

Vegetation Management Plan

Boomerang Drive, Blueys Beach, NSW

Prepared For: Addenbrooke Pty Ltd

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VMP Lands: Drainage line in south of Subject Site



Current state of vegetation in drainage line.



View towards VMP Lands from the north, VMP land present at low point in landscape



Native vegetation on the edge of the Subject Site, north of the VMP Lands

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1.0 Introduction

Anderson Environment & Planning (AEP) was commissioned by W T Malouf Pty Ltd (the Proponent) to prepare this Vegetation Management Plan (VMP) to detail and guide the rehabilitation of riparian associated with retained lands which is a part of a proposed multi-purpose development within Lot 23 DP 537919, off Boomerang Drive, Blueys Beach, NSW (the Site). The Site location is shown in Figure 1.

1.1 Site Details

Table 1 – Summary of Site Characteristics

| Detail | Comments |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Client | Addenbrooke Pty Ltd. |
| Title | Lot 23 DP 537919 (the Parent Lot). |
| LGA | Mid Coast Council (Council) |
| Local Environmental Plan | Great Lakes Local Environmental Plan 2014 (pub. 4-4-2014) |
| Study Area | Approx. 35.08ha. |
| Development Footprint | Approx. 8.88ha. |
| VMP Lands | Approx. 0.16ha. |
| Subject Site Zoning | B1 – Neighbourhood Centre, R2 – Low Density Residential, and C4 – Environmental Living |
| Subject Site Usage | Until recently the Site was used for livestock grazing. It is currently unoccupied, containing a mosaic of disturbed ecotones, comprising improved pasture, derived native grassland, two constructed dams within drainage lines and remnant native vegetation in varying condition. |
| Surrounding Usage | The Site is bounded by residential and commercial development to the north and east, cleared land and vegetation to the south and remnant naïve vegetation to the west. |

1.2 Proposed Development

The following development of the Site is proposed, in accordance with the lad's zoning (the Development):

- Approx. 73 residential lots between 500-1000m²;
- Approx. 2600m² of commercial space; and
- Associated roads and services.

1.3 VMP Lands Existing Plant Community Types

Examination of vegetation mapping Mid-north Coast Vegetation Mapping (Bell 2019) and previous assessments for the Site have informed initial vegetation classification.

Site surveys by AEP included multiple BAM Plot and random data point surveys to verify previously mapped vegetation communities, transect surveys for threatened flora as well as targeted survey for habitat and presence of threatened fauna.

Examination of Mid-north Coast Vegetation Mapping (Bell 2019) and previous assessments for the Site have informed vegetation classification:

- **PCT 1737 - Typha rushland** - This vegetation zone is located in the southern portion of the Subject Site. It follows a drainage line running from littoral rainforest in the west down to the eastern boundary of the site.

The zone is narrow, consisting of the channel and banks of the drainage line, and surrounded on either side by slashed pastureland. The vegetation condition is likely owing to previous stock pressures and edge effects. A tenth plot (Plot 10) identified another patch of PCT 1737 in a dam outside the VMP Lands and to the west.

Scattered *Livistona australis*, likely present due to the zone's location downstream of PCT 1537, are located along the drainage line. The dominant species are *Persicaria strigosa* and *Typha orientalis*, two diagnostic species of PCT 1737. There is also a significant proportion of non-native weed species that are also present through the site, such as *Senna pendula*, *Paspalum spp.* and *Lantana camara*.

- **Cleared / Non-native Grassland** - Subject Site has been identified as non-native vegetation and cleared land containing previously grazed paddocks and several dams. It is almost entirely devoid of native species and is dominated by non-native grasses such as *Cenchrus clandestinus* (Kikuyu), *Andropogon virginicus* (Whisky Grass) and *Setaria spp.* (Pigeon Grass) likely introduced in the scope of pasture improvement for cattle grazing. Other exotic species present include *Senecio madagascariensis* (Fireweed), *Hypochaeris radicata* (Catsear), *Trifolium repens* (White Clover), and *Lysimachia arvensis* (Scarlet Pimpernel).

Cynodon dactylon (Couch) is co-dominant with Kikuyu. Although native, this species is considered non-endemic and potentially invasive in locations east of the Great Dividing Range in NSW.

1.4 VMP Objectives

The purpose of this plan is to define and outline actions to implement and monitor works for regeneration works within retained lands, refer to **Figure 3**.

The overall VMP objectives are to provide:

- Increase biodiversity within the VMP Lands;
- Reduce weeds loads;
- Regenerate and maintain native PCTs;

- Reduce indirect impacts on surrounding areas of vegetation;
- Protection of native fauna and the enhancement of foraging and habitat opportunities within VMP Lands;
- Include measures to mitigate impacts of construction activities upon naïve animal welfare; and
- Geomorphological stability of the unnamed streams to maintain biodiversity, function and water quality.

The five-year VMP aims to regenerate the vegetation to a state of Natural regeneration.

1.5 Project Team

Prior to commencement of construction, the Proponent will appoint a Project Ecologist to oversee and manage VMP measures scheduled in this VMP and a Bush Regeneration Contractor (BRC) to implement the plan.

BRCs must be accredited with the Australian Association of Bush Regenerators. The BRC Site Supervisor must:

- Have demonstrated minimum of 2 years' experience in bush regeneration or related field;
- Have experience at a supervisory level in providing training, supervision and technical advice to staff, clients and volunteers;
- Hold a current AQF 3 qualification or higher and must have completed the Bush Regeneration Level IV Certificate or have a diploma or degree in a field related to natural resource management; and
- Oversee all regeneration works prescribed in this VMP.

2.0 Regeneration Approaches

VMP schedules differing ecological approaches to the regeneration of the VMP Lands by implementing the principles of the Society for Ecological Restoration Australasia *National standards for the practice of ecological restoration in Australia* (SERA 2021, ed. 2.2). This approach utilises three integrated restoration techniques to achieve the end goal of Natural Regeneration. Approaches have been assigned to VMP Land areas based on their history of disturbance:

1. Reconstruction Approach – this approach is where a site is highly degraded and has limited to no ability to regenerate naturally.
2. Facilitated Regeneration Approach – this approach is when a site is in moderate condition, and will naturally regenerate with minimal plantings and weed management.
3. Natural Regeneration - this approach is where damage is relatively low, and pre-existing biota should be able to recover after cessation of degrading practices. It requires limited to no intervention, with weeding being the only task undertaken to encourage continual natural regeneration.

This approach is the overall aim for the entirety of the VMP lands to achieve this state within five (5) years.

This is based on general condition at the point of assessment, where the Ecologist determines the most appropriate level of regeneration based on the Biodiversity Assessment and random meander of the Subject Site.

The National Guidelines also require that at commencement of approved regeneration works the first step is to gather baseline data. It is undertaken at the commencement of the VMP to ensure the most appropriate measure are used to ensure regeneration can occur. Natural events such as drought high rainfall, fire, floods, etc can all have significant impact on the condition of vegetation within a site. Hence the guidelines require regeneration areas be broken into the three categories and detailed baseline data be collected at commencement.

2.1.1 Reconstruction Approach

This Approach is to be used where vegetation condition is poor, generally due to heavy anthropogenic influences such as clearing and grazing. Works includes:

- Site preparation – weed control, slashing and ripping of the soil;
- Mass planting of canopy and pioneering shrubs to quickly provide quick canopy to prevent re-infestation by exotic species; and
- Managing regrowth of exotic species while mass plantings establish.

