181 Forest Way, Belrose

Biodiversity Management Plan

Huntingdon Nursing Home

10 May 2024

Final

(02) 9868 1933 | PO Box 2474 Carlingford Court NSW 2118 | cumberlandecology.com.au

Report No. 24003RP1

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

Version	Date Issued	Amended by	Details
V01	26 Nov 2019	EC, VO, TP, MW	Final (16222RP2)
V02	10 May 2024	MP, JB	Final

Approved by:	
Position:	Mikael Peck
Signed:	
Date:	10 May, 2024

Table of Contents

Table of Tables

Table of Photographs

Table of Graphs

No table of figures entries found.

Table of Appendices

Table of Figures

Glossary

Abbreviation/ Term	Definition
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Plan
BRC	Bushland regeneration contractor
DA	Development Application
DFEC	Duffys Forest Ecological Community
DoEE	Commonwealth Department of the Environment and Energy
EEC	Endangered Ecological Community
EES	Environment, Energy and Science Group (EES), as part of the Department of Climate Change, Energy, the Environment and Water (DCCEEW)
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
LGA	Local Government Area
Locality	The area within a 5 km radius of the centre of the study area
NSW	New South Wales
OEH	The former NSW Office of Environment and Heritage (now the Environment, Energy and Science Group (EES), as part of the Department of Climate Change, Energy, the Environment and Water (DCCEEW)
Proposed development	Demolition of existing residential dwelling and development of a 105 bed residential aged care facility in the west of the subject site.
SEPP	State Environmental Planning Policy
Study land	181 Forest Way, Belrose (Lot 3 DP805710)
Subject site	The eastern portion of the subject land, which will be managed under the BMP and excludes the proposed development and landscaped areas (see **Figure 1**)
BC Act	NSW Biodiversity Conservation Act 2016
Warringah LEP 2011	Warringah Local Environmental Plan 2011

1. Introduction

1.1. Purpose

Cumberland Ecology Pty Ltd (Cumberland Ecology) has been commissioned by Huntingdon Nursing Home C/- Trinity Management Services Pty Ltd, on behalf of Morrison Design Partnership Architects, to prepare a Biodiversity Management Plan (BMP) to support a proposed Development Application (DA) for 181 Forest Way, Belrose (Lot 3 DP805710) ('the subject land').

The purpose of this BMP is to provide guidelines for the rehabilitation, conservation and management of vegetation that will be retained outside of the proposed development in an area defined as "the subject site" (see **Figure 1**). In particular, the BMP has been prepared to allow the retention and management of the Endangered Ecological Community (EEC), Duffys Forest Ecological Community (DFEC) occurring in the north of the subject site, as well as improving the overall biodiversity values of the subject site as it has been largely cleared of remnant vegetation. This BMP also provides for general biodiversity management measures to be undertaken in the subject land, including vegetation clearing protocols and fauna relocation protocols.

The aims of the BMP are as follows:

- To improve the ecological condition of the subject site;
- To manage and improve the native vegetation that is broadly representative of the original plant communities at the subject site;
- To protect adjoining areas of native vegetation, and habitat for threatened species;
- Minimise impacts on biodiversity that will occur outside of the subject site as a result of the development by providing clearing protocols and fauna relocation protocols;
- To establish and enhance habitat for local fauna species with the potential to occur or known to occur within the subject site; and
- To enhance the ecological character of the subject site by systematic removal and control of weed and exotic species.

1.2. Background

1.2.1. Location

The subject land comprises Lot 3 DP805710, and is located at 181 Forest Way, Belrose, in the Northern Beaches Council (formerly Warringah) Local Government Area (LGA) (**Figure 1**). The subject land is unzoned under the *Warringah Local Environmental Plan 2011*. The subject land is bound by Forest Way to the west and residential dwellings to the north, east and south. It is approximately 2.12 ha in size and contains an existing residential dwelling in the west. The topography of the subject land varies, and the land slopes down towards the east.

1.2.2. Vegetation

The majority of the vegetation in the subject land has been cleared previously and comprises open cleared ground. Nonetheless, native vegetation communities, in various states of regeneration are present in the north and east of the subject land, and these will be retained and managed under this BMP within the subject site.

Approximately 1.46 ha of vegetation occurs within the subject site. This includes 0.08 ha of Duffys Forest Ecological Community (DFEC) (regrowing understorey). DFEC is listed as an Endangered Ecological Community (EEC) under the BC Act but is not listed under the EPBC Act. Other vegetation types present in the subject site are:

- PCT 882: Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion;
- PCT 1250: Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion;
- PCT 1783: Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (planted); and
- PCT 1786: Red Bloodwood - Silvertop Ash - Stringybark open forest on ironstone in the Sydney region (associated with Duffys Forest Ecological Community);
- Exotic Grassland.

These vegetation communities are shown on **Figure 2**.

1.2.3. Proposed Development

The proposed development in the subject land comprises the construction of a 105 bed residential aged care facility. The building footprint will be confined to the elevated building platform towards Forest Way and a surrounding landscaped area (see **Figure 3**). An access driveway to Forest Way is proposed via the south of the subject land. A deceleration lane is also proposed for construction on Forest Way, with land along the western boundary (shown on **Figure 3**) to be acquired by RMS.

Since the lodgement of the current DA in 2018, feedback has been provided by Council (Memo dated 13 February 2019). This has resulted in further amendments to the development layout, in relation to building form, bushfire protection requirements and impacts to biodiversity, in particular to Duffys Forest endangered ecological community (EEC). Consequently, the footprint of the proposed development has been reduced, and re-configured, to provide and appropriate bushfire set-backs, and retain the entire patch of Duffys Forest EEC, as shown in **Figure 3**.

Additional to the consultation with Council, a meeting with the Rural Fire Service (RFS) was attended by the proponent and bushfire consultants on 13 June 2019 to discuss the proposed changes to the development layout, and changes to exclude the Duffys Forest patch as unmanaged vegetation. The meeting resulted in a number of further changes to the development layout, including a reduction in the scale of the main building, resulting in a greater set-back from the northern and southern boundaries, and retained bushland on the adjoining properties. In order to respond to concerns from the RFS, the development layout was further modified to reduce the footprint of the main building, and increase the landscaped/paved areas at the northern and southern boundary.

The subject land will retain a large area of undeveloped land to the north and east, which will be managed as an Asset Protection Zone (APZ) (Travers Bushfire & Ecology 2019). The APZ has been divided into an Inner

Protection Zone (IPA) and Outer Protection Zone (OPA), as shown in Schedule 1, Bushfire Protection Measures (Travers Bushfire and Ecology, 2019). A portion of the APZ will be landscaped, as per the amended Landscape Management Plan (Stuart Noble Associates 2019), while the remainder of the subject land will be retained as managed bushland, according to this BMP prepared for the Project.

The amended development application has been submitted to Council with a detailed Biodiversity Development Assessment Report (BDAR) (16222 RP4), which assesses the impacts of species, populations and ecological communities listed under the *NSW Biodiversity Conservation Act 2016* (BC Act) (Cumberland Ecology 2019).

No impacts to Matters of National Environmental Significance (MNES) are predicted as a result of the proposed development, and therefore approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is not required.

1.3. Relevant Legislation

Legislation relevant to this BMP includes:

- Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);
- NSW Environmental Planning and Assessment Act 1979;
- NSW Biosecurity Act 2015;
- NSW Pesticides Act 1999; and
- NSW Biodiversity Conservation *Act 2016* (BC Act).

1.4. State and Local Government Planning Instruments

Planning instruments that relate to the development of the subject land include the following described below:

1.4.1. State Environmental Planning Policy 19 – Bushland in Urban Areas

State Environmental Planning Policies (SEPPs) deal with issues significant to the state and people of NSW. They are made by the Governor on the recommendation of the Minister for Planning and may be exhibited in draft form for public comment before being gazetted as a legal document.

SEPP 19 is designed to protect bushland in public open space zones and reservations, and to ensure that bush preservation is given a high priority when local environmental plans for urban development are prepared.

1.4.2. Warringah Local Environmental Plan 2011

The subject land is located within the Northern Beaches Council LGA and falls under the *Warringah Local Environmental Plan 2011* (Warringah LEP 2011). The subject land is unzoned under the Warringah LEP 2011.

A description of the permitted activities in unzoned areas is detailed below:

1. Development may be carried out on unzoned land only with development consent.

2. Before granting development consent, the consent authority:

    a. must consider whether the development will impact on adjoining zoned land and, if so, consider the objectives for development in the zones of the adjoining land, and

    b. must be satisfied that the development is appropriate and is compatible with permissible land uses in any such adjoining land.

2. Methodology

2.1. Literature Review

The preparation of this BMP involved a literature review to ascertain the current methods of weed control for exotic species that are present on the subject site. This literature review involved a variety of sources including government fact sheets and websites. A Cumberland Ecology staff member with prior expertise in bush regeneration was consulted during the preparation of this BMP.

The species list prepared for revegetation within the subject site includes species identified in the dominant vegetation community, PCT882, present on the subject site for revegetation, and Duffys Forest EEC (where applicable). This community will require supplementary plantings as it has been largely cleared from within the subject site. This species list is a broad list of species characteristic of the community, and does not take into account natural variation at the site level.

2.2. Flora Survey

Cumberland Ecology has previously surveyed the subject land in November 2016 for the preparation of the Flora and Fauna Assessment. Further vegetation surveys were conducted in October 2017, and March 2019 (for preparation of a BDAR).

Species lists for weed species and native species present in the subject land have been compiled from quadrat data and random meander transects undertaken during Cumberland Ecology surveys.

As the site inspection was undertaken relatively recently, an additional site inspection was not undertaken for the preparation of this BMP. Exotic species may be present in higher abundance relative to site surveys, due to additional growth, but it is unlikely that additional species are present.

3. Existing Biodiversity Values

This section presents the results of previous surveys and describes the flora and fauna of the subject site.

3.1. Vegetation Communities

The following vegetation communities are present within the subject site:

- PCT 882: Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion;
- PCT 1250: Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion;
- PCT 1783: Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (planted); and
- PCT 1786: Red Bloodwood - Silvertop Ash - Stringybark open forest on ironstone in the Sydney region (associated with Duffys Forest Ecological Community); and
- Urban Native/Exotic vegetation.

PCT 1768 is associated with Duffys Forest Ecological Community (DFEC), which is listed as an EEC under the BC Act but is not listed under the EPBC Act. Due to former clearing that has been undertaken throughout the subject land, native communities present within the subject site are in various condition states and have been categorised and described both by the Sydney Metropolitan Catchment Management Authority (SMCMA) unit name (where applicable unit applies) and condition below. The areas of each are provided in **Table 1** below.

Coastal Sandstone Damp Heath has been previously mapped on the site under the SMCMA (OEH 2013) mapping. Areas of the site may have once been consistent with this community, but occurrence of the community on the site is not currently discernible due to clearing and it has not been mapped as currently occurring (See ***Section 3.1***).

Table 1 Vegetation communities and areas within the subject site

Vegetation Community	Area (ha)
PCT 882: Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion	0.72
PCT 1250: Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	0.11
PCT 1783: Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (planted)	0.02
PCT 1786 (Duffys Forest EEC): Red Bloodwood - Silvertop Ash - Stringybark open forest on ironstone in the Sydney region	0.06
Total	**1.15**

Descriptions of each of the vegetation communities are provided below.

3.1.1. Red Bloodwood - Silvertop Ash - Stringybark open forest on ironstone in the Sydney region

Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation)

Vegetation Class: Sydney Coastal Dry Sclerophyll Forests

TEC Status: Endangered Ecological Community (EEC)

3.1.1.1. General Description

Red Bloodwood – Silvertop Ash – Stringybark open forest on Ironstone in the Sydney Basin, which corresponds to Duffys Forest Endangered Ecological Community as listed under the BC Act, covers 0.08 ha in the north of the subject land. It occurs as an open forest with some scattered shrubs (**Photograph 1**), though much of the shrub layer and ground layer are in a state of regrowth following former clearing. The community is situated on a ridgetop, at the highest point within the subject land.

The characteristic canopy species is *Eucalyptus sieberi* (Silvertop Ash), with other native trees being *Corymbia gummifera* (Red Bloodwood) and *Eucalyptus globoidea* (White Stringybark). Characteristic shrubs for DFEC present within the subject land are *Phyllota phylicoides* (Heath Phyllota), *Acacia ulicifolia* (Prickly Moses), *Leptospermum trinervium* (Flaky-barked Tea-tree), *Persoonia levis* (Broad-leaved Geebung) and *Lambertia formosa* (Mountain Devil). Many of the shrub species within the community are juveniles in the early stages of regrowth or as coppiced regrowth from cut stumps.

