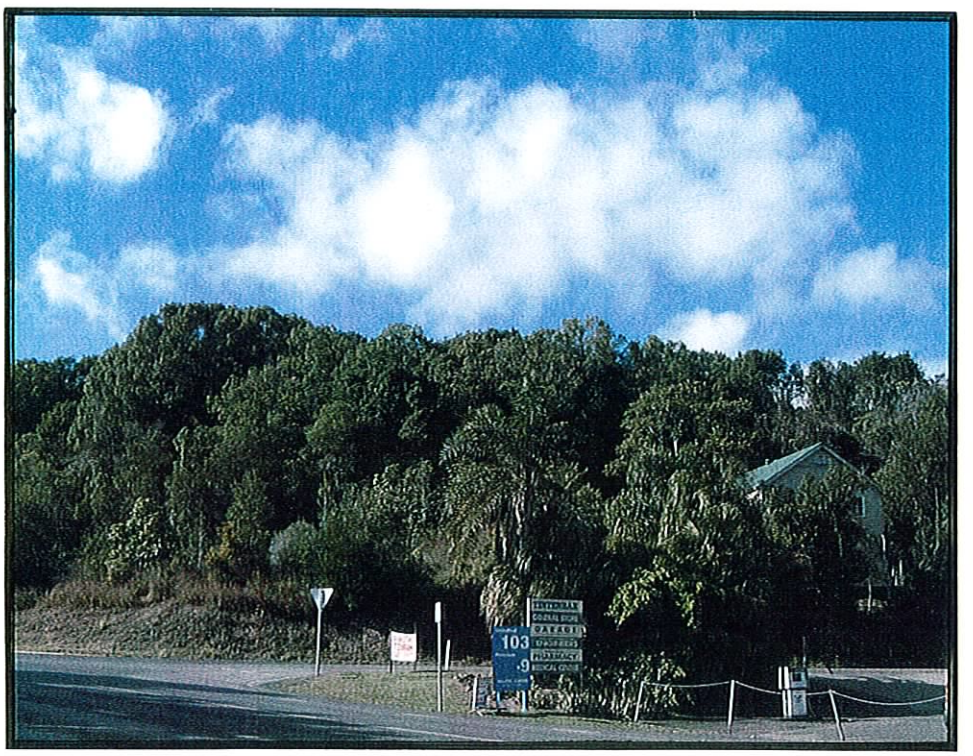
TINTENBAR HALL RESERVE



VEGETATION MANAGEMENT PLAN

Stephanie Lymburner

June 2004

ACKNOWLEDGEMENTS

The valuable assistance in site assessment and compilation of this report from Julian Lymburner and James Brideson is gratefully acknowledged.

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1. SUMMARY

A study has been made of the Tintenbar Hall Reserve for Ballina Shire Council to create a Vegetation Management Plan– as part of the commitment of the Council to complete Vegetation Managemant Plans for small areas of Public Lands under their control and to assist with local Landcare groups who wish to care for these areas.

An assessment of the site has been carried out, during the study thirty four (34) native species were identified – most were regrowth rainforest species, with a single specimen of Southern Quassia (*Quassia* sp.) found on the site and two others on the adjacent property, this is listed as a Rare or Threatened Plant (ROTAP) species.
A single tree of Macadamia (*Macadamia tetraphylla*) was also identified on site, this plant is listed as Vulnerable on the National Parks Wildlife Service (NPWS) Threatened Species List.
The study found that whilst some planting of native and exotic species has been done previously, maintenance has been lacking and most of the specimens are in poor health.

Twenty two (23) weed species were identified, they dominate all strata of the forest ecosystem with the site being severely degraded throughout.
Weed control priorities have been determined within the context of an integrated approach to their removal, and a supplementary planting recommended for areas affected by erosion or that have high public profile.

The Plan proposes an on-going weed management control, a landscaping and planting program, the establishment of photo monitoring points to evaluate the progress of regeneration, the placing of educational signage and a program aimed at the long term rehabilitation of the site – all of this will require a significant commitment by both the Council and the local Landcare group.

