NEPA 224737

STATE FORESTS
NORTHERN REGION

URBENVILLE MANAGEMENT AREA

NATIVE FOREST HARVESTING PLAN

AREA:	MT LINDESAY STATE FOREST No 542	
LOCATION:	Compartments 279	
OPERATION:	FOREST HARVESTING	
PLAN No.	UMA 96/04	1/5/96

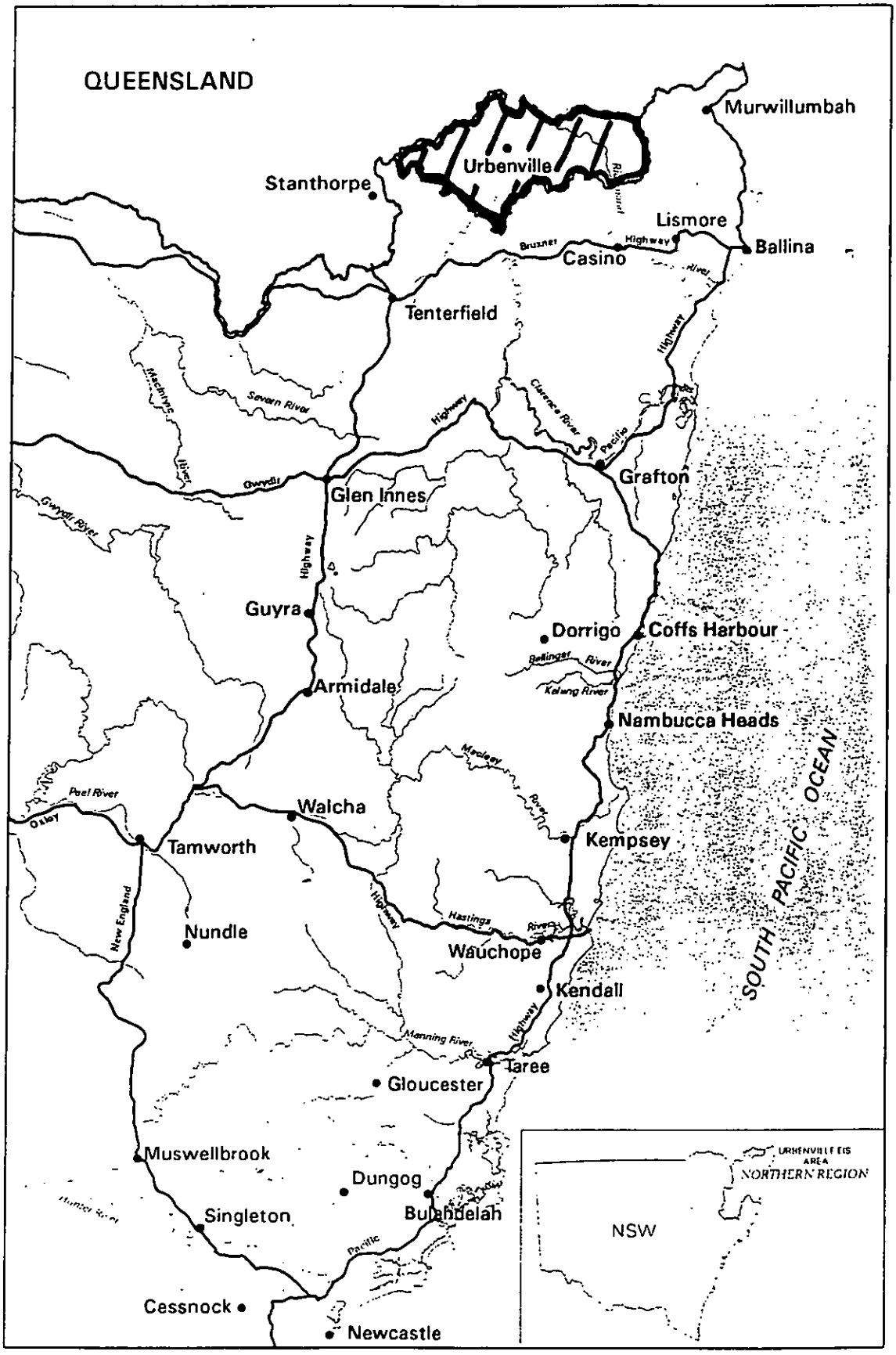
STATE FORESTS

MANAGING - CARING - SUSTAINING

FIGURE 2

URBENVILLE MANAGEMENT AREA

REGIONAL CONTEXT



Management Area

Major Road

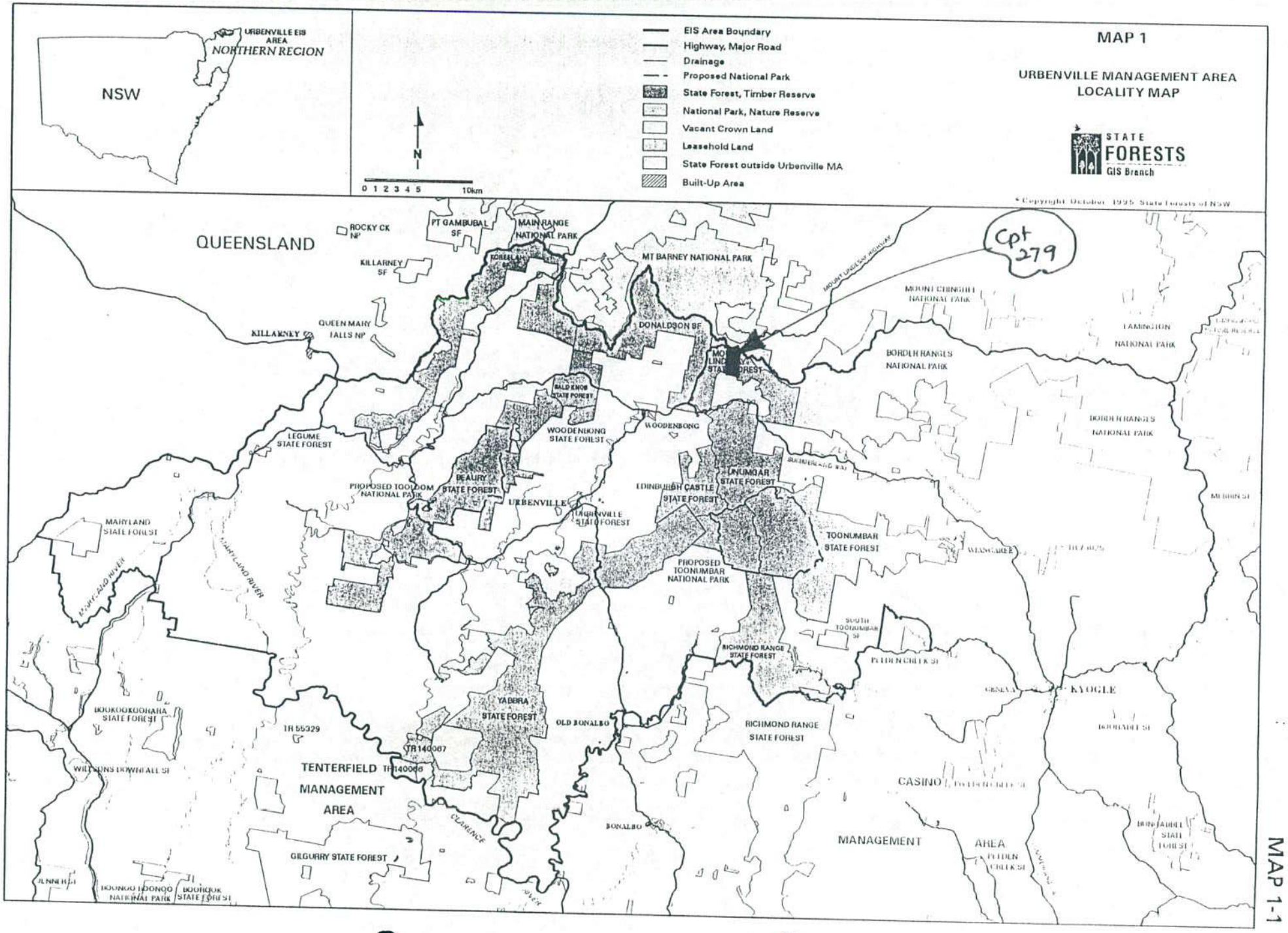
Major River

N

Scale 1 : 2 500 000

0 10 20 30 40 50 100km

STATE FORESTS
GIS Branch

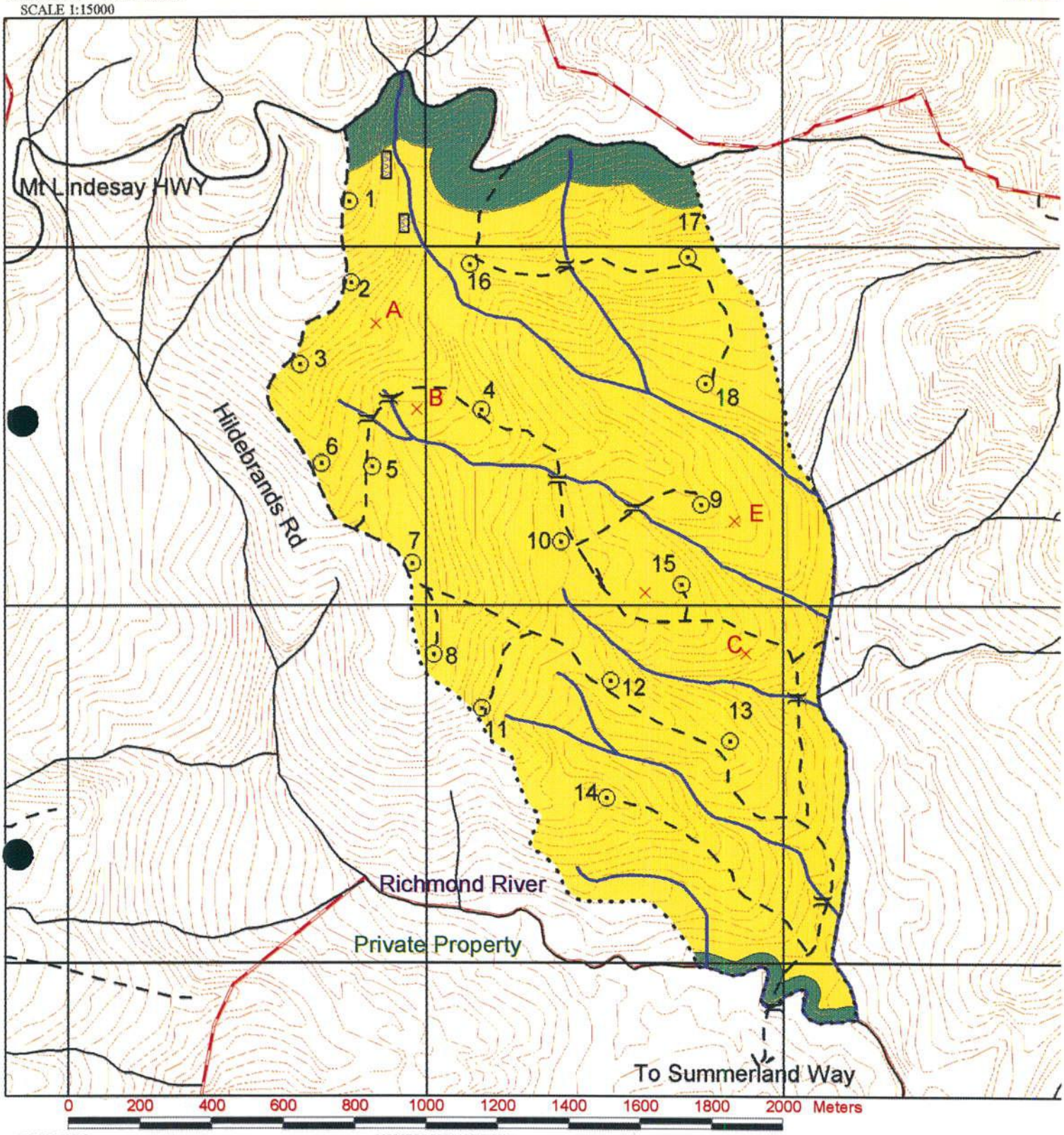

URBENVILLE EIS AREA
NORTHERN REGION
NSW
N
0 1 2 3 4 5 10km
EIS Area Boundary
Highway, Major Road
Drainage
Proposed National Park
State Forest, Timber Reserve
National Park, Nature Reserve
Vacant Crown Land
Leasehold Land
State Forest outside Urbenville MA
Built-Up Area
MAP 1
URBENVILLE MANAGEMENT AREA
LOCALITY MAP
STATE FORESTS
GIS Branch
Copyright October 1995 State Forests of NSW
QUEENSLAND
ROCKY CK NP
PT GAMBUBAL SF
MAIN RANGE NATIONAL PARK
KILLARNEY SF
KILLARNEY
QUEEN MARY FALLS NP
MT BARNEY NATIONAL PARK
DONALDSON SF
MOUNT LINDESAY HIGHWAY
MOUNT CHINGHEE NATIONAL PARK
TAMBOURINE NATIONAL PARK
BORDER RANGES NATIONAL PARK
BALD ENOS STATE FOREST
WOODENBONG STATE FOREST
WOODENBONG
LEGUME STATE FOREST
BEAURY STATE FOREST
PROPOSED TOOLOOM NATIONAL PARK
URBENVILLE
URBENVILLE STATE FOREST
EDINBURGH CASTLE STATE FOREST
LYNUMBAR STATE FOREST
MARYLAND STATE FOREST
MARYLAND RIVER
TOONUMBAR STATE FOREST
PROPOSED TOONUMBAR NATIONAL PARK
WIANGAREE
RICHMOND RANGE STATE FOREST
KYOGLE
YABRA STATE FOREST
OLD BONALBO
BOOKOOKOONARA STATE FOREST
TR 55329
TR140067
TR140066
TENTERFIELD MANAGEMENT AREA
CASINO MANAGEMENT AREA
BONALBO
CLARENCE
GILGURRY STATE FOREST
BOONOO BOONOO NATIONAL PARK
BOOROOK STATE FOREST
Cpt 279

MAP 1-1

NORTHERN REGION - URBENVILLE DISTRICT
HARVEST PLAN OPERATIONAL MAP
COMPARTMENT 279
MOUNT LINDESAY STATE FOREST
HARVEST PLAN NUMBER 96/04

FORESTS

MT LINDESAY MAP SHEET
SCALE 1:15000



BOUNDARIES
- State Forest Boundary
- Compartment Boundaries

ROADS (Proposed in Red)
- Natural Surface
- Sealed or Gravelled

NORMAL PRESCRIPTIONS
- Harvestable Area

MODIFIED PRESCRIPTIONS
- Visual Resource Protect
- Flora and Fauna Protect
- Slopes likely over 30 degrees
- Rainforest

NON HARVEST AREAS
- General

DUMP SITES OR LANDINGS
- Permanent Dry
- Permanent Wet

WATERCOURSES & DRAINAGE
- External Drainage
- Internal Drainage
- Approved Crossings
- Soil sample sites

