

Flowering times of plants found in Oxley Park, Tamworth

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Abstract

Hosking, J.R. (NSW Agriculture & Fisheries, Agricultural Research Centre, R. M. B. 944, Tamworth, Australia, 2340) 1990. Flowering times of plants found in Oxley Park, Tamworth. *Cunninghamia* 2(2): 197-216. The vegetation of Oxley Park, Tamworth, N.S.W. (between 31°04'S and 31°07'S and 150°56'E and 150°59'E) was surveyed. A list of plant species and periods over which they flowered has been compiled from January 1984 to December 1985, with some records for other times. In all, 434 species were recorded, 243 being native and 191 exotic.

Introduction

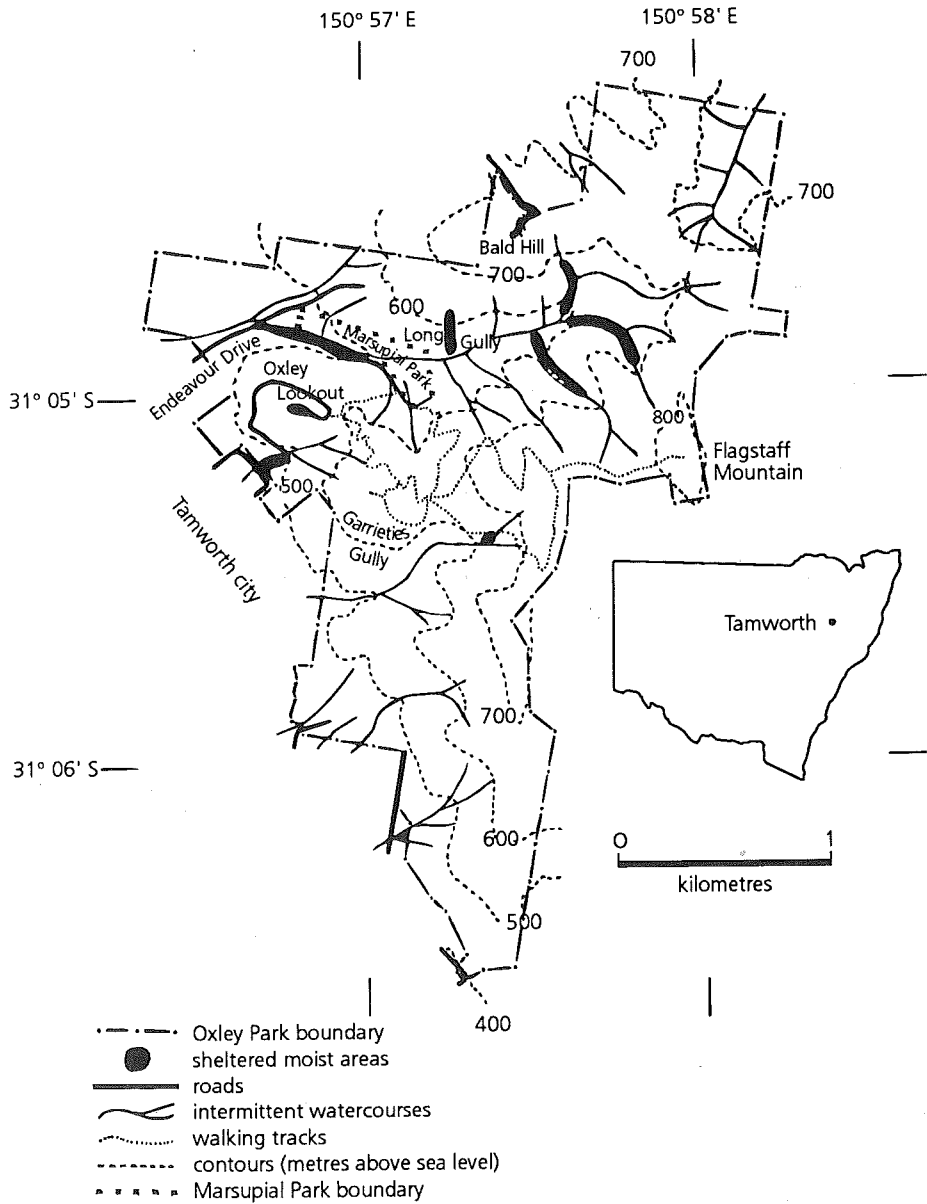
Oxley Park is on the north-eastern edge of Tamworth and covers the hills which form a backdrop to the city. The most frequently visited feature in the Park is Oxley Lookout (31°05'S 150°57'E), an area overlooking Tamworth. The height of the Park varies from 400 m in the south-east corner to 831 m on the top of Flagstaff Mountain. Soil is generally shallow red brown earth. The long-term average rainfall at Tamworth airport is 675.9 mm (Anon. 1972) but rainfall is higher in the Park because of the higher altitude. Approximately 60% of rainfall falls in the summer and 40% in the winter. Temperatures vary from an average minimum of 2.7°C in July to an average maximum of 32.5°C in January (Anon. 1972).

