

Vegetation Management Plan



Lot 1 // DP 1245993, 70-100 Fullager Road, Wentworthville, NSW, 2145

Redevelopment of Wentworthville Public School

Prepared for: Alphitonia Pty Ltd

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Glossary and abbreviations

Acronym	Description
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
КРІ	Key Performance Indicator
LGA	Local Government Area
LLS	Local Land Services
MZ	Management Zone
NSW	New South Wales
РСТ	Plant Community Type
WONS	Weeds of National Significance
VMP	Vegetation Management Plan



1 Introduction

1.1 Purpose of this Vegetation Management Plan

This Vegetation Management Plan (VMP) has been prepared for the proposed redevelopment of the Wentworthville Public School located at Lot 1 // DP 1245993, Fullager Road, Wentworthville (the 'study area') (**Figure 1.1**).

This is a State Significant Development which was approved by the Department of Planning, Industry and Environment on 28 June 2019. This VMP responds to Consent Condition B4, which requires that a VMP be prepared to the satisfaction of the Certifying Authority. The VMP is required to be consistent with recommendations and mitigation measures in the Biodiversity Development Assessment Report (BDAR) prepared by Travers Bushfire and Ecology (dated October 2018) and with the recommendations of the Aboricultural Impact Assessment Report prepared by TreeTalk Consulting (dated April 2019).

The VMP is required to provide details on the replacement area for Cumberland Plain Woodland and management, monitoring and maintenance of vegetation within the site. These areas of vegetation area are hereafter referred to as the VMP 'subject site' and they are the same areas of vegetation that will be managed within the Landscape Plan prepared by Ground Ink Landscape Architects (2019).

1.2 Site description

The suburb of Wentworthville is located in the Cumberland Local Government Area (LGA) (**Figure 1.2**). The study area contains scattered remnant trees between existing school buildings and infrastructure, playground and garden beds (Travers Bushfire and Ecology 2019). There are no watercourses within the study area, which is located on a small ridge between Finlaysons Creek and Coopers Creek.

The study area contains scattered native trees and exotic lawns that are located around existing buildings, areas of asphalt and garden beds and is approximately 2.2 ha in size. It contains a total of 0.14 ha of native vegetation including, trees, shrubs and groundcover species (Travers Bushfire and Ecology 2019). The study also contains areas managed as lawns or garden beds and with some planted exotic, endemic and non-endemic native species (Travers Bushfire and Ecology 2019).





Figure 1.1: Study area and VMP subject site.





Figure 1.2: Locality of the study area depicting surrounding suburbs and landscape features.

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2 Ecology and conservation values of the site

2.1 Methods

A review of the following reports and information concerning the study area was undertaken to inform the preparation of this VMP:

- Development Assessment Report (BDAR) (Travers Bushfire and Ecology 2018)
- Aboricultural Impact Assessment Report (TreeTalk Consulting 2019
- Landscape DA Documentation Plan (Ground Ink Architects 2019)
- Supplementary Letter (Travers Bushfire and Ecology 2019)

This review aimed to determine and assess the overall resilience of the subject site, and therefore its capacity to respond to replacement landscaping using Cumberland Plain Woodland species. Appropriate management methods to achieve the replacement landscaping of the land were considered during the desktop review.

The review also identified any problematic exotic species, priority weeds and Weeds of National Significance (WoNS) and reviewed appropriate site weed control techniques in the context of the site.

2.2 Results

2.2.1 Vegetation communities and condition

A review of vegetation mapping of BDAR (Travers Bushfire and Ecology 2018) identified one native vegetation community within the subject site, namely Cumberland Plain Woodland (CPW) (PCT 849: Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion) (**Figure 2.1**).

Approximately 0.14 ha of this community was mapped in the BDAR (Travers Bushfire and Ecology 2018). This CPW consisted of remnant scattered individuals, and a small patch of planted trees in a small courtyard, of *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia maculata* (Spotted Gum) and *E. moluccana* (Grey Box). The BDAR notes that the shrub and ground layers under the scattered trees have been almost entirely replaced. Within the small patch of planted trees in the small courtyard there are no native understorey species as the ground layer has been planted with exotic species.

In addition, the BDAR mapped 'Managed Lands', which consists of scattered exotic planted trees and shrubs as well as few remnant locally-occurring species. This vegetation does not correspond to any PCT (Travers Bushfire and Ecology 2018). The vegetation mapping in the BDAR is considered to be sufficient for identifying the environmental values on the subject site for the purposes of this VMP.





Figure 2.1: Vegetation mapping (Travers Bushfire and Ecology 2018).

