LUMLEY PARK

VEGETATION

MANAGEMENT PLAN

Stephanie Lymburner

July 2004

TABLE OF CONTENTS

ACKNOWLEDGMENTS

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

1. EXECUTIVE SUMMARY:

A study has been made of Lumley Park for Ballina Shire Council for a Vegetation Management Plan to assist in further restoration and rehabilitation for this remnant of sub-tropical rainforest.

A series of Plans are being completed as part of an assessment of high conservation value (HCV) vegetation for a consortium consisting of Ballina Shire Council (BSC), Big Scrub Rainforest Landcare Group (BSRLG), Department of Infrastructure, Planning and Natural Resources (DIPNR), Environmental Training and Employment(EnViTE), Lismore City Council and Rous Water with assistance from National Heritage Trust (NHT) funds.

An assessment of the Park was carried out. The entire park was found to require attention and priorities for the implementation of this schedule have been determined.

During the study completed in 2000, one hundred and fifty nine (159) native flora species were identified, including flora and fauna species covered by the Threatened Species Act (1995)

The study found that while restoration works have been carried out intermittently for the past fifty years, there has been regular commitment to work over the past ten years – resulting in a significant decrease in the number of weed species present

Twenty eight (28) weed species were identified in the earlier study but currently there are only thirteen (13) weed species present in the park. Weed control priorities have been determined within the context of an integrated approach to their removal.

The park is still vulnerable to further degradation through a number of factors such as the presence of Flying Foxes, the aggressive weed species Madeira Vine (*Anredera cordifolia*) and the high edge to core ratio.

The Plan considers issues such as relevant legislation and proposes an on-going weed control and regeneration program aimed at the rehabilitation of the Park.

2. AIMS AND OBJECTIVES :

AIM: *To restore, to the extent possible the structure, the function, the integrity and the dynamics 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.
- To enhance the habitat of Threatened and Vulnerable Flora and Fauna species.
- To control erosion along drainage lines within the park.
- To provide educational signage within the park
- To monitor Flying Fox population.
- To conduct a comprehensive fauna study of the park.
- To link the park with other high conservation value rainforest remnants along Maguires Creek.

3. PROFILE OF THE RESERVE

3.1 Location:

Lumley Park is a 1.7 hectare area of sub-tropical rainforest remnant situated within the urban area of Alstonville, it is 700 metres from the main shopping centre on the North Western edge of the township, Lismore is approximately 15km to the West and Ballina is 16 km to the East. The Park is bounded by the Bruxner Highway on the South West, Pearces Creek Road on the East, and Maguires Creek forms the boundary on the North and West (see Map 1).

The Park is Crown Reserve land under trusteeship and managed by Ballina Shire Council and is located on C.M.A. Lismore 9540-2-N. Ref. NP427099 (see Map 2).

3.2 Background:

The 'Big Scrub' was once the largest continuous tract of sub-tropical rainforest in Australia and is estimated to have exceeded 75 000 hectares. It was situated mainly on a low basaltic plateau, part of the residual southern slope of Mt. Warning shield volcano. Of the original 75 000 hectares only about 300 hectares or 0.4% remains as small isolated remnants (Floyd 1990).

Lumley Park is recognised as one of these high conservation value remnants, and is on the National Trust Register and the Register of the National Heritage Estate and whilst it is disjunct from other rainforest remnants it forms an important link in the mosaic of remaining remnants. Only recently has the high conservation value of these remnants been recognised as being essential for maintaining regional biodiversity.

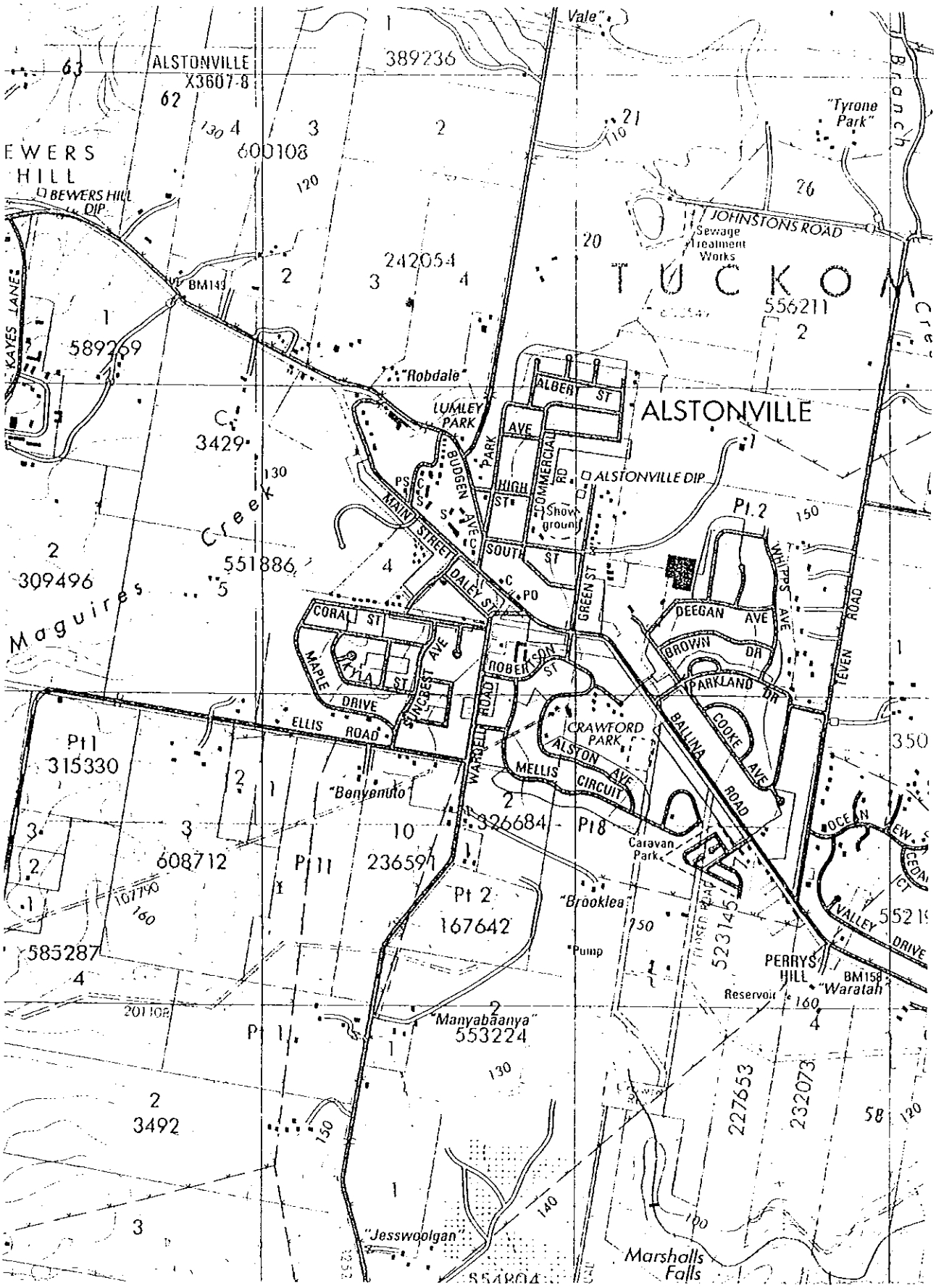
The portion of the park that this Plan is prepared for, is north west of Pearces Creek Road (see Map 2), and represents the area of high conservation value sub-tropical rainforest.

The area to the east of the road is also designated Public Reserve and has a number of significant isolated remnant trees, public conveniences, bar-be-cue areas, a covered shelter with picnic tables and a car park and currently a separate Plan is being drawn up for this area.

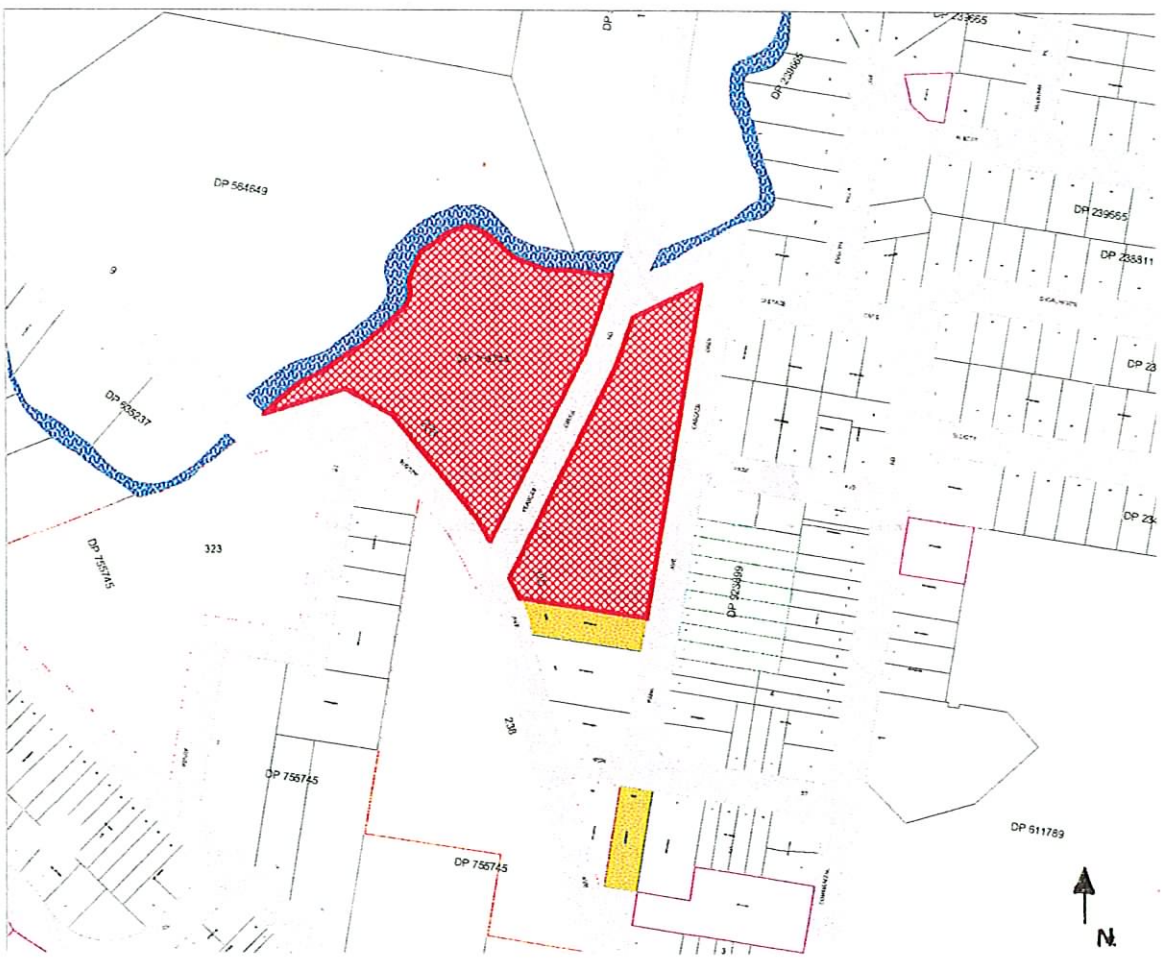
Regeneration of the Park began shortly after its dedication with weed removal and planting's of local and exotic species.