Oxley Park is predominantly an open woodland community dominated by *Eucalyptus albens* (white box), while some of the sheltered gullies have dry rainforest species forming vine thickets. There are also areas of native grassland.

The Park was gazetted as a public reserve in 1888 and since then there have been a number of additions and the area has increased from 372 ha to 521 ha (Map 1). It is held in joint trusteeship by Tamworth City Council and the Lands Department.

Specimens were identified by the National Herbarium of New South Wales. Voucher specimens of most species found in the Park have been lodged at the herbarium of the Agricultural Research Centre, Tamworth and additional specimens are lodged at the National Herbarium of New South Wales, Sydney and the herbarium of The University of New England, Armidale.

Tamworth is in the south-eastern part of the botanical sub-division of New South Wales known as the North Western Slopes and few plant lists are available for this region. Williams (1979) lists plants found in pastures of the North West Slopes, however, it does not include all the species covered in the present work. The most comprehensive list could be extracted from Jacobs and Pickard (1981) but this covers all species found throughout the entire North West Slopes. This sub-division covers a large area with many soil types and climates.



Map 1. Oxley Park showing contours, streams, roadways, walking tracks and sheltered moist areas.

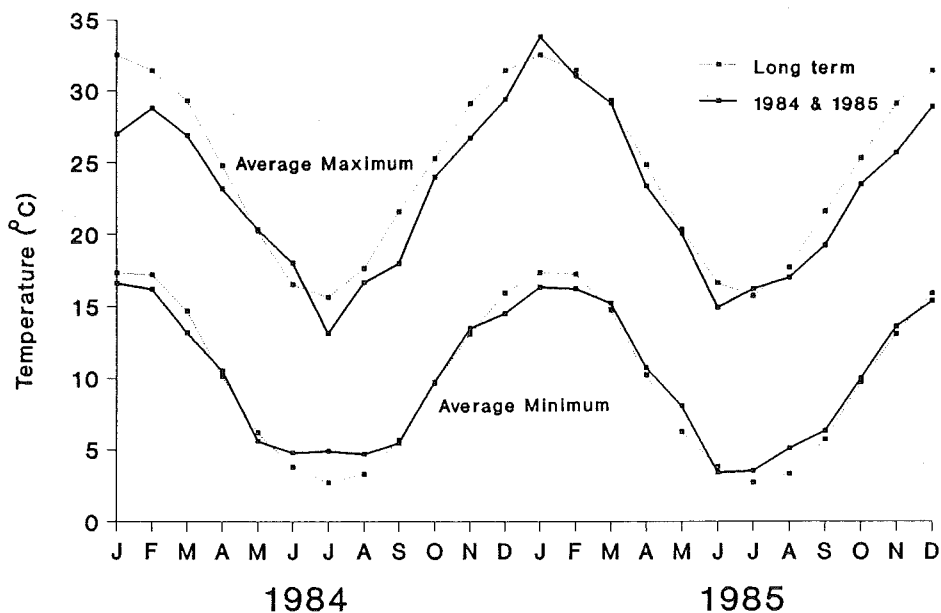


Figure 1. Temperature data for Tamworth airport, New South Wales, approximately 9 km east of Oxley Park. Data for 1984, 1985 (airport records) and long term average (Anon. 1972).