2.2.2 Site resilience

Resilience is a measure of a sites capacity to respond to restoration works and is often an indication of the extent and severity of past disturbance. In addition, the presence of certain disturbance-sensitive native ground cover species can be good indicators of general resilience in western Sydney (Department of Infrastructure, Planning and Natural Resources 2003b, DEC 2005). Three such species were recorded on the side (Travers Bushfire and Ecology 2018) which were *Dianella caerulea* var. *caerulea* (Flax Lily), *Lomandra cylindrica* and *Lomandra longifolia* (Spiky-headed Mat-rush).

However, given the high level of past disturbance from construction and use of the site, its isolation and the dominance of exotic ground and few ongoing sources of propagules for native species the overall resilience of the subject site is expected to be low.

2.3 Flora species

The review of existing reports aimed to identify exotic flora within the subject site, particularly priority weeds listed under the NSW *Biosecurity Act 2015* for the Greater Sydney Region and WoNS. A total of 37 exotic flora species have been identified within the subject site (Travers Bushire and Ecology 2018) (**Appendix A**), of which one is priority weed for Greater Sydney and which is also a Weed of National Significance (WoNS) (**Table 2.1**). It is acknowledged that other less problematic exotic flora species occur within the subject site.

Common name	Scientific name	WoNS	Duty	
Fireweed	Senecio madagascariensis	Y	Prohibition on dealings	
			Must not be imported into the State or sold	

|--|

2.3.1 Threatened flora

One threatened flora species, *Eucalyptus scoparia*, which has been planted, has been identified within the subject site (Travers Bushfire and Ecology 2018). No other threatened flora species or populations are known to occur within the subject site or are likely to occur (**Figure 2.2**).

2.4 Threatened fauna and fauna habitat

One threatened fauna species was recorded in the subject site during the field assessment for the BDAR being *Pteropus poliocephalus* (Grey-headed Flying-fox) (Travers Bushfire and Ecology 2018). Potential habitat for *Miniopterus orianae oceanensis* (Easter Bent-winged Bat) occurs on the site and this species is considered likely to occur (Travers Bushfire and Ecology 2018).





Figure 2.2: Threatened species within 5 km of the study area (OEH 2019).



The following species are considered to have potential habitat in the subject site but are considered either as unlikely to occur or with a low potential to occur (Travers Bushfire and Ecology 2018):

- Yellow-bellied Sheathtail-bat (Saccolaimus flaviventris) low potential
- Little Lorikeet (Glossopsitta pusilla) unlikely to occur
- Swift Parrot (Lathamus discolor) unlikely to occur
- East-coast Freetail Bat (Mormopterus norfolkensis) unlikely to occur
- Eastern Falsistrelle (Falsistrellus tasmaniensis) unlikely to occur
- Little Bentwing-bat (*Miniopterus australis*) unlikely to occur
- Greater Broad-nosed Bat (Scoteanax rueppellii)



3 Vegetation Management

3.1 Aims

The aims of this VMP are to conserve and protect existing ecological and environmental values in the subject site as outlined in **Section 2**. These values include CPW and potential habitat for threatened fauna species. This VMP aims to ensure that the Critically Endangered Ecological Community (CEEC) CPW is retained or replaced, in accordance with the consent conditions for the project.

As approximately 0.04 ha of CPW will be removed for the project. In accordance with the consent conditions and recommendations in the BDAR, replacement of CPW will consist of planting of CPW tree, shrub and groundlayer species in dedicated landscape beds. The proposed ratio of replacement is 2:1. Therefore, the area of the dedicated landscaped beds will be 0.08 ha.

Replacement landscaping will use locally occurring native species commensurate with CPW including trees, shrubs and ground covers to encourage local fauna use, to consolidate remnant vegetation linkages and to provide 'island' refuges for native flora and fauna species within the locality. In addition, once construction has been completed and landscaping has commenced, control measures will be undertaken to control the remaining exotic species within the subject site.

3.2 Planting of CPW

3.2.1 Introduction

Planting of CPW in dedicated landscaped beds site will be necessary to achieve the target of replacement of CPW. The densities for revegetation have been calculated based on the modified condition of the VMP subject site and the low likelihood of native species recruiting following restoration works. Planting and revegetation should follow the guidelines in DEC (2005) *Recovering bushland on the Cumberland Plain*.

Seed used in the landscaping should be collected from the local endemic vegetation where possible.

3.2.2 Timing and density

Planting of CPW species is to be undertaken once the landscaped beds have been installed. Supplementary planting is will occur for if initial plantings do not establish after the first three months. Any plants lost will be replaced with the same plant species, or if individual species are not available at the time of replacement, only CPW species will be used for replacement plantings. If different species are to be used in replacement plantings, their form must remain consistent (e.g. trees must replace trees, shrubs must replace shrubs, etc.).

