HUTLEY ROAD RESERVES

NATIVE VEGETATION RESTORATION

PLAN OF MANAGEMENT

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AKNOWLEDGEMENTS

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SUMMARY

A study has been made of Hutley's Road Reserve and the adjacent Road Reserve for Ballina Shire Council, to create a Vegetation Management Plan. An Environmental Impact Assessment was conducted on part of the Reserves in 2003 by Landmark Ecological Services Pty.Ltd in response to the need for proposed maintenance works on two existing table drains, as part of this assessment and an earlier study an extensive native plant species list has been compliled with one hundred and five (105) species present and forty weed (40) species presently identified on the site, they have been used as a basis of this Vegetation Management Plan.

The presence of the Threatened Species Red Lilly Pilly (*Syzygium hodgkinsoniae)* in the reserve area poses a problem to any proposed drainage work as Legislation (Threatened Species Act 1995) protects areas up to 4 metres around these species from any form of disturbance.

Weed control priorities have been determined within the context of an integrated approach to their removal.The study found that whilst no recorded restoration work has been performed on the reserves there are indications of some limited plantings' of native species on the open grassed area.

Owing to its size,linear shape and proximity to urban areas the further invasion of weed species poses a significant threat, especially with any disturbance of the existing canopy.

The Plan proposes an on-going weed control program, the establishment of photo monitoring points to evaluate the progress of regeneration, the placement of educational signage at strategic points to inform the community to the value of remnant vegetation – especially those containing Threatened Species.

1. AIMS AND OBJECTIVES

AIM: *T o restore, to the extent possible the structure, function, integrity and dynamics of the pre-existing vegetation and sustaining habitat it provided.*

OBJECTIVES:

- To assist natural regeneration by systematic and integrated weed removal.
- To enhance the habitat for Threatened and Vulnerable plant species.
- To improve the habitat for fauna.
- To involve interested members of the community in the restoration project.
- To educate the broader community to the threat that weeds pose to fragile ecosystems.
- To provide educational signage.
- To implement a buffer planting, of locally indigenous species to enhance and strenghten the forest structure.

2. SITE HISTORY:

Hutley Drive reserve an area of 379 metres long and 20 metres wide and the adjacent road reserve an area of 198 metres and 20 metres wide and represent a small area of littoral rainforest – on red krasnozem soil.

The area was first designated as a road reserve approximately 100 years ago and was was transferred from Crown to Council on 13 August 1999, and is currently managed by Balllina Shire Council.

There has been limited planting of some native plant species by adjoining landholders in the Hutley Road Reserve section of the site, but no recorded restoration or weed control has been work done on the site.

ballina

Aerial Photo (Sept. 2003) - Road Reserve to North of Lennox Meadows Estate

Produced by : Fran King
Dept : Regulatory Services
Referred to : James Brideson
Date : 04/03/2004

N W E S

GDA

3. THREATS AND IMPACTS

5.1 Weeds: pose the most significant threat to the current health of the ecosystem and long term viability of the the reserve, with invasive weed species being present at all levels of the forest structure. There is an ongoing threat to the reserves from weed species as it is surrounded by urban development. (see section 6.2 and appendix 2)

5.2 Drainage: Heavy rains in June 2003 caused flooding of properties below and adjacent to the reserve and subsequent investigations showed that the table drains within the reserve required reforming by deepening and re-shaping (Landmark Ecological Services 2003).
Whilst drainage is recognised as an urban problem, the work associated with the drainage has the potential to damage the forest structure and impact on the health of the Threatened species in the area.

5.3 Urban Area: both reserves are bounded on three sides by urban development. All the houses represent a potential threat to the health of the remnant due to rubbish dumping, of both household items, eg.bricks, shade cloth and plastic piping – and vegetative dumping raising the possiblity of the introduction of further weed propagules.
Most of the neighbouring properties have recognised weed species growing, that represent a seed bank of propagules capable of invading the reserves. Several property incursions occur on the boundaries, with landholders mowing into the reserve and using the reserve for their own purposes. eg.vegetable gardens and barbeque areas.