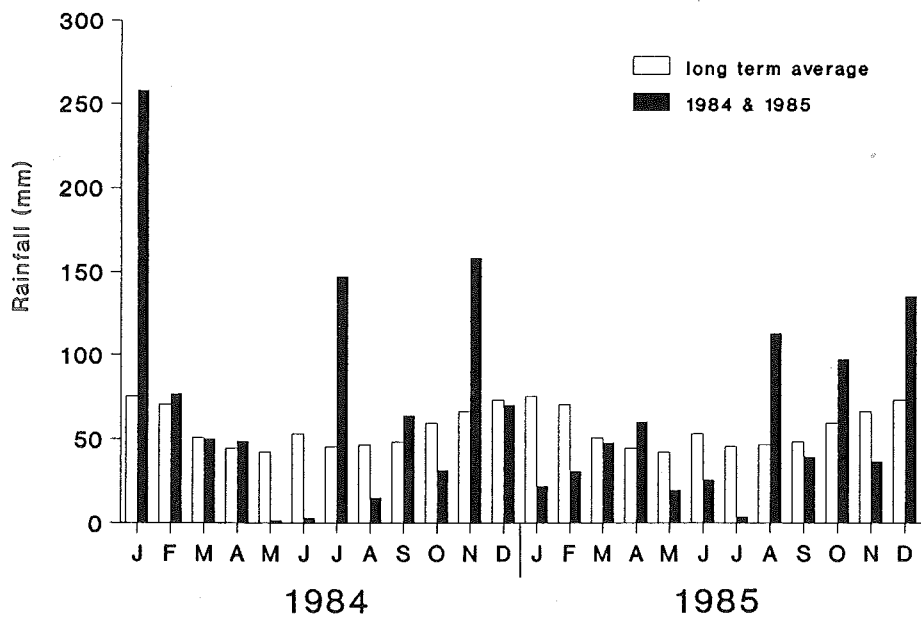


Figure 2. Rainfall data for Tamworth airport, New South Wales, approximately 9 km east of Oxley Park. Data for 1984, 1985 (airport records) and long term average (Anon. 1972).

Methods

The flora list and flowering times were largely compiled between January 1984 and December 1985. Visits to the Park were usually made three times per month, between days 1 and 10, between days 11 and 20 and between days 21 and the end of the month. Not all areas of the Park could be visited on each occasion so the flowering times are conservative. The areas visited the most during this study were along the town boundary, the walking tracks and Long and Garrieties Gullies. Flowering times covered here include all times that each species was found in flower. In many cases most plants of the same species flower over a much shorter period. Flowering times of Pteridophytes cover the time that spores were being produced.

Climatic data, both long-term and from 1984 and 1985, from Tamworth airport, are shown in Figures 1 and 2.

Species list and discussion

A list of species is given in Table 1 and a short description of the vegetation of Oxley Park is included to give some further explanation and to clarify the abundance and distribution of some of the species. Botanical names in the list are from Jacobs and Pickard (1981), alterations to that census by Jacobs and Lapinpuro (1986), volumes of *Flora of Australia* (published by the Australian Government Publishing Service) or recent names supplied by the National Herbarium of New South Wales.

Table 1. Flowering times of plants found in Oxley Park, Tamworth.

Key

Before the species

* indicates an exotic species

! indicates a native species which is probably not, or definitely not, native to this area

Voucher	V = vouchers lodged with National Herbarium of New South Wales and the herbarium of the Agricultural Research Centre, Tamworth
	= no voucher available
Habitat	D = disturbed areas and town edge of Park (includes roadsides, lawns and tracks)
	H = high elevations of the Park (above 700 m)
	M = many habitats
	N = plant rarely found and habitats therefore uncertain
	P = plants deliberately introduced to the area and showing no apparent spread (planted in Marsupial Park, as shelter belts or in lawns)
	W = moist and wet areas
Abundance	C = common
	L = locally common
	U = uncommon
Frequency (visits)	F = area where species occurs was checked frequently
	I = area where species occurs was checked infrequently

Flowering times

The letters correspond to the month, commencing with January.

Within the table flowering times are recorded as:

+ = 1984

x = 1985

* = both 1984 & 1985

o = years other than 1984 & 1985

Species	Voucher Habitat Abundance Frequency (VHAF)													
		J	F	M	A	M	J	J	A	S	O	N	D	
Park visits during 1984 and 1985		*	*	*	*	*	*	*	*	*	X	*	*	*
PTERIDOPHYTES														
ADIANTACEAE														
<i>Adiantum aethiopicum</i> 1984 and 1985	V W C F	*	*	*	*	X	*	*	*	X	*	*	*	*
PTERIDOPHYTES														
ADIANTACEAE														
<i>Adiantum aethiopicum</i>	V W C F	*	*	*	*	X	*	*	*	X	*	*	*	*
ASPLENIACEAE														
<i>Asplenium flabellifolium</i>	V W L I	o	o						o		X	X	X	
DENNSTAEDTIACEAE														
<i>Pteridium esculentum</i>	V N U I												X	X
SINOPTERIDACEAE														
<i>Cheilanthes distans</i>	V M C F	*	*	+	*		*	+	+	o	X	*	*	*
<i>Cheilanthes lasiophylla</i>	V M C F	*	+	+	*	*	*	*	+	X	*	*	*	*
<i>Cheilanthes sieberi</i>	V M C F	*	*	+	*		*	+	+	o	X	*	*	*
<i>Pellaea falcata</i> var. <i>falcata</i>	V W C F	*	*	+	+	*	*	+	+	X	*	*	*	*
GYMNOSPERMS														
CUPRESSACEAE														
<i>Callitris glaucophylla</i>	V M C F									X	o	*		
* <i>Sabina virginiana</i>	V D U I				X			X				X		
ZAMIACEAE														
<i>Macrozamia diplomera</i>	V H L I						X	X	X	X	X			
MONOCOTYLEDONS														
ALLIACEAE														
<i>Nothoscordum inodorum</i>	V D U I												X	*
ARECACEAE														
* <i>Phoenix canariensis</i>	V N U I									o				
COMMELINACEAE														
<i>Commelina cyanea</i>	V W L I	x	x										*	
* <i>Tradescantia albiflora</i>	V D U I	o	o										X	X
CYPERACEAE														
<i>Carex inomitata</i>	V W C F	*								o	*	*	*	*

