File- NIGHTCAP NATIONAL PARK- in Special Topics

OPENING OF THE PARK by R.S.Vincent, from Northern Star, May 18th, 1937

Park opened May 15, 1937

JCCESS OF LONG AGITATION

Nightcap Range Park Opened

By Mr. R. S. Vincent

17/5/37

THIRTY thousand acres of forest on the Nightcap Range were dedicated as a National Forest by the Minister for Mines and Forests (Mr. R. S. Vincent) in the presence of a crowd of 400 on Saturday afternoon.

The ceremony was performed on a picturesque clearing a few yards from the op of Minyon Falls, which tumble 420 feet into a rocky basin.

The declaration marked the culmination of a district-ide agitation extending over many years, and secured in erpetuity to the people of the Richmond and Tweed iver districts an area with great possibilities for develop-ent as a "people's playground."

It is the second of its kind to be dedicated in New South Wales and forms part of the Government's policy of pre-erving and developing natural forest resources.

State Forests included in the cap National Forest comprise n Whian State Forests Nos. 173 3 of 14,295 acres, Burringbar Forest No. 4 of 171 acres, m State Forest No. 355 of acres, and Goonimbar State t No. 344 of 6785 acres. The area of the National Forest is acres and includes the whole five State forests with the ex-on of two small areas—part of ingbar and Goonimbar—which being set aside for settlement. e forest is on the range divid-the Tweed and Richmond Rivers also on the Nightcap Range it-The northern boundary of the t is 18 to 20 miles north of Lis-e by road. The Nightcap Range our miles north of that bound-Byron Bay is 14 miles east of eastern boundary and Mullum-by is seven or eight miles east the northern section of the st. The most northerly point of forest is about seven miles h-east of Murwillumbah.

2360 FEET ABOVE SEA

he Nightcap Range from which forest derives its name is a spur n the Great Dividing Range run-g in a north-westerly direction. erally the area is tough and ken, consisting of steep stony rs and high ridges, in parts pre-ious. The elevation ranges from feet in the north to 2360 feet at junction of the Nightcap and bergemyah ranges.

s part of the Government's Un-ployment Relief Scheme work is w in hand on the southern parts the forest, roads of access being structed to give access both to more via Dunoon and Byron Bay Minyon Falls and Cooper's ek.

n addition to considerably aiding e sale of timbers these roads will of distinct value to the sur-nding district, enabling easy ac-s to the National Forest and its ny beauty spots.

bout 70 motor vehicles conveyed 400 people to the Minyon was there about 11 a.m. There was a large number of Lismore residents and representatives of some of the oldest families in the Richmond and Tweed river districts. A community open air fire place was provided and picnic parties were arranged.

A lorr was used for a platform. Those on the official dais included the deputy-Mayor of Lismore (Ald. S. T. Selwood), the Minister for Mines and Forests (Mr. R. S. Vincent), Mr. W. Frith, M.L.A., Mr. A. E. Budd, M.L.A., Cr. J. G. Snow (Byron Shire), Mr. E. H. F. Swain (Forestry Commissioner), and Mr. J. T. Sexton.

Ald. Selwood submitted a number of apologies, including one from the Mayor of Lismore (Ald. S. J. Hosie), the presidents of Tintenbar, Byogie and Gundurimba shires, the Mayor of Ballina (Ald. Hogan), J. T. Reid, M.L.A., the Bishop of Lismore (Dr. Carroll), Rev. T. McDougall (Lismore), and Messrs. O. G. Morton (Muswellbrook), and E. M. Allman (Chatswood).

OFFICIAL PARTY

Ald. Selwood welcomed the official party, which included the Minister, the Forestry Commissioner, and Messrs. M. D. Welsh, E. L. Westbrook, L. G. Hudson, R. J. Hillelie, and J. Frape of the Forestry Commissioner's Department, Sydney, and Messrs. J. Duncan (private secretary) and G. Rummery (District Forestry Officer).

Ald. Selwood said the gathering included aldermen, ex-aldermen, shire councillors, ex-shire councillors, officers of local governing bodies and citizens from all parts of the district. He said it was a pity that circumstances prevented the Mayor of Lismore (Ald. Hosie) from attending. It was a well known fact that Ald. Hosie, with many others, had worked hard to have the Nightcap area dedicated as a National Forest.

The deputy-Mayor said that in Mr. Vincent the district had a sympathetic and experienced Minister who was well in touch with the requirements for the development of the Forestry who sponsored the rearrangement of the Forestry Department which had been the means of improving the system.

Mr. Swain had already proved capable and efficient in his position as Forestry Commissioner and his appointment two years ago had been well justified.

PRAISE FOR OFFICERS

Ald. Selwood said the people of the district appreciated what the Minister and the Government had done. He paid a tribute to the work of the district forestry officer (Mr. G. Rummery) and his staff and to others who had worked hard to bring about the result which district people were celebrating that day.

The welcome was supported by Messrs. Frith and Budd. Mr. Frith said the agitation for the reservation of the forest had commenced more than 30 years ago. Among those who took a prominent part in the early movement were the late Ald. J. Quilkind, B. Kelly, Bishop Doyle, Ald. Robert White, and W. T. Missingham, M.L.A.

He mentioned the work of Ald. S. Hosie, ex-Alderman D. J. Riggins, shire councillors and public bodies in more recent years, and said that, although there had been a long agitation, the driving force of the present Minister and Commissioner had in no small measure been responsible for the objective being reached.

Mr. Budd said Mr. Vincent stood out above all other occupants of the office in recent years for his enthusiasm and ability.

WILFUL DESTRUCTION

Mr. Budd referred to the dedication of the Mount Warning National Park and spoke of the value of conserving natural timber resources. He said practically every person had witnessed wilful destruction of forests in the past, and it was pleasing that sound efforts were being made to prevent that waste.

The Minister thanked the deputy-Mayor, members for the district and others who had worked hard in inducing the Government to declare the forests embraced in the Nightcap a national forest.

Mr. Vincent said he had been interested in the references made to the work of many pioneers in striving to bring about the protection of the areas which nature intended should be devoted to the growth of timber. It was only in recent years that he had been able to place the capping stone on the work of these men.


NIGHTCAP
NATIONAL PARK

National Parks Association of N.S.W.

N.P.A

N.S.W

FAR NORTH COAST
BRANCH

22 Terania St
Lismore 2480

16.11.81

Dear Sir or Madam

The Far North Coast Branch of the National Parks Association has proposed to the State Government that a National Park be declared on the Nightcap Range. It is suggested that the park extend from the Nightcap Flora Reserve in the East, through Terania Creek Basin and Goonimbah State Forest, to Blue Knob. All of these areas are presently State Forest or Crown Land. No private land is involved. We are getting in touch with all the neighbours of the proposed park to acquaint them with our proposal and to find out what their opinions are.

As the proposed park is too small to be ecologically viable in the long term (i.e. over thousands of years), we would like to encourage the preservation of forested areas and reforestation of degraded farmlands adjacent to the park. At present rising rates associated with the increase in the value of land in the area are tending to have the opposite effect. Increasing financial pressure will encourage people to clear or to subdivide rather than pay high rates on 'unproductive' regrowth.

We are considering including in our proposal some sort of rating relief for people who wish to plant or preserve forests adjacent to the park. This would broaden the gene pool of the flora and fauna in the park and increase its ecological viability. Under this plan, landholders who enter into such an agreement could still take a certain amount of timber while encouraging forest cover on their land.

We enclose our arguments for a national park, and would like you to let us know how you feel about these ideas. We would be grateful for any feedback on this proposal, especially your answers to the following questions:

.....

1. I am/am not in favor of a National Park on the Nightcap Range
2. The campaign should/should not include rating relief for forested private land adjacent to the proposed National Park

yours sincerely

John Seed (president)

TO THE HONOURABLE SPEAKER AND MEMBERS OF THE LEGISLATIVE ASSEMBLY OF NEW SOUTH WALES IN PARLIAMENT ASSEMBLED

We the undersigned residents of Lismore and surrounding areas do humbly request that a **National Park** be declared on **the Nightcap Range** as outlined by the National Parks Association proposal.

And your petitioners, as in duty bound, will ever pray.

NAME	ADDRESS	SIGNATURE

When full please return to the Environment Centre
22 Terania St, Lismore.

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1.0 $18.40

311.00
36.58
.95
348.45

looking at cost

408-95

I am only mentioning those three Regions because they are three where I can say personally that I am sure that what I am saying is right. So a very, very big improvement overall by everyone has to be made because those are the grounds on which (and the only grounds on which) we can be pulled into the Lands and Environment Court. The grounds are that we are breaching the law, which we are doing.

Now where that translates into the ordinary nuts-and-bolts forestry, so to speak, very importantly, is related to the assessments that are now going on for the smaller wood components in the North Coast eucalypt forests. If you in the field don't understand that the logs of the past, the logs that were regarded as marginal logs 10 years ago are now Rolls Royces in the chain going into the sawmill, you have missed the whole point. Similarly, if you don't project your thinking 10 years ahead and say that the stuff which is marginal right now because it is too small, is going to be the Rolls-Royce in 10 years time, you have also missed the point.

Now, some final remarks on the Administration side. First of all, it is our intention, which I do not think has been announced before, to come much closer into conformity with what the Forestry Act requires of some of the positions in the Commission.

These extracts are from a 24 page transcript. For a copy of this document, send a stamped addressed envelope to th e Rainforest Information Centre, 22 Terania St. Lismore 2480

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A NATIONAL PARK FOR LISMORE

The National Parks Association of New South Wales has called on the State Government to declare a National Park on the Nightcap Range north of Lismore, an area of more than 4000 Ha. extending from the Nightcap Flora Reserve in the east through Terania Creek Basin and Goonimbah State Forest to Blue Knob in the west. The Minister responsible for the National Parks and Wildlife Service, The Hon. Eric Bedford, has studied our proposal and states that it has "... considerable merit, especially for the preservation of virgin rainforest."

We have three main arguments to show why this area should be declared a National Park - historical, economic and ecological:

1. Historical: Lismore's long lost National Park.

Since the turn of the century, there have been numerous attempts to have areas of the Nightcap reserved. Finally, in the thirties, a number of councils in the region and local residents made representations to the NSW Government for the establishment of a National Park. Notable among those pressing for the park was the Mayor of Lismore, E. J. Eggins, who sought the dedication of an area centred on the old Nightcap track.

The Government responded by declaring the Nightcap National Forest comprising about 30,000 acres incorporating Whian Whian, Goonimbah, Burringbar and Nullum State Forests. On 15 May, 1937, the Hon. Roy S. Vincent M.L.A., Minister for Mines and Forests in his declaration stated that the management plan for the National Forest would provide for " ...what is to all intents and purposes a National Park serving all time." The total park area was to be about 3000 acres. The Northern Star of 17 May, 1937, devoted its front page and two others to stories and photographs of the dedication ceremony at Minyon Falls. Included was a statement by the late Ald. S. J. Hosie, Mayor of Lismore

> " ... thanks to the Minister for the Forestry Act and to the three district members for the efforts producing this happy culmination to thirty years' agitation for the Nightcap National Park."

War intervened. Those intentions were never carried out. After the war, the management plans were 'misplaced', not to resurface until 1975. The areas "to all intents and purposes a National Park" have been lost to intensive forestry and even bananas (with the exception of 375 unlogged hectares of the Nightcap Flora Reserve).

Again, in 1963, the Minister for Lands proposed a National Park on the Nightcap but on the advice of the Forestry Commission this was rejected by the Minister for Conservation.

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2. Economic: Five years of timber, or tourism in perpetuity?

According to the Forestry Commission's present management plan, the remaining stands of mature trees in the proposed park (some carbon-dated at 1300 years old), will be cut out by 1986. At that time, the one mill in Murwillumbah cutting timber there will have to close or find alternative timber supplies. We propose that the State Government assist this mill in converting its operations to utilise thinnings or plantation pine.

In contrast to this situation, tourism is booming in this area. "Between April 1979 and March 1980, the North Coast received 2.67 million visitors who stayed an average of 4.78 nights." (Dept. Industrial Development and Decentralisation) This number is expected nearly to double in the next decade. "The North Coast is a major tourist destination. In 1979-80 no other non-metropolitan region in NSW rivalled the North Coast in terms of number of visitor nights." (Dept. Industrial Development and Decentralisation) These visitors last year spent an estimated $35 million in the Richmond Valley and the same in the Tweed. (Dept. Tourism)

In spite of this trend, the Richmond-Tweed has less National Park per head of population than any other region in NSW, (with the exception of the Murray and Murrumbidgee which are distinguished by having none at all). There is great pressure on the existing parks here, especially Mount Warning which is already in danger of degradation from over-use. The Nightcap quite literally is our last chance to rectify this situation. There is no more natural forest left in the area.

Under the headline "Conservation 'row' may have led to Tourist Boom", the Northern Star of 26 May 1981 quoted the Lismore City Council development officer in charge of the Tourist Information Centre as saying that " ... many visitors simply were asking: 'Where is the nearest rainforest?' "

"There has been an increase in the number of visitors going through the centre"

"Most of them are showing an increasing awareness of and concern about conservation issues."

"They are asking about our natural forests such as Terania Creek ..." said the development officer.

Economic analysis shows that with the number of tourists in the region, the economic benefits of a National Park outweigh the costs by an order of magnitude, even in the short term. With proper management, these economic benefits are ours in perpetuity.

..../3

3. The Ecological Argument

The Forestry Commission believes that samples of indisturbed forest are important for a number of reasons:

"(a) they provide an historic link with forests of aboriginal days;

(b) they represent the original habitat of our native plants and animals;

(c) they shelter plants and animals that could under some circumstances be otherwise threatened with extinction;

(d) they often contain forest stands of particular grandeur and beauty;

(e) they allow us to study the way forests grow and behave under essentially natural conditions;

(f) they provide a recreational resource of great significance in our increasingly urbanised lives."

(Forest and Timber, vol.10, no.1, 1974)

In its Background Paper, Rainforest Policies, 1979, the State Government's National Parks and Wildlife Service states:

"Where previously large tracts of rainforest such as 'the Big Scrub' and 'the Illawarra Brush' have been almost obliterated by clearing, there is justification for maximising the conservation effort for the few remaining vestiges."

(N.P.W.S. Background Paper, Rainforest Policies, October 1979)

The International Union for the Conservation of Nature (of which Australia is a member), would certainly agree with both of the above statements. This body recommends that at least 5% of each country be set aside primarily for the preservation of natural ecosystems. Diamond's work on island bio-geography has shown that even if 5% of a given ecosystems is set aside undisturbed, 60 - 70% of the species originally present will be lost in the long term, due to genetic drift and other factors.

The N.R.C.A.E.'s North Coast Region Resources Inventory and Land-use Planning Guidelines to the Year 2001 suggests that " ... with the extreme diversity of flora and fauna native to the North Coast region, more than 5% of the total land area should be preserved to ensure a greater depth of protection for the region's irreplaceable biological resources."

Far less than one per cent of the region is being preserved primarily for the preservation of natural ecosystems.

The Nightcap is part of the rim of an ancient volcano. When this volcano erupted 20 million years ago, the plug, Mount Warning, was 3,500 feet higher than it is now. Even then the rainforest was 100 million years old.

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When we were all part of Gondwanaland, before Antartica sailed away to the south, Asia to the north, that rainforest existed. Decisions we make in the remaining decades of this century will determine whether this most ancient of forests is to continue at all.

* The Nightcap National Park is the last chance for the people of Lismore to preserve an ecologically viable fragment of the original nature of our area.

Documentation is available for any of the quotes above.

Contact the Rainforest Information Centre, 22 Terania Street, North Lismore, or the National Parks Association, Far North Coast Branch, Secretary - Mr. M. Kaveney, Emerson Road, Rosebank.

A copy of the thirty-page proposal for a Nightcap National Park submitted to the State Government is available from the National Parks Association at the above address. ($2.00 including postage) This includes maps, and information on geology, physiology, soils, climate, flora, fauna, aboriginal influence, history, recreation and competing land uses.

Lehrstuhl für Geobotanik
Systematisch-Geobotanisches Institut
der Universität Göttingen

Professor H.Ellenberg,Director

D-3400 Göttingen, Untere Karspüle 2
Telefon (0551) 39-57..21
39-5722 Sekretariat
39-1.. Universität
Telex 96703 unigoe
FRG

12.1.1981

The Hon. N.K. Wran, Q.C., M.L.A.
Premier of New South Wales,
Premier's Department,
State Office Block,
Phillip Street,
Sydney.N.S.W. 2000
Australia

Sir,

Conservation of Australian Rainforests

Please allow me, as a German Botanist much concerned with tropical ecoloy, to contribute to the actual discussion about the future of Australian rainforests.

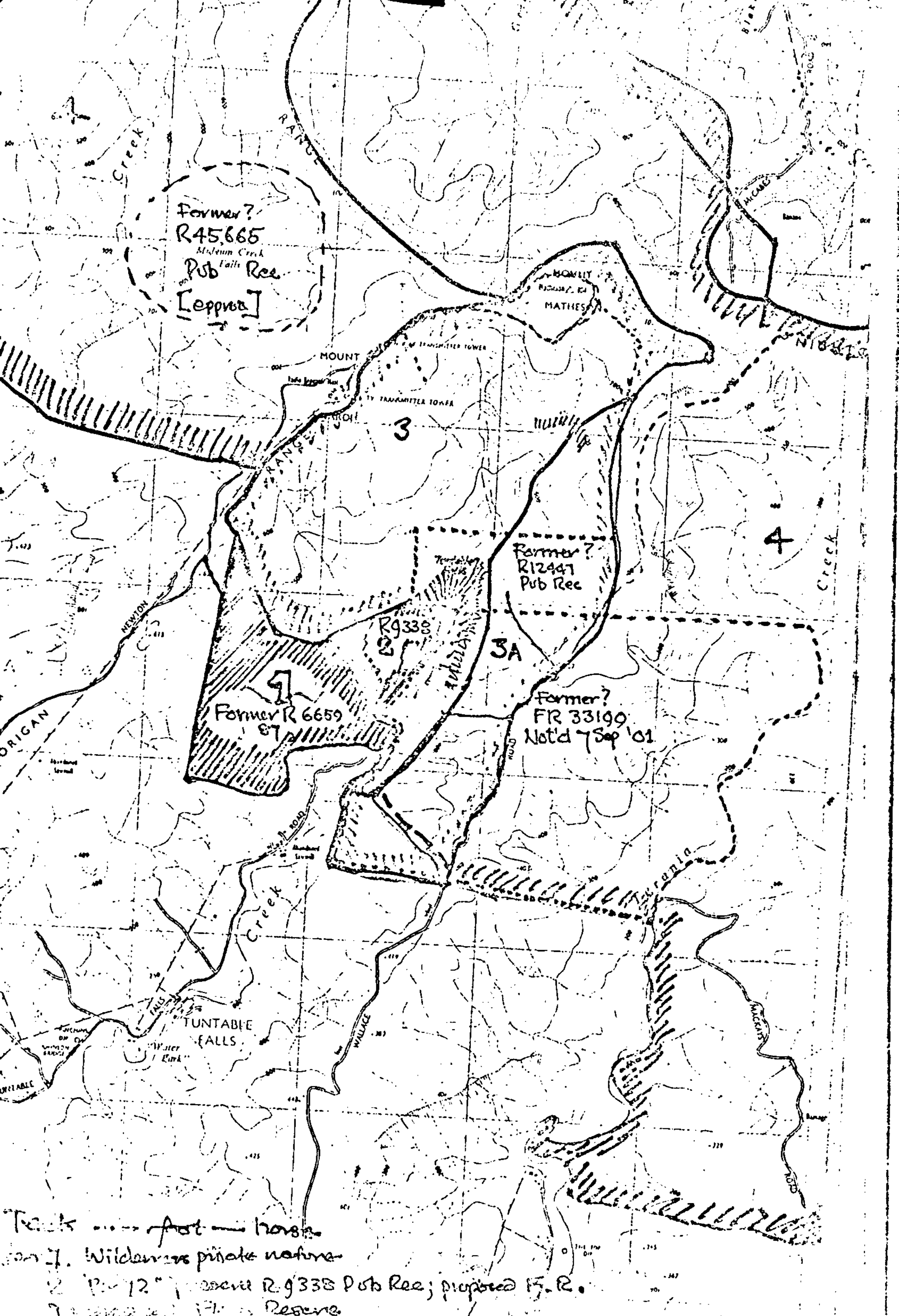
In all parts of the world forests are threatened with logging, clearing or agricultural use. In contrast to other forest types, for most of the tropical rainforest ecosystems this means their definite destruction. The main reason is that tropical rainforests normally are built up by a great number of different tree species forming varying mixtures. The seeds of nearly all of these trees are heavy and cannot be transported rapidly over great distances. When many species are involved, their arranging in a mixture ratio due to competition needs a long time, at least several generations of trees. Therefore it certainly takes much more than 500 (and probably more than 1000) years for their regeneration. This is proved e.g. by historical evidence in Mexico.