2. 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 improve the habitat for fauna.
- To involve interested members of the community in the restoration project.
- To implement a planting, of locally indigenous species to enhance, beautify and strenghten the forest structure surrounding the Hall.
- To educate the broader community to the threat that weeds pose to fragile ecosystems.
- To provide information and educational signage.

3. SITE HISTORY:

The Tintenbar School of Arts Hall is located on Lot 1 Section 5, Village of Tintenbar, Parish of Ballina, County of Rous. This land was dedicated as a "Site for Mechanics Institute' on 15 September 1891 and is administered under the Trustees of School of Arts Enabling Act, 1902. While the Land is not formally crown land or a crown reserve, the Department of Lands identifies it for administrative purposes as Reserve 540007. The land has an area of 1012 sq.mtrs. The current hall was built in 1905.

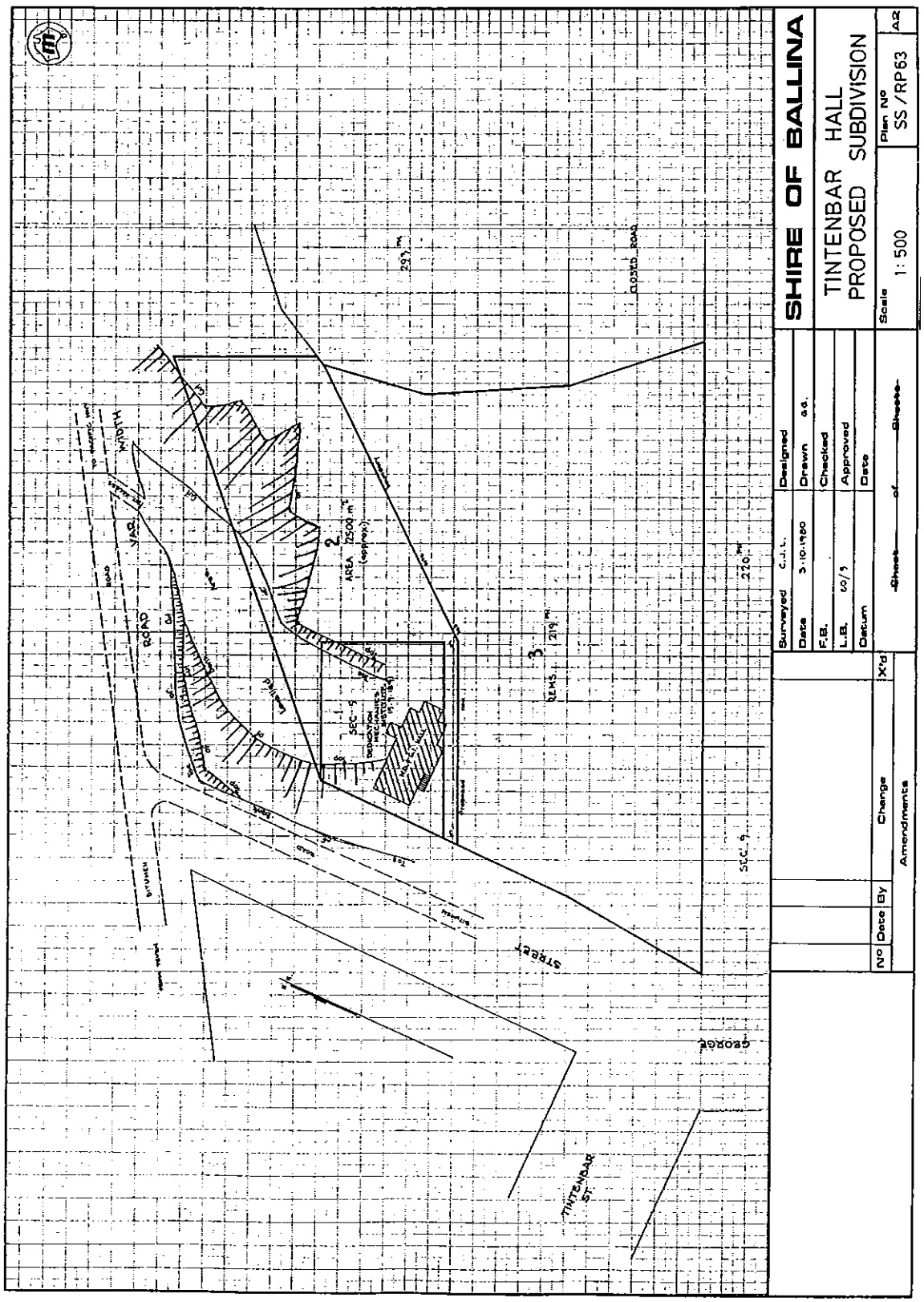
A strip of land (approx 2005 sq.mts.) was acquired between the hall site and Tintenbar Road Lot 2 DP 624352 in 1982 from Ian McDonald and Edna Loveridge for the peppercorn sum of one dollar. The purpose of the land acquisition was to secure access for the hall.
It is possible that Lot 2 was created to allow Council to address erosion issues on the embankment adjacent to Tintenbar Road or possibly as land suitable for quarrying.

