VEGETATION MANAGEMENT PLAN

PROPOSED DEVELOPMENT DA NO. 99/2019

LOT 3 DP242332
303 BLACKHEAD ROAD
TALLWOODS

JULY 2020
REF: 20079

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Conacher Consulting Pty Ltd

Environmental and Land Management Consultants

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PREFACE

This Vegetation Management Plan has been prepared by *Conacher Consulting Pty Ltd* for a proposed manufactured housing estate at 303 Blackhead Road, Tallwoods.

PROJECT TEAM

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SECTION 1

BACKGROUND DETAILS

1.1 INTRODUCTION

Conacher Consulting have been engaged to prepare a Vegetation Management Plan (VMP) for the residual vegetated areas of a proposed development at 303 Balckhead Road, Tallwoods.

This VMP has been prepared in relation to the future management of the proposed vegetation retention within the RE1 zoned areas of the site for development application DA99/2019.

This VMP is a preliminary document for development assessment purposes provided to identify the overall intent and actions for the future management of the vegetated areas retained and improved in the site, including the RE1 zoned parts of the site. It is anticipated that this VMP will be revised, as required, and included as a consent condition for any future development approval.

There are no guidelines provided by Mid Coast Council for the preparation of Vegetation Management Plans. However to provide an acceptable VMP format, this VMP has been prepared with consideration and inclusions from the Vegetation Management Plan section of the Flora and Fauna Guidelines (Central Coast Council 2019) and the Vegetation Management Plan Guide (Blue Mountains City Council 2016).

Additionally some details on vegetation management has been provided from Sections 4, 12 and 13 of the Great lakes Development Control Plan. Details on the proposed development, landscape works/plans and bushfire hazard assessments have been provided as separate documentation to this VMP. Likewise detailed biodiversity impact assessment (Biodiversity Development Assessment Report) was prepared (Conacher Consulting 2020).

The site details are provided in Table 1.1.

TABLE 1.1
SITE DETAILS

Location	Lot 3 DP 242332, 303 Blackhead Road, Tallwoods
Local Government Area	Mid North Coast Council
Existing Land Use	Rural land with dwelling
Site Zoning	RE1 and R1

1.2 LAND OWNERSHIP DETAILS

The subject site is under private ownership. Parts of the RE1 zoned areas are to be retained and managed in accordance with this VMP and any subsequent versions of this VMP.

1.3 PROPOSED DEVELOPMENT

The proposed development is for a manufactured home estate and associated infrastructure. Parts of the R1 and RE1 zoned areas are proposed for retention and management under this VMP.

The parts of the RE1 zoned land managed under this VMP are to contain retained areas of vegetation and are to be managed for environmental conservation and utilised for recreation purposes permissible with the zone.

1.4 PLAN OBJECTIVES AND IMPLEMENTATION

The objectives of this VMP are to outline:

i) areas of the site to be incorporated into future environmental management areas,
ii) appropriate measures for the protection and management of the vegetation,
iii) Details on the revegetation of areas within the RE1 areas covered in this VMP.
iv) areas and methods for ongoing weed management,
v) details on the implementation, review and monitoring of the proposed works within the VMP area.

The implementation of this VMP is to commence following the issue of the final certification for the development works and to occur over an initial period of five years with a further extension of time after 5 years. The works required under this plan are to be implemented in the Vegetation Management Plan Areas and the Tree Retention & Asset Protection Zone (APZ) Outer Protection Area (OPA) shown in Figure 1.1.


Legend
Subject Site Boundary
RE1 - Public Recreation Area
Development Footprint
(refer to Landscape Architect plan)
Tree Retention & APZ OPA Management Area
Vegetation Management Plan Areas
Wildlife Corridor & Vegetation Rehabilitation Area
Wildlife Corridor & Vegetation Rehabilitation Area - managed as IPA
Wetland Planting Areas / Water Quality Ponds
conacher consulting
N
0 25 50 75 100 m
Plan produced as A4 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 20079
Date: 15/07/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 27/11/2019
Figure 1.1
Vegetation Management Plan Areas
Blackhead Road, Hallidays Point

SECTION 2

SITE CHARACTERISTICS

2.1 SITE DETAILS

Location
The Vegetation Management Plan Areas are shown in Figure 1.1. The northern parts of the site adjoin Coastal View Drive, while Blackhead Road adjoins the southern boundary. The western boundary of the Vegetation Management Areas adjoins existing partially cleared land for a golf practice range. The Vegetation Management Areas of the site are shown in Figure 1.1.

Topography and Drainage
The VMP Areas comprise the lower slopes of a small local hill and un-named drainage line which flows from Tallwoods Golf Course. Runoff from the partially urbanized catchments to the north and north-east flow into these drainage lines. A small swamp/wetland area is located adjacent to Blackhead Road where surface drainage is impeded by culverts under Blackhead Road.

Soils
The soils present in the low slopes of the northern part of the VMP area are colluvial soils with a sandy loam top soil (to 150mm depth) over a clay loam subsoil. The southern flatter parts of the VMP area contain deep silty loam alluvial soils with moist, mottled, silty clay subsoils at approximately 800 meter depth.

2.2 VEGETATION CHARACTERISTICS

The following descriptions are provided for the plant community types (PCTs) observed within the vegetation management areas of the site. The current locations of PCTs are mapped in Figure 2.1.

i. PCT 1550 – Small-fruited grey Gum – Turpentine – Tallowwood moist open forest on foothills of the lower North Coast

The site mapping for this PCT includes areas with an intact canopy and native understorey species and areas best described as derived grasslands predominantly vegetated by exotic species, with some native ground cover species and regrowth saplings.

Where a canopy stratum is present it is dominated by *Corymbia intermedia, Eucalyptus microcorys, Eucalyptus pilularis, Eucalyptus propinqua, Angophora costata and Allocasuarina littoralis.* Dominant shrubs which occur include *Leucopogon juniperinus, Acacia longifolia, Acacia brownii, Polyscias sambucifolia* and *Zieria smithii. C*ommon native ground covers present include *Imperata cylindrica, Themeda triandra, Echinopogon caespitosus, Hibbertia obtusifolia* and *Aristata vagans.*

This PCT does not correspond to any threatened ecological communities listed within the Biodiversity Conservation Act (2016).

ii. PCT 1235 Swamp oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion

This PCT occurs in highly disturbed areas of the site, with *Casuarina glauca*, the dominant tree species for this PCT present mainly along fence lines. Other areas of this PCT are considered and have been mapped as in a derived grassland condition. Common native understory species present include *Cyperus polystachyos, Fimbristylis dichotoma, Juncus planifolius, Juncus usitatus, Centella asiatica, Philydrum lanuginosum* and *Ranunculus repens.*

This PCT corresponds to the Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions endangered ecological community listed under the Biodiversity Conservation Act (2016).

