

**BIODIVERSITY MANAGEMENT PLAN**

**FOR**

**LOT 6 DP 229296 GARFIELD ROAD EAST, RIVERSTONE**

**(REFERENCE NUMBER: 20213007)**

For:

**ORION CONSULTING C/-0 LANDEN PROPERTY GROUP**

August 2021

Final Report

**Enviro Ecology**

PO Box 345, Ourimbah 2250

| Revision | Details                      | Date       | Amended By |
|----------|------------------------------|------------|------------|
| A        | Biodiversity Management Plan | 02/08/2021 | John Whyte |
| B        | Biodiversity Management Plan | 03/08/2021 | John Whyte |

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Signed:



Date: ..... 3<sup>rd</sup> of August 2021

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# 1. Introduction

Enviro Ecology has been commissioned by Mr Steven Johnstone of Orion Consulting C-/O Landen Property Group to prepare a Biodiversity Management Plan (BMP) in support of construction of a large format retail building, including car parking, deceleration lane, landscaping and associated works (Figure 1-2) over Lot 6 DP 229296 Garfield Road East, Riverstone NSW within Blacktown City LGA.

## 1.1. Aims and objectives Roles and Responsibilities for the implementation of the BMP

This BMP has been prepared to outline and describe how Linden Property Group will, during the construction of the Project, comply with the Project's Conditions of Consent (CoC) and manage and minimise impacts to biodiversity. Additionally, it outlines how Landen Property Group will minimise environmental risks and achieve environmental outcomes on the Project by providing a structured approach to ensure appropriate management mitigation measures and controls are implemented.

The primary aim of this BMP is to provide a working document for the management of the Biodiversity within "BMP area". The purpose of this Plan is to describe how impacts on biodiversity will be minimised and managed during construction of the Project.

The key objective of the BMP is to ensure that impacts to biodiversity are minimised and are within the scope permitted by the planning approval. To achieve this objective, the following will be undertaken:

- Ensure controls and procedures are implemented during site establishment, construction, and road work activities to avoid, minimise or manage potential adverse impacts to biodiversity within and adjacent to the project area
- Ensure appropriate measures are implemented to address the mitigation measures detailed in the biodiversity development assessment report and Council Biodiversity Management Plan Guidelines.
- Ensure measures are implemented to comply with all relevant legislation and other requirements as described in this Plan

## 1.2. Targets

The desired overarching environmental performance outcome for biodiversity management is that impacts to biodiversity values are minimised as far as practicable during construction. The following targets have been established for the management of biodiversity impacts during the

Project:

- Ensure full compliance with the relevant legislative requirements
- Ensure full compliance with relevant requirements of the conditions of approval
- No disturbance to biodiversity outside the construction footprint
- Minimise disturbance to biodiversity within the project area
- No increase in distribution of environmental weeds currently existing within the project area
- No new environmental weeds introduced to the project area
- No fauna mortality during clearing and construction
- No pollution or siltation of aquatic ecosystems, endangered ecological communities or threatened species habitat

### 1.1.1. Terminology

This report uses the following terminology:

- Subject property-BMP Area Lot 6 DP 229296 Garfield Road East, Riverstone NSW which is defined as the yellow boundary on the aerial photograph see (Figure 1.1);
- BC Act abbreviates the *Biodiversity Conservation Act 2016*;
- EPBC Act abbreviates the *Environment Protection and Biodiversity Conservation Act 1999*;
- EP&A Act abbreviates the *Environmental Planning and Assessment Act 1979*;
- LGA abbreviates Local Government Area;
- Threatened species refers to those flora and fauna species listed as vulnerable, endangered or critically endangered under the BC Act or EPBC Act
- BMPA abbreviates Biodiversity Management Plan Area defined by the area of land (Figure 1-1);
- DPIE abbreviates Department of Planning, Industry and Environment (NSW);
- Threatened species refers to those flora and fauna species listed as vulnerable, endangered or critically endangered under the BC Act or EPBC Act; and
- WSUD abbreviates Water Sensitive Urban Design.

Figure 1-1 Subject property & BMP area



Figure 1-2 Proposed Development

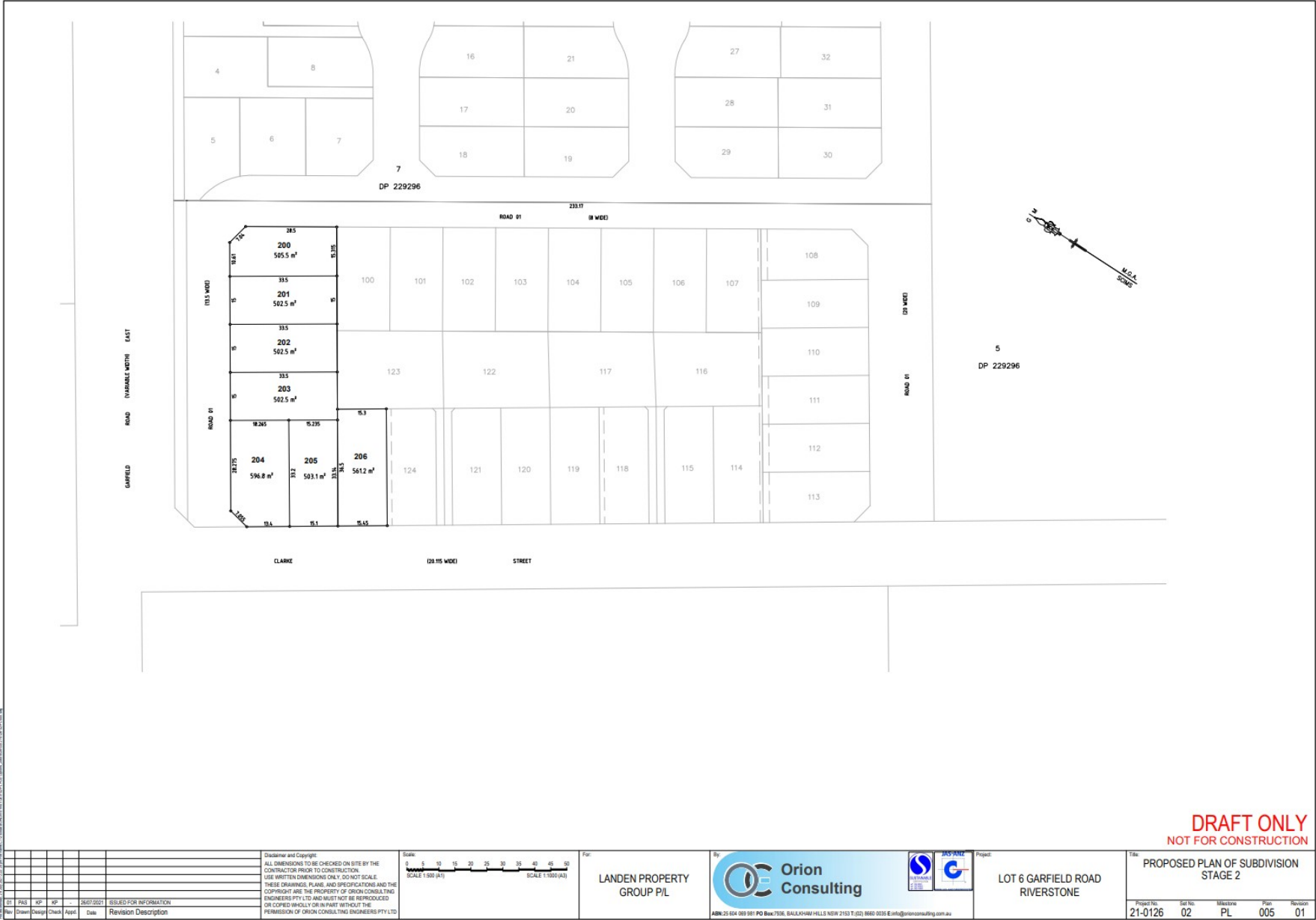
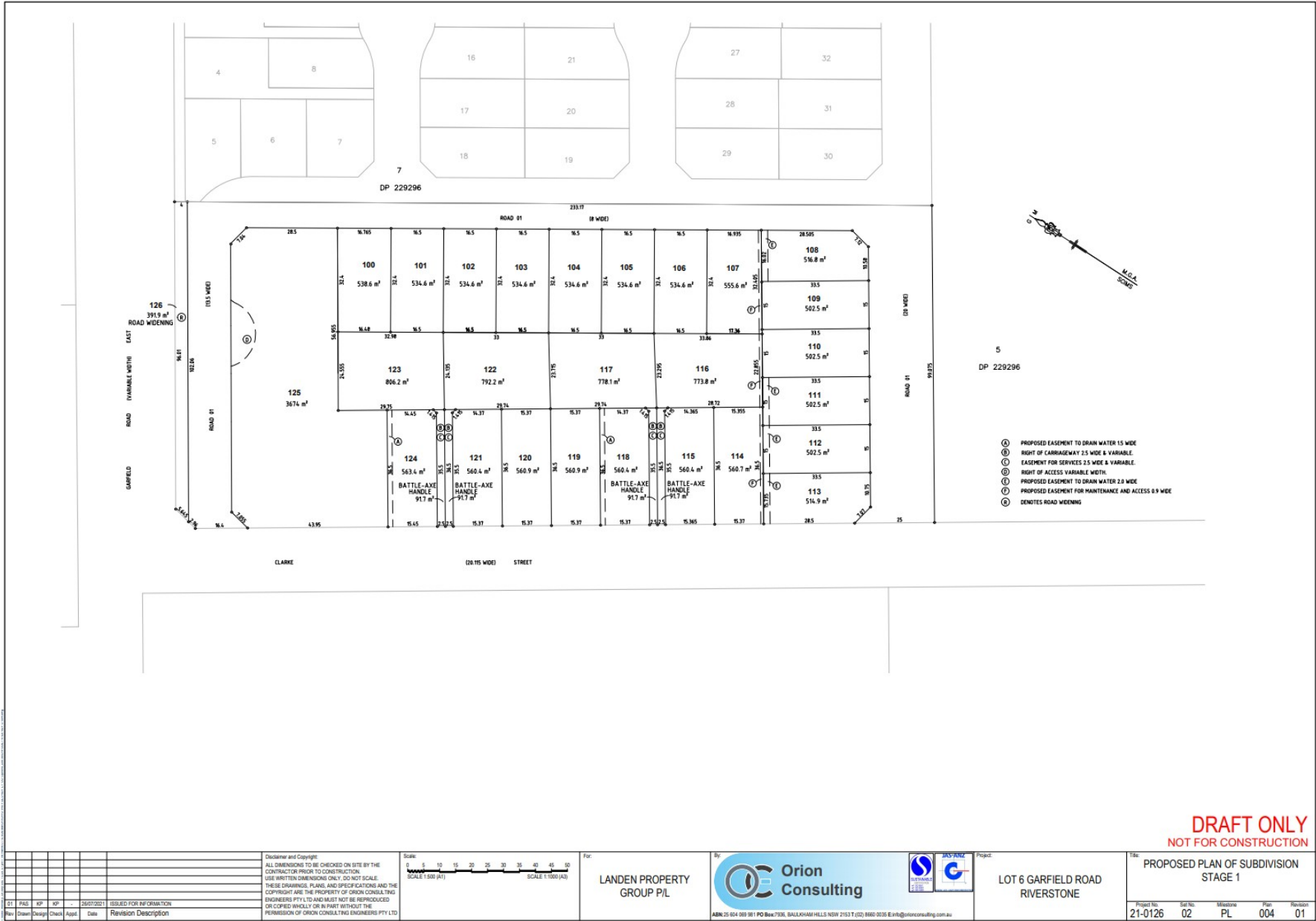




Figure 1-3 Proposed Development



## 1.1 Site Description

The planning and cadastral details of the BMP area are provided in (Table 1-1). The BMP area is bordered by Garfield Road to the north, east by Clarke Street and to the east and south by bio certified lands (Figure 1-1).

