

Western Sydney University, Milperra Campus

Vegetation Management Plan

Mirvac Residential

10 June 2026

Final

cumberland
ecology

PART OF  SLR

Report No. 23021RP5

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

Version	Date Issued	Amended by	Details
Final	19/12/2024	AM, HG	
Final v2	29/05/2025	AM, TM	Updated APZ as per Council RFI
Final v3	7/05/2026	AM, GK	Updated following RTS
Final v4	10/06/2026	AM, TM	Updates following RTS

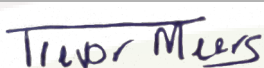
Approved by:	Trevor Meers
Position:	Principal Ecologist
Signed:	
Date:	10 June, 2026

Table of Contents

Glossary	vi
1. Introduction	1
1.1. Background	1
1.2. Purpose	3
1.3. Site Description	5
1.5. Relevant Legislation	6
2. Methodology	8
2.1. Desktop Assessment	8
2.2. Field Surveys	9
3. Existing Biodiversity Values	11
3.1. Vegetation Communities	11
3.2. Threatened Flora Species	15
3.3. Fauna Habitat	16
4. Vegetation Management Zones	18
4.1. Management Zone 1 – Native Vegetation Maintenance	18
4.2. Management Zone 2 - Revegetation of Native Vegetation	19
4.3. Management Zone 3 – Asset Protection Zone - IPA	20
4.4. Management Zone 4: Asset Protection Zone – OPA	21
5. Vegetation Clearing Protocols	23
5.1. Introduction	23
5.2. Hygiene Protocols	23
5.3. Fencing	23
5.4. Pre-clearing Surveys	24
5.5. Clearing Supervision	25
5.6. Weed Management during Construction	25
5.7. Seed Collection / Harvest	25
5.8. Habitat Salvage	26
5.9. Hollow Offset and Replacement Strategy	26
6. Weed Management Plan	27
6.1. Introduction	27
6.2. Relevant Legislation	27
6.3. Weed Species in the VMP Area	28
6.4. Weed Control Objectives	28
6.5. Best Management Practice	28
6.6. Weed Control Methods	29
6.7. Stages of Weed Control	30
7. Restoration and Regeneration Plan	34
7.1. Objectives	34

7.2. Vegetation Protection Measures	34
7.3. Site Preparation	34
7.4. Recommended Revegetation Techniques	35
7.5. Management of Existing Native Vegetation	38
7.6. Maintenance of Plantings	38
7.7. Schedule of Works	38
8. Monitoring and Reporting	40
8.1. Responsibilities	40
8.2. Monitoring	40
8.3. Reporting	41
8.4. Review of this VMP	42
9. Timing and Responsibilities	43
10. References	52

Table of Tables

Table 1 RTS table	1
Table 2 Extent of vegetation communities within the study area and VMP Area	11
Table 3 Priority weeds and WoNS identified within the VMP Area	28
Table 4 Timing and responsibilities	44
Table 5 Performance criteria for weed cover and planting densities	51
Table 6 Flora species list for the study area	54
Table 7 Weed control methods	59
Table 8 Species Planting List - Cumberland Plain Woodland	64

Table of Photographs

Photograph 1 Example of PCT 3320 (intact) within the VMP Area	13
Photograph 2 PCT 3320 (exotic ground) within the VMP Area	14
Photograph 3 PCT 3320 (mown) within the VMP Area	15
Photograph 4 Flowering <i>Acacia pubescens</i> (Downy Wattle) located in the VMP Area	16

Table of Appendices

APPENDIX A : Flora Species List

APPENDIX B : Weed Control Measures

APPENDIX C : Species Planting List

Table of Figures

Figure 1 The study area and VMP Area

Figure 2 Land zone uses

Figure 3 Vegetation mapping for the study area and VMP Area

Figure 4 Management zones within the VMP Area

Figure 5 Proposed locations of photo monitoring points

Glossary

Abbreviation	Definition
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	<i>NSW Biosecurity Act 2015</i>
CEEC	Critically Endangered Ecological Community
Client	Mirvac
DA	Development Application
DBH	Diameter at Breast Height
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DPE	(former) Department of Planning and Environment
EEC	Endangered Ecological Community
EHG	NSW Environment and Heritage Group
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
GPS	Global Positioning System
ha	Hectares
IBRA	Interim Biogeographic Regionalisation for Australia
LEP	Local Environment Plan
LGA	Local Government Area
Locality	The area within a 5 km radius of the study area
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
OEH	NSW Office of Environment and Heritage (former)
PCT	Plant Community Type
the project	The Western Sydney University Milperra Campus Redevelopment
the study area	Western Sydney University, Milperra Campus (see Figure 1)
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VMP	Vegetation Management Plan
VMP Area	Areas subject to the VMP (see Figure 1)
WoNS	Weed of National Significance
WSU	Western Sydney University

1. Introduction

1.1. Background

Cumberland Ecology was commissioned by Mirvac (the 'client') to prepare a Vegetation Management Plan (VMP) to support a development application (DA) for the Western Sydney University (WSU), Milperra, New South Wales (NSW) (the 'study area'). Specifically, this VMP largely applies to an area in the northeast of the study area (hereafter referred to as the 'VMP Area') (**Figure 1**), but should also be applied to any additional retained Cumberland Plain Woodland throughout the study area. The DA involves the subdivision of land into residential lots, park areas, a business area that will contain a childcare centre, sales office, café, and associated infrastructure (roads, drainage basins) within the study area (the 'project'). This VMP will form part of the documentation to support an application for Development Consent under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

A VMP is required to guide the future management of the bushland areas retained within the study area, as well as the vegetated Asset Protection Zone (APZ) surrounding the childcare centre and the scattered remnant Cumberland Plain Woodland. The management and revegetation measures described in this VMP apply to the VMP Area that is zoned a mix of C2 – Environmental Conservation and B1 - Neighbourhood Centre under the *Canterbury-Bankstown Local Environmental Plan 2023* (LEP) (**Figure 2**).

This VMP was revised to reflect the changes in the bushfire prone land mapping within the study area, and has been prepared in accordance with the Bushfire Hazard Assessment for the Childcare Centre Modifications (Blackash 2025) and the Planning for Bushfire Protection – Appendix 4 Asset Protection Zone Standards (NSW Rural Fire Service 2019).

1.1.1. Response to Submissions

This VMP was submitted as part of the State Significant Development Application for the project on the 16 December 2025. The Department of Planning, Housing and Infrastructure (the Department) reviewed the SSDA package, and issued a Response to Submissions (RTS) on 2 February 2026, which included a number of items relating to the VMP. These items have been replicated in **Table 1** below with their locations within the VMP.

Table 1 RTS table

Item	Location in VMP
The Department Preliminary Assessment Comments	
A revised Vegetation Management Plan satisfying Council and Conservation Programs, Heritage and Regulation Group's comments.	This VMP
Council Submission Comments	
The Vegetation Management Plan must include any retained Cumberland Plain Woodland, not just the C2 zoned area. However, it is noted that there would be different management zones for areas where midstory and groundcover species cannot be reestablished.	Section 1.1, Section 4.1
A positive covenant must be created for the perpetual management of all management zones identified in the Vegetation Management Plan.	Section 1.1.1.1

Item	Location in VMP
Conservation Programs, Heritage and Regulation Group Submission Comments	
The VMP does not mention the Hollow Offset Replacement Strategy and Nestbox Management Plan that were both prepared in 2024. To ensure vegetation restoration and fauna replenishment within the VMP are appropriately integrated, update the VMP to reference the Hollow Offset Replacement Strategy and Nestbox Management Plan, including any recommendations.	Section 5.9
The Canterbury-Bankstown Development Control Plan 2023 (CB DCP 2023) sets out a number of requirements for the VMP. However, the VMP does not include or address the following two requirements from Appendix A – Matters to be addressed in Cumberland Plain Woodland Management (C2 Environmental Conservation zoned land) (C2):	-
A permanent fence must be placed around the C2 area and must be designed to allow for the safe movement of arboreal fauna outside of the southern boundary of the C2 zoned land. There is no mention in the VMP of this requirement or how it would be met.	Section 5.3.1, Table 4
Removal of vegetation - G4: The proponent must identify where practicable to reuse any of the native trees that are approved for removal from the site, including tree hollows and tree trunks (greater than 25–30cm in diameter and 3m in length), and rootballs to enhance habitat. There is no mention that this requirement would be undertaken.	Section 5.8, Table 4

1.1.1.1. Positive Covenant

The following positive covenants are proposed to be registered on the land title of the Community Title Lot with the exact wording to be determined by the surveyor at the time of the creation of the 88B Instrument:

- The registered Community Association of the lot(s) hereby burdened shall comply with all obligations regarding the maintenance, monitoring, and rehabilitation of native vegetation in the management zones, as detailed in the Vegetation Management Plan dated 18 March 2026.
- The registered Community Association of the lot(s) hereby burdened will maintain at the sole expense of the registered Community Association the whole of the asset protection zone delineated in the Vegetation Management Plan dated 18 March 2026, including, but not limited to, the removal of vegetation in accordance with fuel load requirements and restricting the placement of combustible materials, buildings or Improvements. The Community Association, and Owners and Occupiers of APZ Areas must comply at all times with the requirements of the NSW Rural Fire Service relevant and applicable at the time.

1.1.2. Proposed Development

The project will be conducted in several stages and will ultimately result in the development of residential lots and parkland areas with associated infrastructure (roads, drainage basins) within the final development footprint. The staged project will comprise the following components:

- Subdivision and construction of residential dwellings;
- Construction of a main 'connector' road to the existing road network;
- Vegetation removal;
- Tree protection works for retained trees within the residential sub-division;
- Earthworks (including cut and fill works) and remediation of contaminated soil;
- Construction of roads and infrastructure;
- Construction of bio-detention basins for stormwater management; and

1.2. Purpose

The purpose of this VMP is to provide guidelines to:

- Prescribe management of vegetation within the VMP Area;
- Reconstruct areas of the VMP Area currently mapped as exotic groundcover to native vegetation, using bushland regeneration and revegetation techniques; and
- Promote regeneration of areas of the VMP Area currently mapped as remnant native vegetation through appropriate weed control techniques.

The objectives of the VMP are as follows:

- To improve the biodiversity values of the VMP Area;
- To re-establish native vegetation that is representative of the original plant communities in the VMP Area, comprising three strata including canopy (mature trees), understorey (small trees/shrubs) and groundcovers (herbs, sedges, and grasses);
- To establish and enhance habitat for local fauna species with the potential to occur or known to occur within the VMP Area;
- To enhance the ecological character of the VMP Area through removal and routine control of weeds and other exotic species present; and
- To protect the vulnerable flora species *Acacia pubescens* (Downy Wattle).

Parts of the study area, including within the VMP Area, contain Bushfire Prone Land, and as such an APZ is required surrounding the childcare centre to the south of the VMP Area. The APZ will not be subject to revegetation to reduce the fire risk to the childcare centre, in accordance with the Planning for Bushfire Protection (NSW Rural Fire Service 2019).

The vegetation within this APZ has been further zoned as either an Inner Protection Area (IPA) or Outer Protection Area (OPA) in accordance with the Planning for Bushfire Protection (NSW Rural Fire Service 2019)

under the direction of the bushfire consultant. Planning for Bushfire Protection (NSW Rural Fire Service 2019) defines an IPA and OPA as follows:

- The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.
- An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA. Because of the nature of an OPA, they are only applicable in forest vegetation.

1.2.1. Canterbury-Bankstown DCP 2023

Following the approval of the Planning Proposal lodged by the client for the rezoning of the WSU Milperra Campus, it was rezoned R1 – General Residential, B1 – Neighbourhood Centre, C2 – Environmental Conservation and RE1 – Public Recreation. Parts of the R1 and RE1 zones, particularly in the north, and all of the C2 zone, are currently mapped as Biodiversity under the Canterbury-Bankstown LEP.

The NSW Environment and Heritage Group (EHG) provided advice and recommendations for the rezoning following approval, a number of which are applicable to biodiversity and have been included in the Canterbury-Bankstown Development Control Plan (DCP) 2023, which includes a specific clause (Clause 11.13) that applies to the entire study area. The ecological objectives of the clause are to ensure that any proposed development will not detrimentally affect the environment and ensure that satisfactory measures are incorporated to mitigate any impacts arising from the proposed development.

The following mitigation measures relevant to the VMP have been listed in the DCP:

- A 35% tree canopy target through retention of existing trees and the planting of the following tree species:
 - *Eucalyptus moluccana* (Grey Box);
 - *Eucalyptus tereticornis* (Forest Red Gum);
 - *Eucalyptus crebra* (Narrow-leaved Ironbark);
 - *Eucalyptus eugeniodes* (Thin-leaved Stringybark);
 - *Eucalyptus maculata*/*Corymbia maculata* (Spotted Gum); and
 - *Eucalyptus fibrosa* (Red Ironbark).
- A VMP should be prepared and implemented for all retained Cumberland Plain Woodland for the rehabilitation, management and long-term maintenance of the community;

- Any trees requiring consent for removal (as per Chapter 2.3 of the Canterbury-Bankstown LEP) must be replaced at a 3:1 ratio using a mix of local provenance large trees that conform with the Cumberland Plain Woodland within the study area;
- Native seed from the trees proposed for removal should be collected and propagated to be used in revegetating the study area;
- Juvenile native plants proposed to be removed should be salvaged and transplanted to areas that are to be conserved within the study area;
- Vegetation clearing should not take place in late winter/spring during the breeding period of birds, and a suitably qualified ecologist must be present during all tree removal; and
- Habitat that has the potential to be salvaged (e.g. tree hollows, tree trunks and root balls) should be reused within the study area for habitat enhancement.

This VMP has been prepared in accordance with Clause 11.13 and the Canterbury-Bankstown DCP.

1.3. Site Description

1.3.1. The Study Area

The study area is located entirely within the suburb of Milperra in the Canterbury-Bankstown Council Local Government Area (LGA) (**Figure 1**) and is located approximately 20 kilometres (km) west of the Sydney Central Business District. It is located at 2 and 2A Bullecourt Avenue, Milperra NSW, which is legally known as Lot 2 DP1291984 and Lot 1 DP101147. It has an area of approximately 19.7 hectares (ha), which comprises a patch of a native woodland, a childcare centre, a sport's field and the disused university campus. It is generally bounded by an industrial estate to the north and east, the M5 Southwest Motorway to the south, and residential development to the west. A patch of good-quality remnant Cumberland Plain Woodland is positioned in the northeast corner of the study area, in the area zoned C2 – Environmental Conservation, and it is a conservation area referred to as the VMP Area in this report.

The study area has a relatively flat topography, with elevations ranging between approximately 3 m Australian Height Datum in the north to about 10 m above the Australian Height Datum in the south (**Figure 1**). There are no mapped or unmapped watercourses within the study area. The Soil Landscapes of the Penrith 1:100 000 Sheet Map (Hazelton et al. 1989) and soil landscapes available on eSpade (DPIE 2020a) indicates that the study area is mapped as the Blacktown soil landscape. The Blacktown soil landscape comprises gently undulating rises on Wianamatta Group shales with red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines.

Two (2) Plant Community Types (PCTs) have been recorded in the study area, PCT 3320 Cumberland Shale Plains Woodland which occurs in varying condition states throughout and PCT 4025 Cumberland Red Gum Riverflat Forest. Cumberland Shale Plains Woodland conforms to the threatened ecological community (TEC) Cumberland Plain Woodland in the Sydney Basin Bioregion (Cumberland Plain Woodland) which is listed as a Critically Endangered Ecological Community (CEEC) under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). Cumberland

Red Gum Riverflat Forest conforms to the TEC River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (River-Flat Eucalypt Forest) which is listed as an Endangered Ecological Community (EEC) under the BC Act and a CEEC under the EPBC Act. Approximately 3.03 ha of Cumberland Shale Plains Woodland in varying condition states and 0.03 ha of Cumberland Red Gum Riverflat Forest occurs in the study area.

Further details of the vegetation communities present in the study area and VMP Area are provided in **Chapter 3**, and the extent of the vegetation communities in the study area and VMP Area are depicted in **Figure 3**.

1.3.2. VMP Area

The VMP Area refers to the area within the study area that is currently zoned as C2 – Environmental Conservation and the area within the B1 – Neighbourhood Centre containing Cumberland Plain Woodland under the LEP (**Figure 2**). It has an approximate area of 2.8 ha and currently contains approximately 2.16 ha of Cumberland Shale Plains Woodland. The VMP Area is shown on **Figure 1**, but the VMP only applies to the areas already mapped as containing Cumberland Plain Woodland and does not apply to the cleared areas (**Figure 3**).

1.4. The VMP

This VMP has been prepared to provide management guidelines for the revegetation of native vegetation characteristic of Cumberland Plain Woodland within the VMP Area to satisfy the requirements of the Canterbury-Bankstown DCP.