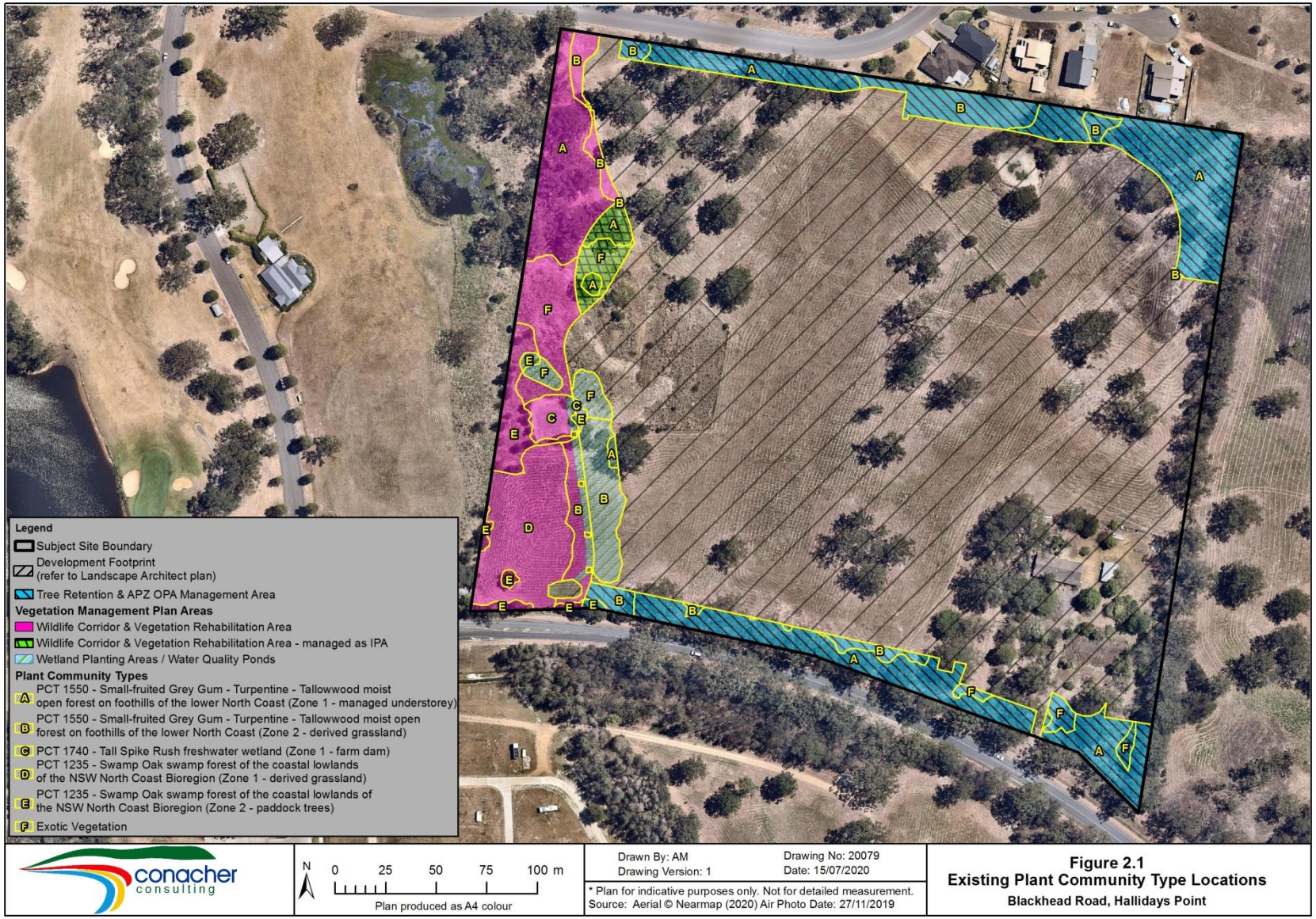
iii. PCT 1740 Tall Spike Rush Freshwater Wetland

This PCT occurs in dams which have been historically constructed on the site. The dominant species present include *Eleocharis sphacelata, Ludwigia peploides subsp. montevidensis,* and *Persicaria hydropiper.* This PCT does not correspond to any threatened ecological communities listed under the Biodiversity Conservation Act (2016).

2.3 WEED OCCURRENCE

The VMP area contains a diverse mix of weed species, as identified in the initial flora species list for the site (Conacher Consulting 2020), as provided in Appendix 1.

Weed occurrence is highest in areas of derived grassland which are currently not subject to regular slashing. Further refinement of the weed density areas should be undertaken during initial baseline monitoring works and prior to the commencement of targeted weed management.


Legend
Subject Site Boundary
Development Footprint
(refer to Landscape Architect plan)
Tree Retention & APZ OPA Management Area
Vegetation Management Plan Areas
Wildlife Corridor & Vegetation Rehabilitation Area
Wildlife Corridor & Vegetation Rehabilitation Area - managed as IPA
Wetland Planting Areas / Water Quality Ponds
Plant Community Types
A PCT 1550 - Small-fruited Grey Gum - Turpentine - Tallowwood moist open forest on foothills of the lower North Coast (Zone 1 - managed understorey)
B PCT 1550 - Small-fruited Grey Gum - Turpentine - Tallowwood moist open forest on foothills of the lower North Coast (Zone 2 - derived grassland)
C PCT 1740 - Tall Spike Rush freshwater wetland (Zone 1 - farm dam)
D PCT 1235 - Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion (Zone 1 - derived grassland)
E PCT 1235 - Swamp Oak swamp forest of the coastal lowlands of the NSW North Coast Bioregion (Zone 2 - paddock trees)
F Exotic Vegetation
conacher consulting
N
0 25 50 75 100 m
Plan produced as A4 colour
Drawn By: AM
Drawing Version: 1
Drawing No: 20079
Date: 15/07/2020
* Plan for indicative purposes only. Not for detailed measurement.
Source: Aerial © Nearmap (2020) Air Photo Date: 27/11/2019
Figure 2.1
Existing Plant Community Type Locations
Blackhead Road, Hallidays Point

SECTION 3

VEGETATION MANAGEMENT STRATEGY

3.1 VEGETATION MANAGEMENT OBJECTIVES

The following vegetation management objectives are identified:

- Retain and protect native vegetation within the wildlife corridor & vegetation rehabilitation area, including the parts zoned RE1 Public Recreation,
- Retain and managed native vegetation within the identified bushfire Asset Protection Areas subject to this VMP,
- Prevent the spread of weeds between the proposed development area and retained vegetation areas of the site,
- Undertake supplementary planting within existing cleared or disturbed parts of the Wildlife Corridor / Vegetation Rehabilitation Area,
- Revegetate the water quality ponds with suitable native species following construction,
- Remove rubbish dumped within retained vegetation areas,
- Undertake monitoring and evaluation of performance targets for the VMP.

3.2 NATIVE VEGETATION PROTECTION

All native vegetation within the retained part of the RE1 zoned area and all existing native vegetation within the Wildlife Corridor / Vegetation Rehabilitation Area is to be retained and managed in accordance with this VMP.

i. Construction Area Fencing

A 1.8m chain wire or metal panel interlocking construction fence is to be installed between the VMP area and the development area and maintained for the duration of construction works. The upslope side of the fencing is to be clearly marked with signage as a No Go Zone environmental protection area. Where tree removal operations in the development area would damage a chain wire fence, other temporary delineation such as high visibility safety mesh fencing is to be used.

Activities excluded from the Vegetation Management Plan area which are associated with the residential development include:

- Non-approved clearing of vegetation;
- Storage of vehicles or machinery;
- Storage of waste, fill or materials;
- Unauthorised access;
- Refuelling;
- Wash down and cleaning of equipment;
- Lighting of fires;
- Unauthorised soil level changes.

ii. Perimeter Fencing

Details of the proposed or perimeter fencing around the VMP area are provided below:

- Perimeter adjoining proposed development area:
  - Residential lot boundary fencing such as timber or metal panel fence.
  - Post and rail roadside fence.

- Western Perimeter along:
    - Wildlife friendly post and four strand plain wire.

- Southern perimeter along Blackhead Road:
    - Post and rail timber fence.

iii. Signage

Signs identifying “NO VEHICLE ACCESS” are to be installed along any fencing around the perimeter of the vegetation management area.

3.3 BUSHFIRE ASSET PROTECTION ZONE MANAGEMENT

Bushfire asset protection zones are to be located within the VMP area in the locations identified in the Bushfire Assessment Report, as shown in Figure 2.1. These areas are to be managed as either inner protection or outer protection areas in accordance with the requirements of Appendix 4 of RFS (2019).

Tree and shrub retention is allowable in the APZ provided that the tree canopy meets the following criteria:

Inner Protection Area
- <15% tree canopy cover
- Tree canopies should be separated by 2-5 metres
- Shrubs should not be located under trees and not form >10% ground cover
- Grass should be mown t a height <100mm,

Outer Protection Area
- <30% tree canopy cover
- Canopies separation of 2.5 metres
- Shrubs to comprise <20% ground cover
- Grass should be mown to a height <100mm

Screen plantings can occur in the outer protection zone areas along the northern site boundary, where compliance with the above requirements are achieved.

3.4 WEED MANAGEMENT

The Hunter Regional Strategic Weed Management Plan 2017-2022 (Hunter Local Land Services 2017) identifies the key priority weeds of the region, as identified under the provisions of the Biodiversity Act.

Weed control is to be undertaken throughout the VMP area. The extent and level of weed infestations (high, moderate and low levels) is identified in Figure 2.2. This initial Weed Occurrence Plan is to be revised following the initial weed inspection by the contracted bushland regenerator. Weed control is to consist of weed control actions over an initial period of 5 years. These works are to be undertaken by a professional bush regeneration contractor.

Ongoing weed control is required to ensure that weeds which regrow from regrowth or from the soil seed bank are managed after the initial weed control actions. Suitable weed control methods include both physical and herbicide controls. Details on suitable methods are provided in Appendix 2 and summarised below.

i. Physical Control Methods

Physical control methods involve using physical means such as machinery, hand removal and the use of hand tools and hand operated power equipment to remove either specific or broad ranges of weeds.

ii. Herbicide Control Methods

Herbicide control methods involve the use of chemicals which can target specific types of weeds or a broad spectrum of weeds.

