJKMPQRSW
<i>Lophostemon suaveolens</i>	32	.	.	31	9	.	.	14	24	9	ANB	ADEFGLOSTUVY
<i>Melaleuca alternifolia</i>	H 7	.	.	6	3	.	.	3	5	2	ANB	ADFG
<i>Melaleuca decora</i>	H 1	.	.	1	.	.	.	.	.	2	B	F
<i>Melaleuca quinquenervia</i>	4	.	.	3	3	.	.	3	2	2	N	DNT
<i>Melaleuca nodosa</i>	9	.	.	7	6	.	.	.	4	9	NB	DFHLTU
<i>Melaleuca sieberi</i>	11	.	.	5	18	.	.	3	7	7	ANB	DHOTU
<i>Melaleuca styphelioides</i>	3	.	.	2	3	.	.	.	2	2	N	DT
<i>Melaleuca tamariscina</i> subsp. <i>irbyana</i>	1	.	.	1	.	.	.	.	1	.	N	FY
<i>Melaleuca thymifolia</i>	2	.	.	.	6	.	.	3	.	2	N	T
<i>Rhodamnia argentea</i>	5	31	3	.	.	.	.	.	3	4	AB	ER
<i>Rhodamnia rubescens</i>	25	23	50	3	.	.	.	17	12	15	ANB	BDEIKPRW
<i>Rhodomyrtus psidioides</i>	2	.	5	.	.	.	.	3	1	.	AB	DR
<i>Syncarpia glomulifera</i>	27	.	13	13	30	.	.	17	18	7	ANB	BDGMOQRTV
<i>Syzygium australe</i>	2	8	3	.	.	.	.	3	.	2	AB	R
<i>Syzygium corynanthum</i>	H 7	54	.	.	.	.	.	.	3	7	AB	ERW
<i>Syzygium crebrinerve</i>	H 5	23	5	.	.	.	.	3	3	2	AB	ER
<i>Syzygium francisii</i>	5	38	.	.	.	.	.	.	3	4	AB	RW
<i>Syzygium oleosum</i>	5	.	8	2	.	.	.	.	4	2	AN	BDEVW
<i>Tristaniopsis collina</i>	2	.	3	1	.	.	.	.	1	2	B	EW
<i>Tristaniopsis laurina</i>	2	.	3	1	.	.	.	.	1	2	NB	BG
OLEACEAE												
<i>Jasminum singuliflorum</i>	2	15	.	.	.	.	.	.	1	2	B	R
<i>Jasminum suavissimum</i>	H 4	.	.	4	.	.	.	.	3	2	B	FLU
<i>Jasminum volubile</i>	2	8	3	.	.	.	.	.	1	2	B	BP
<i>Notelaea longifolia</i>	18	.	16	13	.	.	.	9	13	6	ANB	BDFGIPRV
<i>Notelaea ovata</i>	8	.	.	3	15	.	.	6	3	6	ANB	BDST
<i>Notelaea species A</i>	1	.	3	.	.	.	.	.	.	2	B	I
<i>Olea paniculata</i>	4	15	.	2	.	.	.	3	2	2	NB	RW
ONAGRACEAE												
<i>Epilobium billardierianum</i> subsp. <i>cinereum</i>	1	.	.	1	.	.	.	.	1	.	A	B
<i>Epilobium billardierianum</i> subsp. <i>hydrophilum</i>	1	.	.	1	.	.	.	3	.	.	N	E
<i>Ludwigia peploides</i> subsp. <i>montevicensis</i>	H 1	.	.	.	.	50	.	.	.	2	B	R
OXALIDACEAE												
<i>Oxalis chnoodes</i>	6	.	5	4	.	.	.	6	1	6	NB	DIJRW
<i>Oxalis corniculata</i> spp. agg.	12	.	13	7	.	.	.	11	7	4	AN	BEJMN RVW
<i>Oxalis exilis</i>	H 6	.	.	6	.	.	.	6	3	2	NB	DGM
<i>Oxalis radicata</i>	H 3	.	.	2	3	.	.	.	2	2	NB	AGW
PASSIFLORACEAE												
* <i>Passiflora aurantia</i>	2	.	3	1	.	.	.	3	1	.	NB	JW
* <i>Passiflora edulis</i>	5	8	8	1	.	.	.	3	4	.	NB	DEKNR

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
PEPEROMIACEAE												
<i>Peperomia leptostachya</i>	1	.	3	.	.	.	.	.	1	.	B	B
<i>Peperomia tetraphylla</i>	3	15	3	.	.	.	.	.	1	4	B	E
PIPERACEAE												
<i>Piper novae-hollandiae</i>	6	31	5	.	.	.	.	3	2	6	NB	ERW
PITTIOSPORACEAE												
<i>Billardiera scandens</i>	27	.	8	19	18	.	.	11	17	13	ANB	ABDEGIOTV
<i>Bursaria longisepala</i>	1	.	.	1	.	.	.	.	1	.	N	T
<i>Bursaria spinosa</i>	2	.	3	1	.	.	.	6	.	.	NB	DR
<i>Bursaria spinosa</i> var. <i>macrophylla</i>	H 1	.	3	.	.	.	.	.	.	2	B	I
<i>Citriobatus lancifolius</i>	3	.	8	.	.	.	.	.	2	2	N	JR
<i>Citriobatus pauciflorus</i>	33	85	50	3	.	.	.	9	14	31	ANB	BDEIJPRW
<i>Hymenosporum flavum</i>	5	8	11	.	.	.	.	.	1	7	NB	EIJR
<i>Pittosporum revolutum</i>	6	8	8	2	.	.	.	3	.	9	ANB	DEGIR
<i>Pittosporum rhombifolium</i>	2	15	.	.	.	.	.	.	1	2	B	R
<i>Pittosporum undulatum</i>	3	.	3	2	.	.	.	3	1	2	NB	IMR
PLANTAGINACEAE												
<i>Plantago debilis</i>	10	.	.	11	.	.	.	11	3	6	ANB	BEFIMR
POLYGALACEAE												
<i>Comesperma defoliatum</i>	1	.	.	.	3	.	.	.	1	.	A	D
<i>Comesperma ericinum</i>	H 6	.	.	2	9	100	.	6	.	7	ANB	ADEMT
<i>Comesperma sphaerocarpum</i>	H 2	.	.	1	3	.	.	.	1	2	AB	B
<i>Polygala japonica</i>	6	.	.	6	.	.	.	9	2	2	ANB	EFUY
POLYGONACEAE												
<i>Muehlenbeckia gracillima</i>	2	.	3	1	.	.	.	3	1	.	N	JN
<i>Persicaria decipiens</i>	1	.	.	1	.	.	.	.	.	2	N	G
<i>Persicaria elatior</i>	H 1	.	.	.	.	50	.	.	.	2	B	R
<i>Persicaria lapathifolia</i>	1	.	.	1	.	.	.	.	1	.	N	G
<i>Persicaria orientalis</i>	H 1	.	.	.	.	50	.	.	.	2	B	R
<i>Persicaria strigosa</i>	1	.	.	.	.	50	.	.	.	2	B	R
<i>Persicaria subsessilis</i>	H 1	.	.	.	.	50	.	.	.	2	B	R
PROTEACEAE												
<i>Banksia aemula</i>	1	.	.	.	3	.	.	.	.	2	B	H
<i>Banksia cunninghamii</i> subsp. A	H 1	.	.	.	3	.	.	.	.	2	B	E
<i>Banksia integrifolia</i> subsp. <i>compar</i>	1	.	.	.	3	.	.	.	.	2	B	E
<i>Banksia integrifolia</i> subsp. <i>integrifolia</i>	5	.	.	5	.	.	.	3	4	.	ANB	BDMVY
<i>Banksia marginata</i>	1	.	.	1	.	.	.	.	.	2	N	Y
<i>Banksia oblongifolia</i>	18	.	.	5	39	.	.	3	11	13	ANB	ADGHOTV
<i>Banksia serrata</i>	4	.	.	1	9	.	.	.	2	4	ANB	BD
<i>Banksia spinulosa</i> var. <i>collina</i>	12	.	.	5	21	.	.	6	8	6	ANB	DEGHOT
<i>Grevillea linearifolia</i>	1	.	.	.	3	.	.	3	.	.	N	T
<i>Grevillea robusta</i>	2	.	.	2	.	.	.	3	1	.	NB	FR
<i>Hakea dactyloides</i>	2	.	.	2	.	.	.	.	2	.	N	MO
<i>Hakea eriantha</i>	1	.	.	.	3	.	.	3	.	.	N	E
<i>Hakea florulenta</i>	2	.	.	.	6	.	.	.	.	4	B	GH
<i>Hakea salicifolia</i>	25	.	.	17	27	.	.	11	17	9	AN	ABDGMORSTV
<i>Isopogon mnoraifolius</i>	H 2	.	.	.	6	.	.	3	.	2	NB	HT
<i>Lambertia formosa</i>	2	.	.	.	6	.	.	.	1	2	NB	GV
<i>Lomatia silaifolia</i>	28	.	5	12	45	.	.	9	18	15	ANB	ABDEGHIMOQTUV