The objectives of the VMP include the following:

- Weed removal from the areas of Cumberland Plain Woodland in the VMP Area;
- Revegetation of approximately 0.54 ha of native vegetation characteristic of Cumberland Plain Woodland; and
- Maintain and monitor the vegetation subject to this VMP in order to document the success of revegetation/weeding works, as well as make recommendations to improve the revegetation/weeding works if required.

In order to accomplish the aims of the VMP, two separate management plans have been developed that apply to the entire VMP area. The two separate management plans are as follows:

- Weed Management Plan (see **Chapter 5**); and
- Revegetation Plan – applies to all areas to be revegetated within the VMP Area with Cumberland Plain Woodland species (see **Chapter 6**).

1.5. Relevant Legislation

Legislation relevant to this VMP includes:

- NSW EP&A Act;

- *NSW Biosecurity Act 2015* (Biosecurity Act);
- *NSW Pesticides Act 1999*; and
- NSW BC Act 2016 and associated regulations.

2. Methodology

2.1. Desktop Assessment

2.1.1. Literature Review

This section provides details of the information sources utilised in the preparation of this VMP, including databases, literature, and aerial photography. Existing information on biodiversity values within the VMP Area was reviewed, which includes:

- Western Sydney University, Milperra Campus - Stage 1 Flora and Fauna Assessment (our reference: 23021RP1) (Cumberland Ecology 2024c);
- Western Sydney University, Milperra – Campus Stage 2 Biodiversity Development Assessment Report (our reference: 23021RP2) (Cumberland Ecology 2024a);
- Cumberland Ecology: Western Sydney University, Milperra Campus – Commercial Area Stage Biodiversity Development Assessment Report (our reference: 23021RP6) (Cumberland Ecology 2024b);
- Western Sydney University, Milperra Campus - Arboricultural Impact Assessment (Temporal Tree Management 2024);
- Greater Sydney Regional Strategic Weed Management Plan (LLS: Greater Sydney 2022);
- Canterbury-Bankstown Local Environmental Plan (LEP) 2023 (Canterbury-Bankstown LGA 2023b);
- Canterbury-Bankstown Development Control Plan 2023 (Canterbury-Bankstown LGA 2023a);
- Planning for Bushfire Protection – Appendix 4 Asset Protection Zone Standards (NSW Rural Fire Service 2019);
- NSW Environment and Heritage (2011): Final Determination – Cumberland Plain Woodland in the Sydney Basin Bioregion;
- Department of Climate Change, Energy, Environment and Water (2010): Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest;
- Department of Climate Change, Energy, Environment and Water (2009): Listing Advice – Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest;
- Department of Climate Change, Energy, Environment and Water (2008): Conservation Advice - Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community;
- NSW Environment and Heritage (2011): Final Determination – River-flat Eucalypt Forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions; and
- Department of Climate Change, Energy, Environment and Water (2020): Conservation Advice – River-flat Eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria.

The literature review also identified the most up to date methods of weed control for weed species that are present in the study area and included a review of government fact sheets and websites. Cumberland Ecology

staff with expertise in bushland regeneration were also consulted on current best practice methods and techniques. To prepare species planting lists for revegetation, and determine revegetation strategies, relevant documents were reviewed in conjunction with a review of data obtained during field surveys undertaken for the works previously completed on the study area.

2.1.2. Databases

Several databases were utilised during the preparation of this VMP, including:

- NSW Environment and Heritage Group (EHG) BioNet Atlas (EHG 2024a);
- EHG BioNet Vegetation Classification database (EHG 2024b);
- EHG Threatened Biodiversity Data Collection (TBDC) (EHG 2024c);
- NSW State Vegetation Type Map (DPE 2024);
- The NSW SEED Database (NSW Government 2024); and
- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Species Profile and Threat Database (DCCEEW 2024).

2.2. Field Surveys

Flora surveys were undertaken by Cumberland Ecology on 20-23 August 2024 and included vegetation mapping and plot-based vegetation survey. The surveys were guided by the following:

- NSW Government (2020a): Biodiversity Assessment Method 2020 (BAM); and
- NSW Government (2020b): Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method.

2.2.1. Vegetation Mapping

The vegetation within the VMP Area was ground-truthed by Cumberland Ecology to examine and verify the mapping of the condition and extent of the different plant communities. Mapping of plant communities within the VMP Area was undertaken by random meander searches throughout each patch of vegetation, noting key characteristics of areas in similar broad condition states such as similar tree cover, shrub cover, ground cover, weediness, or a combination of these. Soils were also inspected.

Records of plant community boundaries were made using a hand-held Global Positioning System (GPS) and mark-up of aerial photographs. The resultant information was synthesised using GIS to create a spatial database that was used to interpret and interpolate the data to produce a vegetation map of the VMP Area and study area (**Figure 3**).

2.2.2. Plot-based Floristic Survey

A plot-based floristic survey was undertaken within the VMP Area. The survey was conducted in accordance with the BAM and included establishment of a 20 m x 50 m plot within which the following data was collected:

- Composition for each growth form group by counting the number of native plant species recorded for each growth form group within a 20 m x 20 m plot;
- Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within a 20 m x 20m plot;
- Cover of 'High Threat Exotic' weed species;
- Assessment of function attributes within a 20 m x 50 m plot, including:
 - Count of number of large trees;
 - Tree stem size classes, measured as 'diameter at breast height over bark' (DBH);
 - Regeneration based on the presence of living trees with stems <5 cm DBH;
 - The total length in metres of fallen logs over 10 cm in diameter;
- Assessment of litter cover within five 1 m x 1 m plots evenly spread within the 20 m x 50 m plot; and
- Number of trees with hollows that are visible from the ground within the 20 m x 50 m plot.

All vascular plants recorded or collected were identified using keys and nomenclature provided in PlantNET (Botanic Gardens Trust 2021).

2.2.3. Threatened Flora Species Searches

Targeted threatened flora surveys were undertaken in conjunction with collection of floristic plot data as well as vegetation mapping surveys and further threatened flora surveys were undertaken in February 2025. Surveys were targeted towards threatened species that were identified as candidate species credit species under the BAM Calculator and were conducted in areas considered to provide potential habitat for these species. Targeted surveys were conducted using a random meander in accordance with the NSW Guide to Surveying Threatened Plants (NSW Government 2020b). Targeted threatened flora surveys using parallel traverses were undertaken on the 20-23 August 2024 and 24 February 2025. Where threatened flora species were observed, the location was recorded with a handheld GPS.

Details of the threatened flora species targeted during surveys undertaken in the VMP Area are provided in the BDAR report prepared for the project (Cumberland Ecology 2024a).

3. Existing Biodiversity Values

3.1. Vegetation Communities

The native vegetation within the study area and VMP Area has been mapped as containing:

- PCT 3320 Cumberland Shale Plains Woodland in the following condition states:
 - PCT 3320 Cumberland Shale Plains Woodland – Intact;
 - PCT 3320 Cumberland Shale Plains Woodland – Mown;
 - PCT 3320 Cumberland Shale Plains Woodland – Canopy;
 - PCT 3320 Cumberland Shale Plains Woodland – Exotic Ground.
- PCT 4025 Cumberland Red Gum Riverflat Forest - Canopy; and
- Planted Native Vegetation.

All four vegetation condition states of Cumberland Plain Woodland in the Sydney Basin Bioregion conform to the Threatened Ecological Community (TEC) listing under the BC Act, however only the intact, mown and exotic ground conditions of Cumberland Plain Woodland in the Sydney Basin Bioregion conform to the TEC listing under the EPBC Act (see **Table 2**). These condition states occur in the VMP Area, but the canopy condition is scattered throughout the study area and exists as small patches of remnant trees over a totally exotic and manicured garden understorey.

The small patch (~0.03 ha) of PCT 4025 conforms to the TEC listing for Riverflat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions under the BC Act, but does not conform to the TEC listing under the EPBC Act due to its small size and lack of native understorey.

In addition, the following non-native communities/areas have been recorded from the study area:

- Exotic Dominated Grassland;
- Exotic Woody Vegetation; and
- Cleared (comprising bare earth where tracks currently occur).

The area of the vegetation communities within the study area and VMP Area are shown in **Table 2** and depicted in **Figure 3**.

Table 2 Extent of vegetation communities within the study area and VMP Area

Vegetation Community				PCT	EPBC Act Status	BC Act Status	Study Area (ha)	VMP Area (ha)
Cumberland Shale Plains Woodland (Intact)				3320	CEEC	CEEC	1.39	1.33
Cumberland Shale Plains Woodland (Mown)				3320	CEEC	CEEC	0.15	0.11

Vegetation Community				PCT	EPBC Act Status	BC Act Status	Study Area (ha)	VMP Area (ha)
Cumberland Shale Plains Woodland	(Exotic Ground)	3320	CEEC	CEEC	0.87	0.70		
Cumberland Shale Plains Woodland	(Canopy)	3320	-	CEEC	0.60	0.00		
Cumberland Red Gum Riverflat Forest		4025	-	EEC	0.03	0.00		
Planted Native Vegetation		-			1.93			
Exotic Woody Vegetation		-			2.06			
Exotic Dominated Grassland		-			6.55	0.05		
Cleared Land		-			6.38			
				Total:	19.99	2.19		

General descriptions of species recorded within the different vegetation zones within the VMP Area based on surveys conducted by Cumberland Ecology are provided below.

3.1.1. PCT 3320 - Cumberland Shale Plains Woodland

Vegetation Formation: Grassy Woodlands

Vegetation Class: Coastal Valley Grassy Woodlands

Percent Cleared Value: 93.03

3.1.1.1. General Description

This community is a tall sclerophyll open forest to woodland with a sparse mid-stratum of soft-leaved shrubs and small trees with a grassy ground cover on the undulating shale plains of western Sydney (EHG 2024b). The canopy very frequently includes *Eucalyptus tereticornis* and *Eucalyptus moluccana*, with ironbarks (*Eucalyptus crebra* and *Eucalyptus fibrosa*) occasionally present, however prominent in localised areas, and the stringybark species *Eucalyptus eugenioides* commonly occurs. The sparse shrub to small tree layer very frequently includes *Bursaria spinosa* and one or more species of Acacia, of which *Acacia parramattensis*, *Acacia decurrens* and *Acacia falcata* are the most frequent and abundant.

The mid-dense ground layer typically includes grasses, forbs, twiners and a hardy fern. *Microlaena stipoides* is almost always present and *Themeda triandra*, *Dichondra repens*, *Brunoniella australis*, *Cheilanthes sieberi* subsp. *sieberi*, *Desmodium varians*, *Aristida vagans* and *Glycine tabacina* are very frequent. This is the most widespread PCT on the Cumberland Plain, occupying much of the plain between Bankstown and the Hawkesbury and Nepean rivers. It typically occurs in a warm, moist climate below 120 metres asl however can occur up to 200 metres asl on the undulating terrain between Douglas Park and Campbelltown to the east of the Nepean River. While widespread, this PCT primarily occurs in small, often disturbed patches within a rural or urban matrix.

Within the VMP Area, PCT 3320 occurs as three condition states (also referred to as vegetation zones); intact, mown and exotic ground. These are explained in more detail in the section below.

3.1.1.2. Vegetation Zones within the VMP Area

i. PCT 3320_Intact

This vegetation zone occurs within the north-east of the VMP Area and represents the most intact occurrences of PCT 3320 present, in which native species are dominant in all strata. This is likely due to bushland regeneration efforts, as other areas within the VMP Area have large abundances of exotic species. The canopy is dominated *Eucalyptus moluccana* (Grey Box), and *Eucalyptus tereticornis* (Forest Red Gum), and *Eucalyptus crebra* (Narrow-leaved Ironbark) also occurs. A sub-canopy is present and includes younger individuals of the canopy species along with *Melaleuca nodosa* and *Exocarpos cupressiformis* in some areas.

The shrub layer is moderately dense and includes *Bursaria spinosa* (Blackthorn), *Daviesia ulicifolia* (Bitter Gorse Pea), and *Leucopogon juniperinus* (Prickly Beard Heath). Exotic species are rare in the layer, but there are sporadic occurrences of some such as *Ochna serrulata* (Mickey Mouse Plant).

The ground layer is dominated by *Microlaena stipoides* var. *stipoides* (Weeping Grass), with other species present including the grasses *Themeda triandra* (Kangaroo Grass), *Aristida vagans* (Threeawn Grass), and *Paspalidium distans*, the forbs *Brunoniella australis*, *Brunoniella australis* (Blue Trumpet), and *Solanum prinophyllum* (Forest Nightshade), and the sedge *Gahnia aspera*.

There are scattered occurrences of exotic species which include the grass *Setaria parviflora* (Pigeon Grass), and the forbs *Asparagus aethiopicus* (Ground Asparagus), and *Bidens pilosa* (Cobbler's Pegs).

An example of PCT 3320 (intact) in the VMP Area is shown in **Photograph 1**.

Photograph 1 Example of PCT 3320 (intact) within the VMP Area



ii. PCT 3320_Exotic_Ground

This vegetation condition has a native dominated canopy of *Eucalyptus moluccana* and *Eucalyptus tereticornis*, and to a lesser extent *Eucalyptus crebra*. *Allocasuarina littoralis* (Black Oak), *Exocarpos cupressiformis*, and *Acacia decurrens* (Black Wattle) are present in the sub-canopy along with younger individuals of the canopy species. The shrub layer is dominated by native species, and includes *Ozothamnus diosmifolius*, *Olearia viscidula*, and *Bursaria spinosa*, and the vulnerable *Acacia pubescens* (Downy Wattle). The presence of scattered individuals of native species which do not match well with shales in Western Sydney, such as *Zieria smithii*, have probably been planted in the patch, potentially by bushland regenerators. Exotic species are relatively common and include *Olea europaea* subsp. *cuspidata* (African Olive) and *Ochna serrulata*.

The ground layer in this vegetation zone is highly dominated by exotic species in most areas, often with sub-dominant occurrences of the grasses such as *Entolasia marginata* (Bordered Panic), and *Microlaena stipoides* var. *stipoides*. Native forbs are present, though not as commonly as in the intact condition state and include *Dianella longifolia* and *Dichondra repens* (Kidney Weed).

Dominant exotic grass species include *Ehrharta erecta* (Panic Veldtgrass), *Ehrharta longiflora* (Annual Veldtgrass), and *Megathyrsus maximus* (Guinea Grass). Common exotic forbs include *Bidens pilosa* and *Asparagus aethiopicus*.

An example of PCT 3320 (exotic ground) in the VMP Area is shown in **Photograph 2**.

Photograph 2 PCT 3320 (exotic ground) within the VMP Area



iii. PCT 3320_Mown

This vegetation zone comprises remnant Cumberland Plain Woodland trees with some native species remaining in the ground layer, however with an absent shrub layer, and closely cropped ground layer due to mowing. Canopy species include *Eucalyptus moluccana* and *Eucalyptus tereticornis*.

Native species persisting in the ground layer include *Microlaena stipoides* var. *stipoides*, *Eragrostis leptostachya* (Paddock Lovegrass), *Bothriochloa decipiens* var. *decipiens* (Pitted Bluegrass), and *Rytidosperma racemosa*. Native forbs include *Cotula australis* (Common Cotula), *Oxalis perennans*, and *Veronica plebeia* (Trailing Speedwell).

Exotic grass species are dominant in the ground layer and include *Poa annua* (Winter Grass), *Paspalum dilatatum*, *Ehrharta erecta*, and *Briza minor* (Little Quaking Grass).

An example of PCT 3320 (mown) in the VMP Area is shown in **Photograph 3**.

Photograph 3 PCT 3320 (mown) within the VMP Area



3.2. Threatened Flora Species

3.2.1. *Acacia pubescens* (Downy Wattle)

A few patches of *Acacia pubescens* (Downy Wattle) are located within PCT 3320 (exotic ground) occurring within the VMP Area – see **Figure 3**.

Acacia pubescens (Downy Wattle) is listed as vulnerable under the BC Act and the EPBC Act.

Acacia pubescens (Downy Wattle) is a spreading shrub, 1 - 5 m high with brilliant yellow flowers, bipinnate leaves (divided twice pinnately) and conspicuously hairy branchlets. It flowers from August to October with pollination of the flowers usually by insects and birds. The pods mature in October to December. Recruitment is more commonly from vegetative reproduction than from seedlings. The percentage of pod production and seed fall for this species appears to be low ((OEH 2018)

Acacia species generally have high seed dormancy and long-lived persistent soil seedbanks. It is thought that the species needs a minimum fire free period of 5 - 7 years to allow an adequate seedbank to develop.

An example of *Acacia pubescens* in the VMP Area is shown in **Photograph 4**.