Planted vegetation will be watered for at least 12 months following planting.

Planted CPW will be maintained until all plants reach maturity. Plant maturity is to be defined as when individual plants are able to reproduce (i.e. set flowers, and seeds). However, there



will be a limit of 5 years of maintenance set for the proposed VMP works as this time frame is considered appropriate for the CPW planting to become established on the subject site.

3.2.3 Density

Plantings will be installed at a density resembling the vegetation community CPW. Revegetation should aim to recreate the density of this community in an unmodified condition. Planting will include only sparse cover of shrubs to allow light to reach the ground and promote the growth of ground layer species.

Plantings are recommended at the following densities:

- 1 canopy per 40 m²
- 1 shrub per 25 m²
- 1 groundcover (grass, fern, forb or sedge) at a density of 3/m²

3.2.4 Soil treatment

Soils underlying naturally occurring CPW are clay-rich, fine-textured and only moderately fertile (DEC 2005). In the context of the subject site, the naturally occurring soil on the site itself is the most appropriate medium for the replacement CPW plantings. Imported man-made soils will not easily match naturally occurring CPW soils as they are usually high sand alluvial soils mixed with organic composts.

Additional organic matter does not need to be added to improve the soils for the replacement CPW plantings.

As soils underlying naturally occurring CPW are only moderately fertile, any fertilisers used for the replacement CPW plantings are to be low in Phosphorus, and are to be suitable for use on Australian native plants.

Mulch is be used in the replacement CPW landscape beds. This will both conserve moisture and delineate revegetated areas clearly.

Mulch generated from the removal of the CPW trees on the subject site is to be used if available. If this is not available then 'Eucalyptus Leaf Mulch' is to be used.

3.2.5 Habitat

Native trees that are to be removed from the site, including dead trees and trunks (greater than approximately 25-30 cm in diameter and 3 m in length) shall be salvaged and used in the dedicated landscape beds to enhance habitat.

3.3 Weed management

Weed management will be carried out using primary and secondary weed control followed by ongoing maintenance. Weed control will include mechanical removal techniques, herbicide application and natural shading techniques. Disturbance of the soil during the weed management process should be minimised at all times (see Buchanan, 2000, Bradley, 2002). Weed control objectives and treatment techniques are outlined below (Appendix B) in accordance with weed type.



A suitably qualified and experienced bush regeneration contractor as per **Section 4.3** must be engaged to carry out vegetation management works.

3.3.1 Primary weed control

Primary weed control is the initial removal of weed species and is typically when a majority of the standing weed biomass is removed. Mechanical removal techniques relevant to the weed being removed (Buchanan, 2000; Bradley, 2002; DPI 2018) should be used for all woody weeds and herbaceous plants. Herbicide application, such as backpack spraying should be avoided where non-target loss of native species is likely to occur.

3.3.2 Secondary weed control

Secondary weed control involves follow-up weed control to remove seedlings that have emerged after primary control and treatment of any existing plants that reshoot. Any new weed infestation areas identified must also be treated.

3.3.3 Maintenance

Maintenance is the long-term management of a site to prevent weeds from becoming reestablished after primary and secondary work. Effort should be focussed on reducing the weed seed bank, eradicating problematic weeds and supporting the growth of native vegetation. A structured maintenance regime following primary and secondary work will reduce the time taken for the site to reach a reasonable level of stability.

3.3.4 Weed disposal

All seeding herbaceous/grass material and tubers should be bagged, removed from site and disposed of at an appropriate green waste facility. No woody weeds have been detected within the subject site. If woody weeds are recorded within the subject site, and subsequently removed, woody material will be removed from site and disposed of at an appropriate green waste facility.

3.4 Vegetation Management Zone

The VMP subject site will be managed as two management zones (MZs). These MZs include the dedicated landscaped beds required for the replacement CPW plantings (MZ1) and all other landscaped areas (MZ2) (**Figure 3.1**).

Management actions within the dedicated landscaped beds required for the replacement CPW plantings (MZ1) will include installation of bollards, marked posts, or fencing in the ground to identify the perimeter of the bed (whichever option is deemed appropriate for the operation of the school in the context of each individual landscape bed), removal of weeds, planting, management of plantings, control or weeds and monitoring.

The planting and management of MZ2 will be mostly undertaken through the Landscape Plan and the management measures for MZ2 in this VMP are restricted to integrated weed management and implementation of the hollow-bearing tree removal procedure, where applicable.