All weed control methods, particularly any herbicide application methods, are to be implemented in accordance with the methods outlined in the NSW South Wales Weed Control Handbook (NSW Department of Primary Industries 2018).

iii. Target Weed Species

Priority weed species, identified in accordance with the Biosecurity Act (2015) in the Hunter Regional Strategic Weed Management Plan 2017 – 2022 (Hunter Local Land Services 2017) and weeds of national significance are to be targeted for control within the vegetation management areas of the site. Weed species to be targeted during the weed control works are listed in Table 3.1, only the weed species observed are to be targeted during works.

Future monitoring may also identify further weed species which can be practically controlled and managed and will result in a direct strategic benefit to the replanting and rehabilitation works proposed.

TABLE 3.1
WEED SPECIES

Common Name	Scientific Name	Priority Weeds	Weeds on National Significance	Observed on Site
African boxthorn	*Lycium ferocissimum*	x	x	
African lovegrass	*Eragrostis curvula*	x		x
African olive	*Olea europaea subsp. cuspidata*	x		
All species of the vascular plant Tracheophyta	*Tracheophyta* spp.	x		
Alligator weed	*Alternanthera philoxeroides*	x	x	
Anchored water hyacinth	*Eichhornia azurea*	x		
Arrowhead	*Sagittaria calycina*	x		
Asparagus fern	*Asparagus scandens*	x		
Asparagus (Broom)	*Asparagus virgatus*	x		
Asparagus weeds	*Asparagus aethiopicus, A. africanus, A. asparagoides* including western cape form, *A. plumosus, A. scandens*	x	x	
Athel pine	*Tamarix aphylla*	x	x	
Balloon vine	*Cardiospermum grandiflorum*	x		
Bellyache bush	*Jatropha gossypifolia*	x	x	
Bitou bush	*Chrysanthemoides monilifera*	x	x	
Black knapweed	*Centaurea x moncktonii*	x		

TABLE 3.1 WEED SPECIES				
Common Name	**Scientific Name**	**Priority Weeds**	**Weeds on National Significance**	**Observed on Site**
Blackberry	*Rubus fruticosus spp. agg.*	x	x	x
Blue heliotrope	*Heliotropium amplexicaule*	x		
Blue periwinkle	*Vinca major*	x		
Boneseed	*Chrysanthemoides monilifera subspecies monilifera*	x		
Brazilian button flower	*Centratherum punctatum*	x		
Bridal creeper	*Asparagus asparagoides*	x	x	
Bridal veil creeper	*Asparagus declinatus*	x		
Broad-leaf pepper tree	*Schinus terebinthifolius*	x		
Broomrape	*Orobanche spp.*(all species except the native *O. cernua var. Australiana and O. minor*)	x		
Cabomba	*Cabomba caroliniana*	x	x	
Camphor laurel	*Cinnamomum camphora*	x		
Cape broom	*Genista monspessulana*	x	x	
Cats claw creeper	*Dolichandra unguis*	x	x	
Chilean needle grass	*Nassella neesiana*	x	x	
Chinese celtis	*Celtis sinensis*	x		
Chinese knotweed	*Persicaria chinensis*	x		
Chinese tallow	*Triadica sebifera*	x		
Chinese violet	*Asystasia gangetica subsp. micrantha*	x		
Climbing asparagus	*Asparagus africanus*	x		
Cockspur coral tree	*Erythrina crista-galli*	x		
Coolatai grass	*Hyparrhenia hirta*	x		
Cotoneaster	*Cotoneaster spp.*	x		
Crofton weed	*Ageratina adenophora*	x		
East Indian hygrophila	*Hygrophila polysperma*	x		
Espartillo, Broad kernel	*Amelichloa caudata (Achnatherum caudatum)*	x		
Espartillo, Narrow kernel	*Amelichloa brachychaeta (Achnatherum brachychaetum)*	x		
Flax-leaf Broom	*Genista linifolia*		x	
Fireweed	Senecio madagascariensis	x	x	x
Frogbit / Spongeplant	*Limnobium* spp. (all species)	x		
Galenia	*Galenia pubescens*	x		
Gamba grass	*Andropogon gayanus*	x	x	
Giant Devil's	*Solanum chrysotrichum*	x		
Giant Parramatta grass	*Sporobolus fertilis*	x		x

TABLE 3.1 WEED SPECIES				
Common Name	**Scientific Name**	**Priority Weeds**	**Weeds on National Significance**	**Observed on Site**
Giant rats tail grass	*Sporobolus pyramidalis*	x		
Giant rattlepod	*Crotalaria lunata*	x		
Giant reed	*Arundo donax*	x		
Glory lily	*Gloriosa superba*	x		
Glush weed	*Hygrophila costata*	x		
Gorse	*Ulex europaeus*	x	x	
Green cestrum	*Cestrum parqui*	x		
Ground asparagus	*Asparagus aethiopicus*	x		
Groundsel bush	*Baccharis hamlimifolia*	x		
Hawkweed	*Hieracium* spp.	x		
Honey locust	*Gleditsia triacanthos*	x		
Horsetail	*Equisetum arvense*	x		
Hudson pear	*Cylindropuntia rosea*	x		
Hydrocotyl/Water pennywort	*Hydrocotyle ranunculoides*	x		
Johnson grass	*Sorghum halepense*	x		
Karoo acacia	*Vachellia karroo* (syn. *Acacia karroo*)	x		
Kidney leaf mud plantain	*Heteranthera reniformis*	x		
Kochia	*Bassia scoparia* (excluding *subsp trichophylla*)	x		
Koster's curse	*Clidemia hirta*	x		
Kudzu	*Pueraria lobata*	x		
Lagarosiphon	*Lagarosiphon major*	x		
Lantana	*Lantana spp.*	x		
Lantana	*Lantana camara*	x	x	x
Leaf cactus	*Pereskia aculeata*	x		
Long leaf Willow Primrose	*Ludwigia longifolia*	x		x
Ludwigia	*Ludwigia peruviana*	x		
Madeira vine	*Anredera cordifolia*	x	x	
Mahonia / Chinese holly	*Berberis lomariifolia*	x		
Mesquite	*Prosopis spp.*	x	x	
Mexican feather Grass	*Nassella tenuissima*	x		
Miconia	*Miconia spp*. (all species)	x		
Mikania vine	*Mikania micrantha*	x		
Mimosa	*Mimosa pigra*	x	x	
Ming asparagus fern / Pompom asparagus	*Asparagus macowanii var. zuluensis*	x		
Mistflower	*Ageratina riparia*	x		
Moth vine	*Araujia sericifera*	x		
Mother of millions	*Bryophyllum sp.*	x		

TABLE 3.1 WEED SPECIES				
Common Name	**Scientific Name**	**Priority Weeds**	**Weeds on National Significance**	**Observed on Site**
Mouse-ear hawkweed	*Hieracium pilosella*	x		
Mysore thorn	*Caesalpinia decapetala*	x		
Nodding thistle	*Carduus nutans*	x		
Noogoora burr	*Xanthium occidentale*	x		
Olive Hymenachne	*Hymenachne amplexicaulis*	x	x	
Orange hawkweed	*Hieracium aurantiacum*	x		
Ox eye daisy	*Leucanthemum vulgare*	x		
Pampas grass	*Cortaderia sp.*	x		
Parkinsonia	*Parkinsonia aculeata*	x	x	
Parthenium weed	*Parthenium hysterophorus*	x	x	
Paterson's curse	*Echium plantagineum*	x		
Pear	*Opuntia spp., Cylindropuntia spp., Austrocylindropuntia spp.* excluding *O. ficus indica*	x	x	
Pond apple	*Annona glabra*	x	x	
Prickly acacia	*Vachellia nilotica*	x	x	
Prickly pear	*Opuntia sp.*	x		
Rhus tree	*Toxicodendron succedaneum*	x		
Rubber Vine	*Cryptostegia grandiflora*	x	x	
Sagittaria	*Sagittaria platyphylla*	x	x	
Salvinia	*Salvinia minima*	x		
Salvinia	*Salvinia molesta*	x	x	
Scotch/English broom	*Cytisus scoparius subspecies scoparius*	x	x	
Sea spurge	*Euphorbia paralias*	x		
Senegal tea plant	*Gymnocoronis spilanthoides*	x		
Serrated tussock	*Nassella trichotoma*	x	x	
Siam weed	*Chromolaena odorata*	x		
Sicilian sea lavender	*Limonium hyblaeum*	x		
Sicklethorn	*Asparagus falcatus*	x		
Silver leaf nightshade	*Solanum elaeagnifolium*	x	x	
Spotted knapweed	*Centaurea stoebe subsp. micranthos*	x		
St Johns wort	*Hypericum perforatum*	x		
Sweet briar	*Rosa rubiginosa*	x		
Tiger pear	*Opuntia aurantiaca*	x		
Tree of heaven	*Ailanthus altissima*	x		
Tropical soda apple	*Solanum viarum*	x		
Water caltrop	*Trapa spp.* (all species)	x		
Water hyacinth	*Eichhornia crassipes*	x	x	

