

Vegetation Management Plan (Amended)

Bonville Caravan Park

***Lot 104 DP876697 Pine Creek Road & Lot 501
DP606422, Bonville Station Road Bonville.***

Development Application No. 623/09

Contents

INTRODUCTION	4
AIM	4
OBJECTIVES OF THIS REPORT.....	4
BACKGROUND	4
SITE ASSESSMENT	4
<i>Methods</i>	4
SITE OUTLINE	5
SITE LOCATION	5
SITE DETAILS	6
SITE DESCRIPTION	6
OVERVIEW.....	6
CONTROL OF ENVIRONMENTAL AND NOXIOUS WEEDS –OVERVIEW	7
RESULTS	8
VEGETATION MANAGEMENT ZONES.....	9
VEGETATION MANAGEMENT ZONE 1	9
<i>Initial Works</i>	11
<i>Follow Up work</i>	13
VEGETATION MANAGEMENT ZONE 2	14
<i>Initial Works</i>	14
<i>Follow Up work</i>	16
VEGETATION MANAGEMENT ZONE3	17
<i>Initial Works</i>	17
<i>Follow Up work</i>	18
VEGETATION MANAGEMENT ZONE 4	19
<i>Initial Works</i>	20
VEGETATION MANAGEMENT ZONE 5	21
<i>Initial Works</i>	21
<i>Follow Up work</i>	22
APPENDIX 1: AERIAL PHOTOGRAPH.....	23
APPENDIX 2: SITE MAP	24
APPENDIX 3: LEP MAPPING	25
APPENDIX 4: KOALA HABITAT MAPPING	26
APPENDIX 5: NATIVE FLORA SPECIES LIST.....	27
APPENDIX 6: WEED SPECIES LIST.....	28
APPENDIX 7: WEED PROFILES AND CONTROL TECHNIQUES.....	29
WEED PROFILES	29
WEED CONTROL TECHNIQUES.....	41
NOXIOUS WEED CATEGORIES	43
APPENDIX 8: REVEGETATION SPECIES LIST & TECHNIQUES.....	44
REVEGETATION TECHNIQUES	44
PLANTING DIAGRAM	45
APPENDIX 9: PRINCIPLES OF BUSH REGENERATION	46
APPENDIX 10: REVEGETATION SUPPLIERS	48
POSSIBLE SUPPLIERS FOR THE PLANTING PROGRAM	48
APPENDIX 11: RESTORATION WORKS SCHEDULE.....	49
<i>Initial Works Zones 1- 4</i>	49
<i>Follow Up Works Zones 1 - 5</i>	49
REFERENCES	50

This Vegetation Management Plan was prepared by John Ross of Coffs Harbour Bushland Regeneration Group Pty Ltd and Brent Hely of Coffs Harbour Bushland Regeneration Group Pty Ltd accredited member of The Australian Association of Bushland Regenerators (AABR member no. 0305)

VMP. Bonville Caravan Park. September 2009
Coffs Harbour Bushland Regeneration Group P/L Tel: 0427562459

Introduction

Aim

To satisfy Coffs Harbour City Council's Strategy and Sustainability Branch requirement for a Vegetation Management Plan to accompany the Development Application for an extension of the Bonville Caravan Park, Lot104,DP876697 Pine Creek Road and Lot 501,DP606422, Bonville Station Road, Bonville.

Objectives of this Report

- To determine the location and number of trees in the original Ecological Consultant biodiversity assessment and recently removed and to recommend compensatory planting in accordance with Council's Biodiversity Guideline No4- Compensatory Planting Advice.
- To rehabilitate and enhance existing native vegetation with weed control
- To ensure that riparian zones have vegetated buffers to assist sediment and erosion control.
- To ensure newly planted areas have a plan of management that ensures these areas become self-sustaining.
- To outline procedures for plantings of native indigenous species
- To map proposed areas requiring weed control
- To outline the methodology for removal of environmental/noxious weeds and ongoing management detailing the Initial and Follow up Maintenance works required.
- Provide table of costing for all works

Background

This report has been prepared at the request of Neill and Ann Thwaite owners of Bonville Caravan Park

Site Assessment

Methods

Aerial photo interpretation was undertaken to delineate "vegetation management zones".

A field assessment of the site was undertaken on 11th May 2009

An assessment of recently removed trees was carried out using the Schedule of Existing Trees and accompanying Map prepared on 5 -05-2008 by Newnham Karl Weir and Partners Pty Ltd.

"Vegetation management zone" boundaries were confirmed.

Native and weed plant species were identified (Appendices 5 and 6).

Fieldwork also involved a search for species listed under *Schedules 1 and 2 (Threatened Species Conservation Act 1995(NSW))* and the list of *Rare or Threatened Australian Plants* (Briggs & Leigh,1995) known to occur in the Coffs Harbour region.

The location, extent and condition of the native vegetation were assessed and a *Works Schedule* developed for each "vegetation management zone".

Site Location

The property is located at Bonville, approximately 2 kilometres south of Sawtell on the corner of the Pacific Highway and Bonville Station Road

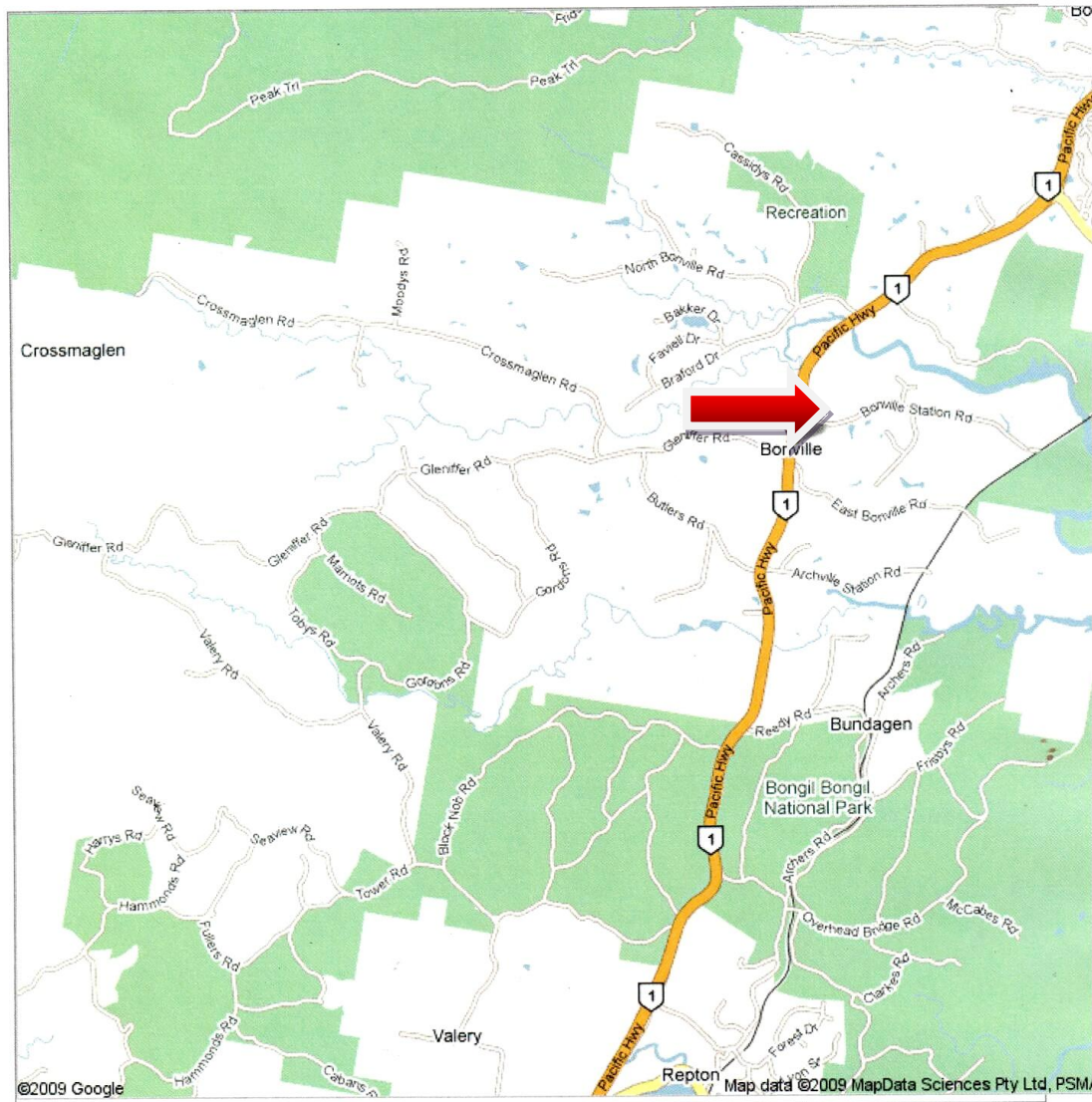


Figure 1: Site Location Map

Site Details

The property consists of two Lots.

- The first of these, Lot 104 DP 876697 Pine Creek Road is the site of the existing Caravan Park and contains mostly only scattered specimens of native and exotic trees in a park setting, the exception being a cluster of large indigenous trees on the northern creek bank toward the eastern boundary of this Lot.
- The second Lot, Lot 501 DP606422, Bonville Station Road, located east of the current Caravan Park consists largely of mown pasture with the exception of a narrow band of mixed indigenous trees and Camphor Laurels along approximately 60m of the northern bank of the creek running through the Lot.

Both lots are situated on 1A zonings.

Site Description

Soil Type

The lower portion of the property south of the creek is mapped as Soil Landscape Grouping ..Bonville foot slopes and drainage plains on Permian metasediments with soils imperfectly drained Prairie Soils or Yellow Earths

The higher portion of the property north of the creek is mapped as Soil Landscape Grouping..Glenifer..level to undulating alluvial terraces with well drained structured Red Earths and Red Podzolic soils.

Vegetation

The native vegetation on this property is mapped as containing the following vegetation types (refer to Appendix 4) under the Vegetation Classification system adopted by the Coffs Harbour City Council (Fisher *et al* 1996):

- Moist Sclerophyll Tall Open Forest (N52A Flooded Gum Community)

The site also contains (although not mapped) Coastal Riparian vegetation (RV1) Dominant species are *Syncarpia glomulifera*, *Lophostemon confertus*, and *Eucalyptus grandis*.

Overview

- The site will require weed control.
- Shall require revegetation works in some Riparian areas within 10 metres of the creek,
- A statement of completion will be provided by CHBRG on successful completion of the Initial Works as set out in this Plan.

Control of environmental and noxious weeds –overview

All environmental and noxious weeds shall continue to be controlled in accordance with the methods described in this Plan beyond the five year period outlined in this plan until such a time as the Development Consent approval applying to the land is replaced by another approval.

Due to the presence of native vegetation of medium and high ecological value environmentally sensitive weed control techniques are required.

Machinery and Powersprays shall not be used for the control of weeds at this site.

Results

The site has been divided into 5 “Vegetation Management Zones” that are displayed on the Site Map in Appendix 2

Zone 1: A 10 metre wide zone largely consisting of the higher steep northern bank of the creek and extending from the dam wall /roadway to the eastern boundary of the proposed Caravan Park extension.

This zone currently includes an area of scattered large remnant native trees with a very weedy understory between the dam and the boundary fence of the current Caravan Park. An area of steep bank with a mix of natives/Camphor Laurel canopy is present along the western portion of the creek in Lot 501. The remainder of this zone is a cleared and mown area along the eastern section of creek in Lot 501.

This zone should be regenerated and where appropriate replanted with indigenous tall open forest and rainforest species to act as a filter in sediment control and an erosion control.

Zone 2: A 10 metre wide zone consisting of the lower southern creek bank opposite zone1. Currently mown pasture with one large Camphor Laurel tree this zone should be planted with a mixture of indigenous Swamp Sclerophyll species and indigenous tall open forest and rainforest species tolerant of periodic inundation. This will provide a sediment filter and erosion control.