5.4 Size and Edge Effects:: The linear shape and the narrowness of the reserve indicate that it is under considerable threat from further weed invasion, edge effects and wind shearing, the area is also vulnerable to further degradation due to its proximity to the urban area.
The presence of an edge has a major impact on the ecology of the remnant. The edges of remnants are subject to physical effects which include elevated wind turbulence and incursion, temperature variablity, lateral light penetration and reduced humidity. The changes in the physical environment have consequences for the plants and animals which inhabit the remnant.(Hunter, 1998)

6. SITE ASSESSMENT

6.1 Native Vegetation: The reserve has a small population of a **Threatened Species**: Red Lilly Pilly (*Syzygium hodgkinsoniae*). During a site visit in March '04 thirteen (13) specimens were counted, with one parent tree approximately 4.5 metres tall – in flower at the time of the visit – and twelve smaller trees that varied in height from 20 cms. to 1.5 metres they were all in a small area adjacent to the parent tree. The species is at significant threat from native vines that are damaging and smothering the parent tree and Ground Asparagus (*Protasparagus aethiopicus*) is suppressing seedling germination. A small well worn track passes very close to the population. Branch drop of dead tree limbs also pose a threat to the population of this species.

Photo 1. Juvenile plants of Red Lilly Pilly

Rare or Threatened Australian Plants (ROTAP) occur within the reserve:
Smooth Scrub Turpentine (*Rhodamnia maideniana*)
Southern Quassia (*Quassia* sp.A)
Coast Palm Lily (*Cordyline congesta*)
Richmond River Birdwing Butterfly Vine (*Pararistolochia praevenosa*)
Coelospermum (*Coelospermum paniculatum*)
Macadamia (*Macadamia tetraphylla*)
An earlier record of Xylosma (*Xylosma terrae-reginae*) exist but the plant was not located during the site visits for this Plan.

The native vegetation on the site is regarded as being Littoral Rainforest with the alliance of Cupaniopsis anacardiodes – Acmena spp. and suballiance 17 occurring in the Richmond Valley (Floyd, 1990).
The canopy is represented by Tuckeroo (*Cupaniopsis anacardiodes*) and Guioa (*Guioa semiglauca*) which is consistent with other remnants of littoral rainforest in the Lennox Head area.
The middle stratum of the forest is represented by Beach Alectryon (*Alectryon coriaceus*) and Plum Myrtle (*Pilidostigma glabrum*)with this layer being healthy and having a diversity of species.
The lower stratum has isolated vigorous clumps of ferns Rough Maiden Hair (*Adiantum hispidulum*) and Prickly Rasp Fern (*Doodia aspera*) forming dense colonies in some areas. There is a distinct possibility of cryptic terrestial orchids being present on the site – with them being dormant at the time of the survey.
The 'in situ' resilence in part of the reserves is regarded as being high due to the presence of native species in all strata of the forest structure. Migratory resilence, however, would be regarded as being low as the reserve is an isolated remnant with a significant loss of natural ecological processes due to its small size and shape (see 5.4 and appendix 1)

6.2 Weed species: Are present in all strata of the forest in varying degrees of density.
The canopy, is still reasonbly intact with only a small number of weed species present with outbreaks of Camphor Laurel (*Cinnamomum camphora*) and Umbrella Tree(*Schefflera actinophylla*), both of these species are recognised as being highly invasive.
The middle strata has a mix of shrubby weed species such as Cherry Guava (*Psidium cattleianum*), Brazilian Cherry (*Eugenia uniflora*) Ochna (*Ochna serrulata*) and African Olive (*Olea europea var. africana*) all of which are prolific seeders.
The weeds present on the forest floor represent the greatest threat to the on-going health of the forest structure, as they restrict and in some cases, prevent germination of native species. Whilst species such as Ground Asparagus (*Protasparaus aethiopicus*) and Mistflower (*Ageratina riparia*) occur in dense clumps in the Hutley Drive section of the reserve and are recognised as inhibiting seedling germination.
Other species of concern are, Coastal Morning Glory (*Ipomoea cairica*) a highly invasive vine species that is capable of smothering and destroying both edge and canopy species. Lantana (*Lantana camara*), also highly invasive, occurs in small outbreaks along the southern edge of the Hutley Drive section adjacent to houses. A number of exotic grasses and annual weed species occur in the cleared areas and on edges where the light levels are high, these are currently suppressing small native species and preventing further germination.
Several plants of the Category 1 Noxious weed Groundsel (*Baccharis halimifolia*) will require removal at the earliest opportunity,

An unusual weed species, for this area, African Boxthorn (*Lycium ferrocissimum*) is present in the reserves, this species is a declared noxious weed in many areas of NSW.

