THE CONSERVATION OF ORIGINAL VEGETATION REMNANTS IN THE MIDLANDS, TASMANIA

by R. J. Fensham and J. B. Kirkpatrick

(with two tables, three text-figures and an appendix)

FENSHAM, R.J. & KIRKPATRICK, J.B., 1989 (31:x): The conservation of original vegetation remnants in the Midlands, Tasmania. *Pap. Proc. R. Soc. Tasm.* 123: 229–246. https://doi.org/10.26749/rstpp.123.229
ISSN 0080-4703. Department of Geography and Environmental Studies, University of Tasmania, GPO Box 252C, Hobart, Australia 7001.

Following 180 years of agricultural settlement, the Midlands area of Tasmania has been drastically transformed and 83% of the original area of native vegetation has been replaced. By comparing information from two recent intensive floristic surveys with historical botanical records, it was determined that 11.8% of the higher plant flora has vanished. With current rates of change and land tenure, it is probable that further extinctions will occur in this environment. Grazing was found to increase significantly native species richness on loams and clays, although the same relationship was not evident on sandy soils. The management of grassy remnants should include regular burning and/or grazing as a means of intermittently depleting the grass sward. Many herbaceous exotics are habitat specific, and it is suggested that their passive spread is not an immediate threat to native vegetation on well-drained land. The long-term viability of native vegetation may, however, necessitate the implementation of simple management programs designed to maintain native species diversity and to minimise the spread of the more vigorous woody exotics.
Key Words: grassy vegetation, species richness, grazing, burning, exotics, Tasmanian Midlands, conservation, extinction.

THE CURRENT STATUS OF MIDLANDS VEGETATION

The Midlands area of Tasmania (fig. 1) was one of the first areas developed for agriculture in Australia and, since the early part of last century, the area has been radically transformed (Kirkpatrick *et al.* 1988: 17–21). Today, a vast expanse of cultivated ground extends to the base of the surrounding escarpments. Plant communities and species that were restricted to these agriculturally desirable habitats are now confined to scattered refugia that have accidentally avoided destruction. In the period from European settlement to 1985, native vegetation was reduced to 16.9% of its original area (fig. 2). With current rates of change, virtually all of the remaining vegetation of the Midlands could be destroyed by forestry and agricultural exploitation; 99.3% of land is privately owned.

The Midlands form a natural landscape unit, defined by its mountainous borders, low altitudes, dry climate, broad fertile river valleys and plains. As well as prime agricultural land, it contains dissected dolerite hills and ancient lateritised surfaces. Fensham (1989) identified 14 terrestrial plant communities that are derived from five gross formations, identifiable by their structure or overstorey dominants. These formations are *Eucalyptus amygdalina* forest, *E. viminalis* woodland, *E. pauciflora* woodland, *E. ovata* woodland and *Poa labillardieri* tussock grassland.

Specht (1981) identified the savannah woodlands of temperate southeastern Australia as one of seven major plant formations virtually absent from Australia's reserve network. Surveys of Tasmania's dry forests and grassy ecosystems (Duncan & Brown 1985, Kirkpatrick *et al.* 1988) have found all of the major dryland Midlands communities, with the exception of *E. viminalis* woodlands, to be poorly reserved or unreserved.

Most of the Midlands consisted of sparsely wooded plains dominated by *E. pauciflora* and/or *E. ovata*. These formation survive only in very small areas and are extremely vulnerable to further landscape change. Many roadside remnants continue to be damaged or destroyed by road widening, rerouting and herbicide spraying. In 1985, the Campbell Town cemetery was in excellent native condition and represented one of the last woodland remnants on basalt soils. However, recent "clean up" attempts have excised half of its area into the adjoining paddock, poisoned much of the remainder and disturbed the ground, destroying one of the three known populations of one of Australia's rarest plant species *Colobanthus* aff. *strictus*.

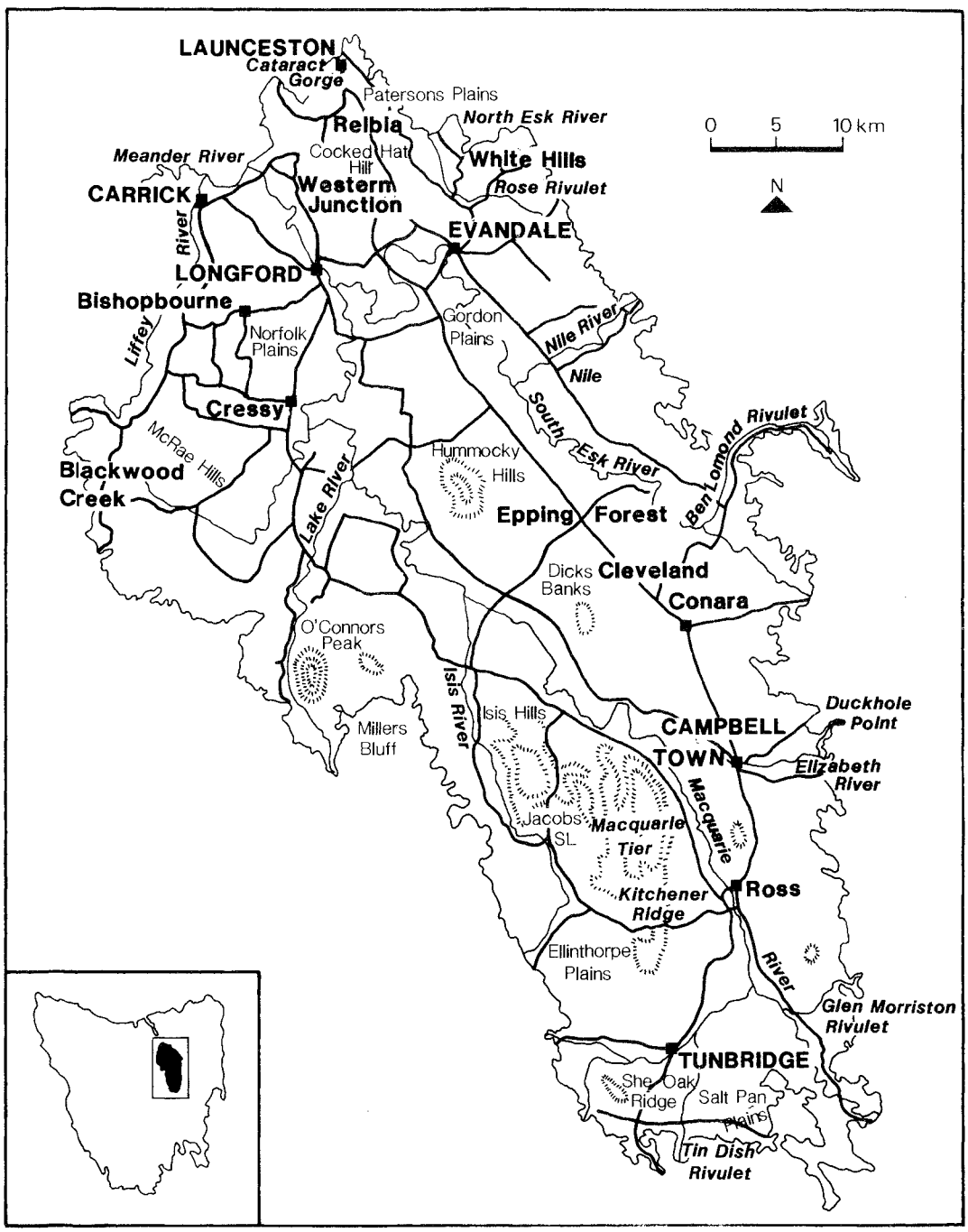

FIG. 1 — Locality map.

