PORTLAND
FOREST MANAGEMENT AREA

ESTIMATE OF SAWLOG RESOURCE

Department of Natural Resources and Environment
Victoria

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FOREWORD

In March 2001 the Minister for Environment and Conservation initiated a process to issue new sawlog licences at appropriate levels. This process culminated in the preparation and release of the *Our Forests Our Future* Statement in February 2002. This Government Statement announced wide ranging reforms to the management of Victoria's native forests and will result in a sustainable timber industry. In the short term a reduction of about 30% to the sawlog levels across the State is required.

This report describes the data and method used to calculate the appropriate sawlog level for the Portland Forest Management Area. This level has been adopted in the *Our Forest Our Future* Statement.

The estimate of the sawlog levels in this report is based on the information that is known about our forests and a series of estimates about the future, the preferences of industry and the best way to analyse the data. These estimates may be improved in the future as new information becomes available and more measurements of actual performance are recorded. Consequently the sawlog resource available in the future may also change. The *Our Forests Our Future* Statement outlines how these changes will be managed.

An independent Expert Data Reference Group was commissioned to review the data and methodology used to determine this estimate. This group reported in October 2001. It made extensive recommendations on how the processes and data could be improved. This document has considered the advice of the group.

This report provides the opportunity for the timber industry and interested people to gain access to information on how sawlog resources are estimated for Victoria's native forests.

Ken King
Executive Director, Forests Service

CONTENTS

1 Introduction

This Estimate of Sawlog Resource (ESR) summarises current Portland Forest Management Area timber resource volume, growth and area information, licence commitments and ten-year timber production history in public native forests. The level of forest timber resources available into the future is determined by scheduling future harvesting and growth. This estimate has been prepared as part of a process established by the Minister for Environment and Conservation in March 2001 to develop a strategy for the issue of sawlog licences following the expiry of current licences, which will occur from 2002. The information contained in this document has been reviewed by an independent Expert Data Reference Group and peak industry and union groups, and is intended to assist in identifying soundly based estimates for future sawlog availabilities for the timber industry.

2 Background

Portland Forest Management Area (FMA) occupies the south-western corner of the State of Victoria. Centred around Heywood, it stretches from Peterborough in the east to the South Australian border in the west, and from Chetwynd across to Dunkeld in the north to the south coast along the Curdies River (see Map 1).

The Timber Industry Strategy (TIS) released in 1986 established the basis for regional sustainable harvesting of sawlogs from State forest in Victoria. Based on resource data available at the time, sustainable sawlog yield rates were determined for each one of 15 Forest Management Areas identified by the TIS in order to facilitate the proper planning, management, and administration of publicly owned native forest. The TIS also provided resource security to the timber industry through the introduction of fifteen year licences, and flexibility to cope with market variations by allowing annual intake variation between 70% and 130% of annual licence volume. The concept of value adding was introduced with the establishment of four grades of sawlog and the allocation of the better grades of sawlog to those licensees with better value adding performance. It also provided a planning hierarchy of Forest Management Plans (FMP), Wood Utilisation Plans and Coupe Plans.

As a result of the TIS, Schedule 3 of the *Forests Act* 1958 was amended by the *Forests (Timber Harvesting) Act* 1990 scheduled the sustainable yield rate for the Portland FMA at 14,000m^3 nett per year grade C or better (C+). In 1996, the Statewide Review of Sustainable Yield adjusted yield calculations from C+ grade to grade D or better (D+) resulting in no change to the scheduled sustainable yield of 14,000m^3 nett sawlog volume for the Portland Forest Management Area.

Portland Forest Management Area is covered by the West Victoria Regional Forest Agreement (RFA), established between the Commonwealth and Victorian Governments in March 2000. The RFA has provided for the protection of all conservation values to agreed targets in the Special Protection Zone (SPZ) and allowed harvesting in General Management Zone (GMZ) and Special Management Zone (SMZ) under specific conditions (Figure 1).

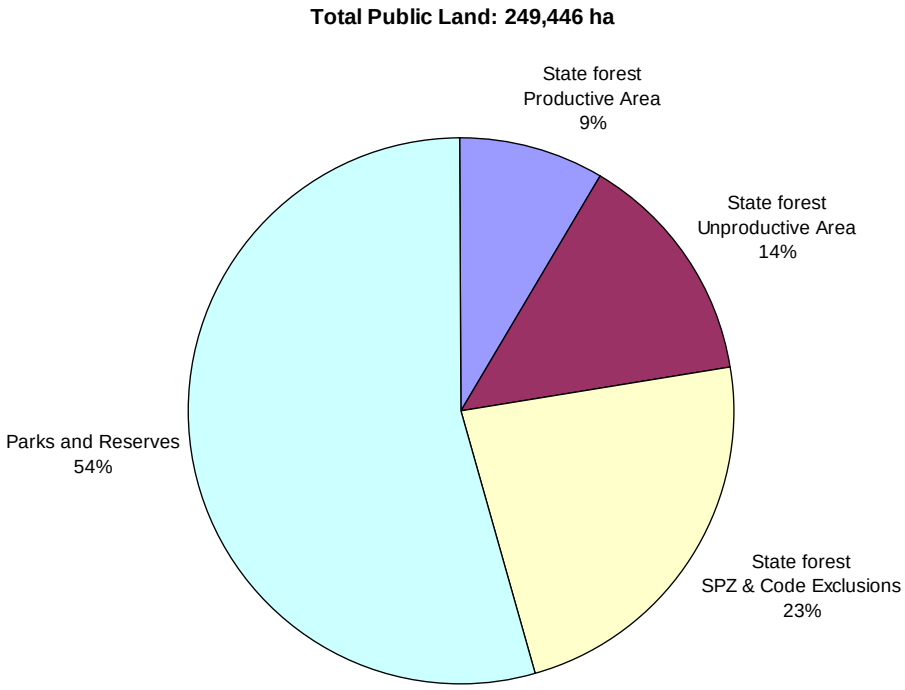

Figure 1. Public Land in the Portland Forest Management Area

As a result of the implementation of a Comprehensive and Adequate Reserve system as part of the West Victoria RFA the area available for timber production was reduced from 27,552ha to 20,974ha. As a consequence of this reduction, the available harvest rate was reduced to 10,000m^3 nett D+ sawlog. The Portland Forest Management Plan is still to be finalised. Initial planning commenced in 2001.

The timber resource information used in developing this Estimate of Sawlog Resource has been derived from preliminary data from the Statewide Forest Resource Inventory (SFRI) project. The SFRI project used the latest sampling and inventory techniques to map species composition, management history, age, height and density of forest stands. This information was used to develop the Portland Forest Management Area Timber Resource Analysis (as outlined in the RFA) which incorporated estimates of Coastal Mixed Species growth rates. Portland SFRI information superseded previous assessments outlined in earlier sustainable yield reviews and provides new forest information on forest stands, age classes, stand height and area available for timber production.

Current resource age structure of the almost entirely coastal mixed species forest is predominantly uneven-aged (75%), with mature (22%), defined regrowth from logging and fire events (2%) and defined senescent growth stage (1%).

3 Licence Commitments

The status of current licence tenure and commitments as at 30th June 2001 for Portland Forest Management Area are shown in Tables 1 and 2.