Species	(VHAF)	J	F	M	A	M	J	J	A	S	O	N	D
<i>Carex inversa</i>	V M C F		+	x						x	*	*	*
<i>Cyperus gracilis</i>	V M C F	*	*	+	x						x	x	*
* <i>Cyperus rotundus</i>	V D U I			+	+	x						x	x
<i>Cyperus vaginatus</i>	V W C I	+	x				x				+	*	*
<i>Schoenus apogon</i>	V M U I	x									+	x	+
<i>Scleria mackaviensis</i>	V M U I	o	*	+									x
IRIDACEAE													
* <i>Iris germanica</i>	N U I										+		
JUNCACEAE													
<i>Juncus usitatus</i>	V W C I	+	x									*	*
<i>Luzula meridionalis</i>	V N U I									o	x	x	
LILIACEAE (s. lat.)													
* <i>Aloe saponaria</i>	V N L I												+
<i>Arthropodium milleflorum</i>	V M C F	*	+	+						o	*	*	*
<i>Arthropodium minus</i>	V M C F									x	*	*	+
* <i>Asparagus officinalis</i>	V W U I											o	
* <i>Asphodelus fistulosus</i>	V D C F	*	*	*	+		*	*	x	*	*	*	*
<i>Bulbine bulbosa</i>	V H C I									o	o	x	+
<i>Dianella laevis</i>	M C F	*	+									*	*
<i>Dianella revoluta</i>	V M C F	x			+	+			o	x	*	*	x
<i>Dichopogon fimbriatus</i>	V M C F	+	+							o	x	*	*
* <i>Myrsiphyllum asparagoides</i>	V W L I									o			
<i>Thysanotus tuberosus</i>	N U I											o	
<i>Wurmbea biglandulosa</i>	V N L I									o			
ORCHIDACEAE													
<i>Cymbidium canaliculatum</i>	N U I												x
<i>Dipodium punctatum</i>	N U F											*	
var. <i>punctatum</i>													
<i>Microtis unifolia</i>	V N U I											x	
<i>Pterostylis hamata</i>	N U I											o	
PHILESIACEAE													
<i>Eustrephus latifolius</i>	V W C F					o	o	o	+		x	*	*
POACEAE													
<i>Agropyron scabrum</i>	V M C F	*	*	+	*	+	+		+	o	*	*	*
var. <i>scabrum</i>													
! <i>Agrostis avenacea</i>	V D U I				+						*	+	x
var. <i>avenacea</i>													
! <i>Aristida leptopoda</i>	V D L F	*	*	*	*							+	x
<i>Aristida ramosa</i>	V M C F	*	*	*	*	*	*	*			x	*	*
* <i>Avena fatua</i>	V D C F					x		x	x	x	*	*	*
* <i>Avena ludoviciana</i>	V D U I										x	+	x
<i>Bothriochloa macra</i>	V M C F	x	*	*	*	*	*	*				*	*
* <i>Briza maxima</i>	V D L F										*	*	x
* <i>Briza minor</i>	V D L F										*	*	
* <i>Bromus catharticus</i>	V D C F	*	*	*	*	+				x	*	*	*
* <i>Bromus molliformis</i>	V M C F								+	x	*	*	+
* <i>Bromus rubens</i>	V D L I							x		x			
* <i>Catapodium rigidum</i>	V M C F									o	*	x	
<i>Chloris acicularis</i>	V D U I	o	+	+							o	*	x
<i>Chloris truncata</i>	V M C F	*	+	+	*	x	x			x	o	*	*
<i>Chloris ventricosa</i>	V M C F	*	*	*	*	*	*				x	*	*