Once these areas have the necessary cover to protect the lower layers within the vegetation community from the elements (such as direct sun, storms, winds, etc.), then direct seeding of grass, forbs, etc. will be conducted if required at the fourth year of management under this VMP. This will ensure the structure and composition of these communities will meet the targets set.

When set targets are met, works on these areas will then change to the Assisted Regeneration Approach.

2.1.2 Facilitated Approach

In lesser degraded areas, or once the areas under the Reconstruction Approach have achieved set targets for canopy and shrub cover and weed control, the Assisted Regeneration Approach will be used, where further active interventions to correct biotic or abiotic damage may be required as determined by Site monitoring (scheduled in Section 6).

Active interventions, which will be determined by the PE or Bush Regeneration Contractor (BRC) may involve the following works:

- Weeding,
- Watering;
- Replacement of dead plants; and
- Maintenance of tree guards, etc.

The aim of this approach is to manage vegetation to achieve set targets to move into the Natural Regeneration Approach.

2.1.3 Natural Regeneration Approach

This Approach is to be used where canopy, shrub and understorey layers are relatively intact and where exotic component is relatively low. Existing native biota is deemed to be able to recover naturally, with weeding and monitoring being the only tasks undertaken to ensure continued natural regeneration (works scheduled in Section 6).

3.0 Management Zones in Stage 1

The VMP lands be managed in two (2) Management Zones (MZs) to clearly identify of objectives and targets, **Figure 4** shows the MZs.

3.1.1 Zone 1: Reconstruction - Aquatic Zone

This zone is located in the low flow channel to toe of bank, consisting of a width of 1m – 2m; it will include the reinstating of aquatic vegetation and habitat such as snags.

The Reconstruction Approach is being utilised in MZ1 due to the high weed loads, erosion and lack of native vegetation within this zone. Therefore, planting of native species will assist with meeting the Targets outlines in **Section 6**.

Weeding as defined in **Table 2**, (effectively control priority species and areas through appropriate methods to eliminate highly competitive weeds from an area).

All works should be undertaken to ensure bed and bank stability, provisions of aquatic habitat for both flora and fauna (approx. 0.16ha).

As stated, the Reconstruction Approach requires active interventions, the tasks of which will be determined by the Bush Regeneration Contractor (BRC) and may involve the following tasks:

- Planting;
- Installation of snags;
- Weeding;
- Watering;
- Mulching (if required); and
- Replacement of dead plants (1:1).

The VMP aims to move into Natural Regeneration Approach by the end of Year 5.

3.1.2 Zone 2: Reconstruction – PCT 1537

MZ2 is located from the toe of bank to the edge of the VMP lands and will be replanted with PCT 1537 - *Tuckeroo* - *Yellow Tulipwood* - *Red-fruited Olive Plum Littoral Rainforest of the lower North Coast*. Vegetation is currently non-native grassland, so this PCT was chosen as scattered plants indicative of PCT 1537 vegetation are present to the west and east of the VMP area.

It is a requirement in the Great Lakes Development Control Plan (DCP) 2013, clause 16.14.3 for *Livistona australis* (Cabbage Tree Palms) removed for development to be relocated within the land. **Figure 3** shows the location of *Livistona* in and around the development area. As *Livistona* is a diagnostic species of PCT 1537, it is considered appropriate that some of the 32 trees mapped can be relocated within MZ2 as part of the regeneration works. The remainder will be utilised within landscaping as set out in the Landcape Management Plan.

The Reconstruction Approach is being utilised in this section due to the high weed loads and lack of native vegetation within this zone. Therefore, planting of native species form PCT 1537 will assist with meeting the Targets outlines in **Section 6**.

Weeding as defined in **Table 2** (effectively control priority species and areas through appropriate methods to eliminate highly competitive weeds from an area).

All works should be undertaken to ensure bed and bank stability, provisions of terrestrial habitat for both flora and fauna.

Signage is to be installed along the high bank providing information on the community and fauna species likely to use the banks and aquatic vegetation.

As stated, the Reconstruction Approach requires active interventions, the tasks of which will be determined by the Bush Regeneration Contractor (BRC) and may involve the following tasks:

- Planting;
- Installation of habitat;
- Weeding;
- Watering;
- Mulching (if required); and
- Replacement of dead plants (1:1).

The VMP aims to move into Natural Regeneration Approach by the end of Year 5.

4.0 Regeneration Targets

The Integrated Regeneration Approach will be used across the entire VMP Lands and the following targets have been designed to be measurable, providing both quantitative and qualitative data on species abundance and cover for the vegetation communities within the VMP Lands.

Weeds have a significant impact on structural integrity of vegetation communities. Flora surveys identified 44 exotic species, with the following list being the most prevalent within the vegetation communities on site;

Lantana (*Lantana camara*), Camphor Laurel (*Cinnamomum camphora*), Small-leaved privet (*Ligustrum sinense*), Blackberry (*Rubus fruticosus*)

Black Nightshade (*Solanum nigrum*), Cobbler's Peg (*Bidens pilosa*) and Asparagus Fern (*Asparagus aethiophiticus*).

Exotic grasses comprise *Paspalum dilatatum* and Narrow-leaf carpet grass (*Axonopus fissifolius*).

Some of these species are identified as priority weeds for Greater Sydney. Predominantly exotic grasses and other herbaceous weeds will be the focus of weed management activities.

To achieve a Natural Regeneration throughout the entire VMP lands within five (5) years targets have been set within **Table 1**. **Tables 3 to 8** also summaries the works schedule required to achieve the targets.

Table 2 – Summary of Regeneration Targets for Stage 1

| Year | Abundance of Natives (%) | Cover of Native (%) | Cover of Biosecurity Weeds (%) | Cover of Other Priority Weeds (%) | Pasture Grasses (%) |
|------|--------------------------|---------------------|--------------------------------|-----------------------------------|---------------------|
| 1 | 30 | 30 | <75 | <75 | <80 |
| 2 | 40 | 45 | <50 | <45 | <50 |
| 3 | 55 | 55 | <40 | <30 | <35 |
| 4 | 60 | 65 | <25 | <25 | <20 |
| 5 | 70 | 80 | <10 | <15 | <10 |

5.0 Regeneration Management

5.1 Site Preparation

Prior to the commencement of regeneration, the vMP Lands must be prepared. The following works have been recommended to assist in site preparation:

- Establishment of pathogens and diseases controls. Diseases which could affect the site include Myrtle rust (*Puccinia psidii*), affecting Myrtaceous plants, including *Melaleuca* species, and Amphibian Chytrid fungus disease, Chytridiomycosis, caused by Chytrid fungus (*Batrachochytrium dendrobatidis*). Appropriate hygiene controls are to be employed to minimise the chances of any such introduction occurring. This may include a hygiene station equipped with sterilizing agents and cleaning equipment to clean boots, tools and machinery. Response plans are needed to be designed and implemented to mitigate impacts in the event of disease or pathogen outbreaks;
- All extant rubbish/waste is to be removed from VMP lands including farm fencing and structures. The need to remove such material should be assessed on a case-by-case basis as in some instances the material is inert, such as concrete, rocks and timber posts, etc. Such material may inadvertently provide geomorphic stability;
- Clearly mark native vegetation for retention and approved removal;
- Install temporary fence around the VMP Lands, and clearly mark as a "No Go Area" prior to commencement of civil works;

- Fencing should have clearly visible signage erected at key entry points to VMP;
- Implement erosion and sediment control measures in accordance with specifications set out in the latest edition of the Landcom publication "Soils and Constructions – Volume 1" (The Blue Book);
- Establish monitoring and photo points;
- Vegetation clearing;
- Determine baseline data;
- Primary weed removal;
- Installation of ground habitat;
- Planting of Vegetation (see **Appendix B** for a detailed species list). All plant stock must be provenance specific seed/ material collected from locally endemic species, grown by suitably experienced and qualified nurseries, and hardened-off before planting. This will ensure the structure and composition of these communities will meet the targets set; and
- Mulching and watering.