Table 1. Current Portland FMA Commitments by Licence Type and Expiry

Licence Type	Product	Expiry Date	No. of Licences
Standard	Sawlog (D+)	30/06/2002	2
Standard	Residual	30/06/2002	1
Standard	Thinnings	30/06/2002	1

Table 2. Current Portland FMA Commitments by Species and Grade

Product / Grade	Annual Allocations
	Coastal Mixed Species
Sawlog (m^3 nett)	
D+	9,350
Sawlog Total	**9,350**
Residual Log (m^3 gross)	
Residual Log	10,268
Thinnings	4,465
RL/Thinnings Total	**14,733**

4 Harvest History

4.1 Total Sawlog Production

Figure 2 shows sawlog volume production by forest type from 1990/91 to 2000/01. Average nett sawlog production over the last ten years is 11,378m^3 nett, with licence commitments reduced from 14,000m^3 nett to 10,000m^3 nett in 2000.

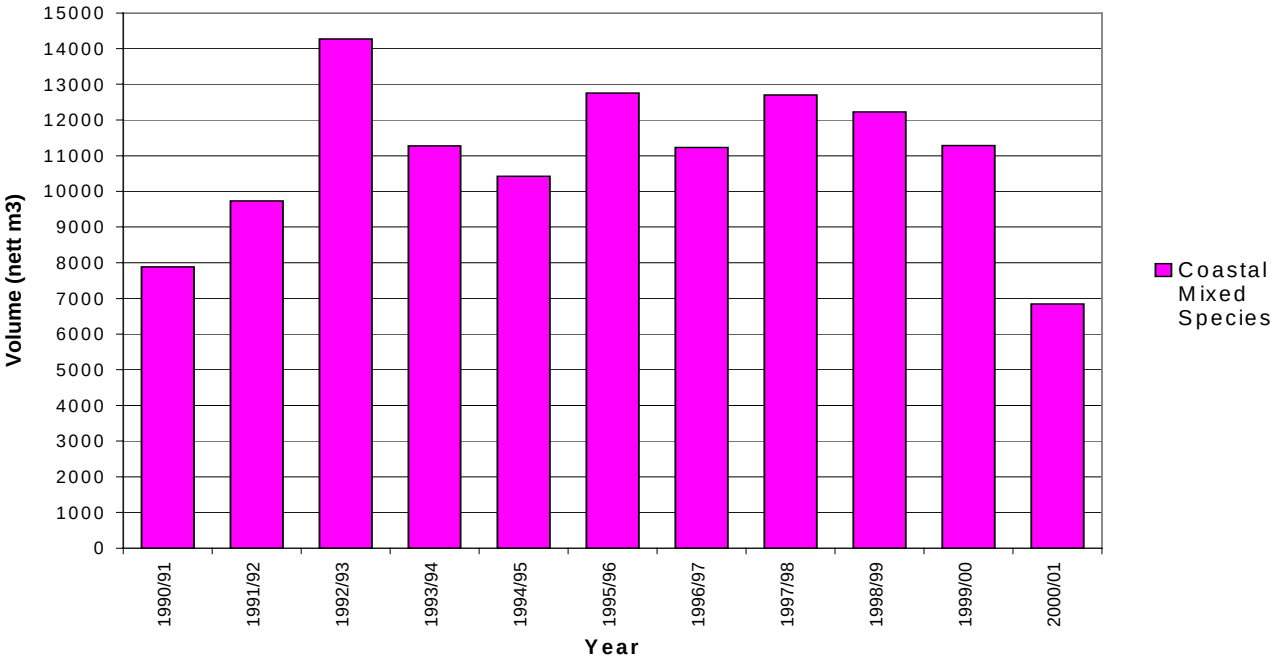

Figure 2. D+ Volume Produced by Forest Type by Year from 1990/91 to 2000/01

Figure 3 shows sawlog production by forest block from 1990/01 to 2000/01.

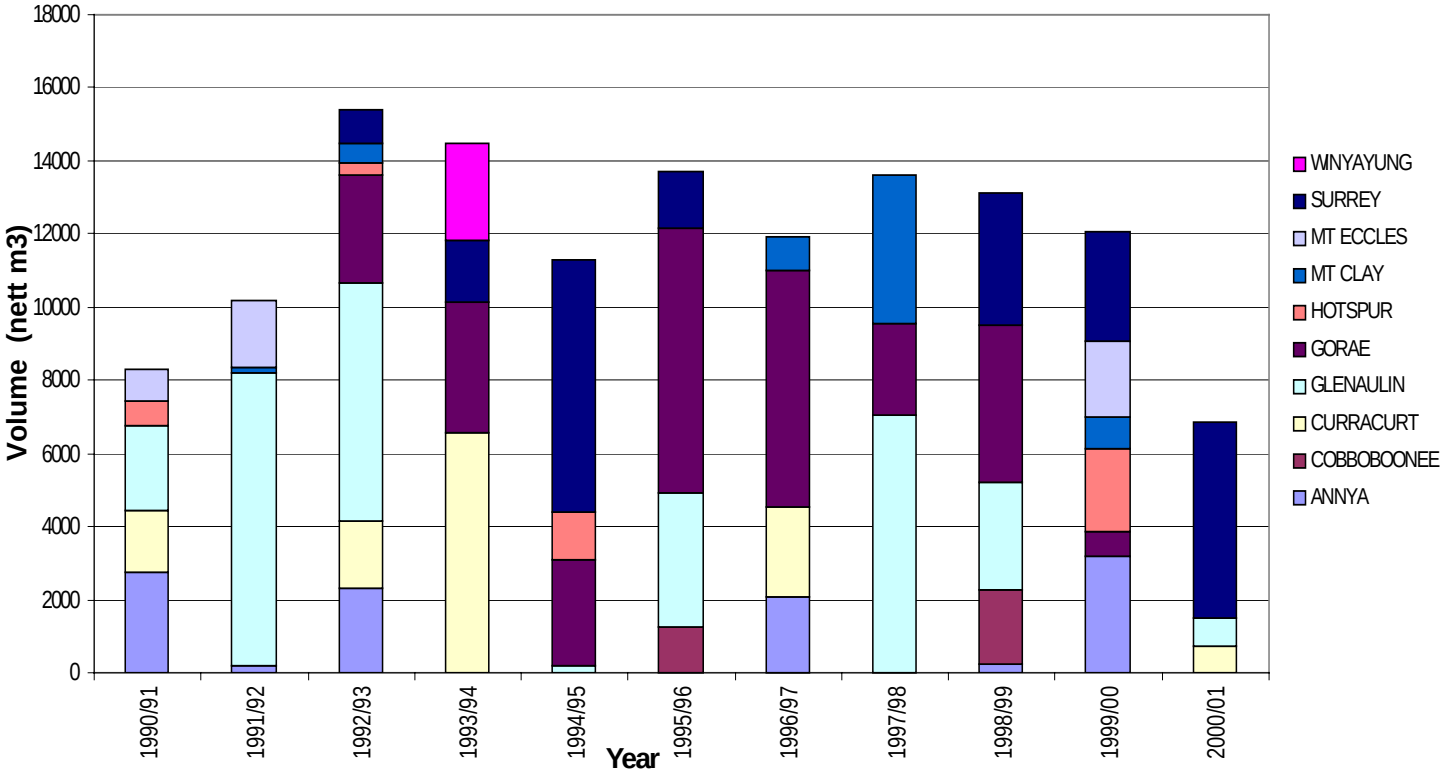

Figure 3. Total Sawlog Production by Forest Block from 1990/91 to 2000/01

4.2 Sawlog Grades

Figure 4 shows sawlog grade proportions from 1990/91 to 1995/96. On average, production of each grade has been 3.7% B grade and better (B+), 57.2% C grade and 39.1%% D grade. The pricing system of the Portland FMA changed in 1996/97 to a size class based system for one grade of D grade and Better (D+) sawlogs. Data for 1996/97 is not included due to this transition.

