

# **Management Plan & Proposal for Regeneration of**

## **Tara Downs Rainforest Palm Forest and Wetlands**



Submitted by  
Tara Downs Landcare Group



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## **Introduction**

Tara Downs Landcare Group has a commitment to regenerate the area of land between Tara Downs Estate, Lennox Palms Estate and Skennars Head Road which is public land under Ballina Shire Council's control and management. The area mentioned in this proposal has an incredibly diverse range of flora and fauna habitats making it unique in the local area.

Many of the areas mentioned in this proposal have been severely damaged and changed by intervention of humans, both by development (removal of top soil) and by urban pressures (introduction of weeds and sedimentation of watercourses and wetlands)

The Landcare group has a keen group of volunteers (up to 30 people on some days) who meet monthly for weeding and clearing.

This management plan is submitted for approval so that the efforts of this group can proceed in an agreed direction. It also indicates the type and amount of support from council that would greatly assist in rehabilitating the area. This plan also outlines the history of the area, the existing flora and fauna of the site, the management issues which require resolution and proposed action to resolve the problems mentioned.

The Landcare Group has undertaken a lot of work to inform the community of its activities and of the value this area could have once rehabilitated. This includes a number of media releases prior to weeding days, a display at the Lennox Head Street Fair and distribution on a pamphlet (Appendix 1) in the Lennox Head & Ballina areas.



## Location

Tara Downs is located approximately 3km. south of the town of Lennox Head, on the north east coast of New South Wales (Figure One). It lies approximately 1km west of Boulders Beach, on the north-eastern side of the intersection of North Creek Road and Skennars Head Road (Figure two).

Figure 1

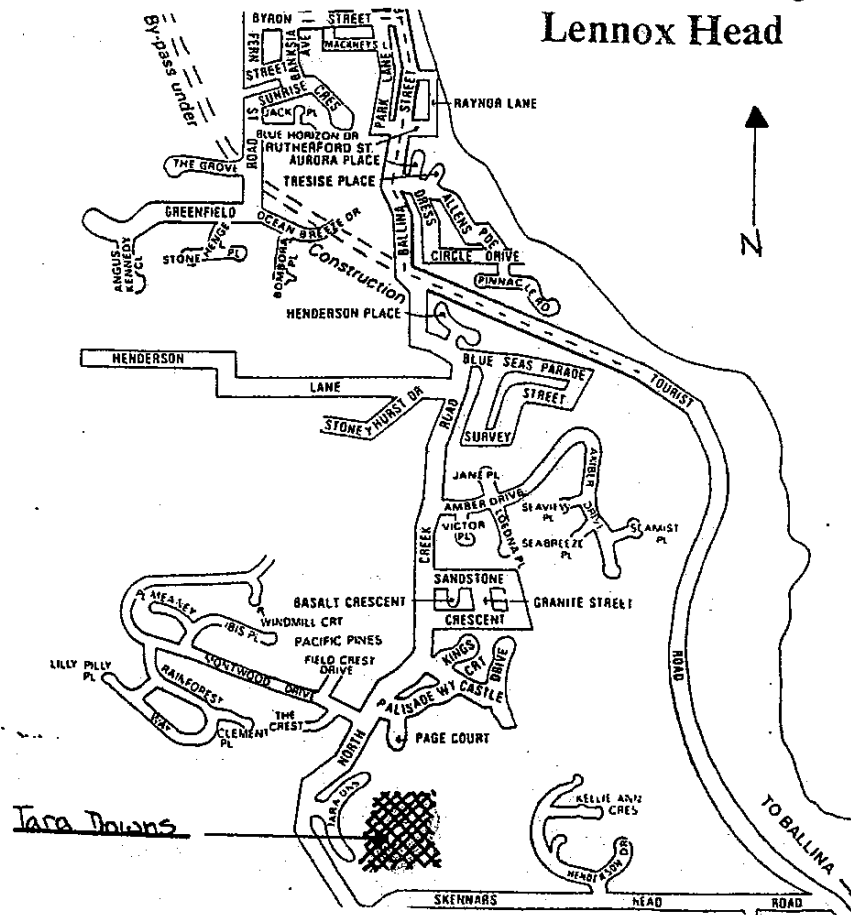


Figure 2

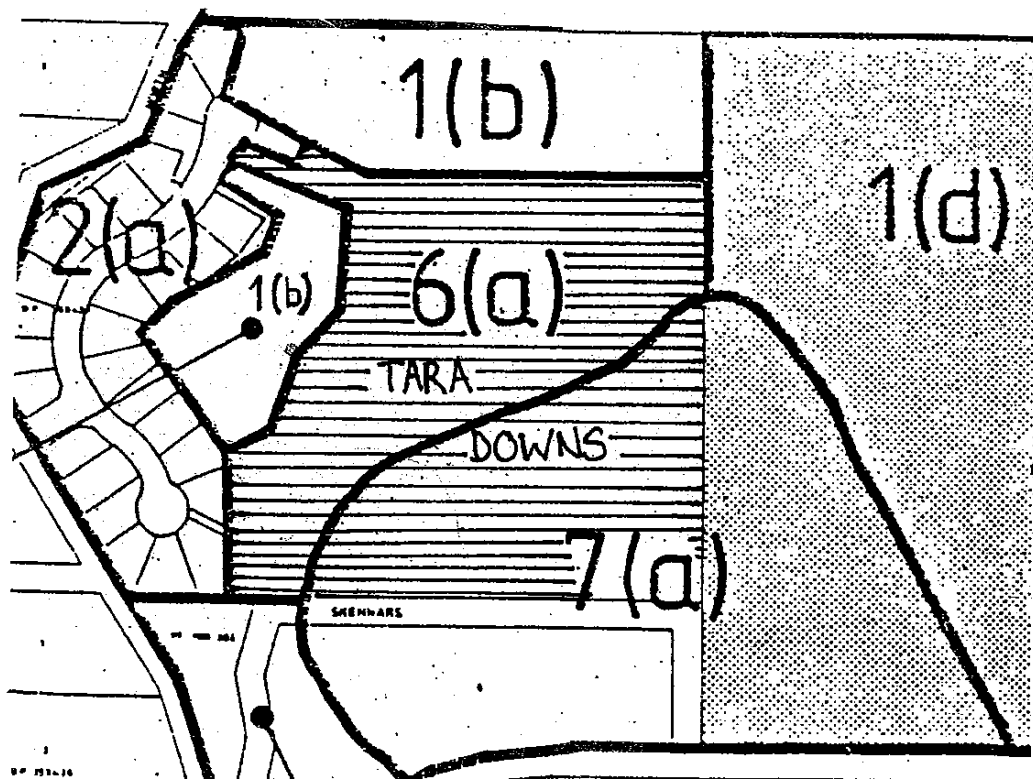






Figure 3

Areas

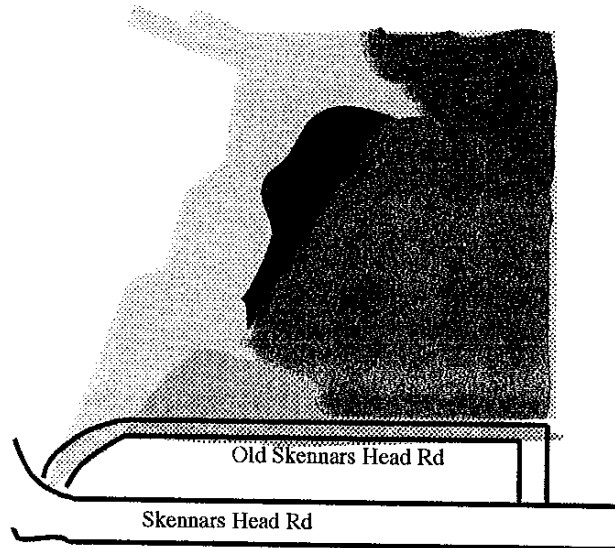
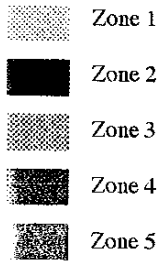
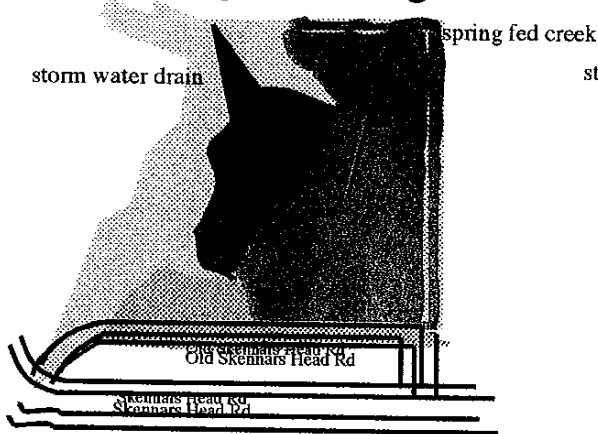


Figure 4

Existing Drainage



Proposed Drainage

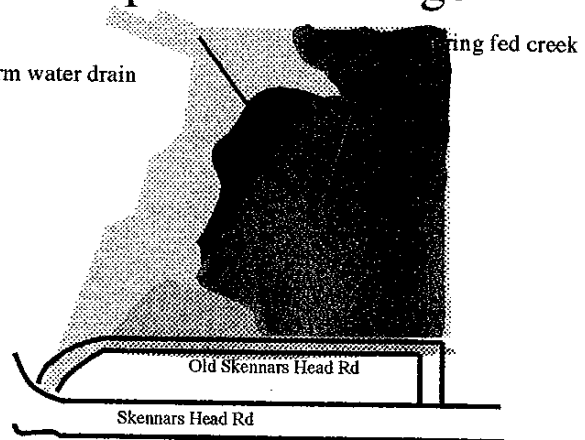
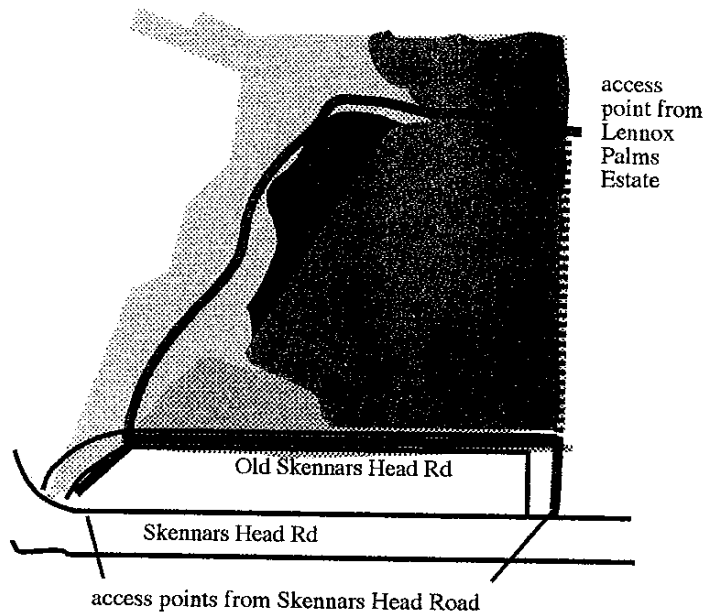
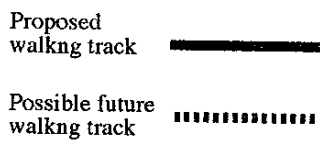