Where the total area of tropical rainforests is as large as for instance in the Amazonian region, their regeneration seems possible, but difficult in any case. Only in regions, where the species diversity is low, like in Central European and many temperate forests, the return of the natural species mixture is no problem. Here it needs less than 300 years and can be accelerated artificially, if necessary.

In Australia however the total area of rain forests is relatively small, and the species living there are numerous. Moreover, most of these species are unique in the world because of the long isolation of the Australian continent. Thus destroying or even reducing the Australian rainforest largly means killing an ecosystem unique at a global scale.

Would you like to enter into history as the personality and the government responsible for a crime of such extension?

Yours sincerely
H. Ellenberg
(Ph.D.,Honorary Ph.Ds.)
Heinz Ellenberg



Track ---- foot — horse

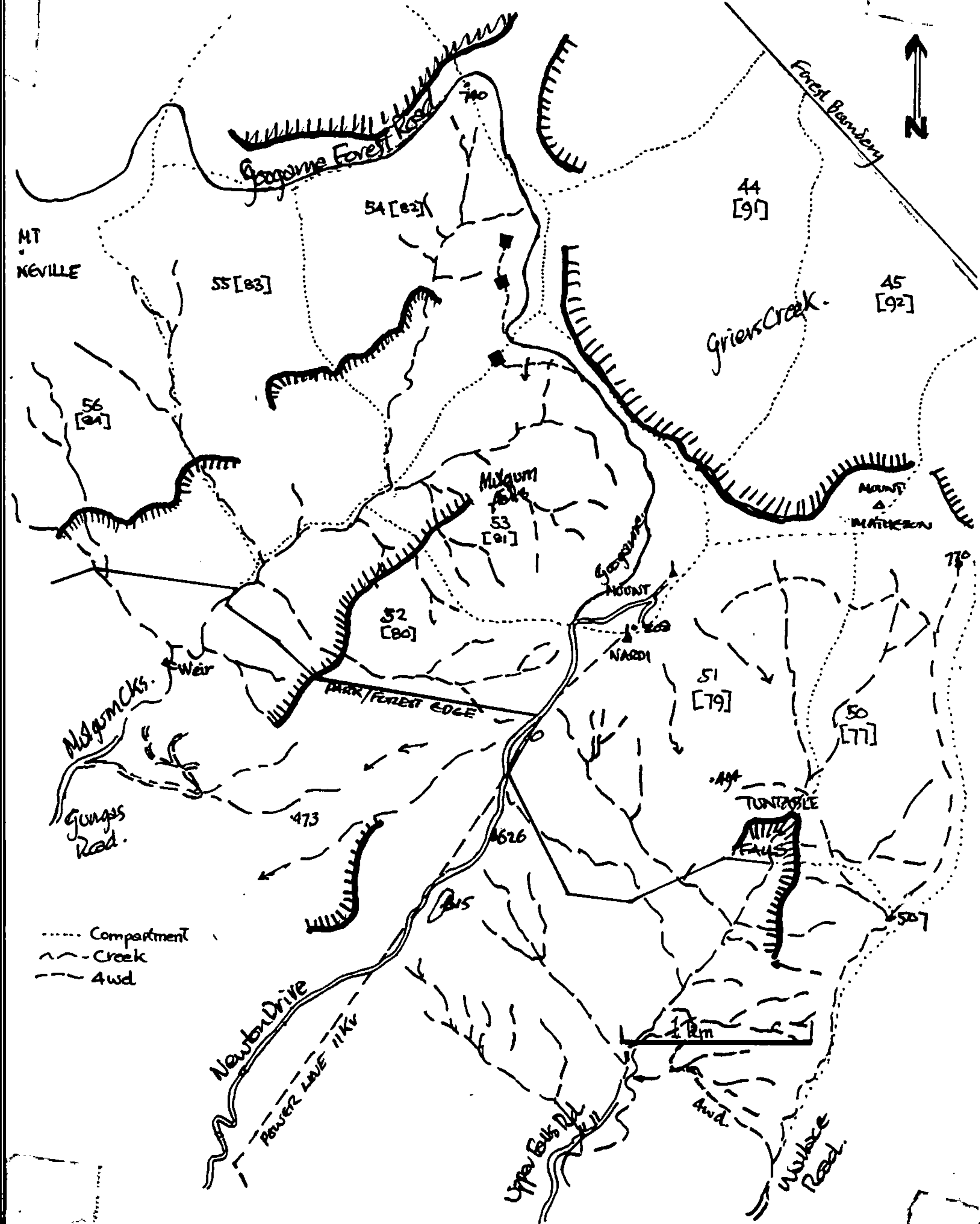
[illegible] 1. Wilderness private nature

2 [illegible] 12" reserve R 9338 Pub Rec; proposed F.R.

3 : proposed [illegible] Reserve

[illegible] Reserve including former R 12447 Pub Rec.

[illegible] Reserves.


N
Googarne Forest Road
740
Forest Boundary
44
[91]
45
[92]
Griers Creek
54 [82]
55 [83]
MT
NEVILLE
56
[84]
Mount
Mathieson
53
[81]
52
[80]
51
[79]
50
[77]
770
Mount
Nardi
Park/Forest Edge
Weir
473
626
Turntable
Falls
507
Compartment
Creek
4wd
1 km
Newton Drive
Power Line 11Kv
4wd.
Wallace Road.

Legend — 1a 20ch. to 1 inch. (1:15840)

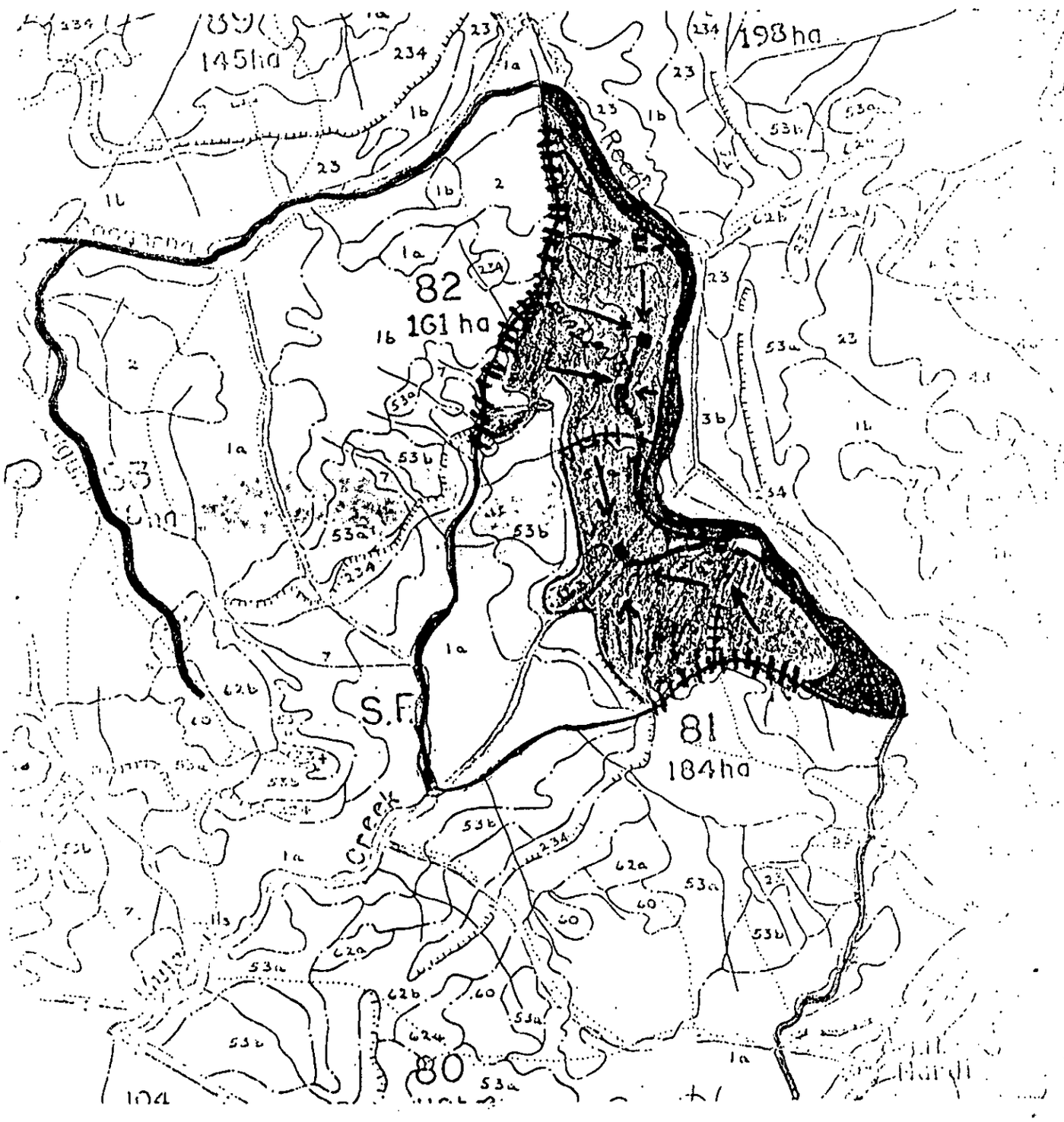
- Cpt. 82E
- Cpts. 82S, 81N
- Cpt. 81E
- Filter strip 20m wide either side.
- Protection strip 10m wide either side.
- Roadside protection strip 20m wide.
- Logging roads to be constructed by miller.
- Log dump.
- Sniggsing direction.

Estimated	Species	Composition		
Cpt. 82E	B.W.D.	650m3		
	H.W.D.	700m3	Totals	
Cpt. 82S, 81N	B.W.D.	280m3	B.W.D.	1100m3
	H.W.D.	1200m3	H.W.D.	1900m3
Cpt. 81E	B.W.D.	170m3		3000m3

Notes

1. On grades over 18°, consolidated height of erosion cross banks is to be 0.5m (0.7m unconsolidated).
2. Note inclusion of protection strips. The same conditions apply as for filter strips.
3. Note all standard conditions, but particularly numbers 7,8 and 9.

Dated 26-10-81



NIGHTCAP ACTION GROUP . P.O. NIMBIN . INFORMATION (066) 891 492 MEDIA 066 886 227

Unique, rare or endangered species of the Nightcap

Giant tree climbing orchid	*Galeola foliata*
Onion cedar	*Owenia cepiodora*
Small Bolwarra	*Eupomatia bannettii*
Durobby	*Syzygium moorei*
Ribfruited Malletwood	*Rhodamnia costata*
Glossy Acronychia	*Acronychia laevis*
Smooth Davidsonia	*Davidsonia (undescribed)*
Corokia	*Corokia whitiana (unique)*
Nightcap Wattle	*Acacia Orites*
Scrub Daphne	*Phaleria chermsideana*
Filmy Ferns	*1. Microtrichomanes vitiense*
	2. Gonocormus saxifragoides
	3. Selenodesmium elongatum

There are over 200 species of birds found on the Nightcap. Of these birds 70% are dependent upon the forest for their primary habitat, need tree hollows as nests or require a mature forest. Destruction of their habitat will greatly reduce numbers, or in the case of the sensitive and endangered species risk extinction.

Richmond Birdwing *Ornithoptera priamus richmondius*
This spectacular butterfly is found only in the Northern Rivers region.

Plumed Frogmouth	*Podargus plumiferus*
Albert's Lyrebird	*Menura alberti*
Double-eyed Fig-parrot	*Psittaculirastris diophthalma*
Turqoise parrot	*Neophema chrysostoma*
Glossy black cockatoo	*Calyptorhynchus lathami*
Black-breasted button quail	*Turnix melanogaster*
Wompoo fruit dove	*Ptilinopus magnificus*
Sooty Owl	*Tyto tenebricosa*
Olive Whistler	*Pachycephala olivacea*
Rufous Scrib bird	*Atrichornis rugescens*
Crested Hawk	*Aviceda slcristata*
Spinetailed Chowchilla	*Orthonyx temminkii*
Rufous shrike-thrush	*Colluricincla megarhyncha*
Paradise Riflebird	*Ptiloris paradiseus*
Jabiru	*Xenorhynchus asiaticus*
Eastern Quoll	*Dasyurus viverrinus*
Tiger Quoll	*Dasyurus maculatus*
Feathertail glider	*Acrobates pygmaeus*
Sugar glider	*Petaurus breviceps*
Greater glider	*Schoinbates volans*
Marsupial Frog	*Assa darlintoni*

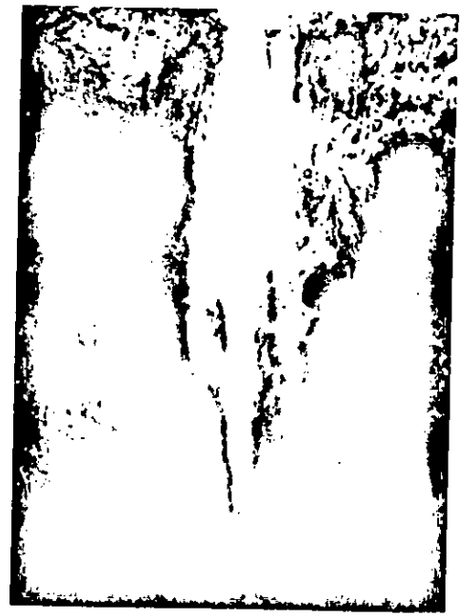
"We have not inherited the Earth from our parents; we have borrowed it from our children."

What you can do

- Write to the Premier (C/- Parliament House, Macquarie St, Sydney 2000) asking for the gazettal of the Nightcap National Park, preservation of the State's small remaining wildernesses and an end to rainforest logging.
- Donate time or money to our campaign. Cheques may be made out to "Nightcap N.P. Campaign" and sent to 22 Terania St, Lismore 2480.
- Join the Australian Conservation Foundation (whose generosity made this brochure possible). Ordinary membership $17, students or pensioner $7.
- Subscribe to ACF's colour magazine *HABITAT AUSTRALIA* ($15 for 6 issues, $12 for members).
- Make a (tax deductible) donation to "ACF's Rainforest Fund".

AUSTRALIAN CONSERVATION FOUNDATION
6726 Glenferrie Rd,
Hawthorn, Victoria 3122
Telephone: (03) 819 2888

NIGHTCAP
NATIONAL PARK



Rescue the rainforests

VALUES IN PERSPECTIVE

Rainforest once covered the whole of Australia. Climatic changes over the last millions of years have forced them to recede to a few small isolated pockets. They are ancient relics of Australia as a much wetter place in the Tertiary geological era, 80 to 10 million years ago.

Rainforest is the world's oldest surviving and most complex ecosystem. About twice as many kinds of organisms occur in rainforest as occur in all the rest of the world's vegetation types combined. It is the biotic community within which flowing plants — and ultimatly ourselves — first appeared upon the earth. If for no other reason, rainforest is worth preserving as a world bank of genetic diversity, still capable of future dividends as important as the eucalypts, which came forth from this great womb some 30-40 million years ago.

100 years ago, when we were all part of the supercontinent Gondwanaland, before South America, Antarctica and Australia drifted apart, even then the rainforest existed. Decisions we make in the next few years will determine whether these most ancient of forest can continue at all.

Gazettal of the Nightcap National Park is our last chance to preserve an ecologically viable section of the original nature of our area.

THE PROPOSAL FOR THE NIGHTCAP NATIONAL PARK

The proposed park area stands 35km north of Lismore on the west end of the Nightcap Ranges, which form the sorthern rim of the Mt. Warning volcanic caldera. The terrain is steep and deeply gullied, consisting of a series of summits, up to 933m elevation, connected by narrow ridges falling as a steep escarpment to the north and as gradually declining shoulders to the south. It is estimated that more than half the area slopes steeper than 21°, and it is this inaccessibility that has protected some parts of the area from past logging.

Two State forests lie on the Nightcap Ranges; Goonimbah 3197ha and Whian Whian 6398ha. Whian Whian has been largely cut over in the past and is now on sustainable yield management, with yield estimated at about 2% annual increment. Goonimbah is being generally cut for the first time, though some areas have been worked for timber before, mainly during and following the 2nd World War.

The proposed park adds some areas of vacant Crown Land to Goonimbah State Forest and extends east of Terania Basin to include the present Nightcap Track Flora Reserve and other small recently harvested parts of Whian Whian, for a total area of 4,500ha.

FOREST TYPES

Forest types range from cool temperate palm forest through temperate coachwood-crabapple associations to subtropical rainforest of which booyong and carabeens are the large commercial species. In drier areas on poorer soils large stands of emergent brushbox, flooded gum, grey gum, white mahogany, and some New England blackbutt occur, and it is these which constitute the main commercial attractions, as they are approximately the last fully mature hardwood stands remaining unchanged.

EXTINCTION

The map shows an area of about 2,400sqkm. Prior to our settlement this was almost all forest. There remain now less than 10% describable as tall forest, and most of this is at least 50% degraded.

Biogeographical researches indicate that if only 5% of a given broad area is preserved, then in time only 30%-40% of the local species will survive.

The proposed park covers less than 2% of the map area. Under the present management proposals most of this will have suffered "maximum economic utilisation" by mid-1986.

PROMISES, PROMISES . . .

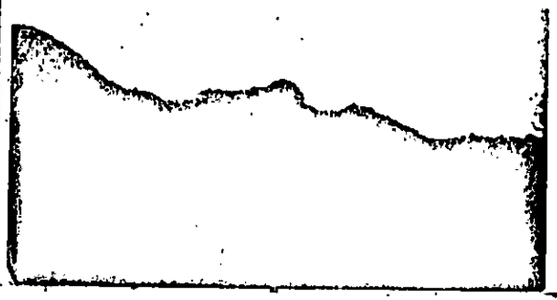
In 1937, the Forestry Commision promised that a 3,000 acre section of the Nightcap Range would be set aside as "...what to all intents and purposes will be a national park for all time." This preservation did not succeed.

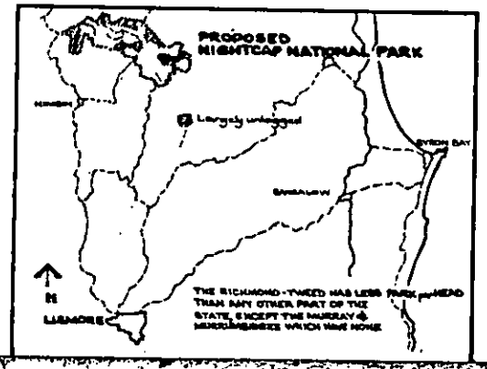
From a letter to The Hon. N. K.Wran, Q.C., M.L.A.
Premier of New South Wales

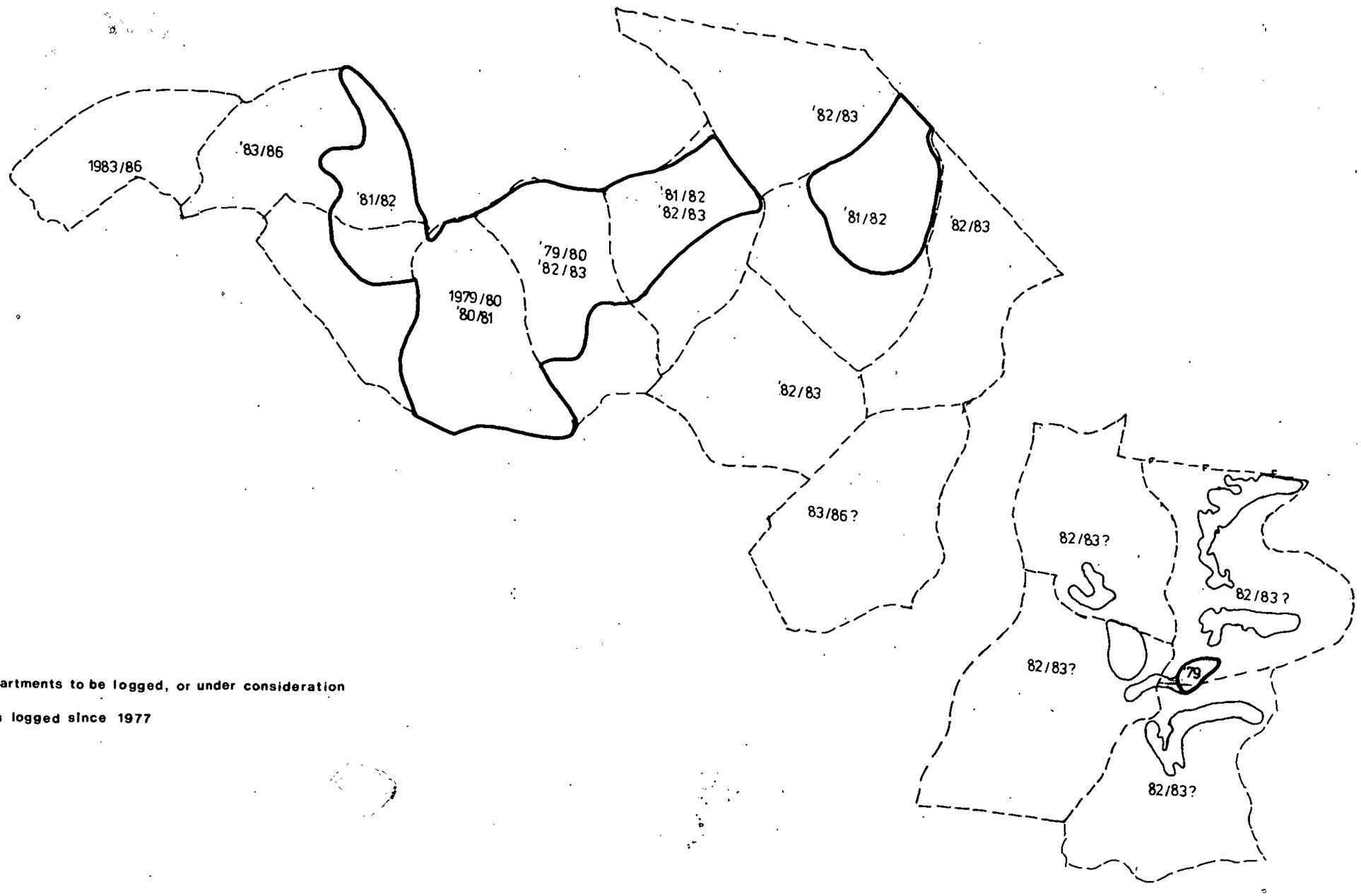
"Only 1% of Australia's great land area was covered by rainforest before European settlement and now only one quarter of it is left due to clearing for agriculture and other developments. Australia is not in the relatively happy position that its remaining rainforests are situated in one large area; as you know, the forest exists in patches and each small area is a refuge for a unique collection of plant and animal species. The smaller the size of the patch, the more vulnerable is its living community to any form of disturbance, let alone logging.

