Revised Vegetation Management Plan

The Pines Expansion

Original VMP prepared by Coffs Harbour Bushland Regeneration Group October 2011

PO Box 119
Lennox Head NSW 2478
T 02 6687 7666

PO Box 1446
Coffs Harbour NSW 2450
T 02 6651 7666

PO Box 1267
Armidale NSW 2350
T 02 6772 0454

PO Box 229
Lismore NSW 2480
T 02 6621 6677

info@geolink.net.au

Prepared for: Hometown Australia

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1. Introduction

1.1 Background

GeoLINK has been engaged by Hometown Australia Holdings Pty Ltd to prepare a revised Vegetation Management Plan (VMP) in association with the approved expansion of The Pines over 50's Lifestyle Village at Lot 106 DP1144462, 8 Hearnes Lake Road, Woolgoolga ('the site'). The site is within the Coffs Harbour Local Government Area (LGA) (refer to **Illustration 1.1**).

Development application (DA) 08_0005 was approved on 4 June 2012 for the proposed development. Condition of Consent (CoC) C7 required the preparation of a VMP prior to a Construction Certificate being issued:

C7. Vegetation Management Plan

The **Vegetation Management Plan** prepared by *Coffs Harbour Bushland Regeneration Group dated October 2011 prepared by Coffs Harbour Bushland Regeneration Group* contained in the Preferred Project Report under Condition B2 shall be submitted to and approved by Council prior to commencement of any work on site. The Plan shall also include the following:

a) The aims and methods of site preparation, including methods for planting, schedule and establishment of fully structured and appropriate native vegetation (trees, shrubs and groundcover species) that consists of local endemic communities. *Callistomen salingnus* and *Melaleuca Linariifolia* shall be included amongst the understorey species to be planted

b) All rehabilitation works are to be undertaken by a suitably qualified Bush Regenerator. All tree protection works are to be undertaken by a suitably qualified arborist

c) The planting schedule shall be in accordance with the *Vegetation Management Zones* contained in the Plan. Selected weed species may be retained at the discretion of the Bush Regenerator during rehabilitation stages to assist in the re-vegetation process. The management of zone two shall incorporate clump canopy plantings.

d) Identify trees to be retained and trees to be removed during construction

e) Rehabilitation works shall occur over no less a time period than five years.

f) A Security Bond of $24 670 for the satisfactory completion of rehabilitation works shall be deposited with Council prior to the issue of a Construction Certificate. The Bond shall be released following certification by Council of the practical completion of the works under this Plan such that rehabilitated areas are in a healthy, self sustaining state.

g) All rehabilitation areas shall be maintained by the Proponent into perpetuity. Long term management post-rehabilitation works shall be described by the Plan

h) Provision for habitat boxes for the threatened Squirrel Glider at the site and details in relation to the number, location and design of habitat boxes

i) Details of weed control, installation of sedimentation and erosion control, surface stabilisation and sterile ground covers

j) Fire management measures and an ecological fire regime in accordance with *Planning for Bush Fire Protection 2006* (RFS)

k) Detail short term and long term fencing requirements to protect areas to be rehabilitated and conserved during construction.

Figure 1.1 Condition of Consent C7 (DA08_0005)

A modification request to the approved DA was approved 24 July 2018 to reduce the number of long-term sites from 53 to 47 and to revise the internal site layout.

The original VMP was prepared in October 2011 by Coffs Harbour Bushland Regeneration Group (CHBRG) and due to the potential change in site conditions since originally written, a revised VMP has been requested by Council. It should be noted that CHCC Biodiversity Guideline #4 (Compensatory Planting Advice) (July 2008) was used during preparation of the VMP in 2011 to determine the number of compensatory offset plantings required.

The overall aim of the revised VMP is to achieve the best environmental/ biodiversity outcomes for the site, while merging historical requirements with current VMP guideline requirements, updating site conditions while meeting CoC C7 (refer to **Figure 1.1**).

This revised VMP is to be submitted to Coffs Harbour City Council (Council) for approval and subsequent implementation by persons with professional qualifications and/or knowledge and experience in bush regeneration/stream rehabilitation practices and who are eligible for membership to the Australian Association of Bush Regenerators (AABR).

1.2 The Site and Approved Development

The approved expansion at The Pines involves:

- Native and introduced vegetation removal within the expansion footprint.
- Bulk earthworks to cut material from the upper slope and place fill within the now dysfunctional effluent treatment ponds, to form level terraces for development of lots.
- Formation of perimeter and internal access roads.
- Establishment of 47 individual lots for the over 50's lifestyle village.
- Construction of 47 dwellings.

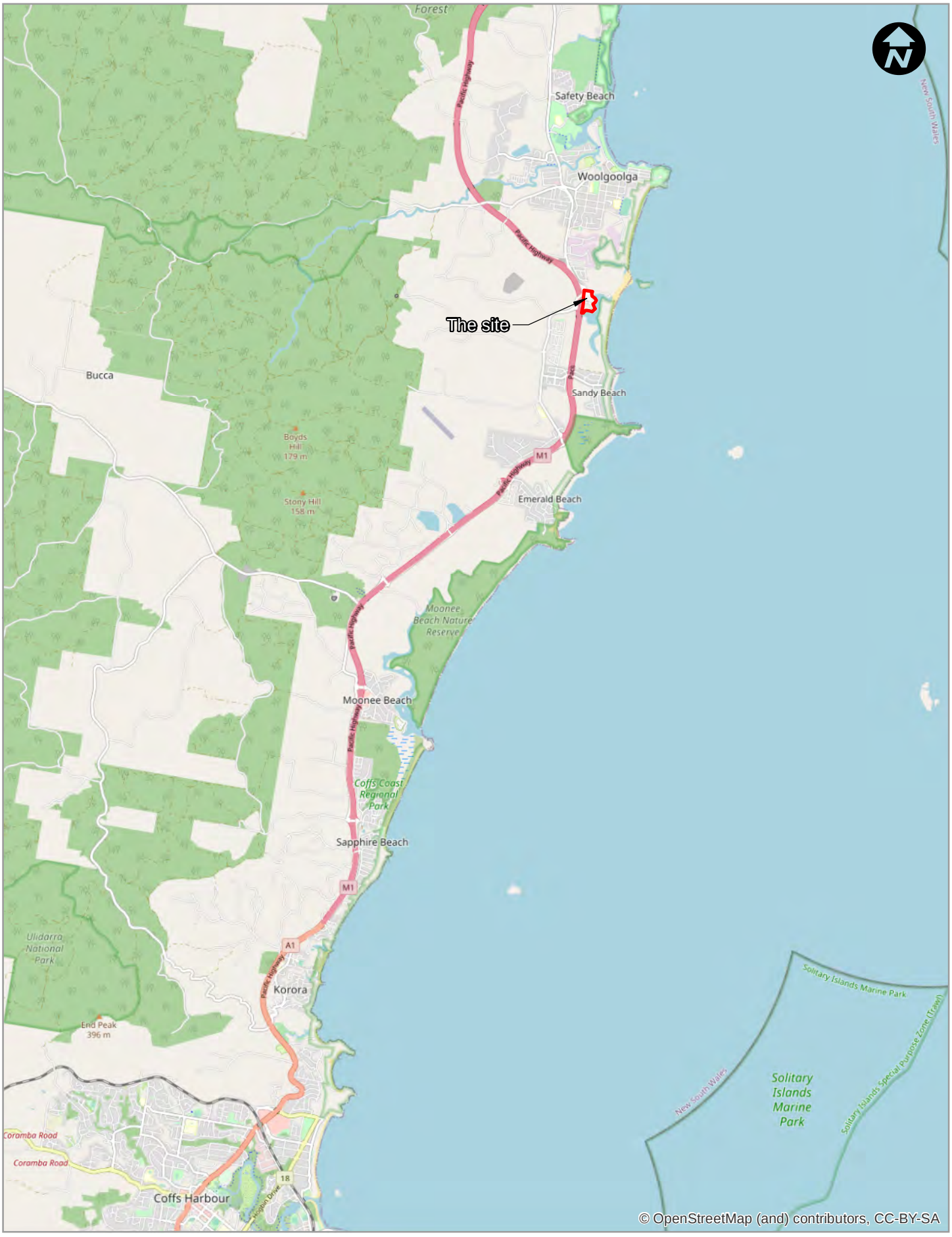
The site plan and lot layout is shown in Illustration 1.2.