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Orites excelsa</i>	7	38	5	.	.	.	.	2	9		AB	EI
<i>Persoonia adenantha</i>	H 3	.	.	2	3	.	.	3	1	2	B	EI
<i>Persoonia media</i>	1	.	.	1	.	.	.	3	.	.	N	E
<i>Persoonia oleoides</i>	H 2	.	.	1	3	.	.	.	.	4	B	EI
<i>Persoonia stradbrokeensis</i>	H 66	.	5	40	79	.	.	37	37	35	ANB	ABDEGMOQSTUVY
<i>Persoonia tenuifolia</i>	H 21	.	.	2	58	.	.	9	9	19	ANB	ABDGHMOQT
<i>Petrophile canescens</i>	H 6	.	.	.	18	.	.	3	1	7	NB	BEGHQ
<i>Stenocarpus sinuatus</i>	1	8	.	.	.	.	.	.	.	2	B	R
<i>Stenocarpus salignus</i>	3	15	3	.	.	.	.	.	2	2	ANB	EK
<i>Xylomelum pyriforme</i>	1	.	.	.	3	.	.	.	1	.	N	V
RANUNCULACEAE												
<i>Clematis aristata</i>	6	.	11	2	.	.	.	3	2	6	ANB	EGIP
<i>Clematis fawcettii</i>	H 1	8	.	.	.	.	.	.	.	2	B	R
<i>Clematis glycinoides</i>	14	15	21	4	.	.	.	11	8	6	ANB	EGIKMPR
<i>Ranunculus lappaceus</i>	4	.	.	4	.	.	.	.	2	4	ANB	IM
<i>Ranunculus plebeius</i>	4	.	.	4	.	.	.	9	1	.	N	ER
<i>Ranunculus sessiliflorus</i>	2	.	3	1	.	.	.	3	1	.	N	JR
RHAMNACEAE												
<i>Alphitonia excelsa</i>	75	.	24	61	27	.	.	43	50	26	ANB	ABDEFGKLMNQRSTUVWY
<i>Cryptandra propinqua</i>	H 1	.	.	.	100	.	.	.	.	2	B	M
ROSACEAE												
<i>Rubus hillii</i>	11	.	24	2	.	.	.	9	7	4	ANB	BDEGRVW
<i>Rubus moorei</i>	6	.	16	.	.	.	.	6	3	2	AN	ER
<i>Rubus parvifolius</i>	11	.	5	10	.	.	.	6	7	6	ANB	BEIMNR
<i>Rubus rosifolius</i>	17	8	26	6	.	.	.	20	10	2	ANB	EJMNRW
<i>Rubus sp. A (aff. moorei)</i>	5	8	11	.	.	.	.	.	1	7	B	EI
RUBIACEAE												
<i>Asperula conferta</i>	1	.	.	1	.	.	.	3	.	.	N	R
<i>Canthium buxifolium</i>	6	8	13	.	.	.	.	.	4	4	NB	BJPR
<i>Canthium coprosmoides</i>	H 2	8	3	.	.	.	.	.	.	4	AB	EW
<i>Canthium odoratum</i>	3	.	8	.	.	.	.	.	3	.	N	PR
<i>Canthium vacciniifolium</i>	H 2	15	.	.	.	.	.	.	.	4	B	PW
<i>Galium binifolium</i>	1	.	3	.	.	.	.	3	.	.	B	D
<i>Galium ciliare</i>	1	.	.	1	.	.	.	.	.	2	B	I
<i>Galium gaudichaudii</i>	2	.	5	.	.	.	.	3	.	2	N	EJ
<i>Galium liratum</i>	1	.	.	1	.	.	.	.	1	.	B	D
<i>Galium migrans</i>	2	.	.	2	.	.	.	3	1	.	N	R
<i>Hodgkinsonia ovatiflora</i>	H 3	8	5	.	.	.	.	.	2	2	NB	BR
<i>Ixora beckleri</i>	H 4	15	5	.	.	.	.	.	2	4	NB	JRW
<i>Morinda acutifolia</i>	1	8	.	.	.	.	.	.	.	2	B	P
<i>Morinda jasminoides</i>	27	69	32	6	.	.	.	6	13	24	ANB	BDEGIKMN
<i>Opercularia aspera</i>	8	.	.	7	3	.	.	9	4	2	ANB	BEUY
<i>Opercularia diphylla</i>	5	.	.	4	3	.	.	3	2	4	AN	ADMQ
<i>Opercularia hispida</i>	3	.	.	2	3	.	.	.	1	4	AB	DEI
<i>Pomax umbellata</i>	29	.	5	14	42	.	.	17	14	19	ANB	ABDEGHMQRUSUVY
<i>Psychotria daphnoides</i>	9	.	13	4	.	.	.	6	7	2	ANB	BPR
<i>Psychotria loniceroides</i>	36	31	68	6	.	.	.	14	16	30	ANB	BDEGLIMPRW
* <i>Richardia brasiliensis</i>	H 6	.	.	6	.	.	.	11	1	2	ANB	BEQY
* <i>Richardia stellaris</i>	4	.	.	4	.	.	.	3	2	2	N	EMN
<i>Spermacoce brachystema</i>	4	.	.	3	3	.	.	6	.	4	N	EQ

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
RUTACEAE												
<i>Acradenia euodiiformis</i>	3	23	.	.	.	.	.	.	6		B	E
<i>Acronychia oblongifolia</i>	10	8	24	.	.	.	.	6	3	9	ANB	EIJKPRW
<i>Acronychia octandra</i>	H 2	8	3	.	.	.	.	.	1	2	B	E
<i>Acronychia pubescens</i>	5	15	8	.	.	.	.	3	3	2	ANB	EPR
<i>Boronia chartacea</i>	H 1	.	3	.	.	.	.	.	1	.	B	B
<i>Boronia polygalifolia</i>	H 3	.	.	3	.	.	.	6	1	.	NB	EGU
<i>Correa reflexa</i> var. <i>reflexa</i>	1	.	.	1	.	.	.	.	1	.	B	I
<i>Flindersia australis</i>	5	15	5	1	.	.	.	3	2	4	ANB	BRW
<i>Flindersia bennettiana</i>	2	.	5	.	.	.	.	.	1	2	NB	PR
<i>Flindersia schottiana</i>	2	8	3	.	.	.	.	.	1	2	AN	JR
<i>Flindersia xanthoxyla</i>	1	.	3	.	.	.	.	.	1	.	A	R
<i>Geijera latifolia</i>	5	15	8	.	.	.	.	.	2	6	NB	JKRW
<i>Melicope micrococca</i>	6	.	16	.	.	.	.	6	3	2	ANB	JKR
<i>Pentaceras australe</i>	1	8	.	.	.	.	.	.	1	.	A	R
<i>Phebalium squamulosum</i> subsp. <i>squamulosum</i>	1	.	.	.	100	.	.	.	.	2	B	M
<i>Sarcomelicope simplicifolia</i>	5	31	3	.	.	.	.	.	3	4	AB	EPRW
<i>Zanthoxylum brachyacanthum</i>	5	23	5	.	.	.	.	.	3	4	ANB	PRW
<i>Zieria minutiflora</i>	H 2	.	3	1	.	.	.	3	.	2	B	D
<i>Zieria smithii</i>	3	.	8	.	.	.	.	.	2	2	ANB	EIK
<i>Zieria</i> species K	H 1	.	3	.	.	.	.	.	.	2	B	E
SANTALACEAE												
<i>Exocarpos cupressiformis</i>	3	.	.	.	9	.	.	.	3	.	AB	BQ
<i>Santalum obtusifolium</i>	1	.	.	1	.	.	.	.	1	.	B	I
SAPINDACEAE												
<i>Alectryon subcinereus</i>	13	23	21	2	.	.	.	6	8	7	ANB	BPRW
<i>Alectryon subdentatus</i>	2	8	3	.	.	.	.	.	1	2	B	BP
<i>Arytera divaricata</i>	10	38	13	.	.	.	.	6	5	6	ANB	PR
<i>Castanospora alphandii</i>	H 1	8	.	.	.	.	.	.	.	2	B	E
<i>Cupaniopsis flagelliformis</i> var. <i>australis</i>	8	31	11	.	.	.	.	3	5	4	NNB	R
<i>Cupaniopsis parvifolia</i>	9	15	18	.	.	.	.	.	4	9	ANB	BJPRW
<i>Diploglottis australis</i>	14	46	21	.	.	.	.	3	7	13	NB	EJKRW
<i>Dodonaea megazyga</i>	1	.	3	.	.	.	.	.	1	.	N	E
<i>Dodonaea triangularis</i>	1	.	.	3	.	.	.	.	1	.	N	A
<i>Dodonaea triquetra</i>	7	.	3	2	12	.	.	6	4	2	NB	ABDGQ
<i>Dodonaea viscosa</i>	2	.	.	2	.	.	.	3	.	2	AN	DQ
<i>Elattostachys nervosa</i>	9	31	13	.	.	.	.	3	7	4	ANB	R
<i>Elattostachys xylocarpa</i>	5	15	8	.	.	.	.	.	2	6	NB	BPR
<i>Guioa semiglauca</i>	31	62	55	2	.	.	.	14	15	22	ANB	BEIJPRW
<i>Harpullia hillii</i>	H 2	8	3	.	.	.	.	3	.	2	B	R
<i>Jagera pseudorhus</i>	9	31	13	.	.	.	.	3	4	7	ANB	JKPRW
<i>Mischocarpus australis</i>	3	23	.	.	.	.	.	.	1	4	B	R
<i>Rhysotoechia bifoliolata</i>	H 2	15	.	.	.	.	.	.	.	4	B	PR
SAPOTACEAE												
<i>Planchonella australis</i>	2	15	.	.	.	.	.	.	1	2	AB	R
<i>Planchonella myrsinoides</i>	1	8	.	.	.	.	.	.	1	.	A	R
SCROPHULARIACEAE												
<i>Veronica plebeia</i>	10	.	3	10	.	.	.	11	1	9	NB	EGINRUWY
* <i>Veronica persica</i>	3	.	5	1	.	.	.	6	1	.	N	JS