Species	(VHAF)	J	F	M	A	M	J	J	A	S	O	N	D
<i>Glycine clandestina</i> var. <i>sericea</i>	V M C F	+	+	x		x	x		+	x	*	*	+
<i>Glycine tomentella</i> s. lat.	V M C F	*	*	*	*	x			o	o	x	*	*
<i>Hardenbergia violacea</i>	V M U F							*	*	x	*	*	
<i>Hovea lanceolata</i>	V W L I								o	o			
<i>Indigofera adesmitifolia</i>	V M C F						x		*	x	*	*	
* <i>Lathyrus odoratus</i>	V D U I										x	x	x
<i>Lotus australis</i>	V H C I	+	+		x						o	x	x
* <i>Medicago lupulina</i>	V D U I											x	x
* <i>Medicago minima</i>	V M C F		+	+	+	+		*	*	x	*	*	*
* <i>Medicago orbicularis</i>	V D U I		+								*	x	
* <i>Medicago polymorpha</i> var. <i>vulgaris</i>	V D C F	+	*	*	*	+	x	*	x	*	*	*	
* <i>Medicago sativa</i>	V D U I	+	*										
* <i>Melilotus albus</i>	V D C F	x	x	*	*	*	x				x	+	x
* <i>Melilotus indicus</i>	V D C F	o	x						+		*	*	*
<i>Rhynchosia minima</i>	V M C F		+	*								+	*
<i>Senna barclayana</i>	V M C F	*	*	x								*	*
* <i>Senna pendula</i> var. <i>glabrata</i>	V P U I			+	*	x						x	
<i>Swainsona galegifolia</i>	V M C F	*	*	*	*	x	*	*	*	x	*	*	*
<i>Swainsona monticola</i>	V H L I									x	+	x	
<i>Tephrosia brachyodon</i>	V M L F	*	+	+							x	+	*
* <i>Trifolium angustifolium</i>	V D U I											x	
* <i>Trifolium arvense</i>	V M C F	*	+							o	*	*	*
* <i>Trifolium campestre</i>	V M C F	+		+	+				+	x	*	*	*
* <i>Trifolium glomeratum</i>	V D C F	+								x	*	*	x
* <i>Trifolium repens</i>	V D U I	o										x	x
* <i>Vicia monantha</i> subsp. <i>triflora</i>	V D L F	o						o	o	x	*	x	
* <i>Wisteria sinensis</i>	V P U I	*	x							x	x	+	
FUMARIACEAE													
* <i>Fumaria capreolata</i> subsp. <i>capreolata</i>	V D C F					x	x	x	x	x	x	*	x
* <i>Fumaria muralis</i> subsp. <i>muralis</i>	V D U I								x		x	x	
GENTIANACEAE													
* <i>Centaurium erythraea</i>	V M C F	*	*	*	*		+	+		x	+	*	*
GERANIACEAE													
<i>Erodium cicutarium</i>	V D U I										x	x	
<i>Erodium crinitum</i>	V M C F	+	+		+				o	x	x	*	x
* <i>Geranium molle</i> subsp. <i>molle</i>	V D L I										o		
<i>Geranium solanderi</i> var. <i>solanderi</i>	V M C F	*	*	*	*		x			x	*	*	*
* <i>Pelargonium x hortorum</i>	V D U I										x	*	x
GOODENIACEAE													
<i>Goodenia glabra</i>	V M C F	*	+	+						o	x	*	*
<i>Goodenia pinnatifida</i>	V M C F										x	*	*
<i>Velleia paradoxa</i>	V M L F	x									*	*	x
HALORAGACEAE													
<i>Haloragis serra</i>	V W C F	*	*	+	+		+					x	*