"Australia, as you know, is unique in its plant and animal life and it is essential that as much of this as possible is preserved for the benefit and enjoyment of Australians in the future."

(signed) *Gerald Durrell*
Jersey Wildlife Preservation Trust
Channel Islands, U.K.







Compartments to be logged, or under consideration

Areas logged since 1977

NPA – AGM – APOLOGIES NAG

It is a long story, but maybe it is the mythological or spiritual or aboriginal values which is/are in doubt at present.

I mean, some of us hear stories, apparently some from Lyle & some from Lorraine Mosti Williams, about what specifically the place – and this goes for the Nimlim Rocks and maybe the Tweed / Manning / Wallumbilla as well ; that the place was known Australia wide and is a place high clever men come to die and receive high burial, in the mountains and the trees

Bob Fredericks, (the NPWS Reg Planner), cannot accept this. He has to make a meeting with the local Elders, ask them direct, 'Do you allow/mind us to have a Walking Track across the top of Blue Knob?" (and Spicers or Lions Head)(1000) and if 'Yes', OK, but if No then why exactly why?

Of Course the spiritual significance to (non-Aborigines) is a whole another question, [redacted]

So, no one was ever threatened with pushing off the cliff, though some individual Naggs were upset when they found the Dorrigo Service Platform Builder making holes in the Rock at Phalis. But he was slammed, They went home, and are at present working elsewhere

Till next Friday; at least 1.30 Media Centre Nim, & 2nd mtg with Bob Fredericks, of hopefully some steadier Nags. Last Friday was the first, same place (not Turtable), much was "He icon Anawhirt. I don't mind telling you, I was a bit rattled..." said and noted, about roads, rehabilitation, turn rounds, closing Googama right off, ugly TV facilities, tracks for the blind, — many feelings. We wandered off, writing to see what we remembered as important. Bob stopped his maps quite often. I arranged these meetings to try and smooth it up; "The Service is quite willing to pull out of Nightcap". Would leave it naked; as before the FC, even. Bob willing to come up to L tonight, Tues, to prediscuss for Weds NAG mtg (tomorrow from here), with cool heads Ian, Andy Fr, Gummy ... Have spent long on the phone with him, and Jeff Martin. Bob to do the job. But we did get near stuck on the spirit of the place today again.

Can NPA press spiritual values?

Please support Telli-Telli and Unumgar proposals along. Subs due noted.
How about 'Exploratory walks' program? (But not my phone, thank you!)

RMB 125
Blue Knob 2480
27-11-81

The President
Far North Coast Branch
National Parks Association of NSW.
Dear Sir,

Thank you for your circular letter of 16.11.81 regarding the proposed Nightcap Range National Park, which came to us via our solicitors. (Note address above).

Our property fronts Blue Knob Road and rises steeply up the range to include the headwaters of Websters & Callicos Creeks. It is regenerating rapidly and we intend that of the 233 acres at least 200 will revert to forest – having identified ~~of~~ over 50 species of rainforest trees and shrubs amongst the lantana I assume that means rainforest.

Thus we strongly favour the National Park proposal. If we can assist the campaign in some way we would be pleased to do so.

As for the rating relief proposal, we

MARIA

Replied 26.12

'Eragella'
Synard Rd
Blue Knob

Dear John,

Thankyou for the letter on the proposed NightCap National Park. I am in full agreement with the formation of the Park and I have already signed the petition at the Show.

I do have different ideas on the suggested rating relief. I believe that the idea is basically sound, but that it will further complicate matters concerning the declaration of a national park and that it could set the whole project back.

Lismore Council is very strong on tourism benifits and the Park I believe will be attractive to most councilors, but to have Rate Relief is another matter which I can't see most of the Conservative councilors agreeing to. If this complicates the whole project it would be a pity.

I would say get the Park agreed to by Council, gain their support for submissions to goverment. Then when the Park is declared, press for this idea of paddy forest adjacent to the park and seeking rate relief.

I would ask you to consider this idea for political reasons, as the ~~[illegible]~~ setting up of the Park may only be the beginning of other related matters.

There is a group recently formed at Bue Knob called the Wild Dog Ad Progress Assoc. Formed mainly by tradional farmers its primary reason is the eadication of Wild Dogs. Some of these Wild Dogs are 90% Dingo and it is a very emotive issue. I haven't heard any evidence of power damage to cattle, but nevertheless a campaign has been mounted against the Dogs. This group I believe, & could get very emotive about the proposed National Park - especially if it believed adjoining landholders (not tradional farmers) were to get Rate Relief

Further to this the tradional farmers are very opposed to weeds and blame new settlers and the State Forest for the problem, rather than their unsuited agricultural practices. They don't understand regeneration and call all forest "rubbish"

All this I'm sure you know. What my I'm saying it is that pushing for rate relief would make the National Park Proposal even more unpopular, and may jeopodise it.

Let me say I appreciate all the effort the National Parks Association is putting into this and I wish the project success. Enclosed is a $50 contribution to the campaign.

Yours in Solidarity

Rod Thorpe.

LISMORE
TEACHERS'
ASSOCIATION
OF THE
N.S.W.T.F.

PRESIDENT:
Ross Rynehart
Wilson Park S.S.P.
Wyrallah Rd, Lismore
Ph. 066-217937

SECRETARY:
Arthur Thornborough
Kadina High School.
Goonellabah 2480
Ph. 066-243133

June 25 1982

Dear Friends,

Find enclosed two petition sheets returned to me as a result of having them circulated to every school in our Association. I'm sorry there aren't more. However, I'll ask the Federation Representatives in the schools to forward them to you as soon as possible.

Yours,
A Thornborough
Sec.
L.T.A.

P.S. Received letter inviting affiliation with Peace Committee - this will be put to L.T.A. at July Monthly meeting.

Dear Sir,

We were interested to receive your information on the proposed Nightcap National Park.

Most of our land is steep and forested, much of it being the top of the leading spur of Blue Knob Range. We have a bit of flat cleared land, but also heavily cleared slopes — probably due to bananas many years ago.

Any information about reforesting cleared parts of our land, in particular the slopes would be greatly appreciated

Thanking you,

R + J.A. Derrin

NC Hayes.

National Parks Association of N.S.W.

FAR NORTH COAST
BRANCH

22 Terania St
Lismore 2480

16.11.81

Dear Sir or Madam

The Far North Coast Branch of the National Parks Association has proposed to the State Government that a National Park be declared on the Nightcap Range. It is suggested that the park extend from the Nightcap Flora Reserve in the East, through Terania Creek Basin and Goonimbah State Forest, to Blue Knob. All of these areas are presently State Forest or Crown Land. No private land is involved. We are getting in touch with all the neighbours of the proposed park to acquaint them with our proposal and to find out what their opinions are.

As the proposed park is too small to be ecologically viable in the long term (i.e. over thousands of years), we would like to encourage the preservation of forested areas and reforestation of degraded farmlands adjacent to the park. At present rising rates associated with the increase in the value of land in the area are tending to have the opposite effect. Increasing financial pressure will encourage people to clear or to subdivide rather than pay high rates on 'unproductive' regrowth.

We are considering including in our proposal some sort of rating relief for people who wish to plant or preserve forests adjacent to the park. This would broaden the gene pool of the flora and fauna in the park and increase its ecological viability. Under this plan, landholders who enter into such an agreement could still take a certain amount of timber while encouraging forest cover on their land.

We enclose our arguments for a national park, and would like you to let us know how you feel about these ideas. We would be grateful for any feedback on this proposal, especially your answers to the following questions:

.....

1. I am/~~am not~~ in favor of a National Park on the Nightcap Range
2. The campaign should/~~should not~~ include rating relief for forested private land adjacent to the proposed National Park

yours sincerely

John Seed (president)

CO-ORDINATION CO-OPERATIVE LTD.
P.O. BOX 26
NIMBIN N.S.W. 2480

Dec. 4, I98I.

John Seed,
National Parks Assoc. of N. S. W.,
22 Terania St.,
Lismore 2480.

Dear John;

Further to your printed letter dated I6 Nov I98I, the co-operative fully supports the creation of the proposed Nightcap National Park for the reasons you outline in your submission.

This co-operative also fully supports the general concept of private forest reserves to act as buffer zones to the Park, and it intends to request the Minister for Environment & Planning to designate the area above the 330 meter contour on our Portion 87 as a Private Wilderness Nature Reserve to be available for scientific research (I estimate this area to be about 60 ha). This area would remain undisturbed in every manner and no timber would be used from it including even the removal of dead fallen timber.

The remainder of our forest areas (about 280 ha) located on Portions 73, 27, 44 & 69 are managed to provide timber to our own members on a non-commercial basis and limited control burn-offs are undertaken in certain areas of these portions. When your association more accurately defines the management practices to be followed in the proposed buffer zones, we can then both determine if our forest areas falls within the guidelines adopted.

Like every other landowner we would appreciate lower rates, however, we could not support a campaign for lower rates in such forest areas because: I) it will encourage Lismore Council to rate multiple occupancy on a per dwelling basis which would greatly disadvantage our co-op; 2) Lismore Council will refuse anyhow; 3) it will antagonise local reaction, ie. forcing up their rates to subsidise 'new settler' property owners and 4) it would be legally complex if not impossible to define forest areas which should legitimately be exempted and to prevent them from being subsequently cleared.

However, we feel that such areas should be exempt from the payment of land tax under s. I0(I)g(vi) of the Land Tax Management Act as a "public garden, a public reserve". Our reasoning behind this is that the I) State governemnt could easily afford the decrease in revenue, 2) local feelings/disparities are not aroused and 3) land tax was meant to be a tax on wealthy holdings for investment purposes. Our solicitors have applied to the Land Tax Commissioner for an exemption on this section but under several other sections as well. The Commissioner has not shown himself to be very sympathetic. I would suggest that your association ask the Commissioner if the forest reserves as you envisage are exempt and if not, why not; then request State Cabinet to amend the Act. We would be very interested to receive copies of any replies received.

Keep up your good work in trying to convince Cabinet to dedicate the proposed park and we look forward to any progress you make. I enclose $2. for a copy of the thirty page proposal to Cabinet in this respect. Let me know if we can be of any further assistance.

Yours truly

Dave Lambert
(Secretary)

CC Ian Dixon

7 Red Lion Street,
Rozelle, N.S.W. 2039.
December 2nd, 1981.

Mr. John Seed,
Nation Parks Association,
22 Terania Street,
Lismore 2480.

Dear John Seed,

Thank you most heartily for your letter 16.11.81 concerning the Nightcap National Park proposal. I am definitely in favour of the proposal as I understand it and, as an adjoining land owner, the rating relief would be welcomed.

I very much value the native acreage that I own and often wonder about the future of the State Forest behind. I have also seen many neighbouring properties subdivided and a rapid increase in populations of people, pets and motor vehicles. The only concern that I would express is on the administration of the park. Would this park have to endure as much use as Mt. Warning? Would roads be built up into the range for access by 4 wheel drives, trailbikes, panel vans,buses and cars?

I say this because of the development that I have seen in parks such as The Blue Labyrinth, Blue Mtns National Park next to Glenbrook, west of Sydney. There is a very rough road that goes the full length of the park. As a result cars, panel vans & motorcycles were generally discouraged from going too far beyond the gate near to which is a stream and picnic area. Since they have paved some of that road, the ensuing traffic and crowds have been too much to return. I wrote to the National Parks & Wildlife Service and was told that it was the job of the service to make the parks assessible to as many people as possible. To me this philosophy seems to be self defeating as it destroys the very resource that the service relies upon.

Have you considered the amount of development that would take place, i.e. roads, tracks, trails or no formed access?

I have enclosed a cheque for $2.00 for a copy of the proposal. I would be interested in you comments if my quiries are not covered within the proposal.

Yours truly,

C. H. KIRKWOOD

Dear Mr Seed,
Thank you for your letter about the proposed National Park on the Nightcap Range.
We are all in favour of the idea as we are most concerned particularly about the present logging of the Rainforest on Mt Nardi. (Goonumbar State Forest)
We are also in favour of the rating relief scheme and our small holding has bush box and flooded gum regrowth, 20 - 30 years old which we wish to maintain as natural forest.
With the state of the remaining rainforest at a pityful 2% of what did exist it is criminal to deplete any more of this integral part of our existance.
It is also totally impracticle and greedy to log any where near water catchment areas. New South Wales should be following Victorias astringent

rules regarding this, with fencing of the areas and no possible chance of the hand of commerce reaching in to claim something which does not belong to it.

We will give you our full support and write to Neville Wran.

Good luck with your scheme, and best wishes

KYM DUNCAN, GARY MCINTYRE, JOHN AMOS, MARK SAULWICK.

National Parks Association of N.S.W.

N.P.A
N.S.W

FAR NORTH COAST
BRANCH

22 Terania St
Lismore 2480

16.11.81

Dear Sir or Madam

The Far North Coast Branch of the National Parks Association has proposed to the State Government that a National Park be declared on the Nightcap Range. It is suggested that the park extend from the Nightcap Flora Reserve in the East, through Terania Creek Basin and Goonimbah State Forest, to Blue Knob. All of these areas are presently State Forest or Crown Land. No private land is involved. We are getting in touch with all the neighbours of the proposed park to acquaint them with our proposal and to find out what their opinions are.

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We enclose our arguments for a national park, and would like you to let us know how you feel about these ideas. We would be grateful for any feedback on this proposal, especially your answers to the following questions:

.....

1. I am/am not in favor of a National Park on the Nightcap Range
2. The campaign should/should not include rating relief for forested private land adjacent to the proposed National Park

yours sincerely

John Seed (president)

Operation Lismore

Slide show and talk to:
Services Clubs - Apex, Chamber of Commerce, C.W.A., Benevolent Soc. Candy Stripers, Community Service Seventh Day Adventists, Hillside Circle, Interact Club, J.C.'s, Legacy, Lions Club, Lions Club City Lismore, Quota Club, Rotoract, Rotary Club Lismore, Rotary Club Lismore West, United Protestants Assoc., View Club, Community aid and Information Service, Neighbourhood Centre.

Church Groups, other Assoc's: Reforestation, SGAP, Bushwalkers,

NRCAE? Schools? Technical College?

Street Stalls

Petition?

Northern Star, Nimbin News, Summerland Times, Radio, TV.

Residents: D. Jones etc.
Doug Whitlan, Axtens, Page, Ian Savins, Igor Petrov, Harry & Beth Freeman, Vic Brill etc. Mike Shegog

lobby. individ.
Councilors , Duncan, Anthony Boyd etc.

Shops: Fun Foods, Noahs, natural healers, all the shops. The Govt. buildings

Nightcap Neighbours, other towns - Nimbin, Uki, Murwillumbah, Mullum.

OPEN LETTER TO THE MINISTER FOR EDUCATION, NEW SOUTH WALES

Dear Mr Landa,

In December 1978, your predecessor announced the convening of THE COMMITTEE OF INQUIRY INTO PUPIL BEHAVIOUR AND DISCIPLINE IN SCHOOLS. Now, nearly three years after its inception, the Committee's work is complete, its report published – but to what effect?

We consider SELF-DISCIPLINE AND PASTORAL CARE weak to a fault and ultimately ineffectual; and that it lends itself conveniently to the uses of those who seek an official stamp of approval on the *status quo.*

We have no confidence in the Committee's gentle exhortations to self-improvement. That approach is useless when dealing with the entrenched bad habits of educators. For reasons known only to itself, the Committee is unwilling to follow its evidence to the obvious conclusions. It seems reluctant to say anything that may cause inconvenience or embarrassment to some school authorities. Not surprisingly, PARENTS AND TEACHERS AGAINST VIOLENCE IN EDUCATION has already begun to receive correspondence from school heads, who condone the abusive treatment of children, citing portions of the Committee of Inquiry's Report as their authority.

> *. . . We believe that the discipline policy of a school should be set in accordance with the "charter" of the school by the "appropriate" body in consultation with parents and staff and where appropriate with pupils, and that the policy should be congruent with the aims and "ethos" of the school . . .*

Can the above statement (p. 64) be interpreted in any other way than as a guarantee to caning and strapping schools that their present practices may be continued indefinitely? The Committee's willingness to accept tacitly the flogging traditions of some schools rather than to urge the immediate protection of all children is blatantly evident beneath the verbal camouflage. The fact remains: now, no less than before, any teacher in N.S.W. can assault any pupil for any reason and call it "discipline".

The Committee also fails to serve the real needs of teachers. It falters at the point of identifying and condemning the sordid practices of some teachers and some schools; and by this omission, encourages the teaching profession to remain a refuge for mediocrity and worse. While the Committee recommends the development of teaching practices that build self-esteem and self-discipline, it is strangely permissive toward those practices that achieve the opposite – toward practices that erode dignity and cultivate deviousness.

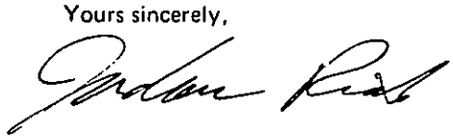
On page 63 we read the following:

> *. . . The issue that would arise in any consideration of a bill to abolish corporal punishment in all schools is not the efficacy of corporal punishment or a desire to retain corporal punishment, but the independence, freedom and development of non-government schools . . .*

In this statement, the Committee seems all too willing to subordinate the safety of children for the sake of political expediency. Are we expected to believe that the "independence", the "freedom" and the "development" of private schools depend on their licence to assault children? Is that a measure of their unique contribution to Australian society?

Why, Mr Landa, do the schoolchildren of Portugal, Spain, France, Luxembourg, Belgium, Netherlands, Denmark, Norway, Sweden, Finland, West Germany, East Germany, Switzerland, Austria, Italy, Poland, Czechoslovakia, Hungary, Yugoslavia, Romania, Bulgaria, Greece, Turkey, Cyprus, Israel, U.S.S.R., China, Taiwan, Japan, Philippines, New Caledonia, Tahiti and Iceland enjoy the normal protection of law, while the schoolchildren of your state are vulnerable to violent assault without redress?

Yours sincerely,



Jordan Riak, Co-ordinator, PTAVE **August, 1981**

PARENTS AND TEACHERS AGAINST VIOLENCE IN EDUCATION
P.O. Box 355, Double Bay, New South Wales. 2028.