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
SIMAROUBACEAE												
<i>Ailanthus triphysa</i>	1	8	.	.	.	.	.	.	2		B	W
<i>Guilfoylia monostylis</i>	H 4	31	.	.	.	.	.	.	1 6		B	ER
SOLANACEAE												
<i>Duboisia myoporoides</i>	9	.	13	4	.	.	.	6 7 2			ANB	BDEMN
<i>Nicotiana debneyi</i>	3	.	8	.	.	.	.	9	.		ANB	JR
* <i>Physalis peruviana</i>	2	.	.	1	.	.	50	.	1 2		AB	BR
<i>Solanum aviculare</i>	2	.	5	.	.	.	.	3 1	.		AB	ER
<i>Solanum callium</i>	1	8	.	.	.	.	.	.	2		B	R
<i>Solanum densevestitum</i>	15	.	16	10	.	.	.	14 5 9			ANB	BDEIJRW
<i>Solanum esuriale</i>	1	.	.	1	.	.	.	.	1		N	M
<i>Solanum furfuraceum</i>	H 2	.	3	1	.	.	.	3 1	.		NB	EW
<i>Solanum opacum</i>	1	.	.	.	.	.	50	.	2		B	R
<i>Solanum prinophyllum</i>	7	.	13	2	.	.	.	11 3	.		AN	EJKR
* <i>Solanum pseudocapsicum</i>	2	.	5	.	.	.	.	3 1	.		AN	JR
<i>Solanum pungetium</i>	1	.	3	.	.	.	.	3	.		B	R
* <i>Solanum seafortianum</i>	H 5	8	11	.	.	.	.	3 2 4			NB	JPR
<i>Solanum semiaratum</i>	1	.	3	.	.	.	.	.	1		A	R
<i>Solanum stelligerum</i>	11	.	13	6	.	.	.	11 4 6			ANB	JKRW
<i>Solanum</i> sp. aff. <i>cinereum</i>	1	.	.	1	.	.	.	.	1		B	W
STACKHOUSIACEAE												
<i>Stackhousia viminea</i>	7	.	.	6	3	.	.	6 5	.		AN	AGV
STERCULIACEAE												
<i>Brachychiton acerifolius</i>	3	15	3	.	.	.	.	.	1 4		NB	EP
<i>Brachychiton discolor</i>	5	8	3	3	.	.	.	9 1 2			NB	GRW
<i>Brachychiton populneus</i>	2	.	.	2	.	.	.	6	.		N	R
<i>Heritiera actinophylla</i>	8	38	8	.	.	.	.	.	7 4		ANB	KR
<i>Heritiera trifoliolata</i>	4	31	.	.	.	.	.	.	2 4		AB	R
<i>Keraudrenia</i> aff. <i>hillii</i>	H 1	.	.	.	100	.	.	.	2		B	M
STYLIDIACEAE												
<i>Stylidium debile</i>	1	.	.	1	.	.	.	3	.		A	D
<i>Stylidium graminifolium</i>	10	.	.	2	24	.	.	9 3 7			ANB	BEQ
SYMPLOCACEAE												
<i>Symplocos thwaitesii</i>	H 3	15	3	.	.	.	.	.	2 2		AB	ER
THYMELACEAE												
<i>Phaleria chermsideana</i>	3	8	5	.	.	.	.	.	2 2		ANB	KR
THYMELAEACEAE												
<i>Pimelea glauca</i>	1	.	.	.	3	.	.	.	1		N	A
<i>Pimelia latifolia</i>	6	.	13	1	.	.	.	9 2 2			AN	ER
<i>Pimelea neo-anglica</i>	6	.	13	.	.	.	.	6 2 4			AN	EJRW
<i>Pimelea ligustrina</i>												
subsp. <i>ligustrina</i>	4	.	11	.	.	.	.	6 2	.		ANB	BKR
<i>Pimelea linifolia</i>												
subsp. <i>linifolia</i>	H 37	.	3	28	30	.	.	20 25 13			ANB	ADEFGLMOQTUVY
<i>Pimelea neo-anglica</i>	2	.	3	1	.	.	.	3	2		B	IR
<i>Wikstroemia indica</i>	12	15	21	2	.	.	.	6 5 9			ANB	BGJKNPRW
TREMANDRACEAE												
<i>Tetratea thymifolia</i>	2	.	.	1	3	.	.	.	2		N	BM
TRIMENIACEAE												
<i>Trimenia moorei</i>	1	.	3	.	.	.	.	3	.		A	E

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
ULMACEAE												
<i>Aphananthe phillippinensis</i>	3	15	3	.	.	.	.	1	4	AB	PR	
<i>Trema aspera</i>	9	.	11	5	.	.	.	6	4	6	ANB	DEJNPRUW
URTICACEAE												
<i>Boehmeria platyphylla</i>												
var. <i>austroqueenslandica</i>	1	.	3	.	.	.	.	3	.	.	A	R
<i>Dendrocnide excelsa</i>	13	62	13	.	.	.	.	3	5	13	ANB	ERW
<i>Dendrocnide photinophylla</i>	6	15	11	.	.	.	.	3	3	4	AB	RW
<i>Elatostemma reticulatum</i>	2	15	.	.	.	.	.	.	.	4	B	EW
<i>Elatostemma stipitatum</i>	2	15	.	.	.	.	.	.	.	4	B	E
<i>Urtica incisa</i>	2	.	3	1	.	.	.	3	1	.	AB	RW
* <i>Urtica urens</i>	2	.	5	.	.	.	.	3	1	.	N	EJ
VERBENACEAE												
<i>Clerodendrum tomentosum</i>	13	.	24	4	.	.	.	6	4	13	ANB	BEGIJR
<i>Gmelina leichhardtii</i>	3	23	.	.	.	.	.	.	1	4	B	R
* <i>Lantana camara</i>	52	8	53	32	3	.	.	31	33	20	ANB	BDEFGJKLMNPQRSUVW
* <i>Verbena bonariensis</i>	4	.	.	4	.	.	.	6	2	.	AN	GMR
* <i>Verbena rigida</i>	H 2	.	.	2	.	.	.	3	1	.	NB	QU
VIOLACEAE												
<i>Hybanthus monopetalus</i>	9	.	5	5	6	.	.	3	9	.	NB	ADMOTV
<i>Hybanthus stellarioides</i>	55	.	16	49	9	.	.	43	34	16	ANB	ABDEGILMNQRSUVWY
<i>Hybanthus vernonii</i>												
subsp. <i>vernonii</i>	2	.	.	1	3	.	.	.	.	4	A	DM
<i>Hybanthus vernonii</i>												
subsp. <i>scaber</i>	H 4	.	.	1	9	.	.	.	3	2	ANB	B
<i>Viola betonicifolia</i>	18	.	.	19	.	.	.	17	9	7	ANB	BEIMRTW
<i>Viola hederacea</i>	H 22	.	32	11	.	.	.	14	11	13	ANB	BDEGIJMNW
VISACEAE												
<i>Notothixos incanus</i>	H 2	.	.	1	3	.	.	.	.	4	NB	FT
VITACEAE												
<i>Cayratia clematidea</i>	23	.	39	9	.	.	.	14	13	11	ANB	DEFGIJKMNPRW
<i>Cayratia euryneura</i>	3	8	5	.	.	.	.	.	3	.	AB	ER
<i>Cissus antarctica</i>	40	38	74	7	.	.	.	20	20	28	ANB	BEGIJKPRW
<i>Cissus hypoglauca</i>	33	46	55	6	.	.	.	20	13	26	ANB	BDEGIMRW
<i>Cissus opaca</i>	8	.	8	5	.	.	.	9	3	4	ANB	BDGJNPRS
<i>Cissus sterculiifolia</i>	5	23	3	1	.	.	.	.	3	4	NB	EKR
<i>Tetrastigma nitens</i>	13	31	18	2	.	.	.	6	5	11	ANB	ERW
WINTERACEAE												
<i>Tasmania insipida</i>	10	46	11	.	.	.	.	.	4	11	AB	EIRW
Class MAGNOLIOPSIDA - LILIIDAE												
AMARYLLIDACEAE												
<i>Proiphys cunninghamii</i>	2	.	3	1	.	.	.	.	.	4	B	W
ANTHERICACEAE												
<i>Arthropodium milleflorum</i>	5	.	.	5	.	.	.	6	2	2	NB	BEIMR
<i>Caesia parviflora</i>	3	.	.	1	6	.	.	.	3	.	AB	DO
<i>Laxmannia gracilis</i>	H 39	.	3	31	27	.	.	34	23	11	ANB	ADEFGMLMOPQSUVY
<i>Thysanotus tuberosus</i>	18	.	.	13	18	.	.	17	12	2	ANB	ABEGMORVY
<i>Tricoryne anceps</i>												
subsp. <i>pteroaulon</i>	H 2	.	.	.	6	.	.	.	1	2	AB	DG
<i>Tricoryne elatior</i>	H 27	.	.	19	24	100	.	11	17	13	ANB	ABDEFGMQTUY