Species	(VHAF)	J	F	M	A	M	J	J	A	S	O	N	D
RANUNCULACEAE													
<i>Clematis glycinoides</i>	V M C F									X	*	*	o
var. <i>glycinoides</i>													
<i>Clematis microphylla</i>	V M C F							+	*	X			
var. <i>microphylla</i>													
<i>Ranunculus lappaceus</i>	V H U I					o					o		
<i>Ranunculus sessiliflorus</i>	V W C I										o	X	*
var. <i>sessiliflorus</i>													
ROSACEAE (s. lat.)													
<i>Acaena novae-zelandiae</i>	V H U I										o		X
<i>Acaena ovina</i> s. str.	V H L I										o		X X
* <i>Cotoneaster</i>	V D C F												X +
<i>glaucophyllus</i>													
* <i>Cotoneaster</i> ?	V D C F												* X
<i>glaucophyllus</i>													
* <i>Malus X domestica</i>	V D U I												X
* <i>Photinia serratifolia</i>	V D U I												X
* <i>Prunus armeniaca</i>	D U I												
* <i>Prunus cerasifera</i>	V D U I								X	X			
* <i>Prunus persica</i>	V D U I									X			
* <i>Pyracantha angustifolia</i>	V D U I												X X
* <i>Pyracantha crenulata</i>	V D U I												*
* <i>Rosa rubiginosa</i>	V D U I												*
<i>Rubus parvifolius</i>	V W C F	o											*
* <i>Spiraea cantoniensis</i>	V P U I					o		o	X	X	X		+
var. <i>lanceolata</i>													
RUBIACEAE													
<i>Asperula conferta</i>	V M C F						X		o	X	*	*	*
<i>Canthium odoratum</i>	V M C I											o	X
* <i>Galium aparine</i>	V M C F	+							X	X	*	*	o
<i>Galium gaudichaudii</i>	V H U I												X
<i>Galium migrans</i>	V M C F	*	*	+	+	X	*		X	X	*	*	*
* <i>Galium murale</i>	V W L I											X	X
* <i>Sherardia arvensis</i>	V H L I										o	X	X
RUTACEAE													
* <i>Citrus limonia</i> s. lat.	D U I												
SANTALACEAE													
<i>Exocarpos cupressiformis</i>	V M U I		+	+	X		X	+	+				
SAPINDACEAE													
<i>Alectryon forsythii</i>	V W L I		X				+	+	+	o	*	*	+
* <i>Cardiospermum</i>	V D U F	X	X	*	*	X	X	X			*	*	*
<i>grandiflorum</i>													
<i>Dodonaea viscosa</i>	V M C F					*	*	*	*				
subsp. <i>angustifolia</i>													
SCROPHULARIACEAE													
* <i>Antirrhinum orontium</i>	V M U I	+				o			o	o	o	X	X
* <i>Linaria arvensis</i>	V M U I								o	X	X	X	
* <i>Verbascum thapsus</i>	N U I												
* <i>Verbascum virgatum</i>	V M C F	*	*	X	o						*	*	*
* <i>Veronica arvensis</i>	V M L I									X	X	X	
* <i>Veronica persica</i>	V D U I										X		
<i>Veronica plebeia</i>	V M U I	+		X						o	X	X	X

Species	(VHAF)	J	F	M	A	M	J	J	A	S	O	N	D
SIMAROUBACEAE													
<i>*Ailanthus altissima</i>	V W L I												X
SOLANACEAE													
<i>*Cestrum parqui</i>	V W L F	x	x	x	x	x	x				x	*	*
<i>*Datura ferox</i>	V D U I				o	o							X
<i>*Datura stramonium</i>	V D U I		*	o	o	o							X X
<i>*Lycium ferocissimum</i>	V D U I				x	x	x			x			X
<i>*Petunia axillaris</i>	V D U I	o								o	o	o	o
<i>Solanum cinereum</i>	M U I	+							o	x	o	o	
<i>*Solanum nigrum</i> subsp. <i>nigrum</i>	M U I	+	*	+	*	o						o	x x
<i>Solanum parvifolium</i>	V M C F	*	*	+	*	o	x			x	*	*	*
<i>*Solanum pseudocapsicum</i>	V W U I												x x
STACKHOUSIACEAE													
<i>Stackhousia monogyna</i>	V M L I							x	x	x	*	*	
<i>Stackhousia viminea</i>	V N U I									o			
STERCULIACEAE													
<i>Brachychiton populneus</i>	V M C I	o											x
THYMELAEACEAE													
<i>Pimelea curviflora</i> var. <i>divergens</i>	V M C F	*	+	+	*	*	x		+	o	x		*
<i>Pimelea linifolia</i> subsp. <i>linifolia</i>	V N U I									o			
<i>Pimelea micrantha</i>	V N U I				o	x							
<i>Pimelea strigosa</i>	V M C F	o	x	+	o			+			*	*	*
URTICACEAE													
<i>*Parietaria diffusa</i>	V W U I												x x
<i>Urtica incisa</i>	V M C F	*	*	*	*	x	x	x	x	x	*	*	*
VALERIANACEAE													
<i>*Centranthus ruber</i>	V W L F	o	o										* x
VERBENACEAE													
<i>*Lantana montevidensis</i>	V D L F	*	+	*	*	*	x	x	x	x	*	*	x
<i>Oncinocalyx betchei</i>	V M C F	*	+								o	*	*
<i>*Verbena bonariensis</i>	V D C F	*	*	*	*	*					x	*	*
<i>Verbena officinalis</i>	V M C F	*	*	*	*	*			+	x	*	*	*
<i>*Verbena tenuisecta</i>	V D L I	o	o	x	x	o	x		x		x	*	x
VIOLACEAE													
<i>*Viola odorata</i>	V D U I									x			
<i>*Viola tricolor</i>	D U I												x
VISCACEAE													
<i>Notothixos cornifolius</i>	N U I					o							o
VITACEAE													
<i>Cayratia clematidea</i>	V W L I	*	x										*
<i>Cissus opaca</i>	V M C F	*	*	*	x								*
ZYGOPHYLLACEAE													
<i>!Tribulus terrestris</i>	V D L F	*	*	*	*								x

Oxley Park is predominantly an open woodland community dominated by *Eucalyptus albens* (white box) with smaller areas of grassland and vine thickets.