NIGHTCAP TALKS SCHEDULE

NOVEMBER

17 th — Jaycees ✓
19 — R.V.R.A. ✓
23 Mon — Rotoract — 7 pm — RSL Club
27 Fri — Interact — 7 pm — Red Cross Room

DECEMBER

2 Wed — Slides — Apex Club (Tuckurimba) 7.15 pm
RSL Club. They have projector
12 Sat — Slides — S.D.A. 2.30 pm
3 Thur — Slides — Apex (Alstonville) 6.30 pm
Alstonville Bowling Club
Bring projector

FEBRUARY

11 Thur — Slides — Naturalists Club. 8 pm.
Rochdale Community Arts Centre
Take extension lead and projector
8 Mon — Organic Growers Assn.

DICK SMYTHE, JOHN PATTERSON

Michael Henry of Australian Frontier says they have the interest and the capacity to conduct a consultation (2, 3 days) of the parties involved in the land-use dispute on the Nightcap.

* Robb Brown (Adelaide SS Co)
* Reps of their employees
* N.P.A.
* Local Council
* Reps of Tourist Industry
* D.E.P.

If D.E.P. could grant (upon request) $1000 to Lismore Council to hire Frontier to set in motion planning – hold discussions with the parties, raise the rest of the money needed, hire process team (ANU CCE)

Mike Smith, new Pr. Manager, Lismore Assoc — Assist council to hire consultant in a exp. in negotiating a sol" to Terania Ck problem

If council agrees to participate write + ask the Dept to do so as well

Ref precedent for joint venture

Consultants necessary.

12 Beatrice St,
Bardon
4065.

3-8-81
H.: 384855
W.: 2265470.

Dear John,

Great to get your letter + the news that a search conf. could occur. I'd love to come down, + talk to you + Mhi, particularly on that issue.

I can manage a weekend + 1 day flex + 1 day without pay, for which I'd charge a small fee. That negotiable, of course, + perhaps Mhi + you + I can talk about it.

Any time after about the 10th Oct is fine for me too, so let me know what you want.

Love + affection,

Jenny.

P.S. Can you send my other mail to me at home? They open letters in this place!!

National Parks Association of N.S.W.

N.P.A. N.S.W.

FAR NORTH COAST
BRANCH

22 Terania St.
Lismore
25.11.81

Dear Sir or Madam

The National Parks Association of N.S.W. is campaigning for the establishment of a National Park on the Nightcap range north of Lismore (details enclosed).

At present we are presenting our proposal to groups and societies in the district - Apex Clubs, Rotory, Jay Cee's etc.

There is ample evidence that the tourist industry would greatly benefit from the establishment of a National Park near Lismore, and we would like the opportunity to discuss this with you.

We are sending invitations to motel and caravan park owners, tourist authorities and others connected with the tourist industry, to attend a talk accompanied by slides.at the Karinga motel, 12 midday Monday December 14. Wine cheese and sandwiches will be served.

yours sincerely

John Seed (president)

AUSTRALIAN LABOR PARTY
NIMBIN BRANCH

Friends,

At their meeting of March 3, the Nimbin branch of the A.L.P. passed the following motions and instructed me to convey them to you:

1. This branch supports the National Parks Association's proposal for a National Park on the Nightcap Range.

2. That this branch write to the State Government's Rainforest Committee making its position known.

3. That this branch writes to all other A.L.P. branches in N.S.W. informing them of its position, and asking them to write to the Rainforest Committee (via the Premier, its chairman) supporting the Nimbin Branch's position.

This National Park proposal was submitted to the Terania Inquiry. Justice Isaacs ruled that this submission fell outside his terms of reference. There have been considerable problems due to the narrowness of his interpretation of the terms of reference of this inquiry.

The Far North Coast has few National Parks in spite of being the most densely populated rural area in Australia, and the most popular tourist destination in N.S.W. (over 3 million visitors last year).

There has been agitation in this district since at least 1910 for a Nightcap National Park, and one was promised in 1937, then lost due to the war.

The proposed park contains the last of the ancient forest of this district, the last of its original nature.

The Minister for Environment and Planning, the Hon. Eric Bedford wrote to the National Parks Association (24.4.81) stating that his director of National Parks and Wildlife had advised him that this proposal has "...considerable merit, particularly for the conservation of virgin stands of rainforest."

A recent poll commissioned by the National Trust found that 69% of the people of N.S.W. wanted an end to rainforest logging.

Many areas within the proposed park (especially Terania and Blue Knob) are sacred to the Bundjalung Aborigine Tribe.

Could you please write to the rainforest committee via the Premier supporting our stand.

yours sincerely

[signature] (sec)

Letters to ALP branches

straightforward.
Send one letter plus one Nightcap leaflet to each.

23 March

It is still uncertain when the addresses for the ALP branches will show up.
When they do, please get them sent as soon as possible.
Bobbi from Dharmananda is willing to help. tel: 88-6307

If more copies are required the original is enclosed in the folder. Take the money from the NPA funds.

John Robinson
Businessman

2 Beaumont Rd
Lismore 2480
28/7/82

Dear Sir,

Enclosed my cheque for $10
as donation towards the cost of
an advertisement calling for declaration
of the Nightcap Range as a State
forest national park and you may
use my name

Yours sincerely

J Robinson

Alstonville Rd.,
Teven,N.S.W. 2480
4th March 1982.

Nightcap National Park C'mm'ttee
22 Terania St.,
Lismore.

Dear Nan,

I am very pleased to be able to support the campaign for the Nightcap range national park and I have enclosed a donation to assist.

You are welcome to use my name as a supporter of the campaign in your advertising literature.

I sincerely hope that this campaign and others like it are successful so that eventually we may preserve a significant proportion of our unique natural heritage for uses other than exploitative ones.

Good luck and best wishes,

Yours sincerely,

Barrie Restall

Barrie Restall.

AD.

18 Thorburn St.
Nimbin 2480
May 24

Friends

It seems that the government will soon formulate a rainforest policy for N.S.W. and I am familiar with the debate surrounding this difficult subject.

I have come upon a document which casts, I believe, an extremely important light onto this issue.

As you are a member of the caucus which will make the ultimate decision on the rainforest question, I am taking the liberty of sending you a copy.

yours sincerely

Mike Shegog

P.S. The above reflects my personal view and has not been written in my capacity as president of the Nimbin branch of the A.L.P.

18 Thorburn St.
Nimbin 2480.
24th May 1982.

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Yours faithfully

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2 April 1982

NAN. 886204

-5 APR 1982

Dear Kerrie, Sue and Steve,

Greetings to you all. I hope that things are running smoothly, and that ~~that~~ the spraypainting fumes have been lessened.

I have spent most of my time here looking after my grandmother – she has been ill. I leave for Melbourne next thursday.

Enclosed is Nan Nicholson's list of people to receive letters – she sent it to my home address and so my parents forwarded it here. Could someone check off the names please and make up a parcel for her. Phone her and ask how many stamps she needs, and ask her to please pick up the package from town, if possible.

Janos is back in town and is chasing up the ALP branch addresses. He should be back in Lismore next week.

My best wishes to you all,

Love Linda

ps I hope you have a lovely holiday in Sydney, Sue

Tue 23 March

Dear Kerrie

There are 2 parcels of letters to be delivered. (Now only one)

Try to reach Rod Ritchie and ask him to pick his up from the E.C. If he can't, then mail it. (I have been trying to reach him for the last ~~week~~ week without success. His phone number is 33-7151). Also, ask him and any others that you happen to talk to if they require the full complement of stamps.

I just spoke to Maree Fowler. Sandy Gilmore will pick up ~~his~~ their parcel tomorrow from the E.C.

Could you please add the NPA membership to the master list. They are receiving theirs via the NPA newsletter.

I have also marked a few names on the N.C.E.C. address list which you could send off (include them on the master list). When you have finished with that address list please return it to the E.C. address book which is kept in the tray next to the typewriter.

Thankyou very much Kerrie,

See you later,

Linda

Please return by March, 1981 to " Beaches for People".
The Environment Centre, 399 Pitt St., Sydney 2000. Phone(02) 2677722.

PETITION TO THE PREMIER OF NEW SOUTH WALES THE HONOURABLE NEVILLE WRAN MLA QC.

We, the undersigned citizens of New South Wales, do humbly request the following:-

1. That the coast be preserved for the whole community.
2. That sand-mining of the beaches of the coast of N.S.W. be halted by 31st March, 1981.
3. That the government require environmentally and aesthetically sound re-habilitation practises for all the damaged beaches.

And we, your petitioners, as in duty bound do humbly pray.

SIGNATURE	NAME(please print)	ADDRESS

NORTHCOAST ENVIRONMENT CEN
22 TERANIA ST.
LISMORE 2480

24 MAR 1982

TEC
17.3.82

Letters sent out 29.3.
Bobbi

Dear Linda,

Here's a list of people to add to the "write to Neville" campaign.

Sydney is polluted. T.E.C. people are a little low key when it comes to public spectacles etc, but with some north-coasters jumping about, colour is being added to the otherwise fairly academic approach to the ~~forest~~ issue.

The TEC is a good place though. People doing all day on their pet issue – Lots of animal liberationists at the moment. Seals are hot stuff. And anyway, what conditions do your chooks live under? Mine all got eaten by a large goanna when we did away with locking them up at night!

The media is a strange monster really. Learning how it works is interesting. I no longer have any vague belief that the Aust. press is a free press as it appears that if you want to be a killer or a sex sensation then you get TV radio & newspapers. So trees are a bit plain for a few people here ho! hum!

Enough silliness. It's hard to write anything with 90 million interuptions, so I'll stop & write a list of names. love to you from Jan

Pauline Ahern
Chris Shaw
Alan Shaw
} Nmbngee
Killian Rock
via Nimbin. 2480

Harry Freeman
Beth Cameron
Mark Bazeley
John Geake
} Paradise Valley
Crofton Rd
Nimbin 2480

Anne Dawill
Glenda Lee
Allan Martin
"

Geoff Rowe
Robyn Staples
Ron Farmer
Pat Walsh
"

Julie Baigent
c/- Nimbin Gallery
Sibley St
Nimbin 2480

Philip du Rhone
Box 152
Wentworth Building
Sydney Uni 2007

Sally Moore
Tuntable Falls Co-Op
Nimbin 2480

Helen Bernard
Tuntable Falls Co-op

Randy & Ruth Nielsen
Bakers Vale

Jenny Kendall &
Paul Tait
Killian Rock
Via Nimbin 2480

Pauline & Jim Williams
Mt Nardi
via Nimbin 2480

3 different collection points!

Susannah
Susan Elliot
Myoori House
Myoor Ave
Wentworth Falls

Gael Knopfer
23 Armstrong St
~~Surgeon Pl~~
Suffolk Park

Irene & John Herrington
Hight St
Nimbin 2480

Sandra & Steve Lansdowne
Bakers Vale

Gabriel & Alan Luchetti
72 Hight St
North Sydney

Cynthia Carr
10/79 Acacia Rd
KIRRAWEE 2232

National Parks Association,
22 Terania Street,
NORTH LISMORE. 2480.

16-3-82

Dear Sir/Madame.

I will be visiting the Gold Coast region, with a friend from Italy, during the ~~Easter~~ Easter Break.

I hope to spend one day in the north coast NSW region and hope to visit Byron Bay - Broken Head - Lismore and Terania Creek or Mt Nightcap area.

Could you, if possible, furnish me with any information on what would be the best to see in one day and maybe some maps or details on how to get there.

I here that you conduct walks into the Nightcap and would it be possible for you to supply me with more information

Is your office open on weekends and public holidays to give out tourist information?

Hoping you can assist me.

Yours sincerely

Thankyou

Responded 22-3-82
Thanks.

phone: 066- 661260

Paddy's Flat Road
Pretty Gully
N.S.W. 2470

Sent 25th March
Bobbi

9th March 1982

Jan Oliver
Paradise Valley
Nimbin

Dear Jan,

We received a telephone call from John Seed. We were to give you a list of names for signatures with regard to Rescue Rainforests. As we have a food co-op meeting this Saturday & a local market at Drake the following Sunday we thought we could save you some work & some money if you sent to us some of those Rescue Rainforest cards for us to distribute. Most people would post them off - We think? At least two dozen would be done at the co-op meeting if you could get them to us by then?

Kind Regards,
Lindsay & Gillian Norton

linda,

This also came to me.
Could you send them
stuff

Again TA!

Sent

PO Box 518
M'bah 2484
January 23, 82

Dear John,

Please find enclosed the names & addresses promised. I can hand out stuff through the bookshop so give me a few extras. Conservation Trust gets underway again on Wednesday week with a pretty full agenda. Sonny I did it make the Byron Bay inspection. Trish & I were at Dhammanada, to which we hope to move in a few months.

Stay well & happy

love

Simon

Simon Clough

WOMBAT BOOKSHOP AND GALLERY would like to invite you to the official opening of the gallery on:

SATURDAY NOVEMBER 28th, 12 noon to 5.30 p.m.

The opening will feature local arts and crafts from:

STOCKERS SIDING POTTERY
ANDREW STEWART — POTTER
COLIN SMART — POTTER
ROB O'BRIEN — ARTIST
TOM KINNEAR — MAKER OF FINE FURNITURE

Paintings by **CLIVE ROBETSON** and **Mr VIEW HAND D.L. LAM** two Brisbane artists will also be on display. The gallery will be selling framed and unframed prints, in this way it is hoped to have a range of prices to appeal to a broad cross section of the Tweed community.

The **WOMBAT'S** Christmas book collection will be on display and of course available for purchase. These books cover a wide range of topics selected especially with Christmas gifts in mind.

DEVONSHIRE TEAS will be served throughout the afternoon in the Plaza.

Don't forget **WOMBAT GIFT VOUCHERS** (for any denomination) the ideal gift to allow someone you care for to select their own gift.

Hoping to see you on Saturday 28th,

CHEERS,

(SIMON CLOUGH)
WOMBAT

*Courtesy — Field Guide to Tracks and Traces of Australian Animals — Rigby
(Common Wombat track)

Wombat
Bookshop
P.O. Box 518,
Muzwillumbah.
2484. Ph. 066: 723637

Marie Jamieson,
Tomorrfoma,
via Tumut. N.S.W. 2720
17.9.81

Rainforest Information Centre,
Lismore.

Dear people of the Rainforest Information Centre,

Could you please send me the full 24 page transcript of Forestry Commissioner Gentle's Opening Address to the Senior Officers' Conference held at Head Office - 4th + 5th June, 1981.

The scanty remnants of the rich + beautiful wet sclerophyl forests of the hills surrounding us at Tumut are being bulldozed at this moment to make way for yet more pine plantations - the two page transcript I have obtained is interesting to say the least!

Good luck with your work. I think it is true to say that the people of the Terania Creek battle have inspired lovers of forests all over. Also that rainforest awareness amongst the community at large has increased incredibly, + continues to do so.

Thanks, + best wishes, Marie Jamieson.

P.S. I am preparing a submission to the For. Commission requesting that they conform to all the requirements of their Act i- the pine plantation programme by way of beginning to keeping flora / fauna resource- do you think it reasonable to quote from Gentle's address i- that, or perhaps in media releases about it??

INTRODUCTION

> "The Director of National Parks and Wildlife has advised me that the National Parks and Wildlife Service acknowledges the biological importance of the [Focal Peak] region which, together with the Tweed Volcano region, is one of the most biologically diverse regions of Australia." Bob Carr, 13 January 1986.

Focal Peak was the centre of eruption for a massive volcano formed over 20 million years ago by outpourings of lavas around what is now the New South Wales-Queensland border.

Its skeletal remains form parts of the McPherson Range, Great Dividing (Main) Range, the Richmond Range, the Koreelah Range and the Capeen (Tooloom) Range. Along the ranges are extensive basalt plateaux and scattered throughout the region the spectacular volcanic plugs of subsidiary vents.

For the purposes of this report the boundaries adopted for the Focal Peak region are the crest of the McPherson Range to the north, the crest of the Great Dividing Range to the west (both these ranges forming the State border), the Richmond Range and its eastern off-shoots represent the eastern boundary and the southern boundary is formed by the Bruxner Highway and the Clarence River.

The rich basaltic soils and higher rainfall of the ranges combine to support the majority of the region's rainforests. Three large stands of sub-tropical rainforest (varying from 3000 to 4000 ha) occur on, and around, the main plateaux of the Koreelah Range (Tooloom), Capeen Range (Yabbra) and Richmond Range (Toonumbar). Other major occurrences of sub-tropical forms are along the 'border ranges', where they give way to small pockets of warm temperate rainforest, and a significant stand of cool temperate rainforest, at the higher altitudes.

Large stands of dry rainforests, with their endangered and rare species, occur in drier areas along the 'border ranges', around the Toonumbar plateau and southern areas of the Richmond and Koreelah Ranges.

Together some 25 000 ha of these rainforest forms are found in the region which represents about 10% of the rainforests estimated by the Forestry Commission as remaining in NSW.

A similar expanse of developing rainforest, dominated by Brush Box, the rare Dunn's White Gum and other eucalypts, also occurs, making the region one of the most significant for rainforests in NSW.

The region also supports a large and diverse native wildlife population including some 46 mammals, 233 birds, 59 reptiles, 32 amphibians, and an

unknown myriad of invertebrates. The number of species of mammals and their abundance is the richest for any area of comparable size in Australia. Many species of reptiles, amphibians and invertebrates undoubtedly await discovery.

Of these species, 38 (12% of the total number in Australia) are listed as Endangered Fauna. Seventeen species are classed as being of Special Concern; 14 species (25% of Australia's) as Vulnerable and Rare; 6 species (29% of Australia's) as Threatened; and one species, the rainforest dwelling Double-eyed Fig-parrot, as being in imminent danger of extinction. For a number of these species the Focal Peak region is their major stronghold.

The remnants of the Focal Peak volcano and its subsidiary vents, coupled with the majestic forests, clear mountain streams and spectacular waterfalls, provide diverse scenic and recreational values.

While a large majority of the remaining rainforests of Focal Peak's twin - the Mt Warning Shield Volcano - to the east, and within Queensland a majority of Focal Peak's rainforests, are protected in national parks, nature reserves and environmental parks, the NSW rainforests of Focal Peak are only represented by a small inclusion in the western extension of the Border Ranges National Park. The large majority of the region's rainforests are still controlled by the NSW Forestry Commission. In an attempt to rectify this situation, two national parks and two nature reserves are proposed to protect the more significant areas.

Focal Peak extension to the Border Ranges National Park

Of approximately 11 200 ha, this proposal encompasses the last major portion of the McPherson Range to be reserved, and a significant portion of the Great Dividing (Main) Range. Its addition will bring the total area of The Scenic Rim (Q'ld)-Border Ranges parks system to over 95 000 ha. Its rugged terrain provides a spectacular backdrop to the region, while ensuring that over 50% of its rainforests have survived virtually undisturbed. It includes the Mt Nothofagus Flora Reserve which is currently being proposed for World Heritage listing.

Tooloom Nature Reserve

Of about 5500 ha, this proposal encompasses the forested portion of the Wallaby Creek valley and the majority of a large stand of rainforest. It is renowned for its 10 species of macropods and abundant birdlife, making it a favoured area for wildlife research.

Yabbra Nature Reserve

This proposal of about 9200 ha includes the significant Yabbra Creek valley and a large stand of rainforest. This is the only major valley remaining in the region with such a diverse range of habitats and almost its entire catchment remaining forested. An 8.5 kilometre segment of the Clarence River is also recommended for inclusion, which will represent the only segment of this mighty river thus preserved.

Toonumbar National Park

This proposal of some 15 600 ha includes a large expanse of various rainforest forms around the culmination of the Richmond Range. A large area of undisturbed Cabbage Palm-Bangalow Palm forest, currently being logged, and the only occurrence of undisturbed lowland sub-tropical rainforest in the region are of special significance. Its rugged and spectacular terrain includes an important Aboriginal Place as well as providing the catchment for the Toonumbar Dam.

Between them, these proposals encompass about 16 000 ha of sub-tropical and dry rainforests, around 100 ha of cool-temperate and warm-temperate rainforests, and some 12 200 ha of developing rainforest overtopped by Brush Box and various eucalypts.

All the fauna of the region are expected to occur within the proposals, the Endangered Species being particularly well catered for. The implementation of these proposals will ensure the long term survival of many species which otherwise may be in jeopardy.

ACKNOWLEDGEMENTS

I am indebted to many people who have supplied information over the years, but I would particularly like to thank Alex Floyd and Jenny Holmes for information on the flora; Glen Holmes for assistance with the Avifauna; Mark Fitzgerald and Eric van Beurden for assistance with the Herpetofauna; and Andrew Smith and Sandy Gilmore for corrections and additions to the draft manuscript.

