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Ecological Consultants
ABN 56 066 448 879

VEGETATION AND FAUNA MANAGEMENT PLAN

Iron Gates Residential Development
Evans Head

A Report Prepared for
Goldcoral Pty Ltd (Receiver and Manager Appointed)

JUNE 2024

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1 INTRODUCTION

1.1 Background

JWA Pty Ltd have been engaged by Goldcoral Pty Ltd (Receiver and Manager appointed) to prepare a Vegetation and Fauna Management Plan (VFMP) for the Iron Gates Residential Development (IGRD), located on Iron Gates Drive, Evans Head. The IGRD site is located on the north coast of NSW in the Richmond Valley local government area (LGA) approximately 1.25km west-southwest of the township of Evans Head (**FIGURE 1**).

This VFMP provides specific measures for mitigating and/or minimising the potential impacts on vegetation to be retained within the IGRD site as a result of development activities. Specific management actions discussed in this VFMP will be triggered and completed on a pre-construction, construction and operational phase basis.

Weed control strategies and the regeneration/revegetation of retained areas of heath, koala habitat and Littoral rainforest communities are the focus of this VFMP. Strategies for the management of native vegetation (including retained habitat) and fauna pre and post construction are also included. The VFMP also provides specific management strategies for the koala including details of compensatory habitat creation.

It should be noted that the weed control strategies outlined in this VFMP will only apply to land zoned as Environmental Protection and associated ecological buffers. For other parts of the site, the control of weeds is the responsibility of landowners, or where they occur on public land, the responsibility of Richmond Valley Council (RVC).

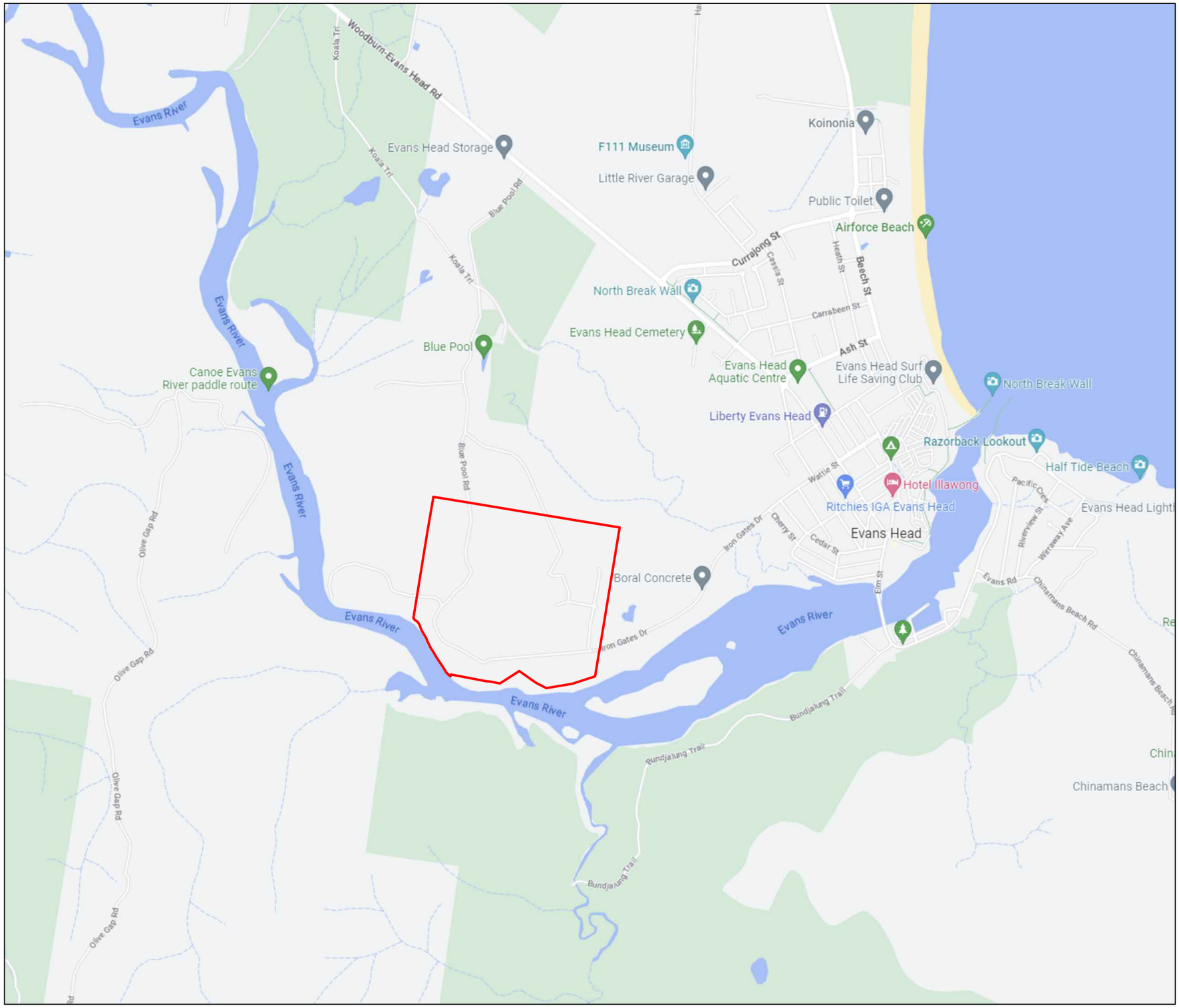
1.2 Aim and Objectives

This VFMP is intended to assist the Proponent in managing existing native vegetation and other environmentally sensitive areas within IGRD site during and after development.

The aim of this VFMP is to develop a comprehensive and integrated approach to guide the immediate and long-term management of retained and rehabilitated native vegetation and to ensure its protection and enhancement. Implementation of this VFMP will ensure ongoing sustainable management of native vegetation to be retained on the IGRD site, and that land clearing and land modification activities associated with the development are effectively remediated.

Specific objectives of this VFMP are to:

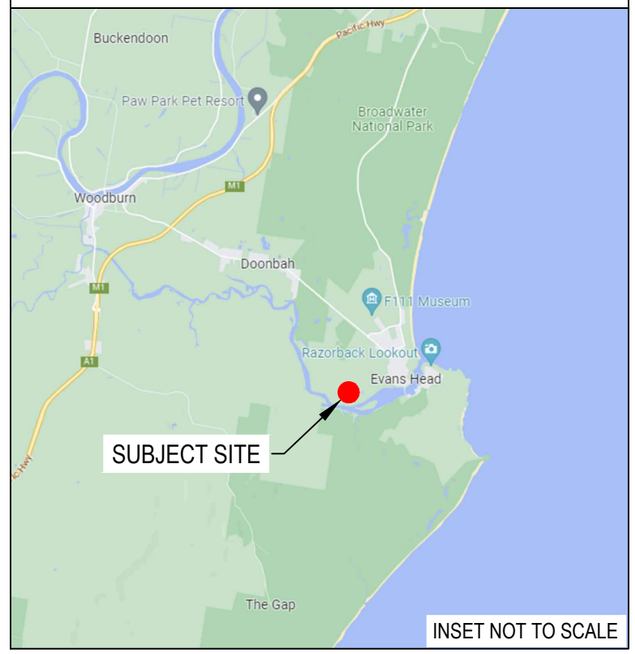
- Protect the environmentally significant site values of the IGRD site from bulk earthworks and construction activities;
- Remove vegetation from the development footprint in a controlled and an environmentally sustainable way;
- Provide permanent protection for the environmentally significant values to be retained on the IGRD site (i.e. threatened fauna species, endangered ecological communities, and wetlands);



LEGEND

Subject Site

REGIONAL CONTEXT



Scale 1 : 20 000

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SOURCE: Google Maps

SCALE: 1 : 20 000 @ A3

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FIGURE 1

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LOCALITY PLAN

- Manage noxious and environmental weeds in an environmentally sustainable manner and prevent the further spread of weeds resulting from the development of the site;
- Utilise assisted natural regeneration where appropriate;
- Restore, enhance and manage the retained and protected vegetation including providing guidelines for revegetation where required;
- Monitor the condition of retained and rehabilitated vegetation to assess if the project completion criteria have been met and report where appropriate;
- Identify known and potential habitat trees (displaying values such as hollows, fissures, nests, drays, arboreal termitaria used as nests etc.) that may be impacted by the proposed development;
- Provide details on how any habitat trees to be impacted are to be inspected for denning or nesting animals and details of fauna removal and relocation methods; and
- Ensure that a suitably qualified ecologist who holds a fauna survey licence is on site during vegetation clearing works to manage wildlife.

1.3 Requirements for Management Plan Updates

This VFMP is considered a 'live' document, incorporating an adaptive management approach and will be updated as and when necessary, during the life of the project. The VFMP should be updated (if necessary) at each stage of development (i.e. prior to construction certificate being issued for any works within that stage) so that proposed measures remain relevant and effective, and based on contemporary scientific data throughout the development of the Project. Updates may also be required in the event that the proposed development of the subject site is amended.

1.4 Related Environmental Management Plans

This VFMP should be read in conjunction with the following documents prepared for the IGRD site:

- Bushfire Risk Management Plan; and
- Construction Environmental Management Plan.

2 SITE DESCRIPTION & EXISTING VALUES

2.1 Location

The IGRD site is located on the north coast of NSW in the Richmond Valley local government area (LGA) approximately 1.25km west-southwest of the township of Evans Head (**FIGURE 1**).

2.2 Site Description

The IGRD is comprised within the following lots, which are accessed from Iron Gates Drive (**FIGURE 1**):

- Lot 163 on DP831052;
- Lots 276 and 277 on DP755624; and
- Crown Road Reserve between Lots 163 on DP831052 and Lot 276 on DP755724.

These allotments are hereafter referred to as the 'subject site'. It is important to note that the proposed development footprint of the IGRD covers only a part of the subject site and is predominately located within the southeastern portion of the site.

The subject site is predominately vegetated, apart from a maintained grassland area in the southern extent associated with an existing dwelling, and areas associated with an electricity supply corridor extending to the northern boundary. An aerial photograph of the subject site is shown in **FIGURE 2**.

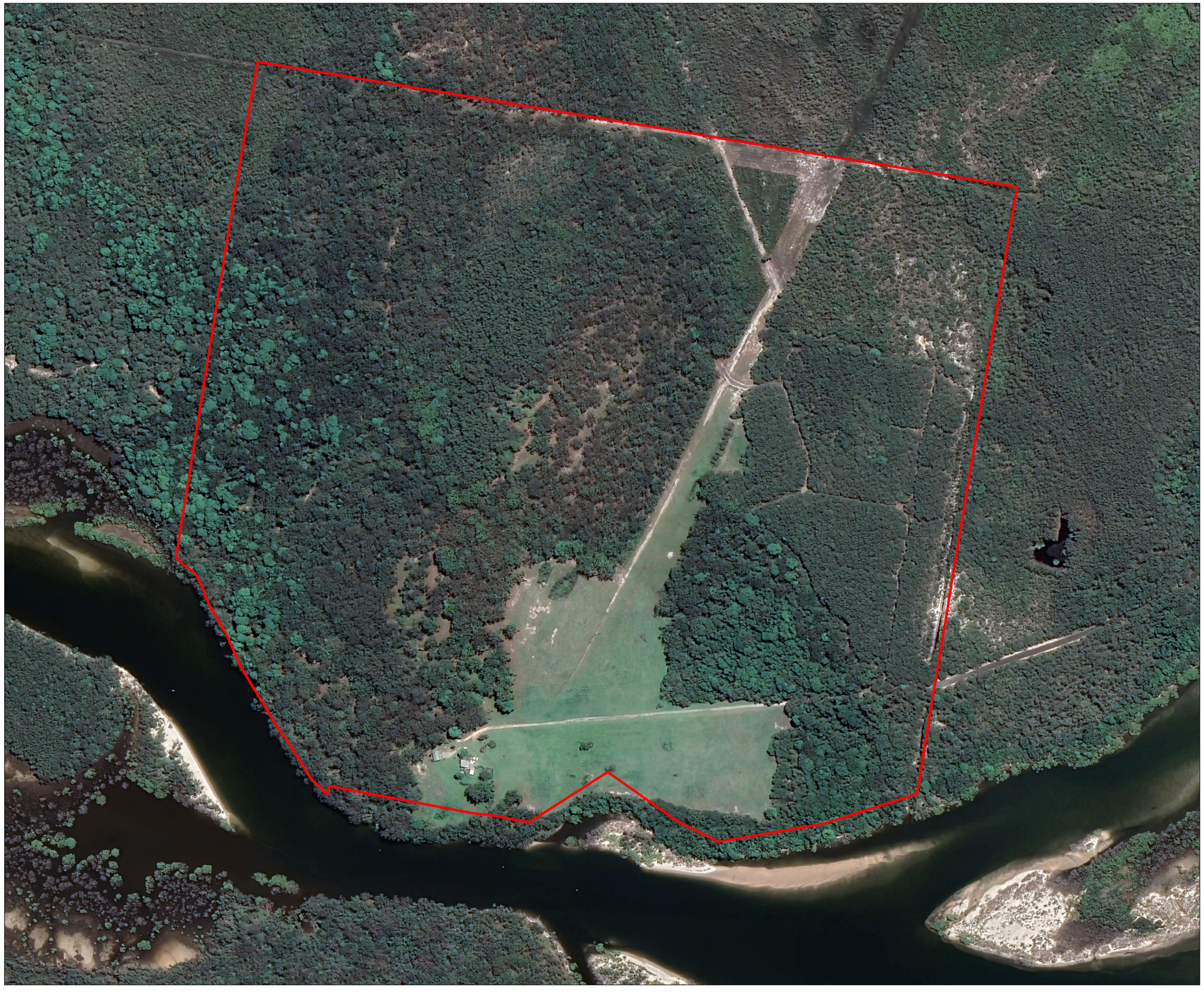
The subject site is bound by the Evans River to the south, which crosses into the Bundjalung National Park (NP). To the north, east and west, there is Crown Land supporting local native forest. In previous years, quarry extraction has taken place in parts of the surrounding Crown Land.

As part of a broader context, the subject site is located in between large contiguous areas of native vegetation, encompassed mostly by the Broadwater NP (421 km^2) to the north, and crossing the Evans River, the Bundjalung NP (210 km^2) to the south. Vast amounts of private and crown owned vegetated land also connects to these NP areas across the landscape (**FIGURE 1**).

2.3 Site History and Context

The site has a long history of disturbance dating back to the 1950s. The history of disturbance includes:

- The site has been used for rural and residential uses since prior to 1958 (the earliest aerial image available) (**PLATE 1**).
- A mineral sand mine operated in the eastern and northeastern portions of the site commencing sometime between 1965 - 1971 (**PLATE 2**). The operation had not commenced in 1964 and appears to have ceased by 1977.



LEGEND

Subject Site

N

Scale 1 : 5000

0 50m 100m 150m 200m 250m 300m

SOURCE: Google Earth Aerial dated 02/02/23

SCALE: 1 : 5000 @ A3

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FIGURE 2

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TITLE

AERIAL PHOTOGRAPH

- An area of cleared land in the southern portion of the site indicates horticultural uses (indicated by planting rows / market gardens) between 1971 and 1977 (**PLATE 3**).
- Additional cleared areas of the site in the south and north may have previously been used for low intensity agricultural purposes.
- Subsequently, unlawful vegetation clearing, road construction and excavation of the eastern and western drainage channels in the north-eastern portion of the site was carried out in the late 1980s and/or early 1990s.

The impacted areas are currently comprised of advanced regrowth vegetation dominated by Acacia species. It is considered likely that this vegetation is representative of the vegetation that occurred prior to the unlawful clearing works, and subsequent to the sand mining, and has therefore regrown since being cleared.

PLATE 1 – 1958 aerial photograph (Source: Martens 2023)

PLATE 2 – 1971 aerial photograph showing extent of mineral sands mine (Source: Martens 2023)

PLATE 3 – 1977 aerial photograph showing horticultural uses in the southern portion of the site (Source: Martens 2023)

2.4 Land Use Zones

The subject site is zoned as the following under the Richmond Valley Local Environmental Plan 2012 (RVLEP) (**FIGURE 3**):

- R1 – General Residential;
- C2 - Environmental Conservation; and
- C3 – Environmental Management.

The proposed IGRD has been strategically positioned within areas zoned General Residential.

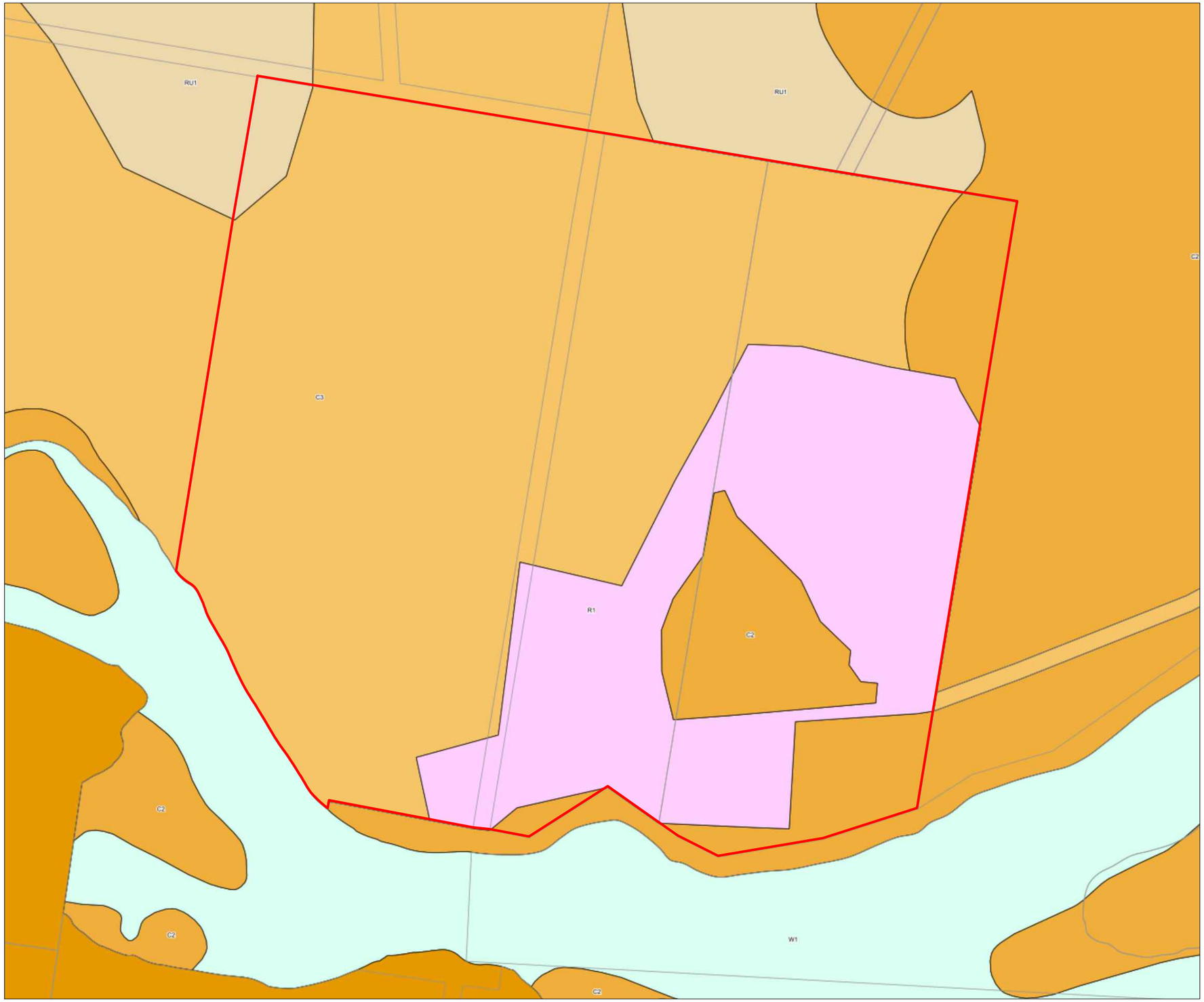
2.5 Vegetation

The IGRD site has a decades-long history of various land uses and land management practices, including sand mining, pasture improvement and cattle grazing, and small cropping. Over many years portions of the land have been extensively cleared for these activities. Remaining cleared areas are maintained via regular slashing. There remain, however, large areas of undisturbed vegetation in the western elevated areas of the site comprising mixed eucalypt forest, and in the central and south-eastern portions of the property comprising Littoral rainforest vegetation. These areas of the site are generally zoned for Environment Protection.