' The oldest rainforest regeneration area (in Australia) is likely to be the weeding and planting of natives and exotics in 1936 at Lumley Park in Alstonville' (Hunter, 1997).

Map 1. C.M.A Location Map.



Map 2. Park Boundaries (Source: Ballina Shire Council).



The area to the west of Pearces Creek Road is the study site of 1.7 hectares, the area to the east of the Road has amenities and isolated remnant trees. Total area of Lumley Park is 2.74 hectares.

Map 3. Aerial Photo of Alstonville with park location.

3.3 Climate:

Alstonville plateau is characterised by mild temperatures, due to its proximity to the Pacific Ocean (10 km to the east). Annual rainfall is between 1600 and 1800 mm per year with summer being the time of highest rainfall. Annual daily maximum temperature averages 23.4 C and minimum temperature averages 14.7 C.
Humidity is high during the warm summer months and frosts occasionally occur on the lower lying areas of the Alstonville Plateau. North easterly winds prevail during the summer months and cold dry westerly winds prevail during the late Winter and early Spring (Chisolm, 1992)

3.4 Soils:

The soils of the Alstonville plateau are well drained red krasnozems and wet alluvial krasnozems along creeks and drainage lines, with underlying Lismore Basalts and Tertiary Basalts. The soil type at Lumley Park could be described as 'self mulching, dark reddish brown clay loam' with a pH of between 4.0 and 5.0.(Morand, 94).

3.5 Topography:

The site is moderately inclined, with an altitude of 120-130 metres. The land slopes gently south to north, with a northerly aspect and drainage flowing into Maguires Creek.

3.6 History:

The park was first declared reserved for public recreation in 1924 by Tintenbar Shire Council. As early as 1930 the significance of this remnant was recognised and the name 'Lumley' was given to the Park as recognition of Councillor Clarence Lumley who volunteered and gave his life in World War 1.
A group of concerned citizens and councillors made a deputation to the Council, in 1930, to request that the area be preserved as a record of the vegetation that was present prior to white settlement. A grassed area was set aside for Croquet in 1931 and the old Croquet Club house still stands, but playing ceased there in the 1970s.
The surrounding area, was declared a 'Preserve for Native Trees' in 1934 . The first recorded meeting of the 'Scrub Reserve Committee ' was held on December 4th 1935. Ambrose Crawford attended this meeting, then continued working and recording information on a regular basis at the Park until 1974. He was 96 when he stopped his invaluable work at the Park.

Weed removal was commenced soon after the first meeting, Madeira Vine was present in the park at this early stage (pers. comm. D.Crawford). Planting of native species was commenced with seeds collected from roadsides, creeks and from interested farmers. Records were kept as to the locations of these trees (see Appendix 8).

An historic museum of old vehicles and farming implements was erected in 1968 to mark the Bi-Centenary of Captain James Cook's discovery of Australia.

Photo 1. First working bee 26:10:1935 present were, from right: Sam Gibson, unnamed, Ambrose Crawford, Alf Elvery, unnamed and Lyle Gerrard. (Photo courtesy Dorothy Crawford).

3.7 Previous works:

Work was commenced in 1935, but records of weed removal techniques were not recorded, though the presence of Madeira Vine (sometimes referred to as Jallop or Jollop), Lantana (*Lantana camara*) and Tobacco Bush (*Solanum maurtianum*) were noted. Work continued through until 1974 when regular working days lapsed.

In November 1991, members from The Society for Growing Australian Plants (SGAP) and volunteers from the broader community, commenced a program to remove Madeira Vine, Wandering Jew (*Tradescantia fluminensis*) and other environmental weeds (see Appendix 3)

None of the volunteers were qualified Bush Regenerators, but were advised by Rosemary Joseph, Contract Bush Regenerator for NPWS and Lismore City Council and Keith King Head of Parks and Gardens Lismore City Council.

BSC provided a council worker for half a day a week to assist the volunteers, when the labourer was withdrawn from the project work continued on an intermittent basis.

In 1995 two qualified Bush Regenerators (members of SGAP) took over the task of regeneration and training the volunteers in regeneration techniques, regularly working half a day a week in a voluntary capacity.

In the next two years, the regenerators organised the removal of thirteen Large Leaved Privets (*Ligustrum lucidum*) and two large Cocos Palms (*Syagrus romanzoffianum*) . with the assistance of the TAFE Tree Surgery Class and BSC.

The group were also successful in obtaining funding from Total Catchment Management (TCM) Minor Project Funds for restoration works and supplementary planting in the riparian zone. An integrated program of spray and hand removal techniques was implemented to control the environmental weeds invading the park.

During the past seven years various labour market teams have assisted with project.

In 1998 the group were successful in obtaining a NHT Grant to pay the regenerators for half a day per week, this funding was for one year only.

Voluntary work continued on a weekly basis when the funding ceased in June 1999.

In 2002 the BSRLG group were successful in obtaining a grant for fencing and a planting program for the riparian zone on the southern side of Maguires Creek in Zones A and B (see appendix 1).

In negotiation with the adjoining landholder and BSC, the landholder fenced of the small remnant of sub-tropical rainforest adjacent to Zone A, effectively increasing the area of the park and excluding stock from his remnant and a significant section of the creek.

There is still a narrow section of Zone B where stock can access the creek.
Planting of locally indigenous species was done the riparian section of Zone A with the assistance of a Work for the Dole team in May 2000.
In August 2000 the BSRLG, employed two qualified bush regenerators to work as contractors in the park on a regular basis, more recently BSRLG has formed a consortium with BSC in funding this project.

3.8 Conservation values:

In both a local and regional context, rainforest restoration has received wider community recognition over the past fifteen years.
The simple but innate attraction of rainforests which stimulated the protection of places such as Lumley Park demonstrates how rainforests enjoy a cultural value which cuts across broad sectional interests.(NSW NPWS, 1994).
Within the park there are three recognised Rare or Threatened Species of flora:
Arrow head Vine (*Tinospora tinosporoides*) 3RC-
Queensland Nut (*Macadamia tetraphylla*) 2VC-1
Red Lilly Pilly (*Syzygium hodgkinsoniae*) 3VC-
(Briggs and Leigh, 1996).
The Queensland Nut and the Arrow Head Vine are both listed as Schedule 2 - Vulnerable on the NPWS Threatened Species List, 1995.
There are two species threatened fauna species present:
Grey Headed Flying Fox (*Pteropus poliocephalus*) listed as Schedule 2 by both Commonwealth and State Governments
Black Flying Fox (*Pteropus alecto*) listed as Schedule 2 on the NSW State Government list.
Flying foxes have an important role in pollination and seed dispersal of Australian forest trees, it is possible that some tree species dispersed only by flying foxes maybe 'pivotal' species.
The continued logging of rainforest in the range of these bats, concommitant with an apparent decline in their numbers, has far reaching long term implications for maintaining the botanical diversity of this ecosystem. (Hall , 2000)

Other values include:

(a) Ecological values with 159 species of native plants, (see appendix 2) including three threatened plant species, and two threatened fauna species and the presence of a high conservation value subtropical rainforest remnant in close proximity to an urban area.

(b) Historical and cultural values with the Croquet Club House and the old machinery museum. The long term protection of the rainforest remnant at Lumley Park at Alstonville by the local community, exemplifies the 'cultural significance' of the Big Scrub to the residents of the sub-region (NSW NPWS 1994).

(c) Educational and recreational values as a resource for students and a place for recreation and relaxation.

4. THREATS AND IMPACTS

4.1 Visitation:

The park lies within the boundary of the village of Alstonville and has a high public profile, with the Bruxner Highway carrying a large capacity of traffic along the south-western boundary. The adjacent car park and facilities encourages visitation. Tourists, the local community and school groups visit the park for educational and recreational purposes. Rubbish dumping,, track compaction and seed removal, continue to cause ecological damage to the park. Occasionally people use the park for weddings and other functions, driving vehicles on the former Croquet Green causing compaction and erosion problems.