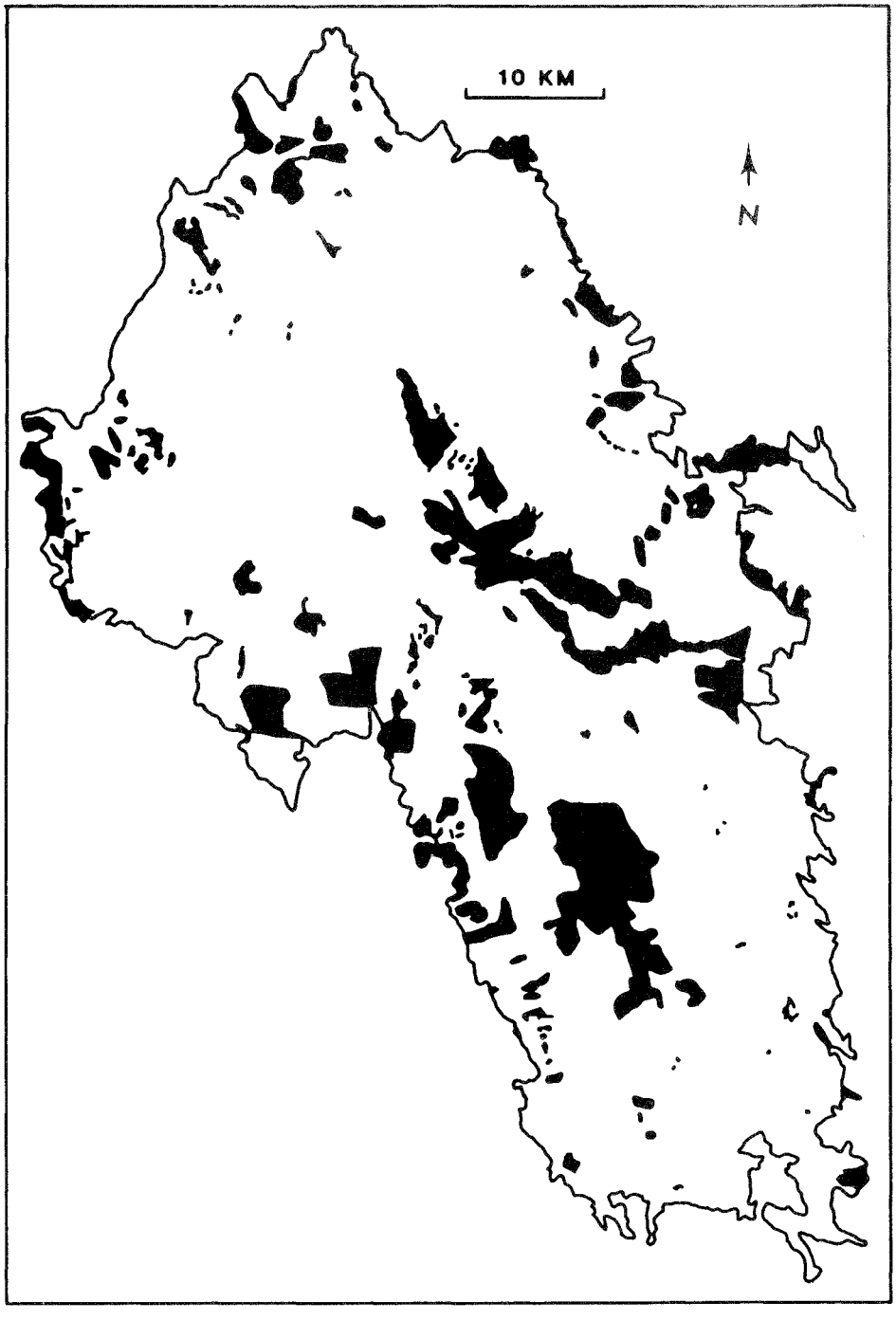

FIG. 2 — Native vegetation remnants, including regenerated clearfell coupes and native pasture with depleted overstoreys; c. 1988.

Eucalypus amygdalina forest covered large areas of the Midlands on poorer soils. However, in recent decades it has been rapidly cleared (fig. 2). The grasslands of the river flats have all been cultivated, with the exception of a small area on the Macquarie River surrounded by steep rocky banks, and a few fragments heavily invaded by exotics. The number of extinct Midlands plant species that were known only from such habitats (appendix) suggests that the full range of these communities has not survived.

The riparian shrub communities are still relatively intact on the edges of the study area at the Macquarie and Elizabeth Rivers and Cataract Gorge. Apart from these peripheral areas riparian communities have virtually disappeared, with the exception of a few small fragments in moderately grazed or rocky situations. The riparian habitat seems particularly susceptible to invasion by woody weeds, especially gorse (*Ulex europaeus*) and willows (*Salix alba*), and the native communities have probably been eliminated by grazing.

The aquatic communities still have apparently original complements of native plants as well as many exotic taxa. There is no evidence of the eutrophication that has so seriously affected waterways of intensively cultivated areas in other parts of the world.

Thirty-four per cent of the area under wetlands has been drained, while a further 23% has been affected by artificial changes of water level (fig. 3). Most of the wetlands have suffered from drainage attempts, although Smiths Lagoon (wetland no.30) has been impounded and Bar Lagoon (wetland no.42) has deepened as a result of increased runoff following clearance and gravel scraping in nearby Verwood Forest (G. Dowling, pers. comm. 1986). Of the remaining wetlands, the infrequently inundated margins are susceptible to exotic invasion following disturbance by introduced grazing animals. Many of these communities have depleted native species complements and are dominated by the exotic herb *Plantago coronopus*.

A search of botanical records and herbarium collections (see appendix for these references) revealed the native species that have been recorded from the Midlands; those not found at these localities in the course of the surveys of Fensham (1989) and Kirkpatrick & Harwood (1983a,b) are indicated. Where possible, the localities of old records were checked for evidence of the existence of a plant species. However, most old records refer to localities where the chances of finding native species is slight, such as R.C. Gunn's collections from *Penquite* — now a part of suburban Launceston (Gunn 1842). Some ephemeral species, particularly orchids, may still be present in the Midlands. Herbarium collections marked with the general locality "Launceston" were not included, as they may have occurred outside the study area. Based on this estimate, 59 of the 499 higher native plant species recorded from the Midlands are extinct. Full details of these historical records can be found in Fensham (1985).

Apart from the Orchidaceae, most of the extinct species were associated with riverine habitats — an indication of the degree of native vegetation displacement in these environments. *Deyeuxia lawrencii*, *Goodenia amplexans*, *Isoetes drummondii*, *Myriophyllum glomeratum*, *Prostanthera cuneata* and *Senecio macrocarpus* may now be extinct in Tasmania, although the record for the *Goodenia amplexans* may refer to a collection in the Melbourne Herbarium marked "Nile Rivulet", which could be a mainland locality. Temporary displacement of aquatic species has been documented for both lentic (Holmes & Whitton 1977) and lotic water (Millar 1973) and, given that not all waters were thoroughly surveyed, it is probable that the aquatic species *Trithuria submersa* and *Utricularia australis* still occur in the Midlands. *Chenopodium pumilio* and *Euphrasia scabra* have been germinated recently from soil collected near Ross (L. Gilfedder, pers. comm. 1988), although these annuals have not been observed in the field.

It is unlikely that the full range of plant communities in the Midlands has survived. Dimmock & Loveday (1953) described a hummocky complex north of Campbell Town as a "complex of low mounds and self-mulching depressions". This is physically comparable to the gilgai complex described by Leeper (1952). The mainland gilgai complexes have been documented as having particular plant associations corresponding to their micro relief features (Williams 1955). The former extent of these formations is unknown. The "hummocky" complexes in the Campbell Town area have nearly all been cultivated and none were located in the study area with native plant cover.