Figure 5

Proposed Access  
& Walking Track







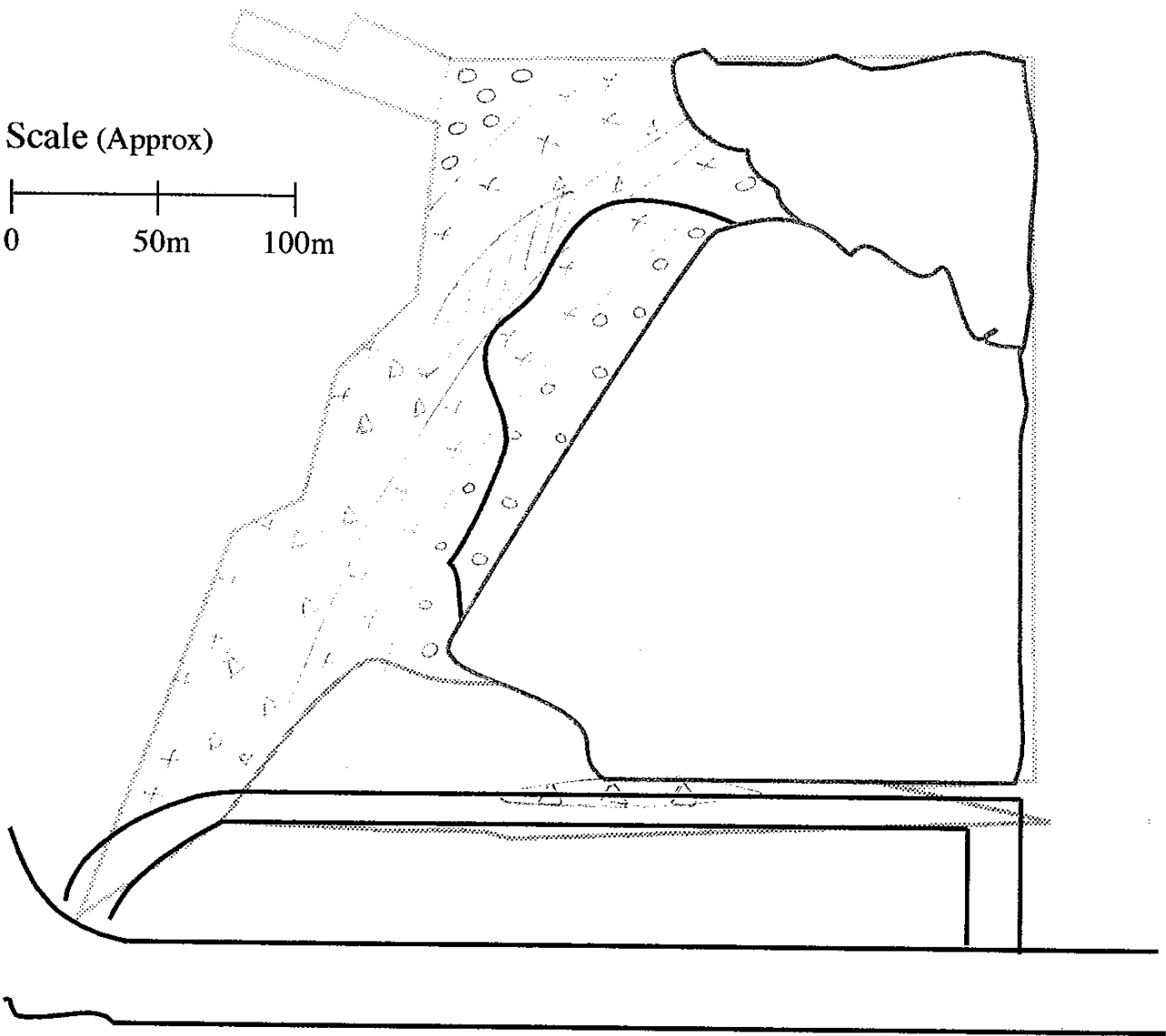


# Action Plan 1997 - 2000

Figure 6

Areas to be planted

-  Year 1
-  Year 2
-  Year 3
-  Bushfood





# Natural Resources and Processes

## Physical Characteristics

Tara Downs is an area of land approximately 8ha. in size. It is located on the far north coast of NSW within 1km of the ocean, and thus is subject to the environmental parameters faced in littoral regions.

Tara Downs has a relatively low and flat topography, with elevations ranging from 1-25m. above sea level with much of the site having an elevation of less than 4m.

The nature of this topography essentially divides the site into two broad regions:

- 1) The gentle slopes with rocky soils in the northern quarter of the site, and
- 2) The regularly waterlogged soils of the southern section of the site

## Soils

The soils encountered at Tara Downs consist of red/brown clay loams of a kraznosemic nature. These soils are derived from basalt, and on the site they range from being shallow and skeletal with boulders and pebbles on the surface and underground, to fine soils and peats with high levels of organic matter.

All of these soils are derived from the local geology of the area. This geology is quite unique, as Tara Downs (and the Lennox Head area), is one of only four areas where the flow of basalt from the Mount Warning caldera reached the coast. The other areas where this occurred are found at Tyagarah, Kingscliff, and Burleigh Heads.

It is also important to note that studies carried out by Alex Jay (1988), in his species recovery plan for *Fontainea oraria*, identified the fact that local soils had a relatively high content of salts. This high soil salinity is due to the deposition of salt particles in dew, and from coastal breezes which face little or no obstacles in their 1km journey from the sea to Tara Downs.

## Climatic Conditions

The north coast of N.S.W. is characterised by a humid sub-tropical climate, with an average annual rainfall 1,400mm. (Water Conservation and Irrigation Commission, 1968). This means that the area experiences hot humid summers, and warm frost-free winters, with an average four month dry period occurring in the late winter-autumn. Extended dry spells can occur, as can cyclonic gales and accompanying flood rains(N.P.W.S., 1990). These events pose a threat to the survival and stability of the vegetation located at Tara Downs.

## Vegetation

Tara Downs is a significant site for littoral rainforest, as it is located nearby the largest remnant (13ha) of coastal sub-tropical rainforest on basalt in N.S.W.. This remnant and others nearby (protected under S.E.P.P. 26), are unique in that they contain the only known specimens (10 mature trees) of Coastal Fontainea, *Fontainea oraria*, in Australia. This species is listed as 2E - Endangered, and thus it is vital to ensure the survival of this species (N.P.W.S., 1990).

Other rare plants are located within these forests, including the Rough-shelled bush nut (*Macadamia tetraphylla*), Arrowhead vine (*Tinospora tinosporoides*), and Silky cucumber (*Trichosanthes subvelutina*) as well as several species at or near their southern limit of distribution (N.P.W.S., 1990) Thus, the Tara Downs site could be used as an extension of these remnant forests, ensuring that populations of these species are maintained in the future. Another significant vegetative factor at Tara Downs, is that the southern portion of the reserve is protected under S.E.P.P. 14-Coastal Wetlands.

Reviews of past studies carried out at Tara Downs (for example, by Andrew Muray, 1993), and field-work carried out from June to November 1994 by Frederick Myers, revealed that the area contains vegetation communities encompassing a total of 111 species, 81 natives and 30 exotics (appendix 2) Both of these studies consisted only of visual observations, making more comprehensive studies an interesting and worthwhile subject for future research.



## **Vegetation (cont)**

Although the vegetation communities at Tara Downs are heavily infested by weeds, they still encompass a broad range of vegetation types. The vegetation types encountered include:

- Rainforest regrowth that partly conforms to Mc Donald et al's (1984) classification as mid high closed simple microphyll Guioa regrowth vine forest (N.P.W.S., 1990).

- Reed wetlands
- An original stand of Bangalow Palms
- Melaleuca and Casuarina regrowth
- Native grasses and ferns
- Weed dominated areas - Kikuyu and Lantana.

The fact that there are at least 30 weed species established on this site (with some having a highly competitive nature), ensures that competition by these weeds will pose a threat to the continuing viability of the native vegetation communities.

## **Fauna**

It was established by the literature review for this project that there was a general lack of information concerning the native fauna that inhabits the Tara Downs site. Further information was not compiled on this aspect as these studies on Tara Downs focused on the vegetation of the area. However, several native species were observed to frequent the area during the field surveys.

The species encountered were mainly birds, with species including sea eagles, kites, magpies, egrets, sacred ibis, and butcher birds. A bird species list is being compiled for the site.

Due to the location of Tara Downs near an urban sub-division and adjoining grazing land, it is reasonable to expect that feral and domesticated animals would frequent the area.

## **Existing Use and Management**

The two L.E.P. zonings that cover Tara Downs are:

- 6(a) Public Open Space (community use); and,
- 7(a) Environmental Protection (regional wetlands)

These zonings are legislated under the Ballina Shire Council Local Environment Plan (1987), and will influence the various uses and management of the area.

Under the zonings of the Ballina L.E.P., the only management of natural resources necessary at Tara Downs are those defined by the 7(a) zoning encompasses the sand of Bangalow Palms and surrounding Typha dominated wetland. This area is also protected by the Department of Planning under S.E.P.P.

14. The primary management objectives of this zoning are:

- To protect and conserve significant wetlands, and;
- Prohibit development which could destroy or damage a wetland ecosystem.

It is evident however, that the management of the 7(a) area is not very effective, as the area is heavily infested with weeds, the south-eastern canopy of Bangalow Palms is badly degraded (probably due to lack of buffering windbreak), and influx of silt laden run off from the surrounding urban catchment.

The northerly 6(a) area (Public open space), has received no management over the past few years since grazing has ceased. This has resulted in the area becoming infested with exotics and losing any aesthetic appeal that it may once have possessed.

The lack of management concerning the natural resources at this site has prompted the formation of the Tara Downs Landcare Group, and the initiation of this management plan in the hope that a rehabilitation program can improve past degradation and lack of management.





## Control of exotics

The present aims of management are concerned with the rehabilitation and revegetation of Tara Downs, with the control of exotic species being seen as one of the major issues facing management. The invasive capabilities of exotic weeds are seen throughout Tara Downs, with extensive growth of weeds in virtually every portion of the site. Exotics will need to be controlled or eradicated if the integrity of the site's vegetation is to be maintained or resorted.

There are at least 30 different weeds species present at Tara Downs (appendix two), with a number that will cause particular concern to the rehabilitation works planned for the area. Species which are of particular concern include Camphor Laurel (*cinnamomun camphora*), Coral tree (*Erythrina sykesii*), Lantana (*Lantana camara*) small leaved privet (*Ligustrum sinense*), Kikuyu (*Pennisetum clandestinum*) and Wandering Jew (*Tradescantia albiflorum*).

It is also probable that exotic animals frequent the Tara Downs site, including feral cats, domestic rats and mice. These animals may pose a threat to native fauna in the area, but their removal is not a viable proposition due to the lack of local information concerning the effects of these animals, and the extensive trapping program that would be necessary to control them. It is also important to note that surrounding urban developments will always provide a source of exotic fauna that can access the remnant.

Weed control mechanism are described in detail in Appendix 3. Specific weed control targets are listed in the management plan.

The future use of Tara Downs as an area for the appreciation of nature will largely depend upon efforts to protect and rehabilitate existing vegetation, and a program of reafforestation aimed at returning the area to a near natural condition. Any reafforestation program implemented on this site will need to closely examine the species selection and the layout of plantings.

The reafforestation of the site will require that the Landcare Group has a good knowledge of the dynamics of rainforest and succession. As well as this, reafforestation works will focus on windbreak design, especially to protect the degenerating south eastern boundary of the Bangalow palm stand.

This site may also prove beneficial for the trialling of ex-situ plantings of the rare rainforest tree *Montanea oraria*. This species is found in the nearby S.E.P.P. 26 forests and is currently being propagated by the Rare Plants Division of the NSW NPWS (pers. comm. Craig Copeland, 1994). Further studies will be required to assess the viability of plantings at Tara Downs, as current knowledge suggests that this species is restricted to elevations above 50m. (N.P.W.S., 1990).

## Access

The continued interest in the rehabilitation and revegetation of Tara Downs will be served well if public access to the site is improved. At the present time there is no provision for public access, with a general lack of walking tracks, parking areas, recreational facilities, and information on the area. Anyone who wishes to visit the site presently has to contend with vigorous weed growth and inundated soils, making a rather undesirable place to visit.

To counter this situation it is proposed that future management incorporates plans for tracks through the remnant (possibly raised in parts), parking and picnic facilities, and visitor displays to convey information on the site.

## Development

The urbanisation of North Creek area has already placed vast pressures on Tara Downs, and it does not appear likely to cease. Currently a new sub division (Lennox Palms) is being built on the eastern side of the remnant, and Ballina Shire Council is considering re zoning the land between the two locations (currently zoned 1(d)) to allow for urbanisation. In conjunction with this, growth in populations and tourism are booming on the north coast.

This scenario may be either beneficial or detrimental to Tara Downs. Increases in populations and in urban area may cause increased runoff, visitation, vegetation, theft and vandalism, invasion of weeds and feral animals. Conversely, it may lead to increased public interest and appreciation of the area and in turn, increased community involvement in its rehabilitation and on-going maintenance.