Zone3: This is a very narrow strip about 60 metres in length between the boundary fence with Lot103 DP876697 and the bank of the recently realigned creek. To help provide erosion control this area should be planted with indigenous Swamp Sclerophyll and riparian species.

Zone4: This zone is the bulk of all other areas of the Caravan Park .It contains scattered indigenous and exotic trees. Included amongst the exotic trees are many Camphor Laurel trees together with specimens of a number of other known environmental weeds able to spread to nearby bushland. These are Cocos Palm (*Syagrus romanzoffianum*) and Indian Coral Tree (*Erythrina crista-galli*).

Zone 5: This is a 10 metre wide strip on the northern edge of the dam and drainage line. This is currently mown lawn with occasional remnant trees

A discussion of the composition of each zone, both native and weed species, is covered in the following chapter.

No *Schedule 1* plant species under the *Threatened Species Conservation Act 1995*(NSW) were encountered.

All native flora species present are listed in *Appendix5*. All weed species present are listed in *Appendix6*

The site will require weed control. Weed control recommendations and prescriptions. Profiles of the weed species are included in *Appendix 7*

Vegetation Management Zones

Vegetation Management Zone 1

This zone, a 10m wide band along the northern bank of the creek from the dam wall/roadway to the eastern boundary of the proposed Caravan Park extension (i.e. of Lot 501),is best considered in 3 sections.

The first of these, the section within the existing Park (i.e. Lot104) is about 40m. in length and is very degraded due to increased nutrient supply from the poorly functioning septic system and dumping of garden waste. Scattered large native trees in this section include several Turpentine (*Syncarpia glomerulifera*), several Blackwood (*Acacia melanoxylon*) and a Flooded Gum (*Eucalyptus grandis*).

There is also several large Camphor Laurels in this section and scattered weed understory of small trees, namely Small Leaved Privet (*Ligustrum sinense*), Umbrella Tree (*Schefflera actinophylla*)and Cockscomb Coral Tree (*Erythrina crista-galli*).The ground layer in this section is a mass of weeds preventing any natural regeneration. There are dense areas of Broad Leaved Paspalum (*Paspalum wettsteinii*),Blue Billygoat Weed (*Ageratum houstonianum*),Freckle Face (*Hypoestes phyllostachya*)and an ornamental exotic ginger species together with an unidentified garden escape and some Crofton Weed (*Ageratina adenophora*).



Exotic Ginger and unidentified garden weed are among those requiring removal

The second section of this zone continues about 50m. downstream from the boundary fence between Lot 104 and Lot 501 and is a steep bank with a dense canopy made up of a mixture of native rainforest species ,one large Flooded Gum (Eucalyptus grandis)and about 25 Camphor Laurel trees.

Native trees here include Black Wattle (*Callicoma serratifolia*), Lily Pily (*Acmena smithii*), Red Ash (*Alphitonia excelsa*), Guioa (*Guioa semiglauca*), Sandpaper Fig (*Ficus coronata*) Grey Myrtle (*Backhousia myrtifolia*) and several large native laurels , Jackwood (*Cryptocarya glaucescens*) and Murrogun (*Cryptocarya microneura*). The understory of this section is open with some small seedlings of regenerating natives and numerous small seedling weeds especially Camphor Laurel, Freckle Face and Small Leaved Privet.

Finally the third section of this zone continues downstream another 50m. to the eastern boundary of Lot 501. The creek bank is a gradual slope and is mostly a mown area of previous pasture. There are occasional native herbs, ferns, weak climbers or seedling shrubs or tree seedlings along the bank and at the water's edge .The last 10m. or so of this section is again steeper bank and has a cluster of 12 small or medium sized Camphor Laurel trees with a few small native trees such as Grey Myrtle and Guioa.



Mature Camphor Laurel trees require careful removal by Aborist so as not to damage surrounding native trees

Initial Works

Initial works required includes weed removal and revegetation works over the whole zone as shown on the Site Plan in Appendix 2

The Restoration Works Schedule in Appendix 11 outlines the estimated labour hours and costs of the initial weed control and planting. The cost of removal of camphor laurels by an aborist is **not included** in the works schedule.

Weed Control

This will involve the removal of all environmental weeds in this zone as listed in Appendix 6 and that are shown on the Site Plan

This will involve:

- Spray with Glyphosate herbicide :Broad Leaved Paspalum, Blue Billygoat Weed, Crofton Weed,
- Spray with Metsulfuron-methyl herbicide and Pulse penetrant: Freckle Face, Small Leaf Privet seedlings and exotic Ginger.
- Spray with Starane herbicide: small seedlings Ochna
- Paint lower stem with Starane/Diesel: larger Ochna,
- Cut and Paint with Glyphosate herbicide: larger seedlings and saplings of Small Leaved Privet and Camphor Laurel, small Cockscomb Coral Tree.
- Direct Inject with Glyphosate herbicide then after tree death lop leaving only stump: medium to large sized Camphor Laurel, Cockscomb Coral Tree, Umbrella Tree.
- Hand Removal: small seedlings Camphor Laurel

All this initial weed control work should be carried out before the revegetation works described below. This includes the removal of large Camphor Laurels by a qualified aborist which must be carried out in such a way as to minimise any damage to native trees, saplings and seedlings. This removal of large Camphor Laurels should also be before revegetation works in the zone 2 areas on the opposite creek bank to allow felling of some Camphor's across the creek into this area.

The bushland regeneration weed control techniques are given in Appendix 7.

Revegetation Works

Detailed site preparation and planting requirements are given in Appendix 8.

This shall involve the planting of 341 indigenous native tree species at a plant spacing of 2metre centres in the weedy degraded western section (Lot104) and in the cleared mown eastern section of Lot 501 and at a plant spacing of 3m. amongst the existing natives in the middle section of the zone as described above.

Additionally 40 tubes of Mat Rush (*Lomandra hystrix*) should be planted at 4m intervals along the toe of the bank. This will act as a seed source for future colonisation of the lower bank by this important bank stabilising species. .Planting should be done following weed control as described above and blanket spraying of the mown pasture areas with a glyphosate herbicide.

These native indigenous species shall be:

- tubestock grown from local provenance seed (i.e. seed collected within a 50 kilometres radius of Coffs Harbour)
- planted using: slow release fertiliser, water retention crystals,
- have weed mats for weed control,
- have large plastic tree guards for protection against Wallaby predation and spray drift when carrying out follow up weed control (**note banana bags shall not be used as a substitute for tree bags**)
- Plants shall be watered on installation and depending on the soil moisture during the plant establishment phase, additional watering may be required.
- Any plants that die within the 5 year covenant period shall be replaced at the owners expense

Native endemic species planted should be a mix of Tall Sclerophyl Forest and Riparian Rainforest species

Stage 2 Rainforest Pioneers shall be spaced evenly throughout the sites with stage 3 and stage 4 species randomly dispersed amongst them. **Definitions of these stages are given in Appendix 9, Principles of Bushland Regeneration.**

Species required shall be 10% Tall Sclerophyl Forest, 30% stage 2, 50% stage 3 and 10% stage 4:

- **35 Tall Sclerophyl species**

10	Brushbox (<i>Lophostemon confertus</i>)
10	Turpentine (<i>Syncarpia glomulifera</i>)
5	Flooded Gum (<i>Eucalyptus grandis</i>)
10	Tallowood (<i>Eucalyptus microcorys</i>)

- **102 Stage 2 Pioneers-**

30	Bleeding Hearts (<i>Omalanthus nutans</i>)
15	Native Peach (<i>Trema aspera</i>)
20	Callicoma (<i>Callicoma serratifolia</i>)
20	Scrub Turpentine (<i>Rhodamnia rubescens</i>)
9	Rose myrtle (<i>Archirhodomyrtus beckleri</i>)
10	Banana Bush (<i>Tabernaemontana pandacaqui</i>)

- **170 Stage 3 Pioners**

20	Blackwood (<i>Acacia melanoxylon</i>)
25	Red Ash (<i>Alphitonia excelsa</i>)
10	Foambark (<i>Jagera pseudorhus</i>)
20	Cheese Tree (<i>Glochidion ferdinandi</i>)
23	Sandpaper Fig (<i>Ficus coronata</i>)*
5	Scentless Rosewood (<i>Synoum glandulosum</i>)
5	White Bolly Gum (<i>Neolitsia delbata</i>)
25	Guioa (<i>Guioa semiglauc</i>)
10	Water Gum (<i>Tristaniopsis laurina</i>)*
4	Native Guava (<i>Rhodomyrtus psidioides</i>)
10	Lily Pily (<i>Acmena smithii</i>)
5	Brush Cherry (<i>Syzygium australe</i>)
5	Blue Lilly Pilly (<i>Syzygium oleosum</i>)
2	Rose Maple (<i>Cryptocarya rigida</i>)
2	Celerywood (<i>Polyscias elegans</i>)

*Creek bank planting

34 Stage 4 Pioneers

12	Grey Myrtle(<i>Backhousia myrtifolia</i>)
5	Murrogun(<i>Cryptocarya micronuera</i>)
5	Jackwood(<i>Cryptocarya glaucescens</i>)
5	Olivers Sassafras (<i>Cinnamomum oliveri</i>)
5	Pepperberry (<i>Cryptocarya obovata</i>)
2	Strangling Fig (<i>Ficus watkinsiana</i>)

The Restoration Works Schedule in Appendix 11 outlines the estimated labour hours and costs of the revegetation works.

Follow Up work

This shall involve the periodic manual removal and spot spraying of weeds (before seed set). Follow up work shall involve regular weed control and this shall take place every 8 weeks for 2 years and thereafter every 12 weeks for the following 3 years as shown in the Restoration Works Schedule in Appendix 11.

Particular attention is required within a metre diameter of the new plantings to ensure exotic grass species do not become established and compete with the establishing plants for moisture and nutrients.

The revegetation areas will require regular spot spraying of weeds to allow the newly establishing plants unrestricted growth until an intact canopy is formed and thus shading out and inhibiting further weed growth. Once this stage is reached only periodic hand weeding shall be required to allow natural regeneration to occur. The spot spraying shall be carried out with glyphosate as per manufacturer's recommendations.

If plantings have not developed a suitable canopy cover (i.e. shading the entire ground in the revegetation site) within four years, additional planting of species from the recommended revegetation species list in Appendix 8 shall be required.

In the first twelve months after planting supplementary watering shall be required in periods of extended dry and hot climatic conditions. **Any plantings that do not survive shall require replacement at the property owner's expense.**

Wild Tobacco shall be treated as a native pioneer species until the native vegetation is established and providing an intact canopy cover, at which time it shall then be controlled.

Newly emerging weeds may be species that are not currently occurring on this site. Weed species that are present in the local area and therefore may germinate on the site in the future and shall require control are outlined in Appendix 7.

Vegetation Management Zone 2

This 10 metre wide zone is the lower creek bank opposite Zone1, i.e. the southern creek bank from the dam wall/roadway east to the eastern boundary of Lot 501. It is currently mown pasture with 1 large Camphor Laurel the only tree. There appears to have been some recent levelling earthworks in the area below the dam wall/roadway.

Initial Works

Initial Works shall involve poisoning and removal of the large Camphor Laurel and blanket spraying of exotic grasses occurring over most of this zone with glyphosate herbicide, followed some weeks later by planting of indigenous species tubestock.

The Restoration Works Schedule in Appendix 11 outlines the estimated labour hours and costs of weed control and revegetation work to establish the sediment and erosion control buffer. The cost of removal of camphor laurels by an aborist is **not included** in the works schedule.

Two areas, each approximately 10m. by 10m. may be left for establishment of creek side picnic/barbeque areas. Any landscaping of these areas **must use only native indigenous species of trees shrubs and groundcovers.**



View from northern side of creek (Zone 1) across to Zone 2. Both sides of creek require revegetation

Weed Control

Weed control in the cleared mown area making up the bulk of this zone should involve blanket spraying of all exotic grasses and herbs with glyphosate herbicide carefully avoiding any areas of native grasses or herbs without intermixed exotics

The large Camphor Laurel should be injected with a glyphosate herbicide and following its death removed by a qualified aborist leaving only the stump.