TABLE 3.1 WEED SPECIES				
Common Name	**Scientific Name**	**Priority Weeds**	**Weeds on National Significance**	**Observed on Site**
Water soldier	*Stratiotes aloides*	x		
Water star grass	*Heteranthera zosterifolia*	x		
Water lettuce	*Pistia stratiotes*	x		
Water milfoil	*Myriophyllum spicatum*	x		
Water poppy	*Hydrocleys nymphoides*	x		
White blackberry / Mysore raspberry	*Rubus niveus*	x		
Willows	*Salix* spp. (excludes *S. babylonica, S.*X *calodendron & S.* x *reichardtii*)	x	x	
Witchweed	*Striga spp.* (except the native *S. parviflora*)	x		
Yellow bells	*Tecoma stans*	x		
Yellow burrhead	*Limnocharis flava*	x		

iv. Weed Management Performance Targets

Various Vegetation Management Guidelines identify that any performance targets set for the objective measurement of the implementation of the VMP are to be specific, measureable, achievable and time based.

The performance targets set for the specifics of this VMP are based on the following criteria:

i) Size of VMP areas (2.35 hectares in total),
ii) Intensity of occurrence of weed species,
iii) Uncontrollable and long term impacts of weed seeds and propagules from unmanaged upstream areas of the gold course and existing residential area,
iv) Long term nature of the duration of the VMP actions (initially for 5 years then as per revision outcomes).

The specific and time based performance targets for this VMP are identified in Table 3.2. The Hunter Regional Strategic Weed Management Plan (Hunter Local Land Services 2017) provides further details on monitoring and continuous improvements for weed management programs, as detailed in Chapter 7 of that document.

TABLE 3.2 VMP PERFORMANCE TARGETS			
SPECIFIC VMP ACTION	**MEASURABLE QUANTITY**	**TIME PERIOD**	**ACHIEVED OUTCOME**
1. Fencing	- Temporary construction fence, - Lineal metres of perimeter fence.	Within 1st year	To be determined at monitoring/reporting stage
2. Weed Management	- 20% reduction of woody weeds, - 20% reduction of groundcover weeds.	20% each year for 5 years	To be determined at monitoring/reporting stage
3. Native Species Replanting	- Area (m^2) planted if needed. - 80% survival of plantings.	Annual planting for 4 years if needed.	To be determined at monitoring/reporting stage
4. Rubbish Management	- Volume of rubbish removed	100% removed by end of 2 years.	To be determined at monitoring/reporting stage
5. Monitoring	- Annual monitoring	Annually	To be determined at monitoring/reporting stage
6. Reporting to Council	- Annual reporting	Annually	To be determined at monitoring/reporting stage
7. Review of VMP	- Initial Review for Subdivision Certificate, - Four year review of approved VMP.	- Prior to approval of subdivision certificate, - At 4 years after approval	To be determined at monitoring/reporting stage

3.5 NATIVE SPECIES REPLANTING

i. Planting Areas

Targeted replanting areas are mapped in Figure 3.1. These areas have been identified for supplementary planting of native vegetation as they have been subject to historical clearing and currently have a low cover of native vegetation.

ii. Soil Remediation

The topsoil in planting areas should not be compacted and, if required can be covered with an approximately 50-100mm layer of weed-free eucalypt mulch to assist in water retention.

iii. Plant Sources

Where possible, plants are to be endemic species propagated from genetic stock sourced within the Central Coast local government area. A qualified and experienced bushland regenerator is to be engaged for any native plant propagation works. Seed collection and propagation is to be undertaken generally in accordance with the Office of Environment and Heritage (2011) Conservation Management Notes on Seed Collecting. Appropriate permissions for any collections undertaken and appropriate licensing under the *Biodiversity Conservation Act* (2016) will need to be obtained for any seed collected from offsite areas, this will be the responsibility of the bushland regenerator engaged to undertaken the works.

iv. Planting Species and Densities

The proposed planting areas have been separated into the following zones:

Wet Sclerophyll Forest Rehabilitation Area
Forested Wetland Rehabilitation Area
Wetland Planting Area / Water Quality Ponds

Suitable species for replanting and appropriate target planting densities for existing cleared areas are specified in Table 3.3. Further detailed methodologies for undertaking revegetation works are provided in Appendix 2.

TABLE 3.3a WET SCLEROPHYLL FOREST REHABILITATION AREA		
Scientific Name	**Common Name**	**Planting Stratum**
Eucalyptus microcorys	Tallowwood	Trees 1 per 5m2
Eucalyptus propinqua		
Eucalyptus resinifera	Red Mahogany	
Glochidion ferdinandi		
Polyscias sambucifolia	Elderberry Panax	Shrubs 1 per 1m2
Ozothamnus diosmifolius	White Dogwood	
Hibbertia aspera	Rough Guinea Flower	
Hibbertia obtusifolia		
Leucopogon juniperinus	Prickly Beard-heath	
Pultenaea retusa		
Acacia binervata	Two-veined Hickory	
Acacia brownii		
Acacia longifolia subsp. longifolia	Sydney Golden Wattle	
Breynia oblongifolia	Coffee Bush	
Rubus moluccanus var. trilobus	Molucca Bramble	
Rubus parvifolius	Native Raspberry	
Zieria minutiflora subsp. minutiflora		
Zieria smithii		
Exocarpos cupressiformis	Cherry Ballart	
Dodonaea viscosa subsp. spatulata		
Pimelea linifolia	Slender Rice Flower	
Lepidosperma laterale	Variable Sword-sedge	Groundcovers 5 per 1m2
Juncus usitatus		
Lomandra filiformis subsp. coriacea	Wattle Matt-rush	
Lomandra longifolia	Spiny-headed Mat-rush	
Lomandra multiflora subsp. multiflora	Many-flowered Mat-rush	
Aristida vagans	Threeawn Speargrass	
Austrodanthonia tenuior	A Wallaby Grass	
Cymbopogon refractus	Barbed Wire Grass	
Echinopogon caespitosus var. caespitosus	Tufted Hedgehog Grass	

TABLE 3.3a WET SCLEROPHYLL FOREST REHABILITATION AREA		
Scientific Name	**Common Name**	**Planting Stratum**
Echinopogon ovatus	Forest Hedgehog Grass	
Entolasia stricta	Wiry Panic	
Eragrostis brownii	Brown's Lovegrass	
Imperata cylindrica	Blady Grass	
Microlaena stipoides var. stipoides	Weeping Grass	
Panicum simile	Two-colour Panic	
Themeda triandra	Kangaroo Grass	
Lepyrodia scariosa		
Caesia parviflora	Pale Grass-lily	
Centella asiatica	Indian Pennywort	
Dichondra repens	Kidney Weed	
Goodenia heterophylla		
Gonocarpus teucrioides	Germander Raspwort	
Pratia purpurascens	whiteroot	
Dianella caerulea var. caerulea	Blue Flax-lily	
Boronia polygalifolia	Dwarf Boronia	
Blechnum cartilagineum	Gristle Fern	
Blechnum neohollandicum	Prickly Rasp Fern	
Convolvulus erubescens	Pink Bindweed	
Hibbertia scandens		Climbers 1 per 1m2
Glycine microphylla	Small-leaf Glycine	
Kennedia rubicunda	Dusky Coral Pea	
Eustrephus latifolius	Wombat Berry	
Billardiera scandens	Hairy Apple Berry	
Smilax glyciphylla	Sweet Sarsparilla	