4.1.1 Path:

The current circular path is an unformed and uneven track through the park and has no consideration for access, drainage or plant species, roots are exposed, and in areas compaction is preventing germination of native seedlings, the path takes in few of the natural features of the park. There are other small tracks that criss cross the area, causing unwanted visitation into sensitive areas and damage to plant species.

4.2 Drainage:

This poses a significant threat to the park, as a stormwater channel enters the park from under Pearces Creek Road, heavy rain events have created significant gully erosion. During the 1920s, this stormwater channel was used as an 'unofficial' dump and evidence of this can still be seen as broken china, glass and large bits of rusty

metal are exposed after heavy rain. The stormwater channel and the rubbish in it pose a potential risk to park visitors.

There is another smaller drain that enters the park under the Bruxner Highway, but the flow from this drain has not caused the same amount of erosion as the larger drain.

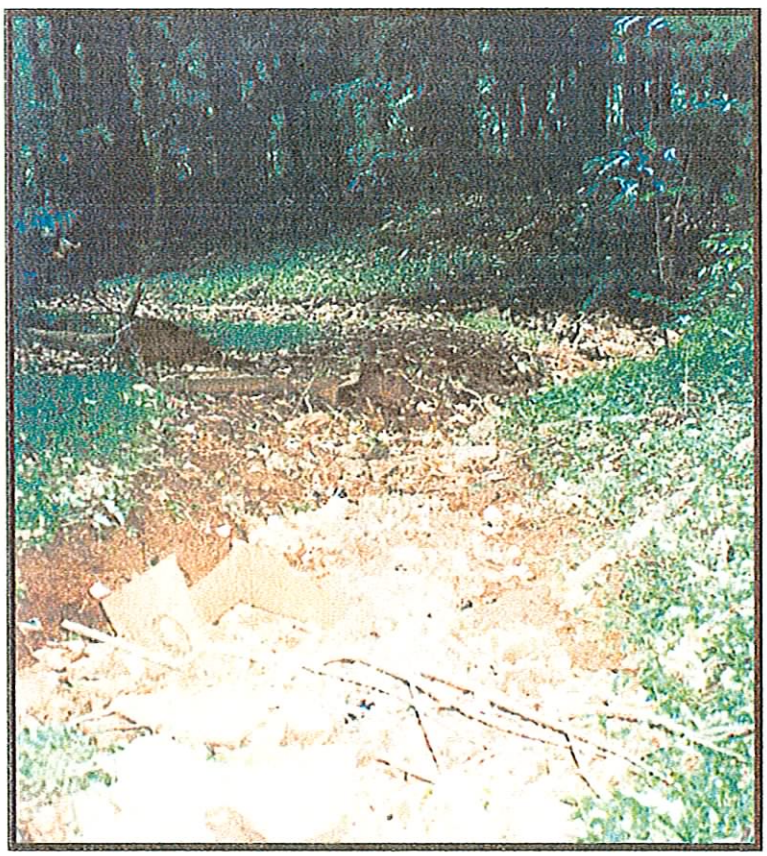


Photo 2. Stormwater channel with exposed material.

4.3 Weeds: In the earlier study, twenty eight weed species were identified as being present in the park –the dominant species being Madeira Vine and Wandering Jew, due to a systematic program of weed removal there are now only **thirteen species currently present in the park.**

Whilst Madeira Vine still poses the greatest threat to the long term viability of the park, currently there are no major vines present, there is still a carpet of underground roots and some tubers present in the ground – due to poor removal techniques used during the first attempts of controlling the vine and the period of time that the plant has been present in the park. Wandering Jew occurs along fencelines and as isolated outbreaks in areas with high light levels.

Photo 3. Madeira Vine- aerial tubers

Species that were once a problem within the park, such as Cat's Claw Creeper (*Macfadyena unguis-cati*), Ochna (*Ochna serrulata*) and Camphor Laurel (*Cinnamomum camphora*) occur on surrounding properties and are occasionally found as seedlings within the park.

However, there are a suite of new weeds that threaten the conservation values of the park they are: Cocos Palms (*Syagrus romanzoffianum*)

Coffee (*Coffea arabica*)

Orange Jessamine (*Murraya paniculata*)

Sapote (*Pouteria sapota*)

Most of these species are used in the surrounding areas as crops or for landscaping and the seeds are brought into the park by various vectors. Cocos palm seedlings are present on the forest floor throughout the whole park and will require a concerted removal program to achieve control – with the prospect of new seedlings emerging each year as vectors bring in more seeds.

4.4 Flying Foxes:

Flying foxes have most recently, been present in the park since October 1998, initially just using the trees as an overnight roost, but during 1999 they over-wintered in the park and established a permanent camp, with young being born and raised in the park. During the past four years their numbers have increased and they have caused significant damage to the canopy in both zones, with many mature trees being stripped of vegetation, leaving dead limbs that rise starkly above the middle canopy of forest below, opening the park to changes in humidity and light levels, altered nutrient levels, further weed invasion and the introduction of new weed species to the area.

Photo 4: Flying foxes roosting in trees – note damage to tree canopy

4.5 Other problems:

- Some trees within the park have died as a result of flying fox damage or old age, they represent a risk to park users, with the prospect of heavy limbs falling at any time.
- Recurrent flooding in some sections of the park will continue to damage native vegetation and hinder the regeneration process. Floodwaters disperse weed propagules and result in constant weed re-invasion.

4.6 RECOMMENDATIONS:

- **Visitation :**

Install educational signage - explaining historical, cultural, flora and fauna (particularly flying foxes) values of the park. Minimise vehicular access to the grassed area.

- **Path:**

Upgrade pathway to formed path, using suitably draining materials, that allows wheelchair access through the park. Close the smaller paths to allow natural regeneration to occur on.

- **Drainage:**

Poor drainage planning is the cause of the erosion within the park and adjacent areas. Special attention needs to be given to the stormwater management to prevent further erosion or accidents occurring to the public from exposed materials (see 4.2).
In 2002 a TAFE Bush Regeneration Certificate 4 Class (under supervision) constructed a section of "Reno" mattress and gabion erosion control, in the major stormwater drain this has been most successful, controlling the flow and allowing plant species to germinate readily. A continuation of this method would decrease erosion and assist in covering the broken glass and rusting metal objects.

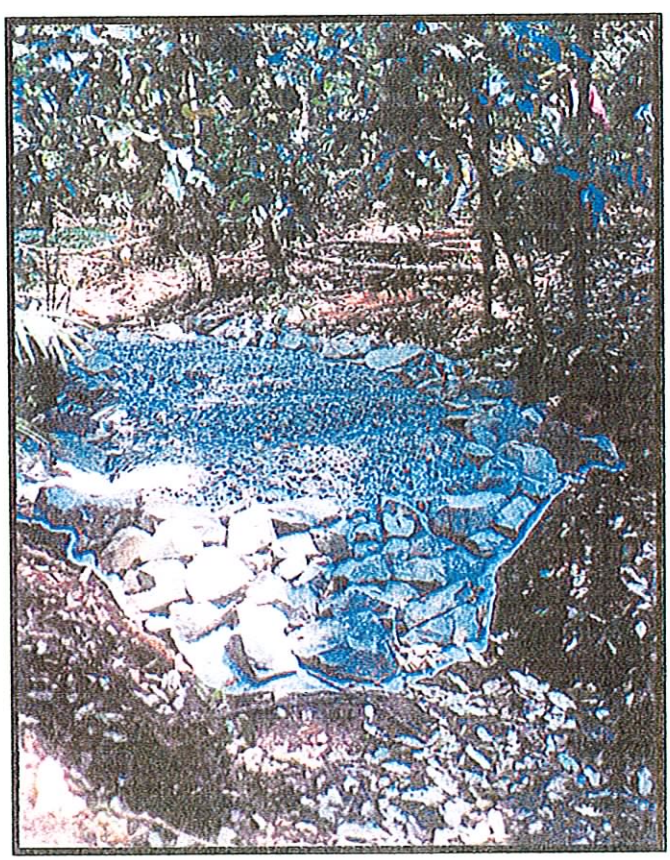


Photo 5: Reno mattress section.

- **Weeds :**

A continuing integrated approach to weed management is essential to maintain the health and floristic structure of the Park. The weeds present (see appendix 3), particularly Madeira Vine,Wandering Jew and Cocos Palms seedlings will require on-going maintenance. The identification of the new weeds will assist in early removal, before they threaten the viablilty of the park.

- **Flying foxes:**

Monitor the size of the camp; species, numbers currently using the park and movements during the year. Whilst there is an annual 'count' of flying foxes done by the Northern Rivers Wildlife Carers in April, a more scientific approach is needed to assess the canopy damage and establish a more accurate estimate of population size. Currently there is no recognised way of 'moving ' a camp of flying foxes on to less sensitive areas.

Educational signage needs to be erected to inform the community of their status and the important role they play in the ecosystem.

- **Other problems:** Further to consultation with council staff it is recommended to place signage at the entrance to the walkways, and one sign within the park to inform the community to the risk of falling limbs.

5. OTHER RELEVANT ISSUES

5.1 Legislative Requirements: There are now a series of these requirements that must be taken in to consideration, they are:

- *Threatened Species Conservation Act* (1995) covering threatened flora, fauna and their habitat. (TSC Act 1995)
- *Native Vegetation Conservation Act* (1997) covering protected lands - being a riparian zone along one boundary.
- *Local Government Act* (1993) covering environmental restoration projects.
- *National Parks and Wildlife Act* (1974) covering protected native fauna.
- *Australian Heritage Commission Act* (1974) covering cultural and heritage issues.
- *Environmental Planning and Assessment* Act (1979) amended (1988) covering all areas of development.
- *Rivers and Foreshores Act* (1948) covering waterways.