Photograph 4 Flowering *Acacia pubescens* (Downy Wattle) located in the VMP Area



3.3. Fauna Habitat

The study area contains native vegetation that provides connectivity to the VMP Area from the southern section of the study area, in a south-north direction. It also provides limited connectivity between urban backyard trees with other retained native vegetation in the surrounding properties in the east. Native fauna species are unlikely to use the VMP Area as 'stepping stone' habitat outside of the study area, such as to reach the Killara, Horsely Park and Kelso Park Reserves in the south, as they are separated from the VMP Area by the M5 South Western Motorway. The VMP Area consists of the majority of woody vegetation within the study area, and habitat connectivity will be conserved and improved as a result of implementing this VMP.

The native vegetation present within the VMP Area provides a range of fauna habitats including potential foraging, shelter, and breeding opportunities for fauna.

Key habitat features recorded within the VMP Area include:

- Fallen logs, debris, rocks and leaf litter – shelter habitat for invertebrates, amphibians, reptiles, and ground-dwelling mammals;
- Hollow-bearing trees– providing shelter and breeding habitat for a range of reptiles, birds, arboreal mammals and microchiropteran bats (microbats); and
- Nectar-producing trees and shrubs – foraging habitat for insects, blossom-dependant birds, arboreal mammals and megachiropteran bats (flying-foxes).

No mapped watercourses occur within the study area or VMP Area.

4. Vegetation Management Zones

Under this VMP, the VMP Area will be managed by the landowner and will require weed management, restoration and revegetation with native, endemic plant species and monitoring.

The VMP Area will be managed as four Management Zones as follows (**Figure 4**):

- Management Zone 1 – Native Vegetation Maintenance;
- Management Zone 2 – Revegetation of Native Vegetation; and
- Management Zone 3: APZ – IPA; and
- Management Zone 4: APZ-OPA;

It is expected that initial management under this VMP would be undertaken over a five-year period, with native trees being protected and/or replaced in the VMP Area in perpetuity. Refer to **Chapter 9** of this VMP for specific timing and responsibilities of Management Zone works.

4.1. Management Zone 1 – Native Vegetation Maintenance

Management Zone 1 is approximately 1.33ha in size and is comprised of PCT 3320 Cumberland Shale Plains Woodland in the intact and mown condition. The overall aim of Management Zone 1 is to regenerate the existing native vegetation in this zone through weed management (see **Chapter 6**).

The actions and objectives outlined in Management Zone 1 should also apply to any areas of remnant Cumberland Plain Woodland scattered throughout the study area. These areas have not been shown on **Figure 4** due to the ongoing discussions with the Department, but Management Zone 1 should apply to all retained Canopy Cumberland Plain Woodland, as shown in **Figure 3**.

4.1.1. Objectives

Objectives for this management zone are:

- Control exotic weed species as per **Chapter 6**; and
- Maintain native regeneration areas as per **Chapter 8**.

4.1.2. Actions

Initial actions within Management Zone 1 of the VMP Area will be the removal of exotic vegetation by a Bushland Regenerator Contractor (BRC). In particular, the removal of weeds listed under the Biosecurity Act (see **Table 3**) is a high priority as these weeds, specifically the state priority weeds, are considered to pose the greatest threat to the natural regeneration of native species present.

All existing native species will be retained. Natural regeneration will be encouraged where needed in currently wooded areas, with planting of native canopy, understory and ground layer species undertaken if natural regeneration does not occur in months following weed removal for the purposes of increasing species diversity in these strata.

4.2. Management Zone 2 - Revegetation of Native Vegetation

Management Zone 2 is approximately 0.54ha and is comprised of PCT 3320 Cumberland Shale Plains Woodland in the 'exotic ground' condition state. These areas contain a diverse native canopy layer, but some areas lack an understorey due to weed infestations, and therefore, the overall aim of Management Zone 2 is to revegetate the areas of existing native canopy with native understorey species characteristic of Cumberland Plain Woodland.

4.2.1. Objectives

Objectives for Management Zone 2 are:

- Control exotic weed species as per **Chapter 6**;
- Revegetation of an array of native understory and ground layer species characteristic of Cumberland Plain Woodland to improve ecological biodiversity as per **Chapter 7**;
- Ensure protection of the vulnerable *Acacia pubescens* (Downy Wattle); and
- Maintain revegetated areas as per **Chapter 8**.

4.2.2. Actions

Initial actions within Management Zone 2 of the VMP Area will be to propagate native shrubs and ground layer species using local provenance seeds. Native shrubs will need to be grown by a nursery that specialises in native plants. Where possible seed should be propagated from areas of Cumberland Plain Woodland within the study area. It is understood that Mirvac is currently propagating trees from within the VMP Area to be used as part of this VMP and for landscaping.

The removal of exotic vegetation will commence concurrently with revegetation works. In particular, the removal of weeds listed under the Biosecurity Act (see **Table 3**). These weeds, specifically the state priority weeds, are considered to pose the greatest threat to the natural regeneration of native species present. Extra care should be taken with the removal of exotic vegetation around the patches of *Acacia pubescens* (Downy Wattle).

Any existing native shrub and understorey species will be retained. After the clearance of all, or most, of the exotic vegetation has taken place, the reconstruction of native vegetation to Cumberland Plain Woodland will commence where necessary. Areas below the proposed boardwalk will be replanted used species tolerant of shading (**Appendix C**). Note that boardwalk maintenance, repairs and replacement to be in accordance with the manufacturer's specifications. Shrub species will be revegetated using Hiko tubestock, and native groundcover species will be revegetated using hydro mulching (if considered suitable and outside periods of high rainfall). **Appendix C** contains species planting lists for Cumberland Plain Woodland, separated by growth form group.

4.3. Management Zone 3 – Asset Protection Zone - IPA

Management Zone 3 covers an area of approximately 0.13ha within the VMP Area. This management zone corresponds to all areas within 20m of the existing childcare centre, which is the minimum requirement for an APZ for this sort of establishment. This zone comprises a mix of areas of the mown condition state of Cumberland Plain Woodland, which has previously been maintained as an APZ, and previously cleared areas.

4.3.1. Objectives

- Maintain vegetation density/cover of all strata at the requisite levels for an Inner Protection Area (IPA);
- Retain and protect canopy species characteristic of BGHF and minimise extent of trimming of these species where feasible;
- Control and reduce cover of exotic weed species with staged replacement planting within the limits allowed for an IPA; and
- Revegetate understorey with selective subset of characteristic BGHF ground layer species tolerant to IPA maintenance mowing.

4.3.2. Actions

The vegetation within this management zone comprises vegetation that has previously been maintained as an APZ, so is lacking in understorey vegetation, and vegetation with a largely weedy understorey. Initial actions within this management zone will be clearing of any exotic trees, shrubs and ground covers present.

i. Trees

- Tree canopy cover should be less than 15% at maturity;
- Trees at maturity should not touch or overhang buildings;
- Lower limbs should be removed up to height of 2 metres above the ground;
- Tree canopies should be separated by 2 - 5 metres; and
- Preference should be given to smooth-barked and evergreen trees.

ii. Shrubs

- Create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards the building should be provided;
- Shrubs should not be located under trees;
- Shrubs should not form more than 10% ground cover; and
- Clumps of shrubs should be separated from exposed windows and door by a distance of at least twice the height of the vegetation.

iii. Grass

- Grass should be kept mown (as a guide should be kept to no more than 100mm (10cm) in height and be discontinuous; and
- Leaves and vegetation debris should be removed off-site.

4.4. Management Zone 4: Asset Protection Zone – OPA

Management Zone 4 covers an area of approximately 0.19ha within the VMP Area. This management zone corresponds to areas within 20 – 40m from the childcare centre, so the APZ comprises all areas within 40m from the centre. This zone comprises a mix of areas with Cumberland Plain Woodland canopy species over a highly modified or exotic understorey and landscaped areas.

4.4.1. Objectives

- Maintain vegetation density/cover of all strata at the requisite levels for an Outer Protection Area (OPA);
- Retain and protect canopy species characteristic of Cumberland Plain Woodland and minimise extent of trimming of these species where feasible;
- Control and reduce cover of exotic weed species with staged replacement planting within the limits allowed for an OPA; and
- Revegetate understorey with selective subset of characteristic Cumberland Plain Woodland ground layer species tolerant to OPA maintenance mowing.

4.4.2. Actions

The vegetation in this management zone predominantly contains endemic canopy trees with scattered occurrences of planted canopy trees and lacks a native understorey. Initial actions within this management zone will be clearing of any exotic trees, shrubs and ground covers present. If further canopy removal and/or trimming is required to attain requisite levels of canopy separation for an OPA, priority should be given to avoid tree species characteristic of Cumberland Plain Woodland and remove/trim tree species that are not characteristic of Cumberland Plain Woodland.

Further management actions for this zone include planting of native shrubs and groundcovers characteristic of Cumberland Plain Woodland. In accordance with Appendix 4 of the Planning for Bushfire Protection (NSW Rural Fire Service 2019), the following criteria are required for the various strata within the OPA.

i. Trees

- Tree canopy cover should be less than 30%; and
- Tree canopies should be separated by 2 - 5 metres.

ii. Shrubs

- Shrubs should not form a continuous canopy; and
- Shrubs should not form more than 20% ground cover.

iii. Grass

- Grass should be kept mown to a height of less than 100mm (10cm); and
- Leaves and vegetation debris should be removed.

5. Vegetation Clearing Protocols

5.1. Introduction

This chapter provides a broad overview summary of the protocols to be followed during vegetation clearing within the study area to minimise the impacts on native flora and fauna as well as additional considerations for weed management during clearing works. All vegetation clearing works should be conducted in accordance with the protocols outlined in this VMP.

5.2. Hygiene Protocols

To avoid the spread of *Phytophthora cinnamomi* and other soil borne pathogens, appropriate hygiene procedures and guidelines described in Best Practice Management Guidelines for *Phytophthora cinnamomi* (Botanic Gardens Trust 2008) within the Sydney Metropolitan Catchment Management Authority Area will be followed.

This will involve the disinfection of all machinery, clothing (such as boots and gloves), and tools which have been in contact with soil with a spray prior to entering and leaving the site.

Recommended disinfectant products include:

- Non corrosive disinfectants including Coolacide®, Phytoclean®, or Biogram® which can be for cleaning footwear, tools, tyres, machinery and other items in contact with soil;
- 70% Methylated spirits solution in a spray bottle which is suitable for personal use (clothing); and
- Sodium Hypochlorite 1%, which is effective, but can damage clothing and degrades rapidly in light.

Additionally, contractors will be required to clean equipment and clothing prior to commencing work and after completion of work, in order to prevent transport of weed propagules.

5.3. Fencing

5.3.1. VMP Area

All boundaries between the proposed development and the VMP Area must be fenced to protect it from potential degradation from unauthorised access or use. It is proposed that the existing fence be used around the VMP Area, but gaps will be installed to allow both arboreal and ground-dwelling fauna to safely pass through. The fencing will follow all relevant legislation for 'fauna friendly fencing'.

No additional fencing is required for the remnant Cumberland Plain Woodland in Management Zone 1 within the study area. These trees are located in the middle of road verges, and so fencing would not be suitable.

5.3.1.1. Signage

Signage should be installed around the permanent fencing to inform the public that the bushland within these areas is protected. The aim of the signage is to inform residents and public of the presence of environmentally significant vegetation and should be designed based on the following rules:

- A limited text count and simple language;

- Focus on visually attractive images to draw in readers;
- Highlight the nature and importance of the remnant bushland fragments in an urban landscape; and
- Made of a durable material with permanent and legible wording.

Signs should have a minimum size of A3 (297 mm x 420 mm). As a minimum, the signage should contain wording such as "The vegetation within this bushland is protected. Activities such as firewood collection, bushrock removal, picking of native flowers and dumping of garden waste are prohibited"

5.3.2. Marking Limits of Vegetation Clearing

Prior to any clearing being undertaken, the edge of the vegetation to be cleared needs to be clearly delineated. Clearing limits can be marked with high visibility tape, temporary fencing, or other appropriate boundary markers. To avoid unnecessary damage to vegetation or inadvertent habitat removal, disturbance is to be restricted to the delineated area.

In addition to full clearing areas, areas subject to partial clearing, such as the APZ should also be clearly delineated using separate markers to the full clearing areas of the development footprint with priority given to retaining locally endemic trees within the APZ area.

No stockpiling of equipment, soils, or machinery will occur beyond the full clearing boundary. The person responsible for the clearance activities will be responsible for ensuring that the boundary markers are installed to enable the suitable environmental and technical inspections of the proposed disturbance to be undertaken..

5.4. Pre-clearing Surveys

Prior to the commencement of any clearing, a pre-clearing survey will be undertaken by a certified ecological consultant in accordance with the protocols outlined below. During the survey, weeds present in the work sites and habitat for native fauna that have the potential to be disturbed during clearing will be identified.

5.4.1. Weed Pre-clearing Surveys

Prior to clearance, a pre-clearance survey will be conducted in the work sites to determine locations of any infestations of significant weeds (i.e. Priority weeds listed under the *Biosecurity Act 2015* and Weeds of National Significance (WONS). If recommended by the ecologist, control of weeds will be undertaken to minimise the risk of spread of weeds during clearing. Weed control measures will be species specific.

5.4.2. Fauna Pre-clearing Surveys

A fauna pre-clearing survey will be undertaken by a qualified ecologist prior to any vegetation clearance. Habitat features that have a high potential to support native fauna species will be identified prior to any clearing activities. These include significant rock outcrops and in particular trees bearing hollows that have potential to contain species such as bats, gliders, possums, reptiles and birds. Trees to be cleared that contain hollows or nests that have a high potential to contain fauna will be identified, recorded, flagged with fluorescent marking tape, and marked with a large (> 1 m) "H" using spray paint on two sides of the tree.

To determine fauna usage, the ground around each tree to be removed will be inspected for scats, and each tree trunk will be inspected for scratch marks and tree hollows. Any fauna utilising the area will be recorded, and where possible, these will be encouraged to leave the area prior to clearing. The location of suitable nearby habitat for the release of fauna that may be encountered during the pre-clearing process will be identified and marked on a map. It is recommended that fauna pre-clearance surveys are conducted within two weeks of commencement of clearing and/or translocation activities to reduce risk of nesting by fauna.

5.5. Clearing Supervision

Any trees that were identified as habitat items (see **Section 5.4.2** above) will be initially isolated by clearing all other non-habitat trees around them, then left in-situ for a 24-hour period prior to clearance under ecologist supervision. During clearance works standard clearance supervision protocols will be observed. This will involve the ecologist inspecting habitat features immediately prior to disturbance for occupying fauna. Following the initial inspection, each habitat tree will be agitated prior to felling in the presence of an ecologist and then inspected by an ecologist once felled. Inspections will consist of a thorough examination of hollows, nests and decorticated bark to find any remaining resident fauna. A torch will be used to facilitate the inspection of deeper parts of hollows for fauna such as microbats. For each species captured and identified after felling, an experienced ecologist will place the animal in an appropriate container/calico bag and relocate it to an appropriate area outside the disturbance footprint.

5.6. Weed Management during Construction

Prior to clearance, infestations of significant weeds (State listed priority weeds under the NSW *Biosecurity Act 2015* and Weeds of National Significance (WONS)) in the subject site will be recorded and mapped (see **Section 5.4.1**). If recommended by the ecologist, control of weeds will be undertaken to minimise the risk of spread of weeds during clearing. Weed control measures will be species specific as detailed in **Appendix B**.

Prior to clearing, all plant equipment entering the site will be inspected and recommended for wash down (in designated wash down areas) as required to ensure weed material from off-site locations do not establish or spread into native vegetation within the study area. Any weed materials will need to be carefully removed off site in a manner appropriate to the species or at the direction of the ecologist and Council guidelines so as to prevent the spread of propagules to uncleared areas of native vegetation, both on and off site. Machinery involved in weed management will also be washed down prior to removal from site to prevent weeds from spreading into off site areas.

5.7. Seed Collection / Harvest

Seed collection will be undertaken in the study area prior to bushland reconstruction of the VMP Area. Seeds collected must be germinated and grown in a nursery for later planting during bushland restoration works within the VMP Area. Use of seed sourced on site for plantings will maintain local genetic diversity of species occurring on site.

Seed collection will be undertaken by a company that specialises in growing endemic native plants from seed collected in bushland areas. This work can be undertaken by the Bush regeneration contractor (BRC) if the BRC chosen has a suitable native plant nursery. Seed collection visits must occur in each season across the study

area to obtain a seed collection from as many native species as possible, as flowering and seed setting times vary with species. Seed should be collected from all strata including grass and herb species where seed will not be contaminated with that of weed species.