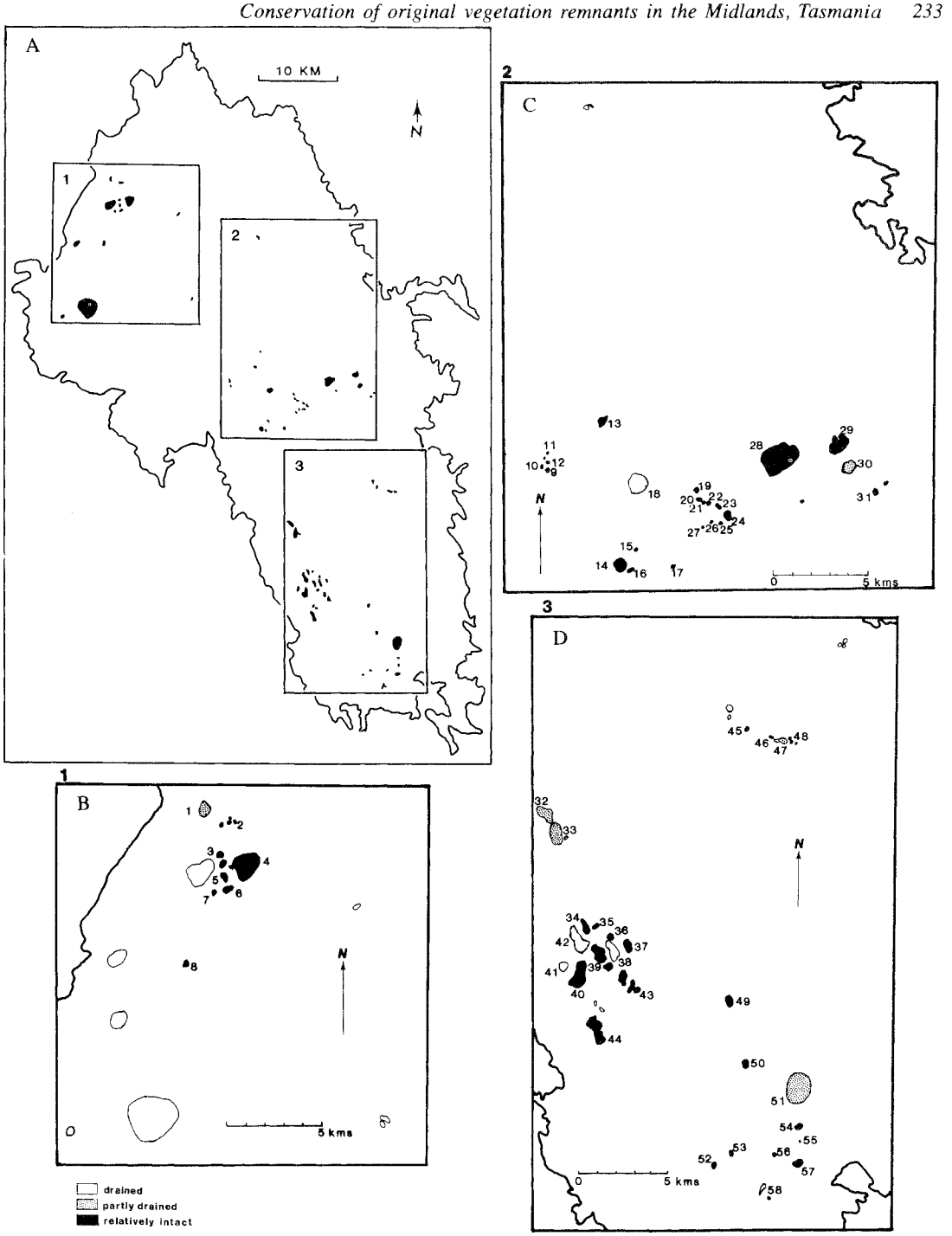

FIG. 3 — (A) Distribution of wetlands in the Midlands showing areas covered by (B), (C) and (D); (B) status of wetlands in area 1; (C) status of wetlands in area 2; (D) status of wetlands in area 3.

STRATEGIES FOR CONSERVATION

While conservation of major structural formations is desirable, detailed botanical surveys allow for the determination of areas that most efficiently conserve the maximum number of species. This survey discovered several species not previously known from Tasmania, which indicates the importance of survey work in endangered habitats. The appendix shows the Midlands species that are unreserved in Tasmania. The species reservation status was established from herbarium and literature searches and discussion with M. Brown, F. Duncan and L. Gilfedder.

Reservation of areas of Epping Forest would preserve *Eucalyptus amygdalina* forest and could include the unreserved species *Amphibromus macrorhinus*, *A. neesii*, *Aphelia gracilis*, *A. pumilio*, *Brunonia australis*, *Caesia parvifolia* var. *vittata*, *Caladenia clavigera*, *Calochilus imberbis*, *Centipeda minima*, *Cyperus tenellus*, *Eragrostis benthamii*, *Glycine latrobeana*, *Haloragis aspera*, *Helipterum australe*, *H. demissum*, *Hypoxis vaginata*, *Lomandra nana*, *Ophioglossum lusitanicum*, *Pilularia novae-hollandiae*, *Poa hookeri*, *P. pratermissa*, *Ptilotus spathulatus*, *Pultenaea humilis*, *P. prostrata* and *Schoenus latelaminatus*. Reservation of an appropriate area of grassy native vegetation in the Tunbridge area would preserve *Eucalyptus pauciflora* woodland and could include the unreserved species *Asperula scoparia*, *Brachyscome rigidula*, *Calocephalus lacteus*, *Craspedia* sp. "Tunbridge", *Cryptandra amara*, *Danthonia carphoides* var. *angustior*, *Dianella longifolia*, *Isoetopsis graminifolia*, *Lomandra nana*, *Poa hookeri*, *Prasophyllum odoratum*, *Pterostylis biseta*, *Scleranthus diander*, *Stipa scabra*, *Pultenaea prostrata*, *Velleia paradoxa*, *Vittadinia cuneata*, *V. gracilis*, *V. muelleri*, *Wilsonia rotundifolia* and the endemic species *Stackhousia gunnii*. The Tunbridge tip site is on Crown Land and most of it has recently been informally declared a refuge area. The area has been subject to some bulldozing and is probably less desirable for reservation than some of the private paddocks in the area. The case for a reserve in Epping Forest is strengthened by its unusually high concentrations of the restricted endemic marsupial *Bettongia gaimardi* (Taylor 1988).

The Elizabeth River gorge has already been identified as an area of high priority for plant conservation because of its large healthy populations of the rare endemic species *Acacia axillaris* (Brown *et al.* 1983). The area also includes another unreserved endemic *Epacris exserta* and the unreserved *Pimelea pauciflora*.

Cataract Gorge in Launceston provides another opportunity of protecting vulnerable species. The presence of the unreserved species *Anogramma leptophylla*, *Doodia media*, *Helichrysum* aff. *semipapposum*, *Micrantheum hexandrum* and the unreserved endemic species *Callitris oblonga* and *Epacris exserta* make this area of public land extremely suitable for reservation.

The wetlands in the study were not identified as high priority areas for plant species conservation by Kirkpatrick & Harwood (1983b) but since their work the endemic species *Ranunculus prasinus* has been described (Menadue & Crowden 1985). This species is only known from Near Lagoon (wetland no.49) and White Lagoon (wetland no.50). Near Lagoon has a population of *Bolboschoenus caldwellii* and both lagoons have populations of *Schoenoplectus validus* and extensive herbfields dominated by *Wilsonia rotundifolia*, all of which are unreserved in the State. A recent analysis of significant wetlands of Tasmania includes Near Lagoon (Kirkpatrick & Tyler 1988).

Other unreserved species of isolated occurrence on private land or small refuge areas in the Midlands may require protection. While control by the appropriate government body is the most desirable means of protecting valuable natural areas, private ownership is not necessarily incompatible with nature conservation. A private trust fund, for purchasing private land for nature conservation, has been established by the Tasmanian Conservation Trust. However, the owners of valuable Midlands regions have proven reluctant to relinquish even the smallest areas (D. Watts, pers. comm. 1987). The reluctance of governments to purchase, and private owners to part with land suggests alternative means of protection may be necessary. The introduction of legislation such as in South Australia, Victoria and New South Wales, where private landholders receive incentives to protect and preserve natural environments and are required to abide by a suitable management plan (Leigh *et al.* 1984), would be extremely appropriate for an area like the Midlands. Several landowners have indicated their interest, given some financial incentive, in protecting native vegetation on their land. One small area of land of a sympathetic landowner is inhabited by three rare plant species; it could be simply protected by a relatively short fence.

VIABILITY AND MANAGEMENT OF SMALL RESERVES IN GRASSY VEGETATION

Problems

The viability of small reserves has been the subject of international debate (e.g. Diamond 1975, Simberloff & Abele 1976, Higgs 1981, Brown & Hopkins 1983). Whatever the theoretical implications of this discussion, it is certain that the suitability of a particular area as a nature reserve will be idiosyncratic, depending on its significance, the availability of alternatives, the size and shape of the area, the behaviour of the particular vegetation type in the face of surrounding land-use, management problems and the aims of the conservation effort.

