

# Vegetation of Mulligans Flat, A.C.T.

B.J. Lepschi

## Abstract

Lepschi, B.J.\* (24 Fullwood St., Weston, Canberra, ACT, Australia 2611) 1993. *Vegetation of Mulligans Flat, A.C.T.* *Cunninghamia* 3(1) 155–166. The vegetation and flora of the Mulligans Flat area, A.C.T. (approximately 35°11'S 149°08'E), are described from data collected during 1988–1989, with some records from 1991 and 1992. A total of 276 species have been recorded, of which 180 are native, 93 introduced and three are persisting from cultivation.

## Introduction

The Gungahlin area of the northern A.C.T. (Figure 1) is currently being developed as Canberra's next 'satellite town'. Although most of the vegetation in the area has been cleared, and the land used for livestock grazing since at least the 1850s (National Capital Development Commission (hereafter 'NCDC'), 1988a), a few remnants of the original vegetation remain. The largest and best-preserved of these is situated at Mulligans Flat, in the north-east part of the area (35°11'S 149°08'E; Figure 1). Mulligans Flat has been identified as an area of ecological significance in the A.C.T. (Frawley 1991, NCDC 1988a, b). The aim of this paper is to provide floristic data to supplement the limited information currently available on the vegetation.

## The study area

For the purposes of this paper, the circumscription of the Mulligans Flat area differs slightly from the previous definition in NCDC (1988a, b), in that the southern and north-eastern borders have been extended (Figure 1), to take in areas of woodland, and the northernmost part of the 'Gungahlin Quartz Ridge' (NCDC 1988b). The Gundaroo road verge is also included, with the total study area covering 275 ha.

Mulligans Flat is currently leasehold grazing land, although stock (sheep) will be removed from the area when it gains full reserve status. The area has been utilised as grazing land since at least the 1850s; limited clearing of vegetation has taken place and a number of small stock dams (most supporting some aquatic/wetland vegetation) have been constructed. There is a shearing shed and a stock race, both of comparatively recent origin. Two vehicle tracks (used by the landholders only), run roughly east-west in the southern part of the study area (Figure 1). Little physical evidence of former habitation remains (NCDC 1988a), except for some plantings of introduced species (e.g.: \**Pinus radiata*, \**Photinia serrulata*) on the site of the former (closed in the 1920s) Mulligans Flat School in the extreme south-western corner of the area (see Figure 1), and tree plantings (local eucalypt species) along the former Bungendore to Ginninderra road, which was in use during the 1880s, in the extreme south of the study area.

---

\* Present address: Australian National Herbarium, CSIRO Division of Plant Industry, GPO Box 1600, Canberra City, Australia 2601.

There is considerable support from both the scientific and general communities to have it declared a Nature Reserve (Frawley 1991).

Limited grazing and/or browsing still occurs by kangaroos and wallabies, and small numbers of rabbits. The area has been burnt by bushfires in the past, with the most recent fire in 1979 (K. Kukolic, pers. comm.).

### Topography and geology

The topography is undulating, with two moderately sloping ridges (rising to approximately 680 m) running north-east to south-west separated by a flat valley (Frawley 1991). The geology consists largely of a formation known as the 'Canberra Formation', predominantly siltstone and mudstone, with a small area of the volcanic rock, dacite, on the north-eastern edge. Some quartz outcropping is also present (NCDC 1988b).

Soils of the surrounding region (and Mulligans Flat) are described generally in Gunn *et al.* (1969) and specifically for the Gungahlin area in NCDC (1988b). Shallow lithosols (often reddish in colour) are found on the ridges and slopes, with solod soils on the flatter parts of the area; these are subject to waterlogging following periods of rain (NCDC 1988a; B.J. Lepschi pers. obs.). Areas of solodic and solod solonetzic soil are present on the north-eastern edge of Mulligans Flat.

Two small ephemeral creeks and their tributaries run approximately parallel to the ridges in the valley area (with another on the areas eastern edge), and it is on these that the stock dams mentioned above are situated. Limited gully and sheet erosion is present throughout the area, associated mainly with the vehicle tracks.

Average annual rainfall at the village of Hall (35°09'S 149°03'E) approximately eight km to the west of the study area, is 700 mm, with a peak in October. Average maximum temperature at Canberra (35°15'S 149°08'E) approximately 12 km to the south of the study area, for January is 28°C and average minimum temperature in July is 0°C (information supplied by Bureau of Meteorology, Canberra).

### Vegetation

Three broad vegetation types occur at Mulligans Flat, namely open-forest, woodland and grassland. These are described individually below and their approximate occurrence is shown in Figure 2.

Open-forest occurs predominantly on the shallower soils of the ridges and slopes. Dominant species are *Eucalyptus macrorhyncha*, *E. rossii* and *E. mannifera*, with some *E. goniocalyx* (this species occurring mostly towards the ridge-tops). Scattered *E. blakelyi* and *E. melliodora* occur on deeper soils on the lower slopes. There is much eucalypt regeneration and saplings are common in the understorey, along with small trees such as *Acacia dealbata*, *A. parramattensis* and *Exocarpos cupressiformis*, and shrubs including *Hibbertia obtusifolia*, *Brachyloma daphnoides*, *Melichrus urceolatus*, *Acacia gunnii*, *Daviesia* spp., *Dillwynia sericea*, and *Pultenaea* spp. The groundlayer consists of various grasses and herbs, with the following species all common: *Aristida ramosa*, *Danthonia* spp., *Dichelachne micrantha*, *Poa sieberiana* subsp. *sieberiana*, *Lomandra* spp., *Gonocarpus tetragynus*, *Hydrocotyle laxiflora*, *Wahlenbergia* spp., *Stylidium graminifolium*, and *Goodenia hederacea* subsp. *hederacea*.