If the requisite quantum of seeds cannot be collected onsite, then seeds may be collected in the first instance within 10 km of the study area. If it can be shown that all reasonable steps have been taken to source from this radius unsuccessfully, then a larger area can be utilised provided:

- Seeds are sourced from the Cumberland Plain;
- Seeds are from species listed in the planting list in **Appendix C**; or
- Seeds are from species listed in the Final Determination for Cumberland Plain Woodland.

In the event that substitution of plant species is required due to supply shortages of species listed in **Appendix C**, the replacement/substitution species should be checked with the project ecologist to confirm suitability of the species. Council is also to be notified in the event of species substitution. The substitute species are not to be utilised for planting without prior approval from Council.

5.8. Habitat Salvage

Any logs, hollows or rootballs that would comprise suitable habitat for native fauna should be salvaged during clearing. These should be identified by the ecologist during clearance supervision and should be separated from remaining material that could be mulched on site. Timber suitable for salvage should include larger logs and branches that are unlikely to decompose between clearing and revegetation. Salvaged features should be stockpiled away from areas impacted by earthworks to ensure the features do not become mixed with soil.

Salvaged habitat items should be placed within the VMP Area, or within the open space areas (where practical) throughout the study area.

5.9. Hollow Offset and Replacement Strategy

Hollow-bearing trees within the study area may provide suitable shelter, roosting and nesting habitat for a range of mammals, birds, reptiles and frogs. The loss of hollow-bearing trees as a result of the project are to be offset through the salvage and relocation of existing tree hollows (as per **Section 5.8**) as well as the installation of nest boxes throughout the conservation area and proposed open spaces.

A Hollow Offset Replacement Strategy and Nestbox Management Plan has been prepared for the project and will be submitted as part of the SSDA package (our reference: 23021RP4).

6. Weed Management Plan

6.1. Introduction

This Weed Management Plan applies to the entirety of the VMP Area. It provides an overview of legislation relevant to weed control, identifies the weed species present and then identifies appropriate weed control methods and the stages of weed control to be implemented.

6.2. Relevant Legislation

6.2.1. Biosecurity Act 2015

Under the Biosecurity Act all weeds are required to be controlled by all persons under a “General Biosecurity Duty”. The General Biosecurity Duty means that all public and private land owners or managers and all other people who deal with weed species (biosecurity matters) must use the most appropriate approach to prevent, eliminate, or minimise the negative impact (biosecurity risk) of those weeds (DPI 2017). The power for enforcement of penalties relating to compliance with the legislation is given to Local Control Authorities (i.e. Local Governments).

State-wide management of weeds under the Biosecurity Act is directed by the NSW Invasive Species Plan (LLS: Greater Sydney 2022). Weed responses are assigned to four categories:

- Prevention of new weeds establishing;
- Eradication of small and localised infestations where feasible;
- Containment of larger infestation to stop wider spread; and
- Protection of key assets, such as threatened plants and agricultural land, to prevent their damage or degradation by weed invasion.

Under the Biosecurity Act some weed species have been prioritised for management by specific regulations and controls under the Act. The state has been divided into 11 regions with weed management in each directed by a regional weed committee. Each committee has prepared a Regional Strategic Weed Management Plan.

Under the Biosecurity Act there are weeds which have legislated management requirements under controls and regulations of the act. These are known as State Priority Weeds. All 32 Weeds of National Significance (WoNS) are also listed as State Priority Weeds. WoNS are species that have been identified by Australian governments based on their invasiveness, potential for spread, and environmental, social, and economic impacts and are priorities for control.

The study area is located within the Greater Sydney Management Region and as such weeds are required to be managed as directed by the Greater Sydney Regional Strategic Weed Management Plan 2023-2027 (LLS: Greater Sydney 2022);

6.2.2. Pesticides Act 1999

The *Pesticides Act 1999* (NSW) controls the use of herbicides within NSW. Under the Act is illegal to use herbicides for species not listed on a particular herbicides’ label, or in a concentration or manner not outlined on the label. Off-label use of a particular herbicide is permitted only upon obtaining a specific permit.

6.3. Weed Species in the VMP Area

Weeds identified within the VMP Area make up the weed species list used for the basis of this VMP. A full list of native and introduced species within the study area is provided in **Appendix A** and the control methods for the weed species identified are provided in **Appendix B**. The priority weed species, as listed under the Greater Sydney Regional Strategic Weed Management Plan 2023-2027, and WoNS identified within the VMP Area are listed in **Table 3** below.

Table 3 Priority weeds and WoNS identified within the VMP Area

Scientific Name	Common Name	Priority Status	WoNS
<i>Anredera cordifolia</i>	Madeira Vine	State Priority – Asset Protection	Yes
<i>Asparagus aethiopicus</i>	Ground Asparagus	State Priority	No
<i>Asparagus asparagoides</i>	Bridal Creeper	State Priority	No
<i>Senecio madagascariensis</i>	Fireweed	State Priority – Asset Protection	Yes

6.4. Weed Control Objectives

The objective of weed management is to reduce the threat of introduced weed species within all management zones, to reduce competition and promote natural regeneration. Specifically, the weed control target is to reduce weed levels to a maximum of 5% cover for the ground layer and <1% cover for the shrub and tree layers within five years of VMP commencement. The removal of introduced species in the ground layer of all management zones prior to planting will be a priority.

6.5. Best Management Practice

Contractors for weed removal within the VMP Area will have regard to the following, to minimise impacts upon existing vegetation and habitats:

- The main principles of the Bradley Method of bush regeneration, such as not over clearing (remove only targeted species), employment of minimal disturbance techniques to avoid soil and surrounding vegetation disturbance, and replacement of disturbed mulch/leaf-litter;
- Removal of fruiting/seeding parts of weeds carefully, to minimise spread of plant propagules;
- Minimise chemical use in all zones;
- Use of chemicals and sprays only when hand-removal cannot be used, and only during suitable weather conditions (such as not during wet or windy conditions), and only during appropriate seasons;
- All equipment should be thoroughly cleaned prior to entering the site to minimise contamination; and
- Presence of native fauna or nesting/breeding sites.

Any weed materials will need to be carefully removed off site in a manner appropriate to the species or at the direction of the ecologist or requirements of Council to prevent the spread of propagules to adjacent areas of native vegetation within adjacent reserves.

Machinery and tools involved in weed management will also be washed down prior to entry to the site and following activities on site to prevent new weed infestations on site and on-site weeds from spreading to offsite areas.

6.6. Weed Control Methods

Weed control is to be implemented throughout the VMP Area using the strategies outlined below.

6.6.1. Manual Weed Removal

Manual removal, or hand weeding, is an effective form of weed control when all viable parts of the plant are removed from the soil (roots, fruiting material, and rhizomes) where practical. All weeds removed by hand will be handled according to best practice bush regeneration techniques to prevent subsequent seed set from the removed weeds.

The bushland regenerator can manually clear small plants with mattocks, brush cutters or other suitable equipment. The root structures of exotic shrubs can be retained to stabilise the soil if required, and if the plant has been killed with herbicide to avoid re-sprouting.

Larger woody weed species will need other methods of removal besides spraying with herbicide, such as by cutting and painting cut stems with herbicide. Areas of occurrence of these weeds should be controlled prior to the spraying of the groundcover species. Introduced vine species that are climbing into native vegetation to be retained should also be removed by hand to prevent damage to native vegetation by herbicides.

6.6.2. Woody Weed Removal

Recommended removal techniques for large woody weed species such as *Ligustrum* spp. include:

- The selective spraying of woody weed regrowth, with selective and non-selective herbicides;
- Cutting/scraping and painting deep rooted woody weeds and climbers with hand tools, chainsaws and brush cutters and painting cut stumps with herbicides containing Glyphosate or Picloram; and
- Target drilling and injecting certain large tree weeds with herbicides such as Glyphosate and a Garlon/diesel mix.

6.6.3. Use of Herbicides

All herbicides should be used according to recommendations on the herbicide label. Some herbaceous weeds reach heights that make control with herbicide impractical as spraying at these heights can be dangerous and will result in a higher instance of herbicide drift which can harm non-target native shrubs and trees. In these instances, mechanical means such as use of a brush cutter can be used, followed by spraying with herbicide when plant remnants at the ground level re-sprout leaves.

To minimise instances of vegetation damage through herbicide drift during spraying, the VMP Area should be searched thoroughly prior to herbicide use for native plants in the understorey/ground layer. Native species in the ground layer that occur in the VMP Area should have plastic tree guards installed around them to prevent the native plants from being harmed by herbicide drift. Some species may be too large for installation of tree guards. In these cases, individuals should be flagged with flagging tape and care taken to spray around these with a hand operated backpack sprayer on a non-windy day.

In areas near water courses, an appropriate form of the herbicide should be used to minimise impact to aquatic life and amphibians. Herbicide use should be avoided within 2 m of the riparian edges. Examples of appropriate herbicide forms are Roundup Biactive and Clearup Bio 360 which have surfactants that are formulated to minimise harm to amphibians. As runoff is a likely way for herbicide residue to enter watercourses, chemical treatment should be avoided prior to or directly after rains.

Appropriate Personal Protective Equipment (PPE) should be worn, and consideration given to time of day, likelihood of rainfall, wind direction and speed and likely impact on native species as per guidelines on the label. Use of Glyphosate will be appropriate for most species. As runoff is a likely way for herbicide residue to enter watercourses, chemical treatment should be avoided prior to or directly after rains.

It is important to note that there can be legal restrictions and permit requirements for use of specific herbicides for specific plants, and chemical labels and permit requirements always need to be researched prior to herbicide application. While the recommended methods for weed treatment detailed in **Appendix B** are effective, some will require a permit to be undertaken. The relevant permit number is PER9907, and PER11916. Herbicide permits need to be obtained from the Federal Government body, the Australian Pesticides and Veterinary Management Authority. Manual removal will be an appropriate form of control for some species, and all chemical treatment should be carried out according to best practice guidelines. Planting should not occur within 10 days of herbicide application.

6.7. Stages of Weed Control

6.7.1. Site Preparation

6.7.1.1. Sediment Fencing

There is potential for the runoff of surface soil after initial weed management works in the study area. Temporary silt sediment fencing should be installed around the VMP Area if required to prevent soil runoff, especially after heavy rainfall events into the ephemeral drainage line.

Temporary fencing should remain in place for the duration of construction, and should be replaced with permanent fencing once construction to protect the VMP Area. Additionally, prior to residential dwellings being occupied, educational signage will be installed along the perimeter of the VMP Area to inform that there is no public access into the VMP Area, and to improve local knowledge of the Cumberland Plain Woodland present and the fauna species that utilise it. This signage will also notify the public that wood collection and rubbish dumping within the VMP Area are prohibited.

6.7.1.2. Installation of Tree Guards around Native Plants

Prior to commencing the initial weed management, remnant trees and endemic native herbs, grasses, and shrubs in areas adjacent to weeding should have a plastic tree guard around them (with the exception of large native shrubs) to protect them from herbicide drift during spraying.

6.7.1.3. Laying of Weed Suppression Materials

Several days after the second application of herbicide, weed suppression materials can be installed, if required. This is most likely to be useful in Management Zone 2, where the native seedbank is likely to be low, and large areas are proposed to be reconstructed with native plantings. This will inhibit germination rates of exotic weed seed in the soil, inhibit vegetative regrowth of resilient exotic weed species and prevent soil runoff of surface soils during rain in the period until native plantings have become established to prevent erosion. Weed suppression material can be a form of biodegradable matting such as jute matting.

Jute matting is a commonly used biodegradable form of matting for bushland regeneration works. The heavier available forms of this product suppress weed growth. Holes would be cut in the matting if used, to allow it to be placed around remnant native species occurring on the site. Holes would also need to be cut to plant tube stock.

Jute matting, or any other form of weed suppressing layer across the ground, will inhibit regrowth of weeds, but it will also inhibit regrowth of native species from seed. For this reason, weed suppression matting should only be used initially to establish a revegetation site while intensive weed control is needed, and be allowed to biodegrade over time without being reapplied, unless required during the establishment period.

6.7.1.4. Removal of Priority Weeds

The priority for weed treatment in the VMP Area will be targeting mature individuals of the priority weed species and other environmental weeds. These species are perennial and take several years to reach reproductive maturity so are easily controlled providing juveniles are continuously eradicated before reaching maturity.

It is recommended that all priority woody exotic shrubs/midstorey be cut at the base with a chainsaw, brush cutters or other suitable equipment. Immediately after cutting, the base of the stump should be sprayed with Glyphosate (where appropriate to use). A marker dye should be used in the herbicide solution to ensure areas are not missed. This and other methods to be used to treat exotic species are outlined in detail in **Appendix B**. Knapsack sprayers with a spray cone to direct the spray towards the ground should be used to prevent herbicide drift into adjacent vegetated areas.

6.7.1.5. Primary Weeding

Following control of mature individuals of state priority and regional concern weed species, primary weeding will be undertaken throughout the VMP Area. The aims of primary weeding will be:

- Eliminating any woody weed species;

- Targeting and eliminating any large, dominant infestations of exotic herbs and grasses. Prior to chemical treatment, any seed on mature exotic plants should be bagged to prevent seed fall and addition to the exotic soil seed bank of propagules;
- The goal of primary weeding for the VMP Area will be to eliminate all the larger weed infestations to allow planting to take place and fill gaps in the understorey and canopy without competition from weed species.

Primary weeding is the first stage of bushland regeneration and may involve techniques such as:

- The selective spraying of weeds, with selective and non-selective herbicides;
- Cutting/scraping and painting deep rooted woody weeds and climbers with hand tools, chainsaws and brush cutters and painting cut stumps with herbicides containing Glyphosate or Picloram; and
- Selective hand removal of weeds and wicker wiping of tall herbaceous weeds in situations where damage to proximate, low growing native plants can be avoided.

During site visits for primary weeding, the bushland maintenance team should start from one end of the VMP Area and work towards the other end to achieve the aims listed above through the entirety of the area and prepare the site for planting. Spot spraying with herbicide will be used in any areas where there is negligible risk to collateral damage of vegetation as it is more cost and time effective than hand weeding techniques.

Following the initial spraying of areas in which revegetation is to take place the site should be left for three weeks to allow time for treated weeds to die back. After this period, the entire area should be resprayed with Glyphosate again, with a focus made on treating any exotic plant species that still have green colouring left in their foliage.

6.7.1.6. Rubbish Removal

Before construction begins, the client must ensure that all rubbish has been removed from the VMP Area. As there may be native fauna utilising the rubbish as habitat (such as native reptiles or ground-dwelling mammals), it is recommended that an ecologist is present for this removal to ensure that these fauna are not injured during the removal process, and that any fauna using the rubbish can be captured and released into other sections of the VMP Area.

6.7.2. Ongoing Weed Maintenance

The most cost and time effective method of controlling weed regrowth in a revegetation area or weedy bushland area is by spraying a non-selective glyphosate herbicide. A list of effective methods for weed control on site is found in **Appendix B**.

Follow-up weeding should be undertaken in all zones that have received past primary weeding treatments in the following months, to treat any regrowth of weeds. Ongoing maintenance of the revegetation and natural regeneration areas should occur for a five-year period by the contracted bushland regeneration company, and it is recommended that each area should be covered in its entirety once every month, to diminish the soil seed bank of exotic weed species present on site. In order to eliminate the occurrence of these species, they need to be controlled before they have a chance to set seed, otherwise progress on site will not be made.

Tree guards should remain around native remnant plants, and native flora that has been planted, for at least six months to protect them from herbivory. Rabbits and other fauna species can devastate revegetation areas soon after planting, if tree guards are not used. Tree guards will also allow herbicide to be used for control of the majority of regrowth weeds, without damage to native flora by herbicide drift.

The following sequential steps are recommended to manage each area of the VMP Area effectively for each site visit:

1. Initially the bushland regeneration team visiting the site should sweep from one end to the other. During this sweep, weeds occurring within each tree guard alongside native plants and any weed occurring within a patch of dominant native flora (such as a patch of grasses) should be removed by hand. During the sweep, regrowth individuals of harder to manage weeds that require other techniques such as sawing, digging, drilling etc should be targeted.
2. A member of the team should then sweep the entire area, spraying all regrowth weeds between native plantings/native remnants in open areas with herbicide, and spot spraying where possible in regeneration areas.

It is important during site visits for ongoing weed maintenance that as many weeds as possible are controlled so individuals are not able to achieve maturity and set seed between site visits. Some weed species are prolific seeders, and many exotic species can have seed that remain viable in the soil for long periods of time. To effectively diminish the soil seed bank occurrences of exotic species, it is important that individuals are not allowed to set seed.

During site visits for weed control, Priority Weeds and WoNS (**Table 3**) should be prioritised for control. Individuals of these species on site should not be allowed to achieve a reproductive stage in their life cycles.

Temporary sediment fencing should be retained until it is determined that plants have established enough to prevent soil surface runoff.