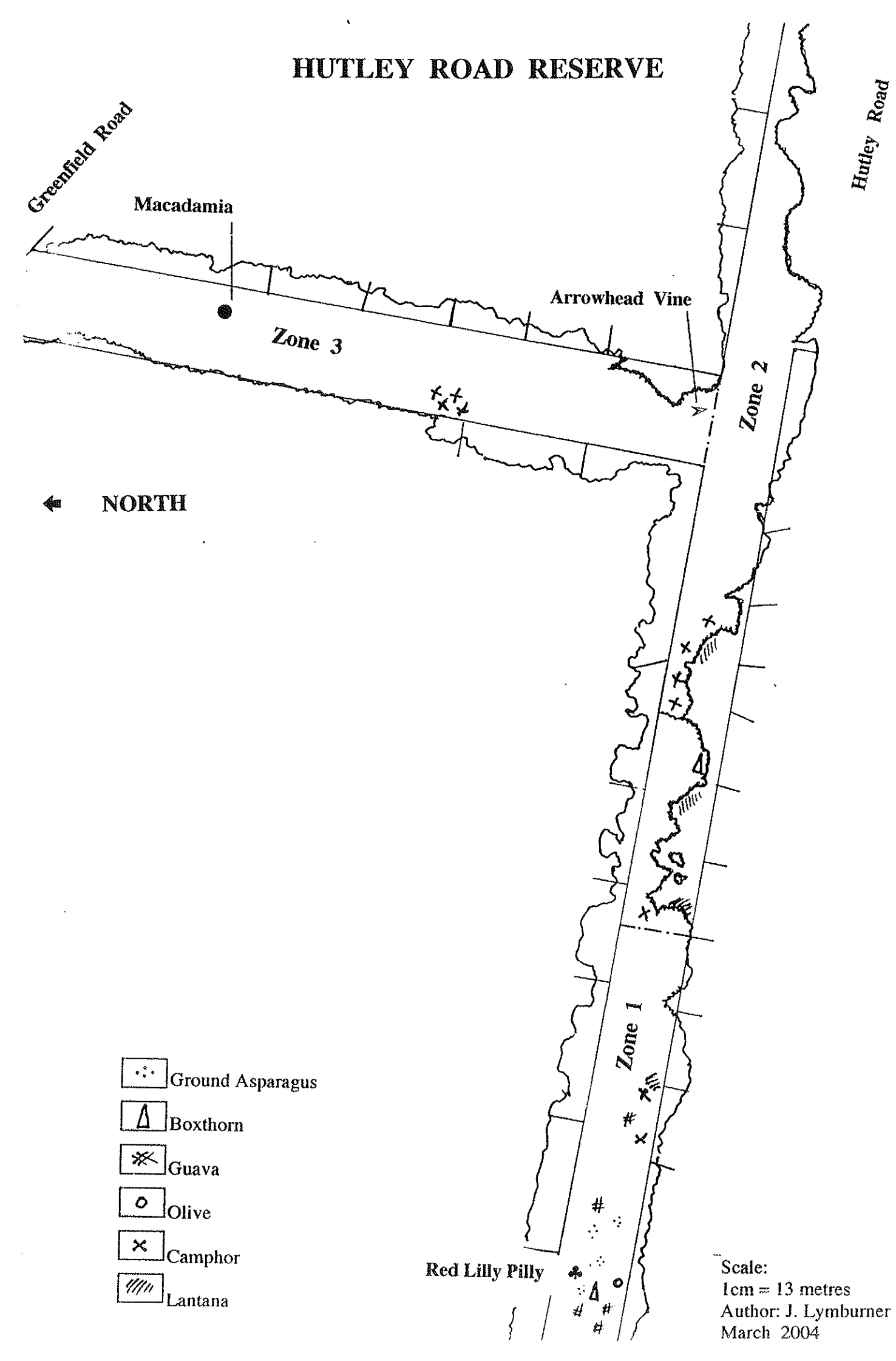
Photo 2 Large specimen of the African Boxthorn.