NORTHERN REGION - URBENVILLE DISTRICT

FOREST TYPES MAP

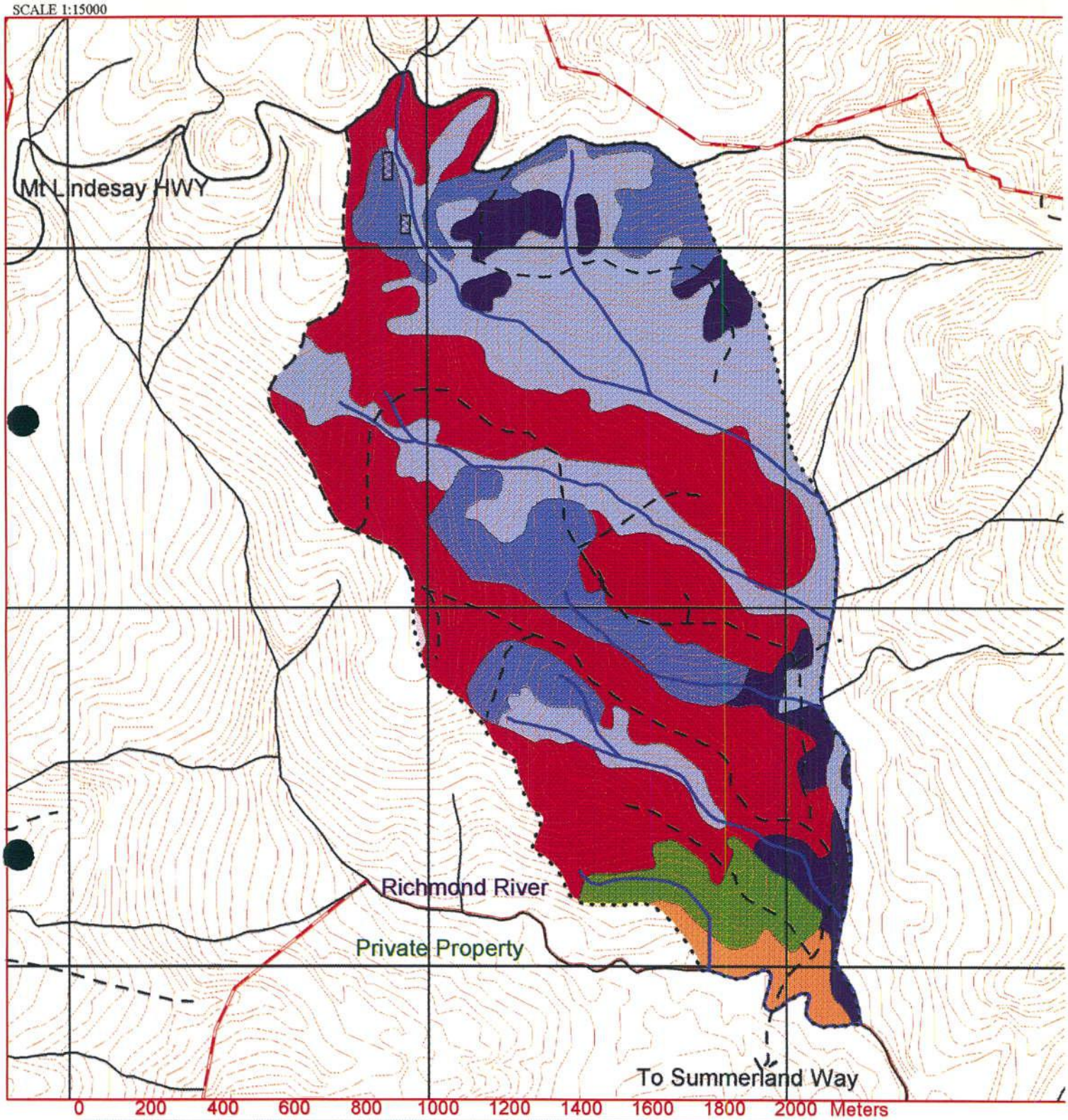
COMPARTMENT 279

MOUNT LINDESAY STATE FOREST

HARVEST PLAN NUMBER 96/04

MT LINDESAY MAP SHEET

SCALE 1:15000



BOUNDARIES

Compartment Boundaries

FOREST TYPES

Sydney Blue Gum

Tallowwood - Sydney Blue Gum

Flooded Gum

Brush Box

FOREST TYPES

Narrowleaved White Mahogany - Red Mahogany - Grey Ironbark - Grey Gum

Forest Red Gum

FOREST TYPES

Rock

HARVESTING PLAN NO. UMA 96/04

Mt Lindesay State Forest No 542 Compartment 279

CONTENTS

Part 2 FOREST MANAGEMENT & ENVIRONMENTAL CONSIDERATIONS

2.1 PHYSICAL FEATURES

Description 1 Physical description of the area

STATE FOREST	Mt Lindesay	DISTRICT	Urbenville
REGION	Northern	COMPARTMENTS	279

The Compartments are bounded by the Mount Lindesay Highway to the North and West, Cpt 281 to the East, and Cpt 277 and private property are to the South. The Queensland border is less than a kilometre from the northern boundary of the Compartments. The Compartment occupies S or WE aspects and falls from a high of 520m ASL on the McPherson Range to a low of 275m ASL. The topography is generally steep. Drainage lines are often very pronounced and feed in a South Easterly direction joining the Richmond River.

Reference Plan Operational Map and Locality Map.

Description 2 Special warning of critical boundaries or non-harvest areas

Boundaries are generally clearly indicated by fence lines and tracks. The boundaries with adjoining compartments will be will be marked with paint prior to harvesting. Temporary boundaries marked with flagging tape.

Due to steep slopes, fauna and riparian protection areas some 11% of the gross area is excluded from harvesting in this cutting cycle.

The 100 metre strip (from the Highway mid-line) along the Mount Lindesay Highway is zoned PMP 1.1.6 Visual. No harvesting is currently permitted in this zone.

The Conservation Protocols for Timber Harvesting on State Forests for the Duration of the IFA decision will be applied to this Plan . The Broad Old Growth Mapping Project (BOGMP) has been used to assess Old Growth and Rainforest B & C .

A small area of old Growth is identified in the NW corner of the compartment . PMP 1.1.6 visual zone excludes this area from logging .

No Rare Non-Commercial Forest Types exist in this compartment. The Threatened Species Protocol will apply to this Plan.

This Plan is classified under the "Regrowth Zone".

2.2 FOREST MANAGEMENT AND SILVICULTURE

Description 3 Area of Plan by Forest Types and vegetation description (hectares)

Compartment 279 Stand condition

Forest Type	85	46	47	48	53	60	62ab	65	234	TOTAL
Unlogged	0	0	0	0	0	0	0	0	0	0
Selectively logged 74/76			35	17	76	108	11	6		253
Net Harvest Area	**0**	**0**	**20**	**16**	**64**	**108**	**11**	**6**	**0**	**225**
Inaccessible/drainage				1	12					13
Visual			15							15
Rainforest										0
Flora & Fauna										0
TOTAL	**0**	**0**	**35**	**17**	**76**	**108**	**11**	**6**	**0**	**253**

Description 4 Broad description of Vegetation

(a) Forest types

The dominant forest types (FT) in the Compartments are Brush Box (FT 53) and Red/white Mahogany (FT 60) with lesser amounts of Tallowwood (FT 47), Flooded Gum (FT 48) and Grey Gum (FT 62ab). These are growing on highly productive sites and grade into the drier mixed eucalypts (FT 60) on the ridges where soils are shallower and evaporation higher. Brush box (Type 53ab) is widespread especially around moister depressions.

(b) Understorey

The understorey of the forest is primarily native grasses over most of the Compartments with some areas also containing Blady Grass. The shrub layer becomes more defined and mesic in nature in some of the FT47 and FT53. Lantana is proloific throughout most of the Compartment.

(c) Ground-cover

Ground cover over the Compartments is well developed and provides a high degree of soil protection. Ground cover becomes a well developed forest litter layer in moister areas.

(d) Rare or endangered species

None were sighted during inspections during planning inspections. A Koala survey was carried out for this Compartment. It was found that 279 is not intermediate/high use area. In Cpt 278 2 km South of Cpt279 there is a recorded observation for a Rose-crowned Fruit Dove. There is a record of the Alberts Lyrebird in Cpt 275 which is on the northern side of the Cpts across the Mount Lindesay Highway.

(e) Rainforest

There are no areas of rainforest in the Compartments although there are large areas of Brush Box which is a species which typically occurs on the fringes of rainforest.

(f) Exotic weeds

Lantana has invaded large areas of the Compartment. Other weeds that were evident included some Cobblers Pegs, Rag Weed and Wild Raspberry.

(g) Regeneration and seral stages

Considerable Eucalypt regeneration is evident especially where disturbance has been high, adjacent to and on dump sites.

Description 5 Forest and crop condition

All of the hardwood areas were logged in 1975-1976 and an average volume of 14 m^3 /Ha was removed. Existing stumps show parts of the Compartments had previously been logged some years before. Areas identified under the old protocol in regard to old growth has been surveyed . Stumps counts will be utilised under the new Conservation Protocols to determine excluded areas .

Description 6 Harvesting Conditions to be determined

(a) Silviculture

The silvicultural prescriptions in the Urbenville Management Plan 1986 and the Silvicultural Workshop notes prepared by the Silviculturist, Forest Planning Branch 1994, should be followed in determining silvicultural conditions.

Harvesting should aim at optimising the production of quota and ex-quota sawlogs, poles, piles and girders. The long term timber production potential will be increased as a result of the harvesting operation. In the Forest Types 46, 47, 47, 53, 60, 65 and 62 selective thinning should promote growth on retained sub-merchantable stems.

This will be achieved by:

1. Removing all mature trees suitable for production of hardwood sawlogs.

2. Retaining sufficient trees to meet habitat requirements.

3. Thinning and spacing of regrowth

4. Enrichment planting of sub-optimally stocked areas.

(b) Fire protection

In addition to silvicultural needs, fuel management of logging debris resulting from the harvesting operations is also needed to ensure that forest areas are adequately protected through reduction of fire fuel hazards. State Forests has to meet its obligations under the Bush Fires Act to ensure that forest fuel levels are kept at strategically low levels to allow effective control of wildfire. Pre-harvesting burning is not required but post-harvesting burning is needed to ensure:

(1) Reduction of flash fuel and log debris levels to an acceptable fuel loading throughout the Compartments to make fire control feasible under worst expected seasonal conditions during the Bush Fire Danger Period;

(2) co-ordination of post-harvest burning with other fuel management burning in accord with the **Urbenville District Fuel Management Plan** 1994;

(3) sufficient post-harvest burning of logging slash to allow regeneration, leaving sufficient unburnt litter and slash in other areas to, minimise potential soil erosion and control water pollution, and maintain wildlife ground-cover requirements with minimal damage to retained trees and sensitive habitat;.

(4) protection of the cattle grazing interests and property of the lessees

Mean monthly rainfall erosivity (**Rm**) does not exceed 500 except in January, and post-harvest burning can be scheduled satisfactorily outside this time.

References

Rosewall C.J. & Turner J. B. *Rainfall Erosivity in New South Wales.* **Technical Handbook No. 11 (1st Edition), Soil Conservation Service of New South Wales**(1992)

Pilgrim D. H. (ed) *Australian Rainfall and Runoff - A guide to flood estimation,* **The Institute of Engineers of Australia,** (1987)

Urbenville Management Plan 1987

Horne. R.H. *Silvicultural Workshop Notes* , **SF NSW Forest Planning Branch** (1994)

Fire Manual **FC NSW** 1992

2.3 FLORA PROTECTION

Description 7 Presence of protected or endangered plant species

See Description 4(d). None present in the area. The rainforest is excluded from harvesting. Readers are referred to the Urbenville Flora Report which is part of the Urbenville Management Area EIS which is now on exhibition.
The Threatened Flora Prescriptions in Section 5.3 of the Conservation Protocols 29th November 1996 will be adhered to if and where they occur.

Description 8 Presence of Rainforest

No type A, B or C Rainforest exists in this compartment . BOGMP was used to determine after consulting with the NP&WS . (Maps are attached)

Reference

Briggs, J.H. and Leigh J.H., *Rare And Threatened Australian Plants* **Special Publication 14, Australian National Parks and Wildlife Service, 1988**

2.4 FAUNA PROTECTION

Description 9 Endangered and protected fauna occurrence

(a) General

The following Schedule 1&2 fauna are known or likely to occur within the Urbenville Management Area.

None were sighted during inspections during planning inspections. A Koala survey was carried out for these Compartments. It was found that this Cpts is not intermediate/high use areas. In Cpt 278 2 km South of Cpt 279 there is a recorded observation for a Rose-crowned Fruit Dove. There is a record of the Alberts Lyrebird in Cpt 275 which is on the northern side of the Cpts across the Mount Lindesay Highway.

Endangered or Vulnerable Species known or likely to occur in Urbenville Management Area.

	COMMON NAME	SCIENTIFIC NAME
V	Koala	*Phascolarctos cinereus*
V	Yellow-bellied Glider	*Petaurus australis*
V	Parma Wallaby	*Macropus parma*
E	Black-Striped Wallaby	*Macropus dorsalis*
V	Tiger Quoll	*Dasyurus maculatus*
V	Brush-tailed Phascogale	*Phascogale tapoatafa*
V	Red-legged Pademelon	*Thylogale stigmatica*
V	Brush tailed Rock Wallaby	*Petrogale pencillata*
V	Rufous Bettong	*Aepyprymnus rufescens*
V	Common Planigale	*Planigale maculata*
V	Long-nosed Potoroo	*Potorous tridactylus*
V	Great Pipistrelle	*Falsistellus tasmaniensis*
V	Eastern Little Mastiff Bat	*Mormopterus norfolkensis*
V	Beccari's Mastiff Bat	*Mormopterus beccarii*
V	Golden-tipped Bat	*Kerivoula papuensis*
V	Large Footed Mouse-eared Bat	*Myotis adversus*
V	Queensland Long-eared Bat	*Nyctophilus bifax*
V	Common Bent-wing Bat	*Miniopterus schreibersii*
V	Glossy Black Cockatoo	*Calyptorhynchus lathami*
V	Red-tailed Black Cockatoo	*Calyptorhynchus magnificus*
E	Red Goshawk	*Erythrotriorchis radiatus*
V	Wompoo Fruit Dove	*Ptilinopus magnificus*
V	Superb Fruit Dove	*Ptilinopus superbus*
V	Rose-crowned Fruit Dove	*Ptilinopus regina*
V	Barred or Yellow-eyed Cuckoo Shrike	*Coracina lineata*
V	Albert's Lyrebird	*Menura alberti*
V	Powerful Owl	*Ninox strenua*
V	Sooty Owl	*Tyto tenebricosa*
V	Masked Owl	*Tyto novaehollandiae*
V	Marbled Frogmouth	*Podargus ocellatus plumiferus*
E	Black-breasted Button Quail	*Turnix melanogaster*
V	White-eared Monarch	*Monarcha leucotis*
V	Loveridge's Frog	*Philoria loveridgei*
V	Giant Barred Frog	*Mixophyes iteratus*
V	Stuttering Frog	*Mixophyes balbus*
V	Fleay's Barred River Frog	*Mixophyes fleayi*
V	Fossirial Skink	*Coeranoscincus reticularis*
V	Stephen's Banded Snake	*Hoplocephalus stephensii*
V	White-crowned Snake	*Cacophis harriettae*
V	Little Bent-wing Bat	*Miniopterus australis*
V	Greater Broad-nosed Bat	*Scoteanax* or *Nycticeius rueppellii*
E	Double-eyed Fig Parrot	*Psittaculirostris diopthalma coxenii*
V	Green Thighed Frog	*Litoria brevipalmata*
V	Squirrel Glider	*Petaurus norfolcensis*

Fauna species that are known or likely to occur in the subject area are documented in the Urbenville Management Plan and more recently in the Urbenville EIS which was placed on exhibition in December 1995 . In respect of Protected species (not listed in Schedule 12 of the NPWS Act), the selective logging operation is not expected to impact in any significant way on their habitat or population status in the locality.