Revegetation Works

Detailed site preparation and planting requirements are given in Appendix 8

A total of 400 native tubestock of species indigenous to the site should be planted at 2 metre centres throughout the whole zone as mapped, excluding the abovementioned picnic sites. Additionally 200 viro-tubes of indigenous sedge species should be planted randomly along the lower portion of this zone.

Spraying of exotic pasture plants will provide bare soil which may result in limited regeneration of natives from seed imported from the remaining large trees on the northern bank of the creek i.e. Zone1

The list of native indigenous species given below for planting is made up in part of local Sclerophyll species tolerant of periodic inundation and in part of rainforest species also tolerant of some inundation and often found locally in the understory of Swamp Sclerophyll Forest.

These native indigenous species shall be:

- tubestock grown from local provenance seed (i.e. seed collected within a 50 kilometres radius of Coffs Harbour)
- planted using: slow release fertiliser, water retention crystals,
- have weed mats for weed control,
- have large plastic tree guards for protection against Wallaby predation and spray drift when carrying out follow up weed control (**note banana bags shall not be used as a substitute for tree bags**)
- Plants shall be watered on installation and depending on the soil moisture during the plant establishment phase, additional watering may be required.
- Any plants that die within the 5 year covenant period shall be replaced at the owners expense

The following species should be planted in the following numbers

15	Tallowwood(<i>Eucalyptus microcorys</i>)*
5	Flooded Gum(<i>Eucalyptus grandis</i>)*
10	Brush Box(<i>Lophostemon confertus</i>)*
35	Swamp Turpentine(<i>Lophostemon suaveolens</i>)**
45	Cheese Tree (<i>Glochidion ferdinandi</i>)
15	Guioa (<i>Guioa semiglauca</i>)*
45	Sandpaper Fig(<i>Ficus coronata</i>)**
20	Swamp Oak(<i>Casuarina glauca</i>)

55	Broad Leaved Paperbark(<i>Melaleuca quinquenervia</i>)
60	White Bottlebrush(<i>Callistemon salignus</i>)
25	Snow In Summer(<i>Melaleuca linariifolia</i>)
30	Cunjevoi(<i>Alocasia macrorrhizos</i>)
40	Swamp Lily(<i>Crinum pedunculatum</i>)**

* High side

** Low side

The following species of sedge should be planted randomly along the lower part of the zone. These will not require wallaby protection (bagging).

50	<i>Gahnia clarkeii</i>
50	<i>Carex appressa</i>
100	<i>Juncus usitatus</i>

Follow Up work

This shall involve the periodic manual removal and spot spraying of weeds (before seed set). Follow up work shall involve regular weed control and this shall take place every 8 weeks for 2 years and thereafter every 12 weeks for the following 3 years as shown in the Restoration Works Schedule in Appendix 11.

Particular attention is required within a metre diameter of the new plantings to ensure exotic grass species do not become established and compete with the establishing plants for moisture and nutrients.

The revegetation areas will require regular spot spraying of weeds to allow the newly establishing plants unrestricted growth until an intact canopy is formed and thus shading out and inhibiting further weed growth. Once this stage is reached only periodic hand weeding shall be required to allow natural regeneration to occur. The spot spraying shall be carried out with glyphosate as per manufacturer's recommendations.

If plantings have not developed a suitable canopy cover (i.e. shading the entire ground in the screen buffer) within four years, additional planting of species from the recommended revegetation species list in Appendix 8 shall be required.

In the first twelve months after planting supplementary watering shall be required in periods of extended dry and hot climatic conditions. **Any plantings that do not survive shall require replacement at the property owner's expense.**

Newly emerging weeds may be species that are not currently occurring on this site. Weed species that are present in the local area and therefore may germinate on the site in the future and shall require control are outlined in Appendix 7.

Vegetation Management Zone3

This zone is the very narrow strip, only 1 to 2 metres wide, between the boundary with Lot103 DP876697 and the bank of the recently realigned creek. No native trees or shrubs occur, the area being weedy mown pasture.

Initial Works

Initial work shall involve spot spraying of planting sites followed by revegetation work with Swamp Sclerophyll and Riparian species

Weed Control

This will be the spraying with a glyphosate herbicide of 1m.diameter planting sites for trees and shrubs at 2m. centres and 1m.planting sites for Mat Rush(*Lomandra hystrix*) at 2m. centres. This work should be carried out at least 2 weeks before the intended planting date.

Revegetation Works

Detailed site preparation and planting requirements are given in Appendix 8

A total of 30 tube stock of indigenous Swamp Sclerophyll and Riparian species shall be planted at 2m. centres throughout the entire zone as mapped together with 30 tubestock of Mat Rush (*Lomandra hystrix*) at 2m. centres.

These native indigenous species shall be:

- tubestock grown from local provenance seed (i.e. seed collected within a 50 kilometres radius of Coffs Harbour)
- planted using: slow release fertiliser, water retention crystals,
- have weed mats for weed control,
- have large plastic tree guards for protection against Wallaby predation and spray drift when carrying out follow up weed control (**note banana bags shall not be used as a substitute for tree bags**)
- Plants shall require to be watered on installation and depending on the soil moisture during the plant establishment phase, additional watering may be required.
- Any plants that die within the 5 year covenant period shall be replaced at the owners expense

The following species should be planted in the following numbers

4	Swamp Turpentine(<i>Lophostemon suaveolens</i>)**
4	Cheese Tree (<i>Glochidion ferdinandi</i>)
5	Sandpaper Fig(<i>Ficus coronata</i>)**
5	Broad Leaved Paperbark(<i>Melaleuca quinquenervia</i>)
12	White Bottlebrush(<i>Callistemon salignus</i>)
30	Mat Rush(<i>Lomandra hystrix</i>)

Follow Up work

This shall involve the periodic manual removal and spot spraying of weeds (before seed set). Follow up work shall involve regular weed control and this shall take place every 8 weeks for 2 years and thereafter every 12 weeks for the following 3 years as shown in the Restoration Works Schedule in Appendix 11.

Particular attention is required within a metre diameter of the new plantings to ensure exotic grass species do not become established and compete with the establishing plants for moisture and nutrients.

The revegetation areas will require regular spot spraying of weeds to allow the newly establishing plants unrestricted growth until surrounding weeds are suppressed. Once this stage is reached only periodic hand weeding shall be required to allow natural regeneration to occur. The spot spraying shall be carried out with glyphosate as per manufacturer's recommendations.

In the first twelve months after planting supplementary watering shall be required in periods of extended dry and hot climatic conditions. **Any plantings that do not survive shall require replacement at the property owner's expense.**

Vegetation Management Zone 4

This zone includes all other areas of the existing and proposed enlarged Caravan Park.

The existing Park is largely open mown areas with scattered remnant native trees and exotic trees a number of which are known environmental weeds, together with van sites and associated gardens and shade trees. The areas of proposed Park extension (Lot 501) within this zone are largely mown pasture.

The trees within this (and the other) zone were mapped and marked during a survey by Newnham Karl Weir and Partners on 5-05-2008. On re-survey as requested, 4 trees were found to have been removed since original survey. These were all specimen trees on the mown south facing slope leading down to the dam in this zone. They were T3, a Turpentine, T13, a River Oak (probably planted), T14, a Sydney Blue Gum (or possibly Flooded Gum) and T17, a Red Ash.

Coffs Harbour City Council's Biodiversity Guideline No. 4-Compensatory Planting Advice recommends a compensatory planting of 4 endemic plants for each removed tree. We recommend that these 16 endemic plants are well compensated by and included within the extensive plantings in Zones 1, 2 and 3.

This zone requires weed control with removal of all specimens of several known environmental weeds.



Environmental Weeds such as these Cocos Palms require removal in Zone 4

The Zone is to be extensively re-landscaped during the Park extension .A landscape master plan with a proposed plant species list has been prepared by Jackie Amos, Landscape Architect.

The proposed planting list complies with the Bushland Friendly Nursery Scheme list. Prepared by the NSW North Coast Weeds Advisory Committee this list recommends those species of exotic garden plants to avoid due to their known or potential ability to spread into natural ecosystems.

Due to its proximity to important natural areas including wetlands of Bongil-Bongil National Park and the potential of weeds on the site to spread to these areas by water (creek) or birds we feel all plantings must comply to this Bushland Friendly Nursery Scheme list and beyond. For pragmatic reasons this list has been restricted in extent to species most widely available in the region and presenting the most serious known threat. We advise that although not on the BFNS list, three species on the Proposed Plant Species list be not used due to known or potential weediness. These are Silver Trumpet Tree (*Tabebuia argentea*), Blue Ginger (*Dichorisandra thrysiflora*) and Breynia (Breynia Ironstone Range).

We also observed a very recent planting in an area being landscaped of 4 or 5 specimens of Orange Jessamine (*Murraya paniculata*) a shrub on the BFNS list with serious known weed potential. We recommend that these be removed and that the Park owners become fully versed in the BFNS.

Initial Works

Initial work in this zone will involve weed control only.

Weed Control

Initial weed control will involve.

- Direct Injection with Glyphosate herbicide followed after tree death by lopping leaving only stump, or total removal of tree (above ground and roots): medium and large Camphor Laurel, Cockscomb Coral Tree, Umbrella Tree., and Cocos Palm.
- Cut and Paint with Glyphosate herbicide: any saplings or larger seedlings of the above species.
- Hand Removal :seedlings of the above species

Vegetation Management Zone 5

This is a 10 metre wide strip on the northern edge of the dam. This is currently mown lawn with occasional remnant native trees

This zone is to be revegetated with scattered clumps, each of one tree and three shrubs, at 8 metre centres as shown on the Site Plan.

These scattered islands shall be mulched with hardwood chips for ease of maintenance.

Initial Works

Initial work shall involve spot spraying of planting sites followed by revegetation with selected native indigenous species.

Weed Control

This shall involve the spraying of exotic grasses with a glyphosate herbicide of the planting islands, several weeks prior to planting.

Revegetation Works

Detailed site preparation and planting requirements are given in Appendix 8

A total of 20 indigenous tree species shall be planted at 8 metre centres throughout the entire zone as shown on the Site Plan These should be a mix of the following species:

Lophostemon confertus (Brush Box)
Lophostemon suaveolens (Swamp Turpentine)
Syncarpia glomerulifera (Turpentine)
Jagera pseudorhus (Foambark)
Hymenosporum flavum (Native Frangipani)
Elaeocarpus reticulatus (Blueberry Ash)
Elaeocarpus obovatus (Hard Quandong)
Callistemon saliginus (White Bottlebrush)

A total of 60 indigenous shrub species shall be planted in the 20 planting islands, these shall be a mix of the following species:

Archirhodomyrtus beckleri (Rose Myrtle)
Pittosporum undulatum (Native Daphne)
Pittosporum revolutum
Pilidistigma glabrum (Plum Myrtle)
Cordyline stricta (Narrow Leaved Palm Lily)

These native indigenous species shall be:

- grown from local provenance seed (i.e. seed collected within a 50 kilometres radius of Coffs Harbour)
- planted using: slow release fertiliser, water retention crystals,

- Mulched with hardwood chip for weed control,
- Plants shall be watered on installation and depending on the soil moisture during the plant establishment phase, additional watering may be required.
- Any plants that die within the 5 year covenant period shall be replaced at the owners expense

Follow Up work

This shall involve the regular mowing of grassed area and periodic manual removal and spot spraying of weeds within the island clump plantings.

Particular attention is required within a metre diameter of the new plantings to ensure exotic grass species do not become established and compete with the establishing plants for moisture and nutrients.