5.2 Baseline Data

Indicative monitoring points have been identified within the VMP Lands (refer **Figure 4**). The final location of the monitoring points is to be determined when commencing works, as environmental conditions change over time and the indicative locations may not be reflective of the communities at the time of commencement.

Baseline data will cover:

- Species diversity (both native and exotic);
- Species Abundance (both native and exotic);
- Overall health of the VMP Lands;
- Photos in north, east, south and west aspects; and
- Record incidental fauna.

The Monitoring Points established for the baseline surveys will then be monitored on a biannual basis.

5.3 Vegetation Clearing

For the clearing phase, retained vegetation will be delineated by safety bunting flags, fencing and signage indicating environmental protection zone, which will still allow fauna to egress the development area as needed. Following the completion of clearing works, permanent delineation features such as logs should be installed to protect the retained vegetation during operational phase of the development:

- Vegetation clearing should be timed to avoid cold weather periods where overnight temperatures are forecast to be less than 12°C. Cold weather is likely to make it difficult for resident hollow dependent fauna

to successfully relocate. This is particularly relevant for low body-weight species;

- A staged approach to clearing is to be undertaken to provide fauna the opportunity to disperse outside the area of impact. Staging to include Phase 1 Clearing: Underscrubbing, Phase 2 Clearing: Removal of non-habitat trees, and Phase 3 Clearing: Removal of habitat and connecting trees;
- All clearing works (phase 1-3) to be undertaken under the supervision of the Project Ecologist;
- Clearing should occur in a direction from previously disturbed lands towards retained lands;
- Implement clearing protocols, including pre-clearance surveys to identify habitat and vegetation to be retained;
- All clearing works to be attended by a suitable equipped and experienced ecologist to deal appropriately with any displaced fauna species;
- All hollow bearing features will be sectionally lowered by tree climbers (where safe to do so);
- Any fauna rescued during vegetation clearing is to be assessed for injuries, and subsequently released to a suitable nearby location; this may require holding fauna until dusk for release in accordance with relevant animal ethics licencing and standards;
- If any fauna is injured during vegetation clearing, they are to be taken promptly to a nearby veterinarian or suitable wildlife carer contact;
- In addition, prior to clearing of any vegetation, an ecologist is to inspect the area for any signs of resident fauna requiring attention, and in particular nesting birds. Where such is identified, appropriate strategies are to be developed and instigated to minimise impacts.
- Pre-clearance surveys to include diurnal surveys, stagwatching and nocturnal surveys;
- Civil Construction staff to be inducted into pre-clearing and clearing protocols, and to identify environmental features for protection;
- Installation of nest boxes within the retained lands prior to construction to mitigate the removal of HBTs within the development footprint and provide supplementary roosting / nesting habitat for resident fauna species that utilise such features.
- Any suitable hollows recovered during clearing works should be reconditioned into suitable hollows and installed in retained lands in addition to the manufactured nest boxes; and
- All cleared vegetation is to be mulched on site and spread to help stabilise any exposed soil and minimise offsite movement of biomass. Fallen timber and hollow logs identified to be retained to be relocated into the retained lands.

5.4 Weed Management

Weed Control works within each Management Zone are to be undertaken by a qualified bushland regeneration team using industry standards (summary provided in **Table 2**).

Any reproductive material of weeds, including weeds that can spread vegetatively or seeds, must be taken off site to be disposed of at an appropriate local waste collection service. No weed material with the potential of spreading may be stockpiled within the Subject Site, or the VMP Lands.

The *Biosecurity Act 2015* outlines several 'duties'; the general biosecurity duty, and additional duties under mandatory measures, regional measures, prohibited matter or biosecurity zone. Specific actions for these measures may be required. Weed control is required to occur in the following sequence:

1. **Primary Weeding** – this is where weeds are removed from Management Zones.
2. **Consolidation** – over the next few months, the weed control zones will require monthly visits to remove weeds that are regenerating and/or have grown in response to the disturbance and are competing with planted and regenerating native plants. These visits are essential, otherwise the weeds will recolonise, dominate and inhibit the regeneration of native species.
3. **Maintenance Weeding** – After the sixth-month and will continue on a monthly basis, due to woody weeds, and other annual weeds being problematic within the locality.

This interval will be evaluated based on-site condition during each monitoring period. Weed control works across the site are to be undertaken over the maintenance period of five (5) years, however given the adaptive management approach, this time-frame is flexible, and may need to be extended based on changing site conditions and results indicating management zones have reached targets set out in this VMP.

5.5 Fauna Management

Macropods and possums were recorded as occurring onsite and in the local area. Therefore, protection guards should be placed around plantings so that revegetation efforts within VMP lands are not compromised by grazing. If monitoring within management zones indicates pest species pose notable impediments to achieving the aims of the VMP (i.e., through excessive browsing, etc.), then management actions will be reviewed to address these issues.

Incidental fauna records are to be undertaken during monitoring surveys and reported.

6.0 Project Management

Establishment of monitoring points and compliance checking of other aspects within this VMP will be the responsibility of the Project Ecologist working with the Civil Contractor.

The client will be responsible for the engagement of a suitably qualified Bush Regeneration Contractor to undertake weed control and planting works outlined in this VMP.

Bush Regenerator(s) or company(s) shall have the following qualifications;

- Australian Association of Bush Regenerators (AABR) Accreditation. The Bush Regenerators shall hold a current AQF3 qualification.
- Site Supervisor must have demonstrated minimum of 2 years' experience in the bush regeneration or related field and must have experience at a supervisory level in providing training, supervision and technical advice to staff, clients, volunteers and members of the public.
- The Site Supervisor must hold a current AQF 3 qualification or higher and must have completed the Bush Regeneration Level IV Certificate or have a diploma or degree in a field related to natural resource management.

The Project Ecologist will be responsible for the establishment of monitoring points within the VMP lands along with collection of baseline data that will be monitored against this over the three-year period of this VMP with the overall targets. The Project Ecologist will be responsible for monitoring and reporting on weed management, and Regeneration Approach success.

6.1 Monitoring

Monitoring will occur at commencement and biannual basis at the proposed monitoring points (refer **Figure 4**).

6.1.1 Baseline Data

Baseline data is collected at commencement of the VMP refer **Section 5.2**.

6.1.2 Biannual Monitoring

This is to occur every 6months from commencements up to three years or reaching of targets (which every is the latter);

- Weed species, coverage and location;
- Native species, coverage and location;
- Effectiveness of weed control methods;
- Photo records at monitoring points at each aspect (North, east, south, west);
- General health of each Management Zone;
- Incidental fauna use of site; and

Evaluation of management effectiveness.

6.2 Reporting

A baseline report is prepared at commencement of the VMP and submitted to Council.

A report is to be prepared annually and delivered to the consent authority for the life of the VMP with a final report prepared at the end of the VMP outlining how the conditions of the VMP have been met.