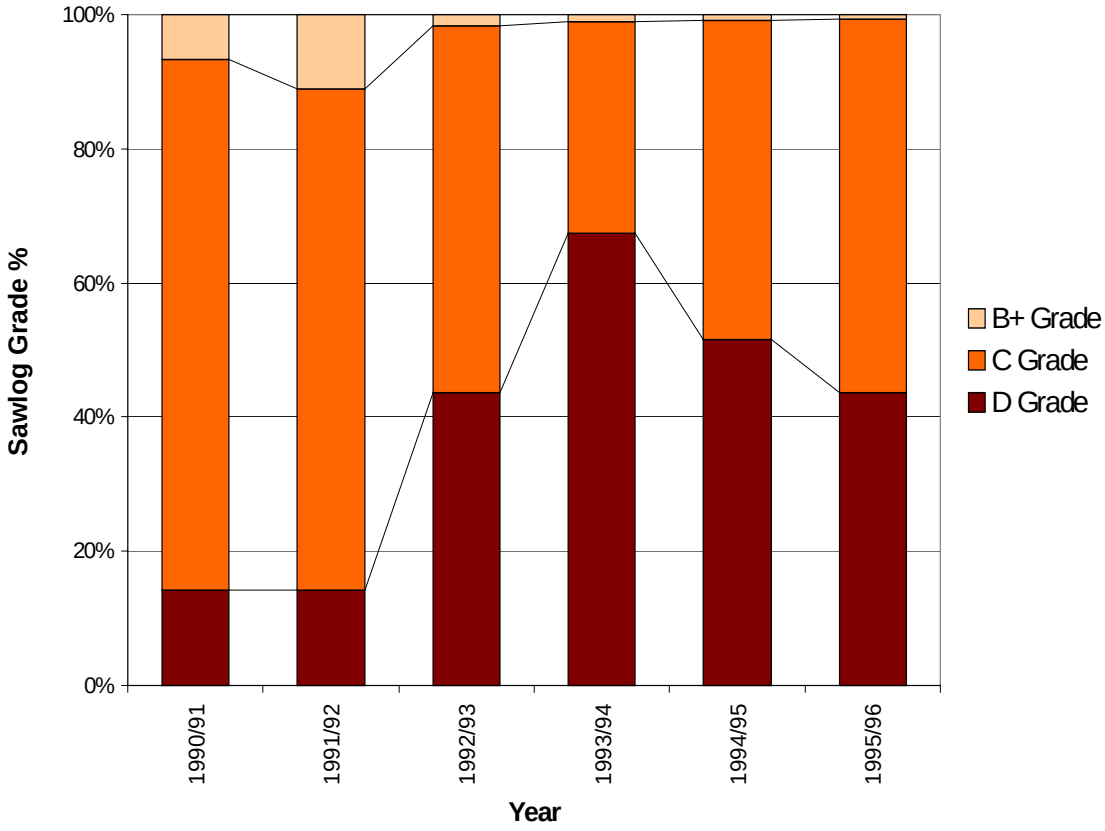

Figure 4. Sawlog Grade Proportions by Year from 1990/91 to 1995/96

4.3 Sawlog Yields by Size Class

Figure 5 shows the proportion of D+ sawlog produced by size class in the Portland FMA 1997/98 to 1999/2000. The method of log pricing changed from log grade to log size class in 1996/97. The size class proportions have remained relatively constant over the period.

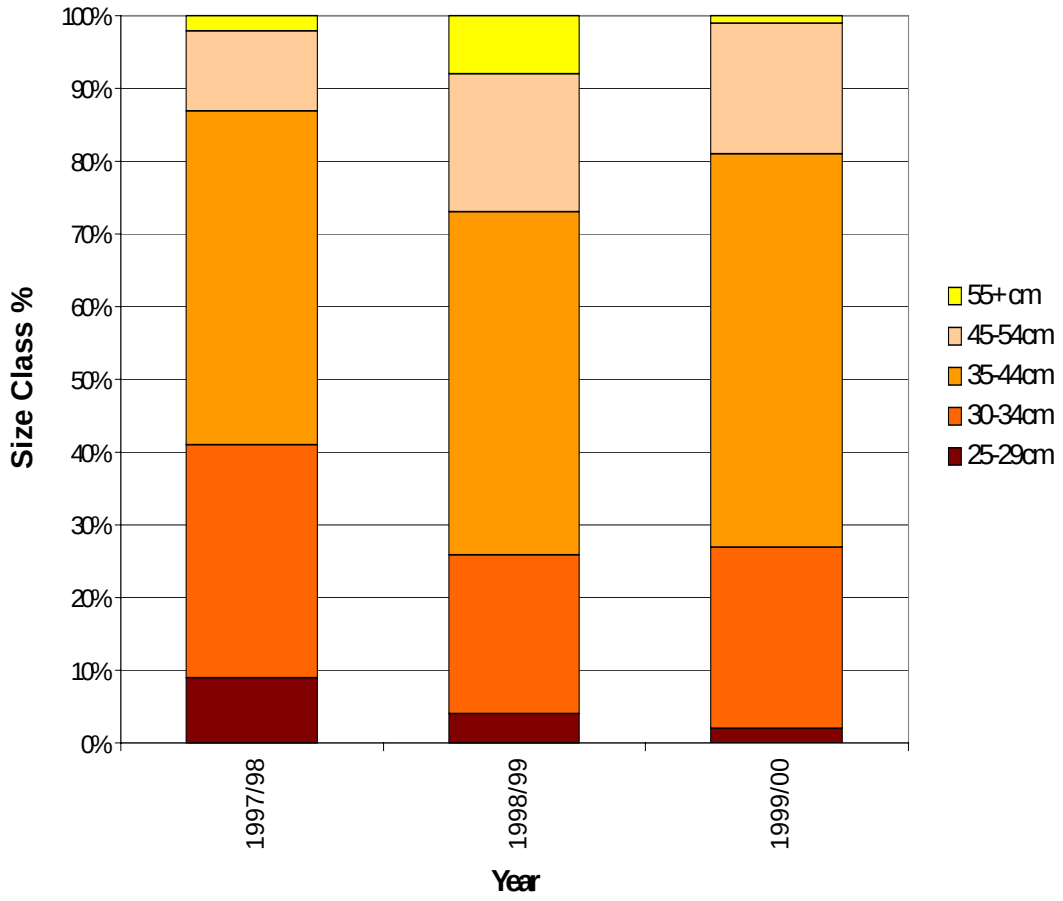

Figure 5. Proportion of D+ Sawlog Produced by Size Class from 1997/98 to 1999/2000

4.4 Residual Log Sales

Figure 6 shows the level of residual log (RL) production and sales from Portland FMA during the nine year period from 1992/93 to 2000/01. Until recently, the majority of the residual log produced was not sold.

