

Survey for the Occurrence of the Yass Daisy,
a Gazetted Species,
on portion of 'Springvale'
27782 Hume Highway, Bowning,
Parish of Bowning, Shire of Yass NSW

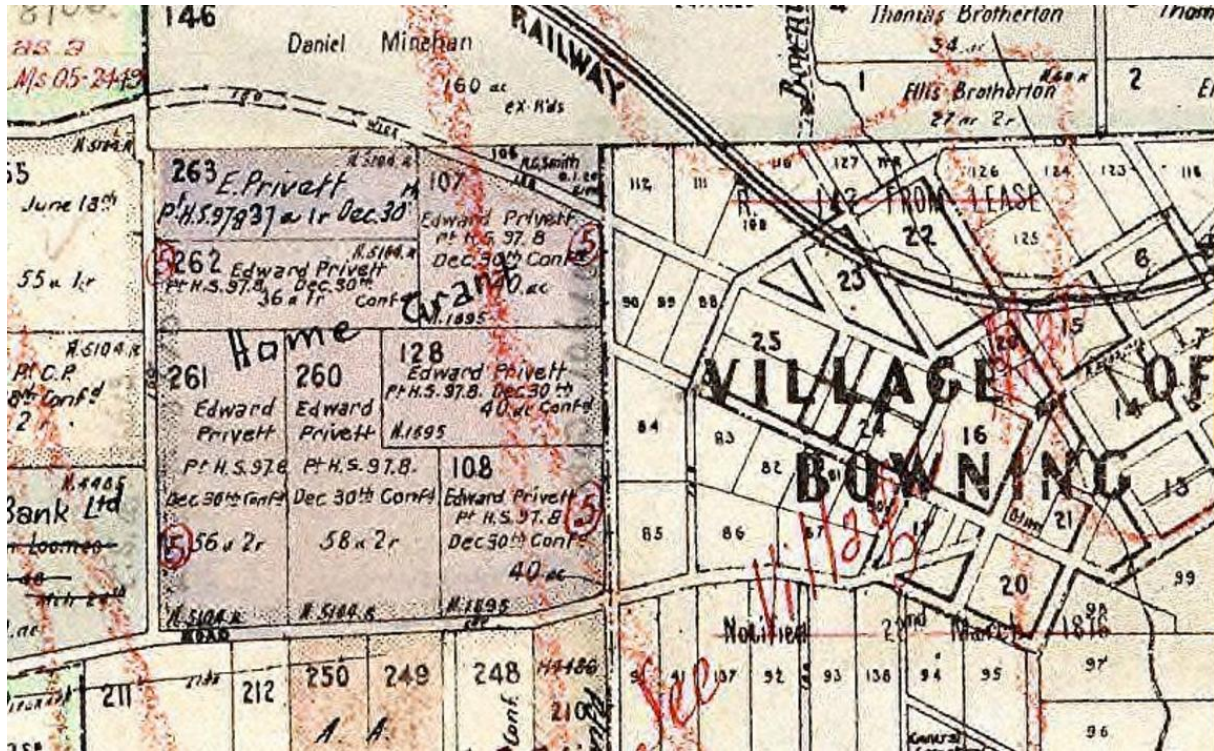


Figure 1, Image from cancelled parish map dated 10th June 1898, showing (shaded purple) the division of the landscape at that date which, has continued until the present. The development is proposed for the southern half of portion 261 on this plan.

Report to Yass Valley Council prepared for Barker Group
by
Australian Ethnography Institute Pty Ltd
March 2017

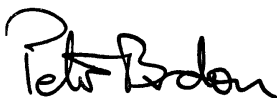
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Certification

Site evaluator details

This report has been prepared and edited by Peter Bindon the Director of Australian Ethnography Institute P/L, from information gathered in the field and interpretations made subsequently on the accumulated data. Australian Ethnography Institute Pty Ltd is a company providing advice in the fields of archaeology, anthropology, ethnobotany and environmental issues.

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Date of assessment: March 2017


Introduction

An assessment for the potential occurrence of the Yass Daisy (*Ammobium craspedioides* Benth.), a Gazetted Species, has been requested for a Proposed Development Site on portion of 'Springvale' 27782 Hume Highway, Bowning, Parish of Bowning, Shire of Yass NSW; (see the attached maps for details of location). The proposed development is the subject of a separate development application lodged with Yass Valley Council. The consultant has been requested to examine the area concerned, taking particular note of the occurrence or otherwise of the Yass Daisy, a plant species listed in the relevant Acts (NSW): Threatened Species Conservation Act, 1995 and the Environmental Planning and Assessment Act of 1979 and their amendments and regulations as gazetted.