Biannual monitoring will inform the evaluation of management effectiveness, until the Regeneration Benchmark Targets are met.

As part of adaptive management, the reports will include evaluations and recommendations relating to all areas covered in the monitoring schedule and also address any other problems or deficiencies found during monitoring. If required the report should also outline any changes that are required to planned works to ensure better ecological outcomes.

Regeneration of the VMP Lands will be undertaken over a period of five (5) years or until the Year five (5) overall targets are reached. As the VMP lands will then be in a state of Natural Regeneration, management of the site after targets have been achieved will be undertaken in accordance with the *Biosecurity Act 2015* & *Biosecurity Regulations 2017*.

Table 3 – Weed Control Activities

| Activity | Minimum Requirement |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pre-works | Undertake baseline surveys to identify priority weeds present on site to be the focus of weed management activities. Priority weeds based on listings under the <i>Biosecurity Act 2015</i> , and notably problematic weeds on site have been identified, and listed in Section 2.2 . |
| Primary Works | Effectively control priority species and areas through appropriate methods to eliminate highly competitive weeds from an area. Include high disturbance activities that could negatively impact later regeneration such as high-volume herbicide application, and physical removal of large trees which would pose safety hazards to the public or others if left to perish <i>in-situ</i> . |
| Secondary Works | Treat any regrowth from primary weed control and expand on control measures by targeting Priority species and expanding the primary control boundaries where desirable. Thin retained weeds to increase light penetration where appropriate. Generally, expand on and solidify primary work. |
| Maintenance Works | Maintain exclusion of weeds controlled during Primary and Secondary works. Prevent reinfestation of weeds progressively, and others as time permits. |
| Woody Trees & Shrubs | Where appropriate, remove trees via mechanical means (i.e., chainsaw or handsaw) and apply chemical to the cut stump. Material may be retained on-Site or disposed of appropriately off-Site. Retained material should be situated to provide additional ground habitat and slope stability but should not be left in such a way that would hamper natural regeneration or existing native plants. Care should be taken with species which have the capacity to regrow vegetatively such as <i>Erythrina x sykesii</i> (Coral Tree). Alternatively, trees and shrubs may be treated via frill or drill application of herbicide and left to perish <i>in-situ</i> as habitat. |
| Woody Thickets | Treat via cut or scrape and paint or high-concentration low-volume foliar herbicide control (i.e., splatter application). Material may be left <i>in-situ</i> (particularly after spraying) or broken up and rafted off the ground to perish (taking care to remove from expected high flow areas of the dam). Do not manually remove root stock in a manner that will encourage soil instability or erosion. Once dead, standing material may be broken down and left on the ground as mulch. Mechanical removal (i.e., brush cutter equipped with mulching blade or similar) may be used where practical and regrowth treated with foliar application of herbicide. |
| Vines and Creepers | Skirt from trees and vegetation to prevent smothering and leave material to perish <i>in-situ</i> . Cut or scrape and paint stems or runners. Foliar herbicide control where appropriate. Do not unduly expose soil via manual removal of plants where they may be providing soil stabilisation. Isolated manual removal as appropriate. |
| Ground Cover | Retain exotic species where they are providing ground stabilisation or habitat until such time as they hinder native species establishment or are no longer necessary. Relevant examples include retaining <i>Tradescantia fluminensis</i> (Trad) along drainage lines where removal would expose bare soil to erosion. Weed control is to focus on the patch removal of such weeds from around native regeneration or planting, with progressive removal of larger patches over time. |
| Retention of forage/habitat | Retain trees and shrubs that have evidence of occupation i.e., bird nest/possum drey, until such time as other suitable habitat is available or the nest is abandoned. Retain manageable clumps of vegetation that can be easily removed at a later date for intermediate food and habitat supply within the semi-cleared and disturbed landscape, which will emerge between weed control and establishment of native plants. These retained features can be removed as they become redundant at the discretion of the Bush Regeneration Contractor (BRC). |

Prior to commencement of the VMP the following must have been undertaken:

- Development of Stage 1 Treatment / Monitoring Plan for *Rhodamnia rubescens*; and
- Peer review and finalisation of Stage 1 Treatment / Monitoring Plan for *Rhodamnia rubescens*.

It should be noted that the Treatment and Monitoring Plan Schedule of works will be provided to Council with the Baseline Data Report.

Table 4 – Year 1 Targets and Schedule of Works for Stage 1

| Timeframe | Works to be Undertaken | 1 st Quarter of Year | 2 nd Quarter of Year | 3 rd Quarter of Year | 4 th Quarter of Year | Targets to be reached at end of 4 th Quarter | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------------------------|---------------------------|--------------------------------------|--------------------------------------------|---------------------------|
| | | | | | | Abundance of Natives (%) | Cover of Native (%) | Cover of Biosecurity Weeds (%) | Cover of Other Priority Weeds (%) | Pasture Grasses (%) |
| Year 1 | Installation of No-Go Zones, fencing and signs | | | | | 30 | 30 | <75 | <75 | <80 |
| | Installation of Monitoring Points | | | | | | | | | |
| | Collection of baseline data | | | | | | | | | |
| | Installation of sediment and erosion controls | | | | | | | | | |
| | Installation of Ground habitat | | | | | | | | | |
| | Preparation of Baseline Data Report | | | | | | | | | |
| | Primary Weeding (Effectively control priority species and areas through appropriate methods to eliminate highly competitive weeds from an area. Include high disturbance activities that could negatively impact later regeneration such as high-volume herbicide application, and physical removal of large trees which would pose safety hazards to the public or others if left to perish <i>in-situ</i>) of all zones – focus is on Biosecurity Weeds (refer Appendix C for Department of Primary Industries Priority Weeds for the Central Coast) | | | | | | | | | |
| | Mass planting of trees and shrubs within reconstruction zones (refer to Appendix B for suitable plants in each PCT) | | | | | | | | | |
| | Installation of tree guards for pest control if required | | | | | | | | | |
| | Secondary Weeding- focus is on Biosecurity Weeds (refer Appendix C for Department of Primary Industries Priority Weeds for the Central Coast) | | | | | | | | | |
| | Replacement dead / dying plantings | | | | | | | | | |
| | Biannual monitoring | | | | | | | | | |
| | Annual Reporting to Council | | | | | | | | | |
| On completion of year 1 the entire VMP Land will be in a state of Ecological Regeneration in accordance with Society for Ecological Restoration Australasia (2018) <i>National standards for the practice of ecological restoration in Australia.</i> | | | | | | | | | | |

Table 5 – Year 2 Targets and Schedule of Works for Stage 1

| Timeframe | Works to be Undertaken | 1 st Quarter of Year | 2 nd Quarter of Year | 3 rd Quarter of Year | 4 th Quarter of Year | Targets to be reached at end of 4 th Quarter | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------------------------------|---------------------|--------------------------------|-----------------------------------|---------------------|
| | | | | | | Abundance of Natives (%) | Cover of Native (%) | Cover of Biosecurity Weeds (%) | Cover of Other Priority Weeds (%) | Pasture Grasses (%) |
| Year 2 | Annual inspection of No-Go Zones, fencing and signs | | | | | 40 | 45 | <50 | <45 | <50 |
| | Annual inspection of sediment and erosion controls (or after rainfall events) | | | | | | | | | |
| | Annual inspection of ground habitat | | | | | | | | | |
| | Replacing dead / dying plantings | | | | | | | | | |
| | Weed management as required to achieve annual targets | | | | | | | | | |
| | Replacement of dead or dying plants | | | | | | | | | |
| | Biannual monitoring of both terrestrial and aquatic environments including water quality data | | | | | | | | | |
| | Biannual inspection or Installation of tree guards for pest control if required | | | | | | | | | |
| | Annual Reporting to Council | | | | | | | | | |
| At end of second year the entire VMP Land will be a state of Ecological Regeneration in accordance with Society for Ecological Restoration Australasia (2018) National standards for the practice of ecological restoration in Australia. | | | | | | | | | | |