The site is zoned RE2 (Private Recreation), is bordered to the west by the Pacific Highway, to the south and east by Double Crossing Creek and associated forested wetlands and to the north by Hearne's Lake Road. The area subject to the VMP management zones is located in the southern portion of the site, referred to herein as the Vegetation Management Area (VMA).

Construction of The Pines expansion requires removal of approximately 152 juvenile and mature native trees (CHBRG, 2011) (refer to **Section 1.5** and **Illustration 1.3**). The associated works (subject to this VMP) include:

- Initial weed control and replacement planting in the VMA to offset trees cleared for the approved expansion.
- Vegetation management and revegetation plan for a period of five years and will outline long-term management of the VMA post-rehabilitation.
- Prescriptions for exclusion fencing and installation of native vegetation restoration signage.
- Nest box installation requirements targeting the threatened Squirrel Glider (*Petaurus norfolcensis*).

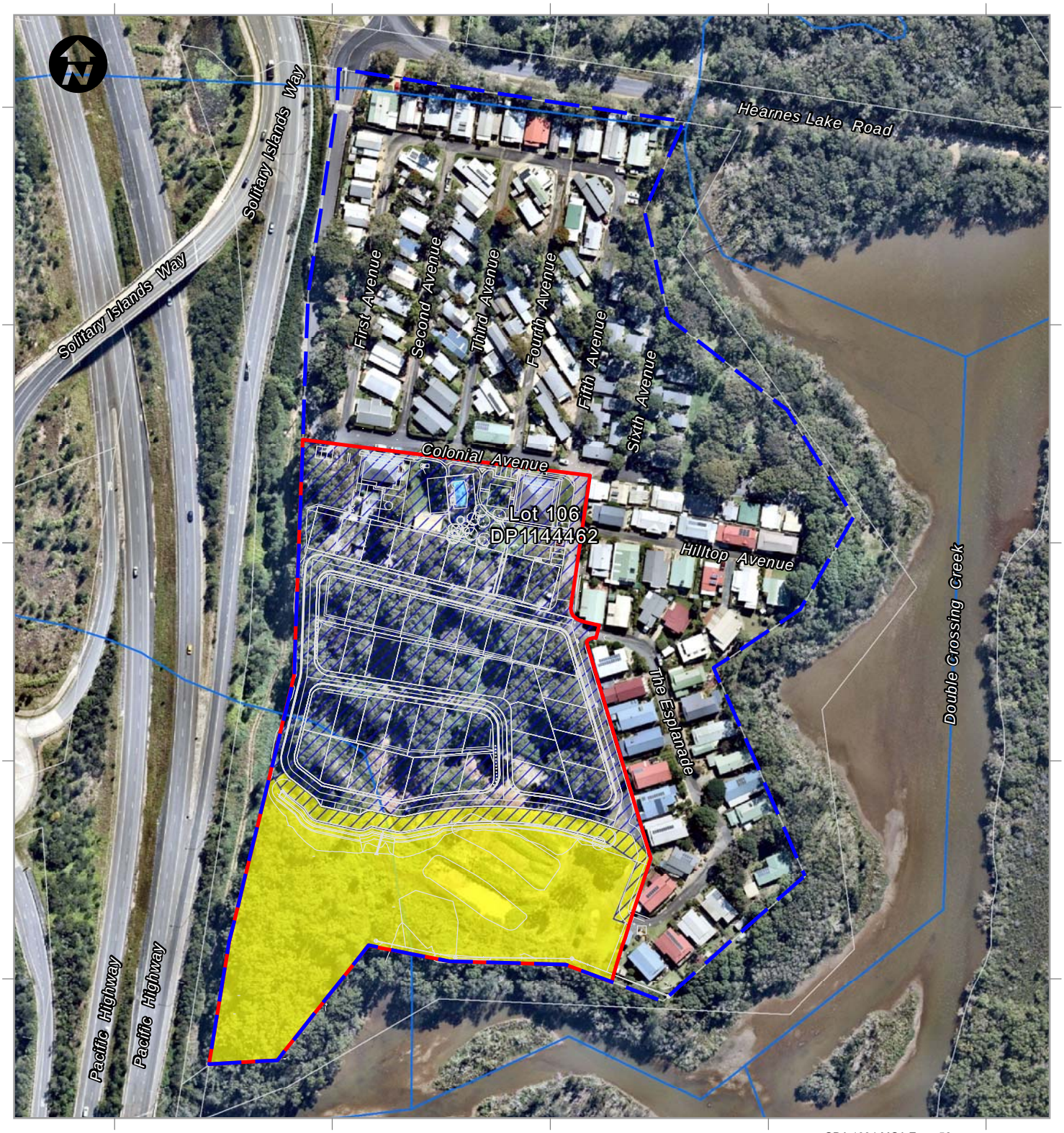
Photographs of the site are shown in **Plate 1.1** to **Plate 1.5.**



0 2 Km

Site Locality - Illustration 1.1

Information shown is for illustrative purposes only
Drawn by: AB Checked by: RE Reviewed by: JOL
Source of base data: OpenStreet Map
Date: 11/06/2021



LEGEND

- The site
- Lot 106 boundary
- Area subject to VMP
- Area subject to The Pines Expansion
- Site plan
- Watercourse

0 50 Metres

The Site - Illustration 1.2

Information shown is for illustrative purposes only
Drawn by: AB Checked by: RE Reviewed by: JOL
Source of base data: Nearmap 19/04/2021
Date: 16/06/2021

Plate 1.1 View north towards the expansion area to be developed and native vegetation to be removed

Plate 1.2 View to the north-east towards the expansion area including native vegetation to be removed and sewerage ponds to be back filled

Plate 1.3 View east of sewerage ponds to be backfilled and part of the VMA to be rehabilitated

Plate 1.4 View south-east of native vegetation and encroachment of exotic species within the VMA

Plate 1.5 View south of better quality native canopy vegetation and encroachment of exotic species within the VMA

1.3 Vegetation Communities and Condition

Retained vegetation is moderately to highly degraded due to selective historical clearing and infestation/ encroachment of exotic species. Whilst the mid-storey and groundcover have been most affected, native canopy trees are in relatively good condition. Exotic grasses, herbs and shrubs are dominant in areas that have been previously cleared.

Two vegetation communities occur at the site (Coffs Harbour Fine-scale Vegetation Map, OEH 2012) (refer to **Illustration 1.2**). Vegetation communities are described at **Table 1.1** and an equivalent plant community type (PCT) is assigned as per the BioNet Vegetation Classification.

Table 1.1 Vegetation Communities On-site

CHCC Fine Scale Vegetation Community	***Plant Community Type (PCT) based on 'best fit'***	***Threatened Ecological Community (TEC) based on the Floristic Composition of the Site***
Vegetation to be removed for the expansion: – (CH_DOF06) - Lowlands Swamp Box - Paperbark - Red Gum Dry Forest	*PCT 686 - Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion*	Not Applicable
Vegetated riparian zone of Double Crossing Creek: – (CH_DOF06) - Lowlands Swamp Box - Paperbark - Red Gum Dry Forest	*PCT 686 - Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion*	Not Applicable
– (CH_FrW01) - Coastal Paperbark Swamp Oak Floodplain Forest	*PCT 1064 - Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion*	*Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions*

Higher elevation vegetation (PCT 686) at the site is dominated by an exotic understorey but with mature native canopy species scattered throughout including Forest Red Gum (*Eucalyptus tereticornis*), Pink Bloodwood (*Corymbia intermedia*), Blackbutt (*E. pilularis*), Northern Grey Ironbark (*E. siderophloia*), Tallowwood (*E. microcorys*), occasional Swamp Box (*Lophostemon suaveolens*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak associated with the drainage lines. The structure of this community has been disturbed through historic land use activities that have resulted in selective tree removal and where a native groundcover or midstorey is generally absent.

A small portion of vegetation associated with the riparian zone of Double Crossing Creek comprises Swamp Mahogany (*E. robusta*), Broad-leaved Paperbark and Swamp Oak as the dominant canopy species (PCT 1064).