Follow-up weeding should be implemented under this VMP for a minimum of five years, after primary weeding, erosion control and revegetation works have been completed. After the initial five-year follow-up and maintenance period has been completed, a review should be conducted with Council to determine on-going site maintenance requirements and an updated VMP for the ongoing and in perpetuity management should be developed.

7. Restoration and Regeneration Plan

7.1. Objectives

The aim of restoration and regeneration actions within the vegetation in the VMP Area is to achieve the following performance-based outcomes:

- Control threats affecting the health of regenerating native vegetation and inhibiting the future regeneration potential of Cumberland Plain Woodland;
- Increase species diversity and percentage cover of native vegetation plant species in retained bushland areas;
- Improve the resistance of native vegetation within the VMP Area to future weed colonisation and establishment and related threats, by initiating the two above aims; and
- Use measurable indicators to monitor regeneration responses and to assist in prioritising regeneration works during the proposed works program.

7.2. Vegetation Protection Measures

7.2.1. Fencing

Access to management zones 1 and 2 by construction contractor personnel and the general public for the duration of construction works must be limited in order to reduce potential impacts during construction. The storage or stockpiling of tools or materials will not be permitted in these areas. Fencing can be erected to separate the development area from the bushland, using constructed safety mesh fencing.

7.2.2. Signage

Signage should be installed along the fencing of management zones 1 and 2. The aim of the signage is to inform residents and public of the presence of environmentally significant vegetation and should be designed based on the following rules:

- A limited text count and simple language;
- Focus on visually attractive images to draw in readers;
- Highlight the nature and importance of the remnant bushland fragments in an urban landscape; and
- Made of a durable material with permanent and legible wording.

Signs should have a minimum size of A3 (297 mm x 420 mm). As a minimum, the signage should contain wording such as "The vegetation within this bushland is protected. Access is prohibited"

7.3. Site Preparation

The replanting of individuals from seed or tube stock will require the treatment of soils, the installation of protective plant fencing, and ongoing maintenance treatments such as watering and weeding.

Recommended reconstruction strategies include:

- Initial and ongoing control of weeds and competing grasses using bushland regeneration techniques and conventional best practice chemical and physical strategies;
- Specifically collecting local plant seed and subsequent propagation as tubestock;
- Stabilising soils within areas (if required) using square jute fibre mats, or a similar sturdy biodegradable material, in areas following initial weed control;
- Protecting individual tree and shrub plantings with a tree guard from feral animal grazing, frost and maintenance herbicide spraying overspray. Wooden stakes and plastic tree guards are suitable for this purpose; and
- Maintaining regeneration treatments (weeding, replacing dead plantings and repairing / replacing weed mat if need during the planting establishment period), as a part of an ongoing maintenance programme.

7.4. Recommended Revegetation Techniques

7.4.1. Plant Sourcing

Any tube stock will be propagated from local native seed and grown by a nursery specialising in native plants purchased of local provenance native plants preferably cultivated using seed or cuttings sourced from within a 10 km radius of the study area. It may be necessary to get the required amounts of seed and vegetative material contract-collected and grown-on by specialist nurseries. Local native plants should be grown in "Hiko" tube, maxi cell or viro-tube, or Forestry Tube-type containers.

A qualified and experienced bushland regenerator is to be engaged for any native plant propagation works. Appropriate permissions for any collections undertaken and appropriate licensing under the BC Act will need to be obtained for any seed collected from offsite areas, this will be the responsibility of the bushland regenerator engaged to undertake the works.

Appendix C lists a planting list of species from Cumberland Plain Woodland, which are to be used for the planting. Substitution of alternate species from those listed in **Appendix C** is not advised as the final revegetated area must represent the species composition of this community. In the event that substitution of plant species is required due to supply shortages of species listed in **Appendix C**, the replacement/substitution species should be checked with the project ecologist to confirm suitability of the species. Council is also to be notified in the event of species substitution. The substitute species are not to be utilised for planting without prior approval from Council.

7.4.2. Planting Densities

Appropriate plant species for Cumberland Plain Woodland are provided in **Appendix C** and are to be used for selective re-vegetation of the VMP Area. As Zone 1 is not proposed to be revegetated but maintained in its current form (albeit with weed management), the revegetation techniques outlined in this chapter do not apply to Management Zone 1. The subset of Cumberland Plain Woodland groundcover species suitable for use within APZ (Management Zone 3 and Management Zone 4) is indicated in **Appendix C**.

7.4.2.1. Bushland Areas

i. Management Zone 2

Management Zone 2 should be revegetated where required with Cumberland Plain Woodland species from the planting list in **Appendix C** at the recommended densities below. It is noted that given the diverse canopy layer, the requirement for replanting of canopy trees is considered unlikely.

The recommended planting specifications for Cumberland Plain Woodland are as follows:

- Canopy Trees @ 1 unit / 16 m²
- Shrubs @ 1 unit / 10 m²
- Groundcovers @ 1-3 unit / 1 m².

In order to ensure that weed maintenance is able to be carried out safely with a backpack sprayer on the site, multiple ground covers can be planted within one hole within a metre square and surrounded within a single tree guard. This will allow the bushland maintenance team to move around the site easily and ensure that the ground cover plantings are protected from predation and herbicide drift until established.

The goal of planting is to recreate a naturally functioning ecological community that contains all vegetation strata – canopy, shrubs and groundcovers. It should be noted that planting will not be required in both management zones, and areas that already contain substantial native vegetation (e.g. Management Zone 1) will be allowed to regenerate naturally, and plantings in these areas will be restricted to bare patches and where some strata are lacking. Planting of understorey and ground layer species will also be undertaken to restore areas where dense weed infestations have been removed and for the purposes of increasing species diversity in these strata. In Management Zone 2, shrub and groundcover strata will be planted following weed control, along with canopy trees if needed.

7.4.2.2. APZ Areas

A.i. Management Zone 3

While all existing canopy trees are to be retained within this APZ area, no further trees are to be planted. Retained trees are to be trimmed/pruned as required to achieve the following IPA requirements:

- Tree canopy cover should be less than 15%;
- Lower limbs should be removed up to height of 2 metres above the ground; and
- Tree canopies should be separated by 2 - 5 metres.
- Shrubs and groundcovers can be planted between trees provided:
- Shrubs are not located within the canopy 'drip zone' of trees and form <10% cover; and
- Grass and other groundcovers are kept mown to a height of no more than 100mm; and
- Leaves and vegetation debris are removed off-site.

a. Management Zone 4

While all existing canopy trees are to be retained within this APZ area, no further trees are to be planted. Retained trees are to be trimmed/pruned as required to achieve the following OPA requirements:

- Tree canopy cover should be less than 30%; and
- Tree canopies should be separated by 2 - 5 metres.
- Shrubs and groundcovers can be planted between trees provided:
- Shrubs form <20% cover and do not form a continuous canopy;
- Grass and other groundcovers are kept mown to a height of no more than 100mm; and
- Leaves and vegetation debris are removed.

7.4.3. Characteristic Planting Units

Where required, native species should be planted in characteristic planting units to correspond with the topology, aspect, soil type and proximity to water.

Grasses may be planted in clumps of 3+ (spaced 15–20 cm apart within clumps) to generate physical / structural support for each other and microclimates. Wind pollinated grasses may be particularly planted in clumps to aid fertilisation and to create a natural grassland understorey within the restoration areas. Trees and shrubs should be planted unevenly in patches to mimic natural distribution. Differential cover of shrubs will also provide a greater diversity of fauna habitat, particularly for some small, woodland birds which forage in grassy areas and shelter in shrub thickets.

7.4.4. Re-vegetation Objectives to Maximise Fauna Utilisation

Native canopy, shrub and ground cover species can also establish and enhance habitat for local fauna species with the potential to occur or known to occur within the VMP Area. Species considerations to maximise fauna utilisation of the subject site include:

- Increase winter flowering species;
- Include marsupial feed trees;
- Increase trees and groundcovers favoured by arboreal mammals such as flowering Eucalypts; and
- Include species that mature to form tree hollows (such as Eucalypts) for hollow-dependent fauna.

In particular, staging of revegetation should be closely aligned with staged primary weeding, using fast-growing/colonising natives such as *Pittosporum undulatum* to establish a degree of native understorey cover upon removal of dense patches of weeds such that vegetation remains suitable as habitat for resident fauna,

7.5. Management of Existing Native Vegetation

Where a retained tree in the VMP Area is removed for safety reasons or lost through natural causes, it is to be replaced with another native canopy tree of the same species to ensure no net loss of current retained trees. Any replacement trees should have a mature height of at least two metres. The replacement trees should be protected until maturity.

Planted trees are to be maintained, to ensure they are not lost, for the 5-year maintenance period of the VMP. This will include watering during dry periods in the first year, and hand-removal of weeds around the base of trees (no use of herbicides or brush cutters).

7.6. Maintenance of Plantings

Plantings must be maintained in accordance with the measures outlined in this section to ensure the long-term success of the revegetation.

Initially, tree and shrub plantings will be protected from feral and domestic animal grazing, frost and maintenance herbicide spraying overspray by the installation of a tree guard and stakes.

After planting works have been completed, treated areas should be maintained weed free by appropriately qualified personnel, selectively spot spraying and hand weeding around native plants, watering plants and replacing dead plants as needed.

Provision should be made to irrigate newly reconstructed areas, as required, in the first 3 months after installation, (on at least 4-5 occasions, depending on rainfall conditions, more watering if required). Irrigation water may be sourced by pumping from the river and local dams. A permit from the NSW Office of Water may be sought to use water for watering-in newly installed plants.

Re-growing environmental weeds such as vines, woody trees and shrubs, broadleaf annuals and naturalised grasses should be closely monitored and controlled using ecologically sensitive bushland regeneration hand weeding and spot-spraying methods, to ensure adequate weed control and native plant establishment.

Weeding inside each planting bag by hand or selective herbicides will be required, as well as in an approximate 50 cm radius around the outside of each plant and tree guard.

Plants that have died due to drought or pest and disease damage should be replaced as required. Plants that are observed to have died should be replaced by the bushland maintenance team with a planting of the same form. At the end of the annual maintenance period the density of living planted plants should be as outlined in **Section 7.4** and described within the annual report.

7.7. Schedule of Works

The measures that are planned over the five year time period of this VMP are as follows:

7.7.1. Year 1 and 2

- Weed control;

- Planting of canopy species (potentially Zone 2);
- Planting of shrub, and groundcover species (Zone 2);
- Planting of selective subset of shrub and groundcover species in APZs (Zone 3 and Zone 4);
- Replacement of any tube stock individuals that have died between site visits;
- Management of fuel loads within APZs; and
- Monitoring, management and reporting.

7.7.2. Years 3, 4, and 5

- On-going weed control;
- Replacement of tube stock as required;
- Additional supplemental planting if natural regeneration does not occur;
- Management of APZ fuel loads; and
- Monitoring, management and reporting.

Vegetation management and maintenance of the VMP Area will be ongoing and in perpetuity. After the initial five-year follow-up and maintenance period has been completed, a review will be conducted to determine on-going on-site maintenance and management requirements.

8. Monitoring and Reporting

8.1. Responsibilities

It is recommended that a project manager/supervisor with the Bushland Regeneration Contractor (BRC) be assigned to coordinate, supervise, and manage all works and correspondence with respect to the management of the VMP Area. The consultant will be responsible for ensuring the measures outlined in this VMP are implemented and that plant stock is replaced, as needed. The project manager will become familiar with the VMP Area and surrounds, and progress of all aspects of works undertaken.

The project manager will be responsible for allocation of maintenance tasks to personnel in response to ongoing monitoring results as well as reporting. Regular monitoring and feedback from personnel will assist in the allocation of labour relative to available funds.

8.2. Monitoring

A monitoring program will be implemented to ensure that Cumberland Plain Woodland is retained without loss of native tree species for the duration of the management period of this VMP (5 years), and to measure success of weed control and revegetation. A qualified BRC or an independent ecological consultant will carry out a program of regular monitoring of the implementation of the VMP.

The monitoring will ensure that key performance measures are achieved for the VMP Area for the five-year management period. These include:

- No loss of native trees from the VMP Area as a result of works associated with the development;
- No decline in tree health within the VMP Area as a result of works associated with the development; and
- Less than 10% cover of exotic species, with no WoNS present.

The following activities are to be conducted annually by a licensed BRC or ecologist as part of the monitoring program:

- Establish a series of fixed monitoring points within the VMP Area;
- Take photographs annually from each monitoring point. Compare photographs to previous years to visually measure the success of management actions;
 - Photographs should be taken once a month by the BRC for the first year of the VMP, and then every six months for the duration.
- Use the photograph point to form a corner of a 20 x 20 m quadrat at each monitoring point. Note any weeds occurring in the quadrat and state relative abundance of weed species (using Braun-Blanquet scale), as well as projective foliage cover of native species in each stratum. Record numbers of failed plantings in each quadrat;
- Note any other weed outbreaks in the regeneration and restoration areas. This can be done while walking between monitoring plots;
- Note areas where erosion is present, and control is required; and

- Note the condition of the retained and planted species and identify where replacement planting is required.
- Notes on plant health including signs of die-back or Myrtle rust infection; and
- Recommendations for corrective measures and/or vegetation management.

Monitoring will be conducted before weed control commences. Once initial plantings are complete in necessary locations, monitoring will be conducted every year for the life of the VMP. Maintenance visits will initially be conducted once every month in the first year of the VMP. This can be reduced to once every two months from the second year of the VMP and then to every three months in Years 3 – 5 following establishment of vegetation. This results in 12 maintenance visits in Year 1, six visits in Year 2 and 4 visits in Years 3 – 5.

The co-ordinates for the locations of the fixed monitoring points should be recorded at establishment of the monitoring sites and documented in the annual report. It is recommended that there should be a minimum of one monitoring points per management zone.

8.3. Reporting

Based on the results of annual monitoring inspections a brief and concise annual report will be prepared documenting the progress of restoration works against the performance criteria outlined in **Table 4** and **Table 5**. The report will be prepared by the project manager and kept as a record of works that have been undertaken within the VMP Area.

Each annual report will:

- Describe the regeneration works undertaken;
- State the findings of the monitoring surveys;
- An evaluation against key performance targets;
- Discuss any problems encountered in implementing the VMP; and
- Recommend any adaptations or additions to the VMP.

The report will contain site photographs, as well as a short description of weeds in each management zone and a short comparison to the photographs of previous years. Any other notable occurrences of weeds will also be reported. The report will also recommend and prioritise areas where weed control should be targeted for the following maintenance period.

Where performance measures have not been achieved, the report must prescribe rectification measures for vegetation management.

A final report should be prepared at the end of the five year period of this VMP documenting the success of the works against performance criteria. This report should also provide recommendations for ongoing and in perpetuity management and monitoring strategies based on the vegetation condition at the end of the duration of this VMP.

8.4. Review of this VMP

If the objectives of this VMP are not met within five years, the monitoring and maintenance works phases are to be extended until they are achieved. Alternate adapted management actions for implementation are to be identified and implemented where relevant to the success of this VMP, in consultation with Council.

9. Timing and Responsibilities

The VMP works will be broken down into phases, although some phases may overlap. Phase 2 to 4 will take place over a five-year period. Some maintenance, monitoring, and reporting (if targets are not met) will be required in perpetuity after this five-year period. The phases are:

- Phase 1 – Site preparation;
- Phase 2 – APZ establishment;
- Phase 3 – Revegetation and weeding;
- Phase 4 – Maintenance;
- Phase 5 – Monitoring and reporting; and
- Phase 6 – In perpetuity maintenance.

Timing and responsibilities at each phase of management within the VMP Area are shown within **Table 4**. This table assigns each activity within each phase to those responsible. Performance criteria for planting densities and weed cover within the VMP Area is shown in **Table 5**.

