ROSS LANE RESERVE

VEGETATION RESTORATION PLAN

S. Lymburner
November 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. EXECUTIVE SUMMARY

A study has been made of the Ross Lane Crown Land Reserve, under the the trust management care of Ballina Shire Council (BSC) to create a Vegetation Management Plan to assist with the rehabilitation of the site after recent roadworks adjacent to the reserve.
The Plan proposes a strategic and integrated program of weed control to be implemented by qualified Bush Regenerators and Landcare members that have had two or more years experience in regeneration techniques for this type of vegetation, the Group wishes to maintain the area in the long term.
An assessment of the site has been carried out, during the study sixty six (66) native species were identified, including Scented Acronychia (*Acronychia littoralis*) listed as a Threatened Species under the Threatened Species Act (1995) (TSC Act) .
Nineteen (19) weed species were identified, including a category 1 Notifiable Noxious weed. Weed control priorities have been determined within the context of an integrated approach to their removal.
The Plan proposes an on-going weed management program and the establishment of photo monitoring points to evaluate the progress of rehabilitation
Restoration and rehabilitation of the reserve will require a significant and long term input by both Council and members of the local Landcare group who wish to participate, if it is to be return ed to a healthy self sustaining ecosystem.

2. AIMS AND OBJECTIVES

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

Regeneration and restoration of native plant communities is a complex, long term process and is more than just weed control. While weed control is of paramount importance, all weeds must be seen as part of a dynamic, interacting eco-system.
By exploiting the natural resilience of the native vegetation, weed species can be controlled in such a way that they are replaced by native species rather than by other weeds. (Joseph,1998).

OBJECTIVES:

- To assist natural regeneration by systematic and integrated weed removal.
- Restore roadside edge vegetation disturbed by the recent roadworks.
- To enhance the habitat of vulnerable flora and fauna species.
- To involve interested members of the community in the restoration project.
- To educate the local residents to the threat that weeds pose to fragile ecosystems

3. PROFILE OF THE RESERVE

3.1 Location: The reserve is approximately 4kms north of the village Lennox Head and is bisected by Ross Lane. The northern half of the reserve (Lot 106 DP 755725 and Lot DP 755 725) is bounded by Fig Tree Hill Drive and Ross Lane. The southern half (Lot 105 DP 755725) is bounded by Ross Lane and Cooper Close. The whole of the reserve area totals 1.37 hectares

3.2 Soils: Both sides of the reserve have nutrient enriched sands and low, damp depressions. Swamp soil landscapes are dominated by ground surfaces and soils which are at least seasonally wet. Soil parent material includes large amounts of accumulated decayed organic matter. Water tables are frequently close to the surface. (Morand'94)


photo 1: Drainage channel in the South Zone

Crown Reserve - Ross Lane, Lennox Head

ballina

Produced by: F. A. King Dept: Regulatory Services

Referred to: James Brideson Date: 14/04/2004

N W E S

DISCLAIMER

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GDA

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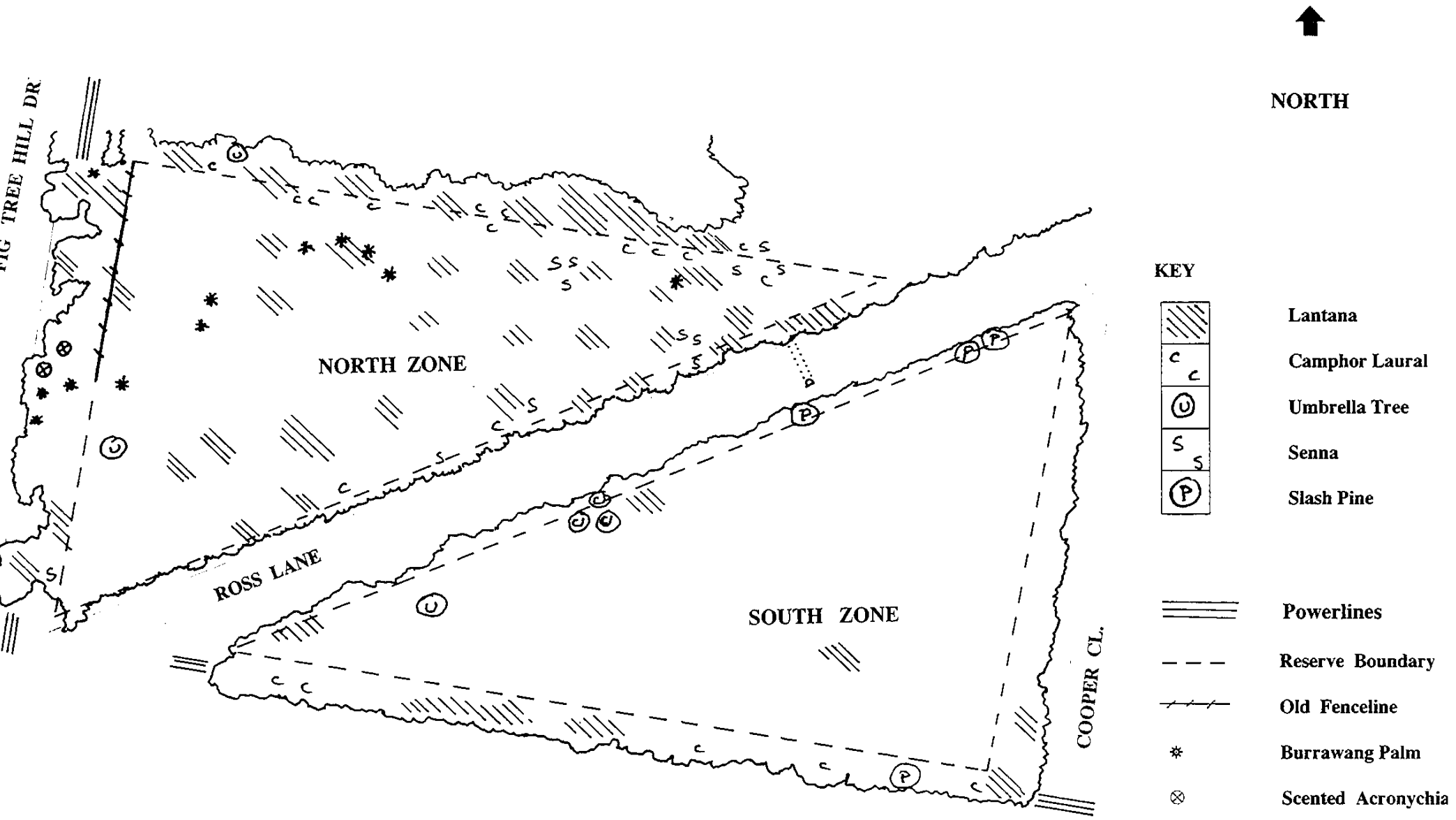
ROSS LANE RESERVE