LEGEND

- The site
- Lot 106 boundary
- Cadastre
- Biodiversity Values mapping
- Secondary Koala habitat
- Coast and Escarpment Blackbutt Dry Forest
- Coastal Paperbark Swamp Box Littoral Forest
- Coastal Paperbark Swamp Oak Floodplain Forest
- Coastal Sand Bloodwood - Banksia Forest
- Coastal Wallum Teatree Banksia Wet Heathland Shrubland
- Estuarine Mangrove Forest
- Lowlands Swamp Box - Paperbark - Red Gum Dry Forest
- Swamp Oak Forested Wetland
- Wallum Banksia Black She-oak Shrubland
- Watercourse

0 50 Metres

Vegetation Plan - Illustration 1.3

Information shown is for illustrative purposes only
Drawn by: AB Checked by: RE Reviewed by: JOL
Source of base data: Nearmap 19/04/2021
Date: 16/06/2021

1.3.1 Threatened Ecological Communities (TEC)

Vegetation within the VMP expansion area is not consistent with any TEC listed under the *Biodiversity Conservation* (*BC*) *Act 2016* or *Environment Protection and Biodiversity* (EPBC) *Act 1999*. Vegetation predominantly adjacent to the site (PCT 1064) is consistent with the BC Act listed TEC *Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* (listed as Endangered) (refer to **Illustration 1.3**). This vegetation will not be impacted by the expansion.

1.3.2 Priority Weeds

The VMA comprises a moderate to high proportion of weeds. Dense infestations occur across most of the VMA dominated by Winter Senna (*Senna pendula* var. *glabrata*), Lantana (*Lantana camara*), Blue Billy Goat (*Ageratum houstonianum*), Coastal Morning Glory (*Ipomoea cairica*) and Aerial Yam (*Dioscorea bulbifera* var. *bulbifera*) (refer to **Section 2.2.2**). Moderate levels of introduced species occur in the south-western portion of the VMA where a mature native tree canopy remains. Exotic species in this area comprise Vasey Grass (*Paspalum urvillei*), Broad-leaf Paspalum (*Paspalum mandiocanum*) and to a lesser extent Winter Senna. Two Priority Weeds listed in the *Biosecurity Act 2015* for the North Coast were recorded at the site: Lantana and Bitou Bush (*Chrysanthemoides monilifera* subsp. *rotundata*), listed as *Prohibition on certain dealings: Must not be imported into the state, sold, bartered, exchanged or offered for sale.*

1.4 Biodiversity Values

An assessment of biodiversity values associated with the expansion was completed by GeoLINK (2008), and a recent site assessment completed by GeoLINK Ecologist Jessica O'Leary on 10 June 2021.

GeoLINK (2008) recorded the following threatened fauna species at the site, listed under the BC Act or EPBC Act:

- Glossy Black-Cockatoo (*Calyptorhynchus lathami*) observed flying over the site
- Squirrel Glider (*Petaurus norfolcensis*) observed flying over the site
- Grey-headed Flying-fox (*Pteropus poliocephalus*) observed with vegetation at the site
- Southern myotis (*Myotis macropus*) during Anabat call detection recording
- Little Bent-winged Bat (*Miniopterus australis*) during Anabat call detection recording.

No threatened flora species listed under the BC or EPBC Act were recorded at the site.

Retained vegetation supports moderate to good biodiversity values for fauna and flora. Foraging habitat occurs for volant species including birds, microbats and flying-foxes with key diet species available for Grey-headed Flying-fox, by way of flowering and fruiting species and habitat for aerial foraging by microbats. Nectar feed resources for Glider species are present at the site.

Tallowwood (*E. microcorys*), Blackbutt (*Eucalyptus pilularis*), Forest Red Gum (*Eucalyptus tereticornis*), Swamp Mahogany (*Eucalyptus robusta*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Forest Oak (*Allocasuarina torulosa*) are listed as preferred Koala feed trees in the Coffs Harbour Comprehensive Koala Plan of Management (CHCKPoM) (1999). Parts of the site are mapped as Secondary Koala Habitat (refer to **Illustration 1.3**). Double Crossing Creek and low-lying areas within the riparian zone provide aquatic and riparian habitat for birds, reptiles, frogs and invertebrates. Scattered hollow-bearing trees were recorded within the vegetation to be removed for

the expansion. Adjacent retained vegetation is likely to contain hollows which provide habitat for hollow-obligate fauna.

Vegetation at the site forms part of a larger area of retained native vegetation and provides stepping-stone and riparian corridor connectivity within the local landscape.

1.5 Compensatory Planting Requirements

As per the 'Outline' described in the original VMP compensatory planting requirements are described in **Figure 1.2**.

The *Hearnes Lake/ Sandy Beach Development Control Plan (Amended 2008)* stipulates '*…A minimum of 50m from an RL Level of 3.5 around Hearnes Lake and Double Crossing Creek...'*

The lot layout of the proposed development has been altered with a reduction in the number of proposed lots enabling a 50m vegetated buffer to be created, without the need for revegetation in the adjacent public reserve as described in the VMP dated May 2010.

A total of 58 mature native trees shall be removed from the area mapped by Coffs Harbour City Council (CHCC) as tertiary Koala Habitat. CHCC Biodiversity Guideline 4 Compensatory Planting Advice stipulates removal of tertiary Koala Habitat requires a replacement ration of 1:4. This equates to the planting of 232 native species.

The Part 3A Response Report (SLR 2011) provides detailed analysis of the vegetation on the site, and determines that this vegetation does not constitute 'Koala Habitat' and that the requirement to offset with planting at a ratio of 1:4 is excessive. Nonetheless, these replanting ratios are met by the planting outlined in this VMP as 711 trees (including 265 Koala forage species) are to be planted.

Furthermore the removal of an additional 94 native trees shall require a replacement ration of 1:2 (defined as 'other' in the Biodiversity Guideline 4 Compensatory Planting Advice). This equates to the planting of 188 native species.

Figure 1.2 Tree Loss and Compensatory Planting Requirements (excerpt from The Pines VMP, 2011)

Based on the current site and vegetation condition and generally in keeping with tree removal and offset numbers identified within the original VMP. A total of **760** compensatory plants (trees, shrubs, groundcovers) are prescribed to offset the loss of 152 native trees (at a 1:5 - loss: replacement ratio) described as High Conservation Value Vegetation (HCVV) in the original VMP. The compensatory plantings are to be planted within the allocated vegetation management zones with the VMA (refer to **Section 2.2.1**) and in conjunction with a comprehensive weed control program.

Part E1.2 (4) of the CHCC DCP (2015) states: *Compensatory planting is to reflect the vegetation community being removed and/or modified in accordance with the community types defined within the Coffs Harbour Fine-scale Vegetation Mapping Volume 2.* This VMP prescribes plantings within the VMP to reflect native vegetation using canopy/ mid-storey species representative of existing vegetation within the VMA (generally consistent with *PCT 686 - Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion*). Where areas are more low-

lying or waterlogged, water tolerant species will be planted. **Table 1.2** lists prescribed plant species (refer to **Section 2.3** for planting numbers and spacings).

Table 1.2 Tree, Shrub and Groundcover Species to be Planted Within the VMA

Scientific Name	*Common Name*
Canopy	
Corymbia intermedia	Pink Bloodwood
Eucalyptus microcorys	Tallowwood
Eucalyptus pilularis	Blackbutt
Eucalyptus pilularis	Blackbutt
Eucalyptus resinifera	Red Mahogany
Eucalyptus robusta	Swamp Mahogany
Eucalyptus siderophloia	Northern Grey Ironbark
Eucalyptus siderophloia	Northern Grey Ironbark
Eucalyptus teriticornis	Forest Red Gum
Midstorey	
Allocasuarina torulosa	Forest Oak
Banksia integrifolia	Coast Banksia
Breynia oblongifolia	Coffee Bush
Callistemon salignus	Willow Bottlebrush
Casuarina glauca	Swamp Oak
Dodonaea triquetra	Large-leaf Hop Bush
Elaeocarpus reticulatus	Blueberry Ash
Glochidion ferdinandi	Cheese Tree
Melaleuca linariifolia	Snow in Summer
Melaleuca quinquenervia	Broad Leaved Paperbark
Persoonia stradbrokensis	Geebung
Pultenaea villosa	Hairy Bush-pea
Groundcover	
Carrex appressa	Tall Sedge
Cynodon dactylon	Couch
Dianella caerulea	Blue Flax Lily
Ficinia nodosa	knobby club-rush
Gahnia clarkei	Tall Saw-sedge
Lomandra longifolia	Mat Rush

1.6 Revegetation within Biodiversity Value Mapped Land

A narrow portion of the VMA occurs within land mapped as Biodiversity Value land as per the Biodiversity Values Map and Threshold Tool (refer to **Illustration 1.3**).

The following is an excerpt from NSW Department of Planning, Industry and Environment (DPIE) website (2021):

Areas on the biodiversity values map where the proposal does not involve clearing native vegetation or threatened species habitat.