Table 4 Timing and responsibilities

Action	Responsibility	Performance Criteria	Performance Measure	Action Required if Performance Criteria is Not Met	Timing
Phase 1 Site Preparation					
Seed Collection	Bush Regeneration Contractor (BRC)	Seed collected from native plants and germinated; or BRC to commission the propagation of plants required for VMP works to ensure adequate supply.	Species list of all seeds collected includes all species present on site.	Increase seed collection or source additional seed from local nursery if seed is not available on-site.	Immediately
Delineation of clearing boundary	Property Owner or Subcontractor	Marking using GPS and high visibility tape, fencing and boundary markers.	All clearing boundaries have been clearly marked and photographs taken for documentation.	Delineate all clearing boundaries.	Before construction works commence
Establish fixed monitoring points	BRC or Ecologist	Using star pickets and GPS establish a series of monitoring sites that can be used for photograph comparison, measuring weed and plant retention.	All monitoring points have a star picket installed, and photographs taken for documentation.	Install star picket at all monitoring points.	Prior to commencement of reconstruction and weeding works.
Flora Pre-clearing Surveys	Ecologist	Identify any locations of significant weed infestations requiring control.	Pre-clearing surveys are completed and results are documented.	Undertake pre-clearance surveys.	Prior to any vegetation clearing
Installation of signage identifying areas of bushland reconstruction	Property Owner or Subcontractor	All areas adjacent to native vegetation to be planted.	Signs have been installed and locations documented.	Install signs in appropriate area.	Prior to commencement of Phase 2

Action	Responsibility	Performance Criteria	Performance Measure	Action Required if Performance Criteria is Not Met	Timing
Installation of fencing and sediment control	Property Owner or Subcontractor	Installation of permanent fencing and sediment control around the VMP Area to prevent grazing and spread of chemicals.	Fencing has been installed around the entire VMP Area, and photographs taken for documentation.	Install fencing and sediment control.	Prior to commencement of reconstruction and weeding works.
Salvage Habitat Features	Ecologist	Tree hollows, Log hollows, other woody material and bushrock will be salvaged and stockpiled for future use in revegetation areas and for habitat complexity.	Salvage habitat features have been stockpiled. Details on the number of items and type are recorded.	Stockpile all salvaged habitat features and record the number and type of items stockpiled.	1-2 weeks after clearing.
Phase 2 – APZ Establishment					
Pruning/Trimming of Canopy in APZ/Fuel Management areas	Property Owner, Bushfire consultant or other nominated contractor	Canopy cover is pruned/trimmed as per RFS requirements for an IPA	Canopy cover meets requirements of an IPA (APZ areas) or hazard reduction requirements (fuel management area)	Additional pruning/trimming works in accordance with recommendations from bushfire consultant or per RFS requirements	Following primary weed removal but prior to revegetation works
Determination of locations for shrub plantings	Bushfire consultant or other nominated contractor	Shrubs, if planted, are not located under retained trees (APZ areas only)	Shrub cover meets requirements of an IPA (Zone 3) or OPA (Zone 4)	Additional pruning/trimming works in accordance with recommendations from bushfire consultant	Following primary weed removal and determination of retained tree extent
Phase 3 - Restoration Works Commence					

Action	Responsibility	Performance Criteria	Performance Measure	Action Required if Performance Criteria is Not Met	Timing
Baseline Condition records.	Bush Regeneration Contractor	Photographs of fixed monitoring sites before initial weeding	Photograph have been taken.	Take photographs.	Prior to commencement of restoration works
Fixed Point Monitoring	BRC	Photographs of fixed monitoring sites before initial weeding.	Photograph have been taken.	Take photographs.	Prior to commencement of restoration works.
Carry out initial weeding	BRC	Main weed infestations, priority weeds and WoNS removed - Reproductively mature plants absent from site.	Primary weeding completed and documented.	Undertake targeted weeding.	First month of restoration works.
Characteristic species are planted according to species list in Appendix C	BRC	Native plants have been planted (species from Appendix C) as required in Management Zone 2	Revegetation has occurred and been documented.	Undertake revegetation works.	Immediately upon establishment of reconstruction areas.
Carry out maintenance weeding	BRC	Weed regrowth following primary weeding removed. Work has commenced on control of annual weed species.	Weeding of regrowth following primary weeding completed and documented.	Undertake targeted weeding.	Following primary weeding, site visits monthly for the first year.
Phase 4 – Maintenance					
Carry out maintenance	BRC	Priority weed cover is reduced annually, ranging from less than 2-10% cover over the 5-year period	Monitoring point 20 x 20 m quadrat data results.	Undertake maintenance weeding.	Monthly for the first year, then every six months for the

Action	Responsibility	Performance Criteria	Performance Measure	Action Required if Performance Criteria is Not Met	Timing
weeding throughout the site		Non-priority weed cover is reduced annually, ranging from less than 4-15% cover over the 5-year period. No new weed species or 'large scale / dense' weed infestations from species extant on site, and prevention of, the encroachment of weeds or exotic lawn/vegetation into area of bush land regeneration as far as feasibly possible. Large scale/dense infestation = an area >2 m² without successfully established native plantings. New weed infestations = areas with infestation not previously recorded on the site in quarterly / annual monitoring reports.			duration of the 5-year maintenance period under VMP.
Maintenance of plantings	BRC	Survival rate of plantings is 90-95% in earlier years. or stratum density is similar to that specified in the VMP via natural recruitment. Species diversity and density equal to or greater than baseline data.	Monitoring point 20 x 20 m quadrat data results.	Any dead plantings replaced, especially if natural recruitment does not occur. Additional plantings where required due to observed gaps in any strata.	Annually for the duration of the 5-year maintenance period under VMP.

Action	Responsibility	Performance Criteria	Performance Measure	Action Required if Performance Criteria is Not Met	Timing
		Plants watered when drought stressed.	Plants are watered during times of drought and documented.	Water plants in times of drought.	In times of drought.
Mowing/Trimming within APZs	Bush Regeneration Contractor or other nominated contractor. Bushfire consultant to advise as required	Ground cover is mown and tree cover/shrub cover is trimmed	Various strata cover are as per requirements for an IPA/OPA or fuel management area	Additional trimming or mowing to be conducted until vegetation strata are at requisite levels for the zone	As required across duration of 5 year maintenance period under VMP. Frequency of maintenance dependent on growth exceeding relevant levels.
Phase 5 - Monitoring and reporting					
Annual inspection of site completed as outlined in Chapter 8	BRC or Ecologist	Survival rate of plantings is 90-95% in earlier years. or stratum density is similar to that specified in the VMP via natural recruitment.	Monitoring point 20 x 20 m quadrat data results.	Undertake replanting, especially if natural recruitment does not occur.	Every year for the 5-year maintenance period of VMP.
		Priority weeds cover is reduced annually, ranging from less than 2-10% cover over the 5-year period.		Targeted weeding.	
		Non-priority weed cover is reduced annually, ranging from less than 10-20% cover over the 5-year period.			

Action	Responsibility	Performance Criteria	Performance Measure	Action Required if Performance Criteria is Not Met	Timing
		Species diversity and density equal to or greater than previous inspection.		Undertake replanting and/or plant additional species.	
		No encroachment of exotic vegetation into area of bush land regeneration.		Targeted weeding and/or installation of physical barrier.	
		No erosion or sedimentation into areas of bush land regeneration.	Photographic evidence	Installation of further sediment/erosion controls.	
Progress report preparation.	BRC or Ecologist	Annual Report prepared on progress of restoration works including all data collected in annual inspections.	Results of data analysis of all data collected in biannual inspections.	Undertake corrective measures including targeted weeding, replanting or additional species plantings and install additional sediment/erosion controls.	Once a year for the 5-year maintenance period of VMP.
Final Inspection of Site carried out at completion of VMP.	BRC or Ecologist	Survival rate of plantings is 90-95% or stratum density is similar to that specified in the VMP via natural recruitment.	Monitoring point 20 x 20 m quadrat data results.	Extended life of VMP until performance criteria is met.	After 5 years of maintenance under VMP.
		Priority weeds to be less than 2% cover.			

Action	Responsibility	Performance Criteria	Performance Measure	Action Required if Performance Criteria is Not Met	Timing
		Non-priority weeds to be less than 10% cover.			
		Species diversity and density equal to or greater than previous inspection.			
		No encroachment of exotic lawn/vegetation into area of bush land regeneration.			
Final Report	BRC or Ecologist	Final report detailing success of restoration or outlining further works needed.	Results of data analysis of all data collected for the life of the VMP.	Extended life of VMP until performance criteria is met.	After 5 years of maintenance under VMP.
Phase 6: In perpetuity maintenance					
Maintenance weeding	BRC	Ensure no new weeds establish, maintain weed cover at or below 5% for ground layer and 0% for other layers.	Monitoring point 20x20 m quadrat data results.	-	6 monthly for life of project
Rubbish removal	Maintenance contractor	No rubbish in the VMP area.	All rubbish removed.	-	6 monthly for life of project

Table 5 Performance criteria for weed cover and planting densities

Performance Criteria	Year 1	Year 2	Year 3	Year 4	Year 5
Priority weed cover	<15%	<10%	<7.5%	<5%	<2.5%
Non-priority weed cover	<20%	<15%	<12%	<10%	<5%
Presence of new weed species or 'large scale / dense' weed infestations, (Large scale/dense infestation = an area >2m x 2m without successfully established native plantings. New weed infestations = areas with infestation not previously recorded on the site in quarterly / annual monitoring reports)	2 - 3 scattered patches maximum	1-2 scattered patches maximum	None	None	None
Survival rate of plantings	90%	85%	Survival rate of plantings is 80% or stratum density is similar to that specified in the VMP via natural recruitment	Survival rate of plantings is 80% or stratum density is similar to that specified in the VMP via natural recruitment	Survival rate of plantings is 80% or stratum density is similar to that specified in the VMP via natural recruitment

10. References

- Blackash. 2025. Bushfire Hazard Assessment for Childcare Centre Modifications for 2 Bullecourt Avenue, Milperra.
- Botanic Gardens Trust. 2008. Best Practice Management Guidelines for *Phytophthora cinnamomi* within the Sydney Metropolitan Catchment Management Authority Area. Botanic Gardens Trust, Royal Botanic Gardens, Sydney.
- Botanic Gardens Trust. 2021. PlantNET. National Herbarium of NSW, Royal Botanic Gardens, Sydney.
- Canterbury-Bankstown LGA. 2023a. Canterbury-Bankstown Development Control Plan 2023.
- Canterbury-Bankstown LGA. 2023b. Canterbury-Bankstown Local Environmental Plan 2023
- Clennell, A. June 17, 2014. M9 Outer-western Sydney Orbital motorway part of big ticket \$5.5b roads package unveiled in today's NSW Budget. The Daily Telegraph. News Limited, Sydney.
- Cumberland Ecology. 2024a. Biodiversity Development Assessment Report for the Western Sydney University Milperra Campus: Stage 2.
- Cumberland Ecology. 2024b. Biodiversity Development Assessment Report for the Western Sydney University Milperra Campus, Commercial Area.
- Cumberland Ecology. 2024c. Flora and Fauna Assessment for the Western Sydney University Milperra Campus: Stage 1.
- Cumberland Ecology. 2025. Hollow Offset Replacement Strategy and Nestbox Management Plan for the Western Sydney University Milperra Campus
- DAWE. 2020. Commonwealth Conservation Advice for the River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria DAWE, Canberra, ACT.
- DCCEEW. 2024. Species Profile and Threats Database.
- DEWHA. 2010. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. Page pg. 11 in W. Department for Environment, Heritage and the Arts,, editor., Canberra.
- DPE. 2024. NSW State Vegetation Type Map.
- DPI. 2017. Fact Sheet: Weed Management Legislation is Changing.
- EHG. 2024a. Bionet Atlas.
- EHG. 2024b. BioNet Vegetation Classification. Environment and Heritage Group.
- EHG. 2024c. Threatened Biodiversity Database Collection.
- LLS: Greater Sydney, editor. 2022. Greater Sydney Regional Strategic Weed Management Plan 2023-2027. Local Land Services.
- NSW Government. 2020a. Biodiversity Assessment Method. Department of Planning, Industry and Environment, Parramatta.
- NSW Government. 2020b. Surveying threatened plants and their habitats. NSW survey guide for the Biodiversity Assessment Method. Environment, Energy and Science. Department of Planning, Industry and and Environment, Parramatta.
- NSW Government. 2024. SEED The Central Resource for Sharing and Enabling Environmental Data in NSW.
- NSW Rural Fire Service. 2019. Planning for Bushfire Protection. NSW Rural Fire Service, Granville.
- NSW Scientific Committee. 2011. River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological community listing.
- OEH. 2011. Cumberland Plain Woodland in the Sydney Basin Bioregion - critically endangered ecological community listing.
- OEH. 2018. *Acacia pubescens* - profile. Office of Environment and Heritage, Hurstville.
- Temporal Tree Management. 2024. Western Sydney University Milperra Campus Arboricultural Impact Assessment Report
- Threatened Species Scientific Committee. 2008. Commonwealth Conservation Advice on Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest. Department of Environment, Water, Heritage and the Arts, Canberra, ACT.
- Threatened Species Scientific Committee. 2009. Commonwealth Listing Advice on Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. Department of the Environment, Water, Heritage and the Arts, Canberra.

APPENDIX A :

Flora Species List

Table 6 Flora species list for the study area

Scientific Name	Common Name	Exotic?	Growth Form
<i>Acacia decurrens</i>	Black Wattle		Tree (TG)
<i>Acacia implexa</i>	Hickory Wattle		Shrub (SG)
<i>Allocasuarina littoralis</i>	Black She-Oak		Tree (TG)
<i>Anredera cordifolia</i>	Madeira Vine	YES	
<i>Araujia sericifera</i>	Moth Vine	YES	
<i>Arctotheca calendula</i>	Capeweed	YES	
<i>Aristida vagans</i>	Threeawn Speargrass		Grass & grasslike (GG)
<i>Arthropodium</i> sp. South-east Highlands			Forb (FG)
<i>Asparagus aethiopicus</i>	Asparagus Fern	YES	
<i>Asparagus asparagoides</i>	Bridal Creeper	YES	
<i>Bidens pilosa</i>	Cobbler's Pegs	YES	
<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	Pitted Bluegrass		Grass & grasslike (GG)
<i>Brassica fruticulosa</i>	Twiggy Turnip	YES	
<i>Briza maxima</i>	Quaking Grass	YES	
<i>Briza minor</i>	Shivery Grass	YES	
<i>Briza subaristata</i>		YES	
<i>Bromus catharticus</i>	Prairie Grass	YES	
<i>Brunoniella australis</i>	Blue Trumpet		Forb (FG)
<i>Bursaria spinosa</i>	Native Blackthorn		Shrub (SG)
<i>Caesia parviflora</i> var. <i>parviflora</i>			Forb (FG)
<i>Capsella bursa-pastoris</i>	Shepherd's Purse	YES	
<i>Cardamine hirsuta</i>	Common Bittercress	YES	
<i>Cenchrus clandestinus</i>	Kikuyu Grass	YES	
<i>Cerastium glomeratum</i>	Mouse-ear Chickweed	YES	
<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	Rock Fern		Fern (EG)
<i>Cirsium vulgare</i>	Spear Thistle	YES	
<i>Clematis glycinoides</i>	Headache Vine		Other (OG)
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	YES	
<i>Conyza sumatrensis</i>	Tall fleabane	YES	
<i>Cotula australis</i>	Common Cotula		Forb (FG)
<i>Crassula sieberiana</i>	Australian Stonecrop		Forb (FG)

Scientific Name	Common Name	Exotic?	Growth Form
<i>Cynodon dactylon</i> var. <i>dactylon</i>	Common Couch		Grass & grasslike (GG)
<i>Cyperus eragrostis</i>	Umbrella Sedge	YES	
<i>Cyperus gracilis</i>	Slender Flat-sedge		Grass & grasslike (GG)
<i>Davidsonia johnsonii</i>	Smooth Davidson's Plum		Tree (TG)
<i>Daviesia ulicifolia</i>	Gorse Bitter Pea		Shrub (SG)
<i>Dianella caerulea</i> var. <i>caerulea</i>			Forb (FG)
<i>Dianella caerulea</i> var. <i>producta</i>			Forb (FG)
<i>Dianella longifolia</i>	Blueberry Lily		Forb (FG)
<i>Dichondra repens</i>	Kidney Weed		Forb (FG)
<i>Digitaria parviflora</i>	Small-flowered Finger Grass		Grass & grasslike (GG)
<i>Ehrharta erecta</i>	Panic Veldtgrass	YES	
<i>Ehrharta longiflora</i>	Annual Veldtgrass	YES	
<i>Einadia trigonos</i>	Fishweed		Forb (FG)
<i>Entolasia marginata</i>	Bordered Panic		Grass & grasslike (GG)
<i>Eragrostis curvula</i>	African Lovegrass	YES	
<i>Eragrostis leptostachya</i>	Paddock Lovegrass		Grass & grasslike (GG)
<i>Eucalyptus amplifolia</i> subsp. <i>amplifolia</i>			Tree (TG)
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark		Tree (TG)
<i>Eucalyptus moluccana</i>	Grey Box		Tree (TG)
<i>Eucalyptus tereticornis</i>	Forest Red Gum		Tree (TG)
<i>Exocarpos cupressiformis</i>	Cherry Ballart		Shrub (SG)
<i>Fumaria muralis</i>	Wall Fumitory	YES	
<i>Gahnia aspera</i>	Rough Saw-sedge		Grass & grasslike (GG)
<i>Gamochaeta americana</i>	Purple Cudweed	YES	
<i>Glycine clandestina</i>	Twining glycine		Other (OG)
<i>Glycine microphylla</i>	Small-leaf Glycine		Other (OG)
<i>Glycine tabacina</i>	Variable Glycine		Other (OG)
<i>Gomphrena celosioides</i>	Gomphrena Weed	YES	
<i>Hardenbergia violacea</i>	False Sarsaparilla		Other (OG)
<i>Hibbertia aspera</i>	Rough Guinea Flower		Shrub (SG)
<i>Hypochaeris radicata</i>	Catsear	YES	
<i>Indigofera australis</i>	Australian Indigo		Shrub (SG)