Description of project area

The site lies on a portion of land cleared of trees and managed for sheep grazing, which has been the case for more than a century. In an adjoining road reserve to the immediate nominal west of the site remnant woodland with a grassy understorey is extant. This may represent the original characteristic vegetation of the target area. Pasture grasses and some clover make up the ground cover of the target area which at the time of the survey was at $\pm 70\%$. The nominal southern half of the westernmost of the three principal paddocks of 'Springvale' is the area surveyed, (see map at page 1). The target area has a northern and easterly aspect, with a difference in elevation between the highest and lowest points of less than 15 metres.

In this area of the Southern Tablelands, the rolling hills that constitute the dominant landform are underlain by volcanic rocks that often outcrop on hilltops. This is the situation at the nominal south western end of the study area and locally within it. The occurrence of exposures of sub-surface rock is insufficient for these areas to be classified as "rocky." Relatively shallow sandy to sandy clay soils cover the remainder of the ± rectangular block. A small dam towards the north eastern edge of the study area provides the only permanent still water habitat.

Methodology

Legislative Framework

Yass Daisy is listed as vulnerable in both State and Commonwealth listings. This species is eligible for listing as vulnerable under the Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) (EPBC Act) as, prior to the commencement of the EPBC Act, it was listed as vulnerable under Schedule 1 of the Endangered Species Protection Act 1992 (Cwlth). Yass Daisy is also listed as vulnerable under the Threatened Species Conservation Act 1995 (NSW).

Threatened Species Conservation Act 1995 No 101 (Current version for 10 March 2017 to date; accessed 17 March 2017 at 09:45). Provisions in force: The provisions displayed in this version of the legislation have all commenced. Does not include amendments by: Environmental Planning and Assessment Amendment Act 2008 No 36 (amended by Statute Law (Miscellaneous Provisions) Act (No 2) 2014 No 88) (not commenced). Proposed repeal: This Act is to be repealed on the commencement of Sch 10 to the Biodiversity Conservation Act 2016 No 63. Authorisation: This version of the legislation is compiled and maintained in a database of legislation by the Parliamentary Counsel's Office and published on the NSW legislation website, and is certified as the form of that legislation that is correct under section 45C of the Interpretation Act 1987.

The NSW *Threatened Species Conservation Act 1995* identifies and protects native plants and animals in danger of becoming extinct. The Act streamlined existing regulatory procedures under the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *National Parks and Wildlife Act 1974* (NP&W Act). The most recent New South Wales legislation is: *Threatened Species Legislation Amendment Act 2004* passed by Parliament in November 2004. The Act was amended by Schedule 4 to the Statute Law (Miscellaneous Provisions) Act (No 2) 2006 No 120 with effect from 4.12.2006. Final determinations of the NSW Scientific Committee (both NSW NPWS and Fisheries) and the Commonwealth Scientific Committee are current to the time of writing. Along with other local vegetation regimes including the Gum–Box Grassy Woodland and derived Grassland, the Yass Daisy was listed as a vulnerable species under the Australian Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 16 July 2000.

Superseded Commonwealth Documents

Commonwealth of Australia (2000). Declaration under s178, s181, and s183 of the Environment Protection and Biodiversity Conservation Act 1999 - List of threatened species, List of threatened ecological communities and List of threatening processes. F2005B02653. Canberra: Federal Register of Legislative Instruments. Available from: <http://www.comlaw.gov.au/Details/F2005B02653>. In effect under the EPBC Act from 16-Jul-2000.

Department of the Environment and Heritage (DEH) (2006bq). *Ammobium craspedioides* in Species Profile and Threats (SPRAT) database. Unpublished species profile. Canberra, ACT: DEH. Available from:

http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=20758.

Background Searches and Literature Review

Prior to the field work being undertaken a desktop study was carried out. This involved background searches of print and electronic resources listed in the bibliography, and examination of the New South Wales National Parks and Wildlife Service Atlas of NSW Wildlife and the Environment Australia Online Database (Environment Australia June 2003) for a 10 km grid around the site.¹

Field Survey Methods

The target area was examined on foot during the week ending 17th of March 2017. The methodology used is from Cropper (1993). The vegetation occurring on the site is classified according to the structural forms used by Specht (1981b). The aim of the survey was to target threatened flora and to identify any associated threatened ecological communities or populations as listed on the state or federal legislation.