5.2 Historical display:

In Section 3.1.6 mention is made of the historical museum which houses the old vehicles and implements. The consultant believes that these are deteriorating at present and not being properly cared for and suggests that they be removed from the site into a suitable stable environment, and maintained. The existing building could then be renovated and used for educational displays of the conservation, cultural and heritage values of the area, as well as picnic tables and possibly an electric bar-be-cue placed within the existing structure. This could be done with the assistance of a community organisation such as Rotary or Lions Club or from a 'one off' funding application see 8.2.

6. SITE ASSESSMENT

6.1 Physical Characteristics:

The park is bounded on two sides by roads, Maguires Creek forms the other boundary, (see map 2) creating a small contained area with limited room for expansion. It has a high edge to core ratio making it very vulnerable, to further weed invasion, wind damage and reduced humidity levels. However, it does form part of a disjunct corridor of vegetation along Maguires Creek. A small remnant of similar floristic composition occurs across Maguires Creek on private land that has been fenced off from stock and forming a link to the park, creating a larger remnant that benefits the flora and fauna in the area.

6.2 Native Fauna:

No formal fauna surveys have been undertaken at Lumley Park..

Fauna data from similarly sized remnants throughout the Big Scrub indicate that such remnants provide important habitat for a diversity of frog, reptile, bird and mammal species.

The park 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 an isolated rainforest remnant this site is an important stepping stone for nomadic nectivorous and frugivorous fauna that effectively disperse seeds and pollen. The 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. Specialist species dependent on rainforest or contiguous forest are disadvantaged by the remnants isolation from surrounding vegetation, its small size and competition by aggressive generalist species. (Bower 1998)

Fauna species listed under the TSC.Act 1995, that are likely to occasionally use the park include:

Bush Hen	*Amaurornis olivacea*
Rose Crowned Fruit Dove	*Ptilinopus regina*
Wompoo Fruit Dove	*Ptilinopus magnificus*
Superb Fruit Dove	*Ptilinopus superba*
Barred Cuckoo Shrike	*Coracina lineata*
White Eared Monarch	*Monarcha leucotis*
Common Planigale	*Planigale maculata*
Eastern Tube Nosed Bat	*Nyctimene robinsoni*

Up to six insectivorous bat species could possibly use the park .

A fauna survey should be undertaken in the park by someone competent in systematic and opportunistic survey techniques for all fauna groups and who holds a current Scientific Investigation Licences.

There are two species of Flying Foxes that 'camp' in the park they are;

Grey Headed Flying Fox (*Pteropus poliocephalus*) listed as Schedule 2 by both Commonwealth and State Governments.

Black Flying Fox (*Pteropus alecto*) listed as Schedule 2 on the NSW NPWS threatened species list.

Apart from the flying foxes, there have been regular sightings of

Land Mullets (*Egernia major*)

Echidnas (*Tachyglossus aculeatus*)

Eastern Water Dragons (*Physignathus lesueurii*)

Carpet Python (*Morelia spilota*)

Northern Brown Bandicoot (*Isodon macrourus*) and many species of birds.

There have been reported of sightings in Maguires Creek of Platypus (*Ornithorhynchus anatinus*). The Southern Angle Headed Dragon has been recorded in the park in the past, but there has been no reliable sighting in the last five years.

Southern Angle Headed Dragons are mainly arboreal lizards that are confined to rainforest and adjacent forest communities of the east coast (Cogger, 1986).

Photo 6: Southern Angle Headed Dragon- Lumley Park 1992

To determine the full extent of fauna in the park a survey should be undertaken as a matter of urgency.

6.2.1 Native Flora:

The park is a remnant of lowland sub-tropical vegetation, classified as belonging to the White Booyong (*Heritiera trifoliolata*) alliance with a Black Bean (*Castanospermum australe*) / Red Bean (*Dysoxylum mollisimum*) sub-alliance. 'This warm subtropical alliance is generally found at low altitudes on fertile soil near sea level. It is the most structurally complex rainforest alliance in New South Wales occurring on the potentially best agricultural land. In consequence, it has often been virtually destroyed with the exception of small remnant patches where terrain is flood-prone' (Floyd,1990).

Within the park there are some fine canopy specimens of Blue Quandong (*Elaeocarpus grandis*),Cudgerie (*Flindersia schottiana*) and Red Apple (*Acmena ingens*). Several native orchid species occur within the park including the Giant Climbing Orchid (*Pseudovanilla foliata*), this is a somewhat unusual plant being both elusive and unpredictable as it grows mainly in openings in rainforests, closely associated with large rotting stumps and logs(Bishop,1996). It was recorded in the park in the 1960's, no plants were seen again until the late 1990's it has occurred in

several different locations since then with as many as ten plants being recorded in 2001.

The Aristolochica or Birdwing Butterfly Vine (*Pararistolochia praevenosa*) occurs within the park, this vine is the host plant for the lavae of the rare Richmond River Birdwing Butterfly, signage with information about this species and its host plant has recently been erected in the park by the NPWS.

6.2.2 Planted Species:

When work first commenced in 1935, a number of trees were planted. Some were exotics, including Privet and Cocos Palms, and other trees, not native to the area were planted, notably Brown Gardenia (*Randia fitzalanii*) a North Queensland species and some Queensland palms. Evidence of earlier planting's are apparent, with a straight row of Plum Pines (*Podocarpus elatus*) and Red Cedars (*Toona ciliata*) parallel to Pearces Creek Road, obvious by their even spacing. Mr.Crawford collected local seeds, recorded where they were collected, propagated these seeds and planted them within the park. (see appendix 8). It should be noted that the original intention was to make the park a 'Preserve for Native Trees' and this obviously included plants that were not indigenous to the area.

During working bees with SGAP an area adjacent to the creek that was subject to flooding was planted with Bangalow Palms (*Archontophoenix cunninghamiana*), and over subsequent years plantings of Lomandra species and Dianella species were done along edges to prevent slashing and undesirable incursions into sensitive areas. Restoration and regeneration work have been carried out on properties, both up and downstream of the park helping to form a fragile link to the nearby Maguires Creek remnant.

6.3 Weeds:

As stated earlier, the dominant weed species is Madeira Vine.

This invasive weed still has the potential of destroying the park, by damaging the mature canopy and preventing native seedling germination on the forest floor. Wandering Jew is still present in the park as small outbreaks where there are high light levels. Both these species have been present in the park for many years, and Maguires Creek provides a source for on-going re-infestation during flooding. Cocos Palm seedlings are germinating throughout the park,, it has recently been listed as a category 4 Environmental weed by the Far North Coast Weeds (FNCW).

Current recognised removal and control techniques are covered in Appendix 5.
Other weed species occur within the park in varying degrees of density .

6.4 Assessment and Management Zones:

6.4.1 Zone A:

This zone covers approximately half the park, the stormwater drain bisects the zone and the main track loops through (see Appendix Site Map1), the lower section of the zone is subject to periodic flooding from Maguires Creek. The stormwater channel presents an area of risk for further weed invasion from urban run-off. During rain events large volumes of water pass through, scouring the existing channel and exposing broken china, glass and metal objects. The regeneration potential of this area is poor due to the frequency of rain events and the lack of sufficient erosion control measures

The Pearces Creek Road edge is at risk from further weed invasion due to its high light levels, exposure and proximity to human habitation.

Flying Foxes are present in the western section of the zone and have significantly damaged the canopy, with some trees completely denuded and represent a safety risk from falling limbs.

The middle canopy, however is in a healthy condition with high species diversity.

The forest floor has a mix of native seedling germination and Cocos palm seedlings.

The riparian section has benefited by the exclusion of stock – with excellent germination of native seedlings, particularly Blue Quandongs and Black Beans. There is an on going problem of weed propagules being deposited from flooding of Maguires Creek.

6.4.2 Zone B:

This zone covers the rest of the park (see Site Map1). and still has a narrow section on the creek boundary that is accessible by stock, The Arrowhead Vine occurs at several locations, the single specimen of Red Lilly Pilly, some Macadamias and many of the North Queensland species occur in this zone.

Most of the zone has good resilience and all levels of the forest structure are well represented. On the western fenceline, Wandering Jew and tuberlings of Madeira Vine occur due to the high light levels and proximity of water and will require regular monitoring and follow up.

A narrow band of vegetation runs parallel to the Bruxner Highway and whilst it has some significant remnant trees, in particular Red Apple (*Acmena ingens*) and Purple Cherry (*Syzygium crebrinerve*), it will always be under stress due to the high edge to core ratio, weed invasion, rubbish dumping and buffeting from passing traffic

The stormwater channel in this zone is not as damaging as in zone A, but poses an on-going source of weed propagules and should be included in any drainage management plans.

Flying Foxes originally roosted in this zone and the canopy shows signs of extreme damage in the central area of the zone, with higher light levels increasing weed growth beneath the damaged trees.

6.4.3 Open park and quarry area: This area is subject to a more in-depth study by Council staff, these are suggestions only for this section of the park.

The quarry site is heavily weed infested and has significant risks owing to its shape and degradation, a supplementary planting list has been written (see appendix 7) for consideration after initial landscaping work is completed by BSC.

There are a number of trees in the open park area that are senescing and a program of planting a 'skirt' of Lomandra species around them. This method could also be used where a group of trees form a small stand, as it would prevent further compaction and inhibit mowing to close to the base of these trees.

7. RECOMMENDATIONS:

7.1 Proposed Restoration Strategies:

Works have been on-going for several years, with successful results, it is recommended that these works continue using the same methods and to increase broader community awareness to the need for such work.