Scientific Name	Common Name	Exotic?	Growth Form
<i>Lactuca serriola</i>	Prickly Lettuce	YES	
<i>Lepidosperma laterale</i>	Variable Sword-sedge		Grass & grasslike (GG)
<i>Leucopogon juniperinus</i>	Prickly Beard-heath		Shrub (SG)
<i>Lobelia purpurascens</i>	whiteroot		Forb (FG)
<i>Lolium perenne</i>	Perennial Ryegrass	YES	
<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	Wattle Matt-rush		Grass & grasslike (GG)
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>			Grass & grasslike (GG)
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush		Grass & grasslike (GG)
<i>Lotus uliginosus</i>	Birds-foot Trefoil	YES	
<i>Lysimachia arvensis</i>	Scarlet Pimpernel	YES	
<i>Malva parviflora</i>	Small-flowered Mallow	YES	
<i>Medicago minima</i>	Woolly Burr Medic	YES	
<i>Medicago polymorpha</i>	Burr Medic	YES	
<i>Megathyrsus maximus</i>		YES	
<i>Melaleuca nodosa</i>			Shrub (SG)
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass		Grass & grasslike (GG)
<i>Modiola caroliniana</i>	Red-flowered Mallow	YES	
<i>Notelaea longifolia</i> f. <i>longifolia</i>			Tree (TG)
<i>Nothoscordum gracile</i>	Onion Weed	YES	
<i>Ochna serrulata</i>	Mickey Mouse Plant	YES	
<i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive	YES	
<i>Olearia viscidula</i>	Wallaby Weed		Shrub (SG)
<i>Oxalis perennans</i>			Forb (FG)
<i>Ozothamnus diosmifolius</i>	White Dogwood		Shrub (SG)
<i>Paronychia brasiliiana</i>	Chilean Whitlow Wort, Brazilian Whitlow	YES	
<i>Parsonsia straminea</i>	Common Silkpod		Other (OG)
<i>Paspalidium distans</i>			Grass & grasslike (GG)
<i>Paspalum dilatatum</i>	Paspalum	YES	
<i>Plantago lanceolata</i>	Lamb's Tongues	YES	

Scientific Name	Common Name	Exotic?	Growth Form
<i>Poa annua</i>	Winter Grass	YES	
<i>Poranthera microphylla</i>	Small Poranthera		Forb (FG)
<i>Ranunculus sceleratus</i>	Celery Buttercup	YES	
<i>Rytidosperma racemosum</i>	Wallaby Grass		Grass & grasslike (GG)
<i>Senecio madagascariensis</i>	Fireweed	YES	
<i>Setaria parviflora</i>		YES	
<i>Sida rhombifolia</i>	Paddy's Lucerne	YES	
<i>Solanum nigrum</i>	Black-berry Nightshade	YES	
<i>Solanum prinophyllum</i>	Forest Nightshade		Forb (FG)
<i>Solanum sisymbriifolium</i>		YES	
<i>Soliva sessilis</i>	Bindyi	YES	
<i>Sonchus asper</i>	Prickly Sowthistle	YES	
<i>Sonchus oleraceus</i>	Common Sowthistle	YES	
<i>Sporobolus africanus</i>	Parramatta Grass	YES	
<i>Stachys arvensis</i>	Stagger Weed	YES	
<i>Stellaria media</i>	Common Chickweed	YES	
<i>Taraxacum officinale</i>	Dandelion	YES	
<i>Themeda triandra</i>			Grass & grasslike (GG)
<i>Trifolium repens</i>	White Clover	YES	
<i>Verbena bonariensis</i>	Purpletop	YES	
<i>Vernonia cinerea</i> var. <i>cinerea</i>		YES	
<i>Veronica arvensis</i>	Wall Speedwell	YES	
<i>Veronica plebeia</i>	Trailing Speedwell		Forb (FG)
<i>Vulpia bromoides</i>	Squirrel Tail Fesque	YES	
<i>Wahlenbergia communis</i>	Tufted Bluebell		Forb (FG)
<i>Wahlenbergia gracilis</i>	Sprawling Bluebell		Forb (FG)
<i>Zieria smithii</i>	Sandfly Zieria		Shrub (SG)

APPENDIX B :

Weed Control Measures

Table 7 Weed control methods

Scientific Name	Common Name	Priority Status	WoNS	Control Method
<i>Anredera cordifolia</i>	Madeira Vine	State Priority – Asset Protection	Yes	- Hand pull juvenile vines, or remove with hand tools taking care to remove roots and tubers - Skirting vines is not recommended as plant can remain alive for up to 2 years without roots - Pulling vines down from canopy is similarly not recommended as it will result in fall of aerial tubers and bulbils which will sprout new plants - Scrape and paint stems with undiluted glyphosate, scrape both sides of stem and scrape from ground to as high as can be reached, taking care not to completely ringbark stem which will stop herbicide dispersal through plant - Spray seedlings with glyphosate 10 mL/1L + surfactant - When removing vines all bulbils and aerial tubers should be bagged and removed from site, and fallen tubers collected and removed from the ground beneath mature vines
<i>Araujia sericifera</i>	Moth Vine	Other Weed of Regional Concern	No	- Hand Weed Juveniles - Spray juveniles with glyphosate 10mL/1L - Skirt mature vines (cut through plant close to root) and then pull root manually or apply undiluted glyphosate to cut surface - Scrape and paint vine with undiluted glyphosate
<i>Asparagus aethiopicus</i>	Ground Asparagus	State Priority	No	- Any branches profuse with fruit should be cut with secateurs and bagged to prevent further spread of species by birds - Juvenile plants can be eased out of soil with a trowel or knife - care should be taken to remove below ground plant material - For large, mature plants the woody crown at the base can be cut around with a sharp knife, or hacked out with a mattock or peter lever

Scientific Name	Common Name	Priority Status	WoNS	Control Method
				and removed - it is easiest to cut all branches off near the base with secateurs prior to removing crown - plant will not resprout from water storing tubers or roots below ground so these can be left to rot to reduce soil disturbance.- July-September - Spray foliage with glyphosate 10mL/1L + surfactant - May to June - Spray foliage with metsulfuron methyl (e.g. Brush Off) 5g/100L + non-ionic surfactant
<i>Asparagus asparagoides</i>	Bridal Creeper	State Priority	No	- Dig out with hand tools - Care needs to be taken to remove all tuberous masses and rhizomes. Tuberous masses need soil excavation around and careful levering with hand tools to remove without leaving plant material behind to resprout. - July-September - Spray foliage with glyphosate 10mL/1L + surfactant - May to June - Spray foliage with metsulfuron methyl (e.g. Brush Off) 5g/100L + non-ionic surfactant
<i>Bidens pilosa</i>	Cobbler's Pegs	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Bromus catharticus</i>	Brome Grass	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Cerastium glomeratum</i>	Mouse-ear Chickweed	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Cirsium vulgare</i>	Spear Thistle	No Status	No	- Hand Weed using gloves - Spot Spray - Glyphosate 10mL/1L
<i>Conyza sumatrensis</i>	Tall Fleabane	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L - On-going grubbing (all year)

Scientific Name	Common Name	Priority Status	WoNS	Control Method
<i>Hypochaeris radicata</i>	Catsear	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Lactuca serriola</i>	Prickly Lettuce	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Lolium perenne</i>	Perennial Ryegrass	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L - On-going grubbing (all year)
<i>Lotus uliginosus</i>	Greater Bird's Foot Trefoil	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Lysimachia arvensis</i>	Scarlet Pimpernel	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Medicago polymorpha</i>	Burr Medic	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Paspalum dilutatum</i>	Dallis Grass	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Plantago lanceolata</i>	Lamb's Tongues	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Senecio madagascariensis</i>	Fireweed	State Priority – Asset	Yes	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Sida rhombifolia</i>	Paddy's Lucerne	No Status	No	- Hand weed - Spot Spray - Glyphosate 10mL/1L - Cut large, firmly rooted individuals at the base with secateurs and paint with undiluted glyphosate

Scientific Name	Common Name	Priority Status	WoNS	Control Method
<i>Solanum sisymbriifolium</i>	Sticky Nightshade	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Sonchus asper</i>	Sow Thistle	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Stachys arvensis</i>	Stagger Weed	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Trifolium repens</i>	White Clover	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L
<i>Verbena bonariensis</i>	Purple Top	No Status	No	- Hand Weed - Spot Spray - Glyphosate 10mL/1L

APPENDIX C :

Species Planting List



Table 8 Species Planting List - Cumberland Plain Woodland

Form	Family	Scientific Name	Common Name	ST*
Trees	Fabaceae (Mimosoideae)	<i>Acacia parramattensis</i>	Parramatta Wattle	
	Myrtaceae	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	
	Myrtaceae	<i>Eucalyptus eugenioides</i>	Narrow-leaved Stringybark	
	Myrtaceae	<i>Eucalyptus moluccana</i>	Grey Box	
	Myrtaceae	<i>Eucalyptus tereticornis</i>	Forest Red Gum	
Shrubs	Asteraceae	<i>Ozothamnus diosmifolius</i>	Dogwood	
	Fabaceae (Faboideae)	<i>Bossiaea prostrata</i>	Creeping Bossiaea	
	Fabaceae (Faboideae)	<i>Chorizema parviflorum</i>	Eastern Flame Pea	
	Fabaceae (Faboideae)	<i>Daviesia ulicifolia</i>	Gorse Bitter Pea	
	Fabaceae (Faboideae)	<i>Dillwynia sieberi</i>		
	Fabaceae (Faboideae)	<i>Indigofera australis</i>	Australian Indigo	
	Fabaceae (Faboideae)	<i>Pultenaea microphylla</i>		
	Fabaceae (Mimosoideae)	<i>Acacia implexa</i>	Hickory Wattle	
	Phyllanthaceae	<i>Breynia oblongifolia</i>	Coffee Bush	
	Pittosporaceae	<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Blackthorn	
	Rosaceae	<i>Rubus parvifolius</i>	Native Raspberry	
	Sapindaceae	<i>Dodonaea viscosa</i>	Sticky Hop Bush	
	Scrophulariaceae	<i>Eremophila debilis</i>	Winter Apple	
	Fabaceae (Faboideae)	<i>Desmodium brachypodium</i>	Large Tick-trefoil	
	Fabaceae (Faboideae)	<i>Desmodium varians</i>	Slender Tick-trefoil	
Vines and Twiners	Fabaceae (Faboideae)	<i>Glycine clandestina</i>	Twining Glycine	
	Fabaceae (Faboideae)	<i>Glycine microphylla</i>	Small-leaf Glycine	
	Fabaceae (Faboideae)	<i>Glycine tabacina</i>	Twining Glycine	
	Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>	Purple Coral Pea	
	Ranunculaceae	<i>Clematis glycinoides</i>	Headache Vine	Yes
Ground covers	Acanthaceae	<i>Brunoniella australis</i>	Blue Trumpet	
	Anthericaceae	<i>Arthropodium milleflorum</i>	Pale Vanilla Lily	
	Anthericaceae	<i>Dichopogon fimbriatus</i>	Chocolate Lily	
	Anthericaceae	<i>Dichopogon strictus</i>	Nodding Chocolate Lily	
	Anthericaceae	<i>Tricoryne elatior</i>	Yellow Autumn Lily	
	Apiaceae	<i>Centella asiatica</i>	Indian Pennywort	
	Apiaceae	<i>Daucus glochidiatus</i>	Native Carrot	

Form	Family	Scientific Name	Common Name	ST*
	Asteraceae	<i>Chrysocephalum apiculatum</i>	Yellow Buttons	
	Asteraceae	<i>Cymbonotus lawsonianus</i>	Bear's Ears	
	Asteraceae	<i>Euchiton sphaericus</i>		
	Asteraceae	<i>Glossocardia bidens</i>	Cobbler's Tack	
	Asteraceae	<i>Vernonia cinerea</i>		
	Campanulaceae	<i>Wahlenbergia gracilis</i>	Small Bluebell	
	Chenopodiaceae	<i>Einadia hastata</i>	Berry Saltbush	
	Chenopodiaceae	<i>Einadia nutans</i>	Climbing Saltbush	
	Chenopodiaceae	<i>Einadia polygonoides</i>		
	Chenopodiaceae	<i>Einadia trigonos</i>	Fishweed	
	Clusiaceae	<i>Hypericum gramineum</i>	Small St Johns Wort	
	Commelinaceae	<i>Commelina cyanea</i>	Native Wandering Jew	Yes
	Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed	Yes
	Crassulaceae	<i>Crassula sieberiana</i>	Australian Stonecrop	
	Cyperaceae	<i>Carex inversa</i>		
	Cyperaceae	<i>Cyperus gracilis</i>		
	Cyperaceae	<i>Fimbristylis dichotoma</i>	Common Fringe-sedge	
	Cyperaceae	<i>Scleria mackaviensis</i>		
	Fabaceae	<i>Desmodium varians</i>	Slender Tick-trefoil	
	Fabaceae	<i>Zornia dyctiocarpa</i>	Zornia	
	Geraniaceae	<i>Geranium homeanum</i>		
	Geraniaceae	<i>Geranium solanderi</i>	Native Geranium	
	Goodeniaceae	<i>Goodenia hederacea</i>	Forest Goodenia	Yes
	Hypoxidaceae	<i>Hypoxis hygrometrica</i>	Golden Weather-grass	
	Lamiaceae	<i>Ajuga australis</i>	Austral Bugle	
	Lamiaceae	<i>Plectranthus parviflorus</i>	Cockspur Flower	
	Lamiaceae	<i>Scutellaria humilis</i>	Dwarf Skullcap	
	Lobeliaceae	<i>Pratia purpurascens</i>	Whiteroot	Yes
	Lomandraceae	<i>Lomandra filiformis</i>	Wattle Mat-rush	
	Lomandraceae	<i>Lomandra multiflora</i>	Many-flowered Mat-rush	
	Malvaceae	<i>Sida corrugata</i>	Corrugated Sida	
	Oxalidaceae	<i>Oxalis perennans</i>	Native oxalis	
	Phormiaceae	<i>Dianella longifolia</i>	Blueberry Lily	
	Phyllanthaceae	<i>Phyllanthus virgatus</i>		

Form	Family	Scientific Name	Common Name	ST*
	Phyllanthaceae	<i>Poranthera microphylla</i>	Small-leaved Poranthera	
	Plantaginaceae	<i>Plantago debilis</i>		
	Plantaginaceae	<i>Plantago gaudichaudii</i>	Narrow Plantain	
	Plantaginaceae	<i>Veronica plebeia</i>	Trailing Speedwell	Yes
	Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	
	Poaceae	<i>Aristida vagans</i>	Three awned Speargrass	
	Poaceae	<i>Bothriochloa decipiens</i>	Pitted Bluegrass	
	Poaceae	<i>Bothriochloa macra</i>	Red-leg Grass	
	Poaceae	<i>Chloris truncata</i>		
	Poaceae	<i>Chloris ventricosa</i>	Plump Windmill Grass	
	Poaceae	<i>Cymbopogon refractus</i>	Barbed Wire Grass	
	Poaceae	<i>Dichanthium sericeum</i>	Queensland Bluegrass	
	Poaceae	<i>Dichelachne micrantha</i>	Shorthair Plume Grass	
	Poaceae	<i>Dichelachne parva</i>	Plume Grass	
	Poaceae	<i>Digitaria diffusa</i>	Open Summer-grass	
	Poaceae	<i>Echinopogon caespitosus</i>	Tufted Hedgehog Grass	
	Poaceae	<i>Echinopogon ovatus</i>	Forest Hedgehog Grass	
	Poaceae	<i>Elymus scaber</i>	Common Wheatgrass	
	Poaceae	<i>Eragrostis leptostachya</i>	Paddock lovegrass	
	Poaceae	<i>Eriochloa pseudoacrotricha</i>	Early Spring Grass	
	Poaceae	<i>Microlaena stipoides</i>	Weeping Grass	Yes
	Poaceae	<i>Panicum effusum</i>	Hairy Panic	
	Poaceae	<i>Paspalidium distans</i>		
	Poaceae	<i>Rytidosperma caespitosum</i>	Ringed Wallaby Grass	
	Poaceae	<i>Rytidosperma racemosa</i>	Wallaby Grass	
	Poaceae	<i>Rytidosperma tenuius</i>	Wallaby Grass	
	Poaceae	<i>Sorghum leiocladum</i>	Wild Sorghum	
	Poaceae	<i>Sporobolus creber</i>	Slender Rat's Tail Grass	
	Poaceae	<i>Themeda triandra</i>	Kangaroo Grass	
	Pteridaceae	<i>Cheilanthes distans</i>	Bristly Cloak Fern	
	Pteridaceae	<i>Cheilanthes sieberi</i>	Rock Fern	Yes
	Rubiaceae	<i>Asperula conferta</i>	Common Woodruff	
	Rubiaceae	<i>Opercularia diphylla</i>		
	Solanaceae	<i>Solanum cinereum</i>		