The ground layer includes indigenous species such as *Pteridium esculentum* (Common Bracken), *Entolasia stricta* (Wiry Panic), *Lepidosperma laterale*, *Cyathochaeta diandra*, *Patersonia sericea* (Silky Purple-flag), *Lomandra glauca* (Pale Mat-rush), *Xanthorrhoea media* and *Lomandra obliqua*. Some exotic species are present including *Cirsium vulgare* (Spear Thistle), *Plantago lanceolata* (Lamb's Tongues), *Ehrharta erecta* (Panic Veldtgrass) and *Paspalum dilatatum* (Paspalum).

A full flora species list is provided in **Appendix A**.

The vegetation within the north of the subject land is considered to conform to DFEC due to a combination of the canopy, understorey and groundcover species, elevation and soil type. The elevation of the subject land where DFEC occurs is 175 m above sea level (asl) which is consistent with the Duffys Forest community (which occurs between 100 – 300m asl). The community on the subject land is also of an open forest to woodland structure, typical of Duffys Forest and the natural soil of the subject land contains a sandstone influence with some ironstone nodules present.

Photograph 1 Red Bloodwood – Silvertop Ash – Stringybark open forest present on the subject land, outside of the development site

3.1.2. Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion

Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation)

Vegetation Class: Heathlands

TEC Status: Not listed

3.1.2.1. General Description

Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion with a regrowing understorey occupies an area of 0.75 ha in the subject land and occurs below the ridgeline on south facing slopes and in the east of the subject land on the flat and the gradual gradient toward the east. Generally, this area is quite open with scattered canopy trees and a sparse shrub layer (**Photograph 2**). Canopy species include *Corymbia gummifera* (Red Bloodwood), *Eucalyptus globoidea* (White Stringybark), *Allocasuarina distyla* (Scrub She-oak), *Allocasuarina littoralis* (Black She-oak) and *Eucalyptus haemastoma* (Scribbly Gum). The canopy species are stunted due to shallow soils.

A diversity of native shrub species in the early stages of regrowth are present. Native shrubs include *Platysace linearifolia*, *Woollsia pungens, Epacris crassifolia*, *Pultenaea stipularis* (Handsome Bush-pea) and *Acacia longifolia* subsp. *longifolia* (Sydney Golden Wattle). Exotic shrubs present include *Senna pendula* and *Solanum mauritianum* (Wild Tobacco Bush).

The ground layer of this community in the study area is comprised predominately of native species including *Gleichenia dicarpa* (Pouched Coral Fern), *Xanthosia pilosa* (Woolly Xanthosia), *Actinotus minor* (Lesser Flannel Flower), *Actinotus helianthi* (Flannel Flower), *Pteridium esculentum* (Common Bracken), *Caustis pentandra* (Thick Twist Rush) and *Lomandra glauca* (Pale Mat-rush). Exotic species present include *Bidens pilosa* (Cobblers Pegs), *Cirsium vulgare* (Spear Thistle), *Trachelospermum jasminoides* (Star Jasmine) and *Paspalum dilatatum* (Paspalum).

This is a regenerating community, with a lack of floristic diversity, and the condition is considered to be moderate.

Photograph 2 Hairpin Banksia - Slender Tea-tree heath present on the development site

3.1.3. Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion

Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation)

Vegetation Class: Sydney Coastal Dry Sclerophyll Forests

TEC Status: Not listed

3.1.3.1. General Description

This community occurs in the south-east corner of the subject land (0.11 ha) in the lowest elevation. It consists of a canopy of one large *Eucalyptus piperita* (Sydney Peppermint), and several smaller, younger trees of *Eucalyptus piperita*, *Eucalyptus sieberi*, *Angophora costata*, and *Glochidion ferdinandi* (Cheese Tree). The shrub and ground layer have been cleared as with elsewhere on the subject land, and regrowing species of shrubs include *Leptospermum polygalifolium* (Tantoon), *Hakea propinqua*, *Persoonia pinifolia* (Pine-leaved Geebung), and *Bauera rubioides* (Dog Rose) (**Photograph 3**).

The ground layer ranges from native regrowth to dominated by exotic weed species. Native species present include *Xanthosia tridentata*, *Dampiera stricta, Lepidosperma laterale*, *Gleichenia dicarpa* (Pouched Coral Fern), and the grasses *Lachnagrostis filiformis* (Blown Grass), and *Imperata cylindrica* (Blady Grass).

Exotic species in the ground layer include *Ageratina adenophora, Cenchrus clandestinus* (Kikuyu), *Paspalum dilatatum*, *Cyperus eragrostis*, and *Bidens pilosa*. The condition is considered to be low.

Photograph 3 Sydney Peppermint - Smooth-barked Apple - Red Bloodwood shrubby open forest on slopes of moist sandstone gullies

3.1.4. Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (Planted)

Vegetation Formation: Dry Sclerophyll Forests (Shrubby sub-formation)

Vegetation Class: Sydney Coastal Dry Sclerophyll Forests

TEC Status: Not listed

Planted Urban Native and Exotic Vegetation is present throughout the west of the subject land near the residential dwelling (**Photograph 4**). Canopy trees present include planted non-indigenous natives such as *Casuarina glauca* (Swamp Oak), *Eucalyptus globulus* subsp. *globulus*, *Eucalyptus cladocalyx* (Sugar Gum), *Lophostemon confertus* (Brush Box) and *Syzygium paniculatum* (Magenta Lilly Pilly). Some remnant native trees are present which include *Syncarpia glomulifera* (Turpentine), *Acacia decurrens* (Black Wattle), *Pittosporum undulatum* (Native Daphne) and *Eucalyptus haemastoma* (Scribbly Gum). Many exotic trees have been planted throughout the west of the subject land such as *Liquidambar styraciflua*, *Syagrus romanzoffiana* (Cocos Palm), *Pinus radiata* (Radiata Pine), *Schinus areira* (Pepper Tree) and *Jacaranda mimosifolia* (Jacaranda).

Shrubs include exotic species *Harpephyllum caffrum* (Kaffir Plum), *Erythrina crista-galli* (Cockspur Coral Tree), *Senna pendula*, *Cotoneaster glaucophyllus* and *Ochna serrulata* (Mickey Mouse Plant). Remnant indigenous *Angophora costata* (Sydney Red Gum) and planted non-indigenous natives also occur: *Syzygium australe* (Brush

Cherry) and *Tristaniopsis laurina* (Water Gum). Groundcover is predominantly exotic grasses such as *Cynodon dactylon* (Couch), *Ehrharta erecta* (Panic Veldtgrass) and *Cenchrus clandestinus* (Kikuyu Grass) maintained by mowing as a lawn. The condition is low planted.

As the majority of the 'urban native and exotic vegetation' present on the subject land has been planted, the few remnant trees present; *Syncarpia glomulifera*, *Acacia decurrens*, *Pittosporum undulatum* and *Eucalyptus haemastoma*, and the landscape position (on a ridge-top) were used as a guide for assigning the best-fit PCT. Further details regarding justification for this PCT selection are set out in the BDAR (our ref. 16222 RP4).

Photograph 4 Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (Planted)

3.2. General Flora Species

Over 160 flora species have been recorded throughout the subject site during surveys. The dominant plant families encountered within the subject site have consistently been represented by the Cyperaceae, Poaceae, Proteaceae, Fabaceae, Asteraceae and Myrtaceae, families. Species present within the subject site consists of a mix of native species (60%) and exotic/non-endemic native planted species (40%). The full flora list is provided in **Appendix A**.

3.3. Threatened Species

3.3.1. Flora Species

One individual of *Syzygium paniculatum* (Magenta Lily Pilly) was recorded in the north west of the subject site. This species is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. It occurs in subtropical and littoral rainforest within a narrow coastal strip between Upper Lansdowne and Conjola State Forest (OEH 2016). This species is not considered to be locally indigenous to the subject site and therefore its conservation significance is reduced. This species has been observed to be planted in gardens and roadside verges within the locality.

Two individuals of *Eucalyptus scoparia* was recorded in the north west of the subject site. This species is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. In NSW *Eucalyptus scoparia* (Wallangarra White Gum) occurs naturally in only three locations near Tenterfield (OEH 2012). This species is not considered to be locally indigenous to the locality and therefore its conservation significance is reduced. It is commonly planted in landscaped areas in the Sydney region.

No naturally occurring threatened flora species have been recorded within the subject site or are likely to occur. Potential habitat is available for some species within the forest areas but none were sighted during the survey or have been previously recorded in the subject site.

3.3.2. Fauna Species

No threatened fauna species have been recorded from the subject site. However, a number of threatened fauna species are considered to have the potential to occur in the subject site. Those most likely to occur are highly mobile species likely to be foraging in the area, although breeding habitat for many of these species is limited. An overview and detailed analysis of fauna species is outlined in Sections 5.2 and 5.3 of the BDAR (our ref. 16222 RP4), along with a complete listing of candidate species outlined in RP4 - Tables 5.1 and 5.2.

4. Management Zones

The subject site has been divided into management zones based on vegetation condition and the specific management objectives required for each area. These zones are:

- Zone 1 – Regenerating PCT 1786 (Duffy's Forest EEC), managed for weed control. Not included as part of the APZ;
- Zone 2 – Regenerating PCT 882 and degraded PCT 1783, managed for weed control and planting as part of the IPA;
- Zone 3 –Regenerating PCT 882 and degraded PCT 1250, managed for weed control, and planting as part of the OPA; and
- Zone 4 – Cleared / Exotic land managed for weed control and planting as part of the IPA.

The management zones are shown in **Figure 4**.

In addition, the entire subject site, excluding the area of Duffys Forest, is required to be managed as an Asset Protection Zone (APZ) for bushfire requirements, which is divided into an Inner Protection Area (IPA) and Outer Protection Area (OPA), as shown in **Figure 4**.

The objectives for the IPA and OPA are provided below, followed by the objectives of management within each management zone.

4.1. Asset Protection Zones

The IPA and OPA will be managed as described in the Bushfire Impact Assessment for the proposed development (Travers Bushfire & Ecology 2019), and to the standard specified in the Planning for Bushfire Protection guidelines prepared by the Rural Fire Services (RFS) (NSW Rural Fire Service 2006).

4.1.1. Inner Protection Area (IPA)

Fuel loads within the IPA are to be maintained so it does not exceed 4t/ha.

Trees are to be maintained to ensure:

- Canopy cover does not exceed 15%;
- Trees (at maturity) do not touch or overhang the building;
- Tree canopies (at maturity) should be well spread out and not form a continuous canopy;
- Lower limbs should be removed up to a height of 2m above ground; and
- Preference should be given to smooth barked and evergreen trees.

Shrubs are to be maintained to ensure:

- Large discontinuities or gaps in vegetation;
- Shrubs should not be located under trees;

- Shrubs should not form more than 10% of ground cover; and
- Clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass cover is to be maintained to ensure:

- A height of 10cm or less; and
- Leaves and debris are removed.

4.1.2. Outer Protection Area (OPA)

Fuel loads within the OPA are to be maintained so it does not exceed 8t/ha.

Trees are to be maintained to ensure:

- Canopy cover does not exceed 30%;
- Trees should have canopy separation;
- Shrubs are to be maintained to ensure:
- They do not form a continuous canopy; and
- Shrubs should be no more than 20% of ground cover.

Grass is to be maintained to ensure:

- Height of 10cm or less; and
- Leaves and debris is mown, slashed or mulched.

4.2. Vegetation Management Zone Objectives

4.2.1. Zone 1

This zone is the most environmentally sensitive area, containing the DFEC EEC, and the most intact areas of PCT 1786: Red Bloodwood - Silvertop Ash - Stringybark open forest on ironstone in the Sydney region present on the subject site. This zone will be targeted as a priority. The objective of this zone is to retain, protect and improve the condition of existing remnant forest communities through continued weeding. The natural regeneration potential is high in Zone 1, and only natural bush regeneration activities are to occur. Supplementary planting will only be used to fill gaps, where natural regeneration does not occur.