Areas of actively regenerating woodland occur throughout Mulligans Flat; some of these appear to be the result of past clearing of the open forest formation (Frawley 1991, NCDC 1988b), and all of the eucalypts recorded for the latter vegetation type

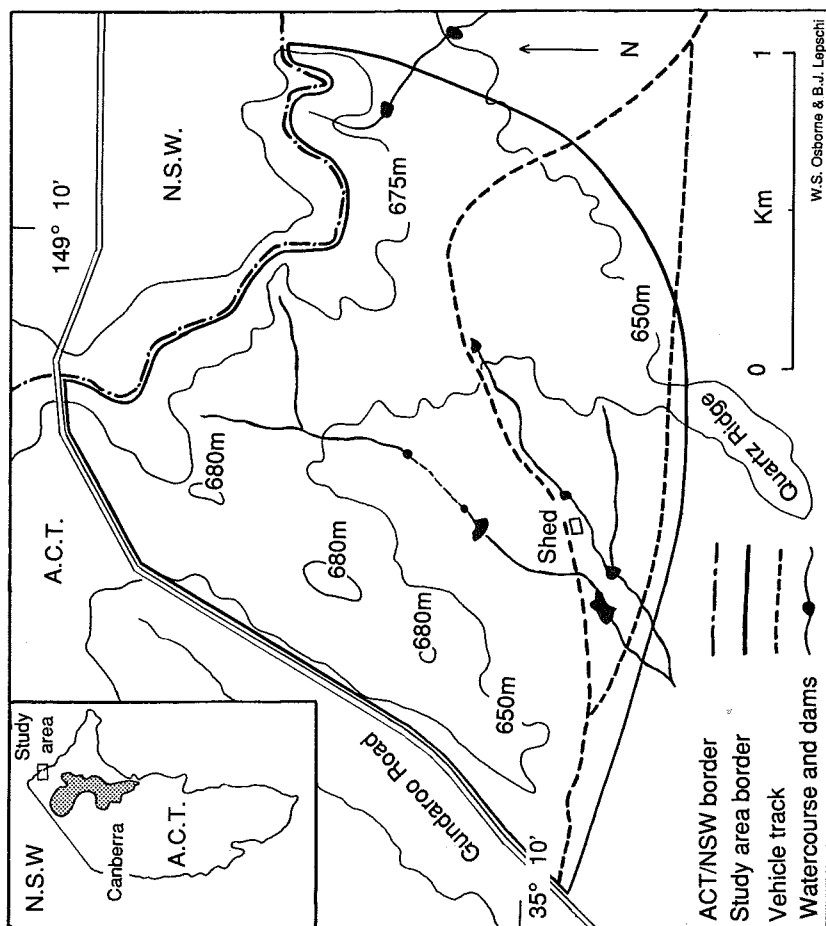


Figure 1. Map of study area showing major features and location (inset)