Lot 2 is required to be managed in accordance with Council's Principal Generic Plan of Management for Community Land. (Source D.Kitson B.S.C.)

4. (a) Aerial photograph

Ballina Shire Council Reserve - Tintenbar
with 10m Contours

4.(b) Subdivision Map:



5. 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. Throughtout the reserve the dominant plants are woody weeds with three species being recognised as particularly invasive, these are Camphor Laurel (*Cinnamomum camphora*) Large-leafed Privet (*Ligustrum lucidum*) and Small-leafed Privet (*Ligustrum sinense*) (see section 6.2 and Appendix 3).
These three species, and a variety of other less invasive weed species are present at all levels of the forest structure, therefore the restoration of the area will be a long term and involved process.
Given the density of the weed species present a slow and methodical approach to poisoning the weed tree species is recommended to allow native species to regenerate naturally and reduce the impact on the forest structure and fauna habitat, this will be especially important in Zone B (see section 6.3).
In the road reserve on the northern side of Tintenbar Road, there is an outbreak of Madeira Vine (*Anredera cordifolia*), this plant is recognised as being the 'worst environmental weed on the North Coast' (pers.comm. Lisa Wellman 2002, Pest Species Management Officer, National Parks and Wildlife Service).
It would have a devastating effect on this reserve if this highly invasive weed was inadvertently introduced.

5.2 Erosion: There is evidence of erosion on the northern and western facing edge of Zone B, due to steepness of these areas, some erosion is also visible on the western facing edge of Zone A.

Photo 1: Erosion and Privets

5.3 Drainage: At the time of inspection there were no perceived drainage problems, but anecdotal evidence suggests that during significant rain events there is an ephemeral stream that courses down through the reserve in Zone B.

5.4 Urban Area: There is only one neighbouring property with housing adjacent to the reserve on the southern boundary so the problems associated with urban areas do not pose a significant threat to the reserve at the time of writing this plan.

5.5 Size and Edge Effect: The reserve is small is size and whilst not linear in shape it does have problems associated with size and edge effect. It is buffered on two sides by vegetation but the other two sides are extremely vulnerable with buffeting, wind turbulence on the north facing edge (Tintenbar Road) , temperature variablity, lateral light penetration and reduced humidity causing significant problems on the western facing edge (George St).

5.6 Carpark: There is an access road to Tintenbar Road with limited carparking availabe adjacent to the Hall, closer to the road a smaller secondary carpark exists that requires formalising with some landscaping with steps leading to the Hall to make pedestrian access easier and safer.

Photo 2: Hall and smaller carpark

6. SITE ASSESSMENT

6.1 Native Vegetation: Whilst the species list (see appendices 1) represents a reasonable number of native species present on the site, they are isolated trees and in many cases sickly specimens. On the northern side of Tintenbar Road there is a steep section of road reserve which has an intact native species canopy and some Threatened Species (Coolamon *Syzygium moorei* and Red Lilly Pilly (*Syzygium hodgkinsoniae*) occurring there and represents a good migratory seed source for the reserve.

On the western edge there are several Red Cedars (*Toona ciliata*) and Black wattle (*Acacia melanoxylon*) and adjacent to the car park there is a Flame Tree (*Brachychiton acerfolius*) and a Bottlebrush (*Callistemon* sp.) but given the species and situation it would appear that they have been part of an earlier planting.