3.3 History: Reserve No. 97310 Ross Lane, Lennox Head
This reserve was originally surveyed as Portions 105 and 106 in the Parish of Newrybar. The land was within R 56959 for public utility notified on 28 March 1924.
The size of the portions were reduced slightly in 1956 with the widening of the Ross Lane Road reserve that traverses the land.
The land was re-reserved as R 97810 for preservation of native flora and Ballina Shire Council appointed as trustee on 14 June 1985. (Source D.Kitson BSC)

3.4 Previous Works: In 2004 road widening and turning lanes were constructed at the intersection of Ross Lane and Sanctuary Village to provide right and left hand turning lane. These works were funded by the Federal Government Black Spot funding program – some adjoining vegetation had to be removed to facilitate these works resulting in the need for this plan.

3.5 Conservation Values: The whole area is zoned 7(l) Environmental Protection (Habitat) Zone under the Ballina Local Environment Plan (BLEP) 1987.
There are some littoral rainforest species present, with a small population of Scented Acronychia, listed on the NSW NPWS Threatened Species List and as 3ECi on the Rare or Threatened Australian Plants (ROTAP). Any restoration works being undertaken in the vicinity of these plants should be done in accordance with the NSW NPWS Recovery Plan for the species.
Whilst the Shining Burrawangs (*Lepidozamina peroffskyana*) are not on the ROTAP list, they are regionally significant being one of the last stands of this species on public land.

4. THREATS AND IMPACTS

4.1 Fire: There is evidence of fire in the northern section with several blackened old fence posts along the boundary, anecdotal evidence relates that 'the last fire through the area was in the summer of 1989' (pers.comm.S.Williams) The reserve is adjacent to large areas of wet and dry heathland, these ecological communities are prone to fire – especially after hot and dry summers The proximity to residential dwellings and Ross Lane may offer some protection from future fire events.

4.2 Weeds: Weeds are present in both sections of the reserve, the northern section being the most significantly affected with Lantana (*Lantana camara*) being present at all layers of the forest structure and dominating the edges forming a dense barrier in sections and inhibiting native species growth. There is one small outbreak of Groundsel Bush (*Baccahris halimifolia*) this is a notifiable Noxious Weed on the roadside edge of the northern zone.
Camphor Laurels (*Cinnamomum camphora*) Umbrella Trees (*Schefflera actinophylla*) and Slash Pines (*Pinus elliotii*) are the dominant weed tree species. Lantana is present in the mid-storey and forms dense clumps on the edges, with the forest floor being relatively weed free apart from some scattered outbreaks of Mistflower (*Ageratina riparia*) and an outbreak of Singapore Daisy (*Widelia trilobata*) on the roadside edge, this species can be very invasive and grows readily in low light levels. (see appendix 2 for full weed species list)

4.3 Rubbish Dumping: There is evidence of localised rubbish dumping adjacent to the road and in a neighbouring property, some of the weed species present within the reserve are most likely the result of vegetative dumping.

4.4 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 shear. 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 variability, 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)
There is evidence of altered drainage in both sides of the reserve due to past roadworks, this has the potential to change the floristic structure of the reserve over the longer term.
Powerlines are present on the southern edge of the southern section, they are also present on the western edge – near the Scented Acronychia and Shining Burrawangs, maintenance and clearing associated with powerlines represent a significant threat to both these species.

5. OTHER RELEVANT ISSUES

5.1 Legislative Requirements to be considered include:

- Local Government Act (1993) covering any environmental restoration projects.
- Threatened Species Act (1995) covering threatened flora and fauna and their habitat.
- Noxious Weed Act (1993)
- Ballina Local Environment Plan 1987 covering zoning and consent requirements.

6. SITE ASSESSMENT

6.1 Physical Characteristics : The reserve is flat with little undulation, it lies at the base and to the south of Fig Tree Hill, it is bisected by Ross Lane(see aerial map 1). There is a small drain linking the two sections, in the southern section there is a small water filled channel that lies parallel to Cooper Close.

6.2 Native Flora: The vegetation in both sections is a mix of heathland,woodland and littoral rainforest species (see native species list 1) with a high species diversity and all layers of the forest structure well represented.
The northern section of the reserve has a small population of a Threatened Species – Scented Acronychia that are very close to the western edge. Apart from the risk of illegal seed collection and physical damage, native and exotic vines could possibly damage the population and prevent seedling germination. A small stand of Burrawangs is present close to the Scented Acronychia ; the Burrawangs are unusual in this vegetation type and represent the only recorded specimens occurring naturally on public land in the area.
During the study, no species of native orchids were recorded however many terrestial orchids found in this vegetation type are seasonal and were not in their growth cycle during the study, in the course of regeneration works it is most likely that several species will be recorded during the late Winter early Spring months.