Vegetation at the subject site has been described in varying degrees of detail (Planit 2014, JWA 2019, JWA 2023). The most comprehensive vegetation mapping over the IGRD site was completed by JWA (2023). **FIGURE 4** shows the vegetation communities occurring over the site (as at February 2023).

In total, thirteen (13) discrete vegetation communities (VCs) have been identified over the IGRD site (**FIGURE 4**). **TABLE 1** below lists the vegetation communities and identifies which of the VCs are representative of a Threatened Ecological Community (TEC) listed within schedules of the EPBC Act and/or the BC Act.

Vegetation community descriptions in this VFMP, including proposed compensatory habitat areas, are discussed in relation to their closest Plant Community Type (PCT) descriptions which were accessed via the NSW BioNet Vegetation Classification System. PCTs are classified based on vegetation types occurring within the Interim Biogeographic Regionalisation for Australia (IBRA) subregions, as developed by the Commonwealth government. The IBRA framework divides Australia landscapes into bioregions and subsequently subregions based on common features such as climate, geology, landform, and vegetation.



LEGEND

- Subject Site

Richmond Valley LEP 2012

- R1 - General Residential
- C1 - National Parks and Nature Reserves
- C2 - Environmental Conservation
- C3 - Environmental Management
- RU1 - Primary Production
- W1 - Natural Waterways

N

Scale 1 : 5000

0 50m 100m 150m 200m 250m 300m

SOURCE: Richmond Valley Council IntraMaps Zoning (accessed 03/02/23)

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FIGURE 3

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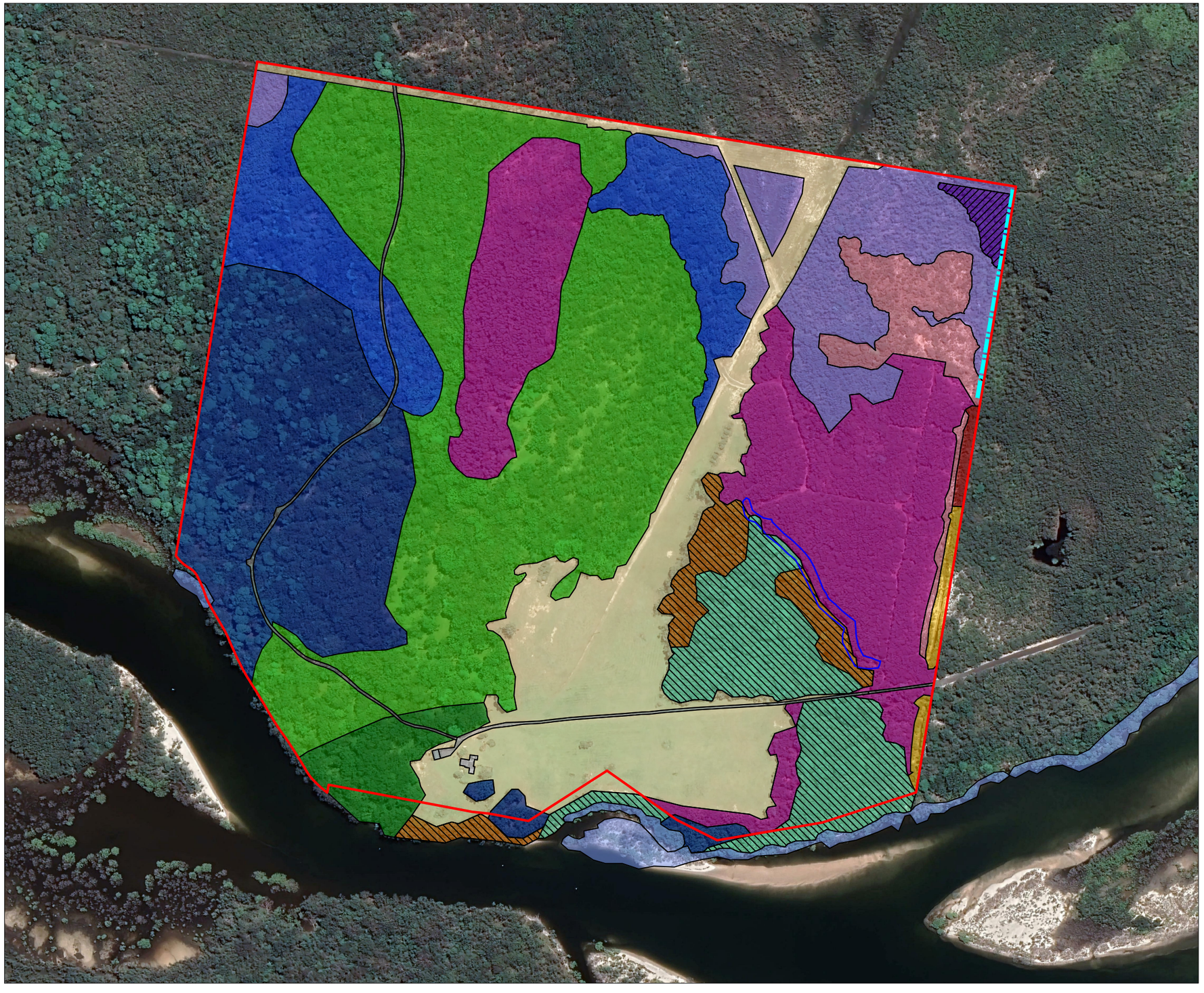
TITLE

ZONING PLAN



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LEGEND

Subject Site

Vegetation Communities

- VC 1 – Tall closed wet sclerophyll forest to 25m (*Eucalyptus planchoniana, Corymbia gummifera, Angophora woodsiana +/- Melaleuca quinquenervia, Callistemon salignus*) (PCT 3573)
- VC 2 – Tall closed wet sclerophyll forest to 25m (*Eucalyptus microcorys, Eucalyptus resinifera, Eucalyptus acmenoides +/- Lophostemon confertus*) (PCT 3148)
- VC 3 – Tall closed dry sclerophyll forest to 25m (*Eucalyptus tereticornis, Corymbia intermedia, Acacia disparrima*) (PCT 4046)
- VC 4 – Tall open dry sclerophyll forest to 20m (*Eucalyptus signata, Eucalyptus planchoniana, Eucalyptus acmenoides, Angophora woodsiana, Corymbia gummifera*) (PCT 3573)
- VC 5 – Tall closed littoral rainforest to 20m (mixed rainforest species) (PCT 3124)
- VC 6 - Tall open/closed dry sclerophyll forest to 20m (*Eucalyptus resinifera, Corymbia intermedia, Acacia disparrima +/- Lophostemon confertus*) (PCT 3148)
- VC 7 – Tall closed swamp sclerophyll forest to 15m (*Melaleuca quinquenervia*) (PCT 3990)
- VC 8 – Mid-high to tall Acacia regrowth with occasional emergent eucalypts to 15m (*Acacia disparrima +/- Eucalyptus signata, Corymbia gummifera*) (PCT 3573 - derived)
- VC 9 - Tall closed wet heath to 3m with mid-high to tall Acacia and Melaleuca to 12m (*Banksia* spp., *Acacia* spp., *Leptospermum* spp. *+/- Melaleuca quinquenervia*) (PCT 3915)
- VC 10 – Tall open regenerating dry heath to 5m (*Leptospermum* spp., *Acacia* spp., *Banksia* spp.) (PCT 3801 - derived)
- VC 11 – Cleared grassland/disturbed areas +/- scattered regrowth (*Cynodon dactylon, Lomandra* spp., *+/- Acacia disparrima*)
- VC 12 - Southern constructed channel, including regrowth *Melaleuca quinquenervia*, scattered *Avicennia marina*, and isolated clumps of *Juncus* sp., *Lepironia articulata* and *Gahnia clarkei*
- VC 13 - Central constructed channel, including dense regenerating *Melaleuca quinquenervia +/-* mixed heath species, and dense *Lepironia articulata +/- Gahnia clarkei*

- Coastal fringe mangroves (FRC 2023)
- Existing infrastructure (e.g. roads, tracks, dwellings etc.)
- Northern Depression
- Western Drain

Representative Threatened Ecological Communities (TEC)

- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia under the EPBC Act 1999 (Critically Endangered) and Littoral Rainforest under the BC Act 2016 (Endangered)
- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland under the EPBC Act 1999 (Endangered) and Swamp Sclerophyll Forest on Coastal Floodplains under the BC Act 2016 (Endangered)

Scale 1 : 5000

0 50m 100m 150m 200m 250m 300m

SOURCE: JWA Site Investigations 2023; Google Earth Aerial dated 02/02/23

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FIGURE 4

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TITLE

VEGETATION COMMUNITIES

TABLE 1
VEGETATION COMMUNITIES PRESENT ON THE SUBJECT SITE

Vegetation Community (VC)	Brief Description	Representative PCT	Representative TEC	
			EPBC Act	BC Act
VC1	Tall closed wet sclerophyll forest to 25 m (*Eucalyptus planchoniana, Corymbia gummifera, Angophora woodsiana +/- Melaleuca quinquenervia, Callistemon salignus*)	3573 - Northern Lowland Scribbly Gum-Bloodwood Forest	n/a	n/a
VC2	Tall closed wet sclerophyll forest to 25 m (*Eucalyptus microcorys, Eucalyptus resinifera, Eucalyptus acmenoides +/- Lophostemon confertus*)	3148 - Far North Brush Box-Walnut Wet Forest	n/a	n/a
VC3	Tall closed dry sclerophyll forest to 25 m (*Eucalyptus tereticornis, Corymbia intermedia, Acacia disparrima*)	4046 - Northern Lowland Swamp Turpentine-Red Gum Forest	n/a	n/a
VC4	Tall open dry sclerophyll forest to 20 m (*Eucalyptus signata, Eucalyptus planchoniana, Eucalyptus acmenoides, Angophora woodsiana, Corymbia gummifera*)	3573 - Northern Lowland Scribbly Gum-Bloodwood Forest	n/a	n/a
VC5	Tall closed littoral rainforest to 20 m (mixed rainforest species)	3124 - Far North Sands Tuckeroo-Banksia Littoral Rainforest	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia - Critically Endangered	Littoral Rainforest - Endangered
VC6	Tall open/closed dry sclerophyll forest to 20 m (*Eucalyptus resinifera, Corymbia intermedia, Acacia disparrima +/- Lophostemon confertus*)	3148 - Far North Brush Box-Walnut Wet Forest	Littoral Rainforest and Coastal Vine Thickets of Eastern Australia - Critically Endangered	Littoral Rainforest - Endangered

Vegetation Community (VC)	Brief Description	Representative PCT	Representative TEC	
			EPBC Act	BC Act
VC7	Tall closed swamp sclerophyll forest to 15 m (*Melaleuca quinquenervia*)	3990 - Far North Paperbark Gahnia Swamp Forest	Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland - Endangered	Swamp Sclerophyll Forest on Coastal Floodplains - Endangered
VC8	Mid-high to tall Acacia regrowth with occasional emergent eucalypts to 15 m (*Acacia disparrima* +/- *Eucalyptus signata, Corymbia gummifera*)	3573 (Derived) - Northern Lowland Scribbly Gum-Bloodwood Forest	n/a	n/a
VC9	Tall closed wet heath to 3 m with mid-high to tall *Acacia* and *Melaleuca* to 12m (*Banksia* spp., *Acacia* spp., *Leptospermum* spp. +/- *Melaleuca quinquenervia*)	3915 - Northern Sands Prickly Tea-tree Wet Shrubland	n/a	n/a
VC10	Tall open regenerating dry heath to 5 m (*Leptospermum* spp., *Acacia* spp., *Banksia* spp.)	3801 (Derived) - Far North Sandplain Wallum Heath	n/a	n/a
VC11	Cleared grassland/disturbed areas +/- scattered regrowth (*Cynodon dactylon*, *Lomandra* spp., +/- *Acacia disparrima*)	n/a	n/a	n/a
VC12	Southern Constructed Channel - regrowth *Melaleuca quinquenervia*, scattered *Avicennia marina*, and isolated clumps of *Juncus* sp., *Lepironia articulata* and *Gahnia clarkei*	n/a	n/a	n/a
VC13	Central Constructed Channel - dense regenerating *Melaleuca quinquenervia* +/- mixed heath species, and dense *Lepironia articulata* +/- *Gahnia clarkei*	n/a	n/a	n/a
	Existing infrastructure (e.g. roads, tracks, dwellings etc.)	n/a	n/a	n/a

3 THE PROPOSED DEVELOPMENT

The Development Application (DA) is a concept proposal for a Torrens title subdivision of the site to create one hundred and twenty-nine (129) lots, comprising one hundred and twenty-one (121) residential lots, one (1) lot for a community refuge building, one (1) residual lot for future (Stage 2) residential subdivision, one (1) residual lot as a future investigation area for further potential residential subdivision (subject to further assessment), two (2) lots for the littoral rainforest, one (1) lot for public open space (within Stage 1), one (1) lot for a sewer pump station and one (1) residual lot, which is not proposed to be developed.

It is intended to dedicate land marked as roads, bioretention basins and a sewer pump station to Council, following completion of these works.

The concept development layout is shown in **FIGURE 5**.

The proposed development layout will seek to maintain the natural stormwater drainage regime across the subject site. Bio-retention areas, ponds and gross pollutant traps are proposed to collect and manage stormwater before leaving the site. In addition, the existing drainage line in the east of the site is proposed to be filled to assist with reducing draw down of the water table from within the mapped SEPP 14 wetland area.

The development is proposed to be completed in two (2) stages. It should be noted that the DA is for the concept subdivision design and Stage 1 works only. The Stage 2 areas are not proposed to be subdivided as part of this application.

It should also be noted that the current proposed development has undergone significant revisions based on current assessments. The proposed development footprint is largely clear from vegetation due to historic land uses and site/bushfire maintenance (**FIGURE 2**). The large majority of the proposed development footprint is within an area of cleared grasslands and previously cleared regrowth acacia. The proposed development has been redesigned based on the results of ecological investigations with particular consideration of the retention of littoral rainforest patches and koala habitat/preferred koala food trees as follows:

- The boundaries of the littoral rainforest and western vegetation edge were surveyed by a registered surveyor and assessed for retention by an arborist;
- A 15m setback to the surveyed edge of vegetation lines applied to the proposed development based on Australian Standard *AS 4970-2009 Protection of trees on development sites* maximum tree protection zones;
- The proposed development also includes the provision of revegetation works surrounding the boundaries of the littoral rainforest (where possible with consideration of bushfire protection zones) to reduce edge effects on these areas;
- The littoral rainforest areas will also be subject to a plan of management to ensure their protection and management in perpetuity; and
- Planting of additional preferred koala trees where possible with consideration of bushfire safety requirements.

Scale 1 : 5000

0 50m 100m 150m 200m 250m 300m

SOURCE: Arcadis (Ref: IRG-AAP-BE-00-XRF -CV-0212-StageBoundaries_Stage01.dwg); Landpartners (Ref: BRJD6396-100-33-32-EXT.dwg)

SCALE: 1 : 5000 @ A3

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FIGURE 5

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TITLE
CONCEPT DEVELOPMENT LAYOUT

4 MANAGEMENT ZONES

4.1 Identification of Management Zones

The IGRD site has been divided into nine (9) zones based on the management intent for each area. These management zones (MZs) are:

- Zone 1 – Construction zone;
- Zone 2 – Bushfire Asset Protection Zones;
- Zone 3 – Retained koala habitat;
- Zone 4 – Compensatory koala habitat;
- Zone 5 – Retained heath areas;
- Zone 6 – Retained Littoral rainforest;
- Zone 7 - Littoral rainforest regeneration/revegetation areas;
- Zone 8 – Wetland vegetation; and
- Zone 9 - Residual lands e.g. tracks and easements.

FIGURE 6 shows the location of management zones applicable to this VFMP. A brief description of each management zone and details of the proposed management intent is provided in the sections below. Specific management actions for each zone are addressed in **SECTION 5**. Monitoring and reporting requirements are detailed in **SECTION 7**.

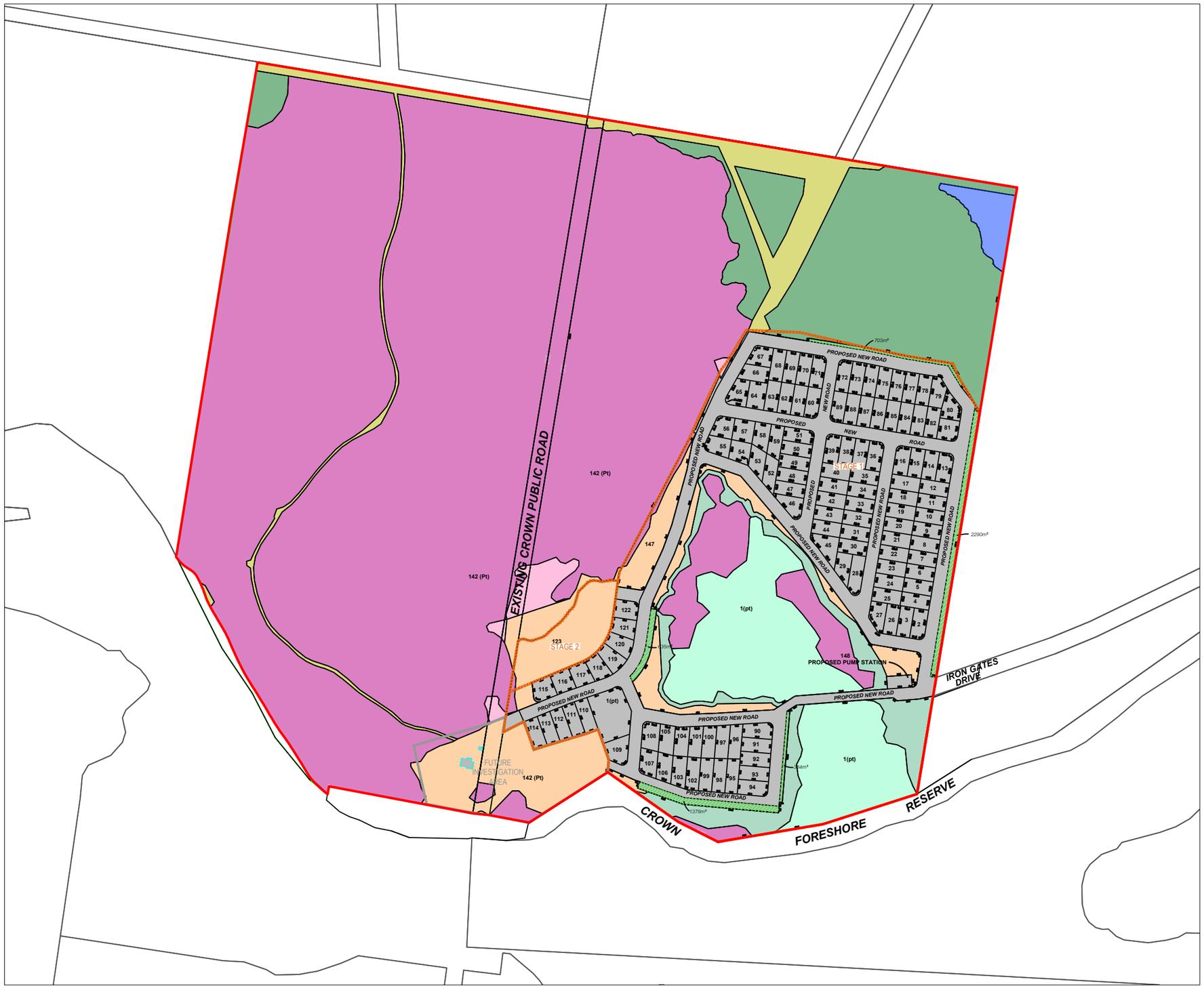
4.2 Zone 1 – Construction Zone

The construction zone consists of the development footprint of the IGRD and covers an area of 12.89 ha. The management intent of this zone is:

- To remove all existing vegetation within the Construction Zone (consistent with the conditions of approval) prior to bulk earthworks and disposal of cleared vegetation in an environmentally responsible manner;
- To undertake vegetation removal operations in a manner that provides maximum protection of the health and livelihood of native fauna;
- To limit human impacts on retained and compensatory habitat, threatened fauna species or ecological communities; and
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable.