One of the most serious problems affecting native vegetation in small reserves in agricultural districts is the edge effect of management practices on adjacent land. The use of herbicides is particularly hazardous; other practices may have less dramatic effects, but nonetheless be deleterious. Drift from fertiliser application has the most serious effect on native vegetation on infertile substrates (Kirkpatrick 1977), particularly where aerial spreading techniques are employed. Thus, a viable reserve on relatively infertile substrates, such as those supporting *Eucalyptus amygdalina* forest in the Midlands, would need to be larger than one on fertile substrates. However, few remnants on any substrate were observed adjacent to improved pasture. Specht & Cleland (1961) suggest that buffer zones should be established to absorb the effects of adjacent land-use patterns.

Mechanical ground disturbance and herbicide spraying seriously affect all native vegetation in the Midlands, particularly grassy vegetation on fertile substrates. The prevention of such incursions should ensure the viability of even the smallest remnants, such as roadside and rail verges, for the immediate future, until more adequate reserves are established or plant species relocated to safer habitats.

Species Richness

The maintenance of species richness in grassy vegetation on fertile soils in southeastern Australia seems to require some mechanism for regularly reducing the biomass of the perennial grasses (Stuwe & Parsons 1977, Kirkpatrick 1986, Dickinson & Kirkpatrick 1986). This hypothesis was tested for the Midlands quadrat data set (Fensham 1989) on substrates with a range of fertilities. Quadrats were placed into three broad groups, using the soil textural classes of McDonald *et al.* (1984): those on dolerite with loams or heavier soils, those on depositional material with light sandy clay loams or lighter soils, and a third intermediate group containing quadrats that could not be defined by these criteria. The Cressy Research Farm and all private property with the exception of two areas not subjected to grazing for several years (as confirmed by the owners) constituted the grazing group. In addition to these two areas the ungrazed group comprised the road and rail reserves, cemeteries, ungrazed Crown Land and city parks. Native species richness was determined for each of the 180 10×1 m quadrats. The percentage frequencies of the individual species were compared between the grazed and ungrazed plots using Student's t-test.

The abundances of grasses, sedges, annual herbs, perennial herbs and shrubs were each compared between grazed and ungrazed sites. Only species with a percentage frequency of more than 10% in any one comparison were included in the following analysis. Each 20% difference between the grazed and the ungrazed groups was regarded as a unit. Thus, if a species had a frequency of 75% in the ungrazed group and 30% in the grazed group, the abundance of that species in the ungrazed groups was 250% greater than the grazed group and the species received a score of 12. Where a species was absent from a group it was given a percentage frequency equivalent to it occurring in one quadrat. The units for all species in each life-form were totalled for both the grazed and the ungrazed treatment. If the importance of grazing did not vary between life-forms, it would be expected that the proportions of units in each treatment for a particular life-form would be equal to the proportion of units in each treatment for the total number of species. The significance of the deviation from the expected value was tested using the chi-squared test.

The comparison between mean native species richness on grazed and ungrazed sites revealed different effects on different soil types and differing life-form groups. It appears that native species richness is increased by grazing on fertile dolerite soils ($t = 5.8$, $P < 0.001$) and other clays and loams ($t = 2.5$, $P < 0.02$), but not on infertile sandy soils.

While grazing does not dramatically affect species richness in the grassy heath understoreys on infertile ground, it can influence community composition. *Leucopogon virgatus* has been

virtually excluded from some areas of forest, leaving *Hibbertia riparia* as the single dominant shrub. When a fence separates an area of forest where grazing has been less intense, *Leucopogon virgatus* is a codominant member of the understorey.

The percentage frequencies of species of the understorey that were most affected by grazing on fertile soil (all sites except those on sandy soils) are shown in table 1. Small annual herbs and geophytes decline most significantly (chi-squared = 16, $P < 0.001$ and chi-squared = 3.3, $P < 0.1$ respectively) in the absence of grazing. The larger (*Helichrysum apiculatum*, *Dianella* spp.) or twining (*Asperula conferta*, *Convolvulus erubescens*) growth-forms may allow some herbaceous species to compete successfully in the ungrazed grass sward.

Grasses showed varying responses, with *Deyeuxia quadriseta* and most of the shorter grasses such as *Agrostis aemula*, *Danthonia laevis*, *D. tenuior*, *D. carphoides* var. *angustior* and

TABLE 1

Percentage Frequency of Species in Ungrazed and Grazed Treatment Groups* for Quadrats Located on Fertile Ground

	Ungrazed	Grazed		Ungrazed	Grazed
Grasses			*D. revoluta*	15.9	5.9
Dichelachne crinita	50	29.4	*Helichrysum apiculatum*	50	17.6
Elymus scabrus	88.6	64.7	*Vittadinia muelleri*	18.2	0
Stipa mollis	18.2	8.8	*Acaena echinata*	36.4	82.4
S. semibarbata	36.4	17.7	*Arthropodium milleflorum*	6.8	14.7
S. stuposa	84.1	61.8	*Dichondra repens*	18.2	82.4
Agrostis aemula	18.2	38.2	*Galium gaudichaudii*	4.6	14.7
Danthonia carphoides	36.2	56.2	*Glycine latrobeana*	0	11.8
D. laevis	40.9	70.6	*Gnaphalium collinum*	25	61.8
D. tenuior	2.3	26.5	*Gonocarpus tetragynus*	34.1	55.9
Ehrharta stipoides	43.2	94.1	*Hydrocotyle sibthorpioides*	2.3	14.7
Pentapogon quadrifidus	34.1	73.5	*Hypericum gramineum*	18.2	67.7
			Hypoxis hygrometrica	2.3	11.8
Sedges and rushes			*Leptorhynchos squamatus*	52.3	76.5
Centrolepis aristata	2.3	11.8	*Lomandra longifolia*	27.3	64.7
Schoenus apogon	61.4	88.2	*Ptilotus spathulatus*	11.5	23
Juncus capitatus	2.3	17.7	*Solenogyne dominii*	13.6	38.2
J. subsecundus	0	20.6	*S. gunnii*	15.9	35.3
			Veronica calycina	6.8	14.7
Annual herbs			*V. gracilis*	9.1	26.5
Senecio quadridentatus	31.8	8.8	*Viola hederacea*	0	11.8
Daucus glochidiatus	11.4	38.2	*Wurmbea dioicia*	6.8	14.7
Poranthera microphylla	11.4	41.2			
Wahlenbergia gracilis	13.6	38.2	**Trees and shrubs**		
W. gymnoclada	4.6	20.6	*Bossiaea riparia*	15.9	0
W. multicaulis	4.6	44.1	*Eucalyptus pauciflora*	20.5	5.9
W. stricta	15.9	35.3	*Exocarpos cupressiformis*	15.9	5.9
			Acacia mearnsii	6.8	20.6
Perennial herbs			*Banksia marginata*	4.6	11.8
Acaena ovina	59.1	26.5	*Bursaria spinosa*	40.9	73.5
Asperula conferta	43.2	20.6	*Eucalyptus viminalis*	27.3	73.5
Caesia vittata	18.2	2.9	*Hibbertia hirsuta*	25	61.8
Convolvulus erubescens	77.3	47.1	*Lissanthe strigosa*	36.4	70.6
Dianella longifolia	20.5	2.9		n = 44	n = 34

* Only species occurring in greater than 10% of either treatment group, where the difference between treatments is more than double or greater than 20%, are included.

Ehrharta stipoides being favoured by grazing. *Themeda triandra* declined from 100% to 82.4%, suggesting a cause for the disappearance of this species on extremely heavily grazed native pastures. All relatively common shrub species of fertile environments were more common in grazed areas, with the exception of *Bossiaea riparia*, which occurs in paddocks but was not recorded in an ungrazed area.

The maintenance of species richness on the fertile remnants requires some mechanism for intermittently depleting the grass sward. Grazing by marsupial herbivores may be the most suitable method (Kirkpatrick 1986) though, given the animosity towards native animals in agricultural areas, the use of fire may be an appropriate tool for periodically opening the grass canopy. Stuwe & Parsons (1977) have suggested that exotic species richness is greater in native grassland that is regularly burnt than in the same vegetation type subject to different treatments. However, there is animosity to burning in agricultural areas and, if this practice is not possible, moderate grazing by sheep may be an alternative, though less desirable. Scarlett & Parsons (1982) have pointed out that the timing and interactions of grazing and firing may be critical to the survival of rare legumes in analogous vegetation in Victoria. Current research being conducted on Tasmanian grassland species may provide information on their survival requirements (L. Gilfedder and J. Whinam, pers. comm. 1979).