The vegetation present on the site was assessed according to the following criteria:

- species present
- history of disturbance including the stage of regeneration and the presence of exotics
- presence of significant plant species
- overall condition and
- viability of the portion and its immediate surrounds

Taxonomy and References

Taxonomy is from references listed and any recent updates from the Royal Botanic Gardens, Sydney. The main references utilised for flora background information in Table 1 and the Seven Part Test of Significance include; NSW National Parks and Wildlife Service Threatened Species Profiles compiled by NSW NPWS, the similar series assembled by the Commonwealth and from field and research experience of the author.

Special concerns

The loss of eucalypt dominated woodlands is of some concern nationally and regionally. The relevant assessment committees have determined that the name of what were formerly separate Eucalypt dominant woodlands with a grassy understorey should be combined because of their ecological similarities and henceforth be known as “Box – Gum Grassy Woodland and Derived Grassland.” Throughout their widespread eastern distribution in Australia, such landscapes provide habitats for a variety of threatened species. In the Yass area, the Yass Daisy (*Ammobium craspedioides*) is a threatened rare species that has been found in association with these woodlands. Although covering only a very small surface area, the study area represents an example of the Derived Grasslands of Box-Gum Woodland, albeit one that has been subject to grazing and pasture improvement since the late 1800’s. Although a road reserve to the nominal west of the site of the proposed development does contain remnant woodland, only one tree that may date from pre-European settlement remains on the target area. Consequently, the species makeup of the grassland was the primary focus of the assessment.

¹ http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=20758

Summary of Findings

Species present

The Yass Daisy is a rosette-forming perennial. Leaves are spoon-shaped, to 12 cm long and 17 mm wide, hairy on top and white and woolly underneath. The spring flowerheads are hemispherical buttons, to 20 mm wide, and surrounded at the base by papery leaf-like structures (bracts). The solitary flowerheads are borne on unbranched stems to 60 cm tall; the stems are sparsely leafed, and edged with narrow "wings." Rosettes die off after fruiting.²

Most populations of the Yass Daisy occur in the Yass District, at Lake Burrinjuck, Bookham, Rye Park and Dalton in a number of Travelling Stock Reserves, Crown reserves, cemeteries and roadside reserves. It is found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts (*Eucalyptus blakelyi*, *E. bridgesiana*, *E. dives*, *E. goniocalyx*, *E. macrorhyncha*, *E. mannifera*, *E. melliodora*, *E. polyanthemos*, *E. rubida*). Apparently the Yass Daisy is unaffected by light grazing, as populations persist in some grazed sites. A small population exists in Livingstone National Park, about 30 km south of Wagga Wagga (Burrows 1999a).³ Other populations are found in Bigga, north of Crookwell and Tumut (RACAC 1995). Vegetation surveys for the proposed Conroys Gap wind farm found a sizeable population of a few hundred plants on private property near McCullums Creek (McPherson 2006).⁴ No occurrences have been found closer to the target area than this latter location.

History of disturbance including the stage of regeneration and the presence of exotics

The vegetation in the target area has been changed from its natural state and retains few native vegetation species; there is no indication that regeneration will occur. The site is adjacent to a road reserve that preserves a percentage of the features suggesting that it could be classified as grassy woodland but this landscape type is outside the boundary of the target area. As the study area has been used for grazing for well over 100 years, most of it is colonised by a range of exotic pasture plants ($\pm$ 45% of species present) along with a few common local non-native weedy species interspersed with some native species. In fact, the composition of the pastures is remarkably homogenous indicating the conscientious management that has occurred since initial clearing took place in the late 1800's. The relatively thin and nutrient poor soils of the target area indicate that the vegetation patterns of woodlands and grassy woodlands are to be expected in the locality, as the soils are too infertile to support tall forest species.

Thin lithosol/colluvial soils and outcrops of basic rocks on the undulating surface are an indication of the underlying regional geology and the fact that the current land surface has been subject to long exposure.⁵ Soil depth was not measured during the survey. No erosion

² Brown, EA 1992, 'Ammobium', in Flora of New South Wales, vol. 3 ed. GJ Harden, University of NSW Press, Kensington, NSW.

³ Burrows, G.E. (1999a). A survey of 25 remnant vegetation sites in the South Western Slopes, New South Wales. *Cunninghamia*. 6(2):283-314.