4.3 Zone 2 – Bushfire Asset Protection Zone

MZ2 consists of land to be maintained as a bushfire Inner Protection Area (IPA) in accordance with the Bushfire Management Plan prepared for the IGRD site and covers an area of 4.16 ha (**FIGURE 6**). For the purposes on this VFMP MZ2 includes the areas identified as Stage 2 of the concept subdivision design and the majority of the area identified as Future Investigation Area.



Scale 1 : 5000

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SOURCE: JWA; Arcadis (Ref: IRG-AAP-BE-00-XRF-CV-0212-StageBoundaries_Stage01.dwg); Landpartners (Ref: BRJD6396-100-33-32-EXT.dwg)

SCALE: 1 : 5000 @ A3

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FIGURE 6

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TITLE

MANAGEMENT ZONES

The MZs associated with these areas will be reconsidered in any future version of the VFMP to be prepared at the appropriate time.

The management intent of this zone is:

- To maintain vegetation and fuel loads in accordance with the requirements of Planning for Bushfire Protection (NSW RFS 2019);
- To create additional koala habitat through planting scattered Preferred Koala Food Trees (PKFTs) in compliance with the requirements of an IPA (i.e. tree canopy cover less than 15% at maturity), excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area.

4.4 Zone 3 – Retained Koala Habitat

MZ3 consists of 41.54 ha of existing koala habitat to be retained (**FIGURE 6**). The management intent of this zone is:

- To protect, restore (through assisted natural regeneration) and provide for the ongoing maintenance of retained koala habitat;
- To limit human impacts on retained koala habitat; and
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable.

4.5 Zone 4 – Compensatory Koala Habitat Areas

MZ4 consists of 0.45 ha of proposed compensatory koala habitat (**FIGURE 6**). The management intent of this zone is:

- To create additional koala habitat through assisted regeneration and revegetation works;
- To limit human impacts on future koala habitat; and
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable.

4.6 Zone 5 – Retained Heath Areas

MZ5 consists of retained heath areas covering 6.16 ha (**FIGURE 6**). The management intent of this zone is:

- To protect and provide for ongoing maintenance of retained heath;
- To restore existing heath areas through assisted natural regeneration works;
- To limit human impacts on retained and restored heath areas; and
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable.

4.7 Zone 6 – Retained Littoral Rainforest

MZ6 consists of 4.27 ha of existing Littoral rainforest vegetation to be retained (**FIGURE 6**). The management intent of this zone is:

- To protect, restore (through assisted natural regeneration) and provide for the ongoing maintenance of retained littoral rainforest vegetation;
- To limit human impacts on retained littoral rainforest vegetation; and
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable.

4.8 Zone 7 - Littoral Rainforest Regeneration/Revegetation Areas

MZ7 consists of littoral rainforest regeneration and revegetation areas covering 1.74 ha (**FIGURE 6**). The management intent of this zone is:

- To provide a dense buffer of rainforest tree, shrub and groundcover species a minimum of 5 m in width to retained littoral rainforest;
- To create additional littoral rainforest areas through assisted regeneration and revegetation works;
- To limit human impacts on future littoral rainforest areas; and
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable.

4.9 Zone 8 – Wetland Vegetation

MZ8 consists of 0.41 ha of wetland vegetation to be retained and restored (**FIGURE 6**). The management intent of this zone is:

- To protect, restore (through assisted natural regeneration) and provide for ongoing maintenance of retained wetland vegetation;
- To limit human impacts on retained wetland vegetation;
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable; and
- To ensure the ongoing protection of water quality within retained wetlands.

4.10 Zone 9 – Residual Lands

MZ9 consists of residual lands covering 2.15 ha (**FIGURE 6**). These areas include lands proposed for fire trails and a power line easement in the northern section of the IGRD site. The management intent of this zone is:

- To maintain the areas in a serviceable condition for their intended purpose; and
- To remove all noxious and environmental weeds in a manner that is environmentally sustainable.

5 MANAGEMENT STRATEGIES

5.1 Introduction

The following sections detail the management strategies to be implemented as part of this VFMP and include:

- Education of site personnel;
- Construction phase management measures;
- Pre-clearing fauna trapping and fauna spotter catcher;
- Management of retained vegetation;
- Weed management;
- Regeneration and revegetation;
- Environmental and Community Liaison Officer(s); and
- Adaptive management.

These management strategies are apportioned to pre-construction, construction and operational phases of the development in the Implementation Schedules (**SECTION 8**). The applicable management zones for each specific management strategy are outlined in **TABLE 2**.

TABLE 2
MANAGEMENT STRATEGIES

Section	Management Strategy	Applicable Management Zone
5.2	Education of site personnel	1
5.3	Construction phase management measures	All
5.4	Pre-clearing fauna trapping and fauna spotter catcher	1
5.5	Management of retained vegetation	3 - 8
5.6	Weed management	All
5.7	Regeneration and revegetation	2 - 8
5.8	Environmental and Community Liaison Officer(s)	All
5.9	Adaptive management	All

5.2 Education of Site Personnel

A key action to be implemented is the development of a construction personnel induction program. The program shall be developed by the Proponent and in addition to koala related issues, should highlight the significance of threatened species and EECs on the site and include a discussion of the management requirements for native vegetation and fauna, threatened species and weeds.

The induction program is to be approved by a suitably qualified person prior to construction commencing and all construction personnel, and any other persons/contractors completing works within the development footprint or adjacent to retained vegetation need to complete the induction prior to starting work on the site.

The general induction of all construction personnel will aim to ensure the awareness of environmental-related issues and of responsibilities and procedures in relation thereto, covering such matters as:

- Areas of the site in which significant threatened species are most likely to be encountered;
- Areas of the site in which significant vegetation will be encountered;
- Threats to threatened species, vegetation and fauna associated with construction activities;
- Requirement to report any incidents, and actions required;
- Prohibition on construction personnel bringing dogs onto the site;
- Requirement to report any evidence of feral animals, particularly dogs within retained habitat areas (sightings, footprints, droppings); and
- Requirements of this VFMP - particularly protocols for vegetation clearing and measures to protect native vegetation and fauna.

Specific detail in relation to education protocols will be located in the Construction and Environment Management Plan (CEMP).

5.3 Construction Phase Management Measures

The following vegetation protection strategies will be implemented during the construction phase of the development:

1. All areas to be cleared and retained will be identified on construction plans and in the field prior to the commencement of clearing. No clearing shall occur outside nominated clearing zones.
2. Temporary tree protection fencing consisting of high visibility webbing and star pickets will be installed at the edge of works line consistent with the extent of works shown in the Bulk Earthworks Plan (Arcadis 2024 – **APPENDIX 1**) prior to the commencement of clearing works. Temporary signage will be provided along all temporary tree protection fencing during the clearing works stating:

   "Vegetation No-Go Zone – No Unauthorised Entry".

   All temporary tree protection fencing will remain in place until all clearing and earthworks have been completed.

   Where temporary construction fencing is required to be installed around the perimeter of the site, every 100 m three (3) panels of the temporary fencing will be raised 300 mm to allow for fauna movement.

3. Within retained vegetation areas the following activities will not be permitted:
    - Storage and mixing of materials;
    - Vehicle parking;
    - Liquid disposal;
    - Machinery repairs and/or refuelling;
    - Construction site office or shed;
    - Combustion of any material;
    - Stockpiling of soil, rubble and debris, cleared vegetation and site mulch;
    - Any filling or excavation including trench line, topsoil skimming and/or surface excavation (with the exception of minor works where necessary for the installation of fauna exclusion fencing); and
    - Unauthorised pesticide, herbicide or chemical applications.
4. All activities in an area adjacent to any retained tree or area are to be carried out in such a manner as to minimise any damage to trees. Trees to be removed will be felled in a direction away from trees to be retained. Where an individual tree to be retained may be impacted by the removal of another tree located at close proximity, the roots of the tree to be disturbed (and the tree to be retained, where required) are to be severed cleanly by a qualified Arborist. All roots are to be exposed first and then cut cleanly with a sharp saw or loppers.
5. Site works shall occur in the following sequence; cutting, shearing of felled vegetation and tub grinding. Where vegetation is cleared or removed, vegetation waste shall be mulched and retained on site for re-use in landscape works. Each area is to be mulched immediately upon completion of clearing and grubbing works. Any vegetation not suitable for mulching (i.e. fertile material from weed species) will not be mulched and will be transported to an appropriate facility.
6. Hollow logs shall not be mulched. If any hollow logs are located on site, they will be relocated to areas proposed for rehabilitation works.
7. Erosion and sedimentation control fencing is to be provided on site in accordance with an approved Erosion and Sediment Control Plan. This will prevent the movement of sediment into ecologically sensitive areas as well prevent the dispersal of weed seeds and vegetative material. All sediment fencing is to be in place prior to the commencement of construction. Prior to any site preparation operations, the Project Manager (or other suitably qualified personnel) shall undertake an inspection of all sediment fencing. The erosion and sediment control measures are to be maintained throughout construction and are not to be dismantled until the works on site have been completed and disturbed areas have been covered by mulch to a minimum depth of 100 mm or otherwise stabilised.
8. The applicant is responsible for the restoration of the site and any adjoining affected lands where sediment deposition has occurred as a consequence of construction activity associated with the development for the duration of works and until the site has been stabilised. Such restoration must be completed in a reasonable timeframe.

9. No soil disturbance is to occur within areas of retained vegetation. Soil disturbance within any areas to be landscaped shall be kept to a minimum to avoid weed recruitment. Areas to be landscaped shall be completed under supervision to avoid unnecessary soil disturbance.
10. Weed or potential weed species shall not be planted during landscaping operations. All nursery stock for landscaping purposes shall be weed, pest and disease free and certified as such by the supplier where feasible. The certificates are to be obtained prior to the commencement of any regeneration/revegetation works on site.
11. Clearing operations are to ensure that propagative material from cleared weeds does not spread across the site. The earthworks machinery must not introduce weed material to the site or spread such material throughout the site.
12. Weeds on the subject site will be managed using suitable control measures (i.e. chemical and/or physical control) in accordance with **SECTION 5.6**.
13. Vehicles shall be restricted to a maximum speed of 40 kph and shall operate only in daylight hours for the duration of the construction phase to minimise the risk of vehicle strike.

5.4 Pre-clearing Fauna Trapping and Fauna Spotter Catcher

5.4.1 Pre-Clearing Fauna Trapping

The following fauna protection strategies will be implemented prior to commencement of any vegetation clearing works.

1. Prior to clearing operations, a suitably qualified ecologist will inspect the site for any habitat trees or other habitat features. Habitat trees are defined as those trees that provide suitable refuge and nesting resources for arboreal and avian fauna. These include hollow-bearing trees and trees with fissures, termitaria, etc. Larger, old growth trees are also considered to be habitat trees as they are likely to provide greater amounts of foraging resources, cover, and a high number of potential tree hollows. Dead (stag) trees are also regarded as important habitat trees as they provide roosting and nesting resources.
2. Any habitat trees or habitat features identified on site will be identified using flagging tape or similar method and shown on appropriately scaled plans. A pre-clearing report shall be prepared prior to clearing which will detail any relevant observations made on site including the presence of any habitat trees.
3. Subsequent to the site inspection, and immediately prior to commencement of site clearing works, a pre-clearing trapping program will be completed within any areas of relatively intact vegetation to be cleared as follows.
    a. The trapping program will target Threatened species as well as any other native ground-dwelling and arboreal species. The program will utilise the following trapping methodologies:
        - Pitfall traps/funnel traps;
        - Small (Type A) Elliott traps – installed both on the ground and on platforms on the trunks of trees;

- Medium (Type B) Elliott traps – installed both on the ground and on platforms on the trunks of trees;
- Cage traps; and
- Active searches.

b. All traps will be baited with the universal mixture of peanut butter, honey and rolled oats. Each stage will be trapped for a minimum of four (4) nights, and any animals captured will be relocated the same day of capture to suitable areas of retained habitat on or adjacent to the site.

5.4.2 Pre-clearing Koala Surveys and Provision of Spotter Catcher

Prior to the commencement of construction associated with each development stage, pre-clearance surveys for koala will be undertaken by a suitably qualified ecologist/fauna handler. Pre-clearing surveys will commence no more than one (1) day prior to commencement of bulk earth moving activities within each development stage and adhere to the following protocols:

1. A suitably qualified ecologist/fauna handler will be on site to supervise tree removal during all clearing activities.
2. The suitably qualified ecologist/fauna handler must inspect all areas proposed for clearing for the presence of koalas each day prior to the commencement of clearing in that area. Approval to commence vegetation clearing is only valid for the day on which the inspection has been undertaken and only within the area inspected.
3. All native vegetation clearing is to be completed as sequential clearing (i.e. clearing will occur in stages) with at least a 12-hour period between 6pm and 6am during which no trees are cleared on the site.
4. Earthworks and/or the clearing of native vegetation will be temporarily suspended (up to 72 hrs) within a 25m radius of any tree in which a koala is located and will not resume until the koala has moved outside of the clearing area of its own accord. If the animal does not self-relocate out of the clearing area within 72 hrs of its initial observation, RVC will be consulted in relation to an appropriate protocol to encourage the animal to relocate. The tree can only to be removed following inspection by an appropriately qualified ecologist/fauna handler to ensure that the koala has dispersed, and that the removal of the tree poses no direct threat to the health or survival of the koala.

A report will be prepared after each pre-clearing event and prior to the commencement of bulk earthworks. Reports will be forwarded to RVC.

5.4.3 Under Scrubbing

Immediately after each precinct has been trapped, and the extent of the trapped area clearly identified, the groundcover and midstorey will be cleared utilising a slasher with a mulching head attachment or similar. Any hollow-bearing trees and/or other significant habitat features identified during the initial site inspection will be retained. All under scrubbing works will be completed with a suitably qualified fauna spotter/catcher in attendance.

5.4.4 Clearing Non-habitat Trees

Immediately after under scrubbing of each area is complete, non-habitat trees (i.e. trees other than those identified as habitat trees) will be cleared and stockpiled for mulching. Clearing of non-habitat trees will only occur where their removal will not impact on any identified habitat trees (e.g. canopies do not interconnect with habitat trees). All clearing works will be completed with a suitably qualified fauna spotter/catcher in attendance.

5.4.5 Tree Hollow Inspection and Removal

After under scrubbing and clearing of non-habitat trees, the following tree hollow inspection and removal protocols will be implemented in the event that any habitat trees are identified on site.

1. An elevated work platform or cherry-picker will be used in conjunction with a chainsaw operator and suitably qualified fauna spotter/catcher to inspect and remove tree hollows as necessary prior to habitat tree felling. This method involves the fauna spotter/catcher inspecting each of the potential habitat features (usually tree hollows, dreys and arboreal termite nests) to determine the presence of arboreal fauna. This process is detailed following the step-by-step basis below:
    a. The fauna spotter/catcher (with arborist unless the fauna spotter/catcher is a qualified chainsaw operator) will inspect each visible tree hollow or potential habitat resource (i.e. ringtail possum drey) identified in each tree using the cherry-picker. This is usually carried out by simply looking into tree hollows with the assistance of a small torch, however, burrow and bore-scopes can also be useful for deep tree hollows.
    b. If fauna is located within a tree hollow, a piece of towel or rag will be firmly placed in the entrance to prevent the wildlife from escaping as in most cases arboreal fauna become aware of the presence of the fauna spotter/catcher and may attempt to flee the nesting/denning tree hollow due to a perceived threat. If an occupied ringtail possum drey is encountered, the fauna spotter/catcher should quietly approach (i.e. avoid contacting other branches) the drey in the cherry-picker bucket and physically capture the possum by placing the entire drey in a catch bag or only the possum if it emerges from the drey. If arboreal fauna are captured, or able to be easily removed from tree hollows, they will be relocated to a suitable retained habitat area/s on or adjacent to the site the same day of capture.
    c. Once the tree hollow entrance has been secured the arborist or fauna spotter/catcher will cut the entire hollow tree limb off below the cavity where the branch remains solid. In circumstances where a tree hollow continues into the main stem of the tree, a small window will be carefully cut into the tree hollow, allowing the fauna spotter/catcher to plug the tree hollow above and below the window, then the hollow tree limb removed and lowered to the ground in sections.
    d. When the fauna has been safely secured within its tree hollow, the entire limb can then be placed in the cherry-picker bucket or lowered to the ground using ropes depending on the size of the limb.

e. This limb will then be placed in a cool, quiet location until translocation to a suitable donor site the same day of capture, when at dusk the tree hollow entrance is re-opened to allow the fauna to emerge of its own accord.

2. Once all tree hollows within any habitat trees have been inspected and cleared, the tree may be removed. All clearing works will be completed with a suitably qualified fauna spotter/catcher in attendance.
3. Where possible, the actual felling of any habitat trees shall be conducted in a manner that will maximize the chances of survival for any fauna remaining within the tree. This shall involve pushing rather than cutting, and cushioning the tree fall with other felled timber and foliage. Following felling, a second inspection of any relevant trees shall be carried out to relocate fauna disturbed by the clearing process or remaining within the felled timber to a suitable location.
4. Any fauna captured on site during clearing works will be relocated/translocated by the spotter catcher to a suitable habitat area/s on or adjacent to the site the same day of capture. Any injured animals requiring treatment or euthanasia shall be immediately removed and taken to an appropriately qualified veterinary surgeon. Any animals requiring support or rehabilitation other than vet assistance will be taken to a qualified wildlife carer or centre.
5. A post-clearing spotter catcher report will be provided to the clearing contractor and Council within two (2) weeks of completion of clearing activities.

5.4.6 Fauna Incident Reporting Protocols

Any threatened species observation or incident during the construction phase will result in an observation/incident report.

The report should contain as a minimum, the date, time and location (GPS coordinates) and nature of the incident. Where appropriate, cause (or likely cause) of the incident, sex of animal, age (teeth wear or other evidence) and any other information such as presence of ear tags, general condition (evidence of disease, weight, etc.) should be collected. The report should also describe what action has been taken to date, and any proposed measures to address the incident. This information should be forwarded to RVC.

5.5 Management of Retained Vegetation

The aim of the management of retained vegetation is the permanent removal of weeds and assisted natural rehabilitation. Retained vegetation areas include:

- MZ 3 – Retained Koala Habitat;
- MZ 5 – Retained Heath Areas;
- MZ 6 – Retained Littoral Rainforest; and
- MZ 8 – Wetland Vegetation.

Each retained vegetation area will be assigned an identifier which will be used to identify relevant rehabilitation areas on the ground and for monitoring and maintenance purposes (refer **SECTION 7**).

Due to the significant disturbance history, the IGRD site supports a variety of weed species. Disturbance during the construction phase will create an opportunity for weeds to colonise and establish, therefore weeds should be diligently controlled during and after construction. Weeds will be controlled in accordance with the protocols described in **SECTION 5.6**. Retained vegetation will also be maintained/improved through assisted natural rehabilitation in accordance with the protocols as described in **SECTION 5.7**.

No areas are to be left bare after weed control works. Appropriate revegetation techniques and specifications (as discussed in **SECTION 5.7**) will be implemented where weed control works result in bare areas or areas of exposed topsoil.

Fauna friendly fencing and/or bollards with gates or lock rails will be installed to prevent unauthorised vehicular access to retained habitat areas.