Table 6 – Year 3 Targets and Schedule of Works for Stage 1

| Timeframe | Works to be Undertaken | 1 st Quarter of Year | 2 nd Quarter of Year | 3 rd Quarter of Year | 4 th Quarter of Year | Targets to be reached at end of 4 th Quarter | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------------------------------|---------------------|--------------------------------|-----------------------------------|---------------------|
| | | | | | | Abundance of Natives (%) | Cover of Native (%) | Cover of Biosecurity Weeds (%) | Cover of Other Priority Weeds (%) | Pasture Grasses (%) |
| Year 3 | Annual inspection of no-go Zones, fencing and signs | | | | | 55 | 55 | <40 | <30 | <35 |
| | Annual inspection of sediment and erosion controls (or after rainfall events) | | | | | | | | | |
| | Annual inspection of ground habitat | | | | | | | | | |
| | Weed management as required to achieve annual targets | | | | | | | | | |
| | Biannual monitoring of both terrestrial and aquatic environments including water quality data | | | | | | | | | |
| | Replacement of dead or dying plants | | | | | | | | | |
| | Direct seeding of groundcover species in all Zones if required | | | | | | | | | |
| | Biannual inspection or Installation of tree guards for pest control if required | | | | | | | | | |
| | Review of VMP success and failures and update where appropriate for submission with Annual Report to CCC | | | | | | | | | |
| | Annual Reporting to Council | | | | | | | | | |
| At end of third year the entire VMP Land will be a state of Facilitated Regeneration Approach in accordance with Society for Ecological Restoration Australasia (2018) National standards for the practice of ecological restoration in Australia. | | | | | | | | | | |

Table 7 – Year 4 Targets and Schedule of Works for Stage 1

| Timeframe | Works to be Undertaken | 1 st Quarter of Year | 2 nd Quarter of Year | 3 rd Quarter of Year | 4 th Quarter of Year | Targets to be reached at end of 4 th Quarter | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------------------------------|---------------------|--------------------------------|-----------------------------------|---------------------|
| | | | | | | Abundance of Natives (%) | Cover of Native (%) | Cover of Biosecurity Weeds (%) | Cover of Other Priority Weeds (%) | Pasture Grasses (%) |
| Year 4 | Annual inspection of sediment and erosion controls (or after rainfall events) | | | | | 60 | 65 | <25 | <25 | <20 |
| | Annual inspection of ground habitat | | | | | | | | | |
| | Weed management as required to achieve annual targets | | | | | | | | | |
| | Biannual monitoring of both terrestrial and aquatic environments including water quality data | | | | | | | | | |
| | Annual Reporting to Council | | | | | | | | | |
| At end of second year the entire VMP Land will be a state of Facilitated Regeneration Approach in accordance with Society for Ecological Restoration Australasia (2018) National standards for the practice of ecological restoration in Australia. | | | | | | | | | | |

Table 8 – Year 5 Targets and Schedule of Works for Stage 1

| Timeframe | Works to be Undertaken | 1 st Quarter of Year | 2 nd Quarter of Year | 3 rd Quarter of Year | 4 th Quarter of Year | Targets to be reached at end of 4 th Quarter | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------------------------------|---------------------|--------------------------------|-----------------------------------|---------------------|
| | | | | | | Abundance of Natives (%) | Cover of Native (%) | Cover of Biosecurity Weeds (%) | Cover of Other Priority Weeds (%) | Pasture Grasses (%) |
| Year 5 | Annual inspection of sediment and erosion controls (or after rainfall events) | | | | | 70 | 80 | <10 | <15 | <10 |
| | Annual inspection of ground habitat | | | | | | | | | |
| | Weed management as required to achieve annual targets | | | | | | | | | |
| | Biannual monitoring of both terrestrial and aquatic environments including water quality data | | | | | | | | | |
| | Final Reporting to Council | | | | | | | | | |
| At end of second year the entire VMP Land will be a state of Natural Regeneration Approach in accordance with Society for Ecological Restoration Australasia (2018) National standards for the practice of ecological restoration in Australia. | | | | | | | | | | |

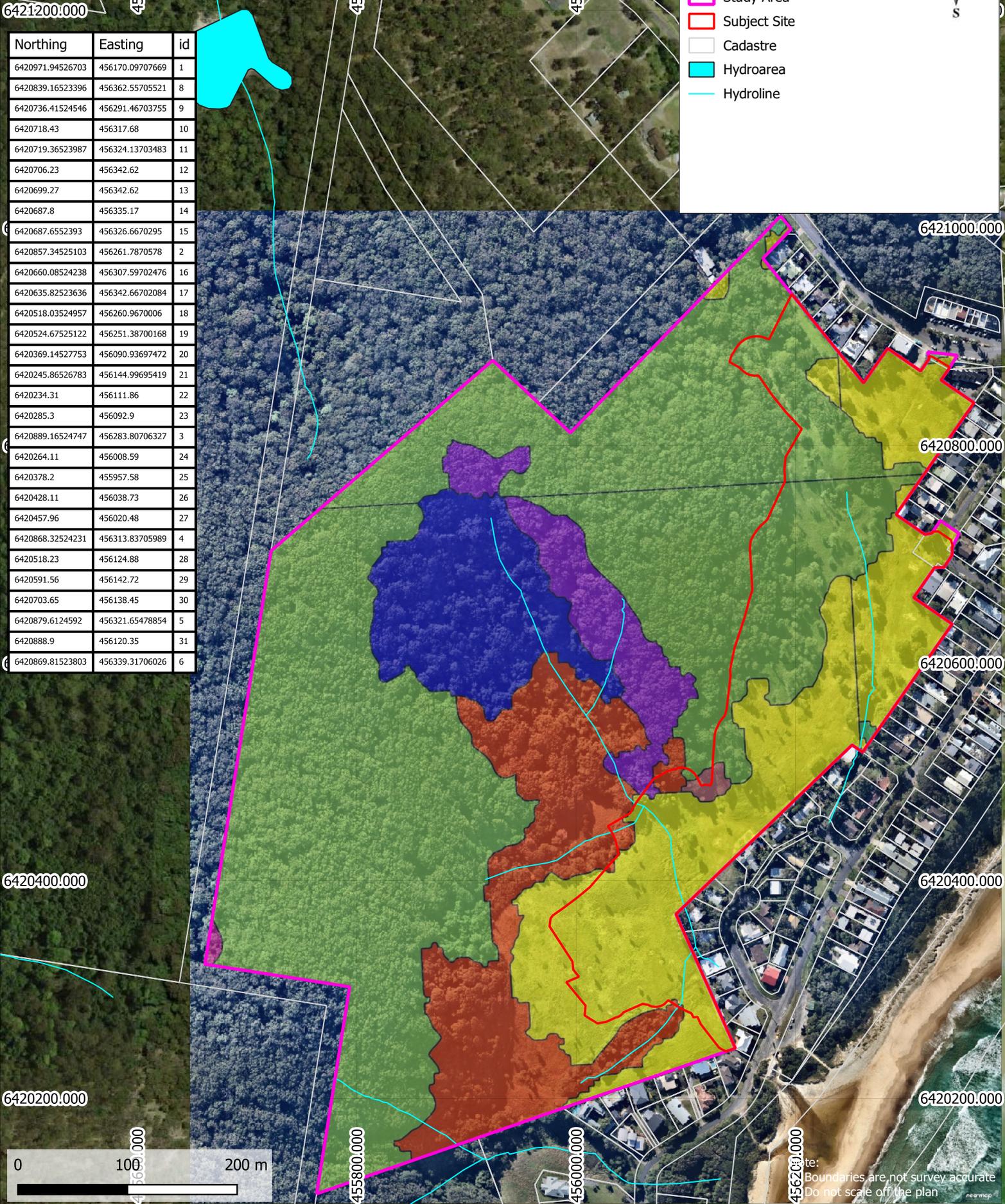
Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