If development within areas on the BV Map does not involve clearing native vegetation (including groundcover, trees and understorey plants) or a prescribed impact (as set out in clause 6.1 of the Biodiversity Conservation Regulation 2017) within the mapped area, the BOS is not applied based on the BV Map. Development applications need to show evidence to support this.

However, the proponent must also consider other criteria for the BOS:

- *whether the area of native vegetation clearing in areas not on the BV Map exceeds the clearing area thresholds as specified in clause 7.2 of the Biodiversity Conservation Regulation 2017*
- *whether the proposed development or activity is likely to significantly affect threatened species, or ecological communities or their habitats based on the test of significance in section 7.3 of the BC Act.*

A very small portion of Biodiversity Value mapped land is located along the southern edge of the VMA. Weed removal and revegetation with native species is considered 'environmental protection works' and on this basis would not require a Biodiversity Development Assessment Report (BDAR) or trigger entry into the Biodiversity Offset Scheme (BOS). An objective of this VMP is to retain all native vegetation including vine and groundcover species within the nominated VMAs (not including areas subject to bulk earthworks). CoC C7 for this VMP requires revegetation (including weed removal) works to be undertaken by qualified bush regenerators proficient in native (including threatened flora) and introduced species identification to avoid impacts to native species within Biodiversity Value mapped land.

1.7 Performance Criteria

To determine whether revegetation measures have been successful, performance criteria have been nominated (refer to **Table 1.3**).

Table 1.3 Rehabilitation Objectives and Performance Criteria

Year	*Performance Criteria*
1 (establishment phase)	■ All woody weeds removed and/or poisoned; exotic vines and groundcovers controlled. ■ Planting and aftercare completed in accordance with prescriptions in this VMP. ■ Emergent weeds controlled by initial treatment following planting. ■ All native flora species within the VMAs are to be retained (not including areas subject to bulk earthworks).
1 & 2	■ Planting areas maintained as per maintenance schedules. ■ Emergent woody and climbing weeds within planting areas are controlled and comprise ≤10% total cover. ■ Minimum 90 percent survival rate for all plantings. ■ Any dead plants are replaced within the planting area.
5	■ Minimum 80% native plant survivorship achieved by end of fifth year's maintenance within the planting area. ■ Emergent woody and climbing weeds controlled and comprise ≤5% total cover within planting zones. ■ Practical completion of the works under this VMP is such that rehabilitated areas are in a healthy self-sustaining state to be certified by Council.
Long term	■ Long term management would be prescribed as part of the final year of maintenance and monitoring. Recommendations for long-term management of the site would be outlined within the final year monitoring report.

2. Vegetation Management, Fencing and Nest Box Prescriptions

2.1 Aims and Objectives

The aim of this VMP is to prescribe a range of measures to meet the CoCs and hence:

- Plant **760** native trees, shrubs and groundcovers to compensate for the loss of 152 trees from an area described as HCVV.
- Install fencing and signage to protect and manage retained native vegetation and revegetation areas.
- Install nest boxes (targeting Squirrel Glider) minimum of two weeks prior to commencement of removal of habitat trees.
- Remove exotic species and plant out non-vegetated areas with native species.
- Enhance retained native vegetation via weed removal, and infill plantings amongst retained native riparian zone.
- Maintain bushfire Asset Protection Zones (APZ) within Zones 1 as Inner Protection Area (IPA) and Zone 2 as Outer Protection Area (OPA).
- Establish an area that (once the five-year maintenance period is complete) will be self-sustaining and provide suitable habitat for flora and fauna species within the locality.

Note: it is expected that this VMP will be implemented by a suitably qualified and experienced Bush Regeneration Contractor. This VMP has been written to convey the project background, compensatory offset planting requirements and general areas subject to regeneration. It is expected that the appointed Bush Regeneration Contractor will have sufficient skills and experience to complete specific weed control and bush regeneration techniques in accordance with current guidelines and best practice. For this reason, detailed weed control techniques have not been included within this report. Minor changes to the implementation of the VMP at the discretion of the Bush Regeneration Contractor are permitted as long as the changes are generally in keeping with the requirements of the VMP. Should aspects of this VMP need to be altered, the appointed Bush Regeneration Contractor will consult the VMP author. This will facilitate plan compliance sign-off by the VMP author after the initial works are complete.

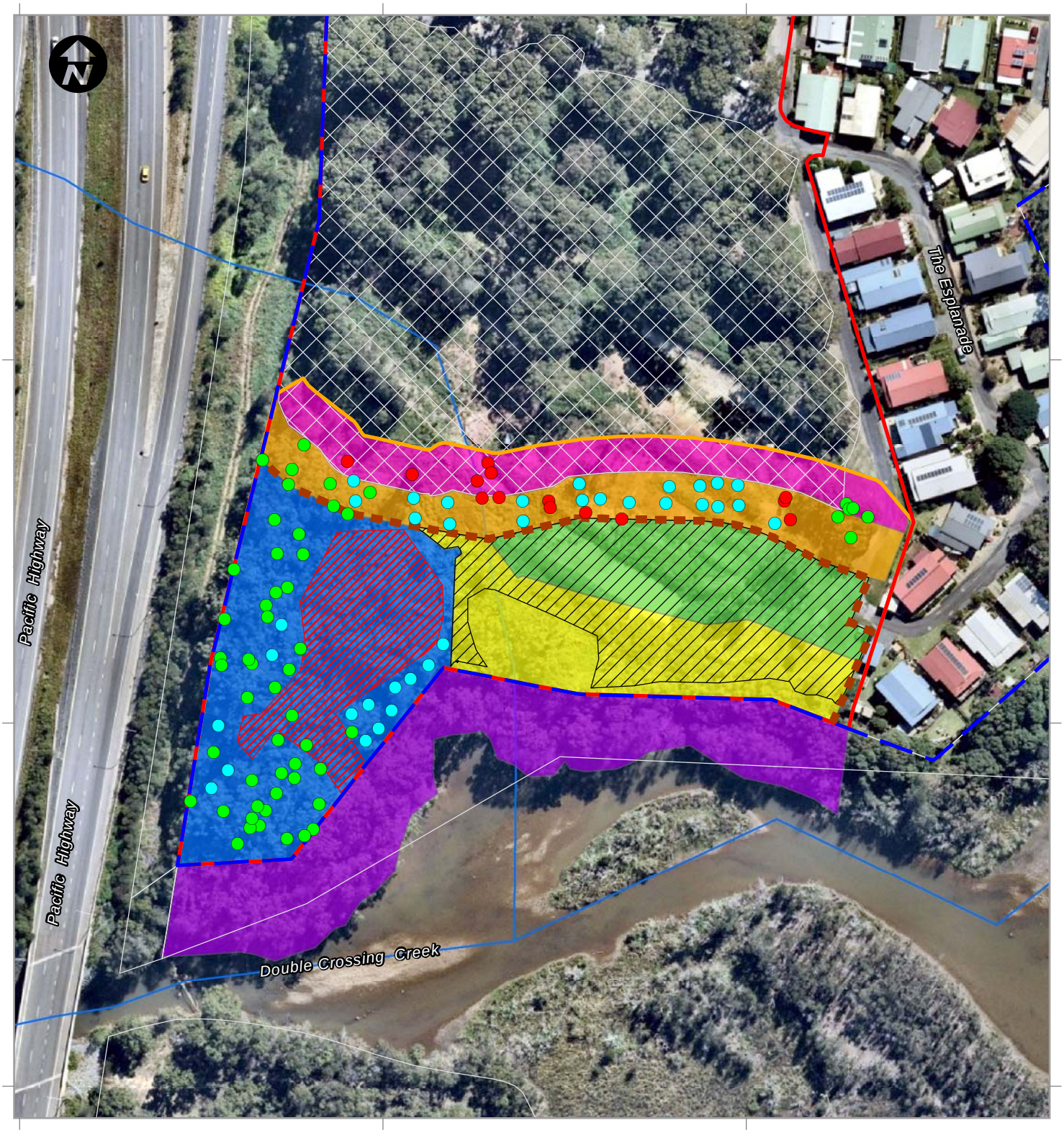
2.2 Work Plan and Schedule

2.2.1 Task 1 – Revegetation and Weed Control

Zones 1-6 have been nominated (refer to **Illustration 2.1** and **Table 2.1**) and are subject to a weed control program and revegetation.