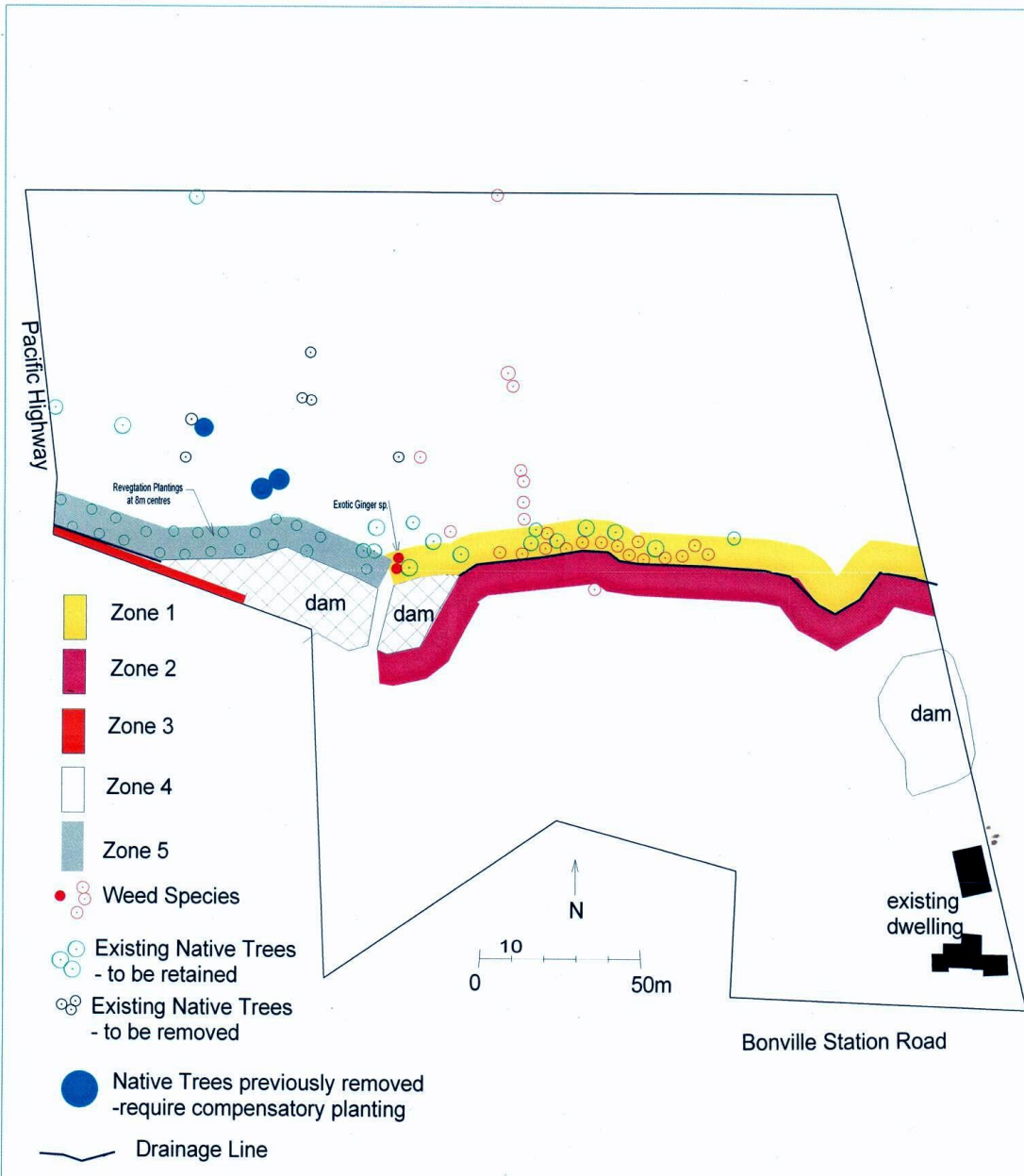
In the first twelve months after planting supplementary watering shall be required in periods of extended dry and hot climatic conditions. **Any plantings that do not survive shall require replacement at the property owner's expense.**

Appendix 1: Aerial Photograph



VMP. Bonville Caravan Park. September 2009
Coffs Harbour Bushland Regeneration Group P/L Tel: 0427562459

Appendix 2: Site Map

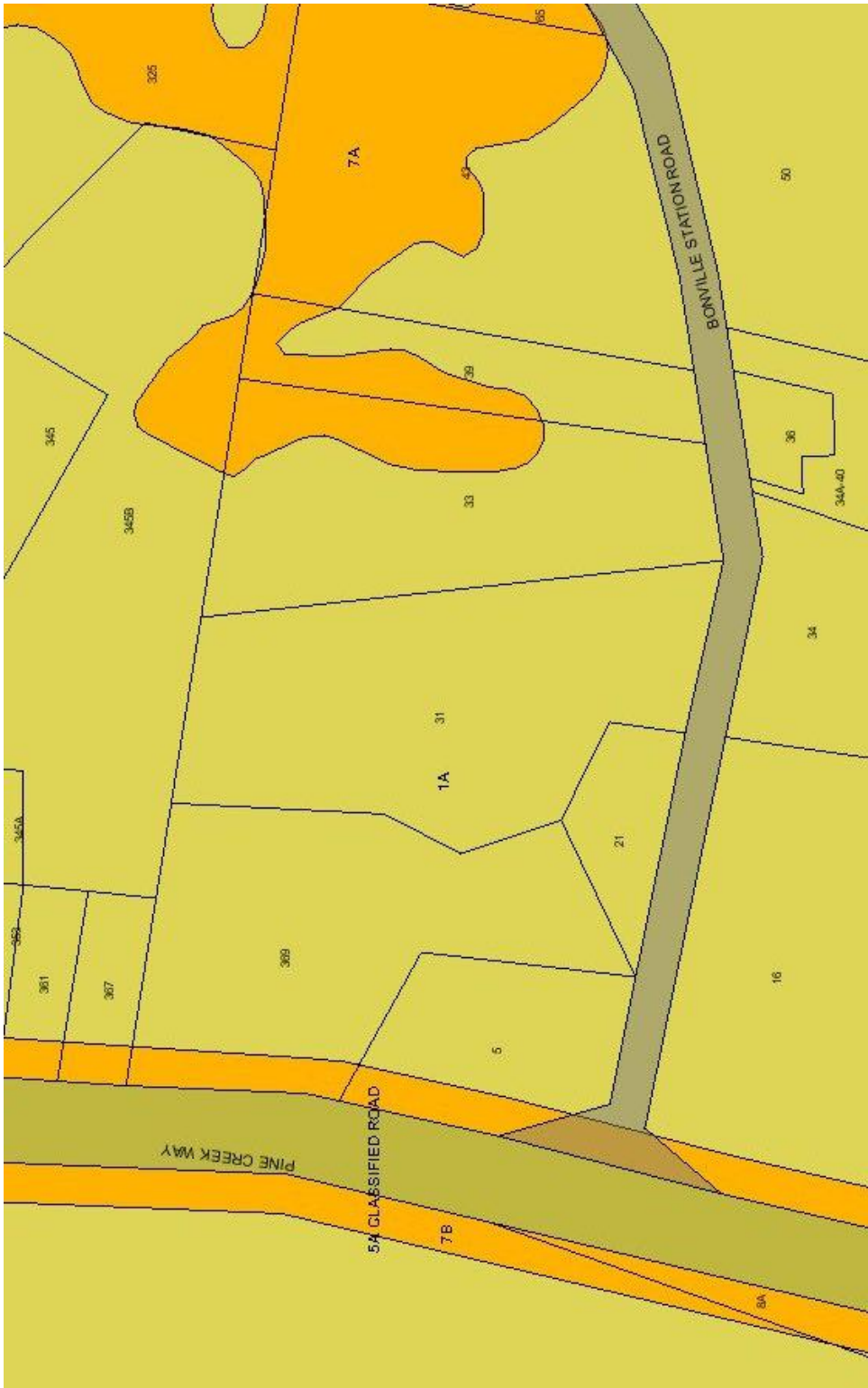


Vegetation Management Plan - Bonville Caravan Park
 Coffs Harbour Bushland Regeneration Group Pty Ltd

Title/Dwg No.	Appendix 2: Site Plan
Drawn:	Date: Sept 2009 Scale:

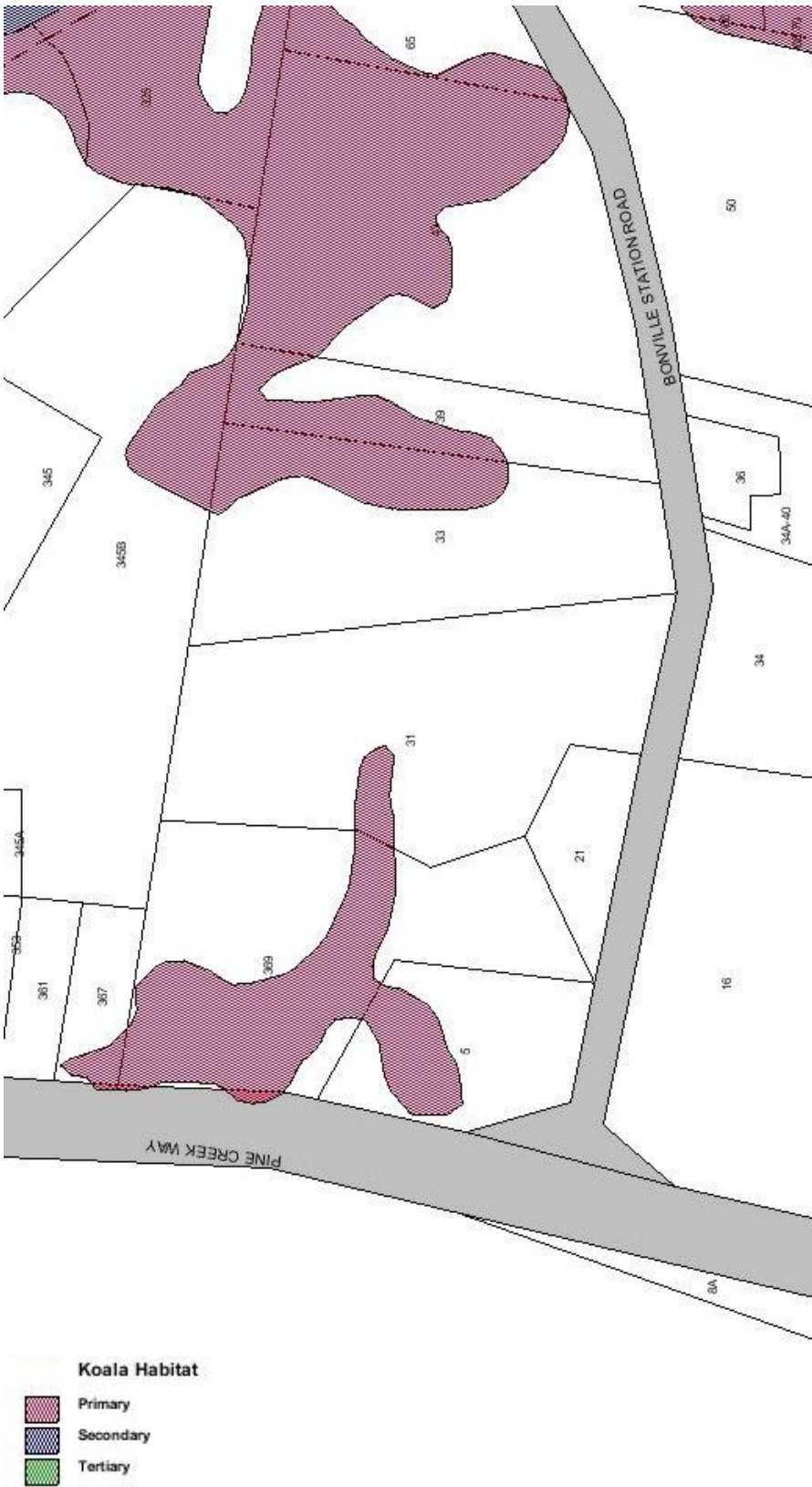
A4

Appendix 3: LEP Mapping



VMP. Bonville Caravan Park. September 2009
Coffs Harbour Bushland Regeneration Group P/L Tel: 0427562459

Appendix 4: Koala Habitat Mapping



Appendix 5: Native Flora Species List.

This species list has been compiled during the search for threatened species; although it is reasonably comprehensive it is not a complete list of the species present on the site. As no native trees or shrubs occur in either Zone 2 or Zone 3 these zones are not included in the table.