5.6 Weed Management

5.6.1 Introduction

The weed management strategies outlined in this section will consist primarily of removal of extensive areas of weeds and targeted removal of individual weed plants. All weed control works are only to be carried out by qualified and experienced personnel using accepted bush regeneration methodology and according to the specifications outlined in this plan. The proponent should appoint a preferred contractor following approval of the project, so that works can commence immediately.

The weed management strategies outlined in the following sections apply to all retained vegetation and rehabilitation areas.

5.6.2 General Weed Management Strategies

The following general management strategies apply to any works on the site completed as part of this VFMP:

- Works should commence on-site once the project is approved.
- The vegetation protective measures, in particular the installation of fencing and erosion and sediment control measures, should be implemented prior to commencing weed control works.
- A long-term program of monitoring and evaluation of weed control sites is essential.
- On the completion of primary weed control works, secondary weed control will be ongoing to ensure weeds are appropriately suppressed. Once the site is occupied, a list of noxious and environmental weeds will be provided to residents and written into the Development Control Plan or other development design requirements for the site, to avoid the use of weed species for planting in private gardens.

5.6.3 Reducing the Spread of Weeds

The spread of weeds and weed seed can be facilitated by disturbance such as vegetation clearing, earthworks and construction activities. Weeds and weed seed can also be dispersed by personnel, equipment and vehicles. The following strategies are recommended to prevent the spread of weeds during earthworks and construction activities:

- Erosion and sediment control devices shall be installed prior to commencement of earthworks in accordance with an Erosion and Sediment Control Plan. This will not only prevent the movement of sediment into ecologically sensitive area but also the dispersal of weed seeds and vegetative material.
- A designated shakedown/wash area will be established for personnel, equipment and vehicles. Designated shakedown/wash area will not be located in or immediately adjacent to retained vegetation or rehabilitation areas.
- Weed hygiene protocols will apply to machinery entering the site as well as movement within the site to minimise the risk of introducing new weeds and/or spreading existing weeds.

5.6.4 Targeted Weed Control

5.6.4.1 Introduction

All weeds will be controlled as part of the rehabilitation works onsite utilising the techniques described in this VFMP. As weed control progresses it is possible that new infestations of weeds (or new weed species) may be recorded over time. Recommendations to ensure that additional weed outbreaks are appropriately addressed include:

- A log of any new weed species and/or infestations is to be kept by the personnel in charge. Any new weed records are to be entered into the log with a GPS location, and the location marked with flagging tape;
- Logged records should be assessed as to their need for priority control (e.g. any highly invasive or noxious species should be controlled as a high priority); and
- Once prioritised, logged weed records should be allocated in work plans for specific zones. High priority species should be treated ASAP, while lower priority areas (e.g. pasture grasses) should be treated within the work unit as a whole.

5.6.4.2 Primary Weeding

Primary weed control is the initial process of weed removal through a series of targeted methods. During primary weeding the following procedures will be utilised:

- Primary weeding should commence at the start of the active growing period (approximately November);
- Where appropriate, primary weeding will be undertaken by hand, to prevent damage to native regrowth or seedlings;
- Careful hand weeding will occur for approximately 50 cm in diameter around the retained native species;

- Before any broad-scale spraying commences (i.e. where appropriate) all native species within treatment areas will be located and clearly marked for retention;
- All genetic material seeds, flowers, underground rhizomes, will be removed and disposed of at an approved green waste facility;
- Weed material that does not contain any fertile parts will be mulched and spread on the ground;
- Utmost care must be taken when utilizing chemicals to ensure that no drift occurs outside of the treatment area;
- Spraying should not occur on windy days or within 24 hours of predicted rainfall; and
- All chemical users should be experienced and licensed in accordance with the relevant legislation.

5.6.4.3 Secondary Weeding

Secondary weeding will eradicate weeds that have been overlooked or that re-shoot after primary treatment. Secondary weeding should occur six (6) weeks after primary weed control and then three (3) monthly for one (1) year and then six (6) monthly thereafter.

5.6.4.4 Control Methods

Specific weed control techniques appropriate to the control of each weed species found on the site, or that are known from the area and may potentially occur on the site over time, are identified in **APPENDIX 2**. Descriptions of the weed control methods to be employed are provided in **APPENDIX 3**.

'Frog-friendly' forms of Glyphosate will be used at all times. Furthermore, wherever surfactants are used, the most benign equivalent will be used. Works adjacent to wetland environments should also be completed during the drier months of the year.

Operators will adhere to the following general principles:

- Weed trees (e.g. Camphor laurel) with trunk diameters greater than 10 cm and height greater than 1.3 m will be stem injected with an herbicide appropriate to the weed being treated (typically Glyphosate). The poisoned weed tree will be left standing to provide a perch for birds (frugivorous birds, in particular, are good seed disseminators).
- Weed saplings (less than 10 cm diameter), scramblers and shrubs will be either sprayed or the 'cut, scrape and paint' technique employed. Herbicide appropriate to the weed being treated will be used (typically Glyphosate). All plant material severed from the stump will be cut into easily compostable segments and spread on the forest floor in such a manner to minimise vegetative regrowth from the severed plant material.

5.7 Regeneration and Revegetation

5.7.1 Introduction

Site rehabilitation works will be completed by a suitably qualified bush regeneration company in accordance with the specifications contained in following sections. These specifications provide details of the proposed rehabilitation phases, site preparation, weed control, natural regeneration and revegetation works (including plant species lists). Performance indicators and targets for the proposed rehabilitation strategy to be achieved during the establishment period and maintenance period of the project are contained in **SECTION 7.5.5**, along with corrective actions that are to be implemented if performance targets are not met.

5.7.2 Rehabilitation Area Selection

Assisted natural regeneration and revegetation works to be completed will, generally, occur within:

- MZ2 - planting scattered Preferred Koala Food Trees (PKFTs) in compliance with the requirements of an IPA (i.e. tree canopy cover less than 15% at maturity), excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area;
- MZ4 - Creation of compensatory koala habitat; and
- MZ7 - Assisted natural regeneration/revegetation of Littoral rainforest vegetation.

The areas requiring rehabilitation are identified in **FIGURE 6** and summarised in **TABLE 3.**

TABLE 3
REHABILITATION AREAS

Management Zone	Rehabilitation Area	PCT	Size
MZ2	Planting scattered PKFTs*	4046 / 3573	4.16 ha
MZ4	Koala compensatory habitat	4046 / 3573	0.45 ha
MZ7	Littoral Rainforest Regeneration /Revegetation	3124	1.74 ha
		TOTAL	**6.35 ha**

Notes:
* Excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area

In addition, where gaps are identified or weed control works result in bare areas or areas of exposed topsoil revegetation works will also be completed within retained vegetation areas (i.e. MZ3 – Retained Koala Habitat, MZ5 – Retained Heath Areas, MZ6 – Retained Littoral Rainforest and MZ8 – Wetland Vegetation).

5.7.3 Rehabilitation Phases

Site rehabilitation works (i.e. assisted natural regeneration and revegetation) will be completed by a suitably qualified[1] bush regeneration company and be undertaken in six (6) phases as follows:

- **Phase 1**: Site preparation of revegetation areas and retained vegetation areas (where necessary).
- **Phase 2**: Initial planting (where necessary) - will commence as soon as the bush regeneration team is satisfied that weed species have been successfully controlled.
- **Phase 3**: Establishment of revegetation sites and initial maintenance of assisted regeneration sites - it is planned that the establishment period will be of a minimum length of twelve (12) months during which time weeds will be controlled and watering will be undertaken on an 'as needs' basis.
- **Phase 4**: Supplementary planting to replace dead seedlings - will commence within two (2) months of the initial planting in each area. Replacement of seedlings/saplings that have died will continue during the approved monitoring period at a rate that will ensure a >90% survival of planted stock.
- **Phase 5**: Additional plantings - works can commence where advanced canopy growth is evident, and the bush regeneration team determines that additional planting is necessary to satisfy the objectives of the offset strategy.
- **Phase 6**: Ongoing maintenance - will continue indefinitely on an as needed basis until performance targets have been met. If the performance targets have not been met, corrective actions will be implemented in accordance with **SECTION 7.5.5**.

5.7.4 Site Preparation

Site preparation will include the following actions:

- Erection of temporary fencing and signage in accordance with **SECTION 5.3**.
- Identification of retained vegetation and rehabilitation area - each retained vegetation area and rehabilitation area will be assigned an identifier which will be used to identify relevant rehabilitation areas on the ground and for monitoring and maintenance purposes (refer **SECTION 7**).
- Primary and secondary weed control in accordance with **SECTION 5.6**.
- Planting works in accordance with the following sections.

5.7.5 Assisted Natural Regeneration

Natural regeneration refers to the natural process by which plants replace or re-establish themselves. Natural regeneration can be described as the "regrowth" or "vegetative recovery" which occurs spontaneously, by seed or otherwise, after a stress or disturbance (Temple and

[1] A Bush Regeneration Company that has demonstrable experience in the rehabilitation or revegetation of native vegetation communities in the Richmond Valley LGA.

Bungey 1980). As long as mature and healthy native plants occur on the subject site, natural regeneration is an option.

Natural regeneration is a powerful tool that can be used to re-establish native vegetation. It ensures that the new growth is derived from genetic material (i.e. parents) that currently occupies the site and as such is adapted to local conditions. Additionally, the chance of outbreeding depression is reduced.

Natural regeneration will be encouraged within all retained vegetation and rehabilitation areas. Natural recruitment will be monitored for the life of the rehabilitation project. Where natural recruitment is determined to be not currently occurring within retained vegetation and rehabilitation areas (e.g. areas devoid of native vegetation after weed control works), active revegetation through planting will be completed. Revegetation methods (if necessary) will follow those outlined below.

5.7.6 Revegetation Works

5.7.6.1 Introduction

Revegetation will commence no later than six (6) months after the primary weeding is completed. Successful completion of primary weeding will be determined by the appointed bush regeneration team. At this time, an assessment will be made as to level of natural regeneration present within retained vegetation and rehabilitation areas. Any areas where the native seedling germination is considered to be low and impeding the achievement of rehabilitation objectives will require revegetation.

5.7.6.2 Sourcing Plants

Plants to be used for revegetation are to be either propagated in a nursery using material (seeds, cuttings, tissues, etc.) from species which occur onsite or obtained from a local nursery able to supply stock from local provenance. Where existing nursery stock from local provenance is not available, collection of propagation material should be carried out as detailed below.

Whenever possible, seed will be removed directly from plants by shaking or cutting branches over a tarpaulin. Secateurs will be sterilised between each use. Seed will be placed in small envelopes with the collection details clearly marked. If the seed is extremely small, it will be stored in glass or plastic vials to avoid undue loss. The seed will be cleaned, its viability checked and prepared for storage. Seed that has lost viability will not be used in the revegetation works due to the dangers of genetic aberration.

The following details will be collected from each source plant:

- Location (GPS position);
- Date of collection;
- Name of collector;
- Soil type;
- Health of plant; and

- Collection method.

The amount of seed collected will not exceed 5% per plant.

Under the NSW *BC Act* (2016) a licence will be required for activities which are likely to:

- harm protected plants or a plant that is a threatened species or part of an endangered population or a threatened ecological community; or
- involve the collection of protected plant specimens or seeds, pick cuttings or whole plants.

The Bush Regeneration Company chosen to complete rehabilitation works on the site must hold all necessary license and approvals to undertake the works.

It is expected that during the seed collection program, a site will be visited on several occasions to ensure optimum seed ripeness. If seed collection proves difficult or impossible, other forms of propagation, such as cuttings, may be attempted.

5.7.6.3 Planting Program

Tube stock seedlings will primarily be used for the plant-out. Seedlings will be sufficiently developed so as to have a significant chance of survival. Plants will be at least the sixth leaf stage and/or 20 cm in height. Tube stock will be sun hardened (plants should be held in full sunlight and systematically stressed to the point of wilting for at least two (2) months prior to planting).

All exclusionary fencing (where applicable) will be in place prior to the commencement of construction and before planting occurs.

Planting will occur at the optimum time of year when there is high soil moisture (between January and May), unless irrigation is available and accessible.

If required, the restoration team may make minor alterations to this revegetation strategy depending on the site requirements. The following strategy will be employed:

- Secondary weeding - Planting sites will be spot sprayed with a frog friendly glyphosate product 3 - 4 weeks prior to commencement;
- All seedlings will be soaked in water overnight prior to planting;
- All seedlings will be provided with a wetting agent such as rain-saver[2] crystals where appropriate;
- Weeds will be controlled, in the short term, through the application of suitable mulch around individual plantings and with spot applications of an appropriate herbicide.

[2] Rain-saver is a polymer water crystal that has been specifically developed for plants. The polymer absorbs and holds water and nutrients at a specific tension which makes it available to plant roots but does not release to the soil. Rain-saver has proven very successful in more difficult environments (e.g. Roadside plantings on the Pacific Motorway between Brisbane and the Gold Coast and in frontal dunes at Pottsville (R. Keene *pers comm.* 2000).

- All seedlings will be protected by a tree guard (commercial tubing or equivalent) or fencing if browsing becomes an issue; and
- Watering will be undertaken after the seedlings have been planted on an 'as needed' basis.

The seedlings shall be planted on the same day (or as soon as practicable) as their transport from the nursery. No seedlings will be left unprotected on the site whilst awaiting planting. Planted seedlings will be marked with a piece of biodegradable tape and staked.

The plants growing medium should be soaked prior to planting and the plant cores should be buried to approximately 1-2 cm deep. Only nitrogenous fertilisers will be used to avoid the introduction of Phosphorous, Potassium and other micronutrients. Planting in areas exposed to full sun or westerly sun will be avoided in the peak summer months, where possible.

5.7.6.4 Planting Density and Species Selection

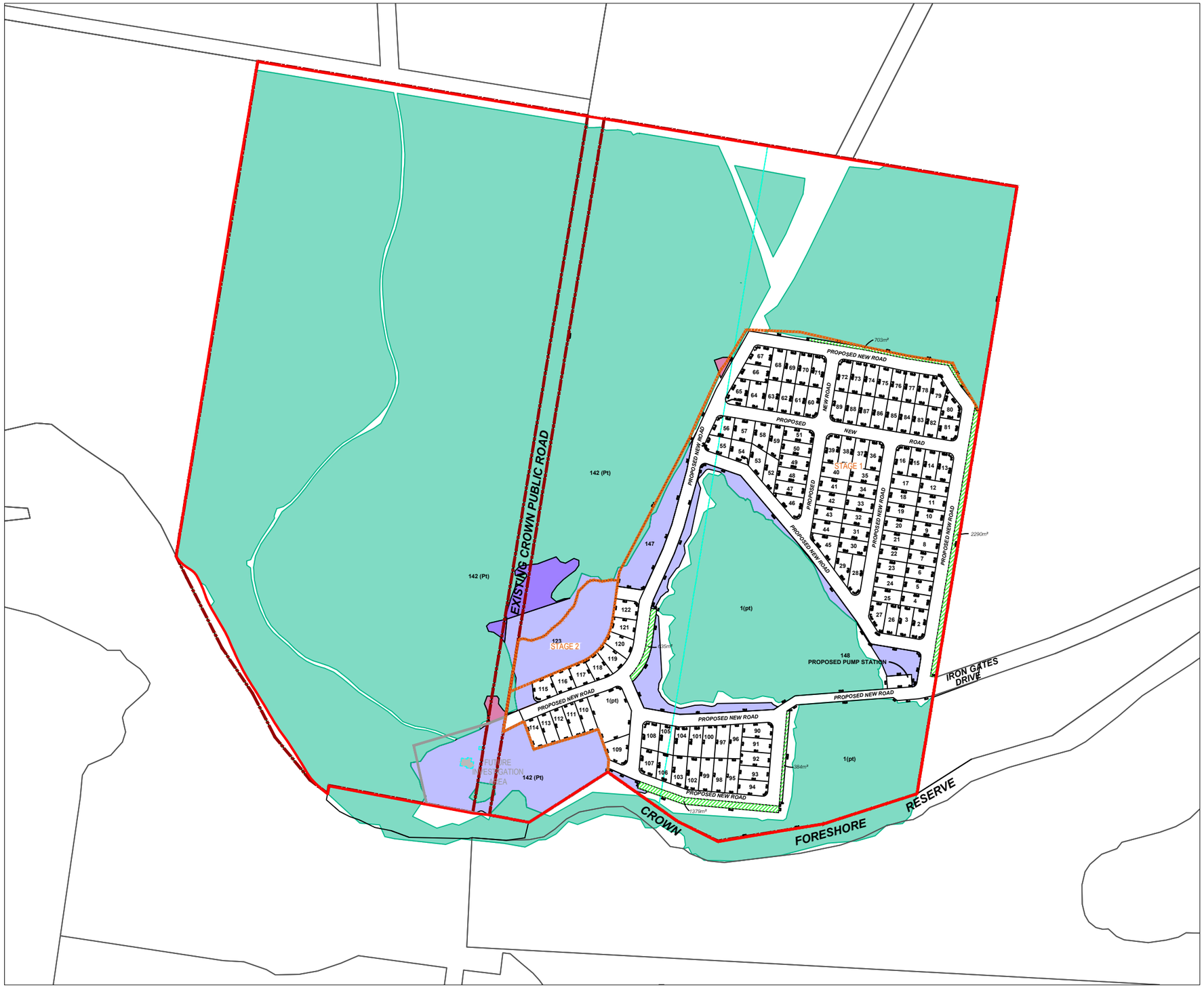
Planting densities and species selection is provided in **TABLE 4** below for areas requiring revegetation works (i.e. MZ2 - Bushfire Asset Protection Zone, MZ4 - Compensatory Koala Habitat Areas and MZ7 – Littoral Rainforest Regeneration/Revegetation Areas).

In relation to compensatory koala habitat areas, two (2) broad types of koala compensatory habitat are proposed – primary (within MZ4) and supplementary (within MZ2 - excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area). It is noted however that both types will utilise a majority of primary food tree species, and for the purposes of koala habitat suitability will act as primary koala habitat. Three (3) sub-types of koala compensatory habitat are identified in **FIGURE 7** and have been proposed based on soil types and aspect as follows:

- Primary koala habitat Type A – lowland areas suitable for planting majority Forest red gum (PCT 4046);
- Primary koala habitat Type B – elevated areas suitable for planting majority Tallowwood (PCT 3573); and
- Supplementary koala habitat - lowland areas suitable for planting majority Forest red gum (PCT 4046) but at a reduced density to minimise bushfire risk (see below).

Within proposed primary koala compensatory habitat areas (Type A and B) trees will be planted at a density of 1 tree per 9 m^2. Within proposed supplementary koala compensatory habitat areas (excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area) trees will be planted at a density of 1 tree per 250 m^2 to ensure that mature tree canopy cover complies with the requirements of a bushfire inner protection area (IPA). The overall plant numbers to be planted in each of the proposed compensatory koala habitat areas are provided in **TABLE 5**. Species diversity will be maintained throughout these revegetation areas and consist of a minimum of three (3) different tree species per 100 m^2.

All proposed koala compensatory habitat will contain a minimum of 50% primary food trees as over-storey trees. At proposed planting densities, a minimum of 512 primary koala food trees and 510 secondary koala food trees will be planted (in 3.19 hectares of compensatory habitat



LEGEND

- Subject Site

Proposed Development Layout

- Lot Boundary
- Stage Boundary
- Drainage Reserve

Retained Koala Habitat

- Retained Koala Habitat

Compensatory Koala Habitat

- Primary Koala Habitat Type A
- Primary Koala Habitat Type B
- Supplementary Koala Habitat

Scale 1 : 5000

0 50m 100m 150m 200m 250m 300m

SOURCE: JWA; Arcadis (Ref: IRG-AAP-BE-00-XRF-CV-0212-StageBoundaries_Stage01.dwg); Landpartners (Ref: BRJD6396-100-33-32-EXT.dwg)

SCALE: 1 : 5000 @ A3

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FIGURE 7

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TITLE

RETAINED & COMPENSATORY KOALA HABITAT

– i.e. excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area).