Within the first year of commencement of the BMP, the following actions commence within Zone 1:

- All native trees proposed for retention, as well as any occurrences of native groundcover or understorey will be demarcated and retained;
- All exotic species will be removed; and

- The soil will be stabilised through a combination of jute matting, mulch or native grasses if required.

In every subsequent year of implementation of the BMP, follow up weeding will be undertaken to remove any exotic species that may have grown from the existing soil seed bank.

4.2.2. Zone 2

This zone comprises regenerating PCT 882 Hairpin Banksia - Slender Tea-tree heath on coastal sandstone plateaux, Sydney Basin Bioregion and degraded PCT 1783 Red Bloodwood - Scribbly Gum / Old-man Banksia open forest on sandstone ridges of northern Sydney and the Central Coast (planted), in which the understorey has largely been cleared or consists of predominantly exotic species. The objective of this zone is to remove exotic species from the ground layer and understorey, and plant clumps of characteristic shrub and groundcover species, to the specifications of an IPA. As this zone includes communities that have previously been cleared, and also exotic grassland, this zone will include supplementary plantings.

For supplementary plantings, preference should be given to naturally occurring native species already present, however other native species typical of the community can also be planted (see **Appendix B** for planting list).

For the purpose of bushfire management, the clumping of shrubs can occur and should be about 5-10% cover of the total zone. The clump size should not be greater than $5m^2$ and these clumps of shrubs should not be located under trees. Grasses are to be maintained at a height of less than 10cm.

The following actions will be required in this zone:

- All native trees proposed for retention, as well as any native groundcover or understorey, will be demarcated and retained;
- All exotic shrubs, understorey, mid-storey and canopy will be removed;
- Planting of ground layer, shrub and canopy will be undertaken, where supplementary planting is required, and to the specifications of an IPA; and
- The soil will be stabilised through a combination of jute matting, mulch or native grasses if required.

In every subsequent year of implementation of the BMP, follow up weeding will need be undertaken to remove any exotic species that may have grown from the existing soil seed bank.

4.2.3. Zone 3

This zone comprises of the full extent of the OPA, which includes degraded and previously cleared PCT 1250 and regenerating PCT 882. This community is in better condition in the north as it contains canopy, scattered understorey and groundcover layers. However, the majority of the community has been cleared within the subject site and overall comprises of scattered trees with occasional native shrubs or groundcover. Some cleared areas are dominated by weeds which have proliferated following disturbance. The objective of this zone is to reduce exotic species abundance in the ground layer and understorey, and to undertake supplementary plantings of native species typical of this community to improve the overall biodiversity. As this

zone includes communities that have previously been cleared, management actions in this zone will include supplementary plantings.

For supplementary plantings, preference will be given to naturally occurring native species already present, however other native species typical of the community can also be planted (see **Appendix B** for planting list).

For the purpose of bushfire management, the planting of shrubs can occur throughout this zone and should be about 20% cover of the total zone. Ground cover species, including grasses and herbs can be planted throughout this zone, to be maintained at a height of less than 10cm.

Within the first year of commencement of the BMP, the following actions will commence within Zone 3:

- All native trees as well as any areas of native groundcover or understorey will be demarcated and retained;
- All exotic shrubs, understorey, mid-storey and canopy will be removed;
- Planting of ground layer, shrub and canopy will be undertaken; and
- Soil stabilisation with a combination of jute matting, mulch or direct seeding of native grasses if required.

In every subsequent year of implementation of the BMP, the following actions will be undertaken:

- Follow up weeding to remove any exotic species that may have grown from the existing soil seed bank; and
- Replacement of any failed plantings.

4.2.4. Zone 4

This zone comprises predominantly exotic species and cleared areas, including an existing sandstone access track. The objective of this zone is to remove exotic species from the ground layer and understorey, and plant clumps of characteristic shrub and groundcover species, to the specifications of an IPA. As this zone includes communities that have previously been cleared, and also exotic grassland, as such this zone will include supplementary plantings.

For supplementary plantings, preference should be given to naturally occurring native species already present, however other native species typical of the community can also be planted (see **Appendix B** for planting list).

For the purpose of bushfire management, the clumping of shrubs can occur and should be about 5-10% cover of the total zone. The clump size should not be greater than $5m^2$ and these clumps of shrubs should not be located under trees. Grasses are to be maintained at a height of less than 10cm.

The following actions will be required in this zone:

- All exotic shrubs, understorey, mid-storey and canopy will be removed;
- Planting of ground layer, shrub and canopy will be undertaken, where supplementary planting is required, and to the specifications of an IPA;

- The soil will be stabilised through a combination of jute matting, mulch or native grasses if required;
- The sandstone access road will be retained as a cleared track for access purposes.

In every subsequent year of implementation of the BMP, follow up weeding will need be undertaken to remove any exotic species that may have grown from the existing soil seed bank.

5. General Biodiversity Management Measures

This section outlines the general biodiversity management measures that will be implemented to minimise the impacts on native flora and fauna. This includes vegetation clearing protocols and actions to be undertaken outside of the subject site.

5.1. Marking Limits of Vegetation Clearing

Prior to clearing for the proposed development, the edge of the vegetation to be cleared will be delineated. Clearing limits can be marked with high visibility tape, fencing, or other appropriate boundary markers. To avoid unnecessary damage to vegetation or inadvertent habitat removal, disturbance is to be restricted to the delineated area. No stockpiling of equipment, soils, or machinery will occur beyond the boundary.

The person responsible for the clearance activities will be responsible for ensuring that the boundary markers are installed to enable the suitable environmental and technical inspections of the proposed disturbance to be undertaken.

5.2. Fencing of Native Vegetation to be Retained

All native vegetation that is to be retained on the subject site will be fenced off with temporary exclusion fencing to prevent inadvertent damage to vegetation. Temporary fencing will be of high visibility flagging tape to visually delineate the native vegetation to be retained. Metal fencing would not be feasible as the subject site is situated on a slope. This fencing is to remain in place until all works have been completed within the area. No vehicles or machinery will be permitted to enter areas of native vegetation to be retained.

5.3. Pre-clearing Surveys

Some canopy trees will need to be removed from within the development area and some trees may be removed from within DFEC in the subject site to ensure that a continuous canopy is not present for bushfire management purposes. Prior to the commencement of clearing, a pre-clearing survey will be undertaken by a certified ecological consultant to identify the native flora and fauna habitat that has the potential to be disturbed during clearing. This includes nests, significant rock outcrops and in particular trees bearing hollows that have potential to contain species such as bats, gliders, possums, reptiles and birds. Trees containing hollows or nests that have a high potential to contain fauna will be identified, recorded, flagged with fluorescent marking tape, and marked with a large "H" using spray paint on two sides of the tree.

The location of suitable nearby habitat for the release of fauna that may be encountered during the pre-clearing process will be identified and marked on a map prior to clearance works. Any fauna utilising the area will be recorded, and where possible, these will be encouraged to leave the area. The ground around each tree will be inspected for scats, and the trees for scratch marks.

5.4. Fauna Relocation and Clearing Protocols

On the day of any clearing, licensed ecologists will capture and/or remove fauna that have the potential to be disturbed as a result of clearing activities. These fauna will be relocated into pre-determined habitat identified for fauna release. All fauna handling will be carried out by licensed ecologists.

The clearing will be conducted using a two-stage clearing process:

1. Trees marked with an "H" by the ecologist will not be cleared during the first instance of vegetation clearing in an area; however all vegetation around the tree will be cleared so that the tree is isolated. Other habitat features marked with an "H", such as logs and log piles, will be supervised during clearing.

2. Identified habitat trees will be left to stand overnight after stage 1 clearing to allow resident fauna to voluntarily move from the area.

The two-stage clearing process enables fauna to self-relocate overnight, when foraging typically occurs. Fauna are not likely to re-inhabit trees, as all adjacent vegetation has been cleared.

The ecologist will be present while clearing to rescue animals injured during the clearance operation. Any fauna found will be captured and relocated to nearby remnant vegetation and released after nightfall to minimise the risk of predation by predators. Any animals that are inadvertently injured will be taken to the nearest veterinary clinic for treatment, or if the animal is unlikely to survive, it will be humanely euthanized. The clinics should be notified to ensure they are able to treat injured animals.

All persons working on the vegetation clearing will be briefed about the possible fauna present at the time of construction, and what procedures should be undertaken in the event of an animal being injured or disturbed. A qualified ecologist will be on call at all times during clearing.

Results and outcomes of pre-clearing and clearing fauna surveys shall be documented by the ecologist and submitted to the proponent. This includes:

- Species and numbers of individuals recorded;
- Incidence of sick or injured animals and the actions taken to care for the fauna; and
- The species and numbers of individuals that were relocated.

If a new threatened species is identified that has not previously been identified as having potential to occur, the occurrence will be surveyed and fully documented. Results will be made available to the Environment, Energy and Science Group (EES), as part of the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and to the Commonwealth Department of the Environment and Energy (DoEE) (if it is a species that is a Matter of National Environmental Significance).

5.5. Salvage of Bushrock, Hollow-bearing Trees, Hollow-bearing Logs and other Woody Material

Any fauna habitat features present in the development area are to be salvaged during clearing and stockpiled for future use in restoration of the subject site. Habitat features are to be stored until such time as restoration of the retained vegetation commences. Placement of stored habitat features within retained bushland areas will be undertaken in co-ordination with the Bushland Regeneration Contractor (BRC) or the ecologist.

5.5.1. Tree Hollows

Any trees with hollows from clearing areas (within the proposed development or trees removed from DFEC for bushfire requirements) are to be salvaged and relocated within the subject site. If adequate hollows cannot be

salvaged, then nest boxes can be installed as an alternative. Nest boxes of various sizes should be installed in order to cater for different native species. These can be placed within Zone 1, 2 or 3.

5.5.2. Logs, Bushrock and Other Woody Material

Any logs or bushrock that can be salvaged from clearing areas are to be relocated within the subject site, and with respect to the requirements of any bushfire management plan in place for the subject site. Logs and bushrock are used by a variety of invertebrate and vertebrate species as microhabitat areas, and for activities such as basking for reptiles. Any existing logs/bushrock on the subject site will be retained *in situ,* and with respect to the requirements of any bushfire management plan in place for the subject site. Hand weeding can occur around these habitat features.

6. Weed Management Plan

6.1. Species Lists

Weeds identified by Cumberland Ecology as occurring within the subject site and subject land make up the weed species lists used for the basis of this Weed Management Plan (refer to **Appendix A**). A list of control methods for specific weeds recorded is provided in **Appendix C**.

Introduced species listed as State Priority Weeds for the Greater Sydney Area under the *NSW Biosecurity Act 2013 or* Weeds of National Environmental Significance (WONS) recorded on the subject land are listed in **Table 2** below.

Table 2 Priority weeds and WONS recorded on the subject land

Species Name	Common Name	Category	Legal Requirements
Lantana camara	Lantana	Prohibition of dealings WONS	Must not be imported into the State or sold
Cortaderia selloana	Pampas Grass	Regional recommended measures	Land managers mitigate the risk of the plant being introduced to their land. Land managers prevent spread from their land where feasible. Land managers reduce the impact on priority assets. The plant should not be bought, sold, grown, carried or released into the environment.
Asparagus aethiopicus	Ground Asparagus	Prohibition on dealings/ WONS	Must not be imported into the State or sold

Environmental weeds listed as 'Other Weeds of Regional Concern' in the Greater Sydney Regional Strategic Weed Management Plan 2017 2022 (LLS: Greater Sydney 2017), are also present on the subject land, and the control of these species will assist in the regeneration of the native vegetation communities present. They have been identified as a potential risk in some (not all) situations, and can threaten biodiversity. Listed weeds of regional concern include; *Ageratina adenophora* (Crofton Weed), *Andropogon virginicus* (whisky Grass), *Arundo donax* (Giant Reed), *Chloris gayana* (Rhodes' Grass), *Erythrina crista-galli* (Cockspur Coral Tree), *Ochna serrulata* (Ochna), *Ligustrum sinense* (Small-leaved Privet), *Lilium formosanum* (Formosan Lily), *Hypericum perforatum* (St John's Wort), *Lonicera japonica* (Japanese Honeysuckle), *Pinus radiata* (Radiata Pine), *Solanum mauritianum* (Wild Tobacco Bush), and *Syagrus romanzoffiana* (Cocos Palm).

6.2. Weed Management in the Subject Site

Weed control methods for all weeds recorded as occurring on the subject land are provided in **Appendix C**. The directions under the following headings should be undertaken sequentially during site preparation.