⁴ McPherson, P. (2006). *Proposed development of a wind farm at Conroys Gap, New South Wales. Environmental Assessment. Attachment 6 - Biodiversity*. Bega, NSW: NGH Environmental. Available from: <http://www.epuron.com.au/desktopdefault.aspx/tabid-786/> [possibly a dead link]

⁵ With regard to the geological aspects of this site, it was observed that the target area does not contain outcrops of sedimentary rocks that include fossils or any other geological feature that could be considered as a significant

features are present that would indicate the absolute depth of the soil and auger holes to test this characteristic were not considered necessary to determine this because of the proximity of the rocky outcrops previously referred to. However, soil exposures in the walls of an earth dam and in the highway cutting adjacent indicate a minimal 'A' horizon low in humus and nutrients overlying the 'B' horizon. Although the soils of the target area are mostly well-grassed, soil depth is likely to be very erratic because of the proximity of the underlying irregular surface of the volcanics at shallow depth. Most surface undulations across the site have developed around outcropping volcanic rocks, a feature that is extremely common regionally. Drainage presently conforms to the general slope towards the north and east except for that part of the surface water run-off caught in a small earthen dam. Shallow sloping paddocks around the target area probably add less than 5% additional run-off to surface water on the block itself, although this figure is only an estimate of actual run-off.

No evidence of saline florescence was seen on the site. Generally, the level of the water table is governed primarily by the proximity to the surface of the impervious volcanic rocks. As previously noted these are shallow and if saline solutions were present in the subsoil, they would appear through suitable surface expressions. It is concluded that the depths of soil present and its porosity have ameliorated any conditions that would have produced a salinity build-up and that there is no soil salinity problem on the site.

Being adjacent to the northbound lane of the Hume Highway the nominal southern boundary of the target area adjoining the highway easement shows a slightly different vegetation pattern to that of the remainder of the block. Access to the proposed development site will occur across the existing road easements where the vegetation consists of species that were planted to prevent roadside erosion, species resulting from debris ejected from vehicles (mainly exotic fruit trees) and other plants whose local origin is unknown but which can be expected in disturbed ground and on local roadsides. Specific plants noticed during the survey are listed in the appropriate tables attached as appendices.

Flora

Presence of significant plant species

A list of the principal flora species detected during the survey is provided in an appendix attached to this report. No threatened species were detected during the survey. The whole of the target area has been heavily grazed for more than 100 years and barely meets the criteria of being described as a remnant woodland community, and is certainly not a core habitat for the Yass Daisy. The vegetation community represents a partly natural pasture that contains several species of non-endemic 'clovers' with sporadic occurrences of grassland weeds.

The presence of Hickory Wattle, (*Acacia falciformis*), River Red Gum, (*Eucalyptus camaldulensis*) and Red Stringybark, (*Eucalyptus macrorhyncha*) have been noted in the road reserve to the nominal west of the block, and Apple Box, (*Eucalyptus bridgesiana*) exists as mature specimens. These tree species dominate the canopy and are typical of the regional woodlands, but as mentioned previously there are no tree species in the project area. Furthermore, none of the above is a threatened species.

Overall condition and viability of the portion and its immediate surrounds

Grassland flora species noted in the study area included those listed in the appended table.

part of natural heritage.

More grasses may occur on the target area than appear in the plant list but as they lacked sexual material at the time of the survey, they were unidentifiable. It can be presumed that many of the unidentified species were non-native species that had either invaded the area from adjacent pastures or had been deliberately seeded into the landscape. Although wooded grasslands with a predominance of native Australian grass species are under threat, no grass species are currently listed as threatened species.^{6 7}

Threatened species

The Yass Daisy (*Ammobium craspedioides*), is a rosette-forming perennial. Leaves are spoon-shaped, to 12 cm long and 17 mm wide, hairy on top, white and woolly underneath. The single yellow flowerhead that emerges from the plant in spring is a hemispherical 'button,' up to 20 mm wide surrounded at the base by straw-coloured papery leaf-like structures (bracts). The solitary flowerheads are borne on unbranched stems up to 60 cm tall; the stems are sparsely leafed and edged with narrow "wings" giving them the appearance of being square. The leafy rosettes die off after fruiting and the plant is sustained by underground 'tubers;' these were the target of Aboriginal people in former times. It is usually recognised in the field by the distinctive rosette of basal leaves, "Billy Button" form of the flower and the strongly "winged" flower stem. In the Yass area, the daisy has persisted in some pastures despite light grazing because its underground 'tubers' store nutrients for the forthcoming season of growth.