NOTE: Zone 6 is located south of the site within Council owned land. Weed control within this area is recommended however it is acknowledged that this is outside the scope of the project. Weed control within this area however would be beneficial for the overall success of VMP objections and performance criteria. It would also reduce the likelihood of longer-term management requirements.

Photographs of the existing vegetation and condition of management areas is shown in **Table 2.1**. Task 1 requirements are provided throughout **Sections 2.2** and **2.3.**



LEGEND

- The site
- Lot 106 boundary
- Area subject to VMP
- Canopy, midstorey and groundlayer plantings
- Midstorey and groundlayer plantings
- The Pines Expansion works footprint - native tree removal required
- Zone 1 / APZ - IPA
- Zone 2 / APZ - OPA
- Zone 3
- Zone 4
- Zone 5
- Zone 6: Council owned land - optional weed control
- Watercourse
- Restoration area fence
- Tree to remove
- Tree to retain
- Indicative canopy tree planting

0 30 Metres

Vegetation Management Area - Illustration 2.1

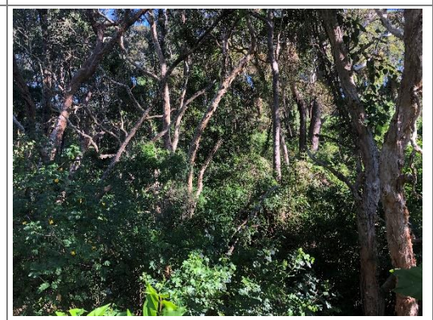
GeoLINK environmental management and design

Vegetation Management Plan - The Pines Expansion
3779-1027

Information shown is for illustrative purposes only
Drawn by: AB Checked by: RE Reviewed by: JOL
Source of base data: Nearmap 19/04/2021
Date: 04/08/2021

Table 2.1 Revegetation Zones and Management Prescriptions

Vegetation Management Zones (refer to Illustration 2.1)	*Works Description and Condition at June 2021*	*Weed Control Requirements*	*Revegetation Requirements*	*Erosion Control Requirements*	*Site Photographs*	
Zone 1 1,980 m^2 APZ – Inner Protection Zone. Grasses only, no trees or shrubs within this zone.	Most of this area will be subject to substantial earthworks with the infilling of the Water Storage Dam and Effluent Dams currently present. As suc,h most of the vegetation present (scattered native canopy trees and predominantly weedy understory) will be removed. Zone 1 is currently dominated by Blue Billy Goat, Broad-leaf Paspalum, Coastal Morning Glory, Lantana, Cobblers Pegs (*Bidens pilosa*), Tobacco Bush (*Solanum mauritianum*), Singapore Daisy (*Sphagneticola trilobata*) and Annual Ragweed (*Ambrosia artemisiifolia*).	■ After all earthworks have been completed, undertake residual weed control in preparation to sow with couch grass and/ or native grasses.	■ Sow Couch 50 – 100 kg/ ha in October to March. ■ Maintain by regular slashing/ mowing.	Erosion and sediment control measures would be implemented as part of bulk earthworks requirements. Once earthworks are complete, grass seed will be applied and regularly watered to achieve soil stabilisation and grass groundcover. Earthworks and seeding would be scheduled during dry weather to reduce the risk of erosion and sedimentation as a result of rainfall runoff.		
Zone 2 2,230 m^2 APZ – Outer Protection Zone, Canopy trees and mowed grass only, no mid-storey species within this zone.	Most of this area will be subject to substantial earthworks with the infilling of the Water Storage Dam and Effluent Dams currently present. As such most of the vegetation present (scattered native canopy trees and predominantly weedy understory) will be removed. Selected native trees will be retained. Zone 2 is currently dominated by Blue Billy Goat, Broad-leaf Paspalum, Coastal Morning Glory, Lantana, Cobblers Pegs, Tobacco Bush, Singapore Daisy, Annual Ragweed and Winter Senna.	■ After all earthworks have been completed, undertake residual weed control by spot spraying and/or hand removal of all weed species (refer to **Section 2.2.2**). ■ Infrequent occurrence of mature Camphor Laurel to be stem injected. Multiple follow-up treatments will likely be required.	■ Protect native canopy trees to be retained with temporary protection fencing. ■ Once weeds have been removed, plant canopy tree tubestock at spacings which can be mowed between to maintain a managed understorey as part of the OPA. ■ Tree crowns must be separated by two to five metres and those native trees should cover no more than 20% of the area. ■ Plant species as per the planting schedule in **Table 2.2** ■ Illustration **2.1**. ■ Mulch heavily around base of tubestock to reduce competition by weeds. ■ Install tree guards and affix with 3 x bamboo stakes to reduce herbivory by wallabies.	Erosion and sediment control measures would be implemented as part of bulk earthworks requirements. Once earthworks are complete grass seed will be applied and regularly watered to achieve soil stabilisation and grass groundcover. Earthworks and seeding would be scheduled during dry weather to reduce the risk of erosion and sedimentation as a result of rainfall runoff.		
Zone 3 2,260 m^2	Most of this area will be subject to substantial earthworks with the infilling of the Water Storage Dam and Effluent Dams currently present. As such most of the vegetation present (scattered native canopy trees and predominantly weedy understory) will be removed. After earthworks have been completed the entire zone shall be revegetated with canopy, midstorey and groundcover species with plantings congruent with the Dry Blackbutt Open forest community (refer to **Table 2.2**).	■ After all earthworks have been completed, undertake residual weed control by spot spraying and/or hand removal of all weed species (refer to **Section 2.2.2**). ■ Infrequent occurrence of mature Camphor Laurel to be stem injected. Multiple follow-up treatments will likely be required.	■ Once weeds have been removed, plant species at spacings as per the planting schedule in **Table 2.2** and **Illustration 2.1**. ■ Groundcover species to be planted in groupings to allow for easy weed control between groupings while follow up weed control is required and as plants are establishing. ■ Mulch heavily around base of tubestock to reduce competition by weeds. ■ Install tree guards and affix with 3 x bamboo stakes to reduce herbivory by wallabies.	Erosion and sediment control measures would be implemented as part of bulk earthworks requirements. Once earthworks are complete, grass seed will be applied and regularly watered to achieve soil stabilisation and grass groundcover. Earthworks and seeding would be scheduled during dry weather to reduce the risk of erosion and sedimentation as a result of rainfall runoff.		

Vegetation Management Zones (refer to Illustration 2.1)	*Works Description and Condition at June 2021*	*Weed Control Requirements*	*Revegetation Requirements*	*Erosion Control Requirements*	*Site Photographs*	
Zone 4 2,760 m^2	Zone 4 is currently dominated by introduced species in the mid and groundcover strata, parts of the north facing edge of native canopy vegetation (scattered Blackbutt and Eucalyptus sp.) is covered in Coastal Morning Glory and Aerial Yam (*Dioscorea bulbifera* var. *bulbifera*). A drainage line flows through part of Zone 4 dominated by midstorey weeds especially Lantana and Winter Senna with canopy species including Northern Grey Ironbark, Pink Bloodwood and occasional Swamp Box. Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*) occur in the low-lying areas. Part of Zone 4 will be subject to earthworks and backfilling of the effluent ponds.	■ Prepare Zone 4 by removal of dense weed infestations including but not limited to Winter Senna, Lantana and exotic vines. ■ After all earthworks have been completed, undertake residual weed control by spot spraying and/or hand removal of all weed species (refer to **Section 2.2.2**). ■ Infrequent occurrence of mature Camphor Laurel to be stem injected. Multiple follow-up treatments will likely be required.	■ Retain native species and canopy trees. Once weeds have been removed plant species at spacings as per the planting schedule in **Table 2.2** ■ Illustration **2.1**Groundcover species to be planted in groupings to allow for easy weed control between groupings while follow-up weed control is required and as plants are establishing. ■ Mulch heavily around base of tubestock to reduce competition by weeds. ■ Install tree guards and affix with 3 x bamboo stakes to reduce herbivory by wallabies.	■ Very low level of soil disturbance is expected. If soil disturbance occurs, place and pin jute mesh.		
Zone 5 5,250 m^2	Native tree canopy is in good condition within Zone 5, with the mid-storey and groundcover low to moderately infested by Winter Senna and Lantana. Predominantly near the drainage line and disturbed outer edges. A larger area within the centre was once regularly mowed and comprises a mix of introduced and native groundcover species including Basket Grass (*Oplismenus aemulus*), Boarded Panic (*Entolasia marginata*), Blady Grass (*Cylindrica imperata*), Broad-leaf Paspalum and Vasey Grass (*Paspalum urvellei*). A drainage line flows through part of Zone 5 with canopy species including Broad-leaved Paperbark (*Melaleuca quinquenervia*) and Swamp Oak (*Casuarina glauca*). No earthworks are required within Zone 5.	Prepare Zone 5 by spraying and removal of all weed species (refer to **Section 2.2.2**).	■ Retain native species and canopy trees. Once weeds have been removed plant species at spacings as per the planting schedule in **Table 2.2** ■ Illustration **2.1**Groundcover species to be planted in groupings to allow for easy weed control between groupings while follow-up weed control is required and as plants are establishing. ■ Mulch heavily around base of tubestock to reduce competition by weeds. ■ Install tree guards and affix with 3 x bamboo stakes to reduce herbivory by wallabies.	■ Plant native tubestock species and apply mulch to reduce erosion of disturbed topsoil.		
OPTIONAL **Zone 6** 4,423 m^2 **Liaise with Council regarding weed removal from Public Reserve to the south of Lot 106 Boundary**	Part of the riparian zone of Double Crossing Creek lies south of Lot 106 which is moderately infested by exotics including (but not limited to) Winter Senna and Lantana. This area will require weed treatment to reduce the weed seed source adjacent to The Pines VMA. If weeds adjacent are not controlled as part of VMP actions, weeds will continue to encroach into the VMA overtime.	■ Prepare Zone 6 by manually spraying and removal of all weed species (refer to **Section 2.2.2**). ■ If undertaken by a Bush Regeneration Contractor, Councils Open Spaces Technical Officer will need to induct the Bush Regeneration Contractor prior to commencement of weed control works on Council land.	■ No planting is required for Zone 6.	■ Minimal topsoil disturbance is expected as a result of weed control.		