- Study Area
- Subject Site
- Cadastre
- Hydroarea
- Hydroline



| Northing | Easting | id |
|------------------|-----------------|----|
| 6420971.94526703 | 456170.09707669 | 1 |
| 6420839.16523396 | 456362.55705521 | 8 |
| 6420736.41524546 | 456291.46703755 | 9 |
| 6420718.43 | 456317.68 | 10 |
| 6420719.36523987 | 456324.13703483 | 11 |
| 6420706.23 | 456342.62 | 12 |
| 6420699.27 | 456342.62 | 13 |
| 6420687.8 | 456335.17 | 14 |
| 6420687.6552393 | 456326.6670295 | 15 |
| 6420857.34525103 | 456261.7870578 | 2 |
| 6420660.08524238 | 456307.59702476 | 16 |
| 6420635.82523636 | 456342.66702084 | 17 |
| 6420518.03524957 | 456260.9670006 | 18 |
| 6420524.67525122 | 456251.38700168 | 19 |
| 6420369.14527753 | 456090.93697472 | 20 |
| 6420245.86526783 | 456144.99695419 | 21 |
| 6420234.31 | 456111.86 | 22 |
| 6420285.3 | 456092.9 | 23 |
| 6420889.16524747 | 456283.80706327 | 3 |
| 6420264.11 | 456008.59 | 24 |
| 6420378.2 | 455957.58 | 25 |
| 6420428.11 | 456038.73 | 26 |
| 6420457.96 | 456020.48 | 27 |
| 6420868.32524231 | 456313.83705989 | 4 |
| 6420518.23 | 456124.88 | 28 |
| 6420591.56 | 456142.72 | 29 |
| 6420703.65 | 456138.45 | 30 |
| 6420879.6124592 | 456321.65478854 | 5 |
| 6420888.9 | 456120.35 | 31 |
| 6420869.81523803 | 456339.31706026 | 6 |



Note: Boundaries are not survey accurate. Do not scale off the plan.

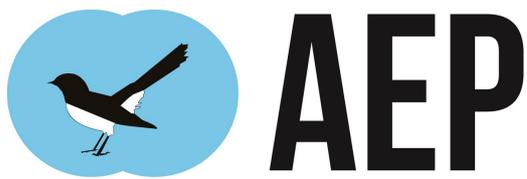


Figure 1 - Site Map

Location: Lot 23 Boomerang Dr, Blueys Beach

Client: Addenbrooke Pty Ltd

Date: August 2022

BOAMS: 00030048

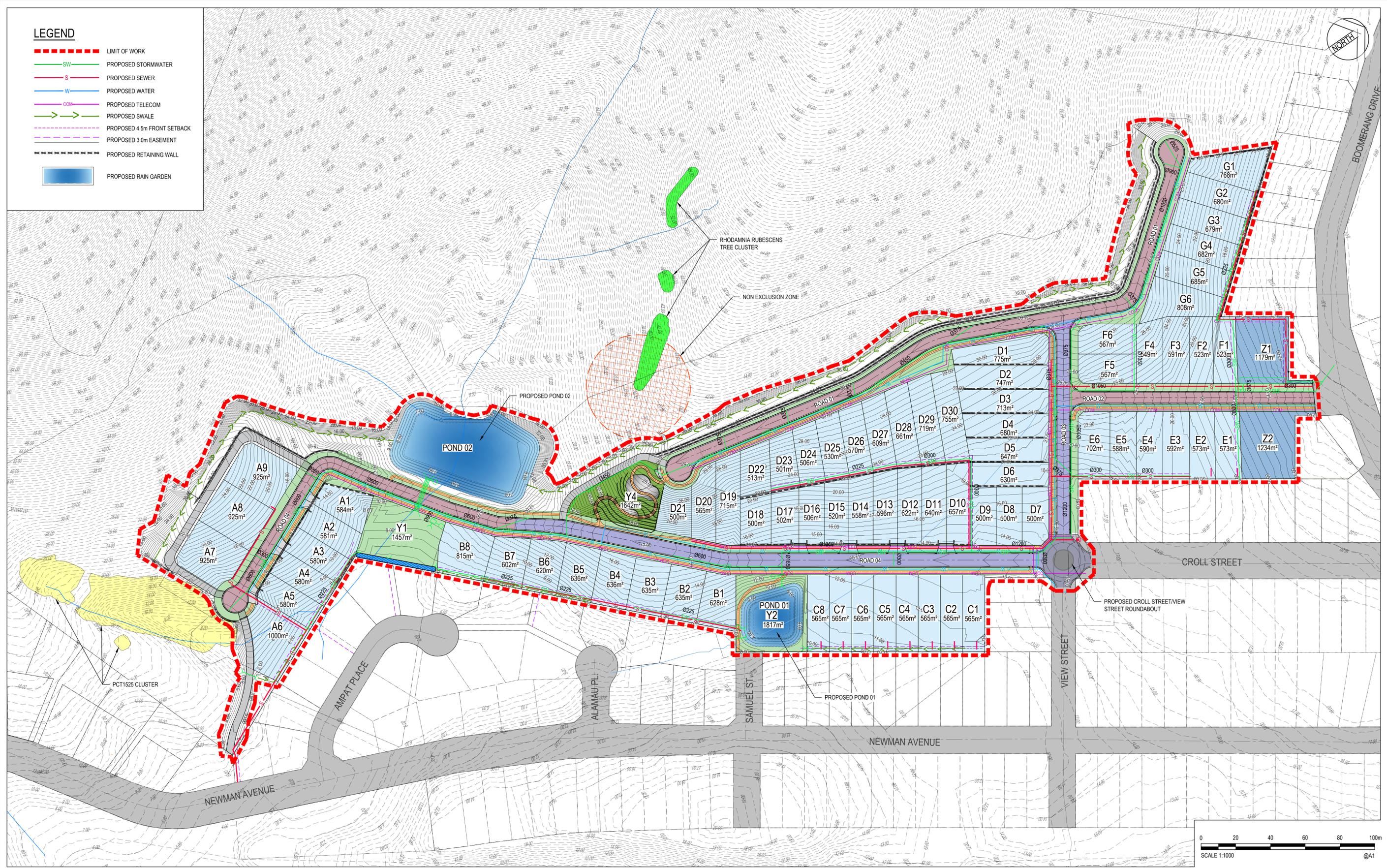
AEP ref: 2506.03

Figure 2 – Proposed Development

DATE PLOTTED: 17 August 2022 5:13 PM BY: MARIO QUINTORIANO
 XREFS: X:Base, G:Source, 20211013: X:ROAD NAMES, X:Ecological Constraints, CONTS DESIGN-1000, X:Final Lot Areas, Option E, CONTS DESIGN SERVICES, X:Limit of Works, BDY, X: PROPOSED STORMWATER
 CAD File: N:\Projects\50522033\BLUEYS BEACH\Drawings\Bulid\DA\50522033-C-1004-00A.dwg