# TARA DOWNS

## RAINFORREST - WETLANDS AND PALMS RESTORATION

**Site** NORTH WEST CORNER

**ELEVATION** 8-25 M

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**Section No** 1

GRASSY SLOPES

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**Soil Type**  
RED BROWN KRAZNOSEMS  
ON  
BASALT

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**Water**  
SOURCE - STORM WATER DRAINS  
LOCAL AND OTHER RUN OFF  
OFTEN HIGH FORCE  
EFFECT - WIDE SPREAD SEEPAGE  
HIGH NUTRIENT SOURCE

**Landform**

Hollow

Flat

Slight Slope

Slope

Exposure	Erosion	
Very High	Intensity	Type
High	Low	wind
Moderate	Mild	water
Low	Moderate	drainage
	Severe	disturbance

<b>Canopy Height</b>	>30m	10-30m	5-10m	0-5m
<b>Canopy Density</b>	70-100%	30-70%	10-30%	<10%
<b>Leaf Litter</b>	V-deep	Deep	Light	Minimal

**Distinguishing Features**

KIKUYU GRASS COVER

NO TREE CANOPY

NO NATIVE SPECIES

SOME AREAS MOWN BY COUNCIL. OTHER VERY THICK

**Human Impact**

High	Medium	Low	Minimal
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**Effects** DEPLETION OF NATIVE SP. BY CATTLE GRAZING IN EARLY YEARS.

- RESIDENTIAL DEVELOPMENT STORM WATER AND RUN OFF
- INTRODUCTION OF WEEDS AND EXOTIC SPECIES

**Plant Species Present**

**TALLEST** NIL

**MID** KIKUYU  
CANE GRASS

**LOWER** KIKUYU

**Weeds**

BANANAS

CANNA LILY

LANTANA

CROTON WEED

TOBACCO

CAMPHOR LAUREL

PRIVET

PASPALLUM

COBBERS PEE

BALLOON PLANT

GROUNDSEL

**Other Comments**

- TO DIG DITCH FOR STORMWATER - WITH EROSION AND FLOW CONTROLS TO DIRECT FLOW TO WETLANDS AND PROPOSED PONDS
- ACCESS TRACK TO COME FROM OLD SKENNARS HEAD ROAD - BRIDGES OVER STORM WATER CHANNELS
- WEED SOURCE ON OLD ROAD ENTRANCE TO BE REDUCED.

# Management Actions

## Zone One

This zone is located in the north-western corner of the public reserve, and is easily accessed from the Tara Downs Estate, across open paddocks. This area has an elevation above sea level ranging from 8-25m., and is intersected by a drainage line that enters from the north western side of the zone. This drainage line is badly infested by weeds.

The soils of this zone consist of re/brown kraznosems, which are generally shallow and skeletal. The nature of these soils is directly related to the large amounts of rock found in the area- both surface and sub-surface. These soils are quite firm.

The vegetation of Zone One is dominated by Kikuyu grass, which is currently smothering any native regeneration. In some areas, closer to the rainforest or Bangalow Palm Forest other species dominate. These include Camphor laurel, Tobacco bush and groundsel bush.

### **Work proposed**

- progresivly clear area of weeds and kikuyu
- mulch and plant with species from appendix 4 red soil sites and from the Tara Downs species list
- contol (re-direct) stormwater flow by digging of trench
- build a bridge over drainage trench
- create walking track

## **Staging**

### **Year One**

- dig drainage ditch
- slash access track and areas to be mulched & planted (see figure 5 - Year 1)
- poison kikuyu grass where plantings & mulching are to take place
- plant & mulch and maintain

### **Resources Required**

machine to dig drainage ditch, mulch, plants, slasher, hericide, fertiliser

### **Year 2**

- poison kikuyu grass where plantings & mulching are to take place (see figure 5 - Year 2)
- plant & mulch and maintain
- build bridge over drainage ditch

### **Resources Required**

materials for bridge, mulch, plants, slasher, herbicide, fertiliser

### **Year 3**

- poison kikuyu grass where plantings & mulching are to take place (see figure 5 - Year 3)
- plant & mulch and maintain

### **Resources Required**

mulch, plants, slasher, herbicide, fertiliser

# TARA DOWNS RAINFOREST - WETLANDS AND BANGALOW PALMS RESTORATION

**Site CENTRAL FLAT**

ELEVATION 4m

**Section No 2.**

BANKSIA AND CASUARINA FLAT

**Soil Type**  
SHALLOW CRUST  
ROCKY SUB SOIL

**Water**  
SOURCE STORM WATER  
RUN OFF WITH EROSION

**Landform**

Hollow

Flat

Slight Slope

Slope

Exposure	Erosion	
Very High	Intensity	Type
High	Low	wind
Moderate	Mild	water
Low	Moderate	drainage
	Severe	disturbance

Canopy Height	>30m	10-30m	5-10m	0-5m
Canopy Density	70-100%	30-70%	10-30%	<10%
Leaf Litter	V-deep	Deep	Light	Minimal

**Distinguishing Features**

ROCKY SURFACE - LOSS OF TOP SOIL  
MANY NEW BANKSIA AND CASUARINA SEEDLINGS  
LACK OF WEED MASS  
GOOD MIXTURE OF NATIVE GRASS

**Human Impact**

High	<input checked="" type="checkbox"/> Medium	Low	Minimal
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**Effects** REMOVAL OF TOP SOIL  
STORM WATER EROSION

**Plant Species Present**

**TALLEST** MELALEUCA  
CASUARINA  
BANKSIA  
GUICA

**MID** ACACIA - BLACKWOOD

**LOWER** NATIVE GRASSES - POA  
CYPERUS  
GRAMINAE  
LEPIDOSPERMA  
PHILIPMITES sp.

CULCITA FERN

**Weeds** PASPALUM  
KIKUYU

**BOUNDARIES** - LANTANA  
CROFTON  
TOBACCO  
BIDENS  
DOCK

PINUS RADIATA  
BANANAS  
CANNALILY

**Other Comments** THIS AREA EXCELLENT TO IMMEDIATELY PLANT SIMILAR SPECIES TO THOSE PRESENT - MAXIMISE CANOPY -

## **Zone Two**

This zone is situated to the south of Zone one, on the western side of the reserve (see figure 3). This site is easily recognised by the fact that all of the topsoil is missing. Zone Two is generally flat (4m above sea level), although slopes do occur on the northerly and western sides. These slopes are showing problems of erosion due to the past removal of vegetation and topsoil for the construction of the neighbouring subdivision.

The fact that this area lacks topsoil is seen as the determining factor of the vegetation that occurs in this zone. This vegetation consists of a general lack of weed species, the limited presence of kikuyu and other grasses and some native tree species. Because of the lack of topsoil or larger amount of mulch and fertiliser will be required than for Zone 1.

### **Work proposed**

clear area of any weeds

direct stormwater drainage with continuing drainage ditch from Zone 1

plant and mulch as per appendix 4 (red soil species)

## **Staging**

### **Year One**

dig drainage ditch

poison weeds & kikuyu grass where plantings & mulching are to take place (Figure 5 Year 1)

plant & mulch and maintain

### **Resources Required**

machine to dig drainage ditch, mulch, plants, herbicide, fertiliser

### **Year 2**

plant & mulch and maintain

### **Resources Required**

mulch, plants, herbicide, fertiliser

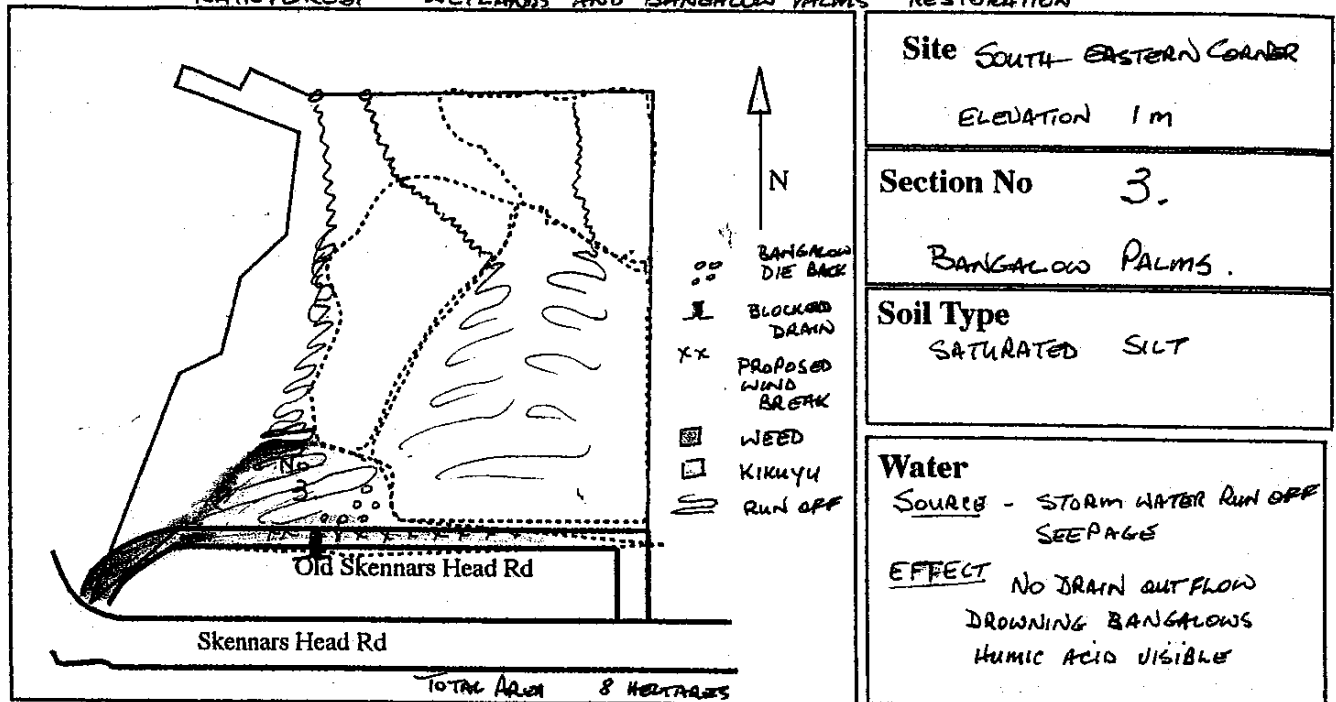
### **Year 3**

plant & mulch and maintain

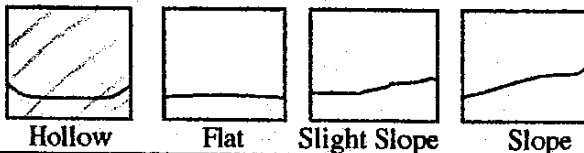
### **Resources Required**

mulch, plants, herbicide, fertiliser

# TARA DOWNS RAINFOREST - WETLANDS AND BANGALOW PALMS RESTORATION



## Landform



## Exposure

~~Very High~~  
High  
Moderate  
Low

## Erosion

~~Intensity~~  
~~Low~~  
Mild  
Moderate  
Severe

## Type

wind  
water  
drainage  
disturbance

Canopy Height	>30m	10-30m	5-10m	0-5m
Canopy Density	70-100%	30-70%	10-30%	<10%
Leaf Litter	V-deep	Deep	Light	Minimal

## Distinguishing Features

DENSE BANGALOW PALM STAND  
SOME BANGALOW DIE BACK  
WATERLOGGED SOIL  
WEED INVASION

## Human Impact

~~High~~      Medium      Low      Minimal

## Effects

THEFT OF BANGALOWS  
DRAINAGE + BLOCKAGE  
LOSS OF WIND BREAKS  
IMMENSE WEED SOURCE ON NEIGHBOURING OLD ACCESS ROAD

## Plant Species Present

TALLEST BANGALOW PALMS

MID BANGALOW PALMS  
PHragmites

LOWER Sedges  
GRASSES  
WEED GROWTH - KIKUYU

## Weeds

LANTANA  
GUAVA  
CAMPHOR LAUREL  
TOBACCO BUSH  
BANANA  
CANDIA LILY  
CROTON

KIKUYU  
EXOTICS  
ON ACCESS ROAD.  
MABERA vine

## Other Comments

- \* BLOCKED DRAIN TO BE LOCATED AND OPENED UP.
- \* OLD ROAD CLEARED OF WEEDS (MOWN + SPRAYED) THEN UTILISED FOR WINDBREAK PLANTING TO CREATE BUFFER ZONE
- \* ACCESS CREATED FROM OLD ROAD
- \* SIGN TO BE ERECTED - VISIBLE - TO PROMOTE AWARENESS OF GROUP/PROPOSAL/HELP NEEDED

## **Zone Three**

This zone is located in the south-eastern section of Tara Downs and is dominated by Bangalow Palms. This zone is very low-lying, with elevations of around 1m., and is thus characterised by saturated soils and periods of regular inundation. Due to this frequent inundation by runoff from surrounding slopes, the soils of this area are characterised by high levels of organic matter, and the sheen of humic acids is clearly visible on surface waters.