2.2.2 Weed Control

A range of weed species were identified at the site ranging from low to very high levels of infestation. Weed species requiring control include but are not limited to:

- Small-leaved Privet (*Ligustrum sinense*)
- Lantana *(Lantana camara)*
- Tobacco Bush (*Solanum mauritianum*)
- Crofton Weed (*Ageratina Adenophora*)
- Pigeon Grass (*Setaria sphacelata*)
- Blue Billy Goat (*Ageratum houstonianum*)
- Mile a Minute (*Ipomoea cairica*)
- Aerial Yam (*Dioscorea bulbiferum*)
- Annual Ragweed (*Ambrosia artemisiifolia*)
- Brazillan Fireweed (*Erechtites valerianifolius*)
- Bitou Bush (***Chrysanthemoides monilifera*** subsp. ***rotundata***)
- Camphor Laurel *(Cinnamomum camphora)*
- Winter Senna (*Senna pendula* var. *glabrata*)
- Umbrella Tree (*Schefflera actinophylla*)
- Broad-leaved Paspalum (*Paspalum mandiocanum*)
- Vasey Grass (*Paspalum urvillei*)
- White Passionflower (*Passiflora subpeltata*)
- Ground Asparagus (*Protasparagus aethiopicus*)
- Singapore Daisy (*Sphagneticola trilobata*)

All weed control and revegetation activities are to be undertaken by a suitably qualified bush regenerator and in accordance with the following principles:

- Weed species are to be controlled using recognised bush regeneration techniques such as stem injection, 'cut and paint', hand removal, crowning or target foliar spray in accordance with methods as outlined in NSW Weed Control Handbook (Ensbey, 2018).
- Personnel applying herbicides must be appropriately experienced with high level weed/native plant identification skills to avoid impacts to native species within Biodiversity Value land (refer to **Illustration 1.3**).
- All weed removal methods will be listed within the annual report.
- Weed species list is indicative and all weed species will be targeted over the course of the VMP implementation period.
- A minimum of two weeks prior to planting, midstorey and groundcover weeds will be removed or treated (with non-residual glyphosate herbicide in accordance with the manufacturers recommended rate and method) to allow time for die-off in preparation for tree/shrub planting.
- Infrequent occurrences of juvenile and mature Camphor Laurels are to be stem-injected as part of initial weed control, allowing for follow up treatments as required.
- Do not spray herbicides/ pesticides close to waterways - use hand removal or other suitable methods to avoid chemicals entering the waterways which may be harmful to aquatic fauna.
- Selected weed species may be retained at the discretion of the Bush Regeneration Contractor during the rehabilitation stages to assist in the re-vegetation process.
- Weed control is recommended but is optional within Zone 6 to reduce weed seed sources from entering the site. If the developer chooses to undertake weed control within Council owned land, Council have requested the developer liaise with Council prior to appointing the Bush Regeneration Contractor to ensure accreditation and insurance minimum requirements.

2.2.3 Nest Box and Installation

A minimum of five nest boxes targeting Squirrel Glider will be installed (a minimum of **two weeks prior** to commencement of vegetation removal) within retained canopy trees within the VMA:

- 3 x rear entry small glider boxes
- 2 x front entry small glider boxes

Nest box installation will be undertaken in accordance with the following guiding principles:

1. It is recommended that the CYPLAS range of nest boxes manufactured by Hollow Log Homes (https://www.hollowloghomes.com/cyplas-range) are utilised on site. CYPLAS boxes are made from 100% recycled, high density polyethylene and Queensland Cypress. All boxes come with the Habisure System ™ ready to be installed (refer to **Figure 2.1**), are termite and rot proof, and have a lifespan of 30+ years.
2. Select native trees >300 mm diameter at breast height with a variety of solid branches between three to six metres above ground level. This will provide support for the wire attachment of the box and provide perch and launch sites for birds and gliders.
   Note: Where trees have high attachment points the use of an experienced tree climber is recommended for safety and access to optimal attachment points for targeted fauna.
3. Install the box a minimum of three metres above the ground, placing the box with a north-east to east facing aspect, this is to avoid full exposure to hot summer afternoon sun and predominant rainfall from the south.
4. Affix a piece of hose pipe or flexible conduit over the attachment wire to prevent the wire cutting into the tree as it grows.
5. Place the box beneath canopy shade in forested area instead of exposed paddock trees; this will provide increased level of protection from predators and more favourable microclimate around the box.
6. Where installing glider or small parrot boxes select trees with + or - horizontal branches close to the box suitable for gliders to launch from.
7. Front entry boxes would be installed where the approach and entry point to the box will not be obstructed by dense leaves or branches to allow clear access flyways for birds or bats.

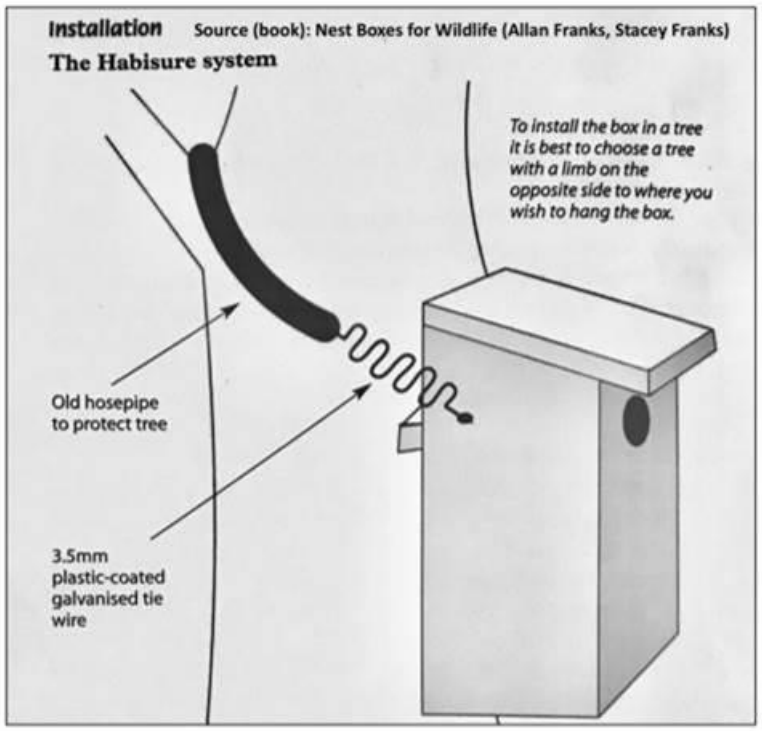


Figure 2.1 Box Installation using the Habisure System (image source: Allan and Stacey Franks, Hollow Logs Homes)

Note: Should the landowner choose to install additional nest boxes, installation would be in accordance with the guiding principles outlined above and preferably in consultation with an experienced ecologist.