LEGEND

- - - - - LIMIT OF WORK
- PROPOSED STORMWATER
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED TELECOM
- - - - - PROPOSED 4.5m FRONT SETBACK
- - - - - PROPOSED 3.0m EASEMENT
- - - - - PROPOSED RETAINING WALL
- PROPOSED RAIN GARDEN



| Rev. | Date | Description | Des. | Verif. | Appd. |
|------|------------|-------------------|--------|--------|-------|
| C | 18/08/2022 | FOR DA SUBMISSION | TM/MML | GZ | JS |
| B | 17/05/2022 | FOR DA SUBMISSION | TM/MML | GZ | JS |
| A | 09/05/2022 | FOR DA SUBMISSION | TM/MML | GZ | JS |

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| | | | |
|----------|-------|------|------------|
| Drawn | MPQ | Date | 09/05/2022 |
| Checked | AS/IM | Date | 09/05/2022 |
| Designed | TM/ML | Date | 09/05/2022 |
| Verified | GZ | Date | 09/05/2022 |
| Approved | JS | Date | 09/05/2022 |

| | |
|---------|----------------------------------------------------------------------------|
| Client | BLUEYS BEACH ESTATE |
| Project | BLUEYS BEACH DEVELOPMENT BOOMERANG DRIVE, BLUEYS BEACH, NEW SOUTH WALES |
| Title | OVERALL GENERAL ARRANGEMENT PLAN |

| | | | |
|------------------------------------------|---------------------|--------|----------|
| Status | FOR APPROVAL | | |
| NOT TO BE USED FOR CONSTRUCTION PURPOSES | | | |
| Date | Datum | Scale | Size |
| 09/05/2022 | AHD | 1:1000 | A1 |
| Drawing Number | 50522033-C-1004 | | Revision |
| | | | C |

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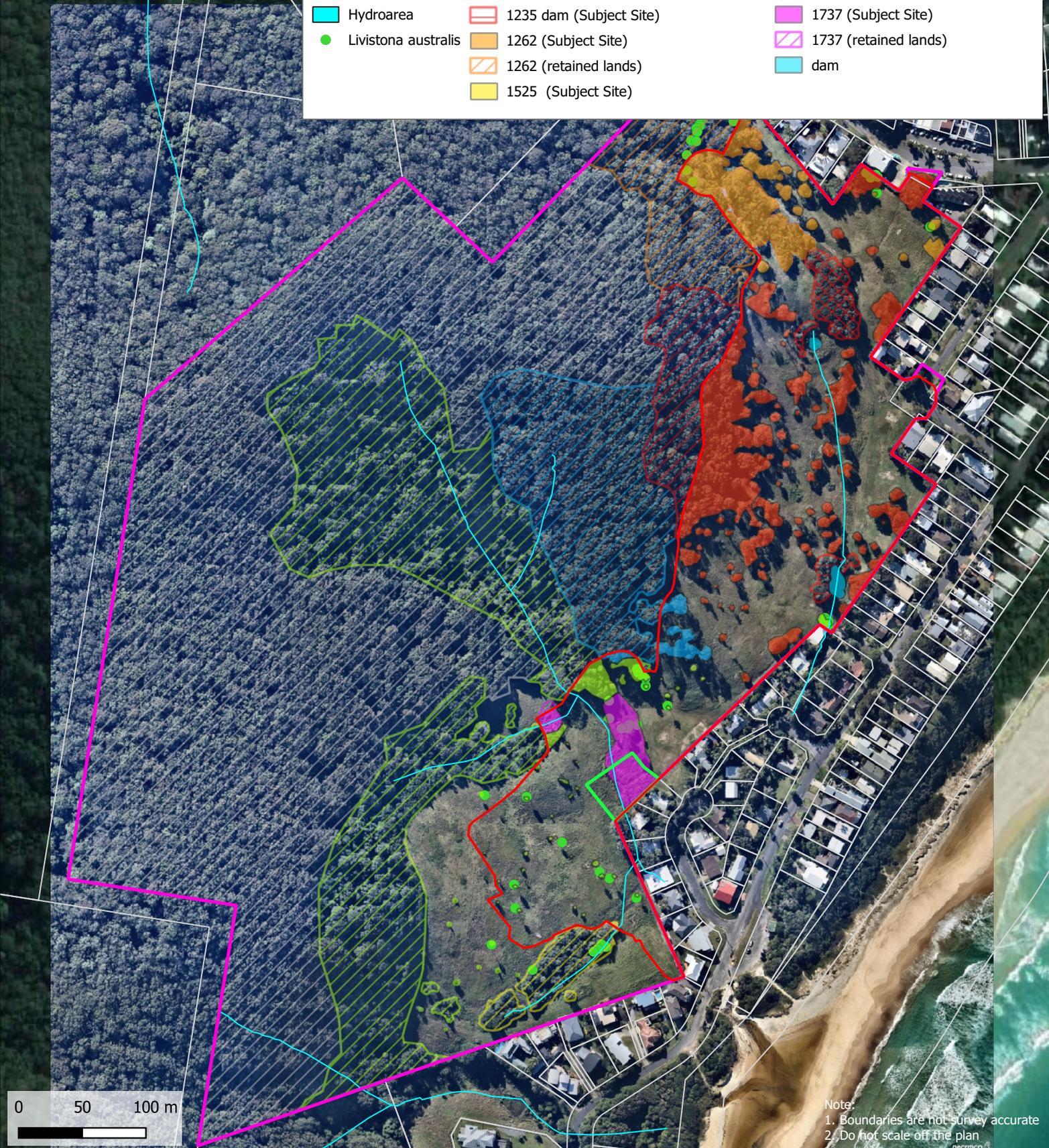
Legend

-  Subject Site
-  Study Area
-  VMP Lands
-  Cadastre
-  Hydroline
-  Hydroarea
-  *Livistona australis*

PCTs and Conditions

-  1215 (retained lands)
-  1235 (Subject Site)
-  1235 (retained lands)
-  1235 Melaleuca dominated (Subject Site)
-  1235 dam (Subject Site)
-  1262 (Subject Site)
-  1262 (retained lands)
-  1525 (Subject Site)

-  1525 (retained lands)
-  1537 (Subject Site)
-  1537 (retained lands)
-  1556 (Subject Site)
-  1556 (retained lands)
-  1737 (Subject Site)
-  1737 (retained lands)
-  dam



0 50 100 m

Note:
 1. Boundaries are not survey accurate
 2. Do not scale off the plan



AEP

Figure 3 - VMP PCTs

Date: August 2022

Location: Lot 23 Boomerang Dr, Blueys Beach

Client: Addenbrooke Pty Ltd

AEP ref: 2506.05

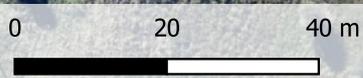
Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Subject Site
-  Study Area
-  VMP Lands
-  Cadastre
-  MidCoast Hydroline

Management Zones

-  1
-  2



Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan

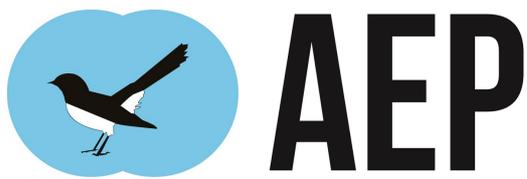


Figure 4 - Management Zones
Location: Lot 23 Boomerang Dr, Blueys Beach
Client: Addenbrooke Pty Ltd

Date: August 2022
AEP ref: 2506.05

7.0 References

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Appendix A – Regeneration Species List

Species List – Approximate densities and species for regeneration.

