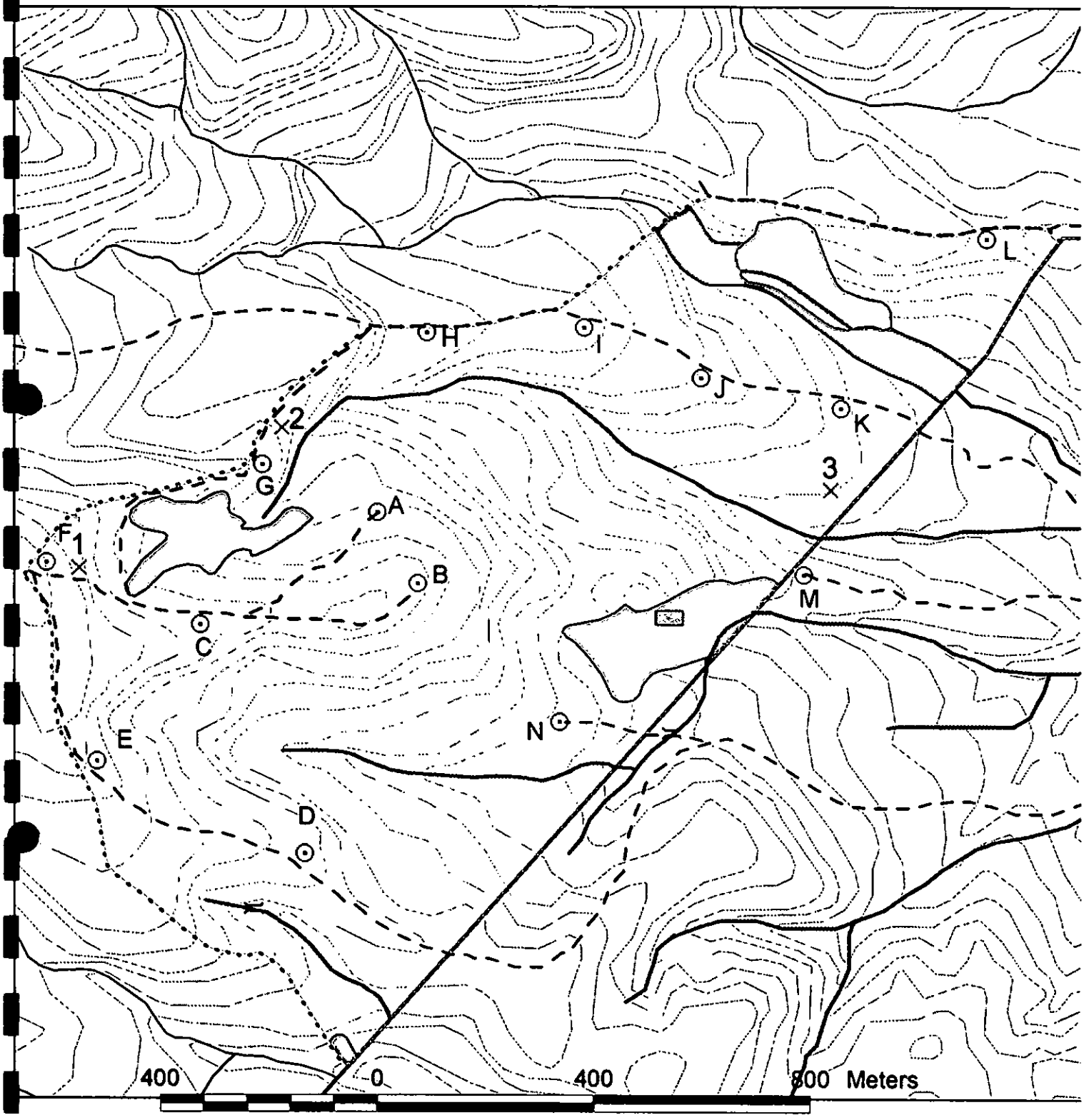
BEAURY
76

Urbenville District
Northern Region

NORTHERN REGION - URBENVILLE
DISTRICT
HARVEST PLAN OPERATIONAL MAP
COMPARTMENT 76
BEAURY STATE FOREST
KOREELAH MAP SHEET
HARVEST PLAN NUMBER 96/09
SCALE 1:10000



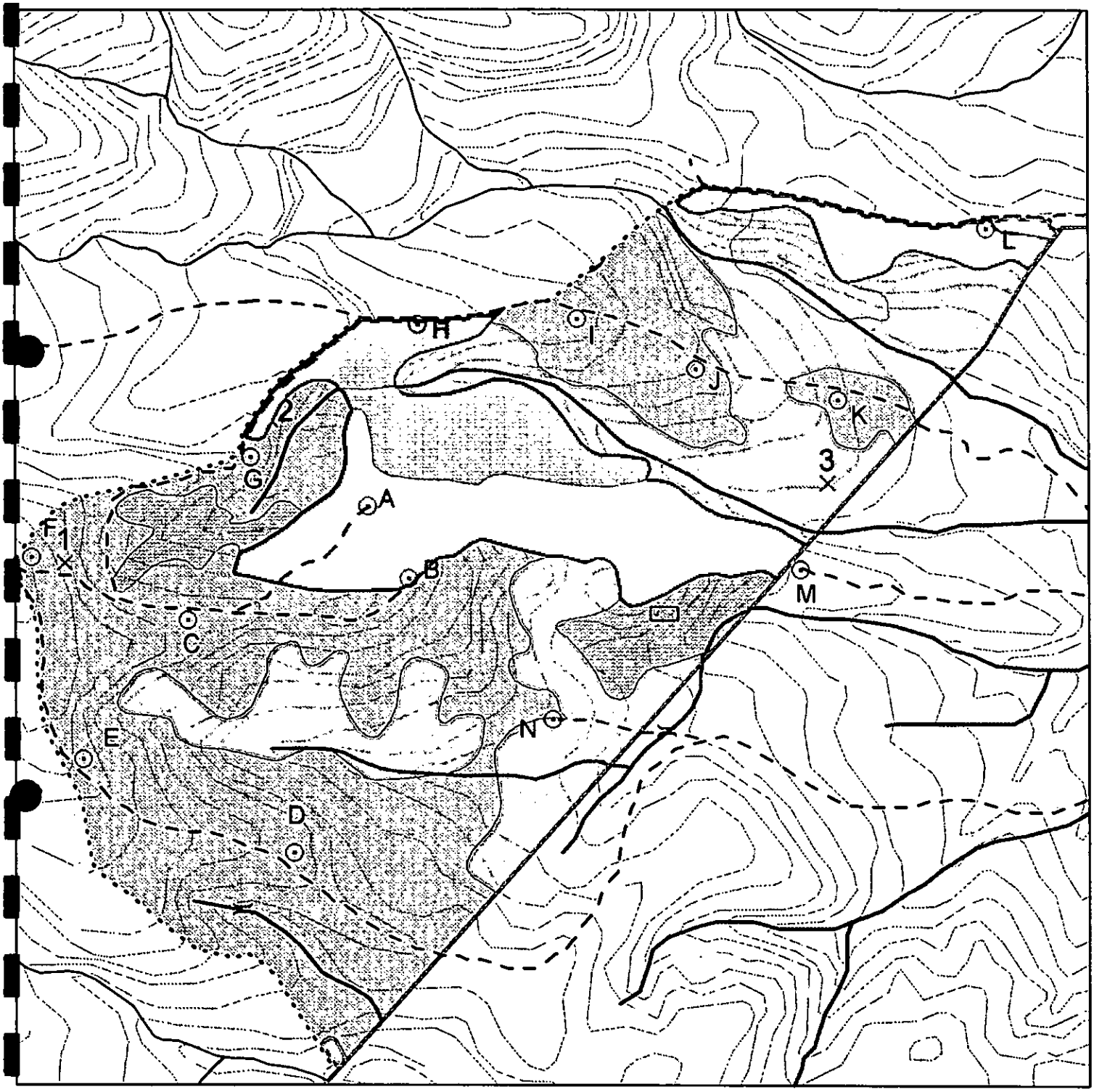
BOUNDARIES
State Forest Boundary
Compartment Boundaries
ROADS (Proposed in Red)
Natural Surface
Sealed or Gravelled
Four wheel drive
NORMAL PRESCRIPTIONS
Harvestable Area
MODIFIED PRESCRIPTIONS
Visual Resource Protect

MODIFIED PRESCRIPTIONS
Flora and Fauna Protect
Slopes likely over 30 degrees
Rainforest
NON HARVEST AREAS
General
Soil sample sites

WATERCOURSES & DRAINAGE
External Drainage
Internal Drainage
DUMP SITES OR LANDINGS
Permanent Dry
Permanent Wet
Temporary Dry
Approved Crossings

MN

NORTHERN REGION - URBENVILLE
DISTRICT
FOREST TYPES MAP
COMPARTMENT 76
BEAURY STATE FOREST
KOREELAH MAP SHEET
HARVEST PLAN NUMBER 96/09
SCALE 1:10000



STATE FORESTS
NORTHERN REGION

URBENVILLE MANAGEMENT AREA

NATIVE FOREST HARVESTING PLAN.

AREA:	BEAURY STATE FOREST No 2
LOCATION:	Compartment 76
OPERATION:	FOREST HARVESTING
PLAN No.	UMA 96/09 20/8/96

STATE FORESTS

MANAGING - CARING - SUSTAINING

HARVESTING PLAN NO. UMA 96/09

Beaury State Forest No 2 Compartment 76

CONTENTS

Part 2 FOREST MANAGEMENT & ENVIRONMENTAL CONSIDERATIONS

2.1 PHYSICAL FEATURES

Description 1 Physical description of the area

STATE FOREST	Beaury	DISTRICT	Urbenville
REGION	Northern	COMPARTMENT	76

The Compartment is bounded by private property to the east, compartments 74 and 75 to the north, compartments 74 and 77 to the west and compartment 77 to the south. The Compartment occupies easterly aspects and falls from a high of 710m ASL on the Koreelah Range to a low of 500m ASL. The topography is generally steep. Drainage lines are often very pronounced and feed in an easterly direction into Oaky or Bark Hut Creek.

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.

There is a 40m wide flora and fauna corridor along the most northerly drainage line in the compartment.

Due to steep slopes, flora and fauna areas, and rainforest 9% of the gross area is excluded from harvesting in this cutting cycle.

The Kempsey API team assessed the compartment according to the Harvesting Protocol of September 1995. Potential old growth areas greater than 25 ha were identified. These areas of tBy and tAy which cover most of the compartment have been stump counted. It was found that there were no old growth areas within the compartment.

A koala survey was carried out in the Compartment. The survey resulted in the identification of the compartment as an intermediate use area. The perscription for this is the retention of ten primary browse trees (or secondary browse species if primary are unavailable) per hectare. These may include habitat trees if they meet the browse requirements. In addition to this three Tallowwood trees were found to have > 20 scats under them and as such will not be logged and debris will be cleared from 10 m around their base. They have been marked with orange tape.

2.2 FOREST MANAGEMENT AND SILVICULTURE

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

Compartment 276 Stand condition

Forest Type	1-23	46	53	60	62a	65	TOTAL
Unlogged	10	0	0	0	0	0	10
Selectively logged 1981/82		68	38	11	19	1	137
Net Harvest Area	**0**	**68**	**35**	**11**	**19**	**1**	**134**
Inaccessible/drainage							
Rainforest	10						10
Flora & Fauna			3				3
TOTAL	**10**	**68**	**38**	**11**	**19**	**1**	**147**

Description 4 Broad description of Vegetation

(a) Forest types

The dominant forest type (FT) in the Compartment is Sydney Blue Gum (FT 46) that commmonly has a dense understorey. There are sections of rainforest (FT 1-23) which typically occur on moist sites like the heads of drainage lines. There are also large areas of Brush Box which also occur predominately moist sites along the drainage lines and lower slope positions on the eastern compartment boundary. A dry eucalypt mix (FT 62) occurs on the central ridge in the compartment.

(b) Understorey

The understorey of the forest is primarily a shrub layer which becomes more defined and mesic in nature in some of the moister sections of FT46 and FT53. There was not much evidence of lantana, however there is a proliferation of vines growing over the understorey in some areas.

(c) Ground-cover

Ground cover over the Compartment is well developed and provides a high degree of soil protection on the drier ridges where the understorey is less dense. Ground cover becomes a well developed forest litter layer in moister areas.

(d) Rare or endangered species

None were sighted during planning inspections. A Koala survey was carried out for the Compartment. It was found that the compartment is an intermediate use area. There is a recorded observation for a Koala approximately 1 km to the south west of the compartment. There are records for the Little-bent wing Bat and the Sooty Owl approx. 3 km to the west of the compartment.

(e) Rainforest

There are small areas of rainforest in the Compartment.

(f) Exotic weeds

There is not much evidence of weeds within the compartment.

(g) Regeneration and seral stages

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

Description 5 Forest and crop condition

All of the hardwood areas were logged in 1981-1982 with an average volume of 5 m^3 /Ha being removed. Existing stumps show parts of the Compartment had previously been logged some years before. The Compartment has been assessed under the Protocol, for API Assessment for Candidate Old Growth Forest. Areas of tAy andtBy were identified within the compartment. These areas were stump counted and it was found that no old growth was present in the compartment.

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, 53, 60, and 62 selective thinning should promote growth on retained sub-merchantable stems.

This will be achieved by:

1. Removing all mature trees suitable for production of hardwood sawlogs.
2. Retaining sufficient trees to meet habitat requirements.
3. Thinning and spacing of regrowth
4. Enrichment planting of sub-optimally stocked areas.

(b) **Fire protection**

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

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

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

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

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

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

References

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

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

Urbenville Management Plan 1987

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

Fire Manual **FC NSW** 1992

2.3 FLORA PROTECTION

Description 7 Presence of protected or endangered plant species

See Description 4(d). None known to be present in the area. The rainforest is excluded from harvesting. Readers are referred to the Urbenville Flora Report which is part of the Urbenville Management Area EIS which is now on exhibition.

Description 8 Presence of rainforest

The occurrences of rainforest areas are excluded from logging. No tree shall be fallen outside the rainforest where there is a likelihood of disturbing the rainforest structure. Buffer strips around rainforest are not necessary since the subtropical rainforest is an aggressive invader of eucalypt forest in the absence of fire.

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 12 fauna are known or likely to occur within the Urbenville Management Area.

None were sighted during planning inspections. A Koala survey was carried out for the Compartment. It was found that the compartment is an intermediate use area. There is a recorded observation for a Koala approximately 1 km to the south west of the compartment. There are records for the Little-bent wing Bat and the Sooty Owl approx. 3 km to the west of the compartment.

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

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

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

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

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

It is also necessary to report and record confirmed sightings of Schedule 12 species to the NPWS through the appropriate channels.

(b) Habitat trees

The following prescription should be followed on the basis that the nett harvestable areas of the Compartments contain predominantly dry eucalypt forest with a xeromorphic understorey and small areas of dry and moist hardwood forest with a mesic understorey.

Habitat tree retention in dry hardwood and moist hardwood forests with a xeromorphic understorey shall be four trees per hectare. For the purposes of this prescription a xeromorphic understorey is considered to be one composed predominantly of grasses, heath and/or shrubs with sclerophyllous leaves.

Habitat tree retention in dry hardwood and moist hardwood forests with a mesic understorey shall be six trees per hectare. For the purposes of this prescription a mesic understorey is considered to be one composed predominantly of moist elements such as vines shrubs with mesophyllous leaves and/or rainforest ferns.

Habitat trees will be live hollow bearing trees. They are to be well spaced throughout the Compartments being harvested. Where the specified density of habitat trees is not present the existing density is to be retained. Sufficient recruitment habitat trees to sustain the retained density of habitat trees into perpetuity are also to be retained. Stags shall not be counted as habitat 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.

(c) Wildlife corridor

Filter strips along gullies and extensive areas of steep terrain will provide undisturbed habitat to facilitate wildlife movement.

(d) Refugia areas

There are areas of the Compartments which will not be disturbed due to stream and gully protection prescriptions and the rugged and inaccessible nature of many parts of the Compartments. The system of filter strips allows movement of wildlife along the drainage lines from the higher ranges and rainforest on the border to the lower more permanent waters of lower creek reaches.

(e) Preservation of Critical Weight Range Species

SFNSW are to ensure to the 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 in the weight range 200 - 5 000 grams 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.

Description 11 Species and habitat description

The following is a list of Schedule 12 species (Vulnerable, rare and threatened species) known or likely to be found in the Compartments, and considered to have a range of sensitivities to logging as summarised on page 373 of the Urbenville Fauna Impact Statement. Sighting of any of the listed species should be reported directly to Urbenville Forestry Office. The procedure to be adopted upon identification is defined for each species although some specific protocols have yet to be agreed.

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

13/8/96 A Koala survey was undertaken to the new Koala prescription agreed between NPWS and State Forests and outlined in OC 96/3. The compartment was found to be an intermediate use area.

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

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

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

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

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

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

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

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

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

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

Have been recorded in several locations in the Management Area. Where a Glider feed tree with V-notch markings is located, a 100 metre radius shall be retained around the tree, with the following procedures to be implemented:

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

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

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

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

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

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

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

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

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

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

(7) **Red-legged Pademelon** - *Thylogale stigmatica*

Inhabits rainforest to moist sclerophyll forest, and is thought to prefer gully forest, feeding mostly on leaves and berries. The Urbenville FIS summarises the species sensitivity to logging as "low". Exclusion of logging from rainforest, as well as filter strip prescriptions will mitigate against any impact on this species.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(23) **Rose-Crowned Fruit Dove** - *Ptilinopus regina*
Common red-crowned pigeon. Inhabits rainforest, wet sclerophyll forests and occasionally open forests.. This bird has low sensitivity to logging and will not be impacted upon by the operation as its principal habitat is rainforest. These forests are above 400 ASL.. Given this species preferred habitat in rainforest the operation is unlikely to impact on the species. It has been reported for Cpt 128.

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

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

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

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

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

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

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

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

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

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

(32) **Fleay's Barred River Frog** - *Mixophyes fleayi*
This frog has been recorded in Yabbra SF. The filter strip prescriptions are to be strictly adhered to in order to protect habitat and water quality, and truck roads shall only cross such gullies in the designated locations.

(33) **Fossirial Skink** - *Coeranoscincus reticulatus*
An inhabitant mainly of rainforests and sometimes moist hardwood, living under leaf litter and rotting logs. Adherence to tree retention, filter strip prescriptions, and excluding logging from rainforest will assist in reducing habitat loss.

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

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

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

References:

Austeco Pty. Ltd. (1993). *Description and Assessment of the Forestry Impacts on Fauna of the Urbenville Forestry Management Area.* **Prepared for Urbenville EIS.**

Baker, J. (1977). A *Field Guide to Australian Frogs.*

Barker, J. (1980). *Reptiles and amphibians of the Gibraltar Range.* **Unpublished Report. National Parks and Wildlife Service, Sydney.**

Baverstock, P. and Chambers, M. (1992). *Murwillumbah Bat Survey.* **Report prepared for the Forestry Commission of N.S.W.**

Blakers, M. Davies, S. J. J. F. & Reilly, P. N. (1984). *The Atlas of Australian Birds.* **RAOU/Melbourne University Press, Melbourne.**

Brouwer, J. and Garnett, S. (Eds.) (1990). *Threatened birds of Australia.* An annotated list. **ANPWS RAOU Report Number 68.**

Calaby, J.H. (1966). *Mammals of the Upper Richmond and Clarence Rivers. New South Wales.* **Technical Paper No. 10. CSIRO Division of Wildlife Research Canberra.**

Cogger, H.G. (1992). *Reptiles and Amphibians of Australia.* **Reed Sydney.**

Corben, C.J. and Ingram, G.J.(1987). *A new Barred River Frog (Myobatrachidae: Mixophyes).* **Mem. Old. Mus. 25: 233-237.**

Date, E.M. and Recher, H.R. (1990). *Interim management plan for rainforest pigeons in northern New South Wales.* **Unpublished Report to the National Parks and Wildlife Service.**

Debus, S.J.S. (1988). *Survey of the Red Goshawk in north-eastern New South Wales.* **Report to NSW NPWS.**

Debus, S.J.S. (1991). *An annotated list of New South Wales records of the Red Goshawk.* **Australian Birds, 2: 42-89.**

Debus, S.J.S. (1992). *Survey of diurnal raptors in north -east New South Wales, 1987-1990.* **Australian Birds, 25: 67-77.**

Ferrier, S. (1984). *The status of the Rufous Scrub Bird. Habitat, Geographic variation and Abundance.* Hon. thesis, University of Queensland.

Ford, H.A., Debus, S.J.S. and Recher, H.F. (1991). *Distribution, status and habitat requirements of the Sooty Owl Tyto tenebricosa in north-eastern New South Wales. Unpublished Report No. 142. Wood Technology and Forest Research Division Sydney.* **Forestry Commission of New South Wales.**

Forshaw, J. & W. (1981). *Parrots of Australia.*

Goldingay, R. (1989). *Time budget and related aspects of the foraging behaviour of the Yellow-bellied Glider, Petaurus australis.* **Aust. Wildl. Res. 16: 105-12.**

Gosper, D.G. (1992). *Forest bird communities of the Richmond River District, New South Wales.* **Corella 16: 79-88.**

Hall, L & Richards, G. (1979). *Bats of Eastern Australia.*

Hartley, S.L. (1990). Correspondence of extract from Hons. thesis on Eastern Bristlebird.

Hill,R. (1968). *Australian Birds.*

Johnson, K.A. (1980). *Spatial and temporal use of habitat by the Red-legged Pademelon, Thylogale thetis. (Marsupialia Macropodidae).* **Aust. Wildlife 7: 157-166.**

Johnson, K.A. (1984). *Red-necked pademelon.* In The Australian Museum. **"Complete Book of Australian Mammals - The National Photographic Index of Australian Wildlife"**, edited by R Strahan. pp.228. Angus and Robertson. Sydney.

Kavanagh, R.P. (1987). *Forest phenology and its effect on faraging behaviour and selection of habitat by the Yellow-bellied Glider, Petaurus australis.* **Aust. Wildlife Res.**

Keast, A, Recher, H.F. Ford, & Saunders (Eds.) (1985). *Birds of Eucalypt forests and woodlands.*

Kennedy, M. (1990). *A complete Reference to Australia's Endangered Species:Mammals, Birds, Reptiles, Amphibians, Fish Invertebrates and Plants.* **Ausworld Publishing, Avalon, NSW.**

King, G. (1984). *Habitat utilised by Pseudomys oralis.*Aust. Mammal. 7: 139-147.

Mackowski, C.M. (1986). *Distribution, habitat, and status of the Yellow-bellied Glider, Petaurus australis Shaw (Marsupialia: Petauridae) in north-eastern New South Wales.* **Aust. Mammal. 9: 141-44.**

Meggs, T. (1993) The distribution, abundance and habitat preference of the marbled Frogmouth in the Northern Rivers Region. Honours Thesis. UNE/SCU Lismore.

Mooney, N. (1988). *Guidelines for alleviating the effects of forestry operations on Raptors.*

Moore, D.M. and Floyd, A.G. (1994). *A description of the flora and an assessment of impacts of the proposed forestry operations in the Grafton Forest Management Area.* **Report prepared for the State Forests of New South Wales.**

New South Wales NPWS. *North east NSW Biodiversity Study.*Pers. Comm.

NPWS (1993). Comments on *the faunal component of the report on flora and fauna* of the Grafton and Casino Forestry Study Areas: description and assessment of forestry impacts. **Report to State Forests of NSW by NPWS.**

Read, D.G. Fox, B.J. (1991). *Assessing the habitat of the Parma Wallaby, Macropus parma (Marsupialia; Macropodidae).* **Aust. Wildl. Res. 18: 469-478.**

Recher, H.F., Shields, J., Kavanagh, R. *Retaining remnant mature forest for NSW: A review of theory and practice.* Nature Conservation: The role of remnants of native Vegetation. Saunders, Hopkins, Burbidge, Arnold eds.

Richards, G. (1992). *Bats of the Wingham Management Area.***CSIRO report to Forestry Commission of NSW.**

Shodde, R. & Mason, I. (1983). *Nocturnal Birds of Australia.*

Slater, P. (1970). *A Field Guide to Australia Birds, Vol 1 & 11.*

Smith, A.P., & Lindenmayer, D. (1988). *Diet and Feeding Strategies of the Marsupial Sugar Glider in temperate Australia.* J. of Animal Ecology: 51.

Southwell, C. (1987). *Macropod studies at Wallaby Creek 11. Density and distribution of macropod species in relation to environmental variables,* **Aust. Wildl. Res. 14: 15-33.**

Strahan, R. (ed) (1988). *The Australian Museum Complete Book of Australian Mammals - The National Photographic Index of Australian Wildlife.* **Angus and Robertson, Sydney.**

Swan, G. (1990). *A Field Guide to the Snakes and Lizards of NSW.* **The Three Sisters. Sydney.**

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** **1025 mm**
Average rainfall erosivity $R = 89.31 \times 7.3^{1.74} = 2838$

Monthly rainfall erosivity

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

Average annual rainfall for Urbenville (8 km SE of the Compartment) 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 76 of approximately 1025 mm/pa. January-March are the wettest months and May-August the driest. Based on 12 hour duration (ARR) the 2 year Recurrence Interval Intensity is estimated as **7.3 mm/hr** from design rainfall isopleths (ref. below). The heaviest rainfall events are known to occur in January and February and this accounts for 36% of annual rainfall in zone 2.

Temperature
Urbenville (8 km SE of the Compartment) is characterised by maxima temperatures ranging from 17° to 29° (July to January) and minimum 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 Compartment is located on the McPherson Volcanics. They contain intrusive doleriete, basalt, intrusive trachyte and rhyolite of Tertiary origin.

Bedding planes

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

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

(d) Soils

Soil Landscape Map		Soils Report Urbenville E.I.S. 1993 Unit A occurs in the Cpt.
Map scale		1:125000
Map source		Veness & Associates 1993 (for reference purposes only)
Soil types		
Texture class	A horizon	SCL-CL
	B horizon	CL-SC
Method of determination		Field Texture
Comment:		
K value	A horizon	.030
	B horizon	.030
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	8
	B horizon	4-6
Method of determination		D2
Comment:		Conducted by qualified soil scientist under laboratory conditions.
Dispersion %	A horizon	
	B horizon	
Method of determination:		
Comment:		

Depth to subsoils and bedrock

Topsoil depth: 0-30 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 10-25 cm.

Inherent fertility

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

Existing erosion

No areas of active or accelerated erosion were present.

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 10th of August 1996. 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 waxing from the ridge tops down to the limits of the net harvest area in the drainage systems. Most of the compartment has slopes between 5- 15°, but are steeper where they fall into drainage lines. There is a gently sloping area on the western boundary of the compartment. Areas over 30° are excluded from the net harvestable area.

Terrain

The net harvestable area of the Compartment covers upper-ridge lines down to lower slopes. The area is dominated by the Koreelah Range to the West.

Drainage line condition

Drainage lines are well defined, and are stable.

Aspect

The general aspect of the Compartment is E with other areas such as the slopes around gullies taking their own small localised aspects within the general trend.

Rockiness

Exposed rock occurs primarily on the high steep ridges and is associated with low site quality.

(f) Hydrology

The Compartment is in the Tooloom Creek Catchment. The Compartment drains in a SE direction into Oaky or Bark Hut Creek which is fed by a system of unnamed gullies and drainage lines. Oaky and Bark Hut Creek drain into Beaury Creek which flows into Tooloom Creek before flowing into the Clarence River to the south west. Drainage lines initiate as drainage depressions from the main ridge lines and upper slopes. Water was present in some drainage lines at the time of inspection. No prescribed streams, swamps or wetlands are found within the net harvest area. The compartment is not within 100 m of a water storage area.

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 Compartment was harvested in 1981-82 with the exception of the rainforest and steep areas. It is proposed that the Compartment 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. The compartment is 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 55% live ground cover, 43% forest litter and 2% natural cover provided by surface rock and stone. Present surface litter in Compartment 76 is estimated at 15-20 tonnes per hectare.
Harvest practices will aim at overall retention of 50% of ground-cover immediately after harvesting, and retention of 40% ground-cover after post-harvest burning.

Recovery time

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

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

Use of existing roads
Log haulage will be predominantly east to Beaury Creek road through private property. Logs will then travel Woodenbong and Urbenville carrying poles, girders and quota logs. A small number of trucks will take poles and durable girders to Coffs Harbour via the Summerland Way and Pacific Highways. All these roads are permanently maintained roads and will require no upgrading or major maintenance. Only existing tracks and roads will be used.

Dumps K, J, I, H and G are located along that runs up a ridge on the northern boundary of the compartment. This track can be reached through private property from Beaury Creek Road. There is a cutting between Dumps G and H which shows no evidence of accelerated erosion. Dump F is located at the western most point of the compartment. Dumps A, B and C are located on tracks running down the central ridge in the compartment. The tracks to these dumps are quite flat and there is small cutting to Dump A.

Dumps E and D are accessed via a track that travels along a ridge in the compartments south. Dumps L, M and N are all accessed from roads in private property.

All batters and creek crossings are stable, well constructed and present no erosion hazard. Where batters do exist their maximum heights are less than 1 m and they are well vegetated and stable. Roads are less than 10 degrees. Existing road surface drainage uses outfall crossfall drainage, supplemented by rollover crossbank drainage to disperse infall table drain water through stable outlets onto undisturbed ground cover.

Road construction

Within the Compartment 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. There will be almost no down hill snigging in this Compartment except in the vicinity of Dumps N and M. where snig distances will be short. Track drainage techniques to prevent downhill confluence of drainage water will be practised.

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

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. There will be almost no down hill snigging in this Compartment except in the vicinity of Dumps N and M. where snig distances will be short. Track drainage techniques to prevent downhill confluence of drainage water will be practised.

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

Post-harvest burning
See Description 6(b).

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

Description 12 Evaluation of soil and water data

(a) Soil Erosion and Water Pollution Hazard Categories

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

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

R=2838	**$R = 89.31 \times 7.3^{1.74}$**
K=.03	**From 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	15	Low
>5 ≤ 23	11 - 49	2	75	Mod
>23-30	50+	3	10	High
Roads/tracks	High	3	n/a	High

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

R = 2838 **K = .03**

(b) Dispersibility

Proportion dispersible soil **A horizon**
B horizon

Method of determination **D2**
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

There are no plots in the compartment.

(b) Special attributes of the area

The compartment within the Beaury State Forest consists mainly of eucalypt woodland forest with a dense understorey. There is considerable eucalypt regeneration over much of the area and therefore provides a mosaic of forest types and associated wildlife.

Part 3 AUTHORISATION CONDITIONS

Condition 3.1 Compliance

(a) Area identification

Compartments 76 Beaury State Forest No. 2

(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) or consistent with variation 24A to the Pollution Control Licence.

Variations and other specified approvals detailed in Condition 5.1(c) or consistent with variation 24A to the Pollution Control Licence, 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 P. StClair Signature P.StClair.

Title Marketing Forester Date 20/8/96

(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 September 1996.**

Signature ..... District Forester. Date 21/8/96.
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 96/09.

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

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

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 96/09 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

Generally commencing at Dump A and harvesting to dumps in alphabetical order.

Condition 4.4 Silviculture

(a) General

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

(b) Canopy gaps

Will not be used in this operation.

(c) Harvesting debris

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

(d) Directional felling

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

Condition 4.5 Flora Protection

(a) Endangered flora species protection

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

(b) Rainforest protection

Logging activity is excluded from rainforest stands. Trees outside the rainforest may not be felled where they are likely to damage the rainforest or necessitate entry into the rainforest to facilitate their removal.

Condition 4.6 Fauna Protection

(a) Sightings of fauna

See Description 10 (a) Fauna Protection Strategy

(b) Habitat Tree retention

See Description 10 (b) Habitat Tree prescription

(c) Non-harvest and modified harvest areas

Wildlife Corridor

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

Condition 4.7 Soil erosion and water pollution control

(a) Basic Water Pollution Hazard Categories

Table 4 Soil Erosion and Water Pollution Categories

Slope Boundaries (degrees)	Water Pollution Hazard Category	SE/WPH Category	Indicative % of Net Harvest Area
0≤5	LOW	1	15
>5 ≤ 23	MODERATE	2	75
>23-30	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) Road Construction

No new roading is required in the Compartments.

Design
NA

Grade
NA.

Survey
NA

Clearing
NA

Batters
NA

Road Surface Drainage
The existing roads utilise outfall crossfall drainage supplemented with rollover crossbanks. Rollover crossbanks must drain onto undisturbed vegetation or where not immediately accessible to the outfall, sediment trap fences must be installed across the outlet. Rollover banks must be operational on roads no longer required, except for the main forest access roads which have conventional culverts installed.

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

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

Patch gravelling
Existing natural surfaces are adequate.

Borrow pits and gravel pits
Not required in the Compartment.

(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°.

(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	≤ 5	< 40	-	5
2	> 5 to ≤ 23	< 40	-	10
3	> 23 to 30	< 40	< 18	15
3	>23 to 30	< 40	**greater > 18**	20
1-3	0 - 30	**greater >40**	< 18	20
1-3	0 -30	**greater > 40**	**greater > 18**	30
Buffer strips must be 5m wide on each drainage depression				
NOTE: The widths above equal or exceed the requirements of PCL No 4017				

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

(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

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

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 accidentally felled into filter strips must be removed with minimal disturbance to the groundcover and soil in the filter strip. Any disturbance caused must be remedied by reshaping and replacement of cover, so that concentrated water flow does not occur. Instances of trees being accidentally felled into filter strips must be documented on the supervising forest officer's copy of the harvesting plan, including the reasons for the accident and the remedial action taken.

Harvesting debris and earth are suitable material for diverting concentrated water flow.

(j) Extraction from drainage depression buffer strips

Soil disturbance in drainage depressions must be minimised by use of the following techniques:

(1) No snigging along drainage depressions;
(2) Minimal use of blades;
(3) Approach logs to be snigged in reverse and minimise change of direction whilst reversing or snigging out of drainage depressions.

(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 must be drained within 2 days of the completion of use, or where operations are temporarily suspended for more than 3 days (SE/WPHC 3), or 5 days (SE/WPHC1 & 2)

Where earth banks are required, they must be constructed to a minimum consolidated height of 35cm, with spacing in accordance with Table 7.

TABLE 7 Maximum earth bank spacing

Track grade (degrees)	General Slope of land (SE/WPHC)		
	1 (≤5)	2 (>5 ≤ 23)	3 (>23)
5	200	150	100
10	150	100	60
15	80	60	40
20	60	40	25
25	40	30	20

The above space is the maximum and should be varied to utilise the most suitable outlet point. Cross banks must discharge into undisturbed vegetation or logging debris.

(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.

(n) Log dumps

Log dumps must be located as indicated on the Harvesting Plan Operational Map. Drainage of log dumps and stabilisation must include the following:

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

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

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

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 plots in the compartment.

(b) Special attributes of the area

The compartment within the Beaury State Forest consists mainly of eucalypt woodland forest with a dense understorey. There is considerable eucalypt regeneration over much of the area and therefore provides a mosaic of forest types and associated wildlife.

Condition 4.9 Modified harvest conditions for special emphasis areas

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

Condition 4.10 Specification of type of Hardwood products to be removed

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

Yield information

Product	Volume (cubic metres)
Quota sawlogs (assessed)	1500
Thinnings	250
Poles, piles and girders	100

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

Part 5 CONDITIONS FOR SUPERVISING FOREST OFFICERS (SFOs)

Condition 5.1 SFO authority to supervise harvesting operations

(a) General

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

(b) Relieving SFOs

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

(c) SFOs authority

The SFO has authority to approve:

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

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

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

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

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

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

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

Condition 5.2 Tree-marking and other harvesting control requirements

(a) Tree marking for forest management and silviculture

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

Canopy gaps for regeneration

Will not be used in this operation.

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

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

Habitat tree retention in dry hardwood and moist hardwood forests with a xeromorphic understorey shall be four trees per hectare. For the purposes of this prescription a xeromorphic understorey is considered to be one composed predominantly of grasses, heath and/or shrubs with sclerophyllous leaves.

Habitat tree retention in dry hardwood and moist hardwood forests with a mesic understorey shall be six trees per hectare. For the purposes of this prescription a mesic understorey is considered to be one composed predominantly of moist elements such as vines shrubs with mesophyllous leaves and/or rainforest ferns.

Habitat trees will be live hollow bearing trees. They are to be well spaced throughout the Compartments being harvested. Where the specified density of habitat trees is not present the existing density is to be retained. Sufficient recruitment habitat trees to sustain the retained density of habitat trees into perpetuity are also to be retained. Stags shall not be counted as habitat trees.

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

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

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

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

Tree marking for non-harvest areas and modified harvest areas

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

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

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.

Provided the catchment is <40ha filter strips within the Compartment must be 5 metres wide where slopes ≤5 (SE/WPHC 1), 10m wide where slopes are between >5 to ≤23 (SE/WPHC 2). Slopes > 23 degrees are SE/WPHC 3. Where slopes are greater than 18 degrees a 20m filter must be used. When slopes are less than 18 degrees a 15m filter strip must be used. Filter strips must be marked at every point where there is a change in filter strip width.

Where the catchment is >40 ha filter strips within the Compartment must be 20 metres wide except where slopes are greater than 18 degrees when a 30m filter must be used. Filter strips must be marked at every point where there is a change in filter strip width.

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 (1973/4).

(b) Post-harvesting Burning Plan

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

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

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

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

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

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

Condition 5.5 Other instructions

Ensure that the SFO and contractors are aware of any subsequent amendments to the Harvesting Plan that may be imposed by Rapic, NPWS or EPA. These appear as amendments to the Harvesting Plan.
The SFO must ensure the installation of sediment trap fencing on any crossbank outlets which do not drain onto undisturbed vegetation.
The SFO should direct any queries to the Marketing Forester.
There are no other instructions concerning the supervision of harvesting this area.

Condition 5.6 SUPERVISING FOREST OFFICERS ACKNOWLEDGMENT

I acknowledge that I have received a copy of Harvesting Plan for Compartment 76 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. A Koala survey was carried out for the Compartment. It was found that the compartment is an intermediate use area. There is a recorded observation for a Koala approximately 1 km to the south west of the compartment. There are records for the Little-bent wing Bat and the Sooty Owl approx. 3 km to the west of the compartment.

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 specifed, are specifications for preventing concentrated water flow included?	Yes	C4.7(l)
112	Is snigging being undertaken on dispersible soils?	Yes	D12(d) D13(a)
	If so, have alert conditions have been included?	Yes	
119	Have specifications for log dump location and drainage been included?	Yes	C4.7(m)

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

NOTES

CLEARANCE CERTIFICATE

HARVESTING PLAN No. **UMA 96/09**

COMPARTMENTS **76 Beaury SF 2**

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=2838	**$R = 89.31 \times 7.3^{1.74}$**
K=.03	**From 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 (12%)	Low	20
> 7≤ 27 (12%-52%)	Mod	75
>27≤30	High	5
na	extreme	n/a

95% 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.

SOIL SURVEY: BEAURY *STATE FOREST CPT 76*

A soil survey of Compartment 76 was conducted on the 10th of August 1996. The results and maps are attached.

There is a geological boundary in the general area of the compartment, with a volcanic layer overlying sedimentary material. The shape of the boundary is dependent on the topography of the area and any erosion of the volcanic layer that has taken place.

In Compartment 76 there are two main soil types. The first is a krasnozem like soil that occurs over much of the compartment. These soils are like those found in Beaury Plantation further upslope (sites 4-7). The second type is a duplex soil (yellow podzolic) that occurs along the main ridges in the compartment. In some areas soils will be a composite of these two general types due to gravitational induced movement of material down slope.

All soils in the compartment were not found to be dispersible and K factors ranged from 0.017 to 0.03. It is therefore recommended that a K factor of 0.03 and no dispersible soil horizons be adopted for water pollution hazard assessment.

Justin Claridge.

Justin Claridge
(EPA Approved Soil Scientist)

20/8/96

	SOIL SURVEY - YABBRA STATE FOREST CPT 76 (10/8/96)									
SITE	GRID REF.	LANDFORM	SLOPE (deg)	DEPTH (cm)	HORIZON	TEXTURE	COLOR	pH	E.A.T.	K FACTOR
2	451100E	MID-SLOPE	11	0-25	A	SCL	7.5YR3/1	7	8	0.025
	6857750N			26-70	B	SC	10YR5/4	6.5	8	0.017
3	452100E	LOWER SLOPE	14	0-30	A	FSCL	7.5YR3/2	7	8	0.025
	6857600N			31-70	B	SC	10YR6/6	6	4-6	0.017
1	449700E	UPPER SLOPE	1	0-10	A	CL	5YR3/2	6.5	8	0.03
	6857450N			11-70	B	CL	10R4/4	6	4-6	0.03
4	449650E	FOOTSLOPE	4	0-15	A	CL	7.5YR4/4		8	0.025
	6856650N			16-70	B	LC	7.5YR4/3		8	0.025
5	449700E	CREST	7	0-25	A	CL	5YR3/3		8	0.025
	6856950N			26-70	B	LC	5YR3/4		8	0.025
6	449850E	SIDESLOPE	13	0-20	A	CL	7.5YR3/4		8	0.025
	6857600N			21-70	B	LMC	5YR4/4		8	0.018
7	450300E	SIDESLOPE	11	0-10	A	CL	2.5YR3/2	6	8	0.03
	6856700N			11-70	B	CL	10R3/4	6	8	0.03
8	451100E	UPPERSLOPE	2	0-20	A	SL	7.5YR4/2	6.5	8	0.025
	6857500N			21-70	B	SCL	7.5YR5/6	6	4-6	0.025

Compartment 77

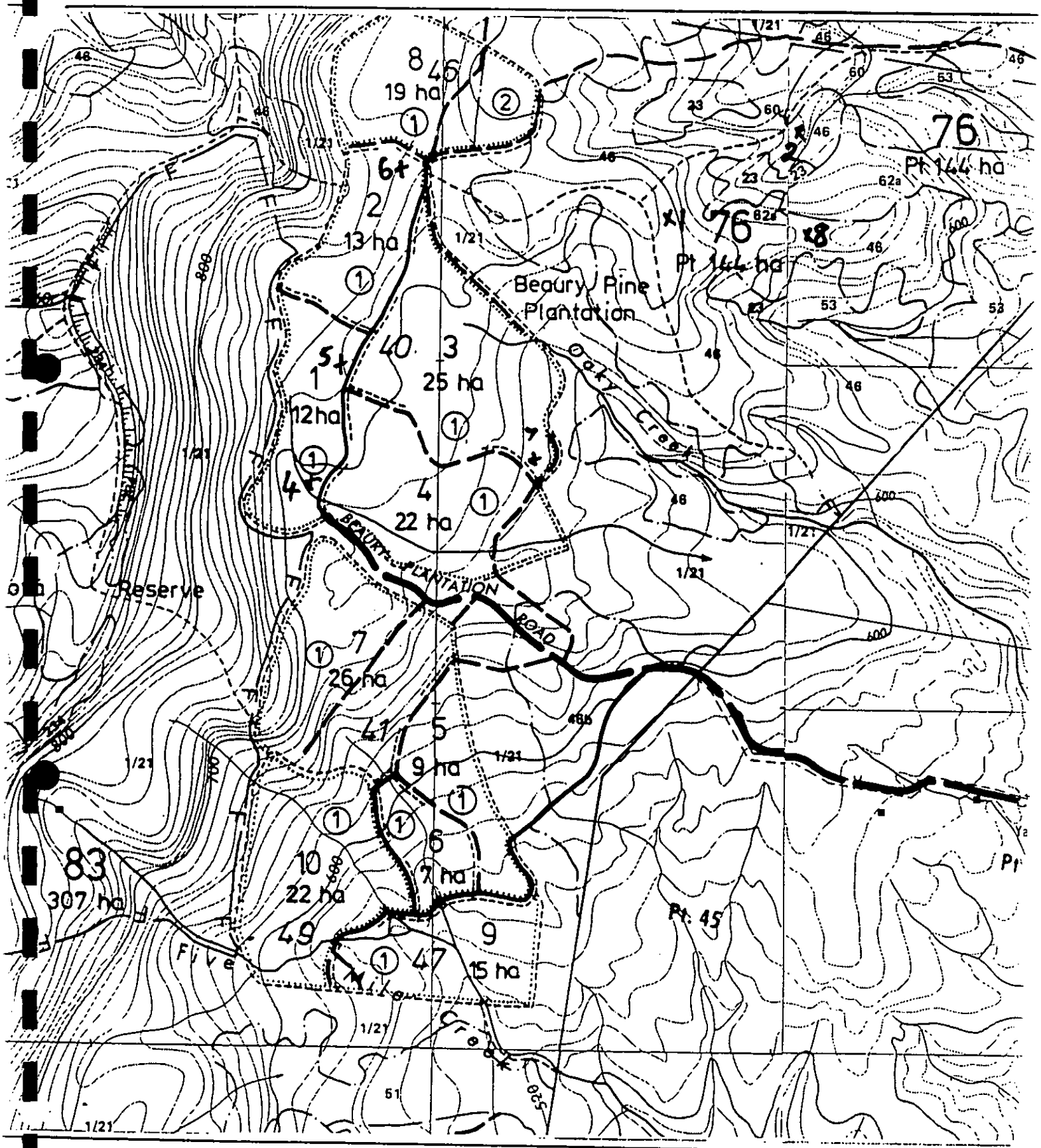
Scale — 1:15 000

0 0·5 1 km.

CU/2

Contour interval 10 m

G N



Compartment boundary .....

Filter strips .....

Protection strips .....

Roads, dump site .....

Wet weather dumps shown in red

Special emphasis .....

SITES 4, 5, 6, 7 + 8 are not included on the Harvesting Plan Map

STATE FORESTS
NORTHERN REGION

URBENVILLE MANAGEMENT AREA

ENVIRONMENTAL IMPACT ASSESSMENT

AREA:	Compartment 76	
LOCATION:	BEAURY STATE FOREST 2	
OPERATION:	FOREST HARVESTING	
PLAN No.	UMA 96/09	20/8/96

Note : ***URBENVILLE MANAGEMENT AREA EIS & FIS December 1995 is now on exhibition.***

CONTENTS

PART A

ENVIRONMENTAL REVIEW - CHECK LIST

Compartment 76
Beaury State Forest No. 2

TITLE OF ACTIVITY: Integrated selective hardwood logging operation	NIL OR N/A	TEMP	MINOR	SUB-STANTIAL	REFER TO NOTES
FACTORS - REGULATION CLAUSE 56					
Will the activity cause:					
a) any environmental or social effect on a community		X	X		1
b) a transformation of the locality		X	X		2
c) any environmental impact on the ecosystems of the locality		X	X		2
d) diminution of (i) aesthetic values		X	X		2
(ii) recreation values		X	X		3
(iii) scientific values	X				
(iv) other values	X				
e) any effect on structure or places having aesthetic, cultural, historical, scientific, archaeological or special values	X				
f) danger to any species of flora or fauna		X			
g) any long term effects on the environment	X				
h) any degradation of the quality of the environment	X				
i) any risk to the safety of the environment	X				
j) any curtailment of the range of beneficial uses of the environment	X				
k) pollution (i) air		X	X		4
(ii) water		X	X		5
(iii) noise		X	X		4
l) any environmental problems from the disposal of waste	X				
m) any increased demand on scarce resources	X				
n) any cumulative environmental effect with other existing or likely future activities		X	X		6
o) any departure from established policy	X				
p) any impact on the habitat of any protected fauna within the meaning of section 98 of the National Parks and Wildlife Act 1974 or endangered fauna within the meaning of that Act and the Threatened Species Conservation Act (1995)		X	X		7

NOTES

1. The proposed logging will result in a short term increase in local traffic. Socio-economic benefits will result to the local community, and to a lesser extent the regional community.

2. Selective logging of mature trees will temporarily alter forest micro climate by reducing canopy cover and stand density, and by disturbing the ground surface. This disturbance will temporarily affect aesthetics.

   These minor impacts will decline as the advance growth present and the regeneration are stimulated. Some modified logging techniques may be adopted in parts of the logging area to reduce lantana infestation and to encourage hardwood regrowth.

3. Recreational values may be diminished in the short term until the area begins to regenerate. Access to the immediate area will also be restricted whilst logging is occurring.

4. Machinery used during the harvesting operation will generate some noise pollution and exhaust fumes, and in dry conditions dust pollution. However these will be localised effects and will dissipate rapidly.

5. Some minor increase in creek turbidity may result if heavy rains occur during or soon after logging. Erosion mitigation measures will be applied to minimise this effect. This operation will conform to the conditions of a Pollution Control Licence issued to State Forests by the Environment Protection Authority.

6. It is proposed to burn logging debris after logging to reduce fuel loads and to promote regeneration. The effects of this will be cumulative with those of the current proposal.

7. Full consideration of this factor is addressed in Part B.

POSITIVE SIGHTINGS OF SCHEDULE 12 SPECIES

None were sighted during planning inspections. A Koala survey was carried out for the Compartment. It was found that the compartment is an intermediate use area. There is a recorded observation for a Koala approximately 1 km to the south west of the compartment. There are records for the Little-bent wing Bat and the Sooty Owl approx. 3 km to the west of the compartment.

Part B

Environmental Review - Checklist

Beaury State Forest No. 2 Compartment 76

Determination of the impact on Protected Fauna pursuant to Section 4a of the Environmental Planning and Assessment Act as amended by Schedule 1 of the Endangered Fauna (Interim Protection) Act, 1991.

For the purposes of Sections 111 and 112 of the EPA Act, in deciding whether there is likely to be a significant effect on the environment or protected fauna (which includes endangered fauna), the following factors are taken into account:-

a) The extent of modification or removal of habitat in relation to the same habitat type in the locality.

Comments:
The dominant forest type (FT) in the Compartment is Sydney Blue Gum (FT 46) that commmonly has a dense understorey. There are sections of rainforest (FT 1-23) which typically occur on moist sites like the heads of drainage lines. There are also large areas of Brush Box which also occur predominately moist sites along the drainage lines and lower slope positions on the eastern compartment boundary. A dry eucalypt mix (FT 62) occurs on the central ridge in the compartment.

In excess of 13 hectares (9%) of the gross area will not be harvested due to steep terrain, rainforest and flora and fauna areas.

The Kempsey API team assessed the compartment according to the Harvesting Protocol of September 1995. Potential old growth areas greater than 25 ha were identified. These areas of tBy and tAy which cover most of the compartment have been stump counted. It was found that there were no old growth areas within the compartment.

Forest types are detailed in the accompanying Harvesting Plan and are typical of the State Forests of the general area.

The proposed operation is to be of a selective nature, the tree marking requirements as specified in the harvesting plan. As a result of this selective basis the extent of habitat removal or modification will be limited.

Canopy habitat removal on a gross area basis will be less than 40%, although groups of trees may be removed from within an immediate area.

Ground habitat disturbance will be limited to snig tracks, minor roads and small gaps required to ensure adequate regeneration.

The majority of trees containing hollows will not be targeted for removal, as it is the sounder trees that will provide sawlog standard logs. However it is acknowledged that some hollow bearing trees will be removed.

The selective nature of the operation, together with the ameliorative measures outlined in section (e) and in the Harvesting Plan will limit the extent of habitat removal or modification.

It should also be noted that there are extensive areas of similar habitat elsewhere in the Beaury State Forest, Tooloom National Park and the adjacent Mt Nothofagus and Mt Clunie flora reserves.

b) The sensitivity of species of fauna to removal or modification of habitat.

Comments: Fauna species that are known or likely to occur in the subject area are documented in Appendix 5 of the Management Plan for Urbenville Management Area.

Endangered species (threatened, vulnerable and rare - Schedule 12 of the NPW Act) known or likely to occur in the subject area are listed in Appendix A. The sensitivity of these species to removal or modification of habitat by selective logging operations is addressed in Appendix B.

In addition to this, the habitat requirements and prescriptions to mitigate against the impact of the operation on Schedule 12 species are set out in Section "2.4 Wildlife Prescriptions" of the Harvesting Plan.

In respect of Protected Species (not listed in Schedule 12 of the NPW Act), the selective logging operation is not expected to impact in any significant way on their habitat or population status in the locality.

c) The time required to regenerate critical habitat which is essential for the survival of that species.

Comments: The subject area does not represent the only habitat range, nor the critical habitat essential for the survival of any single species. The selective nature of the operation will not result in the removal of critical habitat that would result in the survival of a species being threatened.

In respect of the effect of the operation on different habitat types:-

Canopy Removal: Removal of some component of the canopy represents the most substantial modification to the area proposed for logging. In that respect there will be some alteration to forest structure, with the result that it may take 50 years for the forest to revert to its present structure. To keep this in perspective, the following points are made:

- There are numerous areas within and adjacent to the area proposed for logging that will have little or no disturbance.
- Individuals will be disturbed and may be killed. However the habitat critical to maintaining viable populations will not be compromised.
- The structure of the forest after logging will approximate a different stage in the continuous natural cycle of the forest. For foliovores which do not depend on

hollows, the middle stages of canopy recovery may constitute an improvement in habitat.

- Crowns of retained trees in many cases will expand to take up the available space, resulting in the amount of canopy habitat approaching pre-logging levels within 10-20 years.

Hollows: The amount of hollow tree habitat varies over the area with forest type and structure. The time taken for hollows to develop is considerable (80 / 150 years).

Therefore the intent of tree marking (through tree marking for removal) is to retain sufficient of this habitat to maintain species populations. Sufficient recruitment trees will also be retained for future hollow trees.

Understorey/Ground Habitat: Many understorey vegetation species regenerate rapidly following disturbance, resulting in a ground cover within 12-18 months. It may be 8-10 years before the understorey returns fully to its pre-logging condition, particularly some of the moister types.

Riparian Habitat: Localised road crossings of drainage lines may cause an increase in stream turbidity when rain occurs during or soon after logging. Rapid recovery is anticipated. The amount of disturbance to this habitat will be very small due to the provision of filter strips, and the large areas which will not be harvested.

d) The effect on the ability of the fauna population to recover, including interaction between the subject land and adjacent habitat, that may influence the population beyond the area proposed for development or activities.

Comments: The proposed operation will result in a low intensity of tree removals on a gross area basis. Recolonisation will occur both from within the Compartment and from the adjoining forest.

Areas where logging is modified such as filter strips, and areas that will remain unlogged such as rainforest, and the inaccessible areas, occur throughout the compartment. This, combined with habitat tree retention, fauna specific prescriptions detailed in the harvesting plan, and the overall low intensity of the logging, will maximise the ability of the fauna populations to recover.

e) Any proposal to ameliorate the impact.

Comments: A number of harvesting modifications and operational conditions are in place to ameliorate the impact of the proposed logging. These are outlined in the Harvesting Plan. They include:

- Exclusion of logging operations from Rainforest stands.
- Provision for Filter Strips along gullies.
- Marking of trees for removal.
- Retention of habitat and potential future habitat trees.
- Application of the Standard Erosion Mitigation Guidelines 1993, EPA licence conditions, and the common conditions derived from the guidelines
- Application of the Code of Logging Practice for Native Forests.
- Adherence to the Plan of Management for Urbenville Management Area.

- Species specific logging prescriptions for endangered fauna (refer also Appendix A).

f) Whether the land is currently being assessed for Wilderness by the Director of National Parks and Wildlife Service under the Wilderness Act, 1987.

Comments: The subject land is not being assessed for Wilderness.

g) Any adverse effect on the survival of that species of protected fauna or of populations of that fauna.

Comments: It is considered that the numbers of any one species lost to the proposed logging area will be low in comparison to the regional and local population numbers.

This is due to a combination of low operational intensity and the ameliorative prescriptions outlined in e) above and the accompanying Harvesting Plan.

It is considered that the effect on populations of species will not be significant.

Conclusion to part B of EIA Checklist:

The species listed in Appendix A (Fauna List) are schedule 12 species (NPW Act) and are known to or are likely to occur on the area proposed for this activity.

The activity will not commence until authorisation, by way of a Section 120 Licence (NPWS Act), is obtained in respect of endangered fauna.

While it is acknowledged that individual animals of the above species may possibly be "taken or killed" in the meaning of Section 5(1) of the NPW Act, there is no evidence to suggest that the long term evolutionary viability of the species in a regional context is threatened. Therefore, the proposed activity is not likely to significantly effect the environment of these species.

The long term evolutionary viability of other protected species will be maintained in a regional context and therefore the proposed activity will not significantly effect the environment of these species.

Part C. EIA Decision

The environmental impact of the proposed activity is not significant. An environmental impact statement will not be prepared specifically for the area the subject of this proposal.

Prepared by: P. StClair

Position: Marketing Forester

Date: 20th August, 1996.

Checked by Paul Sharpe

Position District Forester

Date 21/8/96.

APPENDIX A

Fauna List - Beaury State Forest
Endangered or Vulnerable Species known or likely to occur in Compartment 76

	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*

APPENDIX B

The list of all fauna that are known or likely to occur in Urbenville Management Area is documented in Appendix 5 of the 1985 Urbenville Management Area Plan and the recently exhibited EIS and FIS for the Urbenville Management Area..

Below is a discussion of the sensitivity to habitat removal or modification of schedule 12 species known or likely to be found in the harvesting area. The information is based on previous Environmental Impact Assessments for selective logging operations in the Urbenville District and literature as shown in the bibliography.

Part "2.4 Wildlife Prescriptions" of the Harvesting Plan for this compartment details the habitat requirements of these schedule 12 species and the mitigative prescriptions to be adopted.

MAMMALS

Koala - *Phascolarctos cinereus*

Requires canopy for feeding and shelter. The leaves of the Forest Red Gum, Grey Gum, Tallowwood, Grey Box and Blue Gum are preferred. The distribution and density of animals depends largely on forest type (tree species) and stand structure. A Koala survey was undertaken. The compartment was found to be an intermediate use area. There is a site 1 km south of cpt 76 at AMG 450100E 6855900N.

Sensitivity
Koalas utilise a range of tree sizes, and although they are known to sometimes adopt certain species in a particular area, they do not generally favour any particular tree size (with the exception of hardwood plantations in some instances).
They are therefore sensitive to canopy removal over a range of tree sizes, although their mobility allows them to escape immediate human impact, and evidence suggests that providing their food source is not significantly denuded they recover well.
A species specific prescription to protect individual animals or colonies, as well as their habitat, is contained in the Harvesting Plan.

Yellow-bellied Glider - *Petaurus australis*

A forest dependent marsupial found from north Queensland to Victoria. It requires hollows and a variety of food sources from eucalypt forest. This Glider is most frequently associated with drier forest types or the ecotones between dry and moist eucalypt types. It feeds on nectar, pollen, eucalypt sap and occasionally insects.

Sensitivity
Sensitive to the removal of canopy containing hollow bearing trees, as well as those trees that supply their primary food source.
They have been recorded in both logged and unlogged forest. Providing sufficient retained trees for nesting and feeding, and identifying and retaining feed trees, will assist in lessening the impact and aiding their recovery.
The Harvesting Plan contains a species specific prescription for this Glider if evidence of v-notched treees are found to occur in the compartment.

Parma Wallaby - *Macropus parma*

This wallaby is known to occur from the Watagan Mountains north to the Gibraltar Range and Poverty Point. It lives in both wet and dry sclerophyll forests as well as rainforest, although its preferred habitat is thought to be wet sclerophyll forest with a thick understorey and grassy patches. It is normally a solitary animal.

Sensitivity
Sensitive to the clearing of forest habitat where is shelters.
Retention of rainforest, filter strips and minimising disturbance to understorey are mitigative measures.

Black-striped Wallaby - *Macropus dorsalis*

Preferred habitat is forested country with a dense shrub layer. This includes rainforest margins, regrowth brigalow scrub, acacia and lantana thickets. The Black-striped Wallaby seldom ventures far from suitable cover.

Sensitivity
Most of the Timber Resource forest does not have a dense shrub layer and is unsuitable habitat for the Black-striped Wallaby.
Non-harvest areas in drainage lines and on steeper slopes will provide sufficient habitat if the species exists here.

Tiger Quoll - *Dasyurus maculatus*

Uses hollow logs, tree hollows and rock crevices for shelter, feeding mostly at night on small reptiles, mammals, birds and insects. It is known to visit or sometimes inhabit areas close to human development such as camp sites. In forest conditions it is found in both hardwood and rainforest.

Sensitivity
Most threatened habitat clearing. Minimising disturbance to understorey, stream-side reservations and no rainforest logging will reduce the risk of habitat modification.

Brush-tailed Phascogale - *Phascogale tapoatafa*

Known to inhabit a range of forest types. It uses small tree hollows for nesting, feeding in the canopy and ground vegetation.

Sensitivity
Sensitive to loss of tree hollows and ground cover. The requirement for small hollows means that breeding habitat will recover over time, probably between logging rotations. Ground cover will recover rapidly. The prescriptions for tree retention, filter strips and minimisation of disturbance to ground cover are mitigative measures.

Red-legged Pademelon - *Thylogale stigmatica*

Inhabits a range of moist sclerophyll and rainforest types, preferring gully sites. It feeds mainly on leaves and berries. It appears to be well distributed throughout northern NSW, and has been recorded over a wide area of Urbenville District. There has been a record of this species in Cpt 146.

Sensitivity
Sensitive in particular to removal of rainforest and gully habitat, as it requires dense understorey for shelter and protection from predators. Exclusion of logging from rainforests, as well as filter strip prescriptions are mitigative measures.

Brush tailed Rock Wallaby - *Petrigale pencillata*

The sub-species "*penicillata*" is common in The Upper Richmond and Clarence Rivers. The smaller, lighter in colour sub-species "*herberti*" occurs in South-east Queensland and is less common. It inhabits exposed rock slopes and shelters in windblown caves, rock cracks or tumbled boulders.

Sensitivity

Sufficient areas are reserved from harvesting that the habitat of the Brush tailed Rock Wallaby will not be threatened. In areas that are harvested the low intensity of the operation is not likely to have any impact on the Brush tailed Rock Wallaby.

Rufous Bettong - *Aepyprymnus rufescens*

Generally found in open forest with a grassy understorey and often no shrub layer, nesting on the ground and feeding nocturnally on grasses, herbs and other vegetative matter. It has been recorded from Sydney to north Queensland.

Sensitivity
Sensitive to predation by feral animals, however it appears to respond well to disturbance that promotes grass cover. It is unlikely that the scale of this operation will impact on this species.

Common Planigale - *Planigale maculata*

A small nocturnal predator, this species occupies a wide variety of habitats, from grassland to rainforest. It shelters in burrows or under rocks and logs.

Sensitivity
It appears that this animal, because of it's wide habitat distribution, will not be significantly affected by forestry operations. It is regarded as common in northern NSW and south east Queensland. The proposal to log this compartment should have no significant effect on the species or it's habitat.

Long-nosed Potoroo - *Potorous tridactylus*

Inhabits coastal heath, dry and wet sclerophyll forests to rainforest. It uses thick ground vegetation and understorey for shelter, foraging on roots, tubers, fungi and arthropods.

Sensitivity
Sensitive to the removal of understorey and ground vegetation, and vulnerable to predation by foxes. Only a small percentage of the understorey (less than 25%) will be effected in the logging area. Retention of trees, filter strip prescriptions, and exclusion of logging from rainforest are mitigative measures.

Great Pipistrelle - *Falsistellus tasmaniensis*

Distributed in south western Australia and south eastern Australia to the NSW/Queensland border and east of the Divide. It's habitat is mainly tall moist eucalypt forest where it roosts in tree hollows (although it is also found in caves and buildings). It feeds on insects.

Sensitivity
Most sensitive to large scale clearing of eucalypt forest with the resultant loss of tree hollows. Tree retention prescriptions and filter strips will help mitigate against the effect this operation will have on the species.

Eastern Little Mastiff Bat - *Mormopterus norfolkensis*

Little is known of it's preferred habitat, but it appears to live in both sclerophyll forest and woodland. Small colonies have been found in tree hollows and under loose bark. Probably an above forest or canopy forager, but is known to hunt in clearings adjacent to forest.

Sensitivity
Appears to be sensitive to loss of hollow bearing trees, although it has been recorded in logged areas. Tree retention along creek and gully lines is effective in preserving habitat, as it is known to favour gullies with a high percentage mixture of larger trees.

Beccari's Mastiff Bat - *Mormopterus beccarii*

Little data exists on it's habitat requirements, although it is known to inhabit a range of forest types from woodland to rainforest. Roosts include tree hollows and bark cavities, and it is an inhabitant of urban environments.

Sensitivity
Appears to be sensitive to loss of hollow bearing trees. Tree retention prescriptions and filter strips are mitigative measures.

Greater Broad-nosed Bat - *Scoteanax rueppellii*

This bat has a requirement for tree hollows for roosting, although it is known to use buildings. It prefers watercourses and wet gullies in forests for foraging for insects, and also uses the margins between forest and cleared paddocks.

Sensitivity
Sensitive to removal of trees containing hollows and loss of forest containing food sources. Prescriptions for tree retention and filter strips will mitigate against any impact.

Golden-tipped Bat - *Kerivoula papuensis*

This Bat has been found along coastal and sub-coastal Australia from south east NSW to the Queensland border. It's habitat ranges from eucalypt forest to sub-tropical rainforest. It has been found in Beaury State Forest. It feeds on insects in the upper canopy of rainforest and moist gully forest, roosting in thick rainforest vegetation.

Sensitivity
Sensitive to the loss of Rainforest habitat and densely vegetated gullies. Exclusion of logging from rainforest and filter strip prescriptions are mitigative prescriptions.

Large-footed Myotis - *Myotis adversus*

Colonies of this bat are usually found in caves, mines and buildings, and occasionally in dense foliage (in the northern part of its range - *Aust. Museum, Complete Book of Aust. Mammals*). They occur close to permanent bodies of water, feeding from the air on aquatic insects

Sensitivity
It is unlikely that this operation will impact significantly on this species. Retention of rainforest, creek and river reserves, together with large non-harvest areas will mitigate against any impact the operation may have.

Queensland Long-eared Bat - *Nyctophilus bifax*

This species appears to occur over a range of habitats from tropical rainforest to dry sclerophyll forest and woodland. Hollow bearing trees are known roost locations. It forages for insects on the wing beneath the canopy.

Sensitivity
Would appear to be sensitive to canopy removal and loss of trees containing hollows. Prescriptions for tree retention, provision of filter strips, the stream-side corridors and other areas reserved from logging are mitigative measures.

Little Bent-wing Bat - *Miniopterus australis*

This species appears to occur over a range of well timbered habitats where it occupies tunnels and caves during the day and at night forages for small insects beneath the forest canopy. It frequently shares roosting sites with the common bent -wing bat.

Sensitivity
Would appear to be sensitive to canopy removal. Given its preferred roost sites of caves and tunnels which are usually found in steep rocky terrain (usually excluded from harvesting) and prescriptions for tree retention, filter strips and other exclusions from harvesting, the viability of this species should not be threatened.

BIRDS

Glossy Black Cockatoo - *Calyptorhynchus lathami*

A large cockatoo with a wide distribution, it feeds almost exclusively on the fruit (cones) of Casuarina trees. They use tree hollows for nesting. Site 4 km north at AMG 451000E 6863900N.

Sensitivity
Sensitive to the large scale removal of feed trees, and the loss of nesting sites. Is a very widespread bird, commonly recorded in both logged and unlogged forest, and it is unlikely that it will be significantly impacted upon in this operation.

Red-tailed Black Cockatoo - *Calyptorhynchus magnificus*

Another large cockatoo, and like the Glossy Black is found over a very wide range of habitats. It nests in large hollows, feeding on seeds of grasses, Eucalypts and Casuarinas.

Sensitivity
As for the Glossy Black. Again this operation is unlikely to impact significantly on habitat.

Red Goshawk - *Erythrotriorchis radiatus*

Very rare. It is regarded as possibly threatened in Queensland, and the McPherson Range is considered significant in it's conservation. In NSW the few recent sightings of pairs (Maryland River, Kyogle, The Risk, Stokers Siding, Bundalong National Park) and the most recent records for the breeding season are confined to the coast north of the Clarence River. The Red Goshawk occurs in areas that are rich in flora and fauna, inhabiting a variety of vegetation types - eucalypt woodland, open forest, tall forest, gallery rainforest on watercourses, paperbark forest, often in rugged or broken country and usually near permanent water. It has a large home range (tens of kilometres) and hunts aerially over dense forest types such as subtropical and dry rainforests. Uses trees for nesting, preferably near water (within a kilometre).

Sensitivity
Most sensitive to clearing of native forests. Nest trees should be identified and avoided, with the implementation of a buffer zone as detailed in the harvesting plan.

Wompoo Fruit Dove - *Ptilinopus magnificus*

A rainforest dweller, or on occasions found on the rainforest margin. Feeds on fruiting plants and trees of rainforests. Has been widely recorded throughout the District and there has been a positive sighting of the Wompoo Fruit Dove in a FIS survey site in Cpt. 140 (464250E 6846050N). This bird has low sensitivity to logging and will not be impacted upon by the operation as its principal habitat is rainforest.

Sensitivity
Sensitive to loss of rainforest habitat. This operation will not impact on the species.

Superb Fruit Dove - *Ptilinopus superbus*

This species is a relatively common inhabitant of rainforest and mangroves. Although it generally lives in the rainforest, it is known to forage in eucalypt forest.

Sensitivity
Sensitive to the loss of rainforest habitat and the wider scale clearing of eucalypt forest on the margins of rainforest. The operation is unlikely to impact on the species.

Rose-crowned Fruit Dove - *Ptilinopus regina*

Distributed from the Bellingen River area to north east Queensland, living in rainforest and feeding on fruits. Common red-crowned pigeon. Inhabits rainforest, wet sclerophyll forests and occasionally open forests. There has been a positive sighting of the Wompoo Fruit Dove in a FIS survey site in Cpt. 140 (464250E 6846050N). Given this species preferred habitat in rainforest the operation is unlikely to impact on the species.

Sensitivity
Sensitive to loss of rainforest habitat. This operation will not impact on the species.

Barred or Yellow-eyed Cuckoo Shrike - *Coracina lineata*

Preferred habitat is open forest or rainforest where there are native figs or fruit.

Sensitivity
Other than in the rainforest and moist gullies there is little food

Albert's Lyrebird - *Menura alberta*

Restricted to the northern part of the State, it mostly inhabits rainforest, feeding on insects and litter dwelling invertebrates. Uses thickets of ground vegetation for nesting. Has been documented foraging in logged areas bordering rainforests.

Sensitivity
Sensitive to rainforest logging and removal of habitat bordering rainforest. The proposal therefore should have little or no effect on it's habitat.

Powerful Owl - *Ninox strenua*
Sooty Owl - *Tyto tenebricosa*

The largest of the nocturnal predators, nesting in large hollows of old trees. Known to inhabit tall eucalypt forest over a wide geographic range, feeding on a variety of forest dependent mammals and birds. They have territories of 1000 hectares or more in size. There is a positive record of the Sooty Owl in Cpt 140 at the FIS survey site. This site and 20 ha of the associated riparian and gully habitat was excluded from harvesting.

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

Sensitivity
Apparently not a lot is known about the effect of logging on their home range. They have however been found to roost in both logged and unlogged forest, the Sooty Owl also inhabiting rainforest.
Sensitive to the loss of roosting trees as well as the impact on available prey species. Tree retention and filter strip strip prescriptions are important, as well as the need to identify and preserve nesting sites.

Masked Owl - *Tyto novaehollandiae*

This owl occupies a variety of habitats, from moist sclerophyll to dry hardwood, including the ecotone with cleared land, roosting in tree hollows. It feeds on a variety of small mammals. It is also known to roost during the day in rainforest.

Sensitivity
Sensitive to the loss of roosting trees as well as the impact on available prey species. Tree retention, filter strip strip prescriptions and the reserved areas are important, as well as the need to identify and preserve nesting sites.

Marbled Frogmouth - *Podargus ocellatus plumiferus*

This bird requires rainforest with a full canopy, although it may sometimes be found in adjoining wet forest. It feeds on small vertebrates such as frogs as well as invertebrates. This bird has been recorded in Yabbra and Toonumbar State Forests. It has been recorded at the FIS survey site in Cpt 140. This site and 20 ha of the associated riparian and gully habitat will be excluded from harvesting. In general, as a rainforest inhabitant, it's habitat will be protected through adherence to the prescriptions excluding logging from rainforest. Meggs (1993) in a study of the species found (with one exception) no individuals greater than 50 metres from flowing water and therefore standard drainage line protection aids in the health of the species in moist hardwood forest.

Sensitivity
Sensitive to disturbance to rainforest canopy and structure. Will not be significantly impacted upon by the proposed logging.

Black Breasted Button Quail - *Turnix melanogaster*

A very rare large black-breasted quail with heavy white spotting on the back and white around the eye. The preferred habitat is rainforest, grassland in recently cleaned rainforest and Lantana. The bird builds a characteristic saucer like nest on the ground.

Sensitivity
The Urbenville Management Area represents the southern limits of its range as it prefers tropical and sub-tropical rainforest. It is unlikely to occur in this proposed harvest area. Should it be discovered descriptions are contained in the Harvesting Plan.

White-eared Monarch - *Monarcha leucotis*

The habitat of this bird is usually heavy canopy along vegetation boundaries, favouring areas between eucalypt forest and rainforest, where it nests in the dense foliage high up in the canopy. It feeds mainly on insects.

Sensitivity
Appears to be sensitive to tree removal in or near rainforest. Excluding rainforest areas from logging, as well as tree retention and filter strip provisions will mitigate against the effect logging will have on habitat.

AMPHIBIANS

Loveridge's Frog - *Philoria loveridgei*

A montane species inhabiting wet sclerophyll, Beech and rainforest, preferring soaks, moist gullies and near permanent water. They shelter in soil burrows, under rotting logs or crevices. This frog has been recorded at the FIS survey site in Cpt 140. Location of boggy/seepage areas may indicate preferred habitat for this frog. Avoidance of ground disturbance in such areas and adherence to filter strip provisions as well as the creek corridor will minimise the disturbance to habitat.

Sensitivity
Sensitive to loss of forest cover, disturbance to ground cover and loss of breeding habitat, particularly disturbance adjacent to gullies. The provision of filter strips and exclusion of logging from rainforests are mitigative measures.

Giant Barred Frog - *Mixophyes iteratus*
Stuttering Frog - *Mixophyes balbus*

Neither have been recorded in Urbenville Management Area. Frogs of this genus are terrestrial inhabitants of rainforest and moist sclerophyll forest, breeding in streams and waterholes.
They have generally experienced a decline in distribution and abundance along the NSW coast. M. balbus was once common along rainforest streams in the Watagan Mountains and the Hawkesbury and Hunter Rivers (*North East Forest Biodiversity Study Report #3d)*, although it is now thought that the range of these two species has been reduced.

Sensitivity
Sensitive to the loss of rainforest and riparian habitat and impacts on water quality. Exclusion of logging from rainforest and the strip along Iron Pot Creek, and adherence to filter strip conditions are mitigative measures.

Fleay's Barred River Frog - *Mixophyes fleayi*

A terrestrial inhabitant of rainforests and moist sclerophyll forests, requiring wet gullies for breeding habitat.

Sensitivity
Sensitive to loss of forest cover, disturbance to ground cover and loss of breeding habitat, particularly disturbance close to gullies. The provision of filter strips strips, and no logging of rainforest areas are mitigative measures.

REPTILES

Fossirial Skink - *Coeranoscincus reticularis*

Inhabits mainly rainforests and sometimes moist hardwood margins, living under rotting logs and leaf litter.

Sensitivity
Sensitive to loss of forest cover and disturbance to ground cover. The provision of filter strips, other tree retention measures, minimising ground disturbance, and not logging rainforests are mitigative measures.

Stephen's Banded Snake - *Hoplocephalus stephensii*

There are three records for this snake in the Urbenville Management Area, all in Richmond Range State Forest to the SE of Yabbra SF. It is distributed from central eastern NSW to south east Queensland, and reasons for its apparent rarity are unknown. It is a nocturnal, partly arboreal snake which feeds on lizards, birds and small mammals, and is known to shelter in tree hollows.

Sensitivity
Sensitive to the loss of rainforest and wet sclerophyll habitat. Tree retention prescriptions, exclusion of logging from rainforest and the filter strip conditions are mitigative measures.

White-crowned Snake - *Cacophis harriettae*

A secretive nocturnal dark grey snake to 40 cm long that has a yellowish band at least partially circling the top of its head between the eyes. Shelters in leaf litter and fallen timber. Venomous but not dangerous. Eats small lizards.

Sensitivity
Sensitive to disturbance of ground cover. The provision of filter strips, other tree retention measures, minimising ground disturbance, and not logging rainforests are mitigative measures.

BIBLIOGRAPHY

References

Austeco Pty. Ltd. (1993). *Description and Assessment of the Forestry Impacts on Fauna of the Urbenville Forestry Management Area.* **Prepared for Urbenville EIS.**

Baker, J. (1977). A *Field Guide to Australian Frogs.*

Barker, J. (1980). *Reptiles and amphibians of the Gibraltar Range.* **Unpublished Report. National Parks and Wildlife Service, Sydney.**

Baverstock, P. and Chambers, M. (1992). *Murwillumbah Bat Survey.* **Report prepared for the Forestry Commission of N.S.W.**

Blakers, M. Davies, S. J. J. F. & Reilly, P. N. (1984). *The Atlas of Australian Birds.* **RAOU/Melbourne University Press, Melbourne.**

Brouwer, J. and Garnett, S. (Eds.) (1990). *Threatened birds of Australia.* An annotated list. **ANPWS RAOU Report Number 68.**

Calaby, J.H. (1966). *Mammals of the Upper Richmond and Clarence Rivers. New South Wales.* **Technical Paper No. 10. CSIRO Division of Wildlife Research Canberra.**

Cogger, H.G. (1992). *Reptiles and Amphibians of Australia.* **Reed Sydney.**

Corben, C.J. and Ingram, G.J.(1987). *A new Barred River Frog (Myobatrachidae: Mixophyes).* **Mem. Old. Mus. 25: 233-237.**
Date, E.M. and Recher, H.R. (1990). *Interim management plan for rainforest pigeons in northern New South Wales.* **Unpublished Report to the National Parks and Wildlife Service.**

Debus, S.J.S. (1988). *Survey of the Red Goshawk in north-eastern New South Wales.* **Report to NSW NPWS.**

Debus, S.J.S. (1991). *An annotated list of New South Wales records of the Red Goshawk.* **Australian Birds, 2: 42-89.**

Debus, S.J.S. (1992). *Survey of diurnal raptors in north -east New South Wales, 1987-1990.* **Australian Birds, 25: 67-77.**

Ferrier, S. (1984). *The status of the Rufous Scrub Bird. Habitat, Geographic variation and Abundance.* Hon. thesis, University of Queensland.

Ford, H.A., Debus, S.J.S. and Recher, H.F. (1991). *Distribution, status and habitat requirements of the Sooty Owl Tyto tenebricosa in north-eastern New South Wales. Unpublished Report No. 142. Wood Technology and Forest Research Division Sydney.* **Forestry Commission of New South Wales.**

Forshaw, J. & W. (1981). *Parrots of Australia.*

Goldingay, R. (1989). *Time budget and related aspects of the foraging behaviour of the Yellow-bellied Glider, Petaurus australis.* **Aust. Wildl. Res. 16: 105-12.**

Gosper, D.G. (1992). *Forest bird communities of the Richmond River District, New South Wales.* **Corella 16: 79-88.**

Hall, L & Richards, G. (1979). *Bats of Eastern Australia.*

Hartley, S.L. (1990). Correspondence of extract from Hons. thesis on Eastern Bristlebird.

Hill,R. (1968). *Australian Birds.*

Johnson, K.A. (1980). *Spatial and temporal use of habitat by the Red-legged Pademelon, Thylogale thetis. (Marsupialia Macropodidae).* **Aust. Wildlife 7: 157-166.**

Johnson, K.A. (1984). *Red-necked pademelon.* In The Australian Museum. **"Complete Book of Australian Mammals - The National Photographic Index of Australian Wildlife"**, edited by R Strahan. pp.228. Angus and Robertson. Sydney.

Kavanagh, R.P. (1987). *Forest phenology and its effect on faraging behaviour and selection of habitat by the Yellow-bellied Glider, Petaurus australis.* **Aust. Wildlife Res.**

Keast, A, Recher, H.F. Ford, & Saunders (Eds.) (1985). *Birds of Eucalypt forests and woodlands.*

Kennedy, M. (1990). *A complete Reference to Australia's Endangered Species: Mammals, Birds, Reptiles, Amphibians, Fish Invertebrates and Plants.* **Ausworld Publishing, Avalon, NSW.**

King, G. (1984). *Habitat utilised by Pseudomys oralis.* Aust. Mammal. 7: 139-147.

Mackowski, C.M. (1986). *Distribution, habitat, and status of the Yellow-bellied Glider, Petaurus australis Shaw (Marsupialia: Petauridae) in north-eastern New South Wales.* **Aust. Mammal. 9: 141-44.**

Mooney, N. (1988). *Guidelines for alleviating the effects of forestry operations on Raptors.*

Moore, D.M. and Floyd, A.G. (1994). *A description of the flora and an assessment of impacts of the proposed forestry operations in the Grafton Forest Management Area.* **Report prepared for the State Forests of New South Wales.**

New South Wales NPWS. *North east NSW Biodiversity Study.* Pers. Comm.

NPWS (1993). Comments on *the faunal component of the report on flora and fauna* of the Grafton and Casino Forestry Study Areas: description and assessment of forestry impacts. **Report to State Forests of NSW by NPWS.**

Read, D.G. Fox, B.J. (1991). *Assessing the habitat of the Parma Wallaby, Macropus parma (Marsupialia; Macropodidae).* **Aust. Wildl. Res. 18: 469-478.**

Recher, H.F., Shields, J., Kavanagh, R. *Retaining remnant mature forest for NSW: A review of theory and practice.* Nature Conservation: The role of remnants of native Vegetation. Saunders, Hopkins, Burbidge, Arnold eds.

Richards, G. (1992). *Bats of the Wingham Management Area.* **CSIRO report to Forestry Commission of NSW.**

Shodde, R. & Mason, I. (1983). *Nocturnal Birds of Australia.*

Slater, P. (1970). *A Field Guide to Australia Birds, Vol 1 & 11.*

Smith, A.P., & Lindenmayer, D. (1988). *Diet and Feeding Strategies of the Marsupial Sugar Glider in temperate Australia.* J. of Animal Ecology: 51.

Southwell, C. (1987). *Macropod studies at Wallaby Creek 11. Density and distribution of macropod species in relation to environmental variables,* **Aust. Wildl. Res. 14: 15-33.**

Strahan, R. (ed) (1988). *The Australian Museum Complete Book of Australian Mammals - The National Photographic Index of Australian Wildlife.* **Angus and Robertson, Sydney.**

Swan, G. (1990). *A Field Guide to the Snakes and Lizards of NSW.* **The Three Sisters. Sydney.**

see also

URBENVILLE MANAGEMENT AREA EIS & FIS December 1995

CERTIFIED MAIL

RB450485S4

FORESTRY COMMISSION OF NSW
LOCKED BAG 23 P.O.
PENNANT HILLS NSW 2120

Environment
Protection
Authority
New South Wales

Civic Tower
Cnr of Jacobs Street
and Rickard Road
Locked Bag 1502
Bankstown
NSW 2200

Telephone .02. 9795 5000
Facsimile .02. 9795 5002

Our Reference: 600000/D60/Not. Nos. 003431

Your Reference:

18 October, 1996

NOTICE UNDER SECTION 17D(3)
OF THE POLLUTION CONTROL ACT 1970

WHEREAS -

(a) FORESTRY COMMISSION OF NSW is the holder of licence number 004017 in respect of premises situated at LAND IN THE NORTHERN REGION, - which expires on 7 August, 1997.

TAKE NOTICE THAT -

In accordance with the powers vested in the Environment Protection Authority (EPA) under Section 17D(3) of the Pollution Control Act 1970, the EPA with respect to licence number 004017 from the date of this Notice hereby:-

1. Varies this licence by inserting the following compartment description, corresponding water pollution hazard categories, special conditions, representative water quality monitoring site, and date of licence variation into Schedule 1:

   "**Compartment Description**

   Compartment 435
   Ingalba State Forest No. 527

Water Pollution Hazard Categories

Water Pollution Hazard Category	Slope Ranges (degrees)
1	Less than or equal to 2.
2	Greater than 2 or less than or equal to 11.
3	Greater than 11 or less than or equal to 30.
4	Not applicable.

Proportion of dispersible soils: less than 10% (A horizon)
less than 10% (B horizon)

Special Conditions

Special conditions are those conditions contained in the harvesting plan for Compartment 435, Ingalba State Forest No. 527, prepared by State Forests of NSW, received by the EPA on 23 September 1996, and as amended by:

1. addendum 1 received by the EPA on 14 October 1996; and

2. amending the water pollution hazard category slope boundaries in Table 2 in Description 13 (a) on page 15 in accordance with the Water Pollution Hazard Category Slope boundaries specified in this Notice; and

3. amending the water pollution hazard category slope boundaries in Table 4 in Condition 4.7 (a) on page 27 in accordance with the Water Pollution Hazard Category Slope boundaries specified in this Notice; and

4. amending the water pollution hazard category slope boundaries in Table 6 in Condition 4.7 (l) on page 31 in accordance with the Water Pollution Hazard Category Slope boundaries specified in this Notice; and

5. amending the water pollution hazard category slope boundaries in Table 6 in Condition 4.7 (l) on page 31 in accordance with the Water Pollution Hazard Category Slope boundaries specified in this Notice; and

6. inserting the sentence in condition 4.7 (e) on page 28 that reads: "Where water diverted by a drainage structure discharges onto a batter of greater than one metre in height, a drop down structure and dissipater must be used.".

********** F I L E C O P Y **********

Waters Quality Monitoring Site

To be determined

Date of Licence Variation

18 October 1996."

2. Varies this licence by inserting the following compartment description, corresponding water pollution hazard categories, special conditions, representative water quality monitoring site, and date of licence variation into Schedule 1:

"**Compartment Description**

Compartment 76
Beaury State Forest No. 2

Water Pollution Hazard Categories

Water Pollution Hazard Category	Slope Ranges (degrees)
1	Less than or equal to 5.
2	Greater than 5 or less than or equal to 23.
3	Greater than 23 or less than or equal to 30.
4	Not applicable.

Proportion of dispersible soils: less than 10% (A horizon)
less than 10% (B horizon)

Special Conditions

Special conditions are those conditions contained in the harvesting plan for Compartment 76, Beaury State Forest No. 2, prepared by State Forests of NSW, received by the EPA on 23 September 1996, and as amended by:

1. addendum 1 received by the EPA on 14 October 1996; and

2. omitting the sentence in condition 4.7 (e) on page 35 that reads: "Bank spacings must be in accordance with Table 7 on page 37." and inserting in its place "Bank spacings must be in accordance with Table 7 (WPHC 3)."; and

3. omitting the sentence in condition 4.7 (i) on page 36 that reads: "Harvesting debris and earth are suitable materials for diverting concentrated water flow.".

Waters Quality Monitoring Site

To be determined

Date of Licence Variation

18 October 1996."

3. Varies the licence by further amending the harvesting plan for Compartments 64, 65 and 66, Ellis State Forest No. 831, (prepared by State Forests of NSW, and received by the EPA on 3 June 1996, as amended by Notice under section 17D(3) of the Pollution Control Act 1970 issued by the EPA on 9 August 1996) by:

a) inserting the attached additional harvesting plan operational map received by the EPA on 3 October 1996 and certified by Mr Geoff Noonan.

4. Varies the licence by further amending the harvesting plan for Compartment 337, Forestland State Forest No. 529, (prepared by State Forests of NSW, and received by the EPA on 14 November 1995, as amended by Notice under section 17D(3) of the Pollution Control Act 1970 issued by the EPA on 29 February 1996) by:

a) inserting the attached additional harvesting plan operational map received by the EPA on 14 October 1996 and certified by Mr Geoff Noonan.

FOR ACTION OR NOTING BY		
ORIGINATOR	SB	18/10/96
1. MWCP		
2.		
3.		
4.		

NEIL SHEPHERD
Director-General

Per ..... 18/10/96 .....
Geoff Noonan
Manager - Waters & Catchments Policy
WATERS AND CATCHMENTS
(by Authorisation)

292app-KG

FACSIMILE TRANSMISSION

To	Dr. Neil Shepherd, Environment Protection Authority P O Box 1135 CHATSWOOD NSW 2057		
Attention	Mr Geoff Noonan Catchments Branch	**Date**	18 October 1996
Your Fax		**Our Fax**	(02) 9980 7042
From	Kris Gounder Forest Planning Branch	**Phone**	(02) 9980 4217 (015) 271 625
No of Pages	1 (including this cover page)		

STATE FORESTS

State Forests of
New South Wales
Building 2
423 Pennant Hills Road
Pennant Hills NSW
2120
Phone (02) 980 4100

RE: NOTICE UNDER SECTION 17D(3) OF THE POLLUTION CONTROL ACT 1970

In terms of Clause 13(b) of the Pollution Control Regulations, State Forests of New South Wales hereby notifies you that no appeal will be made against EPA's decision to vary Licence No. 4017 on 18 October 1996 to include the following areas:

Compartment No.	State Forest	Managenent Area
435	Ingalba	Urunga
76	Beaury	Urbenville
64, 65 & 66	Ellis	Dorrigo
337	Forestland	Tenterfield

for **KRIS GOUNDER**
for Manager
Forest Planning

For State Forests Use Only (Page 1 of 7)

District Forester: Urunga, Urbenville, Dorrigo & Glen Innes.
As required under the above legislation we advised EPA about our intention not to appeal against this Licence amendment **on 18 October 1996**. Accordingly you may start logging these compartments **on 20 October 1996**.

Manager, Forest Planning

Forest Planning and Fire Management Branch

Phone No. (02) 97955386

STATE FORESTS
MANAGING · CARING · SUSTAINING

To	District Forester - Urbenville / Marketing Forester (P.StClair)
From	Forestry Liaison Officer - Environment Protection Authority
Date	1 October 1996
Subject	HARVESTING PLAN BEAURY 76

The harvesting plan for Beaury 76 has been examined by the Environment Protection Authority (EPA). The harvesting plan will fail to satisfy the EPA without alteration to the text. Please implement any possible alterations requested so that an amended harvesting plan can be submitted to the EPA. Any amended pages must be forwarded to State Forests Forest Regulation Unit for consideration with the original harvesting plan.

Amendments requested are:-

1. locality *map.*

   The EPA request a locality map of the planning unit.

2. *page 5. Part 2.2, description 6, harvest conditions to be determined.*

   The EPA has questioned our format and asks is 'to be determined' warranted in the title heading? Suggest that you delete as other districts do.

3. *page 20. Part 2.5, description 11(d), soils, % clay.*

   Please insert the following clay percentages based on the texture classes
   A horizon 35
   B horizon 40
   Method of determination D3 (field assessment of texture)

4. *page 22, 35. Part 2.5, description 11(h), use of existing roads.*

   Although we have provided comment on most of the road issues, the EPA insist that the harvesting plan must provide all site specific details on roads to be used, in the planning unit, in accordance with schedule 2 of the licence. The EPA specifically requires that we provide the following site specific information:

   a) **total length of existing road to be used**;
   b) **length of road to be re-opened**;

pt4

c) **maximum width of running surface;**
d) **maximum width of allowed clearing either side;** pt4
e) **maximum site specific side slope;**
f) **maximum site specific road grade;**
g) **type and location of existing drainage feature crossings.**

Examining the operational map the EPA expect no crossings and therefore the other parameters would not require statements.
(pt4: Note that these parameters are probably best covered in part 4 as information and prescriptions to the contractor.)

5. *page 25. Part 2.5, description 12(b), dispersibility.*

Insert results of dispersibility calculations.
A horizon EAT 8 x 35% = < 10%
B horizon EAT 4-6 x 40% = < 10%

6. *page 32. Part 4.2, trees marked for information.*

Delete the second instruction as it is out-dated with the new PCL.

7. *page 34. Part 4.7(a), water pollution hazard categories.*

To comply with PCL schedule 4, condition 7 insert an additional stanza below table 4 unless already prescribed
'The SFO is responsible for identifying ground slopes exceeding 30 degrees in the field.'

8. *page 34-35. Part 4.7(e), road construction.*

The EPA maintain that as the harvesting plan is a site specific document we should not prescribe road construction techniques unless a road is proposed or that the option and trigger mechanism is adequately addressed in the plan. The EPA request that we delete the prescriptions for road construction and only leave a statement that no roads are to be constructed.

The EPA request instead that we provide site specific prescriptions to the contractor on the re-opening and maintenance of existing roads to be undertaken by the contractor. This may include some of the works described in part 2. Your section on *road surface drainage, revegetation and rehabilitation*, *patch gravelling* and *borrow pits* is probably relevant. You should also consider if the words on *crossing of drainage features* is relevant. You should also provide some direction on any other contractor works required, acceptable clearing widths and disturbance guidelines to edges/batters.

For existing roads the EPA request that we provide the distances for roll-over cross-bank drainage construction were cross-fall is not effective. We should also prescribe the techniques to achieve schedule 4 condition 63(b)(c) of the PCL.

9. *page 36. Part 4.7(g), drainage feature protection, table 6.*

The EPA request that we place an astrict against the slope column and insert as a footnote
'* refers to the ground slope within the filter strip'

10. *page 35. Part 4.7(g), felling and extraction from filter strips.*

The EPA request that we insert schedule 4 condition 15 and 16 from the PCL to document practices.

Now that protection strips are deleted the EPA request that we delete the last sentence as they no longer consider that we should use harvesting debris in filter strips.

11. *page 36. Part 4.7(j), extraction from drainage depression buffer strips.*

In point (2), reword to
'operating with the blade up at all times'

In point (3), reword part on minimise change of direction to conform with 'preventing skewing of machinery tracks'

12. *page 37. Part 4.7(k), snig tracks.*

Insert as an additional point on drainage structures probably under the point on cross bank height to comply with condition 101(d)
"Cross-banks must be constructed at right angles to the direction of the track. or 'Cross-banks must be constructed at right angles to the flow of water along a snig track' or similar but ensure the prescription reflects your current operational practice.

Insert as an additional sentence on achieving affective drainage and compliance with 101(c)
'Snig tracks leading directly into drainage lines or onto roads or log dumps must be drained to minimise the catchment area immediately above the feature.' or similar

13. *page 42. Part 5.2(b), marking of filter strips.*

The EPA request that we provide a note that the 18 degrees in this section refers to the ground slope within the filter strip.

In preparing the amendments the Marketing Forester should discuss issues with the Liaison Officer before final amendments are dispatched to EPA.

Compliance with this request does not constitute satisfaction by the EPA with harvesting plan UMA 96/09.

Russell Cowgill
for
Tony Howe
Branch Manager
Forest Planning and Fire Management

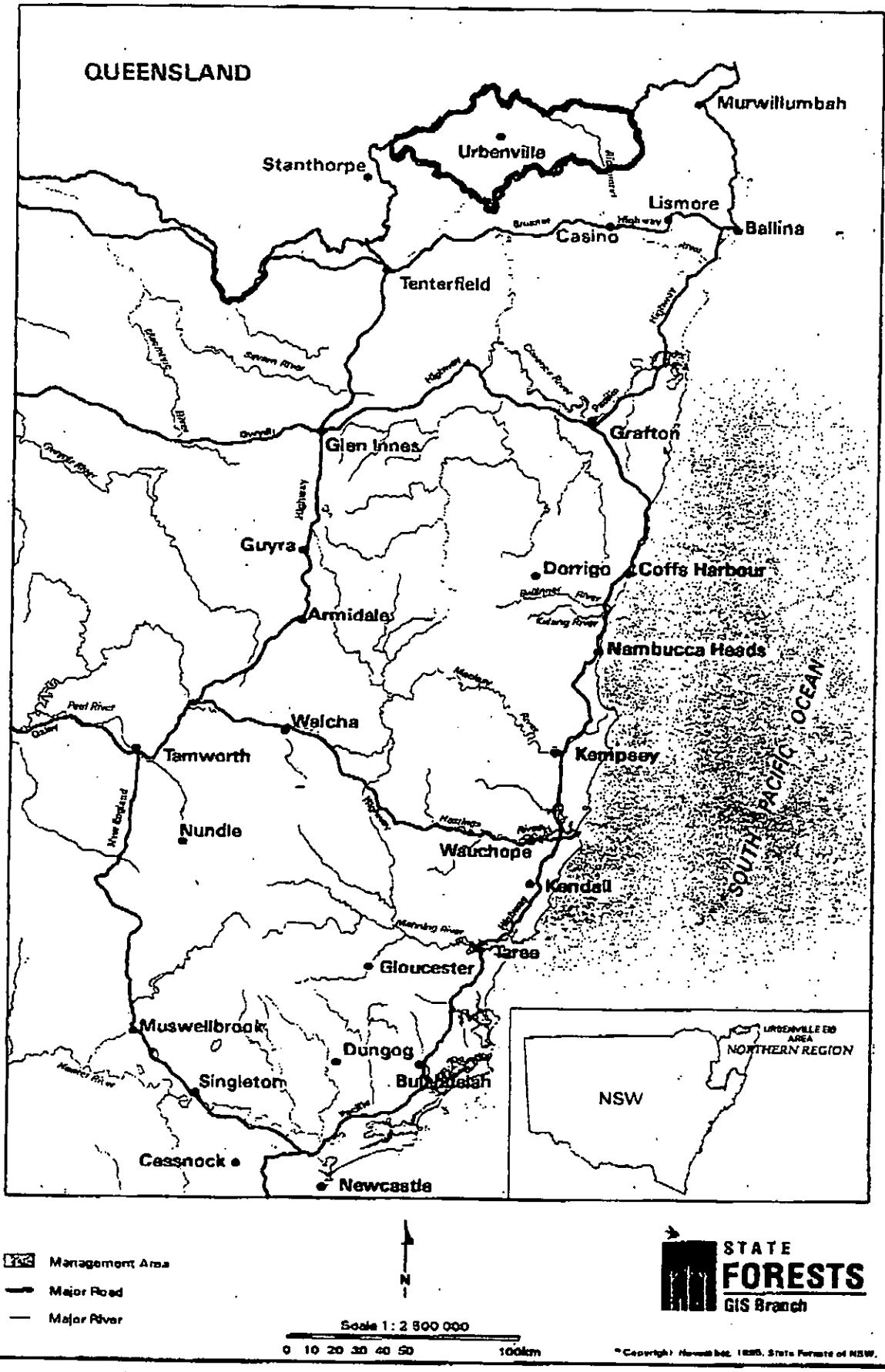
cc
Operations Manager
Northern Region

Beaury 76

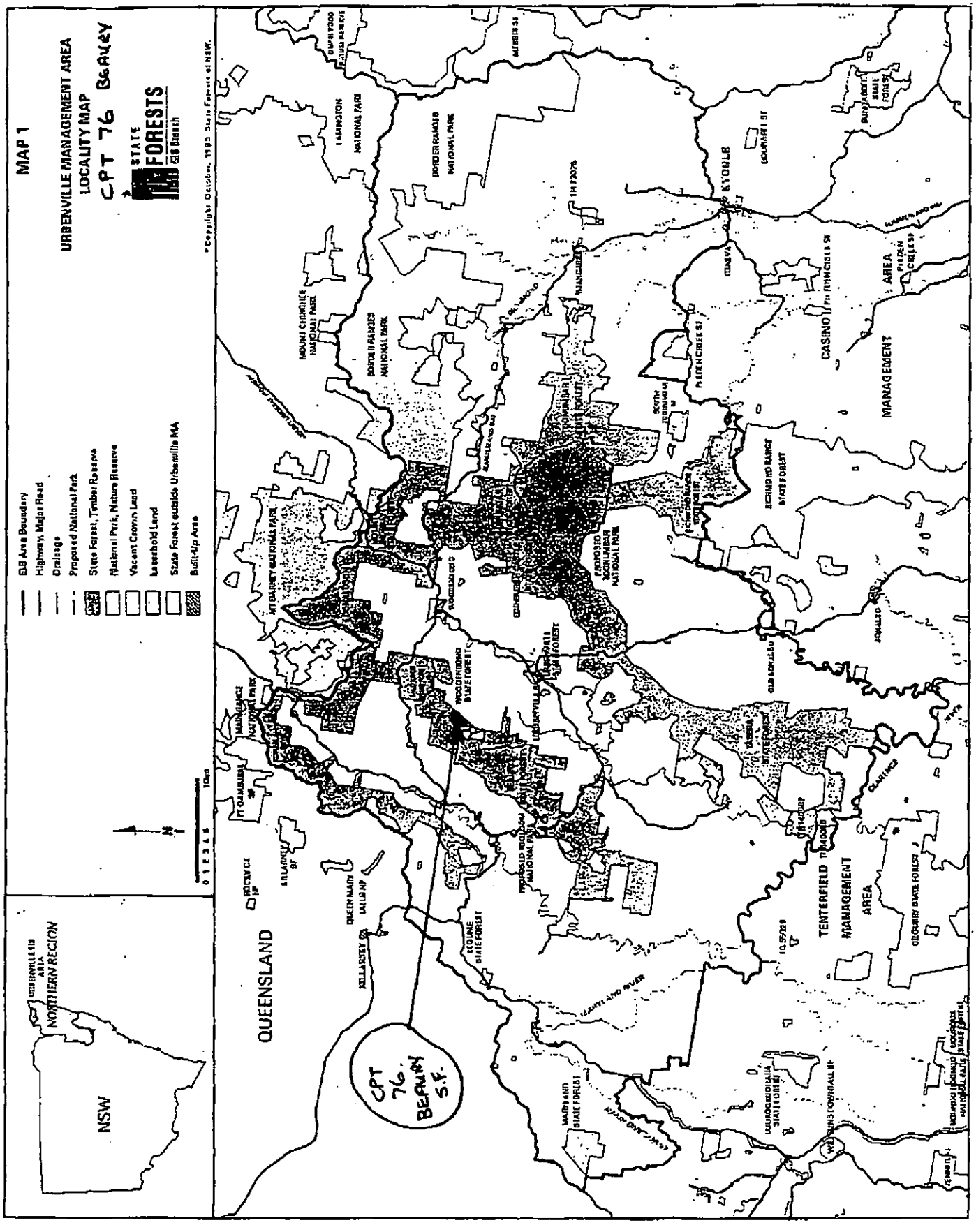
10003
NORTH
14/10/96

URBENVILLE MANAGEMENT AREA

REGIONAL CONTEXT



MAP 1-1


MAP 1
URBENVILLE MANAGEMENT AREA
LOCALITY MAP
CPT 76 BEAUEY
STATE FORESTS
SB Area Boundary
Highway, Major Road
Drainage
Proposed National Park
State Forest, Timber Reserve
National Park, Nature Reserve
Vacant Crown Land
Leasehold Land
State Forest outside Urbenville MA
Built-Up Area
NORTHERN REGION
NSW
QUEENSLAND
CPT 76. BEAUEY S.F.
TENTERFIELD MANAGEMENT AREA
CASINO MANAGEMENT AREA
KYOGLE

(f) Exotic weeds
There is not much evidence of weeds within the compartment.

(g) Regeneration and seral stages
Considerable Eucalypt regeneration is evident throughout the compartment, especially where disturbance has been high, adjacent to and on dump sites.

Description 5 Forest and crop condition

All of the hardwood areas were logged in 1981-1982 with an average volume of 5 m^3 /Ha being removed. Existing stumps show parts of the Compartment had previously been logged some years before. The Compartment has been assessed under the Protocol, for API Assessment for Candidate Old Growth Forest. Areas of tAy andtBy were identified within the compartment. These areas were stump counted and it was found that no old growth was present in the compartment.

Description 6 Harvesting Conditions

(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, 53, 60, 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.

(c) Geology

The Compartment is located on the McPherson Volcanics. They contain intrusive doleriete, basalt, intrusive trachyte and rhyolite of Tertiary origin.

Bedding planes

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

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

(d) Soils

Soil Landscape Map		Soils Report Urbenville E.I.S. 1993 Unit A occurs in the Cpt.
Map scale		1:125000
Map source		Veness & Associates 1993 (for reference purposes only)
Soil types		
Texture class	A horizon	SCL-CL
	B horizon	CL-SC
Method of determination		Field Texture
Comment:		
K value	A horizon	.030
	B horizon	.030
Method of determination		From field texture
Comment:		Adopt 0.03 as the max K value found
% Clay	A horizon	35%
	B horizon	40%
Method of determination		D3 (field assessment of texture)
Comment:		
EAT class	A horizon	8
	B horizon	4-6
Method of determination		D2
Comment:		Conducted by qualified soil scientist under laboratory conditions.
Dispersion %	A horizon	
	B horizon	
Method of determination:		
Comment:		

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 Compartment was harvested in 1981-82 with the exception of the rainforest and steep areas. It is proposed that the Compartment 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. The compartment is 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 55% live ground cover, 43% forest litter and 2% natural cover provided by surface rock and stone. Present surface litter in Compartment 76 is estimated at 15-20 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.

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

Use of existing roads
Log haulage will be predominantly east to Beaury Creek road through private property. Logs will then travel Woodenbong and Urbenville carrying poles, girders and quota logs. A small number of trucks will take poles and durable girders to Coffs Harbour via the Summerland Way and Pacific Highways. All these roads are permanently maintained roads and will require no upgrading or major maintenance. 2 kms of existing tracks and roads will be used. 2 kms of roads will need to be reopened for logging to procede. The maximum width of the running surface will be 4 metres with a maximum clearance width either side of two metres where required. Maximum side slope throughout the roaded area does not exceed 10 degrees. Average side slope is 5-6 degrees. Maximum road grade does not exceed 10 degrees with the average road grade approximately 5 degrees.
No haulage drainage feature crossing exist in the compartment. One snig track approved crossing exist south of dump D. This crossing is a stable natural crossing. Stable log crossings are utilised outside the compartment through private property.

Dumps K, J, I, H and G are located along that runs up a ridge on the northern boundary of the compartment. This track can be reached through private property from Beaury Creek Road. There is a cutting between Dumps G and H which shows no evidence of accelerated erosion. Dump F is located at the western most point of the compartment. Dumps A, B and C are located on tracks running down the central ridge in the compartment. The tracks to these dumps are quite flat and there is small cutting to Dump A.

Dumps E and D are accessed via a track that travels along a ridge in the compartments south. Dumps L, M and N are all accessed from roads in private property.

All batters and creek crossings are stable, well constructed and present no erosion hazard. Where batters do exist their maximum heights are less than 1 m and they are well vegetated and stable. Roads are less than 10 degrees. Existing road surface drainage uses outfall crossfall drainage, supplemented by rollover crossbank drainage to disperse infall table drain water through stable outlets onto undisturbed ground cover.

Road construction

Within the Compartment 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.

Description 12 Evaluation of soil and water data

(a) Soil Erosion and Water Pollution Hazard Categories

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

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

R=2838	**$R = 89.31 \times 7.3^{1.74}$**
K=.03	**From 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	15	Low
>5 ≤ 23	11 - 49	2	75	Mod
>23-30	50+	3	10	High
Roads/tracks	High	3	n/a	High

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

R = 2838 K = .03

(b) Dispersibility

Proportion dispersible soil	**A horizon**	**EAT 8x35% =< 10%**
	B horizon	**EAT 4-6x40% =<10%**
Method of determination	**D2**	
	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

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
Slope angle indication (for operators guidance)	Pink number
Approved dump sites	Pink "D'
Road line	Orange line or tape
	Inventory plot trees
	White line

Condition 4.3 Order of Working

Generally commencing at Dump A and harvesting to dumps in alphabetical order.

Condition 4.4 Silviculture

(a) General

[illegible] sawlogs, poles, piles and girders will be marked

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	15
>5 ≤ 23	MODERATE	2	75
>23-30	HIGH	3	10
Roads/tracks	HIGH	3	n/a

The SFO is responsible for identifying ground slopes exceeding 30 degrees in the field.

(b) **Approved timber harvesting and extraction method**

Chainsaw felling using directional wedging/felling techniques where required;

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

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

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

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

(d) **Wet weather controls**

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

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

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

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

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

(e) **Road Re-opening and Maintenance**

No new roading is required in this Compartment.

Road Surface Drainage
The existing roads utilise outfall crossfall drainage supplemented with rollover crossbanks. Rollover crossbanks must drain onto undisturbed vegetation or where not immediately accessible to the outfall, sediment trap fences must be installed across the outlet. The location of the cross banks will minimise the unchecked flow of water onto extraction tracks, snig tracks or log dumps. By strategically placing drainage banks water will not be discharged directly into watercourses, drainage lines, wetlands or swamps. Rollover banks must be operational on roads no longer required, except for the main forest access roads which have conventional culverts installed. Bank spacings must be in accordance with Table 7 on page 37.

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 Compartment.

Re-opening and road clearance
Approximately 2 kms of road will require to be reopened. Fallen trees weeds and small regrowth may need to be bladed to allow haulage of logs. Maximum clearing either side of the road may be carried out to a distance of two metres where required to allow for safe haulage of logs. Road edges and batters should not be disturbed. An excavator should be used to clear the road edge where damage to batters are likely with a bladed machine. The SFO will direct all road upgrading.

(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°.

(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	≤ 5	< 40	-	5
2	> 5 to ≤ 23	< 40	-	10
3	> 23 to 30	< 40	< 18	15
3	>23 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.

(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

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 raod, extraction track or snig tarck crossing.
Trees must not be felled into filter strips.
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 accidentally felled into filter strips must be removed with minimal disturbance to the groundcover and soil in the filter strip. Any disturbance caused must be remedied by reshaping and replacement of cover, so that concentrated water flow does not occur. Instances of trees being accidentally felled into filter strips must be documented on the supervising forest officer's copy of the harvesting plan, including the reasons for the accident and the remedial action taken.

Harvesting debris and earth are suitable material for diverting concentrated water flow.

(j) Extraction from drainage depression buffer strips

Soil disturbance in drainage depressions must be minimised by use of the following techniques:

(1) No snigging along drainage depressions;
(2) Operating with blade up at all times;
(3) Approach logs to be snigged in reverse and preventing skewing of machinery tracks whilst reversing or snigging out of drainage depressions.

(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 must be drained within 2 days of the completion of use, or where operations are temporarily suspended for more than 3 days (SE/WPHC 3), or 5 days (SE/WPHC1 & 2)

Where earth banks are required, they must be constructed to a minimum consolidated height of 35cm, with spacing in accordance with Table 7.
Cross -banks must be constructed at right angles to the flow of water along a snig track.
Snig tracks leading directly into drainage lines or onto roads or log dumps must be drained to minimise the catchment area immediately above the feature.

TABLE 7 Maximum earth bank spacing

Track grade (degrees)	General Slope of land (SE/WPHC)		
	1 (≤5)	2 (>5 ≤ 23)	3 (>23)
5	200	150	100
10	150	100	60
15	80	60	40
20	60	40	25
25	40	30	20

The above space is the maximum and should be varied to utilise the most suitable outlet point. Cross banks must discharge into undisturbed vegetation or logging debris.

(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.

(n) Log dumps

Log dumps must be located as indicated on the Harvesting Plan Operational Map. Drainage of log dumps and stabilisation must include the following:

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

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

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

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 plots in the compartment.

(b) Special attributes of the area

The compartment within the Beaury State Forest consists mainly of eucalypt woodland forest with a dense understorey. There is considerable eucalypt regeneration over much of the area and therefore provides a mosaic of forest types and associated wildlife.

Condition 4.9 Modified harvest conditions for special emphasis areas

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

Provided the catchment is <40ha filter strips within the Compartment must be 5 metres wide where slopes ≤5 (SE/WPHC 1), 10m wide where slopes are between >5 to ≤23 (SE/WPHC 2). Slopes > 23 degrees are SE/WPHC 3. Where slopes are greater than 18 degrees a 20m filter must be used. When slopes are less than 18 degrees a 15m filter strip must be used. Filter strips must be marked at every point where there is a change in filter strip width. The 18 degrees in this section refers to the ground slope within the filter strip

Where the catchment is >40 ha filter strips within the Compartment must be 20 metres wide except where slopes are greater than 18 degrees when a 30m filter must be used. Filter strips must be marked at every point where there is a change in filter strip width.

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.