6.3 Work Zones

Zone 1: Runs from the western boundary edge for 120 x 20 metres and is the area of highest conservation value with the Red Lilly Pilly. occuring within the zone – the zone will require sensitive work, better suited to a small team of trained regenerators with good plant identification skills.

Zone 2: Continues on from zone1 for a distance of 260 x 20 metres and has areas of exotic grasses and other common weed species like Lantana and Camphor Laurels. The zone could be easily worked by an environmetal trainee group (eg. Greencorps or Work for the Dole) under the direction of a trained supervisor with a planting program to be implemented after the common weeds and grasses were controlled.

Zone 3: Is at right angles to the previous two zones and is 198 x 20 metres, has a dense canopy cover and vine thicket throughout, there is a small stand of Camphor Laurels and a scattering of other weed species. This zone could be worked by small team as the number of weed species in the area is low.


HUTLEY ROAD RESERVE
Greenfield Road
Hutley Road
Macadamia
Arrowhead Vine
Zone 3
Zone 2
Zone 1
NORTH
Ground Asparagus
Boxthorn
Guava
Olive
Camphor
Lantana
Red Lilly Pilly
Scale:
1cm = 13 metres
Author: J. Lymburner
March 2004

7.MONITORING:

The main application of monitoring programs should be the prediction of key factors in the regeneration project, such as:

- follow-up programs for weed species and weed species germination
- the native species regrowth
- the changes in species density, cover and biomass
- ecosystem response to different regeneration techniques

Photo monitoring points will be established throughout the reserves. A regular photo program and daily work sheet observations will be the main form of monitoring.

8 . RECOMMENDATIONS:

- The protection of the Threatened species duirng any drainage works.
- Systematic, integrated removal of weed species
- Establishment of GIS positioning of Threatened Species for the NPWS Wildlife Atlas.
- Removal of illegally dumped items and old barbwire fence.
- Planting of locally indigenous native species to enhance the existing floristic structure, in open cleared areas
- Establishment of photo monitoring points – to assess project.
- Signage, based on educating the community to the threats of weeds and vegetative dumping.

The Landmark Ecological Environmental Impact Assessment proposed a series of recommendations for the reformation of existing Table Drains in the Hutley Drive section of the Reserve, these are currently being assessed by Council staff.

9. PRIORITIES:

- Employ trained Bush Regenerators to implement the Plan – with an immediate start of regeneration work around the Threatened species prior to any drainage work.
- Removal of the Groundsel at the earliest opportunity.
- Erection of a simple fence around the Threatened species of 4 metres distance from the specimens – if the proposed drainage work is commenced – the fence to be removed on completion of the proposed work.
- Treat the outbreak of African Boxthorn to prevent any further spread of this invasive species.
- Establish photo monitoring points, taking photo's before any regeneration work commences.
- Remove old barbwire fence.
- Implement a planting of locally indigenous species in the open grassed areas.
- Erect educative signage at the junction of the two reserves.

- Work done by Landcare group in zone 1 to commence East of the Threatened Species and to continue in an easterly direction removing weeds species carefully to allow natural regeneration to occur in the canopy covered areas.
- Implement a planting of locally indigenous species in Zone 2.
- In Zone 3 work in a northerly direction – this zone has excellent canopy cover from the junction of zone 2 and will only require a minimal amount of work.
- Erect educative signage at the junction of the two reserves.
- An annual review of project.

10. CONCLUSION:

Whilst the overall health of the reserve is regarded as being moderately healthy, reflected by the high native species diversity present, the destruction of canopy species has the potential of disturbing the ecosystem and opening up the area to further weed invasion. The future of these road reserves is under threat from the edge effect, windshearing and invasive plant species with the likelihood of further invasion by 'garden escapes' from the adjoining properties.

The presence of the Threatened species Red Lilly Pilly in the reserve presents significant problems in regard to the potential disturbance of its habitat by proposed drainage work.