**Table 1-1 Site details**

|                   |                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Location</b>   | Lot 6 DP 229296 Garfield Road East, Rouse Hill                                                                                                                           |
| <b>LGA</b>        | Blacktown City                                                                                                                                                           |
| <b>Aspect</b>     | North-south                                                                                                                                                              |
| <b>Vegetation</b> | Cleared land with exotic pasture & remnant PCT 835-Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion |

## **2. Environmental requirements**

### **2.1 Relevant Legislation and Guidelines**

#### **2.1.1 Legislation**

Legislation relevant to biodiversity management includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *National Parks and Wildlife Act 1974* (NPW Act)
- *Biodiversity Conservation Act 2016* BC Act)
- *Bio-security Act 2015* (NW Act)
- *Pesticides Act 1999*
- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act)

#### **2.1.2 Guidelines**

The main guidelines, specifications and policy documents relevant to this Plan include:

- NSW National Parks & Wildlife Service. 2001. Policy for the Translocation of Threatened Fauna in NSW: Policy and Procedure Statement No. 9 Threatened Species Unit, Hurstville NSW
- Relevant recovery plans, priority action statements and best practice guidelines.

## **3. Environmental requirements**

### **3.1 Existing Environment**

#### **3.1.1 Vegetation mapping**

Two vegetation mapping projects have mapped vegetation within and adjacent to the subject property, these are: A Revised Classification and Map for the Coast and Eastern Tablelands. Revised Native Vegetation Maps of the Cumberland Plain - Western Sydney (Department of Planning, Industry & Environment 2015) & The Revised Classification and Map for the Coast and Eastern Tablelands vegetation (Tozer, Turner et al. 2010).

The subject property was mapped as containing plant community type (PCT) 724 Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion & PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion.

### **3.2 Vegetation communities**

Three vegetation communities: PCT 835 Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion, PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion and Cleared/Exotic Grassland occur within the BMP area (Figure 3-1). Detailed descriptions of these communities have been provided below.

### 3.2.1 PCT 835 Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion

PCT 835 Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion community was the dominate vegetation type identified from within the BMP area (Figure 3-3).

The canopy was dominated by *Eucalyptus amplifolia* (Cabbage Gum), *Eucalyptus teriticornis* (Forest Red Gum) with the occasional occurrence of *Casuarina glauca* (Swamp Oak). Canopy trees ranged in height from approximately 8-18m. The projected foliage cover (PFC) of the canopy ranged from >5-45%.

No native shrubs were recorded from this community.

The groundcover was dominated by the following exotic species: *Pennisetum clandestinum* (Kikuyu Grass), *Ehrharta erecta* (Panic Veldtgrass), *Gamochaeta americana* (American Cudweed), *Plantago lanceolata* (Lamb's Tongues), *Onopordum acanthium* and *Verbena bonariensis* (Purpletop). Exotic ground layer was to a height of 0.1-0.4m with a PFC of <80%.

Native groundcover species were primarily absent from this community with the following species recorded: *Cynodon dactylon* (Common Couch), *Dichondra repens* (Kidney Weed), *Oxalis perennans*, *Poranthera microphylla*, *Dichondra repens* & *Viola hederacea* (Native Violet). Native ground layer was to a height of 0.1-0.2m with a PFC of <20%.

Two exotic climbing species *Araujia sericifera* (Moth Vine) & *Asparagus aethiopicus* (Asparagus Fern) were recorded from the northern fence line adjacent to Garfield Road East.

**Photograph 3-1 PCT 835 from the subject property**





**Photograph 3-2 PCT 835 from the subject property**



**Photograph 3-3 PCT 835 from the subject property**





### 3.2.2 PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion community was the dominate native vegetation type identified from within the BMP area (Figure 3-3).

The canopy was dominated by *Eucalyptus mollucanna* (Grey Box), *Eucalyptus teriticornis* (Forest Red Gum) with the occasional occurrence of *Eucalyptus amplifolia* (Cabbage Gum). Canopy trees ranged in height from approximately 7-18m. The projected foliage cover (PFC) of the canopy ranged from >5-35%.

No native shrubs were recorded from this community.

The groundcover was dominated by the following exotic species: *Pennisetum clandestinum* (Kikuyu Grass), *Ehrharta erecta* (Panic Veldtgrass), *Gamochaeta americana* (American Cudweed), *Plantago lanceolata* (Lamb's Tongues), *Onopordum acanthium* and *Verbena bonariensis* (Purpletop). Exotic ground layer was to a height of 0.1-0.4m with a PFC of <80%.

Native groundcover species were primarily absent from this community with the following species recorded: *Cynodon dactylon* (Common Couch), *Dichondra repens* (Kidney Weed), *Oxalis perennans*, *Poranthera microphylla*, *Dichondra repens* & *Viola hederacea* (Native Violet). Native ground layer was to a height of 0.1-0.2m with a PFC of <20%.

Two exotic climbing species *Araujia sericifera* (Moth Vine) & *Asparagus aethiopicus* (Asparagus Fern) were recorded from the northern fence line adjacent to Garfield Road East.

**Photograph 3-4 PCT 849 from the subject property**





**Photograph 3-5 PCT 849 from the subject property**



**Photograph 3-6 PCT 849 from the subject property**





### 3.2.3 Cleared/Exotic Grassland

Trees were absent from this community.

No native shrubs were recorded from this community.

The groundcover was dominated by the following exotic species: *Pennisetum clandestinum* (Kikuyu Grass), *Ehrharta erecta* (Panic Veldtgrass), *Gamochaeta americana* (American Cudweed), *Plantago lanceolata* (Lamb's Tongues), *Onopordum acanthium* and *Verbena bonariensis* (Purpletop). Exotic ground layer was to a height of 0.1-.0.4m with a PFC of <80%.

Two exotic climbing species *Araujia sericifera* (Moth Vine) & *Asparagus aethiopicus* (Asparagus Fern) were recorded from the northern fence line adjacent to Garfield Road East.

**Photograph 3-7 Cleared/Exotic Grassland recorded from the BMP Area**

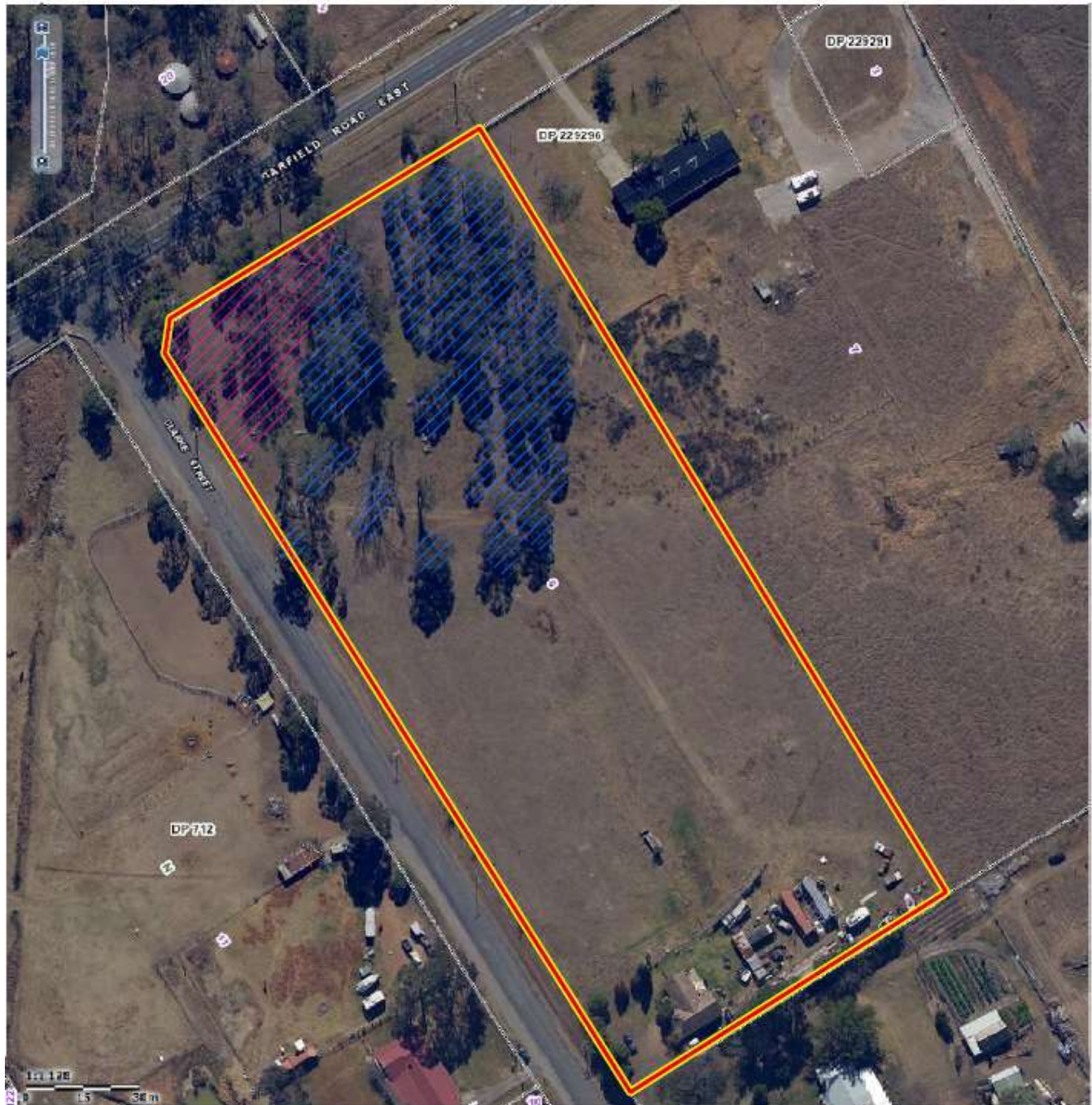


**Photograph 3-8 Exotic Grassland recorded from the BMP Area**





Figure 3-1 Field Vegetation communities mapped within the BMP Area



### Legend

- Subject Property
- BMP Area
- PCT 835 Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
- PCT 849 Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion
- Cleared-Exotic Grassland



### **3.3 Hydrological environment**

Threats to the hydrological environment such as soil disturbance and vegetation removal will not be significant. The hydrological environment within native bushland is unlikely to experience any significant change during or after the proposed works.