6.2.1. Site Preparation

6.2.1.1. Sediment Fencing

The subject site is situated on a slope so would inevitably result in runoff of surface soil after initial weed management works. Temporary silt sediment fencing may need to be installed around parts of the subject site to prevent soil runoff, especially after heavy rainfall events downslope.

6.2.2. Best Management Practice

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

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

6.2.3. Weed Control Methods

Weed control is to be undertaken for all management zones in the subject site. Regeneration works should be approached using the strategies outlined below.

6.2.3.1. Manual Weed Removal

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

6.2.3.2. Mechanical Weed Removal

The BRC can manually clear smaller plants with mattocks, brushcutters or other suitable equipment. The root structures of large exotic shrubs and trees should be retained in order to stabilise the soil.

6.2.3.3. Use of Herbicides

All herbicides should be used according to recommendations on the herbicide label. Appropriate Personal Protective Equipment (PPE) should be worn and consideration given to time of day, likelihood of rainfall, wind direction and likely impact on native species as per guidelines on the label. Use of glyphosate will be appropriate for most species. Glyphosate is the preferred herbicide for use in environmentally sensitive areas as it is rapidly broken down by microbes in the soil so residue is short lived and will not affect remnant and planted native individuals in the long term following application.

It is important to note that there can be legal restrictions and permit requirements for use of specific herbicides for specific plants, and chemical labels and permit requirements always need to be researched prior to herbicide application. While the recommended methods for weed treatment detailed in **Appendix C** are effective, some will require a permit to be undertaken. The relevant permit number is PER9907. Herbicide permits need to be obtained from the Federal Government body, the Australian Pesticides and Veterinary Management Authority.

Manual and mechanical removal will be an appropriate form of control for some species, and all chemical treatment should be carried out in accordance with best practice guidelines.

Planting should not occur within 10 days of herbicide application.

6.2.3.4. Laying of Weed Suppression Materials

Several days after the second application of herbicide across the subject site, weed suppression materials will be installed across the soil surface. This will inhibit germination of weed seeds, inhibit vegetative regrowth of resilient weed species, and prevent soil runoff of surface soils during rain in the period until native plantings have become established to prevent erosion. Weed suppression material can be a form of biodegradable matting such as jute matting and would be utilised in combination with other measures including pine mulch.

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

Jute matting, or any other form of weed suppressant will inhibit regrowth of weeds, but will also inhibit germination of native plants. For this reason, weed suppression matting should only be used initially when intensive weed control is needed, and be allowed to biodegrade over time without being reapplied, unless required during the establishment period. Following application of weed suppression materials Management zones 2 and 3 will be planted out with native plants as per ***Section 7***.

6.2.4. Staging of Weed Control

6.2.4.1. Primary Weeding

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

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

The first priority for weed treatment in the subject site will be targeting mature individuals of the listed and problematic weed species recorded on the site, such as *Lantana camara* (Lantana) and *Ligustrum sinense* (Small-leaved Privet). These species are perennial and take several years to reach reproductive maturity so are easily controlled providing juveniles are continuously eradicated before reaching maturity.

The goal of primary weeding for the subject site will be to eliminate all the larger weed infestations to allow planting to take place to fill gaps in the understorey and canopy without competition from weed species.

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

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

6.2.4.2. Follow-up Weeding

Follow-up weeding should be undertaken in areas that have undergone primary weed treatment in the preceding months, to treat any regrowth of woody weeds. Follow-up weeding will need to be undertaken over a 12 month period after primary weeding has occurred. Due to the exotic species present in the subject site, it is expected that the seed bank will contain weed seeds that will continue to germinate over this time period.

Follow-up weeding involves the selective removal or treatment of weeds, whilst allowing regenerating or planted native plants to grow. All weeds should be targeted during the follow-up weeding phase. Follow-up bushland regeneration works are likely to be required at least every month until weed abundance is negligible. Site visits may be more frequent if it is determined necessary.

It is recommended that woody weeds, climbers, and key herbaceous weeds (which are highly likely to be much more prevalent after clearing) are subject to a programme of intense follow up weeding around any patches of regenerating native herbaceous plants to encourage the spread of the native plant species.

6.2.4.3. Maintenance weeding

A five year maintenance period has been allowed for this plan, and maintenance weeding will be implemented for a minimum period of five continuous years, after primary weeding and revegetation works have commenced. Maintenance weeding would likely overlap with staged weed removal. After the five-year follow-up and maintenance period has been completed, a review will be conducted to determine on-site maintenance requirements. The following sequential steps are recommended to manage each area of the subject site effectively for each site visit:

1. Initially the bushland regeneration team visiting the subject site should sweep from one end to the other. During this sweep weeds occurring alongside native plants should be removed by hand and any weed occurring within a patch of dominant native plants (such as a patch of grasses). During this sweep regrowth

individuals of harder to manage weeds that require other techniques such as sawing, digging, drilling etc. should be targeted.

2. A member of the team should then sweep the entire area, spraying all regrowth weeds between native plantings/remnant natives in open areas with herbicide, and spot spraying where possible in regeneration areas.

It is important during site visits for ongoing weed maintenance that as many weeds as possible are controlled so individuals are not able to achieve maturity and set seed between site visits. Some weed species such as *Bidens pilosa* (Cobbler's Pegs) are prolific seeders, and many exotic plants can have seed that remains viable in the soil for long periods of time. In order to effectively diminish the soil seed bank occurrences of exotic species it is important that individuals are not allowed to set seed.

During site visits for weed control, Priority weeds and WONS (**Table 2**) should be prioritised for control. Individual plants of these species on site should not be allowed to achieve a reproductive stage in their life cycles.

Temporary sedimentation and erosion control fencing should be retained until it has been determined that plants have established sufficiently to prevent surface soil runoff.

7. Revegetation Plan

7.1. Objectives

This section provides details of revegetation that will take place in Management Zones 2, 3 and 4, and guidelines for ongoing maintenance of vegetated areas (including weed control). Areas with existing canopy coverage will largely be left to re-generate naturally with ongoing and sustained weed eradication.

The aim for the vegetation to be revegetated is to achieve the following performance based outcomes:

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

7.2. Species Selection and Planting Densities

7.2.1. Species Selection

Within Management Zones 2, 3 and 4, a mix of local native trees, shrubs, and ground layer plants will be replanted at the specified densities outlined below. Appropriate plant species for restoration of PCTs 882, 1250, 1783 and 1786 within the subject site are provided in **Appendix B**, and are to be used for selection for re-vegetation within Zone 2, Zone 3 and Zone 4.

Please note that this is a comprehensive list which includes herbaceous species. All plants should be disease and pest-free, hardened off and well-watered at the time of planting. All plants should be healthy and good root development and a sturdy shoot system.

Final species selection will be based upon:

- Species availability;
- Exclusion of plants likely to naturally regenerate on the site; and
- Previous experience with species performance in revegetation.

7.2.2. Planting Densities

The recommended revegetation planting specifications for the subject site are as follows:

- Zone 2 and Zone 4:
    - Shrubs to cover between 5-10% of area, with clump size not exceeding 5m2. No shrubs are allowed to be planted under trees.

- Groundcovers (including grasses) to be planted in clumps/thickets, to cover between 10-20% over the entire zone (but not allowed to exceed over 10cm in height); and
- Trees are to be maintained to ensure overall canopy cover does not exceed 15%, and mature trees do not touch/overhang buildings and do not form a continuous canopy, with lower limbs removed up to a height of 2 m above ground.

- Zone 3
  - Shrubs to cover between 15-20% of area.
  - Groundcovers (including grasses) to cover between 40-60% (but not allowed to exceed over 10cm in height); and
  - Trees are to be planted and maintained to ensure overall canopy cover of 15-20%, and mature trees do not touch/overhang buildings and do not form a continuous canopy, with lower limbs removed up to a height of 2 m above ground.

7.2.3. Plant Supply

Plantings to be planted will be sourced from local provenance stock. These may come from seed collections or cuttings taken from within the existing remnant vegetation within the subject site and the wider locality and from additional sources such as from the BRC.

It may be necessary to collect seed locally, in order to grow the numbers of plants required. Seed should be collected using principles prescribed in 'Bringing the Bush back to Western Sydney' (DIPNR 2003). Seeds and vegetative propagules should be of local provenance from within Northern Beaches Council LGA, and not more than 10 kilometres from the site.

It may be necessary to provide seed to specialist native nurseries so as to be contract grown. Local native plants should be grown in "Hiko" tube, maxi cell or viro-tube, or Forestry Tube-type containers.

7.3. Maintenance of Plantings

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

Provision will be made to water revegetated areas, as required, in the first 3 months after installation, (on at least 4-5 occasions, depending on rainfall conditions, more watering if required).

Re-growing environmental weeds will be closely monitored and controlled using ecologically sensitive bushland regeneration hand weeding and spot-spraying methods, to ensure adequate weed control and native plant establishment (see ***Section 6***). Weeding inside each planting bag by hand or selective herbicides will be conducted, as well as in an approximate 50 cm radius around the outside of each plant.

Plants that have died will be replaced as required. Plants that have died will be replaced by the bushland maintenance team with a planting of the same form during the next site visit by the team. At the end of the maintenance period the density of living planted plants should be as outlined in ***Section 7.2.2***.

7.4. Management of Ground Fuel Loads

Following the establishment of canopy plantings, a ground fuel assessment will be undertaken by a suitably qualified bushfire ecologist if required. This assessment will inform the future management of the site with regards to the manual removal of ground fuels and hazard reduction burns. The assessment will provide clear directions as to the amount of ground fuel to be removed annually, and a timeline for works. Annual monitoring will be undertaken by a bushfire ecologist to ensure that targets are being met.

8. Monitoring and Reporting

It is recommended that a project manager/supervisor with the BRC be assigned to coordinate, supervise and manage all works and correspondence with respect to the restoration of the subject site. The project manager must be available for the duration of the project and become familiar with the site and progress of all aspects of works undertaken.

The project manager will be responsible for allocation of maintenance tasks to personnel in response to establishment issues and other factors as monitoring results are reported (e.g.: plant losses/re-planting, weed control, irrigation). Regular monitoring and feedback from personnel will assist in the allocation of labour relative to available funds.

8.1. Monitoring Program

The following activities will be conducted as part of the monitoring program:

- Two monitoring points should be established as a minimum within each management zone;
- Take photographs annually from each monitoring point. Compare photographs to previous years;
- Use the photograph point to form a corner of a 20 x 20 m quadrat at each monitoring point. Note any weeds occurring in the quadrat and state relative abundance of weed species (using Braun-Blanquet scale), as well as projective foliage cover of native species in each strata. Record numbers of failed plantings in each quadrat; and
- Note any other weed outbreaks in the regeneration and restoration areas. This can be done while walking between monitoring points.

Monitoring will be conducted before weed control commences, then once every month while reconstruction works are undertaken. Once initial plantings are complete, monitoring will be conducted every three months for the next year, then every six months after that for the life of the BMP (5 years).

During the period of six-monthly monitoring, if maintenance weeding is conducted, each patch of land where weed control has occurred should be checked approximately a month afterwards, or after rain, in order to determine whether more weeding is required.

8.2. Reporting

A brief and concise report should be submitted every six months for the life of the BMP. This report will be forwarded to Northern Beaches Council and will provide a record of the implementation of the BMP. The report will:

- Describe the reconstruction works undertaken;
- State the findings of the monitoring activities;
- Discuss any problems encountered in implementing the BMP; and
- Recommend any adaptations or additions to the BMP.

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

9. Timing and Responsibilities

9.1. Schedule of Works

It is expected that the full extent of works for this BMP would be undertaken over a five year period. The majority of the works, including exotic tree and weed removal and revegetation will be undertaken in the first year of the BMP. Subsequent years will involve weed management, monitoring and supplementary revegetation in Management Zones 2, 3 and 4.

The measures that will be conducted over this time period are as follows:

9.1.1. Short Term: Year 1 and 2

- Fencing;
- Weed control;
- Planting of canopy, shrub, and groundcover species in Zone 2, Zone 3 and Zone 4;
- Replacement of any tube stock individuals that have died between site visits;
- Management fuel loads in accordance with bushfire requirements; and
- Monitoring, management and reporting.