Zone three is bordered by melaleuca in the far south west corner and reed wetlands on its southern and eastern sides. It is relevant to note that bordering farmland on the southern side of the Paper Road is likely to be a constant source of weed seed due to the high levels of weed infestations present.

Another factor relating to the surrounding vegetation, is that the lack of canopy species to the south and east of Zone three appear to make the area vulnerable to the drying and destructive winds, that mostly originate from the south east.

As stated before, the dominate canopy vegetation of this zone consists of a stand of Bangalow palms. This canopy dominance is reduced on the edges of the zone (excepting the southern edge), with an ecotonal gradation of species including Banaglow palms Melaleucas, species of Fig and Lilly pilli. This edge zone also contained native vine species such as Wonga vine, and a proliferation of exotic species. These exotics include Camphor laurel, Lantana, tobacco Bush, grasses and Umbrella trees. Isolated umbrella trees and other exotics were also observed within the Bangalow stand.

The understorey of this zone was dominated by native grasses and ferns, with exotic weeds and reed wetlands dominating the edges. the only significant regeneration of Bangalow palms observed was on the northern edge of the stand, in fairly dry conditions, underneath a canopy of Palms and Ficus species. The general lack of Bangalow palm regrowth is probably due to the dense groundcover over most of the site resulting from water entereng the site with a high sediment level, gradually filling in the area. In addition drainage through the site appears to be restricted by blocked culverts underneath Old Skennars Head Rd

### **Work proposed**

- erect sign along Skennars Head Road to inform public of the project
- clear drain under road to clear palm forest of excess water
- slash road area approx 4m wide
- plant fast growing wet area species to create windbreak for palm forest
- plant Bangalow Palm seedlings
- facilitate research into existing problems within palm forest

## **Staging**

### **Year One**

- supply and erect sign
- slash road
- plant windbreak trees
- clear drain

### **Resources Required**

- slasher, mulch, plants, equipment to clear drain, researcher, sign, herbicide

### **Year 2**

- plant & mulch and maintain
- any actions suggested by researcher

### **Resources Required**

- mulch, plants, herbicide

### **Year 3**

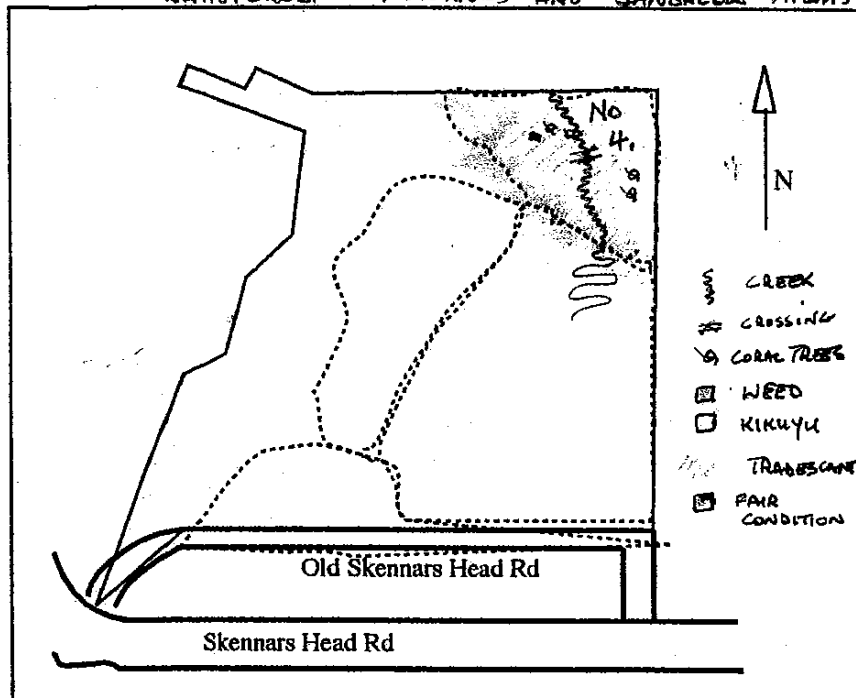
- plant & mulch and maintain

### **Resources Required**

- mulch, plants, herbicide

# TARA DOWNS

RAINFOREST - WETLANDS AND BANGALOW PALMS RESTORATION



Site NORTH EAST CORNER

ELEVATION 6-15 m.

Section No 4

RAINFOREST

Soil Type

RED BROWN KRAZNOSEMS  
ON BASALT

BOULDERS AND ROCK FRAGMENTS

Water

SOURCE - SPRING AND RUN OFF

CREEK - SLOW FLOW  
TO 20-60 cm.

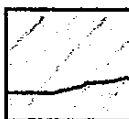
## Landform



Hollow



Flat



Slight Slope



Slope

## Exposure

Very High

High

Moderate

Low

## Erosion

Intensity

Low

Mild

Moderate

Severe

Type

wind

water

drainage

disturbance

## Canopy Height

>30m

10-30m

5-10m

0-5m

## Canopy Density

70-100%

30-70%

10-30%

<10%

## Leaf Litter

V-deep

Deep

Light

Minimal

## Distinguishing Features

EXCELLENT POCKET OF RAINFOREST SP.  
SURROUNDED BY BLANKET OF LANTANA  
AND WEED INFESTATION  
CREEK FAIRLY CLEAN - THOUGH SILTING UP

## Human Impact

High

Medium

Low

Minimal

## Effects

LOSS OF ANY PROTECTION -  
WEED INVASION EXTREME ON SURROUNDS

## Plant Species Present

CLASSIFIED AS GUIDA REGROWTH VINE FOREST

TALLEST

MORETON BAY FIGS

TUCKEROO

TAMARIND - MAJORITY OF SPECIES ON LIST

MID

VINES -

BURRY

SMILAX

CISSUS

GINGER

LOWER

FERNS

NATIVE VIOLET

COMMELINA

ANEILIMA

## Weeds

CORAL TREES

LANTANA

CROTON

GUINA

CAMPHER LAUREL

PRIVETS

TOBACCO TREE

KIKUYU

TRADESCANTIA

ACERAS

BIDENS

EXOTICS

## Other Comments

ACCESS NEEDED FOR REMOVAL OF CORAL TREES.

LANTANA + OTHER WEED MASS TO BE REMOVED TO ALLOW REGENERATION

EXTEND AREA BY PLANTING RAINFOREST SP EXISTING ON SITE

CREATE WALKING TRACK EXTENDING TO FULL CIRCUIT OF TOTAL AREA.



## **Zone Four**

This site is located in the north eastern region of Tara Downs, and is characterised by undulating land of elevations ranging from 6m to 15m., with the hills to the north of it eventually reaching heights in excess of 50m. The soils of this zone are similar to those of Zone One, being red/brown kraznosems, with abundant rock fragments. From initial investigations, it would appear that the soils of this site are even shallower than Zone One. This, and the fact that the area contained many more, and larger, surface boulders than other sites, may indicate that this zone was not subject to as much human alteration; the only constructed features present being boundary fencelines.

The major drainage line located at Tara Downs snakes along the western side of this zone before curving to the east, through the middle of the area, and out into the wetlands. This creek ranges in depth from 20-60cm, provides a source of invasion for weed growth.

The native vegetation of zone four consists of littoral rainforest regrowth which conforms to McDonald et al's (1984) classification as mid high closed simple Guioa regrowth vine forest, with edge species consisting of Soft Corkwood, Broak leaved paperbark, and Tuckeroo. Other native species of interest in this zone were the Bangalow palms along the creek, two large Moreton bay figs, and the presence of the Rough shelled bush nut near the northern boundary. A preliminary species list of this site is provided in appendix 3.

The native understorey of this zone was heavily degraded by the dominance of exotic groundcovers such as Asparagus fern, Lantana and Wandering Jew. The depth of the Wandering Jew in the remnant regrowth reached over 60cm. The native groundcovers observed in this area included Cungevoi lily (*Allocasia brisbanensis*), Native ginger (*Alpinia caerulea*), Forest grass (*Echinopogon caespitosus*), Knotweed (*Persicaria strigosum*) and the Native violet (*Viola hederacea*). The native Smilax vine (*Smilax australis*) was also observed to be common to this area.

The presence of exotics was not restricted to groundcovers, with many canopy weeds being present. These species were mainly located along the edges of the rainforest regrowth, and along the creek line, although there were some within the remnant itself. They were observed to be well established and actively invading into new areas. The main species of weed encountered in this zone included Camphor laurel, small leaved privet, Coral tree, Lantana and Tobacco bush.

### **Work proposed**

clear area of weeds, including coral trees, camphor laurels and lantana  
plant suitable species to regenerate rainforest  
mulch new plantings and selected areas to eliminate weed regrowth  
slash weed growth surrounding the forest

## **Staging**

### **Year One**

clear weeds & trees  
plant and mulch

### **Resources Required**

chainsaw, mulch, plants, truck to remove coral tree waste, herbicide

### **Year 2**

slash surrounding weeds  
plant & mulch and maintain

### **Resources Required**

mulch, plants, slasher, herbicide

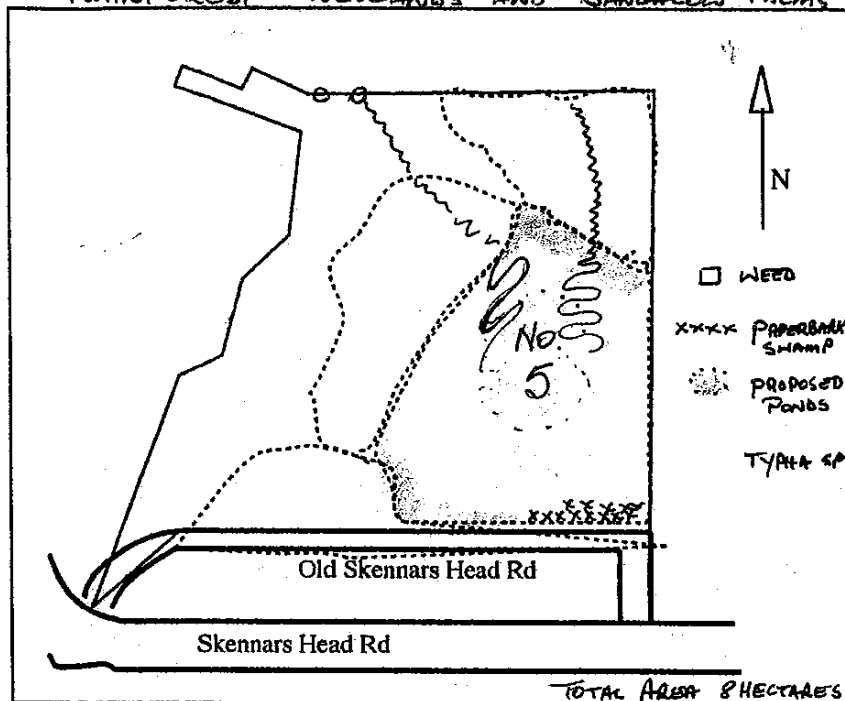
### **Year 3**

plant & mulch and maintain

### **Resources Required**

mulch, plants,

# TARA DOWNS RAINFOREST - WETLANDS AND BANGALOW PALMS RESTORATION



**Site** SOUTH EASTERN CORNER

**Section No** 5.

**WETLANDS.**

**Soil Type** CAUSTIC TO SATURATED  
HIGHLY ORGANIC  
PEAT BASE

**Water**  
Source - STORM WATER  
CREEK  
SEEPAGE

**Landform**

Hollow	Flat	Slight Slope	Slope

Exposure	Erosion	
Very High	Intensity	Type
High	Low	wind
Moderate	Mild	water
Low	Moderate	drainage
	Severe	disturbance

Canopy Height	>30m	10-30m	5-10m	0-5m
Canopy Density	70-100%	30-70%	10-30%	<10%
Leaf Litter	V-deep	Deep	Light	Minimal

**Distinguishing Features**

LARGE AREA DUG OUT FOR FILL WHEN DEVELOPMENT DONE.