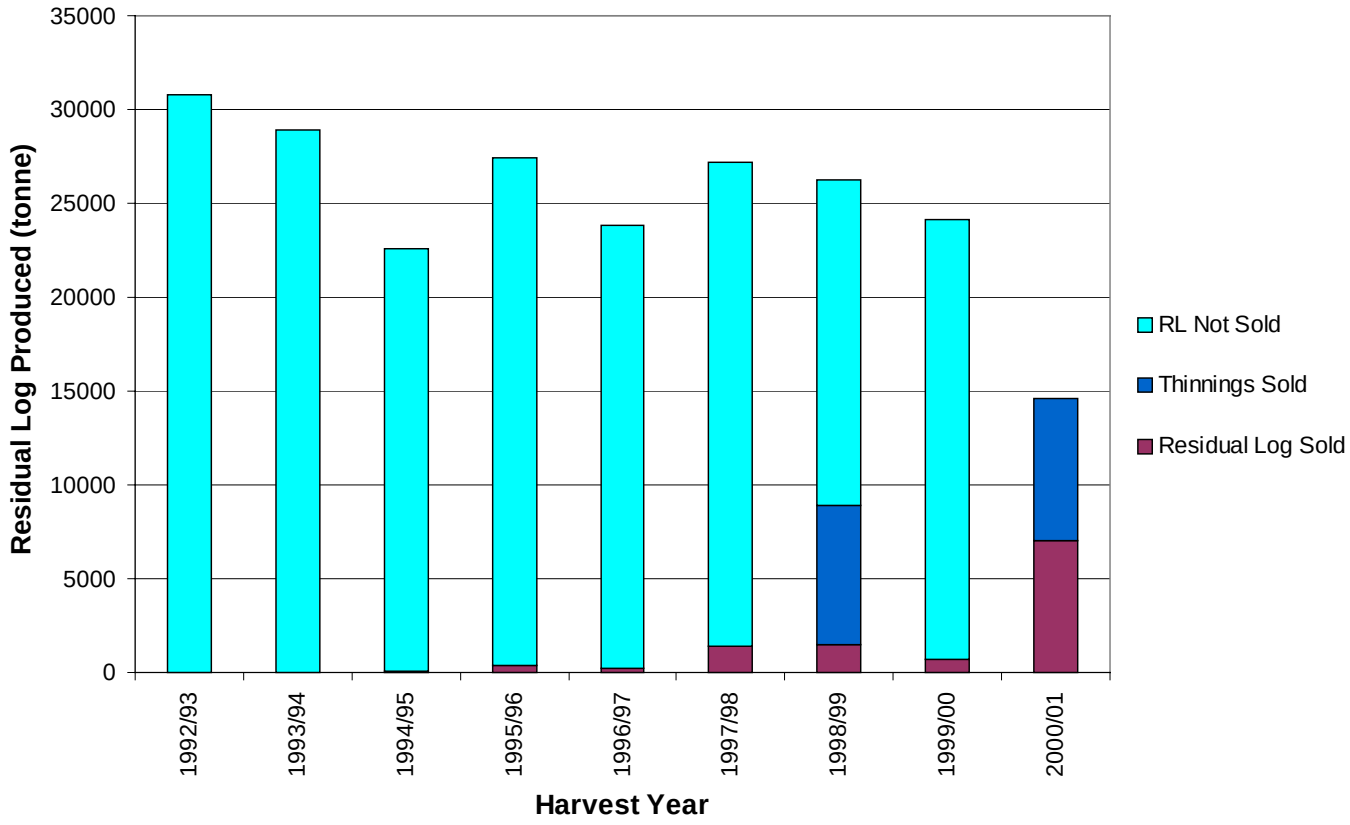

Figure 6. Residual Log Sales from 1992/93 to 2000/01

5 Volume and Growth Information

5.1 Standing Volume

Full SFRI volume information is not yet available. The SFRI has completed the first stage of area sampling and a comprehensive data set of area and volume estimates will become available in 2004.

Volume data in this Estimate of Sawlog Resource are derived from the 1986 assessment of sustainable yield through the application of the MESSIM Model. This aimed for long term sustainable yields with harvesting occurring on a 15 to 20 year cutting cycle.

Actual sawlog yields have varied from the MESSIM model estimates. This was because of a change from single tree selection to group selection silvicultural systems in 1992/93 resulting from a reduction in the log diameter specification from 50cm to 45cm diameter breast height over bark (DBHOB).

The change in silvicultural system has resulted in an increased cutting cycle of 20 to 40 years. This is more appropriate for the uneven-aged stands, given that a lower basal area is retained after harvesting than that prior to the change-over in 1992/93.

5.2 Growth

Research shows growth rates ranging from Mean Annual Increments of 0.34 to 0.61m^3 nett/ha/year for uneven-aged stands to 1.08m^3 nett/ha/year for regrowth stands on good sites where silvicultural inputs have been applied in terms of both overwood treatment and non-commercial thinning. The 2000 Timber Resource Availability analysis determined that diameter increment of 0.5cm/year was not unreasonable for this forest type and was consistent with previous studies of short term increment and with growth rates in other Coastal Mixed Species forests. In order to calculate an estimate of Long Term Sustainable Yield, Periodic Annual Increments (PAI's) have been assigned to the 8 productivity classes ranging from 0.3 to 0.7m^3 nett/ha/year.

Recent SFRI area and volume information has allowed a total of eight productivity classes to be derived in the harvestable area. Table 3 summarises these productivity classes.

Table 3. SFRI Derived Productivity Classes used in SYSS Modelling

Productivity Class	Messmate Proportion	Stand Height	PAI (m^3/ha/yr)
FMS1_3b	>75%	28-32.9 metres	0.6
FMS1_4a	>75%	22-27.9 metres	
FMS1_4b	>75%	18-21.9 metres	
FMS2_3b	50-75%	28-32.9 metres	0.5
FMS2_4a	50-75%	22-27.9 metres	
FMS2_4b	50-75%	18-21.9 metres	
FMS3_4a	25-50%	22-27.9 metres	0.4
FMS3_4b	25-50%	> 22metres,or >18metres if dominated by regrowth	

An analysis of recent logging history has been undertaken to provide yield estimates for each of the Productivity Classes above. Several coupes contained multiple productivity classes and

therefore only limited data is available to determine the yield for a specific productivity class. The analysis also indicated that approximately 10-15% of the area harvested each year comprised SFRI stand classes now considered as unmerchantable. Predicted yield estimates were assigned to the eight productivity classes shown in Table 3. A +/-30% variation in the average yield for each productivity class has been considered due to the lack of quality yield data available for the uneven-aged forests of the Portland FMA.

6 Resources

6.1 Wood flows

In the Portland FMA the predominant silvicultural systems used are group selection in uneven-aged stands and seed-tree silvicultural system in even aged stands. These result in both even aged regrowth and mixed age stands. Trees are retained in both group selection and seed tree operations for growing stock, habitat, seed fall and in buffers along streams. The estimate of the availability of sawlogs into the future is based on the assumption that group selection and seed-tree will continue as the predominant silvicultural systems.