### **3.4 Soil erosion and sedimentation**

Vegetation removal works within the subject property as a result of the proposed development will result in some minor and generally localised disturbance of soils. Soil erosion and sedimentation is an undesirable result and should be mitigated to reduce impacts such as:

- Loss of top soil;
- Sedimentation of drainage lines (north); and
- Promotion of exotic weed and pests through dispersal, changes in habitat or germination of weed species

In order to ensure that sedimentation does not occur down slope into the drainage line or vegetation, sediment control measures are to be installed in accordance with the Blacktown City Council's requirements for erosion and sedimentation control. The measures are also to follow best management practices in accordance with the (Department of Environment and Climate Change 2008) NSW Department of Housing and Landcom, (Landcom 2004), *Managing Urban Stormwater: Soils and Construction (Blue Book)* (NSW Department of Housing 1998). These measures will be maintained for as long as necessary after the completion of works to prevent sediment and dirty water entering the natural environment for up to five (5) years post construction or until all exposed soil has been stabilised.



## 4. Methodology

This Biodiversity management plan was based on the results of a desktop review and site inspections on the 2<sup>nd</sup> & 3<sup>rd</sup> of April, 22<sup>nd</sup> & 23<sup>rd</sup> of July 2021 by Mr John Whyte B.Bio.Sc (Majors Botany & Zoology) of Enviro Ecology.

Activities specifically related to the preparation of this BMP included:

- Ensure full compliance with the relevant legislative requirements
- Ensure full compliance with relevant requirements of the BDAR and conditions of approval
- No disturbance to biodiversity outside the construction footprint and associated access tracks and site compounds
- Minimise disturbance to biodiversity within the project area
- No increase in distribution of environmental weeds currently existing within the project area
- No new environmental weeds introduced to the project area
- No fauna mortality during clearing and construction
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat; and
- Preparation of a schedule of activities, outlining the responsibilities under this BMP and performance criteria.

### 4.1 Nomenclature

Names of plants used in this document follow Harden (Harden 1992; Harden 1993; Harden 2000; Harden 2002) with updates from PlantNet (Royal Botanic Gardens 2021). Scientific names are used in this report for species of plant. Scientific and common names of plants are listed in Tables.

### 4.2 Literature review

This assessment included a review of:

- Topographic maps & Aerial photographs
- Vegetation mapping of the area
- A review of *Native Vegetation of Southeast NSW: A Revised Classification and Map for the Coast and Eastern Tablelands. Version 12*, Department of Environment and Climate Change, Hurstville (Tozer, Turner et al. 2016) & Native Vegetation Maps of the Cumberland Plain - Western Sydney (NSW National Parks and Wildlife Service 2008).

### 4.2.1 Threatened ecological communities

Eighteen endangered ecological communities were identified from desktop review to occur within the locality of the study area (Table 4-1).

**Table 4-1 Endangered Ecological Communities known from the Locality**

| Scientific Name                                                                                                                     | Common Name                                                                                                                         | BC Act | EPBC Act |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------|----------|
| Agnes Banks Woodland in the Sydney Basin Bioregion                                                                                  | Agnes Banks Woodland in the Sydney Basin Bioregion                                                                                  | E4B    | E        |
| Blue Gum High Forest in the Sydney Basin Bioregion                                                                                  | Blue Gum High Forest in the Sydney Basin Bioregion                                                                                  | E4B    | CE       |
| Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion                                                                       | Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion                                                                       | E3     | CE       |
| Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion                                                                     | Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion                                                                     | V2     | E        |
| Castlereagh Swamp Woodland Community                                                                                                | Castlereagh Swamp Woodland Community                                                                                                | E3     |          |
| Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion                                                               | Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion                                                               | E3     | CE       |
| Cumberland Plain Woodland in the Sydney Basin Bioregion                                                                             | Cumberland Plain Woodland in the Sydney Basin Bioregion                                                                             | E4B    | CE       |
| Elderslie Banksia Scrub Forest                                                                                                      | Elderslie Banksia Scrub Forest                                                                                                      | E4B    | CE       |
| Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions        | Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions        | E3     |          |
| Moist Shale Woodland in the Sydney Basin Bioregion                                                                                  | Moist Shale Woodland in the Sydney Basin Bioregion                                                                                  | E3     | CE       |
| 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 on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions | E3     | CE       |
| Shale Gravel Transition Forest in the Sydney Basin Bioregion                                                                        | Shale Gravel Transition Forest in the Sydney Basin Bioregion                                                                        | E3     | CE       |
| Shale Sandstone Transition Forest in the Sydney Basin Bioregion                                                                     | Shale Sandstone Transition Forest in the Sydney Basin Bioregion                                                                     | E4B    | CE       |
| Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion                                      | Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion                                      | E3     |          |
| Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions                       | Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions                       | E3     | E        |
| Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions   | Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions   | E3     |          |
| Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion                                                                     | Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion                                                                     | E4B    | CE       |
| Western Sydney Dry Rainforest in the Sydney Basin Bioregion                                                                         | Western Sydney Dry Rainforest in the Sydney Basin Bioregion                                                                         | E3     | CE       |

### 4.2.2 Endangered populations

Two threatened populations were identified from the desktop review to occur within the locality of the BMP area:

- *Marsdenia viridiflora subsp. viridiflora* - endangered population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas; and
- *Dillwynia tenuifolia* - endangered population (Kemps Creek)

No endangered populations were identified within the BMP area.

### 4.2.3 Threatened Flora

Forty-four threatened species of plant listed under the *BC Act* and/or *EPBC Act* were predicted to occur within the locality of the BMP area based on database searches.

Based on targeted surveys within the BMP area none are considered to have suitable habitat within the BMP area. No further consideration is required for threatened flora species.

### 4.2.4 Threatened fauna

Fifty threatened fauna species were identified as occurring or having potential to occur within the locality of the BMP area.

Based on the habitat assessment and targeted surveys there is potential habitat within the BMP area for seven threatened fauna species that may be impacted through the removal of foraging habitat. Other species may occur within the habitats from time to time.

**Table 4-2 Suitable habitat (Fauna) from the subject site**

| Species Name                      |                                | Conservation Status |                       |
|-----------------------------------|--------------------------------|---------------------|-----------------------|
|                                   |                                | State <sup>1</sup>  | National <sup>2</sup> |
| <b>Threatened Fauna</b>           |                                |                     |                       |
| <b>Mammals</b>                    |                                |                     |                       |
| <i>Chalinolobus dwyeri</i>        | Large-eared Pied Bat           | V                   | V                     |
| <i>Falsistrellus tasmaniensis</i> | Eastern False Pipistrelle      | V                   |                       |
| <i>Miniopterus schreibersii</i>   | Eastern Bent-wing Bat          | V                   |                       |
| <i>Pteropus poliocephalus</i>     | Grey-headed Flying-fox         | V                   | V                     |
| <i>Mormopterus norfolkensis</i>   | Eastern Freetail-bat           | V                   |                       |
| <i>Saccolaimus flaviventris</i>   | Yellow-bellied Sheath-tail Bat | V                   |                       |
| <i>Scoteanax rueppellii</i>       | Greater Broad-nosed Bat        | V                   |                       |

Notes:

1. State conservation status: V= Vulnerable, E1 = Endangered, (*Biodiversity Conservation Act 2016 and Fisheries Management Act 1994*). \* indicates species listed under the *Fisheries Management Act 1994*.

2. National conservation status: V = Vulnerable, (*Environment Protection and Biodiversity Conservation Act 1999*)

## 4.3 Species of animal

### 4.3.1 Amphibians

One common species of frog: Common Eastern Froglet (*Crinia signifera*) was recorded calling outside of the BMP area on western side of Clarke Street in association with a box culvert located within First Ponds Creek. No suitable amphibious breeding habitats were identified from the BMP area.

No threatened frogs listed under the BC or EPBC Acts were identified within the BMP area, the habitat within the BMP area was not suitable for any threatened frogs species listed under both the BC & EPBC Acts.

#### **4.3.2 Reptiles**

Two common species of reptile the Garden Skink (*Lampropholis guichenoti*) & the Eastern Water Skink (*Eulamprus quoyii*) were recorded within the BMP area. No other reptile species were identified during the site inspections.

#### **4.3.3 Birds**

Nineteen species of bird were identified within the BMP area. The vegetation within the BMP area provides a range of foraging opportunities for birds.

The lack of diversity of tree and shrub species within the vegetation community provided limited nectar resources to maintain bird populations throughout the year.

No Glossy Black-cockatoo (*Calyptrorhynchus lathamii*) or Gang-gang Cockatoo (*Callocephalon fimbriatum*). No Glossy-black or Gang-gang Cockatoos were identified from the BMP area despite targeted surveys being undertaken.

#### **4.3.4 Mammals**

Habitat for mammals was limited within the BMP area were limited with remnant trees providing marginal foraging habitat. Common species likely to utilise the remnant trees are those species adapted to urban/rural development e.g. the Brush-tailed Possum and the Common Ring-tail Possum. Habitats for threatened mammals were limited.

The blossoms of the juvenile canopy trees within the BMP area were not of maturity to provide suitable foraging resources for the Grey-headed Flying-fox (*Pteropus poliocephalus*); this species was not however recorded from the BMP area during the site inspections.

### **4.4 Weed Survey**

Thirty-nine (39) species of weed were recorded from the BMP area (Table 3-2). Of the exotic species, six of these species are High Threat Exotics (HTEs) as determined by the OEH high threat weeds list (OEH, 2021b).



## 4.5 Weed ecology

Generally, weeds are exotic plants that grow at the expense of a native plant and that produce large numbers of seeds or other propagules and so can reproduce and spread quickly. They typically benefit from disturbance to soils or native vegetation. Grazing, soil erosion, floods, fires, urban run-off, increased nutrients, sedimentation or mechanical soil disturbance can trigger major outbreaks of weeds. Weeds can:

- compete with native plants;
- reduce germination of native plants;
- suppress native tree and seedling growth;
- alter fire regimes;
- modify nutrient cycling within an ecosystem;
- change soil conditions;
- affect food and habitat opportunities for native fauna;
- provide harbour for feral animals; and
- reduce recreation potential of bushland.

Weed outbreaks are often from seeds that have lain dormant in the soil until disturbance, providing the conditions necessary for germination. Weeds can spread and establish by the following pathways:

- seeds and other propagules travelling on vehicles, people and animals from one place to another;
- invading open areas that have been disturbed by over grazing, earthworks and other activities that disturb the soil;
- establishing in areas with reduced tree cover (poorly competitive weeds); and
- dispersing from infested areas to weed free areas via wind or water.

## 4.6 Weed mapping

Weed mapping densities across the BMP area was undertaken by recording the abundance of target weeds in each stratum. These methods are explained below.