The Dome Mountain area encompasses one of the most environmentally significant areas of unlogged old-growth secondary rainforest (moist hardwood) remaining on the far north coast of N.S.W. The Forestry Commission considers that the 'heavy selective' logging of the area will not significantly affect the environment.

The Forestry Commission has consistently refused to undertake any faunal surveys in the area or prepare an Environmental Impact Statement. As the proposed roading, logging and burning of the forests in the Dome Mountain Area will undoubtably have a significant impact on the environment, the Focal Peak Region Flora and Fauna Society now has no option but to pursue legal avenues.

Due to the impending commencement of roading at any moment and the planned extraction of 6,160 m^3 gross of timber from the area this calendar year, immediate action is required.

D. Pugh
Secretary
Focal Peak Region Flora and Fauna Society
P.O. Box 7
BONALBO
N.S.W. 2470

June 1988.

THE DOME MOUNTAIN AREA

The Dome Mountain area encompasses some 2,870 ha of forested public lands comprising the headwaters of Capeen and Duck Creeks on the south-western slopes of the Richmond Range in the Focal Peak region of far north-east N.S.W. Dome Mountain caps a series of basalt plateaus and shelves which rim the heads of the valleys. The rich soils, high rainfall, southerly aspect and inaccessability have resulted in extensive stands of well-developed old-growth forests within which diverse fauna abound.

The Dome Mountain area is particularly significant because:

- it supports over 1,000 ha. of unlogged old-growth eucalypt and Brush Box stands.
- it represents the majority of well-developed unlogged 'hardwoods' in the Urbenville Management Area, and by far the largest single stand remaining on the Richmond Range. Most of the 'hardwood' stands in the National Parks and State Forests of the adjacent Mt. Warning region have been logged and there are similarly no unlogged stands as extensive.
- it is the most important refuge for fauna dependent upon mature eucalypts and tree-hollows remaining in the region and may be the only one large enough to maintain genetic viability of some species.
- it supports one of the largest and most westerly populations of the threatened Marbled Frogmouth remaining in N.S.W.
- a total of 10 species of animals listed in Schedule 12 of the National Parks and Wildlife Act as endangered fauna have been observed in the area. Unusually large populations of Alberts Lyrebirds, Southern Angle Headed Dragons and Koalas have been noted.
- the Double-eyed Fig parrot, listed as in imminent danger of extinction, was observed within the same forest in the adjacent valley in 1984 and can be expected to occur in the Dome Mountain area. A large number of other endangered animals are also expected to inhabit the area.
- many species of plants and animals reach or approach their western limits of distribution within the area.
- the aesthetic appeal of unlogged old-growth forest, the well-developed and extensive palm understorey, the spectacular spur crowned by Dome Mountain, unique perched swamps, and swift creeks in deep sandstone ravines give the area outstanding scenic attributes.

Dome Mountain, at 916 meters altitude, is the loftiest peak on the Richmond Range and represents the junction with the Capeen Range. Dome Mountain is central to a narrow spur jutting out to the west from the extensive Toonumbar plateau, a basalt remnant from the ancient Focal Peak volcano. To the south the spur plummets 200 m. over cliffs and steep rocky slopes to a broad basalt shelf which extends into a small plateau to the west.

Clothing the basalt is complex sub-tropical rainforest, dominated by White Booyong, Black Booyong, Yellow Carrabeen, Strangler Fig and a large variety of co-dominants, with Hoop Pines on more exposed steep slopes and Giant Water Gum on poorly drained sites. Bangalow Palm and Walking-stick Palm dominate the understorey with occasional Cabbage-tree Palms. Lianes and epiphytes are common.

Near the base of the spur are two small swamps, surrounded by rainforest and patches of massive Flooded Gum, they are appealing and unique features of the area.

Capeen Creek, Duck Creek and their many tributaries have eaten deep valleys and narrow ravines into the sandstone underlying the basalt, as they rapidly drop to 400m. The valleys then widen, with extensive terraces, as the creeks level out before leaving the area at 250m.

Below the mature rainforest, extensive stands of secondary rainforest (also termed 'moist hardwood') occur on the edges of the basalt and over most of the lower sandstone country which is subject to occasional wildfire. On the more favourable sites, principally fringing the mature rainforest and in the vicinity of creeks and gullies, Brush Box and Flooded Gum dominate extensive stands. Various other rainforest species are co-dominants, varying from one or a few species on poorer sites to a diverse array on better sites where rainforest succession is well advanced. The understorey is dominated by Bangalow Palms on the wetter sites, which form almost pure stands, overtopped by occasional Blue Quandongs along many creeksides.

On the steeper slopes and drier ridges subject to greater moisture stress and higher fire frequency, Tallowwood and Sydney Blue Gum emerge above a diverse rainforest understorey.

On the driest ridges, particularly at lower altitudes, more open forests of Red Mahogany, White Mahogany and Pink Bloodwood, interspersed with numerous Forest Oaks, dominate a generally sparse rainforest understorey. At the drier extremes Grey Gum and Ironbark begin to take over.

The forests of the Dome Mountain area can be broadly separated into: White and Black Booyong associations 510 ha. (18%), Flooded Gum association 530 ha. (18%), Brush Box association 820 ha.(29%), Sydney Blue Gum-Tallowwood association 710 ha. (25%), and Red and White Mahogany association 300 ha. (10%). An incomplete plant species list for the area is provided in Appendix 1. Similarly, an incomplete faunal list for the area is given in Appendix 2.

SECONDARY RAINFOREST

Some 2,060 ha. of what the Commission terms 'moist hardwood' forests occur in the Dome Mountain area. These types of forest have been variously described as tall-open forest, wet-sclerophyll forest, mixed forest and transition forest. Webb (1988, pers.comm.) suggests that the term secondary rainforest is a more useful and accurate classification, and this classification is adopted in the rest of this report.

Secondary rainforests are considered to have evolved in relatively recent times through man-induced infrequent destructive fires repeatedly eliminating rainforest plants of later successional stages (Smith and Guyer 1983). Webb (cited by Ashton 1981) considers that secondary rainforests are the special product of intense fires on a grand scale. The often sharp boundaries between rainforest and open sclerophyll forests in northern Australia are the result of surface fires of lower intensity causing a gradual attrition of rainforest margins.

Secondary rainforest is a transitional forest within which, in the absence of disturbance, the eucalypts will gradually senesce as the rainforest undergoes a sequence of successional stages until mature rainforest dominates the site. The species composition of the resultant rainforest is largely dependent upon fertility and moisture availability.

Natural disturbance is caused on a limited scale by the death and decay of trees, windthrows and landslips, and on a larger scale by fire and cyclones. Brush Box, Flooded Gum and Tallowwood are able to regenerate in the absence of fire, though wildfires are considered to be the principle natural regenerative agent on a large scale. Turner (1984) found a fire frequency of 325-380 years in a Brush Box stand. Kershaw (1981) notes that under existing man-induced fire regimes secondary rainforest is expanding at the expense of mature rainforest. Open eucalypt forests are similarly expanding at the expense of secondary rainforest.

The overstorey of unlogged secondary rainforest consists of a number of even aged cohorts of trees, each cohort having arisen from a single regeneration event. Turner (1984) noted that stands of Brush Box were of mixed age classes which implied that not all individuals were killed in a fire. By analogy with Mackowski's (1984) results in Blackbutt forests, an unlogged stand of secondary rainforest generally consists of a number of overlapping cohorts, sometimes one cohort occuring within a larger cohort.

The other principle factors influencing the distribution of the various secondary rainforest associations are moisture availability, soil nutrients, aspect and slope (Forestry Commission 1982c, Ellis 1971, Lambert, Turner and Kelly 1983). Ellis (1971) found that above an altitude of 600m. evaporation rates decrease, fog drip increases and mean annual rainfall increases rapidly with increasing altitude. Ellis suggested that these factors could be of major importance in determining the distribution of forest types on ridges while soil factors are probably more important in valley situations.

Ashton (1981) notes that low cloud and fog-drip may add 15-20% to the total precipitation in some mature Mountain Ash forests at altitudes of 600 to 700m., further that the great height of the mature forest may increase orographic rainfall since a rise in altitude of 100m. has been noted to increase annual precipitation by about 150 mm on the Great Dividing Range in Victoria.

Turner and Kelly (1981) found that the White Booyong, Brush Box and Blackbutt associations were broadly delineated by soil parent material, topography and soil morphology. They considered that more precise

differentiation was provided by the soils mineral nutrients, though there was no significant difference between soils supporting White Booyong and Flooded Gum indicating that fire history was probably responsible for the occurrence of Flooded Gum. Their observed differences between Brush Box and Blackbutt soil nutrients may also be largely attributable to fire history (see Fire 1).

Rainforest plants rather than eucalypts are disproportionally responsible for the accumulation of the vast majority of above ground nutrients (Forestry Commission 1982c). Lambert, Turner and Kelly (1983) found that specific elements are accumulated by certain rainforest species and that plant species had a significant effect on some soil nutrients. As the rainforest understorey develops it generally creates a progressively moister microenvironment within which species with higher moisture requirements are better able to grow.

A general progression of dominants occurs in the Dome Mountain area; Sydney Blue Gum dominates on the driest and more fire prone sites, with reducing fire frequency and better site conditions, Tallowwood becomes a co-dominant while Brush Box and other rainforest trees begin to appear in the canopy, eventually Brush Box co-dominates with a variety of other rainforest trees. On some drier and steeper sites Brush Box forms a simple association with Grey Myrtle, while on the most favourable sites, the Brush Box gradually senesce and a complex White Booyong association becomes dominant. Stands of Flooded Gum appear to have similar ecological requirements to Brush Box.

Mackowski (1984) estimated an average life expectancy of 300 years for successful Blackbutt while Turner (1984) found that Brush Box can live for over 1,300 years. The life span of successful Sydney Blue Gum would be in the order of 330 years (Mackowski pers.comm.) while Tallowwood may be around 500 years.

King (1985) notes that mature stands of secondary rainforest with emergent Sydney Blue Gum, Tallowwood and Brush Box generally have a stocking of 40-65 trees/ha.

The rainforest understorey develops in a series of successional stages, the stage of development being related to site conditions and time since disturbance. In the Dome Mountain area, Bangalow Palms are the most obvious and widespread understorey dominant on moister sites, often with Walking Stick Palm and occasional Cabbage-tree Palms. Almost pure stands occur on the more waterlogged soils close to creeks.

FAUNAL VALUES OF THE DOME MOUNTAIN AREA

The northern section of the Richmond Range, dominated by Dome Mountain, is an area of special faunal significance. The high annual rainfall and extensive wet forests distributed mainly between 400 and 800 m, together with the area's relatively undisturbed condition make it a refuge for subtropical rainforest fauna of major importance in N.S.W. Generally the area is wetter than the remainder of the Richmond Range and adjacent Tooloom and Koreelah Ranges and has probably functioned as a source area for rainforest and wet sclerophyll forest colonists following drier periods in the past.

Many subtropical rainforest and wet sclerophyll forest-dependent vertebrates, including several endangered species, occur in the area at higher densities than elsewhere in the State. Examples are the Northern Leaf-tailed Gecko *Phyllurus cornutus*, Southern Angleheaded Dragon *Gonocephalus spinipes*, Yellow-bellied Legless Skink *Ophioscincus truncatus*, Wompoo Fruit-dove *Ptilinopus magnificus*, Sooty Owl *Tyto tenebricosa*, Noisy Pitta *Pitta versicolor* and Paradise Riflebird *Ptiloris paradiseus*. The area appears to be one of the strongholds of the threatened Marbled Frogmouth *Podargus ocellatus* in N.S.W. and supports a significant population of the endangered Alberts Lyrebird *Menura alberti* close to the western limit of its distribution. It is also an important breeding area for the migratory Topknot Pigoen *Lopholaimus antarcticus* in the State.

Dome Mountain is at the centre of the N.S.W. distribution of three of the State's rarest birds, the Red Goshawk *Erythrotriorchis radiatus*, Black-breasted Button-quail *Turnix melanogaster* and Double-eyed Fig-parrot *psittaculirostris diopthalma*, all of which have been recorded closeby and are likely to be present. Another endangered bird, the Rufous Scrubbird *Atrichornis rufescens*, could also occur in the area.

The frog fauna is poorly known although the unique rainforest swamps at the base of Dome Mountain contain a population of the newly-described Whirring Tree Frog *Litoria revelata*. The Richmond Range is also one of the few localities in the State where the newly-described Fleays Barred River Frog *Mixophyes fleayi* has been recorded. The area is close to the southern limit of the frog *Philoria kundagungan* and could be important in resolving the relationship and differences between it and the closely-related Loveridges Frog *P.loveridgei*.

Apart from the species previously listed, there is little information on the area's reptiles although it appears to support a diverse group of burrowing species including the skinks *Calyptotis scutirostrum* and the rare *Coeranoscincus reticulatus*.

The mammal fauna is also poorly known although there are unconfirmed sightings of the endangered Parma Wallaby *Macropus parma* which would represent its northern limit of distribution. The Eastern Pygmy Possum *Cercartetus nanus* is another rare marsupial which is likely to be present and the status of the threatened Long-nosed Potoroo *Potorous tridactylus*, of which there are a number of records, requires investigation. Microchiropteran bats are entirely unknown in the area but there is little doubt that it would be important for a number of restricted species.

Of particular importance in the Dome Mountain area are the approximately 1,000 ha. of unlogged so-called 'moist hardwoods'. Composed of mixed stands of subtropical rainforest and wet sclerophyll forest, these are characteristically dominated by species such as Brush Box *Lophostemon confertus*, Flooded Gum *Eucalyptus grandis* and Sydney Blue Gum *E.saligna*. Often such forests exist as well-developed rainforest with scattered sclerophyll emergents and function ecologically as rainforest. With both

sclerophyll and rainforest elements present, they can be faunistically more diverse than either on their own and may have higher productivity. They appear to be particularly important to ground-foraging birds such as the Marbled Frogmouth, Noisy Pitta and Alberts Lyrebird and other vertebrates associated with a moist leaf litter such as the ground-dwelling rainforest frogs and burrowing skinks. To species such as the Sooty Owl, which have both sclerophyll and rainforest requirements, such mixed forests are optimum habitat.

Because of the scarcity of undisturbed moist hardwood habitat in the Urbenville Forestry Management Area and the heavy logging prescription currently applied to this type, it is critical that stands in the Dome Mountain Area receive protection from logging in the future, to function both for fauna conservation and as an area for scientific reference. With the general paucity of information for most vertebrate groups it is also essential that a comprehensive faunal survey of the area be initiated without delay to fully assess the resource.

David Milledge,
Wildlife Ecologist,

20. 3. 1988

CURRENT LAND USE AND MANAGEMENT

For this report the Dome Mountain Area is considered to encompass compartments 201 to 208 (inclusive) Richmond Range State Forest and compartments 135 and 136 Yabbra State Forest. These are part of the Forestry Commission's Urbenville Management Area. Compartments 201 to 207 are known as the Richmond Range Allocated Area (R.R.A.A.) while compartments 208, 135 and 136 are part of their General Area.

The first extensive logging in the area occurred 1955-7; since then parts of the periphery of the area were logged at various times up until 1983 when the Commission began its present strategy of systematically logging every available hectare of secondary rainforest ('hardwoods') in the area. Over 1,000 hectares of old growth secondary rainforest remains.

Pugh (1982) proposed the creation of the Capeen and Dome Mountain Flora Reserves in the area in 1982, apparently the National Parks and Wildlife Service were independently considering a Dome Mountain reserve at the same time. In May 1986 the National Parks Association of N.S.W. proposed the creation of a Toonumbar National Park which incorporated the Dome Mountain area.

On the 1st of January 1987 the District Forester was informed of the presence in the area of Albert's Lyrebirds, Wompoo Pigeons and the likely presence of Marbled Frogmouths - all endangered fauna. In February and April 1988 the acting District Forester said that the Commission had not undertaken any faunal assessments in the area, nor did they intend to do so. The only faunal records he was aware of for the area were those bird observations made by Glen Holmes - which also included a number of endangered species.

The Dome Mountain Flora Reserve was gazetted on the 28th August 1987 as 340 ha, it incorporates most of the rainforest on the steep and rugged spur around Dome Mountain. It also preserves some 10ha. of the area's extensive Brush Box and Flooded Gum stands.

To date, Dome Road has been reconstructed into a major access road and extended through previously unlogged mature rainforest to link up with an old logging road up the ridge between the two valleys. Most of the accessible higher altitude (above the cliffs) secondary rainforests of the Capeen valley have been logged or re-logged. The Commission has surveyed a road into the lower Capeen valley (Bruce, Northern Star 28.5.1988) and intend to commence roading and logging operations in compartment 201 as soon as weather permits. They will then heavily log every accessible hectare of old-growth forest, and re-log other areas, within the valley over the next 2-3 years.

The regional forester Mr. Bruce (ibid.) claims that the Commission has recently completed a preliminary flora survey and some fauna trapping in compt.201 and would undertake progressive informal surveys of fauna and flora as access roads were constructed. The quota for this year is 6,160 m^3 gross.

Parts of the western side and south-eastern corner of the Duck Creek valley have been logged in the past, recent logging has concentrated on the catchments of two tributaries on the western side of the valley (compt. 207). Once the Commission has finished off the Capeen valley they intend to construct a major access road down a steep cliff and onto a previously inaccessible and extensive creek flat on the western banks of Duck Creek (compt.207) and log the impressive old Brush Box and Flooded Gum at the lowest altitudes in the area.

Then the Commission intends to construct a major access road and

numerous snig tracks through the mature rainforest on the shelf below Dome Mountain to gain access to the remaining old-growth forests on the western side of Duck Creek. Then another major access road will be constructed across Duck Creek or up the Richmond Range and the old-growth forests on the eastern side of the valley heavily logged.

At the proposed cutting rate it seems that there will be little old-growth secondary rainforest left in the Dome Mountain area in 10 years time, aside from the 10 ha. currently reserved, narrow filter strips along creeks and whatever areas prove to be inaccessible.

Details of the Urbenville Management Area (Based on Management Plan for the Urbenville Management Area 1986 and other Commission data)

The State Forests of the Urbenville Management Area encompass 68,491 ha. of which 18,818 ha. (27%) is classified as 'rainforest', 31,050ha. (45%) as 'moist hardwood' and 15,386 ha. (22%) as 'dry hardwood'. For management purposes, the area is divided into three working circles;

(1) Preserved Areas.

This encompasses some 5,800 ha. of Flora Reserves, and cosmetic roadside and ridge strips. The area is comprised of some 4,520 ha. of 'rainforest' and 1,280 ha. of 'hardwoods'. Flora Reserves total 5,030 ha. The area of mature 'hardwoods' remaining in a natural state is in the order of 300 ha.

(2) General Area.

The Commission estimates that this encompasses some 44,083 ha. of 'hardwoods' and 13,728 ha. of 'rainforest'. The condition of the hardwood stands was assessed in 1985 as: 213 ha. remaining in a natural state, 7,646 ha. logged but retaining a low to moderate stand density of old growth trees, 29,667 ha. logged with trees mostly less than 80cm d.b.h.o.b., 5,557 ha. logged and consisting of pole sized, and smaller, regrowth, and 1,000 ha. as steep and of low site quality. It appears that the area of hardwoods may be overstated by some 500 hectares.

The total available volume of timber at 1985 in 'hardwood' areas was estimated at 1,405,935 cubic meters gross. This is broken down into: rainforest species 26,391 (2%), Flooded Gum 50,051 (4%), Brush Box 548,901 (39%), Dunn's White Gum 70,384 (5%), Tallowwood 79,600 (6%), Sydney Blue Gum 186,582 (13%), Red Mahogany 11,072 (1%), White Mahogany 62,331 (4%), Bloodwood 7971 (1%) and other timbers (25%). The available volume for the present cutting cycle (1985-2010) was estimated to be able to supply a yearly gross allocation of: 30,000 m^3 of hardwood quota sawlogs; 6,700 m^3 small (ex-quota) hardwood sawlogs; 21,600 m^3 other ex-quota hardwood sawlogs; 3,000 m^3 poles, piles and girders, 1,000 m^3 rainforest salvage logs. The hardwood quota sawlogs are at present fully allocated, the small hardwood sawlogs "have been harvested" (Forestry Commission 1986), rainforest salvage logs are fully utilized while the other two categories have only a small demand.

Rainforest areas are reserved for speciality purpose logging, for which there is no specific commitment at present. Current operations are limited to the taking of dead or dying trees, and the salvage of trees killed or damaged in roading operations.

(3) The Richmond Range Allocated Area.

Comprised of compartments 201-7 Richmond Range State Forest the R.R.A.A. encompasses some 190 ha. of 'rainforest' and 1,750 ha. of 'hardwoods'. A further 340 ha., mostly rainforest, was gazetted as the Dome Mountain Flora Reserve in 1987.