It should be noted that not all of the listed species above are easily obtainable, substitutions to be made on the advice of bush regeneration contractor or Project Ecologist.

| Canopy | Density | Shrubs | Density | Ground Cover | Density |
|--------------------------------------------------------|---------------------|----------------------------------------|--------------------|-----------------------------|------------------------------------|
| Aquatic Species – Low Flow Channel to Upper Toe | | | | | |
| Not Applicable in this Management Zone | N/A | Not Applicable in this Management Zone | N/A | <i>Cyperus gracilis</i> | 6 to 8 /1m ² |
| | | | | <i>Juncus usitatus</i> | |
| | | | | <i>Carex longebrachiata</i> | |
| | | | | <i>Lomandra longifolia</i> | |
| | | | | <i>Gahnia clarkei</i> | |
| PCT 1537 | | | | | |
| <i>Cupaniopsis anacardioides</i> | 1/30 m ² | <i>Wilkiea huegeliana</i> | 1/10m ² | <i>Pellaea falcata</i> | 5/m ² or Direct Seeding |
| <i>Elaeodendron australe</i> | | <i>Sarcomelicope simplicifolia</i> | | <i>Doodia aspera</i> | |
| <i>Drypetes deplanchei</i> | | <i>Pittosporum revolutum</i> | | <i>Dianella caerulea</i> | |
| <i>Planchonella australis</i> | | <i>Diospyros australis;</i> | | | |
| <i>Ficus rubiginosa</i> | | <i>Claoxylon australe;</i> | | | |
| <i>Elaeocarpus obovatus</i> | | <i>Guioa semiglauc;</i> | | | |
| <i>Livistona australis</i> | | <i>Cissus antarctica;</i> | | | |
| <i>Alphitonia excelsa</i> | | <i>Smilax australis;</i> | | | |
| <i>Ficus fraseri</i> | | <i>Dioscorea transversa;</i> | | | |
| <i>Acmena smithii</i> | | <i>Parsonsia straminea;</i> | | | |

Appendix B – Authors' CVs

Dennis Neader

Curriculum Vitae

Dennis works with AEP in the role of senior ecologist. He is an experienced bird watcher and a regular participant in Hunter Bird Observers' Club (HBOC) Bird Surveys in the wider Hunter Valley. Dennis has previously had a varied career as an environmental scientist, contaminated land consultant and bush regenerator with local firms. His background in birdwatching, post-approval project management and bush regeneration, combined with his ecological knowledge is utilised in a diverse array of applications in his current role.

Qualifications

- Bachelor of Science (Environmental Geoscience) University of Newcastle (2011).
- Graduate Diploma in Environmental Management University of Newcastle (2 subjects to complete) (2014).

Further Education & Training

- NSW Class HR Driver's Licence.
- Experienced 4WD operator.
- Current Senior First Aid.
- Occupational Health & Safety Training.
- High Risk NSW Elevated Work Platform, Dogging and Light Forklift Truck.
- Open Water PADI Dive Certificate.
- Non-Friable Asbestos Removal.
- Chainsaw Operation and Maintenance.

Fields of Competence

- Ecological field survey, covering terrestrial and aquatic flora and fauna.
- Avifauna surveys, including challenging wetland and bushland environs.
- Field transect survey for cryptic flora species.
- Field survey for terrestrial fauna species including bird and reptile survey, koala habitat and SAT assessment, microbat, mammal track, scat identification and herpetological survey.
- Spotlighting, call playback, and stagwatch for arboreal mammal species, including Forest Owls, Squirrel Glider and Koala.
- Trapping and translocation works with mammals, reptiles and amphibians.
- Remote trapping including SongMeter and camera trapping emplacement and analysis.
- Post-approval Project management including Fauna Welfare.
- Bush regeneration.
- Native plant ID and seed collection.

- Contaminated Land – Asbestos Identification and Removal.

Relevant Employment History

2016 – Present

Senior Ecologist

Anderson Environment & Planning, Newcastle

Currently employed by Anderson Environment & Planning to assist in the provision of consulting services to land, property, mining industry, legal and government sectors. Covering ecological, project management, environmental, planning services, rehabilitation, advices, strategy and representation.

2014 - 2016

Environmental Scientist

JM Environments, Newcastle

As an environmental scientist with JM Environments, I was responsible for ecological surveys and reporting, water and air quality monitoring, calibration and maintenance of monitoring equipment, contaminated land Phase 1, 2 and 3 assessments, Remediation Action Plan preparation and project management, development of safe work procedures and safety inspections on site. I was responsible for ensuring projects were completed on time and on budget whilst meeting clients' expectations and achieving quality assurance standards.

2010 - 2014

Environmental Technician

AECOM, Newcastle

Landscape Function Analysis surveys and reporting, water quality monitoring air quality monitoring.

2010 – 2014

Contract GIS Technician

Geodata, Newcastle

Data entry and interpretation of cadastral survey information into GeoCadastre and MapInfo software.

2006 – 2010

Coal Superintending

ALS & SGS Newcastle

Coal sampling, superintending and testing, sampling and data entry. Accurate, timely product processing and data entry of coal quality and analysis.

Pre 2006

Rigging, crane dogman, including outages and construction at major mine and building sites, self-employed in print industry

Relevant Ecological Experience

- 2011 – Current Bird Surveys
- Hunter Bird Observers Club – Shorebirds, Earthcare Park, Grahastown Dam Monthly Surveys
- Avifauna Baseline Surveys on Broughton Island.
- CVA Newcastle and Trees in Newcastle – Bird surveys in Hunter Valley for *Hunter Valley Stepping Stones Project Great Eastern Ranges* 2014-2017.

- NPWS - Population survey Gould's Petrel Cabbage Tree Island Port Stephens.
- 2008 – Current Bush Regeneration, Plant ID and Seed Collection
- CVA Newcastle and Trees in Newcastle.
- Blueys Beach DuneCare – Mid Coast Council Bush Regeneration.
- 2010 Volunteer Coral Reef Research
- University of Newcastle - Lady Elliot Island Queensland.

Professional Affiliations / Memberships

- Hunter Bird Observers' Club
- Birdlife Australia.
- Society for Growing Australian Plants.
- Australian Assoc. of Bush Regenerators.

Desktop and Site VMP works were undertaken by:

| Staff | Title/Qualification | Tasks |
|-----------------|------------------------------------------------------------------------------------------|------------------------------------|
| Dennis Neader | Senior Ecologist BSc (Environment Geoscience) Grad Dip Env Mgt | Report Author, fauna surveys |
| Darcy Kilvert | Ecologist BSc (Biology) | Riparian assessment, flora surveys |
| Frances O'Brien | Senior Ecologist (Lead Botanist) BEnv LLB GDLP MEL BAAS: 20013 | Flora surveys, PCT determination |
| Natalie Black | Senior Environmental Manager BSc (Hons), Master Planning, Cert IV (TA) BAAS: 19076 | Technical Review |