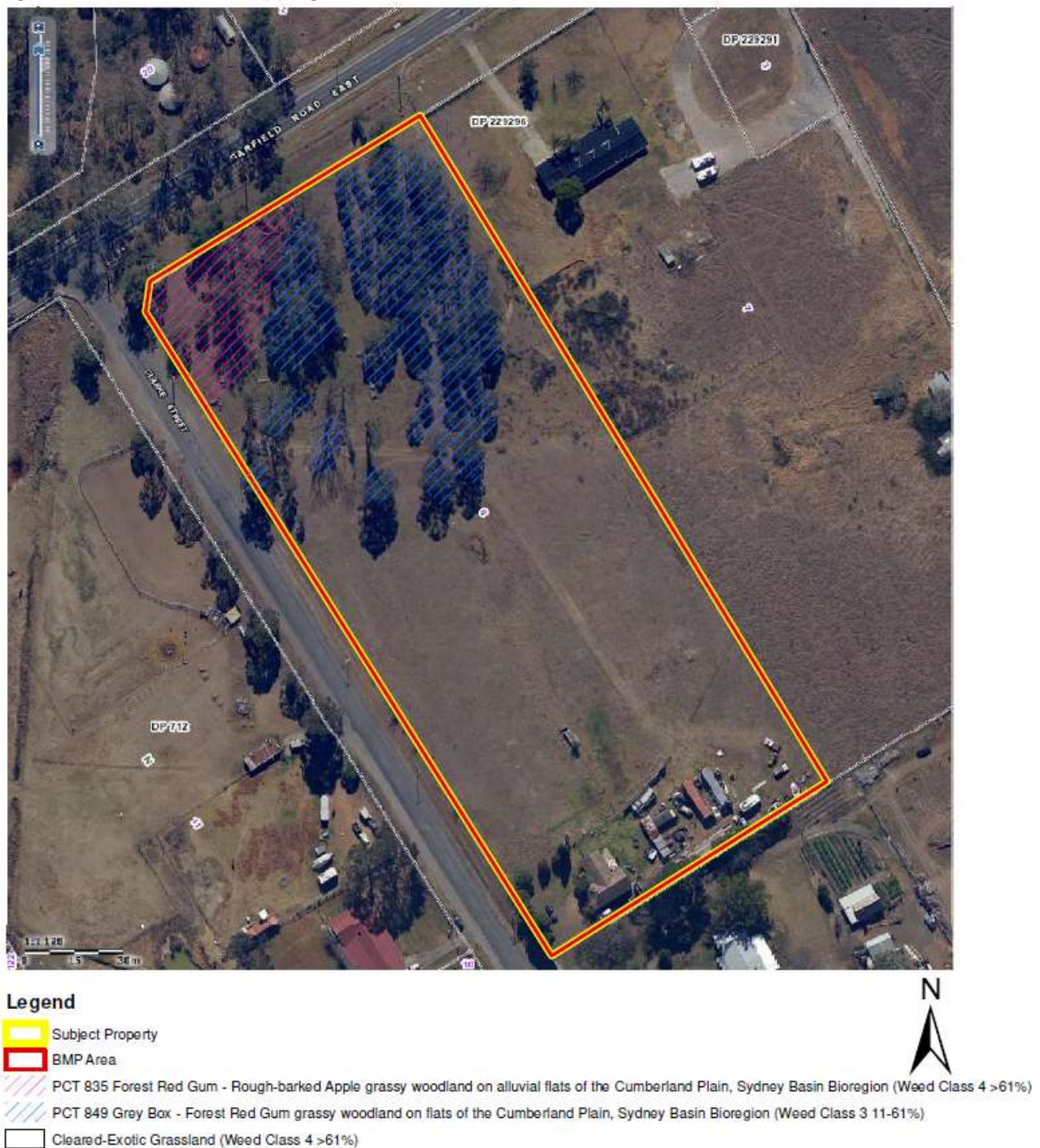
Weed Classes were defined to provide a logical basis for the sequence of weed management using the following criteria:

- The type and density of weed infestation occurring;
- The potential for native plant regeneration from the soil seed bank (i.e. site resilience); and
- Weed codes - an estimate of the relative weed density within each stratum.

Vegetation quality was based on the stratum layer with the highest percentage cover of exotic weeds, where:

- Good quality vegetation was considered to be equivalent to vegetation falling into Weed Class 1. Where the stratum layer with the highest percentage cover of exotic weeds is less than 10%;
- Moderate quality vegetation was considered to be equivalent to vegetation falling into Weed Class 2 or 3. Where the stratum layer with the highest percentage cover of exotic weeds is between 11 and 60%; and
- Poor quality vegetation was considered to be equivalent to vegetation falling into Weed Class 4. Where the stratum layer with the highest percentage cover of exotic weeds is greater than 61%.

Figure 4-1 Current weed mapping from the BMP area



## 5. Biodiversity Management Issues

This chapter outlines the major activities to be undertaken as part of the VMP. They include the following:

- Required qualifications and experience
- Impact Mitigation;
- Hygiene and disease control:
- Program of Works:
- Clearing of native vegetation and habitats (Hollow-bearing trees)
- Proposed Weeding Activities:
- Primary Weeding;
- Secondary Weeding or Follow-up Weeding;
- Maintenance Weeding;
- Soil erosion & drainage;and
- Monitoring and auditing

The roles and responsibilities of key personnel are identified and a schedule of activities provided for the implementation of the program.

The primary Contractor engaged on behalf of the developer will be primarily responsible for the implementation of this BMP.

The *Biodiversity management schedule of activities* (Table 5-5) outlines the proposed works for the site.

### 5.1 Environmental mitigation and management measures

### 5.2 Environmental Activities, Impacts and Risks

The environmental activities referred to in this plan are those activities associated with the project that have the potential to cause adverse environmental impacts on flora and fauna. The risks that these activities create for flora and fauna can be determined by considering the likelihood of potential impacts and their consequences as shown below in Table 4-1. Construction activities that may have an adverse impact on flora and fauna and their associated risk ratings are summarised in Table 4-2 below.

**Table 5-1 Risk Matrix**

|            |            | Consequence |            |          |
|------------|------------|-------------|------------|----------|
| Likelihood |            | 1 Major     | 2 Moderate | 3 Low    |
|            | 1 Certain  | High        | High       | Moderate |
|            | 2 Possible | High        | Moderate   | Moderate |
|            | 3 Remote   | Moderate    | Moderate   | Low      |



| Consequence                  |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low                          | Negligible or minor ecological impacts, as defined by relevant guidelines.                                                                                                                                                                                                                                                                                                                                               |
| Moderate                     | Possible ecological impacts (or moderate level, as defined by relevant guidelines) resulting in legal action and/or community/stakeholder concern. Small scale but generally reversible damage to ecological aspects.                                                                                                                                                                                                    |
| Major                        | Major ecological impact, as defined by relevant guidelines. May be reversed with significant effort and/or financial outlay, or feature permanent or long-term damage or destruction of species, populations, communities or ecological features or processes, that could not be practicably reversed (definition of long term in accordance with relevant guidelines). Potential for significant fines or legal action. |
| Likelihood                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Remote                       | Not expected to occur under usual circumstances <33% chance of occurring                                                                                                                                                                                                                                                                                                                                                 |
| Possible                     | Could occur under usual circumstances 33-66% chance of occurring                                                                                                                                                                                                                                                                                                                                                         |
| Almost certain or inevitable | High likelihood of occurring or expected to occur >66% chance of occurring                                                                                                                                                                                                                                                                                                                                               |

**Table 5-2 Risk Assessment**

| Activity                                   | Potential Impact                                                    | Likelihood | Consequence | Risk, in absence of controls | Residual Risk with controls |
|--------------------------------------------|---------------------------------------------------------------------|------------|-------------|------------------------------|-----------------------------|
| <b>Clearing, pruning and grubbing</b>      | Habitat removal (native vegetation and mature/hollow-bearing trees) | Certain    | Moderate    | High                         | Low                         |
|                                            | Habitat modification                                                | Certain    | Low         | Moderate                     | Low                         |
|                                            | Degradation of adjacent areas of habitat                            | Remote     | Moderate    | Moderate                     | Low                         |
|                                            | Environmental weed introduction and spread                          | Possible   | Major       | High                         | Low                         |
| <b>Excavation (for construction roads)</b> | Habitat removal                                                     | Certain    | Low         | Moderate                     | Low                         |
|                                            | Habitat modification                                                | Certain    | Low         | Moderate                     | Low                         |
|                                            | Erosion of disturbed areas and stockpiles                           | Possible   | Low         | Moderate                     | Low                         |
|                                            | Dust generation                                                     | Possible   | Low         | Moderate                     | Low                         |
|                                            | Environmental weed introduction and spread                          | Possible   | Major       | High                         | Low                         |
| <b>Operation of machinery and plant</b>    | Noise                                                               | Certain    | Low         | Moderate                     | Low                         |
|                                            | Collisions with wildlife                                            | Possible   | Moderate    | Moderate                     | Low                         |

### **5.3 Activities**

Activities with the highest risks can be seen to be associated with habitat removal and environmental weed introduction and spread. Generally, given the small scale of the works and discreet nature of the impacts, the environmental risks are considered to be moderate.

Specific protocols have been developed as follows:

- Design measures
- Vegetation clearing and damage
- Hollow bearing tree removal
- Weed control
- Monitor and adapt actions

### **5.4 BMP Delineation Protective Fencing**

Protective is to be installed around the subject property in particular adjacent to Garfield Road East and Clarke Street (Figure 3-1).

The protection fence is not to hinder the movement of wildlife throughout the site or harm fauna.

Figure 5-1 Delineation of protective fencing



## 5.5 Soil Erosion and Drainage

Erosion and sediment control measures are to be implemented on a needs basis to minimise adverse effects as a result of increased erosion and sediment loading. These include:

- Coordinated work practices aimed at minimising land disturbance;
- Identification of potential erosion areas;
- Installation and maintenance of flow, erosion, sediment and nutrient control structures particularly around regenerations area;
- Routine site inspections of any sediment control fences and/or structures
- The safe disposal of all waste products
- The minimisation of soil erosion will be achieved through soil stabilisation measures, sediment fencing, water control techniques.

## 5.6 Mitigation measures

The mitigation of potential adverse impacts of the proposed development will be implemented through the following procedures:

- Implementation of erosion and sediment control measures prior to the commencement of clearing works (Development area) within areas where erosion is likely to impact on adjacent bushland. This involves installation of filter fences down slope of bushland.
- Removal of weeds and weed propagules in such a manner that they are not spread to other areas;
- Removal of native vegetation in accordance with Appendix B Vegetation Clearing Procedure
- Application of appropriate weed control / bush regeneration methods (BMP area) (Appendix A);
- Vehicles and other equipment to be used in weed works are to be received completely free of soil, seeds and plant material before entering the subject property to prevent the introduction of exotic plant species and pathogens. Equipment failing inspection should be sent away for cleaning.

### 5.6.1 Truck and machine wash down areas

Vehicles and other equipment to be used undertaking works in accordance with the BMP are to be received completely free of soil, seeds and plant material before entering the site to prevent the introduction of exotic plant species and pathogens, equipment failing inspection should be sent away for cleaning. Appropriate records of inspections shall be maintained.

Buildup of mud, soil and organic matter present on vehicles during wet and muddy conditions shall be manually removed prior to vehicles entering/leaving the construction site.

Works and vehicular movements shall cease if wet and muddy conditions develop/persist to limit the movement of soil and organic matter onto, through and from the VMP Area, minimising the potential for the spread of weeds.

### 5.6.2 Hygiene and disease control

Hygiene is particularly important to prevent the transfer of plant diseases such as *Phytophthora* or Myrtle Rust.

The following simple procedures can reduce the chance of transferring diseases:

- use of sharp equipment (i.e. knives and secateurs) that are regularly cleaned with methylated spirits;
- cleaning of loose soil off boots and tools with bleach;
- make all efforts to ensure all plants brought onto the site are free of pathogens such as *Phytophthora* fungus and Myrtle Rust.

### 5.6.3 Hollow-bearing trees

Four hollow-bearing trees were recorded from the BMP Area. All HBT's are proposed for removal.