ENTRANCE TO FURTHER EXTENSIVE WETLANDS PROTECTED BY 7A ZONING

AREA OF PAPERBARK SWAMP

**Human Impact**

High	Medium	Low	Minimal
------	--------	-----	---------

**Effects**

DEEP EXCAVATION OVER WIDE AREA

**Plant Species Present**

**TALLEST** CASUARINAS AND METALLEUCAS  
FAR STH. EAST CORNER

**MID** SEDGES  
TYPHA  
PRAGMITES

**LOWER** SELECTION NATIVE GRASS SP.  
LYCOPodium MOSS  
CULCITH FERN

**Weeds** PASPALUM  
CROTON  
LANTANA  
KIKUYU

**Other Comments** PROPOSAL TO CREATE PONDS BY FURTHER EXCAVATION WHERE PREVIOUS DISTURBANCE LEFT DAMAGED AREA. - THESE COULD BENEFIT BY HOLDING AND FILTERING STORM WATER AS WELL AS CREATING A NEW WETLAND HABITAT.

\* EXTEND CLEARING OF OLD ROAD AND WIND BUFFER FOR PALMS BY MORE PLANTING

\* WALKING TRACK EXTENDED ALONG BOUNDARY TO COMPLETE CIRCUIT.

## **Zone Five**

Is located on the south eastern side of Tara Downs and is protected by a SEPP14 coastal wetland zoning. This zone covers approximately one-third of the site, and is characterised by the saturated soils and the regular inundations of a wetland environment. Field surveys conducted in this area established that the soils were high in organic matter (of similar consistency to peat) and were quite boggy.

The topsoil from a 5000sqm area has been completely removed within the northern part ostensibly to create a playing field. The area is now floodprone and the lack of drainage precludes any uses. The vegetation consists predominantly of frogmouth and mosses as well as casuarina & melaleuca regrowth.

A large amount of soil has been excavated for within this area which has resulted in inundation with water.

### **Work proposed**

facilitate research into feasibility of artificial water body

## **Staging**

### **Year One**

facilitate research

### **Resources Required**

researcher, engineers etc

### **Year 2**

work as suggested by research

### **Resources Required**

unknown

### **Year 3**

work as suggested by research

### **Resources Required**

unknown



## Acknowledgements

Tara Downs Landcare Group has drawn a significant amount of information within this plan from the work of Mr Frederick Myers who completed an Intergrated project for Southern Cross University in 1994. The group wishes to express its sincere thanks to Mr Myers for his efforts

## References

- Date, E.M. and Recher H.F. 1991, The Role of Remnants in Nature Conservation,  
In: *Rainbforest Remnants*, NSW N.P.W.S., Sydney
- Hitchcock, P.P., 1991 The Rainforests of North Eastern New South Wales - Their Conservation Status  
as a Context for Rainforest Rehabilitation Projects  
In: *Rainbforest Remnants*, NSW N.P.W.S., Sydney
- Jay, A. 1988 *Fontanea oraria: A Species Mamangement Plan*  
NSW N.P.W.S. Alstonville
- N.P.W.S 1990 *Fontanea oraria: Species Recovery Plan*  
N.P.W.S . Alstonville
- Myers, F. 1994 *Management Plan for the Rehabilitation and Revegetation of Tara Downs*,  
Southern Cross University, Lismore



## **APPENDIX 1**





**Imagine  
creating  
our own  
Botanic  
Gardens!!**

**Nature did  
it once...  
she just  
needs a  
little help  
now!!**

## **Yes...I want to help**

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

I would like to assist by

- ☐ Manual Labour
- ☐ Lending Equipment
- ☐ Making a cash donation
- ☐ Expert Advice
- ☐ Donation of native plants
- ☐ Donation of chemicals or fertilisers
- ☐ None of the above just yet but

please keep me informed

Please send this form to

Tara Downs Landcare Group  
c/- 26 Tara Downs, Lennox Head  
or phone

Craig & Paula Copeland on 876 276

or

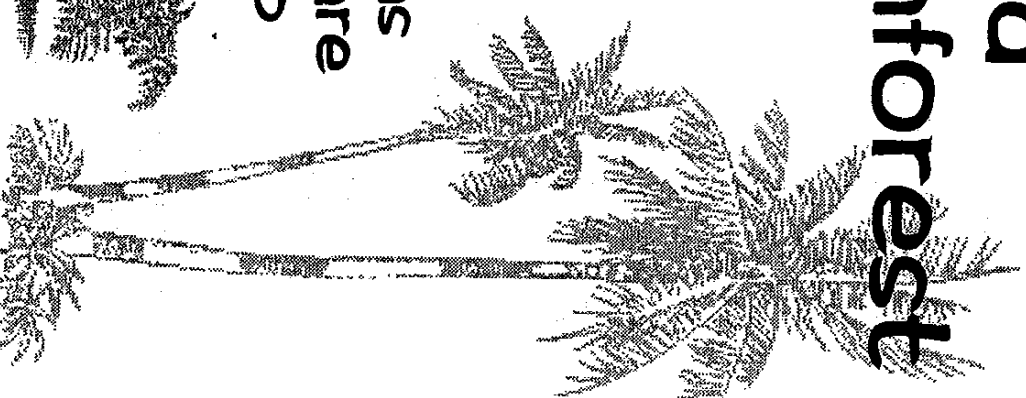
Gary & Liz Blackman on 876 498  
for further information

THIS BROCHURE WAS DONATED BY  
THE INSTANT SIGN CO BALLINA 864 874

## **A PROPOSAL**

**To Restore The  
Lennox  
Head  
Rainforest**

**Tara  
Downs  
Landcare  
Group**



# The Project

The aim of this project is to rehabilitate the area known as Tara Downs on the southern side of Lennox Head (see map below).

In the medium term we envisage an area of rainforest with walking paths, picnic areas and information signs for use by schools, interest groups and the general public.

We believe that in the long term this site has the potential to become a unique attraction of significant ecological and recreational value to the local area, possibly as a Botanical Gardens.

## The Site

The area to be restored is zoned either "public open space" or "environmental protection"

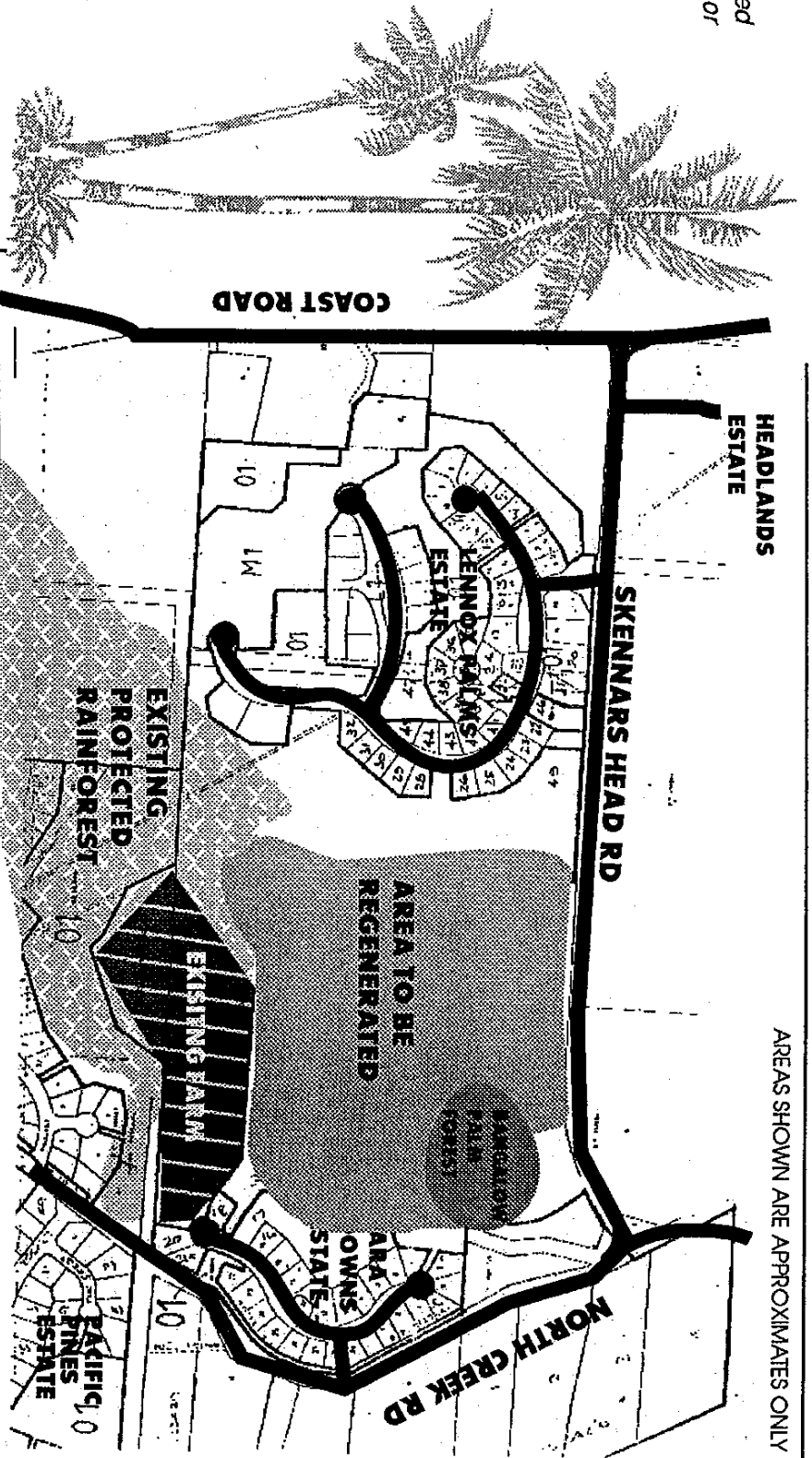
## Funding

Our group can apply for a Government grants to help cover the cost of trees, equipment hire etc. Before this occurs it is necessary for us to get the project underway with volunteer workers in order to -1. Prove we are serious about the project & 2. To get an idea of how much time, effort & materials are required to complete the project.

There are grants available where the Government matches our donations of time & money so it is imperative that we do as much as we can.

## Some facts about the area

- The area contains a Big Scrub Rainforest remnant
- The area contains a variety of vegetation communities including a Bangalow Palm Forest, a wetland and is adjacent to the largest Big Scrub Rainforest remnant in coastal N.S.W.
- This remnant contains one of the rarest rainforest plants in Australia Fontanea oraria - nine of only 10 mature plants left are found in the area.
- There is a spring fed a creek which in the past contained many freshwater crayfish.
- The area contains at least 83 native species



## **APPENDIX 2**



### 5.1 Manual removal of weeds.

These techniques encompass removal of weeds through physical means, and the use of machinery such as chainsaws and tractors. Such techniques include:

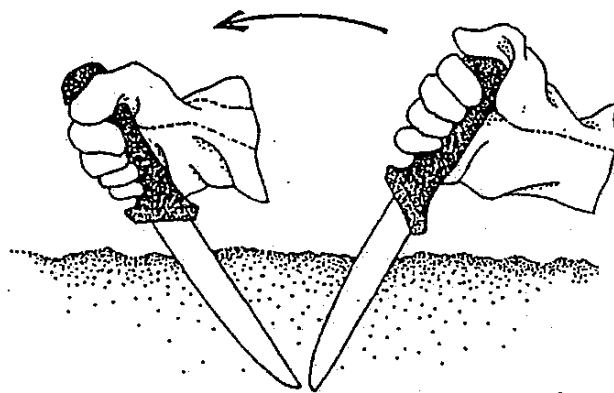
- \* Actually pulling the weeds out by hand - used on soft weeds and seedlings, annuals and tufted grasses.
- \* Using a knife or trowel - for removal of weeds with underground reproductive parts (Figures two and three).
- \* Application of weed mats and mulches to smother groundcovers such as Wandering Jew.
- \* Use of controlled burning to eliminate extensive areas of grass.
- \* Encouraging fungal attack through ring-barking (below ground), mulching and tying with black plastic - used on canopy weeds such as Camphor laurel.
- \* Using secateurs, brush hooks, and other machinery such as tractors for lopping, bulldozing, slashing, and the removal of debris.