Species lists and planting densities have also been provided below for areas of retained vegetation (i.e. MZ3 – Retained Koala Habitat, MZ5 – Retained Heath Areas, MZ6 – Retained Littoral Rainforest and MZ8 – Wetland Vegetation) in the event that infill planting is required where gaps are identified or where weed control works result in bare areas or areas of exposed topsoil. The focus of an infill planting within MZ3 – Retained Koala Habitat will be dense stands of additional Preferred Koala Food Trees (PKFTs).

MZ5 – Retained Heath Areas is comprised of both wet heath and dry heath communities (i.e. VC9 and VC10 respectively) (**FIGURE 4**). Species lists have been provided for each VC in the event that infill planting is required.

Lists of species to be used for planting within the proposed revegetation areas, and any infill planting areas within retained vegetation, along with the plant spacings to be adopted are provided in **TABLE 4**. Other suitable species may be used where appropriate.

TABLE 4
PLANTING DETAILS

Management Zone	Management Intent	Area	PCT to be Recreated	Indicative trees, shrubs, or groundcover plant species to be planted*	Plant Spacings
MZ 2 – Bushfire Asset Protection Zone	Planting scattered PKFTs	4.16 ha	PCT 4046	**Trees -** *Eucalyptus tereticornis (> 50%) +/- Eucalyptus robusta, Corymbia intermedia, Lophostemon suaveolens*	1 per 250 m^{2}^
MZ 3 – Retained Koala Habitat	Assisted regeneration (infill planting if necessary)	41.54 ha	PCT 3573 / 4046#	**Trees** - *Eucalyptus tereticornis, Eucalyptus microcorys*	Trees (where necessary) = 3 m centres
MZ 4 – Koala Compensatory Habitat	Primary koala habitat – Type A	0.08 ha	PCT 4046	**Trees -** *Eucalyptus tereticornis* (≥ 50%) *+/- Eucalyptus robusta, Corymbia intermedia, Lophostemon suaveolens*	1 per 9 m^{2}
	Primary koala habitat – Type B	0.37 ha	PCT 3573	**Trees -** *Eucalyptus microcorys* (≥ 50%) *+/-Eucalyptus racemosa, Eucalyptus resinifera, Lophostemon confertus*	1 per 9 m^{2}
MZ 5 – Retained Heath Areas	Dry Heath assisted regeneration (infill planting if necessary)	1.63 ha	PCT 3801	**Trees** – n/a	n/a
				Small trees/Shrubs – *Banksia aemula, Allocasuarina littoralis, Leucopogon leptospermoides, Dillwynia retorta, Monotoca scoparia, Homoranthus virgatus, Persoonia virgata, Gompholobium virgatum, Acacia suaveolens, Pimelea linifolia, Leptospermum trinervium*	Small trees/Shrubs (where necessary) = 2 m centres
				Ground – *Caustis recurvata, Schoenus ericetorum, Coleocarya gracilis, Themeda triandra, Patersonia sericea, Xanthorrhoea johnsonii, Pteridium esculentum*	Groundcovers (where necessary) = 1.5 m centres
	Wet Heath assisted regeneration	4.53 ha	PCT 3915	**Trees** – n/a	n/a
				Small trees/Shrubs – *Banksia ericifolia, Banksia robur, Leptospermum juniperinum, Callistemon pachyphyllus, Epacris obtusifolia, Pultenaea myrtoides, Leptospermum liversidgei, Melastoma affine*	Small trees/Shrubs (where necessary) = 2 m centres

Management Zone	Management Intent	Area	PCT to be Recreated	Indicative trees, shrubs, or groundcover plant species to be planted*	Plant Spacings
	(infill planting if necessary)			**Ground** – *Telmatoblechnum indicum, Gleichenia dicarpa, Lygodium microphyllum, Baloskion tetraphyllum, Machaerina rubiginosa, Gahnia sieberiana, Empodisma minus, Entolasia stricta*	Groundcovers (where necessary) = 1.5 m centres
MZ 6 – Retained Littoral Rainforest Areas	Assisted regeneration (infill planting if necessary)	4.27 ha	PCT 3124	**Trees** – *Cupaniopsis anacardioides, Polyscias elegans, Cryptocarya triplinervis, Lophostemon confertus, Banksia integrifolia, Trochocarpa laurina, Euroschinus falcatus, Mischocarpus pyriformis, Alphitonia excelsa, Litsea australis, Glochidion ferdinandi, Flindersia bennettii, Endiandra sieberi*	Trees = 3 m centres
				Small trees/Shrubs – *Acronychia imperforata, Austromyrtus dulcis, Dodonaea triquetra, Breynia oblongifolia, Syzygium oleosum, Pittosporum revolutum, Myrsine variabilis, Notelaea longifolia*	Small trees/Shrubs = 2 m centres
				Ground – *Pteridium esculentum, Lomandra longifolia, Imperata cylindrica, Ottochloa gracillima, Dianella caerulea, Hibbertia scandens*	Groundcovers (where necessary) = 1 m centres
MZ 7 - Littoral Rainforest Regeneration/ Revegetation Areas	Revegetation	1.74 ha	PCT 3124	See Littoral rainforest species lists above.	Trees = 3 m centres
					Small trees/Shrubs = 2 m centres
					Groundcovers = 1 m centres
MZ 8 – Wetland Vegetation	Assisted regeneration (infill planting if necessary)	0.41 ha	PCT 3990	**Trees** – *Melaleuca quinquenervia*	Trees (where necessary) = 3 m centres
				Small trees/Shrubs – *Elaeocarpus reticulatus*	Small trees/Shrubs (where necessary) = 2 m centres
				Ground – *Telmatoblechnum indicum, Gahnia clarkei, Gahnia sieberiana, Baloskion tetraphyllum, Lomandra longifolia*	Groundcovers (where necessary) = 1.5 m centres
TOTAL		**73.76 ha**			

Management Zone	Management Intent	Area	PCT to be Recreated	Indicative trees, shrubs, or groundcover plant species to be planted*	Plant Spacings
Notes: ^ Excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area. * Other suitable species may be used where appropriate. # The focus of an infill planting within MZ 3 – Retained Koala Habitat will be dense stands of additional PKFTs.					

TABLE 5
PROPOSED KOALA COMPENSATORY HABITAT PLANTING DETAILS

Koala Compensatory Habitat Type	Total Area	Vegetation community PCT to be Recreated	Broad Vegetation Structure to be Created	Planting Density	Minimum Total Number of koala Food Trees to be Planted	Species List*
Primary koala habitat – Type A	0.08 ha	PCT 4046	Open/Closed Forest	1 per 9m^2	Primary Trees: 45 Secondary Trees: 44	*Eucalyptus tereticornis* (≥ 50%) +/- *Eucalyptus robusta, Corymbia intermedia, Lophostemon suaveolens*
Primary koala habitat – Type B	0.37 ha	PCT 3573	Open/Closed Forest	1 per 9m^2	Primary Trees: 412 Secondary Trees: 411	*Eucalyptus microcorys* (≥ 50%) +/-*Eucalyptus racemosa, Eucalyptus resinifera, Lophostemon confertus*
Supplementary koala habitat	4.16 ha	PCT 4046	Open Woodland	1 per 250 m^2^	Primary Trees: 55 Secondary Trees: 55	*Eucalyptus tereticornis* (≥ 50%) +/- *Eucalyptus robusta, Corymbia intermedia, Lophostemon suaveolens*
TOTALS	**4.61 ha**				**Primary Trees: 512** **Secondary Trees: 510**	
Notes: ^ Excluding the MZ2 areas within Stage 2 of the concept subdivision design and the Future Investigation Area.						

5.8 Environmental and Community Liaison Officer(s)

The proponent must engage a Community Liaison Officer and an appropriately qualified Environmental Officer(s) for the duration of works. The Community Liaison Officer is required to consult with potentially affected property owners and RVC before and during construction works and shall respond to complaints of an environmental impact nature. The Environmental Officer(s) shall oversee environmental compliance until all relevant approval conditions have been satisfied. The roles of Community Liaison Officer and Environmental Officer may be undertaken by the same person.

The Environmental Officer must submit a report to RVC within three (3) weeks of the completion of each earthworks stage detailing the project's compliance with relevant approval conditions, management plans and progress onsite.

A sign is to be erected at a suitable and highly visible location prior to commencement of bulk earthworks to clearly advise the environmental/community liaison officer's details and contact number. These details are also to be documented in the Construction Environmental Management Plan.

5.9 Adaptive Management

5.9.1 Introduction

Adaptive management is an approach that involves continually monitoring a process to evaluate its effectiveness, an improving the process based on this evaluation. It requires transparent planning systems and implementation strategies, and a strong emphasis on monitoring and reviewing to ensure emerging information is reflected in future planning. The principles of adaptive management have been incorporated into the administration of restoration projects within a variety of governmental authorities and programs (Thom 1997).

As the IGRD project evolves conflicts between management plans may be identified during the management plan approval process. In addition, changes to site conditions and the results of monitoring (i.e. rehabilitation monitoring) may require amendments to the management actions anticipated in this VFMP and other environmental management plans.

The following sections outline the adaptive management approaches to be utilised to manage conflicts between management plans and to respond to issues identified during routine monitoring.

5.9.2 Management Plan Conflicts

Issues related to conflicts between management plans will be addressed using the following adaptive management approach:

1. Issues of concern will be identified as they are detected during the management plan review and approval process.
2. Approved management plans can only be updated using the adaptive management approach where the inconsistency:

- results following the approval of an associated management plan; and
- is in response to advice from, or acknowledged in writing by RVC or a relevant State agency; and
- is genuinely minor and/or administrative in nature; and
- results in no additional environmental impact.

Discretion as to whether approved management plans may be updated using the adaptive management approach (or may require re-satisfaction or a modification of the development approval) rests with RVC and any other relevant agencies.

3. The management plan under review will be amended to acknowledge the issue(s) of concern and how the issue(s) will be addressed through the adaptive management provisions. Updates must be consistent with the rationale, aims, objectives and expected outcomes of the relevant management plan (e.g. the principles of the VFMP) and continue to comply with the relevant approval conditions and any relevant benchmarks. For example, where proposed rehabilitation works conflict with other uses an alternative planting site will need to be located elsewhere to satisfy the overall rehabilitation commitment.
4. Once the plans commence implementation, the recommended adaptive management issues and the relevant management response should be implemented and included in the annual reporting for the affected management plan.
5. When management plans are updated, any changes made to the plan because of adaptive management are to be included in the updated plan and adaptive management log (**SECTION 5.9.4**). A copy of all management plans will be kept on the project website, clearly indicating current and archived versions.

5.9.3 VFMP Adaptive Management

Once the VFMP commences implementation, it is possible that routine monitoring will identify issues with the strategies outlined in this report, in particular the health and conditions of the plantings, natural regeneration and the status of the weed infestation. Alteration to the design and maintenance of works may be required to ensure the objectives of the VFMP are achieved and will be addressed through the adaptive management provisions. Adaptive management strategies for this VFMP will be determined by the information provided in monitoring reports. Examples of adaptive management strategies that may be required within this VFMP include:

- Amendment of species list for revegetation works;
- Replacement of enhancement plantings that do not survive; and
- The status of the weed infestation and alteration of weed control methods or timing.

Before the implementation of any adaptive management strategy a brief report is to be provided to the Proponent and other relevant agencies detailing the proposed management actions and the predicted outcomes. The implementation must be approved by the relevant authority prior to implementation.

5.9.4 Adaptive Management Log

A log of changes to each management plan will be updated monthly and published on the project website. In addition, a copy of the adaptive management log will be included in the Annual Vegetation Monitoring Report (**SECTION 7.6.2**). The log shall include (as a minimum), the date, the title of the plan affected, an explanation of the inconsistency and update made, and confirmation that RVC or any relevant agencies support the amendment.

6 PROJECT WORK PLAN

As detailed in **SECTIONS 5.5 and 5.7**, mapped polygons within MZs 2 - 8 will be allocated an individual identifying number. After development approval and prior to commencement of site works each management polygon will be assessed to determine and/or map the following:

- Areas requiring specific management actions (i.e. pegging boundaries, monitoring natural regeneration etc.);
- Areas requiring significant weed control in accordance with **SECTION 5.6**; and
- Areas of cleared/highly disturbed land that will require revegetation in accordance with **SECTION 5.7**.

This process will be completed, and a rehabilitation project work plan prepared and provided to prospective rehabilitation contractors during the tendering process, to ensure that resources are adequately allocated to each management polygon and to areas requiring the greatest level of rehabilitation effort.

7 MONITORING AND REPORTING

7.1 Introduction

Monitoring will be undertaken to determine the effectiveness of mitigation measures implemented. Monitoring will be required during the 'establishment period[3]' and 'maintenance period[4]' of the project to determine the effectiveness of management actions implemented. Monitoring has been separated into three (3) types:

- Baseline monitoring – completed in MZs 2 – 8;
- Monitoring of retained vegetation – completed in MZs 3, 5, 6 and 8; and
- Rehabilitation monitoring – completed in MZs 2, 4 and 7.

7.2 Baseline Monitoring

7.2.1 Background

Baseline monitoring will be completed by a suitably qualified ecologists within retained habitat areas (MZs 3, 5, 6 and 8), compensatory habitat areas (MZs 2 and 4) and other proposed revegetation/regeneration areas (i.e. MZ 7) in accordance with the following sections. Additionally, the bush regeneration team will gather baseline data at each weed treatment site prior to commencement of weed control (refer to **SECTION 7.3**).

7.2.2 Monitoring Locations

Baseline monitoring location have been identified within MZs 2 – 8 to ensure uniform and unbiased coverage and representative sampling of all habitat types (**FIGURE 8**). A focus on the interface between the development footprint and retained vegetation areas was also considered.

7.2.3 Methodology

7.2.3.1 Introduction

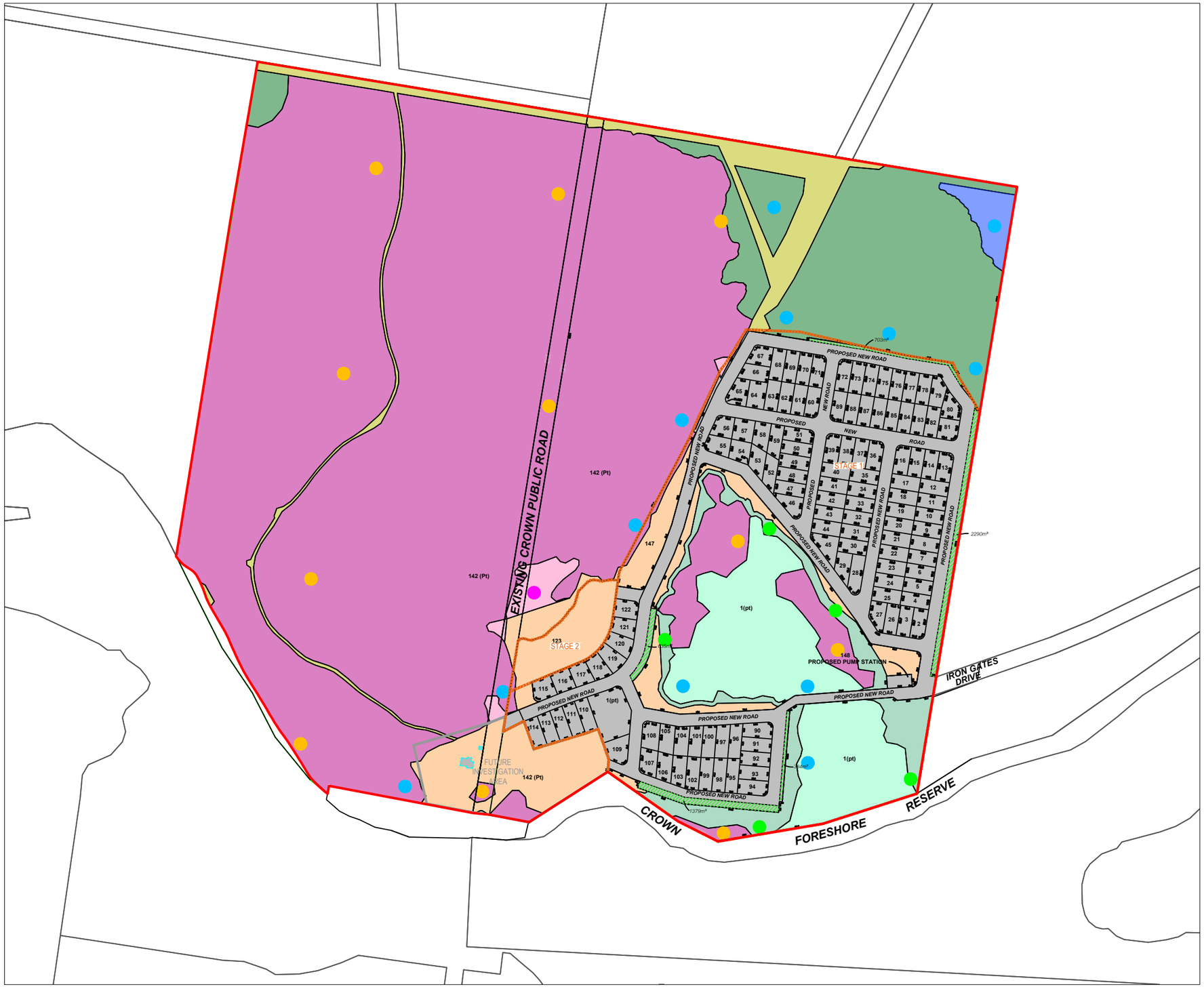
To assess if the project completion criteria have been met, vegetation assessments will be completed using plot-based vegetation surveys (transects) and photo point monitoring at the locations discussed above.

7.2.3.2 Plot-Based Vegetation Surveys

Plot-based vegetation surveys (transects) will be undertaken at the monitoring locations shown on **FIGURE 8**. Vegetation survey sites will be permanently marked (i.e. star pickets or wooden

[3] means the period commencing with the implementation of the relevant approved environmental management plan(s) and ending when the works specified in that plan meet the establishment period performance criteria (as defined by the relevant approved environmental management plan) to the satisfaction of RVC. The establishment period represents the time necessary to carry out initial environmental repair, restoration and monitoring prior to ongoing maintenance.

[4] means the period commencing immediately after the end of the establishment period during which environmental management and monitoring works specified in the relevant approved environmental management plan(s) are to be carried out in accordance with the maintenance period performance to the satisfaction of RVC.



N

LEGEND

- Subject Site

Indicative Monitoring Locations

- Koala activity/retained vegetation
- Koala activity/compensatory habitat
- Retained vegetation
- Rehabilitation/compensatory habitat

Proposed Development Layout

- Lot Boundary
- Stage Boundary
- Drainage Reserve

Management Zones

- MZ1 - Construction Zone
- MZ2 - Bushfire Asset Protection Zone
- MZ3 - Retained Koala Habitat
- MZ4 - Compensatory Koala Habitat Areas
- MZ5 - Retained Heath Areas
- MZ6 - Retained Littoral Rainforest
- MZ7 - Littoral Rainforest Regeneration/Revegetation Areas
- MZ8 - Wetland Vegetation
- MZ9 - Residual Lands

Scale 1 : 5000

0 50m 100m 150m 200m 250m 300m

SOURCE: JWA; Arcadis (Ref: IRG-AAP-BE-00-XRF-CV-0212-StageBoundaries_Stage01.dwg); Landpartners (Ref: BRJD6396-100-33-32-EXT.dwg)

SCALE: 1 : 5000 @ A3

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Richmond Valley Council LGA

FIGURE 8

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DATE: 11 June 2024
FILE: N16006_Court_20240611.dwg

TITLE

INDICATIVE MONITORING LOCATIONS

stakes) and the end positions identified on a sitemap using a hand-held Global Positioning System (GPS).

The plot-based vegetation surveys will be based on a 20 m × 20 m plot (or 400 m^2 equivalent for linear areas). Survey plots should be established around a central 50 m transect as follows:

a) One (1) 400 m^2 plot (standard 20 m x 20 m) is used to assess all performance indicators as set out in **TABLE 6** below.

b) Five (5) 1 m^2 sub-plots can be added to the program for the first monitoring event to assess groundcover recruitment for the plot. A decision as to the utility of these plots can be made after the first or second monitoring events.