Apart from white box other tree species include *Callitris glaucophylla* (white cypress pine) mainly along the western side of the Park, *Angophora floribunda* (rough-barked apple) scattered throughout the Park, *Eucalyptus blakelyi* (blakely's red gum) in Long Gully behind the Marsupial Park and *Brachychiton populneus* (kurrajong) scattered throughout the Park. Some species, such as *Canthium odoratum* (iamboto) and *Notelaea microcarpa* var. *microcarpa* (native olive), grow as small trees in open areas and as large trees in sheltered gullies. In gullies shaded from the sun for most of the day there are a number of species more commonly found in rainforests; these include *Ficus rubiginosa* (rusty fig), *Alectryon forsythii* (ravine bird's eye) and *Croton phebaloides*.

The shrub layer is dominated by *Olearia* sp. G (aff. *elliptica*), *Olearia viscidula*, *Dodonaea viscosa* subsp. *angustifolia* (broad-leaf hopbush) and *Acacia decora* (western golden wattle). Many other shrubs are also present including *Cassinia quinquefaria*, *Maytenus cunninghamii*, *Breyenia oblongifolia*, *Acacia deanei* subsp. *deanei*, *Acacia implexa*, *Acacia neriifolia*, *Acacia paradoxa*, *Cassia eremophila* var. *zygophylla*, *Cassia coronilloides*, *Hovea lanceolata*, *Indigofera adesmiifolia*, *Abutilon tubulosum*, *Myoporum montanum*, *Bursaria spinosa*, *Pittosporum phillyreoides* and *Exocarpos cupressiformis*.

There is a great diversity of grasses in the Park, with most species flowering and seeding in summer. *Aristida ramosa* (purple wiregrass) is particularly common. A number of native species appear to have been introduced to the Park accidentally. For example, *Aristida leptopoda* is only found on, and alongside, the track between the Marsupial Park and Oxley Lookout and may have been introduced in soil used to topdress the path. *Dicanthium setosum* appears to have been introduced to the same area, as well as along Endeavour Drive. *Heteropogon contortus* is not found elsewhere in the district and the only known localities in the Park are alongside the same track and alongside roads in the Park.

Some of the more common vines include *Myrsiphyllum asparagoides* (a naturalised exotic species), *Eustrephus latifolius*, *Parsonsia eucalyptophylla*, *Gymnema pleiadenum*, *Pandorea pandorana*, *Convolvulus erubescens*, *Glycine clandestina* var. *sericea* and *Glycine tomentella*, *Hardenbergia violacea*, *Clematis glycinoides* var. *glycinoides*, *Clematis microphylla* var. *microphylla*, *Cayratia clematidea* and *Cissus opaca*. *Gymnema pleiadenium*, an uncommon species, usually found in dry rainforest, is abundant in the lower portion of a gully which runs approximately north west from Flagstaff Mountain into Long Gully.

Four mistletoes are present in the Park; *Amyema miquelii* (box mistletoe) found on *Eucalyptus albens* is most abundant around the edges of the Park, *Dendrophthoe vitellina* (long-flower mistletoe) most commonly seen on *Brachychiton populneus* and *Angophora floribunda* (but also found on *Dodonaea viscosa* subsp. *angustifolia* and *Schinus areira*) is also a common species, *Lysiana subfalcata* var. *subfalcata* (northern mistletoe) is frequently found on a number of shrub species (*Maytenus cunninghamia*, *Acacia deanei* subsp. *deanei*, *Notelaea microcarpa* var. *microcarpa*, *Bursaria spinosa*, *Alectryon forsythii* and *Exocarpos cupressiformis*) and *Notothixos cornifolius* is occasionally found on *Brachychiton populneus*. *Exocarpos cupressiformis* is also a hemiparasite on the roots of other plants and can be found scattered through the Park.