EXOTIC SPECIES

Exotic plant species in the Midlands were recorded from each quadrat during a recent survey of patterns of native vegetation (Fensham 1989); their percentage frequencies, in the classificatory groups established from the native vegetation (Fensham 1989), are shown in table 2. In some instances different levels of invasion reflect the site selection procedure. Less common environments were sampled with higher exotic complements than would have been tolerated for the more frequent environments. This is the case for the heavily exploited *Eucalyptus pauciflora* woodlands (groups 8, 9 and 10), where the frequencies of exotics are high. Exotic species abundance may also be a reflection of how recently, or rapidly, they have spread from dispersal centres.

Some exotic species occur in a wide range of Midlands environments. Particularly widespread are the grasses *Aira caryophyllea*, *Briza minor*, *Holcus lanatus* and *Vulpia bromoides*, and the herbs *Centaurium erythraea*, *Hypochaeris radicata* and *Trifolium dubium*. However, many of the exotic species seem to have strict environmental preferences. For example, *Briza maxima* prefers well-drained non-clayey substrates and *Hypochaeris glabra* is widespread but apparently less frequent in the groups of low-lying habitats. By contrast, *Juncus articulatus* and *Lotus tenuis* occur in those communities associated with depressions, while *Lysimachia nummularia* was only seen growing by streams, where it is particularly prolific. *Agrostis capillaris*, *Anthoxanthum odoratum* and *Filago gallica* did not occur in any of the quadrats that comprise groups 8, 9 and 10. These groups are associated with the lowest rainfall zones, and these three species are probably limited by the frequency of drought in the most extreme Midlands environments.

There are virtually no areas in the Midlands without some naturalised exotic species. While the factors that influence most such species are only poorly understood (Weir 1977 cf. Gleadow 1982, Gleadow & Ashton 1981, Gleadow & Rowan 1982, Gleadow *et al.* 1983 for *Pittosporum undulatum*), the ubiquity of exotic species throughout the Midlands probably reflects the dissected nature of the remnant vegetation and the ready transport of disseminules by a variety of herbivores and machinery.

When the imposed conditions are not detrimental to native vegetation, most exotic species seem to co-exist without causing declines in native species richness (Fensham 1989). This is so for non-woody species in well-drained fertile habitats (Kirkpatrick 1986) and probably also in well-drained infertile substrates in the Midlands, where herbaceous exotic populations appear to be relatively stable. In favourable environments, woody weeds, such as gorse (*Ulex europaeus*) and blackberries (*Rubus fruticosus*) may be capable of invading native vegetation where disturbance phenomena are restricted to those that can be assumed for pre-European conditions. Once established, their ability to form dense thickets excludes native vegetation. The control of these species in the early stages of their invasion is of paramount importance in maintaining the effectiveness of areas of native vegetation for long-term nature conservation.

TABLE 2

Percentage Frequencies of Exotic Species in the Classificatory Groups* of Fensham (1988)

Species†	Community‡													
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Juncus articulatus	–	50	57	–	–	–	–	–	–	–	–	–	–	–
Anthoxanthum odoratum	–	50	57	–	7	10	21	–	–	–	–	–	–	–
Agrostis capillaris	–	–	14	–	13	–	29	–	–	–	7	22	–	–
Cynosurus cristatus	–	–	14	–	–	–	–	–	–	–	11	–	–	–
Filago gallica	–	–	–	–	27	10	–	–	–	–	11	–	–	–
Briza maxima	–	–	–	57	17	10	14	–	83	11	–	–	–	–
Aira caryophyllea	67	50	71	78	83	86	79	80	83	83	85	67	–	–
Anagallis arvensis	–	–	43	22	-	14	14	10	-	-	7	22	-	-
Centaurium erythraea	50	100	43	56	47	74	57	25	67	61	56	78	-	-
Vulpia bromoides	67	50	43	-	27	52	29	65	50	39	70	78	-	-
Leontodon taraxacoides	-	-	100	-	10	45	-	35	-	11	30	44	67	100
Trifolium glomeratum	-	-	29	-	-	10	-	75	-	11	30	-	-	-
Hypochaeris glabra	-	-	-	33	27	35	-	55	-	39	33	-	-	-
Romulea rosea	-	-	-	-	-	-	29	10	-	11	-	-	-	-
Hypochaeris radicata	67	100	43	56	57	69	86	75	50	100	70	78	67	100
Briza minor	-	100	57	-	53	76	36	45	-	72	74	56	67	-
Poa annua	-	-	14	-	-	-	-	10	-	-	-	-	67	-
Cerastium fontanum	33	-	-	-	13	-	-	-	33	-	26	22	-	-
Cirsium arvense	67	-	14	-	13	14	14	-	-	11	30	56	100	-
Trifolium dubium	33	50	57	22	10	31	–	70	83	39	57	78	100	–
Rosa rubiginosa	–	–	–	–	–	–	14	15	–	11	7	–	–	–
Ulex europaeus	–	–	14	–	–	–	–	–	–	–	11	–	–	–
Rubus fruticosus	–	–	14	–	–	–	–	–	–	17	11	–	–	–
Trifolium subterraneum	–	–	–	–	–	7	–	20	–	17	19	–	–	–
Cynosurus echinatus	–	–	14	–	–	21	–	50	–	17	11	–	–	–
Holcus lanatus	50	100	57	–	7	10	21	–	50	33	19	78	100	–
Taraxacum officinale	–	–	29	–	–	–	–	–	–	–	–	22	67	100
Agrostis stolonifera	–	50	29	–	–	–	–	–	–	–	4	33	–	–
Linum trigynum	–	–	–	–	–	–	22	–	–	–	7	–	–	–
Hordeum murinum	–	–	–	–	–	–	–	10	–	–	–	–	–	–
Dactylis glomerata	–	–	–	–	–	–	–	10	–	–	–	–	–	–
Geranium dissectum	–	–	–	–	–	–	–	10	–	–	–	–	–	–
Vicia sativa	–	–	–	–	–	–	–	10	–	–	–	–	–	–
Erodium cicutarium	–	–	–	–	–	–	–	20	–	–	–	–	–	–
Lolium perenne	–	–	–	–	–	–	–	30	–	–	–	44	–	–
Plantago lanceolata	–	–	–	–	–	–	–	35	–	22	7	–	–	–
Sonchus asper	–	–	–	–	–	–	–	20	33	–	7	–	–	–
Plantago coronopus	–	–	–	–	–	–	–	25	–	–	14	33	–	–
Rumex acetosella	–	–	–	–	–	–	–	–	50	33	19	–	–	–
Bromus hordeaceus	–	–	–	–	–	17	–	90	50	33	30	33	67	–
Lotus tenuis	–	–	14	–	–	–	–	–	–	–	–	22	–	100
Petrorhagia prolifera	–	–	–	–	–	–	–	50	–	–	19	–	–	–
Silene gallica	–	–	–	–	–	–	–	–	–	11	–	–	–	–
Bromus sterilis	–	–	–	–	–	–	–	40	–	22	11	–	–	–
Carduus tenuiflorus	–	–	–	–	–	–	–	15	50	–	15	–	–	–
Myosotis discolor	–	–	–	–	–	–	–	–	–	–	11	–	–	–
Tragopogon porrifolius	–	–	–	–	–	–	–	–	–	–	7	–	67	–
Lysimachia nummularia	–	–	–	–	–	–	–	–	–	–	–	–	–	100

Notes to Table 2

* Only species with >10% in any group are included.
† Species nomenclature follows Buchanan *et al.* (1989).
‡ (1) *Eucalyptus amygdalina* open forest on dolerite hills. (2) *E. ovata* woodlands on infertile sandy depressions.
(3) Grasslands on moderately fertile sandy depressions. (4) *E. amygdalina* open forest on flat sandy ground.
(5) *E. amygdalina* forest on infertile sands. (6) *E. amygdalina* forest on mixed substrates with moderate rainfall.
(7) *E. amygdalina* forest on mixed substrates with high rainfall. (8) *E. pauciflora* woodland on doleritic clay loams.
(9) *E. pauciflora* woodland on basaltic loams. (10) *E. pauciflora* woodland on sand.
(11) *E. viminalis* woodland on dolerite hills. (12) *E. ovata* woodlands on clayey depressions.
(13) Grasslands on clayey depressions. (14) Grasslands on riverine flats.