The consultant suggests that BSC continues to employ contract Bush Regenerators, on a regular basis , using funding from one of the sources referred to in 8.2 or from within its annual budget to ensure the long term viability of the Park.

7.1.1 Zone A:

- Follow site map work direction plan.
- Hand weeding around native seedlings should take place prior to the spray program.

- Implement drainage control in stormwater channel.
- Groundcover weed species should be seen as the priority for removal (see removal techniques, Appendix 5).
- Monitor the flying fox camp to establish numbers and seasonal movements.
- Monitor existing 'black plastic' covered weed dump near the stormwater channel.

7.1.2 Zone B:

- Follow site map work direction plan.

***Caution should be taken whilst spraying around the Arrowhead Vine, a Threatened species. It is advised that the position of these plants should be identified prior to any spraying.**

- Hand weeding around native species should take place prior to the spray program.
- Groundcover weed species should be seen as the priority for removal (see removal techniques, Appendix 5).
- Spray for grasses and annuals along north and east facing edge, to extend the forest.
- Rehabilitate riparian zone along Maguires Creek.
- Monitor 'black plastic' dump near old access point on Bruxner Highway.

7.2 Other Management Strategies:

These strategies are listed in order of priority:

- Continue to employ qualified Bush Regenerators to implement this Plan.
- Place signage at the entrance to the walkways to inform the public to presence of dead limbs and trees and the risk they pose.
- Remove old barbwire and restrict access to riparian zone with branches etc.
- Conduct a full fauna survey.
- Monitor Flying Fox species, numbers, seasonal movements and canopy damage.
- Upgrade existing path to wheelchair access standard.
- Erect educational signage in appropriate area to inform the community to the biodiversty, conservation and heritage values of the park.
- Position permanent monitoring points, to assess progress of regeneration and weed control.
- Minimise vehicular access to the park.

7.3 IMPLEMENTATION OF PRIORITIES:

The priorities of this Plan take into account the previous work completed, the density of weeds and the threat that they pose to the floral and fauna communities .
During previous work the large Madeira Vines have been treated and the level of existing weed infestation from this species is at ground level, with no climbing vines being present in the park at the time that this Plan was written.

Zone A: Control climbing Madeira vine, hand weeding to be undertaken around existing native species before commencing a spray program for the ground cover weed species. Spraying should proceed from the Pearces Creek Road edge in toward the track in parallel 'runs' working from south to north.
The Pearces Creek Road edge has a high level risk of infestation of Madeira Vine due to high light levels and nutrient rich road run-off. This edge will need long term monitoring and regular follow-up.

Zone B: Control climbing Madeira vine, hand weeding to be undertaken around existing native species before commencing a spray program for the ground cover weed species. Spraying should proceed from Zone A, toward the Bruxner Highway. As stated earlier Madeira Vine and Wandering Jew pose the most significant threat to the Park and are given priority. Other weeds occur in small amounts, and should be treated during the course of spraying, or left 'marked' to be treated on days when spraying is not appropriate, ie. on wet or windy days.
*The western edge of the Park has a high level risk of re-infestation of Madeira Vine,Wandering Jew and other water borne weed species from Maguires Creek as propagules are swept down from upstream properties during flooding. This edge also will need long term monitoring and regular follow-up.

8. IMPLEMENTING THE PLAN:

8.1 Program Scheduling:

This is a long term on-going project. Currently the park is in a maintenance mode and work still needs to continue regularly. Spray programs should be carried out during late summer and early autumn for maximum effectiveness.

8.2 Sources of Funding:

In the past most of the work has been done by community volunteers.

Recently Ballina Shire Council has formed a consortium with Rous Water and BSRLG to pay contract bush regenerators to work on this site and other remnants of the Big Scrub.

Other funding bodies include Envirofund and Environmental Trust of NSW, applications made to these organisations could assist Council in continuing to fund this project.

- **Costings:** Labour costs are based on 8 hours @ $27:50 = $220 per person day.

The maintenance required currently is two person days per month. During periods of accelerated growth of weed species it maybe necessary for extra days to be allocated, these seasonal factors will be taken into account by the contractors,

8.3 Project Monitoring & Evaluation:

Photographic records date back to 1934, but more recently photos have been taken from various points to record rehabilitation. Monitoring should take place every six months, with work sheet records compiled for each zone. This type of monitoring greatly assists evaluation of the project and the direction of future work plans.

9. SUMMARY OF RECOMMENDATIONS:

In order of priority

- Maintain funding source to employ qualified bush regenerators on a contractual basis.
- Install signage to alert the public to the danger of falling limbs.
- Continue to implement integrated weed control program.
- Conduct fauna survey
- Extend drainage control.
- Upgrade path.
- Install educative signage.
- Monitor Flying Fox population.
- Set up permanent monitoring points.
- Minimise vehicular access.

10.CONCLUSION:

Whilst the overall health of the park has improved over the past four years, due a committed work program, the destruction of the canopy by flying foxes is disturbing the ecosystem by allowing extra light to penetrate, adding extra nutrients into the forest and the introduction of further weed species.

At present there is no recognised way of relocating flying foxes, as they are listed as an endangered species, legislation precludes any disturbance of their habitat.

However, if work were to cease now the park would quickly revert to the condition it was in before 1991 – due to the continuing presence of Madeira Vine.

As with the earlier report it is believed that the rehabilitation and restoration of the park is possible, it will continue to need a commitment to an ongoing regeneration program and further research into flying foxes and their habitat requirements.

Remnants such as Lumley Park represent a valuable resource for community education, the biodiversity of the region and as an important fragment in the mosaic of Big Scrub remnants.

11. REFERENCES:

Auld B.A and Medd R.W. 1992 Weeds: an illustrated botanical guide to weeds of Australia, Inkata Press, Melb., Sydney, Australia.

Bishop A. 1996 Field Guide to the Orchids of New South Wales and Victoria University of New South Wales Press, Sydney, Australia

Bower H.& Bower S. 1998 Willowbank Rainforest Restoration Management Plan. Unpublished report. Big Scrub Rainforest Landcare Group.

Briggs J.B and Leigh J.H. 1996 Rare or Threatened Australian Plants, CSIRO Publishing, Collingwood, Victoria.

Chisolm D. 1991 Study of an Area of Native Bushland - Lumley Park Alstonville. Unpublished.

Cogger H.G. 1986 Reptiles and Amphibians of Australia Reed Books Frenchs Forest N.S.W Australia.

Floyd A. 1990 Australian Rainforests in N.S.W. Vol 2, Surrey Beatty and Sons Pty.Ltd. N.S.W. Australia.

Hall L.S. 2000 Flying Foxes, Fruit and Blossom Bats of Australia. UNSW Press Sydney. Australia.

Harden G. (ed).1990, 1991,1992, 1993 Flora of N.S.W. vols.1-4 , University Press, Sydney, Australia.

Hopkins M.S. 1990 Disturbance - the Forest Transformer, Australian Tropical Rainforests. CSIRO.

Hunter R.J. 1995 A Review of Rainforest Restoration in Nature Reserves in Lismore District. Unpublished report NPWS Lismore District.

Joseph R. 1999 An Integrated, Systematic Approach to Rainforest Remnant Restoration, in Rainforest Remnants - Decade of Growth Horton, S. (ed), NSW NPWS, 1998.

Joseph R. 1995 Rainforest Remnants Restoration and Rehabilitation Project - Moore Park Nature Reserve. Unpublished report NPWS Lismore District.

Morand D.T. 1994 Soil Landscapes of the Lismore-Ballina 1:100 000 Sheet Report. Soil Conservation Service of N.S.W. Sydney.

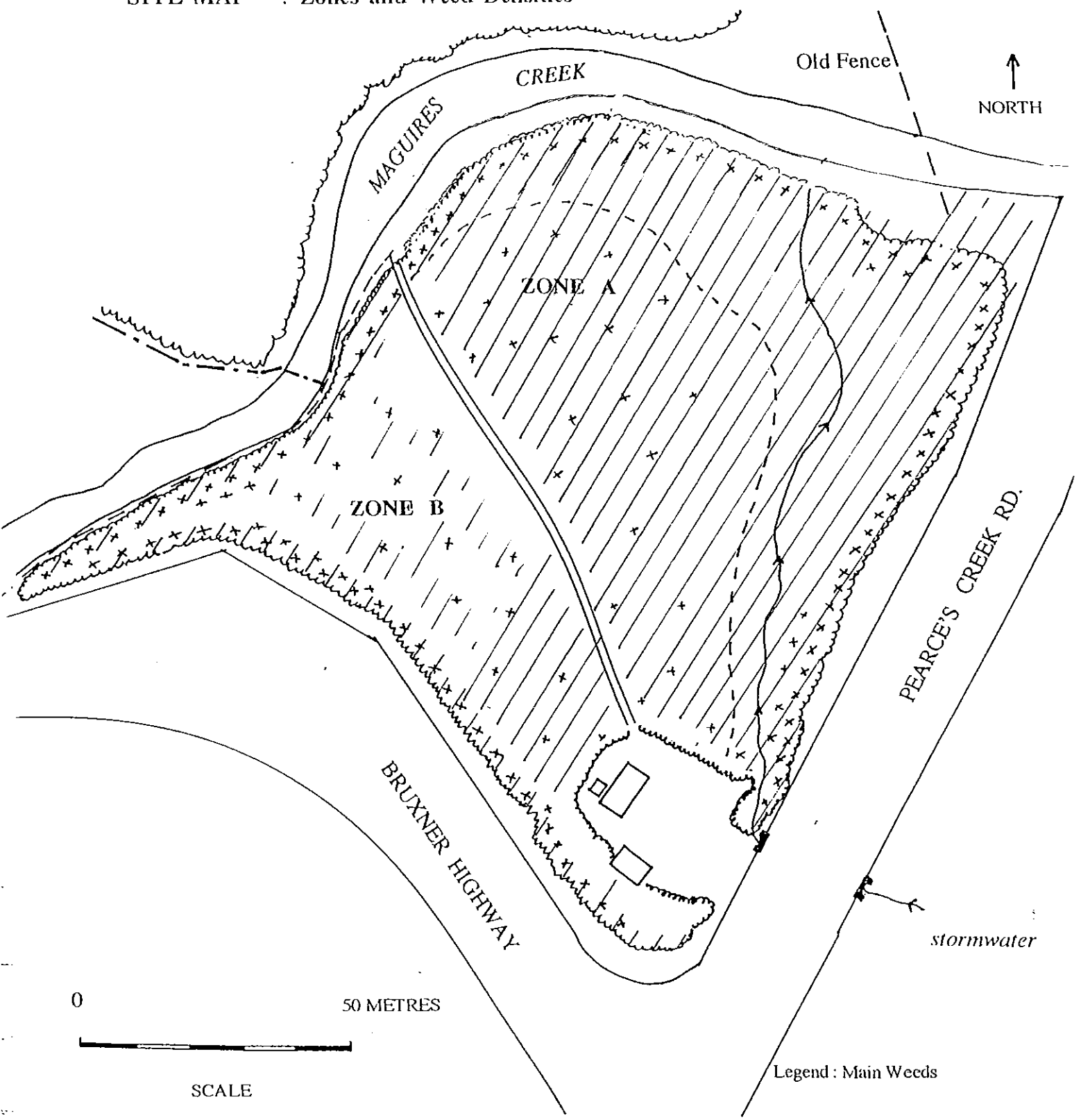
NSW National Parks and Wildlife Service 1994 Draft Plan of Management for Big Scrub Nature Reserves. Unpublished report. NPWS Lismore District.