To estimate the availability of sawlogs into the future a method of scheduling wood flows is required. This estimate uses a spreadsheet developed by NRE for this task. It uses the area of each forest type of known cutting cycle and the yields for a range of ages. Areas of forest can then be scheduled at or near the cutting cycle during periods into the future. The availability of sawlog has been called the Economically Accessible Resource and is based on the level that can be maintained or increased over the entire planning period, usually to 2100.

6.2 Resource Profile

Table 4 provides a simple representation of sawlog resource within a uniform statewide format. Volumes are indicative only. This profile is to be read in conjunction with the accompanying comments on each resource element.

Table 4. Profile of Resource Elements for Portland FMA

No.	RESOURCE ELEMENT	Area (ha)	Annual Volume (m^3 nett/yr)
	STATE FOREST (INCLUDING SOME HISTORIC AREAS)	113,346	
	Code and Forest Management Plan (FMP) elements:		
1	SPZ & proportion SMZ	56,282	
2	*Code* slope & stream buffer exclusions	643	
3	FMP prescriptions	0	
4	Unmapped streams and soaks not considered in *Code* buffer exclusions	621	
5	Standard SFRI unproductive stands	34,826	
	BIOLOGICALLY SUSTAINABLE YIELD	20,974	8,700
	Operational elements:		
6	Further unproductive stands	0	0
7	Slopes additional to *Code* exclusions	0	0
8	Areas not harvested near stream buffers	200	70
9	Small and isolated areas	73	30
10	Rocky areas	0	0
11	Harvesting losses		670
	Management elements:		
12	Landscape buffers	0	0
13	Fire losses		330
14	Disease losses		0
15	New flora, fauna and cultural site reservations	0	0
16	Temporal and spatial constraints	0	0
	Remaining element:		
17	Economically Accessible Resource	20,701	7,600
	Potential issue elements:		
18	Changed residual log markets		
19	Changed minimum log diameter specification		1341
20	Changed silviculture system		
21	Additions to the forest estate		
22	Reforestation of unstocked stands		

Notes: Elements 6 to 16 and 18 to 22 may alter, increasing or decreasing the economically accessible resource element 17. Element 19 has been removed from the economically accessible resource.

6.3 Resource Elements

6.3.1 Special Protection Zone and Proportion of Special Management Zone

All Special Protection Zone is excluded from harvesting and 50% of Special Management Zone is considered available for timber production.

6.3.2 Code Slope and Stream Buffer Exclusions

The *Code of Forest Practices for Timber Production* (NRE, 1996) requires exclusion of slopes steeper than 30 degrees, streamside and rainforest buffers.

6.3.3 Forest Management Plan Prescriptions

This element is not relevant or significant in this estimate for this FMA.

6.3.4 Unmapped Streams and Soaks Not Considered in Code Buffer Exclusions

An allowance of 621ha has been made for the volume unavailable for timber production due to unmapped streams and soaks.

6.3.5 Standard Statewide Forest Resource Inventory Unproductive Stands

SFRI defines unproductive stands in the Portland FMA as those with less than 25% messmate crown cover in the species mix. These stands are dominated by currently unmerchantable species such as *Eucalyptus aromaphloia* (Scent Bark), *E. ovata* (Swamp Gum) and, *E. viminalis* (Manna Gum). Productive species acceptable for sawn timber include *E. obliqua* (Messmate), *E. baxteri* (Brown Stringybark) and *E. willisii* (Shining Peppermint).

6.3.6 Further Unproductive Stands

Industry consultation indicates that there are no additional non-preferred species in the Portland FMA and that the SFRI definition of productive stands is appropriate. Therefore no further reduction to productive area has been made on the basis of further unproductive stands.

6.3.7 Slopes Additional to Code Exclusions

Slopes additional to *Code* exclusions are not considered to contribute to area reductions. No reduction has been made due to the very flat terrain and generally good access across the estate.

6.3.8 Areas Not Harvested Near Stream Buffers

Minor streams and soaks in areas of high erosion risk have been buffered an additional 10m to modelled *Code* exclusions.

6.3.9 Small and Isolated Areas

Small isolated stands have been excluded from the area statement as they are not viable to be included as part of a harvesting unit. Isolated small productive areas in Moleside, Weecurra and Cavendish blocks have not been included in the nett productive area.

6.3.10 Rocky Areas

There are no areas that are unavailable for harvesting due to rocky areas.

6.3.11 Harvesting Losses

A 690m^3 nett per year volume reduction is applied to compensate for harvesting losses within the Portland FMA. This allowance has been made to compensate for variations in productivity class across the available productive areas and the inclusion of unmerchantable species within marked coupes.

6.3.12 Landscape Buffers

It is considered that buffers placed on visually sensitive ridgelines or roads or private property boundaries in the General Management Zone can be managed temporally, or are not significant.

6.3.13 Fire Losses

A volume allowance for losses due to wildfire of 330m^3 nett per year has been made based on a fire frequency of 20 years for Coastal Mixed Species forests. Significant fire events consistent with this are Gorae in 1962, Cobboboonee in 1976 & Tremaine Swamp in 1991.

6.3.14 Disease Losses

There has been no area or volume allowance for disease losses.

6.3.15 New Flora, Fauna and Cultural Site Reservations

Further Special Management Zones and Special Protection Zones may be created around future identified sites of cultural, historic, flora or fauna significance occurring in General Management Zone areas within the Portland FMA. Under the West Victoria Regional Forest Agreement, if additional Special Protection Zones are required over areas that were previously General Management Zone or Special Management Zone, land of equal value can be swapped from the current reserve system, so there is no nett loss of productive area.

6.3.16 Temporal and Spatial Constraints

The West Victoria Regional Forest Agreement established Special Management Zones for the protection of the Spot-Tailed Quoll. These have been included in the area of Special Management Zones available for harvesting (refer Element 6.2.1). When completed, the Portland Forest Management Plan will provide specific Special Management Zone plans for the Spot-Tailed Quoll.

6.3.17 Economically Accessible Resource

The area of economically accessible resource is estimated based on current harvesting practices and management. The volume of this element is the proposed level for licensing. The volume of the economically accessible resource accounts for expected volume reductions due to changes in the minimum log diameter specifications.

6.3.18 Changed Residual Log Markets

This element is not relevant or significant in this estimate for this FMA.

6.3.19 Changed Minimum Log Diameter Specification

The Portland FMA has changed from a small end diameter under bark of 25cm to 30cm for D+ sawlogs, following licensee discussions. The impact of this has been quantified through sampling and is estimated to be a 15% reduction in sawlogs. This is equivalent to 1,341m^3 nett per year and this volume has been removed from the economically accessible resource.

6.3.20 Changed Silviculture Systems

Senescent stands are considered uneconomic to harvest and silvicultural treatment is not cost effective to return these stands to production. If this situation changes, a further 363ha (1.7%) could become available.

Regrowth stands could be scheduled for a non-commercial thinning until 2010, with later commercial thinning until 2030.

6.3.21 Additions to the Forest Estate

This element is not relevant or significant in this estimate for this FMA.