ACKNOWLEDGEMENTS

We thank Chris Harwood and Steve Harris who conducted much of the field work in the wetlands and Louise Gilfedder and Fiona Coates for a large part of the herbarium searching and for checking a draft of this manuscript. Alex Buchanan, Winifred Curtis, Mary Cameron, Dennis Morris and Tony Orchard drew our attention to important botanical records.

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(accepted 18 August 1989)

APPENDIX

List of Known Midlands Higher Plant Species, showing those presumed to be extinct in the region (*), those unreserved in Tasmania (†)

Numbers refer to references confirming the previous existence of an extinct species.
(1) Spicer (1878)
(2) Rodway (1903)
(3) Hewson (1982)
(4) Belcher (1983)
(5) Leigh *et al.* (1984)
(6) Tasmanian Herbarium
(7) Queen Victoria Museum, Herbarium
(8) Melbourne Herbarium
(9) D. Morris, pers. comm. 1986 (specimen held at Kew Herbarium, London)
(10) A. Buchanan, pers. comm. 1989 (specimen held at N.S.W. Herbarium).
Nomenclature follows Buchanan *et al.* 1989.

PTERIDOPHYTA
ADIANTACEAE
Adiantum aethopicum L.
ASPIDIACEAE
Polystichum proliferum (R.Br.) C. Presl.
ASPLENIACEAE
Asplenium flabellifolium Cav.
AZOLLACEAE
Azolla filiculoides Lam.
BLECHNACEAE
Doodia media R. Br. †
DENNSTAEDTIACEAE
Anogramma leptophylla (L.) Link †
Cheilanthes austrotenuifolia Quirk & Chambers
Hypolepis rugosula (Labill.) J. Smith * 6
Pteridium esculentum (Forst. f.) Nakai
DICKSONIACEAE
Dicksonia antarctica Labill.
ISOETACEAE
Isoetes drummondii A. Braun † * 6
I. elatior F. Muell. †
I. muelleri A. Braun † * 6
MARSILEACEAE
Pilularia novae-hollandiae A.Br. †
OPHIOGLOSSACEAE
Botrychium lunaria (L.) Swartz † * 6
Ophioglossum lusitanicum L.
ssp. *coriaceum* (cunn) Glausen †
SELAGINELLACEAE
Selaginella uliginosa (Labill.) Spring

GYMNOSPERMAE
CUPRESSACEAE
Callitris oblonga A. & L.C. Rich †

ANGIOSPERMAE — MONOCOTYLEDONAE
ALISMATACEAE
Alisma plantago-aquatica L.
CENTROLEPIDACEAE
Aphelia gracilis Sonder †
A. pumilio F. Muell. ex Sonder †
Centrolepis aristata (R.Br.) Roem & Schult.
C. glabra (F. Muell.) Hieron. * 2
C. strigosa (R. Br.) Roem. & Schult.
CYPERACEAE
Baumea arthrophylla (Nees) Boeck.
B. gunnii (Hook. f.) S.T. Blake † * 1,2
Bolboschoenus caldwellii (V. Cook) Sojak
Carex appressa R. Br.
C. bichenoviana Boott † * 6
C. breviculmis R. Br.
C. chlorantha R. Br. * 1,6
C. fascicularis Soland. ex Boott
C. gaudichaudiana Kunth.
C. inversa R. Br. †
C. iynx E. Nelmes
C. tasmanica Kuk. † * 6
C. tereticaulis F. Muell.
Chorizandra cymbaria R. Br.
Cyperus gunnii Hook f.
C. lucidus R. Br. †
C. sanguinolentus Vahl †
C. tenellus L. †
Eleocharis acuta R. Br.
E. pusilla R. Br.
E. sphacelata R. Br.
Gahnia filum (Labill.) F. Muell.
G. grandis S.T. Blake
I. cernua (Vahl.) Roem. & Schult.
I. crassiuscula Hook. f.
I. fluitans (L.) R. Br.
I. hookeriana Boeck
I. inundata R. Br.
I. marginata (Thunb.) A. Dietr.
I. montivaga (S.T. Blake) K.L. Wilson
I. nodosa (Rottb.) R. Br.
I. platycarpa (S.T. Blake) Sojak
I. stellata (C.B. Clarke) K.L. Wilson † * 6
Lepidosperma concavum R. Br.
L. filiforme Labill. * 1
L. laterale R. Br.

L. linreare R. Br.
L. longitudinale Labill.
Schoenoplectus pungens (Vahl) Palla
S. validus (Vahl) A. & D. Love †
Schoenus apogon Roem. & Schult.
S. fluitans L.
S. latelaminatus Kuekenth. †
S. maschalinus Roem. & Schult.
S. nitens (R.Br.) Poir.
S. tesquorum J.M. Black
HYDATELLACEAE
Trithuria submersa Hook. f. † * 2,6
HYDROCHARITACEAE
Vallisneria gigantea Graebner
HYPOXIDACEAE
Hypoxis hygrometrica Labill.
H. vaginata Schldl. †
IRIDACEAE
Diplarrena moraea Labill.
JUNCACEAE
Juncus amabilis Edgar †
J. australis Hook. f.
J. bufonius L.
J. capitatus Weig.
J. filicaulis Buch.
J. holoschoenus R. Br.
J. kraussii Hochst.
J. pallidus R. Br.
J. pauciflorus R. Br.
J. planifolius R. Br.
J. procerus E. Mey.
J. sarophorus L.A.S. Johnson
J. subsecundus N.A. Wakefield
Luzula spp.
JUNCAGINACEAE
Triglochin procera R. Br.
T. striata Ruiz. & Pav.
LEMNACEAE
Lemna disperma Hegelm
L. trisulca L.
Wolffia australiana (Benth.) Hartog and Plas. †
LILIACEAE
Arthropodium milleflorum (DC.) Macbride
A. minus R. Br.
Bulbine glauca (Raf.) E.M. Watson
Burchardia umbellata R. Br.
Caesia parviflora R. Br.
var. *parviflora*
var. *vittata* (R. Br.) R. Henderson †
Chaemaescilla corymbosa (R. Br.) F. Muell. ex Benth.
Dianella longifolia R. Br. †
D. tasmanica Hook. f.
Dichopogon strictus (R. Br.) Baker
Thysanotus patersonii R. Br.
Tricoryne elatior R. Br.
Wurmbea dioica (R. Br.) F. Muell.
ORCHIDACEAE
Caladenia catenata (Sm.) Druce
C. caudata W.H. Nicholls
C. clavigera A. Cunn ex Lindley †
C. cucullata FitzG.
C. pattersonii R. Br.
Calochilus imberbis R.S. Rogers †
C. gunnii Lindley * 6
C. reflexa (Labill.) Druce * 6
Corybas incurvus D. Jones & M. Clements † * 6
Dipodium punctatum (Smith) R. Br.
Diurus maculata Smith
D. sulphurea R. Br. * 6
Eriochilus cucullatus (Labill.) Reichb. f.
Glossodia major R. Br.
Microtis unifolia (Forst. f.) Reichb. f.
Prasophyllum odoratum R.S. Rogers † * 6
Pterosylis biseta J.A. Blackmore & Clemesha †
P. curta R. Br.
P. furcata Lindley * 6
P. mutica R. Br. * 6
P. pedunculata R. Br.
P. rufa R. Br.
Spiranthes sinensis (Pers.) Ames * 1
Thelymitra aristata Lindley * 6
T. carnea R. Br.
T. megcalyptra R.D. FitzG.
T. pauciflora R. Br.
POACEAE
Agrostis aemula R. Br.
A. avenacea J.F. Gmel.
A. billardieri R. Br.
A. venusta Trin.
Amphibromus archeri (J.D. Hook.) P.F. Morris
A. macrorhinus S.W.L. Jacobs & L. Lapinpuro †
A. neesii Steud. †
A. recurvatus Swallen
A. sinuatus S.W.L. Jacobs & L. Lapinpuro †
Danthonia caespitosa Gaudich.
D. carphoides F. Muell. ex Benth.
var. *angustior* Vickery †
D. dimidiata Vickery
D. laevis J.W. Vickery
D. penicillata (Labill.) P. Beauv.
D. pilosa R. Br.
D. popinensis D.I. Morris †
D. procera Vickery †
D. racemosa R. Br.
D. semiannularis (Labill.) R. Br.
D. setacea R. Br.
D. tenuior (Steudel) Conert
Deyeuxia lawrencii Vickery † * 9
D. quadriseta Benth.

