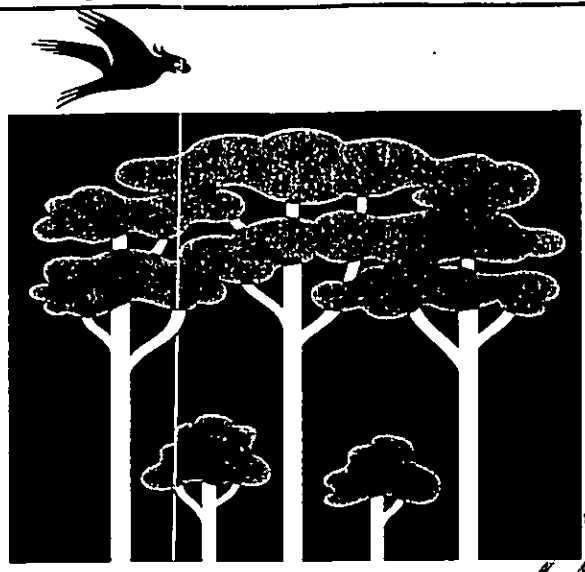


URBENVILLE MANAGEMENT AREA

NATIVE FOREST HARVESTING PLAN

AREA: YABBRA STATE FOREST No 394

LOCATION: Compartments 157 & 158

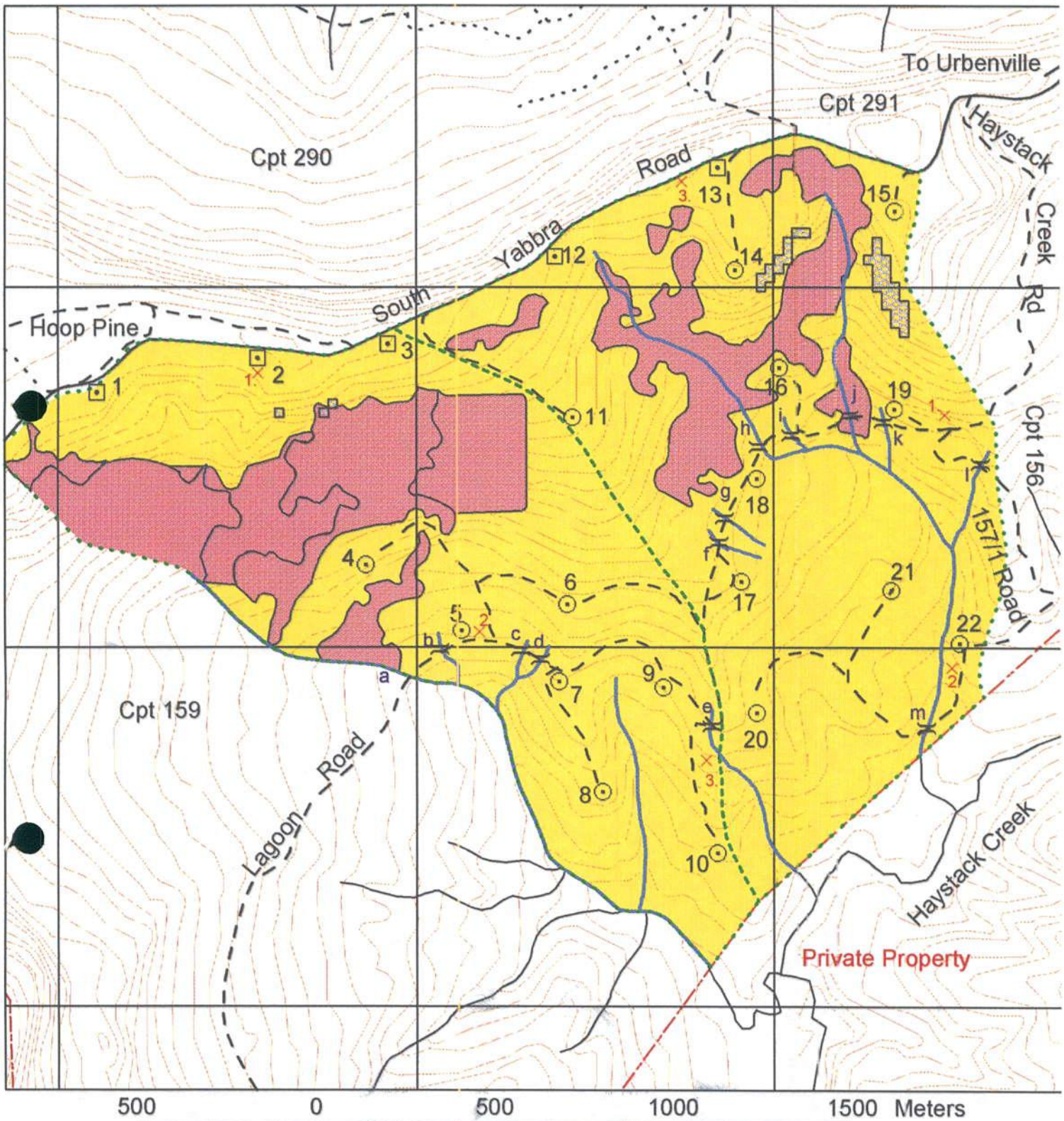
OPERATION: FOREST HARVESTING

PLAN No. UMA 97/03 6/3/97

STATE FORESTS

MANAGING - CARING - SUSTAINING

NORTHERN REGION - URBENVILLE
DISTRICT
HARVEST PLAN OPERATIONAL MAP
COMPARTMENT 157
YABBRA STATE FOREST
CAPEEN MAP SHEET
HARVEST PLAN NUMBER 03
SCALE 1:15000



BOUNDARIES
- Compartment Boundaries
- State Forest Boundary

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

NORMAL PRESCRIPTIONS
- Harvestable Area

MODIFIED PRESCRIPTIONS
- Flora and Fauna Protect
- Slopes likely over 30 degrees
- Rainforest A & B

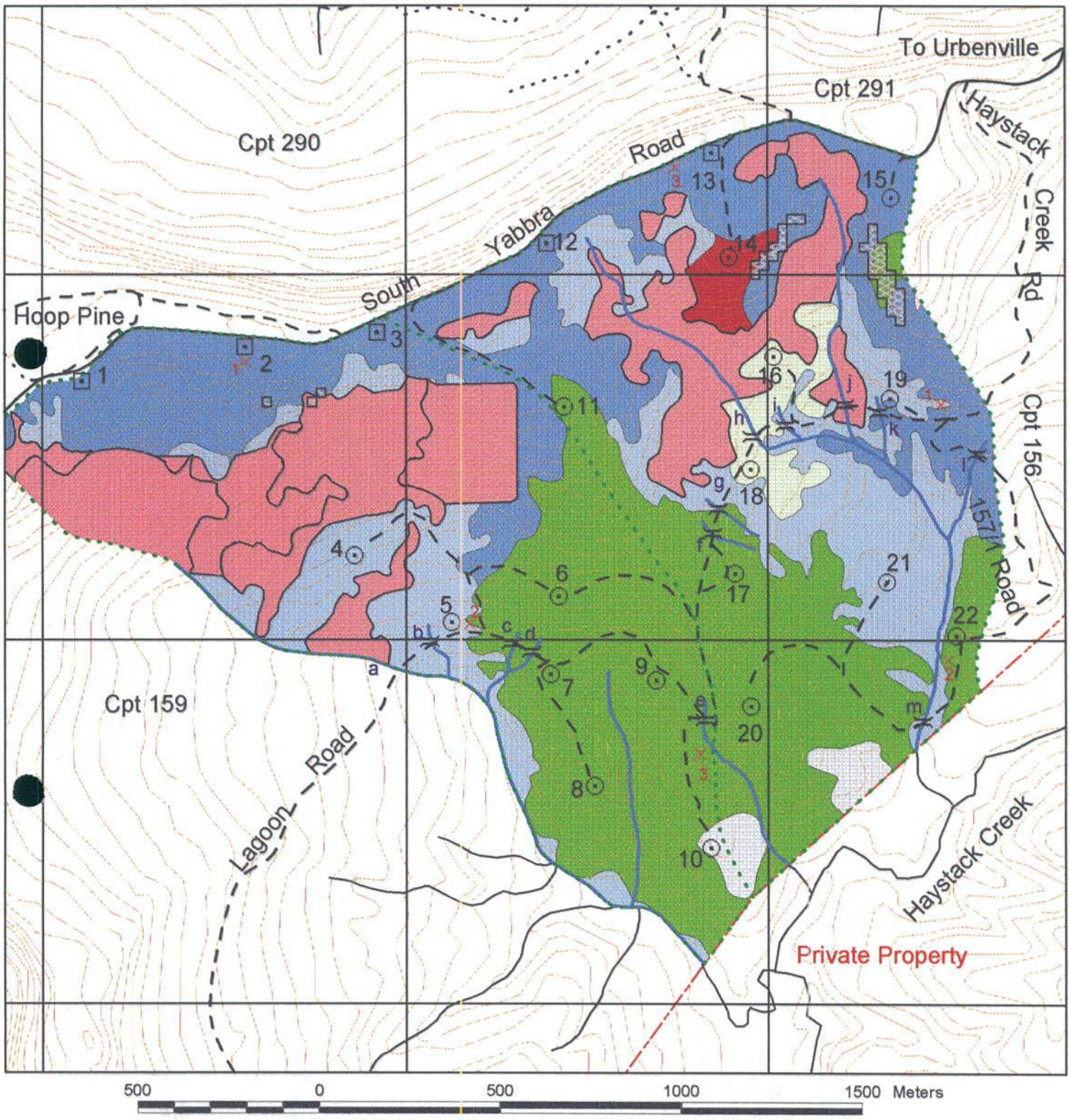
NON HARVEST AREAS
- General

DUMP SITES OR LANDINGS
- Temporary Wet
- Temporary Dry

WATERCOURSES & DRAINAGE
- External Drainage
- Internal Drainage
- Approved Crossings
- Soil Sites

MN

NORTHERN REGION - URBENVILLE
DISTRICT
FOREST TYPES MAP
COMPARTMENT 157
YABBRA STATE FOREST
CAPEEN MAP SHEET
HARVEST PLAN NUMBER 03
SCALE 1:15000



BOUNDARIES
Compartment Boundaries

FOREST TYPES
Sydney Blue Gum
Tallowwood - Sydney Blue Gum
Narrowleaved White Mahogany - Red Mahogany - Grey Ironbark - Grey Gum
Brush Box
Forest Red Gum
Rock
Grey Gum - Grey Ironbark - White Mahogany
Rainforest A & B

MN

RECORD OF DUMPS

Dump No.	Date Opened	Date Closed	Comments
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			

HARVESTING PLAN NO. UMA 97/03

Yabbra State Forest Compartments 157 & 158

CONTENTS

Part 2 FOREST MANAGEMENT & ENVIRONMENTAL CONSIDERATIONS

2.1 PHYSICAL FEATURES

Description 1 Physical description of the area

STATE FORESTS	Yabbra	DISTRICT	Urbenville
REGION	Northern	COMPARTMENTS	157 & 158

The compartments are bounded by cpt 156 to the east, cpt 159 to the west, private property to the south and South Yabbra Rd to the north. The compartments occupy a predominantly southerly aspect. The topography is generally steeper in the north of the compartments and falls from 650m ASL on South Yabbra Rd on the top of Tooloom Range to 360m ASL in the south above Haystack Creek. Drainage lines are often very pronounced and flow in an southerly direction feeding into Haystack Creek.
There are no areas within 1 km of high natural heritage values

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, and rainforest areas some 19% of the gross area is excluded from harvesting in this cutting cycle.

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. No potential old growth was found to occur in these compartments. Cpt 158 contains approximately 11ha of rainforest B which extended the area of existing typed rainforest.

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 157

Forest Type	1-23	46	47	53	60	62ab	92	TOTAL
Stand condition								
Unlogged	0	0	0	0	0	0	0	0
Selectively logged	27	8	45	41	4	49	4	178
TOTAL	**27**	**8**	**45**	**41**	**4**	**49**	**4**	**178**
Inaccessible/drainage			1			1		2
Visual corridor*								
Rainforest A & B	27							27
Non-harvest Research								
Net Harvest Area	**0**	**8**	**44**	**41**	**4**	**48**	**4**	**149**

Compartment 158

Forest Type	1-23	46	47	53	60	62a	92	TOTAL
Stand condition								
Unlogged	0	0	0	0	0	0		
Selectively logged	23	8	22	41	4	49	4	151
TOTAL	**23**	**8**	**22**	**41**	**4**	**49**	**4**	**151**
Inaccessible/drainage								
Visual corridor*								
Rainforest A & B	23		2	9				34
Non-harvest Research								
Net Harvest Area	**0**	**8**	**20**	**32**	**4**	**49**	**4**	**117**

Description 4 Broad description of Vegetation

(a) Forest types

Approximately one third of the harvestable area is dominated by FT 62ab on ridgelines and particularly in the drier areas of the cpts, with a mixed age class ranging from regeneration to mature trees. There is a small patch of FT 60 in compartment 157 in the northern section, adjoining the rainforest. Approximately 20 % of the area is rainforest FT 1-23, generally in the northern sections which are moister and more fertile. Forest types 47 and 53 occur in moist sites around the rainforest and are the dominant merchantable type in the northern section of the cpts. Forest types 46 and 92 only occur in localised areas.

(b) Understorey

The understorey of the forest is well defined and mesic in nature in the northern areas of the compartments which are dominated by rainforest and wetter forest types. Understorey in parts of the compartment consist of native grasses which have prevented the infestation of lantana. Areas of previous disturbance and higher site quality is typified with blanket lantata.

(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 planning inspections. National Parks records show there have been sightings of Wompoo Fruit Dove, Rose-crowned Fruit Dove, Tiger Quoll, and Kerivoula papuensis in areas adjacent to the compartments and a koala has been sighted in compartment 158. A koala survey was conducted in the cpts which were not found to be intermediate or high use areas although koala activity in the cpts was found.

(e) Rainforest

There is 27 ha of rainforest in compartment 157 and 34 ha of rainforest in compartment 158, which has previously been selectively logged. A 20 metre buffer zone must be placed around all rainforest areas. This area has been reserved from logging.

(f) Exotic weeds

Lantana has invaded large areas of the compartments. Croften weed along roads.

(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 have been logged previously. Compartment 157 was logged in 1967-1969 and 1984/85 with average volumes of 41.4 m^3 /Ha and 29.7 m^3 /Ha removed respectively. Compartment 158 was logged in 1970-73 and 1984/85 with average volumes of 30 m^3 /Ha and 22.9 m^3 /Ha removed respectively. The forest in the compartment has a structure with a mosaic of regeneration, saplings, pre-merchantable trees and mature trees being present over the area. The area would support a light selective logging as utilisation standards have increased. Eucalypt regeneration is poor in some areas where there is thick undergrowth and in areas infested with lantana.

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, 53, 60, 92 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). There areas of rainforest A and B which are excluded from harvesting and protected by a 20m buffer. 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

Type A and B Rainforest exist in this compartment. The extent of the rainforest can be seen on the Harvest Plan Operational Map. BOGMP was used to determine after consulting with the NP&WS .

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 planning inspections. National Parks records show there have been sightings of Wompoo Fruit Dove, Rose-crowned Fruit Dove, Tiger Quoll, and Kerivoula papuensis in areas adjacent to the compartments and a koala has been sighted in compartment 158. A koala survey was conducted in the cpts which were not found to be intermediate or high use areas although koala activity in the cpts was found.

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 1 & 2 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 available , 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 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 hollow-bearing trees with good crown development. Trees in the mature and intermediate growth stages should be retained as recruitment 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 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 to comply 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 directional 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 excluded from connection corridors , with the exception of road construction and road maintenance where there is 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 and the first junction with another stream, whereupon it becomes a second 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 the 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 eucalypt 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 requirements 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 form a shallow waterbody when inundated cyclically , intermittently or permanently with fresh , brackish or salt water , and where the inundation determines the type and productivity of the soils and the plant 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 emergent 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 10 Threatened Flora and Fauna Prescriptions

THREATENED FLORA PRESCRIPTIONS

Threatened flora prescriptions as cited in Section 5.3 of the Conservation Protocols must be applied where the following threatened flora have been recorded.

Prescription A:

This prescription applies to the following species:

Amorphospermum whitei
Eucalyptus glaucina
Eucalyptus tetrapleura
Tetratheca juncea

a) Buffers of 10m radius must be established around 50% of individuals of these species. Specified forestry activities must be excluded from these buffers. All attempts should be made not to fell trees into these buffers.

b) Around buffers established in a), an additional 10m wide modified harvesting zone must be established. Within this zone, at least 50% of the canopy must be retained. As far as possible, this canopy must be evenly spaced.

Prescription B:

This prescription applies to the following species:

Acacia courtii
Acacia georgensis
Acacia ruppii
Corchorus cunninghamii
Corokia whiteana
Hakea trineura
Hibbertia hexandra
Olearia flocktoniae
Pomaderris brunnea
Pomaderris parrisiae
Prostanthera species 6
Sophora fraseri
Tasmannia purpurascens
Tetratheca glandulosa

Damage to plants caused by specified forestry activities must be avoided. No buffer is required.

Prescription C:

This prescription applies to the following species:

Acacia bynoeana
Angophora robur
Arthraxon hispidus
Boronia umbellata
Bothriochloa biloba

Caesia parviflora var *minor*
Correa baeuerlenii
Corybas undulatus
Cryptostylis hunteriana
Cynanchum elegans
Diuris tricolor
Diuris venosa
Elaeocarpus species A
Endiandra hayesii
Eucalyptus kartzoffiana
Eucalyptus nicholli
Eucalyptus parramattensis subsp. *decadens*
Eucalyptus parvula
Floydia praealta
Grevillea beadleana
Grevillea masonii
Hibbertia marginata
Hicksbeachia pinnatifolia
Leptospermum sejunctum
Lindsaea incisa
Macadamia tetraphylla
Macrozamia johnsonii
Marsdenia longiloba
Melaleuca groveana
Melichrus hirsutus
Ochrosia moorei
Parsonsia dorrigoensis
Phyllota humifusa
Plectranthus nitidus
Prostanthera cryptandroides
Pterostylis species D
Pultenaea campbellii
Quassia species B
Randia moorei
Restio longipes
Sarcochilus fitzgeraldii
Sarcochilus hartmanii
Sarcochilus weinthallii
Senna acclinis
Styphelia perileuca
Symplocos baeuerlenii
Syzygium hodgkinsoniae
Syzygium moorei
Thesium australe
Triplariana nowraensis (syn. *Baeckea camphorata*)
Tylophora woollsii
Uromyrtus australis
Zieria floydii

a) Buffers of 10m radius must be established around all individuals of these species. Specified forestry activities must be excluded from these buffers. All attempts should be made not to fell trees into these buffers.

b) Around buffers established in a), an additional 10m wide modified harvesting zone must be established. Within this zone, at least 50% of the canopy must be retained. As far as possible, this canopy must be evenly spaced.

THREATENED FAUNA PRESCRIPTIONS

Koala - *Phascolarctos cinereus*

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.

Powerful Owl

Where a record of a Powerful Owl exists within 2km of the compartment boundary, the following must apply.

a) Pre-logging surveys for roost and nest sites along gully lines and heads of gullies must be conducted within 50m of the net logging area.

b) Specified forestry activities must be excluded from within 50m of a Powerful Owl nest site, and from within 30m of a permanent roost site. (A permanent roost site is defined as a roost that shows evidence of more than one visit/use.)

c) 300ha of potential habitat, must be retained within a 2km radius of a record (ie. an observation, call detection site, roost or nest site location). SFNSW must liaise with NPWS regarding the retention of appropriate areas of potential habitat for the Powerful Owl pending final agreement between NPWS and SFNSW on potential habitat definitions. Retained potential habitat must be mapped on the Harvesting Plan map.

d) Specified forestry activities must be excluded from the retained potential habitat.

e) Where information indicates that an abundance of more than one Greater Glider per hectare exists within 2km of a Powerful Owl record, eight habitat trees per hectare should be retained within the net logging area.

Masked Owl

Where a record of a Masked Owl exists within 2km of the compartment boundary, the following must apply.

a) Pre-logging surveys for roost and nest sites along gully lines and heads of gullies must be conducted within 50m of the net logging area.

b) Specified forestry activities must be excluded from within 50m of a Masked Owl nest site, and from within 30m of a permanent roost site. (A permanent roost site is defined as a roost that shows evidence of more than one visit/use.)

c) 300ha of potential habitat, must be retained within a 2km radius of a record (ie. an observation, call detection site, roost or nest site location). SFNSW must liaise with NPWS regarding the retention of appropriate areas of potential habitat for the Masked Owl pending final agreement between NPWS and SFNSW on potential habitat definitions. Retained potential habitat must be mapped on the Harvesting Plan map.

d) Specified forestry activities must be excluded from the retained potential habitat.

Sooty Owl

Where a record of a Sooty Owl exists within 2km of the compartment boundary, the following must apply:

a) Pre-logging surveys for roost and nest sites along gully lines and heads of gullies must be conducted within 50m of the net logging area.

b) Specified forestry activities must be excluded from within 50m of a Sooty Owl nest site, and from within 30m of a permanent roost site. (A permanent roost site is defined as a roost that shows evidence of more than one visit/use.)

Squirrel Glider

Where a record of a Squirrel Glider exists within 400m of the compartment boundary, the following must apply.

a) Logging must be excluded from an 8ha area (~200m x 400m) centred on Squirrel Glider records. This 8ha area should cover gully, midslope and ridgetop areas where possible. Retained habitat must be mapped on the Harvesting Plan map.

b) When 10 of these areas, separated by 2km or more, are retained over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

Yellow-bellied Glider

a) Persons conducting pre-logging and pre-roading surveys and site inspections must search for Yellow-bellied Glider sap feed trees (ie. "v-notch" trees and trees with other incisions made by Yellow-bellied Glider).

b) All Yellow-bellied Glider sap feed trees must be retained. Within a 100m radius of retained sap feed trees, 15 additional feed trees must be retained. The additional retained feed trees should be of the same species as the identified sap feed tree, and/or trees that shed their bark in long strips, eg species from Blue, Flooded, Grey, Red and White Gum groups. The retained feed trees must be >30cm dbh where available.

c) A 50m buffer must be established around all Yellow-bellied Glider den sites. Logging must be excluded from this buffer.

Brush-tailed Phascogale

Where a record of a Brush-tailed Phascogale exists within 3km of the compartment boundary, the following must apply.

a) 50ha of potential habitat, must be retained within a 3km radius of a Brush-tailed Phascogale record. Potential habitat must be that agreed to between SFNSW and NPWS.

b) Retained potential habitat must be on mid-slope or ridge-top areas. Retained potential habitat can include areas of identified old growth forest where this occurs on mid-slope or ridge-top areas. SFNSW must liaise with NPWS regarding the retention of appropriate areas of potential habitat for the Brush-tailed Phascogale pending final agreement between NPWS and SFNSW on potential habitat definitions. Retained potential habitat must be mapped on the Harvesting Plan map.

c) When 10 of these areas, separated by 3km or more, are retained over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

Critical Weight Range Vertebrates

Where a record of a CWRV exists within 2km of the compartment boundary (or a Tiger Quoll record within 5km), the following must apply.

a) A 20m buffer must be established around all areas of rainforest. Machinery must not enter this buffer. Trees may be felled out of and into the buffer. Trees must not be felled out of or into the rainforest. (This prescription is notwithstanding conditions applied under Prescription 1. Rainforest Protocol.)

b) Commercial and private firewood licences should specify that fallen hollow logs over 40cm diameter should not be removed.

c) Feral predator surveys should be conducted after harvesting operations using day light and/or nocturnal techniques. Species specific control measures should be undertaken to remove feral predators as required and reasonable, using the results of the surveys to justify the action taken.

d) The area covered by fuel reduction burns should not exceed 75% of the net logging area in any one compartment.

e) Grazing regimes should aim to minimise adverse impacts on CWRV species.

f) In addition to the above, the following species specific conditions must be applied.

I. <u>Bush Thick-knee</u>

A. Where records (observation, call or nest) exist for Bush Thick-knee, within 2km of the compartment, the NPWS must be notified to develop site specific prescriptions where necessary.

B. A 20m buffer must be established around all Bush Thick-knee nest sites. Specified forestry activities must be excluded from this buffer.

II. <u>Alberts Lyrebird</u>

A. Where records (observation, call or nest) exist for Albert's Lyrebird, within 2km of the compartment, the NPWS must be notified to develop site specific prescriptions where necessary.

B. A 10m buffer must be established around all Albert's Lyrebird nest sites. Specified forestry activities must be excluded from this buffer.

III. <u>Tiger Quoll</u>

A. Where records (observation, latrine, den site, hair analysis) exist for Tiger Quoll the exclusion zones listed below must be established. Placement of these exclusion zones should take into account the location of Tiger Quoll records.

- Around maternal den sites: 12ha exclusion with link to riparian buffers.
- Around permanent den sites: 3.5ha exclusion with link to riparian buffers.
- Around latrine sites: 12ha exclusion.

⇒ Long-nosed Potoroo

i) Harvesting and burning must be excluded from a 5m buffer around six trees per ha that are retained to meet Prescription 4.

Threatened Frogs

The following general frog protection measures must be applied throughout the net logging area.

a) A 10m buffer must be established around all ponds and dams (as separate from streams and wetlands detailed in other prescriptions). No trees must be felled within this buffer. All practical precautions should be taken to avoid felling trees into this buffer. Machinery must not enter this buffer.

b) Grazing and associated burning should be excluded from swamps and ephemeral wetlands.

c) Any burning should be conducted in a manner which precludes its encroachment into any buffer zones established under this condition; OR in a manner consistent with continued wetland management.

d) Where more than 10 male threatened frogs per hectare are detected, stream crossings should be bridged if possible. This principle is to be applied within 500m of the perimeter of the concentration of frogs.

e) In addition to the above the following species specific prescriptions must be applied.

I. *Pseudophyrne australis*

A. Where records exist within 2km of the compartment, the NPWS must be notified to develop a site specific prescription.

B. Sandstone habitat should be protected from exploitation by bush-rock collectors.

II. *Mixophyes fleayi*

A. Where a record exists, a 40m wide buffer must be established on both sides of the stream that extends 200m upstream and 200m downstream of the record. Specified forestry activities must be excluded from this buffer.

III. *Mixophyes iteratus* and *Mixophyes balbus*

A. Where a record exists on a first or second order stream, a 30m wide buffer must be established on both sides of the stream that extends 200m upstream and 200m downstream of the record. Specified forestry activities must be excluded from this buffer.

IV. *Philoria spp.*

A. Where a record exists in the riparian buffer zone (established under Prescription 6 of this licence) along first or second order streams, planners should place connection corridors (established under Prescription 7 of this licence) on this stream.

B. Where recorded elsewhere, a 50m radius buffer must be established around the record. Specified forestry activities must be excluded from this buffer.

V. *Litoria aurea*

A. Pending finalisation of the *Litoria aurea* species recovery plan, a 5ha buffer must be established around any waterbody where this species has been recorded. Specified forestry activities must be excluded from this buffer.

B. When 10 of these areas, separated by 2km or more, are accumulated over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

VI. *Litoria brevipalmata*

i) A 5ha buffer must be established around records of this species. Specified forestry activities must be excluded from this buffer.

ii) When 10 of these areas, separated by 2km or more, are accumulated over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

Threatened Bats

Within 5km of records of threatened bat species, the following must apply.

a) Likely multiple bat roost trees should be inspected prior to operations commencing within 100m of such trees. Likely roost trees are dead stags greater than 100cm dbh; OR large trees with accessible base hollows.

b) The area covered by fuel reduction burning should not exceed 75% of the net logging area in any one compartment where threatened bats have been detected.

c) Post-logging burning should plan for no more than 75% coverage of the gross harvesting area in areas where threatened bats have been detected.

d) In addition to the above the following species specific prescriptions must be applied.

I. *Pteropus alecto*

A. A 50m buffer must be established around roosting camps of the Black Flying-fox. Specified forestry activities must be excluded from this buffer.

B. The locations of Black Flying-fox camps and their buffers must be clearly mapped and recorded in the harvesting plan.

II. *Saccolaimus flaviventris, Mormopterus beccarii, Mormopterus norfolkensis, Scoteanax rueppellii, Chalinolobus nigrogriseus, Falsistrellus tasmaniensis*

A. A 50m buffer must be established around roost sites harbouring more than three individuals of these species. Specified forestry activities must be excluded from these buffers.

III. *Nyctophilus bifax* and *Nyctophilus timoriensis*

A. A 50m buffer must be established around roost sites harbouring an individual of these species. Specified forestry activities must be excluded from these buffers.

IV. *Chalinolobus dwyeri* and *Vespadelus troughtoni*

A. A 50m wide buffer must be established around entries to known major subterranean roosting sites of these species. Specified forestry activities must be excluded from these buffers.

V. *Kerivoula papuensis*

A. Where a record exists, a 40m wide buffer must be established on both sides of streams for 200m upstream and 200m downstream of the record. Specified forestry activities must be excluded from these buffers.

VI. *Myotis adversus*

A. Where a record exists, a 40m wide buffer must be established on both sides of permanent streams and around other natural water bodies used by this species.

VII. *Miniopterus australis, Miniopterus schreibersii, Chalinolobus dwyeri, Vespadelus troughtoni*

A. SFNSW and the NPWS must develop a management strategy for forests around known maternity and hibernation sites of these species.

f) Where 10 roost exclusion sites for a particular threatened bat species, separated by 2km or more are accumulated within a two year period, SFNSW can apply to the NPWS for review of this prescription.

Olive Whistler and Pink Robin

Where these species are recorded the following must apply.

a) A 20m buffer must be established around all areas of rainforest. Machinery must not enter this buffer. Trees may be felled out of and into the buffer. Trees must not be felled out of or into the rainforest. (This prescription is notwithstanding conditions applied under Prescription 1. Rainforest Protocol.)

Glossy Black Cockatoo

a) A 50m radius buffer must be established around all Glossy Black Cockatoo nest sites. Specified forestry activities must be excluded from this buffer.

b) When 10 Glossy Black Cockatoo nest buffers are retained over a two year period in any one SFNSW Management Area, SFNSW may apply to the NPWS for a review of this prescription.

Gilberts Whistler

Where this species is recorded, the following must apply.

a) Exclusion of logging in 4ha blocks around territories.

Turquoise Parrot

a) Turquoise Parrot nest sites must be protected by a minimum 20m radius exclusion.

Swift Parrot

a) Where this species is detected, harvesting must be temporarily from flowering eucalypts.

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.

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

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**	**1050 mm**
	Average rainfall erosivity	**$R = 89.31 \times 7.2^{1.74} = 2771$**
	Monthly rainfall erosivity	**Maximum 526 Minimum 55**

Average annual rainfall for Urbenville (8 km N 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 157 & 158 of approximately 1050 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 **7.2 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 (8 km N 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.

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)

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

(c) Geology

The Compartments are located on the Walloon Coal Measures. 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. There are 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	SCL-CL
	B horizon	CL-MHC
Method of determination		Field Texture
Comment:		Determined at sample sites by qualified soil scientist
K value	A horizon	.03
	B horizon	.03
Method of determination		From field texture
Comment:		Adopt 0.03 as the max K value found
% Clay	A horizon	
	B horizon	
Method of determination		
Comment:		
EAT class	A horizon	4-6 Aggregate slakes but does not disperse
	B horizon	4-6 Aggregate slakes but does not disperse
Method of determination		D2 and D3
Comment:		Conducted by qualified soil scientist.
Dispersion %	A horizon	
	B horizon	
Method of determination:		
Comment:		Not dispersible

Depth to subsoils and bedrock
Topsoil depth: 0-15 cm. Depth to bedrock: 70+ cm
Field survey through observation of road batters and from the soil samples showed the predominant depth of the topsoil to be 10-15 cm.

Inherent fertility
Whilst these soils are of low to moderate fertility, the predominantly southerly 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
There is a batter slip on Haystack Creek Road, cause by a large stump but presents no further erosion risk. Refer to the soil survey report attached. There are no areas of erosion that need to be dealt with.

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

Qualified soil scientist
Justin Claridge (EPA Approved Soil Scientist) conducted an investigation of the soils on the 14th of February 1997. A range of soil characteristics were recorded including colour, E.A.T., depth of A and B horizons, pH and K factor. Sites were selected to sample soils over a range of slope positions and soil types.

(e) Landform

Slope
Slopes are generally convex from the ridge tops down to the limits of the net harvest area. While the ridgetop harvesting areas and lower slopes are largely under 15° the balance of the slopes within the net harvestable area are between 15° and 25°. Areas over 30° cover 3% of the gross area. (See Table 2 under Description 12.)

The net harvestable area of the Compartments covers upper-ridgelines down to lower slopes. The area is dominated by the Tooloom Range.

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

Aspect
The general aspect of the Compartments is south with other areas such as the slopes around gullies and ridges 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

Compartments 157 and 158 lie within the Haystack Creek Catchment and drains into Duck Creek and onto the Clarence River approximately 30 km to the South. Drainage lines within the compartment are well developed. They initiate as drainage depressions from the main ridgelines and upper slopes and due to the mountainous relief quickly become clearly defined, stable and rocky drainage lines. Water was present in some of the drainage lines at the time of inspection. Other than the unnamed gullies marked on the harvesting plan no prescribed streams, 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
The compartments were harvested for saw logs, poles and girders in the 60's and 70's and again in the mid 80's over all accessible country. There is also evidence in the form of weathered stumps that a selective logging operation occurred many years prior to documented operations. 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 Compartments 157 & 158 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) Operation system [See Condition 4. 7(b)]

Haulage direction
Haulage will be east and north to South Yabbra Road where logs will travel via the Bonalbo Rd to Urbenville and Woodenbong and Summerland Way to Grevillia.

Condition of existing roads in the planning unit to be used for the logging operation.

Primary access roads : **Bonalbo Road** A permanently maintained surfaced road.

Secondary access road : **South Yabbra Road** A permanently maintained crowned gravel road with outfall drainage, infall to relief pipes and mitre drains. Maintenance - cleaning of some table drains.

Feeder road :

*Haystack Creek Road

* Length of road	1100 metre.
* Type of pavement	Natural dirt , vegetated with grasses and weeds.
* Maximum road grade	8°
* Maximum side slope	36°
* Max width of running surface	4.5 metre.
* Maximum batter height	5 metre
* Length of batters	1100 metre
* Existing road drainage	Outfall, mitre drains and infall to relief pipes. Infall along side cuts to seven 450mm relief pipes approx. 100m apart with concrete/rock headwalls.
* Condition of road drainage outlets	Vegetated outlets onto undisturbed ground.
* Condition of batters	Earth/rock , vegetated and stable.
* Drop down structures & dissipaters	Rock on two pipes. One of these (350m from South Yabbra rd) requires more rock because there is some erosion below the outlet.
* Erosion of road information	No obvious erosion present.

Maintenance by State Forests:
* Any disturbed batters must be sown with a grass mix at the rate of 20kg/ha.
* Periodic slashing will be conducted by State Forests to keep the road trafficable.
* Mitre drains must be cleaned to prevent any obstructions to cause water diversions.

* Lagoon Road

* Length of road	2400 metre
* Type of pavement	Natural dirt , vegetated with grasses and weeds.
* Maximum road grade	8°
* Maximum side slope	24°
* Max width of running surface	4.5 metre.
* Maximum batter height	3 metre
* Length of batters	2000 metre
* Existing road drainage	Outfall, infall and mitre drains. Infall is usually into undisturbed vegetation using mitre drains before a drainage feature which has a pipe crossing over it.
* Condition of road drainage outlets	Vegetated and stable.
* Condition of batters	Earth/rock , vegetated and stable.
* Drop down structures & dissipaters	N/A on this section.
* Erosion of road information	Nil.

Maintenance by State Forests:
* Any disturbed batters must be sown with a grass mix at the rate of 20kg/ha.
* Periodic slashing will be conducted by State Forests to kept the road trafficable.
* Mitre drains must be cleaned to prevent any obstructions to cause water diversions.

* 157/1 Road

* Length of road	1700 metre
* Type of pavement	Natural dirt , vegetated with grasses & weeds.
* Maximum road grade	7°
* Maximum side slope	18°
* Max width of running surface	4.5 metre.
* Maximum batter height	1.5 metre

* Length of batters	1100 metre
* Existing road drainage	Outfall and mitre drains.
* Condition of road drainage outlets	Vegetated outlets onto undisturbed ground.
* Condition of batters	Earth/rock , vegetated and stable.
* Drop down structures & dissipaters	N/A on this section.
* Erosion of road information	No obvious erosion present.

Maintenance by State Forests:
* Any disturbed batters must be sown with a grass mix at the rate of 20kg/ha.
* Mitre drains must be cleaned to prevent any obstructions to cause water diversions.

Harvesting road :
Roads to Dumps 4, 6, 8, 10, 11, 20 and 21 could not be described due to heavy lantana infestation. Details of these roads will be forwarded to the EPA as an amendment variation with all road and crossing descriptions prior to direct harvesting.

Existing road drainage feature crossing description

Site a

* Location	Western boundary of Cpt 158
* Drainage feature	Drainage line, semi permanent flow.
* Type	Log bridge
* Type of pavement	Natural earth with vegetation.
* Approach drainage	Infall outfall drainage.
* Approach condition	Stable and vegetated.
* Table drain checks	Table drains are directly onto bank of watercourse. Hay bales will be placed in these drains.
* Containment of fill	Kerb logs.
* Structure stability	Stable, structurally sound for light traffic, it will not be crossed by trucks.
* Bed & bank stability	Stable vegetated.
* Sediment control	Natural pavement, approaches and banks vegetated.

Maintenance by State Forests :
* Nil.

Site b

* Location	On Lagoon Rd 100m east of crossing a.
* Drainage feature	Drainage line , no permanent flow.
* Type	700mm pipe crossing.
* Type of pavement	Natural earth with vegetation
* Approach drainage	Outfall drainage Approaches 2°
* Approach condition	Stable , vegetated condition
* Table drain checks	Drains directed into at least 5 metres of vegetation.
* Containment of fill	Vegetated banks and sides.
* Structure stability	Stable
* Bed & bank stability	Vegetated and stable, rock drop down structure.
* Sediment control	Grassed pavement, natural earth.

Maintenance by State Forests :
* Gravel bridge pavement and approaches if required

Site c

* Location	500m east of Cpt boundary 158
* Drainage feature	Drainage line
* Type	700mm Pipe crossing
* Type of pavement	Natural earth with vegetation.
* Approach drainage	Infall drainage.
* Approach condition	Stable, approaches 2-3°
* Table drain checks	Mitre drains into 5m of undisturbed vegetation.
* Containment of fill	N/A.
* Structure stability	Very Stable
* Bed & bank stability	Stable, rock dissipater.
* Sediment control	Natural vegetated pavement , approaches and banks.

Maintenance by State Forests :
* maintain gravel pavement if deformation occurs.

Site d

* Location	Lagoon Rd 50m east of crossing c.
* Drainage feature	Drainage depression.
* Type	450mm pipe crossing
* Type of pavement	Natural earth with vegetation
* Approach drainage	Outfall drainage Approaches 2°
* Approach condition	Stable , semi vegetated condition
* Table drain checks	Drains directed into at least 5 metres of vegetation.
* Containment of fill	Vegetated.
* Structure stability	Stable
* Bed & bank stability	Vegetated and stable.
* Sediment control	Grassed pavement, natural earth.

Maintenance by State Forests :
* Gravel bridge pavement and approaches if required

Site e

* Location	Hair pin cnr, cpt boundary 157/158.
* Drainage feature	Drainage depression
* Type	450mm pipe crossing
* Type of pavement	Natural earth with vegetation.
* Approach drainage	Road only 1-2° and outfall drainage adequate.
* Approach condition	Stable and vegetated.
* Table drain checks	Table drains are directly into depression.
* Containment of fill	None.
* Structure stability	Very Stable
* Bed & bank stability	Stable.
* Sediment control	vegetated approaches, depression is vegetated.

Maintenance by State Forests :
* None

Site f

* Location	Cpt 157 600m from hair pin cnr
* Drainage feature	Drainage depression, intermittent flow.
* Type	450mm pipe crossing
* Type of pavement	Natural earth with vegetation.
* Approach drainage	Road only 1-2° and infall outfall drainage adequate.

* Approach condition	Stable and vegetated.
* Table drain checks	Mitre drains into 5m of undisturbed vegetation.
* Containment of fill	Rock/cement headwalls.
* Structure stability	Very Stable
* Bed & bank stability	Stable.
* Sediment control	vegetated approaches, depression is vegetated.

Maintenance by State Forests :
* Gravel bridge pavement and approaches if required

Site g
Same as site f.

Site h

* Location	500m west of Cpt boundary 157/156
* Drainage feature	Drainage line, semi-permanent flow.
* Type	Log bridge which needs repair (refer to maintenance by contractor)
* Type of pavement	Logs.
* Approach drainage	Infall drainage 15m before crossing at 7° outfall drainage further back
* Approach condition	Stable.
* Table drain checks	Hay bales to be placed in infall table drains.
* Containment of fill	N/A.
* Structure stability	4 cross logs are unsound and will be replaced.
* Bed & bank stability	Stable, rocky bed.
* Sediment control	Natural vegetated pavement , approachs and banks.

Maintenance by State Forests :
* maintain gravel pavement.

Site i

* Location	100m west of crossing j.
* Drainage feature	Drainage depression.
* Type	450mm pipe crossing
* Type of pavement	Natural earth with vegetation
* Approach drainage	Outfall drainage Approaches 1-2°
* Approach condition	Stable , vegetated condition
* Table drain checks	Drains directed into at least 5 metres of vegetation.
* Containment of fill	Rock/concrete headwall.
* Structure stability	Stable
* Bed & bank stability	Vegetated and stable.
* Sediment control	Grassed pavement, natural earth.

Maintenance by State Forests :
*None

Site j

* Location	300m west along Lagoon Rd.
* Drainage feature	Drainage line
* Type	900mm pipe crossing
* Type of pavement	Natural earth with vegetation.
* Approach drainage	infall outfall drainage adequate.
* Approach condition	Stable and vegetated. Approaches 2-3°.
* Table drain checks	Mitre drains into 5m of undisturbed vegetation.
* Containment of fill	Rock/cement headwalls.

* Structure stability	Very Stable
* Bed & bank stability	Rocky bed on lower side acts as dropdown and dissipater.
* Sediment control	vegetated approachs and banks,.

Maintenance by State Forests :
* None

Site k

* Location	100m east of crossing J
* Drainage feature	Drainage depression
* Type	700mm pipe crossing
* Type of pavement	Natural earth with vegetation.
* Approach drainage	infall and outfall drainage. approaches approx 2^{o}
* Approach condition	Stable.
* Table drain checks	Mitre drains into 5m of undisturbed vegetation.
* Containment of fill	Rock/cement headwalls.
* Structure stability	Very Stable
* Bed & bank stability	Stable.
* Sediment control	vegetated approachs, depression is vegetated.

Maintenance by State Forests :
*None

Site l

* Location	100m down 157/1 Road.
* Drainage feature	Drainage depression
* Type	450mm pipe crossing
* Type of pavement	Natural earth with vegetation.
* Approach drainage	Road only 3^{o} and infall outfall drainage adequate.
* Approach condition	Stable and vegetated.
* Table drain checks	Mitre drains into 5m of undisturbed vegetation
* Containment of fill	Rock headwalls.
* Structure stability	vegetated and stable
* Bed & bank stability	Stable.
* Sediment control	vegetated approachs, depression is vegetated.

Maintenance by State Forests :
* None

Site m

* Location	South eastern crn of cpt 157
* Drainage feature	Drainage line with permanent flow
* Type	To be constructed. Refer to - Prescription for road drainage feature crossing construction by the logging contractor.

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=2771	**$R = 89.31 \times 7.2^{1.74}$**
K=0.03	**Soil Survey**
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≤5	< 10	1	20	Low
>5 ≤ 24	11 - 49	2	70	Mod
>24≤30	50+	3	10	High
Roads/tracks	High	3	n/a	High

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

R = 2771 K = 0.03

(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

Yabbra State Forest is very scenic as a result of the rugged terrain and location in the Tooloom Range. It provides a mosaic of forest types and associated wildlife. The Compartments occupy steep country near the top of the range and flatter country near Haystack Creek.
No cultural or Aboriginal sites exist.
Rainforest is common in the upper moister areas of the compartments.

Part 3 AUTHORISATION CONDITIONS

Condition 3.1 Compliance

(a) Area identification

Compartments 157 & 158 Yabbra State Forest No.394

(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 10/3/97

(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 April 1997.**

Signature ..... District Forester. Date .....10/3/97.....
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		
EPA		
RaPIC		
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 97/03.

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

(e) **Date for commencement of operations** .....April 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

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

Position ..... Company

Condition 3.5 Industry Field Supervisor/ Bush Supervisors acknowledgment

I acknowledge that I have received a copy of Harvesting Plan No UMA 97/03 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
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

As directed by the SFO to coincide with weather and conditions, industry requirements and orderly harvesting for completion of the cpts.

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 known to occur in the net harvest area.

(b) Rainforest protection

Rainforest A and B have been identified in these compartments.
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 Fauna Protection Strategy

(b) Habitat Tree retention

See Description 9 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≤5	LOW	1	20
>5 ≤ 24	MODERATE	2	70
>24≤30	HIGH	3	10
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) **Use of existing roads**

Roads or crossings not to be used for this logging operation

All mapped roads are available for use.

Prescription for road maintenance by the logging contractor.

Haystack Creek Road

* Length	1100 metre
* Maximum road grade	8°
* Control of existing erosion	Outfall, mitre drains and infall to relief pipes. Infall along side cuts to seven 450mm relief pipes approx. 100m apart with concrete/rock headwalls.
* Max clearing beyond pavement	2 metre. Light shrub and lantana on batters which obstruct the passage of log trucks must be cleared by blade or excavator. Debris must be deposited on fill batter except where debris on top side does not interfere with haulage. Debris must not obstruct water through mitre drains. Any batter trees greater than 15cm diameter at breast height required to be removed must be fallen where safe rather than removed by blade.
* Batter disturbance allowed	Yes, surface disturbance only.
* Road drainage	Reinstate existing outfall and ensure mitre drains are functioning where affected by clearing.
* Drop down structures and dissipaters	down structures of armoured rock on two relief pipes.
* Practices to assist return of edge ground cover	Disturbed fill batters must be sown by SFO with grass seed at the rate of 20kg/ha .

* Other site specific prescriptions	N/A
* Action after use	Road to remain trafficable .

Lagoon Road

* Length	2400 metre
* Maximum road grade	8°
* Control of existing erosion	Outfall, infall and mitre drains. Infall is usually into undisturbed vegetation using mitre drains before a drainage feature pipe crossing.
* Max clearing beyond pavement	3 metre. Light shrub and lantana on batters which obstruct the passage of log trucks must be cleared by blade or excavator. Debris must be deposited on fill batter except where debris on top side does not interfere with haulage. Debris must not obstruct water through mitre drains. Any batter trees greater than 15cm diameter at breast height required to be removed must be fallen where safe rather than removed by blade.
* Batter disturbance allowed	Yes, surface disturbance only.
* Road drainage	Reinstate existing outfall and ensure mitre drains are functioning where affected by clearing.
* Drop down structures and dissipaters	N/A
* Practices to assist return of edge ground cover	Disturbed fill batters must be sown by SFO with grass seed at the rate of 20kg/ha .
* Other site specific prescriptions	N/A
* Action after use	Road to remain open.

157/1 Road

* Length	1700 metre
* Maximum road grade	7°
* Control of existing erosion	None present
* Max clearing beyond pavement	2 metre. Light shrub/weeds on batter surface which will obstruct the passage of log trucks must be cleared by blade or excavator. Debris must be deposited on fill batter except where debris on top side does not interfere with haulage. Debris must not obstruct water through mitre drains. Any batter trees greater than 15cm diameter at breast height required to be removed must be fallen where safe rather than removed by blade.
* Batter disturbance allowed	Yes, surface disturbance only.
* Road drainage	Reinstate existing outfall and ensure mitre drains are functioning where affected by clearing.
* Drop down structures and dissipaters	N/A.
* Practices to assist return of edge ground cover	Disturbed fill batters must be sown by SFO with grass seed at the rate of 20kg/ha .
* Other site specific prescriptions	N/A
* Action after use	Close road to any further use.

Where the location of snig tracks or log dumps results in concentration water flow off the road and onto the feature, then a mitre drain or crossbank must be constructed that reduces the catchment area onto the site. The outlets of drainage structures must discharge onto undisturbed vegetation or logging debris. If during the course of harvesting the outlet is disturbed and cannot be stabilised by placement of logging debris, then the SFO must ensure that State Forests installs sediment fence at the outlet. Where the outlet discharges onto a fill batter of greater than 1 metre height , then a drop down structure of the type described above must be installed. This condition is applicable to both existing and newly constructed roads.

Prescription for road drainage feature crossing repair by the logging contractor
All work will be supervised by a SFO.

Drainage line crossing h.

- Location
  500m west of cpt boundary 157/156
- Type of drainage feature
  Drainage line, semi-permanent flow.
- Estimates approach grade
  < 7° either side
- Type of crossing structure proposed
  Log crossing to have 4 unsound logs removed and replaced by an excavator .
  Sediment sheeting is to be laid ontop of the logs before spoil is pushed over the bridge.
  Spoil for the crossing pavement will be from blading the approach batters back 15cm.
- Estimated clearing total clearing width through crossing
  None
- Bank and bed reshaping
  N/A.
- Containment of fill
  Kerb logs
- Approach reforming
  Batter bladed back appromimately 15 cm.
- Approach drainage
  Infall drainage over 15m before the crossing beyond this it is outfall mitre drains into undisturbed vegetation.
- Any necessary stabilisation of bed and banks
  N/A.
- Sediment control
  SFO will supply sediment sheeting (Jutemaster Thick Mat), to be laid on top of logs before spoil is pushed onto the bridge.
  The SFO or Operations Foreman will place hay bales along drains that flow directly in to drainage line as sediment traps.
- Action after use
  A SFO will sow Grass seed at the rate of 20kg/ha on all disturbed areas
  Crossing is to remain in place at the completion of operations.

Prescription for road drainage feature crossing construction by the logging contractor
All work will be supervised by a SFO.

Drainage line crossing m.

- Location
  South east crn of cpt 157
- Type of drainage feature
  Drainage line, permanent flow
- Estimates approach grade
  < 4-5° either side
- Type of crossing structure proposed
  Temporary hollow log crossing requiring 3 logs to replace old crossing that has been washed out.
- Estimated clearing total clearing width through crossing
  None
- Bank and bed reshaping
  N/A.
- Containment of fill
  Kerb logs
- Approach reforming
  N/A.Minor blading of pavement to cover log crossing
- Approach drainage
  On the west side mitre drains into at least 10m of undistrubed vegetation. On the east side infall mitre drains into 5m undisturbed vegetation
- Any necessary stabilisation of bed and banks
  N/A.
- Sediment control
  SFO will supply sediment sheeting (Jutemaster Thick Mat), to be laid on top of logs before spoil is pushed over.
- Action after use
  A SFO will sow Grass seed at the rate of 20kg/ha on all disturbed areas
  Crossing is to be removed at the completion of operations and will have crossbanks constructed before the crossing to prevent runoff from the road eroding the stream banks.

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 table 5 below and based on peak flow 1 in 5 year storm event. Cross bank spacing should avoid unnecessary soil disturbance cognisant of the previous calculations.

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.

Prescription for road drainage feature crossing maintenance by logging contractor.

Ensure logging debris is removed following harvesting, crossing drainage is effective and functional during harvesting. Drainage feature crossing maintenance will be conducted by State Forests .

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	25°.
Maximum side slope for snig track construction	30°.
Maximum road grade permitted	10°.
Maximum side slope for road construction without engineering design	30°.

The SFO is responsible for identifying ground slopes in excess of 30° in the field.

(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 widths

		DRAINAGE FEATURE		STRIP WIDTH EITHER SIDE
SE/WPHC	WPHC Slope	Catchment	Slope *	Filter
	(degrees)	(hectare size)	(degrees)	(metres)
1	0 ≤ 5	< 40	-	5
2	> 5 to ≤ 24	< 40	-	10
3	>24 to 30	< 40	< 18	15
3	>24 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

* refers to the ground slope within the filter strip

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 encountered 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*) accidentally felled into filter strips must be removed with the minimal disturbance to the ground cover and soil in the filterstrip. 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 channelled 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 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. Snig tracks leading directly onto roads must be drained by mitre drain or crossbank to minimise the catchment area immediately above the road.

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 Pollution Hazard Category		
	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 undisturbed vegetated 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 consolidated effective bank height of 25cm, unless otherwise calculated in accordance with the above.
Crossbanks must be constructed at right angles to the direction of the snig track.
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 physical 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.

Snig tracks leading directly into watercourses and drainage lines must be drained to minimise the catchment area immediately above the 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, 10-15 cms of 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

There are no research or inventory plots present in the compartments.

Condition 4.9 **Modified harvest conditions for special emphasis areas**

Care to be taken of fencelines, flora and fauna, and rainforest 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 Thinnings	40 cm cdub minimum 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)	2100
Thinnings	900
Poles, piles and girders	

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 available , 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 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 hollow-bearing trees with good crown development. Trees in the mature and intermediate growth stages should be retained as recruitment 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 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 to comply 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 directional 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 understorey 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 habitat 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 (1984/85).

(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 Compartments 157 & 158 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 planning inspections. National Parks records show there have been sightings of Wompoo Fruit Dove, Rose-crowned Fruit Dove, Tiger Quoll, and Kerivoula papuensis in areas adjacent to the compartments and a koala has been sighted in compartment 158. A koala survey was conducted in the cpts which were not found to be intermediate or high use areas although koala activity in the cpts was found.

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
10.	Conditions for marking/ identifying: - filter strips - buffer strips in the field	Yes	C4.2 C4.7(h) 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 specified, 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

CLEARANCE CERTIFICATE

HARVESTING PLAN No. **UMA 97/03**

COMPARTMENTS **157 & 158** **SF 394**

DISTRICT **URBENVILLE**

To M.....Supervising Forest Officer

I request approval for me to move my logging crew and all associated machinery from the above mentioned area to the next Compartments (Section or Coupe) in accordance with Section 3.5 of the Code of Logging Practice.

I certify that:

(a) all permanent roads, trails and mitre drains have been cleared of harvesting debris;
(b) butt damage to retained trees has been kept to acceptable limits;
(c) all trees marked for removal have been felled;
(d) utilisation limits have been satisfactorily met;
(e) stump heights conform to requirements;
(f) all hanging trees have been felled and brought down;
(g) all log dump sites/landings/log stack sites have been satisfactorily restored as required;
(h) harvesting debris is not accumulated around retained trees;
(I) all accumulated litter has been disposed of properly;
(j) all filter and buffer strip requirements have been complied with;
(k) all snig track, extraction track and temporary logging road drainage has been installed satisfactorily and other required rehabilitation work has been completed;
(l) all necessary repairs to damaged roads, signs, fences and other structures have been carried out.

I believe that I have met all my obligations under the conditions of the Timber Licence, the Pollution Control Licence, and/or any licence issued under Section 120 of the National Parks and Wildlife Act, which apply to the Compartments (Section, Coupe) just completed, as stated in this Harvesting Plan.

Signature.....Licence No.....Date .....
Contractor/licensee

As a result of inspections of the logging operations made in accordance with this Harvesting Plan, I am satisfied that, to the best of my knowledge, the licensee/ contractor responsible for this harvesting operation has satisfactorily completed all work and approval is given for her/him to remove her/his machinery and equipment and leave the area/ commence operations in another Compartments. (Compartments.....).

This clearance does not release the licensee/contractor from any obligation to undertake any remedial work if subsequent deficiencies are shown to result from inadequate practices during the harvesting operation, which are found during any inspections of the area made within 12 months of the date of this post- harvesting inspection.

Last inspection was made on .....(Date)

Signed (Supervising Forest Officer).....(Date).....

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=2771	**$R = 89.31 \times 7.2^{1.74}$**
K=0.03	**Soil Survey**
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
≤7	Low	30
> 7≤ 27	Mod	68
>27≤30	High	2
na	extreme	n/a

98% 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: Soil Reports

SOIL SURVEY: *YABBRA STATE FOREST CPTS 157 & 158*

A soil survey of Compartments 157 & 158 was conducted on the 4th of February 1997. The results and maps are attached.

The compartments are located on the southern side of Tooloom Range and fall from 640m ASL on the top of the range to 360m ASL just above Haystack Creek. Soils in the compartments change from red volcanics at the very top of the range to predominantly yellow podzolics over the rest of the area having heavier textures in lower areas.

All roads and batters in the compartments appear stable. However, there is a batter slip on Haystack Creek Road and a slip in the very west of compartment 157. These slips occurred in the steeper mid-slopes in the sandier yellow podzolics. It is only very steep mid-slope areas which appear less stable.

K factors were found to range from between 0.013 to 0.03. It is recommended that a K factor of 0.03 and no dispersible soil horizons be adopted for water pollution hazard assessment.

Justin Claridge

Justin Claridge 17/2/97
(EPA Approved Soil Scientist)

	SOIL SURVEY - YABBRA STATE FOREST CPT 157 (4/2/97)									
SITE	AMG	POSITION	SLOPE (degrees)	HORIZON	DEPTH (cm)	COLOUR	TEXTURE	pH	E.A.T.	K FACTOR
1	454500E	MID-SLOPE	3	A	0-10	7.5YR2.5/1	SCL	6	4-6	0.025
	6840650N			B	11-70	10YR5/3	SMC	5.5	4-6	0.017
2	453750E	CREST	3	A	0-15	5YR3/2	SCL	6.5	8	0.025
	6841250N			B	16-70	2.5YR3/4	CL	6	8	0.03
3	454550E	LOWERSLOPES	2	A	0-20	7.5YR2.5/1	FSCL	6	8	0.025
	6839950N			B	21-70	2.5Y6/3	MC	5	4-6	0.015
	SOIL SURVEY - YABBRA STATE FOREST CPT 158 (4/2/97)									
SITE	AMG	POSITION	SLOPE (degrees)	HORIZON	DEPTH (cm)	COLOUR	TEXTURE	pH	E.A.T.	K FACTOR
1	452550E	CREST	1	A	0-10	5YR2.5/2	CL	6.5	8	0.03
	6810775N			B	11-70	10R3/6	CL	6.5	4-6	0.03
2	453075E	MID-SLOPE	4	A	0-10	10YR4/6	SCL	6.5	4-6	0.025
	6840025N			B	11-70	10YR6/6	SC	4.5	4-6	0.017
3	453800E	MID-SLOPE	5	A	0-15	10YR3/1	FSCL	6.5	8	0.025
	6839700N			B	16-70	5YR4/6	MHC	5.5	4-6	0.013

E.A.T.

1 - Complete dispersion
2 - Some dispersion
3 - dispersion after remoulding
4-6 - Aggregate slakes
8 - Aggregate stable

Koala Survey of Compartments 157 and 158

A koala survey was conducted on the 5th of Feburary 1997 by Justin Claridge and Warren Weaver. The survey did not find the compartments to be intermediate or high use areas. Single scats were found under trees in different transects which indicates that the compartments are used by koalas. Transects were located in the net harvestable area and were concentrated in forest types that have a relatively high proportion of primary browse treees. An idea of the forest types was gained from driving the compartment and from walks over much of the area. Most of the compartments are infested with lantana which made some transects difficult to put in and search along.