The importance of this remnant of littoral rainforest on krasnozem soils is significant for its addition to bio-diversity in the mosaic of small coastal remnants in the area and its value for broader community awareness of littoral rainforest.
The success of any restoration program of the reserves will only be fully achieved by a commitment to educational awareness, ongoing regeneration and a continuing maintenance program.

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APPENDICES

NATIVE SPECIES LIST

Vascular Plant Species recorded on the Site, in July 2003 compiled by Landmark Ecological Services Pty. Ltd. An earlier species list compiled by John Nagle has been incorporated in this list, further species may well occur on site and will be recorded as they are found

.

	Scientific Name-	Common Name
Adiantaceae		
	Adiantum aethiopicum	Common Maidenhair
	Adiantum hispidulum	Rough Maidenhair
Apocynaceae		
	Melodinus australis	Southern Melodinus
Aralaceae	*Polyscias murrayi*	Pencil Cedar
Arecaceae		
	Archontophoenix cunninghamiana	Bangalow Palm
	Calamus muelleri	Wait-a-While
Aristolochiaceae		
	Pararistolochia praevenosa	Aristolochia **RS (8S)**
Asclepiadaceae		
	Melodinus australis	Southern Melodinus
Asteliaceae		
	Cordyline congesta	Coast Palm Lily **(2RC-)**
	Cordyline rubra	Palm Lily
Bignoniaceae		
	Pandorea jasminoides	Bower Vine
	Pandorea pandorana	Wonga Vine
Blechnaceae		
	Blechnum cartilagineum	Gristle Fern
	Doodia aspera	Prickly Rasp Fern
Celastraceae		
	Celastrus subspicatus	Large-leaf Staff Vine
	Hedraianthera porphyropetala	Hedraianthera
	Siphonodon australe	Ivorywood
Cyperaceae		
	Cyperus tetraphyllus	Four-leaved Flat Sedge
Dennstaedtiaceae		
	Hypolepis glandulifera	Soft Ground Fern
Discoreaceae		
	Discorea transversa	Native Yam (vine)
Dryopteridaceae		
	Lastreopsis marginans	Bordered Shield Fern
	Lastreopsis microsora	Creeping Shield Fern

Ebenaceae		
	Diospyros fasiculosa	Grey Ebony
	Notelea sp.	Native Olive
Elaeocarpaceae		
	Elaeocarpus obovatus	Hard Quandong
	Sloanea australis	Maiden's Blush
Euphorbiaceae		
	Breynia oblongifolia	Breynia
	Glochidion ferdinandi	Cheese Tree
	Glochidion sumatranum	Umbrella Cheese Tree
	Mallotus discolor	White Kamala
	Mallotus philippensis	Red Kamala
Eupomatiaceae		
	Eupomatia laurina	Bolwara
Caesalpinioideae		
	Caesalpinia subtropica	Corky Prickle Vine **RS (8S)**
Mimosoideae		
	Acacia melanoxylon	Black Wattle
Faboideae		
	Austrosteenisia glabristyla	Giant Blood Vine
	Derris involuta	Native Derris (vine)
Flacourtiaceae		
	Xylosma terrae-reginae	Xylosma
Flagellariaceae		
	Flagellaria indica	Whip Vine
Lauraceae		
	Cinnamomum virens	Red-barked Sassafras
	Cryptocarya laevigata	Red-fruited Laurel **RS (8S)**
	Cryptocarya triplinervis-	Three-veined Laurel
	Litsea reticulata	Bolly Gum
	Neolitsea dealbata	White Bolly Gum
	Neolitsea australiensis	Green Bolly Gum
Lomandraceae		
	Lomandra longifolia	Mat-rush
Luzuriagaceae		
	Geitonoplesium cymosum	Scrambling Lily
Meliaceae		
	Dysoxylum fraserianum	Rosewood
	Melia azadarach var.*australasica*	White Cedar
	Synoum glandulosum	Scentless Rosewood
Menispermaceae		
	Stephania japonica var.*discolor*	Snake Vine
	Tinospora tinosporoides	Arrow-head Vine (**3RC-**)
Monimiaceae		
	Wilkiea huegeliana-	Veiny Wilkiea