3.4.1 Management Zone 1 – Dedicated landscaped beds for CPW replacement plantings

This zone covers 0.11 ha and includes areas along the perimeter of the subject site that have been identified for landscaping in the Landscape Plan. This MZ has a moderate-low regeneration potential; therefore, replanting is required to meet the goal of replacement of CWP that is required by the consent conditions.

Maintenance works will focus on the removal of exotic grasses and herbaceous weeds prior to their establishment and seeding. This will be achieved by conducting regular sweeps for target species, which will be treated through a combination of hand removal and spot spraying. Care should be taken to avoid off target spraying, hence spot spraying should be avoided where native grasses and groundcovers are dense in cover.

3.4.2 Management Zone 2 – other landscaped areas

This zone incorporates all of the landscaped areas shown in the Landscape Plan. Primary Weed control is not necessary in this MZ, as weeds will be removed through the landscaping process.





Figure 3.1: Management zones within the VMP subject site.

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It is recommended that sweeps are conducted in this MZ, once the landscaping has been complete, to prevent encroachment of exotic grasses and herbaceous weeds further into MZ2. Spraying is prohibited within this MZ, given the closeness of buildings and areas used by schoolchildren.

3.5 Management of human disturbance

The management of human disturbances within the subject site will largely be controlled through landscaping information and fencing (where appropriate), which will help to restrict access of students to the dedicated landscape beds of CPW. Erecting of signage is recommended to educate students and staff of the importance of the flora and fauna, including their habitats, within the subject site.

3.6 Management of fire for conservation

Appropriate management of fire usually plays an important part in the long-term management of the recognised conservation values in western Sydney. However, the use of fire as a management tool within a school grounds is not recommended, for safety purposes.

3.7 Waste

Dumped garden refuse and any waste material will be removed from the subject site prior to the implementation of this VMP. The experienced bush regeneration contractor could be engaged to assist in the removal of the waste or provide advice on appropriate removal methods.

3.8 Maintenance

The subject site is currently in a maintenance stage, as such the maintenance phase will begin at the initiation of the contract and extend throughout the five-year management period. Regular inspections of site condition will be conducted, including general site monitoring for potential new infestation areas and subsequent weed control of any identified weed species. These inspections should be conducted during a site walkover and documented in a letter report every 6 months. This schedule could be revised depending on performance criteria recorded.

Weed maintenance works will include:

- Removal of all exotic species prior to establishment and seeding,
- Careful spot spraying of exotic grasses and herbaceous weed where off target damage will not occur to native species,
- Eliminate all WoNS and priority weeds before establishment, and
- Hand weeding exotic species amongst expanding patches of native groundcovers.



4 Performance criteria and monitoring

4.1 Monitoring reports

The bush regeneration contractor will monitor the vegetation for changes over time and document this in a letter report for the subject site that will be prepared every six months for the five year maintenance period. The reports will determine the effectiveness of the works undertaken and record changes to the vegetation as a result of vegetation management works. Monitoring photo points should be established at ten permanent reference points.

An example report is detailed in **Table 4.1**, the report should include:

- Works carried out, including weed species targeted and their location;
- An approximation of the time spent on each task;
- Any observations, such as the occurrence of new weed species;
- Rates of regeneration of native species;
- A description of any problems encountered and how they were overcome;
- A summary of how the site-specific objectives have been met (or not);
- Herbicide and other chemicals used, including quantity, dilution rate and other relevant information;
- Weed control techniques used;
- Climatic conditions which may have influenced weed germination and growth;
- Performance criteria and success; and
- If required, maps of weed distribution and density.

4.2 Performance criteria

The progress and compliance with the VMP will be monitored and reviewed every six months. This process will involve the bush regeneration contractor and landowner assessing the site and analysing works carried out onsite, as documented in the six-monthly reports.

4.3 Bush regeneration contractors

Suitably qualified and experienced bush regeneration contractors that are members of the Australian Association of Bush Regenerators or fulfil the membership criteria must undertake all vegetation management works. In addition to this, team leaders should hold a Certificate III in Conservation & Land Management or possess equivalent field experience and certification. The contractor should carry out best practice bush regeneration techniques as described by Buchanan (1989).



Date		
Name of Contractor:		
Hours worked on site since last monitoring report:		
Site Condition:	Zone	
]	Weed cover %	
	Herbicide used (in Litres)	
	Other	
Describe relevant weed management techniques and fuel load reduction methods:		
Describe problems; e.g. weed invasions, damage to planted material, etc.:		
Photographic evidence:		
Planned work before next monitoring report:		

Table 4.1: Example monitoring report template.



5 References

Department of Environment and Conservation (NSW) (DEC) (2005) *Recovering Bushland on the Cumberland Plain: Best practice guidelines for the management and restoration of bushland*. Department of Environment and Conservation (NSW), Sydney.