Both zones have a healthy vegetation core with mainly the edges being weed infested. In some cases native vines become similar to weed species degrading forest edges and topping canopy species, vines that are typically advantaged by disturbance and degrade forest edges are generally fast growing species including Smilax (*Smilax australis*),Common Milk Vine (*Marsdenia rostrata*) and Common Silk Pod (*Parsonsia straminea*).
The 'insitu' resilience of both sections is regarded as high and the migratory resilience high as well, given its proximity to other sclerophyll and heathland areas.

6.3 Native Fauna: No formal fauna surveys have been undertaken in the reserve.
Remnant vegetation such as this provide important habitat for a diversity of frog, reptile, bird and mammal species.The reserve provides important habitat for a range of sedentary and nomadic fauna. Sedentary species rely on the site all year round whilst nomadic species opportunistically use the site for feeding and breeding when suitable resources are available. Being part of a contiguous stretch of vegetation, this site provides important habitat for nomadic nectivorous and frugivorous fauna that effectively disperse seeds and pollen.

The avi-fauna of the site is largely impacted by the surrounding landscape. Much of the fauna that use the site are open habitat generalist species. These species use the site for refuge and as breeding habitat.

Fauna species listed under the TSC.Act, 1995, that are likely to occasionally use the reserve include: Red Goshawk (*Erythrotriorchis radiatus*)
Red–tailed Black Cockatoo (*Calyptorhynchus banksii*)
White-eared Monarch (*Monarcha leucotis*)
Common Planigale (*Planigale maculata*)
Wallum Froglet (*Crinia tinnula*)
Olongburra Frog (*Litoria olongburensis*)
Ground Parrot (*Pezoporus wallicus*)
Grass Owl (*Tyto capensis*)
Black Flying Fox (*Pteropus alecto*)
Grey-headed Flying Fox (*Pteropus poliocephalus*)
Common Blossom-bat (*Syconycteris australis*)
Little Bent- wing bat (*Miniopterus australis*)
Australasian Bittern (*Botaurus poiciloptilus*)
Osprey (*Pandion haliaetus*)
Mitchell's Rainforest Snail (*Thersites mitchellae*)

Unfortunately the road bisecting the two sections of the reserves poses a significant threat to small animals – and in turn must affect their breeding cycles and as the reserve is in close proximity to residential areas there is a threat to native faunal species from domestic animals.

6.4 Weeds: Are present throughout both sections of the reserve and pose a significant threat to its long term viability, Lantana is the most aggressive weed species present and whilst it can be regarded as having some habitat value and a buffer against wind turbulence on the edges, it also scrambles up vegetation, distorting trees and shrubs, forming thickets and suppressing native seedling germination.

There is a small outbreak of Groundsel Bush, a Category 1 Notifiable Noxious Weed, this species must have the highest priority for removal.
Camphor Laurel occurs along the boundaries of both sections with several large specimens occurring in the Northern Zone. This species along with the Slash Pines need to be treated with a high priority to prevent the spread of these weeds further into the reserve and surrounding heathland areas.
Most of the other weeds occur in small outbreaks and can be dealt with during the course of the systematic removal program.

6.5 Assessment and Management Zones

6.5.1 Northern Zone: Located on the north side of Ross Lane is a complex zone,abutting swamp sclerophyll forest with Swamp Mahogany (*Eucalyptus robusta*) as the dominant tree species. A number of Shining Burrawangs occur throughout and the small population of Scented Acronychia is on the western boundary.
NB Any restoration work undertaken in the vicinity of Scented Acronychia population will have be undertaken by qualified or experienced Bush Regenerators holding a Scientific Licence from NPWS and in accordance with the (draft) Recovery Plan for this species.
Lantana is present on all the edges and scattered throughout, Camphor Laurel is present along the northern boundary with some scattered individuals in the core. Winter Cassia (*Senna pendula var.glabrata*) is also present throughout. Coastal Morning Glory (*Ipomoea cairica*) is climbing into the canopy and smothering native trees damaging branches and inhibiting growth, as are some native vines such as Smilax that also damage native species in a similar manner. A small stand of Groundsel Bush occurs on the roadside edge.
Powerlines run parallel to the western boundary, the ongoing maintenance and lopping of vegetation will continue to disturb this edge, it is advised to inform the local power authority to the presence of both the Scented Acronychia and the Burrawangs.

photo 2:Reserve edge with Fig Tree Hill Drive

6.5.2 Southern Zone: On the southern side of Ross Lane, the vegetation is mainly dry sclerophyll forest with Scribbly Gum (*Eucalyptus signata*) as the dominant tree species and a significant stand of Paperbarks (*Melaleuca quinquenervia*) adjacent to Cooper Close.
The zone has a very light weed infestation, with most of the weeds present on the edges – there is a threat from an adjacent property that has a boundary of Slash Pines – these trees fruit prolifically and have a high germination rate. Powerlines run parallel to the southern boundary, the ongoing maintenance and lopping of vegetation will continue to disturb this edge.

photo 3: Southern zone with powerlines and adjacent slash pines.


photo 4: Recent road works and bare soil channel

On the Ross Lane boundary there have been recent road widening works and this edge is currently bare sand, descending into a wide channel – with some erosion evident on the roadside edge. A supplementary planting of endemic plant stock or reproductive material collected from within the reserve or within 5kms of the reserves, may be needed if regeneration is slow or the erosion is extreme.