According to the Commission's available logging history maps for the area some 760 ha. of the central area's 'hardwoods' were logged between 1955 and 1957, primarily for durable 'hardwoods'. It appears that Brush Box and Flooded Gum weren't heavily utilized with logging being most severe in the Red and White Mahogany stands on ridges of easy access. As a rough estimate some 500 ha. may have been logged at that time.

Logging also extended in 78 ha. of 'rainforest', right up on to the spur near Dome Mountain. Logging apparently concentrated on a limited number of prized species.

Between 1962 and 1963 a 72 ha. strip of 'hardwoods' along the eastern boundary of compartment 205 was logged.

While not shown on maps, an additional area of 'hardwoods' in compartment 201, low down on Capeen Creek, has been heavily logged. A rough estimate of extent is 50 ha. Limited 'hardwood' logging also took place at the start of Dome Road.

Dome Road was extended into the rainforest, and past one swamp, in the 1982-83 financial year. The road passed through some of the rainforest logged in 1955-7 but it and numerous snig tracks were also pushed through previously undisturbed stands of mature rainforest.

Logging of 'hardwoods' and 'rainforest salvage logs' began in the 1983-4 financial year but according to the acting District Forester, G.Neville (9.3.1988 pers.comm.) less than 10,000 m^3 have probably been removed to date. A large part of the area logged 1955-7 has been relogged and also some previously unlogged stands. As a rough estimate this may have involved an additional 50 or so hectares.

It appears that in the order of 1,080 ha. ($\pm$100 ha.) of the 'hardwood' stands in the R.R.A.A. remain in a natural condition. Of the 520 ha. of 'rainforest' in the R.R.A.A. and Dome Mountain Flora Reserve some 420 ha. could be considered to be unlogged or not yet converted into a road, 130 or so hectares of this would be within the R.R.A.A. The total area of 'hardwoods' and 'rainforest' (by Commission definition) in the R.R.A.A. and Dome Mountain Flora reserve is in the order of 2,280 ha., of this 1500 $\pm$110 ha.(66%) is unlogged old growth forest.

The Commission estimates a yield of 47 m^3 gross per hectare. They also estimated that there were 2,810 ha. of 'mature and overmature hardwoods' in the R.R.A.A. as at 1985, an apparent overestimation of the area by 1,060 ha. By the simple procedure of multiplying the anticipated yield of 47 m^3 by the inflated total area of hardwoods the Commission estimated a total available yield of 132,000 m^3 gross, which they anticipate will sustain a quota of 5,600 m^3 gross per annum for over 23 years.

Using the actual area of 'hardwoods' of 1,750 ha., with an allowance made for a conservative 20% of the area being unloggable, retained as filter strips, or with very low volumes of timber resultant from previous logging, the total area of loggable hardwoods may only be in the order of 1,400 ha. By multiplying this figure by 47 m^3 gross a total available yield of 65,800 m^3 gross is arrived at, which would sustain an annual quota of 5,600 m^3 gross for less than 12 years.

The Commission's 1977 Urbenville Management Plan estimated on average yield of 15 m^3 gross per hectare from unlogged hardwood forests. The proposed 47 m^3 gross per hectare in the R.R.A.A. is overcutting the forest's natural increment.

It appears that only some 1,500 hectares of the 46,436 ha. of

hardwoods in the Urbenville Management Area remain in an undisturbed natural state. Outside of the Dome Mountain Area the 500 hectares consist of relatively small isolated stands. The remaining 1,000 hectares of old growth 'hardwood' forest in the Dome Mountain area is not only the largest remnant remaining in the Urbenville Management Area but appears to be far larger than any remnants left on the Richmond Range or in the National Parks of the Mt. Warning region.

THE LIKELY ENVIRONMENTAL IMPACT OF LOGGING THE DOME MOUNTAIN AREA

A forest is the sum of numerous interactions and complex inter-dependencies that the plants and animals have developed over millions of years of co-evolution. The damage or destruction of each link starts a new chain reaction that spreads throughout the forest.

Knowledge of how the components of a forest function and inter-relate is extremely limited. As such the effects of man-induced disturbance to a natural ecosystem are mostly unknown. Enough research into certain aspects has been undertaken to show that the proposed roading, logging and burning of forests in the Dome Mountain area will have a variety of significant adverse impacts upon the environment.

Some consequences of the proposed operations will be:

- a degradation of soil structure and stability
- extensive soil compaction
- an increase in erosion
- altered streamflows
- loss of nutrients
- degradation of aquatic habitats
- a severe reduction in hollow-dependent fauna
- an increase in fauna from more open habitats
- an increase in introduced predators
- a reduction in fauna preferring mature forest, rainforest, a stable microclimate and some specialized food sources
- a reduction in populations of endangered species, with increased risk of elimination of some species
- a possibly significant reduction in genetic variability and viability of some rarer species
- an increase in introduced plants
- a degradation of forest structure
- an increase in pioneer and early successional plants
- a decrease in later successional rainforest plants
- inadequate regeneration on some sites
- an increased chance of the introduction of pathogens
- an altered microclimate
- an increased chance of wildfire

THE IMPACT OF ROADS AND HEAVY MACHINERY

The Forestry Commission plans to construct a number of major permanent access roads over steep and often difficult terrain in the Dome Mountain area. Logging roads and snig tracks together may account for an average of 16% of the logging areas. The steep terrain, major construction works needed for some sections of roads and practice of wet weather logging indicate that roads and the use of heavy machinery will have a significant effect on both the environment within the Dome Mountain area and surrounding rural communities.

Numerous landslips and greatly increased erosion have been noted to have resulted from recently constructed roads and logged forest in the area.

1. Compaction

Compaction of forest soils during logging operations is caused by the weight of machinery, loads and falling trees. The single passage of machinery has been shown to cause major compaction (e.g. Incerti, Clinnick and Willatt 1987) while repeated loadings and logging cycles have been shown to increase compaction effects (e.g. Seymour 1981). Compaction effects have been shown to dramatically increase with soil moisture (e.g. Greacen and Sands 1980) while, to some extent, gravel and organic matter in the soil reduce compaction effects (e.g. Wronski 1984).

Shear stress and wheel slip can increase the compaction effect of static loads by up to 2 and 5 times respectively (Greacen and Sands 1980). Wronski (1984) found that after two or more passes of logging vehicles the full depth of the A horizon of the soil was compacted immediately beneath the wheel tracks and to a lesser extent up to 0.75 m from the edges of the tracks.

Wronski (1984) found that soils covering 23% of an area were visibly compacted or severely disturbed during thinning operations in a karri forest. Incerti *et al* (1987) found that 10% of a logged area of Mountain Ash had significant changes in soil physical properties and saturated hydraulic conductivity was reduced across the entire coupe area.

Van Loon (1966) found that on average 16% of the Sydney Blue Gum - Tallowwood association was tractor disturbed (snig tracks and logging dumps) during logging operations. The Forestry Commission's practice of maximizing soil disturbance in this type can result in disturbance and exposure of up to 70% of the total area (Forestry Commission, 1982a). This practice may therefore result in the majority of the logging area being affected by compaction.

For krasnozem soils compaction is generally greatest in the top 25-30 cm of the soil profile though compaction has some effect down to 50 cm (Jakobsen and Moore 1981, Jakobsen 1983). In some soils movement down to 120 cm depth has been recorded (Greacen and Sands 1980).

As noted by Jakobsen (1983):

> 'Compacted forest soils, in the absence of ameliorative treatment, recover slowly under the influences of climatic processes and the activity of roots and soil fauna. However, it may take 10-20 or more years for soil to recover after shallow compaction... while compaction of deeper layers may persist for 50 to 100 years... When biological activity in the soil is severely reduced by compaction, recovery may be further retarded.'

Soil compaction, resultant from logging, has been shown to significantly:

(i) increase soil density (Greacen and Sands 1980, Seymour 1981, Jakobsen and Moore 1981, Jakobsen 1983, Wronski 1984, Incerti *et al* 1987). Incerti *et al* (1987) found density increases of 27% and 38% on major snig tracks and log landings respectively. Greacen and Sands (1980) report increases in densities of 20-30%.

(ii) reduce infiltration capacity (Langford and O'Shaughnessy 1977, Greacen and Sands 1980, Jakobsen and Moore 1981, Wronski 1984). This can lead to increased surface runoff, loss of water from site, and erosion

(iii) reduce hydraulic conductivity (Jakobsen and Moore 1981, Jakobsen 1983, Wronski 1984, Incerti *et al.* (1987) found that saturated hydraulic conductivity was reduced across an entire logging coupe.

(iv) reduce productivity, this is chiefly attributed to the reduction and restriction of root penetration and growth with increased soil density (Greacen and Sands 1980, Seymour 1981, Jakobsen and Moore 1981, Jakobsen 1983, Wronski (1984). Wronski found that eighteen months after logging, root length density in soil compacted by one or more passes of machinery was only one-sixth of that in undisturbed soil. Jakobsen estimated the productivity of a 32 year old snig track on krasnozem soils at about 20% of the undisturbed area. Greacen and Sands predict a 15% reduction in volume yield due to compaction from tractor logging.

(v) reduce aeration (Greacen and Sands 1980, Jakobsen and Moore 1981, Wronski 1984). This may interfere with the function of soil microorganisms and plant roots.

(vi) reduce nutrient availability and uptake (Greacen and Sands 1980).

(vii) reduce and destroy beneficial soil organisms, for example mycorrhizal fungi (Greacen and Sands 1980) and worms (Jakobsen and Moore 1981).

Wet weather logging has been shown to be very detrimental to soil structure (Greacen and Sands 1980, Seymour 1981, Jakobsen and Moore 1981, Wronski 1984). Greacen and Sands report that one passage of a tractor over wet soil made it almost impermeable to water and the effect was equivalent to four passages over dry soils. As they further note:

> 'Wetter soils are more prone to compaction and the avoidance wherever possible of logging wet soils is probably the most important management practice for prevention or reduction of compaction damage.'

The often poorly drained soils of the Dome Mountain area, as illustrated by the abundance of Bangalow Palms, coupled with the Forestry Commission's practice of allowing wet-weather logging and maximizing tractor disturbance imply that soil compaction will significantly affect the environment of Dome Mountain.

2. Other Effects of Machines

Direct and often complete destruction of soil structure is caused by the tilling or puddling effects of machines (Jakobsen and Moore 1981, Wronski 1984). Wheel ruts are major sources of both runoff and erosion.

Wronski (1984) concluded that where tracks constitute less than 2% of a block area severe rut formation would result in c.8% of the shallow root system being severed. This would further enable easy entry for disease organisms into the roots. He notes that the first pass of a heavy vehicle

kills the understorey vegetation in the track which increases exposure and causes higher temperatures and reduced soil moisture in the top 100 mm of the soil profile during summer.

Other adverse effects of machines include direct destruction of plants and animals, excessive noise levels, pollution, and the transport of weed seeds and diseases.

Logging trucks affect the local population by reducing road safety, and increasing road damage, bridge damage, noise levels, and pollution. Dobinson (1985) notes that road pavement damage increases in relation to the fourth power of axle load and that therefore a truck loaded to the permissable limit will do 14,000 times the damage of an average car to road pavements. He further notes that bridge life depends on the extent of concentrated load by an axle group and the gross weight of the vehicle on the bridge.

The roads and bridges in the Kyogle Shire are deteriorating rapidly and represent the single largest problem the shire faces. There is no doubt that use of rural roads by logging trucks causes significant damage, the resultant damaged roads and bridges are long term problems that the local community has to cope with and (when some of the councils limited funds are available) meet the costs of repairing.

3. Runoff

The reduced infiltration capacity of road surfaces, areas subject to compaction and heavily disturbed soils, combined with reduced canopy interception and transpiration, cause an increase in water runoff following logging.

Bren and Leitch (1985) conclude that the introduction of forest roads could markedly influence both the stormflow and peak flow. On a road with a grade of 2-6% they found that for less than c.10 mm, between 0 and 50% of the rainfall impinging on the road surface leaves as runoff, while for storms the percentage returned as runoff increases and in the largest storm encountered subsurface flow caused 20% more runoff than could be accounted for on the basis of runoff from the road and overland flow. They concluded that the diminution of runoff by simply passing across an infiltrating slope does not appear to be feasible.

Langford and O'Shaughnessy (1977) report increases in streamflows, peak flows and stormflows of 10 to 20% following clearfelling of forests. Streamflows can actually be reduced in the long term by the increased transpiration of the regenerating forest.

4. Erosion

Roads, snig tracks and areas of disturbed soil are the major sources of erosion following logging. Langford and O'Shaughnessy (1977) cite American studies which found that 93% of soil erosion resulted from landslides and mudflows initiated at roads, even though roads and embankments constituted only 6 % of the area. In another study cited clearfelling without roads increased sediment loads from 10 mg/l to 50 mg/l on steep slopes, while the introduction of roads increased it to 320 mg/l.

Langford and O'Shaughnessy cite Gilmour as attributing most sediment as coming from inadequately drained snig tracks and poorly constructed stream crossings. Kriek and O'Shaughnessy are cited as finding significant increases in sediment yields following 'good practice' logging operations in Mountain Ash forests, sediment yields up to 3 times greater than undisturbed forest were recorded and in one case a road embankment slump

increased it to 5 times.

The construction of roads and snig tracks in the steep and often difficult terrain of most of the Dome Mountain area can be expected to cause significant soil erosion. Inspection of the rainforest section of the new Dome Road on 20 May 1988 revealed 3 major landslips, involving the loss of mature trees and large areas of vegetation which completely blocked the road. Numerous smaller slips, associated with the collapse of embankments, were also noted.

5. Effects on Fauna

The easier access and increased sunlight provided by roads enable dispersal and increased populations of mammalian and reptilian predators, and closely related species from more open habitats (Gilmore pers. com.).

The predation of medium-sized ground-dwelling marsupials, such as the Long-nosed Potoroo and Black-striped Wallaby, has been noted to increase as a result of greater access provided by roads for foxes and dingoes (Shields and Kavanagh 1985, Loyn 1985, Forestry Commission 1986). Feral cats, Lace Monitors and various other reptiles appear to be in greater densities near roads on the Capeen Range (pers. obs.). Tyler (1976) suggests that the dispersal of Cane Toads may also be assisted by roads.

Roads have been noted to form an effective barrier for exchanges between populations of small mammals (McIlroy 1978, Barnett, How and Humphreys 1978). Barnett *et al.* (1978) found that roads severely restricted or stopped the movement of small mammals even when the road consisted of a long-unused and partly overgrown track.

Road-kills by vehicles could be significant if species tend to congregate periodically on roads or if the road passes through prime habitat. Rainforest Dragons have been observed to congregate on roads at certain times and Fletchers Frog often uses puddles in roads for breeding (pers.obs.). The construction of the road past one swamp and planned construction past the second swamp at Dome Mountain can be expected to maximize road kills of some frog species.

Changes in the microclimate, predation, and plant species along roads would significantly alter the fauna in the vicinity of roads.

6. Effects on Flora

The altered microclimate, changed soil environment, and disturbance of soil and vegetation along roads allows for the dispersal and proliferation of weeds and species from earlier successional stages (pers.obs., Gilmore pers. com.).

Hopkins, Kikkawa, Graham, Tracey and Webb (1977) point out that the increased densities of early successional pioneer tree species along permanent roads, and their resultant prolific seed, can lead to a limited degradation in the seral status of surrounding rainforest.

The pathogen *Phytophthora cinnamomi* has caused severe dieback of eucalypts in Victoria and Western Australia, and patch dieback of rainforests in Queensland. There is abundant evidence that car tyres and machinery are a major contributor to its rapid dispersal (Gerrettson-Cornell and Dowden 1978, Forests Department of Western Australia 1979, Dawson and Weste 1985). Gerrettson-Cornell and Dowden particularly recommend avoiding any activity that may increase waterlogging of the soil and thus the chance of infection.

7. Other Effects of Roads

The canopy gaps caused by roads, snig tracks and logging generally, cause increased penetration by sunlight, winds, and more extreme temperature fluctuations. Thus the microclimate along and adjacent to roads is significantly altered in the denser forests, with consequent effects on the more sensitive plants and animals.

Shooters, timber and plant (e.g. orchids) poachers, and commercial marijuana growers are active in the region. They mostly rely upon forestry roads and tracks for access.

Roading, logging and fire all combine to cause intial increases in runoff and erosion. This can result in increased flooding and stream bank erosion, and decreases in streamflows in dry periods or over the longer terms from increased transpiration of regrowth. The increased fluctuations in water levels will have direct impacts on aquatic flora and fauna.

Increased erosion will increase turbidity and suspended sediment levels in streams, where stream-bed slopes level out sufficiently there will be extensive sedimentation (Langford and O'Shaughnessy 1977, Forestry Commission 1980, Atkinson 1984). Langford and O'Shaughnessy cite American studies in steep mountain catchments as finding that suspended sediment loads increased 5 to 100 times following logging, the major cause being mass slumping triggered by roads on steep slopes. They also note that ionic concentrations and water temperatures can increase after logging. The Forestry Commission (1980) note that the decomposition of plant material resultant from logging may reduce stream oxygen levels.

The aquatic environment of streams will be degraded by logging and this will undoubtably prove to be unfavourable for a number of aquatic plants and animals. Increased flooding, erosion, sedimentation of streams and degraded water quality will also affect people downstream.

IMPACT OF LOGGING

The secondary rainforests of the Dome Mountain area are planned to be logged on a maximum economic utilization basis and then brought into the 25 year logging cycle of the general area. For the less-accessible secondary rainforests of the Washpool area the Forestry Commission estimated that logging would result in the removal of 60% of the overstorey canopy (Forestry Commission 1982a). While Dunning and Smith (1986) found that in practice normal logging of this type in Mt. Boss State Forest resulted in 75-95% canopy removal.

The only apparent specific constraints on logging are: that mature and overmature trees of value for wildlife habitat (and suitable recruitments) be retained at an average frequency of one per hectare, but preferably in clumps of up to five trees (per 5 ha.); trees identified as being used for feeding by Yellow-bellied Gliders be retained; and that a 10 m strip of undisturbed rainforest understorey be left adjacent to grassy areas as a potential refuge for Black-striped Wallabies (Forestry Commission 1986).

Most of the forests surrounding the Dome Mountain area have been heavily logged or clearfelled and are dominated by young regrowth and weeds. The proposed systematic logging of every available hectare of remaining mature forest will leave no refuge for fauna dependent upon mature forest in the vicinity.

Logging will lead to major changes both in species abundance and forest structure, the more moist the forests the greater the effect and the longer the recovery time (Forestry Commission 1980).

The planned intensive logging will cause significant environmental degradation and adversely affect those animals most reliant upon a stable ecosystem and mature forest.

1. Loss of Hollows

It has been estimated that a total of 399 species of vertebrates use tree-hollows in Australia; 28% of frogs, 28% of reptiles, 17% of birds and 42% of mammals (Ambrose 1982). 142 of these use hollows in tall open-forest.

Dunning and Smith (1986) found that the number of hollow bearing trees (>96 cm.d.b.h.) in secondary rainforest varied from 0.5 per hectare on some logged sites to an average of 16 (8-30) per hectare in mature unlogged forest.

Species of animals dependent upon tree-hollows for denning and nesting are directly affected by the loss of hollow trees in logging operations (Recher, Rohan-Jones and Smith 1980, Forestry Commission 1980, 1981, Mackowski 1984, Dunning and Smith 1986, Smith and Lindenmayer 1988).

Mackowski (1984) dissected 24 trees in a mature Blackbutt forest with a Bladey grass understorey and recorded the average occupancy rate of trees by hollow-dependent fauna for various size classes as: 100-120 cm. d.b.h. 1.14, 120-140 cm. d.b.h. 0.51, 140-160 cm. d.b.h. 2.9, 160 + cm. d.b.h. 2.81. In mature forest with a diverse understorey occupancy rates would be higher due to the higher productivity. Hollows are also variously utilized at different times of the year for nesting so that a single hollow may be utilized by a succession of species (Saunders, Smith and Rowley 1982).

To maintain populations of hollow dependent possums and gliders at a natural level Dunning and Smith (1986) suggest that 3 evenly spaced or 5 randomly spaced self-sustaining potential nest tree clusters are required in

each hectare of logged forest. Mackowski (1984) found that 3 hollow bearing trees per hectare were required and concluded that 0.45 hectares per hectare was needed to provide sufficient hollow trees in perpetuity.

Smith and Lindenmayer (1988) found that the total numbers of possums and gliders per site were significantly related to the number of 0.25 ha. blocks on each site supporting hollow trees and concluded that it is possible that maximum possum and glider density will only be reached when all 0.25 ha. blocks support hollow trees.

