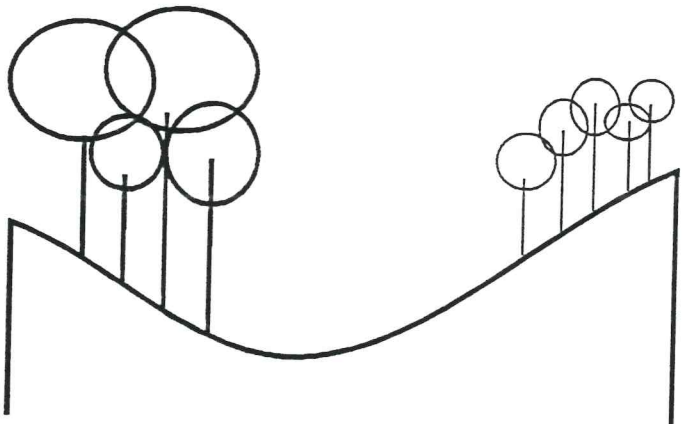

Guidelines for

MANAGING PLANTATION LANDSCAPES

Department of Conservation and Land Management

DEPARTMENT OF PARKS AND WILDLIFE

Guidelines for
MANAGING PLANTATION LANDSCAPES

THE WHAT, WHY, HOW, & WHEN TO INTEGRATE LANDSCAPE VALUES IN PLANTATION MANAGEMENT ?

INTRODUCTION

THERE are some simple questions and answers to the needs of Scenic or Visual Management of Plantation Landscapes. The following notes provide a brief summary of the important points to consider. For further details please refer to CALM's Landscape Management Section, and associated Program Guidelines.

SOME BASIC QUESTIONS

•Question 1 : What is Visual Landscape Management ?

Answer : Visual Landscape Management is a positive and integral component in land use planning and management processes. Its prime goal is to ensure that all uses and activities are planned and implemented so as to complement rather than detract from the inherent visual qualities of the environments in which they occur.

•Question 2 : Why should we integrate & manage scenic values in plantation management ?

Answer : The Western Australian countryside has a wide range of visual qualities. As a part of multiple resource land management CALM is committed to sensitively managing such landscape visual qualities. Some areas are scenically outstanding, and there are others that are severely degraded and are major visual blights in the landscape. When plantation areas are selected, planned & designed, established and harvested, such landscape visual qualities should be taken into account. With proper planning, we can protect, maintain, or enhance natural or cultural landscapes, visually, with plantations.

•Question 3 : When is a landscape scenic ?

Answer : Scenic qualities vary from district to district depending upon such factors as landform, vegetation, waterform and landuse patterns. As a general rule scenic quality increases with :

- greater degrees of uniqueness in rock outcropping, water and other natural features;
- greater degrees of naturalness and lesser degrees of human alteration;
- greater degrees of relative topographic relief and ruggedness;
- greater degrees of vegetation diversity and general landscape variety;
- greater degrees of vegetation diversity and green crop patchwork effects in agricultural landscapes; and
- greater degrees of vegetation mixture and edge diversity in coniferous plantations.

Landscape appreciation should also consider the position and numbers of viewers. Generally speaking, scenic views from major travel routes or use areas are more visually sensitive than from the 'back-blocks'. However, local communities or individual private landholders may insist that their landscapes should be sensitively managed as well as the more populated areas of the countryside.

Use visual landscape management mapping data where available. Classifying areas into Management Zones A, B, C will determine scenic importance levels, with corresponding visual quality objectives.

•Question 4 : When does a landscape become scenically degraded ?

Answer : Visual landscape degradation is usually due to changes in landscape naturalness, e.g, over-clearing, excessive planting, over-grazing, soil erosion, poor land sub-division design, the construction of buildings, roads, dams and other structures and the imposition of mining, fire, disease and other impacts.

•Question 5 : What are the essential attributes of a scenic plantation ?

Answer : A *scenic plantation* is generally one which reflects or borrows from the desired visual character of the surrounding landscape. Visual character is determined by the types of form, line, colour, texture, patterns and scales found in past or present landscapes. For example, if the landscape is undulating and curvilinear in appearance, with an open, mixed, extensive woodland cover then the plantation could also be extensive in scale, with a mix of species types, age groups, planting

densities, etc, with curvilinear boundaries. Hence the plantation does not contrast dramatically with its immediate environment.