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
ARACEAE												
<i>Alocasia brisbanensis</i>	9	38	8	.	.	.	50	3	4	7	ANB	ERW
<i>Gymnostachys anceps</i>	27	31	47	5	.	.	.	11	12	22	ANB	BDEGIJKMPRW
<i>Pothos longipes</i>	3	23	.	.	.	.	.	.	2	2	AB	R
ARECACEAE												
<i>Archontophoenix</i>												
<i>cunninghamiana</i>	15	23	32	.	.	.	.	9	4	15	ANB	BEIRW
<i>Linospadix monostachya</i>	17	77	16	1	.	.	.	3	8	17	ANB	EIKRW
<i>Livistona australis</i>	16	23	29	2	.	.	.	11	7	11	ANB	EORW
ASTELIACEAE												
<i>Cordyline petiolaris</i>	20	31	39	1	.	.	.	9	9	17	ANB	BEIJKPRW
<i>Cordyline rubra</i>	4	8	8	.	.	.	.	.	4	.	AN	KR
<i>Cordyline stricta</i>	20	8	37	5	.	.	.	11	9	15	ANB	BDEGIRVW
COLCHICACEAE												
<i>Burchardia umbellata</i>	1	.	.	.	3	.	.	.	1	.	B	O
<i>Iphigenia indica</i>	H +	.	.	+	.	.	.	+	+	+	B	BM
COMMELINACEAE												
<i>Aneilema acuminatum</i>	3	.	5	1	.	.	.	3	1	2	NB	EI
<i>Aneilema biflorum</i>	3	.	8	.	.	.	.	3	.	4	NB	ERW
<i>Commelina cyanea</i>	32	8	16	22	9	.	50	34	15	11	ANB	BDEFGJKLMPQRSUWY
<i>Murdannia graminea</i>	23	.	.	24	.	.	.	11	17	6	ANB	ADFGLMUVY
<i>Pollia crispata</i>	6	15	11	.	.	.	.	3	2	6	ANB	ERW
CYPERACEAE												
<i>Abildgaardia ovata</i>	1	.	.	1	.	.	.	3	.	.	N	Q
<i>Abildgaardia vaginata</i>	H 2	.	.	1	3	.	.	3	.	2	AB	DQ
<i>Baumea arthropophylla</i>	H 1	.	.	.	.	.	50	.	.	2	B	R
<i>Baumea articulata</i>	1	.	.	1	.	.	.	3	.	.	A	D
<i>Baumea juncea</i>	1	.	.	1	.	.	.	.	.	2	N	D
<i>Baumea rubiginosa</i>	H 2	.	.	1	.	.	50	3	.	2	AB	D
<i>Bolboschoenus fluviatilis</i>	1	.	.	.	.	.	50	.	.	2	B	R
<i>Carex breviculmis</i>	8	.	.	7	3	.	.	11	.	7	NB	EGICR
<i>Carex brunnea</i>	2	8	3	.	.	.	.	.	.	4	B	PR
<i>Carex declinata</i>	2	.	3	.	.	.	50	3	.	2	NB	JR
<i>Carex fascicularis</i>	1	.	.	.	.	.	50	.	.	2	B	R
<i>Carex hubbardii</i>	H 2	8	3	.	.	.	.	.	1	2	NB	PR
<i>Carex inversa</i>	4	.	.	4	.	.	.	6	2	.	ANB	EMR
<i>Chorizandra sphaerocephala</i>	1	.	.	.	.	.	50	.	.	2	B	D
<i>Cyperus cyperoides</i>	6	.	.	6	.	.	.	6	3	2	AN	BEQ
<i>Cyperus disjunctus</i>	H 8	23	13	.	.	.	.	9	2	6	ANB	EW
<i>Cyperus enervis</i>	H 8	.	13	3	.	.	.	9	1	7	ANB	EJPRW
<i>Cyperus exaltatus</i>	1	.	.	1	.	.	.	.	.	2	N	G
<i>Cyperus fulvus</i>	2	.	.	2	.	.	.	3	1	.	AN	MQ
<i>Cyperus gracilis</i>	H 10	.	13	5	.	.	.	11	4	4	ANB	JMQRU
<i>Cyperus laevis</i>	8	.	3	7	.	.	.	6	5	2	AB	BEUWY
<i>Cyperus leiocaulon</i>	2	.	.	2	.	.	.	.	2	.	A	B
<i>Cyperus mirus</i>	H 2	.	3	1	.	.	.	3	.	2	B	RW
<i>Cyperus polystachyus</i>	1	.	.	1	.	.	.	.	1	.	N	M
<i>Cyperus sanguinolentus</i>	1	.	.	1	.	.	.	.	1	.	N	D
* <i>Cyperus sesquiflorus</i>	2	.	.	2	.	.	.	.	2	.	N	MN
<i>Cyperus tetraphyllus</i>	9	31	11	1	.	.	.	3	3	9	ANB	KPRW
<i>Cyperus trinervis</i>	1	.	.	1	.	.	.	.	1	.	N	O
<i>Fimbristylis cinnamometorum</i>	4	.	.	2	6	.	.	3	3	.	AN	AE

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Fimbristylis dichotoma</i>	H 18	.	.	16	6	100	.	17	9	7	ANB	ABDEGMQSU
<i>Fimbristylis ferruginea</i>	6	.	.	6	.	.	.	7	.	.	A	ABM
<i>Fimbristylis velata</i>	1	.	.	1	.	.	.	1	.	.	N	D
<i>Gahnia aspera</i>	33	15	39	13	12	.	.	20	16	20	ANB	ABDEGLMPQRSVY
<i>Gahnia clarkei</i>	5	.	.	5	.	.	.	5	.	.	AN	DOTV
<i>Gahnia melanocarpa</i>	9	.	21	1	.	.	.	6	2	9	ANB	EIW
<i>Gahnia sieberiana</i>	14	.	.	7	21	.	.	9	9	6	NB	ABDGOV
<i>Lepidosperma elatius</i>	H 1	.	.	.	100	.	.	.	2	B	M	
<i>Lepidosperma filiforme</i>	1	.	.	1	.	.	.	.	1	.	N	M
<i>Lepidosperma gunnii</i>	H 2	.	.	.	6	.	.	3	.	2	NB	HT
<i>Lepidosperma laterale</i>	H 70	.	34	36	70	.	.	51	30	44	ANB	
ABDEGHILMOPQRSTVW												
<i>Lepidosperma urophorum</i>	1	.	.	.	3	.	.	3	.	.	N	T
<i>Lepironia articulata</i>	H 1	.	.	.	.	.	50	.	.	2	B	R
<i>Ptilothrix deusta</i>	8	.	.	2	18	.	.	6	3	6	NB	DEHOT
<i>Schoenoplectus validus</i>	H 1	.	.	.	.	.	50	.	.	2	B	R
<i>Schoenus ericetorum</i>	H 1	.	.	.	3	.	.	.	.	2	B	A
<i>Schoenus paludosus</i>	1	.	.	.	3	.	.	3	.	.	N	T
<i>Scleria mackaviensis</i>	5	.	.	5	.	.	.	3	2	4	NB	EMQUW
DIOSCOREACEAE												
<i>Dioscorea transversa</i>	17	15	39	.	.	.	.	11	7	13	ANB	BEJMPRW
FLAGELLARIACEAE												
<i>Flagellaria indica</i>	3	15	3	.	.	.	.	.	2	2	AB	R
HAEMODORACEAE												
<i>Haemodorum planifolium</i>	33	.	.	18	48	.	.	20	16	20	ANB	ABDEGHQTUVY
HYPOXIDACEAE												
<i>Curculigo ensifolia</i>	2	.	.	2	.	.	.	3	1	.	NB	FG
<i>Hypoxis hygrometrica</i>	6	.	.	6	.	.	.	6	4	.	AN	ABEMST
<i>Hypoxis hygrometrica</i> var. <i>villosisepala</i>	H 3	.	.	3	.	.	.	3	1	2	B	FU
IRIDACEAE												
<i>Patersonia fragilis</i>	1	.	.	.	3	.	.	.	.	2	N	T
<i>Patersonia glabrata</i>	17	.	3	9	24	.	.	14	7	11	ANB	ABDEMOTV
<i>Patersonia longifolia</i>	1	.	.	.	3	.	.	.	.	2	A	M
<i>Patersonia sericea</i>	H 23	.	.	4	58	.	.	6	12	19	ANB	ABDGHOQTV
JUNCACEAE												
<i>Juncus continuus</i>	2	.	.	2	.	.	.	.	1	2	AN	DV
<i>Juncus prismatocarpus</i>	1	.	.	1	.	.	.	.	.	2	N	G
<i>Juncus subsecundus</i>	2	.	.	2	.	.	.	6	.	.	AN	RS
<i>Juncus usitatus</i>	2	.	.	2	.	.	.	3	1	.	N	GR
LOMANDRACEAE												
<i>Lomandra confertifolia</i> subsp. <i>pallida</i>	H 4	.	.	2	6	.	.	.	2	4	AB	ADQR
<i>Lomandra filiformis</i>	H 65	.	24	41	52	.	.	31	41	30	ANB	ABDEFGHILMOPQRSTUVWY
<i>Lomandra gracilis</i>	1	.	.	1	.	.	.	.	.	2	N	D
<i>Lomandra laxa</i>	H 4	.	.	2	6	.	.	9	.	2	NB	QUY
<i>Lomandra longifolia</i>	69	.	34	55	12	.	.	43	40	31	ANB	BDEFGILMOQRSTUVWY
<i>Lomandra multiflora</i>	43	.	3	32	36	.	.	34	18	26	ANB	ABDEFGIMQRSTUVY
<i>Lomandra obliqua</i>	8	.	.	.	24	.	.	3	4	6	NB	ABGQV
<i>Lomandra spicata</i>	15	69	16	.	.	.	.	6	7	13	ANB	EIRW
LUZURIAGACEAE												
<i>Eustrephus latifolius</i>	88	.	47	66	24	.	.	66	51	33	ANB	ABDEFGHILMOPQRSTUVWY
<i>Geitonoplesium cymosum</i>	53	31	63	26	3	.	.	31	25	35	ANB	BDEFGIJKMNPQRSVY