There are 24 native species which are not, or probably not, native to the Park. Some of these have been deliberately planted and have shown no sign of

spreading, these include *Acacia baileyana*, two *Callistemon* species, *Eucalyptus sideroxylon* and *Melaleuca armillaris*. Two are garden escapes, *Melia azedarach* var. *australasica* and *Grevillea robusta*, the former species confined to roadways and the latter scattered in very low numbers throughout the Park. A number of species have been introduced in material used for roadmaking or path construction and for levelling or planting of lawns and are largely confined to these disturbed areas. Some of these have been mentioned in the grass section above and others include *Cynodon dactylon*, *Amaranthus mitchellii*, *Cotula australis*, *Leptorhynchus panaetioides*, *Atriplex semibaccata*, *Chenopodium desertorum*, *Salsola kali* var. *kali*, *Pratia concolor*, *Persicaria lapathifolia*, *Portulacca oleracea* and *Tribulus terrestris*.

Large numbers of exotic species are naturalised in the Park, many are garden escapes while others have been introduced by grazing animals, rubbish dumping and vehicles as well as in soil for tracks and roadworks. *Opuntia aurantiaca* (tiger pear) is a low growing spiny cactus which is found on the edge of the Park nearest town and the north east portion of the Park. *Opuntia stricta* var. *stricta* (common pest pear), another cactus species, has spread throughout the Park. *Ligustrum lucidum* (broad-leaf privet) is a widespread and frequent tree while *Olea europaea* (european olive) and *Ailanthus altissima* (tree-of-heaven) are frequent in some parts of the Park. *Myrsiphyllum asparagoides* (bridal creeper) is locally frequent and appears to be spreading in Long Gully from the town boundary to the eastern side of the Marsupial Park and in the gully crossed by the road to Oxley Lookout. Most of the introduced species are only frequent along the town boundary of the Park, however, a few species such as *Schinus areira* (pepper tree), *Tweedia coerulea* (tweedia), *Cirsium vulgare* (spear thistle), *Centaurium erythraea* (common centaury), *Opuntia stricta* var. *stricta* and *Centranthus ruber* (red valerian) can be encountered throughout the Park.

Two species, *Dicanthium setosum* and *Macrozamia diplomera*, are listed in *Rare or Threatened Australian Plants* (Briggs and Leigh 1988). A survey of the Park, in February 1990, revealed over 1000 plants of each species. *D. setosum* is listed as having a range greater than 100 km, a vulnerable species, conserved in Carnarvon National Park but no information is available on the adequacy of reservation. Around 1000 plants were present between the Marsupial Park and the Lookout alongside the walking track and approximately 100 plants occurred alongside Endeavour Drive near the entrance to Oxley Park. Both localities would suggest that this species has been introduced to the Park. Some clumps of *D. setosum* were over 20 cm diameter. *Macrozamia diplomera* is listed as having a range greater than 100 km, a rare species, conserved in Warrumbungle National Park but no information is available on the adequacy of reservation. *M. diplomera* occurs in two areas within the Park; about 700 plants were present on the southern side of Bald Hill and about 350 plants occurred on a south facing slope of Flagstaff Mountain alongside the walking track.

New species are being continually introduced to the area. Some of these will only survive for a few years and some will become a permanent part of the flora. One species which became established during this study was *Hyparrhenia hirta* (coolatai grass), it first appeared along Endeavour Drive in November 1984. Another species which was found on the town edge of the Park on one occasion only was *Araujia hortorum*.

A number of species are only present for short periods in certain areas, or are in areas only visited infrequently (for example *Phoenix canariensis*), so the full extent of their flowering period is not recorded. Some, such as *Isoetopsis*

graminifolia and *Stuartina hamata* are inconspicuous annuals and this has resulted in few records of flowering times. The species mix and areas of occurrence vary from year to year, some are very common following drought years, others are only common in wet years. *Senecio lautus* subsp. *dissectifolius* (variable groundsel) was particularly common in September 1981 following a number of dry years. *Centranthus ruber* is an example of one which is usually confined to moist gullies but can be more widespread in years of high summer rainfall.

Plants found in Oxley Park are typical of those found in the Tamworth area so this flora list will be of particular value to many pollen allergy sufferers. In the past Tamworth medical practitioners and others have had to rely on lists of plants known to occur at Armidale and in Sydney, or on the coast, to correlate allergies with suspected plant species.

Botanists and agriculturalists studying distributions of plant species will also find the list of use. For example, lists of species of the same family present in an area are important to those involved with biological control of weeds, as this knowledge can be used to determine which native plants are likely to be exposed to biological agents introduced for control of other members of the same family. These native plants can then be tested to determine if the introduced biological control agents are likely to have any adverse effect on native species. There are many ways in which this study could be expanded in the future. The major field not covered in this study is plant frequencies over time. This could be studied by means of a number of permanent transects spread through various habitats in the Park. Studies could also be undertaken to define times when plants germinate, growth times to flowering and records of flowering times obtained during this study could be extended.

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