7. RECOMMENDATIONS:

- Systematic, integrated removal of weed species
- Employ qualified Bush Regenerators to implement the Plan with the assistance of the local Landcare group volunteers who have experience in bush regeneration techniques.
- Establish photo monitoring points – to help to assess and monitor the project.
- Information leaflet explaining the value of the reserve and Councils' and the local Landcare groups' commitment to the restoration project, to be distributed local residents.
- Inform the powerline maintenance authority to the presence of Threatened Species to ensure minimal disturbance.
- Manage native vine species
- Supplementary plantings, of locally indigenous species in locations where natural regeneration is not occurring or is extremely slow.

7.1 Proposed Restoration Strategies:

Weeds are treated systematically, working in 'marked" bands across the zones, with weeds being treated as they occur, with appropriate treatment methods as described in Weed Control Techniques Appendix 3. Using this method weed species can be controlled in such a way that they are replaced by native species rather than by other weeds.

Native vines that pose threats to the canopy or edge species can be treated by cutting 'one in three' of the stems, but are not to be treated with herbicide..

7.1.1 Northern Zone:

- Set up monitoring points.
- Control small outbreak of Groundsel Bush and Singapore Daisy.
- Follow work directions, working systematically from the western edge – eastwards.
- Poison large Camphor Laurels, control smaller Camphor Laurels in the course of controlling other weed species.

7.1.2 Southern Zone

- Set up photo monitoring points
- Follow work directions, working systematically, from the western corner – eastwards.
- Monitor regeneration on roadside verge for 12 months – an appraisal to be done then to assess the need for a supplementary planting of appropriate locally indigenous species. that have had reproductive material collected from within 5 kms of the site.

8.PROJECT MONITORING AND EVALUATION:

Many projects falter and sometimes fail due to a lack of monitoring, mainly because the people doing the hard work, don't record what the site looked like before they started. Monitoring provides people with valuable photographic evidence of what they have achieved. Photographic points should be established before the project starts and regular recording sessions undertaken, in conjunction with daily work sheet records of attendees, weather, weeds treated, chemicals, methods used and observations.
This type of monitoring greatly assists evaluation of the project and the direction of future work plans.

9. CONCLUSION:

Whilst the overall conditon of the reserve is regarded as being healthy, with all layers of the forest structure well represented which is reflected by the high native species diversity present. The future of these road reserves is under threat from edge effect, wind turbulence and invasive plant species with the possibility of further invasion by 'garden escapes' from the surrounding area.
The importance of these road reserves is significant for their bio-diversity and increasing the viability of the surrounding heathland, providing refugia for animals and raising the local residents' awareness to the importance of ecotonal vegetation systems.
It is essential that the weed species be controlled in an integrated program in order to allow successive generations of native species to strengthen the existing core species.
The success of any restoration program of the reserve will only be fully achieved by a commitment to ongoing regeneration as well as a continuing maintenance program.

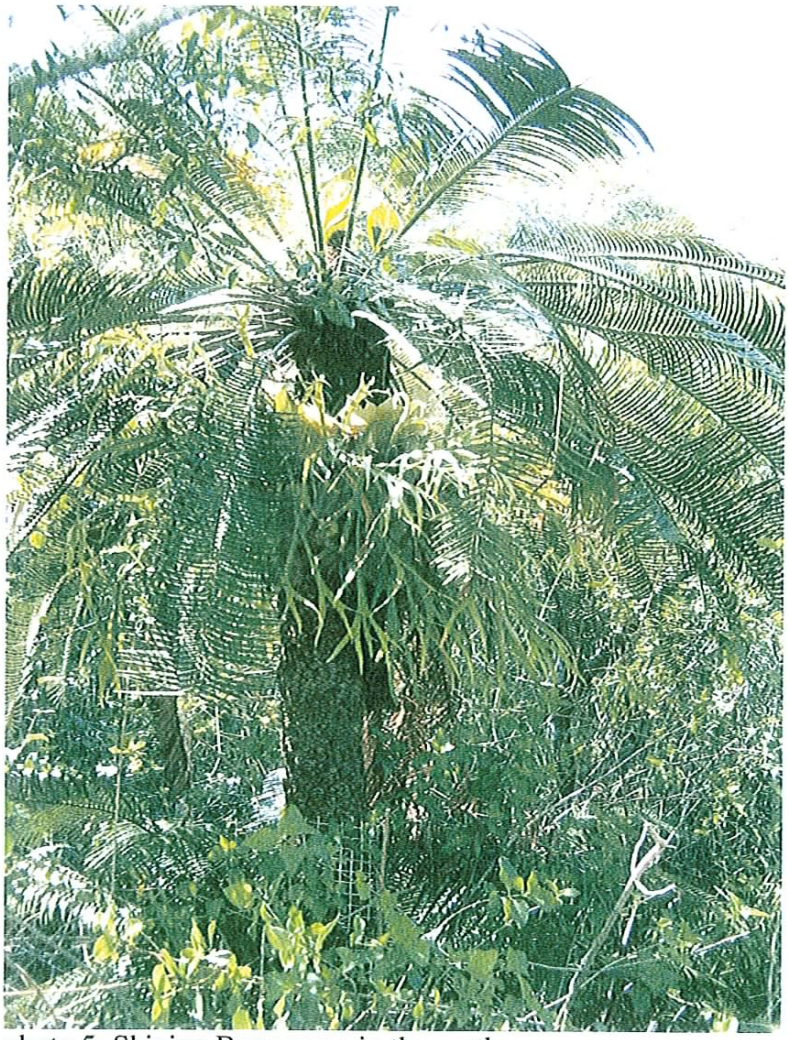


photo 5: Shining Burrawang in the northern zone.