If the landscape is primarily cleared farmland with a geometric layout, clusters of exotic plantings, etc, then the plantation can follow suit - small scale, exotic, dense, even aged and geometric.

The degree to which visual objectives are met will depend on the sensitivity and scenic significance of the landscape. Some simple, low cost design input can often reap heaps of visual resource benefit.

•Question 6 : What plantation operations are visually significant ?

Answer :

- Plantation Planning - location, scale, species selection, age class, etc;
- Boundary definition - are plantation boundaries straight or curvilinear?;
- Fire Protection - are fire breaks straight, curvilinear, mown, slashed, or bare earthed?;
- Spraying - if possible, select time when vegetation colour contrasts are minimal;
- Thinning and subsequent vegetation debris management; and
- Harvesting - location, scale and shape of harvest area. Gaps should reflect the open space patterns of the surrounding landscape. If appropriate, use harvest sequencing techniques to avoid major vegetation cover contrasts.

•Question 7 : What are the major landscape design factors to consider in plantation layout?

Answer : The major landscape factors to consider in the plantation design phase are -

- Location (or topographic position), size, shape, line, pattern & texture of existing and proposed plantation areas;
- Definition of tree lines and other vegetation boundaries;
- Plantation age and species diversity;
- Road, firebreak and/or hose lay network requirements;
- Natural landscape retention & enhancement opportunities;
- Location, extent and timing of proposed thinning and harvest operations; and
- Location and proximity of important travel routes, public and private vista points.

•Question 8 : What are the essential steps in the Visual Landscape Management of Plantations ?

Answer : In summary, the major steps to follow in the plantation landscape planning and design process are :

- Observe the plantation landscape setting. Take some time to see and appreciate the visual character of the surrounding landscape. What are the local, district or regional visual attributes or features of these landscapes?;
- Ask yourself - will the proposed plantation maintain, enhance or have a negative visual impact on these natural or cultural landscape features? How will the plantation look in 5, 15, or 30 years time?; What impacts will the plantation have on major private or public views and vistas of the landscape - during all establishment and harvest periods?;
- Are there any other local community landscape design ideas and aspirations that should be respected?;
- How then can the plantation be planned and designed to accommodate such visual landscape considerations?;
- Prepare preliminary plantation design plans and prescriptions to suit landscape management objectives and share these with neighboring property owners/residents;
- In sensitive areas, maintain a landscape evaluation & monitoring program. Take periodic photographs and monitor public and private feedback; and
- For any landscape management assistance please consult your State and Regional Landscape Planners -
  - Recreation & Landscape Group - Pinnacle House, Perth;
  - Southern Forest Region, Manjimup;
  - Central & Swan Forest Regions, Kelmscott.

Landscape Management Section,
Department Of Conservation And Land Management, Western Australia, Australia.
1993.

Guidelines for Managing Plantation Landscapes

Softwood and hardwood plantations have become major components of W.A.'s southwest landscapes. Their placement in the landscape can significantly improve an area's scenic value, or conversely degrade them. Often scenic improvements can only be achieved if suitable landscape planning is integrated into the overall plantation planning process. Failure to do this may cause unacceptable levels of social and economic impact, whilst reducing the potential multiple use value of plantation resources.

The aim of these notes is to provide a general background to the landscape planning requirements of plantations. Landscape planning criteria and design guidelines are essential to integrated resource management of plantation environments. They cannot stand alone. Moreover, the communication and implementation of these principles and procedures will become a key component of successful plantation management.

The guidelines presented in these notes have been adapted from various works, in particular Van Pelt (1980) and Crowe (1978). Details of these publications and others are provided as 'Further Reading' below. Land managers who wish to obtain more information on this topic and who are working within sensitive landscapes are encouraged to seek further assistance fromthe Department' of Conservation and Land Management's (CALM) Landscape Planning staff.

DESCRIBING PLANTATION LANDSCAPES

From a visual quality point of view, plantation landscapes can usually be described in one word - *uniformity.* This uniformity is generally apparent irrespective of whether a plantation is viewed from a considerable distance or up close, with plantation colour, texture, form, shape and line being the dominant visual elements. Refer Figure 1 and descriptions below.