The Faunal Impact Statement associated with the Urbenville EIS which was prepared by the Australian Museum was also placed on exhibition in December 1995 and a copy is held by the NPWS.

Fauna protection measures include adoption of other non-harvest areas such as steep areas (slopes generally over 30°) as contributing to wildlife habitat because of minimal disturbance. These inaccessible areas within the Compartments forms a large contiguous area that will be undisturbed by harvesting and therefore constitute an important conservation resource.

It is also necessary to report and record confirmed sightings of Schedule 1&2 species to the NPWS through the appropriate channels.

(b) Tree Retention

(i) Hollow-bearing tree retention

a) A minimum of ten hollow-bearing tree must be retained per two hectares. Where this density is not availabel , ten trees must be selected from trees with diameters within the largest 30% of the stand.
b) Retained , hollow-bearing trees must be selected from trees with diameters within the largest 30% of the stand and be live trees with good crown development.
c) Retained hollow-bearing trees should represent the range of species that occurs in the area.
d) Trees retained outside the net logging area must not be counted as hollow-bearing trees.
e) Hollow-bearing trees must be scattered throughout the net logging area.
f) Hollow-bearing trees must be be marked for retention.

(ii) Recruitment tree retention

a) A minimum of ten recruitment trees must be retained per two hectares.
b) Retained recruitment trees must show potential for developing into hollw-bearing trees with good crown development. Trees in the mature and intermediate growth stages should be retained as recruiment trees.
c) Retained recruitment trees should represent the range of species that occurs in the area.
d) Trees retained outside the net logging area must not be counted as recruitment trees.
e) Recruitment trees must be scattered throughout the net logging area.
f) Recruitment trees must be be marked for retention.

(iii) "Regrowth zone" habitat and recruitment tree retention.

a) This compartment is within the "regrowth zone ".
b) Within that area (i) & (ii) above must be applied if there are sufficient existing hollow bearing trees available.
c) Where there are not sufficient hollow bearing trees available tp comlpy with section 2.4b(i) (a) above , then those hollow bearing trees present must be retained.
d) For each hollow bearing tree retained in 2.4(iii))c) above, a recruitment tree as defined in 2.4 b (ii) must be retained.
e) In the "regrowth zone " where there are less than 10 hollow bearing trees per two hectares, there is no requirement to retain additional trees as otherwise required in section 2.4(i)(a).

(iv) Protection of hollow bearing trees, recruitment trees and dead stags

a) Specified forestry activities and post-logging burning must aim to minimise damage to hollow-bearing trees, recruitment trees and dead stags. The potential for damage should be minimised by techniques of dircetional felling . Felled heads must be flattened or removed from 5m of stems retained to meet this condition.

(v) Dead stag retention

a) Dead stags must be retained in areas outside the net harvesting area , visual protection strips , and elsewhere where it is safe to do so.
b) Dead stags must not be counted as hollow-bearing trees or recruitment trees.

(c) Connection corridors

a) Each 500 ha of State forest must include a minimum of two connection corridors at least 40 m wide (connecting third order streams) , which establish links between different drainage systems. the option is to be chosen by SFNSW. These connection corridors should not be cut by roads if possible.
b) Specified forestry activities must not be xecluded from connection corridaors , with the exception of road construction and road maintenance where thereis no other practical means of access.
c) All practical precautions should be taken to avoid feeling trees into these corridors.
d) These connection corridors must be mapped and clearly recorded in Harvesting Plans.

(d) Riparian Buffers

a) Riparian buffers must be at least 10 m on each side of all first order streams, and at least 20m wide on each of all second order streams. For at least 80% of third and higher order streams , riparian buffers must be at least 40m wide on each side of the stream. the remaining 20% will have a buffer of 20m or greater on each side.
b) A first order stream is defined as that part of a stream between its point of origin anf the first junction with another stream, whereupon it becomes a seocnd or higher order stream. A third order stream commences at the junction of two second order streams.
c) These buffers must be mapped and clearly recorded in Harvesting plans.
d) Specified forestry activities , with the exception of road construction and road maintenance where there is no other practical means of access , must be excluded from riparian buffers . Where threatened species occur in riparian buffers , road construction and road maintenance should avoid areas where they occur.
e) all practical precautions should be taken to avoid felling trees into these riparian buffer zones.

(e) Preservation of Critical Weight Range Species

SFNSW are to ensure to he fullest extent practicable that any post-logging burning is carried out in such a manner that encroachment into critical habitat for those species listed below is prevented. This can be achieved by carrying out post-logging burning under weather and fuel conditions which minimise the chances of encroachment into critical habitat and minimise the destruction of large fallen logs (i.e. those logs with a diameter greater than 40cm).

Critical Weight Range species are those small to medium-sized mammals as defined in the Conservation Protocol 29th November 1996, which are threatened by predation or competition from feral carnivores. An example of this type of species is the Tiger Quoll which has a critical habitat defined as moist gullies, wet sclerophyll, rainforest and fallen logs with a diameter greater than 40cm.

(f) Frugivores

These species are the wompoo fruit-dove, superb fruit-dove, rose-crowned fruit-dove and the yellow-eyed cuckoo-shrike.

Within coastal forests below 400 metres asl, all precautions shall be undertaken to protect mature rainforest trees (including native laurels, figs and palms) within 100 metres from either side of gully lines which adjoin forest types 47, 48 and 53 exhibiting a well developed rainforest understorey. Prescribed burning shall be conducted, to the fullest extent practicable, in such a way and under fuel and weather conditions that ensure its encroachment into these areas is minimal.

(g) Significant Food Resources

a) Stands where *Allocasuarina* spp. dominate tha canopy should be protected from specified forestry activities. Where more than 30 crushed cones have been found beneath individuals of *Allocasuarina* spp. , indicating intensive use by the Glossy Black Cockatoo , the tree must be protected.

b) At least 4 mature (>40cm dbh) winter-flowering ecucalypt species per two hectares must be retained where they occur. Where retained hollow-bearing or recruitment trees meet these requirements , the hollow-bearing and recruitment trees can be counted as food trees.

c) Damage to mature banksias and *Xanthorrhoea* spp. should be avoided during forestry operations.

d) All trees with "V-notch" incisions or other incisions made by Yellow-bellied Glider must be retained . Where retained hollow-bearing or recruitment trees meet these requirments , the hollow-bearing and recruitment trees can be counted as food trees.

e) Specified forestry activities and post-logging burning must aim to minimise damage to retained food trees . the potential for damage should be minimised by techniques of directional felling. Felled heads must be flattened or removed from 5m of stems retained to meet this condition.

h) Wetlands

a) Wetlands are defined as areas that for ashallow waterbody when inundated cyclically , intermittently or permanently with fresh , brackish or salt water , and where the inumdation determines the type and productivity of the soils and the palnt and animals communities.

b) A buffer zone at least 10 m wide must be established around all wetlands and swamps more than 0.1 ha and less than 0.5 ha surface area.

c) A buffer zone at least 40m wide must be established around all wetlands and swamps greater than 0.5 ha surface area and all SEPP 14 wetlands.

d) The buffer zone must be measured from the outer edge of the vegetation communities dominated by wetland species.

e) Specified forestry activities must be excluded from wetlands and their buffers. All precautions should be taken to avoid felling trees into this zone.

f) Wetlands and wetland buffers must be mapped recorded in Harvesting Plans.

(I) Rocky Outcrops

a) Rocky outcrops are defined as areas characterised by high proportion of exposed rock or boulders relative too the surrounding area, or , areas with skeletal soils, supporting heath or shrub communities (sometimes with occasional emergnet trees). These sites can occur where the geology varies from the surrounding area (eg. rhyolite outcrops).

b) A buffer zone at least 20m wide must be established around all rocky outcrops more than 0.1 ha and less than 0.5 ha surface area.

c) A buffer zone at least 40m wide must be established around all rocky outcrops greater than 0.5 ha surface area.

d) Specified forestry activities must be excluded from within the buffer. All precautions should be taken to avoid felling trees into this zone.

e) Rocky outcrops must be mapped and clearly recorded in Harvesting Plans

Description 11 Species and habitat description

The following is a list of Schedule 1&2 species (Vulnerable, rare and threatened species) known or likely to be found in the Compartments, and considered to have a range of sensitivities to logging as summarised on page 373 of the Urbenville Fauna Impact Statement. Sighting of any of the listed species should be reported directly to Urbenville Forestry Office. The procedure to be adopted upon identification is defined for each species although some specific protocols have yet to be agreed.

(1) **Koala** - *Phascolarctos cinereus*

24/4/96 A Koala survey was undertaken by Mr. Paul Flower to the new Koala prescription agreed between NPWS and State Forests and outlined in OC 96/3. Results of the survey indicate that the Cpt is not intermediate/high use areas.

Koalas have been recorded in many locations in the Management Area. Where a Koala or recent evidence of a Koala is located the tree shall be retained together with all other trees within a 100 metre radius of the location subject to further survey. Recent evidence of Koala activity is indicated by the presence of dung pellets beneath trees being used by Koalas or by characteristic claw mark scratchings on the trunks of trees used by Koalas. The survey procedure to be adopted is as follows:

(a) The extent of habitat use and preferred food trees within the 100m radius shall be assessed using the modified asterisk technique. Paragraph (b), (c) & (d) below will then apply as appropriate to the outcome of the assessment.

(b) If no further evidence of regular Koala activity is found, forestry operations may resume but a minimum of 5 Koala food trees must be retained within the 100m radius area. If Koala was recorded in a preferred food tree that tree must be included among the retained trees.

(c) If regular Koala activity is detected but less than 20% of trees examined have Koala faecal pellets underneath and no further Koalas are observed, limited forestry operations may resume under the following conditions:

(i) trees with evidence of regular Koala activity shall be retained.

(ii) a minimum of 15 Koala food trees per hectare shall be retained within the 100m radius area.

(iii) if the density of Koala food trees per hectare does not permit the above specified number of trees to be retained, all existing Koala food trees will be retained.

(d) If regular Koala activity is detected and more than one koala is observed or more than 20% of trees examined have Koala faecal pellets underneath, forestry operations including post harvest and hazard reduction burning shall be excluded from the 100m radius area and the Director General of National Parks notified.

The definition of Koala food trees for these purposes are trees with leafy broad crowns and representing the range of sizes greater than 40cm dbh and be selected with preference to Tallowwood, Small-fruited Grey Gum, Grey Gum, Large fruited Grey Gum, Forest Red Gum, Sydney Blue Gum, and White Mahogany. If these species are not present in adequate numbers, food trees should be selected from the following species - Blackbutt, Flooded Gum, and Red Mahogany. Koala food trees may be counted as habitat trees or habitat recruitment trees for the purposes of other conditions.

(2) **Yellow-Bellied Glider** - *Petaurus australis*

Have been recorded in several locations in the Management Area. There have been no sightings of a Yellow Bellied Glider in Cpts 276 & 279. Where a Glider feed tree with V-notch markings is located, a 100 metre radius shall be retained around the tree, with the following procedures to be implemented:

- an inspection shall be undertaken in the vicinity of any Yellow-bellied Glider record or where there is evidence of Yellow-Bellied Gliders to determine the tree with the most active V-notch markings or other incisions made by Yellow-bellied Gliders;
- this tree shall then become the centre of the 100 metre radius; all trees with V-notch markings shall be retained;
- a minimum of 30 trees (>10 cm dbh) of the feed tree species shall be retained within the 100 metre radius;
- a minimum of 15 mature gum bark trees, with their bark shedding in long strips, shall be retained within the 100 metre radius. Examples of relevant bark shedding species include Flooded Gum, Blue Gum, Grey Gum, Forest Red Gum, and White Gum groups;
- where the density of these tree species does not permit the above specified number of trees to be retained, all existing species appropriate to the above shall be retained.
- If there is more than one V-notch tree within the 100 metre radius the additional V-notched trees can be counted in those feed trees to be retained.

(3) **Parma Wallaby** - *Macropus parma*

The optimum habitat for the Parma Wallaby is wet sclerophyll forest with a thick, shrubby understorey associated with grassy patches. The Parma Wallaby was thought to be extinct in the 19th Century but is now known to be secure in parts of the Great Dividing Range. The retention of vegetation on steep slopes and the abundance and proximity of suitable habitat in surrounding areas should mitigate against impacts to this species. Retention of areas of dense vegetation along water courses will provide habitat continuity if the animal exists in this harvesting area.

(4) **Black-Striped Wallaby** - *Macropus dorsalis*

The preferred habitat for this wallaby is forest with dense shrub layers, including rainforest margins. Care shall be taken to minimise snig track disturbance to the understorey, particularly adjacent to any cleared grassy areas where it may feed.

If during the tree marking or logging operations Black-striped Wallabies are observed, logging is not to start or recommence until a survey is undertaken to determine the extent of the population within the logging area.

(5) **Tiger Quoll** - *Dasyurus maculatus*

The Tiger Quoll has been widely recorded in the Management Area, as well as the north eastern part of the State, in some cases (eg. Dorrigo District) becoming a common inhabitant around camp sites. It uses logs and tree hollows for nesting. Prescriptions for the retention of filter strips and protection strips, no logging in rainforest and minimisation of disturbance to fallen logs and ground cover are to be adhered to.

(6) **Brush-tailed Phascogale** - *Phascogale tapoatafa*

Known to inhabit a range of forest types. It uses small tree hollows for nesting, feeding in the canopy and ground vegetation. Has been found in numerous locations in the Management Area. Adherence to prescriptions for the retention of habitat trees will mitigate against loss of habitat.

(7) **Red-legged Pademelon** - *Thylogale stigmatica*
Inhabits rainforest to moist sclerophyll forest, and is thought to prefer gully forest, feeding mostly on leaves and berries. The Urbenville FIS summarises the species sensitivity to logging as "low". Exclusion of logging from rainforest, as well as filter and protection strip prescriptions will mitigate against any impact on this species.