Botanical Name	Common Name	Zone 1	Zone 4	Zone 5	Habit
<i>Acacia melanoxydon</i>	Sally Wattle	R			Tree
<i>Alphitonia excelsa</i>	Red Ash	O	R		Tree
<i>Backhousia myrtifolia</i>	Grey Myrtle	O			Tree
<i>Billardiera scandens</i>	Common Apple Berry	R			Vine
<i>Breynia oblongifolia</i>	Breynia	R			Shrub
<i>Callicoma serratifolia</i>	Black Wattle	O			Tree
<i>Calochlaena dubia</i>	Common Ground Fern	O			Fern
<i>Cryptocara microneura</i>	Murrogun	R			Tree
<i>Cryptocarya glaucescens</i>	Jackwood	R			Tree
<i>Duboisia myoporoides</i>	Duboisia	R			Tree
<i>Eucalyptus grandis</i>	Flooded Gum	O	R		Tree
<i>Ficus coronata</i>	Creek Sandpaper Fig	O			Tree
<i>Geitonoplesium cymosum</i>	Scrambling Lily	R			Vine
<i>Glochidion ferdinandi</i>	Cheese Tree	R			Tree
<i>Guioa semiglauca</i>	Guioa	O			Tree
<i>Jagera pseudorhus</i>	Foambark	R			Tree
<i>Lophostermon confertus</i>	Brushbox	O		R	Tree
<i>Lophostemon suaveolens</i>	Swamp Turpentine			R	Tree
<i>Maclura cochinchinensis</i>	Cockspur Thorn	R			Vine
<i>Melaleuca quinquinervia</i>	Broad Leaved Paperbark	R	R		Shrub
<i>Oplismenus imbecillus</i>	Creeping Beard Grass	O			Grass
<i>Ozothamnus diosmifolius</i>	White Dogwood	R			Shrub
<i>Persicaria strigosa</i>		C			Herb
<i>Pittosporum revolutum</i>	Hairy Pittosporum	R			Shrub
<i>Pittosporum undulatum</i>	Sweet Pittosporum	R			Tree
<i>Pteridium esculentum</i>	Bracken Fern	O			Fern
<i>Ripogonum discolor</i>	Prickly Supplejack	R			Vine
<i>Ripogonum fawcettianum</i>	Small Supplejack	R			Vine
<i>Rubus rosifolius</i>	Native Raspberry	R			Herb
<i>Smilax glycyphylla</i>	Sweet Sarsaparilla	R			Vine
<i>Stephania japonica</i>	Snake Vine	R			Vine
<i>Syncarpia glomulifera</i>	Turpentine	O	O	R	Tree
<i>Syzygium smithii</i>	Lily Pily	O			Tree
<i>Tabernaemontana pandacaqui</i>	Banana Bush	R			Shrub
<i>Trochocarpa laurina</i>	Tree Heath	O			Tree
<i>Wikstroemia indica</i>	Wikstroemia	R			Shrub

Appendix 6: Weed Species List

Botanical Name	Common Name	Zone1	Zone 2	Zone4	Habit
<i>Cinnamomum camphora</i>	Camphor Laurel	C	R	O	Tree
<i>Erythrina crista-gali</i>	Cockscomb Coral Tree	C		R	Tree
<i>Paspalum wettsteinii</i>	Broad leaf Paspalum	C			Grass
<i>Ageratina adenophora</i>	Crofton Weed	O			Shrub
<i>Ageratum houstonianum</i>	Blue Billygoat Weed	O			Herb
<i>Ligustrum sinense</i>	Small leaved Privet	C			Tree
<i>Schefflera actinophyllum</i>	Umbrella Tree	O		R	Tree
<i>Hypoestes phyllostachya</i>	Freckle Face	C			Herb
<i>Ochna serrulata</i>	Mickey Mouse Plant	O			Shrub
<i>Senna pendula</i>	Eastern Cassia	R			Shrub
	An exotic Ginger	O			Herb
<i>Syagrus romanzoffianum</i>	Cocos Palm			R	Tree

Appendix 7: Weed Profiles and Control Techniques

The weed species shown in Appendix 8 include those that are currently present on the site as well as those species that are not present at this point in time, but that do occur in the local area.

Weed Profiles

Weeds marked with an * although not currently listed on the CHCC environmental weed list are recognized as being bushland weeds by bushland regenerators/ecologists.



***Ageratina adenophora* (Crofton Weed)** erect multi stemmed perennial herbs up to 1-2 metres high grows in full sun or shade but enjoys moist sites especially, and bare soil. Wind dispersed seeds. Forms dense cover inhibiting natural regeneration. **Class 4 noxious weed**

Control: manually remove or; spray seedlings with glyphosate; mature plants can be sprayed with Grazon (following manufacturers

recommendations). Metasulfuron-methyl is also effective and results in less off target damage but is not registered for this weed.

***Ageratina riparia* (Mistflower)**



A scrambling perennial groundcover to 1m in height. White “mists” of flowers. Narrow, opposite toothed leaves. Mostly found in wet areas but not restricted to any soil or aspect. Forms dense mats preventing regeneration of native species. Leachate from leaves and plant litter have a harmful effect on other plants (Alleopathic). The many seeds are easily spread by wind and water. Roots form when stems hit the ground, forming a dense mat. Also spread by contaminated produce. **Class 4 noxious weed**

Control Methods: manually remove ; spray seedlings with glyphosate; mature plants can be sprayed with

Grazon (following manufacturers recommendations). Metsulfuron-methyl is also effective and results in less off target damage but is not registered for this weed.

***Ageratum houstonianum* (Blue Billy Goat Weed)** erect or decumbent annual herb to 1 metre in height. Likes wet sites. Dispersal mechanisms wind, water, animals, machinery. Forms dense cover inhibiting natural regeneration. Mulch / plant out to reduce germination of seed

Control manual removal or spray with glyphosate requires follow up.

***Andropogon virginicus* Whiskey Grass** A tufted erect brownish perennial grass with solid stems. Flower/ seed heads are long and narrow.

Control Methods: Spray (100:1)/ wick-wipe with glyphosate.



***Anredera cordifolia* (Madeira Vine)** Climber with soft fleshy leaves, aerial tubers forms on stems, flowers small greenish/ white and fragrant. Spreads when tubers drop to ground and regrow. Forms very thick infestations, often smothering trees, particularly in rainforest.

Control: Small plants spray with Metsulfuron-methyl and surfactant. Large plants need to be carefully scrape and painted with Metsulfuron-methyl (1g to 1 litre) or Glyphosate. Care needs to be taken as severing the stems will result in the drop of all aerial tubers. Large plants can also be treated by scraping and painting at ground level and then inserting the scraped portion of the stem into a small container of Metsulfuron-methyl (1g to 1 litre) and leave for several days.

***Araujia hortorum* (Moth Vine)** Climber with twining stems, 5-10m in height. Large grayish green leaves. White milky sap. White flower. Produces choko like fruit encasing feathery (airborne) seeds. Seed longevity high. Smothers native vegetation. Can be confused with the native moth vine (*Marsdenia* sp.) one of which is on the threatened species list.

Control: Hand remove ensuring all roots removed. Cut /scrape and paint with glyphosate. Bag and remove any fruit.

***Ardisia crenata* (Ardisia)** Small shrub. Lanceolate oblong dark glossy green leaves with slightly wavy margins. White sweet scented flowers followed by bright red berries. Can grow in full shade.

Control Can be difficult to remove manually due to long taproot. Cut and paint with glyphosate.

***Baccharis halimifolia* (Groundsel Bush)** Shrub or small tree. Wind dispersed seeds over short distance. **Class 3 noxious weed**

Control Methods: small plants manual removal larger specimens cut and paint with glyphosate. Spray with Grazon at manufacturers recommended rate

***Bidens pilosa* (Farmers Friends)** slender tall annual (or short lived perennial) herb of disturbed areas. Produces large amounts of seed with high longevity. Only germinates on bare soil mulch or plant out to reduce.

Control Methods: Manual removal or spray with glyphosate.

***Bromelia* sp.** Evergreen garden plant. Stem short and tubular. Leaves pale green arching form.

Control Methods Hand Remove.

***Canna indica* (Canna Lily)** Perennial erect herb with a rhizome. Large light green sheathing leaves. Red flower followed by viable black capsule.

Control Manually remove all of rhizome (difficult). Spray with Metsulfuron-methyl.

***Cardiospermum grandiflorum* (Balloon Vine)**



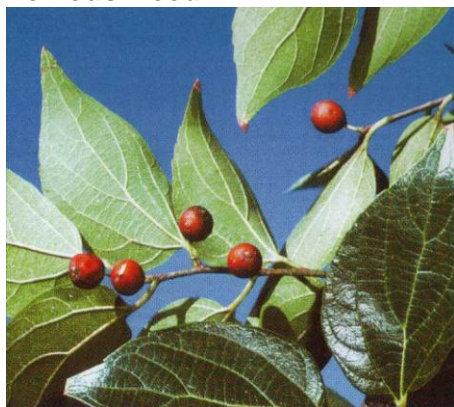
A climber with tendrils and stems up to 10m long. Leaves are bright green with 'biternate' arrangement with 3 sets of 3 leaves on each leaf stem. The stems and leaves are covered with soft hairs with the stem often having reddish ribs. Small, white flowers are present summer to autumn. The fruit/seed is a green, papery, inflated capsule, and is produced any time of year. Can grow vegetatively from stem fragments. Vigorous climber that can smother and kill native trees.

Control Methods: Seedlings can be manually removed.

For more mature plants cut, scrape and paint with herbicide (glyphosate).

Alternatively cut stems allow to reshoot and then spray the regrowth with glyphosate.

***Celtis sinensis* (Chinese Celtis)** Deciduous tree to 15 metres. Green serrated leaves. Small reddish brown fruit. Serious environmental weed declared **Class 3 noxious weed** .



Control: Large specimens direct inject with glyphosate. Saplings cut and paint with glyphosate. Small plants hand remove.



***Cestrum parqui* (Green Cestrum)** Woody shrub up to 3 metres tall. Deep green glossy leaves. Flower greenish to yellow. Fruit a black berry. **Class 3 noxious weed**

Control methods: Hand weed small plants. Cut and paint larger specimens with glyphosate.

***Cinnamomum camphora* (Camphor Laurel)** large trees of spreading habit can grow up to 25-30 metres.

Abundant seed production dispersed mainly by birds. Can also form dense stands by suckering

Control Methods Direct injection/ cut and paint with glyphosate.

***Chloris gayana* (Rhodes Grass)** erect tufted stoloniferous grass to 1.2 m high, perennial

Control Methods crown tuft with knife or mattock. Remove stolon, glyphosate in late spring early summer.

***Coffea arabica* (Coffee Plant)** Large shiny green leaves with wavy margins forms red berries (from which Coffee is produced). Seedlings germinate prolifically.

Control Manually remove or cut and paint with glyphosate.

***Colocasia esculenta* cv. Fontanesii (Ornamental Taro):** Robust herb to 1m , large purple leaves (60 cm long 30 cm wide). Large underground tubers. Likes wet open sites. Can colonize sites densely and rapidly.

Control: manual removal (must remove all underground tubers). Can control with herbicide by spraying or injecting with Glyphosate & Metasulfuron-methyl mix ('Cut out'), but this is problematic as species usually inhabits areas that are waterways or wetlands.

***Conyza albida* (Fleabane)** Single stem, erect annual herb up to 1.5m high. On disturbed sites. Control methods Manual removal or spray with glyphosate.

***Cortaderia selloana* (Pampas Grass)** Large tussock grass to 2 metres width to 1 metre. Leaves to 2 metres in length and to 3.5cm wide, blue green above darker green below. Flower stem to 6 metres, large silvery white panicle to 80cm. Dense infestations can invade and replace native communities and also provide heavy fuel load for fires.