They further predicted that the prescription for the retention of a minimum of 15 trees for every 10 ha. clear-felled in Mountain Ash forests would reduce the total number of hollow-dependent possums and gliders to less than one eighth that of unlogged forest. Also that once the number of hollow trees falls below 4.2 per 3 ha. or when less than 1.7 0.25 ha. blocks contain hollow trees they predicted that the average density of Leadbeaters possum would be zero.

The territorial requirements of hollow-dependent fauna needs to be considered when assessing the availability of hollows. Saunders *et al.* (1982) consider that the concentration of hollows in one area may pose behavioural problems for some species. Saunders (1979) notes that White-tailed Cockatoos space their nests out over the available breeding area and for about 15% of the breeding season the female attempts to limit access to trees around her nest site by other females.

Saunders *et al* (1982) found that the smallest tree nested in by Galahs had a cirumference of 0.8 m. and for Corellas and Red-tailed Black Cockatoos it was 1 metre.

Following logging the sudden exposure of large trees to new wind stresses often leads to these trees dying or being thrown by the wind (Recher *et al.* 1980). Saunders (1979) notes that hollows are also lost by sections being broken off, collapse of floors of hollows, the ceiling falling in, being taken over by feral bees, human predation of nestlings, and because hollow trees are particularly susceptible to fire. Recher *et al.* (1980) also note that dead trees appear to be unsuitable to many species of hollow-dependent wildlife.

Mackowski (1984) found that hollows suitable for larger wildlife did not form in Blackbutt trees less than about 200 years old, longevity was estimated at three hundred years. As large hollows only form in trees over 120 cm. d.b.h.o.b. their formation in Sydney Blue Gum would take over 220 years, Tallowwood over 300 years, and Brush Box in the order of 500 years.

2 Other Effects on Fauna

Dependent residents of forest with special adaptations for a stable environment or mature forest requirements can be severely affected by logging operations (Tyndale-Biscoe and Calaby 1975, Milledge 1979, Recher *et al.* 1980, Loyn 1985, Shields and Kavanagh 1985).

Loyn (1985) notes that old trees provide food sources that may be less abundant in forests of younger trees, e.g. nectar, some insects in the bark and foliage, and nectar and fruit of mistletoe. He further states that it appears that old forest is needed to supply a regular abundant supply of insect food.

Recher *et al.* (1980) found significant correlations between canopy height and the number of understorey plant species and bird species diversity. They noted that species which nest in hollows or in the canopy and those which forage on tree trunks or in the canopy are absent from young

logging regeneration.

Loyn (1985) observed that the retention of 14 mature trees per hectare apparently failed to provide habitat for a significant small group of arboreal birds and mammals even up to 70 years after harvesting. Recher *et al.* (1980) found that forest 40-45 years old is too young for some species which depend upon mature forest for refuge, nest sites or foraging.

Animals with high site attachment are often killed in logging operations (Tyndale-Biscoe and Calaby 1975) while any remaining unlogged areas may be fully occupied and unable to support survivors forced out of logged areas.

The Forestry Commission found that in the Hastings Catchment logging had an initially severe impact on amphibians with a recovery in numbers with canopy re-establishment (Shields and Kavanagh 1985).

Vagrant reptiles from more open habitats have been observed to invade logged forests (Shields and Kavanagh 1985, Dunning and Smith 1986). Dunning and Smith (1986) found that selective logging, 33% canopy retention, caused a significant decline in numbers of Challenger's skink.

Birds from more open habitats, often transitory and non-breeding individuals, invade logged forest while birds most dependent upon mature forest decline in numbers or are lost (Pattemore and Kikkawa 1975, Milledge 1979, Recher *et al.* 1980).

McIlroy (1978) considers that forest bird diversity is correlated with plant species diversity and foliage height diversity. Cowley (1971) notes that certain species of birds are specific to certain plants or plant associations, for example the Glossy Black Cockatoo and She-oaks. He considers that the many birds with fairly restricted diets must move to a new area or die should their supply fail.

Many plants rely upon birds for insect control, cross-pollination and/or seed dispersal and an alteration in bird species may initiate an alteration in vegetation.

Dunning and Smith (1986) found that the numbers of Greater Glider, Ringtail Possum and Brown Antechinus declined in approximate proportion to the amount of forest biomass removed, while the Fawn Footed Melomys declined in greater proportion.

Lunney, Cullis and Eby (1987) found that Bush Rats declined in response to logging and that populations did not recover by 10-15 years, they concluded that this demonstrates that animals respond differently to dense ground cover in unlogged and regrowth areas. They also found that logging had no impact on Brown Antechinus, this may indicate that habitat requirements of populations are variable within a species or that the Antechinus is sensitive to the effects of logging only under certain conditions.

Many researchers have concluded that the only sure way of preserving species dependent upon mature forest as habitat is to preserve large areas of mature forest intact (Tyndale-Biscoe and Calaby 1975, Recher *et al.* 1980, Shaw 1983, Loyn 1985, Shields and Kavanagh 1985, Lunney *et al.* 1987). Recher *et al.* note that it is possible that some species dependent upon mature forest which currently occur in buffer strips, reserves and in regenerating forest are derived from animals bred in mature forest. Once the area of mature forest is sufficiently reduced it will no longer be able to maintain these populations.

Shields and Kavanagh (1985) note that the preferred habitats of many species do not include narrow riparian strips or steep unloggable country. Mackowski (1984) notes that in many situations on the north coast of N.S.W. corridor retention in gullies will not maintain suitable habitat for possums and gliders.

Tyndale-Biscoe and Calaby (1975) suggest that an effective population of 1,000 individuals is near to the minimum to ensure the continuance of genetic viability. Dunning and Smith (1986) suggest a minimum population size of 500 and note that it is necessary that each population effectively isolated by vegetation or geographical barriers needs to be maintained at least at this size.

3. Effects on Flora

The eucalypt and Brush Box overstorey of secondary rainforest often arise from a single regeneration event while the rainforest understorey develops in a series of successional stages. Each stage increases nutrient availability and produces a more favourable microclimate for succeeding species. It may take hundreds or thousands of years until a form of mature rainforest is arrived at.

Dunning and Smith (1986) suggest that successional change after logging of secondary rainforest may enhance eucalypt and acacia regeneration to the detriment of rainforest regeneration for at least 25 years after logging.

The 25 year logging cycle proposed for the Dome Mountain area will initiate repeated disturbance which will cause the replacement of the diverse rainforest understorey with weeds and early successional species.

The Forestry Commission (1982a) concluded that about 40 m. is required between 30 metre high eucalypt trees to provide for adequate seed distribution, this requires the retention of 6-8 seed trees per hectare.

Harvesting of seeds by ants and other insects has been observed to be rife (Ashton 1981, van Loon 1966, Forestry Commission 1982a). Ashton noted that more than 60% of the annual seedfall of *Eucalyptus regnans* may be removed, which in the warmer months involves nearly all the full fertile seed.

Poor and inadequate regeneration of eucalypts and Brush Box can often occur in moister areas of secondary rainforest (van Loon 1966, Forestry Commission 1982a, King 1985). Van Loon also noted problems in regenerating steep slopes which the Forestry Commission (1982a) attributed to soil washing away from the roots of young seedlings and excessive drainage of some sites.

Eucalypt and Brush Box regeneration is often poor in the absence of fire (van Loon 1966, Forestry Commission 1982a, King 1985). Van Loon attributed this to the dense nature of the understorey and dense surface litter. King found that 35% of plots that did not receive a post logging burn had no regeneration.

The Forestry Commission (1982a) cite Curtin as finding that in an unburnt block 46% of plots on snig tracks were stocked with regeneration compared to only 5% of those away from tracks. They cite Curtin as finding regeneration height on unburnt blocks was one seventh that of burnt blocks. Compaction can be considered to be one of the causes of this reduced growth. They further note that mechanically cleared sites are usually satisfactory for regeneration establishment, though some unsuitable compacted sites are often present.

Ashton (1981) notes that the poor growth of eucalypt seedlings in mature forest soils has been attributed to phytotoxin from fungus, inhibitory substances from living roots and an inhibition of the nitrifying bacteria by leachate concentration from eucalypt leaves.

King (1985) found that there was no evident relationship between the total regeneration stocking and percentage canopy cover retained.

Hopkins (1981) notes that disturbance of rainforest can result in arrested succession or culminate in a forest type completely unlike the original. Gilmore (pers. com.) considers that it can result in a reduction in floristic diversity of mature-phase rainforest plants.

The development of the rainforest understorey will be affected where eucalypt and Brush Box regeneration is inadequate. The nature and significance of this effect needs to be assessed.

Prolific weed growth is one of the most important factors hindering regrowth of secondary rainforest (van Loon 1966). Numerous exotic weeds have invaded the forests of the Focal Peak region following logging, roading and grazing (Jarman, Johnson, Southwell and Stuart-Dick 1987, Forestry Commission 1986, pers.obs.). Of the numerous weeds that vigorously invade logged forest, lantana and croftons weed are the most prolific in the Dome Mountain area, dominating the understorey of extensive areas of logged secondary rainforest. Lantana has replaced the rainforest understorey on many sites.

The extensive disturbance caused by logging, particularly when repeated by fire or re-logging, enables introduced species to establish themselves as permanent components of the flora.

4. Effects on the Microclimate

Climatic fluctuations are ameliorated to some extent by the open overstorey of secondary rainforest but more importantly and effectively by the dense canopy of the rainforest understorey. This produces a relatively stable and seasonally predictable microenvironment.

The removal of most of the overstorey during logging and the severe disruption to, or elimination of, the understorey canopy would greatly increase temperature extremes and wind velocities, and decrease relative humidity in the understorey.

Species of animals adapted to more stable environments often have low reproductive capacity (Cowley 1971, Tyndale-Biscoe and Calaby 1975, Barry 1984) and may have comparative longevity and utilize specialized resources (Barry 1984). Such animals may be sensitive to the environmental change associated with logging. Frogs and moisture-requiring invertebrates are likely to be significantly affected.

Many rainforest plants are sensitive to environmental change and may not be able to re-establish populations until earlier successional species have created a suitable microclimate.

The Forestry Commission (1982a) note that frost can damage regeneration and in extreme cases convert forest to grassland once opened up. They state that the risk of frost is greatest on high altitude sites with impeded air drainage, and that Tallowwood is more susceptible than Blue Gum to frost damage.

The sudden exposure of large trees to new wind stresses can result in their dying or being thrown by the wind (Recher *et al.* 1980). The

Forestry Commission (1982a) note that young stands can be damaged by wind squalls.

The opening of the canopy causes increased drying of the understorey which may directly affect a number of species of animals (e.g. frogs) and plants. Dryness and higher ground temperatures would also increase the chance of wildfire occuring.

5. Other Effects of Logging

Reduced transpiration, canopy interception and infiltration capacity of the soil contribute to increased runoff and erosion following logging. Langford and O'Shaughnessy (1977) cite an American study that found that removal of the understorey which accounted for 22% of the basal area increased streamflow by 70 mm. Another American study cited found that clearfelling without roads increased sediment loads fivefold on steep slopes.

Logging can markedly decrease soil stability. Langford and O'Shaughnessy (1977) cite an American study by Swanston as finding that increased saturation of the soil mantle as a result of reduced transpiration and canopy interception can lead to a decrease in effective stress and shear strength and increased seepage forces in the soil, which consequently increases the risk of landslide. Swanston also attributed a marked decrease in soil strength about 3 to 5 years after clearfelling to the decay of root systems. Living tree root systems increase soil tensile strength.

The export of nutrients off-site in log form can be significant. Harwood and Jackson (1975) cite Attiwill as estimating that the bark and harvestable wood of a 51 year old eucalypt forest contained 50, 65 and 54 per cent of the above ground phosphorus, potassium, and calcium respectively.

Eucalypts have the tendency to accumulate specific nutrients, for example high bark calcium in Flooded Gum (Forestry Commission 1982 c), and so the loss of particular nutrients from the ecosystem may be disproportionate. As large quantities of nutrients are stored in eucalypt bark this loss would be less severe if de-barking was carried out on site.

IMPACT OF FIRE

Tree head disposal burning, control burning and wildfire can all have significant effects on the environment. Fire is the most common means employed by the Commission to obtain regeneration of secondary rainforest after logging.

1. Nutrient Loss

Soil nutrients are a major determinant in the delineation of forest communities (Forestry Commission 1982a, Turner and Lambert 1986, Braithwaite 1986). Turner and Lambert consider that differences in soil nutrients lead to variations in distribution of forests, forest productivity and community complexity. They note that even small changes in nutrients can cause subtle changes in species.

Braithwaite (1986) and Barry (1984) consider that site fertility appears to be the major determinant of the distribution and numbers of some animals, the highest densities occuring in the most nutrient rich forests.

Barry (1984) notes that soil infertility acts indirectly to reduce animal abundance by typically stimulating plant chemical defence against herbivory. He cites Neldner as finding that 14 rainforest species had significantly higher mean levels of polyphenols when grown on coarse white sand than when grown on brown loam or krasnozem soil.

Rainforest plants generally have high nutrient requirements. The rainforest understorey of a 27 year old Flooded Gum stand comprised only 9.1% of the total above ground biomass and yet contributed 55%, 59%, 30%, 44% and 69% of the annual net accumulation of aboveground nitrogen, phosphorus, calcium, magnesium and potassium respectively (Forestry Commission 1982 c).

Turner and Kelly (1981) found that the nutrient status of Booyong rainforest and Flooded Gum stands were similarly rich and concluded that the Flooded Gum stands probably represented rapidly developing rainforest after fire disturbance. They noted that soils that had more than about 800 p.p.m. total phosphorus in the surface horizon generally supported Booyong type rainforest.

Lambert, Turner and Kelly (1983) found that individual species of rainforest plants accumulate one or more specific nutrients and directly affect soil nutrient status.

Turner and Lambert (1986) note that young forests have high nutrient demands, almost entirely derived from the soil, which peak at around the time of crown closure. With increasing maturity the forest requires less nutrients from the soil and meet most requirements from redistribution and mineralization of litter nutrients. While nutrient losses following logging on nutrient rich soils may not be limiting for regrowth, nutrient losses can significantly alter reconstructive succession on nutrient poor soils (Hopkins 1981).

Harwood and Jackson (1975) consider that there are three major potential sources of nutrient loss in logging operations; export in the log harvest, losses to the atmosphere on burning, and downslope washing and deep leaching of nutrients mineralized in the ash. Langford and O'Shaughnessy (1977) cite an American study that found some streamflow nutrient concentrations doubled after wildfire.

Fire has been shown to result in large losses of nutrients to the atmosphere. Stewart and Flinn (1985) found that the burning of a clearfelled eucalypt forest resulted in a moderate to high intensity fire which consumed

50% of all debris and resulted in volatilization temperatures for all nutrients being exceeded and further nutrients lost through ash convection. They estimated total loss of nutrients from the debris and top 20 cm of surface soil to be 1.7% phosphorus, 6.5% nitrogen, 17.2% potassium, 19.9% magnesium and 32.8% calcium. Harwood and Jackson (1975) assessed the atmospheric losses of 4 nutrients in an 'unusually cold' slash burn from the above ground fuel following logging of a mixed forest; 50% of the fuel was consumed with resulting atmospheric losses from the burnt fuel of 18%, 17%, 12%, and 29% of phosphorus, potassium, calcium and magnesium respectively.

Fire has been noted to significantly increase soil pH, usually decrease organic carbon, increase exchangable potassium and calcium and increase extractable phosphorus (Stewart and Flinn 1985). Atkinson (1984) points out that nutrients so released in soluble form are readily removed by water. Large quantities of nutrients can be lost following fire, by wind and water transport of ashes and organic matter, and by leaching.

Turner and Kelly (1981) found that the soils of Blackbutt stands, with an average fire frequency of 280 years (Turner 1984), had higher soil pH, higher exchangable calcium, and lower total phosphorus and organic matter than Brush Box stands with a fire frequency of 325-380 years (Turner 1984).

As Ashton (1981) has pointed out, the fertility of soils is likely to be depleted in areas of high rainfall subjected to repeated burning. In terms of ecosystem potential it is a downward spiral.

2. Runoff and Erosion

Wildfires have been noted to result in very significant increases in surface runoff following rainfall (Langford and O'Shaughnessy 1977, Good 1973, Atkinson 1984). Langford and O'Shaughnessy (1977) attribute this to a reduction of the soils infiltration rate caused by high temperatures, and loss of litter and vegetation cover.

McArthur (in Langford and O'Shaughnessy 1977) found that streamflows for a 14,600 ha. area in Western Australia increased by 72% following wildfire. Various recovery periods of one to six years have been reported (e.g. Langford and O'Shaughnessy 1977).

Langford (in Langford and O'Shaughnessy 1977) found that in a Mountain Ash forest, streamflows declined significantly 6 to 15 years after wildfire, with an average 24% decrease of the average pre-fire streamflows per annum 6 years after the fire. This was attributed to increased transpiration of regrowth with streamflow still significantly less 36 years after the fire.

Wildfire can also result in significant erosion. Atkinson (1984) estimated soil losses of 30 to 48 t/ha, over a 10 week period, following a wildfire in Royal National Park. He suggests that for that terrain and climate 20 t/ha may be a more realistic estimate of soil loss following wildfire in an average year. Good (1973) found large increases in water sediment loads following wildfire with extreme erosion potential persisting for many months at one site.

Atkinson (1984) observed that large proportions of ash, charcoal, seeds and other organic matter were transported offsite in initial rainstorms. Langford and O'Shaughnessy (1977) consider that fuel reduction burning consumes organic material leaving lines of weakness in the soil aggregates leading to long term deterioration in soil structure.

3. Effects on Plants

Fire chiefly affects the composition and structure of the understorey, though overstorey trees can also be severely damaged or killed in fires. Rainforest plants are generally very susceptible to fire damage (Gill 1974) while many of the eucalypts associated with secondary rainforest have thin bark, no lignotubers and poor dormant bud development which means that they are also easily killed or damaged by fire (Bridges 1986, Gill 1974).

Ashton (1981) notes that fire results in the replacement of the normal soil microbiological flora by an entirely different one for a period of years.

Frequent low intensity fires (prescribed burns) have been noted to eliminate the shrub layer and allow grasses and ferns to dominate the understorey (McIlroy 1978, Gill 1974). Frequent hot fires have been noted to cause dominance of bracken and shrubs at the expense of herbs and grasses (Anon 1984). Vegetation change associated with fire has also been observed to be related to the time of year (Gill 1974, Anon 1984).

Floyd (1976) found that both fire intensity and frequency can cause major changes in the understorey vegetation of secondary rainforest, and that the intensity and duration of a fire will determine to a large extent the species composition of the regeneration.

Floyd (1976) and Ashton (1981) note that fires select for more fire-tolerant species. When comparing part of a Blackbutt-Sydney Blue Gum stand burnt 30 years ago and also part logged and burnt 14 years age Floyd (1976) found that the more diverse rainforest understorey was being replaced by quick-maturing, short-lived shrubs overtopped mainly by *Acacia binervata*.

Repetitive burning within the primary non-flowering period of an obligate seed-regenerating species can result in its reduction or complete elimination from a site (Floyd 1976, Ashton 1981). Gill (1974) notes that some eucalypts are sensitive to fire and their regeneration depends on seed held on the tree and shed after the fire, *E.regnans* is then vulnerable to fire until about 15-20 years of age when reproduction begins. Ashton (1981) notes that younger trees are more likely to be damaged or killed by fire than older trees. Secondary insect and fungal attack may follow fire damage (Forestry Commission 1982a).

Fire affects the seed resources of a forest in a variety of ways; all surface seed in burnt areas is killed (Floyd 1976), fire-induced seed falls can be lost by fire-induced erosion (Atkinson (1984) and predation (Forestry Commission 1982a), seed trees are often killed in fires before fullfilling their function (van Loon 1966, Forestry Commission 1982a), seed trees can shed their seed before a fire (Forestry Commission 1982a), and leaf fall following fires can blanket the ground and hinder seed contact with the soil (van Loon 1966, Forestry Commission 1982a).

Van Loon (1966) found that in burnt areas Tallowwood shed the majority of its seed in the first time period after burning. It has also been noted that eucalypt seed germination will not occur if the seed bed is dry and is likely to be inhibited by very low or high temperatures (Forestry Commission 1982a).

Fires create an ash-bed effect which has been observed to stimulate regeneration two to threefold for 2-3 years following fire (Ashton 1981). This has been attributed to enhanced nitrogen and phosphorus availability, nutrients released by dead micro-organisms and most importantly to the

altered microbiological fauna (Ashton 1981).