**Table 5-3 Hollow-bearing Trees**

| <b>Hollow-bearing Tree</b> | <b>Species</b>                                 | <b>Hollow Type/size (cm)</b>     | <b>Location</b> |
|----------------------------|------------------------------------------------|----------------------------------|-----------------|
| 1                          | <i>Eucalyptus terticornis</i> (Forest Red Gum) | Trunk branch 10cm and branch 5cm | southern side   |
| 2                          | Dead Stag                                      | Trunk 7cm and spout hollow 15cm  | western side    |
| 3                          | <i>Eucalyptus terticornis</i> (Forest Red Gum) | 2x Branch stub hollow 5cm        | Eastern side    |
| 4                          | Dead Stag                                      | 3x branch hollow 5-10cm          | Various         |



Photograph 5-1 HBT 1 recorded from BMP Area





**Photograph 5-2 HBT 2 recorded from BMP Area**





**Photograph 5-3 HBT 3 recorded from BMP Area**



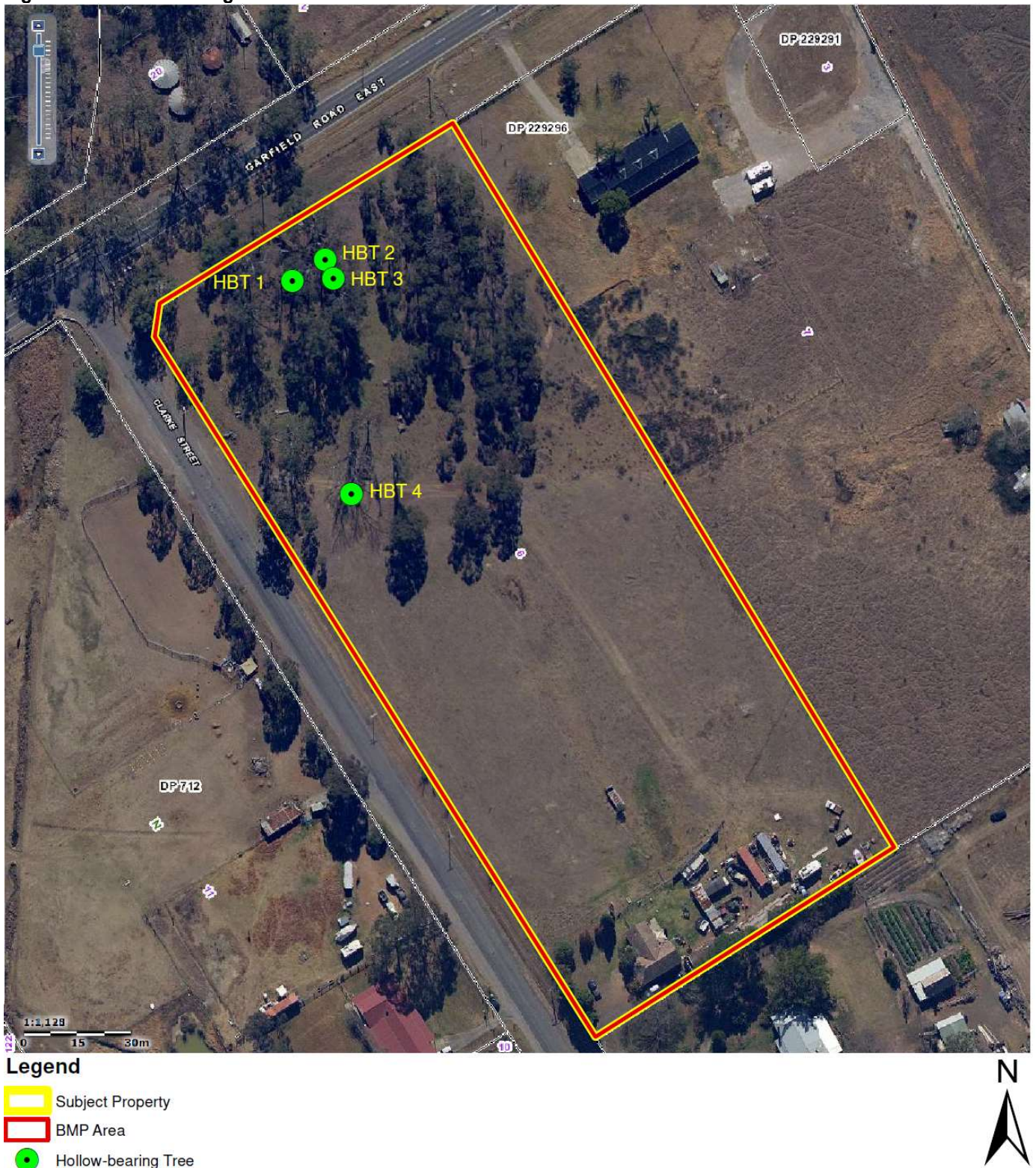


**Photograph 5-4 HBT 4 recorded from BMP Area**





Figure 5-2 Hollow-bearing tree locations from the BMP Area





## **5.7 Proposed Weeding Activities**

The objectives of management actions are to protect natural vegetation (existing native vegetation within the areas subject to weed removal, BMP area. This will primarily involve the removal of exotic grasses and herbaceous weeds within the BMP area (Table 3-2).

## **5.8 Weeds**

Thirty-nine (39) species of weed were recorded from the BMP area.

All herbaceous and grassy weeds (Table 3-2) are to be managed within BMP area.

The principal mechanisms for weeds establishing in an area include:

- Provision of weed seed/vegetative source e.g. Kikuyu;
- Physical disturbances to the soil via clearing of native vegetation;
- Increased soil moisture from shading and ponding of water; and
- Increased light at the margins of vegetation

## **5.9 Weed Management, suppression & control**

All weeds need to be eradicated and controlled within the subject property. During the recent site inspection detail targeted survey were undertaken to identify weeds which are to be managed under the BMP.

Garden waste, weed propagules (seeds, tubers etc.) need to be periodically collected and disposed of at an approved waste transfer facility, and should not be stored or disposed of into any bushland areas.

Flora surveys conducted over the BMP area have resulted in the identification of thirty-nine weed species, consisting of a variety of invasive, aggressive and environmental woody and herbaceous weeds (Table 3-2).

A variety of general weed removal techniques are to be used to suppress and control weeds within the revegetation area, including:

- cut-and-paint, stem scraping, stem injection, and frilling and chipping for woody weeds;
- hand removal and crowing for herbaceous weeds; and
- Chemical control where appropriate.

Detailed weed removal techniques for the control of woody weeds, weeds with underground reproductive structures, small hand-pullable plants and vines and scramblers, are provided in Appendix A of this BMP.

### **5.9.1 Primary Weeding**

Primary weeding is the initial weeding. It is recommended that primary weeding should be carried out across the entire BMP area to remove the majority of dominant weeds. This involves removal of weeds through herbicide use and hand removal. It is important to note primary weeding usually initiates new growth of both weeds and native species. Primary weeding of the BMP may take up to 1 weeks.

### **5.9.2 Secondary or Follow-up Weeding**

Secondary or follow-up weeding involves intensive weeding in areas that have already received primary work to remove weed re-growth or overlooked weeds. It is recommended that secondary weeding be conducted two weeks after primary weeding and the every 3-6 months after during the construction phase. Secondary weeding of the site may take up to 1 week or been undertaken progressively over the works period.

### **5.9.3 Maintenance Weeding**

After primary and secondary weeding is undertaken the BMP area should be able to resist most weeds. However, weeds will re-establish within the BMP area from bird, wind, water transport and other seed or propagules dispersal mechanisms within the BMP area. Maintenance weeding should be undertaken once or twice a year until such time as the construction works have been completed.

The use of herbicides is needed where hand removal of weeds is impractical. The use of Glyphosate based herbicides is recommended in accordance with the manufacturers labels.

The potential for destabilizing soils and causing erosion as a result of spraying vegetation with herbicide needs to be considered prior to commencement of weed control works.

Only operators with Chemcert or equivalent training must undertake the spraying of weeds. The operator must evaluate the success of each treatment after a set period of time according to the labelled effectiveness for each herbicide. Care must be taken when applying herbicides near water bodies due to the sensitivity of the waterways, and flora and fauna, to runoff containing these herbicides.

All herbicides must be applied according to the herbicide usage label and provisions of the Protection of the Environmental Operations Act (NSW).

Exotic species targeted for removal throughout the duration of the management plan are listed in (3-2) below. These are exotic species that have been observed on site within the BMP Area. Generic management strategies enabling appropriate removal of these species are provided in Appendix A.

**Table 5-4 Exotic species recorded within the BMP area**

| Family Name                 | Scientific Name                 | Common Name         | Primary | Secondary |
|-----------------------------|---------------------------------|---------------------|---------|-----------|
| Asclepiadaceae              |                                 |                     |         |           |
|                             | <i>Araujia sericifera</i>       | Moth Vine           | Y       |           |
| Asparagaceae                |                                 |                     |         |           |
|                             | <i>Asparagus aethiopicus</i>    | Asparagus Fern      | Y       |           |
|                             | <i>Asparagus asparagoides</i>   |                     | Y       |           |
| Asteraceae                  |                                 |                     |         |           |
|                             | <i>Bidens pilosa</i>            | Cobbler's Pegs      |         | Y         |
|                             | <i>Cirsium arvense</i>          | Perennial Thistle   |         | Y         |
|                             | <i>Cirsium vulgare</i>          | Spear Thistle       |         | Y         |
|                             | <i>Conyza albida</i>            | Tall Fleabane       |         | Y         |
|                             | <i>Conyza bonariensis</i>       | Flaxleaf Fleabane   | Y       |           |
|                             | <i>Onopordum acanthium</i>      |                     | Y       |           |
|                             | <i>Senecio madagascariensis</i> | Fireweed            | Y       |           |
|                             | <i>Sonchus asper</i>            | Prickly Sowthistle  |         | Y         |
|                             | <i>Sonchus oleraceus</i>        | Common Sowthistle   |         | Y         |
|                             | <i>Tagetes minuta</i>           | Stinking Roger      | Y       |           |
| Brassicaceae                |                                 |                     |         |           |
|                             | <i>Brassica rapa</i>            |                     |         | Y         |
| Cactaceae                   |                                 |                     |         |           |
|                             | <i>Opuntia cylindrica</i>       |                     | Y       |           |
| Commelinaceae               |                                 |                     |         |           |
|                             | <i>Tradescantia albiflora</i>   | Wandering Jew       | Y       |           |
| Cyperaceae                  |                                 |                     |         |           |
|                             | <i>Cyperus eragrostis</i>       | Umbrella Sedge      |         | Y         |
| Fabaceae (Caesalpinioideae) |                                 |                     |         |           |
|                             | <i>Senna pendula</i>            |                     | Y       |           |
| Fabaceae (Faboideae)        |                                 |                     |         |           |
|                             | <i>Trifolium repens</i>         | White Clover        |         | Y         |
|                             | <i>Vicia sativa</i>             |                     |         | Y         |
| Gentianaceae                |                                 |                     |         |           |
|                             | <i>Centaurium erythraea</i>     | Common Centaury     |         |           |
| Juncaceae                   |                                 |                     |         |           |
|                             | <i>Juncus cognatus</i>          |                     |         | Y         |
| Malvaceae                   |                                 |                     |         |           |
|                             | <i>Sida acuta</i>               |                     |         | Y         |
|                             | <i>Sida rhombifolia</i>         | Paddy's Lucerne     |         | Y         |
| Oleaceae                    |                                 |                     |         |           |
|                             | <i>Ligustrum lucidum</i>        | Large-leaved Privet | Y       |           |
|                             | <i>Ligustrum sinense</i>        | Small-leaved Privet | Y       |           |
| Plantaginaceae              |                                 |                     |         |           |
|                             | <i>Plantago lanceolata</i>      | Lamb's Tongues      |         | Y         |
| Poaceae                     |                                 |                     |         |           |
|                             | <i>Chloris gayana</i>           | Rhodes Grass        | Y       |           |
|                             | <i>Ehrharta erecta</i>          | Panic Veldtgrass    |         | Y         |