Moraceae		
	Ficus coronata	Creek Sandpaper Fig
	Ficus macrophylla	Moreton Bay Fig
	Ficus watkinsiana	Strangling Fig
	Maclura cochinchinensis	Cockspur Thorn
	Malaisia scandens	Burny Vine
Myrsinaceae		
	Rapanea variabilis	Muttonwood
Myrtaceae		
	Acmena smithii	Lilly Pilly
	Austromyrtus dulcis	Midgenberry
	Pilidiostigma glabrum	Plum Myrtle
	Rhodamnia maideniana	Smooth Scrub Turpentine (**2RC**) **RS** (**8S**)
	Rhodamnia rubescens	Scrub Turpentine
	Syzygium hodgkinsoniae	Red Lilly Pilly **VRS** (**8S**)
	Syzygium luehmannii	Riberry
	Syzgium oleosum	Blue Lilly Pilly
Passifloraceae		
	Passiflora herbertiana	Native Passionfruit
Philesiaceae		
	Geitonoplesium cymosum	Scrambling Lily (vine)
Pittosporaceae		
	Hymenosporum flavum	Native Frangipani
	Pittosporum undulatum	Sweet Pittosporum
Poaceae		
	Oplismenus aeumulus	Basket Grass
Proteaceae		
	Banksia integrifolia	Coast Banksia
	Helicia glabriflora	Smooth Helicia
	Macadamia tetraphylla	Macadamia
	Stenocarpus sinuatus	Firewheel Tree
	Triunia youngiana	Honeysuckle Bush
Rosaceae		
	Rubus moluccanus var *moluccanus*	Molucca Bramble
Rubiaceae		
	Coelospermum paniculatum	Coelospermum **RS** (vine)
	Canthium coprosmoide	Coast Canthium
	Hodgkinsonia ovatifolia	Hodgkinsonia
	Morinda jasminoides	Morinda (vine)
Rutaceae		
	Flindersia australis	Teak
	Flindersia bennetiana	Bennet's Ash
	Geijera salicifolia var. salicifolia	Narrow- leaved Brush Wilga
	Sarcomelicope simplicifolia	Bauerella

Sapindaceae		
	Alectryon coriaceus	Beach Alectryon
	Cupaniopsis anacardioides	Tuckeroo
	Guioa semiglauca	Guioa
	Harpullia hilli	Blunt-leaved tulip
	Jagera pseudorhus	Foambark
	Mischocarpus pyriformis	Yellow pear- fruit
	Mischocarpus sundaicus	Red pear- fruit
	Sarcopteryx stipata	Steelwood
	Toechima dasyrrhache	Blunt-leaved Steelwood
Simaroubaceae		
	Quassia sp.	Southern Quassia **(3R2-) RS (8S)**
Smilaceae		
	Ripogonum elseyanum	Hairy Supplejack (vine)
	Smilax australis	Sarsparilla (vine)
Solanaceae		
	Dubosia myoporides	Soft Corkwood
Thymelaeaceae		
	Wikstroemia indica	Wikstoemia
Ulmaceae		
	Aphananthe philippensis	Rough-leaved Elm
Violaceae		
	Viola hederacea	Native Violet
Vitaceae		
	Cissus antarctica	Water Vine
	Cissus hypoglauca	Five-leafed Water Vine
Zingiberaceae		
	Alpinia caerulea	Native Ginger

E Endangered, Schedule 1, *Threatened Species Conservation Act 1995*
V Vulnerable, Schedule 2 *Threatened Species Conservation Act 1995*
RS Regionally Significant (Sheringham and Westaway 1995)
8S - reaches southern distributional limit north of Grafton.
ROTAP Rare or Threatened Australian Plant (Briggs and Leigh 1995)

WEED SPECIES LIST:

Family	Botanical Name	Common Name
Araliaceae	**Schefflera actinophylla*	Umbrella Tree
Areaceae	*Syagrus romanzoffianum*	Cocos Palm
Asclepiadaceae	*Gomphocarpus physocarpus*	Swan Plant
Asparagaceae	*Protasparagus aethiopicus*	Ground Asparagus
Asteraceae	*Ageratina adenophora*	Crofton Weed
	Ageratina riparia	Mistflower
	Ageratum houstonianum	Billy Goat Weed
	** *Baccharis halimifolia*	Groundsel
	Bidens pilosa	Farmers Friend
	Widelia trilobata	Singapore Daisy
Balsaminaceae	*Impatiens walleriana*	Balsams, Busy Lizzy
Caryophyllaceae	*Drymaria cordata*	Tropical Chickweed
Commelinaceae	*Tradescantia fluminensis*	Wandering Jew
	Trandescantia zebrina	Striped Wandering Jew
Convolvulaceae	*Ipomoea cairica*	Coastal Morning Glory(vine)
	Ipomoea indica	Morning Glory (vine
Fabaceae	*Senna pendula var.glabrata*	Winter Cassia
Lauraceae	*Cinnamomum camphora*	Camphor Laurel
Myrsinaceae	*Ardisia crenata*	Coral Berry
Myrtaceae	*Eugenia uniflora*	Brazilian Cherry
	Psidium cattleianum	Cherry Guava
Ochnaceae	*Ochna serrulata*	Ochna, Mickey Mouse Plant
Oleaceae	*Ligustrum lucidum*	Large-leafed Privet
	Ligustrum sinense	Small- leafed Privet
	Olea europea var. africana	Common Olive
Passifloraceae	*Passiflora edulis*	Passionfruit (vine)
	Passiflora subpeltata	White Passionflower (vine)
Phytolaccaceae	*Rivina humilis*	Coral Berry
Poaceae	*Chloris gayana*	Windmill grass
	Paspalum wettsteinii	Broad-leafed paspalum
	Setaria sphacelata	Setaria
Rubiaceae	*Coffea aribica*	Coffee
Rutaceae	*Murraya paniculata*	Orange Jessamine
Sapindaceae	*Keolruteria paniculata*	Golden Rain Tree
Solanaceae	*Lycium ferrossimum*	African Boxthorn
	Solanum americanum	Glossy Nightshade
	Solanum mauritianum	Wild Tobacco
Verbenaceae	*Lantana camara*	Lantana

* denotes invasive native species growing out of range
** denotes category 1 noxious weed
With ongoing work more species will probably be added to this list

WEED REMOVAL and CONTROL TECHNIQUES for individual species

(1) Cut- scrape-paint method: (CS&P) This method applies to all woody shrubs, trees.
(a) Cut plant low to the ground
(b) Apply glyphosate immediately at the rate of 1:1.5 with a paint brush
(c) Scrape sides lightly to reveal green tissue and apply the herbicide to the scraped area
(d) Take care that the brush is not contaminated with soil.

(2) Stem injection this method applies to large trees
(a) Drill downward angled holes at 5cms deep around the base of the tree at 20cm intervals
(b) Fill holes IMMEDIATELY with glyphosate 1:1 – if uptake is rapid, refill holes.
(c) Drill holes in any exposed roots and fill

Species and treatment methods:

TREES AND SHRUBS:

Common Name	Botanical Name
Large-leafed Privet	(*Ligustrum lucidum*) CS&P saplings.
Smal- leafed Privet	(*Ligustrum sinense*) CS&P saplings.
Camphor Laurel	(*Cinnamomum camphora*) CS&P saplings, stem inject larger trees and spray regrowth with glyphosate 1:50 +Li700
Common Olive	(*Olea europea var. africana*) treat as for Camphor Laurel
African Boxthorn	(*Lycium ferrossimum*) Stem inject large trees, CS&P saplings Care to be taken when handling this species.
Groundsel	(*Baccharis halimifolia*) CS&P small trees.
Umbrella Tree	(*Schefflera actinophylla*) CS&P when treating this species make sure the cut trunk is not in contact with the ground as it 'strikes' readily.
Coffee	(*Coffea aribica*) hand remove seedlings, CS&P small trees.
Winter Cassia	(*Senna pendula var.glabrata*) CS&P
Brazilian Cherry	(*Eugenia uniflora)* CS&P
Cherry Guava	(*Psidium cattleianum*) CS&P
Ochna, Mickey Mouse Plant	(*Ochna serrulata*) do not hand pull seedlings, even with small plants it is advised to scrape and paint the green tissue with 100%. glyphosate
Orange Jessamine	(*Murraya paniculata*) CS&P
Lantana	(*Lantana camara*) CS&P
Cocos Palm	(*Syagrus romanzoffianum*) Knife out seedling and small plants.
Wild Tobacco	(Solanum mauritianum) CS&P, or leave as 'nursery species' as it will eventually be shaded out by increased canopy coverage.