(8) **Brush tailed Rock Wallaby** - *Petrogale penicillata*
Inhabits cliffs, steep stony hills, and escarpments in dry forest types. Core habitat area will not be affected due to the steep and rocky nature of the terrain preferred as habitat. Regeneration of the shrub layer following logging disturbance may be beneficial for the food sources of this species.

(9) **Rufous Bettong** - *Aepyprymnus rufescens*
A common (Strahan 1983) Rat-kangaroo with a head and body length of 380 mm and tail length of 360 mm. Distinguishable from other macropods of comparable size by reddish-brown fur and hairy muzzle. Watch for nests in shallow excavations at the base of tussocks. Habitat thought to be encouraged by not burning long grass.

(10) **Common Planigale** - *Planigale maculata*
Occupies a wide variety of habitats, including Rainforest and Sclerophyll forests, sheltering under rocks, logs and utilising burrows. Given its very wide ecological range it is not expected that the operation will have a significant effect on the species. Retention of filter strips and protection strips, no logging in rainforest and minimisation of disturbance to fallen logs and ground cover will mitigate against loss of habitat.

(11) **Long-nosed Potaroo** - *Potorous tridactylus*
A major habitat requirement of the long nosed Potoroo is relatively thick ground cover with light sandy soils. It digs small holes in the ground and eats roots, tubers, fungi, insects and soft bodied animals in the soil. It is recognisable by its long tapering nose.

(12) **Great Pipistrelle** - *Falsistellus tasmaniensis*
A large insectivorous bat occurring in both wet and dry sclerophyll forest, using tree hollows (and caves and buildings) for roosts. Tree retention and filter strip/protection strip prescriptions shall be adhered to.

(13) **Eastern Little Mastiff Bat** - *Mormopterus norfolkensis*
Beccari's Mastiff Bat - *Mormopterus beccarii*
Neither of these bats have been recorded in the immediate area, the former having been recorded in the Dome Mountain area (30 km SW), although they are known to inhabit similar forest on the north coast. Both have requirements for hollows, and adherence to the tree retention and the Wildlife Corridor will mitigate against loss of habitat.

(14) **Greater Broad-nosed Bat** - *Nycticeius rueppellii*
Has not been recorded in the immediate locality, although there are records for dry hardwood forests in the District. It utilises hollows for roosting and is known to favour watercourses and wet gullies for foraging for insects. Adherence to the tree retention and filter strip prescriptions will help mitigate against disturbance to its habitat and food sources.

(15) **Golden-tipped Bat** - *Kerivoula papuensis*
The habitat of this bat ranges from eucalypt to sub-tropical rainforest, and it has been found in Beaury State Forest. Exclusion of logging from rainforest will be beneficial. Adherence to filter/protection strip and tree retention prescriptions are important.

(16) Large Footed Myotis - *Myotis adversus*
Usually found in caves, buildings and under bridges, but occasionally roosting in dense foliage. They use nearby permanent water bodies for feeding. Adherence to prescriptions for rainforest, tree retention and filter and protection strips and the provision of the Flora and Fauna and Visual Protection strips are important mitigative measures.

(17) Queensland Long-eared Bat - *Nyctophilus bifax*
Has not been recorded in the Urbenville Management Area and generally occurs North of the tropic of Capricorn in a range of habitats. Nests in hollow trees.
If the bat exists in the harvest area the species will be protected by habitat tree prescriptions, and the system of undisturbed retained vegetation along drainage lines.

(18) Glossy Black Cockatoo - *Calyptorhynchus lathami*
This bird nests in tree hollows and feeds almost exclusively on Casuarina. All practical attempts shall be made to minimise disturbance to mature seeding forest oaks throughout the logging area. On location of a nest tree the NPWS Forest Conservation Unit Manager is to be informed and logging in the immediate area (within a 100 metre radius) is to cease pending delineation of an appropriate buffer by a joint NPWS/SFNSW inspection.

(19) Red-tailed Black Cockatoo - *Calyptorhynchus magnificus*
Found in a variety of habitats, from coastal forests to the arid woodlands. Nests in large hollows, feeding on seeds of eucalypts, grasses and casuarinas. Covers a very large area, and is unlikely to require the Urbenville forests for critical habitat. Adherence to tree retention prescriptions is important, as well as retention of at least three surrounding buffer trees if a nest tree is identified. All practical attempts shall be made to minimise disturbance to mature seeding forest oak throughout the logging area.

(20) Red Goshawk - *Erythrotriorchis radiatus*
Not recorded for the District and is thought to be extremely rare. Any nest sites should be reported to a forest officer and a buffer of 250 metre radius immediately placed around the tree pending confirmation of the sighting.

(21) Wompoo Fruit Dove - *Ptilinopus magnificus*
Has been widely recorded throughout the District and there has been a positive sighting of the Wompoo Fruit Dove in a FIS survey site in Cpt. 140 (464250E 6846050N) 20 km SE. This bird has low sensitivity to logging and will not be impacted upon by the operation as its principal habitat is rainforest. These forests are above 400 ASL.

(22) Superb Fruit Dove - *Ptilinopus superbus*
A relatively common inhabitant of rainforests, and is known to forage in eucalypt forest. This bird has low sensitivity to logging and will not be impacted upon by the operation. These forests are above 400 ASL.

(23) Rose-Crowned Fruit Dove - *Ptilinopus regina*
Common red-crowned pigeon. Inhabits rainforest, wet sclerophyll forests and occasionally open forests.. This bird has low sensitivity to logging and will not be impacted upon by the operation as its principal habitat is rainforest. These forests are above 400 ASL.. Given this species preferred habitat in rainforest the operation is unlikely to impact on the species. It has been reported for Cpt 278.

(24) Barred or Yellow-eyed Cuckoo Shrike - *Coracina lineata*
A dark grey bird with yellow eyes and boldly barred abdomen. Preferred habitat is open forest and rainforest particularly where there are native figs and fruit.

(25) **Alberts Lyrebird** - *Menura alberti*
Has been recorded in several areas of the District. Because of its preferred habitat of viney scrub/rainforest the mitigative prescriptions in this Plan in respect of protection of rainforest will protect its habitat.

(26) **Powerful Owl** - *Ninox strenua*
Sooty Owl - *Tyto tenebricosa*
Masked Owl - *Tyto novaehollandiae*

These owls have a wide ranging habitat in NSW, distributed throughout the Great Dividing Range as well as the coastal and escarpment forests. However, despite this wide range they are listed as rare

Prescriptions relating to tree retention, filter and protection strips, and in the case of the Sooty and Masked Owls retention of rainforest, are to be adhered to. Nesting or roost sites, if located, are to be preserved together with application of the Protocol detailed in the FIS and EIS. The location is to be immediately reported to the Foreman or Forester.

(27) **Marbled Frogmouth** - *Podargus ocellatus plumiferus*
This bird has been recorded in Yabbra and Toonumbar State Forests. In general, as a rainforest inhabitant, it's habitat will be protected through adherence to the prescriptions excluding logging from rainforest. Meggs (1993) in a study of the species found (with one exception) no individuals greater than 50 metres from flowing water and therefore standard drainage line protection aids in the health of the species in moist hardwood forest.

(28) **Black-breasted Button Quail** - *Turnix melanogaster*
Supervising Foreman and logging contractors have been informed of how to identify Black-breasted Button Quail, their nesting characteristics and their feed scrapings. If any of these are observed during marking or harvesting the National Parks & Wildlife Services Northern Regional Manager is to be informed. Operations within 250 metres of this location are to cease until the level and extent of Black-breasted Button Quail is assessed. A common habitat is reported to be on the fringe between tall moist forest and lantana thicket, although none have ever been confirmed in the Management Area.

(29) **White-eared Monarch** - *Monarcha leucotis*
Has been recorded Yabbra State Forest some 20 km SSW of the Compartments. Requires canopy, preferably dense foliage for nesting, and in these types of forests it is most likely to occupy the ecotone area between hardwood and rainforest. Adherence to tree retention prescriptions, and no logging of rainforest will mitigate against significant disturbance to its habitat.

(30) **Loveridge's Frog** - *Philonia loveridgei*
Boggy seepage areas may indicate preferred habitat for this frog. Avoidance of ground disturbance in such areas and adherence to filter and protection strip provisions as well as the creek corridor will minimise the disturbance to habitat.

(31) **Barred Frog** - *Mixophyes iteratus*
Stuttering Frog - *Mixophyes balbus*
Neither of these frogs have been recorded in the Management Area. They are terrestrial inhabitants of rainforest and wet sclerophyll forest, requiring water for breeding. Adherence to prescriptions excluding logging from rainforest and the Flora and Fauna and Visual Protection strips and prescriptions for filter and protection strips are important.

(32) Fleay's Barred River Frog - *Mixophyes fleayi*

This frog has been recorded in Yabbra SF some 20 km SSW. The filter and protection strip prescriptions are to be strictly adhered to in order to protect habitat and water quality, and truck roads shall only cross such gullies in the designated locations.

(33) **Fossirial Skink** - *Coeranoscincus reticulatus*
An inhabitant mainly of rainforests and sometimes moist hardwood, living under leaf litter and rotting logs. This species has been sighted approximately 10 km (in Cpt 130) to the S of the Compartments. Adherence to tree retention, filter and protection strip prescriptions, and excluding logging from rainforest will assist in reducing habitat loss.

(34) **Stephen's Banded Snake** - *Hoplocephalus stephensii*
There are three records of this snake in Yabbra State Forest some 13 km to the S of the Compartments. It is a nocturnal partly arboreal snake known to shelter in tree hollows. Tree retention prescriptions, exclusion of logging from rainforest and prescriptions for filter and protection strips are important.

(35) **White-crowned Snake** - *Cacophis harriettae*
A secretive nocturnal dark grey snake to 40 cm long that has a yellowish band at least partially circling the top of its head between the eyes (Cogger 1975 p636). Shelters in leaf litter and fallen timber. Venomous but not dangerous. Eats small lizards.

(36) **Little Bent-wing Bat** - *Minopterus australis*
This species occurs over a range of well timbered habitats where it occupies tunnels and caves during the day (often in association with the Common Bent-wing Bat) and at night forages for small insects beneath the forest canopy. Prescriptions for tree retention, filter/protection strips and other areas excluded from logging are mitigative measures.

Fauna surveys for those threatened species requiring spcies-specific prescriptions according to section 5.2 of the Conservation Protocols , must be conducted in known or potential threatened fauna habitat in the net logging area and within 50m of the boundary of the net logging area.
The survey methodologies conducted to fulfil the conditions of the Protocol must be those approved by the NP&WS, in consultation with SFNSW. the results of all surveys must be provided to the NP&WS within 30 days of the informtion being collected.

Notwithstanding any of the above conditions, SFNSW may carry out activities necessary for its compliance with the provision of the *Bushfires act 1949*.

The Threatened Fauna Prescriptions outlined in section 5.2 of the Conservation Protocols 29th November 1996 will be applied in this Harvesting Plan . At the time of issuing licences , the NP&WS must consult with SFNSW and ensure that the licence conditions reflect the intent of those protocols.

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2.5 SOIL EROSION AND WATER POLLUTION CONTROL

Description 11 Site soil and water data and other information

(a) **Location** See Map

(b) **Climate**

Rainfall **Average annual rainfall** **1400 mm**
Average rainfall erosivity $R = 89.31 \times 7.3^{1.74} = 2838$

Monthly rainfall erosivity

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
539	482	341	114	57	85	57	57	170	199	312	426

Average annual rainfall for Urbenville (18 km SW of the Compartments) is 1082 mm p.a. with a summer rainfall pattern common to the North Coast and Northern Tablelands. There is an average of 130 raindays per year. Average annual rainfall in the Management Area varies from 1400mm in the Richmond catchment to less than 1000mm in the Western Clarence Catchment sector of the area. The rainfall isohyet map (App. 2a UMP) indicates rainfall in Cpt 279 of approximately 1400 mm/pa. January-March are the wettest months and May-August the driest. Based on 12 hour duration (ARR) the 2 year Recurrence Interval Intensity is estimated as **7.3 mm/hr** from design rainfall isopleths (ref. below). The heaviest rainfall events are known to occur in January and February and this accounts for 36% of annual rainfall in zone 2.

Temperature
Urbenville (18 km SW of the Compartments) is characterised by maxima temperatures ranging from 17° to 29° (July to January) and minima temperatures ranging from 3°to 16°. This combination of reasonably frost free conditions and good ambient temperatures during the wetter periods of the year facilitate the good continuous growth of ground-cover and an expectation of full recovery from disturbance on most sites.

Generally weather conditions will allow harvesting operations to continue throughout the year subject to normal wet weather restrictions. Occasionally operations may be stopped altogether by periods of high rainfall which are likely to occur in January to March..

References Design Rainfall Isopleths of Northern Region. **State Forests of NSW. GIS Branch** 1993.

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UMA Urbenville Management Plan. **State Forests of NSW.**

(c) Geology

The Compartments are located on the Walloon Coal Measures and Marburg Sandstone beds. The Walloon Coal Measures contain sandstone, siltstone and mudstone of middle Jurassic origin.

Bedding planes

There are no obvious bedding and fracture planes in the area. Similarly this geology is now very stable with no porous rocks or other strata overlying impermeable layers. The geology of the area presents no problems in relation to road maintenance or upgrading.

References 1:250,000 Geological Survey (Map & Commentary) Warwick Sheet.
NSW Dept Minerals & Energy 1972

(d) Soils

Soil Landscape Map		Soils Report Urbenville E.I.S. 1993 Unit C and Unit D occur in the Cpts.
Map scale		1:125000
Map source		Veness & Associates 1993 (for reference purposes only)
Soil types		
Texture class	A horizon	CL
	B horizon	MC
Method of determination		Field Texture
Comment:		Determined at sample sites by qualified soil scientist
K value	A horizon	.060
	B horizon	.060
Method of determination		From field texture
Comment:		Adopt 0.06 as the max K value found
% Clay	A horizon	
	B horizon	
Method of determination		
Comment:		
EAT class	A horizon	Commonly 8. Not dispersive (10 samples from positions shown)
	B horizon	Commonly 8.Not dispersive. (10 samples from positions shown)
Method of determination		D2 and D3
Comment:		Conducted by qualified soil scientist but not under laboratory conditions.
Dispersion %	A horizon	
	B horizon	
Method of determination:		
Comment:		Not dispersible

Depth to subsoils and bedrock
Topsoil depth: 0-30 cm. Depth to bedrock: 40+ cm
Field survey through observation of road batters and from the soil samples showed the predominant depth of the topsoil to be 10-20 cm.

Inherent fertility
Whilst theses soils are of low to moderate fertility, the predominantly SE aspect is the major factor effecting vegetative growth. Ground cover establishment will be rapid on moister Eastern and Southern slopes, and particularly dependent on the soil moisture regime following harvesting on the Northern and Western aspects. Post harvest establishment of 70% ground-cover is expected within 12 months

Existing erosion
No areas of active or accelerated erosion were evident.

Reference
Charman, P.E.V. and Murphy, B.E." Soils - Their Properties and Management", Sydney University Press.