| Family Name  | Scientific Name                | Common Name            | Primary | Secondary |
|--------------|--------------------------------|------------------------|---------|-----------|
|              | <i>Paspalum dilatatum</i>      | Paspalum               |         | Y         |
|              | <i>Paspalum urvillei</i>       | Vasey Grass            |         | Y         |
|              | <i>Pennisetum clandestinum</i> | Kikuyu Grass           |         | Y         |
|              | <i>Setaria gracilis</i>        | Slender Pigeon Grass   |         | Y         |
| Polygonaceae |                                |                        |         |           |
|              | <i>Rumex crispus</i>           | Curled Dock            |         | Y         |
| Primulaceae  |                                |                        |         |           |
|              | <i>Anagallis arvensis</i>      | Scarlet/Blue Pimpernel |         | Y         |
| Rosaceae     |                                |                        |         |           |
|              | <i>Rubus sp</i>                |                        | Y       |           |
| Solanaceae   |                                |                        |         |           |
|              | <i>Solanum linnaeanum</i>      | Apple of Sodom         | Y       |           |
| Verbenaceae  |                                |                        |         |           |
|              | <i>Verbena rigida</i>          | Veined Verbena         |         | Y         |

The primary stages of the weeding phase of this plan are estimated to take approximately one week, while the secondary and ongoing maintenance stage should continue throughout the construction period to achieve effective control.

Monitoring of the progress of weed removal, plant growth should be undertaken on a six monthly basis with progress reports, including photographs, prepared and forwarded to Blacktown City Council's Senior Biodiversity Officer. In addition to the six-monthly reports, a final report certifying the completion of the works is to be submitted at the end of the construction work period.

The *Program of Works* (Table 5.4 below) is aimed at providing a framework for enacting relevant rehabilitation and re-vegetation, maintenance and monitoring and review programs. The implementation is the responsibility of the landholders in association with an ecologist. The re-vegetation works will take up to one year or longer to establish. The re-vegetation/re-generation works will continue for several years until the mass planting is sufficient to dominate exotic weed plants.

**Table 5-5 Proposed Vegetation Management Schedule of Activities**

| Action                                                                                             | Responsibility                                                                                        | Performance Criteria                                                          | Timing                                           |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------|
| <b>Prior to commencement of works within VMP area</b>                                              |                                                                                                       |                                                                               |                                                  |
| Engagement of contractor (s) for implementation of BMP                                             | Proponent                                                                                             | Primary contractor and vegetation management consultant engaged               | Prior to release of the subdivision certificate. |
| Protected Fence to be installed in accordance Figure 3-1                                           | Primary Contractor/Ecologist                                                                          | Fence and signage erected.                                                    | Prior to commencement of development             |
| <b>BMP works</b>                                                                                   |                                                                                                       |                                                                               |                                                  |
| Engagement of vegetation clearing bush-regenerator contractor (s) for implementation of BMP works. | Proponent                                                                                             | Bushland regeneration contractor and vegetation management consultant engaged | Prior to commencement of development             |
| Install sedimentation and erosion control as per CC plans                                          | Primary Contractor                                                                                    | Installation of sediment and erosion control measures                         | Prior to commencement of any works               |
| Placement of on-site facilities (construction compounds, materials laydown etc.) and access        | Use of already cleared areas will be maximised for placement of on-site facilities and access routes. | Site Foreman                                                                  | Pre-construction                                 |
| <b>Weeding</b>                                                                                     |                                                                                                       |                                                                               |                                                  |
| Carry out primary weeding throughout the BMP Area. All primary weeds listed in                     | Vegetation Management                                                                                 | Maintain weed                                                                 | Approximately 1                                  |

| Action                                                                                                                                                                                                                                                     | Responsibility                             | Performance Criteria                                                                                                          | Timing                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| (Table 3-2) are to be targeted first to maintain weeds less than 5% weed occurrence prior to the removal of secondary weeds (Table 3-2).                                                                                                                   | Contractor/Ecologist                       | <i>priority weeds and other weeds</i> as per (Table 3-4)                                                                      | week.                                                                                                            |
| If pesticides are used, contractors must ensure compliance with the <i>Pesticides Act 1999</i> .                                                                                                                                                           | Vegetation Management Contractor/Ecologist | Pesticides used as per the Pesticide Act provisions                                                                           | Ongoing                                                                                                          |
| Ensure use of herbicides that are suitable for use in environmentally sensitive areas such as Round up Bioactive®.                                                                                                                                         | Vegetation Management Contractor/Ecologist | Vegetation Management Contractor has appropriate qualifications for herbicide use; Roundup Bi-Active (or equivalent) is used. | Ongoing                                                                                                          |
| Carry out secondary weeding.                                                                                                                                                                                                                               | Vegetation Management Contractor/Ecologist | Weed regrowth following primary weeding removed, secondary infestations removed.                                              | 4-5 days with bush regenerator onsite following primary weeding and every 3-6 months following secondary weeding |
| Weed biomass to be either composted on-site or disposed of at an approved waste management centre, as appropriate for each weed species.                                                                                                                   | Vegetation Management Contractor/Ecologist | Weed biomass disposed of correctly – not stockpiled on site.                                                                  | Ongoing                                                                                                          |
| <b>Vegetation Clearing Protocol</b>                                                                                                                                                                                                                        |                                            |                                                                                                                               |                                                                                                                  |
| Tree clearing- Clearing would be undertaken between late summer and mid-winter if possible to reduce the impact on potentially breeding fauna. · Tree pruning in accordance with Appendix D would be undertaken in favour of tree removal, where possible. | Site Foreman/Ecologist                     | No injured fauna.                                                                                                             | Construction                                                                                                     |
| Construction access- Use of already cleared areas will be maximised for access.                                                                                                                                                                            | · Contractor                               |                                                                                                                               | Construction                                                                                                     |

| Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Responsibility                             | Performance Criteria                                                                        | Timing                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>Hollow bearing tree removal</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                            |                                                                                             |                                           |
| <p>Prior to clearing ·</p> <p>With input from an ecologist, clearly mark all trees containing hollows which are to be removed/pruned. Most hollows will occur in the trees greater than 500mm communities. Features that are useful for identifying hollow bearing trees include:</p> <ul style="list-style-type: none"> <li>o Dead trees</li> <li>o Snapped off branches</li> <li>o Trunk spouts</li> <li>o Damage to trunk such as disease, areas of rot, etc. that have potential to develop into trunk or branch hollows</li> <li>o Depressions or cavities where hollows</li> </ul> | Ecologist/Site foreman                     | <p>Minimise impacts of clearing, where hollows must be felled</p> <p>No injured fauna.</p>  | Pre-construction                          |
| <p>Clearing hollow bearing trees</p> <p>Hollow-bearing trees and limbs must be cleared/removed according to the methods detailed in Appendix B.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      | Ecologist/Site foreman                     | No injured fauna.                                                                           | Construction                              |
| <p>Handling wildlife</p> <p>Direct contact with any wildlife should be avoided wherever possible.</p> <ul style="list-style-type: none"> <li>· Any uninjured wildlife must be encouraged to leave the site.</li> <li>· If wildlife is injured, 13 000 WIRES or 1300 094 737 or similarly experienced personnel should be contacted to collect and treat any injured individuals.</li> </ul> <p>The 13 000 WIRES or 1300 094 737 contact number should be retained onsite by the Site foreman</p>                                                                                         | Ecologist/Site foreman                     | No injured fauna.                                                                           | Construction                              |
| <b>Maintenance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                            |                                                                                             |                                           |
| Carry out maintenance weeding throughout the VMP Area (Figure 1-1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Vegetation Management Contractor/Ecologist | <p>Weed cover maintained as per (Table 3-4)</p> <p>Regrowth following secondary weeding</p> | Every three-six months for up to 5 years. |



| Action                                                                      | Responsibility                             | Performance Criteria                                                                                                                                                                                                                                                                                                                         | Timing                                                                  |
|-----------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|                                                                             |                                            | controlled.<br>No new weed species or infestations.                                                                                                                                                                                                                                                                                          |                                                                         |
| On-going management of the VMP Area (Figure 1-1)                            | Vegetation Management Contractor/Ecologist | Weed levels throughout MZ's 1-2 are to be maintained as per (Table 3-4)                                                                                                                                                                                                                                                                      | Ongoing, as required                                                    |
| <b>Monitoring</b>                                                           |                                            |                                                                                                                                                                                                                                                                                                                                              |                                                                         |
| Take baseline monitoring photos and complete monitoring sheet (Appendix B). | Vegetation Management Contractor/Ecologist | The data sheet (Appendix B) must be photocopied and filled in after works have been carried out. All boxes must be filled in and the map must be marked with the relevant information on the data sheets and photos taken. Records are to be kept and the data sheets and photos are to be submitted to Councils Senior Biodiversity Officer | Once every six months to provide progress throughout construction works |

#### 5.9.4 Monitoring and auditing

The *Project Ecologist* is to monitor the success of the biodiversity management works, so that appropriate remedies can be pursued. 6 monthly reports are to be provided to Council throughout construction works. The report will include photo monitoring results (above), as well as reporting on the weed control and general works. The annual report will include:

- works carried out, including a measure of effort and other relevant information (e.g. weed species targeted, areas worked, dominant techniques used, etc.)
- any observations, such as the occurrence of new weed species
- a description of any problems or issues encountered (e.g. wildlife matters, rates of regeneration, etc) and how they were overcome
- a summary of how the site-specific objectives and performance criteria have been met (or not). If these have not been met, further explanation and a proposed response may be necessary.
- relevant maps.

The 6 monthly report will highlight the effectiveness of the program and identify any changes needed to improve (i.e. changes to weed control techniques, types of herbicides used or weed priority) weed management. Annual reporting will be crucial in determining whether the actions being implemented are having the desired effect or if alternative weed control techniques (for the particular weed species) are required.

Monitoring activities will be undertaken during the bush regeneration works and will involve:

- Photo points & quadrat monitoring plots are to be established throughout the management zones to monitor the success of BMP works.
- The data sheet (Appendix B) to be submitted to Council years every 6 months until completion of the construction works with a final report prepared prior to each release stage; and
- Compilation of Annual Monitoring Reports to Blacktown City Council's Development Ecologist for
- At a minimum the following information is to be included within monitoring reports:
  1. The time period for which the report relates to.
  2. Date and times of site visits.
  3. The qualifications and experience of contractors.
  4. Works completed on the site at each visit.
  5. A table totalling man hours for each task undertaken on site.
  6. Methods of weeding undertaken and chemicals used.
  7. Current weed coverage estimates (to meet performance criteria of <5% priority weeds and 4% other weeds).
  8. Photo and/ or quadrat monitoring results of each of the scheduled stages of the vegetation progress.