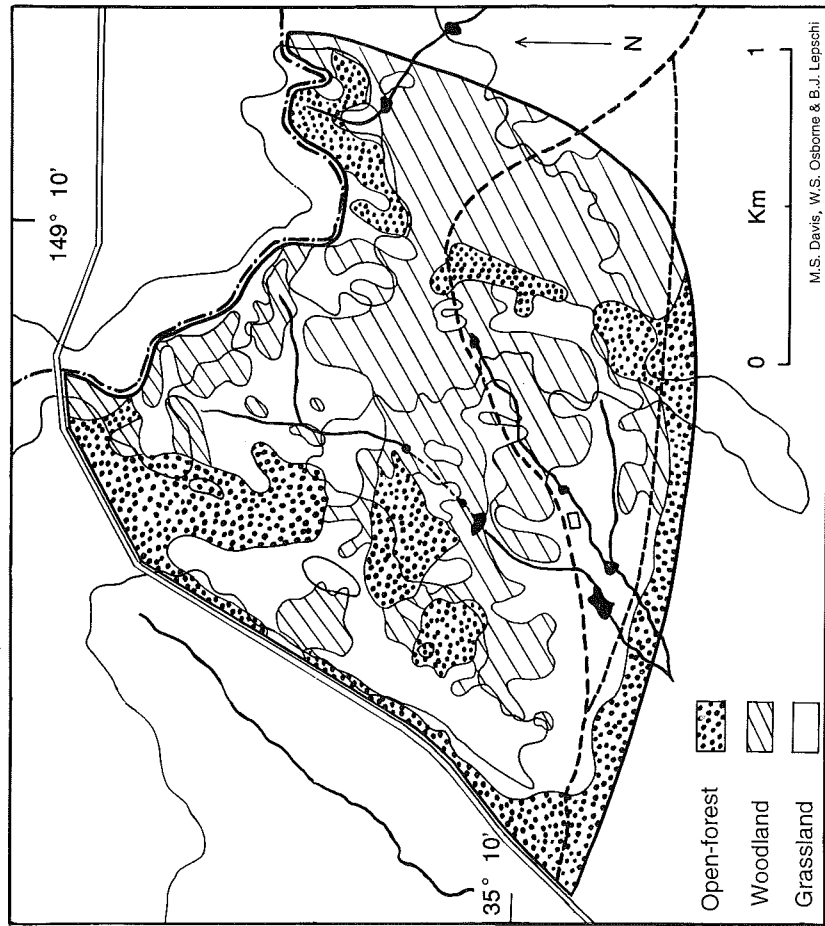


Figure 2. Vegetation of Mulligans Flat

can be found in the woodland areas. On flatter sites with deeper soil, woodland dominated by *Eucalyptus blakelyi* and *E. melliodora* is found, with scattered *E. bridgesiana* and *E. rubida* subsp. *rubida*. The latter is frequent along the creek bordering an area of open grassland near the shearing shed. The understorey is generally sparse, with eucalypt saplings and scattered stands of *Acacia* spp. (mainly *A. dealbata*) and shrubs including *Hibbertia obtusifolia*, *Lissanthe strigosa*, *Melichrus urceolatus*, \* *Rosa rubiginosa*, *Daviesia genistifolia*, and *Cryptandra amara* var. *longiflora*. Grasses and herbs again make up the groundcover, with *Aristida ramosa*, *Bothriochloa macra*, *Danthonia* spp., *Eragrostis benthamii*, *Panicum effusum* var. *effusum*, *Stipa bigeniculata*, *S. scabra* subsp. *falcata*, *Themeda australis*, *Wurmbea dioica* subsp. *dioica*, *Drosera peltata*, *Glycine tabacina*, \* *Trifolium arvense*, \* *T. dubium*, *Hydrocotyle laxiflora*, *Wahlenbergia* spp., \**Hypochaeris* spp., *Solenogyne dominii*, and *Vittadinia muelleri* all commonly occurring.

Patches of grassland occur throughout the area; *Panicum effusum* var. *effusum* and *Themeda australis* are common components, particularly where only light grazing has taken place. Other frequent species include *Danthonia* spp., *Eragrostis benthamii*, *Stipa bigeniculata*, and *S. scabra* subsp. *falcata*. In disturbed sites or areas subjected to heavier grazing, \**Aira* spp., *Bothriochloa macra*, and *Chloris truncata* are also common.

### Species list

All species recorded by the author on (generally monthly) visits to the area during the period May 1988 to August 1989 and again in April 1991 and April and November 1992 are listed (Table 1). It was not possible to cover the entire area on each occasion. Also included are species recorded by M.S. Davis during survey work for Scott and Furphy Pty Ltd, in January 1992. Family concepts (except for the recognition of the Lobeliaceae) and nomenclature follow Hnatiuk (1990); where a name differs from the latter, the author and relevant reference is cited. Vouchers were generally not collected; those that were are lodged in the Australian National Herbarium, CSIRO, Canberra (CANB; authors collections) and the Herbarium of the Australian National Botanic Garden, Canberra (CBG; M.S. Davis's collections).

The list is not exhaustive, and many more species can be expected, particularly when stock have been removed from the area.

**Table 1.** List of plant species recorded at Mulligans Flat, A.C.T. (1988–1992).

Species not indigenous to Australia are marked with an asterisk (\*); indigenous species not native to the Canberra area are marked with a hash symbol (#).

For species recorded by M.S. Davis (see above), the abbreviation 'MD' is included after the name in brackets.

A subjective indication of frequency and abundance (based on that used by Helman *et al* 1988) is given for each species. Abbreviations used are:

W – widespread

L – localised

C – common

U – uncommon

R – rare

P – persisting from former cultivation, but not naturalised

#### PTERIDOPHYTES

##### Adiantaceae

*Cheilanthes austrotenuifolia* WC

*Cheilanthes sieberi* subsp. *sieberi* (MD) LU

##### Ophioglossaceae

*Ophioglossum lusitanicum* subsp. *coriaceum* LC  
(see Wilson 1990)

#### GYMNOSPERMS

##### Pinaceae

\**Pinus radiata* LR

#### ANGIOSPERMS

#### MONOCOTYLEDONS

##### Cyperaceae

*Carex inversa* LU

*Cyperus sanguinolentus* LC

*Eleocharis acuta* LC

*Schoenus apogon* LC

##### Eriocaulaceae

*Eriocaulon scariosum* LR

##### Hydrocharitaceae

*Ottelia ovalifolia* LC

##### Iridaceae

?\* *Sisyrinchium* sp. A LR

(sensu Wilson in prep.;

= *S. micranthum* Cav. (see Cooke 1986))