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APPENDICES

1. Native Plant Species List

Family	Botanical name	Common Name
Agavaceae	Cordyline stricta	Narrow-leaved Palm Lily
Apocynaceae	Parsonsia straminea	Common Silk Pod
Araucariaceae	Araucaria cunninghamii	Hoop Pine
Arecaceae	Archontophoenix cunninghamiana	Bangalow Palm
Asclepiadaceae	Marsdenia rostrata	Common Milk Vine
Bignoniaceae	Pandorea pandorana	Wonga Vine
Aspleniaceae	Aspelnium australasicum	Birds Nest Fern
Blechnaceae	Blechnum indicum	Swamp Water Fern
Commelinaceae	Commelina cyanea	Blue Commelina
Cupressaceae	Callitris columellaris	Coastal Cypress
Cyperaceae	Gahnia clarkei	Swordgrass
Dioscoraceae	Discorea transversa	Native Yam
Elaeocarpaceae	Elaeocarpus reticulatus	Bluberry Ash
Epacridaceae	Leucopogon margarodes	Pearl beard Heath
Euphorbiaceae	Breynia oblongifolia	Breynia
	Glochidion fernandi	Cheese Tree
	Glochidion sumatranum	Umbrella Cheese Tree
	Mallotus discolor	White Kamala
	Mallotus phillippensis	Red Kamala
	Omalanthus nutans	Bleeding Heart
Dennstaedtiaceae	Hypolepis muelleri	Harsh Ground Fern
Dillenaceae	Hibbertia scandens	Twining Guinea Flower
	Trochocarpa laurina	Tree Heath
Lauraceae	Cassytha sp.	Dodder
Liliaceae	Dianella sp.	Blue Flax Lily
Menispermaceae	Stephania aculeata	Snake Vine
Moraceae	Ficus watkinsiana	Strangler Fig
	Maclura cochinchinensis	Cockspur
Mimosaceae	Acacia longifolia var. sophorae	Beach Sally Wattle
	Acacia melanoxylon	Blackwood, Sally Wattle
Myrtaceae	Acmena smithii	Lilly Pilly
	Austromyrtus dulcis	Midgin Berry
	Baeckea stenophylla	Weeping Baeckea
	Eucalyptus robusta	Swamp Mahogany
	Eucalyptus signata	Scribbly Gum
	Lophostemon confertus	Brush Box
	Melaleuca linariifolia	
	Melaleuca quinquenervia	Paperbark
	Pilidostigmum glabra	Plum Myrtle
	Syncarpia glomulifera	Turpentine
Orchidaceae	Cryptostylis erecta	Striped Hood
Philesiaceae	Geitonoplesium cymosum	Scrambling Lily
Polypodiaceae	Platycerum bifurcatum	Elkhorn
Poaceae	Oplismenus aemulus	Basket Grass

Proteaceae	Banksia serrata	Saw Banksia
	Banksia integrifolia	White Banksia
	Persoonia cornifolia	Broad leafed Geebung
Pteridaceae	Pteris esculentum	Common Bracken
Restionaceae	Restio tetraphyllus	Feather plant
Rosaceae	Rubrus hillii	Molucca Bramble
Rubiaceae	Pomax umbellata	Pomax
Rutaceae	Acronychia littoralis	Scented Acronychia (E) 3ECi 8S
	Melicope elleryana	Pink Euodia
	Phebalium squameum var. squameum	Satinwood
Sapindaceae	Cupaniopsis anacardiodes	Tuckeroo
	Guioa semiglauca	Guioa
Schizaeaceae	Lygodium microphyllum	Climbing Fern
Smilacaceae	Smilax australis	Austral Sarsparilla, Smilax
	Smilax glyciphylla	Sweet Sarsaparilla
Sterculiaceae	Commersonia bartramia	Brown Kurrajong
Thymelaceae	Wikstroemia indica	Wikstroemia
Ulmaceae	Trema aspera	Poison Peach
Vitaceae	Cissus antarctica	Water Vine
Xanthorraceae	Lomandra longifolia	Mat Rush
	Xanthorrahoea macronema	Bottle brush Grass Tree
Zamiaceae	Lepidozamia peroffskyana	Shining Burrawang

This species list was compiled by members of the Lennox Head Landcare Group, Sue Williams and Malcolm Milner and Stephanie Lymburner. Further species will probably be found during the course of restoration works.
Nomenclature is taken from the Flora of New South Wales. Volumes 1 to 4.

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)

2. Weed Species List

This list was compiled on 3:11:'04 further species will probably be identifed once work on the reserve has commenced.

Family	Botanical Name	Common Name
Araliaceae	Schefflera actinophylla	Umbrella Tree
Asteraceae	Ageratina adenophora	Crofton Weed W2/3
	Ageratina riparia	Mistflower W2/3
	Ambrosia artemisiifolia	Annual Ragweed
	Baccharis halimifolia	Groundsel Bush W1
	Widelia trilobata	Singapore Daisy
Asparagacae	Protasparagus aethiopicus	Ground Asparagus
Cannaceae	Canna indica	Canna Lily
Caryophyllaceae	Drymaria cordata	Tropical Chickweed
Convolvulaceae	Ipomoea cairica	Coastal Morning Glory
Fabaceae	Desmodium uncinatum	Silver Leafed Desmodium
	Senna pendula var.glabrata	Cassia/ Winter Senna
	Macroptilium atropurpureum	Siratro
Lauraceace	Cinnamomum camphora	Camphor Laurel
Passifloraceae	Passiflora edulis	Passionfruit
	Passiflora subpeltata	White Passion Flower
Poaceae	Andropogon virginicus	Whiskey Grass
Solanaceae	Solanum mauritianum	Tobacco Bush
Verbenaceae	Lantana camara	Lantana W2/3

W1 and W2/3 are classes of environmental weeds.

W1 weeds must be fully and continuously suppressed and destroyed.