The Yass Daisy is an herb of dry forests, box – gum woodland and the margins of these habitats following clearing where some shade falls. These situations usually occur in a variety of light soils on the Southern Tablelands and South Western Slopes, centred on the Yass region.⁸ It has been found in association with a variety of eucalypts, namely *Eucalyptus blakelyi*, (Blakeley's Red Gum), *E. bridgesiana*, (Apple Box), *E. dives*, (Broad-leaved Peppermint), *E. goniocalyx*, (Long-leaved Box), *E. macrorhyncha subsp. macrorhyncha*, (Red Stringybark), *E. mannifera subsp. mannifera*, (Brittle Gum), *E. melliodora*, (Yellow Box), *E. polyanthemos subsp. polyanthemos*, (Red Box) *E. rubida*, (Candlebark). Other tree species that may be present in Yass Daisy habitat include the Rough-barked Apple, (*Angophora floribunda*) and Hickory Wattle, (*Acacia falciformis*). Although some of these tree species occur adjacent to the target area, the open and exposed nature of the site does not provide favourable habit for the Yass Daisy.

Legislative extracts

The main threats to the survival of the Yass Daisy are:

- intensive agriculture;
- intensive grazing resulting from over-stocking;
- colonisation of habitat by invasive weed species;
- road works – particularly widening and re-routing because many known populations are on road verges and -
- inappropriate maintenance regimes in cemeteries and stock reserves which are known vestigial habitats.

⁶ 6 Oliver, L. 1999. Threatened Species of South-eastern New South Wales. Riverina Highlands. NSW National Parks and Wildlife Service, Southern Region, Queanbeyan NSW

⁷ Threatened Species Conservation Act, 1995

⁸ Information from: <http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10043>

Species action statement

This species has been assigned to the 'Keep-watch' species management stream under the 'Saving our Species' program.

Justification for allocation to this management stream:

Relatively large populations of this species occur within reserves where current management is sufficient to ensure their long term security.

The Department of Environment and Conservation has identified 8 priority actions to help recover the Yass Daisy in New South Wales.

- Protect known populations from changes to land use.
- Do not undertake road works, pasture modification or other changes in land use that may affect populations.
- Do not increase grazing pressures on sites where populations persist - reduce grazing pressures where possible.
- Undertake weed control in and adjacent to populations, taking care to spray or dig out only target weeds.
- Maintain traditional cemetery mowing regimes, taking care not to mow during the species' active period in spring and summer.
- Mark sites and potential habitat onto maps (of the farm, shire, region, etc) used for planning (e.g. road works, residential and infrastructure developments, remnant protection, rehabilitation).
- Search for new populations in potential habitat.

In this report I propose to address each of these actions in order with regard to the development proposal (service centre, parking and access thereto) for the lot in question.

- Protect known populations from changes to land use.

There is no certain habitat of the Yass Daisy on the interior of the block. It was not seen close to here in any of the previous environmental surveys undertaken on adjacent portions of land. As the block in question has been heavily grazed, it is assumed that any substantial former population of this plant has disappeared.

- Do not undertake road works, pasture modification or other changes in land use that may affect populations.

The modifications that will occur on the surface of this block will take place away from the only likely habitat occupied by the Yass Daisy, which is along the unused gazetted road to the nominal west of the target area. It will not be modified by any development and consequently development on the target area will not affect any known population of this endangered plant.

- Do not increase grazing pressures on sites where populations persist - reduce grazing pressures where possible.

This clause is not applicable as there are no known plants on the block, and it is not scheduled for grazing in the development application.

- Undertake weed control in and adjacent to populations, taking care to spray or dig out only target weeds.

The owner of this block is sensitive to the required management techniques required for this plant.

- Maintain traditional cemetery mowing regimes, taking care not to mow during the species' active period in Spring and Summer.

This clause is not applicable.

- Mark sites and potential habitat onto maps (of the farm, shire, region, etc) used for planning (e.g. road works, residential and infrastructure developments, remnant protection, rehabilitation).

This action is a community responsibility as well as a task for planners to map and subsequently to monitor the relevant locations if this plant is found on the target area in the future.

- Search for new populations in potential habitat.

This is not a task for the landholder exclusively, but for all those wishing to use landscapes in which this endangered plant is known to occur or is likely to occur.