##### Juncaceae

*Juncus australis* WU

\**Juncus articulatus* LU

*Juncus bufonius* WU

\**Juncus capitatus* WU

*Juncus filicaulis* WC

*Juncus holoschoenus* LC

*Juncus homalocaulis* WU

*Juncus sarophorus* LC

*Juncus subsecundus* WC

*Juncus vaginatus* LU

*Luzula flaccida* WC

##### Liliaceae

*Bulbine bulbosa* LR

*Burchardia umbellata* LR

*Caesia calliantha* LR

*Dianella revoluta* subsp. *revoluta* LR

*Dichopogon fimbriatus* LU

*Hypoxis hygrometrica* var. *hygrometrica* LC

*Hypoxis vaginata* var. *vaginata* LU

*Thysanotus tuberosus* subsp. *tuberosus* LR

*Tricoryne elatior* WU

*Wurmbea dioica* subsp. *dioica* WC

##### Orchidaceae

*Dipodium punctatum* (MD) LR

*Diuris* sp. LR

*Eriochilus cucullatus* LR

*Microtis unifolia* LC

*Thelymitra pauciflora* (MD) LR

##### Poaceae

*Agrostis avenacea* var. *avenacea* LC

\**Aira cupaniana* WC

\**Aira elegantissima* WC

*Amphibromus nervosus* LC

*Aristida ramosa* R. Br. (see Simon 1992) WC

\**Avena barbata* LR

\**Avena fatua* LC

*Bothriochloa macra* WC

\**Briza maxima* LC

\**Briza minor* WU

\**Bromus catharticus* LC

\**Bromus diandrus* LU

\**Bromus hordeaceus* subsp. *molliformis* LR

\**Bromus madritensis* LR

*Chloris truncata* WC

*Cynodon dactylon* WU

\**Cynosurus echinatus* LC

*Danthonia auriculata* (MD) LU

*Danthonia caespitosa* WC

*Danthonia carphoides* var. *carphoides* WC

*Danthonia laevis* (MD) WC

*Danthonia monticola* (MD) LU

*Danthonia pallida* WC

*Danthonia penicillata* (MD) WC

*Danthonia pilosa* var. *pilosa* WU

**Poaceae** (cont'd)

<i>Danthonia racemosa</i> var. <i>racemosa</i> (MD)	WU
<i>Dichelachne micrantha</i>	LC
<i>Elymus scaber</i> var. <i>scaber</i> (sensu Jacobs in prep.)	WU
<i>Enneapogon nigricans</i>	WU
<i>Eragrostis bentharii</i>	WU
* <i>Hordeum leporinum</i> Link. (sensu Jacobs in prep.)	LR
* <i>Lolium perenne</i>	LU
* <i>Lolium rigidum</i>	LU
<i>Microlaena stipoides</i> var. <i>stipoides</i>	WU
* <i>Nassella trichotoma</i>	LR
<i>Panicum effusum</i> var. <i>effusum</i>	WC
* <i>Paspalum dilatatum</i>	LC
* <i>Phalaris aquatica</i>	LU
* <i>Phleum pratense</i>	LU
<i>Poa sieberiana</i> var. <i>sieberiana</i>	LC
* <i>Rostraria cristata</i> (MD)	LR
* <i>Setaria gracilis</i> var. <i>pauciseta</i>	LC
<i>Stipa bigeniculata</i>	WC
<i>Stipa densiflora</i>	LU
<i>Stipa scabra</i> subsp. <i>falcata</i>	WC
<i>Themeda australis</i> (R.Br) Stapf. (sensu Jacobs in prep.)	WC
* <i>Vulpia bromoides</i>	WU

**Potamogetonaceae**

<i>Potamogeton tricarlinatus</i>	LC
----------------------------------	----

**Xanthorrhoeaceae**

<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	WC
<i>Lomandra multiflora</i> subsp. <i>multiflora</i> (see Lee and Macfarlane 1986)	WU

## DICOTYLEDONS

**Amaranthaceae**

<i>Alternanthera denticulata</i>	LU
<i>Alternanthera</i> sp. A (sensu Jacobs & Lapinuro 1990)	WU

**Apiaceae**

<i>Daucus glochidiatus</i> (s. lat.)	WU
<i>Eryngium rostratum</i> Cav. (see Powell & Wiecek 1992)	LU
<i>Hydrocotyle laxiflora</i>	WC
<i>Hydrocotyle peduncularis</i> (s. lat.)	LC

**Apocynaceae**

* <i>Vinca major</i>	P
----------------------	---

**Asteraceae**

* <i>Arctotheca calendula</i>	WU
<i>Brachycome rigidula</i>	WU
<i>Calocephalus citreus</i>	LR
* <i>Carduus pycnocephalus</i>	LR
* <i>Carthamus lanatus</i>	LU
<i>Cassinia aculeata</i>	LR
<i>Cassinia longifolia</i>	LR