Control methods: Spray with glyphosate (75:1) with surfactant added. Alternatively to reduce risk of fire, brushcut then manually remove rhizome or spray regrowth

***Delairea odorata* (Cape Ivy)** vigorous, twining perennial herb with succulent stems many metres long. Forms dense mats smothering low vegetation. Spreads vegetatively, does not set seed in northern NSW.

Control Methods Manual removal or spray with Metasulfuron-methyl.

***Desmodium uncinatum* (Velcro Weed)**

Herb/scrambler that forms dense smothering mass. Trifoliate leaves. Leaves hairy upper surface with a silver stripe. Stem is densely hairy with hooked hairs. Flowers pink to mauve or white. Seeds contained in pods covered with hooked hairs.



Control Methods Hand remove minor infestations (including root system) bag and remove from site if seeding. Major infestations spray with Metasulfuron-methyl (*Brush-off*)

***Eriobotrya japonica* (Loquat)** Evergreen tree with dark glossy green foliage, hairy underneath. Fragrant yellow/white flowers borne on stiff woolly panicles. Yellow fruit.
Control Manually remove small seedlings. Mature specimens cut and paint or direct inject with glyphosate.

***Erythrina crista-galli* (Cockscomb Coral Tree)** Deciduous tree up to 6 metres in height. Prickles on trunks and branches. Flowers scarlet tube shaped held in clusters. Problem weed in north of NSW and Queensland.

Control Methods direct injection with glyphosate. Cut and paint saplings with Glyphosate. Spray seedlings with Glyphosate and surfactant.

***Erythrina x sykesii* (Coral Tree)** Deciduous tree, hybrid up to 15 metres in height. Easily re grows from sections of stem/ branches, suckers from large sections of roots.

Control Methods direct injection with glyphosate.

***Eucalyptus torelliana* (Cadaghi)** A native of North Queensland that has been planted for horticultural / plantation purposes in NSW where it has become an invasive species.

Control Methods: Large specimens direct inject (or remove totally in areas where falling branches may create a public safety issue). Seedlings may be sprayed with glyphosate or hand weeded.



***Gleditsia tricanthos* (Honey Locust)**

Deciduous tree to 10 metres. Flowers in spring producing golden yellow flowers. Stout spines present on branches and trunk. Compound bipinnate leaves. Seed pods 15-40 cm long enclosing large dark brown seeds. Grows readily from seed/ cuttings and suckers freely forming dense thickets. **Class 3 noxious weed**
Control Methods: Direct inject with undiluted glyphosate/ cut and paint smaller specimens.

***Gomphocarpus fruticosus* (Cotton Bush)** erect perennial shrub with narrow dull green leaves. Exudes milky sap when damaged. Large green ovoid fruit covered in long silky hairs.

Control Manually remove. Cut and paint/ spray with glyphosate.

***Hedychium gardnerianum* (Kahili Ginger)** perennial herb to 2.5 metres high. Prefers damp areas on good soil. Large yellow orange flower with red filaments. Produces seed attractive to birds. Thick fleshy rhizome near soil surface.

Freckle Face/Polka Dot Plant herbaceous garden/indoor plant that rapidly infests areas. Long thin dark green leaves with pink spots.

Control Methods Difficult to completely manually remove. Spray with Metasulfuron-methyl

Ice-Cream Bean (*Inga paterna*) Evergreen tree to a height of 17 metres. Leaves compound and pinnate with 6-8 leaflets 15cm long with woolly undersurface. Flowers are white & pea shaped. The fruit are pods 15 cm long.

Control Methods: Hand remove small seedlings; cut and paint saplings; direct inject /frill larger specimens.



***Ipomea cairica* (Mile a Minute)** Vigorous, perennial with trailing and twining stems. Palmate shaped leaf with pink- purple flowers. Produces seed spread by wind/ gravity, also spreads vegetatively

Control Methods Manual removal by gently pulling up runners, cut and paint larger stems. Spray with glyphosate during period of rapid growth.



***Ipomea indica* (Morning Glory)** A vigorous vine which can smother trees and whose stolons can penetrate and establish metres into native vegetation. It is widely naturalized in coastal districts of N.S.W.

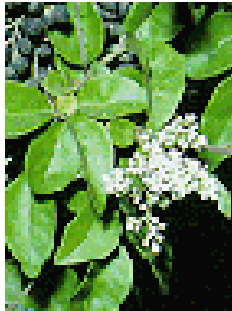
Control Methods Manual removal by gently pulling up runners, scrape and paint larger stems. Spray with Glyphosate during period of rapid growth.

***Koelreuteria paniculata* (Golden Rain Tree)** Deciduous tree with long pinnate leaves and large terminal panicles of yellow flowers.

Control Methods Cut and paint or direct inject with glyphosate.

***Lantana camara* (Pink/ Red Lantana)** Perennial, scrambling thicket forming shrub to 3m high. Stems multi branched sprawling to 5m long with prickles. Can be vine like and climb trees. Grows best in fertile moist disturbed sites. Black fruit spread by birds. Red flowering form **Class 3 noxious weed** .

Control methods Manual removal of taproot, mechanical removal with follow up. Stems lying on ground may re shoot. Cut and paint base with glyphosate. Spray with glyphosate (Red form needs penetrant added)



***Ligustrum lucidum* (Large leaf Privet)** can grow to large tree. Likes fertile moist sites. Can dominate rainforest and wet sclerophyll forest. Produces masses small berries spread by birds or water. Germinate in even shady conditions. Coppices from base. **Class 4 noxious weed**

Control methods small seedlings manually remove or spray with Metasulfuron-methyl. Cut and paint mature specimens with glyphosate. Direct inject mature specimens with glyphosate.

***Ligustrum sinense* (Small Leaf Privet)** Large shrub small tree to 4m high. Moist fertile sites. Can slowly establish on undisturbed sites in shady conditions. Small berry with short viability spread by birds and water. Coppices from base and suckers from roots **Class 4 noxious weed**

Control methods small seedlings manually remove or spray with Metsulfuron-methyl. Cut and paint mature specimens with glyphosate. Direct inject mature specimens with glyphosate.

***Lonceria japonica* (Japanese Honeysuckle)** Woody twining climber or small shrub with a dense smothering habit. Leaves dark green above lighter below. Flowers tubular 30mm long, white tuning yellow, sweetly fragrant. Fruit is a small black shiny berry, spread by birds. Can regrow from stem nodes.

Control methods Manual removal with care to remove all root forming nodes. Cut and paint or scrape and paint with glyphosate. Spray with herbicide (Metasulfuron-methyl) where no desirable vegetation may be damaged (or cut back then spray regrowth). Follow up needed for all techniques.



***Macfadyena unguis-cati* Cats Claw Creeper**

Large woody vine to 30m+, distinguished by three tiny hooked claws on the end of tendrils. Leaves dark green with new foliage being red. From spring to summer, bright yellow flowers with orange lines are present. Produces seed capsule 15-45cm long containing winged seeds that are wind and water dispersed. Can germinate and grow in shade so can easily invade undisturbed bushland. Forms

underground tubers. Grows rapidly and totally smother and kill mature trees.

Control Methods: Spray seedlings with glyphosate (100:1). Cut stems and apply glyphosate (undiluted), or pull young stems from tree and spray with glyphosate (100:1) can also drill an inject large stems with glyphosate (undiluted).

***Macroptilium atropurpureum* (Sirato)** Twining herb with stems 2-3 metres long. Dark purple pea like flower with long slender pods.

Control Methods Care must be taken when removing by hand due to large root system. Seed pod collection and disposal is important to ensure eradication. Scrape and paint with glyphosate is effective.

****Monstera deliciosa* (Fruit Salad Plant)** Evergreen vine to a height of 5 metres. Glossy large green perforated leaves with deeply incised margins. Flowers are greenish similar to that of an Arum Lily. Fruit are edible cob like spikes.

Control methods: Hand remove

***Nephrolepis cordifolia* (Fishbone Fern)** endemic to the far north coast of NSW and Queensland but has become an invasive species that develops dense infestations excluding endemic native vegetation. Erect fronds covered with brown spores on the back. Rhizomes are connected by wiry stolons.

Control Methods Manually remove by digging up entire plant including rhizomes and bag and remove from site (dispose of responsibly -garden waste dumping of this weed in bushland is a serious problem). Large infestations may be sprayed with Metasulfuron methyl.

***Ochna serrulata* (Mickey Mouse Plant)** Shrub 2-3 metres high. Dark green-toothed oblong leaves, new foliage bronze coloured. Conspicuous fruit with bright red sepals holding 5 glossy green fruit that ripens to black. Well-developed taproot, which can reshoot from considerable depth, makes control difficult.

Control Methods Hand remove small specimens (only when soil is moist to prevent root snapping. Scrape and Paint (glyphosate) is generally more effective than cut and paint. Better results achieved by painting bottom third of plant around entire circumference of stem with Starane mixed with diesel @ 5ml Starane to 100ml diesel. Small seedlings can be sprayed with Starane @ 65ml to 10L water.

****Paspalum urvillei* (Giant Paspalum)** tufted perennial grass, large up to 2.5m high. Distinguished by its long (up to 12cm) and more numerous racemes (12-20)

Control methods Manual removal for minor infestations/ major infestations spray with glyphosate.

****Paspalum wettsteinii* (Broad Leaf Paspalum)** tufted perennial, which can grow in moderately shady conditions. Can form extensive dense infestations inhibiting or preventing regeneration.

Control methods manual removal (remove crown and adventitious roots) for minor infestations or those surrounding young native specimens. For major infestations spray with glyphosate and follow up with mulching and planting's.

***Passiflora edulis* (Edible Passionfruit)** A climber with auxillary tendrils glossy green leaves trifoliate shape. Produces edible back/ purple/yellow fruit.

Control methods large specimens manually remove or cut and paint with glyphosate.

***Passiflora subpeltata* (White Passionflower)** A climber with axillary tendrils.

Smother plants and trees in forest edges and gaps, as well as disturbed sites. Grey/green leaves with waxy coating. Fruit spread by birds and animals. Reshoots from any root part left in ground.

Control methods large specimens manually remove or cut and paint with glyphosate. Spray with penetrant when young or cut and spray when reshoots

****Pennisetum clandestinum* (Kikuyu)** Rhizomatous and stoloniferous aggressive, creeping coarse perennial grass often mat-forming. Inhibits seedling growth and prevents regeneration.

Control methods Spray with weak rate glyphosate.

****Pennisetum purpureum* (Barner Grass)** A robust stoloniferous, perennial grass forming large bamboo like clumps to 7m high.

***Phoenix dactylifera* Date Palm** characterized by numerous bright yellow spines that arm the short frond stalk.

Control Methods Cut and paint with glyphosate when small. Direct inject larger specimens

***Pinus sp.* (*P. radiata*, *P. elliotii*) Pine Tree** Evergreen with alternate needle like spreading leaves. Forms cones.

Control Methods Cut tree down or ringbark as cannot regrow from stump.

***Protasparagus aethiopicus* Ground Asparagus** dense ground smothering spiny herb, preventing or discouraging regeneration. Can reach size of up to 2 metres wide Grows in dense shade but prefers areas of higher light. Prefers sandy soils of littoral rainforest. Short thick rhizome and forms mat of tuberous roots- can regrow from rhizome but not from tuberous roots. Produces long-lived bird attractive seed



Control Methods Hand pull small seedlings; manually remove larger plants by removing rhizome from plant no need to remove tuberous roots. Spray with Metsulfuron-methyl.

***Protasparagus plumosus* Climbing Asparagus** climber with wiry stems, forms dense layer, which smother plants and inhibit regeneration. Produces bird attractive fruit and has woody rhizome that regrows.

Control Methods small infestation handpull seedlings, larger plants manually remove all rhizomes. Larger infestations cut and paint or cut and allow to reshoot before spaying regrowth. Spray with Metsulfuron-methyl

***Psidium cattleianum* Cherry Guava** Shrub or tree to 6 metres. Purplish red fruit. Has the ability n invade undisturbed native vegetation.

Control: Hand remove small seedlings. Cut and paint larger specimens with glyphosate (cutting close to the ground as possible).