6.3.22 Reforestation of Unstocked Stands

This element is not relevant or significant in this estimate for this FMA.

7 Resource Outlook

A sawlog level of 7,600m^3 nett per year is forecast to maintain current log diameters. Harvesting would be based on a mix of group selection and seed tree systems, with overwood treatment (thinning from above) within current habitat prescriptions. Based on current management prescriptions, further improvement in long term forest growth could occur through silvicultural treatments.

Optimal harvest ages for the Portland Coastal Mixed Species forests are between 80 to 100 years. Rotation lengths of 80 to 100 years and cutting cycles of 20 to 40 years identified by SFRI were used in these models. The TIS allows for harvesting above or below the nominal harvest age in order to regulate age classes and to provide for smooth timber flows.

The application of a single cutting cycle for any given productivity class does not necessarily reflect the structural differences within the forest. The variation in stand structures resulting from past harvesting events has the greatest bearing on the application of cutting cycles for a given stand. Accordingly, assignment of cutting cycles has an inherent error component and may be a significant variable in scheduling harvesting events.

The volume and proportion for individual forest productivity classes for this scenario is shown in Table 5

Table 5. Volume available by forest productivity classes for Portland FMA

Forest Productivity Class	Volume (m^3 nett per year)	Proportion of Total (%)
FMS1_3b	100	1
FMS1_4a	1,600	21
FMS1_4b	200	3
FMS2_3b	200	3
FMS2_4a	3,700	49
FMS2_4b	1,400	18
FMS3_4a	400	5
FMS3_4b	0	0
Total	**7,600**	**100**

8 Data Standard

The Expert Data Reference Group (EDRG) has provided an independent assessment of data and methods used in the development of Estimates of Sawlog Resource. The EDRG has used a one to five star rating to classify data quality and methodological rigour in terms of three fundamental parameters and their relationship to forecasting long term allocation levels:

- area,
- woodflows, and
- yield.

One star indicates data inadequacy and five stars indicate data excellence for the basis of issuing long term licences at the proposed allocation level. An overall score is also given, based on the weakest of the three fundamental parameters.

In the Portland Forest Management Area, area was given two stars, yield, one star, and woodflows, two stars. This resulted in an overall one star rating.

This rating will be considered in determining future licensing arrangements within a risk management framework.

9 Conclusion

The forests of the Portland FMA are generally foothill mixed species which is predominantly uneven-aged (75%) with mature (22%), defined regrowth from past logging and fire events (2%) and defined senescent growth stage (1%). The area available for harvesting has been reduced from previous estimates due to the inclusion of operational constraints not previously measured. The growth and yield data are considered inadequate by the Expert Data Reference Group. Revised estimates are expected in 2005. Current licence levels need to be reduced by approximately 19% to 7,600m^3 nett per year due in part to changed log diameter specifications.

10 References

NRE (2000). *West RFA Portland FMA Timber Resource Analysis.* Department of Natural Resources and Environment, Melbourne.

NRE (1996). *Code of Forest Practices for Timber Production, Revision No. 2.* Department of Natural Resources and Environment, Melbourne.

11 Glossary

"A" Grade Sawlog A sawlog with a minimum small end diameter underbark of 50cm which has no defective quarters and maximum defects on exposed end of: one-quarter diameter lengths of all gum vein or gum pockets, light stain, and maximum angle of sloping grain of 1:10 along the length of the sawlog.

Advance Growth (Advance Regeneration) Any established seedlings, saplings or poles which are present in a forest when some form of forest treatment is planned to obtain regeneration.

Age Classes Stands of timber originating at a defined time ie. wildfire or harvesting disturbance.

Agreement An arrangement for harvesting and removal of forest produce authorised by specific legislation.

Annexures Additions to licences that specify target volumes for sawlog grade or species.

Annual Allocation The annual quantity of timber specified in schedule 1 of a Long Term Licence, and which the Secretary is to make available from time to time under Condition 11 of the Licence Conditions.

"B" Grade Sawlog A sawlog with a minimum small end diameter under bark of 35cm which has maximum allowable defects on exposed ends of: one-quarter diameter length of loose gum veins/pockets and shakes, one diameter length of tight gum vein more then 3mm in width, two diameters length of tight gum vein less then 3mm in width, light stain, 1:10 angle of sloping grain along the sawlog axis, and a maximum of 105cm squared of pipe in an exposed end.

Block A major division of a forest, delineated for management purposes and bounded by natural features such as ridges and streams. Usually comprises a number of compartments.

Buffer A protective margin of vegetation abutting a stream, spring, wetland, body of standing water, swampy ground, private property, road, landscape feature, valued area or an area of rainforest, which protects it from potentially detrimental disturbances in the surrounding forest. Buffer width is defined as horizontal distance from which various operations are excluded.

"C" Grade Sawlog A "C" grade sawlog is considered to be any sawlog with a minimum small end diameter under bark of 30 cm which has maximum allowable defects on exposed ends of: one diameter length of loose gum veins/pockets and shakes, seven diameters length of tight gum vein more than 3 mm width, unlimited lengths of tight gum veins less than 3 mm width, dark stain, maximum sloping grain angle of 1:8 along the length of the sawlog, maximum of two defective quarters, and maximum of 112 cm square pipe on exposed end.

Code of Forest Practices for Timber Production A set of operational principles and, in some cases, minimum performance standards for the conduct of timber harvesting and associated works in forests in Victoria, referred to as the Code.

Comprehensive, Adequate and Representative Reserve System A reserve system to conserve all native forest types as well as the plants and animals that depend on them. Comprehensive: the full range of forest communities recognised by an agreed national scientific classification at appropriate hierarchical levels; Adequate: the maintenance of the ecological viability and integrity of populations, species communities; Representative: those sample areas of the forest that are selected for inclusion reserves which should reasonably reflect the biological diversity of the communities.

Continuous Forest Inventory Plots (CFI Plots) Plots established throughout the forest on which tree growth information is measured. The plots are measured periodically (at five- or ten-year intervals, for example), and growth on the plot can be determined from the difference between measurements.

Coupe An area of forest of variable size, shape and orientation from which logs for sawmilling or other industrial processing are harvested.

"D" Grade Sawlog A "D" grade sawlog is considered to be any sawlog with a minimum small end diameter under bark of 25cm which has maximum allowable defects on exposed ends of: two diameters length of loose gum veins/pockets or shakes, 10 diameters length of tight gum vein more than 3mm width, unlimited length of tight gum vein less than 3mm width, dark stain, maximum sloping grain angle of 1:8 along the length of the sawlog, maximum of three defective quarters, and maximum of 120cm square of pipe defect on exposed ends.

D+ Sawlog Sawlogs of grade D and better ie. Including C, B, and A grades.

DBHOB Diameter breast height over bark (breast height = 1.3m).

Ecologically Sustainable Forest Management The management of forests on all land tenures to maintain the overall capacity of forests to provide goods, protect biodiversity, and protect the full suite of forest values at the regional level.

Even-aged forest/stand Forest predominantly of the one age. Usually originating as a result of an intense burn or harvesting activity.

Evergreen Licence A sawlog licence with a provision for renewal before the fifth year of the licence, if the licensee has proposals for significant capital expenditure.