The assessor will assess the plot for the information contained in **TABLE 6**.

TABLE 6
VEGETATION SURVEY DATA TO BE COLLECTED – BASELINE MONITORING

Attribute	Survey Required
Native Canopy Cover	Native canopy cover will be measured via the 'line intercept method' along the 50 m transect. Key canopy species will be noted.
Weed Canopy Cover	Weed canopy cover will be measured via the 'line intercept method' along the 50 m transect. Individual canopy weed species should be assessed separately.
Native Midstorey Cover	Estimate the % foliage cover of each native species within the midstorey across the 400 m^2 plot. Cover should be recorded in decimals if less than 1% (0.1, 0.2…), or whole numbers up to 5% (1, 2, 3…), or to the nearest 5% where greater than 5% cover (5, 10, 15, 20, 25…).
Weed Presence in the Midstorey	Estimate the % foliage cover of each weed species within the midstorey across the 400 m^2 plot. Cover should be recorded in decimals if less than 1% (0.1, 0.2…), or whole numbers up to 5% (1, 2, 3…), or to the nearest 5% where greater than 5% cover (5, 10, 15, 20, 25…).
Groundcover	Estimate percentage cover of native species vs. weeds within each of the five (5) 1 m^2 sub-plots. Cover should be recorded in decimals if less than 1% (0.1, 0.2…), or whole numbers up to 5% (1, 2, 3…), or to the nearest 5% where greater than 5% cover (5, 10, 15, 20, 25…). Identify each native and weed groundcover species.

The full species name (genus species) must be recorded for all native species, unless insufficient diagnostic plant material is present, in which case the genus name followed by a species number must be used. Comments should also be included for all attributes (**TABLE 6**) on any notable variations elsewhere in the relevant management polygon - e.g. weeds occurring in the management polygon that are not (or poorly) represented in the transect.

7.2.3.3 Photo Point Monitoring

Photo-monitoring points will be completed as a means of demonstrating compliance or otherwise with performance criteria. Permanent photo stations are to be located at each monitoring location (**FIGURE 8**). Where transects are to be established, photo points have been located on each transect. Where selected vegetation/habitat polygons are too small in size

and/or are not covered by transects, photo point monitoring points will be identified, mapped and included in the baseline monitoring report.

Four (4) photos are to be taken from each photo point. Photos are to be taken to the north, south, east and west. Photos should be labelled with the:

- Transect code or photo point code;
- Direction of view; and
- Date and time.

Photos must be supplied in the Baseline and Annual Vegetation Monitoring Reports in a form of prints no smaller than 4" x 6" and must be colour.

7.2.4 Timing of Baseline Monitoring Visits

Collection of baseline data will be completed prior to commencement of construction.

7.3 Bush Regeneration Team Monitoring

The Bush Regeneration Team will gather baseline data at each weed treatment site prior to commencement of weed control to assist in documenting vegetation recovery in the long term. A baseline monitoring proforma is contained in **APPENDIX 4**.

The bush regeneration team will also keep detailed work sheets for all works completed within retained habitat areas (MZs 3, 5, 6 and 8), compensatory habitat areas (MZs 2 and 3) and other proposed revegetation/ regeneration areas (i.e. MZ 7), recording the following:

- All work completed each day;
- Site conditions;
- Chemicals used;
- Problems encountered; and
- Future works required.

A daily work sheet template is attached in **APPENDIX 5**. These records and general comments on progress will be provided to the Ecologist for consideration and inclusion in the Annual Vegetation Monitoring Reports (**SECTION 7.6.2**).

7.4 Monitoring Retained Vegetation

7.4.1 Background

Ongoing vegetation monitoring will be completed by an Ecologist within retained habitat areas (MZs 3, 5, 6 and 8), in accordance with the following sections. In addition, in the event of a planned or unplanned bushfire occurring on the IGRD site, an additional vegetation monitoring event is to be completed in accordance with the following sections.

7.4.2 Monitoring Locations

Ongoing vegetation monitoring within retained habitat areas (MZs 3, 5, 6 and 8) will utilise the same monitoring locations as the baseline monitoring as discussed in **SECTION 7.2** above.

In the event of a planned or unplanned bushfire on the IGRD site, an additional monitoring event is to be completed within the affected area at monitoring sites spaced no more than 100 m. Where possible, this should include any of the standard monitoring sites as shown in **FIGURE 8**.

7.4.3 Methodology

Ongoing retained vegetation monitoring and additional bushfire monitoring events will utilise the same methodology (i.e. plot-based vegetation surveys and photo point monitoring) as discussed for the baseline monitoring above (**SECTION 7.2**).

7.4.4 Timing of Monitoring Visits

Monitoring events should occur:

- To set up monitoring transects and quadrats, and to collect the first round of monitoring data after 1st event of secondary weeding;
- Six (6) monthly until the establishment period performance criteria are met; and
- Then annually during the maintenance period.

In the event of a planned or unplanned bushfire on the IGRD site an additional monitoring event will be completed three (3) to six (6) months after the bushfire to inform any additional maintenance and rehabilitation requirements.

7.4.5 Performance Targets and Corrective Actions

TABLE 7 provides the performance indicators and targets for retained vegetation/habitat within MZs 3, 5, 6 and 8. Corrective actions are provided that are to be implemented if performance targets are not met.

TABLE 7
PERFORMANCE TARGETS AND CORRECTIVE ACTIONS FOR RETAINED VEGETATION (MANAGEMENT ZONES 3, 5, 6 & 8)

Performance Indicator	Target - Establishment period[1]	Target - Maintenance period[2]	Corrective Actions
Natural recruitment of native species.	Evidence of natural recruitment of shrub and ground cover species.	Increasing natural recruitment of shrub and groundcover species.	Where natural recruitment fails to meet performance targets discussions with RVC shall be initiated by the proponent or their consultants to consider adjustments to the assisted regeneration strategy being used to improve natural recruitment.

Performance Indicator	Target – Establishment period[1]	Target – Maintenance period[2]	Corrective Actions
All identified weeds controlled to an acceptable level within retained vegetation areas.	Foliage Projective Cover (FPC) (%) assessed using eye estimates or photo points reduced to <10% within first year.	Foliage Projective Cover (FPC) (%) assessed using eye estimates or photo points: • reduced to <10% within first year; • <10% in second year; • <5% in the third year and consecutive years.	Weed control as necessary.
Infrastructure (e.g. protection fencing, signage, erosion and sediment control devices) functional and well-maintained.	Relevant infrastructure maintained.	Relevant infrastructure maintained.	Maintenance as necessary.

Notes:

[1] "Establishment period" means the period during which initial environmental repair, restoration and monitoring works required by the relevant approved environmental management plan(s) are undertaken. The establishment period ends when the works meet the establishment period performance criteria, as defined by the relevant approved environmental management plans, to the satisfaction of RVC.

[2] "Maintenance period" means the period of environmental management and monitoring works commencing immediately after the end of the establishment period. Maintenance period works are to be carried out in accordance with the relevant performance criteria to the satisfaction RVC.

7.5 Rehabilitation Monitoring

7.5.1 Background

Monitoring is crucial in ensuring the continuing success of the rehabilitation program and will be carried out for the duration of this plan. Monitoring in accordance with this VFMP will be completed within MZ2 - Bushfire Asset Protection Zone, MZ4 - Compensatory Koala Habitat Areas and MZ7 – Littoral rainforest regeneration/revegetation areas. Details of the rehabilitation monitoring program are provided in the following sections.

In addition, in the event of a planned or unplanned bushfire occurring on the IGRD site, an additional rehabilitation monitoring event is to be completed in accordance with the following sections.

7.5.2 Monitoring Locations

Ongoing rehabilitation monitoring within MZ2, MZ4 and MZ7 will occur in locations shown in **FIGURE 8.** Field sites have been selected to ensure representative sampling of all rehabilitation areas and to ensure uniform and unbiased coverage.

In the event of a planned or unplanned bushfire on the IGRD site, an additional monitoring event is to be completed within the affected area at monitoring sites spaced no more than 100 m. Where possible, this should include any of the standard monitoring sites as shown in **FIGURE 8**.

7.5.3 Methodology

Ongoing rehabilitation monitoring will utilise the same methodology (i.e. plot-based vegetation surveys and photo point monitoring) as discussed for the baseline monitoring above (**SECTION 7.2**), however the assessor will assess the plot for a slightly expanded list of details/data.

Vegetation data to be collected in MZ2 and MZ4 is contained in **TABLE 8**. Vegetation data to be collected in MZ7 is contained in **TABLE 9**.

TABLE 8
VEGETATION SURVEY DATA TO BE COLLECTED
– REHABILITATION MONITORING (MZ2 & MZ4)

Attribute	Survey requirement
Seedling survival	The first monitoring event will require a count of the total number of seedlings, individual species counts and a count of the number of dead or dying seedlings of each species. Subsequent monitoring events will only require counts of dead or dying seedlings and their species identification.
Native Canopy Cover	Estimate the % foliage cover across the plot. Cover should be recorded in decimals if less than 1% (0.1, 0.2…), or whole numbers up to 5% (1,2,3…), or to the nearest 5% where greater than 5% cover (5,10,15,20,25…)
Weed Presence	Estimate the % cover in the plot of individual weed species. Count the number of each species.
Shrub and Groundcover Recruitment	Identify native shrub and groundcover species, their percentage cover and the numbers recruiting. The identification of individual recruits may not be possible when they first appear. These should be recorded as unidentified until the next or subsequent monitoring events.

TABLE 9
VEGETATION SURVEY DATA TO BE COLLECTED – REHABILITATION MONITORING (MZ7)

Attribute	Survey Required
Seedling Survival	The first monitoring event will require a count of the total number of seedlings, individual species counts and a count of the number of dead or dying seedlings of each species. Subsequent monitoring events will only require counts of dead or dying seedlings and their species identification.
Native Canopy Cover	Native canopy cover will be measured via the 'line intercept method' along the 50 m transect. Key canopy species will be noted.
Weed Canopy Cover	Weed canopy cover will be measured via the 'line intercept method' along the 50 m transect. Individual canopy weed species should be assessed separately.
Native Midstorey Cover	Estimate the % foliage cover of each native species within the midstorey across the 400 m^2 plot. Cover should be recorded in decimals if less than 1% (0.1, 0.2…), or whole numbers up to 5% (1, 2, 3…), or to the nearest 5% where greater than 5% cover (5, 10, 15, 20, 25…).
Weed Presence in the Midstorey	Estimate the % foliage cover of each weed species within the midstorey across the 400 m^2 plot. Cover should be recorded in decimals if less than 1%

Attribute	Survey Required
	(0.1, 0.2…), or whole numbers up to 5% (1, 2, 3…), or to the nearest 5% where greater than 5% cover (5, 10, 15, 20, 25…).
Groundcover species	Estimate percentage cover of native species vs. weeds within each of the five (5) 1 m^2 sub-plots. Cover should be recorded in decimals if less than 1% (0.1, 0.2…), or whole numbers up to 5% (1, 2, 3…), or to the nearest 5% where greater than 5% cover (5, 10, 15, 20, 25…). Identify each native and weed groundcover species
Shrub and Groundcover Recruitment	Identify the numbers of native shrub and groundcover species recruiting within each of the five (5) 1 m^2 sub-plots. The identification of individual recruits may not be possible when they first appear. These should be recorded as unidentified until the next or subsequent monitoring events.

The full species name (genus species) must be recorded for all native species, unless insufficient diagnostic plant material is present, in which case the genus name followed by a species number must be used. Comments should also be included for all attributes (**TABLES 8 & 9**) on any notable variations elsewhere in the relevant management polygon - e.g. weeds occurring in the management polygon that are not (or poorly) represented in the transect.

7.5.4 Timing of Monitoring Visits

Monitoring events should occur:

- To set up monitoring transects and quadrats, and to collect the first round of monitoring data after 1st event of secondary weeding;
- Six (6) monthly until the establishment period performance criteria are met; and
- Then annually during the maintenance period.

In the event of a planned or unplanned bushfire on the IGRD site an additional monitoring event will be completed three (3) to six (6) months after the bushfire to inform any additional maintenance and rehabilitation requirements.

7.5.5 Performance Targets and Corrective Actions

TABLE 10 provides the performance indicators and targets for the proposed rehabilitation strategy within MZ2 and MZ4. **TABLE 11** provides the performance indicators and targets for the proposed rehabilitation strategy within MZ7. Corrective actions are provided that are to be implemented if performance targets are not met.

TABLE 10
PERFORMANCE TARGETS AND CORRECTIVE ACTIONS
- REHABILITATION MONITORING (MZ2 & MZ4)

Performance Indicator	Target - Establishment period[1]	Target - Maintenance period[2]	Corrective Actions
Survival and continued growth of seedlings (i.e. planted stock).	>90% survival of plantings during all monitoring events.	>90% survival of plantings during all monitoring events	Irrigation if required. Additional planting if required.
Establishment of native canopy cover (where	Planted trees substantially established[3].	MZ2	Monitoring and maintenance period must

Performance Indicator	Target – Establishment period[1]	Target – Maintenance period[2]	Corrective Actions
applicable) within revegetation areas.		• Maintained at <15% canopy cover MZ4 • >60% canopy cover of native tree species >1.5 m in height after three (3) years; • >80% canopy cover of native tree species >2.5m in height after five (5) years.	be extended until the targets are met.
Natural recruitment of native shrub and groundcover species (where applicable) throughout rehabilitation areas.	MZ2 • maintained at less than 100mm in height MZ4 • Evidence of natural recruitment of shrub and ground cover species.	MZ2 • maintained at less than 100mm in height MZ4 • Increasing natural recruitment of shrub and groundcover species.	Where natural recruitment fails to meet performance targets discussions with RVC shall be initiated by the proponent or their consultants to consider adjustments to the assisted regeneration strategy being used to improve natural recruitment.
All identified weeds controlled to an acceptable level within retained vegetation areas.	Foliage Projective Cover (FPC) (%) assessed using eye estimates or photo points reduced to <10% within first year.	Foliage Projective Cover (FPC) (%) assessed using eye estimates or photo points: • reduced to <10% within first year; • <10% in second year; • <5% in the third year and consecutive years.	Weed control as necessary.
Infrastructure (e.g. protection fencing, signage, erosion and sediment control devices) functional and well-maintained.	Relevant infrastructure maintained.	Relevant infrastructure maintained.	Maintenance as necessary.

Notes:

[1] "Establishment period" means the period during which initial environmental repair, restoration and monitoring works required by the relevant approved environmental management plan(s) are undertaken. The establishment period ends when the works meet the establishment period performance criteria, as defined by the relevant approved environmental management plans, to the satisfaction of RVC.

[2] "Maintenance period" means the period of environmental management and monitoring works commencing immediately after the end of the establishment period. Maintenance period works are to be carried out in accordance with the relevant performance criteria to the satisfaction of RVC.

[3] "Substantial establishment" means "the plantings have progressed beyond the need for intensive maintenance e.g. weed control, watering etc. and are clearly established by way of persisting through a recognised growth period and a suitably qualified horticultural/environmental specialist has provided a short report confirming that the plantings are established."

TABLE 11
PERFORMANCE TARGETS AND CORRECTIVE ACTIONS – REHABILITATION MONITORING (MZ7)

Performance Indicator	Target – Establishment period[1]	Target – Maintenance period[2]	Corrective Actions
Survival and continued growth of seedlings (i.e. planted stock).	>90% survival of plantings during all monitoring events.	>90% survival of plantings during all monitoring events	Irrigation if required. Additional planting if required.
Establishment of native ground cover within revegetation areas.	Planted ground covers substantially established[3].	• >60% after three (3) years; • >80% after five (5) years;	Supplementary planting.
Establishment of native canopy cover (where applicable) within revegetation areas.	Planted trees substantially established[3].	• >60% canopy cover of native tree species >1.5 m in height after three (3) years; • >80% canopy cover of native tree species >2.5m in height after five (5) years.	Monitoring and maintenance period must be extended until the targets are met.
Natural recruitment of native species throughout rehabilitation areas.	Evidence of natural recruitment of shrub and ground cover species.	Increasing natural recruitment of shrub and groundcover species.	Where natural recruitment fails to meet performance targets discussions with RVC shall be initiated by the proponent or their consultants to consider adjustments to the assisted regeneration strategy being used to improve natural recruitment.
All identified weeds controlled to an acceptable level within retained vegetation areas.	Foliage Projective Cover (FPC) (%) assessed using eye estimates or photo points reduced to <10% within first year.	Foliage Projective Cover (FPC) (%) assessed using eye estimates or photo points: • reduced to <10% within first year; • <10% in second year; • <5% in the third year and consecutive years.	Weed control as necessary.
Infrastructure (e.g. protection fencing, signage, erosion and sediment control devices) functional and well-maintained.	Relevant infrastructure maintained.	Relevant infrastructure maintained.	Maintenance as necessary.

Notes:

[1] "Establishment period" means the period during which initial environmental repair, restoration and monitoring works required by the relevant approved environmental management plan(s) are undertaken. The establishment period ends when the works meet the establishment period performance criteria, as defined by the relevant approved environmental management plans, to the satisfaction of RVC.

Performance Indicator	Target – Establishment period[1]	Target – Maintenance period[2]	Corrective Actions

[2] "Maintenance period" means the period of environmental management and monitoring works commencing immediately after the end of the establishment period. Maintenance period works are to be carried out in accordance with the relevant performance criteria to the satisfaction of RVC.

[3] "Substantial establishment" means "the plantings have progressed beyond the need for intensive maintenance e.g. weed control, watering etc. and are clearly established by way of persisting through a recognised growth period and a suitably qualified horticultural/environmental specialist has provided a short report confirming that the plantings are established."

7.6 Reporting

7.6.1 Baseline Vegetation Monitoring Report

Subsequent to the completion of baseline vegetation monitoring, a report will be prepared outlining the results. The report will be provided to RVC and will form the baseline for future monitoring. The Baseline Vegetation Monitoring Report will be available on the project website for twelve (12) months.

7.6.2 Annual Vegetation Monitoring Report

An Annual Vegetation Monitoring Report will be prepared which discusses the results of the monitoring of retained vegetation and rehabilitation areas against the Monitoring Performance Criteria identified in **SECTION 7.4.5** and **SECTION 7.5.5** respectively**.** The information provided in the report should include, but not necessarily be limited to:

- Works undertaken (i.e. a summary of bush regenerators daily reports);
- A presentation of the results of the particular monitoring event/s;
- A detailed discussion of the results of each particular monitoring event including additional monitoring completed after any planned or unplanned bushfire;
- A detailed comparison with the baseline parameters and with previous survey data, as appropriate;
- A statement of compliance with the Monitoring Performance Criteria identified in **SECTION 7.4.5** and **SECTION 7.5.5**;
- Any problems since the previous inspection (death of a significant number of seedlings, broken fences etc.) and what effects these issues have had on the regeneration area;
- Success or failure of measures implemented to rectify previously identified problems;
- Measures to be taken to rectify new problems; and
- Adaptive management log to ensure that the management plan remains relevant and effective (**SECTION 5.9.4**).

Each Annual Vegetation Monitoring Report will be submitted to RVC within two (2) months of completion of the relevant monitoring. The Annual Vegetation Monitoring Report will be available on the project website for twelve (12) months.

8 IMPLEMENTATION SCHEDULES

8.1 Introduction

Specific management actions discussed in **SECTION 5** will be triggered and completed on a pre-construction, construction and operational phase basis. The implementation schedules provided in **TABLES 12 - 14** below summarise all pre-construction, construction and operational phase management strategies and identify the associated management actions, timing and responsibilities and performance measures.

Performance indicators and targets for retained vegetation and the proposed rehabilitation strategy to be achieved during the 'establishment period' and 'maintenance period' of the IGRD project are contained in **SECTION 7.4.5** and **SECTION 7.5.5**. Corrective actions are also provided that are to be implemented if performance targets are not met.