On the southern edge and in the adjacent property there are a few specimens of Southern Quassia (*Quassia* sp.), listed as 3RC- on the ROTAP list and are regarded as being regionally significant.

On the western edge, adjacent to the Hall there is a single tree of Macadamia (*Macadamia tetraphylla*), and is listed as Vulnerable on the NPWS Threatened Species List.

Photo 3: Western edge behind hall – with Red Cedar and Privet understorey.

6.2 Weed species: The whole site is heavily infested with weed species affecting all layers of the forest structure. The canopy is comprised of 85% weed species mainly Camphor Laurel and Large-leafed Privet with the adjoining properties similarly affected.

The middle stratum is dominanted by juvenile species of Camphor Laurel, Large-leafed Privet and Small-leafed Privet; also present are clumps of Ochna (*Ochna serrulata*) all of these species are prolific seeders and represent a significant threat to the ongoing health of the forest structure within the reserve and adjoining properties.

The forest floor is the most depauperate of the site with little germination of any species, except for large patches of Privet seedlings.

Lantana (*Lantana camara*) occurs on the northern and western edges as well as a large patch in the middle of the reserve, several exotic grass species dominate the area at the base of the steep drop off. Ragweed (*Ambrosia artemisiifolia*) and exotic grasses occur in the car park area,preventing any seedling germination and outcompete any native species for water and nutrients.

In Area A, where an earlier planting has been done, several specimens of Duranta (*Duranta repens*) are present, whilst this has been used extensively in gardens it is now recognised as being a potential threat to forest eco-systems, as it is closely related to Lantana and can invade areas in a similar way.

The presence and density of the weed species at all levels of the forest structure, is currently inhibiting the germination of native species and unless significant restoration work is commenced shortly the forest will increasingly become a weed reservoir for the surrounding areas affecting both the flora and fauna of the area.

6.3 Work Zones: The area has been divided up into three (3) work zones A B C.

A: The area directly to the north and west of the Hall, this area is the most suitable for work by the Landcare group with the possible assistance of a Work for the Dole team, for any landscaping. The area is already highly disturbed, mainly with exotic grasses and some previously planted species.

This area requires landscaping done around the lower carpark to formalise the carpark, a simple track to be built providing better and safer access to the Hall.

On completion of the initial phase, a planting of locally indigenous species in the area to make it more attractive, assist in erosion control and to help establish a bank of rainforest species.

This zone has high public profile, the planting and landscaping would assist in raising broader community awareness to the value of the previously occurring vegetation types as well as improving the visual amenity of the Hall and its entrance.

It is recommended that this work be completed and a maintenance program in place before commencing on work zones B and C.

B: The area to the north east of the Hall and dominated by Camphor Laurel and Large-leafed Privet regrowth, this area is very depauperate and will require a long term commitment to return to a healthy forest structure. The area is steep and reasonably inaccessible with a signifcant drop off down to Tintenbar Road, which poses an Occupational Health and Safety (OH&S) issues for both Council and the local Landcare group. A planting of species such as Mat Rush (*Lomandra longifolia*), Dianella sp, and Native Ginger (*Alpinia caerulea*) on the bank directly behind the Hall will assist in controlling further erosion.

Photo 4: Privet understorey Zone B

C: The area from B down to the Tintenbar Road – this section is extemely steep – and will require professional regenerators to implement any restoration works as it has significant OH&S risks associated with any proposed restoration work. A planting program with species similar to Zone B for erosion control and the use of vegetative matter, for instance, branches and small logs lain across the slope will also assist to stabilise the zone.