2.2.4 Ecological Fire Regime

No ecological fire regime is proposed for the site due to its relatively small size and proximity to residential area. Vegetation prescribed within the VMP is such that is does not require regular fire to survive or regenerate.

Once bulk earthworks are completed, fuel loads will be low until native vegetation has established and is approaching a mature state. APZs have been imposed at part of the expansion to reduce bushfire risk to the development.

2.3 Planting Methodology

2.3.1 Plan Compliance

All plant stock shall be forestry tube size with species and spacings as specified within **Table 2.2**. If the specified species are not available, contact the VMP author (GeoLINK) prior to ordering or purchasing substitutes.

Table 2.2 Plant Species, Spacing and Numbers of Plants Required

Scientific Name	*Common Name*	*Spacing (m)*	*Zone 1 1,980 m²*	*Zone 2* 2,230 m²*	*Zone 3 2,260 m²*	*Zone 4 2,760 m²*	*Zone 5 5,250 m²*	*Planting Area and Species Total*
Canopy Species								
Eucalyptus pilularis	Blackbutt	5	-	3	15	10	3	30
Eucalyptus siderophloia	Northern Grey Ironbark	5	-	3	20	10	3	35
Eucalyptus teriticornis	Forest Red Gum	5	-	3	20	10	3	35
Eucalyptus resinifera	Red Mahogany	5	-	3	20	10	10	45
Corymbia intermedia	Pink Bloodwood	5	-	3	20	5	3	30
Eucalyptus microcorys	Tallowwood	8	-	3	20	10	11	45
*Eucalyptus robusta**	Swamp Mahogany	8	-	3	25	10	11	50
Midstorey Species								
*Melaleuca quinquenervia**	Broad Leaved Paperbark	2	-	-	-	5	10	15
Allocasuarina torulosa	Forest Oak	2	-	-	-	15	15	30
*Casuarina glauca**	Swamp Oak	3	-	-	-	15	30	45
Glochidion ferdinandi	Cheese Tree	3	-	-	10	15	10	35
Elaeocarpus reticulatus	Blueberry Ash	3	-	-	15	15	10	40
*Callistemon salignus**	Willow Bottlebrush	2	-	-	10	15	10	35
*Melaleuca linariifolia**	Snow in Summer	2	-	-	-	15	10	25
Banksia integrifolia	Coast Banksia	2	-	-	15	10	10	35
Breynia oblongifolia	Coffee Bush	2	-	-	15	15	-	30
Dodonaea triquetra	Large-leaf Hop Bush	2	-	-	15	-	-	15
Persoonia stradbrokensis	Geebung	2	-	-	15	-	-	15
Pultenaea villosa	Hairy Bush-pea	2	-	-	15	-	-	15
Groundcover Species								
Cynodon dactylon	Couch		50 – 100 kg/ ha	50 – 100 kg/ ha	-	-	-	-
Lomandra longifolia	Mat Rush	clumps	-	-	10	10	15	35
Dianella caerulea	Blue Flax Lily	clumps	-	-	10	10	10	30
Ficina nodosa	knobby club-rush	clumps	-	-	10	10	10	30
Carrex appressa	Tall Sedge	clumps	-	-	10	10	10	30
Gahnia clarkei	Tall Saw-sedge	clumps	-	-	10	10	10	30
Planting Area Total				**21**	**300**	**235**	**204**	**760**

* High soil moisture tolerant species suitable for low-lying or riparian areas.

Zone 2: Plant spacings such that trees can be mowed around and that tree crowns must be separated by two to five metres and those native trees should cover no more than 20% of the area.

2.3.2 Species Quality

All plants are to be well formed, hardened off, and disease free. Seed provenance should be local within the Coffs Harbour LGA.

They will be container grown in potting soil with root systems firmly established but not pot bound and with no large roots growing out of the container.

Form and habit will be consistent with normal growth habit of the particular species.

Plants must not be cut back so severely that growth and development of natural form has been severely retarded. Pruning scars should be clean cut to leave little or no protrusion from the trunk or branch.

Plants should show no visible evidence of weeds or pests at the time of purchase and planting.

2.3.3 Preparation

A minimum of two weeks prior to planting, vines, mid-storey and groundcover weeds will be removed or treated (with non-residual glyphosate herbicide in accordance with the manufacturers recommended rate and method) to allow time for die-off in preparation for tree/shrub planting.

Once weeds have been removed or died-back, lightly cultivate/ rip topsoil within the proposed planting locations. Prior to planting, excavate planting hole at least twice the size of the plant root-ball.

Select planting locations based on good available topsoil and where conditions are suitable for species. i.e. plant tubestock within existing topsoil and where ground is not heavily compacted such as wheel ruts, without first roughening the soil.

2.3.4 Planting

Thoroughly water plants immediately after planting, and as required to maintain growth rates free of stress throughout the establishment period.

Plants are to be removed from containers with minimum disturbance to the root ball. Ensure that the root ball is moist and placed plumb in its final position in the centre of the hole with the surface flush with surrounding finished ground levels.

Slow release fertiliser should be applied in accordance with the manufacturer's instructions at the time of initial installation and at subsequent times post-planting. For native plants use a native plant low phosphorus slow release fertiliser.

Ensure depression be made around the plant to assist trapping and infiltration of water.

Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain.

One label indicating species name to be left on each species in planted area.

Do not vary the plant locations or quantities from those indicated on **Illustration 2.1** and **Table 2.2**. If variations are necessary, seek direction from the VMP author (GeoLINK).

Notify in writing of all soil or other drainage conditions which are considered detrimental to the growth of plant materials. State condition and submit proposal for correcting condition if feasible including change in cost, if any.

2.3.5 Mulch or Weed Mat

To reduce weed encroachment, protect against moisture loss and reduce erosion of disturbed topsoil, apply hardwood mulch produced onsite and retained from tree removal works. Or straw mulch around individual plants at a rate of six plants per bale.

Lay the mulch material in a 0.5 m to 1.0 m diameter area around the plant at least 0.10 m deep. If hardwood mulch is used, ensure it is free of seed and deleterious or extraneous material particularly leaf and plant matter of weed species. Do not place mulch within 50 mm of the plant stem to avoid collar rot.

Biodegradable jute weed mat squares (or similar biodegradable product) can also be used in conjunction with stakes and tree guards.

2.3.6 Vegetation Protection and Signage

2.3.6.1 Short-term Protective Fencing

Short-term protective fencing shall be installed to delineate vegetation to be retained and prevent impacts or entry to no-go areas during the construction, particularly the earthworks phase of development. Tree protection fencing will be installed outside of the tree canopy drip line to provide a buffer to the tree and prevent soil and root compaction.

2.3.6.2 Long-term Protective Fencing and Signage

Fencing along the edge of the revegetation area will be installed to prevent mowing and general access within the revegetation area. Fencing will be constructed with treated Pine posts and have two strands of Bayco wire. Access gates can be installed at suitable locations for access and maintenance. Location of the long-term fence is shown in **Illustration 2.1**.

A damaged boundary fence occurs on the southern boundary of Lot 106 and the Public Reserve. This fence should be removed (currently not functional) or replaced with smooth strand wire to prevent harm to native fauna that may become entrapped/ injured on the barbed wire.

A minimum of four Vegetation Restoration Area signs will be affixed to the long-term exclusion fencing. The signs will include the following wording:

"*Weed Control and Native Vegetation Restoration Area – Please Keep Out*"

2.3.6.3 Tubestock Plant Protection

Each plant is to have 3 x 600 mm bamboo (or hardwood) stakes around the tree with plastic tree sleeve over canes ensuring that the plastic sleeve is taught to prevent sagging. Take care to not undertake planting prior to potential flood events as plants may be damaged and tree guards washed into the surrounding environment. Groundcover species can be grouped together in small clumps and larger tree guards installed around the clumps.

Use of a biodegradable tree guard such as the Field Pro Biodegradable Guard is preferred - https://www.suregrotreemax.com.au/product/biodegradable-tree-guard-sleeve/

2.3.7 Insect Attack/ Disease

Immediately report any evidence of insect attack or disease amongst plant material to the Bush Regeneration Contractor.

Where required, spray with insecticide, fungicide or both in accordance with the manufacturers' recommendations. Use products which have been approved for use near waterways and are environmentally sustainable. Submit proposal and obtain approval before starting this work.