***Raphiolepis indica* Indian Hawthorn**

Shrub 1 to 1.5 high. Dark green leathery leaves, slightly toothed. Small white flowers with red centers. Small bluish fruit.

Control Methods: Hand pull small seedlings. Cut and paint larger specimens with undiluted glyphosate.

***Rivina humilis* Coral Berry**

small shrub to 1 metre high. Dark green leaves. Produces small red globular berries

Control Manually remove or cut and paint with glyphosate (remove and bag any berries present). Spray with glyphosate.

***Rubus fruticosus* Blackberry**



A perennial scrambling shrub to 3m high. **Class 3 noxious weed** Hook-spined canes grow to 6m long. New plants form when they meet the ground. Fruit a segmented red berry ripening to black. The many fruits are eaten and spread by birds and foxes. May be confused with native *Rubus* species which are distinguished by lighter green leaves and finer thorns.

Control Methods: Spray with Metsulfuron-methyl at the manufacturer's recommended rate.

***Schefflera actinophylla* Umbrella Tree** Native of North Queensland, tree to 10m high often multi stemmed and sometimes epiphytic. Red fruit dispersed by birds. Adventitious roots form readily from stem segments left in contact with ground.
Control methods Cut and paint or direct inject with glyphosate.

***Schinus terebinthifolia* Broad-leaf Pepper Tree**



Tree to 16m in height with dense spreading crown. Dark glossy green leaves with prominent cream venation. Produces masses of red/pinkish berries in winter/spring. Leaves have a peppery smell when crushed. Has been known to cause allergic reactions in some people care needs to be taking when removing trees as to avoid inhaling toxins that may be released when cutting or wood chipping trunk and branches. Significant environmental weed with a serious large

infestation at Sapphire. **Class 3 noxious weed**

Control Methods: Manually remove small seedlings, cut and paint saplings with glyphosate, larger trees direct inject with glyphosate.

***Senecio madagascariensis* (Fireweed)** Spreading herb up to 50cm high with bright yellow daisy like flowers present spring to autumn. Produces numerous white fluffy seeds. Commonly mistaken for a native fireweed *Senecio lautus*, which is found more commonly on dunes. Identification between the two involves counting the involucre bracts. Generally *S. madagascariensis* has 20-21 bracts and *S. lautus* has 15-18 bracts.

Control Methods: Manually remove taking care not to place on ground as will re root (bag and remove from site). Spray with Bromoxynil 1.4-2.8L in 110-220L of water per hectare. Spray young, actively growing plants during autumn/winter. Use low rate before flower budding, higher rate for early flowering. Will not be effective on mature plants in full flower.

***Senna pendula* var. *glabrata* (Eastern Cassia/Senna)** Large shrub to 3m. Can regrow from larger sections of taproot and main laterals. Seeds dispersed by birds, water, and gravity, germinate prolifically.

Control methods Cut and paint with glyphosate, direct inject larger specimens, spray large infestations of seedlings with glyphosate 9 hand remove small infestations)

***Sida rhombifolia* Paddy's Lucerne** Perennial erect herb to 1m. Grows in sunny or disturbed areas and on compacted soils. Strong deep taproot.

Control methods difficult to remove by hand especially in heavy soils. Cut and paint or spray with glyphosate.

***Setaria palmifolia* Palm Grass** Tufted perennial grass to 1.5 metres high. Leaves 'pleated'. Flower a creamy white/yellow silky panicle to 80 cm long. Forms dense infestations especially near water courses.

Control: Small infestations dig out plant with mattock. Larger infestations spray with glyphosate. Care must be taken not to pollute watercourses

***Solanum mauritianum* Tobacco Bush** Perennial shrub or small tree to 4m, densely tomentose especially under surface, Produces fruits which are eaten by many native fauna. High seed longevity requires light for germination. In many cases can be left as part of a rainforest regeneration process as; provides shade which represses many annual weeds but allows growth of third stage pioneer species and attracts birds and bats which bring in native seeds from other areas.

Control Methods if removal is necessary cut and paint with glyphosate.

***Solanum seforthianum* Brazillian Nightshade** Sprawling vigorous climber with light green divided leaflets. Flowers violet in colour with typical form of those in the Solanum family (e.g. similar to tomato/ potato flower). Produces masses of bright red berries that hang in bunches. Berries are bird attractive and this plant is therefore spread easily. Aggressively smothers native vegetation.

Control Methods: Hand remove or for larger vines scrape and paint with glyphosate.

***Sphagneticola trilobata* Singapore Daisy** A perennial creeper found on the edges of rainforests and coastal dunes. It has coarse bright green leaves. Flowers are yellow and daisy like. This weed re-shoots very easily and when well established can smother other plants.

Control Method: Hand-pull small plants. Be sure to remove all parts of this plant from the site as they will re-shoot. Spray with metasulfuron-methyl.

***Sporobolus indica* var. *major* (Giant Parramatta Grass)** tufted perennial growing on poor or compacted soils and disturbed sites. Seed adheres to animals, vehicles, and water. **Class 3 noxious weed**

Control Methods small infestations hand remove or spot spray with glyphosate.

***Syagrus romanzoffianam* Cocos Palm** Large Palm with drooping feathery type fronds. Produces masses of orange coloured fruit that hang in large panicles. Very attractive to fruit Bats which aid in the spread of the seed. Germinates readily.

Control Methods Larger specimens can be felled with no need to apply herbicide, as they will not regrow, direct injection with herbicide for specimens that are to be left in situ. Smaller specimens and seedlings need to be either cut and painted or manually removed (including the root system) as spraying herbicide is not effective.

****Syngonium* sp. Prayer Plant/ Arrowhead Vine**

Vigorous climber to 3 metres. Glossy spear shaped leaves dark to light green in colour (dependant on light levels where it grows). Can also have variegated leaves with a creamy colour towards the centre with light green edges. Forms roots at nodes. Can produce seedpods encasing bright red seeds when well established up a tree etc (not known if these are viable). Difficult to control due to its resistance to most herbicide sprays.

Control Methods: Spray with glyphosate at a rate of 50:1 with LI 700



***Tagetes minuta* Stinking Roger** Very erect annual herb, strongly aromatic, which grows on disturbed sites. Flowers February –April.

Control methods Small infestations hand remove, larger ones spray with glyphosate.

***Tecoma stans* Yellow bells** A shrub or small tree, often to 4m in height. Widely grown for its bright yellow trumpet-like flowers. Flowers between spring and summer producing yellow flowers with reddish lines at the base. Large pods contain many seeds that are easily spread by wind **Class 3 noxious weed**



Control Method: **Hand-pull or foliar spray seedlings with herbicide. Cut and paint saplings. Frill or stem inject herbicide into sapwood of mature trees.**

***Tithonia diversifolia* Japanese Sunflower** tall perennial herb 2-5 metres tall, large toothed leaves. Flowers April- June. Wind dispersed seeds long seed longevity.

Control Methods manually remove smaller plants. Cut and paint larger specimens (low to ground to avoid plant re shooting) or preferably drill and apply herbicide. Care must be taken as stems placed directly on the ground will commonly grow roots from nodes.

***Tradescantia flumensis* Tradescantia (Wandering Jew)**

Perennial creeping succulent herb rooting well from well-defined nodes. Invasive weed grows vigorously, smothering low growing shrubs herbs and seedlings of native species, inhibits regeneration. Likes moist fertile sites can grow in dense shade or full sun. Spreads vegetatively.

Control methods manually rake and roll with repeated maintenance. Spray with glyphosate-repeated follow up required.



***Triadica sebera* (Chinese Tallow)**

A deciduous tree growing to a height of 12 metres. Flowers are yellowish and occur in elongated clusters. The fruit is a splitting capsule that exposes large, white seeds.

Control Methods: Hand-pull or foliar spray seedlings with herbicide. Cut and paint saplings (glyphosate).

Direct inject mature trees (glyphosate). **Class 3 noxious weed**

***Verbena* sp. Purple Top** Tall, erect, perennial herb of sunny disturbed areas. Purple flower and square stem.

Control methods Weed manually infestations (rarely dense).

Weed Control Techniques

- 1) **Cut and paint:** This method applies to all woody shrubs, trees and some vines. cutting stem of plant as close to the ground as possible, also scraping sides lightly to reveal green tissue
apply chemical(usually undiluted glyphosate) immediately (within 15 seconds)

- 2) **Scrape and Paint** This method is applicable to many species of vines where it is desirable to treat the vine intact, particularly those with aerial tubers (e.g. Madeira Vine) or those that will propagate from segments.
 - i. Scrape the stem **on one side of the stem only** for 20- 30 cm if possible
 - ii. Apply herbicide immediately.

- 3) **Direct Inject** This method applies to all woody trees and shrubs with a diameter of about 6- 10cm or greater
 - i. Make cuts into the trunk (as low down as possible) with a tomahawk. Make cuts the width of the blade at a slight angle. Or preferably make drill holes with cordless drill. Holes or cuts shall be angled downwards into the trunk to prevent herbicide escape.

- ii. Apply herbicide immediately into the cut or hole
 - iii. Repeat this pattern in brickwork pattern around the circumference of the tree, or if using a drill holes approximately 10 cm apart 25mm deep.
 - iv. Treat any visible lateral roots as per i.
- 4) **Spot Spraying** should be carried out using a knapsack sprayer to keep pressure/volume to a minimum. This is to ensure newly planted tubestock/germinating natives are not affected by spray drift. Glyphosate is the main herbicide used, though some weed species require Metsulfuron methyl (*Brush-off*) for treatment. A combination of the two herbicides can be used for treatment in areas where there area combination of species that are susceptible to either glyphosate or Metsulfuron methyl. A marker dye and surfactant will improve control results.
- 5) **Chemical Crowning** This applies to those species which have a fleshy root system such as a rhizome or large bulbs (e.g. Asparagus Fern, Canna Lily)
- i. Gouge out sections of fleshy base with a knife
 - ii. Apply undiluted herbicide.
- 6) **Manual Removal** Is the preferred method of control if practical. Especially useful in follow up work as mitigates any risk of off target damage to germinating or young native species
- i. **Hand pulling** removal by hand (or with a mattock etc) of the plant including all tap and lateral roots. Is especially useful for smaller specimens; species with a bulb, corm or tuber; isolated grass specimens amongst native species.
 - ii. **Crowning** This method is applicable to weeds which have their growing points below the surface of the ground (corms, bulbs, rhizomes, clumped or fibrous root systems etc e.g. grasses, Asparagus Fern)
 1. Grasp the stems or leaves and hold them tightly so that the base of the plant is visible
 2. Insert a knife close to the base of the plant at a slight angle with the tip well under the root system
 3. Cut through the roots close to the base
 4. Remove the plant ensuring that the base of the plant where the roots begin is completely removed.

Noxious Weed Categories

<p>Class 1: State Prohibited Weeds</p>	<p>These are noxious weeds that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent. These are noxious weeds which must be eradicated from the land and the land must be kept free of the plant.</p>
<p>Class 2: Regionally Prohibited Weeds</p>	<p>These are noxious weeds that pose a potentially serious threat to primary production or the environment of a region to which the order applies and are not present in the region or are present only to a limited extent. These are noxious weeds which must be eradicated from the land and the land must be kept free of the weed.</p>
<p>Class 3: Regionally Controlled Weeds</p>	<p>These are noxious weeds which pose a serious threat to primary production or the environment of an area to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area. These are noxious weeds which must be fully and continuously suppressed and destroyed.</p>
<p>Class 4: Locally Controlled Weeds</p>	<p>These are noxious weeds that pose a threat to primary production, the environment or human health, are widely distributed and are likely to spread in the area or to another area. The growth and spread of these noxious weeds must be controlled according to the measures specified in the relevant management published by Council.</p>
<p>Class 5: Restricted Plants</p>	<p>These are noxious weeds that are likely, by their sale or sale of their seeds or movement within the State or an area of the State, to spread either within or outside the State. These noxious weeds are prohibited from sale.</p>

Appendix 8: Revegetation Species List & Techniques

Revegetation Techniques

Clear away weed and exotic grass growth within a 500mm radius area where the plant is to be placed, by spot spraying with *Glyphosate* (following manufacturer's directions).