9.1.2. Long Term: Years 3, 4, and 5

- On-going weed control in accordance with any specific Northern Beaches Council weed management practices;
- Replacement of any tube stock individuals that have died between site visits; and Monitoring, management and reporting in accordance with Northern Beaches Council policy.

9.1.3. Timing and Responsibilities

- Short and long-term tasks have been further divided into a series of phases as follows:
- Short-term Tasks:
- Phase 1 – Site Preparation; and
- Phase 2 – Restoration Works Commence;
- Long-term Tasks
- Phase 3 – Maintenance; and
- Phase 4 – Monitoring and Reporting.

Timing and responsibilities at each phase of management within the management zones are shown within **Table 3**. The timing and responsibilities during fauna clearing is shown in **Table 4**. These tables assign each activity for the management zone within each phase to those responsible.

Table 3 Timing and responsibilities within management zones

Management Zone	Action	Responsibility	Performance Criteria	Timing
Phase 1 Site Preparation				
All zones	Seed Collection	Bush Regeneration Contractor	Seed collected from native plants and germinated (if required).	Immediately
All zones	Delineation of clearing boundary	Property Owner or Subcontractor	Marking using GPS and high visibility flagging tape and boundary markers.	Before construction works commence
All zones	Establish fixed monitoring points	Bush Regeneration Contractor or Ecologist	Using star pickets (or something smaller like a small stake and pink flagging) and GPS establish a series of monitoring sites that can be used for photograph comparison, measuring weed and plant retention.	Prior to commencement of Bushland Restoration and Weeding works
All zones	Delineate and protect retained native vegetation	Property Owner or Subcontractor	High visibility marking tape (temporary metal fencing is likely not practical for much of the site owing to the topography). All native species within this area will be retained.	Prior to construction works commencing
All zones	Clearance	Contractor	Removal of exotic vegetation	TBC
Phase 2 - Restoration Works Commence				
All zones	Fixed Point Monitoring.	Bush Regeneration Contractor	Photographs of fixed monitoring sites before initial weeding.	Prior to commencement of restoration works for each area.
All zones	Carry out primary weeding.	Bush Regeneration Contractor	Main weed infestations and Priority weeds and WONS removed - Reproductively mature plants absent from site.	First two months of restoration works for each Zone.

Management Zone	Action	Responsibility	Performance Criteria	Timing
Zone 2 Zone 3 and Zone 4	Revegetation. Canopy, small tree, shrub, and ground cover species will need to be planted throughout Zone 2,Zone 3 and Zone 4.	Bush Regeneration Contractor	Native plants have been planted (species from **Appendix B**) in all vegetation strata.	Immediately upon establishment of reconstruction areas
All zones	Fixed Point Monitoring.	Bush Regeneration Contractor	Photographs of fixed monitoring sites to compare the survival and retention of plantings.	Every 3 months after the first year of plantings. Every 6 months following the initial year for the life of the BMP.
All zones	Carry out secondary weeding.	Bush Regeneration Contractor	Weed regrowth following primary weeding removed. Work has commenced on control of annual weed species.	Following primary weeding, site visits monthly (or as often as deemed necessary by BRC).
Phase 3 - Maintenance				
All zones	Carry out maintenance weeding throughout vegetation zones.	Bush Regeneration Contractor	Existing weed growth minimised or controlled. Regrowth following secondary weeding controlled. No new weed species or infestations.	Monthly for each zone for duration of 5 year maintenance period under BMP
Zone 2 Zone 3, and Zone 4	Maintenance of plantings.	Bush Regeneration Contractor	Any dead plantings replaced. Plants watered when drought stressed. Additional plantings where required due to observed gaps in any strata.	Monthly for each zone for duration of 5 year maintenance period under BMP
Phase 4 - Monitoring and reporting				
All zones	Biannual inspection of site.	Bushland Management or Ecologist	Site inspection completed as outlined in ***Section 8***.	Every 6 months for 5 year maintenance period of BMP

Management Zone	Action	Responsibility	Performance Criteria	Timing
All zones	Progress report preparation	Bushland Management or Ecologist	Annual Report prepared on progress of restoration works.	Once a year for the 5 year maintenance period of BMP
All zones	Final Inspection of Site.	Bushland Management or Ecologist	Final Inspection carried out at completion of BMP.	After 5 years of maintenance under BMP
All zones	Final Report.	Bushland Management or Ecologist	Final report detailing success of restoration or outlining further works needed.	After 5 years of maintenance under BMP

Table 4 Timing and responsibilities for fauna during clearing

Management Zone	Action	Responsibility	Performance Criteria	Timing (since commencement of BMP)
Development area (outside of the subject site), and Zone 1, Zone 2,and Zone 4 (for bushfire requirement for canopy thinning)	Habitat Assessment	Licensed Wildlife Carers or Ecologist	Spray paint trees and habitat features e.g. Hollows, logs with 'H'	1-2 weeks prior to Clearing
Development area (outside of the subject site)	Fauna Relocation and Clearing	Licensed Wildlife Carers or Ecologist	Capture and/or remove fauna to pre-determined habitat for release.	Day of clearing
Development area (outside of the subject site)	Salvage Habitat Features	Contractor	Tree hollows, Log hollows and other woody material will be salvaged and stockpiled for future use in revegetation areas and for habitat complexity	1-2 weeks after Clearing
All Zones	Nest Box	Contractor	Where hollow relocation not possible, nest box placed in tree.	Prior to clearing

10. References

Cumberland Ecology. 2019. 181 Forest Way Belrose: Biodiversity Development Assessment Report. 16222 RP4.

DIPNR. 2003. Bringing the Bush Back to Western Sydney: Best Practice Guidelines for Bush Regeneration on the Cumberland Plain. Department of Infrastructure, Planning and Natural Resources, Sydney.

LLS: Greater Sydney, editor. 2017. Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022. Local Land Services NSW.

NSW Rural Fire Service. 2006. Planning for Bushfire Protection. NSW Rural Fire Service, Sydney.

OEH. 2012. Wallangarra White Gum (Eucalyptus scoparia) - Profile. Office of Environment and Heritage, Sydney.

OEH. 2013. The Native Vegetation of the Sydney Metropolitan Area. Office of Environment and Heritage, Sydney.

OEH. 2016. Syzygium paniculatum - Profile. Office of Environment and Heritage, Hurstville.

Stuart Noble Associates. 2019. Belrose Manor: 181 Forest Way, Belrose, NSW, Landscape Architectural Drawing Set.in P. f. H. N. Home, editor., NSW.

Travers Bushfire & Ecology. 2019. Bushfire Protection Assessment Addendum: Proposed Residential Aged Care Facility, Lot 3 DP 805710, 181 Forest Way, Belrose. Kariong NSW.

APPENDIX A :
Flora Species List

Table 5 Flora species recorded within the subject land

Family	Exotic	Scientific Name	Common Name
Canopy			
Altingiaceae	*	*Liquidambar styraciflua*	
Arecaceae	*	*Syagrus romanzoffiana*	Cocos Palm
Casuarinaceae	**P**	*Casuarina glauca*	Swamp Oak
Moraceae	*	*Ficus microcarpa* var. *hillii*	Hill's Fig
Moraceae	*	*Ficus benjamina*	Deciduous Fig
Myrtaceae		*Angophora costata*	Sydney Red Gum
Myrtaceae		*Corymbia gummifera*	Red Bloodwood
Myrtaceae	*	*Eucalyptus cladocalyx*	Sugar Gum
Myrtaceae		*Eucalyptus globoidea*	White Stringybark
Myrtaceae	**P**	*Eucalyptus globulus* subsp. *globulus*	Tasmanian Bluegum
Myrtaceae		*Eucalyptus piperita*	Sydney Peppermint
Myrtaceae	**P**	*Eucalyptus scoparia*	Wallangarra White Gum
Myrtaceae		*Eucalyptus sieberi*	Silvertop Ash
Myrtaceae	*	*Lophostemon confertus*	Brush Box
Myrtaceae		*Syncarpia glomulifera*	Turpentine
Myrtaceae	**P**	*Syzygium paniculatum*	Magenta Lilly Pilly
Pinaceae	*	*Pinus radiata*	Radiata Pine
Sub-canopy			
Anacardiaceae	*	*Schinus areira*	Pepper Tree
Arecaceae	*	*Archontophoenix cunninghamiana*	Bangalow Palm
Bignoniaceae	*	*Jacaranda mimosifolia*	Jacaranda
Casuarinaceae		*Allocasuarina distyla*	Scrub She-oak
Casuarinaceae		*Allocasuarina littoralis*	Black She-oak
Casuarinaceae	**P**	*Allocasuarina torulosa*	Forest Oak
Cupressaceae	*	*Cupressus* sp.	
Cupressaceae	*	*Metasequoia glyptostroboides*	Dawn Redwood
Fabaceae (Mimosoideae)		*Acacia decurrens*	Black Wattle
Melastomataceae	*	*Tibouchina* sp.	
Myrtaceae	**P**	*Callistemon salignus*	
Myrtaceae		*Corymbia gummifera*	Red Bloodwood
Myrtaceae		*Eucalyptus haemastoma*	Scribbly Gum

Family	Exotic	Scientific Name	Common Name
Myrtaceae		*Eucalyptus globoidea*	White Stringybark
Myrtaceae	**P**	*Melaleuca styphelioides*	Prickly-leaved Tea Tree
Phyllanthaceae		*Glochidion ferdinandi*	Cheese Tree
Pittosporaceae		*Pittosporum undulatum*	Native Daphne
Rosaceae	*	*Prunus persica*	Peach Tree
Shrubs			
Anacardiaceae	*	*Harpephyllum caffrum*	Kaffir Plum
Apiaceae		*Platysace linearifolia*	
Asteraceae	*	*Chrysanthemoides monilifera*	Bitou Bush
Casuarinaceae		*Allocasuarina distyla*	Scrub She-oak
Cunoniaceae		*Bauera rubioides*	River Rose
Dilleniaceae		*Hibbertia empetrifolia* subsp. *empetrifolia*	
Dilleniaceae		*Hibbertia linearis*	
Elaeocarpaceae		*Elaeocarpus reticulatus*	Blueberry Ash
Ericaceae (Epacridoideae)		*Woollsia pungens*	
Ericaceae (Epacridoideae)		*Epacris crassifolia* subsp. *crassifolia*	
Ericaceae (Epacridoideae)		*Leucopogon microphyllus*	
Ericaceae (Epacridoideae)		*Epacris microphylla*	Coast Coral Heath
Ericaceae (Epacridoideae)		*Epacris pulchella*	Wallum Heath
Ericaceae (Epacridoideae)		*Styphelia triflora*	Red Five-Corner
Ericaceae (Epacridoideae)		*Lissanthe strigosa*	Peach Heath
Fabaceae (Faboideae)		*Bossiaea heterophylla*	Variable Bossiaea
Fabaceae (Faboideae)		*Pultenaea stipularis*	Handsome Bush-pea
Fabaceae (Faboideae)		*Phyllota phylicoides*	Heath Phyllota
Fabaceae (Faboideae)		*Bossiaea scolopendria*	

Family	Exotic	Scientific Name	Common Name
Fabaceae (Faboideae)		*Viminaria juncea*	Golden Spray
Fabaceae (Faboideae)		*Dillwynia retorta*	
Fabaceae (Faboideae)	*	*Erythrina crista-galli*	Cockspur Coral Tree
Fabaceae (Caesalpinioideae)	*	*Senna pendula*	
Fabaceae (Mimosoideae)		*Acacia longifolia* subsp. *longifolia*	Sydney Golden Wattle
Fabaceae (Mimosoideae)		*Acacia suaveolens*	Sweet Wattle
Fabaceae (Mimosoideae)		*Acacia myrtifolia*	Red-stemmed Wattle
Fabaceae (Mimosoideae)		*Acacia floribunda*	White Sally Wattle
Fabaceae (Mimosoideae)		*Acacia stricta*	Straight Wattle
Fabaceae (Mimosoideae)		*Acacia ulicifolia*	Prickly Moses
Fabaceae (Mimosoideae)		*Acacia terminalis* subsp. *angustifolia*	Sunshine Wattle
Goodeniaceae		*Dampiera purpurea*	
Goodeniaceae		*Scaevola ramosissima*	Purple Fan-flower
Malaceae	*	*Cotoneaster glaucophyllus*	
Myrtaceae		*Kunzea ambigua*	Tick Bush
Myrtaceae		*Leptospermum squarrosum*	Peach Blossom Tea-tree
Myrtaceae		*Leptospermum trinervium*	Flaky-barked Tea-tree
Myrtaceae		*Angophora hispida*	Dwarf Apple
Myrtaceae		*Baeckea imbricata*	Fringed Baeckea
Myrtaceae		*Leptospermum polygalifolium*	Tantoon
Myrtaceae	**P**	*Syzygium australe*	Brush Cherry
Myrtaceae	**P**	*Tristaniopsis laurina*	Water Gum
Myrtaceae		*Angophora costata*	Sydney Red Gum
Ochnaceae	*	*Ochna serrulata*	Mickey Mouse Plant
Oleaceae	*	*Ligustrum sinense*	Small-leaved Privet
Pittosporaceae		*Pittosporum undulatum*	Native Daphne