**Asteraceae** (cont'd)

<i>Cassinia quinquefaria</i>	WU
<i>Centipeda cunninghamii</i>	LC
<i>Centipeda minima</i>	LU
* <i>Chondrilla juncea</i>	LR
<i>Chrysocephalum apiculatum</i> (Labill.) Steetz	WU
Steetz (s. lat.) (syn. <i>Helichrysum apiculatum</i> (Labill.) DC.; see Anderberg 1991)	
<i>Chrysocephalum semipapposum</i> (Labill.) Steetz	LR
(s. lat.) (syn. <i>Helichrysum semipapposum</i> (Labill.) DC.; see Anderberg 1991)	
* <i>Cirsium vulgare</i>	WC
* <i>Conyza albida</i>	LR
<i>Cotula australis</i>	WU
<i>Craspedia variabilis</i> Everett & Doust (see Everett & Doust 1992)	LC
<i>Cymbonotus preissianus</i>	WU
<i>Euchiton gymnocephalus</i> (DC.) A. Anderb. (syn. <i>Gnaphalium gymnocephalum</i> DC.; see Anderberg 1991)	LC
<i>Euchiton sphaericus</i> (Willd.) A. Anderb. (syn. <i>Gnaphalium sphaericum</i> Willd.; see Anderberg 1991)	WU
* <i>Gnaphalium americanum</i> Miller (sensu Everett 1992)	LU
* <i>Hypochaeris glabra</i>	WU
* <i>Hypochaeris radicata</i>	WC
<i>Isoetopsis graminifolia</i>	LR
<i>Leptorhynchus squamatus</i>	LR
* <i>Logfia gallica</i>	LC
<i>Microseris lanceolata</i> (s. lat.)	WU
<i>Pseudognaphalium luteo-album</i>	WU
<i>Senecio quadridentatus</i>	WU
<i>Solenogyne dominii</i>	WC
<i>Solenogyne gunnii</i>	LU
* <i>Sonchus asper</i> subsp. <i>glaucescens</i>	LU
* <i>Sonchus oleraceus</i>	WU
* <i>Taraxacum</i> sp. agg.	WU
* <i>Tolpis umbellata</i>	WU
* <i>Tragopogon dubius</i>	LR
<i>Triptilodiscus pygmaeus</i>	WC
<i>Vittadinia cuneata</i> var. <i>cuneata</i>	WU
<i>Vittadinia muelleri</i>	WC

**Boraginaceae**

<i>Cynoglossum suaveolens</i>	LR
* <i>Echium plantagineum</i>	LC
* <i>Myosotis discolor</i>	WU

**Brassicaceae**

* <i>Hirschfeldia incana</i>	LU
* <i>Lepidium africanum</i>	LU
* <i>Sisymbrium officinale</i>	LC

**Campanulaceae**

<i>Wahlenbergia communis</i>	WC
<i>Wahlenbergia graniticola</i> (MD)	LR
<i>Wahlenbergia multicaulis</i> (MD)	LR
<i>Wahlenbergia stricta</i>	WC

Table 1. (cont'd)

**Caryophyllaceae**

* <i>Moenchia erecta</i>	WU
* <i>Paronychia brasiliiana</i>	LU
* <i>Petrorhagia nanteuillii</i>	WU
* <i>Polycarpon tetraphyllum</i>	LU
<i>Scleranthus diander</i>	LR
* <i>Silene gallica</i> var. <i>gallica</i>	LR
* <i>Spergularia rubra</i>	WU
* <i>Stellaria media</i>	LU
<i>Stellaria pungens</i>	WU

**Chenopodiaceae**

* <i>Chenopodium album</i>	LR
<i>Chenopodium pumilio</i>	LC
<i>Einaidia nutans</i> subsp. <i>nutans</i>	WU

**Clusiaceae**

<i>Hypericum gramineum</i>	WC
----------------------------	----

**Convolvulaceae**

<i>Convolvulus erubescens</i>	WU
<i>Dichondra repens</i>	LU

**Crassulaceae**

<i>Crassula sieberiana</i> subsp. <i>tetramera</i>	LC
--	----

**Dilleniaceae**

<i>Hibbertia obtusifolia</i> (s. lat.)	WC
--	----

**Droseraceae**

<i>Drosera peltata</i>	WC
------------------------	----

**Epacridaceae**

<i>Astroloma humifusum</i>	LU
<i>Brachyloma daphnoides</i>	LC
<i>Leucopogon virgatus</i>	WU
<i>Lissanthe strigosa</i>	WU
<i>Melichrus urceolatus</i>	WC
(bushy form with hairy, acute sepals and acuminate petals; see Burbidge & Gray 1970)	

**Euphorbiaceae**

<i>Chamaesyce drummondii</i> (Boiss) Hassall (see James & Harden 1990)	WU
<i>Poranthera microphylla</i>	WU

**Fabaceae**

<i>Bossiaea buxifolia</i>	LU
<i>Bossiaea prostrata</i>	LU
* <i>Cytisus</i> sp.	P
<i>Daviesia genistifolia</i>	WU
<i>Daviesia leptophylla</i>	LU
<i>Daviesia mimosoides</i> R. Br. subsp. <i>mimosoides</i> (see Crisp 1991)	LR
<i>Desmodium brachypodium</i> (MD)	LR
<i>Desmodium varians</i>	LU
<i>Dillwynia sericea</i>	LC
<i>Glycine clandestina</i> (s. lat.)	WU
<i>Glycine tabacina</i> (s. lat.)	WU
<i>Gompholobium huegelii</i> (MD)	LR
<i>Hardenbergia violacea</i>	LU

**Fabaceae** (cont'd)

<i>Hovea linearis</i>	LR
<i>Indigofera australis</i>	WU
* <i>Medicago arabica</i>	WU
* <i>Medicago polymorpha</i> (see Weston 1991a)	LR
* <i>Medicago sativa</i>	LR
<i>Psoralea adscendens</i>	LR
<i>Pultenaea microphylla</i> Sieber ex DC. (see Weston 1991b)	LU
<i>Pultenaea procumbens</i>	WC
* <i>Trifolium angustifolium</i>	LU
* <i>Trifolium arvense</i>	WC
* <i>Trifolium campestre</i>	WU
* <i>Trifolium dubium</i>	WU
* <i>Trifolium glomeratum</i>	WR
* <i>Trifolium repens</i>	WU
* <i>Trifolium striatum</i> (MD)	LR
* <i>Trifolium subterraneum</i>	LU
* <i>Vicia sativa</i> subsp. <i>sativa</i>	LR