Dig and loosen soil (150mm deep and 75mm wide) to place tubestock in.

Plant sun-hardened tubestock ensuring root system is below ground level.

It is best to also use slow release fertiliser and "rainsave" water crystals (following manufacturer's recommendations).

Place medium grade jute mat (370x 370mm) around each plant ensuring that the mat does not inhibit water filtration to plant.

Hardwood chips could be used as a suitable alternative to jute matting.

Course grade hardwood chips shall be used (minimum size of 20mm x 20mm x 3mm).

Hardwood chips would need to be 100mm deep with a radius of 500mm.

The cost of either material is equivalent however spreading hardwood chips is more labour intensive.

Plants shall be protected with large (800x 500mm) plastic tree bags using 3 hardwood stakes as support.

This will limit Swamp Wallaby (*Wallabia bicolor*) predation and facilitate follow up weed control when spot spraying.

Banana bags are an unsuitable alternative.

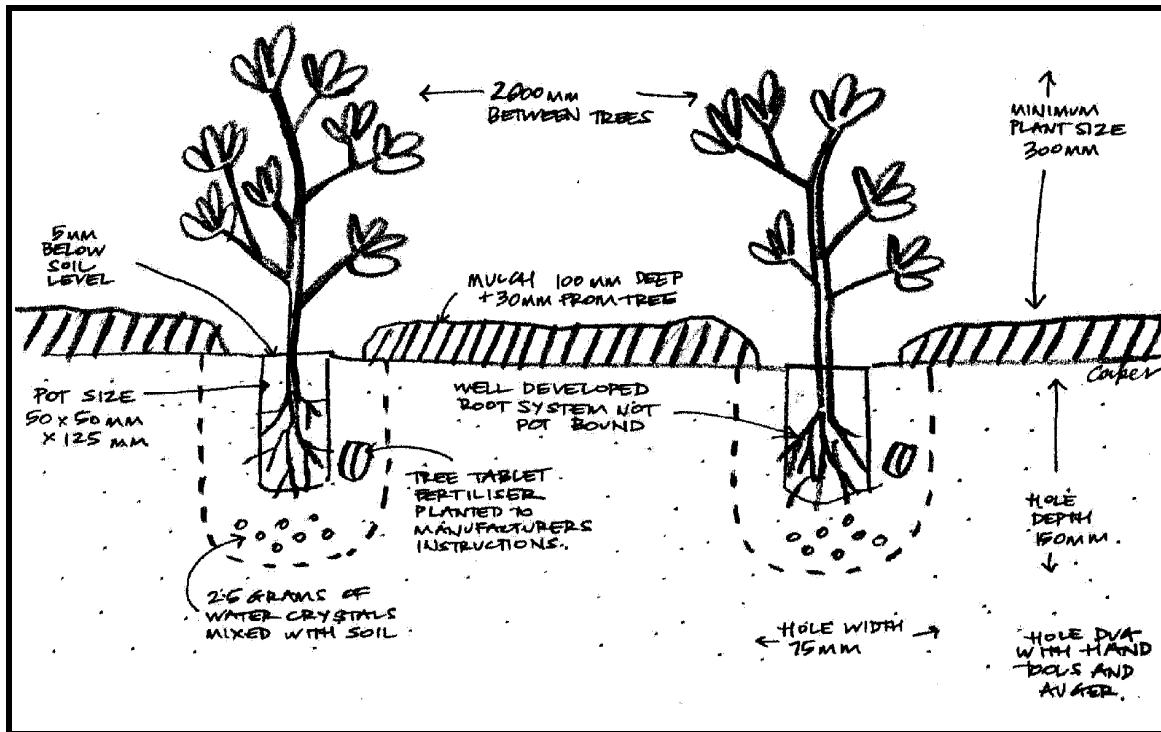
To maximize survival rates, planting should be undertaken in the "wet season" (end of February to beginning May).

Generally, Spring and Summer are too hot and dry for undertaking Revegetation.

Plants will require watering directly after planting if the weather conditions are dry.

Follow up watering will also be required dependant on prevailing weather conditions.

Planting Diagram



Note: Although plant spacing is depicted as being at 2 metre intervals, this is only a general guide and the requirements for each site may vary.

Refer to the specifications given in the zone categories for the specified plant spacings. Jute weed matting may be used instead of hardwood chip.

Refer to specifications given in the zone categories.

Appendix 9: Principles of Bush Regeneration

The aim of Bushland Regeneration work is to restore native vegetation, degraded by weed infestations, to a healthy intact ecosystem or to re-establish an area devoid of native vegetation.

To achieve this, two approaches may be taken:

- 1. Natural Regeneration:** - weed control is carried out but no planting of native species takes place relying on the inputs of seed from surrounding bushland (brought in by birds or other fauna, wind and water).

It requires some form of native canopy to be present on the site.

It also requires that there be a healthy area of bushland in close proximity or adjacent to the site.

- 2. Revegetation:** - planting of native species on site approximately 2- 3 metres apart.

This is most applicable to areas that have severe weed infestations or that are devoid of native vegetation (eg grass paddocks)

Weed control has two phases that applies to both natural regeneration and revegetation.

- 1. Primary treatment:** - Initial treatment of area.
- 2. Secondary treatment- (Follow up work)** consolidation of initial works.

The aim is for this work to be timed as to prevent germinating weeds from reaching seeding stage.

Therefore follow up work must be undertaken on a regular basis.

It may take up to 7 years before the native vegetation is stable enough to out compete weed species/ and or the weed seed bank has been exhausted.

Rainforest vegetation has different requirements than that of sclerophyll (Eucalypt) vegetation.

Eucalypts generally require bare soil to germinate with high light levels and are fast growing species.

The prime objective in rainforest regeneration is to ensure there is a closed canopy (Floyd, 1990).

This will suppress the germination and growth of most weed species and provide the conditions ideal for the germination of further native rainforest seed.

When rainforest vegetation has been disturbed it progresses through a number of successional stages.

- Stage One: herbs and soft wooded shrubs 0-2 years old (e.g. Native Raspberry, exotic annuals)
- Stage Two: pioneers 2-15 years old (e.g. Bleeding Heart, Poison Peach, Blackwood, Wild Tobacco)
- Stage Three: short-lived trees, early secondary trees or nomads, 5-15 years (e.g. Red Ash, Guioa, Pencil Cedar, Foambark)
- Stage Four: mature, long-lived trees. (e.g. Yellow Carabeen, Rosewood, White and Black Booyong)

These successional stages are natural and can be mimicked when undertaking revegetation.

Canopy establishment is most quickly achieved when planting fast growing, short-lived trees and shrubs of the second and third stages of succession (Floyd, 1990)

Appendix 10: Revegetation Suppliers

Possible Suppliers for the Planting Program

- CARES Native Nursery Tel: 66536781
- Lacebark Native Nursery Tel: 6651 3018 / ah 6654 4373
- Thumb Creek Native Nursery Tel: 6564 2266
- Hastings Horticultural Supplies Tel: 6585 3230
- Challenge Foundation (hardwood stakes) Tel: 6652 6066
- Bluedale Nursery (Lomandra) Tel: 6586 0100

Appendix 11: Restoration Works Schedule

Initial Works Zones 1- 4

Item	Sub-Item	Labour	Materials	Cost \$
Weed Control		42 hours @ \$36 p/h	Chemicals \$150	1, 662.00
Planting				
	Plant Purchasing	1hr @ \$36 p/h	851 tubestock @ \$2.50 each 270 viro tubes @ \$1.20 each	2, 451.50
	Planting	186 hours		6, 696.00
	Weed mat/mulch	incl. in planting costs	771 jute weed mats	771.00
	Tree guards	incl. in planting costs	771 large plastic guards @ \$1.00 each	771.00
	Stakes	incl. in planting costs	3 hardwood stakes per plant @ \$0.75 each	1, 735.00
	Fertilizer & Water crystals	incl. in planting costs	1041 tree tablets + water crystals @ \$0.25 each	260.00
Total Cost (does NOT include GST)				\$14, 382.50

This is a cost estimate only

The cost of removal of camphor laurels by an aborist is **not included** in the works schedule.

Follow Up Works Zones 1 - 5

Years 1-2

Zone	Treatment Frequency	Year 1	Year 2*	Total \$
1	7 hrs every 2 months	1650.00	1732.00	3, 382.00
2	7 hrs every 2 months	1650.00	1732.00	3, 382.00
3 and 5	2 hrs every 2 months	500.00	525.00	1, 025.00
			Total Cost:	\$7 789.00

*5% CIP Increase

Totals do NOT include GST

This is a cost estimate only

Years 3- 5

Zone	Treatment Frequency	Year 3*	Year 4*	Year 5*	Total \$
1	7 hrs every 4 months	890.00	934.00	980.00	2, 804
2	7 hrs every 4 months	890.00	934.00	980.00	2, 804
3 and 5	1 hrs every 4 months	118.80	124.74	130.97	374.51
				Total Cost:	\$5 982.51

*5% CIP Increase

Totals do NOT include GST

This is a cost estimate only

All prices are estimation only. Base hourly rates are current at time of VMP preparation

References

- Briggs J.D. & J.H. Leigh 1995 *Rare or Threatened Australian Plants*. CSIRO Publishing, Melbourne. 466p.
- Coffs Harbour City Council (2006) *Korora Rural Residential Development Control Plan and amendments*. Coffs Harbour City Council. 20 pages.
- Ensby R. 2005 *Noxious and Environmental Weed Control Handbook – 2004 -2005 – A Guide to Weed Control in Non-crop, Aquatic and Bushland Situations*. NSW Agriculture. 76p.
- Fisher M., M. Body & J. Gill 1996 *The Vegetation of Coffs Harbour City Council LGA*. Coffs Harbour City Council, 86p. CSIRO Australia. Collingwood, Victoria. 466p.
- Floyd, A.G. 1989. *Rainforest Trees in Mainland South-eastern Australia*. Inkata Press, Melbourne. 420 p.
- Floyd, A.G. 1990. *Australian Rainforest in New South Wales Vol 1*, Surrey Beatty and Sons, NSW
- Harden G.J. & W. McDonald & J.B. Williams 2006. *Rainforest Trees and Shrubs – A Field Guide to Their Identification*. Gwen Harden Publishing, Nambucca Heads, NSW. 264p.
- Harden G.J (ed) 1990-93. *Flora of New South Wales, Volume 1 – 4*. NSW University Press, Sydney.
- Harden G.J (ed) 2002. *Flora of New South Wales, Volume 2* revised edition. NSW University Press, Sydney.690p.
- Milford, H.B. 1999. *Soil Landscapes of the Coffs Harbour 1:100 000 Sheet Report*, Department of Land and Water Conservation, Sydney.
- Muyt A. 2001 *Bush Invaders of South-East Australia – a guide to the identification and control of environmental weeds found in South-East Australia*. R.G and J.G. Richardson, Meredith, Victoria. 304p.
- NSW National Parks and Wildlife Service 2000 *Threatened Species of the Lower North Coast of New South Wales*. NSW National Parks and Wildlife Service. 130p.
- Robinson L. 1991. *Field Guide to the Native Plants of Sydney*. Kangaroo Press, Sydney.450p.
- Tame T. 1992. *Acacias of Southeast Australia*. Kangaroo Press, Sydney. 206p.

The Big Scrub Rainforest Landcare Group 1998 *Subtropical Rainforest Restoration – A Practical Manual for Landowners and Land Managers*. The Big Scrub Rainforest Landcare Group. Mullumbimby, NSW. 84p.

Whistler W.A. 2000. *Tropical Ornamentals – A Guide*. Timber Press, Portland, Oregon, USA. 542p.

Williams J.B. & G.J. Harden 1988. *Rainforest Climbing Plants*. University of New England. 49p.

Acknowledgement:

Planting Diagram in Appendix 6 was supplied by Kirsty Cooper of Emerald Environmental.