S. Phillips (1991), states that; "As the canopy plants usually determine the nature of the total plant community, priority should always be given to removing canopy weeds and the creation of a healthy and stable canopy of indigenous species."

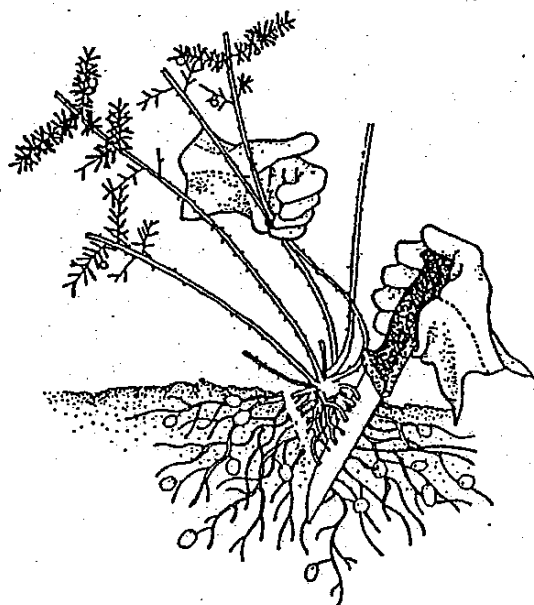
Thus, it is preferable in many circumstances to use techniques of minimal disturbance. There is no reason why these methods cannot be effective, especially if the control of canopy weeds is addressed. The use of minimal disturbance in weed removal is seen as a good approach in environments where the use of heavy machinery or chemicals could have adverse effects. Such environments would be characterised by unstable soils, areas of inundation, and fragile plant and animal species or communities.

Another advantage of employing hand-removal methods lies in the fact that follow-up work is reduced if the entire plant is removed in the first instance.

**Figure two:** Use of knife or trowel. The knife is the most appropriate in loose soils, while the trowel is more efficient in compacted soils. (Brodie *et al.*, 1991).



**Figure three:** Removal of Asparagus fern with knife (Brodie *et al.*, 1991).



## **5.2 Use of herbicides.**

As with manual techniques for weed removal, there will be a number of factors that will determine the optimal treatment to employ. These factors include:

- \* The weed's growth habit;
  - \* The life-cycle stage of the weed;
  - \* Available equipment;
  - \* Surrounding species;
  - \* Climatic conditions; and most importantly,
  - \* Whether or not herbicides can be safely used on the site.
- (Brodie *et al.*, 1991).

Following from this range of factors, is a wide variety of herbicide application techniques. As described, some of the basic techniques employed are:

**SPRAY APPLICATION TECHNIQUES** - Where weeds are in dense beds they may be controlled by selective blanket spraying of a herbicide, such as Roundup® at a concentration of 1:50. Where natives are present, they should be manually isolated by an area of approximately 100mm. or protected with guards, to allow for spot-spraying of weeds with 1:50 concentration herbicide (Bringolf, 1991). Any spraying program should include the use of trace dyes to enable monitoring of usage.

**HAND APPLICATION TECHNIQUES** - Weeds with a trunk size greater than 6mm. are most effectively treated by cutting the stem and painting the base with 1:1 (100%) concentration herbicide (the Cut-stump or Cut and Paint method - Figure four). This method is used for the control of large canopy weeds. (Brodie *et al.*, 1991).

In situations where the Cut and Paint method is undesirable, due to the damage caused by the removal of canopy weeds, it is possible to employ the method of Frilling or Direct Injection (Figure five). This method involves drilling angled holes into the sapwood, and placing the recommended dosage of herbicide into each hole as it is cut. This method kills the canopy weeds whilst retaining their structure, and is thus beneficial in attracting native seed dispersing fauna. (Brodie *et al.*, 1991).

It is important to note at this point that "the success of any systematic herbicide relies on the plant's normal physiological activities to move the chemical through its tissue." (Phillips, 1991). Thus, the best results are achieved with plants that are actively growing.

It is also important to note that the use of Roundup® and other glyphosphate herbicides is a controversial issue, with several government agencies having already banned its use. These agencies include Canadian Forestry and the Auckland City Council, New Zealand (N.P.W.S., 1991).

This controversy, and the fact that there is a lack of studies into the toxicological and environmental fate of herbicides such as Roundup®, means that management should seriously consider their use (Houston, 1992). It is important to remember that human error has led to the serious misuse of chemicals in the past.

**Figure four:** The Cut and Paint Method (Brodie *et al.*, 1991).

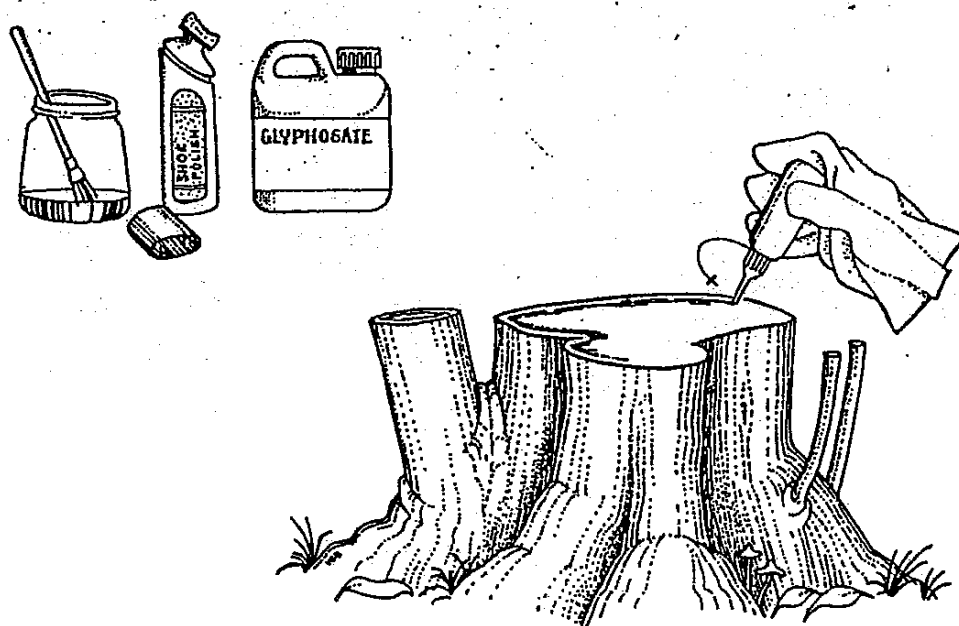
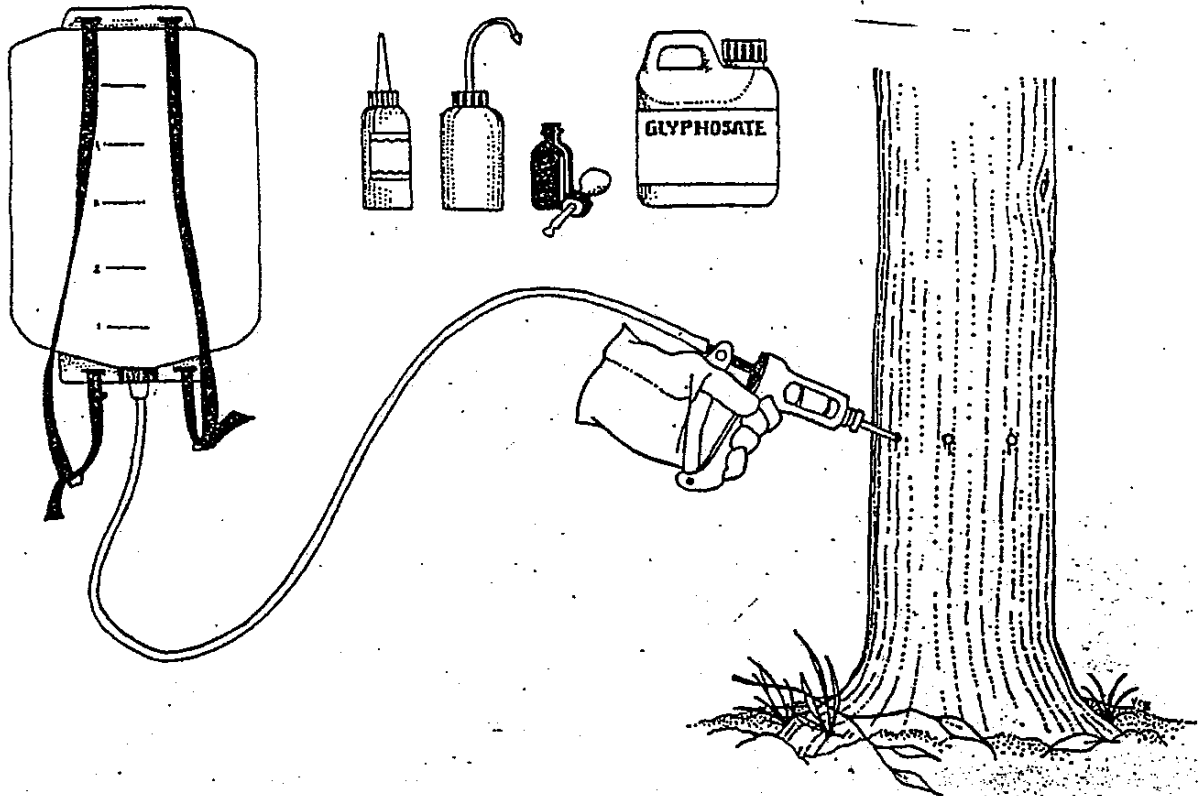




Figure five: Direct Injection (Brodie *et al.*, 1991).



Whatever removal technique is chosen for the remnant site, it is important that the procedure adopted follow three basic steps if any long-term goals are to be achieved. These three stages of weed removal are outlined by Brodie *et al.* (1991), and are as follows:

- 1/ PRIMARY WEED CLEARANCE - Removal of weeds by hand or through the use of herbicides, ensuring that weed control proceeds at the rate of regeneration.
- 2/ SECONDARY TREATMENT OR FOLLOW-UP - Is intensive weeding in areas which have already recieved primary weed clearance, to prevent re-infestation of the cleared site.
- 3/ MAINTENANCE WEEDING - Consists of monitoring the site over time so that weeds can be detected and removed, and spraying and/or mulching remnant and trail edges to keep the weeds in check.

It is important that only the plants that can be identified as weeds be removed. If this is not so, over-enthusiasm may lead to the destruction of many native seedlings.

Another equally important rule to establish in the removal of weed species is to never bite off more than you can chew. This is very important as over-clearing an area with early enthusiasm may result in re-invasion when follow-up work cannot maintain the area cleared (Horton, 1986).

The fact that cleared areas are usually reclaimed by invasive weed species means that any weed eradication program employed should be in conjunction with the replanting of native species. This is also relevant to the success of any replantings, as weed control is probably the most important factor in tree establishment, with tree growth being shown to be 50-75% better with adequate weed control (N.S.W. Agriculture, 1992).

This also means that remnant areas would be best treated through concentrating on different sections of the remnant individually, and/or by concentrating efforts on target weed species (Doss, 1987).

The benefits of weed eradication in rainforest remnants becomes obvious as the work progresses. With improvements in the aesthetics of the site increasing the desire for people to visit and use such areas. However, it is important not to be overly enthusiastic in achieving aesthetically appealing eradication programs at the expense of revegetation works.