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
ORCHIDACEAE												
<i>Acianthus exsertus</i>	H 2	.	.	2	.	.	.	.	4	B	I	
<i>Arthrochilus prolixus</i>	1	.	.	1	.	.	.	1	.	A	B	
<i>Bulbophyllum bracteatum</i>	+	+	.	.	.	.	.	.	+	B	R	
<i>Bulbophyllum exiguum</i>	8	23	11	1	.	.	.	2	11	AB	EIW	
<i>Calanthe triplicata</i>	3	8	5	.	.	.	.	1	4	NB	ERW	
<i>Caleana major</i>	1	.	.	.	3	.	.	1	.	B	Q	
<i>Chiloglottis diphylla</i>	H 3	.	5	1	.	.	.	3	1	2	B	BDG
<i>Corybas barbarae</i>	1	.	3	.	.	.	.	.	2	B	I	
<i>Corybas fimbriatus</i>	2	.	.	2	.	.	.	.	4	B	I	
<i>Cryptostylis subulata</i>	1	.	.	1	.	.	.	3	.	N	O	
<i>Cymbidium suave</i>	7	.	.	5	6	.	.	3	3	6	ANB	ADETVY
<i>Dendrobium aemulum</i>	5	.	11	1	.	.	.	2	6	ANB	BRW	
<i>Dendrobium fairfaxii</i>	3	8	5	.	.	.	.	1	4	B	BPW	
<i>Dendrobium gracilicaule</i>	8	23	11	1	.	.	.	3	2	9	ANB	EIRW
<i>Dendrobium kingianum</i>	2	.	3	1	.	.	.	2	.	B	BD	
<i>Dendrobium mortii</i>	1	.	3	.	.	.	.	.	2	B	I	
<i>Dendrobium pugioniforme</i>	3	15	3	.	.	.	.	1	4	B	E	
<i>Dendrobium schneiderae</i>	+	+	.	.	.	.	.	.	+	B	R	
<i>Dendrobium schoeninum</i>	3	23	.	.	.	.	.	.	6	B	RW	
<i>Dendrobium tarberi</i>	1	.	3	.	.	.	.	1	.	B	B	
<i>Dendrobium tetragonum</i>	3	15	3	.	.	.	.	1	4	B	BEW	
<i>Dipodium punctatum</i>	1	.	3	.	.	.	.	3	.	N	J	
<i>Diuris sulphurea</i>	1	.	.	1	.	.	.	.	2	B	I	
<i>Eriochilus cucullatus</i>	1	.	.	.	100	.	.	.	2	B	M	
<i>Plectorhiza tridentata</i>	7	23	8	1	.	.	.	3	7	ANB	BEFW	
<i>Pterostylis curta</i>	1	.	3	.	.	.	.	1	.	B	B	
<i>Pterostylis daintreana</i>	1	.	.	.	100	.	.	.	2	B	M	
<i>Pterostylis grandiflora</i>	1	.	3	.	.	.	.	.	2	B	I	
<i>Pterostylis hispidula</i>	H 2	.	.	2	.	.	.	.	4	B	I	
<i>Pterostylis longifolia</i>	2	.	.	2	.	.	.	.	4	B	I	
<i>Pterostylis nutans</i>	1	.	.	1	.	.	.	.	2	B	I	
<i>Rhinerrhiza divitiflora</i>	1	8	.	.	.	.	.	.	2	B	W	
<i>Sarcochilus falcatus</i>	1	8	.	.	.	.	.	.	2	B	R	
<i>Sarcochilus hillii</i>	1	.	3	.	.	.	.	1	.	B	B	
<i>Sarcochilus olivaceus</i>	1	8	.	.	.	.	.	.	2	B	E	
<i>Sarcochilus spathulatus</i>	1	.	3	.	.	.	.	.	2	B	I	
PETERMANNIACEAE												
<i>Petermannia cirrosa</i>	2	.	5	.	.	.	.	2	.	N	R	
PHILYDRACEAE												
<i>Philydrum lanuginosum</i>	3	.	.	2	.	.	50	3	1	2	ANB	DG
PHORMIACEAE												
<i>Dianella caerulea</i>	108	8	66	63	70	.	.	54	61	61	ANB	ABDEFGJLMOPQRSTUUVWY
<i>Dianella longifolia</i>	9	.	.	9	3	.	.	14	3	2	AN	BEQRS
<i>Dianella longifolia</i> var. <i>stenophylla</i>	H 2	.	.	1	3	.	.	3	.	2	B	FQ
<i>Dianella revoluta</i>	H 6	.	.	4	6	.	.	6	2	4	NB	BDOQU
<i>Stypantra glauca</i>	1	.	.	.	100	.	.	.	.	2	B	M
POACEAE												
<i>Alloteropsis semialata</i>	H 25	.	.	21	15	.	.	14	16	9	ANB	ABDEFGMLQUY
<i>Anisopogon avenaceus</i>	7	.	.	2	15	.	.	6	5	.	N	AEGMV

Species	Freq.	Broad floristic group						Logging			Obs	State Forests
		Tot.	Rf	Ws	Gf	Hf	Sh	Sw	L1	L2			UL
<i>Aristida acuta</i>	H 1	.	.	.	3	.	.	3	.	.	B	Q
<i>Aristida benthamii</i>	H 9	.	.	.	24	100	.	.	1	15	NB	ABGHMOQ
<i>Aristida calycina</i> var. <i>calycina</i>	12	.	.	9	12	.	.	9	5	7	AN	ABEGMQY
<i>Aristida calycina</i> var. <i>praealta</i>	H 1	.	.	.	3	.	.	.	.	2	B	E
<i>Aristida ramosa</i> var. <i>ramosa</i>	H 7	.	.	6	3	.	.	9	2	4	NB	EMQSU
<i>Aristida vagans</i>	55	.	.	49	27	.	.	40	35	17	ANB	ABDEFGLMQORSTUVY
<i>Aristida warburgii</i>	H 12	.	.	4	24	.	.	6	8	6	NB	ADGHOQT
* <i>Axonopus affinis</i>	H 5	.	.	5	.	.	.	3	4	.	ANB	DEFMU
<i>Bothriochloa decipiens</i>	H 6	.	.	6	.	.	.	6	3	2	ANB	EMQU
<i>Capillipedium spicigerum</i>	5	.	.	4	3	.	.	9	2	.	NB	EFLRS
<i>Cenchrus caliculatus</i>	2	.	3	1	.	.	.	.	2	.	N	PR
<i>Chionochloa pallida</i>	1	.	.	.	3	.	.	.	.	2	B	B
<i>Chloris ventricosa</i>	1	.	.	1	.	.	.	.	.	2	N	E
<i>Cymbopogon refractus</i>	H 71	.	.	60	42	100	.	46	45	26	ANB	ABDEFGLMQORSTUVY
<i>Cynodon dactylon</i>	2	.	.	2	.	.	.	.	2	.	N	GN
<i>Danthonia tenuior</i>	2	.	.	1	3	.	.	3	1	.	N	ST
<i>Deyeuxia reflexa</i>	H +	.	+	.	.	.	.	+	.	.	B	E
<i>Dichanthium setosum</i>	1	.	.	1	.	.	.	.	.	2	N	E
<i>Dichelachne micrantha</i>	H 19	.	.	17	9	.	.	14	14	2	ANB	ABDEGMQSU
<i>Digitaria breviglumis</i>	H 1	.	.	.	.	100	.	.	.	2	B	M
<i>Digitaria longiflora</i>	1	.	.	1	.	.	.	.	.	2	N	E
<i>Digitaria parviflora</i>	H 47	.	8	41	15	.	.	46	25	15	ANB	ABDEFGJLMQORSUY
<i>Digitaria ramularis</i>	H 3	.	.	2	3	.	.	3	1	2	B	FQU
<i>Digitaria</i> sp. aff. <i>oraria</i>	H 1	.	.	1	.	.	.	.	1	.	B	U
<i>Echinchloa telmatophila</i>	H 1	.	.	.	.	.	50	.	.	2	B	D
<i>Echinopogon caespitosus</i>	36	.	.	35	9	.	.	20	28	6	ANB	ABDFGMNOQRSVY
<i>Echinopogon ovatus</i>	2	.	.	2	.	.	.	.	1	2	NB	DI
<i>Enneapogon nigricans</i>	1	.	.	1	.	.	.	.	.	2	N	E
<i>Enteropogon unispiceus</i>	H 2	.	.	2	.	.	.	.	1	2	B	FL
<i>Entolasia marginata</i>	H 14	.	3	13	3	.	.	3	10	7	NB	DFGILMNQUWY
<i>Entolasia stricta</i>	105	.	18	71	91	100	.	57	65	46	ANB	ABDEFGHILMOQRSTUVWY
<i>Entolasia whiteana</i>	H 4	.	3	1	6	.	.	3	.	6	B	ADG
<i>Eragrostis benthamii</i>	12	.	.	10	9	.	.	6	9	4	AB	BFOQUY
<i>Eragrostis brownii</i>	H 6	.	.	3	6	100	.	6	1	6	NB	DMQY
<i>Eragrostis elongata</i>	H 3	.	.	3	.	.	.	6	.	2	NB	EFS
<i>Eragrostis leptostachya</i>	H 35	.	3	29	21	.	.	34	20	9	ANB	ABDEFGMOQSTUVY
<i>Eragrostis interrupta</i>	4	.	.	4	.	.	.	3	2	2	N	DMVY
<i>Eragrostis parviflora</i>	1	.	.	1	.	.	.	3	.	.	N	Q
<i>Eragrostis pubescens</i>	H 1	.	.	1	.	.	.	3	.	.	B	Y
<i>Eragrostis sororia</i>	2	.	.	1	3	.	.	.	2	.	N	AB
<i>Eragrostis spartinoides</i>	4	.	.	2	6	.	.	.	1	6	A	BM
<i>Eragrostis trachycarpa</i>	1	.	.	1	.	.	.	.	1	.	A	B
<i>Eremochloa bimaculata</i>	H 17	.	.	10	24	.	.	6	9	13	ANB	ABDEFGLOQUY
<i>Eriachne glabrata</i>	H 2	.	.	.	6	.	.	.	1	2	B	HO
<i>Eriachne pallescens</i>	H 2	.	.	.	6	.	.	.	1	2	NB	G
<i>Heteropogon contortus</i>	2	.	.	2	.	.	.	3	.	2	N	EQ
<i>Hyparrhenia filipendula</i>	1	.	.	1	.	.	.	.	.	2	N	E
<i>Imperata cylindrica</i> var. <i>major</i>	106	.	29	90	30	.	.	77	63	39	ANB	ABDEFGJLMNOPQRSTUWY
<i>Ischaemum australe</i>	6	.	.	5	3	.	.	6	4	.	AN	ADT
<i>Microlaena stipoides</i> var. <i>stipoides</i>	32	.	8	27	12	.	.	23	16	17	ANB	ABDEFGIMNORSUY
<i>Oplismenus aemulus</i>	51	8	34	38	3	.	.	43	26	22	ANB	BDEFGJLMNOPRSUY