TABLE 3.3b FORESTED WETLAND REHABILITATION AREA		
Scientific Name	**Common Name**	**Planting Stratum & Density**
Casuarina glauca	Swamp Oak	Trees 1 per 5m2
Eucalyptus resinifera	Red Mahogany	
Eucalyptus robusta	Swamp Mahogany	
Eucalyptus tereticornis	Forest Red Gum	
Melaleuca quinquenervia	Broad-leaved Paperbark	
Glochidion ferdinandi		
Goodenia ovata	Hop Goodenia	Shrubs 1 per 1m2
Hibiscus diversifolius	Swamp Hibiscus	
Callistemon pachyphyllus	Wallum Bottlebrush	
Callistemon salignus	Willow Bottlebrush	
Leptospermum juniperinum	Prickly Tea-tree	
Melaleuca ericifolia	Swamp Paperbark	
Melaleuca styphelioides	Prickly-leaved Tea Tree	

TABLE 3.3b FORESTED WETLAND REHABILITATION AREA		
Scientific Name	**Common Name**	**Planting Stratum & Density**
Baumea juncea		Groundcovers 5 per 1m2
Cyperus polystachyos		
Fimbristylis dichotoma	Common Fringe-sedge	
Fimbristylis ferruginea		
Gahnia clarkei	Tall Saw-sedge	
Schoenus apogon	Fluke Bogrush	
Juncus planifolius		
Juncus usitatus		
Lomandra longifolia	Spiny-headed Mat-rush	
Ischaemum australe		
Centella asiatica	Indian Pennywort	
Enydra fluctuans		
Goodenia stelligera	Spiked Goodenia	
Gonocarpus teucrioides	Germander Raspwort	
Philydrum lanuginosum	Frogsmouth	
Persicaria decipiens		
Parsonsia straminea	Common Silkpod	

TABLE 3.3c WETLAND PLANTING AREA / WATER QUALITY PONDS		
Scientific Name	**Common Name**	**Planting Location & Density**
Melaleuca ericifolia	Swamp Paperbark	Basin floor 1 per m2
Juncus usitatus		Basin floor 10 per m2
Carex appressa	Tall Sedge	
Ficinia nodosa	Knobby Club-rush	
Dianella longifolia		Basin Banks 5 per m2
Lomandra longifolia	Spiky-headed Mat-rush	

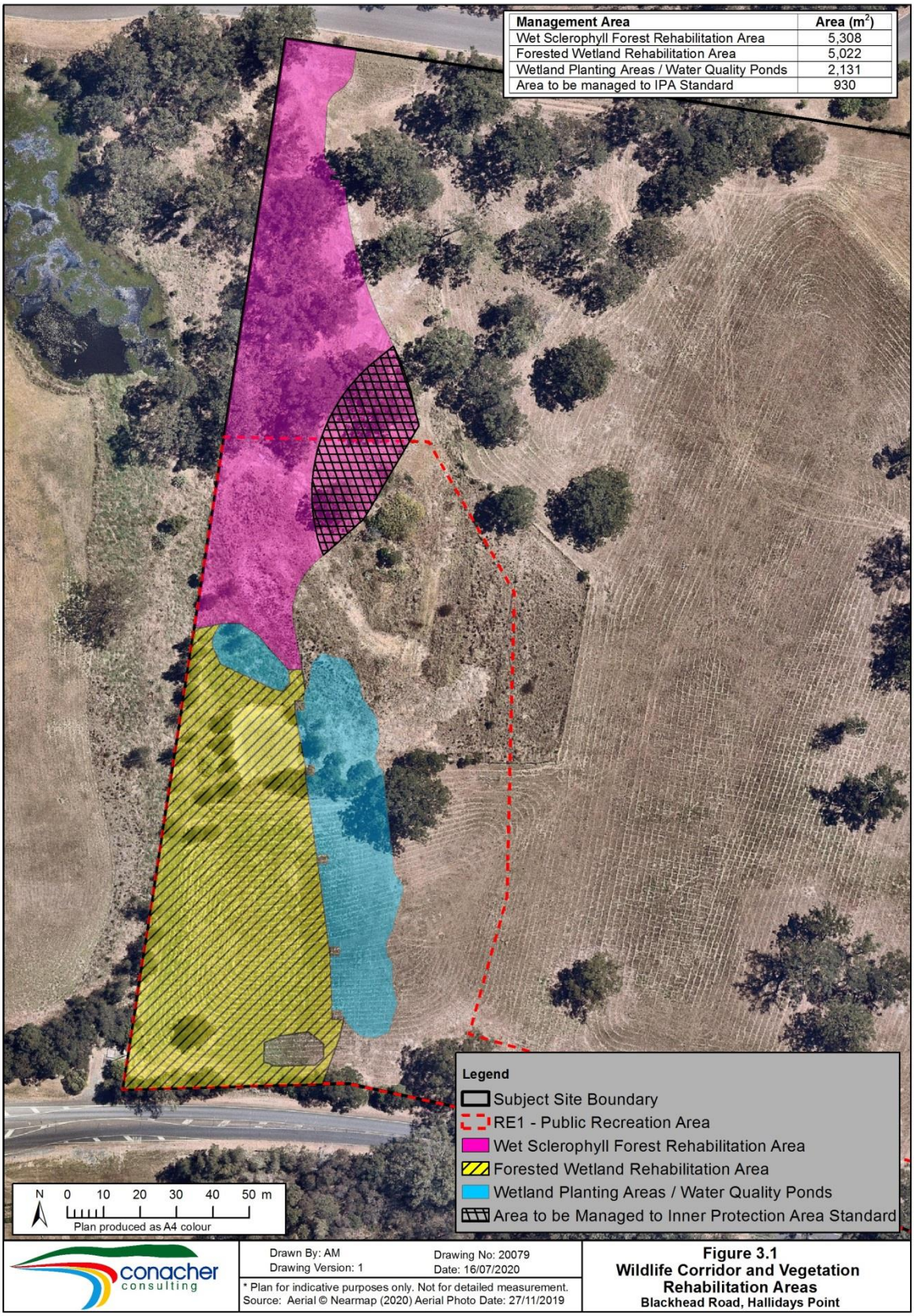


Figure 3.1
Wildlife Corridor and Vegetation Rehabilitation Areas
Blackhead Road, Hallidays Point

v. Pest and Pathogen Management

Monitoring of new plantings is to be undertaken to ensure that pest insect attacks and pathogens are detected early and appropriate control measures are implemented to prevent the widespread loss of plantings.

vi. Mulch and Fertiliser Application

Mulching of exposed soils around plantings is permissible provided any mulch used is free from weeds and harmful pathogens. Mulch can be applied to a maximum depth of 100mm and should not be used as a planting substrate. A slow release native plant specific fertiliser is to be applied to the base of each planting hole at the time of planting.

vii. Plant Protection

Plant guards may need to be provided for any new plantings to prevent herbivory from native wildlife. Plant stakes and guards are to be maintained as necessary and removed when no longer required.

viii. Watering

Watering of new plantings is to be undertaken during initial planting if soil moisture is low. Additional watering is also to be undertaken during periods of prolonged dry and/or hot weather for the first three months to support plant establishment. Ongoing watering will be subject to local rainfall and soil moisture conditions.

ix. Performance Monitoring and Targets

A performance target of 80% survival has been set for plantings over the management period. Planting losses in excess of 20% are to be replaced by the contractor at the landowners cost.

3.6 FAUNA MANAGEMENT AND HABITAT SUPPLEMENTATION

Prior to clearing for development works the clearing contractors are to be provided with an environmental induction by the project ecologist who is to identify the vegetation and fauna management requirements for the site and the implementation of any relevant consent conditions in relation to site management.

i. Fauna Management

Pre-Clearing Survey

Prior to works associated with the development commencing, an appropriately qualified and licensed Ecologist is to be engaged to undertake a pre-clearance survey. The pre-clearance survey is to include the following:

- Identification of all trees containing hollows, nests or dreys and mark with flagging tape;
- All hollows must be inspected, preferably physically or via the use of a camera (otherwise stag-watched), no more than two weeks prior to clearing to determine if any fauna are occupying hollows;
- Identification of habitat resources for salvage (felled hollows, hollow logs, fallen timber and boulders); and
- Identification of resource potential for seed collection and propagation purposes.

- Based on the results of the pre-clearance survey, the Ecologist is to provide advice regarding the appropriate times for felling to occur.