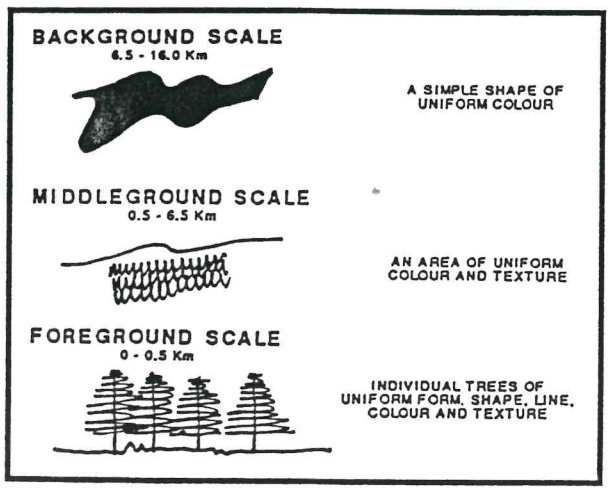

Figure 1 : Plantation Visual Uniformity

Foreground Scale : The viewing area from the observer to a distance of **0.5 km.**

Middleground Scale : The viewing area from **0.5 km to 6.5 km.**

Background Scale : The viewing area from **6.5 km to 16 km.**

Beyond **16 km** most management activities and plantation landscapes are largely indiscernible, or become Foreground or Middleground Scale landscapes from other viewing points.

LANDSCAPE MANAGEMENT & THE PLANTATION PLANNING PROCESS

STEP 1 : Preparation of Landscape Inventory & Analysis Plans

In conjunction with other resource inventory and mapping requirements it is important that the following attributes are identified on suitably scaled aerial photos and topographical plans (refer Figure 2) :

- Existing scale, shapes and patterns created by existing landforms, vegetation, waterforms, open space and land use.
- Existing lines within the total landscape - skylines, ridgelines, tree lines, stream & gully lines, road lines, fence lines, power and telephone lines, etc.
- Contours & steep slopes.
- Existing vegetation (type & location).
- Roads, dams, buildings, fences, powerlines, etc.
- Degraded areas - erosion, salinity, dieback, etc.
- Sites of landscape significance and/or visually sensitive areas, e.g. skylines, focal points, etc.
- Land suitable for plantation establishment (soil, rainfall, slope, etc.).
- Major viewing points and travel routes with Seen Area boundaries defined.
- Distance Zones - Foreground, Middleground & Background.
- Landscape Management Zone Mapping Data (available from CALM Regional & District Offices).

STEP 2 : Defining The Plantation Landscape Objective

Critical to the plantation planning process is the determination and acceptance of the Landscape Management Objective required for the plantation landscape. This vital decision must be made prior to any site selection or plantation implementation program. The objectives are as follows:

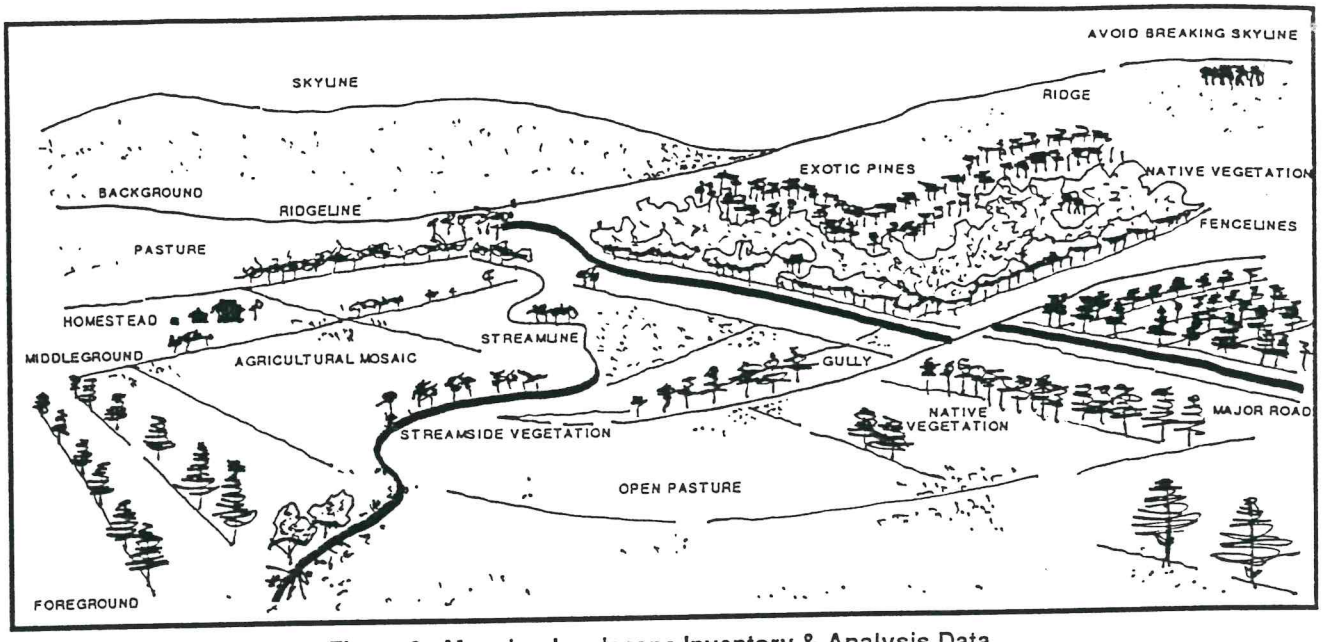

Figure 2 : Mapping Landscape Inventory & Analysis Data

Plantation Landscape Objective	Landscape Management Zone
Integrated Co-existent Dominant	A B C

The **Integrated Objective** is to be followed in sensitive landscapes (Zone A) where the plantation is integrated into the surrounding landscape by borrowing scale, shape, pattern and line characteristics from the surrounding landscape, and is only a minor component or addition to the overall landscape (refer Figure 3).

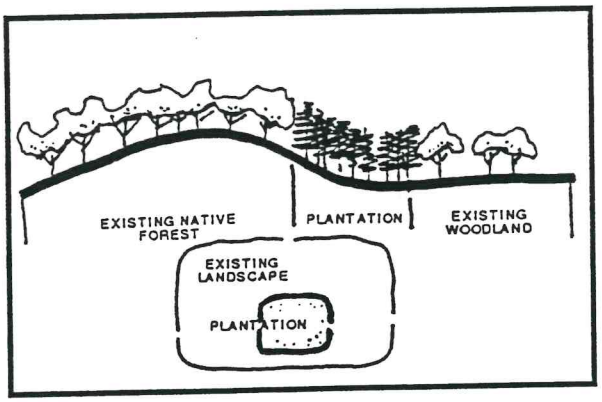

Figure 3 : Integrated Objective : The plantation is visually integrated with and only forms a small part of the surrounding landscape.

The **Co-existent Objective** is to be followed in moderately sensitive landscapes (Zone B) where the plantation co-exists within the landscape, borrowing scale, shape, pattern and line characteristics from the surrounding landscape and where the plantation forms an equal or near equal component of the overall visual landscape (refer Figure 4).

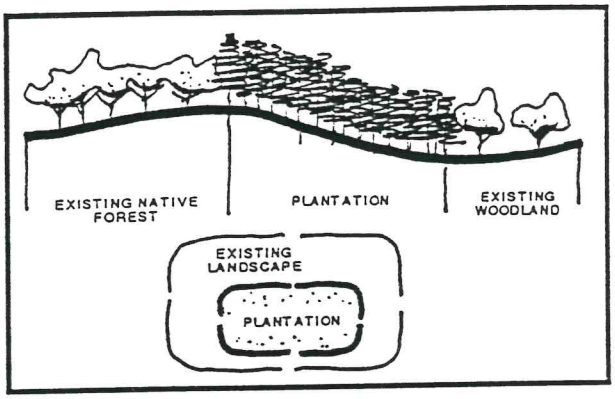

Figure 4 : Co-existent Objective : The plantation is visually co-existent and equal to the surrounding landscape.

The **Dominant Objective** is to be followed in the least sensitive landscapes (Zone C). Here the plantation may dominate and form the largest part of the surrounding landscape (refer Figure 5).

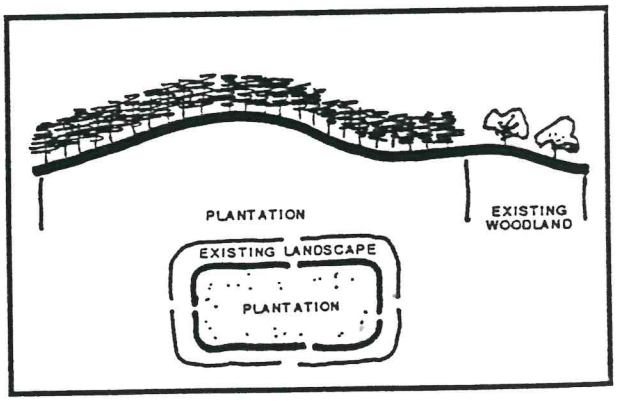

Figure 5 : Dominant Objective : The plantation is visually dominant and the largest part of the surrounding landscape.