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
	Freq.	13	38	94	33	1	2	35	92	54		
<i>Oplismenus imbecillus</i>	21	31	24	7	3	.	.	6	10	19	ANB	BDG:KMOPRUW
<i>Ottochloa gracillima</i>	5	8	5	2	.	.	.	3	1	6	AN	EGRW
<i>Panicum effusum</i>	H 21	.	.	17	15	.	.	26	11	4	ANB	ABEGMQSUY
<i>Panicum lachnophyllum</i>	1	.	3	.	.	.	.	.	.	2	B	P
<i>Panicum pygmaeum</i>	1	.	3	.	.	.	.	.	.	2	B	W
<i>Panicum simile</i>	H 51	.	.	40	39	.	.	29	29	26	ANB	ABDEFGHLMOQRSTUY
<i>Paspalidium aversum</i>	H 2	.	.	2	.	.	.	3	1	.	B	QY
<i>Paspalidium criniforme</i>	H 3	.	.	2	3	.	.	6	.	2	NB	EQ
<i>Paspalidium gausum</i>	1	.	.	.	3	.	.	.	1	.	N	A
<i>Paspalidium grandispiculatum</i>	H 2	.	3	.	3	.	.	3	.	2	B	DG
* <i>Paspalum ciliatifolium</i>	H 1	.	.	1	.	.	.	3	.	.	B	Y
<i>Paspalum distichum</i>	24	.	.	22	9	.	.	17	13	11	ANB	BDEFGHLMQOQV
<i>Paspalum orbiculare</i>	H 5	.	.	5	.	.	.	3	3	2	ANB	DMU
* <i>Paspalum scrobiculatum</i>	1	.	.	1	.	.	.	.	1	.	N	A
* <i>Paspalum urvillei</i>	2	.	.	2	.	.	.	3	1	.	N	GR
<i>Poa queenslandica</i>	H 3	.	3	2	.	.	.	.	3	.	NB	EM
<i>Poa labillardieri</i>	18	.	16	13	.	.	.	17	5	13	NB	EGJRW
<i>Poa sieberiana</i> var. <i>sieberiana</i>	9	.	8	6	.	.	.	3	8	2	AN	BMOPRW
<i>Sacciolepis indica</i>	4	.	.	3	3	.	.	.	3	2	N	ADOY
* <i>Sorghum halepense</i>	1	.	.	1	.	.	.	.	1	.	N	G
<i>Sorghum leiocladum</i>	21	.	5	20	.	.	.	17	11	9	ANB	BEGIJMPSRW
<i>Sporobolus creber</i>	H 2	.	.	2	.	.	.	.	2	.	AB	MU
<i>Sporobolus diander</i>	H 15	.	.	16	.	.	.	11	10	4	ANB	ABFGMQRSUY
<i>Sporobolus elongatus</i>	3	.	.	3	.	.	.	6	.	2	N	EQ
<i>Stipa puberula</i>	H 4	.	3	1	6	.	.	3	.	6	B	DG
<i>Stipa ramosissima</i>	H 1	.	3	.	.	.	.	.	.	2	B	W
<i>Stipa rudis</i> subsp. <i>nervosa</i>	3	.	.	.	9	.	.	.	1	4	B	ABQ
<i>Themeda australis</i> ABDEFGHLMOQRSTUY	H 92	.	.	73	70	.	.	69	50	41	ANB	
<i>Tripogon loliiformis</i>	H 1	.	.	.	100	.	.	.	.	2	B	M
<i>Vetiveria filipes</i>	H +	.	.	+	.	.	.	+	.	.	B	L
RESTIONACEAE												
<i>Hypolaena fastigiata</i>	H 1	.	.	.	3	.	.	.	.	2	B	H
<i>Leptocarpus tenax</i>	1	.	.	.	3	.	.	.	.	2	B	H
<i>Lepyrodia scariosa</i>	H 6	.	.	3	9	.	.	3	3	4	NB	DHOT
<i>Restio pallens</i>	H 1	.	.	.	.	.	50	.	.	2	B	D
<i>Restio tetraphyllum</i> subsp. <i>meiostachyus</i>	7	.	.	5	6	.	.	.	7	2	ANB	DH
RIPOGONACEAE												
<i>Ripogonum album</i>	1	.	3	.	.	.	.	.	1	.	A	R
<i>Ripogonum brevifolium</i>	3	8	5	.	.	.	.	.	1	4	B	BPR
<i>Ripogonum elseyanum</i>	10	38	13	.	.	.	.	9	3	7	ANB	ERW
SMILACACEAE												
<i>Smilax australis</i>	58	15	76	28	3	.	.	31	35	28	ANB	BDEGIJKMOPRTVW
<i>Smilax glycyphylla</i>	15	.	21	6	3	.	.	9	9	7	ANB	BDEIM
UVULARIACEAE												
<i>Tripladenia cunninghamii</i>	3	.	6	.	3	.	.	6	1	.	BN	ADE
XANTHORRHOEACEAE												
<i>Xanthorrhoea fulva</i>	1	.	.	.	3	.	.	.	.	2	B	H
<i>Xanthorrhoea glauca</i> subsp. <i>glauca</i>	H 7	.	5	4	3	.	.	3	1	9	B	EIU
<i>Xanthorrhoea johnsonii</i>	3	.	.	2	3	.	.	.	3	.	N	AFM

Species	Tot.	Broad floristic group						Logging			Obs	State Forests
		Rf	Ws	Gf	Hf	Sh	Sw	L1	L2	UL		
<i>Xanthorrhoea latifolia</i>												
subsp. <i>latifolia</i>	H 23	.	3	11	36	.	.	20	7	19	ANB	ABDEGMOQR
<i>Xanthorrhoea macronema</i>	1	.	.	1	.	.	.	.	.	2	A	M
<i>Xanthorrhoea malacophylla</i>	4	.	3	3	.	.	.	6	1	2	ANB	IRW
XYRIDACEAE												
<i>Xyris operculata</i>	7	.	.	5	6	.	.	.	7	2	N	ADY
ZINGIBERACEAE												
<i>Alpinia arundeliana</i>	1	.	3	.	.	.	.	3	.	.	B	D
<i>Alpinia caerulea</i>	16	15	29	3	.	.	.	14	8	7	ANB	DEJKRW
<p>The following records require confirmation. They are mostly of species which are beyond their formerly known range, but for which occurrence in CMA currently cannot be confirmed.</p>												
<i>Grevillea arenaria</i>	1	.	.	.	3	.	.	.	.	2	A	M
<i>Isotoma fluviatilis</i>	1	.	.	1	.	.	.	3	.	.	A	D
<i>Lomandra glauca</i>	1	.	.	1	.	.	.	.	1	.	N	B
<i>Melaleuca viridiflora</i>	1	.	.	1	.	.	.	.	1	.	A	V
<i>Melichrus erubescens</i>	1	.	.	.	3	.	.	.	1	.	N	V
<i>Parsonsia species B</i>	2	.	3	.	3	.	.	3	.	2	N	JT
<i>Persoonia conjuncta</i>	1	.	.	1	.	.	.	.	1	.	N	T
<i>Persoonia lanceolata</i>	1	.	.	1	.	.	.	3	.	.	A	R
<i>Sida goniocarpa</i>	1	.	.	1	.	.	.	.	1	.	N	D
<i>Thysanotus jncifolius</i>	2	.	.	1	3	.	.	.	1	2	A	D
<i>Xanthorrhoea arborea</i>	1	.	.	1	.	.	.	.	1	.	N	D
<i>Xanthorrhoea media</i>	4	.	.	2	6	.	.	.	4	.	N	BGM
<i>Xanthorrhoea resinosa</i>	2	.	.	.	6	.	.	.	1	2	A	D

APPENDIX 2

SUMMARY OF MAJOR SITE FEATURES OF FLORA SURVEY PLOTS

Date is given as YYYYMMDD. SF is State Forest, coded as: Ban=Banyabba, Bel=Mount Belmore, Bil=Billilimba, Bra=Braemar, Bun=Bungawalbin, Cam=Camira, Che=Cherry Tree, Dev=Devils Pulpit, Dou=Doubleduke, Ell=Ellangowan, Ewi=Ewingar, Gib=Gibberagee, Mar=Mount Marsh, Mor=Mororo, Myr=Myrtle, Nev=Mount Neville, Pik=Mount Pikapene, Ric=Richmond Range, Roy=Royal Camp, Sug=Sugarloaf, Tab=Tabbimoble, Was=Washpool, Whi=Whiporie; CL=leasehold tenure, BNP=Bundjalung NP, NNR=Mount Neville NR, WNP=Washpool NP. Plots with NCA prefix were surveyed by Austeco, NCNP prefix by NEFBS (NPWS), others by Binns.

Altitude (Alt) is in metres. Lith. is lithology (parent material) coded: Av = acid volcanic, Bi = Basic igneous, Gr = granitic, Qa = Quaternary alluvium, Sh = sedimentary, high quartz, Sl = sedimentary, low quartz, Sq = quartz sandstone. MFT is mapped Forest Type from Forestry Commission of NSW (1989).

Fire and logging histories are field estimates, coded as: first digit - intensity (1 low to 3 high); digits 2-3 = age in years; digits 4-5 = accuracy, +/- years, 9 = fire or logging history indeterminate.

CASov and CASf are overstorey and floristic communities respectively, as described in the text.