GROUNDCOVERS

Crofton Weed (*Ageratinia adenophora*) hand remove small outbreaks or spray with glyphosate 1:100

Mistflower (*Ageratina riparia*) as for Crofton Weed

Billy Goat Weed (*Ageratum houstounianum*) as for Crofton Weed

Swan Plant (*Gomphocarpus physocarpus*) hand pull and compost

Singapore Daisy (*Widelia trilobata*) Spray with glyphosate1:50 + metsulfuron methyl 1.5 g per 10 ltrs + Li700.

Ground Asparagus (*Protasparagus aethiopicus*) Hand crown or spray with glyphosate1:100+ metsulfuron methyl 1.5g per 10 litres.

Balsams, Busy Lizzy (*Impatiens walleriana*) Hand pull and compost.

Tropical Chickweed (*Drymaria cordata*) Spray with glyphosate 1:100+ Li700

Wandering Jew (*Tradescantia fluminensis*) Hand removal in small areas and compost or spray with glyphosate 1:50 + Li700.

Striped Wandering Jew (*Trandescantia zebrina*) as for Wandering Jew.

Coral Berry (*Rivina humilis*) Hand pull, hang plants up to dry out, remove ripe berries from site.

Knife out or spray all exotic grass species with glyphosate at 1:100

VINES

Coastal Morning Glory (*Ipomoea cairica*) Roll up runners, hang up to dry out, CS&P rooting nodes and spray regrowth with glyphosate 1:100

Morning Glory (*Ipomoea indica*) as for Coastal Morning Glory

White Passionflower (*Passiflora subpeltata*) Hand removal and cut scrape and paint stems close to ground.

Passionfruit (*Passiflora edulis*) as for White Passionfruit

Regrowth of these vines may be sprayed with a back pack using glyphosate at 1:50 with Li 700(a surfactant) or removed by hand.

RECOMMENDED SPECIES FOR SUPPLEMENTARY PLANTING

Family	Botanical Name	Common Name
Euphorbiaceae	*Macaranga tanarius*	Macaranga
	Mallotus philippensis	Red Kamala
	Omalanthus nutans	Bleeding Heart
Lauraceae	*Cryptocarya triplinervis-*	Three-veined Laurel
	Neolitsea dealbata	White Bolly Gum
	Neolitsea australiensis	Green Bolly Gum
Liliaceae	*Dianella caerula*	Blue Flax Lily
Meliaceae	*Synoum glandulosum*	Scentless Rosewood
Myrtaceae	*Acmena smithii*	Lilly Pilly
	Austromyrtus dulcis	Midgenberry
	Syzygium luehmannii	Riberry
	Syzgium oleosum	Blue Lilly Pilly
Moraceae	*Ficus coronata*	Creek Sandpaper Fig
Pittosporaceae	*Hymenosporum flavum*	Native Frangipani
	Pittosporum undulatum	Sweet Pittosporum
Proteaceae	*Banksia integrifolia*	Coast Banksia
	Stenocarpus sinuatus	Firewheel Tree
Rubiaceae	*Canthium coprosmoides*	Coast Canthium
Rutaceae	*Acronychia imperforata*	Beach Acronychia
Xanthoraceae	*Lomandra longifolia*	Mat-rush

Whilst other species such as Tuckeroo, Guioa, Plum Myrtle and Hard Quandong would also be suitable they occur on the adjacent site and will probably recruit onto the area rapidly.

BUSH REGENERATION WORK REPORT

Remnant name : **HUTLEY ROAD RESERVE** Date

	Name	Hours
Work team Supervisor:		
Volunteers:		

Weather and wind conditions:

Areas Worked, Description of work undertaken and comments:

See map over:

Weeds treated:	Method	Chemicals: Amount & Application rates

Comments / Monitoring:

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