Dichelachne crinita Hook.
D. rara (R. Br.) Vickery
Distichlis distichophylla (Labill.) Fassett
Echinopogon ovatus (G. Foster) P. Beauv.
Elymus scabrus (Labill.) A. Love
Eragrostis molybdea Vic. †
Ehrharta acuminata (R. Br.) Sprengel * 1
E. distichophylla Labill.
E. stipoides Labill.
Festuca plebeia R. Br.
F. hookeriana F. Muell. ex J.D. Hook. * 1
Glyceria australis C.E. Hubb
Hemarthria uncinata R. Br.
Pentapogon quadrifidus Baill.
Phragmites australis (Cav.) Trin. ex Steudel
Poa hookeri Vick. †
P. labillardieri Steud.
P. mollis Vick. †
P. pratermissa D.I. Morris †
P. rodwayi Vickery
P. sieberiana Spreng.
Puccinellia stricta (Hook. f.) C. Blom
Stipa bigeniculata Hughes
S. mollis R. Br.
S. nodosa S.T. Blake
S. pubinodis Trinius & Rupecht
S. rudis Sprengel
ssp. *australis* J. Everett & S. Jacobs
S. scabra Lindley †
S. semibarbata R. Br.
S. stuposa D.K. Hughes
Themeda triandra Forsskal
Zoysia macrantha Desv.

POTAMOGETONACEAE
Potamogeton australiensis A. Bennett
P. crispus L.
P. ochreatus Raoul †
P. pectinatus L. †
P. perfoliatus L. †
P. tricarinatus F. Muell. & A. Bennett ex A. Bennett

RESTIONACEAE
Leptocarpus brownii Hook. f.
Lepyrodia muelleri Benth.

RUPPIACEAE
Ruppia maritima L.

TYPHACEAE
Typha domingensis Pers.
T. latifolia L.

XANTHORRHOEACEAE
Lomandra nana (A. Lee) A. Lee †
L. longifolia Labill.

ZANNICHELLIACEAE
Lepilaena cylindrocarpa (Kornicke) Benth.
L. preissii (Lehm.) F. Muell. † * 2

ANGIOSPERMAE — DICOTYLEDONS

AMARANTHACEAE
Alternanthera denticulata R. Br. † * 7
Ptilotus spathulatus (R. Br.) Poir. †

APIACEAE
Apium prostratum Labill. ex Vent.
Centella cordifolia (Hook. f.) Nannfeldt
Daucus glochidiatus (Labill.) Fisch. et al.
Eryngium vesiculosum Labill.
Hydrocotyle callicarpa Bunge
H. muscosa R. Br.
H. sibthorpioides Lamk.
Lilaeopsis polyantha (Gand.) H. Eichler
Trachymene humilis (Hook. f.) Benth. †

ASTERACEAE
Angianthus preissianus (Steetz) Benth.
Bedfordia salicina (Labill.) DC.
Brachyscome aculeata (Labill.) Less.
B. angustifolia A. Cunn. ex DC. * 6
B. cardiocarpa F. Muell. ex Benth.
B. decipiens Hook. f. * 6
B. radicans Steetz in Lehm. †
B. rigidula (DC.) G.L. Davis †
B. spathulata Gaud.
Calocephalus lacteus Lessing †
Centipeda minima (L.) A. Br. & Aschers.
Cotula australis (Sieber ex Spreng.) Hook. f. * 6
C. coronopifolia L.
C. reptans (Benth.) Benth.
Craspedia glauca (Labill.) Spreng.
Craspedia sp. "Tunbridge" †
Cymbonotus lawsonianus Gaudich.
Gnaphalium collinum Labill.
G. involucratum Forst. f.
G. purpureum L.
Helichrysum apiculatum (Labill.) D. Don.
H. bicolor Lindl.
H. dendroideum N.A. Wakefield
H. scorpioides Labill.
H. semipapposum (Labill.) DC.
H. aff. *semipapposum* "Launceston" †
H. thyrsoideum (DC) P. Morris & J.H. Willis * 6
Helipterum albicans (A. Gunn) DC.
var. *incanum* (Hook.) P.G. Wilson †
H. anthemioides (Sieber ex Spreng.) DC. † * 6
H. australe (A. Gray) Druce †
H. demissum (A. Gray) Druce †
Isoetopsis graminifolia Trucz. †
Lagenifera huegelii Benth. * 9
L. stipitata (Labill.) Druce
Leptorhynchos elongatus DC. * † 2,6
L. linearis Lessing
L. squamatus (Labill.) Lessing
Microseris lanceolata (Walp.) Schultz-Bip.
Millotia tenuifolia Cass. =

Olearia argophylla (Labill.) Benth.
O. ciliata (Benth.) F. Muell. ex Benth. * 1
O. floribunda (Hook. f.) Benth.
O. ramulosa (Labill.) Benth.
O. stellulata (Labill.) DC.
O. viscosa (Labill.) Benth.
Podolepis jaceoides (Sims) Voss
Pseudognaphalium luteo-album (L.) Hilliard & B.L. Burtt.
Senecio glomeratus Desf. ex Poir.
S. hispidulus A. Rich.
S. macrocarpus Belcher † * 4
S. quadridentatus Labill.
Solenogyne dominii L. Adams
S. gunnii (Hook. f.) Carbrera
Vittadinia cuneata DC. †
V. gracilis (Hook. f.) N. Burb. †
V. muelleri N. Burb. †

BORAGINACEAE
Cynoglossum australe R. Br.
C. suaveolens R. Br.
Myosotis australis R. Br.

BRASSICACEAE
Barbarea australis J.D. Hook. † * 3
Cardamine tenuifolia Hook.
Hymenolobus procumbens (L.) Nutt. ex Schinz. & Thell. * 1
Lepidium pseudotasmanicum Thell. †
Rorippa dictyosperma (Hook.) L. Johnson

BRUNONIACEAE
Brunonia australis Smith ex R. Br. †

CALLITRICHACEAE
Callitriche umbonata Hegelm. †

CAMPANULACEAE
Isotoma fluviatilis (R. Br.) F. Muell. ex Benth. *
Lobelia alata Labill.
L. gibbosa Labill.
L. pratioides Benth. † * 1,6
L. rhombifolia deVriese † * 5
Pratia pedunculata (R. Br.) Benth. †
Wahlenbergia gracilenta N. Lothian
W. gracilis (Forst. f.) Schrader
W. gymnoclada N. Lothian
W. multicaulis Benth.
W. stricta Sweet

CARYOPHYLLACEAE
Colobanthus apetalus (Labill.) Druce * 8
C. aff. *strictus*
Scleranthus biflorus (Forst. & Forst. f.) Hook. f.
S. diander R. Br. †
Spergularia media (L.) Cyrillo
Stellaria flaccida Hook.

CASUARINACEAE
Allocasuarina littoralis (Salisb.) L. Johnson
A. verticillata (Lam.) L. Johnson

CHENOPODIACEAE
Chenopodium glaucum L.
C. pumilio R. Br. † * 6
Einadia nutans (R. Br.) A.J. Scott

CLUSIACEAE
Hypericum gramineum Forst. f.
H. japonicum Thunb.

CONVOLVULACEAE
Convolvulus erubescens Sims
Dichondra repens Forst. & Forst. f.
Wilsonia rotundifolia Hook. †

CRASSULACEAE
Crassula helmsii (Kirk) Cockayne
C. peduncularis (SMith) Meigen * 6
C. sieberana (Schult. & Schult. f.) Druce

DILLENIACEAE
Hibbertia hirsuta (Hook.) Benth.
H. prostrata Hook
H. riparia (R. Br. ex DC.) Hoogl.
H. serpyllifolia R. Br. ex DC.

DROSERACEAE
Drossera peltata Thunb.
ssp. *auriculata* (Backh. ex Planchon) Conn
ssp. *peltata*
D. pygmaea DC.

ELATINACEAE
Elatine gratioloides A. Cunn.