Plot	Date	AMGE	AMGN	SF	Alt	Lith	MFT	Fire	Log.	CASov	CASf
NCA00004		521560	6775335	Dou	.	Ss	38	20101	90000	31	1
NCA00005		522230	6771725	Dou	.	Ss	38	20201	90000	30	7
NCA00006		519760	6767315	Dou	.	Ss	38	20301	12505	27.2	1
NCA00007		515890	6766925	Dou	.	Qa	92	10101	30201	35	9
NCA00008		516575	6766000	Dou	.	Qa	41	10301	31505	26	17
NCA00009		516575	6761265	Dev	.	Ss	74	10201	21505	26	17
NCA00010		522170	6761760	Dev	.	Sl	76	10701	21505	24.3	8
NCA00011		472700	6829445	Ric	.	Sl	71a	90000	33000	21.5	12
NCA00013		470705	6830000	Ric	.	Ss	65	10401	20505	17.2	12
NCA00014		477270	6824410	Ric	.	Sl	71b	12005	11505	21.4	12
NCA00015		472595	6821385	Ric	.	Sl	48	10101	33000	12	27
NCA00016		474126	6816475	Ric	.	Bi	1	90000	11505	1	37
NCA00017		474035	6813150	Ric	.	Bi	48	90000	31505	13	33
NCA00018		474475	6812380	Ric	.	Bi	65	30101	20505	39.2	13
NCA00019		472885	6809105	Ric	.	Sl	21	30101	33000	8	37
NCA00020		476070	6774435	Bel	.	Ss	36	31005	21505	27.1	29
NCA00021		476845	6773750	Bel	.	Ss	41	13000	13000	28.2	2
NCA00023		481320	6767870	Mar	.	Sl	74b	20201	90000	28.1	16
NCA00024		482650	6768225	Mar	.	Ss	41	30001	90000	29.3	2
NCA00025		480100	6764980	Mar	.	Sl	37a	20001	90000	27.2	7
NCA00026		485450	6766050	Mar	.	Ss	62	10301	90000	28.1	16
NCA00027		445765	6781365	Ewi	.	Gr	47	22500	32505	14.1	34
NCA00028		444085	6779485	Ewi	.	Gr	53	21500	31505	14.3	34
NCA00029		445430	6779975	Ewi	.	Gr	11	90000	22505	3	38
NCA00030		446945	6779105	Ewi	.	Av	47	90000	30501	14.1	34
NCA0012A		470770	6832090	Ric	.	Ss	48	90000	20101	12	33
NCA0012B		471450	6831560	Ric	.	Ss	47a	90000	23000	16	33
NCA0022A		476130	6771880	Bel	.	Ss	41	21500	22505	27.1	2
NCA0022B		476220	6771720	Bel	.	Ss	37a	20201	20505	27.2	2
NCA0031B		442200	6760830	WNP	.	Sl	46	23005	90000	13	35

Plot	Date	AMGE	AMGN	SF	Alt	Lith	MFT	Fire	Log.	CASov	CASf
NCA0031C		443100	6761790	Was	.	Sl	62	22005	90000	17.2	30
NCA0031D		442520	6761925	Was	.	Sl	53	30001	90000	13	35
NCA0CL35		476685	6777590	Bel	.	Ss	37a	10101	13005	27.1	8
NCA0CL36		476150	6777175	Bel	.	Ss	37a	10101	13005	22.2	8
NCABAN30		496500	6749335	Ban	.	Sl	74	10201	13000	24.2	8
NCABAN31		499530	6749750	Ban	.	Sl	74	10201	13000	24.2	8
NCABAN32		500550	6749045	Ban	.	Sl	74	10100	11505	24.2	8
NCABAR37		473010	6773475	Bel	.	Ss	37a	10101	32005	27.1	8
NCABAR38				Bel	.					27.1	.
NCAWHP33		485050	6758035	Mar	.	Sl	72	10100	21505	21.4	9
NCBAN001	19940302	494930	6752050	Ban	140	Sl	97	10201	00000	28.2	2
NCBAN002	19940302	496030	6750650	Ban	110	Sl	39	10201	00000	24.2	2
NCBEL001	19940131	472900	6784730	Bel	190	Sl	87	12510	26010	38	28
NCBEL002	19940131	473930	6782580	Bel	480	Ss	234	20201	00000	27.1	2
NCBEL003	19940302	477300	6772630	Bel	240	Ss	234	10502	00000	27.2	2
NCBEL004	19940415	475180	6773750	Bel	180	Ss	49/53	11505	13510	13	36
NCBIL001	19940222	440080	6767450	Bil	840	Av	136	10401	11503	40	26
NCBIL002	19940412	429400	6760650	Bil	920	Av	47a	22505	00000	14.3	34
NCBIL003	19940412	431330	6761450	Bil	870	Av	163b	11203	00000	14.3	14
NCBIL004	19940412	430330	6762230	Bil	900	Sl	62a	20201	00000	14.3	14
NCBIL005	19940412	434380	6762950	Bil	880	Av	47a	12505	00000	14.3	34
NCBIL006	19940412	433430	6763830	Bil	730	Av	62a	10301	00000	17.2	14
NCBIL007	19940412	435330	6763680	Bil	900	Av	163a	12505	00000	40	34
NCBRA001	19940301	501850	6788900	Bra	20	Qa	80	11005	21505	19.2	10
NCBRA002	19940301	502500	6789880	Bra	20	Qa	80	10301	00000	19.2	10
NCBUN001	19940226	515050	6780530	Bun	5	Qa	84/126	10201	25010	19.1	10
NCBUN002	19940226	514980	6783200	Bun	20	Sl	84/119	30201	00000	17.2	11
NCBUN003	19940226	511350	6783300	Bun	40	Sl	70/74	10200	10201	24.3	8
NCBUN004	19940226	510080	6783900	Bun	30	Sl	82	10301	24010	19.2	10
NCBUN005	19940226	511780	6785950	Bun	30	Sl	40/41	10401	24010	27.1	8
NCDOU001	19940227	520750	6771150	Dou	30	Ss	128	20301	00000	24.1	23
NCDOU002	19940227	520030	6772280	Dou	10	Qa	32	20301	14010	35	20
NCDOU003	19940227	517550	6769530	Dou	10	Qa	60	10401	20803	15	36
NCDOU004	19940227	516880	6768080	Dou	100	Qa	231	00000	00000	.	41
NCELL001	19940301	501900	6788100	Ell	30	Sl	85	11005	21505	19.1	10
NCEWI001	19940222	442750	6767080	Ewi	910	Gr	2/3	00000	22005	38	38
NCEWI002	19940222	441200	6764930	Ewi	950	Av	23/26	00000	00000	6	38
NCEWI003	19940223	446700	6781930	Ewi	650	Gr	163b	10401	10301	22.1	13
NCEWI004	19940223	446200	6777650	Ewi	560	Gr	2/3	00000	00000	2	38
NCEWI005	19940223	444470	6675330	Ewi	710	Sl	11	00000	00000	5	38
NCEWI006	19940223	443380	6774700	Ewi	850	Gr	2/3	00000	00000	4	38
NCEWI007	19940224	442780	6782600	Ewi	740	Gr	234	10301	00000	27.1	2
NCEWI008	19940224	444430	6770580	Ewi	710	Av	163	12505	00000	40	34
NCGIB001	19940228	507300	6750010	Gib	130	Ss	97	10201	00000	25.3	2
NCGIB002	19940228	507430	6750950	Gib	190	Ss	234	20301	00000	25.3	2
NCGIB003	19940228	509800	6755280	Gib	40	Sl	60	10502	00000	22.1	12
NCMAR001	19940414	478680	6763080	Mar	430	Av	234	00000	00000	.	39
NCMOR001	19940227	524150	6757830	Mor	30	Sl	40/41	30401	21203	30	5
NCMYR001	19940301	497350	6772750	Myr	40	Sl	83	20301	14010	19.1	10