It has been established that the retention of weed species such as Lantana (*Lantana camara*), and Wild tobacco (*Solanum mauritanum*) have proved useful as a pioneer stage for nomad and mature stage species to establish under, and then emerge through (Floyd, 1991). Once the native canopy has established it is then possible to remove these weeds, with the only preliminary work necessary being to ensure that the weeds do not seed too prolifically whilst the natives are regenerating (Floyd, 1991). However, some regenerators on the north coast consider that such benefits are outweighed by the rapid reproduction rate of Wild tobacco (Houston, 1992), (Specht, 1994).

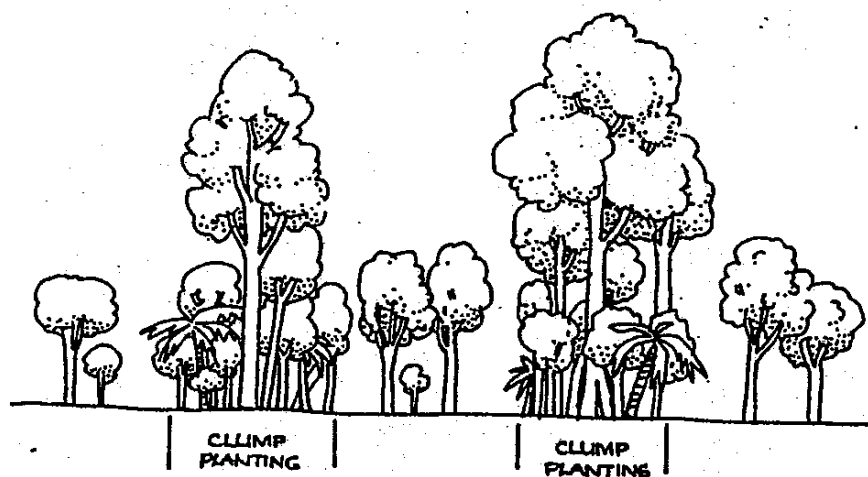
As with natural regeneration techniques, active reforestation of remnant sites relies heavily upon weed eradication techniques. Whether eradication is carried out manually, mechanically, or through the use of chemical herbicides, it has been shown that tree growth is 50-75% better with adequate weed control (N.S.W. Agriculture, 1992). On sites infested by grasses and other vigorous groundcovers, pre-spraying a glyphosphate herbicide, or mulching up to 1m. around each planting hole may be necessary to prevent heavy weed growth out-competing the native replantings. If herbicide use is employed, it is necessary that two weeks elapse prior to the commencement of plantings.

One major benefit of using this approach to remnant revegetation is stated by Robert Kooyman (Regeneration Consultant), who has successfully carried through his techniques on a property owned by himself and Madeleine Fraught. These techniques have shown that managers of remnants on the north coast of N.S.W. can usually bypass the early stages of rainforest succession (as previously outlined), by planting a combination of fast-growing and light-demanding species with the slower growing species of the mature rainforest (N.S.W. Agriculture, 1992).

Due to the success of the rainforest regeneration program carried out by Robert Kooyman and Madeleine Fraught, the remainder of their revegetation criteria will be listed, as they can be considered appropriate for the majority of locations on the north coast. These recommendations include:

- Using as many species as possible in any revegetation program, and ensuring that trees of the same species are planted as far away from each other as possible to ensure the greatest species diversity.
- Seedlings should be planted in groups of 20-50, containing sun-tolerant species and palms, so that planting rates are at about 1,500 trees per hectare.
- Windbreaks consisting of species such as Guioa (*Guioa semiglauca*), Hairy pittosporum (*Pittosporum revolutum*), Sweet pittosporum (*Pittosporum undulatum*), Steelwood (*Sarctopteryx stipata*), Casuarina (*Casuarina glauca*), Melaleuca (*Melaleuca quinquinervia*), and Syzygium species (*Syzygium francisci*) and (*Syzygium oleosum*), may be required to prevent the effects of drying or destructive winds.

- Continuing the planting procedure over the long-term to ensure that early succession plantings will progress into the mature phase.
- Trees should be planted 1m. or less apart (in rainforest settings), with clumps containing fast-growing, tall trees surrounded by slower growing trees. This ensures the creation of a canopy within 2-3 years, due to the rapid growth of the mature trees forcing the remainder to grow up in search of light (Figure six).
- Planting technique should include weed removal, pre-watering, fertilising, and mulching. Seedlings should be 20-90cm. tall at planting.
- Occasional tree deaths are viewed in the in the perspective of their benefits to soil improvement and the subsequent stimulation of microbiological processes.



The 'clump' method of rainforest replanting is an effective establishment method.

**Figure six:** Canopy creation through the use of clump plantings (Kooyman, 1991).

The program carried out by Robert Kooyman and Madeleine Fraught has been largely based upon the natural processes of rainforest dynamics, with plantings consisting of high densities and diversities of the later successional stage species to ensure rapid canopy closure. This method has proved successful, with the creation of a canopy within 2-3 years, and long-term savings on labour and chemicals (N.S.W. Agriculture, 1992).

## **APPENDIX 3**



## APPENDIX TWO: PLANT SPECIES LIST FOR TARA DOWNS.

### NATIVE TREES AND SHRUBS

<u>SPECIES NAME</u>	<u>COMMON NAME</u>
<i>Acacia melanoxylon</i> *	Blackwood
<i>Acmena smithii</i> *	Common lilly-pilly
<i>Alphitonia excelsa</i> *	Red ash
<i>Apananthe phillipensis</i>	Rough-leaved elm
<i>Archonotophoenix cunninghamiana</i>	Bangalow palm
<i>Arytera divaricata</i>	Coogera
<i>Banksia serrata</i>	Saw banksia
<i>Beilschmedia obtusifolia</i>	Blush walnut
<i>Breynia oblongifolia</i>	Breynia
<i>Bridelia exaltata</i>	Brush ironbark
<i>Canthium coprosmoides</i>	Coast canthium
<i>Cassine australis</i>	Red olive-berry
<i>Casuarina glauca</i> *	Swamp she-oak
<i>Commersonia bartramia</i> *	Brown kurrajong
<i>Cordyline rubra</i> *	Red-fruited palm lily
<i>Cryptocarya triplenervis</i>	Three-riened laurel
<i>Cupaniopsis anacardioides</i> *	Tuckeroo
<i>Daphnandra micrantha</i>	Socketwood
<i>Diploglottis australis</i> *	Native tamarind
<i>Duboisia myoporoides</i>	Corkwood
<i>Dysoxylum fraserianum</i>	Rosewood
<i>Dysoxylum mollissima</i>	Red bean
<i>Eleocarpus obovatus</i>	Hard quandong
<i>Ervatamia augustifolia</i>	Banana bush
<i>Ficus coronata</i> *	Creek sandpaper fig
<i>Ficus macrophylla</i>	Moreton Bay fig
<i>Ficus obliqua</i>	Small leaf fig
<i>Ficus superba</i> var. <i>henneana</i> *	Deciduous fig
<i>Ficus watkinsiana</i> *	Strangling fig
<i>Glochidion sumatranum</i>	Umbrella cheese tree
<i>Guioa semiglauca</i> *	Guioa or Bee tree

<i>Harpullia hillii</i>	Blunt-leaved tulip
<i>Macadamia tetraphylla</i>	Rough-shelled bush nut
<i>Mallotus discolor</i>	Yellow kamala
<i>Mallotus philippinensis</i> *	Red kamala
<i>Melaleuca quinquinervia</i> *	Broad-leaved paperbark
<i>Melia azederach</i> var. <i>australasica</i> *	White cedar
<i>Neolitsea cassia</i>	Green bolly gum
<i>Notolea longifolia</i>	Mock olive
<i>Olea paniculata</i>	Native olive
<i>Pilidiostigma glabrum</i> *	Plum myrtle
<i>Pittosporum revolutum</i>	Hairy pittosporum
<i>Pittosporum undulatum</i> *	Sweet pittosporum
<i>Psuederanthemum variable</i>	Pastel flower
<i>Quassia</i> sp. 'aff. <i>bidwillii</i> '	Quassia
<i>Rapanea howittiana</i>	Brush muttonwood
<i>Sarcomelicope simplicifolia</i>	Baurella
<i>Sarctopteryx stipata</i> *	Steelwood
<i>Sloanea australis</i> *	Maiden's blush
<i>Sterculia quadrifida</i>	Peanut tree
<i>Streblus brunonianus</i>	Whalebone tree
<i>Synoum glandulosum</i> *	Scentless rosewood
<i>Syzygium francissi</i> *	Giant water gum
<i>Syzygium leuhmanii</i>	Ryberry
<i>Syzygium oleosum</i> *	Blue lilly-pilly
<i>Trema aspera</i> *	Poison peach

\* These species have been identified by Mike and Adrienne Shepphard (1994) as fast-growing, and sun-tolerant.



## **NATIVE GROUNDCOVERS.**

### **SPECIES NAME**

### **COMMON NAME**

*Allocasia brisbanensis*  
*Alpinea caerulea*  
*Aneilema biflorus*  
*Commelina cyanea*  
*Eclipta prostrata*  
*Echinopogon caespitosus*  
*Lycopodium* sp.  
*Persicaria strigosum*  
*Philydrum lanuginosum*  
*Viola hederacea*

Cungevoi lily  
Native ginger  
Native wandering Jew  
Scurvy weed  
Yellow twin-heads  
Forest grass  
Mosses  
Knotweed  
Frogface  
Native violet

## **NATIVE FERNS.**

*Adiantum* sp.  
*Culcita dubia*  
*Cyclosorus nymphalis*  
*Hypolepis muelleri*  
*Lastreopsis marginans*

Native maidenhair  
Common ground fern  
Binung  
Evergreen fern  
Glossy shield fern

## **NATIVE VINES.**

*Cissus antarctica*  
*Geitonoplesium cymosum*  
*Hibbertia scandens*  
*Ludwigia peploides*  
*Mucuna gigantea*  
*Pandorea jasminoides*  
*Pandorea pandorana*  
*Ripogonum album*  
*Rubus rosifolius*  
*Smilax australis*  
*Stephania japonica*

Water vine  
Scrambling lily  
Twining guinea flower  
Ludwigia  
Giant burny vine  
Bower vine  
Wonga vine  
White supple jack  
Native raspberry  
Smilax vine  
Snake vine

## WEED SPECIES

<u>SPECIES NAME</u>	<u>COMMON NAME</u>
<i>Ageratina riparium</i>	Mist weed
<i>Anaphalis margaritacea</i>	Cottonweed
<i>Arecastrum syagrus</i>	Cocos palm
<i>Argeratum houstonianum</i>	Blue top
<i>Baccharis halimifolia</i>	Groundsel bush
<i>Bidens pilosa</i>	Farmer's friend
<i>Canna flaccida</i>	Canna lily
<i>Cardiospermum grandiflorum</i>	Balloon vine
<i>Cinnamomum camphora</i>	Camphor laurel
<i>Crassocephalum crepidoides</i>	Thickhead
<i>Erythrina sykesii</i>	Coral tree
<i>Gladiolus sp.</i>	Gladioli
<i>Lantana camara</i>	Lantana
<i>Ochna serrulata</i>	Ochna
<i>Passiflora edulis</i>	Black passionfruit
<i>Passiflora subpeltata</i>	White passion flower
<i>Pennisetum clandestinum</i>	Kikuyu
<i>Physalis viscosa</i> L.	Sticky cape gooseberry
<i>Plectranthus parviflorus</i>	Cockspur vine
<i>Protosparagus aethiopicus</i>	Climbing asparagus fern
<i>Protosparagus plumosus</i>	Asparagus fern
<i>Rivina humilis</i>	Red coral berry
<i>Schefflera actinophylla</i>	Umbrella tree
<i>Senna floribunda</i>	Winter senna (pendula)
<i>Sida rhombifolia</i>	Paddy's lucerne
<i>Solanum mauritanum</i>	Wild tobacco
<i>Solanum nigrum</i> L.	Blackberry nightshade
<i>Tagetes minuta</i>	Stinking Roger
<i>Tradescantia albiflorum</i>	Wandering Jew

\*N.B. Useful references for the classification of vegetation are contained within the reference list for this report.