Protocol for the Removal of Hollow Bearing Trees

Hollow bearing trees to be removed are identified in the Biodiversity Development Assessment Report prepared by Conacher Consulting (2020). Hollow bearing tree removal will be undertaken under the direct supervision and instruction of an Ecologist utilising the following methods:

- Hollow bearing trees to be removed are to be clearly marked on site prior to clearing works and inspected for fauna occupation before clearing (within <2 days prior to clearing):

- Hollow bearing trees will be removed after the clearing of non-hollow bearing trees and shrubs;

- When fauna are present, the animals are to be removed and relocated to the adjacent bushland/nest boxes prior to felling; or

- Hollow bearing trees are to be slowly lowered or sectionally dismantled using an excavator, crane or similar technique under the supervision of the Ecologist before relocating animals to the adjacent bushland/nest boxes;

- Where a hollow bearing tree is determined to be too dangerous to climb and site access for an elevated work platform is not reasonably available an excavator is to be used, preferably with a rotating grab attachment. The machine operator will tap the tree with the machine several times in an effort to encourage resident fauna to leave hollows and find refuge elsewhere. The tree will then be nudged over by the machine grabbing the trunk or holding the root bowl in an effort to lower the tree as gently as possible. Once the tree is lowered all hollows will be inspected by the consulting ecologist and any resident fauna is to be cared for or released.

- Where sectional dismantling is to be undertaken it may be undertaken with the use of a crane, elevated work platform or by an arborist who will climb hollow trees and inspect hollows prior to felling for the presence of fauna, using a torch where necessary. If the presence of fauna is detected within a hollow, the hollow opening will be sealed with a towel or other similar fabric to avoid fauna escaping. The hollow will then be severed from the tree at the trunk using a chainsaw and lowered to the ground with the resident fauna contained within for removal, care and/or release.

- Captured fauna are to be released into adjacent bushland in a nest box;

- If the presence of fauna is not detected and an adequate pre-felling inspection has been undertaken of all hollows, then the tree may be felled using standard methods.

Protocol for the Management of Displaced Fauna

If displaced fauna species are encountered they are to be checked for injury. If captured, healthy displaced fauna will be released into a nest box temporarily placed on the subject site. A record of displaced fauna including species and health is to be maintained for reporting purposes.

If fauna is injured during works they are to be immediately transported to the nearest convenient veterinary hospital for appropriate treatment. Nearby veterinary hospitals include the following:

If immature fauna species are displaced and a deemed unable to care for themselves then they will be handed over to a licence local wildlife care organisation or veterinary clinic.

A record of displaced fauna including species and health is to be maintained for reporting to Councils Development Ecologist.

ii. Habitat Supplementation / Nest Box Provision

It is proposed that where possible all hollows removed will be converted into nest boxes with hardwood and reaffixed to recipient suitable trees within retained areas of the site, otherwise they will be transported to the Rehabilitation Area of the site identified in the wildlife corridor as ground habitat.

Where hollows removed cannot be converted to nest boxes for reuse, they are to be replaced with a nest box which will be erected within the wildlife corridor area of the site, or other areas with suitable retained trees. Any nest boxes installed must be of a type commensurate to the hollow to be removed. Nest boxes must be constructed of appropriate durable materials (eg. painted marine ply, native hardwood or similar). Nest boxes/salvaged hollows must be fixed to recipient trees with stainless steel screws, wire or similar.

Reused hollows and nest boxes are to be clearly numbered and their locations recorded with a GPS. A map the nest box locations and the assigned numbers is to be provided in monitoring reports Council's Ecologist.

Nest boxes and modified hollows are to be monitored by the Ecologist to determine their usage and condition and to carry out repairs or replacement (as required). To avoid disturbance to any fauna species utilising the nest boxes, monitoring surveys are to consist of diurnal ground inspections only.

3.7 EROSION & SEDIMENT CONTROL

A site specific erosion and sediment control plan is to be implemented for the subdivision construction works and is to include appropriate measures to protect the VMP area. The erosion and sediment controls are to be monitored throughout the works, particularly prior to and following heavy rainfall. The erosion and sediment control plan is to be updated on an ongoing basis to ensure that effective controls are in place for the duration of the works.

3.8 RUBBISH MANAGEMENT

Rubbish present within the VMP area is to be removed during the initial VMP actions (over a two year period) and then annually for the duration of this VMP. All rubbish is to be disposed of or recycled at an approved waste management or recycling facility.

3.9 WORKPLACE HEALTH AND SAFETY CONSIDERATIONS

Any bushland regeneration contractors involved in the implementation of this VMP are to hold and maintain current and relevant safe work method statements, current chemical handling certificates and workers compensation insurance, in accordance with current workplace safety requirements and legislation.

SECTION 4

IMPLEMENTATION, MONITORING & MANAGEMENT PROGRAM

4.1 WORKS PROGRAM

This plan is to be implemented following approval of the following the issue of the subdivision works certificate. The works outlined in the various sections of this Plan are to be implemented as outlined in Table 4.1.

4.2 MONITORING

Monitoring inspections are to be undertaken by the project ecologist in accordance with the schedule provided in Table 4.1. This will allow for appropriate ecological supervision and identification of any areas for improvement or which require additional management tasks.

Monitoring is to include a performance evaluation of the works and assessment of any deficiencies observed, and determination of a successful outcome for vegetation protection, weed management and any replanting works. Monitoring is to include:

- Photographs to be taken from fixed monitoring locations;
- Estimates of density of exotic vegetation;
- Estimates of density of native plant canopy, shrub and understorey cover;
- The survival rate for any plantings; and
- Identification of any adaptive changes or additional measures required to ensure vegetation regeneration and weed control meets the required targets.

A Monitoring Proforma for completion of the Annual Site Inspection Monitoring Reports is included as Appendix 3. The proforma may be modified as necessary.

If compliance with the monitoring requirements is not achieved within the timeframe of this Plan, the monitoring and management works period is to be extended until the works have been undertaken, to the satisfaction of Council.

4.3 REPORTING

Progress reports are to be submitted to Council's Ecologist each year for a minimum of 5 years after the commencement of works. Reports are to detail the progress of the works and any recommended additional actions, with a final report certifying completion of the Vegetation Management Plan at the end of the implementation period and until the specific objectives of the plan have been met.

4.4 REVIEW OF VMP

This VMP will initially be required to be reviewed initially as identified under any future consent condition. Consent Conditions generally require that the VMP is approved by Council prior to the release of the Subdivision Certificate.

It is also expected that the Consent Conditions will identify the mechanisms for incorporating the requirement to implement the VMP into a Section 88B instrument on the title of the land.

Additionally the final approved VMP is to be reviewed after four years of operation to identify if any changes are required to the text, plans or procedures for the VMP due to changes to best practise methods or vegetation/site conditions.

TABLE 4.1 SCHEDULE OF VEGETATION MANAGEMENT WORKS										
Management Tasks		**Stage**								**Works to be undertaken by**
		Prior to clearing / civil works	**During subdivision civil works**	**Following Civil Works Completion**						
				Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5***	**Ongoing**	
1	Install temporary protection fencing around VMA during subdivision works. Maintain fencing and remove at the completion of works.									Civil works / fencing contractor
2	Install erosion and sediment controls and maintain for the duration of works									Civil contractor
3	Undertake weed management works									Bushland regenerator
4	Undertake planting works									Bushland regenerator
5	Undertake rubbish removal									Bushland regenerator or contractor
6	Undertake annual compliance monitoring inspections and submit annual monitoring reports to Council by the end of the financial year.									Project ecologist
7	Ensure that the management recommendations of compliance monitoring reports are implemented									Landowner(s)
8	Detailed review of VMP performance actions									Project ecologist / consent authority
9	Revised VMP for next 5 years									Project ecologist / consent authority

5. REFERENCES

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Standards Australia (2009) Australian Standard AS 4970-2009 Protection of trees on development sites. SAI Global.