8.2 Development Phases

Management actions outlined in this VFMP will be implemented in three (3) phases:

- **Pre-construction Phase** – The pre-construction phase of the development refers to all preliminary works required to be completed prior to commencement of construction e.g. preliminary survey work, baseline monitoring and commencement of compensatory habitat rehabilitation works.
- **Construction Phase** - The construction phase of the development refers to works completed to construct the development and includes clearing vegetation, bulk earthworks and the construction of infrastructure.
- **Operational Phase** - The operational phase of the development will commence postconstruction and after registration of the plan/s of subdivision.

Commencement of construction is defined as any physical works including clearing vegetation, the use of heavy-duty equipment for the purpose of breaking ground for bulk earthworks, or infrastructure for the proposed project.

TABLES 12 – 14 detail the specific management actions that will be implemented during the pre-construction phase, construction phase and operational phases respectively.

8.3 Roles and Responsibilities

The successful implementation of this VFMP requires a number of key personnel to complete various roles. A summary of key roles/personnel responsible for the management strategies identified in **TABLES 12 - 14** below includes:

Proponent
The Proponent for the works is the approval holder.

Community Liaison Officer
As discussed in **Section 5.8.**

Environmental Officer
As discussed in **Section 5.8**.

Construction/Site Manager
The Construction/Site Manager (to be appointed) is a representative of the project team (typically the project engineer) and is responsible for coordinating the project consultants and construction contractor.

Principal Contractor
The Principal contractor (to be appointed) is responsible for the management of all activities involved in the construction phase of the development.

Site Supervisor
The Site Supervisor is a representative of the Principal Contractor (to be appointed) and responsible for overseeing all pre-clearing, clearing and construction activities are undertaken in accordance with this VFMP and subsequent environmental management documentation.

Ecologist
For the purposes of this VFMP means a qualified ecologist with appropriate training and at least five (5) years of experience in undertaking flora and fauna surveys.

Fauna Spotter Catcher
For the purposes of this VFMP means a suitably qualified ecologist/fauna handler that must hold a relevant scientific license and ethics approvals. A copy of these permits along with their contact details will be passed on to the Site Supervisor. The engaged Fauna Spotter Catcher will be responsible for the management/relocation of native fauna during any clearing activities.

Bush Regeneration Company
For the purposes of this VFMP means a suitably qualified Bush Regeneration Company that has demonstrable experience in the rehabilitation or revegetation of native vegetation communities in the Richmond Valley LGA. It is noted that the Bush Regeneration Company must hold the necessary license and approvals. The engaged Bush Regeneration Company will be responsible for rehabilitation and weed management works on the site.

8.4 Implementation Table – Pre-construction Phase

TABLE 12
VEGETATION AND FAUNA MANAGEMENT STRATEGIES – PRE-CONSTRUCTION PHASE

Management Strategy	Management Zone	Management Action	Responsibility	Performance Measure
Environmental Officer / Community Liaison Officer	All Zones	Appointment of Environmental Officer and Community Liaison Officer.	Proponent	Environmental Officer(s)/ Community Liaison Officer appointed in accordance with **SECTION 5.8**.
Baseline vegetation surveys and report	Zones 2 - 8	Baseline vegetation monitoring program to be completed.	Qualified Ecologist	Baseline vegetation surveys and reports completed in accordance with **SECTION 7.2.** Reports provided to RVC and published on the project website in accordance with **SECTION 7.6**.
Baseline weed survey	Zones 2 - 8	Baseline weed surveys completed.	Suitably Qualified Bush Regeneration Company	Baseline monitoring data collected at each weed treatment area prior to the commencement of weed control in accordance with **SECTION 7.3**.
Education of construction personnel	Zone 1	A construction personnel induction program shall be developed and implemented by the Proponent prior to commencement of construction.	Principal Contractor / Site Supervisor	A construction personnel induction program development and implemented and in accordance with **SECTION 5.2**.
Weed control	Zones 2 - 8	Weeds controlled as required.	Suitably Qualified Bush Regeneration Company	All weeds controlled in accordance with **SECTION 5.6**.
Management of retained vegetation/habitat	Zone 3, 5, 6 and 8	Retained vegetation/habitat managed**.**	Suitably Qualified Bush Regeneration Company	Retained vegetation will be protected and maintained in accordance with **SECTION 5.5**.
Rehabilitation and compensatory habitat works	Zones 2, 4 and 7	Rehabilitation works commenced**.**	Suitably Qualified Bush Regeneration Company	All regeneration/revegetation works (including compensatory habitat creation) to be commenced in accordance with **SECTION 5.7**.
Adaptive management	All Zones	Adaptive Management strategies implemented as required.	Proponent	Adaptive Management Log detailing issues raised, and any changes made to this management plan to be updated monthly and included in the Annual Vegetation Monitoring Report and published on the project website in accordance with **SECTION 5.9**.

Notes:

^ "Establishment period" means the period during which initial environmental repair, restoration and monitoring works required by the relevant approved environmental management plan(s) are undertaken. The establishment period ends when the works meet the establishment period performance criteria, as defined by the relevant approved environmental management plans, to the satisfaction of RVC.

"Maintenance period" means the period of environmental management and monitoring works commencing immediately after the end of the establishment period. Maintenance period works are to be carried out in accordance with the relevant performance criteria to the satisfaction of RVC.

* "Commencement of construction" for the purpose of this VFMP is taken to mean any physical works including clearing vegetation, the use of heavy-duty equipment for the purpose of breaking ground for bulk earthworks, or infrastructure for the proposed project.

8.5 Implementation Table - Construction Phase

TABLE 13
VEGETATION AND FAUNA MANAGEMENT STRATEGIES – CONSTRUCTION PHASE

Management Strategy	Management Zone	Management Action	Responsibility	Performance Measure
Environmental Officer / Community Liaison Officer	All Zones	Environmental Officer to oversee environmental compliance until all relevant approval conditions have been satisfied. Community Liaison Officer to consult with potentially affected property owners and RVC before and during construction works and shall respond to complaints of an environmental impact nature.	Environmental Officer / Community Liaison Officer	Duties of the Environmental Officer / Community Liaison Officer completed in accordance with **SECTION 5.8.**
Installation of temporary fencing	Zones 1 - 8	Temporary fencing to be installed prior to commencement of construction* and regularly checked.	Principal Contractor / Site Supervisor/ Environmental Officer	All temporary fencing to be installed prior to commencement of construction* in accordance with **SECTION 5.3**. Temporary fencing and signage to be regularly checked.
Construction phase management measures	Zones 1 - 8	All areas of vegetation to be cleared within the development site will be clearly identified on construction plans and in the field prior to the commencement of construction.	Principal Contractor / Site Supervisor / Environmental Officer	No clearing in retained and compensatory habitat.
		All activities in an area adjacent to any retained tree or area are to be carried out in such a manner as to minimise any damage to trees.	Principal Contractor / Site Supervisor / Environmental Officer	No trees to be retained are damaged by construction works in accordance with **SECTION 5.3.**
		No machinery, rubbish or spoil will be stored within retained vegetation or rehabilitation areas during the construction phase of the development.	Construction Manager	No machinery, rubbish or spoil stored within retained vegetation or rehabilitation areas in accordance with **SECTION 5.3**.
		No soil disturbance within areas of retained vegetation.	Principal Contractor/ Site Supervisor/ Environmental Officer	Soil is not disturbed within areas of retained vegetation in accordance with **SECTION 5.3.**
		The establishment and propagation of weed species is prevented.	Principal Contractor/ Site Supervisor/ Environmental Officer	No new weed infestations occur during the construction phase in accordance with **SECTION 5.3.**
	Zone 1	Sediment and erosion control devices installed prior to commencement of earthworks and maintained throughout construction phase.	Construction Manager	All erosion and sediment control devices installed and maintained in accordance with an Erosion and Sediment Control Plan (**SECTION 5.3**).
	Zone 1	A designated shakedown/wash area will be established for personnel, equipment and vehicles. Designated shakedown / wash area will not be located in or immediately adjacent to the retained vegetation or rehabilitation areas.	Construction Manager	All shakedown/wash areas installed prior to commencement of earthworks in accordance with an approved Erosion and Sediment Control Plan (**SECTION 5.3**).
	Zone 1	Pre-clearing fauna trapping program as required.	Qualified Ecologist	Prior to commencement of any vegetation clearing works a pre-clearing site inspection will be completed to identify and mark habitat trees or other habitat features within the clearing area in accordance with **SECTION 5.4.1**.

Management Strategy	Management Zone	Management Action	Responsibility	Performance Measure
				Subsequent to the site inspection, and immediately prior to commencement of site clearing works, a pre-clearing trapping program will be completed within any areas of relatively intact vegetation to be cleared in accordance with **SECTION 5.4.1**. Any animals captured to be relocated to suitable areas of retained habitat.
		Appointment of fauna spotter catcher.	Proponent	The proponent will appoint a suitably qualified fauna spotter catcher to conduct a pre-clearing site inspections and to be present during all clearing activities in accordance with **SECTION 5.4.2**.
		A fauna spotter catcher will be present during all vegetation clearing works.	Fauna Spotter Catcher	A suitably qualified fauna spotter catcher is to be present during all clearing activities to rescue and relocate any native fauna species as necessary in accordance with **SECTION 5.4.2**.
		Pre-clearing inspections.	Fauna Spotter Catcher	Pre-clearing site inspections will be completed no more than one (1) day prior to commencement of vegetation clearing activities in accordance with **SECTION 5.4.2**.
		Construction phase fauna management procedures to be implemented as required.	Principal Contractor / Site Supervisor / Fauna Spotter Catcher	Construction phase fauna management procedures are to be implemented in accordance with **SECTION 5.3.**
		A post-clearing spotter catcher report to be prepared.	Fauna Spotter Catcher	A post-clearing spotter catcher report is submitted to RVC in accordance with **SECTION 5.4.5**.
		Fauna Incident Reporting Protocols.	Principal Contractor	Any threatened species observation or incident during the construction phase will result in an observation/incident report in accordance with **SECTION 5.4.6**.
Weed control	Zones 2 - 8	Weeds controlled as required.	Suitably Qualified Bush Regeneration Company	All weeds controlled as required in accordance with the **SECTION 5.6.**
Regeneration and revegetation	Zones 2, 4 and 7	Regeneration and revegetation works carried out as required.	Suitably Qualified Bush Regeneration Company	All regeneration/revegetation works to be carried out in accordance with **SECTION 5.7**.
Maintenance of retained vegetation	Zones 3, 5, 6 and 8	Retained vegetation/habitat managed as required.	Suitably Qualified Bush Regeneration Company	Retained vegetation protected and maintained in accordance with **SECTION 5.5**.
Retained vegetation monitoring	Zones 3, 5, 6 and 8	Retained vegetation monitoring program to be completed.	Qualified Ecologist	Ongoing retained vegetation monitoring program and reporting completed in accordance with **SECTION 7.4**. Reports provided to RVC and published on the project website in accordance with **SECTION 7.6**.
Rehabilitation monitoring	Zones 2, 4 and 7	Rehabilitation monitoring program to be completed.	Qualified Ecologist	Ongoing rehabilitation monitoring program and reporting completed in accordance with **SECTION 7.5**. Reports provided to RVC and published on the project website in accordance with **SECTION 7.6**.
Adaptive management	All Zones	Adaptive Management strategies implemented as required.	Proponent	Adaptive Management Log detailing issues raised, and any changes made to this management plan to be updated as monthly and included in the Annual Vegetation Monitoring Report and published on the project website in accordance with **SECTION 5.9.**

8.6 Implementation Table - Operational Phase

TABLE 14
VEGETATION AND FAUNA MANAGEMENT STRATEGIES – OPERATIONAL PHASE

Management Strategy	Management Zone	Management Action	Responsibility	Performance Measure
Environmental Officer / Community Liaison Officer	All Zones	Environmental Officer to oversee environmental compliance until all relevant approval conditions have been satisfied. Community Liaison Officer to consult with potentially affected property owners and RVC before and during construction works and shall respond to complaints of an environmental impact nature.	Environmental Officer / Community Liaison Officer	Duties of the Environmental Officer and Community Liaison Officer completed in accordance with **SECTION 5.8.**
Weed control	Zones 2 - 8	Weeds controlled as required.	Suitably Qualified Bush Regeneration Company	All weeds controlled as required in accordance with the **SECTION 5.6.**
Regeneration and revegetation	Zones 2, 4 and 7	Regeneration and revegetation works completed as required.	Suitably Qualified Bush Regeneration Company	All regeneration/revegetation works to be completed in accordance with **SECTION 5.7**.
Maintenance of retained vegetation	Zones 3, 5, 6 and 8	Retained vegetation/habitat managed as required.	Suitably Qualified Bush Regeneration Company	Retained vegetation protected and maintained in accordance with **SECTION 5.5**.
Retained vegetation monitoring	Zones 3, 5, 6 and 8	Retained vegetation monitoring program to be completed.	Qualified Ecologist	Ongoing retained vegetation monitoring program and reporting completed in accordance with **SECTION 7.4**. Reports provided to RVC and published on the project website in accordance with **SECTION 7.6**.
Rehabilitation monitoring	Zones 2, 4 and 7	Rehabilitation monitoring program to be completed.	Qualified Ecologist	Ongoing rehabilitation monitoring program and reporting completed in accordance with **SECTION 7.5**. Reports provided to RVC and published on the project website in accordance with **SECTION 7.6**.
Adaptive management	All Zones	Adaptive Management strategies implemented as required.	Proponent	Adaptive Management Log detailing issues raised, and any changes made to this management plan to be updated monthly and included in the Annual Vegetation Monitoring Report and published on the project website in accordance with **SECTION 5.9**.

REFERENCES

JWA (2019) Amended Terrestrial Flora and Fauna Assessment - Iron Gates Development, Evans Head. Report prepared for Gold Coral Pty Ltd.

JWA (2023) Supplementary Terrestrial Ecological Assessment - Iron Gates Residential Development, Evans Head. Report prepared for Goldcoral Pty Ltd (Receiver and Manager Appointed).

Martens (2023) Preliminary Site Investigation: 240 Iron Gates Drive, Evans Head, NSW. A report prepared for Goldcoral Pty Ltd (Receiver and Manager Appointed).

NSW Rural Fire Service (RFS) (2019) Planning for Bush Fire Protection. A guide for councils, planners, fire authorities and developers. NSW RURAL FIRE SERVICE, Granville NSW. Accessed online 10th May 2024: https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0005/174272/Planning-for-Bush-Fire-Protection-2019.pdf

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APPENDIX 1 - BULK EARTHWORKS PLAN (ARCADIS 2024)

LEGEND

- PROPOSED CONTOUR
- EXISTING CONTOUR
- BUILDING PAD
- PROPOSED MOUNTABLE KERB / LAYBACK KERB
- PROPOSED BARRIER KERB & CHANNEL
- PROPOSED SEMI-MOUNTABLE KERB
- PROPOSED EDGE RESTRAIN KERB
- DC — DIVERSION CHANNEL
- NOMINAL KERB LINE
- EARTHWORKS EXTENTS
- LITTORAL RAINFOREST BUFFER
- PROPOSED RETAINING WALL (MAX 1.5m)
- PROPOSED GABION WALL
- STAGE BOUNDARY
- MIDDEN LOCATION
- EARTHWORKS CUT
- EARTHWORKS FILL

BULK EARTHWORKS VOLUMES

TOTAL CUT	-5,455m^3
TOTAL FILL	152,638m^3
TOTAL BALANCE (IMPORT)	147, 183m^3

NOTES:

1. EARTHWORKS VOLUMES HAVE BEEN CALCULATED BETWEEN THE EXISTING SURVEY SURFACE AND DESIGN EARTHWORKS SURFACE.
2. VOLUMES ARE APPROXIMATE ONLY AND DO NOT TAKE INTO ACCOUNT THE FOLLOWING:
   - BULKING FACTORS
   - RETAINING WALL BACKFILL
   - SEDIMENT AND EROSION CONTROL BASINS AND DRAINS
   - EXCAVATION FOR FUTURE BUILDING, CIVIL INFRASTRUCTURE OR LANDSCAPING WORKS.

Issue	Description	DR	CH	VE	Date
04	AMENDED STAGE BOUNDARIES AND WORKS EXTENTS	LP	LP	LP	06.06.24
03	AMENDED FPL DESIGN	GP	LP	LP	15.04.24
02	AMENDED LAYOUT DESIGN	HP	LP	LP	10.11.23
01	ORIGINAL ISSUE	JS	LP	LP	12.06.23

100mm on Original

Scales

0 30 60 90 120 150m

1 : 1500

Surveyor: ROBERT A HARRIES SURVEYOR

Client: GOLDCORAL PTY LTD

Status: FOR APPROVAL

Original Issue Signatures			
Drawn	J. SANTOS	Original Size	A1
Designed	MA. STA.CRUZ	Height Datum	AHD
Project Manager	L. PRIZEMAN	Grid	GDA94
Verified	L. PRIZEMAN		

Project: RESIDENTIAL DEVELOPMENT LOT 277 IRON GATES ROAD EVANS HEAD

Title: BULK EARTHWORKS PLAN OVERALL

ARCADIS
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Project Number: 30180356

Drawing No.: IRG-AAP-DA-00-DRG-CV-0100

Issue: 04

Date Plotted: 7 Jun 2024 - 12:01PM File Name: C:\Users\lpaz2589\DC\ACCDocs\Arcadis ACC US\AAU-30180356-Iron Gates Residential\Project Files\10_WIP\10_CV\Stage_01\Drawings\IRG-AAP-DA-00-DRG-CV-0100-BulkEarthworksPlan_Overall.dwg

APPENDIX 2 – SPECIES SPECIFIC WEED CONTROL TECHNIQUES

Target Weed		Recommended Techniques
Common Name	**Botanical Name**	
Balloon Cotton Bush	*Gomphocarpus physocarpus*	• Hand-pull; spray (G 1:100 + surfactant).
Barner Grass	*Pennisetum purpureum*	• Overspray (G 1:100); slash back and spray regrowth.
Billygoat Weed	*Ageratina houstonianum*	• Spray or hand-pull and spray regrowth (G 1:100 + surfactant).
Bird of Paradise	*Strelitzia* sp.	• Hand pull young plants and bag and disposed of appropriately. • Glyphosate (G 1:100 + surfactant) can be applied as a cut stump, stem injection or basal bark application for mature plants.
Bitou Bush	*Chrysanthemoides monilifera*	• Hand pull young plants and hang up. • Cut-scrape-paint at 1:1.5 glyphosate for small plants. • Systematic knapsack over spraying of Roundup at the rate of 1:200 with LI700 at a rate of 5ml per litre if no risk to native seedlings.
Blackberry Nightshade	*Solanum nigrum*	• Spray/hand-pull and spray regrowth (G 1:100 + surfactant).
Broad-leaved Paspalum	*Paspalum dilatatum*	• Spray (G 1:100 + surfactant).
Camphor Laurel	*Cinnamomum camphora*	• Seedlings: hand-pull/spray (G 1:100 + MM [1-2g/10L] + surfactant). • Stems: <100mm CSP (G 1:1) >100mm frill or inject @ <250mm (G 1:1 2ml/cut) >250mm diameter (G neat 2ml/cut).
Canna Lily	*Canna indica*	• Mattock out or Spray (G 1:100 + surfactant).
Castor Oil Plant	*Ricinus communis*	• Spray (G 1:100 + surfactant) or hand remove. C&P (G 1:1.5)
Cherry Guava	*Psidium cattleianum*	• Hand pull seedlings where possible (i.e. wet areas). • Spray seedlings up to 50 cm tall with Glyphosate 1:50 or Glyphosate 1:50 plus Metsulfuron Methyl 1-2 g /10 l H20. • For plants greater than 50 cm tall and less than 5 cm basal diameter apply Access © (1:30 diesel) using basal bark method. Do not use this method within 5 m of creeks. • For plants over 5 cm basal diameter cut and paint immediately with Access © (1:30 diesel). • Alternate methods (off label, requires permit): cut and paint with Garlon © (1:60 diesel) or Starane © (35 ml per l diesel) or basal bark application with Garlon © (1:60 diesel) or Starane © (35 ml per l diesel).
Chinese Burr	*Triumfetta rhomboidea*	• Spray (G 1:100 + surfactant).