**Gentianaceae**

* <i>Centaurium erythraea</i>	WC
<i>Sebaea ovata</i>	LU

**Geraniaceae**

* <i>Erodium botrys</i>	LR
* <i>Erodium cicutarium</i>	LC
* <i>Geranium molle</i>	LC
<i>Geranium solanderi</i> var. <i>solanderi</i>	WU

**Goodeniaceae**

<i>Goodenia hederacea</i> Smith subsp. <i>hederacea</i> (See Carolin 1992)	WC
<i>Velleia paradoxa</i>	WU

**Haloragaceae**

<i>Haloragis heterophylla</i>	WC
<i>Gonocarpus tetragynus</i>	WC
<i>Myriophyllum crispatum</i>	LC

**Lamiaceae**

* <i>Marrubium vulgare</i>	LR
<i>Mentha diemenica</i> (MD)	LR
<i>Mentha</i> sp. aff. <i>diemenica</i> (sensu Burbidge & Gray 1970)	WU
* <i>Salvia verbenaca</i>	LR

**Linaceae**

* <i>Linum trigynum</i>	WR
-------------------------	----

**Lobeliaceae**

<i>Isotoma fluviatilis</i>	LC
----------------------------	----

**Loranthaceae**

<i>Amyema miquelii</i>	WC
<i>Amyema pendulum</i> subsp. <i>pendulum</i>	LR

**Lythraceae**

<i>Lythrum hyssopifolia</i>	WU
-----------------------------	----



**Malaceae**

- \**Crataegus monogyna* (see Harden & Rodd 1990b) LR  
 \**Pyracantha angustifolia* LR

**Malvaceae**

- \**Modiola caroliniana* LU

**Mimosaceae**

- # *Acacia baileyana* LR  
*Acacia dealbata* WC  
*Acacia gunnii* LU  
*Acacia implexa* LU  
*Acacia mearnsii* LU  
*Acacia parramattensis* LC

**Myrtaceae**

- Eucalyptus blakelyi* WC  
*Eucalyptus bridgesiana* LU  
*Eucalyptus dives* (MD) LU  
*Eucalyptus goniocalyx* LC  
*Eucalyptus macrorhyncha* Benth. WC  
 (see Brooker and Kleinig 1990)  
*Eucalyptus mannifera* Mudie (see Brooker & Kleinig 1990) WC  
*Eucalyptus melliodora* WC  
*Eucalyptus rossii* LU  
*Eucalyptus rubida* Deane & Maiden subsp. *rubida* (see Hill and Johnson 1991) WU

**Onagraceae**

- Epilobium billardierianum* subsp. *cinereum* WU

**Orobanchaceae**

- \**Orobanche minor* LR

**Oxalidaceae**

- \**Oxalis* sp. A (see Conn 1992) LU  
*Oxalis exilis* LR  
*Oxalis perennans* WU

**Papaveraceae**

- \**Papaver somniferum* subsp. *setigerum* (see Jacobs 1990) LR

**Plantaginaceae**

- \**Plantago coronopus* subsp. *commutata* LC  
*Plantago gaudichaudii* LR  
 \**Plantago lanceolata* WU  
*Plantago varia* (sensu Briggs et al 1977) LC

**Polygonaceae**

- Persicaria prostrata* LC  
 \**Polygonum arenastrum* LU  
 \**Rumex acetosella* WU  
*Rumex brownii* WC  
 \**Rumex crispus* LC

**Portulacaceae**

- Montia fontana* subsp. ?*chondrosperma* LC  
*Portulaca oleracea* (sensu West 1990) LC

**Primulaceae**

- \**Anagallis arvensis* (red-flowered form; see Makinson 1990) WU

**Ranunculaceae**

- Ranunculus lappaceus* WU  
*Ranunculus sessiliflorus* var. *sessiliflorus* LR

**Rhamnaceae**

- Cryptandra amara* var. *longiflora* WU

**Rosaceae**

- Acaena novae-zelandiae* LR  
*Acaena ovina* (s. str.; see Harden & Rodd 1990a) WC  
 \**Photinia serrulata* P  
 \**Prunus* sp. LR  
 \**Rosa rubiginosa* WU

**Rubiaceae**

- Asperula conferta* WU  
 \**Galium divaricatum* WU  
*Galium gaudichaudii* LR  
 \**Sherardia arvensis* LC

**Santalaceae**

- Exocarpos cupressiformis* WU

**Scrophulariaceae**

- \**Linaria pelisseriana* WU  
 \**Parentucellia latifolia* LU  
 \**Verbascum thapsus* LR  
 \**Veronica arvensis* LR

**Solanaceae**

- \**Solanum nigrum* LR

**Stylidaceae**

- Stylidium graminifolium* LC

**Thymelaeaceae**

- Pimelea curviflora* var. *sericea* WU

**Violaceae**

- Viola betonicifolia* (see James 1990) LR

## Discussion

The vegetation and floristics of Mulligans Flat show similarities to other comparable areas in the A.C.T., such as Black Mountain Reserve (Gray & McKee 1969) and the Ainslie-Majura Reserve (Ingwersen *et al.* 1974), although neither of these reserves contain such large areas of woodland or grassland as at Mulligans Flat. The presence of species such as *Acacia parramattensis*, *Pultenaea microphylla*, *Eucalyptus goniocalyx* and possibly (see below), *Cheiranthera cyanea*, point to an association with vegetation of similar areas to the north of Mulligans Flat (i.e.; the northern part of the Southern Tablelands of N.S.W.), where these species are more abundant and widespread than in the A.C.T. (B.J. Lepschi unpubl.).