Form	Family	Scientific Name	Common Name	ST*
	Solanaceae	<i>Solanum prinophyllum</i>	Forest Nightshade	
	Stackhousiaceae	<i>Stackhousia viminea</i>	Slender Stackhousia	

*ST=Shade tolerant

FIGURES

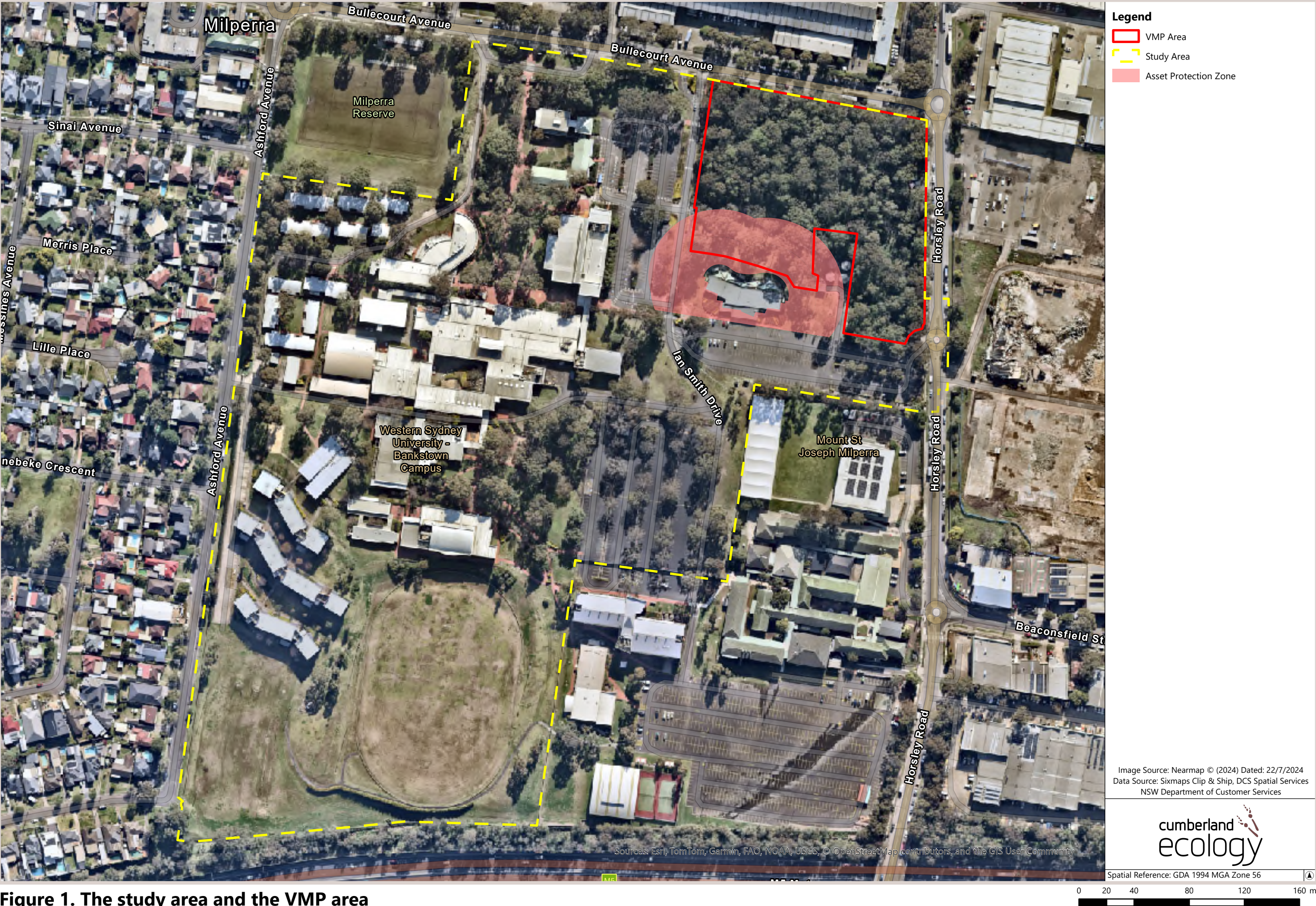
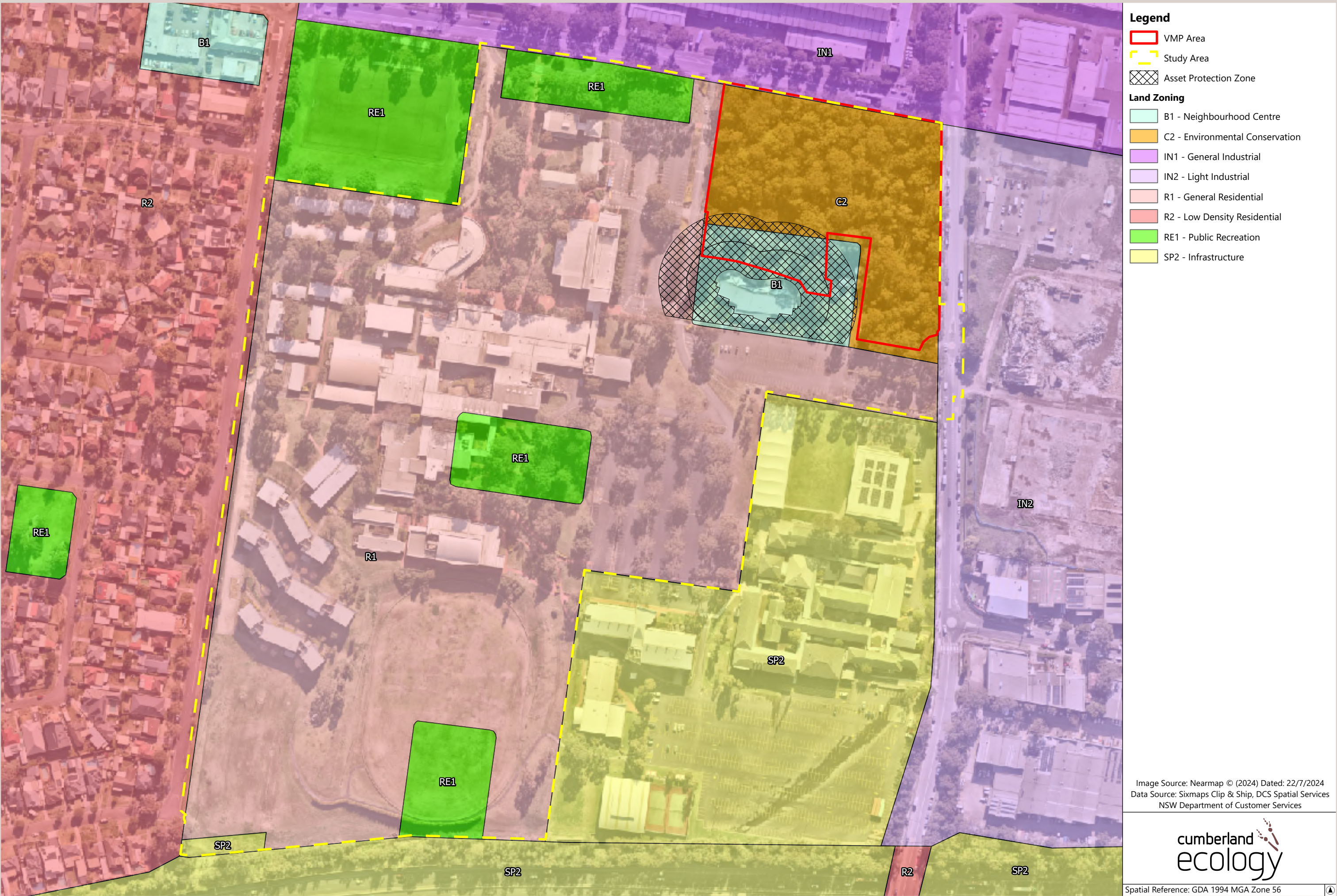


Figure 1. The study area and the VMP area



Legend

- VMP Area
- Study Area
- Asset Protection Zone

Land Zoning

- B1 - Neighbourhood Centre
- C2 - Environmental Conservation
- IN1 - General Industrial
- IN2 - Light Industrial
- R1 - General Residential
- R2 - Low Density Residential
- RE1 - Public Recreation
- SP2 - Infrastructure

Image Source: Nearmap © (2024) Dated: 22/7/2024
Data Source: Sixmaps Clip & Ship, DCS Spatial Services
NSW Department of Customer Services



Spatial Reference: GDA 1994 MGA Zone 56

Figure 2. Land zone uses



Figure 3. Plant community types and threatened flora within the study area

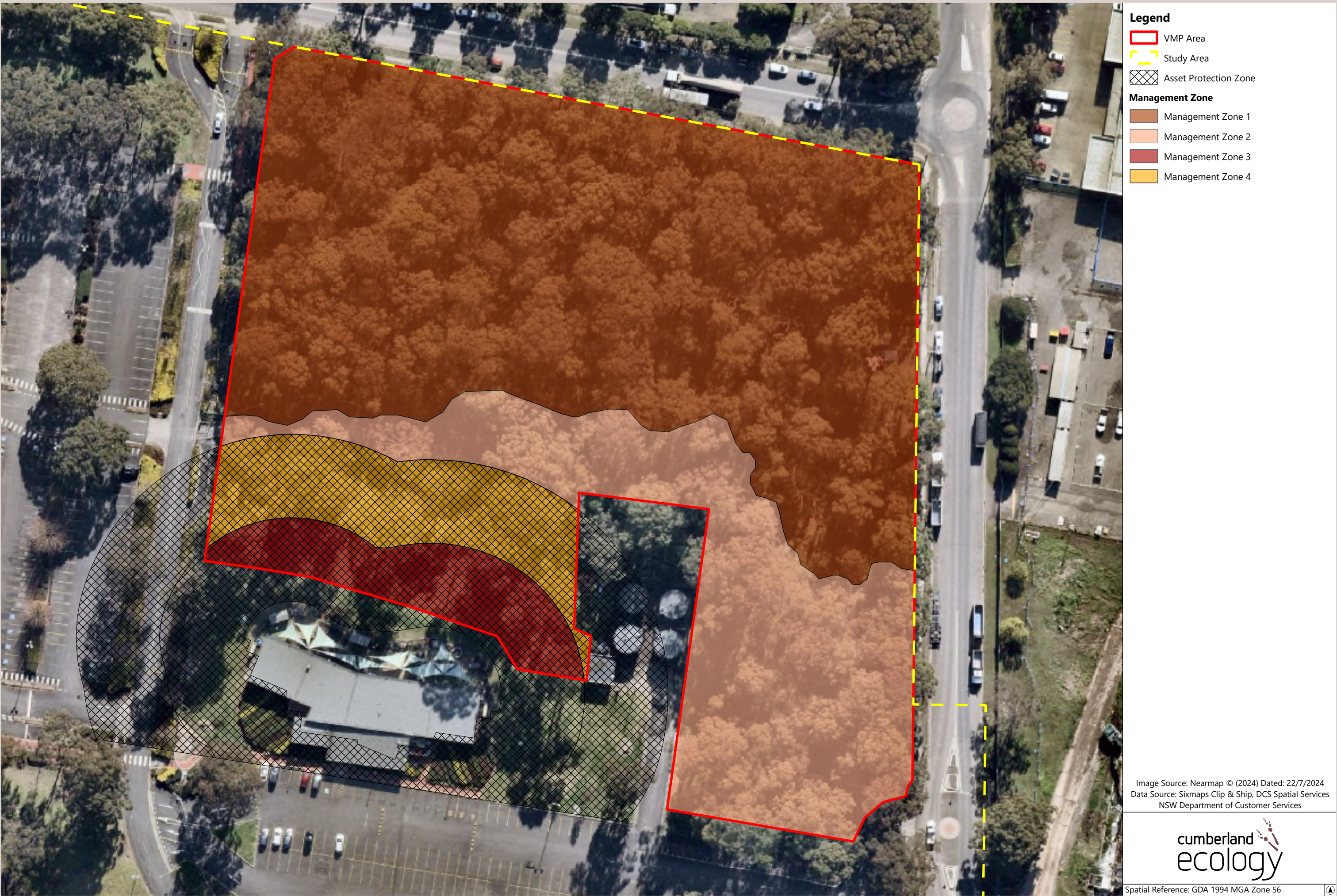


Figure 4. VMP management zones

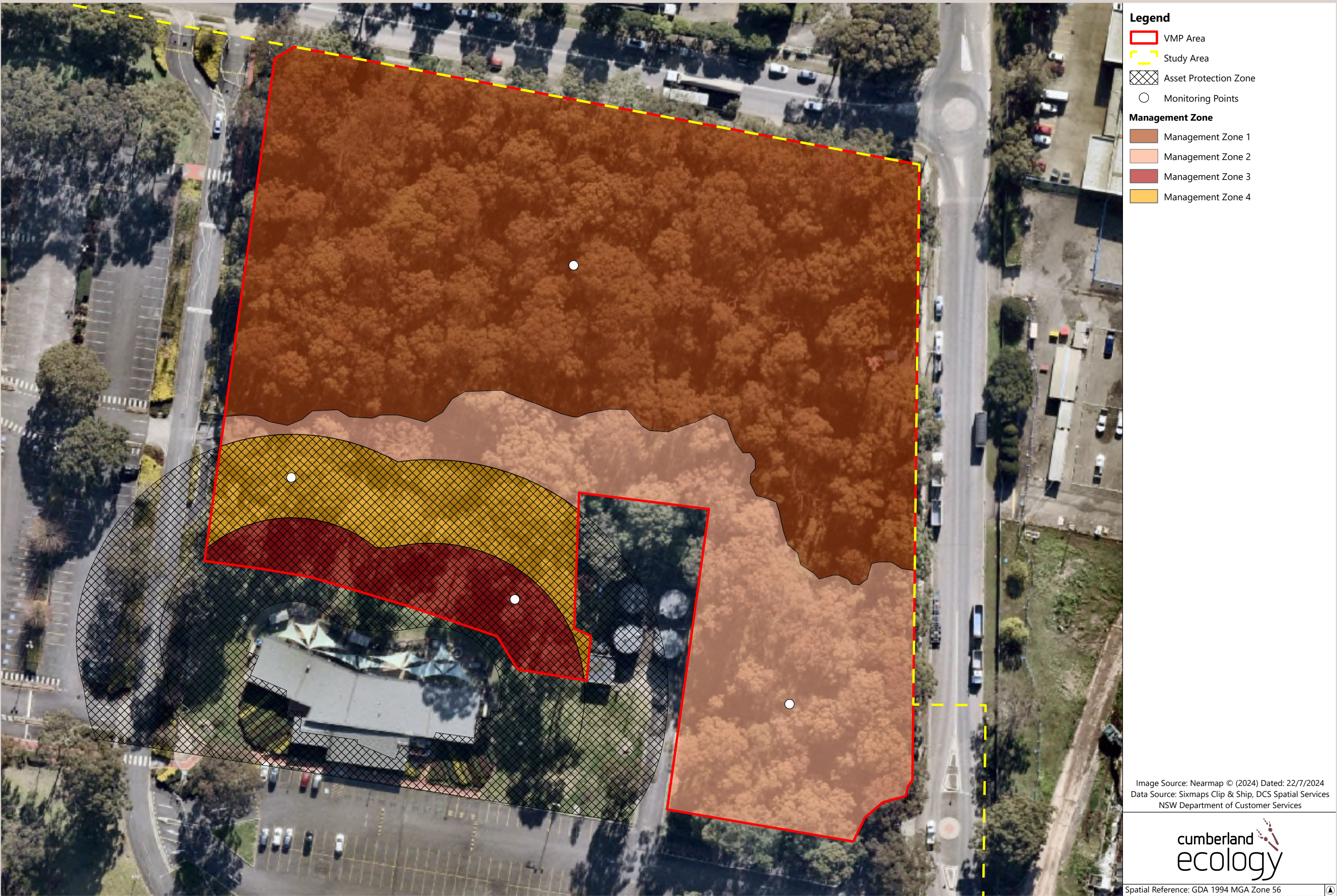


Figure 5. Predicted fixed monitoring point locations