W2/3 These weeds pose a threat to agriculture, the environment or the community and that has the ability to spread to other areas. Land holders must continuously suppdress and destroy the infestation.

There are several annual weed species and exotic grasses on the boundary of both sections of the reserve that will be controlled in the course of an ongoing weed maintenance program.

3. WEED REMOVAL and CONTROL TECHNIQUES for individual species

The following shrub and tree species are to be treated using the 'cut scrape paint' method:
(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.**Tree injection**: This method applies to all woody trees and shrubs with a diameter greater than 6-10 centimetres.
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 with glyphosate.
**This method is not to be used if the tree is overhanging the road or likely to drop limbs onto the road. Contact council staff to discuss other options for removal in these cases.*

3. **Spray:** Back pack is the recommended means of spraying.
Groundcovers
Annuals, Tropical Chickweed and exotic grass species: Glyphosate at 1:100.

Vine species:
Silver–leafed Desmodium (*Desmodium uncinatum*) Hand removal or crown, collect and bag seeds.
White Passionflower (*Passiflora subpeltata*) as for the above.
Coastal Morning Glory (*Ipomoea cairica*) Vines and runners: hand pull, roll up and hang up to dry. CS&P main stems
Regrowth of these vines may be sprayed with a back pack using glyphosate at 1:50 or removed by hand.

Trees and Shrubs:
Groundsel Bush (*Baccharis halimifolia*) CS&P
Camphor Laurel (*Cinnamomum camphora*). CS&P trees to 10mm.diameter Inject larger trees and leave in situ.
Slash Pines (*Pinus elliotii*) – as for Camphor Laurels
Umbrella Tree (*Schefflera actinophylla*) when treating this species make sure the cut trunk is not in contact with the ground as it 'strikes' readily.
Winter Cassia (*Senna pendula var.glabrata*) cut / scrape and paint Collect all seed pods and compost off site

Lantana (*Lantana camara*) cut scrape/paint: take care with 'cut ends' coming in contact with the ground – especially in moist area.

The ground covers and exotic grasses are to be treated with the following methods.

Singapore Daisy (*Widelia trilobata*)
Glyphosate1:50 + metsulfuron methyl 1.5 g per 10 ltrs + Li700.

Ground Asparagus (*Protasparagus aethiopicus*) Hand crown or spray with Glyphosate 1:100 + metsulfuron methyl 1.5g per 10 litres..

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

Mist Flower (*Ageratina riparia*) hand removal or spray larger areas with Glyphosate 1:100 " " " " "

Crofton Weed (*Ageratina adenophora*)" " " " "

The information given here is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer from BSC. When using herbicides always read the label and ensure that the herbicide is registered or the is an appropriate permit for th e intended use

BUSH REGENERATION WORK REPORT

Remnant name : **ROSS LANE 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:

Checklist For Bush Regeneration Activities In The Habitat Of Threatened Species, Endangered Populations And Endangered Ecological Communities

Background

Threatened species, endangered populations and endangered ecological communities are protected in NSW under the *Threatened Species Conservation Act* 1995 (TSC Act).

It is an offence to "harm" or "pick" threatened species, populations or ecological communities, or cause "damage" to critical habitat or the habitat of threatened species, populations or ecological communities[1].

"Harm" refers to native fauna, and is defined as to: hunt, shoot, poison, net, snare, spear, pursue, capture, trap, injure, or kill.
"Pick" refers to native flora, and is defined as to: gather, pluck, cut, pull up, destroy, poison, take, dig up, remove or injure the plant or any part of the plant.
"Damage" is not defined but the common dictionary definition would apply.

It is a defence to a prosecution if the action was:

- authorised in accordance with a Section 120 licence or a Section 132C licence under the *National Parks and Wildlife Act* or a licence granted under Section 91 of the TSC Act (flora and ecological communities);
- authorised in accordance with a development consent under the *Environmental Planning & Assessment Act 1979;* or
- authorised by or under the Rural Fires Act 1997, or the State Emergency and Rescue Management Act 1989.

Bush regeneration activities

Areas where bush regeneration is undertaken are often the habitat of threatened species or may be an endangered ecological community (e.g. Lowland Rainforest on Floodplain). It is understood that the intention of bush regeneration activities is to have a positive impact, however, there is a chance that these activities may adversely impact on threatened species, populations or ecological communities. This may occur where:

- a species (flora or fauna) is not known to exist on the site (e.g. cryptic species such as orchids);
- a species may be accidentally harmed or picked (e.g. by spray drift or accidental cutting).
- a species may be misidentified and is thought to be either an exotic or common native species and therefore may be removed or damaged;
- the requirements of the species, including habitat structure and components, may be temporarily adversely impacted (e.g. maintaining microclimatic conditions, connecting or sheltering habitat for fauna);

Licensing

Those undertaking bush regeneration activities may consider applying for a Section 132C licence under the NPW Act.

A Section 132C licence is issued where the Department of Environment and Conservation (DEC) considers that the proposed work is for conservation purposes.

Licence Conditions

Generally, licences are issued on an annual basis; however, shorter or longer term licences are also issued where appropriate.

The DEC may prohibit, condition, or limit bush regeneration works in some areas where it may affect research plots. Other licence conditions may be applied after consideration of population estimates, age structure, viability and health of the population or individuals.

The Bush Regeneration Checklist

The intention of the checklist is to ensure that bush regeneration activities will **not** have a significant impact on threatened species, populations or ecological communities and their habitats. Applicants should consider attaching this standard checklist to any Section 132C licence application to assist the DEC in assessing the significance of the proposed activity. The DEC will assume the applicant is prepared to adhere to the guidelines in the checklist where they form part of the licence application. Detail of any proposed work additional or contrary to that described in the checklist must be provided. The DEC then assesses the likely significance of the impact of the proposal[2] using the information provided in the licence application.