Qualified soil scientist
David Morand B.Sc.(Hons. soils) LaWC Casino performed dispersibility tests on 10 topsoil and 10 subsoil samples (5 per compartment) on samples supplied to him by the Marketing Forester Urbenville. Soil samples locations are marked on the Harvesting Plan map. They were collected from a range of terrain positions during the harvest preplanning phase.

(e) Landform

Slope
Slopes are generally waxing from the ridge tops down to the limits of the net harvest area in the drainage systems. Initial slopes from the ridgeline or peaks are generally steep (25° to 30°+). This gives way to more gentle slopes which are 10- 20° except where they fall into drainage lines. Areas over 30° are excluded from the net harvestable area and are primarily located in the NE corner of Compartment 279.

Terrain
The net harvestable area of the Compartments covers upper-ridgelines down to lower slopes. The area is dominated by the McPherson Range on which the Cpts occur on the southern slopes.

Drainage line condition
Drainage lines are well defined, and appear stable.

Aspect
The general aspect of the Compartments is South East with other areas such as the slopes around gullies taking their own small localised aspects within the general trend.

Rockiness
The Compartments have only a small amount of rock which is both exposed to the surface and through the soil profile. Exposed rock occurs particularly on the upper steep slopes and in areas of lower site quality.

(f) Hydrology

The Compartments are in the Upper Richmond River Catchment and contain the source of the main tributary of the Richmond River. Compartment 279 drain in SE direction into Richmond River which is fed by a system of unnamed gullies and drainage lines. Drainage lines initiate as drainage depressions from the main ridgelines and upper slopes. Water was not present in drainage lines at the time of inspection but was found in the Richmond River near the SE boundaries of the Cpts. No prescribed streams (other than the Richmond River), swamps or wetlands are found within the net harvest area. The area is not within 100 metres of a water storage.

Representative water quality monitoring site
Yet to be determined

Reference Forest Planning Branch *Water quality monitoring program* SF NSW 1994

Previous harvesting and proposed harvesting
Both Compartments were harvested in 1975-76 with the exception of the steep areas.. It is proposed that the Compartments be harvested for quota logs , poles, girders and small logs with the aim of silviculturally treating the area to promote growing stock and ensure adequate regeneration. Low impact operations such as small poles and fence post cutting may be used to thin and space superior growing stock in conjunction with the main operation, if the stand structure in specific areas is found to warrant such treatment.

Upstream catchment water use
Forestry. These compartments are at the top of the catchment.

Downstream catchment water use
Forestry and grazing. This area is not within 100 m of a water storage.

Domestic water use
While many people use the water from these streams for domestic water supplies, human consumption is typically based on rainwater.

(g) Vegetation and ground-cover

Effect on ground-cover during Operations

Harvesting operations are expected to have the potential to temporarily remove less than 40% overall ground-cover and post-harvest burning slash disposal will only remove a further 10%. Ground-cover currently comprises 68% live ground cover, 30% forest litter and 2% natural cover provided by surface rock and stone. Present surface litter in Compartment 279 is estimated at 5-10 tonnes per hectare.
Harvest practices will aim at overall retention of 50% of ground-cover immediately after harvesting, and retention of 40% ground-cover after post-harvest burning.

Recovery time

Live ground-cover recovery of grasses, shrubs and tree seedlings would be expected within 12 months over 90% of the area under normal seasonal rainfall conditions.

(h) Proposed operation system [See Condition 4. 7(b)]

Use of existing roads

Log haulage will be either N and W to the Mt Lindesay Highway or SE to the Summerland Way. Logs will travel short distances along Hildebrands Road which acts as a feeder road to the bitumened Highways. Trucks carrying poles, piles logs and girders will travel to Woodenbong and Urbenville via these Highways. A small number of truck movements will take poles and durable girders to Coffs Harbour via the Summerland Way and Pacific Highways. All these roads are permanently maintained roads and will require no upgrading or major maintenance. Only existing tracks and roads will be used. Understorey vegetation will be required to be cleared along some of the tracks.

Dumps 1, 2, 3, 6, 7, 12 and 13 are located on ridges beside Hildebrands Road as it runs from the Mt Lindesay Highway to the SE Cpt boundary and therefore have access to a stable road. Hilderbrands road is a natural earth construction vegetated with grasses , weeds and litter . The average grade of this road is 7 degrees with two steeper portions 10-12 degrees near dumps 1 & 2. All batters are vegetated and stable with the maximum height 1.5 metres extending for no greater than 50 metres. Existing drainage consists of mitre drains with roll-over constructions . There is an approved crossing at the lower end of Hildebrands road as an existing log bridge crossing that is in a stable condition. Dumps 8 and 11 have earth tracks from Hildebrands Rd onto south facing ridges. Outfall drainage is used on this section with minimal grades and slight cuts . A Telecom Road joins Hildebrands Road at the lower end of Cpt 279 and there is an approved stable rocky crossing on this road before Dump 15. The roads to Dumps 4 and 9 could not be reached due to an inpenetrable wall of lananta but were located from aerial photos as old dump locations. Dump 14 is accessed via a stable track up a gradual ridge line from Hildebrands Rd near the Creek flats. Road grades do average 8 degrees , but do exceed 10 degrees in the vicinity of dumps 10 & 14, with maximum batter heights of 2 metres. The crossing between Dumps 4 and 5 is a stable earth crossing and is gradual. The crossings between Dumps 4 and 10 and 9 and 10 are both existing log crossings that require no maintenance. Dump 16, 17 & 18 are accessed via a track off the Mt Lindesay Highway . Due to heavy lantana it was not possible to inspect the entire road , however old plans and photos have been used to identify the remainder of the road . Closer inspections will be made at the time of logging and all EPA conditions will be applied in relation to the crossing. Amendments will be submitted if required. Grades , batters and vegetation cover is expected to be similar to the above stated roads.

All batters and creek crossings are stable, well constructed and present no erosion hazard. Where batters do exist their maximum heights are less than 2 m and they are well vegetated and stable. Roads are less than 10 degrees, except in the vicinity of Dumps 10 and 14. Existing road surface drainage uses outfall crossfall drainage, supplemented by rollover crossbank drainage to disperse infall table drain water through stable outlets onto undisturbed ground cover.

Road construction

Within the Compartments old logging roads will be used. As stated in the above section, crossfall drainage, supplemented by rollover crossbank drainage to disperse infall table drain water through stable outlets onto undisturbed ground cover must be maintained where road pavements are cleared of shrub growth.(Ref. 4.7 (e)).

Harvesting method

The harvesting method proposed for the area is based on currently acceptable operational practices. It comprises:

Selective logging.

Chainsaw felling using directional felling techniques where required;

Snigging of logs using a crawler, bladed tractor up to D8 size and an articulated rubber tyred skidder;

Debarking and loading of logs, poles, piles and girders at dump using the above machines or an excavator fitted with a log clamp.

Transport of logs from the site using a tandem bogie jinker and prime mover.

The crawler tractor is used for road maintenance and snigging from steeper slopes including winching of logs. The rubber-tyred skidder is used on the flatter upper slope terrain and for snigging smaller logs.

Cover factor

The harvesting operations described above result in a cover factor **C = 0.108.**

References *Lacey S.T. USLE factors for categorising Water Pollution Hazard* **SF NSW (1994)** Unpublished report.
Rosewell C.J. *Procedure for deriving C factor values for forest land* **CaLM/SCS (1994)** Unpublished report.

Location of log dumps

See Harvesting Plan Operational Map. Log dump locations have been selected on ridgetops and natural benches to facilitate uphill snigging, effective drainage of snig tracks, and ridge-top loading wherever possible. Down hill snigging will be used on short sections which have gentle grades and which can be adequately drained by outfall drainage and crossbanks, where it is considered that this will minimise erosion hazard potential. Where downhill snigging is proposed measures to prevent concentration of water flow must be taken by way of crossfall drainage and approaching tracks to direct water flow away from the dump immediately before reaching it.

When snigging needs to cross a road to access a log dump all disturbance and damage to the effective drainage mechanisms must be repaired at the completion of snigging from that area.
Loading will be via excavator or crawler tractor.

Post-harvest burning

See Description 6(b).

Post-harvest rehabilitation

Rehabilitation to 70% ground cover within 12 months occurs through natural re-seeding, regeneration, sowing of drains on batters (where necessary) sowing of drainage line crossing approaches (where necessary) and return of logging debris. Supervision by the SFO and fortnightly reports must assess that the provision of cross-fall drainage and installation of drainage structures are adequate to ensure stabilisation within 12 months. District staff must assess the harvest area within the first 12 months after harvesting to ensure that stabilisation is attained.

Description 12 Evaluation of soil and water data

(a) Soil Erosion and Water Pollution Hazard Categories

Soil Erosion and Water Pollution Hazard Ratings (SE/WPHR) have been assessed using SOILOSS 5.1. The rating has then been used to determine Soil Erosion and Water Pollution Hazard (SE/WPC) categories for the net harvest area.

SE/WPH Rating = R x K x LS x C x P (5.1) where

R=2838	**$R = 89.31 \times 7.3^{1.74}$**
K=.04	**DEFAULT**
S=slope	**As factored in SOILOSS 5.1**
L=20 metres	**As agreed with EPA**
C=0.108	**Native forest harvesting "B"**
P=1.0	**Support Practice Factor**

Table 2 Soil Erosion and Water Pollution Categories

Slope Boundaries (degrees)	Water Pollution Hazard Rating	SE/WPH Category	Indicative % of Net Harvest Area	Erosion Hazard Class
0≤3	< 10	1	5	Low
>3 ≤ 11	11 - 49	2	20	Mod
>11-30	50+	3	75	High
Roads/tracks	High	3	n/a	High

The following factors for rainfall erosivity also apply to road construction.

R = 2838 **K = .06**

(b) Dispersibility

Proportion dispersible soil **A horizon** **<10**
B horizon **<10**

Method of determination **D2 Not under laboratory conditions**
D3

Comment: Not dispersible

(c) Other factors

There are no other EHSCS/PCL factors which need to be considered in relation to the planned harvesting of this Compartments.

References *Standard Erosion Mitigation Guidelines for Logging in New South Wales* **Soil Conservation Service, CaLM, NSW** 1993

Rosewall C.J. *SOILOSS A program to assist in the selection of management practices to reduce erosion* **Soil Conservation Service Technical handbook No. 11 First Edition** 1990, **2nd Edition** 1993

2.6 FOREST ZONING AND SPECIAL ATTRIBUTES

Description 13 Forest zoning and Special Attributes

(a) Research plots

N/A

(b) Special attributes of the area

The Mt Lindesay State Forest is very scenic as a result of its rugged terrain and location in the McPherson Range near the QLD Border. It provides a mosaic of forest types and associated wildlife.

There is a 80m flora and fauna corridor along Richmond River in the compartments and a 100m visual strip along the Mt Lindesay Highway.

Part 3 AUTHORISATION CONDITIONS

Condition 3.1 Compliance

(a) Area identification

Compartment 279 Mt Lindesay State Forest No. 542

(b) Third party interests

The are no apiary sites in the area.

There are no grazing leases in the area.

(c) Environmental compliance requirements

This Harvesting Plan is prepared by State Forests of New South Wales (State Forests) under the authority of the Forestry Act 1916. This Harvesting Plan is a condition of all Timber, Forest Products, Contractors and Operators Licences issued in connection with the timber harvesting operations described in the Plan.

All operations conducted under the authority of the Timber Licence and other licences and agreements issued for the area covered by this Harvesting Plan must comply with:

Licence conditions issued by State Forests under the Forestry Act 1916;

the **"Code of Logging Practice for Native Forests - State forests and Crown-timber Lands Part 2"** (1995);

the **"Standard Erosion Mitigation Guidelines for Logging in New South Wales" (SEMGL 1993)** issued by the Soil Conservation Service of the Department of Land and Water Conservation (LaWC).

the conditions of Pollution Licence No.4017 issued by the Environment Protection Authority under the Pollution Control Act 1970. Those general conditions which affect licensees are set out in Schedule "A" attached to every Timber, Contractors and Operators Licence.

conditions attached to licences issued by the National Parks and Wildlife Service under the Endangered Fauna (interim Protection) Act 1992 and the National Parks and Wildlife Act 1967 (NPW Act);

conditions resulting from determination of an Environmental Impact Statement;

the regional silvicultural specifications applicable to this operation, Namely, the "**Silvicultural Workshop Notes**" by the Siviculturalist, Forest Planning Branch, November 1994.

the schedule of specifications for the harvesting and utilisation of timber applicable to this operation, in this case, the "**Schedule of compulsory utilisation limits**"

the Code of Procedure for the measurement of timber and other products applicable to this operation, in this case, the "**Code of Procedure for the Measurement of hardwood Logs and other Timber Products-**"

the "**Standing Instructions for Fire Prevention and Control in State Forests-**"

Variations, additions or amendments to the above documents may be made by the responsible authorities at any time, and must be implemented immediately by the State Forest Licensee.

(d) Environmental Planning & Assessment Act requirements

In preparing this Harvesting Plan, the requirements of Part V of the EPA Act (as amended) and Section 92 of the NPW Act have been considered and an Environmental Impact Assessment (EIA) has been prepared.

(e) Breaches and Infringements

Non-compliance with any condition or instruction set out in this Harvesting Plan will be dealt with in accordance with Section 4 of the **"Code of Logging Practice for Native Forests - State forests and Crown-timber Lands"**. Serious breaches may lead to the issue of a Penalty notice, licensee suspension or prosecution.

(f) Variations and amendments to this Harvesting Plan

Conditions and requirements of the Pollution Control Licence cannot be varied in the field without prior written approval from the EPA, other than those areas detailed in condition 5.1 (c).

Variations and other specified approvals detailed in Condition 5.1(c), may be made by the Supervising Forest Officer to this Harvesting Plan, subject to the District Forester's counter approval.

Other approvals may only be made by the Supervising Forester and are also subject to the District Forester's counter approval, and where relevant to the Pollution Control Licence, with prior approval from the EPA.

All approvals must be recorded on a variation advice, attached as Section 6 to all operational copies of this Harvesting Plan.

This Plan must not be amended by a licensee or contractor.

(g) Harvesting Plan availability

Copies of this Harvesting Plan must be held available by the contractor or bush supervisor at the site of timber harvesting operations at all times that felling, snigging or environmental work is being undertaken within the area covered

Condition 3.2 Certification

(a) Plan Preparation (by Forester, Forest Assistant)

Prepared by K. W. PETTY Signature

Title A/Marketing Forester Date 21/1/97

(b) District Approval (by District Forester)

I approve the issue of this Harvesting Plan subject to any amendments, endorsements or approval that may be made following submission to the National Parks and Wildlife Service, the Environment Protection Authority and/or the Regulatory and Public Information Committee (constituted under the Timber Industry (Interim Protection) Act, 1992 as amended).

(c) The date that operations will need to commence is Jan 1997.