*Acacia parramattensis*, *Bossiaea prostrata*, *Desmodium brachypodium* and *Eucalyptus gonio-calyx*, four species recorded from the study area, are regarded as uncommon in the A.C.T. (Burbidge & Gray 1970; Gilmour *et al.* 1987; NCDC 1984; NCDC 1988; National Capital Planning Authority 1992). A fifth, *Cheiranthera cyanea*, was recorded as occurring at Mulligans Flat by Burbidge & Gray (1970), Frawley (1991) and NCDC (1988a), but was not located during this study (or in recent survey work by M.S. Davis). It is very inconspicuous when not in flower, and may well have been overlooked; it is known to occur on the Gundaroo road verge in N.S.W. approximately 1.5 km to the north-east of the study area, and is fairly common in the Gunning and Yass districts, approximately 30 km to the north (B.J. Lepschi unpubl.).

Two introduced herbs, *\*Linum trigynum* and *\*Logfia gallica* are of regional significance. *\*Linum trigynum* (Lepschi & Davis 918 (AD, BRI, CANB, CHR, HO, K, MEL, NSW)) does not appear to have been previously recorded for the A.C.T. or the southern tablelands of N.S.W. (Gardner 1992), although it has since (early 1993) been collected at a few other sites in the Canberra-Queanbeyan area (B.J. Lepschi unpubl.). *\*Logfia gallica* (Lepschi 866, Lepschi & Davis 919 (both CANB, MEL, NSW)) represents a new record for both the A.C.T. and N.S.W. (Brown 1992).

Introduced species comprise 34% (93 spp; #*Acacia baileyana* is here regarded as introduced) of the 276 species recorded from Mulligans Flat; they occur throughout the area, but are most prevalent in the woodland and grassland formations, which have been subject to greater disturbance than the open forest areas. Grossly disturbed sites such as the Gundaroo road verge, the area around the shearing shed, the old school site and the verges of the vehicle tracks are particularly heavily invaded, with major weed species such as *\*Marrubium vulgare*, *\*Echium plantagineum*, and *\*Chondrilla juncea* largely confined to these sites at present.

*\*Rosa rubiginosa* is the only woody weed of any importance in the area, with other potentially invasive species (e.g.: *\*Crataegus monogyna*, *\*Pyracantha angustifolia* and #*Acacia baileyana*) currently of limited distribution and abundance.

Of the ornamental plantings on the old Mulligans Flat School site, only two species, *\*Pinus radiata* and #*Acacia baileyana* show signs of spreading. *\*P. radiata* is present as scattered small plants and seedlings, mainly in the vicinity of the parent plants, while *A. baileyana* occurs predominantly as mature plants in a few localities within the study area.

Mulligans Flat is an area of great conservation significance; low altitude woodland and grassland communities are very poorly represented in conservation reserves within the ACT and surrounding areas. Those that have been reserved are predominantly in the southern part of the Canberra area (lowland communities do not extend far beyond the current southern edge of Canberra), and Mulligans Flat represents the northernmost reservation of these communities in the ACT. It is also the

only reserve of any substantial size in the Gungahlin area of Canberra.

The relatively light clearing and grazing activity on Mulligans Flat has resulted in some of the best preserved areas of lowland open-forest, woodland and grassland in the ACT, which apart from their botanical importance also provide valuable habitat for a diverse vertebrate fauna (Frawley 1991; Taylor & Canberra Ornithologists Group 1992; W.S. Osborne pers. comm.).

### Acknowledgments

Lyn Craven, Maxine Davis, Frank Ingwersen and Will Osborne all commented on the manuscript; Maxine kindly made available her unpublished survey data for the Mulligans Flat area and provided information for the preparation of Figure 2. Will also drew the draft for the figures and provided much appreciated encouragement and assistance.