Strachan R. 1983 Complete Book of Australian Mammals Angus and Robertson Australia.

Williams J.B., Harden G.J. and W.J.F. McDonald. 1984 Trees and Shrubs in Rainforests of N.S.W. and S.E.Queensland. University of New England.

APPENDICES

SITE MAP : Zones and Weed Densities



APPENDIX 2

NATIVE SPECIES LIST:

TREES AND SHRUBS.

*P = denotes planting and the year it was planted in i.e. P'95.

Family	Botanic name	Common Name
Agavaceae	Cordyline rubra	Red-fruited Palm Lily
	Cordyline stricta	Narrow-leafed Palm Lily
	Cordyline petiolaris	Broad-leafed Palm Lily. P'96
Alangiaceae	Alangium villosum ssp.polyosmoides	Muskwood
Apocynaceae	Alyxia ruscifolia	Prickly Alyxia P'97
	Tabernaemontana pandacaqui	Banana Bush
Araliaceae	Polyscias elegans	Celery Wood
Araucariaceae	Agathis robusta	Kauri Pine Qld.
	Araucaria cunninghamii	Hoop Pine
	Araucaria bidwillii	Bunya Pine Qld.
Arecaceae	Archontophoenix cunninghamiana	Bangalow Palm
	Linospadix monostachyus	Walking-Stick Palm
	Livistona australis	Cabbage Tree Palm
Atherospermataceae	Daphnandra Species A.	
	Daphnandra tenuipes	Red Flowered Socketwood
Caesalpiniaceae	Barklya syringifolia	Barklya QLD.
Capparaceae	Capparis arborea	Brush Caper Berry
Caprifoliaceae	Sambucus australasica	Native Elderberry
Cunoniaceae	Geissois benthamii	Red Carrabeen P'96
	Callicoma serratifolia	Callicoma P'97
Cyatheaceae	Cyathea cooperi	Straw Tree Fern
	Cyathea leichhardtiana	Prickly Tree Fern
Davidsoniaceae	Davidsonia pruriens var.jerseyana	Davidson's Plum
Ebenaceae	Diospyros pentamera	Myrtle Ebony
Ehretiaceae	Ehretia acuminata	Koda

Elaeocarpaceae	Elaeocarpus grandis	Blue Quandong
	Sloanea australis	Maidens Blush
	Sloanea woolsii	Yellow Carrabeen
Euphorbiaceae	Actephila lindleyi	Actephila
	Alchornea ilicifolia	Native Holly
	Baloghia inophylla	Brush Bloodwood
	Briedelia exaltata	Brush Ironbark
	Claoxylon australe	Brittlewood
Eupomatiaceae	Eupomatia bennettii	Small Bolwarra
	Eupomatia laurina	Bolwarra
Escalloniaceae	Anopterus macleayanus	Macleay Laurel.
Fabaceae	Castanospermum australe	Black Bean
Icacinaceae	Citronella moorei	Churnwood
Lauraceae	Beilschmiedia elliptica	Grey Walnut
	Cinnamomum oliveri	Oliver's Sassafrass
	Cinnamomum virens	Red Barked Sassafrass
	Cryptocarya laevigata	Glossy Laurel P'96
	Cryptocarya obovata	Pepperberry Tree
	Cryptocarya mackinnoniana	Rusty Laurel Q.
	Endiandra muelleri	Green-leaved Rose Walnut
	Endiandra pubens	Hairy Walnut
	Litsea australis	Brown Bolly Gum
	Litsea reticulata	Bolly Gum
	Neolitsea dealbata	White Bolly Gum
	Neolitsea australiensis	Green Bolly Gum
Lomandraceae	Lomandra longifolia	Mat Rush P'98
	Lomandra hystrix	Creek Mat Rush P'95
Meliaceae	Anthocarapa species	Incense Cedar
	Dysoxylum fraserianum	Rosewood
	Dysoxylum mollisimum	Red Bean
	Dysoxylum rufum	Hairy Rosewood
	Melia azedarach var.australasica	White Cedar
	Toona ciliata	Red Cedar

Mimosaceae	Archidendron grandiflorum	Lace Flower Tree
	Archidendron muellerianum	Veiny Lace Flower
	Pararchidendron pruinosum	Snow Wood
Moraceae	Ficus coronata	Creek Sandpaper Fig
	Ficus fraseri	Sandpaper Fig
	Ficus macrophylla	Moreton Bay Fig
	Ficus obliqua	Small-leafed Fig
	Ficus rubiginosa	Rusty Fig
	Ficus watkinsiana	Strangler Fig
Monimiaceae	Wilkea austroqueenslandica	Smooth Wilkea
	Wilkea macrophylla	Large-leafed Wilkea
Myrtaceae	Acmena ingens	Red Apple
	Acmena smithii	Lilly Pilly P '95
	Austromyrtus acmenoides	Scrub Ironwood
	Rhodamnia rubescens	Scrub Turpentine
	Rhodamnia maideniana	Smooth Scrub Turpentine P'98
	Syzygium australe	Brush Cherry
	Syzygium crebrinerve	Purple Cherry
	Syzygium francisii	Giant Water Gum
	Syzygium hodgkinsoniae	Red Lilly Pilly
	Syzygium paniculatum	Magenta Lilly Pilly P'95
	Tristaniopsis laurina	Water Gum
	Uromyrtus australis	Peach Myrtle P'98
	Waterhousea floribunda	Weeping Lilly Pilly P,96
Pittosporaceae	Hymenosporum flavum	Native Frangipani
	Pittosporum undulatum	Sweet Pittosporum
	Pittosporum rhombifolium	Holly Wood P '95
Podocarpaceae	Podocarpus elatus	Plum Pine
Proteaceae	Alloxylon pinnatum	Dorrigo Waratah
	Helicia glabriflora	Smooth Helicia
	Macadamia tetraphylla	Queensland Bush Nut
	Stenocarpus sinuatus	Firewheel Tree
Truinia youngiana		Honeysuckle Bush

Rhamnaceae	Alphitonia excelsa	Red Ash
	Emmenosperma alphitoniodes	Yellow Ash
Rubiaceae	Randia fitzalani	Brown Gardenia Q
Rutaceae	Melicope micrococca	White Euodia
	Flindersia bennetiana	Bennet's Ash
	Flindersia schottiana	Cudgerie
	Flindersia xanthoxyla	Long Jack
	Geijera paniculata	Axe-Breaker
	Geijera salicifolia var.salicifolia	Narrow-leafed Brush Wilga
	Melicope erythrococca	Tingle Tongue
Sapindaceae	Alectryon subcinereus	Wild Quince
	Arytera distylis	Twin-leafed Coogera
	Cupaniopsis flagelliformis var.australis	Brown Tuckeroo
	Diploglottis australis	Native Tamarind
	Diploglottis campbellii	Sml-leaved Tamarind P'99
	Ellatostachys nervosa	Green Tamarind
	Guioa semiglauca	Guioa
	Harpullia pendula	Tulipwood
	Jagera pseudorhus	Foambark
	Sarcopteryx stipata	Steelwood
	Toechima dasyrrhache	Blunt-leafed Steelwood
Sapotaceae	Planchonella australis	Black Apple
Simaroubaceae	Ailanthus triphysa	White Bean P'96
Sterculiaceae	Brachychiton acerifolius	Flame Tree
	Brachychiton discolor	Lacebark Tree
	Commersonia bartramia	Brown Kurrajong
	Heritiera trifoliolata	White Booyong
Urticaceae	Dendrocnide excelsa	Giant Stinging Tree
	Dendrocnide photinophylla	Shiny-leaved Stinging Tree
Verbenaceae	Clerodendron floribundum	Smooth Clerodendron
	Gmelina leichhardtii	White Beech
Zamiaceae	Lepidozamia peroffskyana	Shining Burrawang