## 6. References

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## **Appendix A**

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### Weed Management Techniques



Environmental weeds are to be controlled in accordance with the following specifications and bush regeneration methods of Appendix B. The following weed management techniques; as recommended by the National Trust, NSW National Parks and Wildlife Service and Australian Association of Bush Regenerators; are to be used for all activities as specified under this Vegetation Management Plan.

### **Woody Weeds Removal Techniques:**

#### Cut and Paint (Woody weeds to 10 cm basal diameter)

Make a horizontal cut close to the ground using secateurs, loppers or a bush saw; and  
Immediately apply herbicide to the exposed flat stump surface.

#### *Considerations:*

Cuts should be horizontal to prevent herbicide from running off the stump, sharp angle cuts are hazardous;

Herbicide must be applied immediately before the plant cells close (within 30 seconds) and translocation of herbicide ceases;

If plants re-sprout cut and paint the shoots after sufficient re-growth has occurred; and  
Stem scraping can be more effective on some woody weeds.

See Figure 4-3 for further details

#### Stem Injection

At the base of the tree drill holes at a 45 degree angle into the sapwood;  
Fill each hole with herbicide immediately; and  
Repeat the process at 5 cm intervals around the tree.

#### Frilling or Chipping

At the base of the tree make a cut into the sapwood with a chisel or axe;  
Fill each cut with herbicide immediately; and  
Repeat the process at 5 cm intervals around the tree.

#### *Considerations:*

Plants should be actively growing and in good health;  
Deciduous plants should be treated in spring and autumn when leaves are fully formed;  
For multi-stemmed plants, inject or chip below the lowest branch or treat each stem individually; and  
Herbicides must be injected immediately before plant cells close (within 30 seconds) and translocation of herbicide ceases.

### **Small Hand-Pullable Plants Removal Techniques:**

#### Hand Removal

Remove any seeds or fruits and carefully place into a bag;  
Grasp stem at ground level, rock plant backwards and forwards to loosen roots and pull out; and  
Tap the roots to dislodge any soil, replace disturbed soil and pat down.

*Considerations:*

Leave weeds so roots are not in contact with the soil e.g. hang in a tree, remove from site or leave on a rock.

See Figure 4-2 for further details

**Vines and Scramblers Removal Techniques:**

Hand Removal

Take hold of one runner and pull towards yourself;

Check points of resistance where fibrous roots grow from the nodes;

Cut roots with a knife or dig out with a trowel and continue to follow the runner;

The major root systems need to be removed manually or scrape/cut and painted with herbicide; and

Any reproductive parts need to be bagged.

See Figure 4-4 for further details

Stem Scraping

Scrape 15 to 30 cm of the stem with a knife to reach the layer below the bark/outer layer; and

Immediately apply herbicide along the length of the scrape.

*Considerations:*

A maximum of half the stem diameter should be scraped. Do not ringbark;

Larger stems should have two scrapes opposite each other; and

Vines can be left hanging in trees after treatment.

**Weeds with Underground Reproductive Structures Removal Techniques:**

See Figure 4-3 for further details

Hand Removal of Plants with a Taproot

Remove and bag seeds or fruits;

Push a narrow trowel or knife into the ground beside the tap root, carefully loosen the soil and repeat this step around the taproot;

Grasp the stem at ground level, rock plant backwards and forwards and gently pull removing the plant; and

Tap the roots to dislodge soil, replace disturbed soil and pat down.

See Figure 4-1 for further details

Crowning

Remove and bag stems with seed or fruit;

Grasp the leaves or stems together so the base of the plant is visible;

Insert the knife or lever at an angle close to the crown;

Cut through all the roots around the crown; and

Remove and bag the crown.

#### Herbicide Treatment – Stem Swiping

Remove any seed or fruit and bag; and

Using an herbicide applicator, swipe the stems/leaves.

#### *Considerations:*

Further digging may be required for plants with more than one tuber;

Some bulbs may have small bulbils attached or present in the soil around them which need to be removed;

It may be quicker and more effective to dig out the weed;

Protect native plants and seedlings; and

For bulb and corm species the most effective time to apply herbicide is after flowering and before fruit is set.

Exotic vegetation should be removed and stockpiled in a clear area away from adjoining bushland. This stockpile should be removed from the site at a convenient time. As part of the regular maintenance of the restored area any re-growth of the exotic plant species should be removed and disposed of appropriately.

#### *Use of Herbicides*

Herbicides are only to be used by trained personnel who hold a Chem Certificate. Herbicides should not be applied prior to rain occurring. This reduces the herbicides effectiveness as well as being transported in runoff to creek lines and waterways.

An advantage of herbicide use is the low time taken to spray weeds as compared to physically removing them, particularly for large infestations of weeds.

Enviro Ecology recommends that the use of herbicides should be considered when:

- There are small areas of dense weeds with few or no native plants to protect
- There are large areas of weeds
- The weeds are growing too rapidly for physical removal

The spraying of weeds must only be undertaken by experienced persons with Chemcert or equivalent qualifications. The success of each treatment must be evaluated by the operator after a set period of time and re-applied (if necessary) according to the labeled effectiveness for each herbicide. Care must be taken when applying herbicides near drainage lines to avoid excess use due to the sensitivity of the water bodies into which runoff will eventually flow.

Figure 6-1 Control of small hand-pullable plants




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of Bush  
Regenerators

BUSH REGENERATION INFORMATION SHEET

## Control of Small Hand-pullable Plants

To Control: ● Small soft weeds eg. fleabane, crofton weed, small grasses  
● Seedlings of any weeds including privet, lantana, moth vine

**METHODS OF REMOVAL**

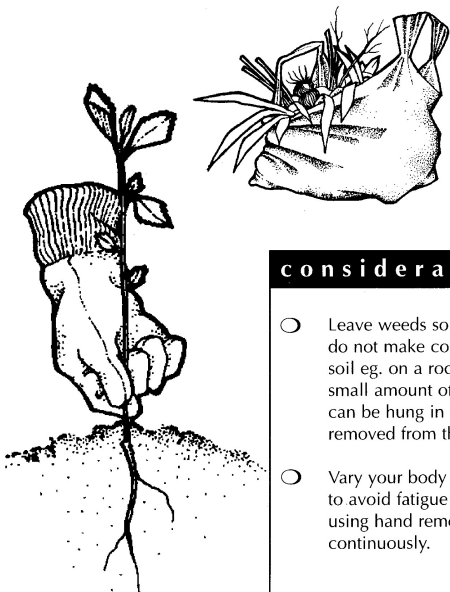
**1 HAND REMOVAL (Minimal Disturbance)**

**STEP 1** Gently remove any seeds or fruits and carefully place into a bag.

**STEP 2** Grasp stem at ground level.

**STEP 3** Rock plant backwards and forwards to loosen roots, and pull out gently.

**STEP 4** Carefully tap the roots to dislodge any soil. Replace disturbed soil and pat down.



**considerations**

- Leave weeds so that roots do not make contact with soil eg. on a rock - a small amount of debris can be hung in a tree or removed from the site.
- Vary your body position to avoid fatigue when using hand removal continuously.

Illustrations: V.Bear

Figure 6-2 Control of weeds with underground reproductive structures




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## Control of Weeds with Underground Reproductive Structures

Examples: Weeds with ● Tap roots - catsear, dandelion  
● Rhizomes - asparagus fern, ginger plant  
● Bulbs and corms - oxalis, onion weed, watsonia, freesias, montbretia  
● Tubers - madiera vine, arrow head vine

**METHODS OF REMOVAL**

**1 HAND REMOVAL OF PLANTS WITH A TAPROOT**  
Examples: Paddy's lucerne, dandelion

**STEP 1** Gently remove and bag seeds or fruit.

**STEP 2** Push a narrow trowel or knife into the ground next to the taproot. Carefully loosen soil. Repeat this step around the taproot.

**STEP 3** Grasp stem at ground level, rock plant backwards and forwards and pull gently.

**STEP 4** Gently tap the roots to dislodge soil. Replace disturbed soil and lightly pat down.

**2 CROWNING (Many grasses can be crowned)**  
Example: asparagus fern

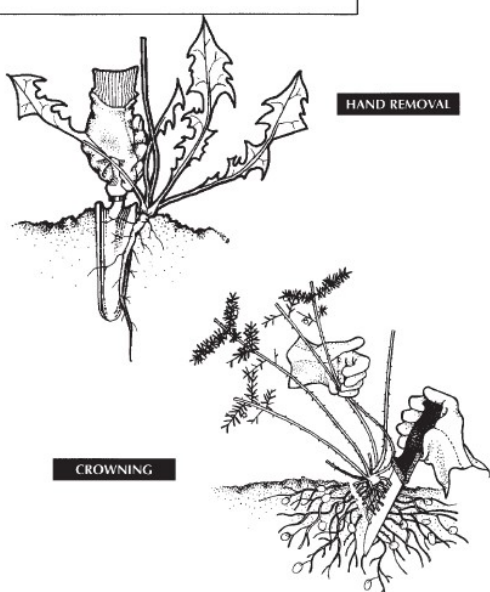
**STEP 1** Gently remove and bag stems with seed or fruit.

**STEP 2** Grasp the leaves or stems together so that the base of the plant is visible.

**STEP 3** Insert, at an angle, a knife or lever, close to the "crown".

**STEP 4** Cut through all the roots around the crown.

**STEP 5** Remove and bag the crown.



Illustrations: V.Bear



Figure 6-3 Control of woody weeds





Australian Association of Bush Regenerators

BUSH REGENERATION INFORMATION SHEET

## Control of Woody Weeds

Examples of woody weeds include:

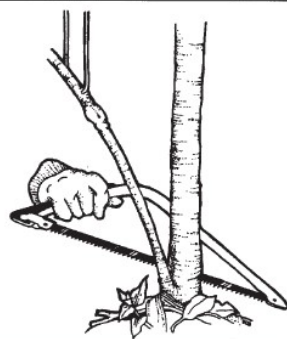
- lantana, bitou bush, cotoneaster, privet (cut and paint)
- camphor laurel, Mickey Mouse bush (ochna) and cassia/senna (stem scrape)

### METHODS OF REMOVAL

**1 CUT AND PAINT** —Useful for small to medium sized woody weeds up to 10cm basal diameter

**STEP 1** Make a horizontal cut as close to the ground as possible with secateurs, loppers or a bush saw.

**STEP 2** Immediately apply herbicide to the exposed flat stump surface.



### SAFETY CONSIDERATIONS

The following general precautions should be made when using herbicides:

- Read the label before opening the container and follow the instructions.
- Wear protective clothing as directed on the label.
- Wash hands after use and before eating or smoking.



### considerations

- Cuts should be horizontal to prevent herbicide from running off the stump. Sharp angle cuts are hazardous.
- Herbicide must be applied immediately before the plant cells close and translocation of herbicide ceases.
- If plants resprout, cut and paint the shoots after sufficient regrowth has occurred.
- Stem scraping can be more effective on some woody weeds.