Signature ..... District Forester. Date 23/1/97.....
Paul Sharpe

(d) Receipt of external authority approvals

(To be completed by the person who originally prepared the Plan who must attach the relevant approvals to the Plan)

Table 3 External Authority Approvals

Name of authority	Date received	Attached to Plan by
NPWS	12/6/96	to be reissued
EPA		
RaPIC	20/5/96	
Other authority		

I note approval of this Harvesting Plan from the above-mentioned authorities, together with the amendments they have required to be included in the Plan.

These amendments have been added to the final Plan. This Harvesting Plan comprises the Index (page 1) through to Condition 5.6, Checklist and Clearance Certificate attached and the Operational Map marked and referenced to this Harvesting Plan. This is Harvesting Plan No. UMA 96/04.

Signature ..... District Forester. Date .....
Paul Sharpe

(e) Date for commencement of operations .....January 1997 .....

Condition 3.3 Distribution

RECIPIENT	PARTS	COPIES (Minimum)
Timber Licensee	1,3,4	1
Contractors	1,3,4	1
Operator(s) (where required)	1,3,4	
Supervising Forest Officer [SFO(s)]	All	1
Supervising Forester(s)	All	1
District Forester	All	
District Office Register	All	
Compartments History File (Office Original)	All	1
Regional Office (optional)	All	
Community Groups (at District Forester's discretion)	All	
Spare copy	All	1
Soil Conservationist (Forestry)	All	1

Forest Planning Branch, Head Office, for distribution to:

Regulatory and Public Information Committee	All	3
National Parks and Wildlife Service	All	2
Environment Protection Authority	All	3
Department of Conservation & Land Management (for harvesting on areas within other Crown-timber lands)	All	

Condition 3.4 Industry endorsement

I endorse the harvesting plan on behalf of industry and look forward to some logs

Signature ..... Licence No. .....Date .....

Position ..... Company

Condition 3.5 Industry Field Supervisor/'Bush Supervisors acknowledgement

I acknowledge that I have received a copy of Harvesting Plan No UMA 96/04 and that I understand the Conditions of the Plan as explained to me by a State Forests officer.

Signature Licence No. Date

Position

Signature Licence No. Date

Position

Part 4 OPERATIONAL CONDITIONS

Condition 4.1 Harvesting Activity Description

Selective harvesting operations in mature native hardwood forest, producing quota and ex-quota quality hardwood sawlogs, poles, piles and girders. Operations are aimed at initiating regeneration of regrowth forest stands where possible and selective harvesting of other areas to promote growth of retained trees.

Condition 4.2 Tree-marking and Harvest Regulation

The Tree-marking Code shown in this Plan must be used to apply other Conditions of this Plan as required. All necessary tree-marking in the field must be carried out before and during the harvesting operation by the SFO.

Marking will generally be for trees to be harvested since the number of trees that remain generally exceeds the number harvested. **This also ensures boundaries, filter and buffer strips and wildlife corridors are protected since the SFO is responsible for each tree felled.** There is **provision** to mark **non-harvest areas** with **blue paint** but this is on a **"needs only" basis at the discretion of the SFO.** Minimisation of spray marking is safer for the SFO, and improves the appearance of the forest following harvesting.

HABITAT trees will be marked only where it is considered by the SFO that the integrity of the tree and its surrounds might be affected or otherwise damaged by the logging or post-harvest burning operations.

TREE-MARKING CODE

RETAINED TREES AND NON-HARVEST AREAS

Marking as required to convey the message to the operator.

Boundary not to be crossed	Blue line
Line not to be crossed or disturbed by fallers or harvesting machinery at any time	Blue line
Private property boundary	Blue line
National Park or Flora Reserve boundary	Blue line
Filter strip [PCL Sch4]	3 Pink h.lines
Protection strip [PCL Sch4]	2 Pink h.lines
Drainage depression buffer strip	Not marked
Wildlife refugia/wildlife corridor	Blue line
Other no entry areas for current operation	3 Pink h lines
Areas where disturbance by harvesting is allowed but machinery access is prohibited	Not applicable
Retained tree for wildlife habitat	Pink "H"

TREES TO BE REMOVED

Individual sawlog, pole or girder	Pink dot, "P" or "G"
Directional felling mark	Pink arrow
Tree jacking mark	Pink arrow, plus "J"
Tree to be removed at dump	Pink dot
Tree to be removed during road line/snig track alignment	Pink dot
Cancellation mark	Pink cross

TREES MARKED FOR INFORMATION

Compartments boundary	Blue line
Distance indicator/buffer strip from filter strip	Blue number
Slope angle indication (for operators guidance)	Pink number
Approved dump sites	Pink "D'
Road line	Orange line or tape
	Inventory plot trees
	White line

Condition 4.3 Order of Working

Generally commencing at Dump 1 and harvesting to dumps in numerical order or as directed by the SFO.

Condition 4.4 Silviculture

(a) General

All mature trees suitable for the production of hardwood sawlogs, poles, piles and girders will be marked for removal, unless required for subsequent cutting cycles, promotion of vigorous forest regeneration or to meet flora, fauna and soil prescriptions.

(b) Canopy gaps

Will not be used in this operation.

(c) Harvesting debris

Debris from selective harvesting must be removed from the butts of retained habitat trees and future crop trees to minimise later bark scorch during post-logging burning operations, or in the event of any wildfire. These standard prescriptions may be modified by habitat prescriptions required by other regulatory authorities.

(d) Directional felling

Directional felling must be carried out where specified by the SFO and in this harvesting plan.

Condition 4.5 Flora Protection

(a) Endangered flora species protection

No endangered or threatened Australian plant species (ROTAPS) are likely to be encountered in the net harvest area.

(b) Rainforest protection

No Rainforest has been identified in this compartment.
Logging activity is excluded from rainforest stands. Trees outside the rainforest may not be felled where they are likely to damage the rainforest or necessitate entry into the rainforest to facilitate their removal.

Condition 4.6 Fauna Protection

(a) Sightings of fauna

See Description 10 (a) Fauna Protection Strategy

(b) Habitat Tree retention

See Description 10 (b) Habitat Tree prescription

(c) Non-harvest and modified harvest areas

Wildlife Corridor

Wildlife movement along gully sides and to the ridges will be facilitated by the filter strip system and other non-harvest areas shown on Map.

Condition 4.7 Soil erosion and water pollution control

(a) Basic Water Pollution Hazard Categories

Table 4 Soil Erosion and Water Pollution Categories

Slope Boundaries (degrees)	Water Pollution Hazard Category	SE/WPH Category	Indicative % of Net Harvest Area
0≤3	LOW	1	5
>3 ≤ 11	MODERATE	2	20
>11-30	HIGH	3	75
Roads/tracks	HIGH	3	n/a

(b) Approved timber harvesting and extraction method

Chainsaw felling using directional wedging/felling techniques where required;

Snigging of logs using a crawler, bull bladed type tractor up to D8 size and/or a rubber tyred wheeled skidder with bull blade, fitted with grapple and/or winch;

Debarking and loading of logs at dump using a tracked excavator tractor.

(c) Marking and location of soil protection and water pollution control measures

The marking of soil protection and water pollution control measures in the field must be in accordance with Condition 4.2. The location of known drainage lines is indicated on the Harvesting Plan Operational Map.

(d) Wet weather controls

Harvesting operations may be conducted throughout the year subject to the application of normal wet weather closure procedures and restriction to wet weather areas as set out in Condition 4.4. Operations may be stopped altogether for safety reasons for short periods of time because of heavy rainfall. Areas adjacent to the main gravel roads will be retained for wet weather as required.

During wet weather, the controls for road usage and for snigging set out in the Code of Logging Practice must apply. In particular:

1. **Haulage must cease** on natural surface roads where **runoff occurs from a road surface.**

2. **Snig tracks must not be used** where there is **runoff from a snig track** surface.

3. **Snig tracks must not be used** where there is **likelihood of significant rutting leading to turbid runoff** from the track surface.

(e) Road Construction

No new roading is required in the Compartments.

Road Surface Drainage
The existing roads utilise outfall crossfall drainage supplemented with rollover crossbanks. Where outfall drainage is not practical following blading off of shrub regrowth, rollover crossbanks must be spaced at maximum intervals as per Figure 1 Schedule 4 dependant on road grade and K factor and based on peak flow 1 in 5 year storm event. Cross bank spacing should avoid unnecessary soil disturbance cognisant of the previous calculations.

The banks must have a minimum designed vertical height from spillway to bank top of 25 cm which permits vehicle traffic to pass over. Since we have adopted the default K=.06 constructed drainage must be installed where concentrated water flow exceeds 20m in run. Using figure 1 results in drainage spacings being unnecessarily close. So Kel Christiansen recomments adopting smig track drainage spacings for roads as per Table 2 of Schedule 4 of the PCL using the spacings for Water Pollution Hazard Category 3. Accordingly in these Compartments crossbanks must be spaced at a maximum of 200 m where track grade is less than 5 degrees, at 60 m where track grade is 5-10 degrees, and at 40 m for any short sections which exceed 10 degrees (refer to table 3).

Table 5: Maximum Spacing of Road Drainage Structures (metres)

Track grade (Degrees)	Water Pollution Hazard Category 3
5	100
10	60
15	40

Rollover crossbanks must drain onto undisturbed vegetation or where not immediately accessible to the outfall, sediment trap fences must be installed across the outlet. At the completion of falling and snigging unprotected fill batters below the outlet must be sown with rye grass at a rate of 20 kg per ha where adequate protection from existing vegetation does not exist. Rollover banks must be operational on roads no longer required, except for the main forest access roads which have conventional culverts installed.

Crossing of Drainage Features
Trucks and machinery must use drainage line crossings in dry weather only. Existing rock causeways are to be utilised where they occur.

Revegetation and rehabilitation
Natural regeneration will generally provide stabilisation of any disturbed topsoil areas.

Patch gravelling
Existing natural surfaces are adequate.

Borrow pits and gravel pits
Not required in the Compartments.

(f) Slope limits for the area

Maximum slope for harvesting	30°.
Maximum slope for snig track construction	30°.
Maximum side slope for snig track construction	30°.
Maximum road grade permitted	10°.
Maximum side slope for road construction without engineering design	30°.

(g) Drainage feature protection

Filter strips and drainage depression buffer strips must be retained along all watercourses, drainage lines and drainage depressions within the net harvest area of the Compartments, at the minimum widths as indicated in Table 6.

Table 6 Filter strip strip widths

		DRAINAGE FEATURE		STRIP WIDTH EITHER SIDE
SE/WPHC	WPHC Slope	Catchment	Slope	Filter
	(degrees)	(hectare size)	(degrees)	(metres)
1	0 ≤ 3	< 40	-	5
2	> 3 to ≤ 11	< 40	-	10
3	> 11 to 30	< 40	< 18	15
3	>11 to 30	< 40	**greater > 18**	20
1-3	0 - 30	**greater >40**	< 18	20
1-3	0 -30	**greater > 40**	**greater > 18**	30

Buffer strips must be 5m wide on each drainage depression
NOTE: The widths above equal or exceed the requirements of PCL No 4017

In addition buffer strips 5 metres wide on either side of drainage depressions must be maintained.

It is the responsibility of the contractor to identified and observe these features encounted in the field.

(h) Tree marking rules for filter and buffer strips

Filter strips will only be marked in the field where it is necessary to convey a particular message to an operator which cannot be done verbally or in the tree marking for removal strategy. Where marking is used the Supervising Forest Officer is responsible for marking filter strips in the field progressively and prior to the commencement of operations into that section of the harvest area.

Contractors and operators are responsible for identifying drainage depressions encountered in the field and taking appropriate protective action within the buffer strip area whilst operating or traversing the drainage depression. (See also 5.2.)

(i) Felling and extraction from filter strips

Trees must not be felled into filter strips.

Directional felling must be used to avoid felling of trees into filter strips.

Trees located in a filter strip must not be felled, except for the purposes of constructing an approved road , extraction track or snig track.

Machinery must not enter a filter strip except for the construction and use of a road or snig track crossing.

Crowns, logs and substantial debris (*greater than 100mm in diameter & 3 meters in length*) accidently felled into filter strips must be removed with the minimal disturbance to the bed and banks, unless removal would result in more damage to the bed and banks than non-removal. Any disturbance caused must be remedied by reshaping and replacement of cover , so that concentrated water flow does not occur . Instances where crowns, logs, or substantial debris are not removed must be documented on the SFO's copy of the harvesting plan, including the reason for the accident and the remedial action taken.

(j) Extraction from drainage depression buffer strips

Buffer strips must be provided along all drainage depression within the compartment. Buffer strips must be 5 metres wide each side of the drainage depression.
Machinery must not operate in buffer strips when the soil is saturated.

Machinery operating within buffer strips must :

a) minimise soil exposure ; and
b) not cause channelised flow.

This must be achieved by :

a) the use of walkover techniques wherever possible; and
b) preventing sewing of machinery tracks; and
c) operating with the blade up at all times; and
d) not snigging along drainage depressions.

No earthworks can be undertaken within buffer strips except for the construction of road, extraction track or snig track crossings.

The width of buffer strips on drainage depressions must be measured from the apparent centre of the drainage depression.

It is the contractor's responsibility to identify plantation drainage depressions encountered in the field.

(k) Snig tracks

Snig tracks must be located on ridges to ensure free crossfall drainage wherever practicable Side cut tracks must have crossfall drainage and no track should be located immediately adjacent to and parallel to a filter strip.

Sections of extraction tracks and snig tracks must be progressively drained at the completion of logging operations around each section of track, using one of the following techniques, or a combination thereof :

a) existing ground cover must be retained as far as practicable. Where this prevents concentrated water flow in excess of the distances specified in Table 7, constructed drainage is not required; or
b) slash and logging debris must be retained as far as practicable. Where retained slash will prevent concentrated water flow in excess of the distances specified in Table 7 and no post logging burning is planned, constructed drainage is not required; or
c) outfall drainage must be used as far as practicable. Where outfall drainage will prevent concentrated flow in excess of the distances in Table 7, constructed drainage is not required.

Table 7 : Maximum Spacing of Extraction/Snig Track Drainage Structures (metres)

Track grade (degrees)	Water Category	Pollution	Hazard
	1	2	3
5	200	150	100
10	150	100	60
15	80	60	40
20	60	40	25
25	40	30	20
30	30	25	15
35	25	20	10

Snig track and extraction track drainage structures must be designed to:

a) have sufficient capacity to convey the peak flow from a 1:2 year storm event; and

b) divert water onto stable surfaces; and

c) minimise the unchecked flow of water directly into watercourses and drainage lines or onto roads and log dumps; and

d) divert water at a velocity which minimises damage to the structure.

Outfall drainage, crossbanks, mitre drains and sediment sheeting will be used to achieve the required outcomes stated above.

Where crossbanks are used they must be constructed to a minimum unconsolidated effective height of 35cm, or a consoildated effective bank height of 25cm, unless otherwise calculated in accordance with the above.
Crossbanks must not be constructed of bark.
Drainage must be effected as soon as practicable at the completion of operations on each extraction track or snig track, and in any event within 2 days, unless soil conditions preclude construction of effective drains or would lead to increased soil erosion. Instances where the drainage is not effected within two days of the completion of logging operations must be documented on the SFO's copy of the harvesting plan, including the reasons why.

The number of snig tracks or extraction tracks open at any one time must be kept to a minimum.

Drainage must be effected if the use of an extraction track or snig track is to be temporarily discontinued in accordance with Table 8:

Table 8: Drainage of Extraction Tracks and Snig Tracks at Temporary Cessation of Operations

Water Pollution Hazard Category	Monthly Rainfall Erosivity Rating	# of Days
1	N/A	10
2	<900	8
	>900	5
3	<900	5
	>900	3

Snigging and timber extraction must occur in an uphill manner unless downhill snigging maintains or decreases the potential for water pollution, or unless phsyical constraints preclude uphill extraction.

(l) Downhill snigging

Where downhill snigging is proposed, measures to prevent concentrated water flow must be taken.
The following techniques must be used by tractor and skidder operators:

(1) Crossfall drainage where practicable;
(2) Tracks approaching log dumps must be located so as to direct water away from the dump immediately before reaching it by entering the dump from the side or from below and if possible by using a short length of uphill track. Where this is not possible a crossbank immediately above the dump must be reinstated at the end of each days operations.

(m) Snig track drainage line crossings

All crossings must be approved by the SFO before construction. Where natural rock crossings are not available, hollow logs or recoverable steel pipes may be used provided they are of sufficient capacity to allow free flow of drainage water. Crossings must be removed after use, all loose material removed from the channel and the crossing point reshaped to its original condition as far as practicable.

Clearing and crossing construction must be undertaken at , or as close as practicable to , right angles to the water flow.
Drainage feature crossings must be constructed and maintained to :
1) minimise damage to the bed and banks; and
2) minimise disturbance to the filter strip; and
3) result in minimal deposition of spoil within the drainage feature.

Spoil from crossing construction and maintenance must not be deposited in filter strips or buffer strips.

(n) Log dumps

Log dumps must be located out of filter strips and buffer strips.
Debris from log dump operation must not be placed in , or within 10 metres of , filter strips.
Log dumps must be located as indicated on the Harvesting Plan Operational Map. Drainage of log dumps and stabilisation must include the following:

Field location of log dumps must utilise the most level site available, consistent with the location indicated on the Operational Map.

Before use, sufficient topsoil must be stripped and stockpiled for subsequent respreading at the completion of operations.

Dumps must be constructed with outfall drainage prior to dump operation to ensure runoff is dispersed onto undisturbed vegetation.

Upon completion of operations the log dump surface must be left in a stable condition by using one of the following techniques or a combination thereof:

a) retaining a 70% cover of at least 5 cm of topsoil;

b) planting with eucalypt seedlings;

c) seeding the log dump with a cover crop, 20kg/ha.

Logging operations by wheeled loaders and trackscavators must cease where there is runoff from the log dump surface.

Drainage

Log dumps must be drained during operations and upon completion of operations, in order to;

minimise the flow of runoff from roads, tracks and other areas above the dumps;

minimise water logging and pooling of water on the dump sites;

minimise runoff from the dump directly onto roads and tracks.

Where runoff cannot be diverted from roads and tracks, the road or track must be drained as soon as practicable below the dump.

Condition 4.8 Research and Inventory Plots

N/A

(b) Special attributes of the area

The Mt Lindesay State Forest is very scenic as a result of its rugged terrain and location in the McPherson Range near the QLD Border. It provides a mosaic of forest types and associated wildlife. There is a 80m flora and fauna corridor along Richmond River in the compartments and a 100m visual strip along the Mt Lindesay Highway.

Condition 4.9 Modified harvest conditions for special emphasis areas

Care to be taken of the flora and fauna, visual strips, areas previously mentioned.

Condition 4.10 Specification of type of Hardwood products to be removed

Product 1	Quota sawlogs	Minimum length 2.4 metres See maximum defect levels specified in the "Schedule of compulsory utilisation for Urbenville District."
	Large	40 cm cdub minimum
	Thinnings	30 cm cdub to 39 cm cdub. Minimum toe 25cm dub, Minimum butt 36 cm dub
Product 2	Ex-quota sawlogs	Logs not meeting above specification
Product 3	Poles, Piles, Girders	Specifications as per Hardwood Pole, Pile and Girder Sales System (1992) and Timber Poles for Overhead Lines (AS2209-1979)
Product 4	Round and Split Posts	Logs not meeting specifications for compulsory sawlogs that have been marked for post utilisation.

Yield information

Product	Volume (cubic metres)
Quota sawlogs (assessed)	1000
Thinnings	300
Poles, piles and girders	100

No analysis of volumes by species or size classes is available.

Part 5 CONDITIONS FOR SUPERVISING FOREST OFFICERS (SFOs)

Condition 5.1 SFO authority to supervise harvesting operations

(a) General

The Supervising Forest Officer responsible for the direct field supervision of this harvesting operation, including tree-marking, log measuring and/or log check measurement, safety, implementation of wet weather controls, and monitoring and reporting generally will be a nominated Hardwood Marketing Foreman of the Urbenville District. The intention is that an individual Marketing Foreman will be responsible for the entire operation within the Compartments from commencement to completion.

(b) Relieving SFOs

Relieving SFOs, if required, are Urbenville District staff that operate in the capacity of Marketing Foreman, Forest Assistant (Marketing) or Marketing Forester.

(c) SFOs authority

The SFO has authority to approve:

(1) The blading off of natural surface roads provided that damage will be minimal and the removed material is recoverable for respreading;

(2) Downhill snigging routes where provided for in the Harvesting Plan;

(3) The exact field location of topsoil stockpiles for later recovery and use;

(4) Use of natural surface roads for snig track crossings or as snig tracks or timber extraction tracks to dumps provided restoration of the road for wheeled traffic is undertaken as necessary and use of the road significantly reduces soil disturbance.

(5) The exact location and type of drainage line crossings for snig tracks

(6) Specific location of log dumps commensurate with the Operational Map

All approvals must be noted on a Harvesting Plan Variation Form and copies attached to the relevant master copies of the Harvesting Plan.

Condition 5.2 Tree-marking and other harvesting control requirements

(a) Tree marking for forest management and silviculture

Normal District practices for tree-marking will apply. (See also condition 4.2.)

Canopy gaps for regeneration

Will not be used in this operation.

Tree marking of habitat trees and habitat recruitment trees for faunal protection

Since the SFO is marking for removal, habitat and habitat recruitment trees will only be marked as is necessary to alert a harvesting contractor. Prescription is specified in Description 10 (b) and is as follows:

(i) Hollow-bearing tree retention

a) A minimum of ten hollow-bearing tree must be retained per two hectares. Where this density is not availabel , ten trees must be selected from trees with diameters within the largest 30% of the stand.
b) Retained , hollow-bearing trees must be selected from trees with diameters within the largest 30% of the stand and be live trees with good crown development.
c) Retained hollow-bearing trees should represent the range of species that occurs in the area.
d) Trees retained outside the net logging area must not be counted as hollow-bearing trees.
e) Hollow-bearing trees must be scattered throughout the net logging area.
f) Hollow-bearing trees must be be marked for retention.

(ii) Recruitment tree retention

a) A minimum of ten recruitment trees must be retained per two hectares.
b) Retained recruitment trees must show potential for developing into hollw-bearing trees with good crown development. Trees in the mature and intermediate growth stages should be retained as recruiment trees.
c) Retained recruitment trees should represent the range of species that occurs in the area.
d) Trees retained outside the net logging area must not be counted as recruitment trees.
e) Recruitment trees must be scattered throughout the net logging area.
f) Recruitment trees must be be marked for retention.

(iii) "Regrowth zone" habitat and recruitment tree retention.

a) This compartment is within the "regrowth zone ".
b) Within that area (i) & (ii) above must be applied if there are sufficient existing hollow bearing trees available.
c) Where there are not sufficient hollow bearing trees available tp comlpy with section 2.4b(i) (a) above , then those hollow bearing trees present must be retained.
d) For each hollow bearing tree retained in 2.4(iii))c) above, a recruitment tree as defined in 2.4 b (ii) must be retained.
e) In the "regrowth zone " where there are less than 10 hollow bearing trees per two hectares, there is no requirement to retain additional trees as otherwise required in section 2.4(i)(a).

(iv) Protection of hollow bearing trees, recruitment trees and dead stags

a) Specified forestry activities and post-logging burning must aim to minimise damage to hollow-bearing trees, recruitment trees and dead stags. The potential for damage should be minimised by techniques of dircetional felling . Felled heads must be flattened or removed from 5m of stems retained to meet this condition.

(v) Dead stag retention

a) Dead stags must be retained in areas outside the net harvesting area , visual protection strips , and elsewhere where it is safe to do so.
b) Dead stags must not be counted as hollow-bearing trees or recruitment trees.

In addition, all practical precautions shall be taken to protect identified habitat trees during logging (harvesting) operations. The following shall be adhered to:

1. All practical precaution shall be taken to avoid tree heads landing adjacent to identified habitat trees.

2. In forests with a xeromorphic understoresy all substantial logging slash (including tree heads, butts, and large bark piles etc) will be removed from within approximately a 5 metre radius of identified habitat trees. Logging slash shall be removed with minimum disturbance to understorey vegetation and ground logs.

3. In forests with a mesic understorey logging slash within a radius of 10 metres of identified habitati trees is no to be spot burnt. Alternatively, if a ground burn can be carried in this forest type then burn conditions shall follow those agreed upon for xeromorphic understorey described in point 2 above.

Tree marking for non-harvest areas and modified harvest areas

Flora and fauna protection
See Flora Protection Strategy, Condition 2; Descriptions 7, 8, 9.10,11 and tree marking code.

(b) Soil erosion and water pollution control requirements - marking of filter.

Filter strips and drainage depression buffer strips must be retained along all drainage features at the minimum widths as indicated in Table 6 in condition 4.7(g).

Filter strips will only be marked in the field where it is necessary to convey a particular message to an operator which cannot be done verbally or in the tree marking for removal strategy. Where necessary filter strips must be marked in the field progressively and prior to the commencement of operations into that section of the harvest area.

Filter strips must be marked by the SFO in the field progressively and prior to commencement of operations into that section of the harvest area. They need not be marked where operations will not occur within their vicinity.

(c) Drainage depression buffer strips

The SFO is responsible for ensuring that contractors and operators are detecting drainage depressions in the field and taking appropriate protective precautions within the buffer strip area whilst operating or transversing the drainage depression. (See also 4.7 (g))

Condition 5.3 Monitoring and reporting

(a) Daily and Fortnightly reporting

The standard Regional procedures for daily and fortnightly reporting on the conduct of operations must be followed.

(b) Faunal reporting and temporary tree-marking

Reports of sightings of any endangered fauna as required in conditions 4.6(a) must be made to District Office within 24 hours of the sighting being made. Immediate action should be taken to place tape-marks for retention of Koala, Yellow-bellied Glider, Owl or Black Striped Wallaby habitat if a sighting or evidence of presence is encountered. (See 4.6.)

(c) Soil erosion and water pollution control conditions

The SFO must report the following matters and record their location if necessary on their copy of the Harvesting Plan Operational Map, or the recording map attached to the Plan for that purpose:

any accidental felling into filter strips and remedial action taken.

any approval to leave spoil from road and track construction in drainage lines or watercourses where attempts at removal would have resulted in excessive damage.

any approval to defer stabilisation works at a drainage feature crossing beyond five days.

any approval to leave a snig track drainage feature crossing structure in place and the reason for it to be left in situ.

any instances where effective cross bank drainage of a snig track is not effected within two days of completion of snigging from the area served by the track.

(d) Sowing of constructed road batters

Where fill batters below crossbanks are unprotected by vegetation following falling and snigging the area must be sown by the SFO. Sowing must be of rye grass at 20kg/ha.

(e) Sowing of crossing approaches during road maintenance and snig track construction

Any crossing approaches will be stable due to the amount of surface rock. Natural regeneration of native grasses, shrubs and trees should be sufficient but where revegetation is considered inadequate by the SFO or the Forest Assistant in compliance checks this is in doubt sowing is to be used. Where rye grass seeding takes place a sowing rate of 20 kg/ha is to be used. The satisfactory completion of stabilisation and/or sowing operations must be recorded in the fortnightly report by the SFO.

Condition 5.4 Pre-and-post-harvest burning

(a) Pre-harvest burning

There will be no pre-harvest burning associated with the harvesting in this area. Top disposal burns were performed in last harvesting operation (1975/6).

(b) Post-harvesting Burning Plan

Objectives
The post-harvesting burning plan for this area has the following objectives:

(a) Integration of this post-logging burning with other priorities set down in the Fuel Management Plan for Urbenville District;
(b) Removal of sufficient fine fuels and debris generated by harvesting to ensure that regeneration and retained stems are not damaged during possible wildfire events;

Fuel reduction will reduce the chances of wildfire spreading through the area and damaging surrounding forest and fauna; increase the chances of effective wildfire control, and promote good seedbed conditions for regeneration.

Ignition
Burning must be undertaken by the lighting of individual heaps of harvesting slash and debris under mild weather conditions. Lighting of debris and flash fuels associated with log dumps and other areas will be carried out to minimise removal of surface litter and damage to habitat trees. The SFO or the Operations Forester and Operations Foreman are responsible for ignition, subject to the fire-safety and other requirements of the District Fuel Management Plan.

Preferred season of burn
March to November depending on fire weather and fuel conditions.

Recording of burning activities
All post-harvesting burning activities must be recorded on the Day of the Burn Checklist on a daily basis and reported on the Post-Burning Checklist.

Condition 5.5 Other instructions

Ensure that the SFO and contractors are aware of any subsequent amendments to the Harvesting Plan that may be imposed by Rapic, NPWS or EPA. These appear as amendments to the Harvesting Plan.
The SFO must ensure the installation of sediment trap fencing on any crossbank outlets which do not drain onto undisturbed vegetation.
The SFO should direct any queries to the Marketing Forester.

There are no other instructions concerning the supervision of harvesting this area.

Condition 5.6 SUPERVISING FOREST OFFICERS ACKNOWLEDGMENT

I acknowledge that I have received a copy of Harvesting Plan for Compartment 279 and that I have been briefed on the Conditions of the Plan and the supervision and operational control requirements as explained to me by the District Marketing Forester.

Signature Date

Position
Forest Officer

Signature Date

Position
Relieving Supervising Forest Officer

HARVESTING PLAN PREPARATION CHECKLIST

FLORA AND FAUNA CONDITION CHECKLIST

None were sighted during inspections during planning inspections. A Koala survey was carried out for these Compartments. It was found that these Cpts are not intermediate/high use areas. In Cpt 278 2 km South of Cpt 279 there is a recorded observation for a Rose-crowned Fruit Dove. There is a record of the Alberts Lyrebird in Cpt 275 which is on the northern side of the Cpts across the Mount Lindesay Highway.

Provision for this is covered in the Fauna Protection Strategy. Any occurrences within the harvest area will be dealt with as required during harvesting.

HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry Needed?	Plan Ref.
C 42	Representative water monitoring site	Yes	D12(f)
	Have the Water Pollution Hazard Categories (WHPC)s and the Proportion of Dispersible Soil (PDS) been calculated for the area?	Yes	D13(a) D13(b)
	Method for soil sampling for K factor	Yes	D12(d)
	Field sampling - sites?	Yes	Map
	- lab analysis?	Yes	
	- field analysis?	No	
1b	Site specific conditions	No	D13(b)
4.	Are areas >30° outside net harvest area?	Yes	Map D12(e)
5.	Are areas in WHPC4 outside net harvest area?	Yes	Map D12(e)
6.	Drainage feature protection	Yes	D12(f) D13(a) C4.7(g)
7.	Any major water storage?	No	D12(f)
8.	DDBS conditions included?	Yes	D13(c)
9.1(c)	Filter strip on Map?	Yes	Map
9.2	Protection strip on Map?	Yes	Map
10.	Conditions for marking/ identifying:		
	- filter strips	Yes	C4.2
	- protection strips		C4.7(h)
	- buffer strips		C4.7(h)
	in the field		C5.2(d)
13.	Reporting accidental felling into filter strips	Yes	C5.3(c)
14.,20.,22.	See 10		
24.	Specify techniques in DDBS	Yes	C4.7(i)

Condition No.	Condition Title/Enquiry	Entry Needed?	Plan Ref.
47.	Road design, etc. for 1:10 yr. storm event: What techniques for 12 month stabilisation?	No	D14(d) C4.7(e)
48.	Are roads shown on Map?	Yes	Map
49.	If road traverses area over 30° what techniques for 1:10 storm event?	No	D12(h)
	What techniques for 6 month stabilisation of road?	No	D12(h)
50.(a),(b)	What is maximum road grade?	Yes	C4.7(f)
51.	Who will mark roads in field?	Yes	C4.7(e)
52.	What is maximum clearing width for road formation?	Yes	C4.7(e)
53.	Is any roadside clearing proposed? If so what techniques for 70% ground-cover within 12 months?	No	D12(h)
57.	Any borrow or gravel pits? If so what batter and stabilisation techniques are required?	No	D12(h) C4.8(e)
60.	What design criteria for stable road batters within 12 months?	Yes	C4.7(e)
63.	Do road drainage techniques specify - peak flow 1:5 year storm capacity? - stable surface water diversion? - minimisation of unchecked flow? - use of sediment traps if necessary?	No	C4.7(e)
64.	What is spacing and type of road drainage structures?	Yes	C4.7(e)
65.	Is an alert condition needed for cutting of roadside waterholding windrows?	No	
66.	Is an alert condition needed to emphasise 2 day removal of debris from drainage structures?	No	
67.	Is an alert condition needed for reporting of blading off approvals?	No	

Condition No.	Condition Title/Enquiry	Entry Needed?	Plan Ref.
71.	Are drainage feature crossing structures for roads specified for location, type and capacity?	Yes	C4.7(e)
74.	Is a report condition included to cover spoil non-removal from drainage features?	Yes	C5.3(c)
76.	Is a report condition included to cover reporting that crossing stabilisation is not completed within five days?	Yes	C5.3 (c),.
77.	Are techniques listed to leave crossing sites stable?	Yes	C4.7(e)
78	Are techniques specified for stabilisation of roads that are no longer required?	Yes	D12(e), C4.7(e)
79.	Have any old roads been evaluated?	Yes	C4.7(e)
80	Are alert conditions required for dispersible soils?	No	D13(b)
81.	Are protection techniques spelt out for roads traversing dispersible soils?	No	D13(e)
82.	Are alert conditions for wet weather restrictions included for roads?	Yes	C4.7(a)
83.	Is a report condition included to cover crossing stabilisation not being completed within 5 days?	Yes	C5.3(c)
84.	Are techniques listed to leave crossings stable?	Yes	C4.7(e) C5.3(e)
85.	Is a report condition needed to cover none removal of temporary crossings?	Yes	C5.3(d)
86.	Are there any crossings of drainage features other than drainage depressions by snig tracks?	Yes	C4.7(m) C5.1(d)
	Are snig track crossing locations type and capacity specified?	Yes	C5.1(c)

Condition No.	Condition Title/Enquiry	Entry Needed?	Plan Ref.
	Is a reporting condition included for SFO approvals for crossings?	Yes	C5.1(c)
	is a report condition included for non-removal of spoil from drainage features?	Yes	C5.3(c)
89.	What conditions are specified for effective snig track drainage?	Yes	C4.7(h)
92.	Is an alert condition needed for snigging along roads?	No	
93	Are alert conditions for wet weather restrictions included for snig tracks?	Yes	C4.7(d)
99	Do specifications for drainage of snig tracks include: - capacity for peak flow in a 1:2 year storm event? - diversion onto stable surfaces? - minimise unchecked flow into drainage features? - divert water at minimum damage to structure?	 No No	C4.7(k)
103.	Is minimum specification for bank height used?	Yes	C4.7(k)
105.	Is a reporting condition needed for non-drainage of snig tracks over two days after use has ceased?	Yes	C5.3(c)
107.	Is an alert condition for temporary cessation of use drainage condition required?	Yes	C4.7(k)
109.	If downhill snigging is specifed, are specifications for preventing concentrated water flow included?	Yes	C4.7(l)
112	Is snigging being undertaken on dispersible soils?	Yes	D12(d) D13(a)
	If so, have alert conditions have been included?	Yes	
119	Have specifications for log dump location and drainage been included?	Yes	C4.7(m)

Condition No.	Condition Title/Enquiry	Entry Needed?	Plan Ref.
120	Is an alert condition for the use of traxcavators and wheeled loaders in relation to wet weather necessary?	No	
125	If pre- or post-logging burning proposed, have burning conditions been included?	Yes	C5.4(a) C5.4(b)
	What other conditions listed in Sch 2 Div 3 need to be included as alert conditions in this Plan?	None	
	Are any appendices required?	No	

NOTES

Appendix: Erosion Hazard Assessment

Soil Erosion Hazard Ratings have been assessed using SOILOSS high. The rating has then been used to determine Soil Erosion Hazard (SEH) categories for the net harvest area.

SE/WPH Rating = R x K x LS x C x P high where

R=2838	**$R = 89.31 \times 7.3^{1.74}$**
K=.06	**EPA Default value**
S=slope	**As factored in SOILOSS high**
L=10 metres	**As agreed**
C=0.45	**Native forest harvesting "B"**
P=1.0	**Support Practice Factor**

Soil Erosion Categories

Slope Boundaries (degrees)	Erosion Hazard Class	Indicative % of Net Harvest Area
≤4 (7%)	Low	5
> 4≤ 19 (7% - 33%)	Mod	60
>19≤30	High	35
na	extreme	n/a

65% of the area is in low to moderate Erosion Hazard Classes

(b) Special Conditions

No special conditions, other than the following are required as the conditions for use with Harvesting Plans, Schedule 2, Division 3, of the EPA Pollution Control Licence (PCL) for 1994/95, are adequate to address the erosion and pollution risk.

No special conditions, other than the following are required as the conditions for use with Harvesting Plans, Schedule 4, Division 3, of the EPA Pollution Control Licence (PCL) for 1995/96, are adequate to address the erosion and pollution risk.

(a) In areas of high erosion hazard, the grades of snig tracks and extraction tracks must not exceed 25°.

(b) Snigging and extraction of timber from areas with an extreme erosion hazard is not permitted if snig track construction is required. Techniques to reduce erosion hazard to a lower erosion hazard classification may be employed. Snigging and extraction of timber may then be allowed.

Appendix: Interim Assessment For Old Growth Forest

District	Urbenville
Management Area	Mt Lindesay State Forest 542
Compartments	279
BOGMP	NP&WS Northern Region
Date Completed	20/1/97

Findings

See attached map.

Appendix: Soil Reports

STATE FOREST Mount Lindesay

COMPARTMENT 279

EMERSON AGGREGATE TEST

SAMPLE	TOPSOIL	SUBSOIL
1	8 - NO REACTION	8 - NO REACTION
2	8 "	8 "
3	8 "	8 "
4	8 "	8 "
5	8 "	8 "

COMMENTS:

I have performed the modified Emerson Aggregate Test on the above samples supplied to me by State Forests Urbenville.

SIGNED: David Morand DATE: 29.1.96

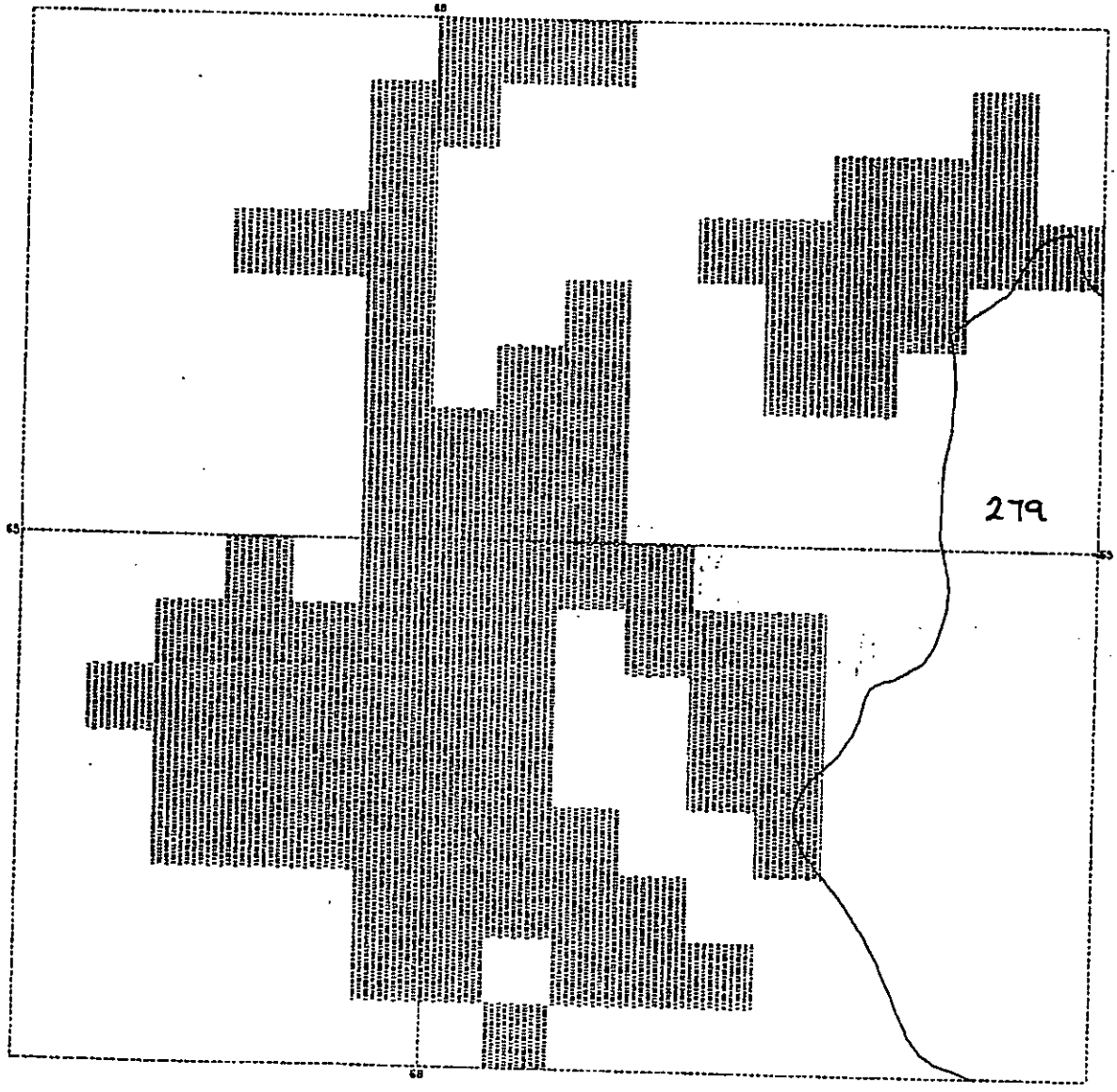
DAVID MORAND
EPA APPROVED SOIL SCIENTIST.

Mt Lindesay SF
cpt 279
Scale 1:10000
Grid: 1000m

— SQL Query Result

Candidate Old Growth

— Negotiation Regions



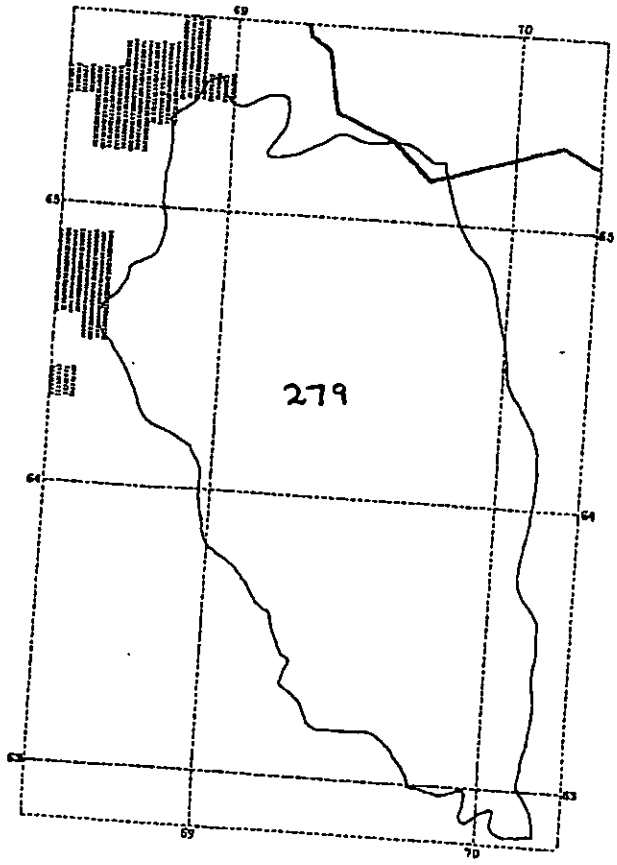
MT LINDSAY 279

Projects: Northern Study Area Neg Dbase (20/4/96)
Scale 1:25000
Grid: 1000m

— SQL Query Result

Rainforest C
Candidate Old Growth

— Negotiation Regions



Appendix: Koala Survey

The Koala survey was undertaken by Paul Flower.

In Compartments 279

Net Harvest Area 225 ha

There were 141 ha of Brush Box which was excluded becuase it is not Koala habitat

Therefore there are 298 ha of potential Koala habitat within the nett harvetsable area

According to the Koala survey guidelines a transect length of 3000 m is required.

The transect length was 1700 m.

Target Primary Browse Species: *E. microcorys*, *E. propinqua* and *E. tereticornis*

Target Secondary Browse Species: *E. saligna* and *E. moluccana*

Result: Nil.

Thus these compartments are not intermediate/high use areas.

The full survey length was not carried out because Paul Flower did not consider it very likely that any evidence of Koalas would be found in these compartments using this survey method.

A copy of the full survey report is being held at Urbenville Forestry Office.