For the purposes of the checklist, bush regeneration is considered as all types of habitat restoration and may include such activities as manual weed removal, herbicide use, temporary damage to, or removal of native plants, planting, track work or maintenance and habitat removal or modification.

1. Threatened Species are listed under two schedules on the *Threatened Species Conservation Act*: Schedule 1 includes Endangered Species, Endangered Populations and Endangered Ecological Communities and Schedule 2 includes Vulnerable species. The *Threatened Species Conservation Act* Schedules are maintained by the NSW Scientific Committee. The most recent versions of these schedules may be obtained on the NPWS Web Site: www.nationalparks.nsw.gov.au.

2. A Species Impact Statement must be prepared where a proposed activity is assessed as likely to have a significant impact on threatened species, populations or ecological communities.

3. The Wildlife Atlas is the DEC statewide flora and fauna database.

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DEC Checklist For Bush Regeneration Activities:

Please Note:

1) The checklist is provided to facilitate licence applications and to draw attention to DEC issues of concern.
2) There is no requirement to use the checklist when applying for a licence. You may alternatively choose to provide details of your project and an explanation of how you will ensure there will not be a significant impact on threatened species, their habitat or on endangered ecological communities.
3) If you provide a negative answer using the checklist this does not necessarily mean your application will be unsuccessful. You will however need to provide a satisfactory explanation as to why you do not wish to comply with the guideline and how you will ensure there is unlikely to be a significant impact on threatened species, their habitat or on endangered ecological communities.
4) You may wish your licence application to cover the collection of Voucher Herbarium Specimens and Plant Material for Identification. Guidelines to cover those activities are also attached.

Management Planning:	yes	no	more info attached
The proposed activities will be in accordance with a management plan or site plan (map). *Please attach the plan or relevant sections of the plan or strategy to the licence application.*			
The project has been discussed with the relevant Landcare coordinator. *If not, provide details of any other professional advice you have sought, e.g. from a qualified bush regenerator.*			
A DEC Wildlife Atlas database search of a 5km radius of the site has been undertaken to identify threatened flora/fauna species known or likely to occur on the site. *The Wildlife Atlas is accessible on the DEC Web Site www.nationalparks.nsw.gov.au.*			
Prior to commencing any works on site, a permit or permission will be obtained from the relevant landowner(s) or land manager(s).			
Training and supervision:			
All workers carrying out bush regeneration and associated works will be supervised by a trained and experienced co-ordinator who has completed a recognised bush regeneration course (e.g. the Certificate of Bushland Regeneration) or a minimum of 2 years bush regeneration experience. *If 'yes', please provide below the name and qualifications of the co-ordinator.* Name: ..... Qualifications/experience:.....			
Other members of the group that have bush regeneration training or experience. Name: ..... Qualifications/experience: ..... Name: ..... Qualifications/experience:..... Name: ..... Qualifications/experience:..... Name: ..... Qualifications/experience:..... Name: ..... Qualifications/experience:.....			
All activities by workers will be regularly checked and approved by the co-ordinator.			
All workers will be informed of any threatened species or endangered ecological communities in the area or which may occur in the area and the potential impacts of activities on these species/communities. *e.g. vines on the edge of a littoral rainforest remnant may protect the remnant from salt-bearing winds.*			
	yes	no	more info

			attached
All workers have adequate weed and native plant identification skills. *i.e. all workers can identify and differentiate between weeds and native plants that occur on the site.*			
Workers will be familiar with the identifying features of threatened flora that are known or likely to occur in the project area. Where threatened species known from the area are similar to weed species, the distinguishing features between these will be understood prior to commencing the work.			
Access to sites			
All vehicular access to sites will be restricted to formed roads.			
Unnecessary damage to sites will be avoided. *e.g. avoid working in wet weather to lessen soil compaction.*			
Impacts on flora:			
Prior to any works being undertaken, the presence or absence of threatened flora will be determined by a thorough walking search of the area.			
All threatened flora will be tagged with highly visible flagging tape before work commences. If a number of individuals occur in a clump, that area should be marked out with flagging tape.			
Cutting or damaging of threatened flora will be avoided.			
All plants will be positively identified before they are removed (pulled, cut, poisoned etc).			
Weed removal within 2m of a threatened species will be undertaken by hand.			
To reduce the possibility of introducing plant diseases and weeds the following measures will be applied: 1. Secateurs will be sharp and cleaned with methylated spirits. 2. Footwear will be cleaned of loose soil and preferably treated with bleach between sites.			
Impacts on fauna:			
All workers will be aware of any threatened fauna that are known or likely to occur on site, and the potential impacts of the proposed activities on those species.			
The habitat and refuge potential of weeds and rubbish will be considered prior to removal. *e.g. Lantana can provide cover for threatened fauna such as the Bush-hen. Dead Lantana and poisoned Camphor Laurels should, where possible, be left in situ.*			
Weeds will be removed gradually in areas where an infestation is extensive. *Ideally, 50% of weeds that may provide habitat should be left until native plant species have re-established and provide alternative refuge.*			
Disturbance to, and removal of rocks, logs and other potential refuge sites will be avoided.			
A herbicide registered for use near waterways will be used within 5m of waterways.			
Herbicide spraying will be prohibited within 5 metres from watercourses where threatened frogs are known or likely to occur and within a 10m radius of records of threatened frogs.			
A buffer of 1m along other watercourses will be maintained in which no herbicide will be sprayed.			
Care will be taken to minimise disturbance to shy or cryptic species. *e.g. the Marbled Frogmouth roosts in vine 'curtains'.*			
Care will be taken to minimise disturbance to the leaf litter layer.			
Reconstruction through revegetation: *This section does not address propagation or planting of threatened species – this activity would need to be separately addressed.*			
Seed collection or cuttings will be from species, populations or ecological communities other than those listed as threatened (unless licensed by NPWS).			
Prior to collecting any seed or cuttings permission will be obtained from the relevant landholder or manager of the site. *e.g. a licence is required to collect native plants on National Parks estate.*			
	yes	**no**	**more info attached**
Seed collection from any one species will be limited to less than 10% of the available crop at that site.			
Seed collection from any individual plant will be limited to less than 10% of the available crop.			
If your seed source is used by other seed collectors, has consideration been given to			