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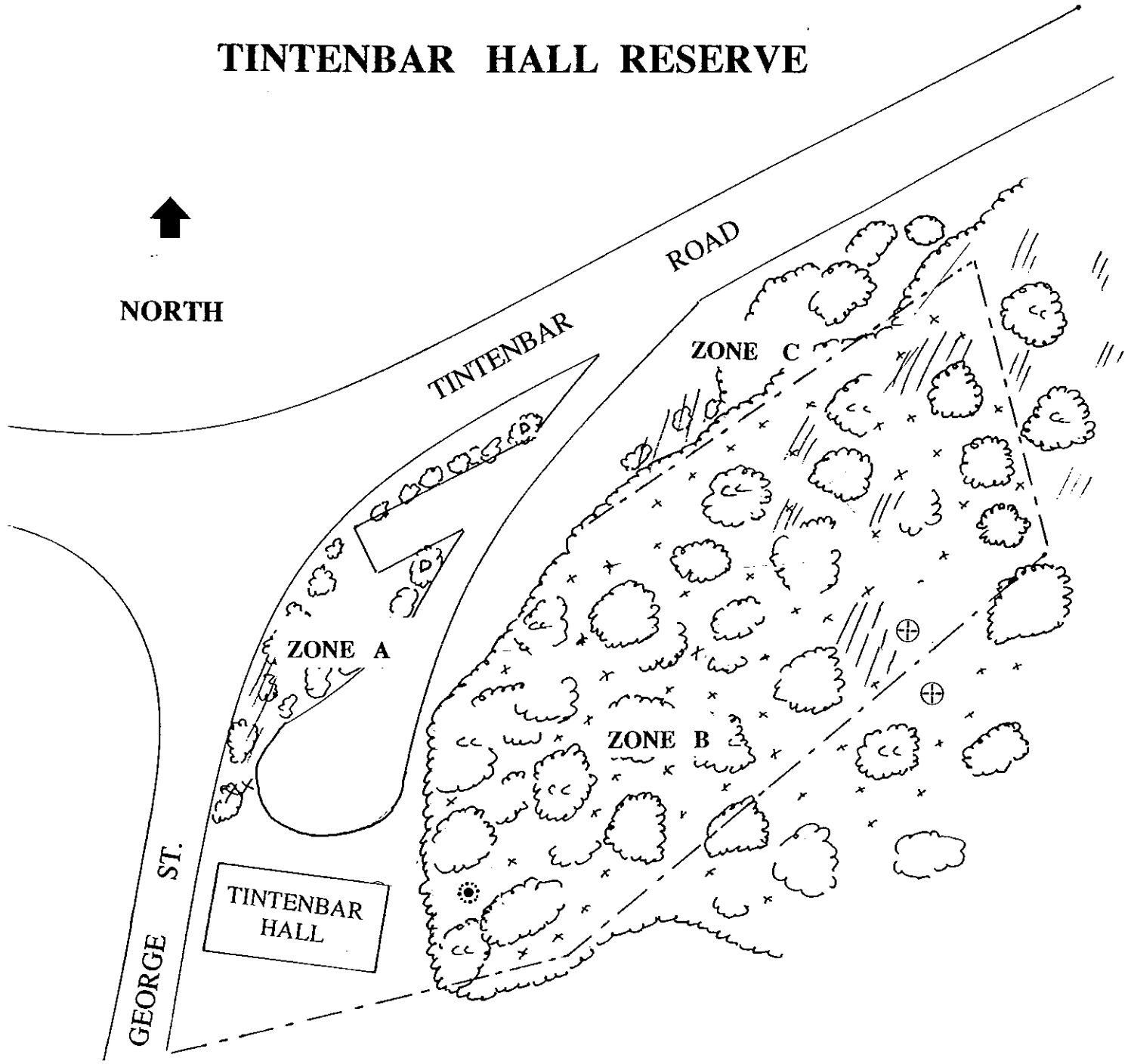

LEGEND

- Privet
- Camphor Laural
- Lantana
- Duranta
- Macadamia Tetraphylla
- Quassia sp.

Scale :
1cm = 6 metres

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
- to assess the success of the project to assist in funding applications

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

8. RECOMMENDATIONS:

- Employ trained Bush Regenerators to assist with the implementation of this Plan.
- Systematic, integrated removal of weed species following the guidelines set out in this plan.
- Organise field days to encourage community capacity building with the local landcare group.
- Establishment of photo monitoring points – to assess project progress.
- Landscape the lower carparking area with fencing and an access path to theHall.
- Planting of locally indigenous native species to assist in erosion control and enhance the existing floristic structure in the open grassed areas as in Zone A.
- Signage to educate the community to the threats of weeds, vegetative dumping and Council involvement , to be erected near the entrance to the Hall.