### References

- Anderberg, A.A. (1991). Taxonomy and phylogeny of the the tribe Gnaphaliae (Asteraceae). *Opera Botanica*. 104 : 1-195.
- Briggs, B.G., Carolin, R.C. & Pulley, J.M. (1977). Plantaginaceae. *Flora of New South Wales* 181:1-35.
- Brooker, M.I.H. & Kleinig, D.A. (1990). *Field Guide to Eucalypts, Vol. 1. South Eastern Australia*. (Inkata Press: Melbourne).
- Brown, E.A. (1992). Asteraceae. In Harden (1992): 131-341.
- Burbidge, N.T. & Gray, M. (1970). *Flora of the A.C.T.* (Australian National University Press: Canberra.)
- Carolin, R. (1992). *Goodenia*. *Flora of Australia* 35: 147-281
- Conn, B.J. (1992) *Oxalis*. In Harden (1992): 17-22
- Cooke, D.A. (1986). Iridaceae. *Flora of Australia* 46: 1-66.
- Crisp, M.D. (1991). Contributions towards a revision of *Daviesia* Smith (Fabaceae: Mirbelieae). II. The *D. latifolia* group. *Australian Systematic Botany*, 4: 229-298.
- Everett, J. (1992) *Gnaphalium*. In Harden (1992): 206-210.
- Everett, J. & Doust, A.N.L. (1992) *Craspedia*. In Harden (1992): 221-226.
- Frawley, K.J. (1991). *The Conservation of Remnant Woodland and Native Grassland in the A.C.T.* (National Parks Association of the A.C.T. (Inc.): Canberra.)
- Gardner, C.L. (1992). *Linum*. In Harden (1992): 16-17.
- Gilmour, P.M., Helman, C.E. & Osborne, W.S. (1987). *An Ecological Survey of the Mount Tennent - Blue Gum Creek Area, A.C.T.* Unpublished report to Conservation Council of the South East Region and Canberra.
- Gray, M. & McKee, H.S. (1969). *A List of Vascular Plants Occurring on Black Mountain and Environs, Canberra, A.C.T.* CSIRO Division of Plant Industry Technical Paper no 26.
- Gunn, R.H., Story, R., Galloway, R.W., Duffy, P.J.B., Yapp, G.A. & McAlpine, J.R. (1969). Lands of the Queanbeyan - Shoalhaven area, A.C.T. and N.S.W. *Land Research Series*. No. 24. (CSIRO, Melbourne.)
- Harden, G. J.(ed) (1990). *Flora of New South Wales*. Vol. 1 (NSW University Press: Sydney.)
- Harden, G.J (ed) (1991) *Flora of New South Wales* Vol. 2 (NSW University Press: Sydney.)
- Harden, G.J (ed) (1992) *Flora of New South Wales* Vol. 3 (NSW University Press: Sydney.)
- Harden, G.J (ed) in press (199-) *Flora of New South Wales* Vol. 4 (NSW University Press: Sydney.)
- Harden, G.J. & Rodd, A.N. (1990a). Rosaceae s. str. In Harden (1990): 528-541.
- Harden, G.J. & Rodd, A.N. (1990b). Malaceae. In Harden (1990): 542-547.
- Helman, C.E., Gilmour, P.M., Osborne, W.S. & Green, K. (1988). *An Ecological Survey of the Upper Cotter Catchment Wilderness Area, Namadgi National Park, A.C.T.* Unpublished report to Conservation Council of the South East Region and Canberra.

- Hill, K. & Johnson, L.A.S. (1991). Systematic studies in the eucalypts, 3. New taxa and combinations in *Eucalyptus* (Myrtaceae). *Telopea*, 4 : 223-268.
- Hnatiuk, R.J. (1990). *Census of Australian Vascular Plants*. (Australian Government Publishing Service: Canberra.)
- Ingwersen, F., Evans, O & Griffiths, B. (1974). *Vegetation of the Ainslie-Majura Reserve*. Conservation Series no 2. Department of the Capital Territory.
- Jacobs, S.W.L. (1990). Papaveraceae. In Harden (1990): 169-172.
- Jacobs, S.W.L. in prep. In Harden (199-).
- Jacobs, S.W.L. & Lapinpuro, L. (1990). Amaranthaceae. In Harden (1990): 248-260.
- James, T.A. (1990). Violaceae. In Harden (1990): 435-441.
- James, T.A. & Harden, G.J. (1990). Euphorbiaceae. In Harden (1990): 389-430.
- Lee, A.T. and Macfarlane, T.D. (1986). *Lomandra*. Flora of Australia 46: 1-65.
- Makinson, R.O. (1990). Primulaceae. In Harden (1990): 504-506.
- National Capital Development Commission. (1984) *The Ecological Resources of the ACT*. National Capital Development Commission Technical Paper no. 42.
- (1988a). *Gungahlin: Environmental Impact Statement: Draft for Discussion*. (National Capital Development Commission: Canberra.)
- (1988b). *Sites of Significance in the ACT, volumes 1-7*, National Capital Development Commission Technical Paper no 56.
- National Capital Planning Authority. (1989) *Sites of significance in the ACT, volume 8*. National Capital Planning Authority Technical Paper no 56.
- (1992) *Sites of Significance in the ACT, volume 9*. National Capital Planning Authority Technical Paper no 56.
- Powell, J.M. & Wiecek, B.M. (1992). *Eryngium*. In Harden (1992): 91-92.
- Simon, B.K. (1992). A revision of the genus *Aristida* (Poaceae) in Australia *Australian Systematic Botany* 5: 129-226.
- Taylor, I.M. & Canberra Ornithologists Group. (1992) *Birds of the ACT: an Atlas*. (Canberra Ornithologists Group and National Capital Planning Authority: Canberra.)
- West, J.G. (1990). Portulacaceae. In Harden (1990): 178-185.
- Weston, P.H. (1991a). *Medicago*. In Harden (1991): 452-455.
- Weston, P.H. (1991b). *Pultenaea*. In Harden (1991): 481-497.
- Wilson, K.L. in prep. In Harden (199-).
- Wilson, P.G. (1990). Ophioglossaceae. In Harden (1990): 17-18.

Manuscript received 10 August 1992

Manuscript accepted 24 March 1993