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APPENDIX 1

PLANT SPECIES LIST

TABLE A1.1
FLORA SPECIES OBSERVED ON THE SUBJECT SITE

Family Name	Scientific Name	Common Name	Q1	T1 & T2	Q2	T3
Canopy Trees						
Cupressaceae	*Cupressus macrocarpa**	Monterey Cypress		x		
Myrtaceae	*Angophora floribunda*	Rough-barked Apple				x
	Eucalyptus pilularis	Blackbutt				x
	Eucalyptus punctata	Grey Gum				x
	Eucalyptus saligna	Sydney Blue Gum	3		3	
	Syncarpia glomulifera subsp. glomulifera	Turpentine		x	5	
Small Trees / Tall Shrubs						
Casuarinaceae	*Allocasuarina torulosa*	Forest Sheoak				x
Fabaceae (Mimosoideae)	*Acacia irrorata*	Green Wattle		x		
	Acacia maidenii	Maiden's Wattle	1			
	Acacia schinoides	Green Cedar Wattle		x		
Lauraceae	*Cryptocarya microneura*	Murrogun			2	
Myrtaceae	*Acmena smithii*	Lilly Pilly			2	
	Callistemon salignus	Willow Bottlebrush				
	Melaleuca biconvexa [TS]	Biconvex Paperbark				x
	Melaleuca styphelioides	Prickly-leaved Tea Tree				x
Phyllanthaceae	*Glochidion ferdinandi*		4			
Rhamnaceae	*Alphitonia excelsa*	Red Ash	4		2	
Understorey Shrubs						
Arecaceae	*Livistona australis*	Cabbage Palm		x	3	
	*Syagrus romanzoffiana**	Cocos Palm				x
Asteliaceae	*Cordyline stricta*	Narrow-leaved Palm Lily			1	
Cannaceae	*Canna x generalis**					
Cyatheaceae	*Cyathea australis*	Rough Treefern				x
Fabaceae (Caesalpinioideae)	*Senna pendula var. glabrata**		1		2	
Lamiaceae	*Clerodendrum tomentosum var. tomentosum*				1	
Meliaceae	*Synoum glandulosum subsp. glandulosum*	Scentless Rosewood	1		2	
Monimiaceae	*Wilkiea huegeliana*	Veiny Wilkiea			1	

TABLE A1.1
FLORA SPECIES OBSERVED ON THE SUBJECT SITE

Family Name	Scientific Name	Common Name	Q1	T1 & T2	Q2	T3
Moraceae	*Ficus coronata*	Creek Sandpaper Fig	1		3	
	*Morus alba**	White Mulberry				
Oleaceae	*Ligustrum lucidum**	Large-leaved Privet		x		
	*Ligustrum sinense**	Small-leaved Privet	1		2	
	Notelaea longifolia f. glabra	Large Mock-olive				x
Poaceae	*Arundo donax**	Giant Reed		x		
Ripogonaceae	*Ripogonum fawcettianum*	Small Supplejack			2	
Rutaceae	*Citrus X limon*	Lemon		x		
	Melicope micrococca				2	
Sapindaceae	*Diploglottis australis*				2	
Solanaceae	*Solanum mauritianum**	Wild Tobacco Bush	2		1	
Verbenaceae	*Lantana camara**	Lantana	1		5	
Ground covers						
Araceae	*Zantedeschia aethiopica**	Arum Lily				
Asteraceae	*Ageratina adenophora**	Crofton Weed				
	*Bidens pilosa**	Cobbler's Pegs	2			
	*Conyza bonariensis**	Flaxleaf Fleabane				
	*Hypochaeris radicata**	Catsear	1			
	Ozothamnus diosmifolius	White Dogwood		x		
	*Senecio madagascariensis**	Fireweed		x		
	Sigesbeckia orientalis subsp. orientalis					x
	*Soliva sessilis**					
	*Sonchus asper subsp. asper**	Prickly Sowthistle	1			
Blechnaceae	*Doodia caudata*	Small Rasp Fern			2	
Brassicaceae	*Brassica fruticulosa**	Twiggy Turnip		x		
Caryophyllaceae	*Stellaria media**	Common Chickweed	2			
Commelinaceae	*Tradescantia fluminensis**	Trad	3		3	
Convolvulaceae	*Dichondra repens*	Kidney Weed		x		
Cyperaceae	*Carex appressa*	Tall Sedge				x
	*Cyperus aggregatus**			x		
	*Cyperus congestus**			x		

TABLE A1.1
FLORA SPECIES OBSERVED ON THE SUBJECT SITE

Family Name	Scientific Name	Common Name	Q1	T1 & T2	Q2	T3
	Gahnia clarkei	Tall Saw-sedge				x
	*Isolepis marginata**		1			
Dennstaedtiaceae	*Hypolepis muelleri*	Harsh Ground Fern	2			
	Pteridium esculentum	Bracken		x		
Dicksoniaceae	*Calochlaena dubia*	Rainbow Fern			3	
Fabaceae (Faboideae)	*Desmodium varians*	Slender Tick-trefoil	1			
	*Erythrina crista-galli**	Cockspur Coral Tree				
	Hardenbergia violacea	False Sarsaparilla				x
Geraniaceae	*Pelargonium domesticum**	Pelargonium				
	Geranium homeanum		1			
Lauraceae	*Cinnamomum camphora**	Camphor Laurel	1			
Lobeliaceae	*Pratia purpurascens*	whiteroot				x
Malvaceae	*Sida rhombifolia**		2			
Oxalidaceae	*Oxalis latifolia**		1			
	Oxalis perennans	Common Yellow Woodsorrel	1			
Phytolaccaceae	*Phytolacca octandra**	Inkweed				
Plantaginaceae	*Plantago lanceolata**	Lamb's Tongues		x		
Poaceae	*Cenchrus clandestinus**	Kikuyu Grass	1			
	*Ehrharta erecta**	Panic Veldt-grass	2			
	Entolasia stricta	Wiry Panic		x		
	Microlaena stipoides var. stipoides	Weeping Grass		x		
	Oplismenus aemulus		3		2	
	Poa affinis			x		
	*Poa annua**	Winter Grass	2			
	*Setaria palmifolia**	Palm Grass	3			
Solanaceae	*Solanum americanum*		2			
	*Solanum nigrum**	Black-berry Nightshade	1			
Typhaceae	*Typha orientalis*	Broad-leaved Cumbungi				
Verbenaceae	*Verbena bonariensis**	Purpletop		x		
Climbers						

TABLE A1.1
FLORA SPECIES OBSERVED ON THE SUBJECT SITE

Family Name	Scientific Name	Common Name	Q1	T1 & T2	Q2	T3
Basellaceae	*Anredera cordifolia**	Madeira Vine	1			
Bignoniaceae	*Pandorea pandorana subsp. pandorana*	Wonga Wonga Vine			1	
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling Lily	1		1	
Menispermaceae	*Stephania japonica var. discolor*	Snake Vine	1		1	
Rosaceae	*Rubus parvifolius*	Native Raspberry			1	
Rubiaceae	*Morinda jasminoides*					x
Smilacaceae	*Smilax australis*		1		1	
Vitaceae	*Cayratia clematidea*	Native Grape			3	
	Cissus antarctica	Water Vine	1		2	
	Cissus hypoglauca	Giant Water Vine				x

APPENDIX 2

WEED MANAGEMENT & PLANTING GUIDELINES

PART 1

WEED MANAGEMENT TECHNIQUES

1. BACKGROUND INFORMATION

Where there is a risk of damage to existing plantings and native vegetation, weed removal should be undertaken using hand held machinery and tools to reduce soil disturbance and minimise damage to nearby native plants. In addition to hand removal of weeds in some situations where weeds are abundant or too large to remove, the use of appropriate herbicide in accordance with the manufacturer's specifications and NSW Department of Primary Industries Weed Management Handbook.

2. WEED REMOVAL TECHNIQUES

Hand weed removal should be undertaken in accordance with the following techniques recommended by the National Trust, NSW National Parks and Wildlife Service, Australian Association of Bush Regenerators, and Buchanan (2009) and Greater Sydney Local Land Services (2019).

2.1 Weed removal techniques for woody plants

Cut and Paint (Woody weeds to 10 cm basal diameter)
- Make a horizontal cut close to the ground using a sharp blade, secateurs or a bush saw;
- Immediately apply herbicide to the exposed flat stump surface.

Considerations:
- Cuts should be horizontal to prevent herbicide from running off the stump, sharp angle cuts are hazardous;
- Herbicide must be applied immediately before the plant cells close (within 30 seconds) and translocation of herbicide ceases;
- If plants resprout cut and paint the shoots after sufficient regrowth has occurred; and
- Stem scraping can be more effective on some woody weeds.

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

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

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

2.2 Weed removal techniques for small hand-pullable plants

Hand Removal

- Remove any seeds or fruits and carefully place into a bag for disposal;
- Grasp stem at ground level, rock plant backwards and forwards to loosen roots and pull out; and
- Tap the roots to dislodge any soil, replace disturbed soil and pat down
- Ensure that any reproductive parts are collected and bagged for disposal.