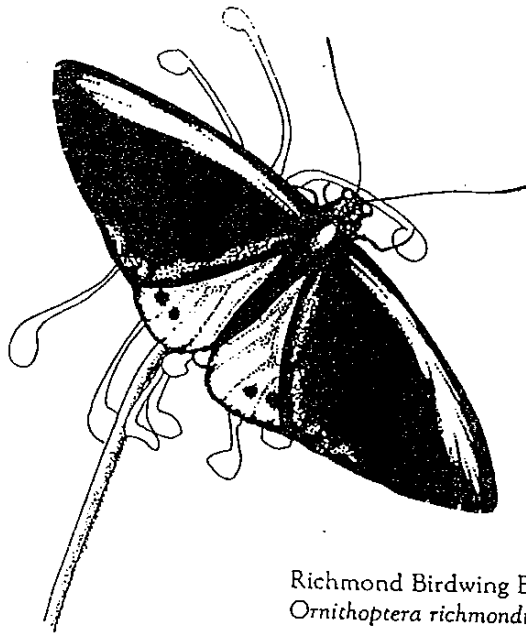
## **APPENDIX 4**



# **DRAFT**

# **Planting Guidelines**

*Selecting native plants for a range  
of site conditions*



Richmond Birdwing Butterfly  
*Ornithoptera richmondia*

## **for the Far North Coast of New South Wales**

**NSW National Parks & Wildlife Service Lismore District**

# Content

## Rainforest species suitable for red soils

"	"	"	chocolate soils
"	"	"	alluvial soils
"	"	"	podsollic soils
"	"	"	cabinet timbers
"	"	"	frosty sites
"	"	"	windy sites
"	"	"	riverbanks
"	"	"	rocky sites
"	"	"	attracting wildlife
"	"	"	landscaping

## Plants for coastal dunes

## Plants for landscaping coastal areas

## Plants for home gardens

## Koala food trees

## Bushfood plants

## Plants below 2 metres in height

## Plants 2 to 4 metres in height

## Plants below 2 metres in height for roadsides

## Plants for swampy sites

## Eucalypt forest plants

## Non- rainforest plants

## Windbreak plants

## Shade trees

## Frog pond plants

## Direct seeding species

## Environmental weed species - Do not plant these species

## Native plant nurseries

## Bibliography

Compiled by John Nagle

## How to use the guidelines

- this booklet is designed to help the landowner, Landcare, Dunecare and community groups, the Service's ranger and field staff and, other government agency staff to select native plant for a range of revegetation and landscaping situations.

- before selecting a list or species from a number of lists you will firstly need to establish;

what is the dominant soil type and soil condition of the site,

what limiting factor(s), ie. frost, floods, wind exposure, exposure to salty winds etc., the site experiences,

what function do you want the species to perform, ie. koala food, roadside planting, shade trees, cabinet timbers etc., and

whether the site is suitable for rainforest plantings, ie. exhibits high rainfall and friable soil.

In doing this you will then be able to select appropriate species for the site and facilitate project success.

- your site may contain irregularities that vary from the overall conditions of the site, these need to be investigated before selecting the appropriate list or species from the lists.
- the plant species lists within this booklet are a guide only to selecting native plants suitable for a range of conditions on the north coast of NSW.
- each list is not a comprehensive list of all species found growing under the specified conditions. The lists contain a suitable number of species that are likely to perform best under the site conditions.
- refer to botanical texts and further readings, see attached, for more information on the characteristics and growth habits of each species.
- the list of environmental weeds should not to be planted, these exotic plants usually require control if they are present at the site.
- seek advice from government extension officers and private practitioners when designing your project and selecting species.
- discuss your project and choice of species with the nursery owner, a list of native plant nurseries is attached.

**Native species suitable for swampy conditions; seasonally inundated areas on sandy soils, near-coastal areas.**

Specific name	Common name
<i>Acmena smithii</i>	Lilly Pilly
<i>Acacia melanoxylon</i>	Blackwood
<i>Alocasia macrorrhizos</i>	Cunjevoi Lily
<i>Araucaria cunninghamii</i>	Hoop Pine
<i>Archontophoenix cunninghamiana</i>	Bangalow Palm
<i>Austromyrtus dulcis</i>	Midgenberry
<i>Banksia ericifolia</i>	Heath-leaved Banksia
<i>Banksia robur</i>	Large-leaf Banksia
<i>Callicoma serratifolia</i>	Callicoma
<i>Callistemon salignus</i>	White Bottlebrush
<i>Casaurina glauca</i>	Swamp Oak
<i>Commersonia bartramia</i>	Brown Kurrajong
<i>Cordyline congesta</i>	Coast Palm Lily
<i>Crinum pedunculatum</i>	Crinum Lily
<i>Dianella caerulea</i>	Blue Flax Lily
<i>Endiandra discolor</i>	Rose Walnut
<i>Endiandra hayesii</i>	Velvet Laurel
<i>Endiandra sieberi</i>	Hard Corkwood
<i>Elaeocarpus reticulatus</i>	Blueberry Ash
<i>Eucalyptus robusta</i>	Swamp Mahogany
<i>Eucalyptus tereticornis</i>	Forest Red Gum
<i>Ficus coronata</i>	Creek Sandpaper Fig
<i>Ficus fraseri</i>	Sandpaper Fig
<i>Ficus watkinsiana</i>	Strangler Fig
<i>Glochidion sumatranum</i>	Umbrella Cheese Tree
<i>Hibiscus tiliaceus</i>	Cottonwood
<i>Litsea australis</i>	Brown Bolly gum
<i>Liverstonia australis</i>	Cabbage Palm
<i>Lomandra hystrix</i>	Forest Mat-rush
<i>Lophostemon suaveolens</i>	Swamp Box
<i>Melaleuca quinquenervia</i>	Broad-leaf Paperbark
<i>Melicope elleryana</i>	Pink Euodia
<i>Syncarpia glomulifera</i>	Turpentine
<i>Tristania laurina</i>	Water Gum
<i>Waterhousea floribunda</i>	Weeping Lilly Pilly



## Rainforest revegetation, fast growing species for red soil sites.

*Specific Name.*

*Common Name.*

### Pioneer and secondary species

<i>Acmena smithii</i>	Lilly Pilly
<i>Acronychia oblongifolia.</i>	Common Acronychia
<i>Alphitonia excelsa</i>	Red Ash
<i>Alphitonia petriei</i>	Pink Ash
<i>Castanospora alphanthii</i>	Brown Tamarind
<i>Commersonia bartramia</i>	Brown Kurrajong
<i>Ficus coronata</i>	Creek Sandpaper Fig
<i>Ficus fraseri</i>	Sandpaper Fig
<i>Glochidion sumatranum</i>	Umbrella Chessetree
<i>Hymenosporum flavum</i>	Native Frangipani
<i>Macaranga tanarius</i>	Macaranga
<i>Mallotus discolor</i>	White Kamala
<i>Melicope elleryana</i>	Pink Euodia
<i>Melicope micrococca</i>	White Euodia
<i>Omalanthus populifolius</i>	Bleeding Heart
<i>Pittosporum undulatum.</i>	Sweet Pittosporum
<i>Polyscias elegans</i>	Celerywood
<i>Rhodamnia argentea</i>	Mallotwood
<i>Syzygium australe</i>	Scrub Cherry
<i>Waterhousea floribunda</i>	Weeping Lilly Pilly

### Primary species

<i>Acmena ingens</i>	Red Apple
<i>Argyrodendron trifoliolatum</i>	White Booyong.
<i>Brachychiton acerifolia</i>	Flame Tree
<i>Brachychiton discolor</i>	Lacebark Tree
<i>Diploglottis australis</i>	Native Tamarind
<i>Dysoxylum muelleri</i>	Red Bean
<i>Ehretia acuminata</i>	Koda
<i>Elaeocarpus grandis</i>	Blue Quandong
<i>Ficus spp.</i>	various Figs
<i>Flindersia schottiana</i>	Cudgerie
<i>Flindersia xanthoxyla</i>	Yellowwood
<i>Geissois benthamii</i>	Red Carabeen
<i>Gmelina leichhardtii</i>	White Beech
<i>Grevillea robusta</i>	Silky Oak
<i>Harpullia pendula</i>	Tulipwood
<i>Melia azedarach</i>	White Cedar
<i>Pentaceras australis</i>	Crow's Ash
<i>Polyscias murrayi</i>	Pencil Cedar
<i>Rhodosphaera rhodanthema</i>	Deep Yellow-wood
<i>Stenocarpus sinuatus</i>	Firewheel Tree
<i>Sterculia quadrifida</i>	Red Fruited Kurrajong
<i>Syzygium luehmannii</i>	Riberry
<i>Syzygium moorei</i>	Durobby



## Edible native - bushfood plants for northern NSW.

Specific name	Common name
<i>Acmena ingens</i>	Red Apple
<i>Acmena smithii</i>	Lilly Pilly
<i>Acronychia oblongifolia</i>	Common Acronychia
<i>Acronychia wilcoxiana</i>	Silver Aspen
<i>Aleurites moluccana</i>	Candle Nut
<i>Alpinia arundelliana</i>	Undulate Ginger
<i>Alpinia caerulea</i>	Native Ginger
<i>Antidesma bunius</i>	Current Tree/ Wild Cherry
<i>Apium prostratum</i>	Sea Celery
* <i>Araucaria bidwillii</i>	Bunya Pine
<i>Archirhodomyrtus beckleri</i>	Rose Myrtle
<i>Athertania diversifolia</i>	Atherton Oak
* <i>Austromyrtus dulcis</i>	Midgenberry
<i>Austromyrtus aff. lasioclada</i>	Velet Myrtle
<i>Backhousia anisata</i>	Ringwood
* <i>Backhousia citriodora</i>	Lemon Myrtle
<i>Backhousia myrtifolia</i>	Native Cinnamon
<i>Cannavalia rosea</i>	Fire Bean
<i>Carpobrotus glaucescens</i>	Pigface
<i>Castanospermum australe</i>	Black Bean
<i>Cissus hypoglauca</i>	Five-leaf Water Vine
* <i>Davidsonia pruriens</i> var. <i>jerseyana</i>	N.S.W. Davidson's Plum
* <i>Davidsonia pruriens</i> var. <i>pruriens</i>	North Qld. Davidson's Plum
<i>Dianella caerulea</i>	Blue Flax Lilly
<i>Dioscorea bulbifera</i>	Aerial Yam
<i>Dioscorea transversa</i>	Native Yam
* <i>Diploglottis campbellii</i>	Small-leaf Tamarind
<i>Eugenia reinwardtiana</i>	Cedar Bay Cherry
<i>Eupomatia laurina</i>	Bolwarra
<i>Eustrephus latifolius</i>	Wombat Berry
<i>Ficus coronata</i>	Sandpaper Fig
<i>Ficus macrophylla</i>	Morton Bay Fig
<i>Geitonoplesium cymosum</i>	Scrambling Lily
<i>Hibiscus tiliaceus</i>	Coastal Cottonwood
* <i>Hicksbeachia pinnatifolia</i>	Red Bopple Nut
<i>Linospadix monostachya</i>	Walking Stick Palm
* <i>Macadamia integrifolia</i>	Smooth Bush Nut
* <i>Macadamia tetraphylla</i>	Rough Bush Nut
<i>Melastoma affine</i>	Blue Tongue
<i>Microcitrus australasica</i>	Finger Lime
<i>Nymphaea gigantea</i>	Water Lily

*Passiflora herbertiana*  
\**Planchonella australis*  
*Pleiogynium timorense*  
*Podocarpus elatus*  
*Solanum aviculare*  
\**Sterculia quadrifida*  
\**Syzygium australe*  
\**Syzygium leuhmannii*  
\**Syzygium oleosum*  
\**Syzygium paniculatum*  
*Tasmannia stipitata*  
*Tetragonia tetragoniodes*

Native Passionfruit  
Black Apple  
Burdekin Plum  
Plum Pine  
Kangaroo Apple  
Red-fruited Kurrajong  
Brush Cherry  
Riberry  
Blue Lilly Pilly  
Magenta Lilly Pilly  
Dorrigo Pepper  
Warrigal Greens

\* most edible/commercial species.