2.4 Task 2 - Preparation of Compliance Report

Prepare a compliance report to demonstrate that the vegetation management actions (other than maintenance works) have been undertaken and are compliant with the approved VMP. The report will be prepared by the author of the VMP or experienced Ecologist with input from the Bush Regeneration Contractor. Provision of the compliance report to CHCC is required prior to the issue of the Construction Certificate.

- The compliance report would include:
  - Date of works completed, notes on weather conditions or rainfall
  - Notes on-site preparation (including herbicide or fertiliser use)
  - Final number and species planted as per **Table 2.2** (or approved deviations from the plan recorded)
  - Issues and resolution with implementation of the VMP, if any.

Formal monitoring of revegetation areas to commence following initial planting.

2.5 Task 3 - Plant and Weed Maintenance

Maintenance of the plantings is required for a period of five years following installation.

Table 2.3 provides a summary of maintenance requirements for vegetation management.

Table 2.3 Maintenance Schedule for Vegetation Management

Requirement	*Timing*	*Action Summary*
Watering	First five weeks following initial establishment – watering for three consecutive days following planting, then once weekly for four weeks. And once fortnightly for six weeks should dry weather conditions persist.	Total of nine events. Should extended dry periods continue additional watering may be required to ensure plant establishment.
Fertilising	At six months and end of years 1 and 2.	Total of three events
Weed control	Three events per year for five years. During early spring, early-summer, late summer for five years.	Total of 15 events
Plant replacement	Assessed and completed at each weed control event.	If required
Fence maintenance	Assessed and completed at each weed control event.	If required

Watering regimes may depend on conditions on-site and the lower lying areas may stay wet for longer and not require frequent watering dependant on weather conditions.

2.6 Task 4 - Monitoring

Formal monitoring of revegetation areas to commence following initial planting. Monitoring would require:

- Installation (and survey by GPS) of permanent photo points within each vegetation management zone. Photo monitoring points are to be established immediately after planting has been completed.
- Preparation of a brief summary report following completion of the plantings, including:
  - Notes on-site preparation (including herbicide use)
  - Issues and resolution with implementation of the VMP, if any.
  - The summary report would be provided to the appointed consultant to prepare the Compliance Report (refer to **Section 2.4**).
- Inspection of plantings at 12-month intervals (i.e. a total of five monitoring events), with tasks including:
  - Inspection of plants.
  - Assessment of weed cover.
  - Success of the planting (including photographs).
  - Details of aftercare which has been completed, as required.
  - Photographs from permanent photo points (locations to be determined by appointed bush regenerator.
  - Assessment of mulch cover.
  - Assessment of condition of retained native vegetation.
  - Assessment of condition of fencing.
  - Maintenance tasks required to be actioned within 4 weeks of completion of monitoring.

2.7 Task 5 - Reporting

Annual monitoring reports (five in total) are to be completed and supplied to Council and shall include the following information:

- A timetable of maintenance works completed in that year
- Details on the replacement of any dead or unhealthy stock within planting areas
- Results of the monitoring completed with regard to performance criteria
- Comments on any problems at the site (e.g. vandalism, browsing etc.) and how these have been managed
- Photographs from fixed photo points showing the progress of the plantings
- A log of herbicide use during all maintenance operations
- Any other relevant information or recommendations for future maintenance.

2.8 Works Summary and Schedule of Rates

A summary of all works required is provided at **Table 2.4**. A schedule of rates with *indicative* costs for planting, maintenance and monitoring and reporting is provided in **Table 2.5.**

Works may not commence until the VMP is approved by a Council representative.

Table 2.4 Prescribed Management Actions

Task	*Action*	*Requirement*	*Timing*	*Responsibility*
Task 1	Nest box installation	A minimum of five nest boxes will be installed within retained canopy trees within the VMA in accordance with **Section 2.2.3.**	Two weeks prior to commencement of vegetation removal.	Developer/ Ecologist
	Weed control and revegetation preparation	Undertake weed control measures (within the VMP area) and prepare the planting area for revegetation in accordance with **Section 2.2.2**.	Upon approval of VMP.	Qualified Bush Regenerator.
	Revegetation	Revegetation with groundcover, mid-storey and canopy species in accordance with **Section 2.3** and **Illustration 2.1.** Refer to **Table 2.2** for plant species, spacings and quantities.	Following site preparation (allow minimum of two weeks for groundcover and midstory weed dieback).	Qualified Bush Regenerator.
	Protective fence installation	Short term trees protection measures and long-term regeneration area no-go area fence will be installed as per **Section 2.3.6**.	– Short-term fencing to be installed prior to works commencing. – Long-term fencing once bulk earthworks are complete and Zones 1 and 2 have been planted.	Developer/ fencing contractor
Task 2	Prepare a VMP Progress Compliance Report.	Prepare a compliance report to demonstrate that the vegetation management actions (other than maintenance works) have been undertaken and are compliant with the approved VMP, refer to **Section 2.4**.	Upon completion of initial vegetation management actions and prior to issue of Construction Certificate.	Author of the VMP or experienced Ecologist, with input from the Bush Regeneration Contractor.
Task 3	Maintenance of plantings	Planting, watering and mulching in accordance with prescriptions within **Section 2.5**.	For five years following planting.	Qualified Bush Regenerator.
	Weed control	Standard bush regeneration techniques to control weeds within the VMA and Zone 6 Council land, refer to **Section 2.2.2** and **Section 2.5**.	Three events annually: early spring, early-summer, late summer for five years.	Qualified Bush Regenerator.
Task 4	Monitoring	An annual monitoring regime to be undertaken in accordance with prescriptions outlined in **Section 2.6**.	For five years following planting.	Qualified Bush Regenerator or experienced Ecologist.
Task 5	Reporting	Annual monitoring reports (five in total) are to be completed and supplied to Coffs Harbour City Council in accordance with prescriptions outlined in **Section 2.7**.	Five reports, one annually.	Qualified Bush Regenerator or experienced Ecologist.

Table 2.5 Indicative Schedule of Rates/ Costing of Planting, Maintenance and Monitoring and Reporting

Treatment	*Item*	*Cost*	*Total*
Primary Weed Control			
Weed control	80 hours	$60 per hour	$4,800
Planting			
Supply and install plants including stakes, guards, watering and fertiliser.	605 trees/shrubs 155 Groundcovers	$17 per plant (trees/ shrubs) $10 per groundcover plant	$10,285 $1,550
Supply and install straw bale mulch Or site won hardwood mulch from tree removal works	120 ~12 m^3	$10 per bale No additional cost	$1,200
Maintenance			
Replacement of failed plants - Supply and install plants including stakes, guards and fertiliser.	As required	$17 or $10 per plant	As required
Weed control	Year 1 = 3 events @ 40 hrs per event	$60 per hour	$7,200
	Year 2 and 3 = 3 events @ 20 hrs per event	$60 per hour	$7,200
	Year 4 and 5 = 3 events @ 15 hrs per event	$60 per hour	$5,400
Monitoring and Reporting			
Preparation of compliance report	1 event including site inspection and report ~11 hours	$145 per hour	$1,595
Monitoring	5 events @ 6 hrs	$60 per hour	$1,800
Reporting	5 reports	$1,200 per report	$6,000
Total			
		Indicative cost estimate	**$47,030 ex GST**

*Current rates are listed above. Rates may rise in line with CPI increases each year.

Fees are approximate only.

References

Coffs Harbour City Council (2015). *Coffs Harbour Development Control Plan.* Viewed June 2021. {https://chcc-con.saas.t1cloud.com/public/pages/plan/Book.aspx?exhibit=chcc_standard_exhibition_dcp_2015&hid=5008}

Coffs Harbour City Council (2015). *Coffs Harbour Development Control Plan Pat H Appendices Appendix 2 Guideline for Preparing Vegetation Management Plans.*

Coffs Harbour Bush Regeneration Group (Amended October 2011) Vegetation Management Plan - Lot 2 DP 1031968 The Pines Estate and Waterside Cabins Hearnes Lake Road, Woolgoolga.

GeoLINK (2008). Ecological Assessment - The Pines and The Waterside Cabins Pacific Highway, Woolgoolga (Ref. 1084678). Unpublished report for Coast Plan Consulting.

Office of Environment and Heritage (OEH) (2012). *Development of a Fine-scale Vegetation Map for the Coffs Harbour Local Government Area. Volume 2: Vegetation Community Profiles.* Report published by the Office of Environment and Heritage on behalf of Coffs Harbour City Council and the Northern Rivers Catchment Management Authority.

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