Family	Exotic	Scientific Name	Common Name
Proteaceae		*Banksia ericifolia*	Heath-leaved Banksia
Proteaceae		*Hakea gibbosa*	Needlebush
Proteaceae		*Grevillea buxifolia*	Grey Spider Flower
Proteaceae		*Grevillea sericea*	Pink Spider Flower
Proteaceae		*Persoonia pinifolia*	Pine-leaved Geebung
Proteaceae		*Banksia serrata*	Old-man Banksia
Proteaceae		*Lomatia silaifolia*	Crinkle Bush
Proteaceae		*Banksia oblongifolia*	Fern-leaved Banksia
Proteaceae		*Persoonia levis*	Broad-leaved Geebung
Proteaceae		*Lambertia formosa*	Mountain Devil
Proteaceae		*Petrophile pulchella*	Conesticks
Proteaceae		*Hakea propinqua*	
Rutaceae		*Crowea saligna*	
Rutaceae		*Boronia ledifolia*	Showy Boronia
Solanaceae	*	*Solanum mauritianum*	Wild Tobacco Bush
Theaceae	*	*Camellia* sp.	
Thymelaeaceae		*Pimelea linifolia*	Slender Rice Flower
Verbenaceae	*	*Lantana camara*	Lantana
Dicots			
Apiaceae		*Xanthosia pilosa*	Woolly Xanthosia
Apiaceae		*Xanthosia tridentata*	Rock Xanthosia
Apiaceae		*Actinotus minor*	Lesser Flannel Flower
Apiaceae		*Actinotus helianthi*	Flannel Flower
Apiaceae		*Centella asiatica*	Indian Pennywort
Apiaceae	*	*Cyclospermum leptophyllum*	Slender Celery
Asteraceae	*	*Bidens pilosa*	Cobblers Pegs
Asteraceae	*	*Cirsium vulgare*	Spear Thistle
Asteraceae	*	*Ageratina adenophora*	Crofton Weed
Asteraceae	*	*Conyza bonariensis*	Flaxleaf Fleabane
Asteraceae	*	*Conyza sumatrensis*	Tall Fleabane
Asteraceae	*	*Coreopsis lanceolata*	Coreopsis
Asteraceae	*	*Hypochaeris radicata*	Catsear
Asteraceae	*	*Sonchus asper*	Prickly Sowthistle
Asteraceae	*	*Facelis retusa*	Annual Trampweed

Family	Exotic	Scientific Name	Common Name
Asteraceae	*	*Gamochaeta americana*	Cudweed
Clusiaceae	*	*Hypericum perforatum*	St. John's Wort
Droseraceae		*Drosera spatulata*	
Elaeocarpaceae		*Tetratheca ericifolia*	
Fabaceae (Faboideae)	*	*Lotus uliginosus*	Birds-foot Trefoil
Gentianaceae	*	*Centaurium tenuiflorum*	
Geraniaceae		*Geranium solanderi*	Native Geranium
Goodeniaceae		*Dampiera stricta*	
Goodeniaceae		*Goodenia paniculata*	Branched Goodenia
Goodeniaceae		*Scaevola ramosissima*	Purple Fan-flower
Haloragaceae		*Gonocarpus teucrioides*	Raspwort
Loganiaceae		*Mitrasacme paludosa*	
Loganiaceae		*Mitrasacme polymorpha*	
Malvaceae	*	*Modiola caroliniana*	Red-flowered Mallow
Malvaceae	*	*Sida rhombifolia*	Paddy's Lucerne
Myrsinaceae	*	*Anagallis arvensis*	Scarlet Pimpernel
Phyllanthaceae		*Poranthera ericifolia*	
Phytolaccaceae	*	*Phytolacca octandra*	Inkweed
Plantaginaceae	*	*Plantago lanceolata*	Lamb's Tongues
Rubiaceae		*Opercularia aspera*	Hairy Stinkweed
Solanaceae	*	*Solanum mauritianum*	Wild Tobacco Bush
Solanaceae	*	*Solanum pseudocapsicum*	Madeira Winter
Solanaceae	*	*Solanum sisymbriifolium*	
Solanaceae	*	*Physalis peruviana*	Cape Gooseberry
Stackhousiaceae		*Stackhousia viminea*	Slender Stackhousia
Verbenaceae	*	*Verbena bonariensis*	Purpletop
Ferns and Allies			
Dennstaedtiaceae		*Pteridium esculentum*	Common Bracken
Dennstaedtiaceae		*Histiopteris incisa*	Bat's Wing Fern
Dennstaedtiaceae		*Hypolepis muelleri*	Harsh Ground Fern
Dicksoniaceae		*Calochlaena dubia*	Rainbow Fern
Gleicheniaceae		*Gleichenia dicarpa*	
Gleicheniaceae		*Gleichenia rupestris*	

Family	Exotic	Scientific Name	Common Name
Lindsaeaceae		*Lindsaea linearis*	Screw Fern
Lomariopsidaceae	*	*Nephrolepis cordifolia*	Fishbone Fern
Pteridaceae		*Adiantum aethiopicum*	Common Maidenhair
Climbers/Vines			
Apocynaceae	*	*Trachelospermum jasminoides*	Star Jasmine
Araliaceae	*	*Hedera helix*	English Ivy
Caprifoliaceae	*	*Lonicera japonica*	Japanese Honeysuckle
Smilacaceae		*Smilax glyciphylla*	Sweet Sarsaparilla
Fabaceae (Faboideae)	*	*Wisteria sinensis*	Chinese Wisteria
Monocots (Grasses)			
Poaceae	*	*Andropogon virginicus*	Whisky Grass
Poaceae		*Anisopogon avenaceus*	Oat Speargrass
Poaceae		*Arundo donax 'Variegata'*	Variegated Giant Reed
Poaceae	*	*Avena barbata*	Bearded Oats
Poaceae	*	*Axonopus fissifolius*	Narrow-leafed Carpet Grass
Poaceae	*	*Briza minor*	Shivery Grass
Poaceae	*	*Bromus catharticus*	Prairie Grass
Poaceae	*	*Cortaderia selloana*	Pampas Grass
Poaceae	*	*Cynodon dactylon*	Couch
Poaceae	*	*Ehrharta erecta*	Panic Veldtgrass
Poaceae		*Entolasia stricta*	Wiry Panic
Poaceae		*Imperata cylindrica*	Blady Grass
Poaceae		*Lachnagrostis filiformis*	
Poaceae	*	*Lolium perenne*	Perennial Ryegrass
Poaceae		*Microlaena stipoides*	Weeping Grass
Poaceae		*Oplismenus aemulus*	Australian Basket Grass
Poaceae		*Panicum simile*	Two-colour Panic
Poaceae	*	*Paspalum dilatatum*	Paspalum
Poaceae	*	*Cenchrus clandestinus*	Kikuyu Grass
Poaceae	*	*Setaria parviflora*	
Poaceae	*	*Sporobolus africanus*	Parramatta Grass

Family	Exotic	Scientific Name	Common Name
Monocots (Other)			
Alliaceae	*	*Agapanthus praecox* subsp. *orientalis*	African Lily
Amaryllidaceae	*	*Clivia miniata*	
Araceae	*	*Monstera deliciosa*	Fruit Salad Plant
Asparagaceae	*	*Asparagus aethiopicus*	Ground Asparagus
Blandfordiaceae		*Blandfordia nobilis*	Christmas Bells
Commelinaceae		*Commelina cyanea*	
Commelinaceae	*	*Tradescantia pallida*	Purple Queen
Cyperaceae		*Gahnia clarkei*	Tall Saw-sedge
Cyperaceae		*Lepidosperma laterale*	
Cyperaceae		*Schoenus brevifolius*	Zig-zag Bog-rush
Cyperaceae		*Cyathochaeta diandra*	
Cyperaceae		*Schoenus apogon*	Common Bog-rush
Cyperaceae		*Gahnia sieberiana*	Red-fruit Saw-sedge
Cyperaceae		*Caustis pentandra*	Thick Twist Rush
Cyperaceae	*	*Cyperus eragrostis*	Umbrella Sedge
Cyperaceae		*Cyperus difformis*	
Cyperaceae		*Cyperus polystachyos*	
Cyperaceae	*	*Cyperus brevifolius*	Mullumbimby Couch
Cyperaceae		*Isolepis inundata*	
Cyperaceae		*Lepidosperma gunnii*	
Cyperaceae		*Ptilotrix deusta*	
Iridaceae		*Patersonia sericea*	Silky Purple-flag
Iridaceae	*	*Sisyrinchium rosulatum*	Scourweed
Iridaceae	*	*Sisyrinchium micranthum*	Blue Pigroot
Juncaceae		*Juncus planifolius*	
Juncaceae		*Juncus usitatus*	
Juncaceae	*	*Juncus cognatus*	
Lomandraceae		*Lomandra filiformis* subsp. *filiformis*	Wattle Mat-rush
Lomandraceae		*Lomandra glauca*	Pale Mat-rush
Lomandraceae		*Lomandra obliqua*	
Orchidaceae		*Cryptostylis subulata*	Large Tongue Orchid
Orchidaceae	**P**	*Dendrobium* sp.	

Family	Exotic	Scientific Name	Common Name
Phormiaceae		*Dianella caerulea* var. *producta*	
Phormiaceae		*Dianella prunina*	
Restionaceae		*Lepyrodia scariosa*	
Restionaceae		*Empodisma minus*	Spreading Rope-rush
Stylidiaceae		*Stylidium graminifolium*	Grass Trigger-plant
Typhaceae		*Typha orientalis*	Broadleaf Cumbungi
Xanthorrhoeaceae		*Xanthorrhoea media*	

**denotes exotic, P = planted native*

Note that the flora species listed were recorded during surveys in 2016 and 2017 for the preparation of this BMP. Additional flora surveys were conducted for preparation of the BDAR in 2019, and may have recorded some additional species (see 16222 RP4).