9. PRIORITIES:

- Organise field days to train the local Landcare Group. These field days to focus on weed identification, native plant identification and current weed removal techniques.
- Establish photo monitoring points – especially in Zones B and C before any rehabilitation work commences.
- Landscape lower carpark, build access path to Hall and plant out with locally indigenous species in area A and on the steep bank adjacent to the Hall in Zone B to assist with erosion control.
- Implement the systematic, integrated removal of weed species following the guidelines set out in this plan.
- Erect educative signage near the Hall entrance.

1. CONCLUSION:

Rainforest restoration is becoming more popular throughout the broader community, with many private and public landholders restoring degraded pasture and bushland such as this reserve.
Whilst overall health of the reserve is poor, there are some native species within the reserve and a small remnant of sub-tropical rainforest on the northern side of Tintenbar road, the presence of this remnant vegetation enhances the prospect of rehabilitation.
Planting of locally indigenous species, in selected areas, will assist in enhancing the existing floristic structure and help to stabilise the erosion prone areas.
The possibility of complete rehabilitation to the healthy forest structure of sub-tropical rainforest will depend on the commitment to hard work by the local Landcare group and the on-going support and financial assistance from Ballina Shire Council for a continuing maintenance program.

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Briggs J.D. and Leigh J.H. 1996 Rare or Threatened Australian Plants, Revised edition., Australian Heritage Commission, Canberra.

Floyd A. 1990 Australian Rainforest in N.S.W. Vol 2. Surrey Beatty and Son Pty. Ltd N.S.W. Australia.

Harden G.J. Flora of New South Wales. Vols.1. 2. 3. 4 New South Wales University Press, Kensington.

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APPENDIX 1.
NATIVE PLANT SPECIES LIST:
This list was compiled in April 2004 and includes the areas of road reserve north and east of the hall. Further species will probably be identified once work has commenced.

Family	Botanical Name	Common Name
Adiantaceae	Adiantum hispidulum	Rough Maidenhair (fern)
	Adiantum formosum	Black stemmed Maidenhair (fern)
Commelinaceae	Commelina cyanea	Native Wandering Jew
Dennstidaceae	Hypolepis glandulifera	Soft Ground Fern
Discoreaceae	Discorea transversa	Native Yam (vine)
Euphorbiaceae	Glochidion sumatranum	Umbrella Cheese Tree
	Mallotus philipensis	Red Kamala
	Omalanthus nutans	Bleeding Heart
Fabaceae	Acacia melanoxylon	Blackwood
Flagellariaceae	Flagellaria indica	Whip Vine
Lauraceae	Cryptocarya laevigata var. bowei	Glossy Laurel
	Cryptocarya obovata	Pepperberry
Meliaceae	Dysoxylom mollisimum	Red Bean
	Synoum glandulosum	Scentless Rosewood
	Toona ciliata	Red Cedar
Monimiaceae	Wilkea austroqueenslandica	Smooth Wilkea
	Wilkea huegeliana	Veiny Wilkea
Moraceae	Ficus fraseri	Sandpaper fig
Myrsinaceae	Embelia australiana	Embelia (vine)
	Maclura cochinensis	Cockspur (vine)
Myrtaceae	Austromyrtus bidwillii	Python tree
	Rhodamnia rubescens	Scrub Turpentine
Pittosporaceae	Pittosporum undulatum	Sweet Daphne
Poaceae	Oplismenus aemulus	Basket Grass
Protaceae	Macadamia tetraphylla	Macadamia 2VC-
Rhamnaceae	Alphitonia excelsa	Red Ash
Sapindaceae	Arytera dystylis	Twin-leafed Coogera
	Cupaniopsis anacardioides	Tuckeroo
	Guioa semiglauca	Guioa
	Jagera pseudorhus	Foambark
	Sarcopteryx stipata	Steelwood
	Toechima dasyrrhache	Blunt-leaved Steelwood
Simaroubaceae	Quassia sp.A	Southern Quassia ROTAP 3RC-
Sterculiaceae	Brachychiton acerfolius	Flame Tree
	Commersonia bartramia	Brown Kurrajong

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

APPENDIX 2

RECOMMENDED SPECIES FOR EROSION CONTROL:

Family	Botanical Name	Common Name
Adiantaceae	Pellea falcata	Sickle Fern
Agavaceae	Cordyline rubra	Red-fruited Palm Lily
	Cordyline stricta	Narrow-leafed Palm Lily
Araliaceae	Polyscias elegans	Pencil Cedar
Aristolochaceae	Pararistolochia pravenosa	Richmond Birdwing Butterfly Vine
Asclepidaceae	Hoya australis	Hoya Vine
Blechnaceae	Blechnum cartilagineum	Gristle Fern
	Doodia aspera	Rasp Fern
Commelinaceae	Commelina cyanea	Native Wandering Jew
Euphorbiaceae	Glochidion sumatranum	Umbrella Cheese Tree
	Macaranga tanarius	Macaranga
Lauraceae	Cryptocarya triplenervis	Three Veined Laurel
	Cryptocarya obovata	Pepperberry
	Neolitsea dealbata	White Bolly Gum
	Neolitsea austaliensis	Green Bolly Gum
Liliaceae	Dianella caerula	Blue Flax Lily
Meliaceae	Melia azedarach var. australasica	White Cedar
	Toona ciliata	Red Cedar
Moraceae	Ficus fraseri	Sandpaper Fig
	Ficus obliqua	Small leafed Fig
Myrtaceae	Acmena smithii	Lilly Pilly
	Pilidiostigma glabrum	Plum myrtle
	Syzygium oleosum	Blue Lilly Pilly
Pittosporaceae	Hymenosporum flavum	Native Frangipani
	Pittosporum revolutum	Hairy Pittosporum
Poaceae	Oplismenus sp.	Basket Grass
	Panic pygmaeum	Dwarf Panic Grass
Proteaceae	Stenocarpus sinuatus	Firewheel Tree
Sterculiacea	Commersonia bartramia	Brown Kurrajong
	Brachychiton acerfolius	Flame Tree
Rutaceae	Flindersia australis	Teak
	Flindersia bennetiana	Bennets Ash
Xanthorrhaceae	Lomandra longifolia	Spiny Mat Rush

Whilst other species such as Guioa, Sweet Pittosporum and Hard Quandong would also be suitable for a supplementary planting they occur within the area and will probably recruit naturally.

APPENDIX 3

WEED SPECIES LIST:

Family	Botanical Name	Common Name
Areaceae	*Syagrus romanzoffianum*	Cocos Palm
Asteraceae	*Ageratina adenophora*	Crofton Weed
	Ageratina riparia	Mistflower
	Ageratum houstonianum	Billy Goat Weed
	Ambrosia artemisiifolia	Ragweed
	Bidens pilosa	Farmers Friend
Asparagaceae	*Protasparagus plumosus*	Climbing Asparagus
Convolvulaceae	*Ipomoea cairica*	Coastal Morning Glory(vine)
Fabaceae	*Senna pendula var.glabrata*	Winter Cassia
Lauraceae	*Cinnamomum camphora*	Camphor Laurel
Myrtaceae	*Eugenia uniflora*	Brazilian Cherry
Ochnaceae	*Ochna serrulata*	Ochna, Mickey Mouse Plant
Oleaceae	*Ligustrum lucidum*	Large-leafed Privet
	Ligustrum sinense	Small- leafed Privet
Passifloraceae	*Passiflora edulis*	Passionfruit (vine)
	Passiflora subpeltata	White Passionflower (vine)
Phytolaccaceae	*Rivina humilis*	Coral Berry
Poaceae	*Setaria sphacelata*	Setaria
Rutaceae	*Murraya paniculata*	Orange Jessamine
Solanaceae	*Solanum seaforthianum*	Brazilian Climbing Nightshade
	Solanum mauritianum	Wild Tobacco
Verbenaceae	*Duranta repens*	Duranta
	Lantana camara	Lantana

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 of 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.
Small- 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
Winter Cassia (*Senna pendula var.glabrata*) CS&P
Brazilian Cherry (*Eugenia uniflora)* 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.