Considerations:

- Leave weeds so roots are not in contact with the soil or remove from site.

2.3 Weed removal techniques for vines and scramblers

Hand Removal

- Take hold of one runner and pull towards yourself;
- Check points of resistance where fibrous roots grow from the nodes;
- Cut roots with a knife or dig out with a trowel and continue to follow the runner;
- The major root systems need to be removed manually or scrape/cut and painted with herbicide; and
- Any reproductive parts need to be bagged.

Stem Scraping

- Scrape 15 to 30 cm of the stem with a knife to reach the layer below the bark/outer layer; and
- Immediately apply herbicide along the length of the scrape.

Considerations:

- A maximum of half the stem diameter should be scraped. Do not ringbark;
- Larger stems should have two scrapes opposite each other; and
- Vines can be left hanging in trees after treatment.

2.4 Weed removal techniques for plants with underground reproductive structures

Hand Removal of Plants with a Taproot

- Remove and bag seeds or fruits;
- Push a narrow trowel or knife into the ground beside the tap root, carefully loosen the soil and repeat this step around the taproot;
- Grasp the stem at ground level, rock plant backwards and forwards and gently pull removing the plant; and
- Tap the roots to dislodge soil, replace disturbed soil and pat down.

Crowning

- Remove and bag stems with seed or fruit;
- Grasp the leaves or stems together so the base of the plant is visible;
- Insert the knife or lever at an angle close to the crown;
- Cut through all the roots around the crown; and
- Remove and bag the crown.

Herbicide Treatment – Stem Swiping

- Remove any seed or fruit and bag; and
- Using a herbicide applicator, swipe the stems/leaves.

Considerations:

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

- Some bulbs may have small bulbils attached or present in the soil around them which need to be removed;
- It may be quicker and more effective to dig out the weed;
- Protect native plants and seedlings; and
- For bulb and corm species the most effective time to apply herbicide is after flowering and before fruit is set.

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

3. USE OF HERBICIDES

There are various categories of herbicides currently used specifically those that kill on contact (contact herbicides), and those that must move through the tissue of the plant (translocated herbicides). Other herbicides include those that are non-selective and those that are selective. There are also residual herbicides that remain active in the soil and give ongoing weed control for a few weeks to a few years.

An advantage of herbicide use is the relatively reduced amount of time taken to spray weeds as compared to physically removing them, particularly for large infestations of weeds. Another advantage is that the dead weeds may provide some measure of soil stabilisation for a short period of time.

Herbicides should not be applied prior to rain occurring. This reduces the herbicides effectiveness as well as being transported in runoff to waterbodies.

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

Herbicides should particularly be considered when:

- There are small areas of dense weeds with few or no native plants to protect;
- There are large areas of weeds;
- The weeds are growing too rapidly or are too large for physical removal; and
- The weeds are located in areas with a high potential for erosion if vegetation is removed.

The spraying of weeds must only be undertaken by experienced and qualified persons. The success of each treatment must be evaluated by the operator after a set period of time according to the labelled effectiveness for each herbicide. Care must be taken when applying herbicides near drainage lines to avoid excess use due to the sensitivity of the wetlands and waterways into which runoff will eventually flow.

All herbicide use is to be in accordance with the:

i) Instructions on the product label,
ii) Requirements of the Pesticides Act,
iii) Details provided by the NSW Department of Primary Industries 2014.

PART 2

PLANTING GUIDELINES

1. SITE PREPARATION

Site preparation activities for all planting areas will include preliminary weed control and where necessary rubbish removal and soil remediation.

2. PLANT MATERIAL

Plant material used for revegetation within the project area shall preferably be sourced only from the catchment management area. The Bushland Regenerator / Landscape Contractor is responsible for obtaining all necessary permits and licenses for collection and propagation of any native plant material. All plants are to be provided in a healthy condition. They must have good root development and a sturdy shoot system. Plants with an elongated or yellowed shoot system shall not be accepted. Planting shall be undertaken immediately after delivery. If this is not possible, the Bushland Regenerator / Landscape Contractor shall be required to provide appropriate storage to keep the plants in good condition on the site, adequately protected from frost, wind, sun and vermin, and secured from vandals.

3. PLANTING GUIDELINES

3.1 Planting Densities and Niche species

The Bushland Regenerator / Landscape Contractor shall be responsible for planting according a Site Planting Plan prepared in consultation with the Proponent. This Plan will detail the required species and their distribution across the planting area. The Bushland Regenerator / Landscape Contractor shall be responsible for ensuring planting densities and appropriate niche species.

Only locally indigenous plants will be used, in accordance with the species list provided within this Plan. Niche preferences shall be considered in planting, with plants being placed in the correct position with regard to soil type, moisture, aspect and slope. Plantings should be at a density which will result in a near natural density once established.

3.2 Planting Methods

Planting holes shall be excavated to an appropriate depth depending on the size of the stock, this will generally be twice the size of the existing plant container. Slow release native plant fertiliser (low phosphorous formulated native plant fertiliser tablet/granules) shall be placed into the planting hole. In poorly structured soils, approximately 200 cubic centimetres of native plant soil mix is to be placed and incorporated into the planting hole with fertiliser and water storing granules. Plants must be placed into moistened soil preferably by soaking of water into each hole. After planting the soil shall be replaced and carefully firmed, leaving a slight depression around each plant to allow for water collection. Soil is to be replaced in the hole so that the base of the stem is level with the soil surface, not set below the soil, or sitting above.

All plants are to be thoroughly watered before planting and again after planting. If the weather is hot, a third watering shall be carried out within two (2) days or an irrigation system may be set up to water plants on a weekly basis.

3.3 Plant Protection

The Bushland Regenerator / Landscape Contractor shall be responsible for adequately protecting plant material from frost, wind, sun, vermin and animals. Plant guards (including 2 stakes) shall be around each plant and maintained throughout the maintenance period of up to 2 years. The use of Jute mats (mulch mats) is recommended where weed regrowth or soil erosion is expected.

3.4 Mulching

After planting, the exposed ground directly around each plant must be mulched with low-nutrient mulch such as weed free chipped eucalyptus. No exotic plant material is to be used. Pine bark is considered not to be a suitable mulch material. The provenance of all mulch material must be known and approved by the Bushland Regenerator. Mulch is not to be used in sand dunes ecosystems or bushfire inner protection areas. Care should be taken to keep mulch material away from the stems of smaller plants. Alternately, a light sowing of a suitable nurse crop can be made between plantings to provide a protective microclimate. Sowing rates to be used are those recommended by the supplier and agreed with the Bushland Regenerator.

3.5 Maintenance and Weed Control

Plantings must be suitably maintained (watering and weeding). During the maintenance phase any plant losses in excess of 20% of the total number planted must be replaced at the expense of the Bushland Regenerator.

Site maintenance shall consist of the following tasks:

- Weeding throughout the planting area;
- Watering plantings;
- Replacing lost plants (as required);
- Removing wind-blown or other rubbish from the planting area; and
- Adjusting plant guards.

APPENDIX 3

VEGETATION MANAGEMENT PLAN MONITORING PROFORMA

ANNUAL SITE INSPECTION MONITORING REPORT

DA No. **REPORT NO:**

ADDRESS: **DATE:**

RELEVANT MANAGEMENT PLAN: **INSPECTED BY:**

1) ACTIONS UNDERTAKEN DURING REPORTING PERIOD

- Fencing
-
-
- Weed Management
-
-
- Native Species Replanting
-
-
- Rubbish Management
-

2) VEGETATION CONDITION ASSESSMENT

- Condition of retained Vegetation (maps, description, photos)
- Growth of planted vegetation
    - Height
    - Survival Rate
-
- Details of natural regeneration occurring
-
-
-
- Weed Occurrences/Location/Cover
-
-

3) OTHER MATTERS

Eg. Bushfire/flood events, weed invasions, severe weather events etc.

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-
-
-

4) COMPLIANCE/NON COMPLIANCE WITH REQUIREMENTS OF VEGETATION MANAGEMENT PLAN

- VMP Performance Targets (Tabel 3.2 of VMP)
-
-

5) REFERENCE AREA PHOTOGRAPHS

-
-
-

6) FOLLOW UP ACTIONS

-
-
-
-

7) CONCLUDING COMMENTS

-
-
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INSPECTION TO BE COMPLETED IN JUNE/JULY EACH YEAR REPORT TO BE FORWARDED TO COUNCIL BY END OF JULY