APPENDIX B :
Species Planting List

Table 6 Species planting list

Family	Scientific Name	Common Name
Canopy		
Myrtaceae	*Angophora hispida*	Dwarf Apple
Myrtaceae	*Corymbia gummifera*	Red Bloodwood
Myrtaceae	*Eucalyptus apiculata*	Narrow-leaved Mallee Ash
Myrtaceae	*Eucalyptus haemastoma*	Scribbly Gum
Myrtaceae	*Eucalyptus luehmanniana*	Yellow Top Mallee Ash
Myrtaceae	*Eucalyptus obstans*	Port Jackson Mallee
Myrtaceae	*Eucalyptus racemosa*	Narrow-leaved Scribbly Gum
Shrub /Sub-canopy		
Apiaceae	*Platysace linearifolia*	
Apiaceae	*Xanthosia tridentata*	Rock Xanthosia
Casuarinaceae	*Allocasuarina distyla*	Scrub She-oak
Cunoniaceae	*Bauera microphylla*	
Dilleniaceae	*Hibbertia cistiflora* subsp. *cistiflora*	
Dilleniaceae	*Hibbertia linearis*	
Dilleniaceae	*Hibbertia riparia*	Erect Guinea-flower
Dilleniaceae	*Hibbertia serpyllifolia*	Hairy Guinea Flower
Cunoniaceae	*Bauera rubioides*	River Rose
Elaeocarpaceae	*Tetratheca shiressii*	
Elaeocarpaceae	*Tetratheca ericifolia*	
Ericaceae (Epacridoideae)	*Epacris microphylla*	Coast Coral Heath
Ericaceae (Epacridoideae)	*Epacris obtusifolia*	Blunt-leaf Heath
Ericaceae (Epacridoideae)	*Leucopogon appressus*	
Ericaceae (Epacridoideae)	*Leucopogon esquamatus*	
Ericaceae (Epacridoideae)	*Leucopogon microphyllus*	
Ericaceae (Epacridoideae)	*Styphelia tubiflora*	Red Five-Corner
Fabaceae (Faboideae)	*Bossiaea ensata*	Sword Bossiaea
Fabaceae (Faboideae)	*Bossiaea scolopendria*	
Fabaceae (Faboideae)	*Daviesia corymbosa*	
Fabaceae (Faboideae)	*Dillwynia floribunda*	
Fabaceae (Faboideae)	*Dillwynia retorta*	
Fabaceae (Faboideae)	*Dillwynia rudis*	
Fabaceae (Faboideae)	*Gompholobium glabratum*	Dainty Wedge Pea
Fabaceae (Faboideae)	*Mirbelia rubiifolia*	Heathy Mirbelia

Family	Scientific Name	Common Name
Fabaceae (Faboideae)	*Mirbelia speciosa*	
Fabaceae (Faboideae)	*Phyllota phylicoides*	Heath Phyllota
Fabaceae (Faboideae)	*Pultenaea aristata*	
Fabaceae (Faboideae)	*Pultenaea stipularis*	Handsome Bush-pea
Fabaceae (Faboideae)	*Pultenaea tuberculata*	Wreath Bush-pea
Fabaceae (Faboideae)	*Sphaerolobium vimineum*	Leafless Globe-pea
Fabaceae (Mimosoideae)	*Acacia myrtifolia*	Red-stemmed Wattle
Fabaceae (Mimosoideae)	*Acacia suaveolens*	Sweet Wattle
Goodeniaceae	*Dampiera stricta*	
Lamiaceae	*Hemigenia purpurea*	
Myrtaceae	*Baeckea brevifolia*	
Myrtaceae	*Baeckea diosmifolia*	Fringed Baeckea
Myrtaceae	*Baeckea imbricata*	Heath Myrtle
Myrtaceae	*Calytrix tetragona*	Common Fringe-myrtle
Myrtaceae	*Darwinia diminuta*	
Myrtaceae	*Darwinia fascicularis*	
Myrtaceae	*Harmogia densifolia*	
Myrtaceae	*Kunzea capitata*	
Myrtaceae	*Leptospermum arachnoides*	
Myrtaceae	*Leptospermum squarrosum*	Peach Blossom Tea-tree
Myrtaceae	*Leptospermum trinervium*	Flaky-barked Tea-tree
Myrtaceae	*Micromyrtus ciliata*	Fringed Heath-myrtle
Olacaceae	*Olax stricta*	
Proteaceae	*Banksia ericifolia* subsp. *ericifolia*	Heath-leaved Banksia
Proteaceae	*Banksia marginata*	Silver Banksia
Proteaceae	*Banksia oblongifolia*	Fern-leaved Banksia
Proteaceae	*Banksia paludosa*	Swamp Banksia
Proteaceae	*Banksia serrata*	Old-man Banksia
Proteaceae	*Conospermum ellipticum*	
Proteaceae	*Conospermum taxifolium*	Variable Smoke-bush
Proteaceae	*Grevillea buxifolia*	Grey Spider Flower
Proteaceae	*Grevillea oleoides*	Red Spider Flower
Proteaceae	*Grevillea speciosa*	Red Spider Flower
Proteaceae	*Grevillea sphacelata*	Grey Spider Flower
Proteaceae	*Hakea dactyloides*	Finger Hakea

Family	Scientific Name	Common Name
Proteaceae	*Hakea gibbosa*	Needlebush
Proteaceae	*Hakea propinqua*	
Proteaceae	*Hakea teretifolia*	Needlebush
Proteaceae	*Isopogon anemonifolius*	Broad-leaf Drumsticks
Proteaceae	*Isopogon anethifolius*	Narrow-leaf Drumsticks
Proteaceae	*Lambertia formosa*	Mountain Devil
Proteaceae	*Persoonia lanceolata*	Lance Leaf Geebung
Proteaceae	*Persoonia pinifolia*	Pine-leaved Geebung
Proteaceae	*Petrophile pulchella*	Conesticks
Rhamnaceae	*Cryptandra ericoides*	Heathy Cryptandra
Rutaceae	*Boronia ledifolia*	Showy Boronia
Rutaceae	*Boronia pinnata*	
Rutaceae	*Boronia serrulata*	Native Rose
Rutaceae	*Eriostemon australasius*	Pink Wax Flower
Rutaceae	*Phebalium squamulosum*	Scaly Phebalium
Rutaceae	*Philotheca buxifolia*	
Rutaceae	*Philotheca salsolifolia*	
Rutaceae	*Zieria laevigata*	Smooth Zieria
Thymelaeaceae	*Pimelea linifolia*	Slender Rice Flower
Xanthorrhoeaceae	*Xanthorrhoea media*	Grass Tree
Xanthorrhoeaceae	*Xanthorrhoea resinosa*	Grass Tree
Groundcover		
Anthericaceae	*Sowerbaea juncea*	Rush Lily
Anthericaceae	*Thysanotus juncifolius*	Branching Fringe Lily
Apiaceae	*Actinotus minor*	Lesser Flannel Flower
Blandfordiaceae	*Blandfordia nobilis*	Christmas Bells
Colchicaceae	*Burchardia umbellata*	Milkmaids
Cyperaceae	*Caustis pentandra*	Thick Twist Rush
Cyperaceae	*Caustis recurvata*	
Cyperaceae	*Cyathochaeta diandra*	
Cyperaceae	*Lepidosperma filiforme*	
Cyperaceae	*Lepidosperma forsythii*	
Cyperaceae	*Lepidosperma neesii*	
Cyperaceae	*Lepidosperma urophorum*	
Cyperaceae	*Lepidosperma viscidum*	

Family	Scientific Name	Common Name
Cyperaceae	*Ptilothrix deusta*	
Cyperaceae	*Schoenus imberbis*	Beardless Bog-rush
Cyperaceae	*Schoenus lepidosperma*	
Cyperaceae	*Tricostularia pauciflora*	
Droseraceae	*Drosera auriculata*	
Droseraceae	*Drosera peltata*	
Droseraceae	*Drosera spatulata*	
Goodeniaceae	*Goodenia bellidifolia* subsp. *bellidifolia*	
Goodeniaceae	*Scaevola ramosissima*	Purple Fan-flower
Haloragaceae	*Gonocarpus tetragynus*	
Haemodoraceae	*Haemodorum corymbosum*	
Iridaceae	*Patersonia glabrata*	Leafy Purple-flag
Iridaceae	*Patersonia longifolia*	Purple Flag
Iridaceae	*Patersonia sericea*	Silky Purple-flag
Lindsaeaceae	*Lindsaea linearis*	Screw Fern
Loganiaceae	*Mitrasacme polymorpha*	
Lomandraceae	*Lomandra glauca*	Pale Mat-rush
Lomandraceae	*Lomandra obliqua*	
Poaceae	*Amphipogon strictus* var. *strictus*	Greybeard Grass
Poaceae	*Anisopogon avenaceus*	Oat Speargrass
Poaceae	*Entolasia stricta*	Wiry Panic
Restionaceae	*Baloskion gracile*	
Restionaceae	*Chordifex dimorphus*	
Restionaceae	*Chordifex fastigiatus*	
Restionaceae	*Empodisma minus*	Spreading Rope-rush
Restionaceae	*Eurychorda complanata*	
Restionaceae	*Leptocarpus tenax*	
Restionaceae	*Lepyrodia scariosa*	
Selaginellaceae	*Selaginella uliginosa*	Swamp Selaginella
Stylidiaceae	*Stylidium lineare*	Narrow-leaved Triggerplant
Stylidiaceae	*Stylidium productum*	
Xyridaceae	*Xyris gracilis*	
Climber		

Family	Scientific Name	Common Name
Lauraceae	*Cassytha glabella*	

**Species taken from positive diagnostic species from the community from the Office of Environment and Heritage (2013) The Native Vegetation of the Sydney Metropolitan Area – Volume 2: Vegetation Community Profiles Version 2.0*

APPENDIX C :
Weed Control Methods

This page intentionally left blank.

Table 7 Weed control methods

Family	Scientific Name	Common Name	Treatment Methods
Altingiaceae	*Liquidambar styraciflua*		Hand weed seedlings. Spray seedlings and coppice regrowth with glyphosphate 10mL/1L. Drill and inject stem with, or chisel and apply, undiluted glyphosphate. Cut and paint stump with undiluted glyphosphate (will require an arborist for large trees). Cut and grind stump of large trees (arborist).
Arecaceae	*Syagrus romanzoffiana*	Cocos Palm	Remove with small excavator.
Moraceae	*Ficus microcarpa* var. *hillii*	Hill's Fig	Tree to be felled by trained arborist. Paint stump with undiluted Glyphosate soon after felling.
Moraceae	*Ficus benjamina*	Deciduous Fig	Tree to be felled by trained arborist. Paint stump with undiluted Glyphosate soon after felling.
Myrtaceae	*Eucalyptus cladocalyx*	Sugar Gum	Tree to be felled by trained arborist. Paint stump with undiluted Glyphosate soon after felling.
Myrtaceae	*Lophostemon confertus*	Brush Box	Tree to be felled by trained arborist. Paint stump with undiluted Glyphosate soon after felling.
Pinaceae	*Pinus radiata*	Radiata Pine	Tree to be felled by trained arborist. Paint stump with undiluted Glyphosate soon after felling.
Anacardiaceae	*Schinus areira*	Pepper Tree	Tree to be felled by trained arborist. Paint stump with undiluted Glyphosate soon after felling.
Arecaceae	*Archontophoenix cunninghamiana*	Bangalow Palm	Remove with small excavator.
Bignoniaceae	*Jacaranda mimosifolia*	Jacaranda	Hand weed or remove large individuals with tools such as mattock. Spray juveniles with glyphosphate 10mL/1L.

Family	Scientific Name	Common Name	Treatment Methods
			Cut large, firmly rooted individuals at the base with secateurs or hand saw and paint with undiluted glyphosphate.
Cupressaceae	*Cupressus* sp.		Drill and inject stem with, or chisel and apply, undiluted glyphosphate. Cut and paint stump with undiluted glyphosphate (will require an arborist for large trees). Cut and grind stump of large trees (arborist).
Cupressaceae	*Metasequoia glyptostroboides*	Dawn Redwood	Drill and inject stem with, or chisel and apply, undiluted glyphosphate. Cut and paint stump with undiluted glyphosphate (will require an arborist for large trees). Cut and grind stump of large trees (arborist).
Melastomataceae	*Tibouchina* sp.		Cut and paint stump with undiluted glyphosphate (will require an arborist for large trees).
Rosaceae	*Prunus persica*	Peach Tree	Hand weed small individuals. Cut and paint stump with undiluted glyphosphate (will require an arborist for large trees).
Anacardiaceae	*Harpephyllum caffrum*	Kaffir Plum	Hand weed small individuals. Cut and paint stump with undiluted glyphosphate (will require an arborist for large trees).
Asteraceae	*Chrysanthemoides monilifera*	Bitou Bush	Hand weed small individuals up to 1m in height. Cut and paint stump with undiluted glyphosphate.
Fabaceae (Faboideae)	*Erythrina crista-galli*	Cockspur Coral Tree	Drill holes with power drill with thick Drill bit into Mature trees, around base of trunk, and fill holes with undiluted glyphosphate. Once glyphosphate has been absorbed refill holes with undiluted glyphosphate several times. Cut shrub and Mature individuals as close to ground as possible with loppers or hand saw (or chainsaw) and treat

Family	Scientific Name	Common Name	Treatment Methods
			stump with undiluted glyphosphate. Spray juveniles and regrowth foliage of cut and painted individuals with glyphosphate 10mL/1L.
Fabaceae (Caesalpinioideae)	*Senna pendula*		Cut shrub and Mature individuals as close to ground as possible with loppers or hand saw and treat stump with undiluted glyphosphate.
Malaceae	*Cotoneaster glaucophyllus*		Cut shrub-sized and mature individuals as close to ground as possible with loppers or hand saw (or chainsaw) and treat stump with undiluted glyphosphate.
Ochnaceae	*Ochna serrulata*	Mickey Mouse Plant	Stems of all juvenile and mature plants should be scraped and painted with undiluted glyphosphate. Follow up treatment may be needed on regrowth stems around base of plant in following monthly site visits. Mature fruits on plants should be bagged and removed from site.
Oleaceae	*Ligustrum sinense*	Small-leaved Privet	Hand weed juveniles. Drill holes with power Drill with thick Drill bit into Mature trees, around base of trunk and fill holes with undiluted glyphosphate. Once glyphosphate has been absorbed refill holes with undiluted glyphosphate several times. Cut shrub and Mature individuals as close to ground as possible with loppers or hand saw (or chainsaw) and treat stump with undiluted glyphosphate. Spray juveniles and regrowth foliage of cut and painted individuals with glyphosphate 10mL/1L.