CLIMBERS

Araceae	Pothos longipes	Pothos
Arecaceae	Calamus muelleri	Lawyer Vine
Aristolochiaceae	Pararistolochia praevenosa	Birdwing Butterfly Vine
Bignoniaceae	Pandorea pandorana	Wonga Vine
Fabaceae	Austrosteenisia glabristyla	Giant Blood Vine
Flagellariaceae	Flagellaria indica	Whip Vine
Menispermaceae	Carronia multisepala	Carronia
	Tinospora tinosporoides	Arrow-head Vine
Moraceae	Maclura cochinchinensis	Cockspur Thorn
	Malaisia scandens	Burny Vine
Smilacaceae	Ripogonum album	White Supplejack
	Ripogonum discolor	Prickly Supplejack
Vitaceae	Cayratia clematidea	Slender Grape
	Cissus antarctica	Water Vine
	Cissus hypoglauca	Five-leafed Water Vine
	Cissus sterculifolia	Long-leaf Water Vine

HERBS AND GRASSES

Acanthaceae	Pseuderanthemum variabile	Pastel Flower
Araceae	Alocasia brisbanensis	Cunjevoi
Commelinaceae	Pollia crispata	Pollia.
Lamiaceae	Orthosiphon aristatus	Cat's Whiskers Qld. P'95
Lomandraceae	Lomandra hystrix	Mat Rush P'96

	Lomandra longifolia	Mat Rush P'96
Philydraceae	Helmholtzia glaberrima	Stream Lily P'97
Phormaceae	Dianella caerulea	Blue Flax Lily P'96
Poaceae	Oplismenus aemulus	Basket Grass
	Oplismenus imbecillis	Basket Grass
Violaceae	Viola hederacea	Native Violet
Zingiberaceae	Alpinia caerulea	Native Ginger P'96

FERNS

Adiantaceae	Adiantum hispidulum	Rough Maidenhair
Aspleniaceae	Asplenium australasicum	Bird's Nest Fern
Polypodiaceae	Platycerium bifurcatum	Elkhorn
	Platycerium superbum	Staghorn
Pteridaceae	Pteris tremula	Tender Brake

ORCHIDS

Orchidaceae	Cheirostylis ovata	------
	Dendrobium tarberi	King Orchid
	Dendrobium kingianum	Rock Orchid
	Dendrobium mortii	----
	Epipogium roseum	Drooping Orchid
	Pseudovanilla foliata	Giant Climbing Orchid
	Zeuxine oblonga	-----

APPENDIX 3

WEED SPECIES LIST:

Family	Botanic Name	Common Name
Araliaceae	* Schefflera actinophylla	Umbrella Tree
Arecaceae	Syagrus romanzoffianum	Cocos Palm
Asteraceae	Ageratina riparia	Mistflower
	Ageratum houstonianum	Blue Billy Goat Weed
Basellaceae	Anredera cordifolia	Madeira Vine, Jollop, Potato
Vine		
Bignoniaceae	Tecoma stans	Golden Bells
Cannaceae	Canna indica	Canna Lily
Caryophyllaceae	* Drymaria cordata	Tropical Chickweed
Commelinaceae	Tradescantia fluminensis	Wandering Jew
Oleaceae	Ligustrum lucidum	Large-leafed Privet
Phytolaccaceae	Phytolacca octandra	Inkweed
Solanaceae	Solanum mauritianum	Wild Tobacco
	Cestrum nocturnum	Lady-of-the-Night

A number of exotic grasses occur on the edges.

*Denotes invasive native species growing out of range.

APPENDIX 4

PROFILE OF WEED SPECIES - LUMLEY PARK

Araliaceae

* *Schefflera actinophylla* Umbrella Tree: Native of North Queensland. A tree to 10m often multi-stemmed, often cultivated as an ornamental; occasionally epiphytic on rainforest trees; north from Brunswick Heads (Harden,1992, 87).Fruit are spread by birds and possibly Flying Foxes. Dark red fruit ripe in winter

Arecaceae

Syagrus romanzoffianum Cocos Palm: Native of Brazil. Palm to 15 metres with a plumed head, widely planted as an ornamental. Fruits prolifically, food for birds and Flying Foxes. Invades rainforest and possibly crosses with native palm species. Flowers are small cream coloured in Winter and Spring followed by orange-red fruit ripe in spring.

Asteraceae

Ageratina riparia Mistflower: Native of Central America. Erect, sometimes decumbent herb.0.3 - 1m. high, Grows in disturbed damp sites, often in or near rainforest ; north from Berry (Harden, 1992, 151). A declared noxious weed on the North Coast in the W3 category. Profuse white flowers in late Spring -early Summer, seeds are wind dispersed in late Summer - Autumn.

Ageratum houstonianum Blue Billy Goat Weed: Native to tropical America, a weakly-erect short lived perennial herb with soft blue/mauve flowers. Can form dense clumps and prevent native seedling germination. Flowers all the year around, will shade out as canopy thickens.

Basellaceae

Anredera cordifolia Madeira Vine, Jollop, Potato Vine. Native of South America. A climber with stems up to 20 metres long, producing tubers on roots and at the nodes of aerial stems. It is widely naturalised in coastal districts, and is invasive on the margins of rainforests (Harden,1990, 177). This vine is extremely prolific, growing over

1 metre per week in warm, humid conditions. It produces numerous vegetative aerial tubers which drop to the ground and remain dormant when conditions are not suitable for their growth. These tubers are spread by water, downhill movement and possibly

rodents. The vine will rapidly smother plants of all sizes, destroying them through weight and inhibition of photosynthesis, and can block secondary succession (Hopkins, 1990). It is extremely difficult to control and is considered to be the most serious and destructive plant pest species affecting the North Coast rainforest remnants (Joseph, 1995). Flowers in late summer /early Autumn. Cream drooping racemes make the plant highly visible.

Bignoniaceae

Tecoma stans Golden Bells. Native to Mexico, Peru and Ecuador. A shrub to 4 metres, naturalized in coastal districts. Yellow bell shaped flowers, flowering in summer, followed by long bean shaped seed pods with many seeds – that are windborne into surrounding, seeds which germinate readily.

Cannaceae

Canna indica Canna Lily. Native to South America. Erect perennial herb, broad fleshy leaf, occurs along creeks and other moist areas. Germinates readily from seed and fleshy rhizome, flowers are a variety of colours, mainly red or yellow.

Caryophyllaceae

**Drymaria cordata* Tropical Chickweed Native to Asia and North Queensland. Annual sprawling herb, rooting at the nodes. Flowers most of the year. Sticky reddish-brown seeds. Prefers high light areas. Vigorous weed of pastures, gardens and disturbed areas; North from Nambucca Heads.

Commelinaceae

Tradescantia fluminensis Wandering Jew: Native of South America. A perennial succulent herb with fibrous roots and branching stems which readily takes root at the nodes. It is naturalised on creek banks and in shaded places, especially rainforest (Harden,1993,256). Its resistance to herbicide and its growth habit make this plant difficult to eradicate. This dense groundcover suppresses the germination and growth of native species, thereby blocking secondary succession. It has been observed, however, that species with large seeds can penetrate and grow well e.g. Black Bean (Joseph,1995).

Oleaceae

Ligustrum lucidum Large Leaved Privet: Native of China and Japan. A shrub or small tree to 10m.Frequently planted as a hedge; often naturalised, an invasive weed especially in coastal districts, north from Bega Flowers long white panicles in spring

- summer followed by blue- black berries in late summer- autumn (Harden,1992,473). Eaten by many birds, seeds germinate readily and profusely, invades creek banks and wasteland and out competes native species in these areas.

Passifloraceae

Passiflora subpeltata White Passionflower: Native of Brazil. A thin stemmed climbing vine. Occurs on roadsides, wasteland and rainforest margins and gaps (Auld and Medd,1992,199). Flowers white in Spring, fruit large globe shaped, soft, full of pale seeds in late spring early summer.

Solanaceae

Solanum mauritianum Wild Tobacco Bush: Native of South America. Shrub or small tree to 4m.Widely naturalised in disturbed near-coastal areas, common in rainforest regrowth (Harden,1992,359). Its fruit are dispersed by birds. In areas of higher light levels it can form thick stands displacing native species by competing for water, space and nutrients (Joseph 1995). Will eventually shade out as the canopy thickens.

In some areas, such as the riparian zone in the park, this species has been left as a 'shade canopy' for the germinating native seedlings – they are trimmed regularly and will be removed as the canopy thickens.

Cestrum nocturnum Lady-of-the-Night: Native of Antilles and Central America. Shrub to 4m. Cultivated, naturalised in Maitland district (Harden,1992,345). Occurs on rainforest margins, gaps and wasteland. Strongly scented, at night, greenish yellow flowers in spring and summer, followed by greenish white globose berry late summer-autumn.

APPENDIX 5

WEED REMOVAL AND CONTROL TECHNIQUES.

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

2.**"Scrape-ditch-paint "method**: This method applies to many species of vines where it is desirable to treat the vines intact, particularly those with aerial tubers such as Madeira Vine, or those which will propagate from segments.
Collect as many tubers as possible, bag and compost or remove from site.
(a) Scrape the stem tissue on one side of the stem only for 20-30 centimetres if possible. (Note: on Madeira Vine it is necessary to scrape heavily.) Scrape as many sections of the stem as possible.
(b) Apply glyphosate at the rate of 100% with a paint brush.
(c) On stems which are thicker or horizontal, make a ditch into the stem with a knife and apply herbicide (Note: Care must be taken not to sever the stem).