Illustrations: V.Bear

Figure 6-4 Control of vines & scramblers





Australian Association of Bush Regenerators

BUSH REGENERATION INFORMATION SHEET

## Control of Vines and Scramblers

Examples of vines include:

- balloon vine, morning glory, honeysuckle, cape ivy, jasmine, madeira vine, blackberry

### METHODS OF REMOVAL

**1 HAND REMOVAL**

**STEP 1** Take hold of one runner and gently pull it along the ground towards you.

**STEP 2** Check points of resistance where fibrous roots grow from the nodes. Cut roots with a knife or dig out with a trowel and continue to follow the runner.

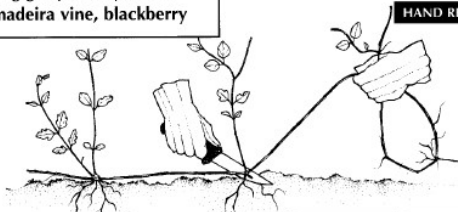
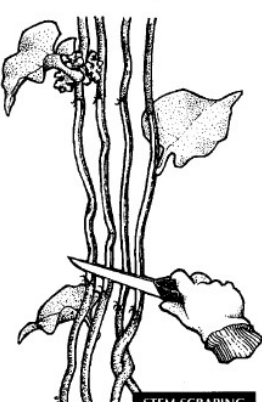
**STEP 3** The major root systems need to be removed manually or scrape/cut and painted with herbicide.

**STEP 4** Bag any reproductive parts.

**2 STEM SCRAPING**

**STEP 1** With a knife, scrape 15 to 30 cm of the stem to reach the layer below the bark/outer layer.

**STEP 2** Immediately apply herbicide along the length of the scrape.

### considerations

- A maximum of half the stem diameter should be scraped. Do not ring bark.
- Larger stems (>1cm) should have two scrapes opposite each other.
- Aerial tubers on madeira vine should die with the plant when stem scraping is used. Those that fall from the plant in the scraping process need to be bagged.
- Vines can be left hanging in trees after treatment.

Illustrations: V.Bear

## **Appendix B**

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Vegetation clearing procedure

**Table 6-1 Vegetation Clearing Procedure**

| <b>Timing</b>                                 | <b>Action</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step one</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| At least 10 days prior to vegetation clearing | <p>At least 10 days prior to any vegetation clearing, a project ecologist will be engaged and undertake a pre-clearing survey to:</p> <ul style="list-style-type: none"> <li>· Confirm the vegetation and habitat to be cleared as part of the Project is limited to the approved clearing limits.</li> <li>· Identify (in consultation with the Site Manager/Project Manager through a site walk) areas that must be cleared and any areas that can be retained based on detailed design</li> <li>· Identify environmentally sensitive areas (such as areas of vegetation to be retained) which are to be delineated and demarcated</li> <li>· Identify the presence and location of any habitat features (including tree hollows and/or potential bat roosts)</li> <li>· Identify any previously unidentified threatened flora and fauna species.</li> <li>· Identify any native wildlife that can be captured and relocated and identify a suitable area for relocation (if possible)</li> <li>· Identify any dead wood and trees containing arboreal and ground hollows which can be relocated to areas of retained vegetation</li> <li>· The species and location of any weeds</li> </ul> <p>Following the pre-clearing survey, the project ecologist will prepare a pre-clearing report which details:</p> <ul style="list-style-type: none"> <li>· Location, number and species of trees/other vegetation marked for removal</li> <li>· Photographs and location of any marked habitat trees</li> <li>· Records of all fauna encounters</li> <li>· Location and species of any weeds</li> </ul> <p>Based on the results of the pre-clearing survey, trees are to be marked (using spray paint on their trunks in a visible location):</p> <ul style="list-style-type: none"> <li>· 'H'- Habitat tree. hollow-bearing or habitat trees are identified as requiring removal the two-staged clearing process outlined below is to be implemented and the clearing supervised by an ecologist.</li> <li>· ''- Ecologist has assessed the tree and it is ready for removal.</li> </ul> |
| <b>Step Two</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| At least 7 days prior to vegetation clearing  | <ul style="list-style-type: none"> <li>· At least 7 days prior to vegetation clearing, exclusion zones will be established around vegetation and trees which are to be retained and to delineate the limits of clearing. Exclusion fencing must:</li> <li>· Be para-webbing or bunting or similar fencing</li> <li>· Have 'no-go zone' signage in prominent, visible locations to clearly identify the exclusion zone</li> <li>· Have periodic reflective strips/other reflective elements along it's length</li> <li>· Identify and mark any tree hollows</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Step Three</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24 hrs prior to vegetation clearing | <ul style="list-style-type: none"> <li>· Confirm all exclusion zones are clearly delineated and any fencing/signage is in visible and in good condition</li> <li>· Suitably licensed wildlife carer and/or ecologist to undertake relocation of known fauna to pre-determined habitat (as required)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Step Four                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| During vegetation clearing          | <p>Vegetation clearing and removal cannot commence until Steps 1-3 have been completed.</p> <p>Following completion of Steps 1-3, a two-stage vegetation clearing process will be implemented.</p> <p>Stage 1- Non-habitat tree removal</p> <ul style="list-style-type: none"> <li>· Non-habitat vegetation removal must be undertaken a minimum of 24 hours prior to habitat tree removal to allow fauna to vacate the habitat on their own accord.</li> </ul> <p>Stage 2- Habitat tree removal</p> <ul style="list-style-type: none"> <li>· Immediately prior to felling, the habitat tree is to be knocked with an excavator bucket (or other similar machinery) to encourage fauna to evacuate the tree under the supervision of an ecologist.</li> <li>· The ecologist shall capture and/or remove fauna that has the potential to be disturbed, injured or killed to predetermined habitat identified for fauna release.</li> <li>· The trees may then be felled carefully by lowering to the ground with minimal impact. Methods and equipment for felling trees should be discussed between</li> </ul> |
| Step Five                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Post vegetation clearing            | <p>Following the completion of vegetation clearing, the project ecologist is to undertake a post-clearing survey and prepare a post-clearing report which includes:</p> <ul style="list-style-type: none"> <li>· Photographs of the cleared areas</li> <li>· Confirmation of the number of trees and species cleared</li> <li>· Records of any fauna rescue events including relocation data (GPS coordinates of relocation area).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 6.1 Microbat survey methodology

At least two weeks prior to any construction commencing, an experienced bat ecologist shall undertake surveys to determine the presence of any resident microbats. At a minimum, the survey/s shall identify:

- Microbat species present
- Locations of roosting microbats
- Total number of individuals and groups per occupied roost site
- Description of occupied roost sites

Surveys for the presence of microbat roosting must be undertaken to cover the period of roosting (where possible) and include diurnal inspections to assess the potential for Hollow-bearing trees to support roosting bats. Roosting behaviour for threatened microbat species identified within the site footprint is detailed in Table 6-2. The surveys shall also identify any habitat features that may require further targeted inspection, including any evidence of microbats and/or microbat use. The surveys will include a combination of echolocation call recording and dawn/dusk surveys to confirm if the culverts are used for roosting. Surveys will be carried out during favourable weather conditions. A report shall be prepared to determine the results of the surveys.

If roosting microbats are determined to be present, the clearing protocol above is to be implemented 1 hour before dawn.

**Table 6-2 Threatened microbat species roosting behaviour**

| <b>Common Name</b>             | <b>Scientific Name</b>            | <b>Roosting Behaviour</b>                                                                                                                                                                                                                                              |
|--------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eastern False Pipistrelle      | <i>Falsistrellus tasmaniensis</i> | Primarily tree roosting species that prefers wet sclerophyll and coastal mallee forests (Churchill, 2008). Mating occurs in late spring- early summer and hibernates in roosts in winter months (OEH, 2017).                                                           |
| Eastern Coastal Freetailed Bat | <i>Micronomus norfolkensis</i>    | Primarily tree roosting species that is also known to roost in buildings (Churchill, 2008).                                                                                                                                                                            |
| Southern Myotis                | <i>Myotis macropus</i>            | Breeding season from October to March. Roosts are found in hollow bearing trees (generally within 200 m of permanent water) and subterranean structures such as old railway tunnels, culverts, bridges, stormwater drains and caves (Churchill, 2008; Campbell, 2014). |



## **Appendix C**

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Monitoring Sheet for BMP works

|                                                                                             |                                                                                                     |                                                |                              |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------|
| <b>Appendix C : Monitoring Sheet</b>                                                        |                                                                                                     |                                                |                              |
| <b>Monitoring Sheet for Biodiversity Management Plan</b>                                    |                                                                                                     | <b>By Enviro Ecology</b>                       |                              |
| <b>Biodiversity Management Plan over Lot 6 DP 229296 Garfield Road East, Riverstone NSW</b> |                                                                                                     | <b>Ph: 0402592399</b>                          |                              |
|                                                                                             |                                                                                                     |                                                |                              |
|                                                                                             |                                                                                                     |                                                |                              |
| <b>General</b>                                                                              | <b>Date:</b>                                                                                        | <b>Vegetation community(_____)</b>             |                              |
|                                                                                             |                                                                                                     |                                                |                              |
| <b>Site Personnel</b>                                                                       | Field Leader                                                                                        | Name:                                          | Signature:                   |
|                                                                                             | Other Field Persons                                                                                 |                                                |                              |
|                                                                                             | Contact No.                                                                                         |                                                |                              |
|                                                                                             |                                                                                                     |                                                |                              |
| <b>Effort</b>                                                                               | Total Hours spent on site                                                                           |                                                |                              |
|                                                                                             | Hours spent weeding                                                                                 |                                                |                              |
|                                                                                             | Hours spent planting                                                                                |                                                |                              |
|                                                                                             | Hours spent other activities (specify)                                                              |                                                |                              |
|                                                                                             |                                                                                                     |                                                |                              |
| <b>Work Completed</b>                                                                       | Include weed control methods used (e.g. hand weeding, spraying) & areas planted and weeded          |                                                |                              |
|                                                                                             |                                                                                                     |                                                |                              |
| <b>Animals seen during field work</b>                                                       | Fauna seen                                                                                          | Species                                        | No of individuals            |
|                                                                                             |                                                                                                     |                                                |                              |
|                                                                                             |                                                                                                     |                                                |                              |
|                                                                                             |                                                                                                     |                                                |                              |
|                                                                                             |                                                                                                     |                                                |                              |
|                                                                                             | Pest species seen on site                                                                           | Circle; Sparrows, Indians Mynas, Rabbits, Hare |                              |
|                                                                                             |                                                                                                     | Other;                                         |                              |
| <b>Monitoring/Photos</b>                                                                    | <b>Photos are to be taken from each point identified on Figure 3-2 within VMP works area Yes/No</b> | <b>Photo Aspect</b>                            | <b>GPS Location of photo</b> |
|                                                                                             | Photo Number:_____                                                                                  | Aspect:_____                                   | Easting:_____ Northing:_____ |
|                                                                                             | Photo Number:_____                                                                                  | Aspect:_____                                   | Easting:_____ Northing:_____ |
|                                                                                             | Photo Number:_____                                                                                  | Aspect:_____                                   | Easting:_____ Northing:_____ |
|                                                                                             | Photo Number:_____                                                                                  | Aspect:_____                                   | Easting:_____ Northing:_____ |

# FURTHER NOTES

## MARK LOCATION OF WORKS COMPLETED

### ON MAP