minimising any cumulative impacts to the source plants? *Some individual plants are known as a reliable seed source and their seed is collected extensively. This may result in – (i) a reduction in genetic diversity); (ii) an impediment to the individual's natural ability to regenerate.*			
When collecting propagation material from a wild population, collection will be random from as many individuals as possible across the population to ensure a representative range of genetic material is collected. Collectors will avoid selection of propagation material on the basis of physical attributes. *e.g. tallest, most attractive, greatest amount of seed or flowers.*			
Plantings will be sourced from stock of local provenance.*			
Propagated plants will be used only at the subject site. *i.e. excess material will only be used at other sites if it meets the provenance criteria.*			
A buffer of 5 metres will be maintained around all threatened plant specimens. Planting will only be undertaken outside this buffer. *This requirement is intended to protect the roots of the threatened plant from damage, introduction of disease or impacts of herbicide.*			
Care will be taken to ensure that mulch does not introduce weeds or impede natural regeneration at the site.			
Care will be taken to ensure that weeds and/or phytopthora are not introduced to a site from any plantings.			
Consideration will be given to the possible impacts of plantings on the ecological requirements of threatened species at the site *e.g. reduced light, competition, etc.*			
Species will be planted within their natural habitat and range. Plantings will be guided by the plants' local habitat preferences. *e.g. the species used for plantings along watercourses should be those that naturally occur in that habitat in your local area.*			
Herbicide use: *A permit from the National Registration Authority for Agricultural and Veterinary Chemicals PO Box E240, Kingston ACT 2604 may be required for herbicide use that is not consistent with conditions specified on the label.*			
A buffer of 2m will be maintained around all threatened plant specimens. Herbicide use will only be undertaken outside this buffer.			
Herbicide use will cease where there are any signs of threatened species being affected by herbicide. *e.g. browning off, wilting, deformed growth.*			
All herbicide spray operators will be capable of undertaking precise and effective weed control.			
Spray will be directed away from threatened flora.			
Herbicide will only be sprayed in suitable weather conditions when the impact of spray drift (windy) or run-off (wet) on threatened flora is minimised.			
Marker dyes e.g. 'white field marker' will be mixed with herbicide before use. *Marker dye enables the worker to see where the spray is landing.*			
Reporting and data records:			
Any new records of threatened species will be provided within three months to NPWS. These records will be in a format appropriate for entry into the Wildlife Atlas, once identification of a threatened species is confirmed by a recognised authority. *Wildlife Atlas cards available on request.*			

*Local provenance species should be regarded as those species propagated from material that has been collected from a natural wild population as close as possible to a site. For example, within the local catchment – which may be based on a local creek.

Please sign below, keep a copy for your records and attach all original pages of checklist, and any additional information, to your application form.

I, the undersigned, agree that the proposed bush regeneration activities are in accordance with all items checked above, additional information attached and the licence application form.

Name (please print) _____ Signature _____ Date _____

Further reading:

Buchanan, R. (1989) *Bush Regeneration: Recovering Australian Landscapes.* TAFE Student Learning publication, Sydney.

Buchanan, R. (1992) "Site assessment – a vital part of bush regeneration" in *Urban Bushland in Western Sydney.* Seminar Proceedings, Nature Conservation Council of NSW, 1992.

FloraBank (1999) *Guidelines 5: Seed collection from woody plants for local revegetation.* FloraBank, ACT.

FloraBank (1999) *Guidelines 6: Native seed collection methods.* FloraBank, ACT.

FloraBank (2000) *Guideline 10: Seed Collection ranges for revegetation. FloraBank, ACT*

Greening Australia NSW (1999) *Management principles to guide the restoration and rehabilitation of indigenous vegetation.* Greening Australia NSW, Sydney.

Harden, G. (1990-1993; 2002) Flora of NSW, Vols 1-4. University of NSW Press, Kensington.

Joseph, R. (1999) An integrated, systematic approach to rainforest remnant restoration. In *Rainforest Remnants – A Decade of Growth.* Proceedings of a conference on rainforest regeneration., NSW National Parks and Wildlife Service, Alstonville.

McDonald, T. (1993) Strategic plans for bush regeneration: in *Bushland in Our Cities and Suburbs Part 1: Making Planning Work.* Seminar Proceedings, Nature Conservation Council of NSW, 1993.

McDonald, T. (1994) What are we doing with ecosystem resilience and the restoration of damaged plant communities. in *Bushland in Our Cities and Suburbs Part 2: Making Bush Regeneration Work.* Seminar Proceedings, Nature Conservation Council of NSW, 1994.

NSW National Parks and Wildlife Service. (2000) *Threatened species of the lower north coast of NSW.* NSW NPWS, Coffs Harbour

NSW National Parks and Wildlife Service. (2002) *Threatened species of the upper north coast of NSW.* Vol 1. Fauna. Vol 2. Flora. NSW NPWS, Coffs Harbour

NSW National Parks and Wildlife Service. (2003) *Threatened species of the New England Tablelands and North West Slopes of NSW.* NSW NPWS, Coffs Harbour

Acknowledgements

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