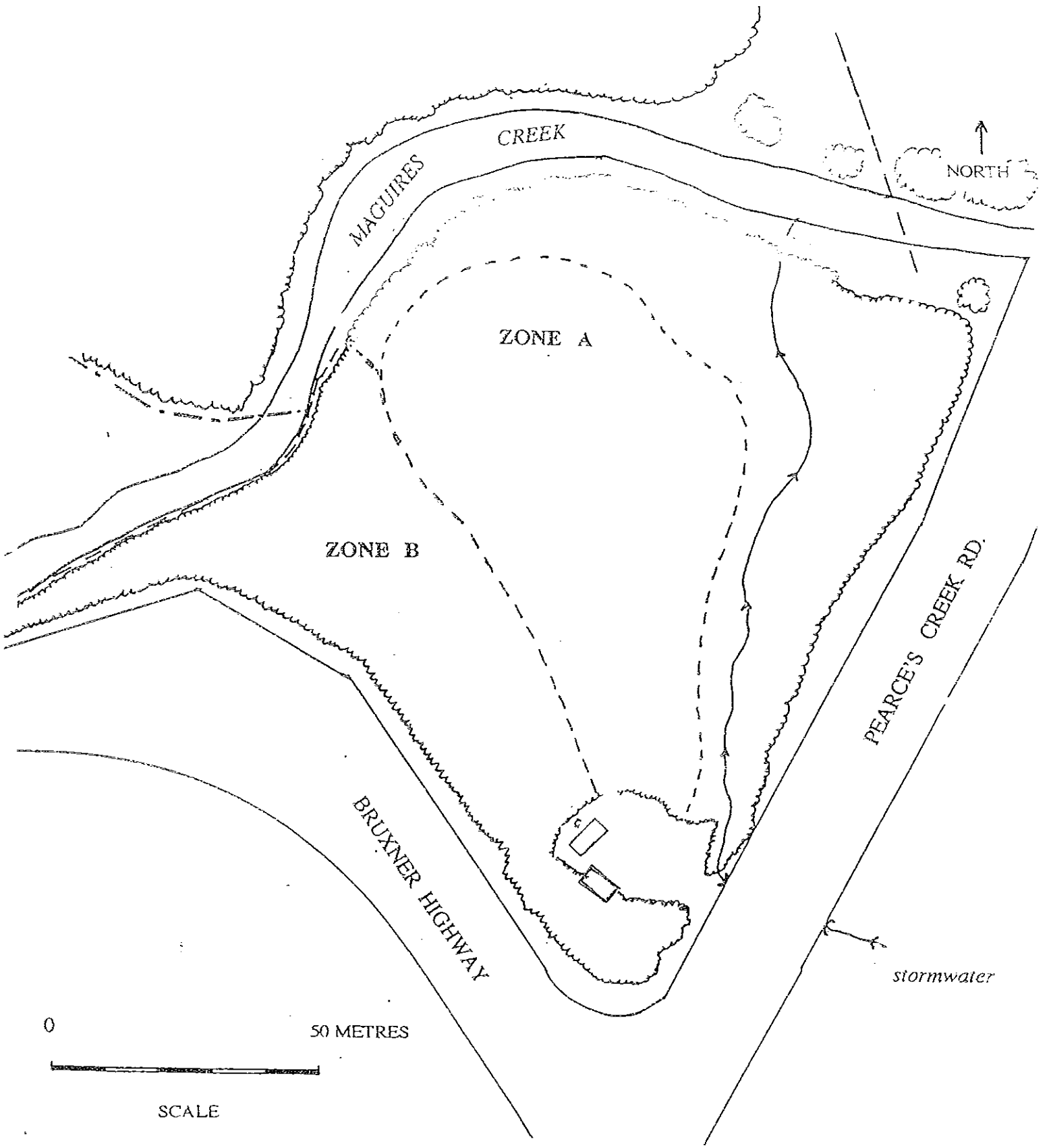
3.**Tree injection**: This method applies to all woody trees and shrubs with a diameter greater than 6-10 centimetres.
Stem injection this method applies to large trees

(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

4. **Spray:** Back pack is the recommended means of spraying.
Groundcovers (Madeira Vine, Wandering Jew): Glyphosate at 1:50 + Li 700 (a surfactant).
Annuals, Tropical Chickweed and exotic grass species: Glyphosate at 1:100.

The information 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 and follow the label and ensure that the herbicide is registered or there is an appropriate permit for the intended use.

LUMLEY PARK


CREEK
MAGUIRES
NORTH
ZONE A
ZONE B
PEARCE'S CREEK RD.
BRUXNER HIGHWAY
stormwater
0
50 METRES
SCALE

BUSH REGENERATION WORK REPORT

Remnant name	Date

Contractor	Phone

Work Team: Name	Hours Worked	Hourly Rate	Total Worked
		Total	

Weather Conditions

Areas Worked, Discription of Work Undertaken, and Comments

Weeds Treated	Methods	Chemicals & Application Rates

Chemical	Volume Used (ml)

Comments on Previous Work Undertaken

APPENDIX 7

SUPPLEMENTARY PLANTING LIST:

A suggested list for the quarry site on the eastern side of Pearces Creek Road.

Family	Botanical Name	Common Name
Araliaceae	Polyscias elegans	Celery Wood
Elaeocarpaceae	Elaeocarpus grandis	Blue Quandong
Euphorbiaceae	Macaranga tanarius	Macaranga
Lauraceae	Cryptocarya obovata	Pepperberry
	Litsea australis	Brown Bollygum
	Neolitsea dealbata	White Bollygum
	Neolitsea australiensis	Green Bollygum
Meliaceae	Toona ciliata	Red Cedar
	Melia azerdarach var.australasica	White Cedar
Myrtraceae	Acmena smithii	Lilly Pilly
	Rhodamnia rubescens	Scrub Turpentine
	Syzygium australe	Brush Cherry
	Syzygium francisii	Giant Water Gum
	Tristaniopsis laurina	Water Gum
	Waterhousia floribunda	Weeping Lilly Pilly
Rhamnaceae	Alphitonia excelsa	Red Ash
Rutaceae	Flindersia australis	Teak
	Flindersia bennetiana	Bennet's Ash
Sapindaceae	Arytera distylis	Twin-leafed Coogera
	Guioa semiglauca	Guioa
	Harpullia pendula	Tulipwood
	Toechima dasyrrhache	Blunt-leaved Steelwood
Sterculiaceae	Commersonia bartramia	Brown Kurrajong
Lomandraceae	Lomandra longifolia	Mat Rush
	Lomandra hystrix	Creek Mat Rush

Other plants from the core of the park will recruit into the area once the weeds have been removed. Plants such as Black bean (*Castanospermum australe*) Pollia (*Pollia crispata*) and Cunjevoi (*Allocasia brisbanensis*) can be brought across as runners or seeds.

Sample 1 of the historical records of seed collection by A.Crawford.

Specimens 1.12.1935

164 Ehretia acuminata — Reserves deciduous tree
Eugenia sp. — On road near croquet lawn
SH 144 Baloghia lucida — Brush bloodwood
163 Notelaea venosa (Similar to N longifolia) — Near Don Kirklands. Seeds like black grapes on long slender stems (Mock orange)
Nephelium leiocarpum (probably) N D Kirklands (Wild Leines) yellow clusters of seeds.
Eugenia Smithii var minor — Seven cutting Small-leafed form of Lillipilli

Specimens 21.5.36

139 Melicope neurococca, possibly, — S J G's Jack wood. 25 ft. fruit like long jack. but no fruits nor flowers supplied.
153 Eugenia Hodgkinsiana — S J G's Shiney apple 30 ft.
169 Helicia glabriflora — S J G's bull paddock 20 ft.
144 Glochidion Ferdinandi — Hugh G's pigeon. 20 ft Cheese tree or penal cedar
150 Elaeocarpus Bauerleni — Pigeon berry ash. N Gibbons
128 Like Litsea dealbata var Rufum — requires fruits & flowers. N Gibbons scrub 20 ft
Litsea hexanthus — Brown Bolly gum, or White Sassafras N Gibbons scrub 30 ft
127 Doryphora Sassafras — Below bowling green
121 Aphananthe philippinensis — Prickly Fig SB J Williams Brown Beech SB

Sample 2 of the historical records of seed collection by A.Crawford.

Specimens 28. 9. 36

1 150 Sloanea Woollsii Same as No 1 sent. 15. 9. 36.

2 Lauraceae On Teven Cutting one chain above No 1 (requires mature flowers or fruits to determine)

3 153 Rhodamnia trinervia (Brown Malletwood or Brush Turpentine) On Roadside opp. Don Kirklands.

4 Eugenia Smithii (Lilly Pilly) Like Eugenia in brush opp. Don Kirklands

5 147 Arytera distylis Narrow leaf. cream to brown clusters of flowers close to No 4.

Specimens 30. 9. 36

1 152 Eugenia Smithii (Lilli-pilly) (see identification note) Eugenia near Jim Wilson's cowyards.

2 160 Callistemon Salignus (White bottle brush) Tea tree with lovely pink young leaves.

3 149 Elaeocarpus obovatus (Bluebeny Ash) Beautiful shaped tree 36 ft behind Charlie Vidler's house on Tom Johnson's

4 131 Hymenosporum flavum (Native Frangipanni) Open tree, 30 ft. in J Walsh's. Yellow flowers of sweet perfume.

5 138 Flindersia Bennettiana (Bennetts ash) Tree near J Walsh bails. about 20 ft. like a teak with white flowers

6 169 Akania Hillii (Turnipwood) Tree with thorny leaves in J Walsh's brush. growing from old butt.

7 123 Ficus Henneana (Deciduous Fig) Fig tree in J. T. Whipps behind Tucki... school.