STEP 3 : Site Selection, Design Guidelines & the Preparation of Landscape Design Plans

The landscape design of the plantation (establishment & harvest areas) can only commence upon completion of the landscape analysis and determination of the Plantation Landscape Objective. This work must also be completed prior to the commencement of any site works. Generally, the principle design aim is to borrow from the existing visual elements of the surrounding landscape when creating new shapes, patterns, lines and textures of the plantation establishment and harvest areas. The same mapping base, used in Step 2 above, should be used to illustrate the plantation landscape design plan/s.

The major factors to consider in the design phase are:

- Location (or topographic position), size, shape, line, pattern & texture of plantation areas;
- Definition of tree lines and other vegetation boundaries;
- Plantation age and species diversity;
- Road, firebreak and/or hose lay network;
- Indigenous landscape retention & enhancement areas; and
- Harvest Sequencing Program.

The following guidelines provide means of avoiding major visual impacts, hence addressing the ***Integration*** and ***Co-existence*** Objectives.

Design Guidelines For Background Scale Landscapes

- Plantation scale should reflect the scale of the surrounding landscape. For example, large open valleys can accommodate a greater area of plantation establishment and harvest area than smaller ones. Scale impacts can be minimised by separating plantation areas with existing vegetation or by creating cells of varying age classes.
- Patterns of the plantation areas should reflect or imitate surrounding vegetation, landform and land use patterns.
- Plantation shape and edges should where possible follow existing landscape lines, created by trees, creeks, gullies, spurs, ridges, roads, fences etc. Avoid reinforcing lines if they are incongruous with the surrounding landscape. For example, in a landscape setting which exhibits free flowing lines and is strong in landform, avoid straight vertical edges, breaking skylines and reinforcing property and fencelines that are geometric in nature. Side boundaries should be gently curving and on the diagonal. All boundaries should have a natural place to stop, such as a stream, existing vegetation and depression (refer Figures 6 and 7).
- The upper and lower boundaries of plantation areas should rise in gullies and fall on spurs and reflect the landscape quality, with jagged shapes in rugged country and smooth shapes in rolling topography. The upper boundary should be positioned so that any open space above the plantation is of sufficient size to reflect the scale of the hill top or ridge.
- In landscapes of weaker landform, plantation patterns may be stronger - with geometric, regimented rows or belts, for example.

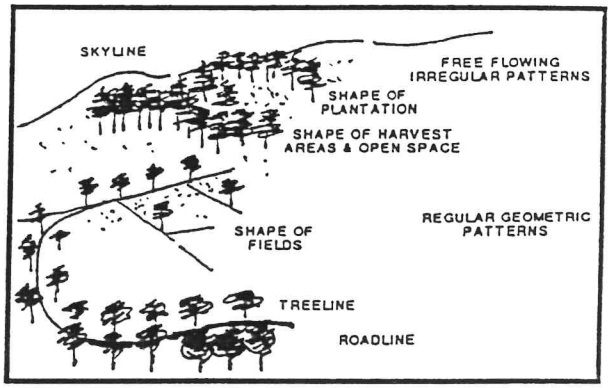

Figure 6 : Background Scale Plantation Design Factors.

- Plantation access roads and fire breaks should be of low visual impact, preferably screened, with alignments following contours, existing road patterns, vegetation lines, etc, as opposed to artificial property boundaries. (Refer Figure 7)

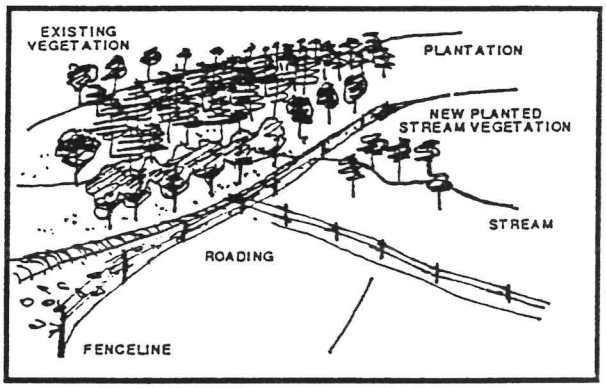

Figure 7 : Design of Background & Middleground Scale Plantation Edges.