Expert Data Reference Group (EDRG) A group appointed by the Minister to review the data used to estimate the available volumes. Consist of Professor J. VanClay (Southern Cross University), Professor B. Turner (ANU).

Fauna A general term for animals (including reptiles, birds, marsupials and fish).

Fuel Management Zone Modification of fuels by prescribed burning or other means. (There are 5 Fuel Management Zones).

Flora A general term for plants of a particular area or time.

Foothill Mixed Species Forest Forest with a mature stand height of less than 40m and generally occurring on mid range elevations.

Forest 25 A GIS spatial data set at 1:25000 scale derived from detailed aerial photography interpretation assessments of ash and mixed species forests , and broad structural vegetation mapping for other mixed species forests.

Forest Coupe Plan A Forest Coupe Plan is a plan that must be prepared for each harvesting operation in public native forest and will contain a map identifying the area and a schedule incorporating the specifications and conditions under which the operation is to be administered and controlled. The Forest Coupe Plan will be prepared prior to the commencement of utilisation and will specify the matters set out in Section 2.3.1 of the Code of Practice.

Forest Management Area (FMA) The basic units for forest planning and management in Victoria. Currently Victoria is divided into 15 Forest Management Areas as defined in the Forests (Timber Harvesting) Act 1990, however, the Wangaratta and Wodonga FMAs are managed as the North East FMA.

Forest Management Plan Forest management plans are developed by the Department of Natural Resources and Environment to address the full range of values and uses in Forest Management Areas which have been designated as the units for planning forest management activities. Forest Management Plans will be prepared according to the guidelines set out in Section 2.1 of the Code of Forest Practices for Timber Production.

Forest Management Zone An area of similar physical capability or forest value to which particular Departmental strategy and specific prescriptions may apply. There are three types of zones: the Special Protection Zone, Special Management Zone and General Management Zone.

Forest Product Licence Authority to harvest and remove Forest Produce issued under section 52 of the Forests Act 1958. Document giving official permission to remove Forest Produce from designated areas of Public Land in the State of Victoria. Licences are issued in various forms depending on the type and quantity of produce, period of licence and method of payment (eg. The Forest Produce Licence and Receipt form is used for small quantities of produce with payment made in advance of removal).

Forest Type A classification of forests according to their life form and height of the tallest stratum, and the projected foliage cover of the tallest stratum.

FORPLAN A computer program that can be used to apply forest values (including financial) to forest stands. It is currently used in conjunction with GIS and models for timber, water and wildlife to estimate the response of these values over time for the whole forest for various management strategies.

General Management Zone (GMZ) Delineates the area to be managed for the broad range of forest values available in the area. The GMZ is divided into two sub-zones: 'Timber Production' where timber harvesting under standard conditions is one of the main uses and 'Other Uses' where the forest is unsuitable for sawlog production but where other activities are permitted.

Geographic Information System (GIS) A system which holds spatially referenced data which can be classified, overlaid, analysed and presented in map, tabular or graphic form.

Grade A measure of the quality of a hardwood log. The grade of a sawlog can be A, B, C, D, E or ungraded. The grade is determined using the Hardwood Sawlog Grading Card. Logsales also uses grade to identify product groups such as residual logs, pulpwood and firewood.

Gross Area The total estimated area of a coupe, forest or block.

Gross Volume The volume of a log inclusive of all defect i.e based only on the external dimensions.

Group Selection System All trees in a small patch are felled, with the gaps created scattered over the forest compartment. Gap size is no more than about two tree-heights in diameter, so that natural (or induced) seedfall from surrounding trees can be used. An uneven-aged system, as the fellings are done every 10-15 years.

Habitat Tree A tree that has been identified as providing important habitat for wildlife and which is given additional protection during forest operations.

HARIS (Hardwood Resource Information System) This system has been in operation since the late 1970's and forms the Statewide timber resource database for native forest on public land in Victoria.

Height Class Height class refers to a specified range of tree heights. The height classes used by the Statewide Forest Resource Inventory are:

Height Class 1a: 60m<	Height Class 1b: 51.1-60m
Height Class 2a: 46-51m	Height Class 2b: 40-45.9m
Height Class 3a: 34-39.9m	Height Class 3b: 28-33.9m
Height Class 4a: 22-27.9m	Height Class 4b: 15-21.9m
Height Class 5a: 10-14.9m	Height Class 5b: 5-9.9m
Height Class 6: <5m	

High Elevation Mixed Species (HEMS) Mixed species forests above 750m elevation but also some forests in frost hollows and on wetter aspects greater than 600m act as HEMS. Successful regeneration generally occurs from spring germination.

Integrated Forest Planning System (IFPS) Victoria has developed a system of linked computer-based tools collectively called the Integrated Forest Planning System (IFPS). The IFPS provides a means of modelling the growth, development and harvesting of forest stands as well as a range of other forest values.

Log Grading Assessment of the quality of a sawlog.

Log Length The length of a log is the shortest distance from end to end along the log. This is measured to the backward 0.1m but is normally considered in multiples of the backward 0.3m when discussing log lengths for grading purposes.

Long Term Licence A licence issued under the Forests Act 1958 for a period of more than 3 years and up to 15 years.

Long Term Sustainable Yield (LTSY) The theoretical rate of harvest that can be maintained in perpetuity.

Low Elevation Mixed Species (LEMS) These forests are usually below 750m elevation except for some forests in frost hollows and on wetter aspects between 600-750m which act as High Elevation Mixed Species. Most successful regeneration occurs from autumn germination.

Management Prescriptions Management Prescriptions detail specific conditions or standards that are to apply to forest operations in the vicinity of certain threatened flora or fauna. More detailed prescriptions are established at the local level and are reflected in Wood Utilisation Plans.

Mature Forest Forest at or beyond nominal rotation age but before it reaches the overmature stage. (Generally 60-150 years).

Mean Annual Increment (MAI) The total increment up to a given age divided by that age; average annual increment to that age (m^3/ha).

Merchantable Trees, which are suitable for processing into, forest products and for which a market exists.

MESSIM (Messmate Simulator) A computer model developed to forecast the growth of messmate forests at Portland.

Minor Forest Produce Produce harvested from State forest other than sawlogs or residual logs. Minor Forest Produce is often collected by small operators or individuals and includes products such as sleepers, posts and poles, craftwood, firewood, honey, extractives, and eucalyptus oil.

Mixed Species Forest Forest, which has two or more eucalypt species commonly found within the canopy. Generally consisting of peppermint, messmate, gum or stringybark species. Does not include ash, red gum or box ironbark forests.

Nett Area The total estimated area of the coupe (to the nearest hectare). This area is to be determined from the calculated gross area less exclusion areas.

Nett Volume The volume of a log which can be converted to sawn timber. It is equal to the gross volume less the defect volume. Accounts are no longer issued in terms of nett volume however some licences are monitored in nett volume and sustainable yields are usually calculated in nett volume.

Non-declining Volumes, which do not decline over time, but may increase.

Old-growth Forest Forest which contains significant amounts of its oldest growth stage - usually senescent trees- in the upper stratum and has been subjected to any disturbance, the effect of which is now negligible.

Overmature A growth stage of a forest stand or individual tree that is characterised by declining crown leaf area and irregular crown shape due to loss of branches and epicormic growth.