EPACRIDACEAE
Acrotriche serrulata (Labill.) R. Br.
Astroloma humifusum (Cav.) R. Br.
Brachyloma ciliatum (R. Br.) Benth.
Cyathodes parvifolia
Epacris excerta R. Br. †
E. impressa Labill.
Leucopogon collinus (Labill.) R. Br.
L. virgatus (Labill.) R. Br.
Lissanthe strigosa (Sm.) R. Br.
Styphelia adscendens R. Br.

EUPHORBIACEAE
Amperea xiphoclada (Sieber ex Spreng.) Druce
Bertya rosmarinifolia Planch. † * 1,2
Beyeria viscosa (Labill.) Miq.
Micrantheum hexandrum Hook. f. †
Phyllanthus australis Hook. f.
Poranthera microphylla Brongn.

FABACEAE
Acacia axillaris Benth. †
A. dealbata Link
A. genistifolia Link
A. gunnii Benth.
A. mearnsi De Wild
A. melanoxylon R. Br.
A. mucronata Willd. ex Wendl.
A. siculiformis A. Cunn. ex Benth. * 1
A. verticillata (L'Herit.) Willd.

Aotus ericoides (Vent.) G. Don
Bossiaea cinerea R. Br.
B. prostrata R. Br.
B. riparia A. Cunn. ex Benth.
Daviesia latifolia R. Br.
D. ulicifolia Andr.
Desmodium varians var. *gunnii* (Hook. f.) Benth. † * 6
Dillwynia cinerascens R. Br.
Glycine latrobeana (Meissn.) Benth. = *Gompholobium huegelii* Benth.
Hovea lanceolata Sims
H. linearis (Smith) R. Br.
Indigofera australis Willd.
Kennedia prostrata R. Br.
Platylobium obtusangulum Hook.
Pultenaea fasciculata Benth.
P. humilis Benth. ex Hook. f. †
P. juniperina Labill.
P. prostrata Benth. ex Hook. f. †

GENTIANACEAE
Sebaea ovata (Labill.) R. Br.

GERANIACEAE
Geranium sessiliflorum Cav. ssp. *brevicaule* (Hook. f.) R.C. Carolin
G. solanderi R.C. Carolin
Pelargonium australe Willd.

GOODENEACEAE
Goodenia amplexans F. Muell. † * 2,8
G. elongata Labill.
G. humilis R. Br.
G. lanata R. Br.
G. ovata Sm.
Selliera radicans Cav.
Velleia paradoxa R. Br. †

HALORAGACEAE
Gonocarpus micranthus Thunb.
G. tetragynus Labill.
Haloragis aspera Lindley †
Myriophyllum glomeratum Schindler † * 8
M. integrifolium (Hook. f.) Hook. f.
M. pedunculatum Hook. f.
M. salsugineum Orch.
M. simulans Orch.
M. variifolium Hook. f.

LAMIACEAE
Ajuga australis R. Br.
Mentha diemenica Spreng.
Prostanthera cuneata Benth. * 2,6,7
P. rotundifolia R. Br.
Prunella vulgaris L.
Teucrium corymbosum R. Br.
Westringia rubiaefolia R. Br.

LENTIBULARIACEAE
Utricularia australis R. Br. * 1
U. dichotoma Labill.
U. monanthos Hook. f.

LAURACEAE
Cassytha pubescens R. Br.

LINACEAE
Linum marginale A. Cunn. ex Planchon

LYTHRACEAE
Lythrum hyssopifolia L.

MALVACEAE
Asterotrichion discolor (Hook.) Melville
Lawrencia spicata Hook.

MENYANTHACEAE
Villarsia reniformis R. Br.

MYRTACEAE
Baeckea ramosissima A. Cunn.
Callistemon pallidus (Bonpl.) DC.
C. viridiflorus (Sims) Sweet
Calytrix tetragona Labill.
Eucalyptus amygdalina Labill.
E. obliqua Labill.
E. ovata Labill.
E. pauciflora Sieber ex Spreng.
E. rodwayi R.T. Bak. & H.T. Smith
E. rubida H. Deane & Maiden †
E. viminalis Labill.
Leptospermum lanigerum (Ait.) Sm.
L. scoparium Forst. & Forst. f.
Melaleuca ericifolia Sm.
M. gibbosa Labill.

OLEACEAE
Notelaea ligustrina Vent.

ONAGRACEAE
Epilobium billardierianum Ser. ex DC.

OXALIDACEAE
Oxalis perennans Haw.

PITTOSPORACEAE
Billardiera procumbens (Hook.) E. Bennett
B. scandens Sm.
Bursaria spinosa Cav.
Pittosporum bicolor Hook.

PLANTAGINACEAE
Plantago antarctica Dcne. †
P. varia R. Br.

POLYGALACEAE
Comesperma volubile Labill.

POLYGONACEAE
Muehlenbeckia axillaris (Hook. f.) Walp.
Persicaria hydropiper (L.) Opiz.
Polygonum decipiens R. Br. † * 6
Rumex brownii Campd.
R. dumosis A. Cunn. ex Meissn. †

PORTULACACEAE
Montia australasica (Hook. f.) Pax & Hoffm.

PRIMULACEAE
Samolus repens (Forst. & Forst. f.) Pers.

PROTEACEAE
Banksia marginata Cav.
Grevillea australis R. Br.
Hakea lissosperma R. Br.
H. microcarpa R. Br.
Lomatia tinctoria (Labill.) R. Br.
Persoonia juniperina Labill.
RANUNCULACEAE
Clematis aristata R. Br.
C. gentianoides DC.
C. microphylla DC.
Ranunculus decurvus (Hook. f.) Melville * 6
R. glabrifolius Hook.
R. lappaceus Sm.
R. pimpinellifolius Hook. * 6
R. prasinus (Menadue & Crowden) †
R. trichophyllus Chaix
RHAMNACEAE
Cryptandra amara Sm. †
Discaria pubescens (Brongn.) Druce † * 6
Pomaderris elliptica sens. Ewart
Spyridium ulicinum (Hook.) Benth.
S. vexilliferum (Hook.) Reiss.
Stenanthemum pimeleoides (Hook. f.) Benth.
ROSACEAE
Acaena agnipila Gand.
var. *tenuiscarpa* (Bitt.) Orch. †
A. echinata Nees
A. novae-zelandiae Kirk
A. ovina A. Cunn.
Rubus parvifolius L.
RUBIACEAE
Asperula conferta Hook. f.
A. scoparia Hook. f. † * 6
A. subsimplex Hook. f. † * 6
Coprosma quadrifida (Labill.) Robinson
Galium australe DC.
G. ciliare Hook. f.
G. gaudichaudii DC.
Opercularia ovata Hook. f.
O. varia Hook. f.
RUTACEAE
Eriostemon verrucosus A. Rich.
Phebalium squameum (Labill.) Engl.
ssp. *retusum* (Hook.) P.G. Wilson †
SANTALACEAE
Exocarpos curpessiformis Labill.
E. strictus R. Br.
Leptomeria drupacea (Labill.) Druce
SAPINDACEAE
Dodonaea filiformis Link
D. viscosa (L.) N.J. Jacq.
SCROPHULARIACEAE
Euphrasia scabra R. Br. † * 5
Glossostigma elantinoides (Benth.) ex Hook. f. * 2
Gratiola latifolia R. Br. * 6
G. nana Benth.
Limosella australis R. Br.
Mazus pumilio R. Br.
Mimulus repens R. Br.
Parahebe derwentiana (Andrews) B. Briggs &
Ehrend. † * 6
Veronica calycina R. Br.
V. formosa R. Br.
V. gracilis R. Br.
V. scutellata L. †
SOLANACEAE
Solanum nigrum L.
STACKHOUSIACEAE
Stackhousia gunnii Hook. f. †
S. monogyna Labill.
STYLIDIACEAE
Stylidium graminifolium Rich.
THYMELEACEAE
Pimelea curviflora R. Br. †
P. glauca R. Br.
P. humilis R. Br.
P. nivea Labill.
P. pauciflora R. Br. †
TREMANDRACEAE
Tetratheca pilosa Labill. * 6
T. procumbens Gunn ex Hook. f.
VIOLACEAE
Hymenanthera dentata R. Br. ex DC.
Viola betonicifolia Sm.
V. hederacea Labill.