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Buchanan R.A (1989) Bush regeneration: recovering Australian landscapes. 2nd edn, TAFE NSW, Sydney.

NSW Office of Environment and Heritage (OEH) (2019). BioNet Atlas of NSW Wildlife. Accessed

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Appendix A Exotic flora

Family Species		Common name	
Asclepiadaceae	Araujia sericifera	Mothvine	
Asteraceae	Bidens pilosa	Cobbler's Pegs	
Poaceae	Bromus molliformis	Soft Brome	
Brassicaceae	Capsella bursa-pastoris	Shepherds Purse	
Asteraceae	Chondrilla juncea	Skeleton Weed	
Lauraceae	Cinnamomum camphora	Camphor Laurel	
Asteraceae	Conyza bonariensis	Flaxleaf Fleabane	
Asteraceae	Conyza sumatrensis	Tall Fleabane	
Myrtaceae	Corymbia ficifolia	Red W.A. Gum	
Apiaceae	Daucus carota	Wild Carrot	
Poaceae	Ehrharta erecta	Panic Veldtgrass	
Poaceae	Eragrostis curvula	African Lovegrass	
Faboideae	Erythrina x sykesii	Coral tree	
Asteraceae	Hypochaeris radicata	Flatweed	
Bignoniaceae	Jacaranda mimosifolia	Jacaranda	
Lythraceae	Lagerstroemia indica	Crepe Myrtle	
Brassicacaea	Lepidium africanum	-	
Malvaceae	Malva parviflora	Small-flowered Mallow	
Meliaceae	Melia azedarach	White Cedar	
Malvaceae	Modiola caroliniana	Red-flowered Mallow	
Musaceae	Musa acuminata	Banana	
Oleaceae	Olea europaea subsp. Europaea	Common Olive Tree	
Poaceae	Pennisetum clandestinum	Kikuyu Grass	
Poaceae	Pennisetum setaceum	Fountain Grass	
Malaceae	Photinia sp.	Photinia	
Phyllanthaceae	Phyllanthus tenellus	Hen and Chicken	
Plantaginaceae	Plantago lanceolata	Ribwort	
Poaceae	Poa annua	Winter Grass	
Anacardiaceae	Schinus areira	Pepper Tree	
Asteraceae	Senecio madagascariensis	Fireweed	
Malvaceae	Sida rhombifolia	Paddy's Lucerne	
Solanaceae	Solanum nigrum	Black Nightshade	
Asteraceae	Sonchus oleraceus	Common Sow-thistle	
Myrtaceae	Syzygium sp. (cultivar)	Lily Pily	
Asteraceae	Taraxacum officinale	Dandelion	
Faboideae	Trifolium repens	White Clover	
Ulmaceae	Ulmus parvifolia	Chinese Elm	



Appendix B Weed treatment methods

Zone	Objective	Main Weeds	Method	Key Performance Indicators (KPI)
MZ1	 Control and suppress exotic grasses and herbaceous weeds 	Ehrharta erecta, Eragrostis curvula, Pennisetum clandestinum, Pennisetum setaceum, Hypochaeris radicata Schinus areira and Senecio madagascariensis	 Herbaceous weeds and exotic grasses will be treated using a combination of hand weeding and careful spot spraying with Roundup Biactive® (i.e. 1%). Hand weeding should be conducted where off target damage to native species could occur and in preparation for selective spot spraying. Herbaceous weeds and exotic grasses should be removed prior to seeding where possible, removed from site and disposed of at a licenced green waste facility. 	• Exotic grasses and herbaceous weeds maintained at currently low cover (i.e. <1% cover) by the end of year one and ongoing.
MZ1	Control and suppress woody weeds and vines	 Araujia sericifera, Cinnamomum camphora, Erythrina x sykesii, Musa acuminata and Ulmus parvifolia 	 Sweeps will be conducted for <i>Araujia sericifera</i>. Small plants of <i>Araujia sericifera</i> will be removed hand-pulling if growing in loose soil or dug out. Large plants will be treated by the scrape and paint method. <i>Large trees</i> will be treated by scrape and painting all stems with neat Roundup Biactive®. or removed physically as part of the project. Woody weeds and exotic vines should be removed prior to planting where possible, removed from site and disposed of at a licenced green waste facility. Tree species removal shall be negotiated with the school community over the 5 year maintenance program. Tree removal will only occur once replacement CPW tree species have grown to a size that will replace the visual amenity on the tree species identified for removal. 	Woody weeds and exotic vines eradicated by the end of year 1 and ongoing.