- In visually sensitive areas, potential plantation impacts can be reduced by enhancing and extending existing vegetation areas with similar species plantings. These plantings could be protected from future harvesting, optimising wildlife, soil, water and recreation values. If harvested, then the sequence and timing of cut should be separate from the main plantation harvest schedule. See Figure 7.

Design Guidelines For Middleground Scale Landscapes

- At this scale Middleground areas dominate the landscape. The local appreciation of ridges, valleys and plains is offered. In comparison to Background Scale plantations, the whole plantation is unlikely to be viewed at one time. Perception of detail increases,

colour and texture replaces shape, and pattern and line become the major visual elements.

- The outline of the plantation area at this scale should be defined by gullies, spurs and ridges, and borrow from the lines offered by the surrounding landscape. Plantation areas should be defined as individual units broken up by ridges, drainage lines and dominant land use patterns.

- Avoid over reinforcing areas of maximum visual contrast, such as treelines, skylines, vegetation changes, etc. Ensure that such contrasts are reflecting other contrasts (if present) in the surrounding landscape. For example, in 'natural' settings, edges of vegetation change can be softened by sympathetic boundary lines, gradual change in density or age class across the interface, or with the use of species of different form, colour and texture. Refer to Figure 8.

- Patterns of open space, alley grazing or cropping areas should reflect the landform and vegetation character of the surrounding landscape. For example, avoid regular spacing and width of alleys in areas of irregular landform. For native plantations, irregular alley widths can help create variety in overall vegetation pattern when viewed from background areas.

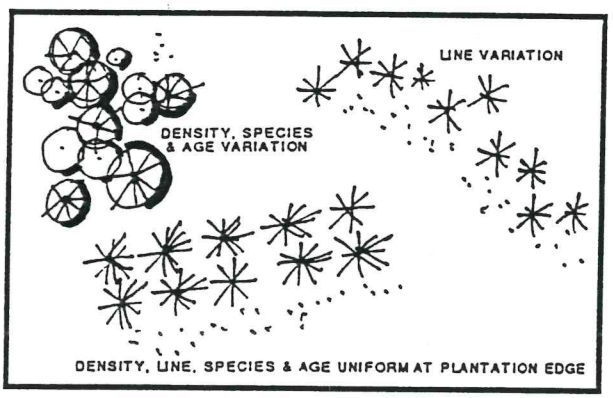

Figure 8 : Design of Middleground Scale Plantation Edges.

- For skyline edges, maintain ridges with species typically dominant within the surrounding landscape. For example, avoid pines in a hardwood forest setting. If pines are necessary then locate below the skyline and vary age class and planting density. The harvesting of ridge or skyline plantation areas should be sequenced to reduce the extent of clearing disturbance visible at any one time, or to enable adjoining areas to be successfully regenerated, etc. Refer Figure 9.

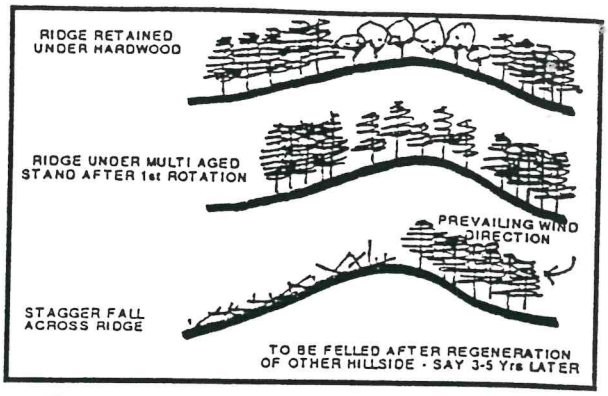

Figure 9 : Managing Middleground Skylines.

Design Guidelines For Foreground Scale Landscapes

- At this scale Foreground areas dominate the landscape. All perception of the Background and Middleground landscapes is lost. The micro scale dominates with occasional glimpses extending to the Middle and Background areas. The observer is virtually in the plantation landscape. There is total perception of details of individual trees, their colours and textures, their diversity or uniformity. Visual change to the plantation is most easily detected at this scale. Hence, Local scale plantation landscapes require a high degree of visual management throughout all stages of the plantation program.