Other threatened communities

Box – Gum Grassy Woodland and Derived Grassland occurs in a narrow strip to the nominal west of the target area. It is estimated that this occurrence is approximately 20 metres wide and runs for 1.6 km at 8.9 degrees east of north, crossing Red Hill Road but ending before the railway easement for the main Southern Line. Areas of high understorey biodiversity tend to occur on public land that has not been utilised for domestic stock grazing or cropping. Examples include cemeteries and road verges (as seen adjacent to the study area), some town commons, or travelling stock routes or reserves. This particular community is isolated from other forest habitats by large swathes of grassland. It is the closest woodland to the proposed development that might be subject to wildfire, but is partially protected from encroachment by the adjacent heavily grazed paddocks. As there are no trees within the proposed development, there is little chance of threat by wildfires except across the grassland. Paved areas for parking and access that will surround the proposed development will reduce any risk of fire arriving from an external source except through falling cinders. A range of building requirements can reduce this latter risk considerably.

Significance and Recommendations

Presence of gazetted species

It is the consultant's opinion that the significance of this portion of land in terms of ecological values is very low.

No evidence was found during the survey that the target area is now the host to a population of the Yass Daisy, (*Ammobium craspedioides*).

The whole of the target area has been heavily grazed for more than 100 years and barely meets the criteria of being described as a remnant woodland community, and therefore is unlikely to have ever been a habitat for the Yass Daisy.

No plants (or animals) were identified during the survey that are threatened species or endangered species and the habitat is unsuitable for most of those identified for this region.

Scientific and educational values.

It is the consultant's opinion that these values are very low for the target area, firstly because of its diminutive size and secondly because of previous alterations to the natural environment. It is the author's opinion that there are no scientific or educational constraints on the development application being granted.

Recommendation

The consultant finds no ecological impediment to granting the development application.



Figure 2, general view of the site from the location of the proposed development looking towards the nominal north east.

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Figure 3, view to the nominal west looking at the road reserve that flanks the proposed development

Appendix 1

Table 1. Woodland plant species seen in the study area (S) and on adjacent road verge (RV) or likely to be present but not seen (L).

Common name	Scientific name	Location (S) or (RV)	Comment
Apple (domestic)*	<i>Malus sp.</i>		
Apple Box	<i>Eucalyptus bridgesiana</i>	RV	
Barley Grass*	<i>Hordeum sp. (syn. Critesion sp.)</i>		L
Black Wattle	<i>Acacia decurrens</i>	RV	
Blackberry*	<i>Rubus fruticosus</i>	RV	
Brome Grass	<i>Bromus sp.</i>	S	Some sp. introduced
Capeweed*	<i>Arctotheca calendula</i>		L
Cat's Ear	<i>Hypochaeris radicata</i>	S,RV	Also: <i>Hypochaeris</i>
Clover*	<i>Trifolium sp.</i>	S	
Early Nancy	<i>Wurmbea dioica</i>	RV	
Grassland Wood Sorrel	<i>Oxalis perennans</i>		L; Some sp. introduced
Hairy Pod Vetch	<i>Swainsona sp.?</i>		L
Hickory Wattle	<i>Acacia falciformis</i>	RV	
Kangaroo Grass	<i>Themeda triandra</i>	S, RV	
Monkey Tussock	<i>Carex appressa</i>	RV	
Paspalum*	<i>Paspalum dilatatum</i>	S, RV	
Perennial Ryegrass*	<i>Lolium perenne</i>		L
Phalaris, Canary Grass*	<i>Phalaris aquatica</i>	S	
Pinrush	<i>Juncus filicaulis</i>	S	
Plum? *	<i>Prunus sp.</i>	RV	
Quaking Grass*	<i>Briza maxima</i>	S	
Red Box	<i>Eucalyptus polyanthemos</i>	RV	
Red Grass	<i>Bothriochloa macra</i>	S	
Red Stringybark	<i>Eucalyptus macrorhyncha</i>	RV	
Ribwort Plantain*	<i>Plantago lanceolata</i>	RV	
Rush	<i>Juncus sp.</i>	S	
Slender Thistle*	<i>Carduus pycnocephalus</i> or <i>C. tenuiflorus</i>	RV	
Sorrel*	<i>Acetosella vulgaris</i> (syn. <i>Rumex acetosella</i>)		L
Stork's Bill	<i>Erodium sp.</i>		Some sp. introduced
Wild Oats*	<i>Avena fatua.</i>	RV	
Woodrush	<i>Luzula densiflora</i>		
Yorkshire Fog*	<i>Holcus lanatus</i>		L

Note: This list does not claim to be exhaustive and is only indicative of species present.

S - site

RV - Road verge

* Denotes an introduced species

Shading indicates listed or gazetted species.

Appendix 2

Maps and plans



Figure 4, general plan showing area for proposed development shaded yellow; map supplied by proponent.