Fire greatly enhances eucalypt regeneration on less moist sites in logged secondary rainforest (King 1985, Forestry Commission 1982a). However, they have obeserved fire to favour the establishment of Sydney Blue Gum at the expense of Brush Box.

The Forestry Commission (1986) note that while slash burning can result in germination of desirable species it also leads to increased browsing of seedlings and may promote the growth of weeds and vines which in turn inhibit regeneration. Van Loon (1966) found that within 6 months burnt seed beds are generally overgrown with fire weeds and vines, in four out of twelve experimental burns extremely dense stands of wattle completely suppressed Tallowwood germinants. On six sites seeded with Tallowwood 28% of seedlings suffered browsing damage.

Many difficulties are associated with obtaining sufficient regeneration of Tallowwood (van Loon 1966, Forestry Commission 1982a). Sydney Blue Gum has been found to be generally very defective in regrowth stands (van Loon 1966).

The understorey of many logged stands of secondary rainforest in the Urbenville Management Area has been converted to Bladey grass by too frequent burning (pers.obs.). Bladey grass itself promotes a greater fire frequency.

Increasing fire frequency increases the flammability of the forest. Gill (1974) considers that in wetter forests flammabilities tend to decrease as succession proceeds and moisture retention within the forest becomes more effective. Hopkins (1981) notes that eucalypt regeneration tends to increase the possibility of fires as does the establishment of certain grasses.

4. Effects on Fauna

Fire consumes large quantities of the leaf litter, fallen timber and the understorey vegetation. In extreme conditions most of the foliage can be consumed and most plants damaged or killed. Animals are affected in a variety of ways; killed in fire, loss of food sources, loss of homesites, alteration/degradation of habitat, and increased competition and predation from species preferring more open habitats.

Invertebrates of the soils and surface litter can suffer high mortality rates in fires of even low intensity, with recovery periods of 5-6 years in drier forests (Leonard 1974, Anon 1984). Leonard (1974) observed that invertebrate densities were greatest on damp sites with a dense understorey and noted that recovery of populations is probably related to the recovery of the understorey structure. It may be expected that some of those invertebrates most reliant upon a stable moist environment will be severely reduced/eliminated until regeneration has sufficiently progressed to restore the pre-logging habitat.

Dunning and Smith (1986) found that post-logging burning probably has a more detrimental long term effect than logging, on reptile numbers, mainly due to the destruction of leaf litter and logs. They observed that normal logging practices in a secondary rainforest resulted in a shift from dominance by Murrays Skink and Challengers Skink to dominance by the Eastern Grass Skink.

While no studies have been conducted on the Southern Angle-headed Dragon and Northern Leaf-tailed Gecko, they can be expected to particularly suffer from loss of food sources (litter invertebrates) and degradation of habitat. The detrimental effect of fire on some frog species would also be

very significant.

Birds that live or feed in the understorey are most affected by fuel-reduction burning. Loss of litter and litter invertebrates will directly affect those understorey birds reliant upon invertebrates for food, such as Alberts Lyrebird and Black-breasted Button-quail. Understorey birds will also suffer from loss of nests, nest sites and cover, for some time dense and tangled regrowth may hinder the movements of some larger understorey birds (Cowley 1971).

Reductions, and alterations, in populations of invertebrates, reptiles, frogs and small mammals following fire will also adversely affect the many birds that feed in the understorey but nest in higher strata, for example the Marbled Frogmouth.

The distribution of most birds is correlated with the structure of the vegetation and therefore it is the changes in vegetation structure caused by fire that determine the long-term effects of fire on most birds (Anon 1984).

Small ground mammals have been shown to be more effected by fuel-reduction burning than logging (McIlroy 1978, Anon 1984, Shields and Kavagna 1985, Dunning and Smith 1986, Lunney *et al.* 1987). This is attributed to reduction in the available invertebrates, nesting/refuge sites, and a simplified ground flora (McIlroy 1978, Forestry Commission 1980).

Dunning and Smith (1986) chiefly attributed the post-logging decline of Brown Antechinus in secondary rainforest to the removal of the litter and log layer by burning. Lunney *et al.* (1987) found that fire reduced the numbers of Bush Rat and Brown Antechinus fivefold, though populations quickly recovered. They also found that even a low intensity fire eliminated Dusky Antechinus and that it had not reappeared by 3 years post fire. McIlroy (1978) states that the Yellow-footed Antechinus prefers areas from which fires have been excluded for 40 or more years.

Dunning and Smith (1986) attributed a decline in the Mountain Brushtail Possum and Fawn-footed Melomys on one plot to a post logging burn and concluded that post-logging burning may be as disadvantageous as canopy removal to species which utilize the ground and shrub stratum.

Many researchers have found that the introduced House Mouse can increase to plague proportions following burning of native forests (e.g. Lunney *et al.* 1987).

Appendix 1. PLANT SPECIES RECORDED IN THE DOME MOUNTAIN AREA
compiled from lists of A. Floyd, J. Holmes,
D. Pugh, A. Gilmore.

TREES

ALANGIACEAE

Alangium villosum, Muskwood, Black Muskheart

ARALIACEAE

Polyscias elegans, Silver Basswood, Celery Wood

P. murrayi, Pencil Cedar

ARAUCARIACEAE

Araucaria cunninghamii, Hoop Pine

ARECACEAE

Archontophoenix cunninghamiana, Bangalow Palm

Livistona australis, Cabbage Palm

ATHEROSPERMATACEAE

Daphnanadra sp., Common Socketwood

CAPPARACEAE

Capparis arborea, Bruch Caper Berry, Native Pomegranate

CELASTRACEAE

D. pittosporoides, Veiny Denhamia

CUNONIACEAE

Caldcluvia paniculosa, Soft Corkwood

Geissois benthamii, Red Carrabeen

Schizomeria ovata, Crabapple

EBENACEAE

D. pentamera, Myrtle Ebony, Grey Persimmon

EHRETIACEAE

Ehretia acuminasta, Koda

ELAEOCARPACEAE

Elaeocarpus grandis, Blue Quandong

Sloanea australis, Maiden's Blush

S. woollsii, Yellow Carabeen

EPACRIDACEAE

Trochocarpa laurina, Tree heath

ESCALLONIACEAE

Anopterus macleayanus, Macleay Laurel

Cuttsia virburnea, Cuttsia

Polyosma cunninghamii, Featherwood

TREES (contd)

EUPHORBIACEAE

Actephila lindleyi, Actephila

Baloghia lucida, Brush Bloodwood

Claoxylon australe., Brittlewood

Drypetes australasica., Yellow Tulip

Omalanthus populifolius, Bleeding heart

EUPOMATIACEAE

Eupomatia laurina, Bolwarra

FLACOURTIACEAE

Scolopia braunii, Flintwood

ICACINACEAE

Citronella moorei, Soapy Box

Pennantia cunninghamii, Brown Beech

LAURACEAE

Beilschihmiedia elliptica, Grey Walnut

B. obtusifolia, Blush Walnut, Hard Bolly Gum

Cinnamomum oliveri, Olivers Sassafras

C. virens, Red-barked Sassafras

Cryptocarya bidwillii, Yellow Laurel

C. erythroxylon, Pigeonberry Ash

C. obovata, Pepperberry Tree

C. triplinervis, Three-veined Cryptocarya

Litsea reticulata, Bolly Gum

Neolitsea australiensis, Green Bolly Gum

N. cassia

N. dealbata, White Bolly Gum

MALVACEAE

Hibiscus heterophyllus, Native Rosella

H. splendens, Pink Hibiscus

MELIACEAE

Anthocarapa sp., Incense Cedar, Bog Onion

Didymocheton rufum, Hairy Rosewood

Dysoxylum fraseranum, Rosewood

Synoum glandulosum, Scentless Rosewood

MIMOSACEAE

A. melanoxylon, Blackwood

Pararchidendron pruinosum, Snow-wood

MONIMIACEAE

Hedycarya angustifolia, Native Mulberry

Wilkiea huegeliana, Veiny Wilkiea

TREES (contd)

MORACEAE

Ficus coronata, Creek Sandpaper Fig

F. watkinsiana, Strangler Fig

Streblus brunonianus, Whalebone Tree

MYRSINACEAE

Rapanea
R. sub sessilis Red Muttonwood

MYRTACEAE

A. smithii, Lilly Pilly

Backhousia myrtifolia, Grey Myrtle

Backhousia sciadophora Shatterwood

Decaspermum parviflorum, Silky Myrtle

D. paniculatum Currant Myrtle

Eucalyptus acmenoides White Mahogany,

E. gradis, Flooded Gum

E. intermedia Pink Bloodwood

E. microcorys Tallowwood

E. punctata Grey Gum

E. resinifera Red Mahogany

E. saligna, Sydney Blue Gum

Lophostemon confertus, Brush Box

Rhodamnia argentea, Malletwood, White Myrtle

R. rubescens, Scrub Turpentine

Syzygium australe, Brush Cherry

S. coryanthum, Sour Cherry

S. crebrinerve, Purple Cherry

S. francisii, Giant Water Gum

S. hodgkinsoniae, Red Lilly Pilly

PITTOSPORACEAE

Hymenosporum flavum, Native frangipani

Pittosporum rhombifolium, Holly Wood, Diamond-leaf Pittosporum

P. undulatum, Sweet Pittosporum

PODOCARPACEAE

Podocarpus elatus, Plum Pine, Brown Pine

PROTEACEAE

Stenocarpus salignus, Scrub Beefwood

RHAMNACEAE

Alphitonia excelsa, Red Ash

RUBIACEAE

C. coprosmoides, Coast Canthium

Hodgkinsonia ovatiflora, Hodgkinsonia, Golden Ash

TREES (contd)

RUTACEAE

A. oblongifolia, Common Acronychia, White Lilly Pilly

A. pubescens, Hairy Acronychia

Euodia micrococca, White Euodia, Hairy-leaved Doughwood

Flindersia australis, Teak

F. schottiana, Cudgerie, Bumpy Ash

Zanthoxylum brachyacanthum, Thorny Yellow-wood

SAPINDACEAE

Alectryon subcinereus, Wild Quince, Birds Eye

A. divaricata, Coogera

Atalaya salicifolia, Brush Whitewood

Diploglottis australia, Native Tamarind

Elattostachys nervosa, Green Tamarind, Beetroot

E. xylocarpa, White Tamarind, Short-leaf Beetroot

Guioa semiglauca, Guioa

Harpullia hillii, Blunt-leaved Tulip

Jagera Pseudorhus, Foambark Tree

Mischocarpus anodontus, Veiny Pear-fruit

M. sundaicus, Red Pear-fruit

Sarcopteryx stipata, Steelwood

SAPOTACEAE

Planchonella australis, Black Apple

SIMAROUBACEAE

Guilfoylia monostylis, Native Plum

SOLANACEAE

Duboisia myoporoides, Soft Corkwood

STERCULIACEAE

Argyrodendron actinophyllum, Black Booyong

A. trifoliolatum White Booyong

Brachychiton acerifolium, Flame Tree

B. discolor, Lace-bark Tree

URTICACEAE

Dendrocnide excelsa, Giant Stinging Tree

VERBENACEAE

Gmelina leichhardtii, White Beech

S H R U B S

AGAVACEAE

Cordyline petiolaris, Broad Palm Lilly

C. stricta, Narrow-leaf Palm Lilly

SHRUBS (contd)

APOCYNACEAE

Alyxia ruscifolia, Chain Fruit

ARECACEAE

Linospadix monostachyus, Walking Stick Palm, Midginbil

CELASTRACEAE

Hedraian

C. leichhardtiana, Prickly Treefern

EUPOMATIACEAE

Eupomatia bennettii, Small Bolwarra

MYRSINACEAE

Rapanea subsessilis, Red (Short-stalked) Muttonwood

PITTOSPORACEAE

C. pauciflorus, Orange Thorn

RUBIACEAE

P. loniceroides, Hairy Psychotria

WINTERACEAE

Tasmannia insipida, Brush (Tasteless) Pepperbush

H E R B S

ARACEAE

Gymnostachys anceps, Settlers Flax

ASPIDIACEAE

Lastreopsis acuminata, Shiny Shield Fern

L. microsora, Creeping Shield Fern

L. munita, Naked Shield Fern

COMMELINACEAE

Pollia crispata, Pollia

ORCHIDACEAE

Calanthe triplicata, Christmas Orchid

UMBELLIFERAE

Hydrocotyle pedicellosa, Scrub Pennywort

URTICACEAE

E. reticulatum Smooth Nettle

ZINGIBERACEAE

Alpinea caerulea, Wild Ginger

Alpinea sp. Small Ginger

V I N E S

ANNONACEAE

Rauwenhoffia leichhardtii, Zig Zag Vine

APOCYNACEAE

Melodinus australis, Southern Melodinus

P. straminea, Common Silkpod

ARALIACEAE

Cephalaralia cephalobotrys, Climbing Panax

ASCLEPIADACEAE

Tylophora paniculata, Thin-leaved Tylophora

BIGNONIACEAE

Pandorea baileyana, Large-leaved Wonga Vine

Pandorea jasminoides, Bower Vine

P. pandorana, Wonga Vine

CELASTRACEAE

Celastrus subspicatus, Large-leaf Staff Vine

CUCURBITACEAE

Zehneria cunninghamii, Slender Cucumber

FABACEAE

Milletia megasperma, Native Wistaria

FLAGELLARIACEAE

Flagellaria indica, Whip Vine

MENISPERMACEAE

Legnephora moorei, Round-leaf Vine

Stephania japonica var. *discolor*, Snake Vine

MONIMIACEAE

Palmeria scandens, Anchor Vine

MORACEAE

Maclura cochin-chinensis, Cockspur Thorn

Malaisia scandens, Burny Vine

MYRSINACEAE

Embelia australasica, Embelia

OLEANDRACEAE

A. tenella, Climbing Fishbone Fern

PAPILIONACEAE

Milletia megasperma

PHILESIACEAE

Geitonoplesium cymosum, Scrambling Lily

PIPERACEAE

Piper novae-hollandiae, Pepper Vine

VINES (Contd)

POLYPODIACEAE

Microsorium scandens, Fragrant Fern

RANUNCULACEAE

Clematis aristata

Clematis glycinoides, Forest Clematis

ROSACEAE

Rubus hillii, Molucca Bramble

R. rosifolius, Rose-leaf Bramble

RUBIACEAE

Morinda jasminoides, Morinda

SMILACACEAE

Ripogonum album, White Supple Jack

R. discolor, Prickly Supple Jack

R. elseyanum, Hairy Supple Jack

VITACEAE

Cayratia eurynema, Soft Watervine

Cissus antarctica, Watervine

C. hypoglauca, Five-leaf Watervine

C. sterculifolia, Long-leaf Watervine

Tetrastigma nitens, Three-leaf Watervine

E P I P H Y T E S

PARASITES AND LITHOPHYTES

ASPLENIACEAE

Asplenium australasicum, Birds Nest Fern

A. falcatum

DAVALLIACEAE

Davallia pyxidata, Hare's Foot Fern

ORCHIDACEAE

Bulbophyllum crassulifolium, Stone crop Orchid

B. elisae, Mountain Bulb Orchid

Dendrobium beckleri, Pencil Orchid

D. gracilicaule, Spotted Orchid

D. mortii

D. pugioniforme, Dagger Orchid

D. speciosum, Rock Lily

D. teretifolium, Pencil Orchid

D. tetragonum, Tree Spider Orchid

EPIPHYTES (contd)

ORCHIDACEAE (contd)

Sarcochilus falcatus, Orange Blossom Orchid

POLYPODIACEAE

Microsorium scandens, Fragrant Fern

Platycerim bifurcatum, Elk Horn Fern

P. superbum, Stag Horn Fern

P. confluens, Horse-shoe Felt Fern

APPENDIX 2. A SYSTEMATIC LIST OF VERTEBRATES RECORDED IN THE DOME MOUNTAIN AREA, 26.2.88 - 29.2.88 by D.R. Milledge.

Amphibians 8 species

Fletchers Frog	Lechriodus fletcheri
Striped March Frog	Limnodynastes peronii
Great Barred Frog	Mixophyes fasciolatus
Red-backed Toadlet	Psendophryne coriacea
Trilling Toadlet	Uperoleia lacuigata
Eastern Dwarf Tree Frog	Litoria fallax
Lesueurs Frog	L. lesueurii
Whirring Tree Frog	L. revelata

Reptiles 10 species

Northern Leaf-tailed Gecko	Phyllurus cornutus
Southern Angle-headed Dragon	Gonocephalus spinipes
Eastern Water Dragon	Physignathus lesueurii
Yellow-bellied Legless Skink	Ophioscincus truncatus
Land Mullet	Egernia major
Eastern Grass Skink	Lamprophelis delicata
Challengers Skink	Saproscincus challengeri
Murrays Skink	Eulamprus murrayi
A burrowing Skink	Calyptotis scutirostrum
Carpet Python	Morelia spilota

Birds 53 species

Australian Brush-turkey	Alectura lathami
Wompoo Fruit-dove	Ptilinopus magnificus
Top-knot Pigeon	Lopholaimus antarcticus
White-headed Pigeon	Columba leucomela
Brown Cuckoo-dove	Macropygia amboinensis
Yellow-tailed Black Cockatoo	Calypforhynchus funcreus
Sulphur-crested Cockatoo	Cacatua galerita
Rainbow Lorikeet	Trichoglossus haematodus
Little Lorikeet	Glossopsitta pusilla
Australian King-parrot	Alisterus scapularis
Crimson Rosella	Platycercus elegans
Soathern Boobook	Ninox novaeseelandiae
Tawny Frogmouth	Podargus strigoides
Marbled Frogmouth	P. ocellafus

Birds (contd)

Australian Owlet-nightjar	Aegotheles cristatus
Spine-tailed Swift	Hirundapus caudacutus
Laughing Kookaburra	Dacelo novaeguineae
Noisy PItta	Pitta versicolor
Alberts Lyrebird	Menura Alberti
Welcome Swallow	Hirundo neoxina
Ground Thrush	Zoothera dauma
Rose Robin	Petroica rosea
Eastern Yellow Robin	Eupsaltria australis
Pale-yellow Robin	Tregellasia capito
Shrike-tit	Falcunculus frontatus
Golden Whistler	Pachycephala pectoralis
Black-faced Monarch	Monarcha melanopsis
Rufous Fantail	Rhipidura rufifrons
Grey Fantail	R. fuliginosa
Logrunner	Orthonyx temminckii
Eastern Whipbird	Psophodes olivaceus
Large-billed Scrubwren	Sericornis magnirostris
White-browed Scrubwren	S.frontalis
Brown Warbler	Gerygone mouki
Brown Thornbill	Acanthiza pusilla
Striated Thornbill	A. lineata
White-throated Treecreeper	Climacteris leucophaea
Red-browed Treecreeper	C. erythrops
Little Friarbird	Philemon citreogularis
Lewins Honeyeater	Meliphaga lewinii
Eastern Spinebill	Acanthorhynchus fenuirostris
Scarlet Honeyeater	Myzomela sanguinolenta
Mistletoebird	Dicaeum hirundinaceum
Spotted Pardalote	Pardalotus punctatus
Red-browed Firetail	Emblema temporalis
Olive-backed Oriole	Oriolus sagittatus
Stain Bowerbird	Ptilonorhynchus violuceus
Regent Bowerbird	Sericulus chrysocephalus
Green Catbird	Ailuroedus crassirostris
Paradise Riflebird	Ptiloris paradiseus
Pied Currawong	Strepera graculina
Yellow-throated Scrubwren	Sericornis citreogularis
White-naped Honeyeater	Melithreptus lunatus

Mammals 10 species

Brown Antechinus	Antechinus stuartii
Koala	Phascolarctos cinereus
Common Ringtail Possum	Pseudocheirus peregrinus
Sugar Glider	Petaurus breviceps
Greater Glider	Petauroides volans
Mountain Brushtail Possum	Trichosurus caninus
Red-necked Pademelon	Thylogate thetis
Grey-headed Flying-fox	Pteropus poliocephalus
Fawn-footed Melomys	Melomys cervinipes
Bush Rat	Rattus fuscipes

Additional Bird Species Recorded for the Dome Mountain Area by Glen Holmes, 14.12.81 and 22.4.82.

Wedge-tailed Eagle	Aquila audax
Rose-crowned Fruit-dove	Ptilinopus regina
Emerald Dove	Chalcophaps indica
Brush Cuckoo	Cuculus variolosus
Socty Owl	Tyto tenebricosa
Black-faced Cuckoo-shrike	Coracina novaehollandiae
Noisy Friarbird	Philemon corniculatus
Silvereye	Zosterops lateralis
Spangled Drongo	Dicrurus hottentottus

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