- Follow the visual expression of the surrounding Foreground landscape. Avoid contrasts to these details. For example, in a uniform, colourful, geometric, foreground agricultural landscape setting, the visual character of an exotic, regimented looking blue gum or pine plantation could enhance the Local landscape.

- In 'natural', non-uniform settings encourage diversity through the physical separation of plantation sections or compartments. These areas may differ with age, species mix, planting density, thinning regime, etc.

- Maintaining visual penetration through the plantation can enhance visual quality of the plantation landscape. This can be achieved by an open or clumped planting density or through thinning techniques. In 'naturally' appearing landscape settings, thinning regimes should be non-uniform. Conversely, in geometric or culturally dominated landscapes thinning regimes should be regular and uniform.

- Access tracks, fire breaks, etc should be designed and constructed with low visual impact.

- Within sensitive areas, avoid visual impacts created by plantation debris, slash, etc. Reduce impacts by screening, burning or scattering debris away from seen areas. Refer Figure 10.

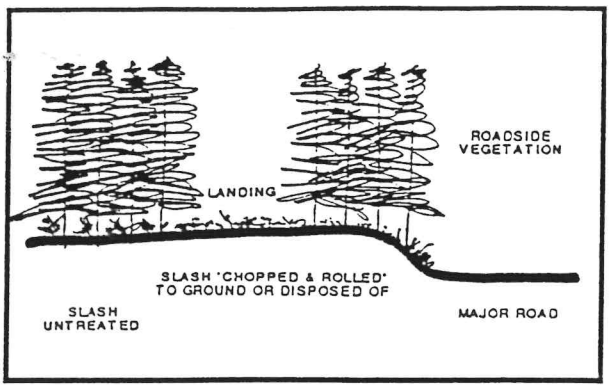

Figure 10 : Treatment of Plantation Debris.

- In sensitive areas, coupes should be of minimal size in relation to the overall plantation landscape. Felled areas should not dominate over unfelled areas. Refer Figure 11.

- In sensitive areas, employ harvest sequencing techniques. Roadside vegetation (future coupes) can reduce the visual impacts of adjoining clearfell areas. Final harvesting of roadside vegetation should take place after surrounding coupe areas have been regenerated or been replanted, and grown to become a strong enough visual element. Roadside vegetation could also be treated as multi-aged stands, and harvested sequentially within themselves. Refer Figure 10 & 11.

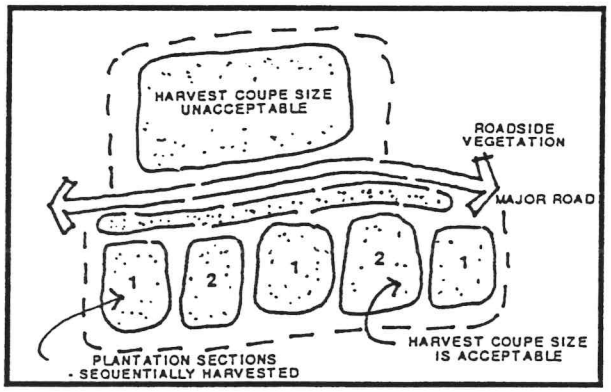

Figure 11 : Coupe Proportions, Sequencing & Roadside Vegetation.

STEP 4 : Plantation Evaluation & Monitoring

Implementation of the above plantation siting and design guidelines should be evaluated and monitored periodically during the life of the plantation. Performance and achievement levels of the Plantation Landscape Objective should be evaluated. In sensitive landscapes, a photographic record should be kept to assist in the plantation evaluation process. Standardised formats for photographic monitoring are available from CALM's Landscape Planning staff.

SUMMARY

The above planning and design process aims to integrate visual resource values with other plantation values in the overall plantation planning program. It is **essential** that this planning integration occurs at the earliest possible time, when prospective plantation areas are being identified and assessed if multiple use values are to be optimised. Landscape Management must be represented amongst the multi-disciplinary planning requirements of establishing and harvesting all plantations.

In summary, the major steps to follow in the plantation landscape planning process are :

- **Prepare Plantation Landscape Inventory & Analysis Plans;**
- **Determine the Appropriate Plantation Landscape Objective/s;**
- **Prepare Plantation Design Plans to suit Objective/s & Plantation Landscape Type;**
- **Maintain A Plantation Landscape Evaluation & Monitoring Program.**

FURTHER READING

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Western Australia
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