Plot	Date	AMGE	AMGN	SF	Alt	Lith	MFT	Fire	Log.	CASov	CASf
NCMYR002	19940301	498530	6771800	Myr	30	Qa	130	10100	20200	22.2	8
NCNP1009	19921214	527000	6759500	BNP	20	Sl		30400	23010	33	8
NCNP1010	19921214	527000	6760200	BNP	20	Sl		20300	20301	33	8
NCNP1011	19921214	528700	6763800	BNP	5	Qs		10300	00000		24
NCNP1012	19921215	515800	6765600	Tab	25	Qa		10502	00000	30	5
NCNP1013	19921215	523900	6768300	Tab	25	Sl	41	20502	23010	27.1	8
NCNP1014	19921215	521700	6767400	Tab	30	Sl	74	10502	24010	21.2	23
NCNP1015	19921215	518100	6766000	Dou	30	Qa	36	20201	33010	16	36
NCNP1016	19921216	517000	6766000	Dou	15	Qa	41/92	20301	24010	27.1	17
NCNP1017	19921216	515800	6765600	Dou	10	Qa		30201	22010	39.1	25
NCNP1018	19921221	479400	6766800	NNR	480	Ss		10200	15020	27.2	2
NCNP1019	19921221	479900	6767400	NNR	285	Ss		10200	00000	27.1	2
NCNP1020	19921221	480500	6767900	NNR	260	Ss		10200	13030	15	36
NCNP1021	19921222	479900	6766300	Mar	420	Ss		10502	14020	27.1	7
NCNP1022	19921222	480300	6765400	Mar	330	Ss	37a	20402	14020	25.2	7
NCNP1023	19921222	480200	6764400	Mar	235	Sl	62/74a	10502	14040	13	36
NCNP1024	19921222	480600	6764100	Mar	260	Sl	36	10502	24020	21.4	12
NCNP1025	19921222	481300	6763400	Mar	275	Sl	41/92	10402	24020	21.4	12
NCNP1026	19921222	480900	6762600	Mar	190	Sl	30/31/9	20402	24020	21.1	12
NCNP1096	19930217	497600	6786800	Bra	50	Sl	31/92	10200	33020	39.1	8
NCNP1097	19930217	497800	6786600	Bra	50	Sl	85	20101	32020	23	10
NCNP1098	19930217	473400	6790600	Pik	280	Sl	72a/74a	00000	25020	23	29
NCNP1099	19930217	472000	6791100	Pik	300	Sl	71	10502	24030	21.4	29
NCNP1100	19930218	470300	6790900	Pik	300	Sl	87	00000	23020	38	29
NCNP1101	19930223	498300	6772900	Myr	30	Sl	130	20201	31020	30	8
NCNP1102	19930223	487600	6767400	Mar	180	Sl	62/74b	20301	32030	18	8
NCNP1103	19930223	474000	6770600	Bel	360	Sl	74a	10201	23030	21.4	12
NCNP1104	19930223	473700	6775500	Bel	450	Ss	41/97	20201	12020	25.2	2
NCNP1105	19930224	476400	6770500	Bel	470	Ss	62/74a	20301	22020	21.1	13
NCNP1106	19930224	497700	6749400	Ban	50	Sl	65/126	20401	12030	30	3
NCNP1107	19930224	497900	6749400	Ban	40	Sl	65/126	20201	15030	30	3
NCNP1110	19930304	507900	6752500	Gib	250	Ss	41/97	20502	22015	25.3	2
NCNP1111	19930304	506600	6758200	Gib	60	Sl	92/126	20503	34030	23	8
NCNP1112	19920304	510400	6759700	Gib	60	Sl	92	10301	25030	39.2	9
NCNP1113	19930304	510800	6764700	Gib	40	Sl	92/126	10502	34040	22.1	8
NCNP1114	19930305	520600	6777900	Gib	70	Ss	129	20301	13030	30	8
NCNP1115	19930305	518000	6774000	Dou	20	Ss	129	30201	12020	30	6
NCNP1116	19930305	518600	6766700	Dou	50	Ss	36	20302	24040	26	17
NCNP1117	19930305	516600	6765800	Dou	20	Qa	41	30201	33030	26	17
NCNP1118	19930305	516100	6766100	Dou	20	Qa	92	20201	14040	37	19
NCNP1119	19930310	501400	6751500	Ban	90	Sl	76	20502	32030	30	8
NCNP1120	19930310	497400	6786800	Bra	50	Sl	31/92	10301	32030	23	8
NCNP1121	19930310	502500	6770800	Myr	30	Sl	72/74	10201	32010	24.3	10
NCNP1122	19930316	518400	6763700	Dev	130	Ss	126	20201	22020	25.3	2
NCNP1123	19930316	519400	6762800	Dev	220	Ss	97	20201	22020	25.2	2
NCNP1124	19930316	529700	6771700	Tab	30	Sh	119	20301	13020	33	8
NCNP1125	19930317	524000	6755800	Mor	30	Sl	62/126	20201	32040	21.3	8
NCNP1126	19930317	523800	6757400	Mor	30	Sl	119	20201	22030	33	5
NCNP1127	19930317	524300	6756700	Mor	40	Sl	62/126	20201	20503	30	8

Plot	Date	AMGE	AMGN	SF	Alt	Lith	MFT	Fire	Log.	CASov	CASf
NCNP1128	19930317	529600	6771100	Tab	20	Sh	129	30301	20503	22.2	5
NCNP1129	19930324	502400	6754500	Gib	90	Sl	72/74	20100	33030	24.1	8
NCNP1130	19930324	506900	6753500	Gib	240	Sl	84	20100	21010	29.3	8
NCNP1131	19930324	507100	6753600	Gib	230	Ss	84	20100	31010	29.2	8
NCNP1132	19930324	508800	6762700	Gib	40	Sl	62	20502	23030	21.5	8
NCNP2001	19921221	460900	6799900	Sug	180	Sl	72/74a	20602	21005	23	4
NCNP2002	19921220	461400	6799400	Sug	150	Sl	65	20502	20503	39.2	9
NCNP2003	19921221	463500	6799300	Sug	210	Sl	72/74b	20603	11005	21.4	13
NCNP2004	19921222	475400	6799400	Che	380	Ss	71	21003	21505	21.3	29
NCNP2005	19921222	474900	6799200	Che	320	Sl	65/85	21005	00000	39.2	29
NCNP2006	19921222	475800	6799800	Che	380	Ss	48	10201	10201	12	32
NCNP2007	19921222	475700	6801500	Che	370	Bi	71a	25020	00000	21.2	29
NCNP2008	19921223	474400	6810700	Ric	300	Sl	71b	21003	20804	21.2	12
NCNP2009	19921223	474600	6811800	Ric	450	Bi	65	10503	10503	39.2	13
NCNP2010	19921223	474300	6810400	Ric	210	Sl	53b	11005	11505	21.5	29
NCNP2011	19921223	474700	6813400	Cam	560	Bi	46a	12010	22010	13	35
NCNP2012	19921224	474700	6812500	Ric	450	Bi	47b	21005	21505	21.5	13
NCNP2013	19921224	473700	6809400	Ric	220	Sl	48	11505	22005	12	35
NCNP2014	19921224	474000	6810600	Ric	280	Sl	71a	21205	21505	21.1	29
NCNP2027	19930120	470400	6828200	Ric	420	Ss	71b	10101	10603	21.1	12
NCNP2035	19930126	437800	6771200	CL	320	Gr	62b	10201	11030	36	13
NCNP2036	19930126	439500	6769700	Ewi	520	Gr	62b	20502	10503	36	13
NCNP2037	19930127	450900	6779600	Ewi	490	Av	74b	10205	21030	21.1	13
NCNP2038	19930127	448100	6778700	Ewi	740	Av	47b	10510	11030	17.1	34
NCNP2039	19930127	443500	6782800	Ewi	650	Gr	37a	10205	11030	16	7
NCNP2040	19930127	443600	6780900	Ewi	710	Gr	37b	10201	20510	27.1	5
NCNP2041	19930128	439300	6769300	Ewi	550	Gr	53	18050	22030	13	34
NCNP2042	19930128	445400	6771200	Ewi	620	Sl	53	15030	00000	14.2	34
NCNP2043	19930129	447000	6770400	Ewi	540	Sl	47b	11005	20510	14.2	34
NCNP2044	19930129	451500	6772700	Ewi	370	Gr	207	10101	00000	20.1	15
NCNP2045	19930129	450900	6770800	Ewi	150	Gr	62b	10101	11005	20.1	15
NCNP2079	19930329	491300	6792000	Roy	70	Ss		10502	10201	19.2	10
NCNP2080	19930329	458300	6806800	CL	90	Qa		13020	39950	.	.
NCNP2081	19930329	469700	6828500	Ric	420	Bi		10201	21005	21.3	14
NCNP2095	19930414	487600	6797300	SF	150	Ss		10703	11005	.	4
NCNP2096	19930414	484000	6793300	Roy	200	Ss		10502	00000	27.1	4
NCNP7004	19930318	522200	6755300	Mor	30	Sl	39	10601	12005	24.2	8
NCNP7005	19930318	523300	6763200	Dev	20	Qa	40/41	20205	11005	27.2	8
NCNP7006	19930318	529700	6772900	CL	10	Sh	31	10505	00000	25	21
NCNP7007	19930319	536200	6751100	BNP	25	Sl	na	13005	00000	.	.
NCNP7008	19930319	530600	6772000	CL	20	Sh	30/31	10302	00000	26	17
NCNP7009	19930325	509800	6768100	Gib	18	Qa	mof	00000	00000	39.1	22
NCNP7010	19930325	512900	6768300	Dou	20	Qa	74	20201	12005	21.5	8
NCNP7011	19930325	518800	6770700	Dou	30	Ss	92	20505	00000	39.1	21
NCNP7012	19930326	531200	6752600	BNP	3	Qs	mof	20505	00000	.	18
NCNP7013	19930326	526900	6773900	Dou	30	Sl	31	10301	00000	34	18
NCNP7014	19930326	498300	6772800	Myr	40	Sl	130	30205	00000	32	8
NCNP7015	19930330	485200	6757700	Mar	135	Sl	85	10201	12525	39.1	9
NCNP7016	19930330	481500	6774300	Nev	95	Qa	na	20502	12030	39.1	9

Plot	Date	AMGE	AMGN	SF	Alt	Lith	MFT	Fire	Log.	CASov	CASf
NCNP7017	19930402	477800	6774700	Bel	300	Ss	37a	20301	31005	27.1	.
NCNP7020	19930408	474000	6777000	Bel	480	Ss	39b	10201	32510	27.1	.
NCPIK001	19940131	472130	6790330	Pik	310	Sl	87	12005	00000	38	28
NCPIK002	19940131	469250	6788550	Pik	270	Sl	21	00000	00000	10	28
NCRIC004	19940129	472730	6830480	Ric	360	Sl	231	00000	00000	.	40
NCRIC005	19940129	474200	6827450	Ric	490	Bi	51	11505	10201	11	33
NCRIC006	19940129	474230	6821630	Ric	300	Sl	21	00000	00000	7	37
NCRIC007	19940130	472880	6815100	Ric	550	Bi	19	00000	00000	7	37
NCRIC008	19940130	473880	6812450	Ric	500	Bi	19	00000	14010	2	38
NCROY001	19940130	486130	6797800	Roy	130	Ss	38	20602	23010	25.1	2
NCROY002	19940225	483900	6789250	Roy	110	Ss	126	20301	20100	29.2	4
NCROY003	19940225	484680	6789850	Roy	150	Sl	234	10301	00000	29.1	2
NCWAS001	19940224	450300	6760080	Was	320	Sl	23	00000	00000	9	28
NCWAS002	19940224	450230	6760780	Was	400	Sl	60	31203	00000	17.2	31
NCWAS003	19940224	450250	6761350	Was	420	Sl	80	10100	00000	19.1	12
NCWAS004	19940225	445280	6758900	Was	420	Sl	70/74	21203	22005	17.1	14
NCWAS005	19940225	444830	6759180	Was	400	Sl	23/26	00000	00000	2	38
NCWHP001	19940228	504700	6766380	Whi	20	Qa	117	20201	00000	33	6
NCWHP002	19940228	504480	6765230	Whi	20	Qa	117	20201	00000	33	6