Family	Scientific Name	Common Name	Treatment Methods
Solanaceae	*Solanum mauritianum*	Wild Tobacco Bush	When working with this plant additional PPE may be required as some individuals are sensitive to the shedding fine hairs of the species - Recommended PPE is a dust mask, long sleeve shirt and pants + gloves. Hand weed juveniles. Mature individuals can be cut and painted with glyphosphate 10mL/1L.
Theaceae	*Camellia* sp.		Cut and paint stump with undiluted glyphosphate
Verbenaceae	*Lantana camara*	Lantana	Hand weed juveniles and regrowth from small pieces. Spot spray with glyphosphate 10mL/1L. Slash using brushcutter, or hand cut with loppers, and spray regrowth foliage with glyphosphate 10mL/1L. Cut near ground level and paint with undiluted glyphosphate - Some individuals will have stumps which will still regrow foliage, spray regrowth foliage with glyphosphate 10mL/1L.
Apiaceae	*Cyclospermum leptophyllum*	Slender Celery	Hand Weed . Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Bidens pilosa*	Cobblers Pegs	Hand Weed . Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Cirsium vulgare*	Spear Thistle	Hand Weed . Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Ageratina adenophora*	Crofton Weed	Hand Weed. Spot Spray with Glyphosphate 5mL/1L. Slash large individuals with brushcutter and spray regrowth foliage with glyphosphate 5mL/1L.

Family	Scientific Name	Common Name	Treatment Methods
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Conyza sumatrensis*	Tall Fleabane	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Coreopsis lanceolata*	Coreopsis	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Hypochaeris radicata*	Catsear	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Sonchus asper*	Prickly Sowthistle	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Facelis retusa*	Annual Trampweed	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Asteraceae	*Gamochaeta americana*	Cudweed	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Clusiaceae	*Hypericum perforatum*	St. John's Wort	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Fabaceae (Faboideae)	*Lotus uliginosus*	Birds-foot Trefoil	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Gentianaceae	*Centaurium tenuiflorum*		Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	Hand weed. Spray with glyphosphate 10mL/1L.

Family	Scientific Name	Common Name	Treatment Methods
			Cut large, firmly rooted individuals at the base with secateurs and paint with undiluted glyphosphate.
Myrsinaceae	*Anagallis arvensis*	Scarlet Pimpernel	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Phytolaccaceae	*Phytolacca octandra*	Inkweed	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Solanaceae	*Solanum pseudocapsicum*	Madeira Winter	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Solanaceae	*Solanum sisymbriifolium*		Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Solanaceae	*Physalis peruviana*	Cape Gooseberry	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Verbenaceae	*Verbena bonariensis*	Purpletop	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Lomariopsidaceae	*Nephrolepis cordifolia*	Fishbone Fern	Hand pull plants taking care to bag and remove all rhizomes and tubers; will need to be repeated over subsequent months to remove regrowth from missed tubers and rhizomes. Large infestations can be sprayed monthly with glyphosphate 10mL/1L; fronds will take several months to die back completely, after which repeated monthly spraying is needed to control regrowth juvenile fronds from tubers and rhizomes until infestation is controlled completely.

Family	Scientific Name	Common Name	Treatment Methods
Climbers/Vines			
Apocynaceae	*Trachelospermum jasminoides*	Star Jasmine	Manually remove with hand tools. Cut stems close to ground and apply undiluted glyphosphate to cut surface. Scrape and paint vine with undiluted glyphosphate.
Araliaceae	*Hedera helix*	English Ivy	Dig out all underground plant material. Spray juvenile regrowth with Glyphosphate 10mL/1L.
Caprifoliaceae	*Lonicera japonica*	Japanese Honeysuckle	Cut and scrape vine stems with undiluted glyphosphate. Hand weed seedlings. Spray low lying foliage, regrowth foliage, and seedlings with 20mL/1L Glyphosphate & metsulfuron methyl (e.g. Brush-Off) 10.5g/10L + non-ionic surfactant. Roots of plant can be dug up with mattock or shovel.
Fabaceae (Faboideae)	*Wisteria sinensis*	Chinese Wisteria	Herbicide should be applied during Spring or Summer. Cut stems as close to the ground as possible and immediately apply an undiluted solution of Glyphosate to the stem. Spray any subsequent sprouts with Glyphosate.
Poaceae	*Andropogon virginicus*	Whisky Grass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Avena barbata*	Bearded Oats	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Axonopus fissifolius*	Narrow-leafed Carpet Grass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Briza minor*	Shivery Grass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.

Family	Scientific Name	Common Name	Treatment Methods
Poaceae	*Bromus catharticus*	Prairie Grass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Cortaderia selloana*	Pampas Grass	Dig out large clumps with mattock. Spot spray with glyphosphate 10mL/1L. Large plants can be mown or brush Cut to ground level, then regrowth sprayed with glyphosphate.
Poaceae	*Cynodon dactylon*	Couch	Hand Weed. Spot Spray with glyphosphate 10mL/1L - May require monthly treatment of regrowth individuals for up to six months.
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Lolium perenne*	Perennial Ryegrass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Paspalum dilatatum*	Paspalum	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Setaria parviflora*		Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Poaceae	*Sporobolus africanus*	Parramatta Grass	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Alliaceae	*Agapanthus praecox* subsp. *orientalis*	African Lily	Plant is resistant to herbicide. Needs to be dug out with a mattock, or hand mattock, with

Family	Scientific Name	Common Name	Treatment Methods
			care taken to remove all rhizomes (rhizomes should be bagged and removed from site).
Amaryllidaceae	*Clivia miniata*		Plant is resistant to herbicide. Needs to be dug out with a mattock, or hand mattock, with care taken to remove all tuberous rhizome to prevent resprouting.
Araceae	*Monstera deliciosa*	Fruit Salad Plant	Hand dig with mattock. Cut stems as close to the ground as possible and immediately apply undiluted Glyphosate.
Asparagaceae	*Asparagus aethiopicus*	Ground Asparagus	Any branches profuse with fruit should be cut with secateurs and bagged to prevent further spread of species by birds. Juvenile plants can be eased out of soil with a trowel or knife - care should be taken to remove below ground plant material. For large, Mature plants the woody crown at the base can be Cut around with a sharp knife, or hacked out with a mattock or peter lever and removed - it is easiest to Cut all branches off near the base with secateurs prior to removing crown - plant will not resprout from water storing tubers or Roots below ground so these can be left to rot to reduce soil disturbance. Spray mature and juvenile plants with metsulfuron methyl 6g/100mL + surfactant.
Commelinaceae	*Tradescantia pallida*	Purple Queen	Small infestations can be removed by hand weeding. Care needs to be taken not to leave behind any plant material which will resprout. Large infestations can be controlled by spraying with

Family	Scientific Name	Common Name	Treatment Methods
			glyphosphate 10mL/1L, and the use of a surfactant will increase the efficacy of herbicide. Spraying needs to be repeated during every site visit.
Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Cyperaceae	*Cyperus brevifolius*	Mullumbimby Couch	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Iridaceae	*Sisyrinchium rosulatum*	Scourweed	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Iridaceae	*Sisyrinchium micranthum*	Blue Pigroot	Hand Weed. Spot Spray - Glyphosphate 10mL/1L.
Juncaceae	*Juncus cognatus*		Hand Weed. Spot Spray - Glyphosphate 10mL/1L.

**note that non-endemic native species have not been included as they are not a high priority for removal*

This page intentionally left blank.

FIGURES

Legend

- Subject Site
- Subject Land
- Development Footprint

Image Source:
Image © NearMap 2019
Dated: 27/09/2019

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 25 50 75 100 m

I:\...\16222\Figures\RP2\20191118\Figure 1.1. Location_subject site_subject land

Figure 1 Location of the subject land and subject site

Figure 2 Vegetation communities of the subject site

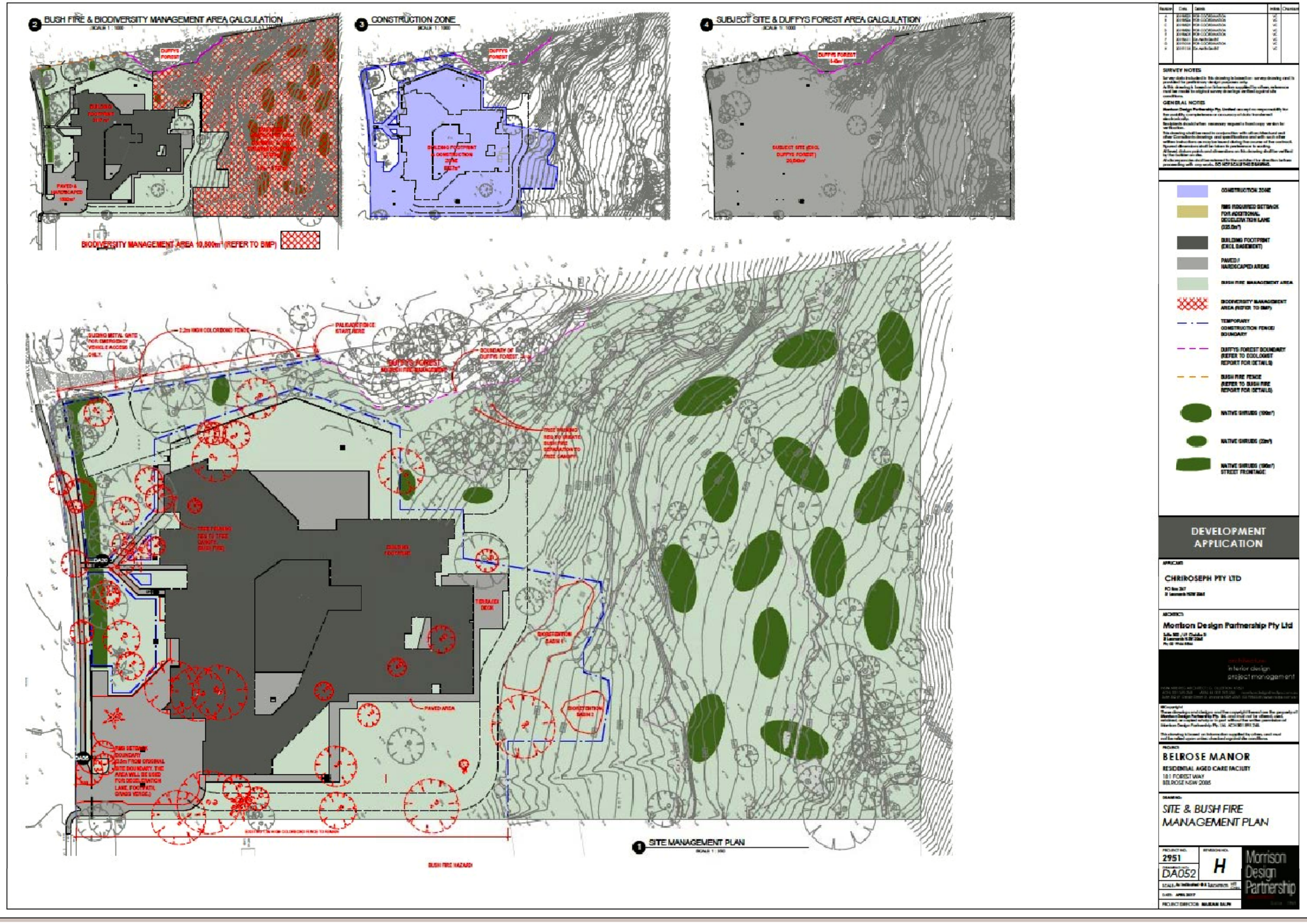

Figure 3 Layout of the Project

Image Source: Morrison Design Partnership (2019)

I:\...\16222\Figures\RP2\20191118\Figure 1.3. Layout_Project

Figure 4 Management Zones