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

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

VINES

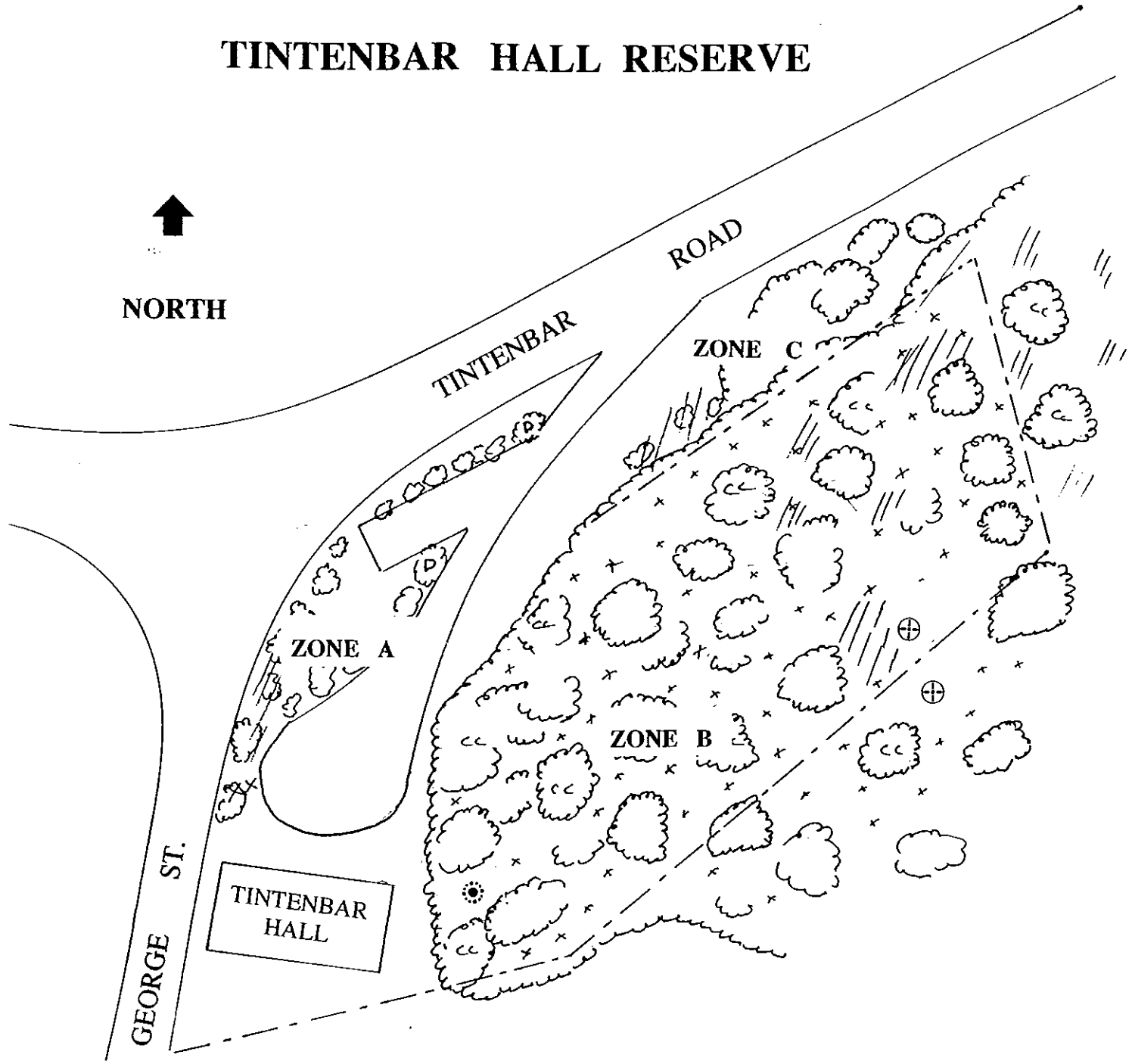
Coastal Morning Glory (*Ipomoea cairica*) Roll up runners, hang up to dry out, CS&P rooting nodes 1:1.5 and spray regrowth with glyphosate 1:100

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

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.

APPENDIX 5
DAILY WORK SHEET

TINTENBAR HALL RESERVE



LEGEND

- Privet
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- Quassia sp.

Scale :
1cm = 6 metres

BUSH REGENERATION WORK REPORT

Remnant name : **TINTENBAR HALL 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: