

## SOIL MANAGEMENT

### MISSION AND OBJECTIVES – 1999-1997

CALM Annual Report 1998/1999. 1999

CALM Annual Report 1997/1998. 1998

CALM Annual Report 1996/1997. 1997

NOTE: REFER TO ENTRY UNDER ANNUAL REPORT 1992/1993 – SIMILAR WORDING

### SILVICULTURAL GUIDELINE - 1997

#### Silvicultural guideline 3/97 Establishment Guidelines for Karri Forest Regeneration Following Harvesting

##### **6. Site Preparation Requirements**

*“Harvesting operations carried out during winter conditions using equipment with high ground pressures results in the mixing of soil horizons and soil compaction. Although soil damage in terms of the mixing of soil horizons is largely confined to major snig tracks and landings, soil compaction will occur on any part of a harvesting coupe traversed by machinery. This will seriously effect the ability of germinating seed to establish and reduce seedling growth.” (p. 2)*

*“To ameliorate this effect, all coupes harvested in winter must be ripped prior to establishing regeneration. This is to include all parts of the coupe traversed by machines.*

*Ripping is to be programmed following regeneration burning to ensure the maximum area is available free of harvesting debris. [...] Access requirements for other tasks such as planting must also be considered.*

*Ripping is not feasible where seed tree regeneration systems are used due to excessive debris being present prior to burning and limited opportunity after burning before seed fall. Therefore where harvesting to seed trees is considered harvesting is to be scheduled for the summer months. This minimises the risk of soil compaction occurring and negates the need for ripping of the site.” (p. 3)*

##### **6.1. Specification for Site Preparation**

###### **6.1.2 Rough Heaping**

*“[...] Heaps to exclude soil. [...]” (p. 3)*

###### **6.1.3 Ripping**

*“Ripping is to be carried out along the contour with a fall of no more than 5 metres in every 100 metres (3 degrees). Where it is considered that ripping may lead to problems with soil erosion it is recommended that the first rip line be pegged using a dumpy level and further reference lines pegged every 150 metres.*

*Rip lines are to be 2 metres apart ripped to a depth of 0.5 metres. Ripping must be completed during dry soil conditions to ensure soil shatter is achieved and soil damage is avoided.” (p. 3)*

###### **6.1.4 Access Tracks**

*“As these tracks will be planted as planting of the coupe progresses movement of topsoil is to be minimised. Access tracks are to be positioned to minimise the risk of erosion. Erosion control measures will be installed as per section 5 of the ‘Timber Harvesting Manual in W.A.’” (p. 4)*

## **FIRE OPERATIONS MANUAL – 1997**

**NOTE: FOR UPDATES ISSUED IN 1997 REFER TO THE ENTRIES UNDER THE FOLLOWING -**

**Fire Operations Manual : Volume 2 : Fire Protection Instructions. 1993**

## **MISSION AND OBJECTIVES – 1996**

**CALM Annual Report 1995/1996. 1996**

**NOTE: REFER TO ENTRY UNDER ANNUAL REPORT 1992/1993 – SIMILAR WORDING**

## **TIMBER HARVESTING ... 1996 ED. – 1996**

**Timber Harvesting in Western Australia ... 1996 Ed. 1996**

### **PART ONE : CODE OF HARVESTING PRACTICE**

**Section 3 : Felling, Trimming and Crosscutting**

**NOTE: REFER TO ENTRY UNDER 1988 EDITION (SIMILAR WORDING)**

**Section 7 : Environmental Protection : Soil**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

### **PART TWO : MANUAL OF LOGGING SPECIFICATIONS**

**Section 1 : Planning and Monitoring**

**Specification 1.1 : Harvesting and Regeneration Plans**

**1. Responsibilities**

**NOTE: REFER TO ENTRY UNDER 1990 EDITION (SIMILAR WORDING)**

**8. Records**

*“SFRBU or District staff must maintain up-to-date field records of areas cut over and silviculturally treated. Forms for inputs into the computer system ‘SILREC’ will be collated every six months with assistance from Forest Management Branch.” (p. 17)*

**Specification 4.5 : Logging Operation Inspections and Certifications**

**NOTE: REFER TO ENTRIES UNDER 1987 EDITION (SIMILAR WORDING)**

**Specification 5.2 : Protection of Soil (Including Rehabilitation Measures)**

**1. Soil Damage**

**NOTE: REFER TO ENTRIES UNDER 1987 EDITION (SIMILAR WORDING) EXCEPT FOR THE FOLLOWING- 1.2 IS NOT IN 1996 EDITION**

**1.2.1 HAS BEEN EXPANDED TO INCLUDE ‘KARRI SEED TREE OPERATIONS’ –**

*(a) “In selectively cut forest (i.e. jarrah forest, karri thinning) and karri seed operations ...*

**NOTE: REFER TO 1987 EDITION FOR FULL PARAGRAPH (SIMILAR WORDING)**

**1.2.2 HAS BEEN AMENDED –**

*“In clearfelling situations (ie, karri forest) the acceptable limits of soil damage are 5% with respect to landings and 15% in the feller’s block totalling 20% overall. Where a ‘partial cut’ or ‘pre-harvesting’ is*

allowed as part of the clearfell operations a limit of 5% is set for a 'partial cut', thus allowing for additional damage up to 15% for the combination of final cut and landings." (p. 66)

## **2. Erosion Control**

**NOTE: REFER TO ENTRY UNDER 1992 EDITION (SIMILAR WORDING)**

**EXCEPT FOR –**

"2.1 CALM staff and harvesting contractors must be aware of the potential for soil erosion along firebreaks, extraction tracks and roads within softwood and hardwood operations during wet weather." (p. 67)

**IN 2.2 BOTH (b) AND (c) HAVE CHANGED –**

- "(b) Size of interceptor banks:  
minimum of 40 cm high and 40 cm thick, using compacted soil.
- (b) Angle of interceptor banks:  
0.3-0.5% from horizontal (1.5-3 degrees)," (p. 67)

## **3. Rehabilitation of Damaged Soil**

### **3.1 Landings and Snig Tracks (Hardwood)**

"Landings will be categorised by the FOIC into one of the following types prior to the feller's block being opened:

- (a) Concreted or dissected laterite close to the surface with a skeletal gravelly or sandy soil.
- (b) Duplex soil with a gravelly or sandy soil over a clay that is operated on under dry conditions.
- (c) Duplex soil with a gravelly or sandy soil over a clay operated on in wet conditions OR deep loam, including gravelly or sandy loam, with no impeding layer, that is operated on in any season.

Each of these landing types will be rehabilitated using the appropriate prescription detailed below. All landings must be rehabilitated by the harvesting contractor to the specifications in the appropriate prescription. The contractor will make available suitable machinery to undertake this work.

All rehabilitation must be carried out in strict accordance with standard dieback hygiene practices.

Any burning of debris considered necessary will be carried out by the relevant CALM District.

Any seeding or fertilising will be carried out by the contractor(s). Seeds and fertiliser will be supplied by CALM.

[...]

#### **3.1.1 Landings with Concreted or Dissected Laterite Close to Surface**

- At the completion of loading out, ensure all landing debris, and all unmerchantable log material and bark generated during the harvesting operation, is neatly stacked at the sides and/or rear of the landing, no closer than 5 metres from any retained crop trees. Some of this material must be used to block access from the landing to snig tracks.
- At any time following the completion of debris stacking, but before application of seed and fertilizer in April, lightly scarify the surface of the landing to disturb any surface crusting that may have occurred, using any suitable machine or implement. The scarifying depth will be governed by the amount of rock or laterite present on the landing, but is not expected to be greater than 100 mm. The aim of the scarifying is to facilitate germination of seed.
- In April, apply CALM-supplied indigenous tree and scrub seed mix to the landing at 1.5 kg/ha, and CALM-supplied superphosphate at 250 kg/ha." (p. 68)

#### **3.1.2 Landings and Major Snig-Tracks with Duplex Soils Operated on Under Dry Conditions**

- "At the completion of loading out, ensure all landing debris, and all unmerchantable log material and bark generated during the harvesting operation, is neatly stacked at the sides and/or rear of the

landing, no closer than 5 metres from any retained crop trees. Some of this material must be used to block access from the landing to the snig tracks.

- At any time following the completion of debris stacking, but before application of seed and fertilizer in April, scarify the landing, and major snig tracks, to a depth of 200 mm, using any suitable machine or implement, in a manner which will facilitate germination of seed.
- In April, apply CALM-supplied indigenous tree and scrub seed mix to the landing at 1.5 kg/ha, and CALM-supplied superphosphate at 250 kg/ha.

### **3.1.3 Landings and Major Snig, Tracks with Duplex Soils Operated on in Wet Conditions, and Deep Loams**

*“(Note requirement for winning and stockpiling of topsoil - Specification 4.3.)*

- At the completion of loading out, ensure all landing debris, and all unmerchantable log material and bark generated during the harvesting operation, is neatly stacked at the sides and/or rear of the landing, no closer than 5 metres from any retained crop trees. Some of this material must be used to block access from the landing to the snig tracks.
- When soils are sufficiently dry - generally between November and April - respread any overburden (not topsoil) back onto the landing and blade flat any irregularities. At the same time blade level all major snig tracks.
- Return and spread topsoil evenly over surface of landing.
- At any time following the completion of topsoil return, but before application of seed and fertilizer in April, rip the landing and the major snig tracks to a depth of 500 mm at one metre spacing, using a winged ripper. Ripping will be considered adequate when an 8 mm rod can be pushed by hand to a depth of 500 mm in the rip lines and to a depth of 200 mm over 60% of the remainder of the landing.
- In April, apply CALM-supplied indigenous tree and scrub seed mix to the landing at 1.5 kg/ha, and CALM-supplied superphosphate at 250 kg/ha.” (p. 69)

### **3.2 Rehabilitation of Outrows and Firebreaks (Softwood)**

*“3.2.1 Soil damage exceeding limits in 1.3.1 must be repaired during the ensuing summer period, as part of the overall firebreak maintenance programme. Particular attention needs to be paid to landing points.*

*3.2.2 Where firebreaks are disturbed through harvesting operations, interceptor banks will be installed as per Section 2 - Erosion Control.*

*3.2.3 Any erosion control interceptor banks damaged during the course of a harvesting operation will be re-installed to the standard listed in Section 2 - Erosion Control.” (p. 69)*

### **4. Protection of Soil Adjacent to Water Reservoirs**

*“4.1 Harvesting operations adjacent to reservoirs (usually softwood harvesting operations) require special treatment to prevent turbidity, and care must be taken during all stages of harvesting. The following checklist of rules and guidelines must be observed by the Forest Officer in Charge and/or contract supervisors. The relevant CALM planning officer must consult with the appropriate Water Authority engineer in the planning process.*

*4.2 Visible turbidity results from soil disturbance and surface erosion on either roads or outrows. Excessive soil disturbance can occur when the soil is saturated or when powdering of the soil occurs during summer.*

- 4.3 *A favourable time for harvesting can be late spring, when the ground is moist but not saturated. This prevents powdering of soil and subsequent turbid runoff.*
- 4.4 *The opportunity for surface erosion to occur is greatest immediately after the disturbance, and decreases with time. Any control measures prescribed to minimise erosion must be well planned and implemented as soon as possible following the disturbance.*
- [...]
- 4.6 *Undisturbed filter strips adjacent to reservoirs and major creeks are required to filter water runoff. [...]*
- [...]” (p. 70)

## **MISSION AND OBJECTIVES – 1995**

### **CALM Annual Report 1994/95. 1995**

**NOTE: REFER TO ENTRY UNDER ANNUAL REPORT 1992/93 – SIMILAR WORDING**

## **SILVICULTURAL SPECIFICATION - 1995**

### **Silviculture Specifications 1/95 : Silvicultural Practice in the Jarrah Forest**

**NOTE: SUPERSEDES SILVICULTURE SPECIFICATIONS 2/91**

#### **5. Silvicultural Treatment**

##### **5.6 Treatment of shelterwoods**

“[...] *This work must only be done in dry soil conditions to ensure that a receptive seedbed results. Install erosion barriers at the appropriate intervals (See ‘Timber Harvesting in W.A.’).*

*Soil disturbance must be done in dry soil conditions immediately prior to the tops burn. Pushing of banksia must not be done more than 12 months prior to the burn.”* (p. 9)

## **GUIDELINE - 1995**

### **Guidelines For Forest Landing & Snig Track Design & Management. 1995**

#### **Introduction**

“*The following set of guidelines provides instructions for all phases of landing, snig track and in-coupe shunt operations from planning through to rehabilitation. [...]*” (p. 1)

#### **Construction**

- *Scrub and ground log debris will be stacked into tight soil free heaps in a suitable forest opening as nominated by the FOIC or his/her representative. [...]*
- *Where trees exist on clearing sites, they will be pushed to fell within the confines of the allowable clearing wherever possible. This is not applicable to clearfell areas.”* (p. 2)
- *“All debris resulting from tree removal will be stacked a minimum of 5 metres away from retained stems in tight, soil free, tall rather than broad heaps, as noted above.*

- *With the exception of sheet laterite areas, top soil will be stripped from the entire landing clearing (to a minimum depth of 100 mm where soil depth allows) and stockpiled in screened areas, clear of site operations. No heavy woody debris will be mixed with or strewn over stockpiled top soil. [...]* (p. 2)

## MISSION AND OBJECTIVES – 1994

### CALM Annual Report 1993/94. 1994

NOTE: REFER TO ENTRY UNDER ANNUAL REPORT 1992/93 – SIMILAR WORDING

## MANAGEMENT PLAN - 1994

### Forest Management Plan 1994-2003. 1994

#### **Vision Statement**

*“The Government requires that the State’s forests are managed so as to provide in perpetuity for biodiversity, fresh water, timber, recreation and tourism, heritage values and other products such as honey and wildflowers.”* (p. i)

#### **Nature Conservation**

##### **Ecological Processes**

*“This Forest Management Plan will ensure that ecological processes continue to be maintained by:*

[...]

- *Ensuring that there is no loss of soil by disturbance (other than that associated with mining) or no net loss of nutrients from forest ecosystems;*

[...]” (p. 42-43)

## LEGISLATION – 1993

### Forest Management Regulations 1993

#### **Part 14. Marking out of Mining Tenements in State Forests and Timber Reserves**

##### **Conditions upon entering State forest or timber reserve**

*“95. A person who is within any State forest or timber reserve in the South West Division for the purpose of, or in connection with, marking out, shall ensure that –*

[...]

*(c) no excavation or other movement of earth soil or rock in the State forest or timber reserve is carried out, whether by hand tools or machinery except with the approval of a forest officer and in accordance with the terms of that approval;*

[...]” (p. 1160)

## MISSION AND OBJECTIVES – 1993

### CALM Annual Report 1992/93. 1993

*“CALM’s mission :*

*We conserve and manage Western Australia’s wildlife and the lands, waters and resources entrusted to the Department for the benefit of present and future generations.”* (p. i)

## TIMBER HARVESTING ... 1993 ED. – 1993

### Timber Harvesting in Western Australia ... 1993 Ed. 1993

#### PART 1 : CODE OF LOGGING PRACTICE

##### Section 3 : Felling, Trimming and Crosscutting

NOTE: REFER TO ENTRY UNDER 1988 EDITION (SIMILAR WORDING)

##### Section 7 : Environmental Protection

###### Soil

NOTE: REFER TO ENTRY UNDER 1987 EDITION, CODE OF HARDWOOD (SIMILAR WORDING)

#### PART 2 : MANUAL OF LOGGING SPECIFICATIONS

##### Section 1 : Planning and Monitoring

###### Specification 1.1 Harvesting and Monitoring and Regeneration Plans

###### Part A : Hardwood

*“Complete details are contained in the Department’s ‘Provisional Manual of Hardwood Logging Planning’. The following is a summary.” (p. 20)*

###### 1. Responsibilities

NOTE: REFER TO ENTRY UNDER 1990 EDITION (SIMILAR WORDING)

##### Section 2 : Roading

###### Specification 2.5 : Gravel Pit Selection Working and Rehabilitation

“2. Contractors involved in gravel extraction, including CALM logging contractors, are required to work to the guidelines set out in the CALM booklet: ‘Guidelines for Management and Rehabilitation of Gravel Pits – South West Forest Areas’. This booklet is undated but was released in 1992.” (p. 54)

##### Section 4 : Coupe Management

###### Specification 4.5 : Logging Operation Inspections and Certification

NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)

##### Section 5 : Environmental Protection

###### Specification 5.2 : Protection of Soil (Including Rehabilitation Measures)

###### 1. Soil Damage

NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)

###### 2. Erosion Control

NOTE: REFER TO ENTRY UNDER 1990 EDITION (SIMILAR WORDING)

###### 3. Rehabilitation of Landings

“3.1 All landings must be rehabilitated by the logging contractor to the satisfaction of the FOIC. All landings requiring ripping must be rehabilitated within 18 months of certification of the sub-coupe or feller’s block. All other landings must be rehabilitated in conjunction with the completion of loading out.” (p. 96)

“3.4 Rehabilitation of landings will involve:

[...]

- c) *the ripping of any damaged soil (such as on landings on karri clearfell areas, and on other landings where the soil horizons have been mixed) to a depth of 500mm and a general spacing of 1 metre, parallel to the natural contour of the land. Ripping will be considered adequate when an 8mm rod can be driven [a] to 500mm into the landing in rip lines and [b] to 200mm/ over 60% of the remainder of the landing.*

- d) *elsewhere, the levelling and raking of any disturbed soil again parallel to the natural contour of the land.” (p. 97)*

## **MANUALS – 1993**

### **Fire Operations Manual : Volume 2 : Fire Protection Instructions. 1993**

**NOTE: INCLUDES UPDATES ISSUED 1997**

#### **Fire Protection Instruction 24 : Mopup and Security Standards**

##### **Technique**

- *“Environmental matters (preventing possible dieback spread, excessive machine activity - soil erosion, damage to trees etc) must be considered and appropriate action taken.” (Fire Protection Instruction 24 : p. 1) Issued 13/1/97*

### **Fire Operations Manual : Volume 3 : Fire Protection Instructions. 1993**

#### **Fire Protection Instruction 53 : Scrubrolling Prior to Prescribed Burning Operations**

##### **7. Method of Operation**

*“The aim of the operation is to lay the fuel onto the ground to allow it to cure sufficiently to ensure satisfactory combustion. Soil is not to be bared, especially if scrubrolling is to remain unburnt over winter.” (Forest Protection Instruction 53 : p. 3) Issued 09/16/93*

#### **Fire Protection Instruction 54 : Standards for Coupe Preparation for Post Harvest and Regeneration Burning**

##### **4. Environmental Protection**

##### **4.2 Soil**

*“Adequate run off, drains and permanent or temporary erosion control barriers are to be constructed to avoid soil erosion. Run off drains must not direct water directly into any water course. Instead it must pass through an adequate litter filter (>5 m) first to prevent water turbidity. [...]” (Forest Protection Instruction 54 : p. 2) Issued 21/09/93*

##### **5.3 Scrub Rolling**

*“[...] Avoid damage to erosion control barriers on snig tracks. Any damage must be repaired.*

*During the entire operation the machine blade must be kept just above the ground to minimise soil disturbance. [...]” (Forest Protection Instruction 54 : Standards for Coupe Preparation for Post Harvest and Regeneration Burning : 54 : p. 4) Issued 21/09/93*

## **POLICY STATEMENT - 1992**

### **Policy Statement No. 41 : Beekeeping on Public Land. 1992**

#### **Strategies**

- “3. *Locate/relocate apiary sites at acceptable intervals, taking account of constraints such as the following:*  
[...]  
*3.5 Risk of water pollution or soil degradation caused by beekeepers' activities.*  
[...]” (p. 4)



## MANAGEMENT PLAN - 1992

### Walpole-Nornalup National Park Management Plan 1992-2002. 1992

#### Management for Conservation – Protection

##### Fire

##### Objectives

[...]

- *Protect vulnerable soils from the risk of wind and water erosion as a result of wildfires, inappropriate fire regimes and the use of machinery.*

[... ] (p. 33)

## SILVICULTURE SPECIFICATION - 1992

### Silviculture specification 1/92 : Karri Thinning

NOTE: THIS SPECIFICATION SUPERCEDES SILVICULTURE SPECIFICATION 2/90

#### Strategy

*“6. Maintain the productive potential of the site by minimising soil damage and delaying prescribed burning for three years after thinning to give sufficient time for the breakdown of leaves in the thinning tops.” (p. 1)*

#### Protection of Soil

*“Frequent and repeated logging operations present a risk of accumulated soil damage. It is therefore imperative that the impact of each operation be kept to a minimum. [...]” (p. 3)*

## TIMBER HARVESTING ... 1992 ED. – 1992

### Timber of Harvesting in Western Australia ... 1992 Ed. 1992

#### PART 1 : CODE OF LOGGING PRACTICE

##### Section 3 : Felling, Trimming and Crosscutting

NOTE: REFER TO ENTRY UNDER 1988 EDITION (SIMILAR WORDING)

##### Section 7 : Environmental Protection

##### Soil

NOTE: REFER TO ENTRY UNDER 1987 EDITION, CODE OF HARDWOOD (SIMILAR WORDING)

#### PART 2 : MANUAL OF LOGGING SPECIFICATIONS

##### Section 1 : Planning and Monitoring

##### Specification 1.1 Harvesting and Monitoring and Regeneration Plans

##### Part A : Hardwood

*“Complete details are contained in the Department’s ‘Manual of Hardwood Harvesting Regeneration Planning’. The following is a summary.” (p. 23)*

## **8. Monitoring and Records**

*“District staff must maintain up-to-date field records of areas cut over and silviculturally treated. For each coupe, a Coupe Silvicultural Report (CLM 160) must be completed as quickly as possible following the completion of harvesting. (Refer Attachment 1.1.2)*

*A Post Operation Checklist (CLM 813) must be completely between 12 and 24 months following the completion of harvesting. (Refer Attachment 1.1.3)” (p. 27)*

### **Section 2 : Roading**

#### **Specification 2.5 : Gravel Pit Selection Working and Rehabilitation**

##### **4. Operational and Rehabilitation Procedures**

###### **4.1.3 Stripping Topsoil:**

###### **4.3 Topsoil Return**

**NOTE: REFER TO ENTRIES UNDER 1990 EDITION (SIMILAR WORDING)**

### **Section 4 : Coupe Management**

#### **Specification 4.5 : Logging Operation Inspections and Certifications**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

### **Section 5 : Environmental Protection**

#### **Specification 5.2 : Protection of Soil (Including Rehabilitation Measures)**

##### **1. Soil Damage**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

##### **2. Erosion Control**

**NOTE: REFER TO ENTRY UNDER 1990 EDITION (SIMILAR WORDING)**

**EXCEPT SECTION D) OF 2.2 AMENDED TO-**

*“2.2 [...]d) Dispersal of water from interceptor drains: The interceptor banks/drains must be constructed so that water is directed into vegetation or silt traps without ponding.” (p. 100)*

##### **3. Rehabilitation of Landings**

**NOTE: REFER TO ENTRY UNDER 1990 EDITION (SIMILAR WORDING)**

## **LEGISLATION - 1991**

### **Conservation and Land Management Amendment Act No. 20 of 1991**

*“AN ACT to amend the Conservation and Land Management Act 1984, and to consequently amend certain other Acts.*

*[Assented to 25 June 1991.]” (p. 1)*

#### **Section 33 Amended**

*“21. Section 33 of the principal Act is amended –*

*(a) in subsection (1) –*

*[...]*

*(dc) to promote the conservation of water, as to both quantity and quality, on land referred to in paragraph (a);*

*(ii) in paragraph (e) by deleting subparagraphs (i) and (ii) and substituting the following subparagraphs -*

*‘ (i) the management of land to which this Act applies;” (p. 12)*

“(ii) the conservation and protection of flora and fauna; and  
(iii) the taxonomy of flora and introduced plants;’;  
and  
(iii) in paragraph (f) by inserting after ‘other person’ the following -  
‘ , whether in the State or elsewhere’;

(b) in subsection (3), by deleting paragraph (b) and substituting the following paragraph –

(i) in the case of nature reserves and marine nature reserves, in such a manner that only necessary operations, within the meaning in section 33A (1) are undertaken;

(ii) in the case of national parks, conservation parks and marine parks, in such a manner that only compatible operations, within the meaning in section 33A(2), are undertaken; or

(iii) in any other case, in accordance with the provisions of section 56 applicable to the land.’.

and

(c) by deleting subsection (4).” (p. 13)

### **Section 33A Inserted**

“22. After section 33 of the principal Act the following section is inserted-

#### ***Definition of ‘necessary operations’ etc.***

‘ 33A. (1) In section 33 (3) (b) ‘necessary operations’ means those that are necessary for the preservation or protection of persons, property, land, flora or fauna, or for the preparation of a management plan.” (p. 13)

### **Section 55 Amended**

“27. Section 55 of the principal Act is amended by inserting after subsection (1) the following subsection (1) the following subsection-

‘ (1a) A management plan for an indigenous State forest or timber reserve shall specify the purpose, or combination of purposes, for which it is reserved being one or more of the following purposes-

(a) conservation;

(b) recreation;

(c) timber production on a sustained yield basis;

(d) water catchment protection; or

(e) other purpose being a purpose prescribed by the regulations.’.” (p. 17)

### **Section 56 Amended**

“28. Section 56 of the principal Act is amended-

(a) in subsection (1)-

(i) by repealing paragraph (a) and substituting the following paragraph-

‘ (a) in the case of indigenous State forests or timber reserves, to achieve the purpose, or combination of purposes, provided for in the proposed management plan under section 55 (1a);’;

(ii) in paragraph (c) by inserting after ‘national parks’ the following-

‘ and conservation parks’;

and

(iii) in paragraph (d) by inserting after ‘and fauna’ the following-

‘, and to preserve any feature of archaeological historic or scientific interest’;

and

(b) by repealing subsection (2).” (p. 17)

### **Division 2 of Part V Repealed and a Division Substituted**

“32. Part V of the principal Act is amended by repealing Division 2 and substituting the following Division-

‘ *Division 2 – Classification of Land*

#### ***Land may be classified***

62.(1) Subject to this section, the Minister may on the recommendation of a controlling body and, where applicable, any associated body, by notice published in the Gazette, classify the whole or any part of land or waters that is vested in that controlling body as-

- (a) a wilderness area;
- (b) a prohibited area;
- (c) a limited access area;
- (d) a temporary control area;
- (e) a recreation area for a purpose or purposes specified in the notice; or
- (f) such other class of area as the Minister, on the recommendation of the relevant controlling body, thinks necessary to give effect to the objects of this Act,

and may in like manner amend or cancel a notice previously so published.

(2) A classification of land or waters as a temporary control area under subsection (1)(d) shall only be made for the purposes of public safety or the protection of flora or fauna, or both flora and fauna, and a notice of classification –

- (a) shall not have effect for a period exceeding 90 days;
- but
- (b) may be made more than once for the same purpose and for the same area.” (p. 19)

“(3) A classification, or amendment of classification, of any land or waters shall not be made under this section –

- (a) unless it is in conformity with the provision of section 56 which is relevant to, or any management plan for, that land or those waters; and
- (b) in the case of land to which section 16 applies, unless the owner, and any person occupying the land with the consent of the owner, has given approval in writing to the classification or the amended classification.

(4) In this section ‘controlling body’ means the Commission or the Authority.’. “ (p. 20)

## POLICY STATEMENT – 1991

### Policy Statement No. 40 : Road Management. 1991

#### Performance Indicators

“Successful implementation of this policy will be assessed on the basis of the extent to which:  
[...]

8. Soil erosion is minimised in road construction and maintenance.” (p. 4)

## OBJECTIVES – 1991

### CALM Annual Report 1 July 1990 to 30 June 1991. 1991

NOTE: THE STRATEGIC PLAN 1989-1993 IS REPRINTED WITH AN ADDITIONAL CLAUSE (THE FINAL ONE UNDER THE FOLLOWING HEADING) –

“To achieve the primary objectives the Department will:” (p. 11)

“Prepare and implement management plans for lands and waters entrusted to the Department.

This will involve:

- Establishing priorities for management plan preparation according to set criteria.
- Preparing and implementing management plans according to agreed priorities.
- Developing and implementing ‘Interim Guidelines for Operations’, according to an approved procedure and format, where there is a need for protection of people, property, land, flora and where there is no approved management plan.” (p. 14)

## SILVICULTURE SPECIFICATION – 1991

### Silviculture Specification 2/91 : Treemarking and Silvicultural Treatment in the Jarrah Forest

NOTE: THIS SPECIFICATION SUPERSEDES SILVICULTURE SPECIFICATIONS 5/89 AND 7/89

#### 6.5 Treatment of Shelterwoods

“[...] This work must be done in dry soil conditions to ensure that a receptive seedbed results. Install erosion barriers at the appropriate intervals (See Manual of Hardwood Logging Specifications).”  
(p. 12-13)

## LEGISLATION – 1990

### Soil and Land Conservation Amendment Act. No. 91 of 1990

“AN ACT to amend the Soil and Land Conservation Act 1945 and for related purposes.” (p. 1)

“7. Section 9 of the principal Act is amended-

(a) by repealing subsection (1) and substituting the following subsection-

‘ (1) There shall be a Council to be known as the ‘Soil and Land Conservation Council’ consisting of 11 members appointed by the Governor on the nomination of the Minister. ‘; ...’ (p. 4)

“Section 16 of the principal Act is repealed and the following section is substituted-

**Functions Of The Council**

‘ 16. The functions of the Council are-

- (a) to advise the Minister as to the condition of soil and land resources;
- (b) to make recommendations to the Minister as to land use, soil and land conservation policy, and programmes for the implementation of that policy;
- (c) to co-ordinate, monitor, and review soil and land conservation programmes and activities;
- (d) to co-ordinate and advise on the implementation in the State and soil and land conservation programmes funded by the Government and the Commonwealth;
- (e) to supervise soil and land conservation programmes undertaken by the Government of the State;
- (f) to promote awareness of land degradation and conservation;
- (g) to co-ordinate the establishment of, and activities within, land conservation districts;
- (h) generally to assist the Commissioner in the carrying out of his functions under this Act and to carry out such functions under this Act as the Commissioner or the Minister, respectively, may refer to the Council.’” (p. 4)

## MANAGEMENT PLAN – 1990

### Lane Poole Reserve Management Plan 1990-2000. 1990

#### **C4 Land Management**

##### **C4.3 Landform and Soils**

“The 2 objectives are:

*To provide interpretive information to the public about the landforms of the Reserve.  
To protect those areas highly susceptible to erosion.*

“[...] Field managers will be aware of the high erosion potential of most of the Recreation Zone and of the Plavins, Federal, Samson and Bell Conservation Areas; erosion control will be a major consideration in all management operations in such areas.” (p. 79)

#### **Prescription**

“Planning for operations will consider the erosion potential of the area. Operations will be modified accordingly.” (p. 79)

#### **C7 Protection**

##### **C7.1 Fire**

“The 10 objectives are:

[...]

*To protect vulnerable soils, and landforms from the risk of wind and water erosion as a result of wildfires, inappropriate fire regimes, or machinery activity.*

[...]” (p. 85)

##### **C13.2 Timber Utilization**

“The objective is to ensure any logging operations remove forest produce in a way which minimises damage to landscape, soil and water values [...]” (p. 119)

## **Background**

*“Timber cutting in the Recreation Zone will involve the temporary unavailability of some areas for recreational use. This is due to the reduction in conservation and recreation values, the need to protect regeneration areas from wildfires and the increased risk of environmental degradation (ie. dieback spread, soil erosion and stream turbidity) following logging and regeneration.”* (p. 119)

## **Prescriptions**

*“10. Operations will be planned to minimise the degradation of other resource values, particularly soils and water. Monitoring is needed to determine baseline data on water quality and stream biota.”* (p. 121)

# **MANUAL OF HARDWOOD ... 3RD ED. – 1990**

## **Manual of Logging Specifications ... 3rd Ed. 1990**

### **Section 1 : Planning**

#### **Specification 1.1 : Logging Plans**

##### **1. Responsibilities**

*“In all cases, planners must produce fully integrated plans and consult with Regional staff, District staff, Specialist Branch staff and where relevant Timber Industry Representatives during plan preparation.”* (p. 1)

### **Section 2 : Road Construction and Maintenance**

#### **Specification 2.4 : Gravel Pit Selection Working and Rehabilitation**

##### **4. Operational and Rehabilitation**

##### **4.1.3 Stripping Topsoil:**

*“Topsoil Management is of critical importance. This is the only effective means of re-establishing a diverse vegetation.*

*- A nominal 100 to 150mm of topsoil is to be stockpiled. [...]. Subsoil below 150mm depth must be stored separately.*

*Topsoil stockpiles will be on elevated, dry locations. The heap will be kept low and not compacted. This will avoid heat build up and an aerobic conditions detrimental to seed survival.”* (p. 38)

##### **Topsoil Return**

*“- Topsoil return is not permitted until the site has been inspected and approved (Checklist B). [...].”* (p. 40)

### **Section 4 : Coupe Management**

#### **Specification 4.2 : Falling (Including Tree Marking Techniques)**

##### **3. Scrub Rolling**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

#### **Specification 4.5 : Logging Operation Inspections and Certifications**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

### **Section 5 : Environmental Protection**

#### **Specification 5.2 : Protection of Soil (Including Rehabilitation Measures)**

##### **1. Soil Damage**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

##### **2. Erosion Control**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

**EXCEPT FOR ONE AMENDMENT -**

*“c) Angle of interceptor banks:*

0.3-0.5% from horizontal.” (p. 89)

### **3. Rehabilitation of Landings**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)  
EXCEPT FOR AND ADDITIONAL POINT –**

“3.4 Rehabilitation of landings will involve:

[...]

b) replacement of topsoil.” (p. 90)

## **CODE OF LOGGING ... - 1990**

### **Code of Logging Practice. 1990**

#### **Section 3 : Felling, Trimming and Crosscutting**

**NOTE: REFER TO ENTRY UNDER 1988 EDITION (SIMILAR WORDING)**

#### **Section 7 : Environmental Protection**

##### **Soil**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION, CODE OF HARDWOOD (SIMILAR WORDING)**

#### **(f) Check Final Expected Stocking**

“(i) Calculate the total area which will be acceptably stocked when all understocked and soil damage outlined on the survey map are treated ie. Area of Optimal Stocking + Area at Adequate Stocking + Area of Infill + Area of Soil Damage Outlined for Treatment.

(ii) If the area calculated in (i) is less than 85% of the productive area then additional areas will need to be outlined for treatment such that the target stocking can be obtained.

Exactly which areas should be selected will depend on the extent of soil damage and the location of the remaining understocked points within the coupe. Select areas which will achieve the target stocking in the most efficient and practicable manner.” (p. 8)

## **SILVICULTURE SPECIFICATION – 1990**

### **Silviculture Specification 2/90 : Karri Thinning**

#### **Strategy**

“6. Maintain the productive potential of the site by minimising soil damage and delaying prescribed burning for three years after thinning to give sufficient time for breakdown of leaves in the thinning tops.” (p. 2)

## **SILVICULTURE SPECIFICATION – 1990**

### **Silviculture Specification 1/90 : Karri Regeneration Surveys**

#### **5.3 Office Procedure**

##### **(e) Rehabilitation of Soil Damaged Areas**

“The exact extent of rehabilitation work required for each coupe is best determined by a specific survey of landings and snig tracks. The area calculated in (ii) below will serve as a guide. If rehabilitation work has already been completed at the time of the regeneration survey the following steps will not be required unless significant areas of soil damage were left untreated.



(i) Outline all soil damaged points on the survey map which are associated with landings and major snig tracks adjacent to landings. These will require ripping and planting. Any additional large areas of soil damage, 1 ha or more, within the coupe are also to be outlined for treatment.

(ii) Calculate the soil damaged area outlined above.” (p. 7)

## **STRATEGIC PLAN – 1989-1993**

### **Strategic Plan For the Period 1989-1993. 1988**

#### **General Principles/Philosophy**

“The Department is committed to the principle that it is managing public land and natural resources, and conserving indigenous wildlife on behalf of the public of Western Australia. Consequently, particular importance is placed on informing the public of the Department’s activities and wherever possible involving the public.

The regional system of management as adopted by the Department ensures that its officers develop a detailed knowledge of the area of their operations, are available to interact with local communities and resolve problems associated with local conservation and land management operations. [...]” (p. 10)

#### **5. Mission**

“Western Australia has a beautiful and diverse natural environment which provides material, aesthetic and spiritual benefits. The natural environment is an essential component of the quality of life for West Australians. The statement of mission for the Department of Conservation and Land Management is therefore:-

*TO CONSERVE WESTERN AUSTRALIA’S WILDLIFE AND MANAGE LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS.”* (p. 11)

#### **6. Primary Objectives**

“Five primary objectives have been established:-

- **MANAGEMENT**  
To protect, restore and enhance the value of resources entrusted to the Department so as to meet, as far as possible, the diverse expectations of the community.
- **CONSERVATION**  
To conserve the indigenous plant and animal species and environmental processes in natural habitats throughout the State.
- **PRODUCTION**  
To provide and regulate the supply of those renewable resources that Government decides should be used, on a sustained yield basis for the satisfaction of long term social and economic needs, and in a manner that minimises impact on other values.” (p. 12)

#### **7. Broad and Sub Strategies**

“To achieve the Primary Objectives the Department will:-  
[...]

7.8 Prepare and implement strategies to promote and encourage development of the forest production requirements of the State.

This will involve:

[...]

7.8.5 *Re-forestation of cleared lands with hardwood forests to supplement production from native forests and to assist in soil and water conservation.” (p. 17)*

## **10. The Organisation**

### **10.3 Planning**

*“Detailed planning of conservation and land management activities is a key function in the Department.*

*Under the Conservation and Land Management Act, there is a responsibility to prepare management plans for all land and water vested in either the Lands and Forest Commission or the National Parks and Nature Conservation Authority. Such plans must be available to the public for comment for a period of at least two months. They apply for a maximum period of ten years.*

*Two levels of this planning are undertaken. These are regional and area management plans.*

*Regional management plans are to be prepared for each CALM administrative region. They will cover all categories of land and water entrusted to the Department. Each plan will describe the management objectives to be achieved over the life of the plan and the strategies for implementation which are to be adopted.*

*Area management plans will apply to specific areas such as a national park, marine park, nature reserve, marine nature reserve. State forest, or other reserve. These are more detailed than regional management plans. Area management plans will be prepared only where there are requirements that cannot be adequately considered by a regional management plan. Each area management plan will also describe management objectives and strategies for implementation.” (p. 31)*

*“Other major plans prepared by the Department are issue plans that are either a follow up to an approved management plan, or consist of interim guidelines for necessary operations where there is not yet an approved management plan. Issue plans cover all relevant topics, such as site plans, fire plans, dieback plans, recreation plans, resource allocation plans and wildlife management programs. Issue plans are generally prepared by district or regional staff in conjunction with research and other specialist branches within the Department. [...]” (p. 32)*

*In addition, the Department prepares operational guidelines, manuals and prescriptions. These draw on the results of research and experience and are used to implement the works and activity programmes derived from the planning process.” (p. 32)*

### **10.4 Regionalisation**

*“The Department is extensively regionalised in a way which provides the benefits of small autonomous organisations in close proximity to their area of operations while providing access to services that are best provided by a larger integrated organisation. Regions are responsible for the management of all departmental lands and waters and for conservation of flora and fauna within their boundaries. According to the intensity of activity regions are subdivided into districts.” (p. 32)*

*“The general responsibilities allocated to regions are to:*

[...]

- *supervise and regulate industry (e.g. wildflower pickers, apiarists, timber and mining operations) on departmental and some other land;*
- *preserve or restore the natural environment on departmental land and water;*
- *provide information and advice on land management and conservation to people in the region; promote conservation and good land and marine area management;” (p. 33)*

## STRATEGIC PLAN (SOUTHERN REGION) – 1989

### Strategic Plan : Southern Forest Region. 1989

#### **3. Regional Strategic Goals**

*“The goals listed below are broad statements largely drawn from goals set by the amalgamating agencies before CALM. These goals are not specific, quantifiable or measurable but provide the basis for formulating KEY RESULT OBJECTIVES which is the next stage of the Strategic Planning process.”* (p. 7)

#### **3.1 Biophysical Resources**

##### **Soil**

*“To minimize the impact of operations on soil resources in carrying out land management activities including logging, roading, provision of recreation facilities, fire control, weed and pest control and research and inventory programmes.”* (p. 7)

*“Fire*

*[...]*

*To minimize environmental disturbance such as erosion, disease spread or impairment of water quality by appropriate fire regimes*

*[...]”* (p.9)

##### **Environmental Controls**

*“Codes of Logging Practice*

###### Objective

*1. Ensure all logging contracts contain a comprehensive ‘Code of Logging Practice.’* (p. 58)

##### **Soil Resources**

###### Objective

*1. Apply prescriptions for control of soil disturbance and erosion control measures as per Codes of Logging Practise.*

###### Measure of Performance

###### ‘Priority’

*1. Establish routine erosion hazard assessment procedure before each coupe is logged (Based on slope, soil type, rainfall, topography). Complete by February, 1988.*

*2. Arrange for Industry to stockpile topsoil on selected landings.*

*[...]”* (p. 59)

##### **Coupe Roading**

###### Objective

*1. Ensure industry submit advance plans for road construction on schedule.*

*Industry to select approved alignments in the field.”* (p. 61)

##### **Environmental Protection**

*“1. Continue to refine prescriptions for road construction to minimise erosion and sedimentation.*

*2. Liaise with Water Authority to develop standard drainage prescriptions, especially near stream crossings.”* (p. 61)

# MANUAL OF HARDWOOD ... 2ND ED. – 1989

## Manual of Hardwood Logging Specifications ... 2nd Ed. 1989

### Section 1 : Planning

#### Specification 1.1 Logging Plans

**NOTE: REFER TO ENTRY UNDER 1987 EDITION (SIMILAR WORDING)**

**EXCEPT FOR**

#### 1. Responsibilities

*“The preparation and distribution of logging plans is the responsibility of the Regional Inventory Branch Offices. These plans are prepared for each Supply Area and include:*

- i) *a one or two year logging plan (short-term)*
- ii) *a four or five year logging plan (medium term)*
- and
- iii) *a long term (eg. 15 years) logging plan (long term).*

*These plans are produced after consultation with District staff, Regional staff and specialist branch staff, and timber industry representatives where necessary. The plans must be integrated with all other operational plans including plans for roading, silviculture, mining, fire control and visual resource management.” (p. 1)*

#### 6. Monitoring and Records

*“Logging must not commence until plans are issued. If during a year additional areas of forest are to be cut, additional or amended plans must be issued by the relevant Inventory Office. Districts supervising logging must keep accurate records of areas cutover and quantities of log products removed and forward such information to the relevant Inventory office as required. [...]” (p. 2)*

### Section 3 : Silviculture

#### 3.2 Removal of Seed Trees:

**NOTE: REFER TO ENTRIES FOR THE ABOVE UNDER 1987 EDITION (SIMILAR WORDING)**

#### 6. Environmental Considerations

##### 6.2 Soil Damage

**NOTE: REFER TO ENTRIES FOR THE ABOVE UNDER 1987 EDITION (SIMILAR WORDING)**

### Section 4 : Coupe Control

#### 3. Scrub Rolling

**NOTE: REFER TO ENTRIES UNDER 1987 EDITION (SIMILAR WORDING)**

#### Specification 4.5 : Logging Operation Inspections and Certifications

**NOTE: REFER TO ENTRIES UNDER 1987 EDITION (SIMILAR WORDING)**

### Section 5 : Environmental Protection

#### Specification 5.2 Protection of Soil (Including Rehabilitation Measures)

##### 1. Soil Damage

**NOTE: REFER TO ENTRIES UNDER 1987 EDITION (SIMILAR WORDING)**

##### 2. Erosion Control

**NOTE: REFER TO ENTRIES UNDER 1987 EDITION (SIMILAR WORDING)**

##### 3. Rehabilitation of Landings

**NOTE: REFER TO ENTRIES FOR THE ABOVE UNDER 1987 EDITION (SIMILAR WORDING)**

## SILVICULTURE SPECIFICATION - 1989

### Silviculture Specification 7/89 : Treemarking and Silvicultural Treatment in Multiple Use Jarrah Forest

NOTE: THIS SPECIFICATION SUPERSEDES SILVICULTURE SPECIFICATION 1/87

#### 6.4 Shelterwood Treatment

##### Competition Removal and Soil Disturbance

*“Remove competing understorey in swathes at least 3 metres wide and not more than 8 metres apart. Preferably use a tracked machine with a rake blade. Also remove mature Banksia grandis and unmarked sheoak. Do not establish swathes within 5 metres of retained trees. This work must be done in dry soil conditions. Instal [sic] erosion barriers at the appropriate intervals. (See Hardwood Logging Specifications)”* (p. 6)

## MINING GUIDELINES – 1989

### Mining on C.A.L.M. Lands Guidelines. 1989

#### Guidelines to CALM Staff for Assessing Exploration Programmes on Conservation Lands

##### Guidelines for Approval : Tracks, Survey Lines, Geophysical Lines

*“3. Construction of new baseline tracks to be limited to pushing or grading the vegetation aside, with a minimum of disturbance to the soil and root systems.”* (p. 20)

##### Guidelines for Approval : Costeans, Trenches, Pits, Drill Holes

*“1. Topsoil to be stockpiled.*

*2. Where possible pits to be progressively refilled to original contour as sampling proceeds.*

*3. All drill holes to be capped or filled in (water bore holes to be capped).”* (p. 21)

*“4. All exploration sites (drill pads, camps etc) to be left clean and rehabilitated.*

*5. Any bulk sampling programme requires special approval.”* (p. 3)

##### Rehabilitation Techniques

*“1. Roads and Tracks – Roads and tracks to be ripped (if compacted) and windrows graded back.*

*2. Drills Pads – Topsoil to be pushed back, site ripped and debris returned.*

*2. Costeans – Topsoil returned and lightly ripped or tyned.”* (p. 22)

## LEGISLATION - 1988

### Soil and Land Conservation Amendment Act. No. 46 of 1988

*“AN ACT to amend the Soil and Land Conservation Act 1945.”* (p. 379)

*“4. Section 4 of the principal Act is amended by-*

*[...]*

*(d) deleting paragraphs (e) and (f) of the definition of ‘Public Authority’ and substituting the following paragraphs-*

*(e) the Water Authority of Western Australia established under the Water Authority Act 1984;*

(f) the Executive Director within the meaning of the Conservation and Land Management Act 1984;’  
[...]" (p. 381)

## **ADMIN. INSTRUCTION– 1988**

### **Administrative Instruction No. 39 : Fire break Construction. 1988**

*“Admin Instruction 39 currently requires the approval of the Divisional Manager Operations for necessary operations involving new fire break construction.*

*For the purposes of this instruction the activity – Fire Break Construction can be considered in two parts.*

1. *Perimeter Fire Break construction.*
2. *Internal Fire Break construction.*

*The Level of approval for Part 1, perimeter fire break construction, is hereby devolved to the Regional Manager.*

*The level for approval for Part 2, internal fire break construction, remains with the Divisional Manager Operations.” (p. 1)*

### **Levels For Approval For Necessary Operations In National Parks, Nature Reserves and Conservation Parks : November 1988**

[...]

*“Control of Soil Erosion/Rehabilitation: RM*

*[...]" (p. 3)*

## **CORPORATE MISSION AND OBJECTIVES - 1988**

### **CALM Annual Report 1st July 1987 to 30th June 1988. 1988**

**NOTE: REFER TO ENTRY UNDER ANNUAL REPORT FOR 1986/87 AND 1985/86, ENTRY IS SIMILAR EXCEPTING THAT THE MISSION STATEMENT HAS CHANGED (THE SCOPE HAS BECOME THE STATEMENT OF MISSION)**

*“TO CONSERVE WESTERN AUSTRALIA’S WILDLIFE AND MANAGE LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS.” (p. 6)*

**NOTE: THE ENTRY UNDER TIMBER PRODUCTION HAS CHANGED TO INCLUDE AN ADDITIONAL OBJECTIVE (SEE THE FINAL OBJECTIVE)**

*“Prepare and implement strategies to promote and encourage development of the forest production requirements of the State.*

*This will involve:*

[...]

- *Re-forestation of cleared lands with hardwood forests to supplement production from native forests and to assist in soil and water conservation.” (p. 9)*

## STRATEGIC PLAN – N.D. - 1988?

### Central Forest Region Strategic Plan. N.D. 1988?

#### **Industry Control – Timber (Function)**

##### **Hardwood**

##### **Objective**

*“3. Minimise environmental impact of logging operation.” (p. 54)*

##### **Strategy**

*“i) Carry out all hardwood logging operations in accordance with the Code of Hardwood Logging Practice and the Manual of Specifications for the Control of Hardwood Logging Operations.*

*ii) [...]” (p. 54)*

##### **Measure of Performance**

*“[...]”*

*1. Soil damage is minimised.” (p. 54)*

#### **Recreation**

##### **Strategy**

*“iii) Restrict access to areas where vehicles are unwanted, e.g. recreation sites, dieback areas, sites with fragile vegetation or soil.” (p. 76)*

## GUIDELINES – 1988

### Guidelines for Slash Burning in the Karri Forest. 1988

#### **Slash Burn Preparation**

##### **4.2 Scrub Roll**

*“Do not scrubroll when soil is wet and soil damage and/or bogging can occur.” (p. 8)*

#### **Slash Burn Preparation**

##### **4.4 Perimeter Tracks**

*“[...] Attention must be paid to all requirements for dieback pegging and hygiene and to erosion control and stream protection when selecting and constructing perimeter tracks.” (p. 9)*

##### **4.8 Installation of Buffer Strips**

*“In all track construction or maintenance, strict adherence to dieback hygiene and erosion control rules must be observed.” (p. 11)*

##### **4.10 General Comments**

*“Consider:*

*[...]”*

- Always prepare wet and difficult areas under dry conditions. If the working of a wet area risks bogging the machine, leave or slash by hand. Avoid soil damage during the preparation of regeneration areas.” (p. 11)*

## CODE OF LOGGING - 1988

### Code of Logging Practice. 1988

#### **Section 3 : Felling, Trimming and Crosscutting**

**NOTE: ENTRY 3.8 UNDER 1987 EDITION, CODE OF HARDWOOD ..., NOT INCLUDED**

#### **Section 7 : Environmental Protection**

**Soil**

**NOTE: REFER TO ENTRY UNDER 1987 EDITION, CODE OF HARDWOOD (SIMILAR WORDING)**

## ADMIN. INSTRUCTION - 1986

### Administrative Instruction No. 23 : Interim Guidelines For Operations. 1986

#### **Introduction**

*“For substantial areas of land under the control of the Department of Conservation and Land Management it will be many years before approved Management Plans will be developed. In the meantime the CALM Act provides in Section 33 (3) (b) that certain operations can be carried out when there is no management plan.” (p. 1)*

*“For indigenous State forest the operations are defined as those actions that ensure the multiple use and sustained yield of that resource for the satisfaction of long term social and economic needs.*

*In accordance with the Departmental Planning Policy (Policy 1, January 1986) the necessary operations must be carried out in a planned manner through the development and implementation of INTERIM GUIDELINES FOR OPERATIONS.*

*The Interim Guidelines will consist of:*

- (1) a brief description and brief guidelines for major potential activities;*
- (2) a map showing the locality and area of proposed management activities;*
- (3) an indication of who must give approval before particular operations can be carried out.*

*This paper shows how the Interim Guidelines are intended to work.” (p. 1)*

#### **Aim**

*“The aims of the Interim Guidelines are:*

- (i) to provide an adequate safeguard against natural and operational calamities on lands administered by CALM in the absence of an approved Management Plan;*
- (ii) to ensure that critical ‘necessary operations’ are identified and properly prescribed;*
- (iii) to ensure that the impacts of necessary operations are fully considered and effectively incorporated within existing management and control systems;*
- (iv) to provide a simple, efficient and attainable means of gaining approval for necessary operations.”*  
*(p. 2)*



### **Identification**

*“The first step is to identify all the necessary operations within each of the areas concerned. Use can be made of a checklist showing all the possible necessary activities – see Appendix 1. Only those operations that are essential for safeguarding the area in question should be considered. These must be consistent with the objectives for the area concerned as described in the CALM Act.”* (p. 2)

*“The development of suitable strategies and prescriptions **will** necessitate consultation and collaboration between CALM Operations, Planning and Specialist groups. [...]”* (p. 3)

### **Duration of Interim Guidelines**

*“Most Interim Guidelines should have an approval duration of at least 3 years with a maximum of 5 years. [...] However, the works programme that emanates from these Interim Guidelines must be reviewed and updated annually.”* (p. 4)

### **Approval**

*“A system of approval for the Interim Guidelines and the methods of implementing these is to be adopted which recognises and utilises the established hierarchy of authority and control, i.e. District Manager to Regional Manager to Divisional Manager (or Branch Manager) to Directorate (Director National Parks or Director Nature Reserves or both, or entire Policy Directorate depending on the range of necessary activities). It is expected that once the pattern of the development of these Interim Guidelines have been universally accepted, that the final approval will be delegated to Divisional or Regional Managers.”* (p. 4)

## **CORPORATE MISSION AND OBJECTIVES - 1987**

### **CALM Annual Report 1st July 1986 to 30th June 1987. 1987**

**NOTE: REFER TO ENTRY UNDER ANNUAL REPORT FOR 1985/1986. ENTRY IS SIMILAR**

## **MANAGEMENT PLAN – 1987**

### **Shannon Park and D’Entrecasteaux National Park Management Plan 1987-1999. 1987**

#### **10.0 Conservation Opportunities**

*“Protection of the natural values of the Parks is a fundamental concern of this plan. Thus, management and sustained use must not cause irreversible environmental damage or impairment of scenic beauty.*

*Certain areas of the Parks are more susceptible to damage than others. This susceptibility is based on key features such as delicate and unusual geological formations, degree of risk or infection or existing infection by dieback (Map 8), rare plant and fragile plant communities (Map 8), extreme susceptibility to soil erosion and degradation (Map 6), and least disturbed areas (based on leased for grazing for less than 20 years [Map 9] not logged [Map 10], and burnt twice or less in the last 45 years [Map 11]).*

*Map 12 is a compilation of the above features, and thus provides a summary of the key conservation opportunities in the Parks. Such areas include the most important and fragile biological and physical features of the Parks.”* (p. 43)

#### **2.0 Management Objectives For the Shannon Park and D’Entrecasteaux National Park**

*“Management objectives specific to the two Parks were derived from: the above general objectives; the dual purpose of ‘national park and water’; and the information provided in B. Description of the Parks. The following background information is most relevant to the determination of specific objectives – [...]*

- *Several areas contain important biological and physical features.*

- *Some areas have been disturbed by human activities and this disturbance is likely to spread unless the areas are actively managed and rehabilitated.*
- *Many areas in the Park are capable of sustaining very little public use without irreparable environmental damage.*

[...]

*The specific management objectives for the Parks are to:*

2. *Protect the biological and physical environment and the cultural and scientific features of the Parks.*

[...]" (p. 48)

### **2.3 Alienated Lands Within and Adjacent to the Parks**

#### **Prescriptions**

##### **Pastoral Leases**

*"5. CALM will liaise with the Department of Land Administration to ensure that: lessees comply with the conditions of lease; erosion does not result from grazing practices; and leases are monitored to determine both compliance with conditions and levels of impact of grazing."* (p. 60)

### **3.3 Soil Resources**

#### **Objectives**

*"1. To minimise impacts on soil resources by management activities (such as road construction and fire protection) and when providing recreation opportunities.*

3. *To protect areas highly susceptible to erosion, and soils subject to seasonable inundation, from physical impacts."* (p. 68)

#### **Background**

*"Just as the biological systems of the Parks are dependent on water resources, they are also dependent on the integrity of the soil resource. When the soil surface is disturbed or vegetation is removed, the process of soil erosion can be accelerated resulting in changes in landform and soil structure, and nutrient loss. [...]"*

*In national parks, the greatest effect on the soil resource occurs as a result of the construction and use of roads and facilities for public and management purposes. For example, the use of horse and walk trails, picnic areas of campsites can also cause soil disturbance resulting in erosion and degradation.*

*Soil erosion can be caused or exacerbated by the spread of plant diseases, such as dieback, or by fires. Severe fire can cause loss of both vegetation and litter layers. [...]"* (p. 68)

#### **Prescriptions**

*"1. Impacts on the soil resource will be minimised or where possible avoided in:*

- i) *the location and development of all Park facilities including roads, carpark, walk trails and picnic sites;"* (p. 68)

*"ii) the provision of recreational opportunities; and*

- iii) *all management operations including fire, weed and pest control and research programs."* (p. 69)

### **3.4 Rehabilitation**

#### **Background**

*"There are many areas in both Parks where the biological or physical environment has been modified or degraded as a result of human activities.*

*Some roads and tracks in the Parks have been placed on alignments which may cause soil erosion or exacerbate the spread of dieback. Other roads have been built on straight alignments which has significantly reduced their scenic value."* (p. 70)

## **Prescriptions**

*“1. All roads and tracks that are poorly located, resulting in soil erosion, degradation of wetlands or impairment of scenic values will be rehabilitated, relocated or closed.*

*2. Designated public access routes that have been constructed at an inappropriate scale or following alignments with low scenic amenity will be systematically realigned to more appropriate routes, subject to the development of approved design plans (eg. Deeside Coast Road, Chesapeake Road).” (p. 70)*

### **6.1 Fire**

#### **Objectives**

*“The Parks are to be managed primarily to conserve their natural ecosystems and landscapes, whilst ensuring the Park visitors have the opportunity to enjoy the Parks without detrimentally affecting them. In setting the specific fire management objectives to achieve the management objectives for the Parks, the protection of life and property within and near the Parks must be of high importance.*

*Consistent with this principle, the following objectives will apply in order of priority:*

*[...]*

*2. To protect community and environmental values in or near the Parks including settlements, private property, recreation facilities, forest regeneration and public utilities.” (p. 75)*

*“9. To protect vulnerable soils from the risk of erosion.*

*[...]” (p. 76)*

### **7.3 Access for Management**

#### **Prescriptions**

*[...]*

*5. Existing tracks not required for specific purposes will be either left to regenerate naturally or rehabilitated (where they adversely affect landscape values or appear to be susceptible to erosion).*

*[...]*

*“7. The use of vehicles and machines off-road will only be permitted for essential purposes such as fire control, if lives are at risk, or in extreme circumstances as judged by the relevant District Manager. Wherever possible, special care will be taken to avoid entering sites that are susceptible to soil erosion and degradation (Map 6) or are known to contain rare species (Map 9).” (p. 94)*

### **9.2 Vehicles Off-road**

#### **Objective**

*“1. To protect the biological and physical environment of the Parks from damage, by directing all vehicle traffic along nominated roads and tracks.” (p. 99)*

#### **Background**

*“Off-road vehicles can have many impacts, especially on poorly consolidated soils where even a single pass by a vehicle can damage vegetation and provide a focus for erosion. In waterlogged areas vehicles can cause extensive soil degradation, including compaction or rutting, leaving long-lasting effects on vegetation growth. Vehicles are a major factor in the spread of dieback. Other impacts include vehicle tracks and noise. [...]” (p. 100)*

*“In national parks all vehicles used must comply with the Road Traffic Act. Non-complying recreational vehicles can be registered under the Vehicles (Off-road) Act, but their use in a national park requires a special permit, endorsed by CALM, from the relevant local government authority. Such a permit is generally only granted in extenuating circumstances.” (p. 100)*

#### **Prescription**

*“1. No vehicle activity off road will be permitted in the Parks. All public vehicle use will be restricted to the access routes designated on Map 15.” (p. 100)*

## MANUAL OF HARDWOOD ... - 1987

### Manual of Hardwood Logging Specifications ... 1987

#### **Section 1 : Planning**

##### **Specification 1.1 : Logging Plans**

##### **Section 3 : Silviculture : 3.2 Removal of Seed Trees**

*“The objective of the operation is to remove seed trees with the minimum of damage to seedlings and soil.”*  
(p. 34)

*“3.2.3 The primary cause of damage to regeneration and soil is uncontrolled movement by log hauling machines. The Forest Officer is to decide, in conjunction with the Industry Supervisor, the pattern of snig tracks and landings to be used. No new major snig tracks of log dumps will be constructed without authorisation from the Forest Officer.*

*3.2.4 The logging crew will be instructed by the Forest Officer with regard to the following points:  
[...] (b) No unnecessary clearing of ground debris en route to logs. Logs blocking snig tracks to be cut and lifted, not pushed into regeneration.”* (p. 35)  
*“(d) Machines will be reversed into butts or crowns at all times.  
(e) No rolling or skidding or logs is permitted to enable hook-up.  
(f) Where a log has to be moved it must be lifted and pivoted on the crown end.*

*3.2.5 Seed Tree removal will be carried out under dry soil conditions. [...]*

*3.2.6 The Forest Officer will assess the likely impact of extracting small chiplogs from seed tree crowns. [...]*” (p. 36)

#### **6. Environmental Considerations**

##### **6.2 Soil Damage**

*“6.2.1 Maximum soil damage levels will be 10% Class 1 and 2, including loading areas (see Specification 5.2)  
[...] 6.2.3 Erosion control on slopes will be done according to Specification 5.2”* (p. 39)

#### **Section 4 : Coupe Control**

##### **Specification 4.2 : Falling (Including Tree Marking Techniques)**

*“Scrub rolling prior to felling may be necessary. Soil disturbance during scrub rolling must be minimised.  
[...]”* (p. 46)

##### **Section 4.5 Logging Operation Inspections and Certifications**

*“1. The contractor’s foreman or supervisor must check logging standards periodically on a faller’s block by faller’s block (or sub-coupe by sub-coupe) basis to ensure falling and extraction standards are maintained. CALM’s Forest Representative will periodically accompany the contractor’s foreman or supervisor on these inspections to monitor standards.*

*Aspects of logging to be inspected include:*

*[...]  
- soil damage  
[...]”* (p. 42)

#### **Section 5 : Environmental Protection**

##### **Specification 5.2 Protection of Soil (Including Rehabilitation Measures)**

##### **1. Soil Damage**

*“1.1 Damaged soil is soil that has either:  
(a) had the A horizon (topsoil) removed,*

- (b) had the A horizon (topsoil) mixed with the B horizon (subsoil usually containing clay)
- (c) suffered severe compaction (meaning compaction which will affect germination or growth of plants). This normally applies to all landings, and been affected by all 3 of the above

1.2 Soil is usually damaged by skidding operations in wet soil conditions.

1.3 In selectively cut forest (i.e. jarrah forest, karri thinnings) soil damage must not exceed 10% in area of any single faller's block or sub-coupe, including the landing. If a Forest Officer considers that damage is approaching 10% then he must:

- (a) survey the faller's block (compass and pace method), plot on graph paper and calculate total area,
- (b) measure the perimeter of the landing and calculate area,
- (c) plot four parallel lines at right angles to the general snigging direction, the four lines positioned to divide the faller's block into five approximately equal sections,
- (d) pace along each sample line, classifying each pace as damaged or undamaged soil, and" (p. 79)
- “(e) record all the above data on a ‘Field Assessment of Soil Damage’ sheet (form CLM 108), and calculate percentage of damaged soil.

If the total area of soil damage, including the landing, is greater than 10% then skidding in that fallers block must cease immediately. The logging operator will then be asked to select the best area in the coupe to continue logging. If the damage levels are exceeded in the best area then the whole coupe will be closed.

Attachment 5.2.1 is an example of a completed ‘Field Assessment of Soil Damage’ sheet, with accompanying plot of faller’s block.

1.4 In clearfelling situations (i.e. karri forest) acceptable limits of soil damage are 5% with respect to landings and 20% overall. In clearfelling situation where a ‘partial cut’ is allowed, the respective limit are 5% and 15%, thus allowing for additional damage during the final cut.

1.5 If skidding is stopped in a faller's block because of excessive soil damage then it cannot recommence in that block until the Forest Officer in Charge decides that the soil is dry enough. This decision cannot be made until the local Soil Dryness Index Exceeds 500 Northern Jarrah Forest and 250 in the Southern and Karri Forest.

1.6 Damaged soil must be rehabilitated by Industry logging operator by the following first day of March as directed by and to the satisfaction of the officer in Charge.” (p. 80)

“On clearfelled areas, rehabilitation will require the ripping and levelling of all damaged soil on affected snig tracks and landings. Ripping must be carried out to a depth of 500mm and at 1 metre spacing. The logging operator must make available suitable machinery to carry out this work. On thinned forest areas, rehabilitation will require raking of damaged soil to promote germination. [...]

## 2. Erosion Control

“2.1 CALM staff and Industry personnel must be aware of the potential for soil erosion along snig tracks during wet weather.

2.2 When skidding is completed in any faller's block, and prior to machinery leaving it, interceptor banks and drains must be constructed across all snig tracks with exposed soil, to the following standards:

- (a) Inteceptor bank/drain spacing:

<u>Slope</u>	<u>On lateritic gravels</u>	<u>On all other soils</u>
0 - 2 degrees	Nil	Nil
3 - 5 degrees	200m	100m
6 - 10 degrees	100m	50m
11 - 15 degrees	60m	30m
16 degrees +	30m	15m

- (b) *Size of interceptor banks:  
40cm high and 40cm thick, using soil or logging debris*
- (c) *Angle of interceptor banks:  
60 degrees to flow of water*
- (d) *Dispersal of water from interceptor drains:  
The interceptor banks/drains must be constructed so that water is directed into vegetation or silt traps without ponding. Water must not be diverted into another drainage line. Water must not be diverted into dieback free forest.” (p. 64)*

### **3. Rehabilitation of Landings**

- “3.1 *All landings in fully integrated logging operations must be rehabilitated by the logging operator to the satisfaction of the FOIC. [...] Elsewhere, rehabilitation must be completed by the first day of May following the completion of logging. Logging is deemed to be complete when the sub-coupe, including landings, has been certified complete by an authorised certifying officer.*
- 3.2 *In areas where logging is carried out concurrently by more than one logging operator, the task of rehabilitation of landings must be shared by the different logging operators as directed by the FOIC.*
- 3.3 *In areas where a logging operation is carried out over an extended time period by more than one logging operator, the task of rehabilitation of landings must be completed by each logging operator at the completion of his operation.” (p. 82)*
- “3.4 *Rehabilitation of landings will involve:*
- (a) *the heaping or windrowing of clearing and logging debris along the sides and rear of landings, such heaps or windrows to be no closer than 5m from crop trees, and*
  - (b) *in clearfelled areas, the ripping of any damaged soil to a depth of 500mm at a spacing of 1 metre, parallel to the natural contour of the land, or*
  - (c) *in thinned areas the levelling and raking of any damaged soil, again parallel to the natural contour of the land.*
- 3.5 *All rehabilitation must be carried out in strict accordance with dieback hygiene principles, as directed by the FOIC.*
- 3.6 *Any burning of debris, seeding or planting considered necessary will be carried out by the relevant CALM District during the winter following rehabilitation.” (p. 83)*

## **CODE OF HARDWOOD – 1987**

### **Code of Hardwood Logging Practice. 1987**

#### **Section 3 : Felling, Trimming and Crosscutting**

- “3.8 *Extraction, erosion control and cleaning up must work progressively through fallers blocks and allocated sub-coupes.”(p. 9)*

#### **Section 4 : Extraction**

“4.7 An Operator shall not carry on extraction at such times or places, or by methods or equipment which a Forest Officer has prohibited until such prohibition has been revoked by the Forest Officer.

4.8 At the completion of snigging or during temporary cessation of snigging, erosion control work must be completed. All extraction tracks and temporary roads subject to erosion will have cross drains installed as prescribed by the Forest Officer.” (p. 13)

#### **Section 7 : Environmental Protection**

##### **Soil**

“7.24 At the completion of snigging or during temporary cessation of snigging, erosion control work must be completed. Extraction tracks and temporary roads subject to erosion will have cross drains installed, as prescribed by the Forest Officer.

7.25 The maximum level of damaged soil in any fallers block or coupe shall not exceed certain specified limits at the completion of extraction. Damaged soil is defined as soil which has been subject to any of the following:

- (a) The A soil horizon (topsoil) removed.
- (b) The A soil horizon (topsoil) mixed with the B soil horizon (sub-soil usually containing clay).
- (c) Severe compaction. (Normally meaning compaction which will affect germination or plant growth).

Surveys will be conducted to determine the percentage area of each fallers block or coupe where soil has been damaged by extraction.

If the level of damage exceeds the specified limit then the fallers block or coupe will be closed and the Operator will be moved to the most suitable winter logging area available. If damage exceeds the specified limit in the most suitable area the whole operation will be closed.” (p. 24)

“After a coupe is closed no consideration will be given to re-opening it until the local Soil Dryness Index exceeds a specified limit. This decision will be made by the Forest Officer in Charge.

7.26 An Operator shall at his expense carry out any measures specified by a Forest Officer to prepare denuded areas for revegetation. These areas shall include landings, gravel pits and temporary roads used during the logging operation.” (p. 25)

## **OPERATIONS MANUAL - 1987**

### **Southern Forest Region Operations Manual. 1987**

#### **Policy for Scrubrolling Prior to Prescribed Burning Operations**

##### **7. Method of Operation**

“[...]

7.3 The aim of the operation is to lay the fuel onto the soil to allow it to cure sufficiently to ensure satisfactory combustion. Soil is not bared, especially if scrub is to remain unburnt over winter.

[...]” (p. 66)

#### **Standards for Coupe Preparation for Karri Regeneration**

##### **Standards**

##### **1.1 Roding**

“a) Internal Roads – [...]

Sufficient drainage to avoid erosion or ponding is required. [...]” (p. 123)

#### 4.3 Scrub Rolling

*“Avoid damage to erosion control barriers on snig tracks.*

*Damage must be repaired.*

*During the entire operation the dozer blade must be kept just above the ground to minimise soil disturbance.” (p. 124)*

#### 4.6 Buffer Burns

*“Dieback hygiene and erosion control rules must be observed during all track construction.” (p. 125)*

### **Gravel Pit Rehabilitation Preparation**

#### 1.Scope

*“Rehabilitation of pits mined for gravel, shale or sand etc.” (p. 127)*

#### 2.Objective

*“2.1 To return site to a condition which will enable growth of new forest.*

*2.2 The site to be aesthetically acceptable.” (p. 127)*

#### 3. Prescription

*[...]*

*3.3 Schedule rehabilitation when soil is reasonably dry so that maximum ‘shatter’ of pit base is achieved by ripping.*

*[...]*

*3.7 Top soil to be spread evenly on the floor of pit.*

*3.8 The floor of pit shall be ripped to a minimum depth of 0.6 metres at 1.0 metre intervals. All ripping shall be on the contour.*

*[...].” (p. 128)*

### **Landing and Snig Track Rehabilitation for Planting**

#### Scope

*“This preparation covers landings and snig tracks in completed cutting coupes in the Southern Forest Region.” (p. 129)*

#### Technique

*“3.1 Preplanning*

*[...]*

*3.1.4 Rehabilitation will commence in late spring (November) in the drier lateritic soil types (Jarrah forest), in the northern end of the region, and proceed south into the loams and clays (Karri forest) during the summer and autumn.” (p. 129)*

*“3.3 Preparation – Field*

*[...]*

*3.3.2 Most landings and snig tracks are to be ripped, however there are some that are NOT.*

*Items not to be ripped are:-*

*[...]*

*(vi) Steep snig tracks liable to erode significantly.*

*[...].” (p. 129)*

### **Direct Seeding of Shrub Species on Rehabilitated Areas**

#### Scope

*“The rehabilitation of borrow pits, log landings, snig tracks and other disturbed areas is of vital importance in the land management process. [...] this section is designed simply to describe the scrub species seeding techniques which are an important adjunct to most rehabilitation processes.” (p. 163)*



## 2. Objectives

*“To establish native creepers and shrub species for revegetation of severely disturbed landings, snig tracks and other rehabilitated sites for the purpose of stabilising surface soils, improving soil nutrient status and growing conditions, and establish a diverse and therefore more stable understorey. At present, shrub seeding does not replace the need to plant the disturbed sites with containerised tree seedlings.”* (p. 163)

## 4. Species Selection

*“Current knowledge indicates that the species that best meet the above objectives are native legumes common to the karri forest, and particularly Kennedyya coccinea, which is a pioneer ground creeper that is effective in stabilising the soil surface. The species mix currently preferred are shown in Table 1.”* (p. 163)

## 9. Sowing Method

*“Seed must be applied evenly, with special considerations given to erosion barriers and ripped lines.”* (p. 164)

## Maintenance of Access for Fire Control

### 3.1 Scrub Control

*“3.1.5 Excessive scrub adjacent to bridges should be removed if possible to protect some from fire but care must be taken to avoid soil damage and damage to standing trees.*

*[...]*

*3.1.7 Standard hygiene practices to avoid dieback spread will be followed, and excessive soil movement is to be avoided. Any steeper sections on which soil erosion may occur are also to be avoided or treated with the utmost care to prevent this occurring (see Item 7.3).”* (p. 170)

### 3.3 Drainage

*“It is essential that effective drainage maintenance be practiced. [...] Turbidity of adjacent waterways is to be avoided also for obvious reasons.*

*To effectively drain road surfaces, off shoot drains at the required spacing and sufficient culverts (frequency of both depends on slope).*

*Off shoot drains must only have sufficient fall to the outlet end to allow water to decelerate before it discharges into a filtering medium (litter, tops, scrub etc). This will allow soakage into the soil and thus avoiding turbidity in adjacent streams and soil erosion. [...]*

*Off shoot drains must only have sufficient fall to the outlet end to allow water to decelerate before it discharges into a filtering medium (litter, tops, scrub etc). This will allow soakage into the soil and thus avoiding turbidity in adjacent streams and soil erosion. [...]*” (p. 170)

## **Access Construction for Blackberry Control Work**

### 1.Scope

*“These guidelines refer to access construction work which may be required to enable control work to be carried out on thickets of blackberries in the Southern Forest Region. They apply whether the work is done by the Department of C.A.L.M. or by a contractor on our behalf.”* (p. 172)

### 2. Objective

*“To ensure access tracks for blackberry control work are environmentally acceptable.”* (p. 172)

### 3.4 Construction of Mineral Earth Access

*“If such access is required the following will apply:-*

*[...]*

*e) Erosion control barriers to be installed according to Item 16 of the Industry Control Manual.*

*[...]”* (p. 173)

## **Appendix 2 : Prescription For Industry Rooding**

*“6. Planning and implementation of each creek crossing will be prescribed in detail to minimize siltation from run-off from roads and drains.*

*6.1 Borrow areas for fill to be approved and will not be closer than 20m from creek. Water draining from borrow pits to be directed into a silt trap or vegetation filter strip.*

*[...]*

*6.2 Table drains to turn water off at regular intervals and silt traps to be installed at all creek crossings.*

*6.4 Fill be consolidated to minimise erosion of fill and risk of slumping.*

*6.5 Batter of large fills to be terraced and revegetated. Rocking will be prescribed where necessary.*

*6.6 Machine activity in the watercourse will be minimised. No heaps of debris within 40m of the creek.*

*7. Where an existing road is re-aligned, the un-used portions of the road must be ripped. Erosion barriers will be installed on ripped roads according to the Rehabilitation Prescription. Recovery of gravel from disused roads to be considered.*

*[...]*

*10. Maintenance. Whilst roads are still being used for log hauling the Industry will maintain them. Pipes to be cleaned out regularly. Silt traps to be cleaned out when required.” (p.176)*

## **CORPORATE MISSION AND OBJECTIVES - 1986**

### **CALM Annual Report 1st July 1985 to 30th June 1986. 1986**

#### **Corporate Objectives**

*“Under a corporate plan formulated in 1985/86 the statement of mission for the Department of Conservation and Land Management is:*

*TO PROVIDE FOR THE USE OF THE NATURAL ENVIRONMENT WITHOUT DETRACTING FROM POSSIBLE FUTURE USE.*

*The scope of the Department’s responsibilities is represented by its charter which is:*

*TO CONSERVE WESTERN AUSTRALIA’S WILDLIFE AND MANAGE PUBLIC LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS.*

*Primary objectives are:*

#### *Management*

*To protect, restore and enhance the value of resources entrusted to the Department so as to meet, as far as possible, the diverse expectations of the community.*

#### *Conservation*

*To conserve the indigenous plant and animal species and environmental processes in natural habitats throughout the State.” (p. 8)*

#### *“Production*

*To provide and regulate the supply of renewable resources on a sustained yield basis in a manner that minimises impact on other values.*

*[...]*

*To achieve the primary objectives the Department will:*

*Provide an effective administrative framework for the conservation of wildlife throughout the State and the management of lands, waters and natural resources entrusted to the Department.*

*This will involve:*

- *The maintenance of a Policy Directorate to establish, review and refine Departmental aims, policies and priorities; to monitor the implementation of management plans; and to see that goals are achieved.*
- *The maintenance of an operations wing to implement policies and management plans and to set up efficient financial, administrative and management systems.” (p. 9)*

*“Establish and maintain a system of secure reserves which protect viable representative samples of all the State’s natural ecosystems and species, both terrestrial and aquatic, as well as areas suitable for recreation and the production of renewable natural resources.*

*This will involve:” (p. 10)*

- *“Protecting ecosystems, landscape and the cultural heritage on lands and waters entrusted to the Department from damage by fire, disease, grazing, feral animals and people.*
- *Developing prescriptions for control of disturbance and for rehabilitation of damaged forests, parks and reserves.*
- *Opposing the incompatible use of lands and waters entrusted to the Department and opposing the release of such lands and waters for other purposes.” (p. 11)*

*“Prepare and implement management plans for lands and waters entrusted to the Department.*

*This will involve:*

- *The establishment of priorities for management plan preparation according to set criteria.*
- *Restricting procedures to necessary operations to maintain public safety and the status quo of area management where no management plan exists.” (p. 13)*

*“Manage exploitation of renewable natural resources according to the following principles:*

- *resources are managed to ensure their long term conservation;*  
*[...]” (p. 13)*

## **MANUAL OF LOGGING ... 1986**

### **Manual of Specifications for Control of Hardwood Logging Operations in the Northern ... 1986**

#### **Specification 2.4 Gravel Pit Selection Working and Rehabilitation**

*“4. Operation of pits:*

*[...]*

- \* *Top soil to a depth of at least 30 cm must be stripped and stockpiled in conveniently situated heaps on the perimeter of the cleared area, at distances of not less than 5m from standing trees or heaps of debris.*

*[...]*

*5. Rehabilitation of pits:*

*An exhausted pit, or exhausted parts of a large pit, must be rehabilitated by the user when, and as directed by, the Forest Officer in Charge, using the following guidelines:” (p. 30)*

“[...]

- \* *Stockpiled top soil must be spread evenly on the floor of the pit.*
- \* *Banks of the pit must be battered to an angle no greater than 10 degrees.*
- \* *The floor of the pit must be ripped, along the contour, to a depth of 70 cm at 1m intervals. [...]*

[...]

- \* *Erosion control drains or barriers must be constructed as required.*
- \* *If the pit is completely exhausted, the pit access road must be ripped to a depth of 70cm at 1m intervals, parallel to its length.*

[...].” (p. 31)

### **Specification 5.2 Protection of Soil (Including Rehabilitation Measures)**

#### **“1. Soil Damage**

**2.1 Damaged soil is soil that has either:**

- (a) *had the A horizon (topsoil) removed,*
- (b) *had the A horizon (topsoil) mixed with the B horizon (subsoil usually containing clay)*
- (c) *suffered severe compaction (meaning compaction which will affect germination or growth of plants). This normally applies to all landings, and*
- (d) *been affected by all 3 of the above*

**2.2 Soil is usually damaged by skidding operations in wet soil conditions.**

**2.3 Soil damage must not exceed 10% in area of any single faller’s block, including the landing. If a Forest Officer considers that damage is approaching 10% then he must:**

- (a) *survey the faller’s block (compass and pace method), plot on graph paper and calculate total area,*
- (b) *measure the perimeter of the landing and calculate area,*
- (c) *plot four parallel lines at right angles to the general snigging direction, the four lines positioned to divide the faller’s block into five approximately equal sections,*
- (d) *pace along each sample line, classifying each pace as damaged or undamaged soil, and” (p. 65)*
- “(e) *record all the above data on a ‘Field Assessment of Soil Damage’ sheet, and calculate percentage of damaged soil.*

*If the total area of soil damage, including the landing, is greater than 10% then skidding in that fallers block must cease immediately.*

[...].” (p. 66)

**“1.4 If skidding is stopped in a faller’s block because of excessive soil damage then it cannot recommence in that block until the Forest Officer in Charge decides that the soil is dry enough. This decision cannot be made until the local Soil Dryness Index Exceeds 500.**

**1.5 Soil damaged during the winter must be rehabilitated by Industry by the following first day of March, as directed by and to the satisfaction of the Forest Officer in Charge.**

*Rehabilitation will require the ripping and levelling of all damaged soil on affected snig tracks and landings. Ripping must be carried out to a depth of 500mm and at 1 metre spacing. Industry must make available suitable machinery to carry out this work.” (p. 66)*

### **3. Erosion Control**

**“2.1 CALM staff and Industry personnel must be aware of the potential for soil erosion along snig tracks during wet weather.**

**2.2 When skidding is completed in any faller’s block, and prior to machinery leaving it, interceptor banks and drains must be constructed across all snig tracks with exposed soil, the following standards:” (p. 66)**

**“(a) Interceptor bank/drain spacing:**

<u>Slope</u>	<u>On lateritic gravels</u>	<u>On all other soils</u>
0-2 degrees	Nil	Nil
3-5 degrees	200m	100m
6-10 degrees	100m	50 m
11-15 degrees	60m	30m
16 + degrees	30m	15m

(b) Size of interceptor banks:

40cm high and 40cm thick, using soil or logging debris

(c) Angle of interceptor banks:

60 degrees to flow of water

(d) Dispersal of water from interceptor drains:

The interceptor banks/drain must be constructed so that water is directed into vegetation or silt traps without ponding. Water must not be diverted into another drainage line. Water must not be diverted into dieback free forest.

2.3 During logging of a faller's block, erosion control work must be done at any time, if the Forest Officer in Charge so requires. Such work will be on snig tracks and to standards as directed by the FOIC." (p. 67)

## LEGISLATION - 1984

### Conservation and Land Management Act. No. 126 of 1984

"AN ACT to make better provision for the use, protection and management of certain public lands and waters and the flora and fauna thereof, to establish authorities to be responsible therefor, and for incidental or connected purposes

[Assented to 8 January 1985]" (p. 1881)

#### **Part IV. - Department of Conservation and Land Management**

##### **Division 1. - Establishment of Department**

"33.(1) The functions of the Department are, subject to the direction and control of the Minister-

(a) to manage land-

(i) to which this Act applies; or

(ii) which becomes subject to the management of the Department under subsection (2), and the associated forest produce, fauna and flora;

(b) to provide the Commission, the Authority and the Council with such assistance as they may reasonably require to perform their functions;" (p. 1905)

"(d) to be responsible for the conservation and protection of flora and fauna throughout the State, and in particular to be the instrument by which the administration of the Wildlife Conservation Act 1950 is carried out by the Executive Director pursuant to section 7 of that Act;

(e) to carry out or cause to be carried out such study or research of or into-

(i) the management of land to which this Act applies; and

(ii) the conservation and protection of flora and fauna, as the Minister may approve;

(f) to provide advice to, or undertake work for or jointly with, and to supply services or facilities to, any department, public or private body or other person if that Minister is of the opinion that the provision of that advice or the undertaking of that work is in the public interest;  
(g) upon request by the Minister to whom the administration of the Land Act 1933 is committed, to advise him on the reservation, alienation, and disposal of Crown land in rural areas under that Act.” (p. 1906)

“33(3) The management of land referred to in subsection (1) (a) (i) and the associated forest produce, flora and fauna shall be carried out-

(a) where there is a management plan for the land, in accordance with that plan; or” (p. 1906)

“(b) where there is for the time being no such plan-

- (i) in the case of national parks and nature reserves, in such a manner that only necessary operations are undertaken; or
- (ii) in any other case, in accordance with the provisions of section 56 applicable to the land.

(4) In subsection (3) (b), ‘necessary operations’ means those that are necessary for the preservation or protection of persons, property, land, flora or fauna, or for the preparation of a management plan.

(5) Nothing in subsection (1) shall be read as limiting the functions of the Commission and the Authority under sections 19 and 22 respectively.

34. Subject to this Act and the Public Service Act 1978, the Executive Director has power to do all things that are necessary or convenient to be done for, or in connection with, the performance of the functions of the Department.” (p. 1907)

## **Part V. – Management of Land**

### **Division 1. – Management Plans**

“54. (1) A controlling body shall be responsible-

(a) for the preparation of proposed management plans; and

(b) the review of expiring plans and preparation of further management plans,

for all land which is vested in it whether solely or jointly with an associated body.

(2) This Part applies to the preparation of a plan under subsection (1) (b) in the same way as it applies to the preparation of an initial management plan.” (p. 1914)

“(3) Proposed management plans for any land shall be prepared-

(a) by the controlling body for that land through the agency of the Department; and

(b) within such period after the commencement of this Act as is reasonably practicable having regard to the resources of the Department available for the purposes.” (p. 1915)

“55. (1) A management plan for any land shall contain –

(a) a statement of the policies or guidelines proposed to be followed; and

(b) a summary of the operations proposed to be undertaken,

in respect of that land during a specified period which shall not exceed 10 years.

*(2) A management plan shall state the date on which it will expire, unless it is sooner revoked, but notwithstanding anything in this section or in the plan, a plan which would otherwise expire shall, unless it is revoked, remain in force until a new plan is approved.” (p. 1915)*

*“56. (1) A controlling body shall, in the preparation of proposed management plans for any land, have the objective of achieving or promoting the purpose for which the land is vested in it, and in particular management plans shall be designed –*

*(a) in the case of indigenous State forest or timber reserves, to ensure the multiple use and sustained yield of that resource for the satisfaction of long-term social and economic needs; [...].” (p. 1916)*

*“(2) In subsection (1) (a) ‘multiple use’ means as many different uses as are possible and compatible among themselves.” (p. 1916)*

*62(2) A classification, or amendment of classification, of any land or waters shall not be made under this section-*

*(a) unless it is in conformity with the provision of section 56 which is relevant to, or any management plan for, that land or those waters; and*

*(b) in the case of land to which section 16 applies, unless the owner, and any person occupying the land with the consent of the owner, has given approval in writing to the classification or the amended classification.*

*(3) This section applies to any national park, nature reserve, marine nature reserve or marine park.” (p. 1919)*

## **Part IX. – Offences and Enforcement**

### **Division 2. – Forest Offences**

*“108. No person shall-*

*[...]*

*(e) unlawfully cut, break, throw down or in any way destroy or damage any building, fence, or gate, in or enclosing any State forest or timber reserve or unlawfully cut through or break down or otherwise destroy the bank, dam, or wall of any part of any natural or artificial reservoir or pond of water within or partly within and adjoining any State forest or timber reserve.” (p. 1940)*

## **RECREATION PLAN – [1984]**

### **Forest Recreation Framework Plan. 1984**

#### **Definitions**

*“Management Priority Areas – the forest has been divided into areas in which the dominant and secondary uses are specified and their priority ranking nominated. Each unit is known as a management priority area (M.P.A.) and is described according to its dominant (or priority) use. Areas in which recreation is the management priority are known as Recreation M.P.A.s.” (p. ii)*

#### **Summary**

*“The aim of this plan is to provide a framework for planning, development and management of forest recreation in the Northern Region.*

*The plan covers the nature of forest recreation, analyses the availability of recreational opportunities in the region and discusses a range of management options. The various environmental, management, legislative and economic constraints which apply are considered.*

*The policy adopted is to provide for recreational activities which:*

- (i) are forest-dependent;*
- (ii) are environmentally acceptable;*
- (iii) do not endanger other forest users, and*
- (iv) are not disruptive to the majority of other forest users.*

*The region is subdivided into a series of 'management units' for which appropriate recreation strategies are developed.*

*The plan then specifies a series of regional strategies which will apply to all management units. These cover site design and maintenance, provision for the disabled, visitor information, dieback hygiene, mining, urban development, use of firearms, camping, off-road vehicles and other matters.*

*The plan concludes with proposals for implementation and control and specifies the structure of the follow-up plans to be developed by local staff in divisions.” (p. iii)*

## **7. Forest Recreation Development and Management Constraints**

*“The capacity of the Forests Department to implement a recreation policy is constrained by a number of factors. Such factors may be environmental, management, legislative or economic.*

*In the Northern Region of State forest, where land use pressures are intense, a number of factors currently determine how the forest is used and managed for outdoor recreation. These existing constraints can be summarised as follows:” (p. 31)*

### **7.1 Environmental and Management Constraints**

*“Several major environmental considerations have a constraining influence on recreation and other forest land uses in the Northern Region. The most important are:*

*[...]*

- The need to prevent soil erosion, particularly on the steeper or more dissected portions of the landscape;” (p. 31)*

*“These factors were considered in assessing the capacity or capability of the forest to sustain different types of recreational use (refer to Table 6). That is, recreational activities which are likely to result in substantial environmental degradation have been directed away from the more sensitive portions of the landscape. [...]” (p. 31)*

*“With respect to management constraints, the ability to provide for recreation is influenced by land tenure and land use. The land considered in this plan is managed under the multiple use concept and includes all land under the control of the Conservator of Forests. In simple terms, this means that recreation provision must be integrated with the provision of other forest values (e.g. timber and water production) and their protection requirements (from disease and fire in particular).*

*The whole of the Northern Jarrah Forest has been classified into Management Priority Areas (Map 3). In some areas, recreation is the designated management priority while in others, recreational activity has been given a lower priority.” (p. 31)*

## **9. Regional Planning and Management Strategies**

### **9.1 The Concept of Use Zoning**

*“The approach adopted in this plan is that of use zoning. This recreation management concept is widely employed elsewhere. Under this approach, recreation activities sharing similar environmental and cultural requirements are allocated to designated zones or management units. Allocation of activities to areas is based on user needs, assessed recreation land use capabilities and the existing environmental, legislative and management constraints. It is in essence a reflection of recreation land use suitability, i.e. capability as modified by existing constraints.” (p. 37)*



### **9.2.5 Monadnock Management Unit**

*“The Specific Management Strategies are:*

- *to exclude all road construction activity so as to discourage vehicular use and to minimise the problems of erosion and dieback spread;*  
[...]" (p. 43)

### **9.3 Planning and Management Strategies Applicable to all Management Units**

*“2. Site Maintenance*

*Strategy*

[...]

- *site maintenance programmes will include the periodic inspection and maintenance of:*  
[...]  
*soil disturbance” (p. 48)*

## **GUIDELINES – 1983**

### **Guidelines for Slash Burning in the Karri forest. 1983**

#### **4.2 Scrub Roll**

*“Do not scrubroll when soil is wet and soil damage and/or bogging can occur.” (p. 8)*

#### **4.10 General Comments**

*“Consider:*

[...]

- *Always prepare wet and difficult areas under dry conditions. If the working of a wet area risks bogging the machine, leave or slash by hand. Avoid soil damage during the preparation of regeneration areas.” (p. 11)*

## **HANDBOOK – 1983**

### **Bauxite Mining : Northern Jarrah Forest : Mining Operations Handbook 1. Ed. 2. 1983**

**NOTE: REFER TO ENTRY UNDER EDITION 1981 AS IT CONTAINS SIMILAR DETAILS EXCEPT FOR AMENDMENTS TO THE FOLLOWING PRESCRIPTONS-**

#### ***‘Rehab 83’ : Prescription for Rehabilitation of Bauxite Mines in the Western Jarrah Forest***

*“Rehab 83 now represents the best current ‘State of the Art’ describing techniques to be used in bauxite mine rehabilitation in the western jarrah forest.” (p. 1)*

#### **Objective**

*“An objective is a broad statement of what it is expected to achieve within known constraints.*

*The overall objective for rehabilitation of bauxite mines in the western jarrah forest is:-*

*‘To regenerate a stable forest ecosystem, planned to enhance or maintain water, timber, recreation, conservation and/or other nominated forest values’.*

*Specific goals (not listed in order of importance since priorities may vary with designated land use) are:-*

[...]

*2.4 Protection: to conserve the residual soils; to control dieback spread, and to ensure that unacceptable fire hazards do not accumulate.” (p. 2)*

#### **3. Rehabilitation Strategies**

*“Strategies are the measures to be adopted in order to achieve the objective. These are:*

3.1 The development of prescriptions for rehabilitation procedures for each mined area, in accordance with the designated land use priority and land use management plans. [...]” (p. 3)

#### **4. Rehabilitation Planning**

“Rehabilitation planning occurs at two levels:

The first is broadscale regional minesite planning on a 5-year time-scale. The second is the detailed operational annual planning on a pit-by-pit basis.” (p. 3)

##### **4.1 Broadscale Regional Planning**

“The mining company is required to produce each year an updated 5-year Mining and Management Plan for approval by Government. In the preparation of these plans, the following aspects of rehabilitation are to be considered:-

- The sequence of mining and rehabilitation.
- Access for mining and future management.

[...]

- Land use priorities.

[...]

This prescription deals with Mining Operations only within Water Production M.P.A.s and Recreation M.P.A.s.

At this stage no mining is proposed for other M.P.A.s.” (p. 4)

##### **4.3 Annual Operational Planning**

“Detailed proposals for each minepit are prepared roughly 12 months in advance of rehabilitation. [...]” (p. 6)

“Each detailed proposal is prepared jointly by Forests Department and mine company staff, and is to deal with the following factors:-

[...]

- Dieback hygiene, drainage, erosion control and water management – specific measures to be adopted from initial drilling through to completed rehabilitation.

[...]

A conceptual rehabilitation proposal will be prepared for each area, and must be initialled as ‘Agreed To’ by the local Forests Department officer in charge.” (p. 6)

#### **6. Preparation of Pits for Planning**

“6.2 Overburden and topsoil will then be evenly respread over all areas to be regenerated. The distribution of this material from pit to pit will be in accordance with the following dieback hygiene requirements:” (p. 7)

##### **6. Preparation of Pits for Planting**

“6.2 Overburden and topsoil will then be evenly respread over all areas to be regenerated. The distribution of this material from pit to pit will be in accordance with the following dieback hygiene requirements:” (p. 7)

“(i) no infected material to be carried to diebackfree areas.

(ii) minimise the movement of topsoil

(iii) clean plant and machinery before entry to diebackfree areas where required.

(v) move soil mainly in dry conditions.

All soil movement must be agreed to by the Forests Department.” (p. 8)

*“6.3 Islands or inliers of low grade ore often occur within a pit. It is desirable that these areas remain undisturbed. However, there will be occasions when they are both cleared and stripped.*

*When this occurs the unmined caprock will be ‘popped’ with explosives to provide planting sites and ameliorate run-off. Blasted craters will be graded level prior to respreading overburden and topsoil.” (p. 8)*

### **6.5 Ripping**

*“Ripping is required to fracture the compacted pit floor so as to facilitate root penetration and drainage, and to provide an ‘anchor’ for the returned topsoil.*

*In general: All compacted pit floors will be ripped along the contour.” (p. 8)*

*“Battered banks and pit edges need not be deep ripped, but must be scarified to control erosion and prepare a seed bed.*

*The distance between parallel riplines is to be determined by the need to ensure a continuous fracture of the compacted subsoil.” (p. 9)*

## **7. Water Management**

*“7.1 Careful water management must be considered in every phase of the operation from initial clearing and road construction through to completion of rehabilitation.” (p. 9)*

### **7.3 Criteria for Success**

*“Irrespective of the system which is used, it must satisfy the following basic criteria:-*

- *there must be minimum topsoil erosion within pits;*  
*[...]” (p. 9)*

## **6. The Forest Improvement and Rehabilitation Scheme Prescription : F.I.R.S. 82**

### **Objective**

*“The objective of FIRS is:-*

*‘To improve the capacity of the forest for longterm production of water, timber, recreation, conservation and/or other forest values.’” (p. 6.1)*

### **The Prescription**

*“4.1 FIRS 1– \*Water Production MPA  
\*Advanced Dieback  
\*Pipehead or pumpback catchments only*

*For all sites except stream zone.*

*[...]*

*(v) [...]*

*Carry out erosion control on all unwanted roads, tracks, landings and pits. Drainage must not empty into DBF forest.” (p. 6.3)*

*“4.2 FIRS 2 - \* Water Production MPA  
\* Advanced Dieback  
\* All other catchments*

*(i) As for (i), (ii), (iii), (iv), (v), (vi), (vii) and (viii) in the FIRS 1 prescription.*

*[...]” (p. 6.4)*

- “4.3 FIRS 3 - \*Water Production MPA  
 \* Other forest (i.e. not advanced dieback).

*These are stands where the overstorey has not suffered extensive mortality. [...]*” (p. 6.5)

*“A wide range of treatments is currently being investigated. The ‘base’ prescriptions, about which variations will be designed, is:”* (p. 6.5)

*“(iii) If it is an even-aged ‘pole’ stand:*

*[...]*

*-[...]. Ensure erosion control, crop tree protection and landing rehabilitation measures are carried out.”* (p. 6.5)

*“(iv) If it is not a ‘pole stand’:*

*[...]*

*Erosion control and crop tree protection to be carried out.*

*[...]*

*(vii) Erosion control works to be completed prior to autumn rains. It is essential to ensure that water from roads, pits, conveyors, etc. does not drain into the treated stand.*

*(viii) Conduct Autumn burn under dry soil conditions aimed at minimum scorch and maximum heat in soil. [...]*” (p. 6.6)

### **Forest Management After Bauxite Mine Rehabilitation in the Western Jarrah : Prescription 82 Responsibilities**

*“This new prescription deals with the subsequent management of these areas, comprising the regenerated stands on pits, roads, crusher sites and other sites disturbed by mining.”* (p. 7.1)

## **6. Basis for Treatments**

### **6.4 Field Inspection**

*“Each stand for which treatment is proposed must be inspected on the ground. The following attributes will be checked and/or measured:-*

*[...]*

*(iv) Soil: Inspect and prescribe remedial treatment where possible for soils which are compacted, bare of topsoil or otherwise unsatisfactory for successful forest growth.*

*[...]*” (p. 7.3)

### **6.5 Success Criteria**

*“Research has not yet proceeded to the point to enable values to be placed on all these criteria, or in some cases to define how they are to be measured.*

*In the meantime the following will apply:*

*“(ii) Hazard*

*All stands to be fully protected from fire at least until codominant heights exceed 10m. Thereafter fuels to be managed in accordance with soil building requirements and local fire protection plans.*

*[...]*

*(viii) Soil Conservation*

*Minimum erosion gullies or transport of topsoil from hillsides to drains. No compacted soils or bare subsoil exposures.”* (p. 7.4)

## WORKING PLAN - 1982

### Working Plan No. 87 1982. Part I, General Working Plan for State Forests in Western Australia, 1982.

#### **Sawlog Production**

##### **Strategy**

“(11) Prevent damage to soil values and further artificial spread of dieback disease by reducing winter logging operations and developing summer stockpiling techniques.” (p. 31)

## WORKING PLAN – 1982

### General Working Plan No. 87 of 1982 : Part II. 1982

“The detailed prescriptions for the operations in each Division which appear in this document are designed to implement the policy contained in Part I of General Working Plan No. 87. These prescriptions are intended to remain in operation until 31<sup>st</sup> December, 1986, unless an earlier revision of the plan becomes necessary in the light of new factors which might arise in the meantime.” (p. 1)

#### **General Prescriptions For The Whole Northern Region**

##### **7. Regulation Of The Harvest**

###### **7.2.3.5 Chipwood**

“No logging will be permitted under conditions allowing Phytophthora cinnamomi to be readily spread, nor irreparable soil damage to occur. [...]” (p. 5)

###### **7.2.4 Hardwood Piles and Bridge Timber**

“7.2.4.2 No logging will be permitted under conditions allowing Phytophthora cinnamomi to be readily spread, nor irreparable soil damage to occur. [...]” (p. 5)

#### **General Prescriptions For The Whole Central Region**

##### **7.2.3.5 Hardwood Firewood**

“No logging will be permitted under conditions allowing Phytophthora cinnamomi to be readily spread, nor irreparable soil damage to occur. [...]” (p. 5)

###### **7.2.4 Hardwood Piles and Bridge Timber**

“7.2.4.2 No logging will be permitted under conditions allowing Phytophthora cinnamomi to be readily spread, nor irreparable soil damage to occur. [...]” (p. 6)

## MANAGEMENT PLAN – 1982

### Hardwood Management Plan (Central Region). 1982

#### **Section 1 : Introduction**

##### **1.1 Objectives and Policy**

###### *1.1 Objectives and Policy*

*Hardwood timber specifications in the Central Region must:*

[...]

(7) Minimise Soil disturbance and any other environmental constraints.

[...]” (p. 1)

##### **1.2 Scope**

“(1) This Hardwood Management Plan attempts to cover all hardwood operations in the Central Region. Sawmill logging cannot be considered in isolation. Silvicultural, hygiene and protection objectives cannot be neglected unless all operations are considered and co-ordinated. [...]” (p. 1)

## **2. Forest Types and Silviculture**

### **2.2.2 Land Use Management Priorities (L.U.M.P.)**

*“To enable a silvicultural system to be prescribed management priority must be considered.*

*[...]*

*(3) Protection*

*[...]” (p. 3)*

## **3. Sawmill Logging and Operations**

### **3.1.6 Erosion Control and Landing Rehabilitation**

*“(1) Where erosion is a potential problem erosion control is required in coupes irrespective of dieback status. Erosion is not a problem in many of the soil types in the Central Region.*

*[...]” (p. 9)*

*“(3) Where possible, cut offs are to be located so that they discharge into logging debris or dense vegetation.*

*(4) Landing Rehabilitation*

*Following loading, the loader will push log and clearing debris into the centre of the landing and ensure drainage lines are open. Where landings are severely compacted, contour ripping must be carried out to allow regeneration.” (p. 10)*

## **NORTHERN REGION OBJECTIVES AND GOALS- 1982**

### **Northern Region : Objectives and Goals 1982/83. 1982**

#### **1.1 Departmental Objective : Conservation**

*“Our overall aim is to achieve the Departmental objective, which is ‘the conservation, through planned use and management, of forest land and resources for the greatest long term social and economic benefit’.” (p. 1)*

#### **1.2 Regional Objective**

*“The role of the Regional Group is to determine management strategies for each activity in the region, so as to provide co-ordinated direction for the achievement of Departmental objectives by divisions.*

*Where necessary, management strategies will be presented in the form of Regional Plans. These will take account of: -*

- *Departmental objectives, policies and strategies*
- *Land use objectives*
- *Site capability and potential*
- *Protection requirements*

*[...]” (p. 1)*

#### **1.3 Resources**

*“The forest resources of the northern region are water, timber, flora and fauna, minerals, recreational and scientific/educational values and the physical environment of soil and air.*

*Factors which threaten the long-term conservation of these resources are fire, disease, alienation of land, and uses which permanently destroy the productive capacity of the forest.*

*The specific land, resource and protection objectives are:” (p. 1)*

*“1.6.4 The Physical Environment*

*Objective: to ensure that land use or management has no deleterious effects on the soils, air and waters of the forest, and in particular to prevent pollution of water catchments and of airspace over Perth metropolitan area.” (p. 7)*

## **HANDBOOK – 1981**

### **Bauxite Mining Northern Jarrah Forest Mining Operations Handbook 1. Edition 1. 1981**

#### **Introduction**

*“Underlying all these developments, the Forests Department remains the authority basically responsible for the management of State Forest. It is our task to see that designated forest values are preserved in the long term.[...]” (p. 3)*

#### **1.2 Objectives, Policy & Strategy**

*“The objective, policies and strategies adopted for forest management in areas affected by bauxite mining operations are set out in Section 5.7 of General Working Plan No. 86 of 1977. They are :” (p. 4)*

##### **1. Forest Management Objective**

*“To guide bauxite mining operations to areas where there will be least conflict with other land uses, to minimise environmental damage and to rehabilitate areas affected by mining to best suit future land use.” (p. 4)*

#### **4.3 Clearing and Mining**

##### **5. Erosion Control**

*“Steps to prevent erosion must be taken by the Company at every stage in the clearing process.” (p. 34)*

##### **6. Mining**

*“Erosion Control – During every stage of the entire operation the obligation is squarely on the Company to prevent the erosion of soils and turbid water entering streams.*

*This must be monitored by local F.D. staff and problem areas immediately brought to the attention of company staff.” (p. 36)*

#### ***‘Rehab 80’ : Prescription for Rehabilitation of Bauxite Mines in Western Jarrah Forest***

##### **3. Rehabilitation Objective**

*“The overall objective for rehabilitation of bauxite mines in the western jarrah forest is :-*

*‘To regenerate a stable forest ecosystem, capable of maintaining or enhancing water, timber, recreation, conservation and/or other nominated forest values’.*

*Specific goals (not listed in order of importance since priorities may vary with designated land use) are :-  
[...]*

*3.3 Protection : To conserve the residual soils; to control dieback spread; and to control fire hazard.  
[...]*” (p. 38)

##### **6. Preparation of Pits For Planting**

*“6.2 Overburden and topsoil will then be evenly respread over all areas to be regenerated.*

*[...]*

*6.4 [...] All ripping is to be done when the soil is dry (i.e. late summer to early autumn) to maximise clay breakup and minimise topsoil compaction.*

*6.5 Pits will be designed to minimise topsoil erosion and to retain rainfall and water inflow by :*

- (i) infiltration and silt trapping in the contoured rip lines and*
- (ii) collection of overland flow in banks and sumps.*

*Each pit must have the capacity to store the run-off from a 15 year storm event, as calculated from hydrological records and catchment area.*

*This requires the installation of an adequate grade or contour bank along each 6M vertical contour within each pit.” (p. 40)*

## **Section 5 : Inventory & Control**

### ***Interim Prescription : FIRS 80***

#### **8. Graveyard Dieback – Water Production MPA**

*“For all sites except stream zone.” (p. 47)*

*“8.6 Carry out erosion control methods on all unwanted roads, tracks, landings and pits.” (p. 48)*

#### ***8.10 Stream Zones in Water Production MPA***

*[...]*

*8.10.4 Inspect for man-made features (such as gravel pits, roads, earth dumps) which may contribute to stream turbidity. If located, prescribe erosion control measures – e.g. cross drains, sumps, seed bed preparation and apply seed.*

*[...]” (p. 49)*

#### **10. Forest other than Graveyard Dieback in Water Production MPA**

*“10.11 Erosion control works to be completed prior to autumn rains.” (p. 50)*

## **MANAGEMENT PLAN – N.D. - 1980?**

### **Land Management Plan for State Forest in the Mount William Area. N.D. 1980?**

#### **3.2. Hardwood Logging**

##### **3.2.2 Prescription**

*“3.2.2.7 Implement erosion control measures by strategic placement of log haul roads, snig tracks and landings. Careful dispersal of water from drainage channels and revegetation of disturbed surfaces are some of the techniques which will be used.” (p. 16)*

#### **3.6 Environmental Control over Bauxite Mining and Rehabilitation of Mined Areas**

##### **3.6.1 Objective Management**

*“To ensure that bauxite mining is carried out on State Forest in areas approved by the Conservator of Forests, and that the ore extraction and rehabilitation phases of mining are undertaken in accordance with land use objectives.” (p. 35)*

##### **3.6.2 The General Prescription**

###### **3.6.2.1 Application for Clearing Phase**

*“(c) Attend annual inspection of areas subject to clearing applications in conjunction with Erosion Control and Rehabilitation Working Group and Alcoa’s Mine Superintendent. The group recommend to the Conservator:*

- adjustments to boundaries to facilitate optimum landscaping and erosion control requirements;*
- treatment for sensitive areas. A plan of operations will be required which will avoid deleterious effects on mining and on land use (e.g. mining adjacent to a dam will require ore extraction to commence from the bottom of the slope, and the provision of sumps and contour banks for erosion control progressively in the wake of extraction);*



*the deletion or deferment of mining in areas where it is considered there is good and sufficient reason (e.g. in high quality protectable forest, essential research areas, Conservation MPAs, potential to damage public utilities, etc.).*

[...]" (p. 36)

*“(e) Modified clearing applications to be forwarded to Head Office by Alcoa.*

*Landscape plans for sensitive areas to be referred back to the Erosion Control and Rehabilitation Working Group for endorsement.*

[...]" (p. 37)

#### **3.6.2.4 Rehabilitation Phase**

*“(b) Accompany the Erosion Control and Rehabilitation Working Group and Alcoa environmental personnel on an inspection of areas available for rehabilitation in order to:*

- *draw up plans to meet the objectives of pit rehabilitation as outlined in General Working Plan 86, land use management plans, and other submissions such as those made by the Water Purity Committee to System 6 for the northern jarrah forest;*
- *lay down specifications for soil erosion control, water disposal, bank height, ground cover, tree species, spacing and ripping intensity. Redundant haul roads not required for the mining process or by the Forests Department are to be included in the rehabilitation plans.*

[...]" (p. 39)

*“(d) Alcoa are to carry out earthworks to prepare the landscape for tree planting according to the rehabilitation specification. This involves the following:*

[...]

- *topsoil is replaced evenly over the pit floor. Where possible, top soil is immediately transferred from areas in advance of mining into pits being rehabilitated and largely overcomes biological degrade caused by stockpiling.*

[...]" (p. 40)

## **PLANNING POLICY - 1977**

### **A Perspective For Multiple Use Planning in the Northern Jarrah Forest. 1977**

#### **Introduction**

*“The Forests Department is required to provide a multiplicity of benefits from the northern jarrah forest according to the inherent capabilities of the environment, the existing statutory constraints and the recognised public demand. This objective is attainable because sufficient data are now available for a comprehensive and environmentally responsible regional plan.” (p. 4)*

*“This document sets the overall perspective for the development and subsequent implementation of detailed proposals. In doing this the region has been divided into six management zones based on geomorphology and climate. However, for detailed local planning it is envisaged that site vegetation zoning will be more appropriate and precise.*

*The management strategies proposed supplement the Forests Department policy on multiple land use.” (p. 4)*

#### **4. Proposed Management Strategies**

##### **Current Land Uses**

- “(a) Water storage (large storage dams and small pipehead dams).*
- b) Recreation, (passive and active), based on optimal opportunity for land and water based recreation and proximity to centres of population.*
- c) Silviculture of Pinus radiata, based on high soil fertility and high rainfall.*

- d) *Conservation of flora and fauna.*
- e) *Silviculture of indigenous hardwoods, in particular blackbutt and jarrah.” (p. 23)*
- “f) *Grazing of cattle and sheep on improved (clover) and rough pastures.*
- g) *Horticulture, market gardening and intensive animal production.” (p. 24)*

#### **4.1 Dissected River Valleys and Scarp, High Rainfall Zone (more than 1 150 mm/annum)**

“(e) [...] *The hardwood forest will be managed extensively, giving due regard to aesthetics and erosion control.*

(f) *Pipelines must be planned and installed with great care so as to avoid erosion and siltation.” (p. 25)*

#### **4.2 Lateritic Uplands, High Rainfall Zone (more than 1 150 mm/annum)**

##### **Management Strategy**

“(b) *Mining is acceptable here (particularly in the western parts of this zone, where a considerable area is already infected by dieback), because:*

[...]

(v) *the vegetation is already disturbed by dieback, can no longer be considered natural and will need to be rehabilitated. Within existing catchments a minimum cover to increase water yield, restore aesthetic appeal and provide for erosion control is proposed.” (p. 27)*

## **FOREST POLICY – N.D. - 1975?**

### **Forest Policy : Western Australia. N.D. 1975?**

#### **Introduction**

*“It has therefore become necessary to restate forest policies to take into account the major changes that have taken place since rigid control of the timber industries was first introduced in 1918.*

*The objectives of forest management at that time were to protect the forest estate through control of the industry and to protect the forest itself from fire and other destructive agencies.*

*In more recent times there has been a greater emphasis placed on multiple-use of the forest but with a strong tendency still to produce timber for industry. However, multiple-use demands have imposed limits on the timber resources of the native forests. Emphasis has therefore been given to pine planting to provide a source of timber to supplement and in some instances replace those native forests that will be required for purposes other than timber production.*

*This statement will outline the current situation regarding those permanently dedicated State Forests and Timber Reserves which come within the stewardship of the Forests Department and formally establish management objectives according to the requirements that now exist. It will take into account a multiple-use concept of those forests managed by the Forests Department.” (p. 2)*

### **3. Future Management Objectives**

#### **3.1 Policy**

*“The future policy will emphasise the multiple-use management of State Forests and Timber Reserves. It will continue to provide for the renewable resources of publicly-owned forests to be utilised in the combination that will best meet the needs of the West Australian people. The aim will be to make the most judicious use of the land for some or all of the resources or related service over areas sufficiently large to provide latitude for periodic adjustments in use to conform with changing public needs and the development of the forest itself.” (p. 12)*

#### **3.1.1 Multiple-Use Priorities**

*“Multiple-use management implies the realisation of the best combination of forest benefits according to the particular attributes of each area considered. Compatible benefits may be derived simultaneously from*

*the same area, but separate areas must be used where there is conflict in management for non-compatible benefits.*

*In order to overcome the problems imposed by limited forest area, it is proposed to establish a system of management priorities so that the greatest possible number of compatible uses can be practised throughout most of the forest, whilst carefully selected representative areas of native forest will be managed specifically to retain them in an undisturbed condition for scientific reference purposes.” (p. 12)*

## **LEGISLATION - 1975**

### **Soil Conservation. No. 15 of 1945. Reprint 1975**

*“AN ACT relating to the Conservation of Soil Resources, and to the mitigation of Erosion.” (p. 1)*

*“1. This Act may be cited as the Soil Conservation Act, 1945-1974, and shall come into operation on a day to be fixed by Proclamation.” (p. 1)*

#### **Part I : Preliminary**

*“4. In this Act, unless the context or subject matter otherwise indicates or requires-  
[...]*

*‘Soil erosion’ means the natural or accelerated removal or deposition of soil which may be detrimental with respect to agricultural, pastoral, or forestry activities, or engineering or other works, and includes any deterioration of the soil which may be detrimental to those activities or works and is attributable to salt encroachment.” (p. 4)*

*“9. (1) There shall be a Committee to be known as the ‘Soil Conservation Advisory Committee’ consisting of twelve members appointed by the Governor on the nomination of the Minister.*

*[...]*

*(e) one shall be an officer on the staff of the Forests Department;*

*[...]*” (p. 6)

#### **Part III : Soil Conservation Service**

*“13. The objects of the Soil Conservation Service created under this Act are-*

- (a) the prevention and mitigation of soil erosion;*
- (b) the promotion of soil conservation;*
- (c) the utilisation of lands in such a manner as will tend towards the attainment of the objects aforesaid;*
- (d) the education of landholders and the public generally in the objects and practice of soil conservation.*

*14. The general functions of the Commissioner shall be-*

- (a) the carrying out of surveys and investigations to ascertain the nature and extent of soil erosion throughout the State;*
- (b) the investigation and design of preventive and remedial measures in respect of soil erosion;*
- (c) the carrying out of experiments and demonstrations in soil conservation and reclamation;*
- (d) the recording and publishing of the results of such surveys, investigations, designs, experiments and demonstrations;” (p. 8)*
- “(e) the dissemination of information with regard to soil erosion and soil conservation and reclamation;*
- (f) the instruction and supervision of landholders in matters pertaining to soil conservation and reclamation;*
- (g) the assistance of landholders whose land has been affected by erosion;*
- (h) the co-ordination, having regard to the purposes of this Act, of the policies and activities of Government departments and public authorities in relation to any of the foregoing matters, and in regard to the alienation, occupation and utilisation of Crown lands or other lands vested in public authorities;*

- (i) *the carrying out of works authorised by this Act;*
- (j) *such other matters as may be authorised by the Governor by order in council.”* (p. 9)

“16. *The functions of the Committee shall be –*

(a) *to consider the general aspects of soil conservation and erosion mitigation as they affect the State;”* (p. 9)

“ (b) *to make recommendations for the consideration of the Commissioner, who if he does not adopt them and is requested by the Committee, shall refer such recommendations to the Minister with a report stating his reasons why he considers they should not be adopted so as to enable the Minister to decide and direct what action (if any) shall be taken;*

(c) *to conduct such investigations relative to any special aspect of soil erosion as may be required by the Minister;*

(d) *to assist the Commissioner in such matters as he may refer to the Committee for advice or information.”* (p. 10)

“17.(2) *So far as practicable the Commissioner shall carry out his functions through the Government departments represented on the Committee, and shall endeavour to co-ordinate the services available in Government departments and public authorities for the carrying out of works relating to soil conservation or reclamation or mitigation of soil erosion.*

[...]

(4) *The Commissioner shall consult with any government department or public authority undertaking any work likely to cause soil erosion or to prejudice any project being undertaken under the authority of this Act, and where agreement cannot be reached between the Commissioner and a Government department or a public authority, the Commissioner shall submit to the Minister a full report of the circumstances.”* (p. 10)

“18. *Every Government department represented on the Committee and every public authority is hereby authorised-*

(a) *upon receipt of a request in writing from the Commissioner to carry out or take part in any survey, experiment or demonstration and to do all such acts and things as are directed or otherwise by or under this Act in all respects; and*

(b) *generally to operate with the Commissioner to carry out the purposes of this Act.”* (p. 11)

“19(4) *Every Government department shall upon a request by the Commissioner in writing addressed to the proper officer make available to the Commissioner any records of measures or operations for the prevention or mitigation of soil erosion or any reports as to soil erosion, soil conservation or the utilisation of land whether undertaken, made or received before or after the commencement of this Act.”* (p. 11)

“21A. *Notwithstanding anything to the contrary contained elsewhere in this Act, where any works proposed to be carried out under the authority of this Act are likely to affect, whether injuriously or otherwise, any State forest or timber reserve, such works shall be carried out only by or with the concurrence of the Minister charged with the administration of the Forests Act, 1918.”* (p. 13)

“48(2) *Without in any way affecting or limiting the generality of subsection (1) of this section the Governor may make regulations particularly in relation to any of the following matters-*

[...]

(n) *subject to the provisions of the Forests Act, 1918-1931, the regulation or prohibition of the destruction of or interference with timber or scrub on land held under any form of lease or licence from the Crown;”* (p. 31)

## CODE OF REGROWTH LOGGING. N.D. - 197-?

### 'Code of Regrowth Logging Practice' for all Logging Operations ...N.D. 197-?

#### **Section 4 : Extraction**

- "4.6 *Extraction of logs and timber shall be carried out in a manner and by such methods and equipment as shall result in a minimum of soil disturbance.*" (p. 8)
- "4.10 *A contractor shall make good, to the satisfaction of a Forest Officer, all soil disturbance caused by the contractor which the Forest Officer shall require him to make good.*" (p. 9)
- "5.7 *Loading and hauling of logs and timber shall be carried out in a manner and by such methods and equipment as shall result in a minimum of soil disturbance.*" (p. 10)
- "5.10 *A contractor shall make good, to the satisfaction of a Forest Officer, all soil disturbance caused by the contractor which the Forest Officer shall require him to make good.*" (p. 11)

## LEGISLATION – 1945

### Soil Conservation. No. 15 of 1945

"AN ACT relating to the Conservation of Soil Resources, and to the mitigation of Erosion." (p. 31)

"1. This Act may be cited as the Soil Conservation Act, 1945, and shall come into operation on a day to be fixed by Proclamation." (p. 31)

"4. In this Act, unless the context or subject matter otherwise indicates or requires-  
[...]

'Crown Lands' includes any lands vested in or controlled by any public authority.

[...]

'Public Authority' includes –

(a) The Ministers of the Crown charged respectively with the administration of the Acts mentioned in the Schedule to this Act.

[...]

(f) The Conservator of Forests." (p. 32-33)

" 'Soil erosion' means the natural or accelerated 'removal or deposition of soil which may be detrimental with respect to agricultural, pastoral, or forestry activities, or engineering or other works.'" (p. 34)

"9. (1) There shall be a Committee to be known as the 'Soil Conservation Advisory Committee' consisting of eight members appointed by the Governor on the nomination of the Minister.

[....]

(e) one shall be an officer on the staff of the Forests Department;" (p. 35)

#### **Part III : Soil Conservation Service**

"13. The objects of the Soil Conservation Service created under this Act are-

(a) the prevention and mitigation of soil erosion;

(b) the promotion of soil conservation;

(c) the utilisation of lands in such a manner as will tend towards the attainment of the objects aforesaid;

(d) the education of landholders and the public generally in the objects and practice of soil conservation.

14. The general functions of the Commissioner shall be-

- (a) *the carrying out of surveys and investigations to ascertain the nature and extent of soil erosion throughout the State;*
- (b) *the investigation and design of preventative and remedial measures in respect to soil erosion;*
- (c) *the carrying out of experiments and demonstrations in soil conservation and reclamation;*
- (d) *the recording and publishing of the results of such surveys, investigations, designs, experiments and demonstrations;*
- (e) *the dissemination of information with regard to soil erosion and soil conservation and reclamation;*
- (f) *the instruction and supervision of landholders in matters pertaining to soil conservation and reclamation;*
- (g) *the assistance of landholders whose land has been affected by erosion;*
- (h) *the co-ordination, having regard to the purposes of this Act, of the policies and activities of Government departments and public authorities in relation to any of the foregoing matters, and in regard to the alienation, occupation and utilisation of Crown lands or other lands vested in public authorities;” (p. 37)*
- “(i) *the carrying out of works authorised by this Act;*
- (j) *such other matters as may be authorised by the Governor by order in council.” (p. 38)*

“16. The functions of the Committee shall be-

- (a) *to consider the general aspects of soil conservation and erosion mitigation as they affect the State;*
- (b) *to make recommendations for the consideration of the Commissioner, who if he does not adopt them and is requested by the Committee, shall refer such recommendations to the Minister with a report stating his reasons why he considers they should not be adopted so as to enable the Minister to decide and direct what action (if any) shall be taken;*
- (c) *to conduct such investigations relative to any special aspect of soil erosion as may be required by the Minister;*
- (d) *to assist the Commissioner in such matters as he may refer to the Committee for advice or information.” (p. 38)*

“17. (2) *So far as practicable the Commissioner shall carry out his functions through the Government departments represented on the Committee, and shall endeavour to co-ordinate the services available in Government departments and public authorities for the carrying out of works relating to soil conservation or reclamation or mitigation of soil erosion.” (p. 39)*

“(4) *The Commissioner shall consult with any government department or public authority undertaking any work likely to cause soil erosion or to prejudice any project being undertaken under the authority of this Act, and where agreement cannot be reached between the Commissioner and a Government department or a public authority, the Commissioner shall submit to the Minister a full report of the circumstances.*

18. *Every Government department represented on the Committee and every public authority is hereby authorised –*

- (a) *upon receipt of a request in writing from the Commissioner to carry out or take part in any survey, experiment or demonstration and to do all such acts and things as are directed or otherwise by or under this Act in all respects; and*
- (b) *generally to co-operate with the Commissioner to carry out the purposes of this Act.” (p. 39)*

“19. (4) *Every Government department shall upon a request by the Commissioner in writing addressed to the proper officer make available to the Commissioner any records of measure or operations for the prevention or mitigation of soil erosion or any reports as to soil erosion, soil conservation or the utilisation of land whether undertaken, made or received before or after the commencement of this Act.” (p. 40)*

“36. *Notwithstanding anything to the contrary contained elsewhere in this Act, where any works proposed to be carried out under the authority of this Act, whether to give effect to a project or otherwise, are likely to affect, whether injuriously or otherwise, any State forest or timber reserve, such works shall be carried*

*out only by or with the concurrence of the Minister charged with the administration of the Forests Act, 1918-1931.” (p. 51)*

*“48(1) The Governor may, in addition to the regulations provided for in section twenty-two of this Act, make regulations for or with respect to any matters or things which are by this Act authorised or permitted to be prescribed or which are necessary or expedient to be prescribed in order to carry the objects and purposes of this Act into effect.” (p. 59)*

*“(2) Without in any way affecting or limiting the generality of subsection (1) of this section the Governor may make regulations particularly in relation to any of the following matters:-  
[...]*

*(n) subject to the provisions of the Forests Act, 1918-1931, the regulation or prohibition of the destruction of or interference with timber or scrub on land held under any form of lease or license from the Crown;” (p. 61)*