Overwood Standing mature trees remaining after harvesting. Can refer to seed trees, habitat trees, culls or retained merchantable trees.

Periodic Annual Increment (PAI) The average annual increment for any defined short period, such as five years.

Productivity Class An area of forest that is considered for the purposes of yield estimation to be relatively uniform.

Public Land Unalienated land of the Crown managed and controlled by the Minister for Conservation and Land Management, the Minister for Agriculture and Natural Resources, or the Secretary of Natural Resources and Environment, whether or not occupied under a licence or other right (but not including land occupied under a lease, or land vested or leased by the Victorian Plantations Corporation or its successor in law).

Pulpwood Timber sold for the purpose of conversion to paper, pulp or other product which requires it to be chipped.

Reforestation The re-establishment of a stand of trees by planting or sowing with species native to the locality (unless an adverse microclimate requires the use of alternative native species for survival and growth) on previously cleared or poorly forested land.

Regional Forest Agreement (RFA) An agreement about the long-term management and use of forests in a particular region between the Commonwealth and a State Government.

Regrowth Forest Forest stands regenerated either naturally or by seeding following death or removal of the forest overstorey. A growth stage of a forest stand or individual tree in which the crowns have a narrow conical form and where trees are actively growing. A forest originating from fire, disturbance or harvesting actively below the nominal rotation age (Generally 1-60 years).

Residual Log (RL) Logs, not of sawlog quality, produced as a consequence of a sawlog harvesting operation. Unlike pulpwood the end-use of a residual log is not specified.

Retained Trees Trees retained on a coupe during a harvesting operation because they are unmerchantable, are to serve as seed trees or wildlife habitat trees, or have been selected to grow on after thinning.

Roundwood A log before it has been cut to produce sawn timber, veneer or woodchips.

Salvage Logging Logging to recover a resource that would otherwise be lost through damage by fire, pests or disease.

Sawlog Any length of merchantable log suitable for conversion to sawn timber which: is at least 2.7m in length, has a small end diameter under bark of 25cm or greater, does not have a sweep or crook which exceeds 1/5 of the diameter from a 2.4m straight edge, is of Grade D standard or better. Log suitable for conversion to sawn timber.

Seed Tree System All live trees are felled apart from a number of uniformly distributed trees retained to provide seed, and those required for environmental purposes. The seed trees would comprise 10-15% of the basal area of the original stand. An even-aged system.

Seed Tree A tree left standing following harvesting to regenerate the site by release of seed contained in the crown.

Selection System Silvicultural systems used to harvest and regenerate particular forest types. Trees are harvested either singly or in small groups at relatively short intervals indefinitely. Regeneration is established continually in the gaps produced and an uneven-aged stand is maintained.

Senescent See Overmature.

Statewide Forest Resource Inventory (SFRI) A strategic level inventory of forest resources on State Forest Victoria.

Shake A shake is a partial or complete longitudinal separation between adjoining layers of wood due to causes other than drying.

Shelterwood System A silvicultural system used for harvesting and regenerating particular forest types. It consists of the removal of a proportion of the mature trees to allow the establishment of essentially even-aged regeneration under sheltered conditions, followed by later felling of the remainder of the mature (seed) trees.

Silviculture The theory and practice of managing forest establishment, composition, and growth, to achieve specified objectives.

Single Tree Selection The felling of scattered mature individual trees, at intervals (generally 10-15 years) over the rotation. Regeneration is largely from lignotubers and coppice.

Site Index The relationship between the heights and ages of the dominant and co-dominant trees in a stand at a particular age, used as a measure of the amount of timber that could be produced from the stand.

Site Quality The potential of the site to grow timber. A function of soil quality, rainfall and aspect.

Size Class A range of log diameters. One product can have many size classes (or none). Size classes are used mainly for the application of royalty rates.

Small End Diameter Under Bark (SEDUB) The diameter is measured by averaging two diameter measurements taken at right angles to each other across the small end of the log, or by using a diameter tape placed around the circumference of the small end of the log. Bark thickness must be allowed for if using a diameter tape on an unbarked log. Diameter is expressed as the backward whole centimetre.

Smash That proportion of sawlogs that is lost due to damage that occurs when trees are harvested.

Soaks Springs and wet areas where the ground water table intersects with ground surface.

Special Management Zone (SMZ) The Special Management Zone will be managed to conserve specific features, while catering for timber production under certain conditions. These include areas where timber must be harvested in a different manner than is normal to protect particular values; for example in areas where accelerated tree senescence is being induced.

Special Protection Zone (SPZ) The Special Protection Zone will be managed for conservation, and timber harvesting will be excluded. It will include areas of special significance of flora and/or fauna, areas for protection of water quality and other values (such as rainforest, riparian vegetation), and other areas of special significance (like special landscape and historic value). Such areas will be linked to the parks and reserves system where appropriate.

Stand A group of trees in a forest that can be distinguished from other groups on the basis of age, species composition, condition etc.

Stand Condition The health, age and size class distribution, and stocking of a forest stand.

Standard Licence A sawlog licence that is renewable within five years of its expiry date.

STANDSIM A computer model developed to forecast the growth of even-aged stands of Ash, Silvertop and Messmate.

Stumpage The value of timber as it stands in the forest.

Sub-dominant A sub-dominant crown is one where the area occupied by the tree crowns of the upper stratum occupies 11%-30% of the total crown cover of the stand.

Sustainable Yield The sustainable yield of a forest is the maximum level of commercial timber which can be maintained in perpetuity under a given management regime. In Victoria sustainable yield is specified in legislation as the rate of harvest that can be maintained for a defined period (usually 10 years).

SYSS (Sustainable Yield Spreadsheet) A computer model developed to schedule woodflows and determine yields of sawlogs into the future.

Thinning The removal of part of a forest stand or crop, with the aim of increasing the growth rate and/or health of retained trees.

Thinning From Above (THA) Removing the larger and well developed stems from a stand allowing the smaller stems to increase their growth.

Thinning From Below (THB) Removing the smaller and poorly formed stems from a stand and allowing the larger better formed stems to increase their growth.

Timber Resource Analysis An analysis of the timber availability prepared for the RFA process.

Uneven-aged Stand Forest stand which contains a continuum of age classes as a result of more or less continuous regeneration within the stand over a number of years.

Unmerchantable Trees which are not suitable for processing into forest products and for which market exits.

Value Adding An economic term which describes how a raw product is processed into a product which is of more value than the material in its raw state. In the forest and wood industry context, examples of this include the kiln-drying of sawn timber and the manufacturing of wood veneers.

Waste See Smash.

Yield Curves A yield curve defines the volumes of logs available (in a particular forest type and productivity class) at different ages for a particular silvicultural regime.

12 Map 1 – Portland FMA

Portland FMA

Edenhope
Harrow
Hans Gap
Ararat
Cavendish
Casterton
Coleraine
Dunkeld
Streatham
Hamilton
Digby
Rennick
Penshurst
Dartmoor
Der
Macarthur
Nelson
Heywood
Camperdow
Koroit
Portland
Port Fairy
Warrnambool
Bridgewater
Timb
Por

State Forest
Parks and Reserves
Other Parks and Reserves
Other Public Land
Plantations
Private land
Water Bodies

State Government Victoria
Department of Natural Resources and Environment
Forests Service
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