Target Weed		Recommended Techniques
Common Name	**Botanical Name**	
Chinese Elm	*Celtis sinensis*	• Seedlings: Hand pull or spray - 1 part Glyphosate to 50 parts water, surfactant, or for better results spray 1 part Glyphosate to 50 parts water + 1.5g Metsulfuron methyl:10L water, spray adjuvant. • Saplings: Cut, scrape and paint - 1 part Glyphosate to 1.5 parts water. • Trees: Stem injection - 1 part Glyphosate to 1.5 parts water.
Coastal Morning Glory	*Ipomoea cairica*	• Roll up long runners CSP (G 1:1.5). • Spray (G 1:100 + surfactant). • Stem: Scrape and paint (G 1:1.5).
Cocos Palm	*Syagrus romanzoffianum*	• Seedling: hand-pull/crown seedlings • Stem: mattock out small trees or cut at ground level below growing joint.
Common Carpet Grass	*Axonopus affinis*	• Spray (G 1:100 + surfactant).
Coral Tree	*Erythrina sykesii*	• Frill with glyphosate (1:1) – requires deep cuts with chainsaw/axe and a large volume of herbicide.
Corky Passionfruit	*Passiflora suberosa*	• Seedling and regrowth: Spray (G 1:100+ surfactant or G 1:100 + MM 1-1.5gm/10L + surfactant). • Stems: CS&P (G 1:1.5).
Crofton Weed	*Ageratina adenophora*	• Spray: (G 1:100 or MM 1g/10L + surfactant).
Cuphea	*Cuphea carthagenensis*	• Spray (G 1:100 + LI700®).
Duranta	*Duranta repens*	• Hand-pull seedlings or spray (G 1:100 + LI700®); cut, scrape and paint saplings (G 1:1.5); frill or spear trees (G (1:1.5). Best time for treatment early summer or when actively growing.
Edible Passionfruit	*Passiflora edulis*	• Handpulling, Cut Scrape and Paint with 1:1 glyphosate. • Spraying of seedlings with 1:100 glyphosate + surfactant (note: spraying is not the most effective control as waxy leaves prevent herbicide uptake).
Exotic Clerodendron	*Clerodendron* sp.	• Roll up long runners CSP (G 1:1.5). • Spray (G 1:100 + surfactant). • Stem: Scrape and paint (G 1:1.5).
Fireweed	*Senecio madagascariensis*	• Hand pull and bag and dispose of appropriately. • Flowering plants can be spot sprayed with herbicides containing aminopyralid or metsulfuron-methyl. The best time to treat fireweed with herbicide is late autumn.
Fishbone Fern	*Nephrolepis cordifolia*	• Spraying of seedlings with 1:50 glyphosate + Brushoff ® mix (1.5g/10L) and Protec®.
Fleabane	*Conyza* sp.	• Spray: (G + surfactant).

Target Weed		Recommended Techniques
Common Name	**Botanical Name**	
Giant Devil's Thorn	*Solanum chrysotrichum*	• Seedling: Hand-pull / spray (G 1:100 + surfactant). • Stems: <100mm CSP (G 1:1.5) • >100mm frill or inject (G 1:1.5 2ml/cut).
Glory Lily	*Gloriosa superba*	• Control prior to fruiting; • 2 sprays required; • First in December using 1:50 glyphosate and 1 g/10 litres Brushoff® with 1% pulse. • Second in February as above. • Ongoing monitoring and treatment required to achieve eradication.
Happy Plant	*Dracaena* sp.	• Cut and paint (G 1:1.5); Cut, scrape and paint (G 1:1.5); Spray (G 1:100 + surfactant).
Inkweed	*Phytolacca octandra*	• Manual removal with mattock or Spray: (G 1:100 + surfactant).
Lantana	*Lantana camara*	• Hand pull/brushhook. • Spray: (G 1:100 +surfactant) or splatter gun (G 1:9). • Stem: CSP (G 1:1).
Lemon-scented Teatree	*Leptospermum petersonii*	• Grub out with bulldozer
Madeira Vine	*Anredera cordifolia*	• Spray: ground infestation (G 1:50 + Pulse®). • Stem: scrape as much stem as possible (inner part of vine on one side only) and paint (G neat). • Tubers: scrape/gouge and paint (G neat). Bag any tubers or small hand-weeded vines and remove from site or compost under black plastic.
Molasses Grass	*Melinis minutiflora*	• Spray: (G 1:100 + surfactant).
Monstera	*Monstera deliciosa*	• Mattock out and remove from site or Overspray Spray: (G 1:100 + Brushoff ® mix (1.5g/10L)
Morning Glory	*Ipomoea purpurea*	• Roll up long runners and hang up to dry; scrape and paint (G 1:1.5); spray (G 1:100 + surfactant).
Moth Vine	*Araujia sericiflora*	• Spray: (G 1:100 + surfactant). Hand pull seedlings. Cut and paint (G 1:1.5) large stems.
Mother-in-law's Tongue	*Sansevieria trifasciata*	• Hand removal of all pants where possible. • Spray plantlets with glyph. 1:50 with Brushoff® 1.5 g/10l and Protec®.
Ochna	*Ochna serrulata*	• Seedlings: Spray (G 1:50 + MM 1-1.5g/10L + surfactant) • Stems: <100mm CSP >100mm frill or inject (G 1:1.5 + MM 1g/L]). Best treatment in late spring.
Paddy's Lucerne	*Sida rhombifolia*	• Spray: (G 1:100 + surfactant).

Target Weed		Recommended Techniques
Common Name	**Botanical Name**	
Pampas Grass	*Cortaderia jubata*	• Spray: (G 1:100 + surfactant) for plants <1m, or use a higher rate (e.g. 1:77) for larger plants. Spray before flowering.
Para Grass	*Brachiaria mutica*	• Spray: (G 1:77 + surfactant) or hand remove (crown out)
Paspalum	*Paspalum* sp.	• Spray (G 1:100 + surfactant).
Perennial Soybean	*Neonotonia wightii*	• Cut and paint (G 1:1.5); Cut, scrape and paint (G 1:1.5); Spray (G 1:100 + surfactant).
Pigeon Grass	*Setaria sphacelata*	• Spray: (G 1:100 + surfactant).
Poor Man's Orchid	*Epidendrum* sp.	• Hand pull, bag and remove. • Spray: 1:50 glyphosate + 1.5 g Associate®:10 L of water + surfactant (e.g. Pulse®) + dye.
Redhead Cotton Bush	*Asclepias curassavica*	• Hand-pull; spray (G 1:100 + surfactant).
Red Natal Grass	*Melinis repens*	• Spray: (G 1:100 + surfactant).
Rhodes Grass	*Chloris gayana*	• Spray: (G 1:100 + surfactant).
Scotch Thistle	*Onopordum acanthium*	• Spray: (G 1:100 + surfactant).
Scrobic	*Paspalum scrobiculatum*	• Spray: (G 1:100 + surfactant).
Slash Pine	*Pinus elliottii*	• Stem injection of trees with glyphosate (using axe or drill) at 1:1.5 or slash.
Siratro	*Macroptilium atropurpureum*	• Spray: (G 1:50 + MM 1-2gm/10L + surfactant). • Stem: CSP (G 1:1).
Small-leaved Privet	*Ligustrum sinense*	• Seedlings: hand-pull or spray (G 1:50 + surfactant or G 1:50 + MM 1.5gms/10L + wetting agent or MM 1-2gms/10L + wetting agent); Saplings: CS&P or C&P (1:1.5); Trees: F/I (1:1.5).
Thickhead	*Crassocephalum crepidioides*	• Spray: (G 1:50 + MM 1-2gm/10L + surfactant). • Stem: CSP (G 1:1).
Umbrella Tree	*Schefflera actinophylla*	• Seedlings: hand-pull/spray (G 1:50 + surfactant or G 1:50 + MM 1-2gms/10L + Ag 2ml/10L) • Stem: <100mm CSP >100mm frill or inject (G 1:1.5). Best treatment in late spring.
Whiskey Grass	*Andropogon virginicus*	• Spray: (G 1:100 + surfactant).
White Passionfruit	*Passiflora subpeltata*	• Handpulling, Cut Scrape and Paint with 1:1 glyphosate. • Spraying of seedlings with 1:100 glyphosate + surfactant (note: spraying is not the most effective control as waxy leaves prevent herbicide uptake).
Wild Tobacco	*Solanum mauritianum*	• Spray: Hand pull/spray (G 1:100 + surfactant). • Stem: CSP (G 1:1).
Winter Senna	*Senna pendula* var. *glabrata*	• Seedlings: hand-pull/spray (G 1:100 + surfactant)

Target Weed		Recommended Techniques
Common Name	Botanical Name	
		• Stem: <100mm CSP >100mm frill or inject (G 1:1.5). Best time for treatment early summer or when actively growing.

APPENDIX 3 – WEED CONTROL METHODS

Weed Control Method	Technique
Bagging	Plants which can reproduce from plant material such as bulbs, tubers, corms, runners (stolons), underground horizontal stems (rhizomes), and plantlets formed on leaves should be bagged and removed from the site. Bagged plant material can be composted, burned or disposed in a landfill. Compost piles should be well anchored and positioned away from the flooding zone and from cattle. Compost piles should be appropriately monitored. Any burning should be undertaken away from the riparian zone and from native vegetation.
Basal bark treatment	Used for saplings up to approximately 75 mm in diameter. The entire surface of the stem is treated from ground level to about 300 mm above the ground. Herbicide can be applied by brush or by spraying with a low pressure setting.
Cut	The cut stump method must involve completely cutting the trunk or stem of the plant, at a level below the first branches or as near as practicable to ground level. Follow up maintenance (on an annual or bi-annual basis) to suppress regrowth, suckering and coppicing is essential.
Cut, scrape and paint	The cut, scrape and paint method must involve completely cutting the trunk or stem of the plant, at a level below the first branches or as near as practicable to ground level. Herbicide must then be immediately applied to the cut surface of the cut trunk or stem. Following the cut and paint, the exposed stem or root surface is scraped till a light green coloured layer is visible. Herbicide is then immediately applied to the scraped surfaces.
Debris management	In the case of non-locally indigenous plants species that reproduce or regenerate vegetatively, debris should be managed in a manner to ensure complete death and should not be stacked and burned within 20 m of remaining native vegetation.
Hand held foliar spraying	Foliar spraying involves spraying the foliage of the plant with an appropriate herbicide. Herbicide should be applied with a low-pressure concentrated spray stream sufficient to avoid misting and spray drift. Foliar spraying should only be used on plants that have a total height of 1.5 m or less. In the case of deciduous plants, foliar spraying should only be undertaken when foliage is present on the target weeds and before yellowing and leaf fall commences. Foliar spraying should only be undertaken in a manner that does not cause harm to any adjacent native vegetation. Any native vegetation within one metre of the target plant must be adequately protected from direct spray, splash or drift. Foliar spraying must not occur over any water body (whether still or flowing) or in any manner which may result in direct or indirect application to a water body. Foliar spraying must only be carried out in calm conditions and must avoid spray drift.
Hand pulling	Hand pulling must involve gripping and pulling the stem of the plant by hand to carefully remove the whole stem and root system from the ground. Hand pulling should only be used for plants that can be removed with minimal disturbance to the soil and existing litter or vegetative groundcover. Hand pulling is most effective when the plants to be removed are small and the soil is moist.

Weed Control Method	Technique
Herbicide use	All use of herbicide involved in the carrying out of clearing activities must comply with: • The directions on the attached labelling; or • The National Registration Authority "North Coast Off-label Permit", or NRA permit PER3512 covering methods listed in the Appendix to Common Weeds of Northern NSW Rainforests published by the Big Scrub Rainforest Landcare Group. Any mixing of herbicide must be carried out at least 20 metres away from any watercourse and used herbicide containers must be disposed of in an appropriate manner. All use of herbicide must be undertaken with regard to the provisions of the *Protection of the Environment Operations Act (1997)*. If a risk of pollution exists, a licence may be required from the Environment Protection Authority before work commences. Herbicide clearing methods must only be undertaken, or actively supervised, by a person or persons who have training and accreditation in the safe use and handling of chemicals. Herbicide clearing methods should only be used whilst the target plants are actively growing.
Ringbarking	Ringbarking must involve the placing of a continuous sharp cut line (frill) around the entire trunk, to a depth below the sap flow zone, generally using an axe or tomahawk.
Scrape and paint	The scrape/gouge and paint, method is used for vine weeds with tubers such as Madeira vine (*Anredera cordifolia*). Sections of stem at least 300 mm long are scraped firmly, exposing the fibres of the stem, and the scraped sections are painted with herbicide (for Madeira vine, 75% Glyphosate is used). The stems must not be severed. Gouging may also be used in the case of plants with fleshy tubers. Gouging is like 'eying' a potato except that a deeper well is gouged with the tip of a knife and then filled with herbicide.
Stem injection – frilling, drilling, spearing	A series of drill-holes or cuts must be made into the sapwood around the trunk below the branches of the plant. Herbicide must then be immediately injected into each hole or cut at the recommended dosage. Holes and cuts must be angled downwards into the trunk to prevent herbicide escape. Stem injection must not be undertaken immediately before or after rain. In the case of deciduous plants, stem injection must be undertaken during late summer to early autumn. Plants that have been stem injected should be left in place undisturbed for a minimum of 12 months after herbicide application.
Vine removal	Where the vines are generally prostrate on the ground, aerial parts of the vine (stems and leaves) should be rolled into heaps then cut and paint or hand pulling applied. Where the vines are hanging from trees then cut and paint or hand pulling applied. Hand pulling of Madeira vine, Cape ivy and Climbing cactus must be avoided.

APPENDIX 4 - BASELINE DATA PROFORMA

Work Area Number:	**Date:**
Climatic Condition:	
Vegetation type: ☐ Rainforest ☐ Sclerophyll Forest ☐ Wetland ☐ Woodland ☐ Heath ☐ Riparian Veg	
Native Regeneration Scoring at Time of Assessment: ☐ Negligible ☐ Poor ☐ Moderate ☐ Good ☐ Exceptional	

NATIVE PLANT SPECIES LIST *Details of native plant species present and their abundance within the work area*			
Stratum	**Native Plants**		**Abundance**
	Common Name	**Scientific Name**	
Lower			
Mid			
Upper			

THREATENED PLANT SPECIES/ENDANGERED ECOLOGICAL COMMUNITIES LIST *List of threatened plant species/Endangered Ecological Communities found at the work area*		
Species and Conservation Status	**Number of Plants**	**Management Implications**

Endangered Ecological Community	**Management Implications**

HABITAT FEATURES	
Fauna observed: *e.g. Turkey mound present on site.*	
Fauna habitat features present on site:	
☐ Hollows in trees	☐ Wet or damp areas (including soaks / springs)
☐ Mature or over-mature trees	☐ Leaf litter
☐ Dead standing trees	☐ Native grasses, rushes and sedges
☐ Rocks and boulders	☐ Fleshy fruited trees and shrubs
☐ Fallen logs	☐ Nectar bearing trees and shrubs
☐ Caves, mineshafts or overhangs	☐ Dense understorey shrubs
☐ Springs	☐ Prickly understorey shrubs
☐ Lagoons	☐ Seasonal cracks in the soil
☐ Pools	☐ Other (please specify):
☐ Watercourses / gullies	
☐ Riparian areas	
Comments:	

ENVIRONMENTAL WEED SPECIES LIST *Details of weed species present and their abundance within the work area*			
Stratum	**Major Environmental Weeds**		**Percentage Cover %**
	Common Name	**Scientific Name**	
Lower			
Mid			
Upper			

OTHER THREATS OR IMPACTS			
Feral Animal Presence:	**Area of Most Disturbance**	**Impact**	**Management Implications**
EXAMPLE: Cane Toad	*Open disturbed area*	*On native fauna*	*Monitor presence*
Possible Negative Impacts	**Impact**	**Management Implications**	
EXAMPLE: Stock intrusion	*On regenerating native plants*	*Stock intrusion is unlikely, however if evidence of significant negative impact of regenerating native vegetation is detected, then fencing of stock may be required.*	
EXAMPLE: Herbicide drift	*On threatened XXXX plant and on native plants*	*Use of herbicides to control weeds around the threatened plants will have to be done with utmost care and only by experienced bush regenerators. In any case weed control using herbicides must comply with current Best Management Practice*	

ENVIRONMENTAL RESTORATION ISSUES	
Weaknesses	
EXAMPLES: Exposed, no canopy, high light. Copious weed regeneration following disturbance. Sloping site difficult to work in. XXX threatened species present in abundance.	
Strengths	
EXAMPLES: Good seed source for native recruitment. Some native regeneration occurring.	
Restoration Objectives for Work Area	
EXAMPLE: To undertake all enhancement plantings and the first stage weed control program by the release of the subdivision certificate, and to achieve an 80% native species canopy cover in all areas by November 2009.	

APPENDIX 5 - DAILY WORK RECORD PROFORMAS

This form is to be filled by the team leader for each workday. The team leader will need to allow 15 minutes each day to gather any relevant information for team members and to fill in this form.

Name of Team Leader:	**Date:**
Vegetation Type:	**Site Number:**
Weather Conditions:	
Specific Work Zone/s:	

Work Team Details

Name	**Zone No**	**Time Started**	**Time Finished**	**Hours Worked**
Total No of Workers:		**Total No of Hours:**		

Description of Work Undertaken
(e.g. spraying, hand weeding, replanting, etc.). Mark work progress on project map.

Weed Control Undertaken	Weed Species	Material Used (tools/machinery)	Chemical Application (type/ratio/volume)	Zone No(s)	Area Worked (m^2)	No of People	Total Hours Worked
Spraying							
Tree injections							
Cut and paint							
Hand weeding							
Other (specify)							

Replanting Undertaken	Material Used (tools/machinery)	Fertilizer, Mulch, Tree Protection Used (type/ratio/volume)	Zone No(s)	No trees Planted	No of People	Total Hours Worked

Fencing Undertaken	Type of Fence	Material Used (tools/machinery)	Zone No(s)	Km of Fence	No of People	Total Hours Worked

Other Work (describe activity)	Material Used (tools/machinery)	Zone No(s)	Quantity	No of People	Total Hours Worked

Observations:
New native species or native species not previously recorded in work zone (please note date and zone no):

Name and date of any native plant species in flower or fruit, sudden and abundant regeneration of a particular species, or other relevant observations:

New weed species or weed species not previously recorded in work zone (please note date and zone no):

Any animal sightings (please indicate if by visual identification, called, nests, footprints, scats, claw marks, shed skin, diggings, smell, feeding etc.):

Blank Project Map:
Use map to indicate work undertaken for each day (e.g. hatching weed control progress).

Signature:

Chemical Operators Data Sheet

This form is to be filled by the team leader for each workday. The team leader will need to allow 15 minutes each day to gather any relevant information for team members and to fill in this form.

Location:	**Date:**	**Time:**
Operators:		

Herbicide	Batch No	Dilution Rate	Total	Operator	Equipment
Glyphosate:					
☐ RoundupBioactive®					
☐ Weedmaster Duo®					
Metsulfuron Methyl:					
☐ Brushkiller®					
☐ Brushoff®					
Glyphosate *PLUS* Metsulfuron Methyl:					
☐ RoundupBioactive®					
☐ Weedmaster Duo®					
☐ Brushoff®					
Triclopyr & Picloram:					
☐ Grazon®					
☐ Tordon T/C®					
Marker Dye:					
☐ White field marker					
☐ Red marker					
☐ Other					
Additive:					
☐ LI 700®					
☐ Agral®					
Other:					

Growing Conditions	Temperature	Weather Conditions	Wind Strength	Wind Direction
☐ Very Good	☐ Cool <20º	☐ Showers	☐ Strong	
☐ Good	☐ Warm 21º – 25º	☐ Overcast	☐ Gusty	
☐ Poor	☐ V/Warm 26º – 30º	☐ Clear Sky	☐ Light	
☐ Very Poor	☐ Hot >30º	☐ Variable	☐ Calm	

Zone/Area:
Comments:
Signature: