Visual Landscape Planning in Western Australia

a manual for evaluation, assessment, siting and design

Western Australian Planning Commission

Department for **Planning and Infrastructure**
GOVERNMENT OF WESTERN AUSTRALIA

Preface

This manual was produced by staff of the Department for Planning and Infrastructure with the support of an interagency working group comprising officers from the Department of Environment and Conservation, Main Roads WA and other agencies that deal with landscape.

The protection of landscape values is now expected by communities. Proposals which pass other tests, such as economic development and environmental management, are no longer accepted if they mar the view or impair highly valued landscapes. Yet there is no formal planning policy at a state or local level on visual impact and little in the way of guidance in setting objectives and undertaking assessments of impacts on the visual landscape.

This manual is intended to be a valuable initial resource for developers and planners in filling the gap.

The Western Australian Planning Commission supports visual landscape planning in Western Australia, so that the practice of visual landscape planning can evolve and mature. We do not want to see another layer of planning added to an already complex system. Instead, visual landscape planning must become simply a routine consideration amongst the many considerations that planning authorities and planners take into account when making plans and assessing proposals.

It is essential that planning authorities which respond to this new expectation do so in a systematic way. They must identify valued landscapes and specify the qualities of the landscapes that they wish to heal, restore, reinforce and protect. They must translate these policies into rules and criteria. They must be explicit about what they want in the landscape, and then express this succinctly in their local planning strategy.

The WAPC has requested the Department for Planning and Infrastructure to apply this approach in plan making and development assessment, so that, through case-by-case application and testing, skills and experience in this area will improve over time.

I commend this manual to all planners and local governments, and encourage you to contribute to its further development.

Jeremy Dawkins
Chairman
Western Australian
Planning Commission

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PART ONE - Introduction

1.1 Introduction

This manual provides advice to state agencies, local governments, developers and the community on techniques for incorporating visual landscape planning into the planning system.

The landscape character of Western Australia varies greatly and it is important that this diversity is enhanced in planning policy and statutory decision making. Landscapes are a fundamental part of our history and cultural heritage. The landscapes of the state are valuable for their intrinsic qualities, for the quality of life and enjoyment of people, and for the economic benefits they bring.

Visual landscape planning helps us to understand and articulate the character of the landscape and identify those features that contribute to scenic quality and sense of place.

This manual is not an academic text, statutory procedure or prescriptive policy for visual landscape planning and management for Western Australia. It deals primarily with the visual aspect of landscape, while recognising the importance of the more holistic social, cultural, environmental, economic and aesthetic factors as well. These are important factors but are beyond the scope of this document.

The manual has been developed by the Department for Planning and Infrastructure with the assistance of a working group including the Department of Environment and Conservation (DEC)[1] and Main Roads WA.

Visual landscape evaluation and visual impact assessment are evolving practices which are continuing to develop to take into account new and emerging issues and techniques. This manual should, therefore, be regarded as a 'work in progress'. It has been produced as a first step in visual landscape planning and will be used as a guide so that the practices of visual landscape evaluation and visual impact assessment can continue to evolve and mature over time.

1.2 The planning context

The planning system provides the context for the methodology set out in the manual. In this context, landscape is one of many considerations which must be taken into account in planning for the sustainable use and development of land. Landscapes are important but not to the exclusion of other factors in planning decision-making. The aim should be to accommodate change while maintaining and, where possible, enhancing the quality of our landscapes.

To achieve this aim, the visual landscape needs to be considered at all levels of the WA planning system.

The State planning framework sets out the general principles for planning and development and brings existing state and regional policies, strategies and guidelines into a central and comprehensive framework. It provides a context for spatial planning and decision making by the WAPC, local governments and other responsible authorities. In particular, it informs responsible authorities of those aspects of state and regional policy which are to be given effect across all aspects of planning.

The State Planning Strategy states that one of the criteria for plans is to "ensure that significant landscapes are identified and protected" and "that development proposals incorporate measures to retain or enhance landscape elements and vegetation".

State Planning Policy No 2: Environment and Natural Resource Policy elaborates on the importance of protecting and enhancing landscapes by stating that planning strategies, schemes and decision making should:

- identify and protect landscapes with high natural resource values (such as ecological, aesthetic or geological) and encourage the restoration of degraded landscapes;

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[1] The Department of Conservation and Land Management (CALM) merged with the Department of Environment (DoE) forming the new Department of Environment and Conservation (DEC) on 1 July 2006.

- consider the capacity of landscapes to absorb development and the need for careful planning, siting and design of new development in a way which is sensitive to the character of the landscape;

- consider the need for a landscape or visual impact assessment for development proposals that may impact upon sensitive landscapes.

Regional strategies provide the broad framework for planning at the regional level and the strategic context for local planning schemes and region schemes. Regional strategies should identify landscapes of regional significance which can be used to underpin planning controls in region and local schemes.

Region schemes provide the statutory mechanism to implement regional strategies, co-ordinate the provision of major infrastructure and set aside areas for region open space and other community purposes. The reservation of land for region open space is fundamental to protecting significant regional landscapes and acquiring land for public use and enjoyment.

Local planning strategies set out the general aims and planning directions of local governments to be applied in promoting and controlling growth and change in their areas. The local planning strategy interprets state and regional policies at the local level and provides the rationale for the zones, reservations and planning controls in the local scheme. Local planning strategies will identify regional and local landscapes and help set the objectives and policies for the protection and enhancement of these landscapes.

Local planning strategies are intended to be working documents which will be regularly reviewed and kept up to date. Local goverments, particularly those with areas of significant landscape value, are encouraged to review and incorporate appropriate landscape policies in their strategy.

Local planning schemes provide the statutory mechanisms to implement local planning strategies through zonings, reservations and planning controls. Some schemes have introduced landscape zonings to protect and enhance local landscapes by controlling land use and development which could adversely impact on the landscape and ensure new development complements and enhances the landscape. The WAPC favours the use of special control areas to identify significant landscapes in local schemes and apply planning controls to conserve and enhance the character of these landscapes. Performance based policies, following a rigorous assessment of the landscape concerned, can also be used.

Development assessment is generally required for developing land or buildings, or changing their use. Planning approval is usually obtained from the local government but, in some cases, approval may be required from the WAPC. The WAPC is also responsible for subdivision approval. The careful assessment and determination of planning and subdivision applications is important in ensuring state, regional and local objectives for the landscape are met and plans and policies put into place.

1.3 Visual landscape in the planning system

Planning systems are best understood as comprising a **plan-making stage** and a **development assessment** stage. The regional and local strategies and schemes, described in the previous section, result from plan making. They establish the priorities, criteria and rules which should guide development. Development assessment is then the process by which proposed development is assessed against these standards.

This manual adopts the terminology commonly used by practitioners of visual landscape planning in Australia and elsewhere.

Plan making

In preparing planning strategies and schemes, **visual landscape evaluation** is the tool which is used to understand what gives landscapes their particular character and to help frame policies and rules which protect and enhance that character.

Development assessment

In development assessment, **visual impact assessment** is the tool used to assess the impact of development on the landscape to ensure that development is sympathetic to the landscape character and complies with adopted policies and rules.

1.4 Scope of the manual

This manual contains 3 parts.

Part 1 – introduction: introduces the manual and sets it within the framework of the planning system.

Part 2 – visual landscape planning methods: explains the techniques of visual landscape evaluation and visual impact assessment in detail.

Part 3 – guidelines for location, siting and design: considers land uses and developments that may give rise to potential impacts on different landscapes and measures to address these impacts.

PART TWO -
Visual Landscape Planning Methods

Background

The concept of landscape

Although the visual landscape of Western Australia is perceived by many as lacking in variety, when we look more closely we find extraordinary diversity, often subtle and subdued, that is anchored in an ancient and varied physiology with diverse ecological components and characteristics.

Landscapes can be fragile or robust, attractive or unattractive, boring or interesting, complex or simple, easy or challenging, depending on how human beings perceive and respond to their characteristics. Perception of and interaction with landscape is as enigmatic as it is dynamic and challenging for land managers and planners.

Image 1: *Western Australian landscapes are anchored in ancient and varied physiology.*

Image 2: *The character of landscapes may change dramatically over a short period of time.*

There are many academic and practical disciplines that help us understand the landscapes where we live, work, recreate and travel. Landscape is where we are: rural or urban, natural or altered. It is a major contributor to our essence as individuals and as a community and helps define our sense of place. These are the very qualities that set one landscape apart from another and make it distinctive.

Landscapes change over time, both naturally and through human intervention. Efficient management of these changes is the responsibility of land managers, planners, government leaders and all members of the community. How changes to landscape features, processes and systems are perceived and managed depends on a large number of human, ecological and cultural variables.

Planning for change to our visual landscapes is extraordinarily complex, as it must deal with environmental alterations in a context of social, economic, cultural, political, spiritual as well as emotional values and sensitivities. The aims of this manual should assist in resolving conflicts between land use and environment, cultural sensitivities and lack of concern, and economic return and exploitation.

Conflicts that result in loss of visual landscape value are generally the outcome of land use decisions that overlook inherent visual landscape characteristics. There are conflicting opinions when it comes to the visual perception of landscape, there are differing opinions on what is valued and what is not and this will result in different outcomes. Other factors to be considered include over-estimating the ability of landscapes to absorb change, trade-offs that have taken place, under-estimating negative impacts resulting from change, and insensitivity to historical or cultural patterns and human value systems.

Landscapes of Western Australia

Western Australia occupies one third of the Australian continent from the tropical climates in the north to the temperate south. The natural landscapes are extraordinarily diverse including arid and semi-arid deserts, rugged tropical savanna, cliffs, gorges and mountain ranges, wide mallee and scrub covered plains, salt lakes, hilly woodlands and majestic tall forests. The long coastline is also extraordinarily varied with sandy, rocky and cliff features, mud flats, mangroves, dune systems, sandy coastal plains, inlets and estuaries. Offshore islands and reefs create diverse seascapes. These landscapes occur on a vast scale with changes often occurring gradually over long distances.

The predominant character of the physiography at the macro scale is subdued and worn, but in this are surprisingly dramatic mountain ranges, gorges, incised drainage systems, hills, dunes and special features provide great diversity and distinction. Associated vegetation patterns also provide magnificent variation in colour, texture and form throughout the seasons and climatic zones. Landscapes of apparent uniformity are often abundant in diversity at a small or micro scale with features such as a cave entrance, dry creek bed or billabong or intense colours in shrubs and minute wildflowers.

The State is also renowned for a number of seasonal events that transform the character of the landscape. These include weather events such as cyclones, the northern wet season, rainfall in the deserts, wind on the coast, ephemeral drizzle on the coastline and seasonal displays of unique wildflowers that provide landscape diversity at a detailed level.

Many of Western Australia's most highly valued natural landscapes are protected in the conservation estate: national parks, nature reserves, marine parks, marine nature reserves and conservation parks, ensuring that they remain essentially natural in character.

Image 3: *Western Australia's natural landscapes exhibit a wide range of characteristics.*

Western Australian landscapes retain much of their natural character, although evidence of change due to human intervention and land development is regionally and locally prominent. Areas of naturally established vegetation are dominant throughout much of the northern and interior eastern regions of the State, with smaller areas of natural forest in the south. Grazing has altered vegetation species composition in many locations.

Image 4: *Regional parks protect Perth's major natural landscape features, such as the Darling Scarp.*

The modified landscapes of Western Australia consist of the rural agricultural lands that stretch from the pastoral lands far north, to the wheat and wool areas of the Mid West. The Wheatbelt region has a distinct character of broad-acre farming lots with stands of remnant vegetation, as well as shelter-belts of trees to protect the soils from wind and water erosion. The colours of the agricultural areas over the state vary, with the deep red soils of the north, the orange dolerite in the wheat-belt, with the occasional York gums, to the grey granite rock outcrops amongst the farming lots of the Great Southern region. There are many different crops grown in the State, from the distinct low lying pastures that stretch for kilometres in the north, to the bright yellow canola crops down in the Lower Great Southern region. Plantations are a regular feature in this region also, where the mixed land use of rural areas increases over time. Vineyards are a dominant rural characteristic of the South-West, with stands of old growth vegetation along the road sides that create a shady, dappled driving experience through the main highways and tourist drives. There are many rural mixed uses in the South West from viticulture, dairy farming, to market gardens and bed and breakfast homesteads.

Cultural features in this modified landscape range from wind mills to rural housing, old homesteads, water tanks, grape vines, rural style fencing and livestock nestled against the Darling Scarp on the

way to the South-West, or scattered in the large expanse of the pasture fields in the north. Other evidence of rural mixed uses in the agricultural areas of the state consists of mine-sites, industrial zones and commercial strips in country town sites. Rural agricultural landscapes are sparsely populated, but heavily modified.

Some countries, such as the UK, place a high value on maintaining historic, scenic or other characteristics of their rural landscapes. Western Australia's image has been shaped and defined by its rural and remote landscapes. However, rural areas have been somewhat under valued for their inherent visual, aesthetic character, and landscape quality tends to be overlooked in statutory processes in rural areas, instead the perception of the land has primarily been in terms of economic return. In recent years there has been some indication that community attitudes toward rural landscapes are changing; with a greater priority being placed on action to address landscape values and changes to rural character, as well as other environmental concerns such as land degradation, loss of biodiversity, and water quality.

Built landscapes are the most highly modified, and are significant to the communities of Western Australia, partly because they are the landscapes experienced by the majority of people on a daily basis. The metropolitan area of the state capital Perth and the CBD display a strong cultural

Image 5: *Protecting rural landscape character has become a greater priority in Western Australia.*

Image 6: *Portions of the built landscape are protected as heritage precincts.*

The development of visual landscape methodologies has evolved over the past 40 years, both globally and in Australia. Numerous summaries of this body of historical work have been researched, documented and assessments made (refer to the Bibliography for a comprehensive list of readings and research).

The visual landscape management system developed by the Department of Environment and Conservation (DEC) (Appendix 6) has suited the requirements of that agency in broad scale planning and managing its public lands, primarily in natural settings. There has been a call for a visual landscape planning model for private land (consisting of natural, rural and built landscapes) that would complement the DEC system.

landscape from the tall glassy skyscrapers to the more historic buildings that still remain on the major streets of the city. Portions of the built landscape are protected through creative development of urban heritage precincts, special historic urban communities and establishment of urban parks and bushland reserves. This protection of heritage precincts has occurred in other cities in Western Australia such as Fremantle, Kalgoorlie, Bunbury and Albany. Regional towns also have significant portions of built landscape that display the historic nature of the towns such as Broome, York, Margaret River, Yallingup and Esperance.

Western Australia has no single model for visual landscape planning in the context of the current planning system. Visual landscape inventory methods differ with dynamic landscape factors and requirements of application. Various methods have been designed to suit the specific needs of planning and management agencies, researchers and individual practitioners, but there has been no single visual landscape methodology that suits all planning applications.

Visual landscape planning methods

There has been a need to develop and document visual landscape evaluation and visual impact assessment procedures that more closely meet the requirements of government planners, planning consultants and developers. There has also been an expressed need for cross-agency guidelines to assess the possible visual impacts of a number of specific land use types, as well as investigation of both statutory and non-statutory planning mechanisms that assist in the protection of landscape.

There are several broad steps common to most visual landscape planning methodologies and the methods developed for this manual are consistent with these. The visual landscape evaluation model promoted in this manual consists of five steps.

Step 1: Define the scope of the evaluation and set the context.

Step 2: Describe the visual landscape character.

Step 3: Evaluate the way the visual landscape character is viewed, experienced and valued.

Step 4: Develop strategies for managing visual landscape character.

Step 5: Implementation strategies through the planning system.

There are also standard sequential steps for visual impact assessment of development proposals. The process developed for this manual comprises five steps.

> Step 1: Determine visual management objectives.
>
> Step 2: Describe proposed development.
>
> Step 3: Describe the potential visual impacts.
>
> Step 4: Develop visual management measures.
>
> Step 5: Prepare final recommendations and options for monitoring.

The visual landscape evaluation and visual impact assessment processes presented in this manual together comprise an effective generic model that is a hybrid amalgam of those that have preceded it.

2.1   Introduction

Awareness that landscape is an issue is usually prompted through local community concern or planning processes calling on a visual landscape evaluation or visual impact assessment to be undertaken. Land managers, planners and consultants may use this document in response to any landscape issues that arise. It is not implied that land managers and planners will assess every landscape area they are responsible for. The visual landscape planning methodologies presented are tailored specifically for addressing landscape issues in the planning process.

Users of this document can adapt the methodology steps to suit the landscape issue that needs to be resolved and the specific planning application. It is important to note that users do not have to undertake all steps outlined in the methodology if they are not relevant to the specific planning application.

Visual landscape assessment tools

The relationship between visual landscape evaluation and visual impact assessment is shown in Figure 2.1.

Visual landscape evaluation is a proactive process used in the preparation of planning strategies and schemes. **Visual impact assessment** is essentially reactive in nature for use in the assessment of development proposals.

Visual landscape evaluation should precede visual impact assessments to provide the background landscape description, establish the appropriate visual character objectives and form the basis of criteria and rules in strategies and planning schemes.

Visual Landscape Planning

Plan making	**Development assessment**
Visual landscape evaluation (for use in preparing planning strategies and schemes)	**Visual impact assessment (VIA)** (for use in assessing proposals)

Define scope and set context ········· Determine visual management objectives

Describe visual landscape character → Describe proposed development

Evaluate how visual landscape character is viewed, experienced and valued ········· Describe potential visual impacts

········· Develop visual management measures

Develop strategies for managing visual landscape character ········· Prepare final recommendations and monitoring options

Implementation
Existing planning mechanisms
Planning outcomes
Development options
Consultation and review

Figure 2.1: *Relationship between visual landscape evaluation and visual impact assessment.*

Setting the scope

The scope and context of the study needs to be determined at an early stage of the process. To set the scope, the investigator needs to:

- review the policy context and planning considerations relevant to the landscape issue;

- consult relevant authorities, developers, statutory planners, tourist interests and landscape consultants;

- informally consult with stakeholders, and local community;

- review any relevant strategic plans or guidelines;

- agree on the terms of reference and techniques to be applied; and

- determine a project time frame and budget.

This will assist in identifying key issues and determining relevant sources of information and expertise.

Scale

Visual landscape planning can be conducted at one of three scales: regional, local/district and site level, which are the primary planning levels in Western Australia. **Appendix 1** (Table 1) shows the scale, the different types of plans that apply to each scale of application, detail required and the amount of professional expertise needed. The steps need to be adapted to suit the scale of planning application.

Triggers for visual landscape assessments

State and local government agencies vary in the triggers that may result in visual landscape planning. For example, triggers that affect DEC may be legal in nature, such as the need to approve proposals that impact on the DEC managed estate. Planning agencies, including DPI and local authorities, may require a visual landscape evaluation as a component of a strategic planning exercise, or require a visual impact assessment as a component of assessment of development proposals.

Stakeholder involvement

The term 'stakeholder' refers to a wide range of groups and individuals who have a direct interest in, or are affected by changes to a region, locality or site. Stakeholders range from communities of residents, visitors, landowners and local interest groups to government agencies, local authorities, consultants and professionals.

Some may have a livelihood, personal or family interest, an environmental or scientific interest and others may be involved in land uses that contribute to the form and condition of the landscape.

All stakeholders, including the general community, and experts such as consultants, landscape architects and planners should be involved in the visual landscape assessment process.

Community consultation and involvement is aimed at creating a greater awareness of community attitudes towards visual landscape planning. Visual landscape values are not inherent in a physical sense, they are perceived by the community. For specific ways to involve the community refer to Appendix 4.

Involving all stakeholders will reduce the likelihood of conflict at the end of the planning process. In particular, community participation in visual landscape planning ensures that the community's perspectives and needs are considered.

It is most important to identify who in the community is likely to be interested or have a stake in the outcomes, and which sectors of the community are likely to be affected. Methods of obtaining stakeholder input at desired stages in the assessment need to be decided. Community advisory groups may represent the general community.

> The benefits of involving stakeholders at various stages of the planning process are:
>
> - more informed assessments;
>
> - obtaining important local knowledge;
>
> - increased ownership of the outcomes;
>
> - increased participation in the decision-making process; and
>
> - reduced likelihood of conflict (eg fewer legal appeals).
>
> It is important to note that the involvement of the community and relevant stakeholders is most effective at the local level, where local authorities can directly develop plans and strategies that encompass their local community and other stakeholder input, where specific development applications may be a local community concern.

2.2 Visual landscape evaluation

The visual landscape evaluation method developed for this manual consists of five steps. Each step is explained in detail; as well as helpful hints and mapping tips in each step. The steps are outlined at the beginning of this section for easy referral. Figure 2.2 illustrates each step of the method, including mapping outputs. In this section the term 'landscape character' predominately means 'visual landscape character'.

STEP 1
Define the scope of the assessment/set the context

Base Map
study area boundary
basic geographical features

STEP 2
Describe the visual landscape character

Map 1 - Landscape character units
uniform patterns of vegetation, topography, water form and land use

STEP 3
Evaluate the way the visual landscape character is viewed, experienced and valued

Map 2 - Viewing experience and values
key views
viewing locations and significance
visual character preferences

STEP 4
Develop strategies for managing visual landscape character

Map 3 - Visual landscape strategies
overlay **Map 1 + Map 2**
+ annotated strategies
+ areas of priority for planning and management
= Map 3

STEP 5
Implement strategies through the planning system

Figure 2.2: *Visual landscape evaluation method with mapping outputs.*

Step 1: Define scope of the evaluation and set the context

- Why is this visual landscape evaluation needed?

- What are the objectives?

- Who will use the evaluation, and for what purpose?

- What is the scale of application?

- What are the boundaries of the landscape being considered?

- How much detail is required?
  Appendix 1 (Table 1)

- What is the role of the expert?
  Appendix 1 (Table 1)

Outputs

1. decisions about objectives, role of experts and stakeholders;

2. decision on scale of application;

3. level of detail confirmed; and

4. a generic base map.

There are three components to Step 1:

1. **Identify the planning outputs for this study and determine stakeholder involvement and methods.**

2. **Determine appropriate steps and amount of detail that will be required.**

3. **Gather and document base information that will be required for this evaluation including the generic base map.**

Identify the type of planning output your study will feed into, and the ways in which your output should be tailored so it can be incorporated. For example, can landscape character units be used as planning precincts?

Decide the stages at which stakeholder input will be obtained, and the measures to be used.

The amount of detail required for the visual landscape assessment will vary according to the scale of application of your project, ie regional, local or site and which steps are applicable to your project. Some of the detailed steps may not be applicable to your landscape study area (see Figure 2.2).

If you decide you need additional help, some options are provided in Appendix 1 (Table 1).

Prepare a **base map** to determine the scale of application and boundary of the study area.

The base map should include:

- a scale and scale bar

- a north point

- a key describing symbols used to represent features

- study area boundary.

Supporting information to provide context should include:

- roads

- settlements

- all prominent landform features, land marks and individual features such as hills, headlands, rivers, coastal bays and distinctive trees

- shire boundaries (if applicable)

- suburb or district boundaries (if applicable)

- planning precincts (if applicable).

Note: if you use aerial photography to produce your base map, the above categories should be superimposed.

Map the above characteristics to produce the base map for your project area, at the appropriate level of application for your project (regional, local, site). The availability of existing detailed base maps will depend on the site location and any previous studies that were conducted. This map is to be used as the base for maps in subsequent steps of the visual landscape evaluation process.

Although most of the following steps are suited for desktop analysis, fieldwork is essential to verify, validate and complement the desktop information (see Section 2.4).

Step 2: Describe the visual landscape character

- What are the individual landscape character units?

- What are the main natural, rural and built characteristics?

- What are the key features in this landscape?

- What is the visual character of this landscape?

Outputs

1. Broad written description of study area's landscape character, detailed description of the visual landscape character of each unit and graphics to illustrate the landscape character descriptions and units.

2. **Map 1 - Landscape character units** that illustrates homogenous patterns of vegetation, topography, waterform and land use; as well as individual landscape features, including natural, rural and built elements. (Figures 2.6 - 2.9.)

There are three components to Step 2:

1. **Identify landscape character units.**

2. **Describe landscape character units.**

3. **Map landscape character units.**

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1. Identify landscape character units

Begin with a general analysis of the landscape of the entire study area; highlighting the major landform, vegetation, water form and land use characteristics.

The primary characteristic of a landscape may be its basic type of land categories or land use: natural, rural or built. This distinction may be particularly relevant at a regional level.

All three types of land use may not apply to a study area. For example, a large area can be divided into natural, rural and built land use categories, but in smaller projects the entire area may be rural in character, but will still contain natural and built features.

Landscape character units generally comprise homogenous patterns of characteristics such as landform, vegetation, water form and land use as well as individual features. Determine the character units using the broad overview description to start with, the homogenous geographical patterns that are evident, and the base map prepared in Step 1 may assist with determining boundaries.

2. Describe landscape character units

'Reading the Remote: Landscape Characters of Western Australia' (CALM et al 1994) provides descriptive inventories of the varied and unique landscapes in Western Australia, and frames of reference to assist in describing the landscape.

Focus on **visual landscape character**, which refers to the appearance of the basic landscape elements; landform, vegetation, water bodies and human land use, that make an area identifiable or unique. A range of terms may be used. The standard visual descriptors in 'Reading the Remote' (1994) are form, line, colour, texture and scale. However, there is a wide range of suitable, non-emotive terms. The examples provided in Table 2 use as a guide, as not all terms are appropriate to every landscape. Modify the descriptions where appropriate. Several other key terms are stated and defined in Appendix 5: Glossary.

In conjunction with the description of the overall visual character of the landscape study area, the landscape character units can also be described in terms of the basic land use categories: natural, rural and built characteristics. The next three sub-sections provide examples of how to describe each of these categories. Figures 2.3 - 2.5 and Table 3 provide examples of ways of describing visual landscape character.

Table 2: Examples of terminology for describing visual aspects of landscape character

Scale	Intimate	Small	Large	Vast
Enclosure	Tight	Enclosed	Open	Expansive
Diversity	Uniform	Simple	Diverse	Complex
Texture	Smooth	Textured	Rough	Very rough
Form	Vertical	Sloping	Rolling	Horizontal
Line	Straight	Angular	Curved	Sinuous
Colour	Monochrome	Muted	Colourful	Garish
Balance	Harmonious	Balanced	Discordant	Chaotic
Movement	Dead	Still	Calm	Busy
Pattern	Random	Organised	Regular	Formal

Adapted from: Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute, 1995).

Natural landscape character

Natural landscape characteristics remain predominately unmodified. A natural area may be large enough to warrant identification as a separate character unit. Enclaves of cleared land may be incorporated in an area designated as a natural landscape if the overall character remains natural. Individual natural elements such as landform (topography), water bodies and remnant native vegetation may also occur in rural and built landscapes.

Describe natural character in terms of established visual elements. Elements to consider may include:

- Landform (topography): ridgelines, escarpments, hills and valleys, Examples of individual landform features include rock outcrops, boulders, sand dunes, natural embankments and clearings, gorges, cliffs and limestone ridges.

- Vegetation: height, patterns, predominant species type, density, colour, textures, understorey layers and percentage of canopy cover. Examples of individual vegetation features include variation in woodland species, individual trees, and wildflowers patterns.

- Waterform: size, extent, depth, colour, common surface texture for example, rippled, flat or choppy, surf breaks, as well as the edge characteristics of the water body eg embankment slope, line of the coast or rock boulders that border a waterform. Linear forms include streams and rivers. Open water bodies include lakes, estuaries and coastal waters. Examples of individual waterform features include: rock pools, waterfalls, rock seepages, fast-flowing stream, rapids or still water pools.

- Soils and exposed rock (describe rock form and surface soil colour and texture).

Straight line of slope to ocean broken by steep shoreline cliffs

Rock features that are prominent at a district level

Rock features that are prominent at a site level

Shoreline diversity created by combination of sandy beaches and rocky shores

Low coastal heath and scrub vegetation open views

Colour, form and texture diversity of rock formations and vegetation visible at close distances

Figure 2.3: Natural landscape character.

Describe rural characteristics in terms of established visual elements. Elements to consider may include:

- agricultural crop patterns, colour and scale;

- plantation density and location, scale, colours, textures;

- remnant vegetation stands;

- individual remnant or exotic trees;

- presence of natural features such as landform and valley slopes;

- location and rural character of farm homesteads and associated buildings;

- settlement pattern of rural towns;

- land tenure and zoning;

- diversity in agricultural land uses;

- mining activities (eg quarries);

- utilities (including powerlines, water pipelines, wind turbines, mobile phone towers);

- road patterns and character;

- roadside vegetation pattern, density and naturalness;

- ephemeral features such as wildflowers, fauna, and water conditions; and

- individual features such as windmills, historic buildings, bridges, fences, livestock and landmarks that are perceived as rural icons of cultural significance.

Remnant vegetation on ridge creates a natural backdrop to cultivated valley

Abrupt edge between cleared land and remnant bush

Strong regimented pattern created by rows of fruit trees. Emphasises undulating landform character
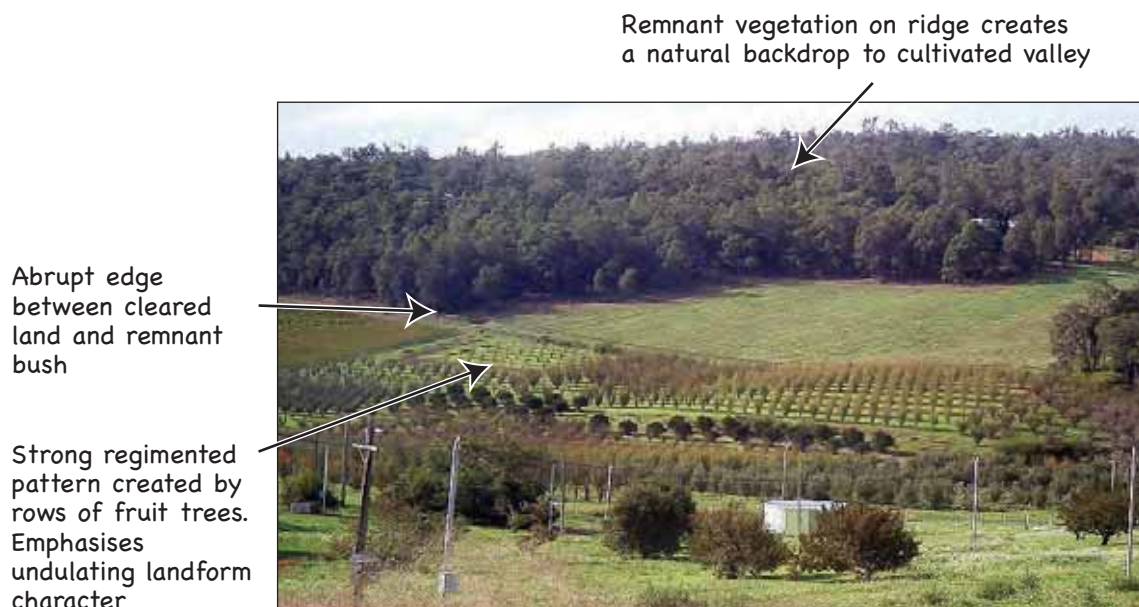
Figure 2.4: Rural landscape character.

Built landscape character

Describe built characteristics in terms of established visual elements. Elements to consider may include:

- settlement patterns;

- land tenure and zoning;

- general road layout;

- streetscapes (general, parking, freeways, main streets, residential);

- buildings (general, residential, commercial, industrial, community, institutional, transport);

- pedestrian ways;

- trees in streets, gardens and parks

- public open space (vegetation and parks in built areas);

- open space (including semi-public and private areas);

- colour and style of built forms;

- location and design of industry and commercial areas (including ports); height, colour and siting of buildings, utility towers, power poles and lines; and

- individual features in a built area, such as historic buildings and features, landmarks, artworks, railway stations and other unique built structures.

Pattern of residential area is defined by road grid. Major roads are orientated either parallel to the coast or at right angles to it

Influence of the coast's configuration is reflected in linear open space, parking, tourist accommodation and coastal road alignment

Figure 2.5: *Built landscape character*

Table 3: Examples of elements (natural, rural, built) that may be described at each scale of application: regional, local and site

Regional	Describe the natural character of national parks, state forest, coastal reserves and areas of partially cleared or little used lands.
	Describe rural character in terms of broad patterns of land use, tenure and settlement.
	For built landscapes, focus on broad aspects, such as large-scale natural features including hills, escarpments, rivers and large water bodies; and related large-scale patterns of urban form, regional parkland, transport corridors and ranges of development densities.
Local	Describe the natural character of large uncleared reserves, or unique landform.
	Describe rural character using more detail about types of buildings or stands of remnant vegetation.
	For built landscapes, focus on smaller scale patterns and features as listed above.
Site	Describe the natural character of areas of remnant vegetation, individual trees or rock outcrops.
	Describe rural character using even more specific detail, such as type of fencing or species of wind break vegetation.
	Focus on detailed streetscapes, site specific built elements and small-scale open space.

3. Map landscape character units

After undertaking a broad analysis and description of the visual landscape character, divide the study area into character units for the purpose of evaluation; and developing strategies to manage and plan for each character unit.

Prepare Map 1 - landscape character units, which illustrates homogenous patterns of vegetation, topography, waterform and land use; as well as individual landscape features, including natural, rural and built elements.

Table 4 assists in the mapping of landscape character units and individual features responsible for the general landscape character of an area. Landscape character maps incorporate character units and prominent individual features and landmarks that contribute to the overall character of an area. In some cases the boundaries of character units may need to be arbitrary. This should be noted in the character description.

Table 4: Examples of mapping landscape character units at the three scales of application

Regional	Using broad scale character units, map the landscape character divisions found in Reading the Remote: Landscape Characters of Western Australia (CALM 1994). Map the three land use categories where applicable: natural, rural, built (Figure 2.7).
Local	The landscape character units mapped at a regional level may be subdivided into smaller units at the local level. Map landscape features such as ridges, creek-lines, wetlands, rural hamlets and prominent individual buildings superimposed on landscape character units.
Site	Units from the local level should be further subdivided for application to individual sites. Map specific individual landscape features such as tree stands, heath and scrub, small water bodies, rock outcrops and varied vegetation species. Note that at a site level character units may not be needed and/or appropriate. Description and determination of individual features may be adequate for mapping at a site level.

Figure 2.6: *Excerpt from landscape character units map, Landscape Background Report (2006) prepared for the Lower Great Southern Regional Strategy (WAPC 2007) visual landscape evaluation, illustrating division of the landscape into overlapping categories comprising both physiographic units and categories that are based on land use.*

Legend

1 Leeuwin Naturaliste Coast
2 Swan Coastal Plain
3 Scott Coastal Plain
4 Darling Plateau
    Sub Types: 4.1 Darling Uplands
               4.2 Pemberton Slopes
5 Wheatbelt Plateau
    Sub Types: 5.1 Geraldton Plain
               5.2 Dryandra Uplands
               5.3 Merredin Plateau
               5.4 Esperance Plain
6 Kalgoorlie Plain
7 The Nullarbor
    Sub Types: 7.1 Nullarbor Plain
               7.2 Mardabilla Plain
               7.3 Israelite Plain
8 Meekatharra Plateau
9 Kalbarri Sandplain
10 Shark Bay Peninsulas
    Sub Types: 10.1 Edel
               10.2 Peron
11 Carnarvon Coastal Plain
12 North West Cape Ranges
13 Wooramel Plains
    Sub Types : 13.1 Minilya Dunes
                13.2 Talisker Plain
14 Ashburton Plain
15 Karratha Coastal Plain
16 De Grey Lowlands
17 Nullagine Hills
18 Chichester Ranges
19 Fortescue Valley
20 Hamersley Ranges
    Sub Type: 20.1 Ashburton Valley

21 Gascoyne Ranges
    Sub Type: 21.1 Tunnel Creek Hills
22 Murchison Plateau
    Sub Types: 22.1 Kennedy Ranges
               22.2 Macadam Hills
23 Great Victoria Desert Dunefields
    Sub Types: 23.1 Stanley Hills and Dunes
               23.2 Carnegie Plain
               23.3 Glengarry Hills
               23.4 Leeman Sandplains
24 Warburton Ranges
25 Central Sandplains
    Sub Types: 25.1 Mueller Sandplain
               25.2 Stansmore Ranges and Dunefield
               25.3 Mackay Dunefield
               25.4 McDonald Sandplain
               25.5 Amadeus Lowlands
               25.6 Rawlinson Petermann Ranges
               25.7 Gungarungal Sandplain
26 Tanami Sandplain
27 Gibson Desert
28 Little Sandy Desert
    Sub Type: 28.1 Rudall Tablelands
29 Great Sandy Desert
30 Eighty Mile Plain
31 Dampier Tablelands
32 Fitzroy Plains
    Sub Type: 32.1 Fitzroy Ranges

33 Sturt Plateau
34 Ord Plain
35 Springvale Hills
    Sub Type: 35.1 Springvale Hills
36 Leopold Durack Ranges
    Sub Types: 36.1 Fitzroy Uplands
               36.2 Carr-Boyd Ranges
37 Yampi Peninsula
38 Cambridge Gulf Lowlands
39 Kimberley Plateau

Produced by project mapping section,
planning information - mapping and spatial,
Department for Planning and Infrastructure,
on behalf of the Western Australian Planning
Commission, Perth, W. A. August 2004
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landscape_planning_guidelines\maps\
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Approximate boundaries only
Source: "Reading the Remote" CALM 1993

Figure 2.7: An example of regional landscape character units mapped at a state level (CALM et al 1994).

Figure 2.8: *For visual landscape evaluation at a local level, landscape character units are divided into smaller units, as in this example used in the Moresby Range Management Strategy (draft 1998).*

Figure 2.9: *Hypothetical illustration of landscape character units and features mapped at a site level.*

Step 3: Evaluate the way the visual landscape character is viewed, experienced and valued

- How is the landscape accessed and experienced?

- What are the important views and where are they seen from?

- What is the community's attitude towards this landscape?

- What is it about this landscape's features and views that are valued?

Outputs

1. Written inventories may be prepared for any of the categories of mapped data to provide detail eg regarding key views (type, features, angle etc).

2. Written inventories for attributes and values

3. Graphics eg photos illustrating key views and examples of view locations such as different types of roads

4. Map 2 – Viewing experience and values, containing viewing locations, key views, viewsheds, screening, preferred and/or valued areas and individual landscape features

Note: Map 2 contains a considerable amount of information in different categories. The mapping tips outlined in each section should assist in mapping the different categories.

Community preferences

It is desirable that stakeholders, including the general community, are involved in Step 3, so that the results are more likely to be an accurate reflection of community experience and preferences.

If the community has been directly consulted in relation to preferred views, view locations, areas, and features, and has provided much material, or conflicting material, it may be desirable to create a separate, additional map that illustrates community input. This data would also need to be incorporated into **Map 2**, in summary form, where appropriate.

There are two components to Step 3:

1. **Evaluate how the visual landscape is accessed, viewed and experienced.**

2. **Identify and assess what is valued in the visual landscape.**

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1. Evaluate how the visual landscape is accessed, viewed and experienced

How a landscape is viewed is of critical importance in understanding changes in the landscape and how people perceive them. Visual landscapes are related to peoples' sense of place and quality of life. How people view, perceive, experience and interact with landscape can be varied and diverse. However it is possible to document viewing experiences and particularly what it is in the landscape that is valued, preferred or not preferred.

The principal components of this stage of the assessment are:

- identifying viewing locations;
- identifying who viewers are and how they experience the landscape (levels of significance);
- describing how the viewers value the landscape, and what their preferences are;

- identifying key views; and
- determining visibility (viewsheds/seen area).

Begin to prepare a map called **Map 2 - viewing experience and values**, which illustrates each part of this step, including viewing locations, view significance, key views, viewsheds (seen area if applicable), screening, preferred and/or valued areas and individual landscape features.

Viewing locations and viewer experience

Identify and map view locations, including roads, recreation sites and residential areas using **Appendix 1 (Table 5)**, together with any written notations regarding the way in which people experience a landscape. Table 5 divides these components into three levels of significance: national/state, regional, and local. All three levels of significance in Table 5 will apply to travel routes, individual sites and landscape areas.

The assumptions are that:

- some viewing locations, views, and areas visible in views will be considered more important than others by those experiencing the landscape; and
- some viewers will be more aware of the landscape and more concerned about its appearance, depending on their reasons for being in the landscape.

Mapping tips: viewing locations and viewer experience

- Use colour coding to indicate the level of significance or value for each mapped view location (Levels 1, 2 or 3).

- Mark any other notations regarding viewer locations and viewing experience that are mappable.

Table 6: Examples of viewing experiences at each scale of application

Regional	Regional viewing experiences include views from main roads, settlements and major recreation sites of regional importance. Key regional views and viewsheds are generally those that receive intense community use and/or scrutiny.
Local	Viewing experiences include views and viewsheds from minor roads, local walk-trails and lookouts, residences and businesses of local significance.
Site	Site-specific viewing experiences include views and viewsheds at the detailed scale from local access roads, car parks, structures, picnic sites, lookout points and trails.

Note: categories viewed at local or site level may also have regional level importance.

Image 7(a): *Regionally significant view of the southern end of the Moresby Range, viewed from Geraldton. The view in itself is not dramatic but its importance lies in its proximity to town.*

Image 7(b): *Part of a regionally significant view in the Chapman Valley (Mt Sommer).*

Image 7(c): *Panoramic views are generally obtained from elevated positions. Most viewpoints that are formally designated as lookouts provide panoramic views.*

Views

Identify and map the views that people experience. Landscapes provide both general viewing experiences and specific key individual views. For example, forested landscapes provide mainly canopied and enclosed views, urban landscapes provide axial views down roads, elevated landscapes such as mountain ranges provide panoramic views, coastal areas are likely to provide open, unobstructed views. Describe the general character of views in the accompanying text.

Provide an inventory and evaluation of view types and observer view experience. Components include: location and direction of view, distance from observer to landscape features, travel routes and use areas, duration of view, type and extent of existing screening and characteristics of view.

Panoramic views are most frequently singled out as significant. However, a wide range of view types typically make up the valued viewing experience of a landscape eg enclosed views in forested landscapes.

Key types of individual views may include: panoramic, canopied, enclosed, feature, focal, landmark and sequential views, as well as view corridors, or long vistas. Significant individual views and viewsheds are often obtained from elevated locations and provide extensive views or views of a distinctive feature. The type of view depends on the relationship between landscape character and the viewer's position in the landscape. Refer to Images 7 – 14 for illustrations of types of views.

Mapping tips: views

- Number key views to link with inventory tables.

- Map key views using a series of arrows showing their location and direction.

Image 8 and 9: Enclosed or canopied views may be experienced along river or road corridors, and viewing locations may be developed as picnic sites, as they typically provide more shelter than sites offering panoramic views.

Image 10: Feature views are dominated by large landscape elements, such as hills.

Image 11: A single feature that is small in comparison to the landscape in which it is situated, but nevertheless draws attention due to its contrasting character may dominate a landmark view. This example shows a lighthouse in a natural landscape.

Figure 2.10: *Excerpt from general viewing experience map, Landscape Background Report (2006) prepared for the Lower Great Southern Regional Strategy (WAPC 2007) visual landscape evaluation. At a regional level it is generally sufficient to simply indicate major viewing locations.*

Image 14: *A series or sequence of varied views may open up to travellers using winding roads through undulating terrain.*

Images 12 and 13: *Focal views occur where the viewer's attention is drawn directly to a single portion of a view, for example, the view straight ahead where a road bends or passes over a rise.*

Visibility (viewsheds/seen area)

Landscape visibility can be defined in two ways:

- whether a feature and/or landscape can be seen or not; and

- how far away the feature and/or landscape is from the observation point.

Where appropriate, identify and map viewsheds, or seen area, defined as the portion of the landscape that can be seen from designated observer positions. The observer position directly relates to the landscape in terms of the visibility of significant landscape areas, features and views.

For example, the viewshed of a road comprises the land visible from the road if vegetation and buildings were removed. The extent of view is normally limited by landform and distance. Screening is more important to note at a site or local level rather than a regional level. For more detail on viewsheds (seen area) refer to Section 2.4.

Distance zones are used to measure visibility in terms of distance from the observer to the landscape. Distance can affect peoples' perception of the landscape area and features they are viewing. Categories are determined by the amount of colour and textural detail that is visible. Textural detail represents the structure and surface characteristics of the landscape and colour provides contrast. Texture ranges from fine and smooth, to coarse and rough. When viewing the same landscape surface, the texture will usually appear to be more coarse and rough in the foreground and progressively finer and smoother as distances increase to the background (CALM 1994:7). The same object viewed from increasingly greater distances will occupy a progressively smaller portion of the observers' field of vision. Refer to Figure 2.11 for a hypothetical illustration of distance zones.

The distance zones adopted by this methodology are: foreground (from the viewer to 500 m); middle-ground (500 m to 6.5 km); and

background (6.5 km – 16 km and beyond) (CALM Visual Landscape Management System 1989)[1].

Screening by vegetation or buildings is not usually mapped as it may be removed (eg clearing or burning of roadside vegetation). However, it should be mapped, or at least described in the text, if it is relevant for a particular assessment because it affects viewer experience by restricting viewing opportunities for road users.

Mapping tips: visibility (seen area analysis)

- A detailed seen area analysis is not usually necessary in regional level assessments.

- Indicate distance zones (visibility) by mapping the zones that are relevant to the study area (foreground, middle-ground or background).

- Accurate seen area mapping and viewshed analysis is more likely to be relevant for local and site level assessments.

- Indicate areas of screening where relevant (eg dense, moderate or sparse roadside vegetation).

- Methods for conducting viewshed and/or seen area analysis are described in detail in Section 2.4 – Tools and Techniques.

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2. Identify and assess what is valued in the visual landscape

Identify those areas, features and views that are valued by the community using the generic list of visual landscape preference indicators (Appendix 7). This has been developed using community preference research to identify criteria that are relevant to community evaluation of landscape character. If the expert needs to identify community-valued features without direct community input, this list provides a starting point.

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[1] These are the distance zones used by the Department of Environment and Conservation (Landscape and Recreation Unit). This manual promotes the same distance zones to maintain consistency across agencies.

Adapt the indicators to the study area by adding to the list or removing irrelevant features as necessary.

Visual character preference indicators

A list of generic visual character preference indicators has been developed for visual landscape evaluation in Western Australia, derived from desktop research and Reading the Remote (CALM 1994). These character indicators have been classified into two components: criteria for **most preferred** visual landscape character; and criteria for **least preferred** visual landscape character (Appendix 7).

This component of Step 3 is one that traditionally has generated the most debate, and the old adage 'beauty is in the eye of the beholder' is often quoted. People are attracted to landscapes of differing character ranging from natural, to rural, to highly modified built landscapes. Factors that affect peoples' preferences and responses to landscape settings include personal sensitivities, age, education, experience, cultural background and economic circumstances.

Determining how people experience and evaluate visual landscapes is a complex task, but not impossible. It is an important component of every visual landscape evaluation process. Determining community sentiment can be based on generic social research or assumptions, project area knowledge, simple surveys, perception studies, personal interviews and workshop feedback. Values may also be implied by people's behaviour, such as use of lookouts and scenic roads.

Values or preferences refer to the value placed on a landscape or landscape feature by the community, based primarily on its perceived visual quality.

Values and preferences are identified either directly by asking the community, or by using the generic list of community preferences based on research findings (Appendix 7).

The criteria used to assign values and preferences to areas, views and features in a landscape need to be listed for each exercise, using this generic preference list and Table 6 (levels of viewer significance) as a starting point.
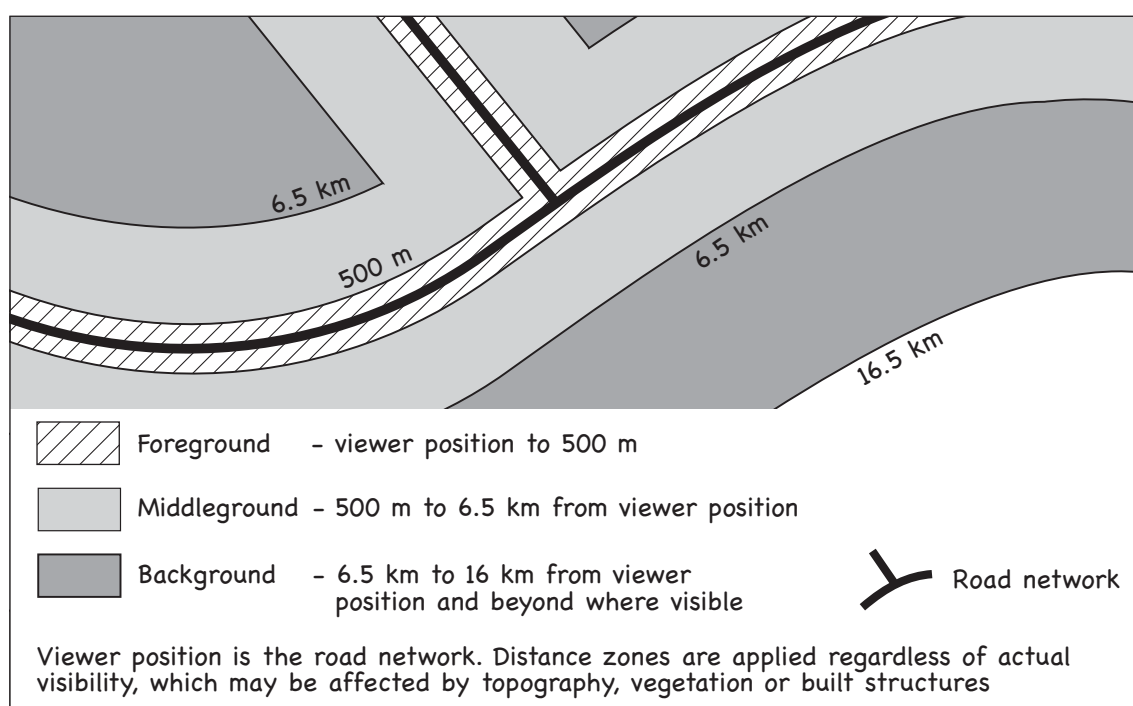
Figure 2.11: *Hypothetical illustration of distance zones (not to scale).*

Ideally the community would have direct input into this stage of the evaluation by identifying areas, features and views that are highly valued, assisted by use of the generic checklist. Modify the generic list of indicators (Appendix 7) to reflect the perceptions of their local community and relevant stakeholders. Remove irrelevant character indicators, modify criteria and add other relevant character indicators where necessary. Appendix 1 (Table 5), which shows the levels of significance for viewing and/or viewers experience, needs to be utilised in the same way, by eliminating what is irrelevant to the evaluation.

If community input is not feasible, identify areas and features in the study area that are likely to be valued more highly by the community, using the generic checklist and Table 5, together with other indications available, such as letters printed in local newspapers. The method used to obtain data on community experiences and values needs to be clearly documented.

Map visual character preferences on **Map 2**. Revise the viewing experience and values illustrated on the map when and if stakeholders are consulted.

Mapping tips: preferred areas and features

- Highlight separately the valued areas, views and features identified directly by the community to distinguish them from areas identified by expert analysis based on the generic visual character preference indicators (Appendix 7) and Appendix 1 (Table 5) (levels of significance).

- In compiling the maps, additional fieldwork may be necessary to confirm or test suggestions made by the community, especially with direction and identification of significant views.

Identify any specific landscape issues

A wide range of land uses currently impact on the visual character and integrity of Western Australian landscapes. These include rural subdivisions, plantations, utilities including wind farms, roads, mining and extractive industries. Identification, discussion and assessment of these issues should progress through each stage of the assessment process. Each development project or proposal will be different.

Specific guidelines to help planners and managers deal effectively with the visual impacts of particular land use issues are presented in

Table 7: Examples of landscape features that may exist in landscapes that are highly valued by the community for their visual character

Regional	Valued landscapes may comprise an entire landscape character unit such as a mountain range, valley system, forested unit or viticulture area or specific valued features such as major escarpments, rivers, waterfalls and historic settlements. Important views may include views from elevated hilltop lookouts, scenic roads, tourist walk trails, navigable rivers and inlets, entry points to regional settlements or from major recreation and/or tourist sites.
Local	The community may value large areas such as a national park, an escarpment or specific landscape features such as individual hills, lakes, creeks or clusters of historic buildings. Views from local lookouts and recreation sites may be considered important, in addition to views valued by the regional community.
Site	The primary emphasis is on valued individual landscape features such as individual rock outcrops, stands of trees or buildings, and specific views.

Note: there will be areas and elements identified in each level of application that the community might find unattractive or incompatible with desired visual character of the study area.

Part 3 of this manual. The guidelines for each of these topics will include techniques to help locate and design these types of developments so as to minimise the extent to which they detract from valued landscapes, landscape characteristics and views.

Identify and describe specific landscape issues that concern stakeholders, including the community, or may affect efficient land use planning, so they can be addressed in specific strategies and guidelines.
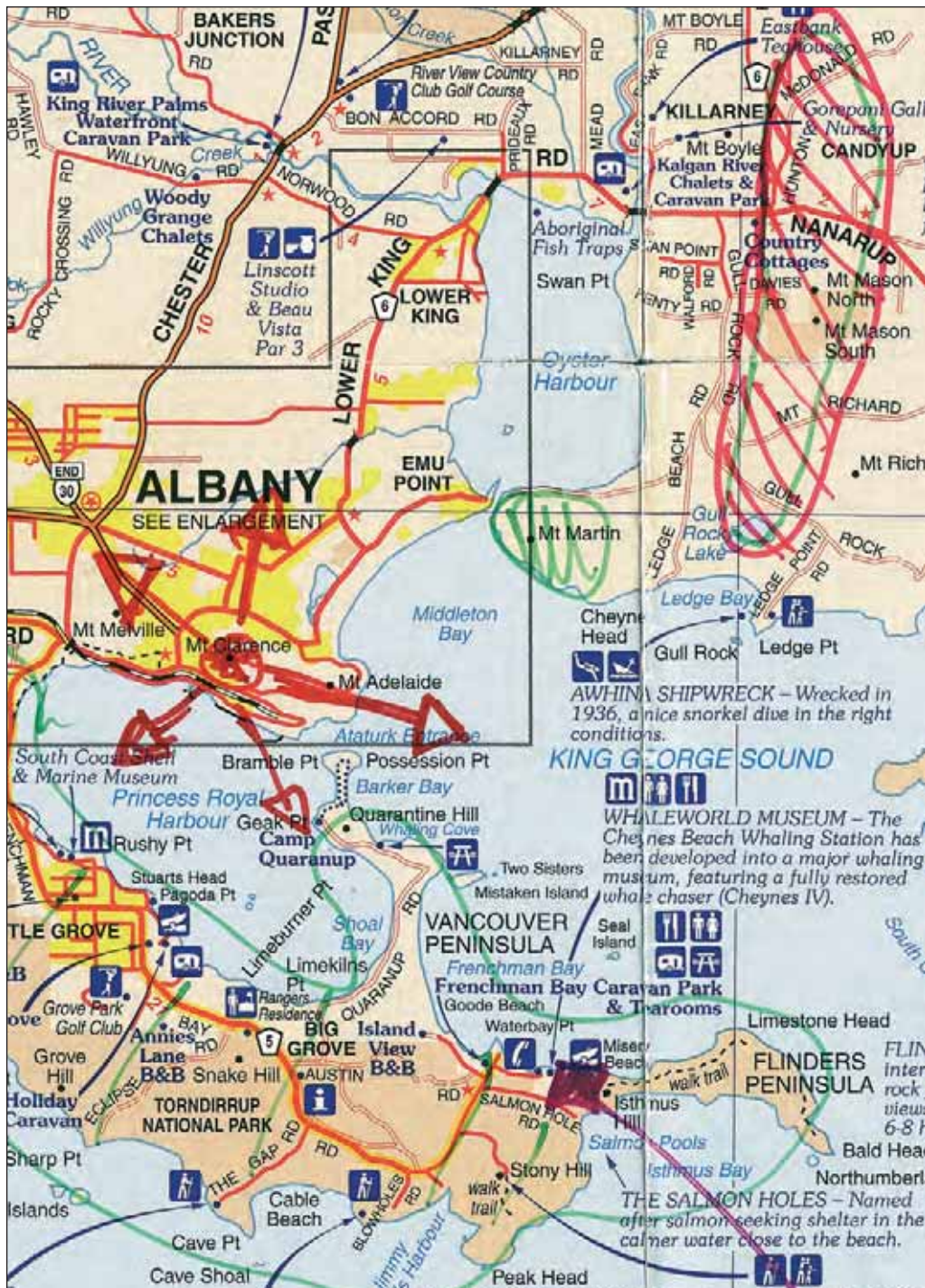
Figure 2.12: *Community identification of major views, preferred rural landscapes (red) and natural landscapes (green), least preferred landscape features (purple). Excerpt from 2002 community workshop mapping for the Landscape Background Report (2006) prepared for the Lower Great Southern Regional Strategy (WAPC 2007).*
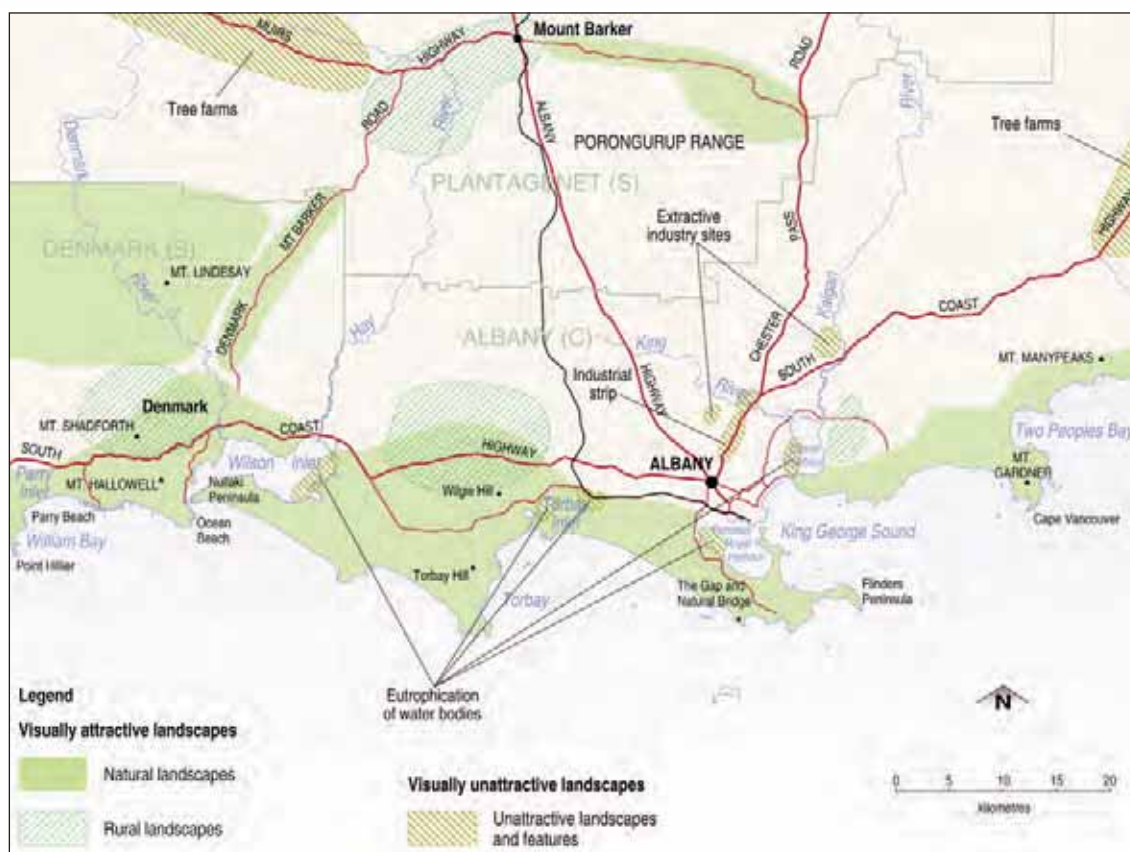
Figure 2.13: *Excerpt from community perceptions map, Landscape Background Report (2006) prepared for the Lower Great Southern Regional Strategy (WAPC 2007): visual landscape evaluation, illustrating most preferred and least preferred identified by the community advisory group.*

Step 4: Develop strategies for managing visual landscape character

- What are the appropriate visual management objectives for each landscape character unit; and how can they be achieved?

- What are the appropriate strategies to address the visual management objectives for each character unit?

- What are the strategies to address any specific landscape issues that have been identified?

Outputs

1. Documentation of all visual management objectives and strategies for each character unit of the study area.

2. Prioritise and review objectives and strategies for implementation.

3. Stakeholder input where possible.

4. **Map 3 – visual landscape strategies** which are an overlay of Maps 1 and 2 illustrating mappable objectives and strategies for each landscape character unit, as well as specific landscape issues.

There are three components to Step 4:

1. **Composite mapping technique.**

2. **Develop broad visual management objectives and strategies for each landscape character unit.**

3. **Develop strategies to address specific landscape issues.**

Stakeholder input should be obtained in relation to the objectives and strategies determined for the management of the study area. An integrated document listing all objectives and strategies with explanatory statements may be referred to stakeholders, using the most effective,

appropriate and cost effective techniques available. For example: workshops, newsletters, neighbourhood meetings, newspapers or personal discussions.

1. Composite mapping technique (Figure 2.2)

Map 1 should display the landscape character units as determined in Steps 1 and 2.

Map 2 should appear with key views; viewer experience and significance preferred and/or not preferred areas and features (Step 3).

Overlays (composite mapping)

Composite technique to achieve the outcomes of the visual landscape evaluation:

- Overlay **Map 1** (character units) with **Map 2** (assessment of areas and features), to visually display landscape areas and/or features for management of visual landscape character for each character unit (Step 4).

- The tools and techniques used to overlay this information can be varied. There is the traditional method of superimposing one map over another, or using computer generated techniques (Section 2.4).

- Drawing from all documentation, consultation and all other information collected during the evaluation process,

the investigator should have some indication of additional annotations and mappable strategies that are required to be illustrated on the overlay of Map 1 and Map 2.

- Once the overlay is complete, the map should illustrate areas and features in each character unit, that require strategies to protect and maintain areas of valued character, or restore and enhance areas that are degraded. This resultant map is **Map 3: Visual landscape strategies**.

The result is the identification of exact areas in or across landscape character units that require strategies for management.

2. Develop broad visual management objectives and strategies for each landscape character unit

Use the composite mapping technique {landscape character units (**Map 1**) and general viewing experience and values (**Map 2**)} as a basis for identifying appropriate management objectives and strategies. Begin to prepare **Map 3 - Visual landscape strategies**, which illustrates each part of this step; those being objectives applied to each character unit, mappable strategies and identified specific landscape issues (see Table 8 for examples of specific landscape issues).

Table 8: Examples of landscape issues at each scale of application

Regional	Issues may include changing patterns of land use, such as establishment of large-scale plantations, large-scale trends in vegetation clearing and/or revegetation, urbanisation of outer metropolitan areas, intensified settlement of rural areas, intensified agricultural use, ports and associated industrial estates and large-scale open cut mining operations.
Local	Issues may include roadside vegetation clearing, rezoning of land uses in local town planning schemes, siting and design of a major facility such as a wind farm, timber mill, resort or harbour, new subdivision in a prominent location or protection of a primary viewshed or viewing experience.
Site	Issues may include establishment of a community park, removal of street trees, and siting and design of individual buildings, signage and street sculpture.

Note: landscape issues often overlap into all scales of application, such as wind farm developments that may have an impact on the landscape and have implications at regional, local and site-specific levels.

The areas, features, view locations and key view points that have a high priority for management will be clear and apparent once the composite overlay technique is complete. As well as mapping, describe these areas in detail in written documentation. Any other descriptions and documentation from Step 3 will assist the investigator in determining the appropriate management strategies to undertake in the study area.

Identify broad **visual management objectives** and **strategies** for managing visual character for each of the landscape character units. The visual management objectives adopted by this manual comprise:

(i) **best practice siting and design: this should be a baseline objective throughout; and should be undertaken for the entire study site;**

(ii) **protection and maintenance of visual landscape character; and**

(iii) **restoration of degraded character or enhancement of opportunities, for example, for viewing.**

(i) Best practice siting and design

This objective applies to all areas of the landscape under study. First and foremost all landscape components should be managed with this objective. **Part 3: Guidelines for location, siting and design** provides practical siting and design guidelines for an extensive range of land uses in Western Australia.

The majority of many landscapes is likely to fall into this broad category, defined as landscape areas in which existing character will be taken into account, but not necessarily maintained in its existing form.

Examples of strategies to meet this objective

- Employ best practice planning and design processes.

- Protect, enhance or restore individual landscape components or features that require attention.

- Retain dominant existing visual landscape characteristics.

- Apply practical and sensitive siting and design guidelines for different land uses and particular landscape types (Part 3).

- Develop strategies to address specific landscape issues for the study area.

Image 15: *Within a landscape area, such as this area west of the Moresby Ranges, may display individual features that require either protection or restoration. The remainder 'bulk' of the landscape should adopt best practice siting and design strategies.*

(ii) Protection and Maintenance

This objective can be defined as maximum protection and maintenance of existing visual landscape character. Any alterations to the visual landscape character assigned to this objective should be planned and designed to have minimal visual impact. This objective is likely to apply to areas that have high value and significance for planning and management.

Examples of strategies to meet this objective

- Development applications and/or plans must demonstrate a clear understanding of the importance and implications that proposed changes would have on areas or features requiring protection and maintenance.

- Any alterations to the existing visual landscape character in these areas should be planned and designed to have minimal visual impact, in which development would typically either be not evident or blend with its landscape setting.

- All features and views should be considered with the aim of retaining the established character as much as possible in response to changes to the landscape. It is unlikely to be acceptable for development proposals to be prominent.

- Designate and manage scenic travel routes to the highest standard.

- Protect valued view types.

- Use planting to retain focus views.

- Use local regulations, controls and enforcement to protect views.

- Minimise roadside clearing.

- Protect canopied views.

Some examples of natural landscape character that may require protection and maintenance at a regional level could include; coastlines, water features, dense forest, individual mountain peaks and hills. Examples at a local or site level may include individual hills, local rivers, individual distinctive vegetation communities and small water bodies.

Some examples of rural landscape character that may require protection and maintenance at a regional level may include; areas with a significant proportion of remnant vegetation, individual remnant trees, rural characteristics such as vineyards and orchards, and the presence of water. Some examples at a local or site level may include rock outcrops, historic rural structures or watercourses and lakes.

Some examples of built landscape character that may require protection and maintenance at a regional level could include residential precincts, historic precincts and natural features in (and backdrop to) urban areas. Examples at a local or

site level may include individual buildings, gardens or parklands or groups of heritage buildings (commercial or residential).

> **Note:** these areas and features are examples only and can vary significantly from one project to another.

> **Note:** the number and complexity of appropriate strategies will depend on the specific area under assessment. Refer to Appendix 2 for a comprehensive list of existing planning mechanisms that can assist in the application of landscape protection strategies.

Image 16: *Dramatic coastal terrain is a priority for protection.*

Image 17: *The Moresby Range has been the subject of a planning strategy aimed at protecting this valued rural landscape.*

Image 18: *Residents often express a desire to protect the character of leafy urban neighbourhoods.*

(iii) Restoration and/or enhancement

This objective can be defined as restoration and enhancement of degraded visual landscape character. Areas in which this objective would apply comprise visually degraded sites or features that require rehabilitation, or enhancement to improve the visual character of the landscape. Enhancement may also refer to opportunities to improve viewing experience (eg additional lookout points). This objective would also apply to landscape character units that require high priority for management, given the need for restoration and/or enhancement of the existing visual landscape character.

Existing and/or proposed developments may help re-establish the characteristics of the landscape that are valued by the community through effective assessment and management of proposed changes.

Examples of strategies to meet this objective

- Borrow from the existing natural character in the visual landscape and help restore degraded landscapes wherever possible to plan any potential changes to the landscape.

- Use a new feature to enhance a landscape that is currently lacking visual interest. It may be acceptable for new development to be prominent in the landscape.

- Restore or enhance an existing development so that it blends with the surrounding visual landscape, or is not evident in the landscape.

- Create and enhance view opportunities, such as roadside lookouts and view corridors through vegetation stands.

- Develop new roads and or walk-trails to improve accessibility.

- Restore and enhance established travel routes.

- Use planting to screen visually degraded views.

- Use of signage to enhance the use of viewing locations and lookouts.

- Use roadside clearing to create enhanced view experience.

- Enhance feature or focal views where possible.

Some examples of natural landscape character that may require restoration and enhancement include statements on the following topics at a regional level: areas affected by salinity, natural forests affected by dieback, quarries that exist in natural areas, areas that are rezoned to future urban. Examples at a local or site level include statements on the following topics: clearing of natural vegetation for prominent firebreaks, extensive diseased vegetation, areas cleared for power easements, extensive roadside vegetation clearing.

Some examples of rural landscape character that may require restoration and enhancement include statements on the following topics at a regional level: landscapes dominated by one type of land use, prominent rural residential areas and broad areas of salinity. Examples at a local or site level include statements on the following topics: diseased vegetation, saline patches, uniform windbreak planting and obtrusively sited homes.

Some examples of built landscape character that may require restoration and enhancement include statements on the following topics at a regional level: industrial areas, areas of suburban sprawl, ribbon development and some areas of commercial development. Examples at a local or site level include statements on the following topics: expansive car parks, streetscapes with no vegetation, overhead powerlines, junkyards and land fill sites.

Development applications and/or enhancement plans must demonstrate a clear understanding of the importance and implications of proposed plans or activities upon landscape character units, areas and features requiring restoration and enhancement.

Image 19: *Clear-felled or dieback infested forest adjacent to a highway is an example of a natural landscape where restoration and enhancement would be an appropriate visual landscape management objective.*

Image 20 and 21: *Rural landscapes may require restoration and enhancement, as in this quarry in the Moresby Ranges and dead karris at Torbay.*

Image 22: *This urban area of light industry on Cockburn Rd could be redeveloped as a visual management objective for restoration and enhancement.*

3. Develop strategies to meet specific landscape issues

Identify and describe strategies that take into account the valued characteristics, viewing experience and pressures that were identified in **Step 3** of the visual landscape evaluation.

Strategies should provide specific direction and action steps in response to issues identified by the stakeholders. Identify these on **Map 3 Visual landscape strategies** if possible.

Tips

- Initial sources can include the local media and field investigations.

- Determination of key issues will evolve from consulting stakeholders, including landowners, residents and relevant state and local government agencies.

- Community members could be offered a forum for feedback, verification and discussion.

- Specific landscape issues can be validated by discussion with community members.

Developing strategies for managing specific viewing experiences

Address individual viewing experiences, such as those available to users of major travel routes. Some routes may require restoration eg urban highways with strip commercial development, while others have potential for enhancement of opportunities, such as increased number of viewpoints along scenic routes. These may pass through a number of character units, and therefore be more readily addressed separately.

Landscapes vary in their ability to maintain existing valued characteristics as some are more sensitive to change than others. The concept of landscape capability, or sensitivity, is discussed further under the heading 'visual absorption capacity', in Section 2.4.

Figure 2.14: *Example of a site level visual landscape strategy map, with recommendations grouped according to relative prominence of portions of the site.*

Source: Excerpt from Figure 7, Leighton Marshalling Yards Regional Planning Guidelines – Assessment of Views, Vistas and Landscape Character (Ministry for Planning, 2000). Courtesy of Thompson Palmer Pty Ltd.

Image 23: *Plantations may block important views such as this glimpse of Pemberton from the highway.*

Mapping Tips for Step 4

- Any strategies that cannot be mapped can be illustrated as annotations, strategic notes or comments on **Map 3**.

- Categorise features, areas and views according to the relevant strategies (for example roads to be designated as scenic).

- Map specific landscape issues on **Map 3** by annotating and/or categorising either locations where issues are focussed, or locations that comprise examples of where issues occur.

- Additional overlays can be used where desirable. For example strategies can be overlayed onto any other resource map, if the assessor needs to establish where priority areas for management are located in relation to landscape character units or land categories (natural, rural, built).

- Additional overlays can provide a clear indication of those landscape character units or land categories that may require more strategic management than others.
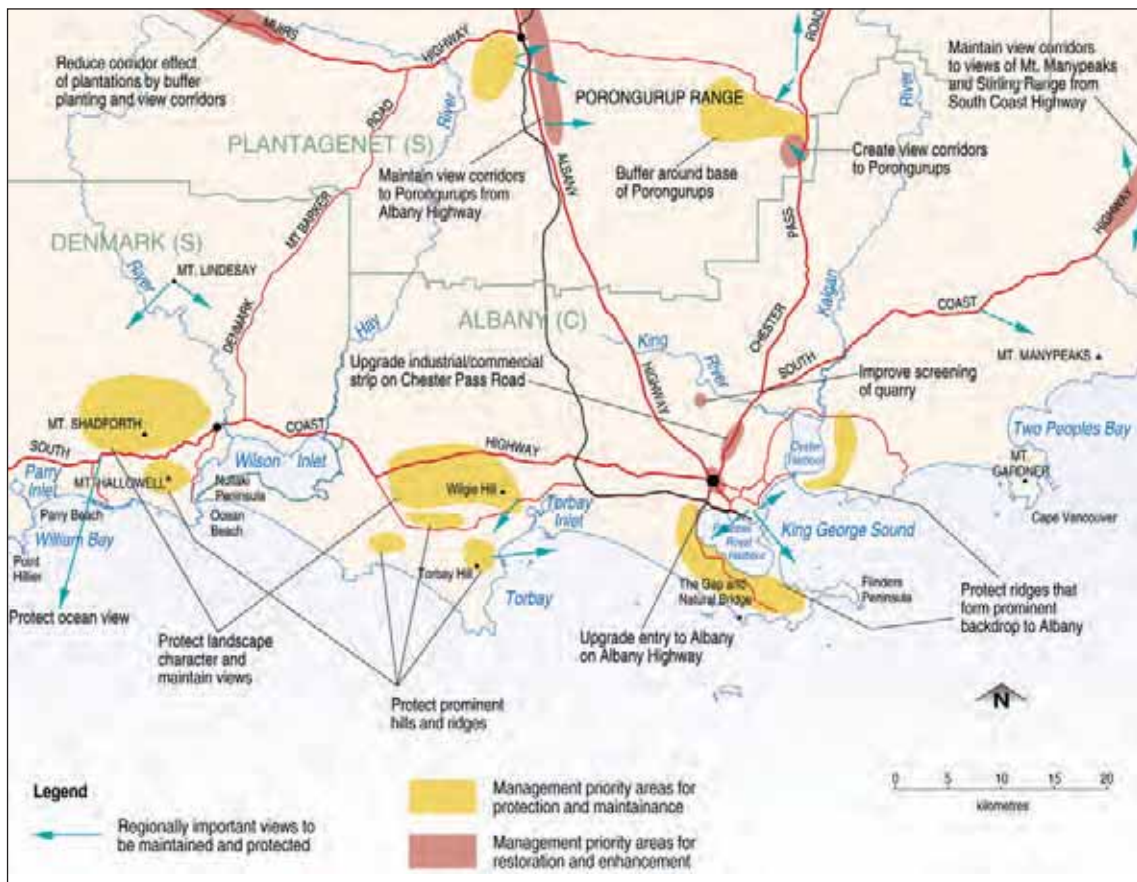
Figure 2.15: *Landscape management strategies map, from Landscape Background Report (2006) prepared for the Lower Great Southern Regional Strategy (WAPC 2007): visual landscape evaluation, illustrating how recommendations may be presented as annotations on a map.*

Step 5: Implementation of strategies into planning outcomes

Once the visual character objectives and strategies have been identified, documented and mapped, a list of actions and priorities for planning can be prepared. This prepares the outcomes of the visual landscape evaluation for incorporation into significant planning documents and processes that influence planning direction and decisions.

Implementation and integration into planning outcomes requires the use of the tools and policies outlined in **Part 1 and Appendices 2, 3 and 4**.

Priorities need to be determined for each project assessment in terms of time lines, budgets and other constraints.

Appendix 2 outlines the planning mechanisms that exist in the planning system to integrate assessments into decision-making. **Appendix 3** outlines policy measures under which this manual operates. **Appendix 4** gives clear guidance on the roles of the assessor, different agencies, local authorities and developers in the visual landscape evaluation process. Community consultation techniques are discussed here.

2.3. Visual impact assessment

Visual landscape evaluation enables goals and directions for landscape protection to be incorporated in regional and local strategies. This in turn enables criteria and rules to be included in region and local planning schemes. Through **visual impact assessment** during the normal assessment of a development application the proposal can be measured against these rules.

The visual impacts of a proposed development are described, analysed and evaluated in the visual impact assessment process. Measures are also identified to minimise the potential impacts.

Visual impact assessments are undertaken mainly at the local and site level, but may be required at the regional level. Some examples are provided below.

A visual impact assessment may be required to accompany a development application. It will be prepared by a proponent and be undertaken by external consultants or specialist internal staff. At the project design stage the findings of the visual impact assessment can be used to optimise visual impacts.

If a visual landscape evaluation has not been made, and if visual landscape criteria and rules have not been included in the local planning scheme, requirements and conditions relating to the visual landscape should be confined to matters already provided for in the scheme.

The following steps outline the basic procedure for undertaking a visual impact assessment at any level. The level of detail at which each step is carried out will vary for each assessment, depending on such factors as the complexity of the proposed development and resources available, including data, expertise and budget considerations.

Table 9:   Examples of visual impact assessments undertaken at each planning level

Regional	Proposals that may require a visual impact assessment include: • major land use projects such as plantations, wind farms, or large scale clearing; • developments that have large-scale impacts such as a new port facility or highly visible development located on a regionally significant site (eg quarry on an escarpment adjacent to an urban area); • projects with incremental or indirect impacts in which large-scale changes result from a number of small individual changes over time (eg clearing for agriculture); and • large scale tourist resorts.
Local	Proposals that may require a visual impact assessment include any of the developments listed for the regional level. Specific examples could include rural residential development, urban subdivisions, new roads or a wind farm.
Site	Nearly all proposals require a visual impact assessment at a site level in response to proposals for development on individual sites, such as subdivisions, buildings and public recreation facilities. Site level impacts may have significance at a local or regional level (eg wind farms).

Note: at a regional scale, concerns such as economic considerations generally outweigh visual landscape character and other social concerns. However, there is usually scope to reduce visual impacts at a regional level through careful siting and design.

Many techniques referred to in the following steps are explained further in **Section 2.4**: Tools and techniques for visual assessments.

Visual impact assessment steps
Step 1   Determine visual management objectives.
Step 2   Describe proposed development.
Step 3   Describe the potential visual impacts.
Step 4   Develop visual management measures.
Step 5   Prepare final recommendations.

Step 1. Describe existing visual landscape character and determine objectives for managing visual landscape character

The visual impact assessment process is used to assess the impacts of specific development proposals while visual landscape evaluation forms the context or background for the visual impact assessment. The visual landscape evaluation provides the visual management objectives against which to measure potential visual impacts.

Determine and describe the visual landscape character objective for the proposed site. A visual landscape evaluation undertaken at the regional, local or site level will provide the baseline data against which changes can be assessed.

- If a visual landscape evaluation has already been completed, all that will be needed is some fine-tuning and additional detailing. If the assessment is not available,

this step should be done as part of the visual impact assessment. An abbreviated version may be appropriate depending on the scale of the proposed impact.

- Summarise the objectives in tabular form, including annotated maps and photographs as required, identifying the location of any priority areas or sites.

Step 2. Describe the proposed development

- Analyse, describe and illustrate the main visual components of the proposed development, particularly elements likely to be visible such as buildings, roads, parking areas, utilities, signage, fencing, firebreaks, contouring, clearing and landscape works.

- Develop and illustrate several development options.

- Prepare plans showing locations and the extent of major visual features. Include cross-sections and elevations of buildings and other major structures, showing key dimensions such as height, colours and proposed materials.

- Include a projected time-line describing changes to a proposed development over a period of time such as phases in a quarrying operation if necessary.

- Illustrations, drawings or simulations of the proposed development should be realistic and comprehensive. They should be based on actual photography with proposed changes superimposed by hand artwork or computer simulation.

Figure 2.16: *This figure from a Kwinana waste site proposal illustrates how a landform analysis could be graphically presented. Adapted from image supplied by Ecoscape Australia Pty Ltd.*

Step 3. Describe and evaluate the potential visual impacts

(i) Identify and describe likely changes to visual landscape character and views

- List likely changes in landscape character for each development option, based on the outcome of **Step 2**. Annotated maps and three-dimensional materials indicating particular impacts should be provided. Refer to the visual landscape character assessment described in **Step 1**.

- Identify the extent of the area likely to be affected by the development (eg visibility, seen area analysis, viewshed identification).

- Identify key views that may be affected by the proposal, including views that are important at regional and local levels and assess changes to views.

- Identify the main views to and from the development. Where will the development be seen from and how will it look from these viewpoints?

- Describe the general type of views that may result from the development such as new feature views, removal of canopied or enclosed views, screening of panoramic views.

- Identify and describe likely changes to the visual landscape character and views throughout the staging of the project, with particular reference to the different stages of development operations.

- Document the findings in tabular form, with annotated maps and photographs as required, identifying the location of any priority areas or sites.

(ii) Evaluate likely changes and/or impacts of each development option

- Assess the magnitude, duration and significance of each specific visual impact. In other words, how extensive is the impact likely to be, how long will it last and how important will it be? The impacts over time need to be considered, at agreed time periods after construction, and at specific stages in on-going developments such as quarry operations.

Present view

View with structure

Note:
Line represents height of RL40

Structure with vegetation
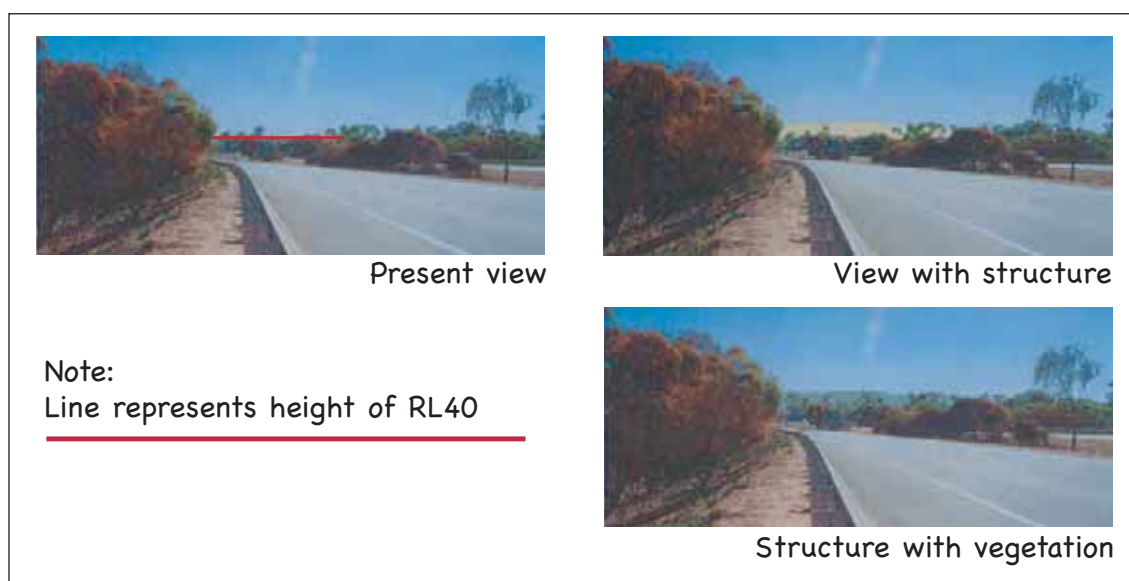
Figure 2.17: *This simulated view of a proposed Kwinana waste site provides an indication of how the proposed development would look from this important view location on Patterson Road. Adapted from image supplied by Ecoscape Australia Pty Ltd.*

- Assess the capacity of the landscape to accommodate the proposed development options without altering its valued visual landscape characteristics. How sensitive is the landscape to the proposed development type? Determine whether the proposed development would introduce a totally new element to the landscape or simply retain what is already there. (Refer to 'visual absorption capacity' in Section 2.4).

  The growth of any vegetation screening needs to be taken into account (**Step 3**). Establish how much natural screening exists in the landscape and whether the site is capable of sustaining more screening.

- Determine if an impact will be temporary or permanent and whether the effect will be beneficial, neutral or adverse.

  The concept of the uniqueness or rarity of the affected landscapes, features and views may be relevant. This will assist in developing strategies to address impacts.

  To determine the significance of potential impacts, develop a set of criteria relevant to each development option being proposed. Individual impacts on project settings can be placed along a continuum ranging from minimal to significant. Take into account the magnitude of projected impacts on landscape characteristics and views that are valued by the community.

  Significance can be determined by considering both magnitude of impacts and likely community sensitivity or degree of concern about the impacts.

An example of a change that would create substantial impact would be a proposal that would result in notable, long term landscape changes in a highly valued landscape which cannot readily absorb the proposed changes, such as a quarry on a prominent scarp face.

A change that would cause minimal impact would be a proposal that would result in imperceptible changes in a landscape that is not highly valued by the community, for example an extension of an industrial facility within an industrial estate.

Document the findings in tabular form, annotated maps and photographs as required, identifying the location of any priority areas or sites.

58 m

RL62

Ground level

RL25

Area below ground

1. Part of the tipsite structure will be formed below ground by
backfilling lot 434, which is currently being excavated. While lot 434
is being backfilled, the rest of the site including the perimeter of
lot 434 will be vegetated to provide visual screening.

Perimeter bund walls

2. The planting will be done in a series of layers so
that vegetation will have established at the base of
the structure by the time the next layer is built.

Tipsite benches

3. Each new layer of planting will begin with the
construction of the perimeter bund. This bund
will be covered in topsoil and mulch and then
vegetated to create a screen to the tipsite activities.

4. Vegetation will continue to be planted on the
structure as every new perimeter bund is built
while the older vegetation will continue to develop.

5. Once complete the top of the structure will be
covered in vegetation to blend in with the
surrounding landscape.

Northern elevation

Figure 2.18: *Simulated view of proposed waste site at Kwinana, showing stages over time. Adapted from image supplied by Ecoscape Australia Pty Ltd.*

Stage 1

Tuarts and Jarrah planted around the base of the structure.
Smaller trees planted along new bunds.

Stage 2

Tuarts and Jarrah will have grown to provide cover.
Small trees and tall shrubs grown along base of hill.

Stage 3

Small shrubs and heath like plants are grown to cover the majority of the structure.
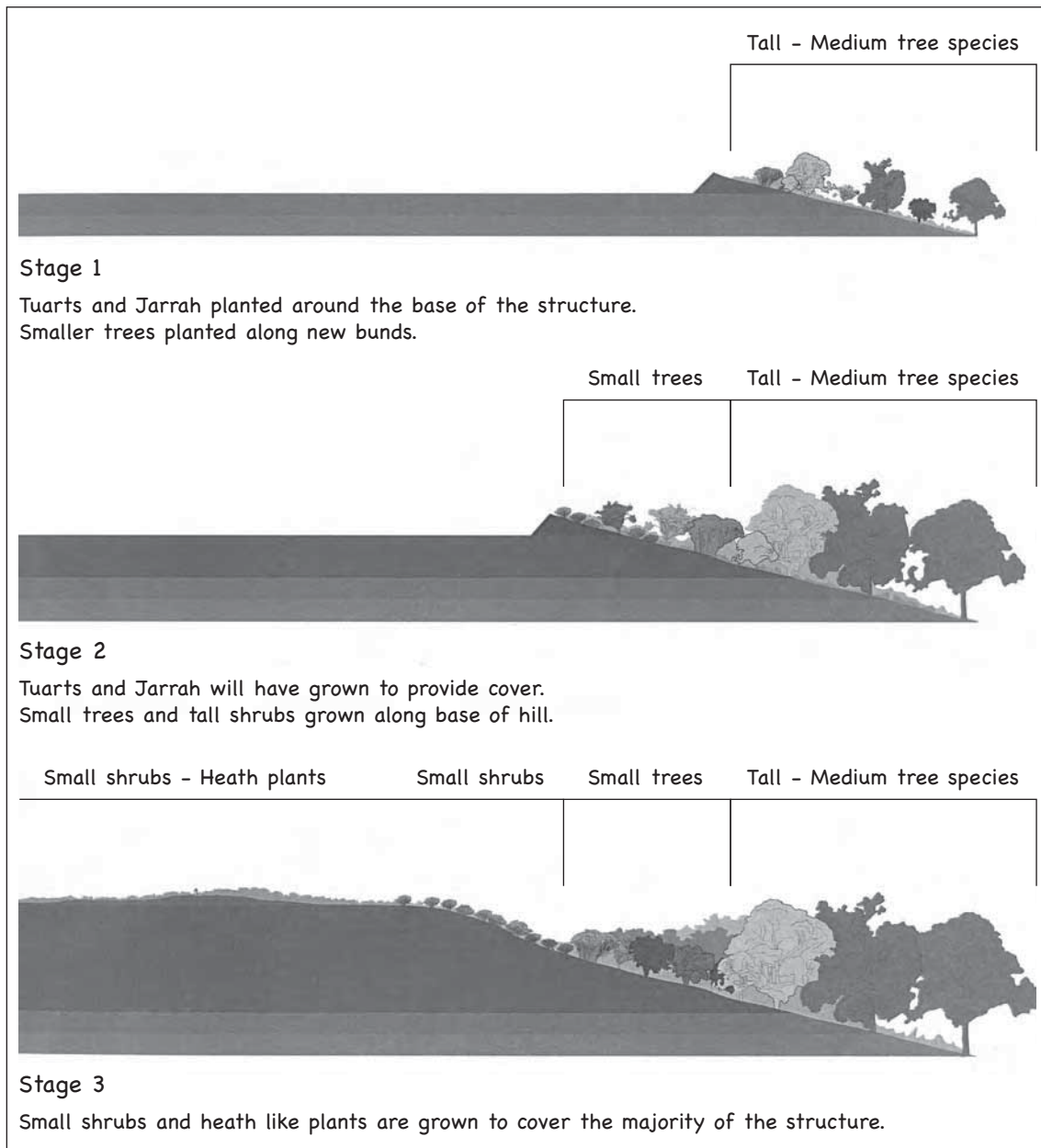
Figure 2.19: *Planting that would be established to screen proposed waste site at Kwinana. Adapted from an image supplied by Ecoscape Australia Pty Ltd.*

Step 4. Develop visual management measures

(i) Determine whether visual management objectives can be achieved

- Determine whether or not the development option chosen meets the relevant visual landscape character objectives established in **Step 1**.

- The visual landscape character objectives derived in Step 1 are likely to be very broad and may not provide adequate guidance at a site level. In this case, a more detailed evaluation may be required. The general focus should be on identifying and preserving or enhancing significant areas, features and views.

(ii) Identify measures that reduce negative impacts; and facilitate positive impacts

- If the proposal does not meet the established objectives, identify and describe measures to reduce negative impacts (ie develop recommendations to avoid or reduce negative impacts or change them into positive impacts). An integral part of all assessments of development proposals is the mitigation or reduction of negative impacts.

- Analyse individual components of development options to determine the source of predicted negative impacts. Tailor specific measures to address these impacts, based on best practice siting and design principles. Measures should also address each stage of a staged development.

- Endeavour to meet all visual character objectives and recommendations through careful siting, planning and design. Identify and avoid serious constraints early in the design process.
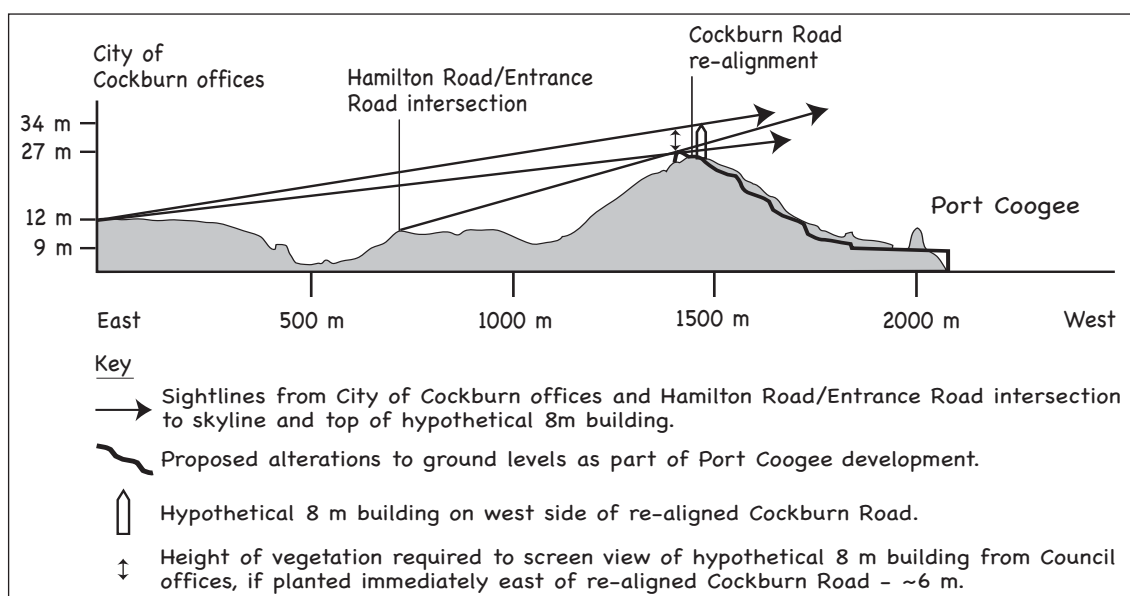
Figure 2.20: *One of the visual management objectives for the proposed development at Port Coogee was that the development not be visible from east of the ridge. Cross-sections such as the one above were prepared to enable planners to determine whether this objective could be met by vegetation screening located in the ridge top open space or in the road reserve.*

Source: Based on cross-sections of proposed development, by Sinclair Knight Merz, in Port Coogee Waterways Environmental Management Plan. Volume 5 Landscape Management Plan (RPS Bowman Bishaw Gorham, 2004).

Step 5. Prepare the final recommendations and monitoring options

- Summarise the findings of the assessment and identify the significant impacts in terms of location, design details or other visual landscape issues that are associated with the proposed development (eg protection, visual intrusion, loss of privacy).

- Compare and discuss development options and determine the extent to which visual management objectives for the site would be met.

- Identify and describe any mitigation measures or design principles that should be applied (including recommended development and performance conditions and monitoring).

- Produce the final recommendations, tables and charts for analysis and presentation. Visibility mapping and graphics depicting the proposed development are central components.

- Recommendations regarding implementation need to address the possibility of monitoring, in particular any conditions that have been placed on the development proposal during the approval process.

Implementation

Once the final recommendations for the visual impact assessment of the development have been completed and documented, a list of actions and priorities for planning applications can be prepared. This includes presenting alternative development options if applicable. The outcomes of the visual impact assessment can then be incorporated into the planning decision-making and approvals process.

Implementation and integration into planning outcomes requires the use of the tools and policies outlined in **Part 1, Appendices 2, 3 and 4**.

Priorities need to be determined for each project assessment in terms of time lines, budgets and other constraints.

2.4 Tools and techniques for visual landscape planning

Introduction

There are a number of tools and techniques that can assist the visual landscape planner.

The principal aim of any technique used in visual landscape evaluation and/or visual impact assessment is to provide objective information that is tailored to the particular project needs. The most appropriate techniques will vary according to a specific project, community sentiment, scale of area being assessed, available resources, landscape issues to be addressed, expected outcomes and numerous other variables such as political, cultural and environmental factors.

The techniques and tips below may apply to either or both visual landscape evaluation and visual impact assessment, although the focus is on techniques for visual impact assessment.

Photography

Photographs are an important technique in visual landscape planning. Aerial photographs in particular can help illustrate and document established visual characteristics, land use patterns and user patterns. Three-dimensional images enable visualisation of an existing or proposed development and can assist decision-makers in assessing proposals and making informed decisions. Photos are useful in many forms of communication: questionnaires, personal interviews, brochures, posters, on the internet, public workshops, newsletters and other print media.

Photographs can help illustrate visual characteristics of landscape character units. During application stages, photos can be used to fine-tune development proposals and address design objectives.

The importance of focal length

Photographs can misrepresent the visual landscape. A long focal length (zooming in) can make distant objects seem relatively larger, and in general compresses the view. A short focal length (wide angle) makes distant objects appear relatively smaller and less evident.

It is important to record the focal length at which photographs are taken. With a 35 mm camera, a focal length of about 90 mm best represents what the eye sees. A sequence of such photographs, assembled into a montage, is required to best represent a panoramic view, rather than a wide-angle view.

Tips for use of photography in visual landscape evaluation

- Aerial photographs can form a useful base for landscape character mapping, especially at a local or site level. Satellite images may assist in regional level assessments.

- Photos should be taken from travel routes and use areas from which the proposed development will be most visible.

- Photo positions should be decided with input from key stakeholders and the members of the community whose views will be affected.

- Photograph locations and conditions must be carefully chosen and well documented.

- An index map indicating photo locations should be prepared.

- Photographs should be taken from a normal human viewing height and angle, for example, from eye level on a road or roadside rather than from the top of roadside banks or from the roof of a vehicle.

Figure 2.21: *Air photo overlaid with annotations indicating locations from which ground level photographs were taken, with angle brackets showing direction and width of views.*

Source: Figure 2, Leighton Marshalling Yards Regional Planning Guidelines – Assessment of Views, Vistas and Landscape Character (Ministry for Planning, 2000). Courtesy of Thompson Palmer Pty Ltd.

- The exact location and height should be mapped and documented, together with compass directions and details about the camera lens used.

- To best represent the view seen by the human eye, panoramic views should be a montage of photographs taken with a long focal length rather than with a wide angle lens.

- The date, time of day and weather conditions such as shadows, glare, reflections and colour intensity should be noted, as they can influence visual qualities.

- The focal length (or degree of zoom/wide angle) should be recorded for each photograph.

- Identifiable reference points should be included in the image to enable accurate positioning of overlays depicting a proposed development.

Photos used in visual impact assessments can be overlaid with annotations that explain the key points of the analysis and label major features of the proposed development.

Field investigations

Most of the techniques described in previous sections apply to desktop data analysis. Field investigations are essential to verify, validate and complement the desktop information.

Important aspects to note in the field include: general types of views available, major viewpoints, descriptions of landscape character components such as type of trees that are prominent in the visual landscape, obvious landscape issues, the character of buildings and other man-made structures, significant roadside vegetation, the nature of small-scale features such as rock outcrops or stands of trees. Roadside vegetation screening may also be noted. Table 10 provides an example of what a record sheet for landscape assessment fieldwork may look like.

In local and site level studies it is useful to use aerial photographs and binoculars to identify the location of specific landscape features that may be the subject of recommendations for protection or enhancement, such as remnant trees on prominent ridgelines or along creek-lines or quarry sites.

Table 10: An example of a field survey record sheet
(adapted from Landscape Institute 1995:39)

Field Survey Record Sheet	
Viewpoint No:　　**Location:**　　**Date:**	**Landscape Condition**
Film/Photo No:　　**Direction of view:**	
Annotated Sketch:	**Most appropriate management strategy**
	Protection
	Restoration
Brief description (main elements and features)	Best Practice Siting and Design
Dominant landscape elements　　　**Ability to accommodate change**	

Simulations and computer generated techniques

Computer simulations can generate photomontage images that are useful when assessing proposals that produce changes to the visual landscape. Simulated images can be a valuable tool to help people visualise a proposed development. However they can also be deceptive. To be effective simulations must accurately portray true scale, perspective, observer position, angle of view, colour, texture, angle of the sun and distance from the observer.

One of the most difficult tasks is accurately depicting the depth of colour of proposed objects, taking into account the weather and time of day. Although computer techniques can generate a large amount of information very quickly, manual techniques can also be effective.

There are a whole new generation of computer simulation techniques that have evolved over the course of producing this manual. One example is visualisation software called SKYLINE, which creates a three-dimensional simulation by draping aerial photography over terrain (contour) data, as well as other layers of information such as vegetation, proposed development plans and settlement areas. It allows the investigator to visualise the potential impacts a proposed development could have on an area with various geographical and land use elements, from an array of viewpoints that are digitised.

Sim Urban is software which creates a real-time simulation of urban environments with highly realistic facades and surfaces, allowing very precise assessments of the visual impact of changes to the built environment.

Sketches and artists impressions

Sketches can illustrate a number of elements in a landscape simultaneously in a hypothetical scene being prepared for a visual landscape character description. However, the resulting image may look unrealistic if these features are not normally located in the same area.

(a) Simulation view of project for EPA assessment in July 2002

(b) Updated simulation view of project (May 2003), with new cooling tower configuration
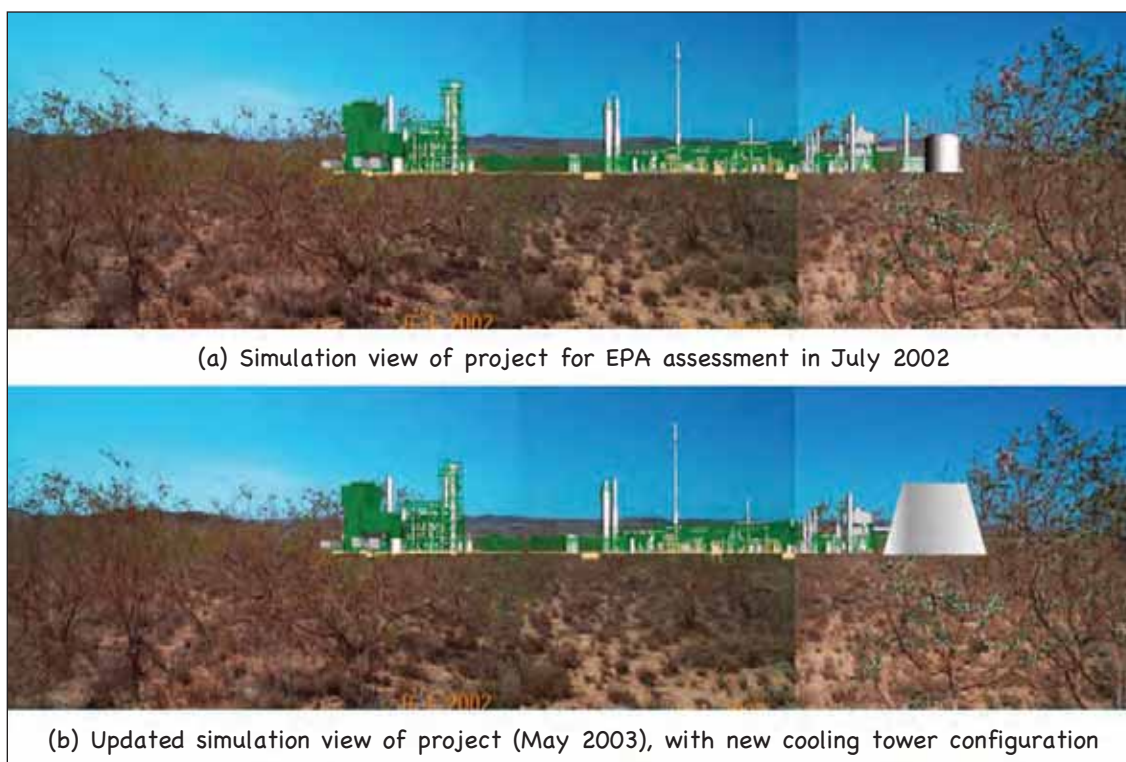
Figure 2.22: *Photo simulations may illustrate alternative development proposals, allowing comparison, as in this proposed plant on the Burrup Peninsular. Image supplied by URS, courtesy of Dampier Nitrogen.*

Annotations written on photographs or sketches are a useful way of communicating key findings of the visual landscape assessment.

An artist's impression is another way of producing a hypothetical image of a landscape and proposed development. This may be an easier way to produce an image that incorporates the proposed changes into an existing landscape, in terms of depth of colour and reflections. It is likely to be less accurate than a computer generated simulation in depicting the exact location and dimensions of a development. An effective image can be created by using computer technology to indicate the dimensions of structures, accurately located in a photo of a scene, and rendered by hand to create a realistic final appearance.

Composite techniques

Regardless of the technique used, it is important to illustrate all components of a development proposal including ancillary elements that may include fencing, powerlines, other utilities, roads, structures, vegetation removal, drainage works and all planting.

Images may be needed to illustrate projections of how a development will appear over time; growth of plantations or screen plantings for example. These could assist in monitoring progress once a development is completed.

Oblique aerial perspective

Overlaying aerial photographs and digital elevation models creates three-dimensional images. Other data layers, including cadastral, land use, roads, hydrology or vegetation cover can be added if required.

Three-dimensional images are useful where landform screening and the relationship between landform and other landscape components are particularly important. They should supplement ground level information that represents normally accessible views of the landscape.

Figure 2.23: *Oblique aerial photo used to illustrate position of major ridge crest through development site.*

Source: Figure 1, Port Coogee Marina Waterways Environmental Management Plan. Volume 5: Landscape Management Plan. (2004). Image supplied by Sinclair Knight Merz, courtesy of RPS Bowman Bishaw Gorham.

Seen area or viewshed analysis

Seen area or viewshed is defined as the land visible from a point or series of points, such as from a lookout tower, road or river (see Figure 2.24).

The most basic form of seen area analysis identifies an area of landscape that would be visible assuming that it had no vegetation cover or built structures, based on landform alone and not taking into account potential screening.
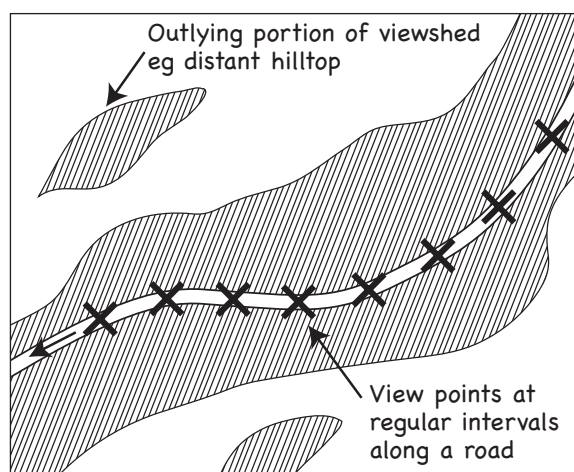

Figure 2.24: *Hypothetical viewshed from a road, comprising combined viewsheds from viewpoints at regular intervals along the road.*

Screening may be taken into account by field investigation or computer analysis.

Amalgamating a series of viewsheds from individual points at regular intervals along the route identifies the composite viewshed of a linear feature such as a road or river.

In this way, a series of individual viewsheds is combined into a single viewshed. The interval used on a route through flat terrain would be greater than that used for undulating terrain (eg every kilometre versus every 100 m), and the scale of analysis should also be taken into account. Viewsheds may contain land that is not contiguous, for example, isolated distant hilltops or ridges.

Visual landscape evaluation

For a visual landscape evaluation of a region, a detailed seen area analysis of the entire region is not usually necessary. Instead, the major locations from which the public sees the landscape may be identified. These include major roads, scenic routes, towns, recreation sites and walk-trails. Accurate seen area mapping is relevant for a local or site level assessment as well.

A seen area analysis is undertaken using a computer program designed for the task. The accuracy of the mapping output depends on the contour data available. The smaller the contour interval used, the more accurate the seen area mapping will be.

At a local or site level seen area mapping can be undertaken using field inspection and hand drawing to produce additional seen area maps that take account of screening by vegetation or buildings.

Visual impact assessment

Two applications of viewshed analysis are relevant for visual impact assessment exercises.

First, the landscape seen from major public viewing locations should be identified. The visibility of a proposed development from these major viewer positions should be identified, assessed and mapped.

Second, viewsheds should be assessed from the point of view of a proposed development itself. The purpose should be to identify all locations from which the development will be visible (Figure 2.25). The analysis should also identify locations from which only part of a development is visible such as the top of an industrial chimney or blades of a wind turbine rather than the whole structure.

Identification of all locations from which a development will be visible is vital if the visibility of a proposed development is to be minimised. Alternative development locations or designs can then be tested and assessed.

Cross-sections

Cross-sections are vertical profiles through a portion of landscape. They help illustrate the typical relationship between landform and other landscape characteristics such as vegetation cover and land use.

Vertical scale is usually exaggerated to highlight specific features. Cross-sections can be drawn by hand using a contour map or produced by computer simulation using digitised contour information.

Cross-sections can help determine the visibility of a proposed development, particularly a vertical feature such as a building or wind turbine. They can also be used to determine height limits for buildings and other structures, and the required height of vegetation screening. Cross-sections are
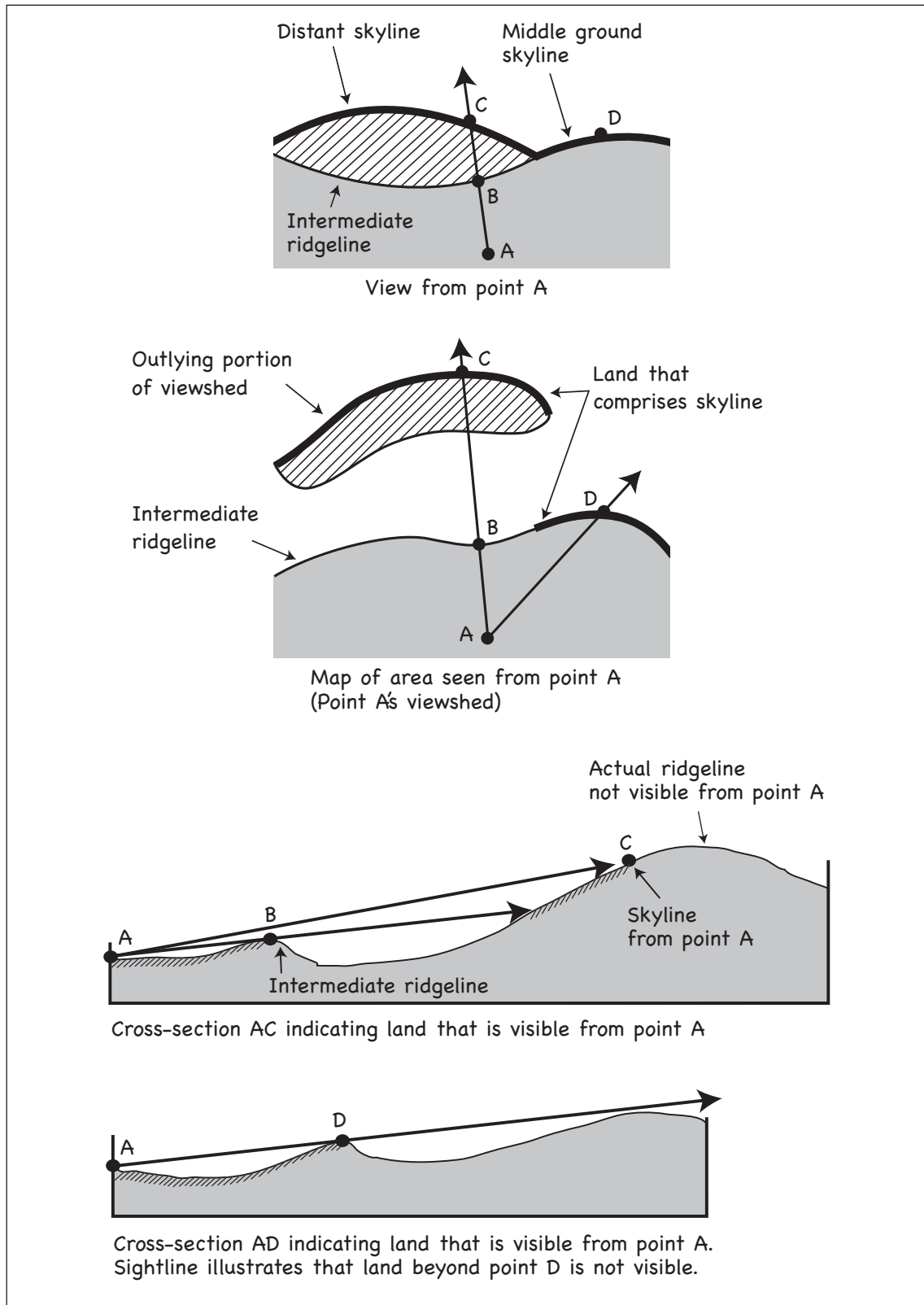
Figure 2.25: *Hypothetical viewshed from a single viewpoint. Accurate viewsheds are generated from multiple terrain cross-sections and can be used to identify exact portions of land that comprise sensitive locations, such as the skyline and foreground ridgelines.*

Figure 2.26: *Seen area analysis - air photo overlaid with area seen from key viewing locations, illustrating the relative prominence of various portions of the site. Terrain cross-sections from each viewing location would indicate the height at which structures would be visible in the areas where the ground surface is not currently visible.*

Source: Figure 5, Leighton Marshalling Yards Regional Planning Guidelines – Assessment of Views, Vistas and Landscape Character (Ministry for Planning, 2000). Courtesy of Thompson Palmer Pty Ltd.

generally undertaken for site level analysis. They are useful when illustrating special features of a site and in developing alternative design options.

Landscape data mapping

Maps depicting specific landscape elements can be used to help understand the unique characteristics of a landscape character unit. Elements of interest may include; elevation and landform features, road hierarchy, water bodies, plant communities, remnant vegetation, salinity patterns, vegetation patterns resulting from clearing, fire, revegetation and plantations, satellite images highlighting ground coverage and land use.

Detailed data maps could assist in identification of major landscape issues and/or formulation of development recommendations. Maps could include: town planning schemes, land managed by the Department for Conservation and Land Management, other reserves, land tenure and land subject to heritage inventories.

Base maps used should be accurate, current, of an appropriate scale, and should include sufficient labels of significant features to enable cross-reference between written texts and mapped data. Any specific features mentioned in the text should be located on a map.

Visual absorption capacity analysis

Visual absorption capacity is a term applied to the ability of a landscape to be changed and still retain its existing visual characteristics, such as natural, rural or built character, sense of scale, degree of complexity, degree of enclosure, dominant patterns, forms, lines, colours and the like.

Some of these characteristics may lend themselves to a particular type of change more readily than others, eg a more enclosed or diverse landscape may accept change more easily than one that is open in character. Factors

that affect capability include the extent to which the landscape is generally visible, eg depending on the screening provided by landform and vegetation; and a landscape's potential for increased screening, eg whether the terrain can support planted screening vegetation that fits with the existing character of the landscape.

Visual absorption capacity analysis can be applied as a highly technical process. Steps include identification of the criteria that are relevant to the area being investigated, such as criteria related to landform units, soil types, vegetation communities and land use types. An assessment is made of characteristics that are considered to be the most and least likely to visually absorb proposed changes without altering landscape character. Relevant information is overlaid to create a composite map of capability levels.

There are similarities between the visual absorption capacity concept, and land capability analysis, in which an area's capacity to sustain a particular type of land use is analysed. Similarly, the visual absorption capacity concept relates to the landscape's ability to absorb a particular type of change.

Analysis of visual absorption capacity is more common as part of a visual impact exercise than a landscape assessment, although consideration of the visual absorption capacity of a broader landscape may assist in the development of recommendations to protect valued landscapes.

The visual absorption capacity concept has been used in the USA and Australia. A similar concept, called landscape capacity has been developed in England and Scotland (Scottish Natural Heritage and Countryside Agency: Topic Paper 6, 2004).

PART THREE -
Guidelines for Location, Siting and Design

3.1 Introduction

Part 3 is intended to:

- provide advice for local communities and local and state agencies on techniques to protect valued visual landscape character, including individual features and views;

- assist development proponents to produce proposals that are compatible with visual landscape character;

- assist those planners and decision-makers who are responsible for assessing the potential impacts of development proposals, for example, in developing approval conditions;

- provide a starting point for local authorities in establishing localised guidelines and policies; and

- help communities to address issues that impact on landscape values.

There is a wide range of documented criteria that are relevant to location, siting and design of development, such as land capability, groundwater protection, vegetation conservation, energy conservation through solar aspect and fire protection. This manual focuses on the visual components of development and changes in land use. Methods for addressing visual criteria for siting and design of development are not well documented, are often contentious and have not previously been comprehensively addressed in Western Australia.

Ideally the consideration of visual landscape issues would be integrated into any detailed guidelines for specific types of land use, as has occurred in the case of telecommunications guidelines that address a range of issues including visual landscape. Separate, complementary guidelines that address visual landscape in more detail are still warranted because broader based guidelines usually address visual management in a cursory manner, and more guidance is needed on how to implement policies that relate to specific land uses.

How to use these guidelines

Refer to Section 3.2 Valued landscapes under pressure if you are involved in planning for coastal, riverine, undulating rural or prominent elevated areas. Issues to consider are provided, as well as general principles and more specific guidance.

Refer to Section 3.3 for specific land use categories such as rural uses or urban uses for discussion of broad issues and generic principles for addressing these. These guidelines should be used in conjunction with existing policies and guidelines as outlined in each section.

Refer to the Utility towers guideline for detailed guidance for the development of wind farms. Material on some uses, such as telecommunications towers, is quite detailed in relation to addressing visual impacts. This guidance complements broader ranging advice available from other sources.

Refer to the Mining and Industry guideline for generic principles and guidance for this land use.

The guidelines are intended primarily for application to private land. Areas that are in public ownership, such as national parks, are already subject to comprehensive management planning.

Assessing development proposals

Part 2 of this manual includes a detailed outline of a process for assessing the visual impacts of development proposals, for use by those decision makers who are responsible for recommending the acceptance or otherwise of specific development proposals.

The outcome of this visual impact assessment process should be a recommendation that based only on visual impacts, the proposed development should be accepted as proposed, accepted with modifications or rejected. This

advice then needs to be integrated with assessment of other factors, such as impact on conservation values.

However the focus in **Part 3** is not on assessing a development proposal, but on producing a development proposal that is likely to meet the visual management objectives that were decided on as part of a visual landscape evaluation. This process should involve a series of repeated steps in which the proposal is refined until it meets agreed objectives.

Part 3 of this manual also assists in identifying measures to address the potential negative impacts and constraints related to development proposals, and to facilitate positive impacts and opportunities. Development proposals should meet visual character objectives through careful siting, planning and design. Serious constraints should be identified and avoided early in the design process, by undertaking a visual impact assessment.

Broad visual management objectives

The visual landscape evaluation method outlined in **Part 2 (section 2.2, Step 4)** refers to three broad, basic visual character objectives:

- **protection and maintenance** of visual landscape character;

- **restoration and enhancement** of degraded visual landscape character, or opportunities for enhancement; and

- for other areas the broad objective is to undertake a combination of protection and enhancement where appropriate; and elsewhere to undertake **best practice siting** and design.

Specific visual management objectives

In order to meet these very broad objectives, strategies that meet more specific objectives need to be used. These specific objectives are:

- **(a) not evident:** development may be hidden, screened or not visible, from specified viewing locations;

- **(b) blending:** development may be evident, but generally not prominent in that it borrows from the existing landscape setting;

- **(c) prominent:** development may be a dominant feature in the landscape, drawing attention to itself.

These three objectives outlined below are intended for application to the broad objectives defined in previously: protection and maintenance; restoration and enhancement; and best practice siting and design. A specific objective may be relevant either due to the nature of the existing visual landscape character (for example, the objective 'not evident' may apply to development in a pristine natural landscape) or due to community preferences for proposed land use types to remain hidden from view.

If the broad objective is to protect and maintain a landscape, feature or view, it is most likely that the preferred specific objective would be for a development to either be 'not evident' or to 'blend' with its visual landscape setting. Prominent landmark developments would be acceptable if they are iconic and provide a complementary meaning to the highly valued landscape.

Where the broad objective is for a landscape to be enhanced or restored, any of the three specific objectives may apply. It is more likely to be acceptable for development to be prominent in the landscape, as a new feature to enhance a landscape that is currently lacking in visual interest. Restoration or enhancement may involve strategies to make an existing development blend better, or even to be made not evident in the visual landscape.

The broad objective 'best practice siting and design' applies to areas that may comprise a combination of areas requiring protection or enhancement, as well as any other areas that do not warrant particular attention, but nevertheless should be planned and designed to meet current best practice for siting and design. Any three of the specific visual management objectives may be applicable.

Examples for possible strategies for location, siting and design to achieve each specific visual management objective are in Appendix 9. Thought starters for guidance on deciding on location, siting and detailed design are presented in Appendix 10.

(a) Not evident

The broad visual management objective that would provide the context for this specific objective would be 'protection and maintenance'.

Development that is to be 'not evident' should not be visible from designated viewing locations such as roads, trails, residences or recreation areas. The degree to which development is evident will relate to its distance from viewers, its magnitude, height and bulk, atmospheric conditions and community attitude towards the form of land use proposed.

The 'not evident' objective would frequently apply to valued natural landscapes, where the broad objective would be to protect and maintain existing character. It would apply less often in rural landscapes and would often be irrelevant in urban settings, other than in areas of open space that retain their natural character.

Examples of the application of this specific objective to particular types of land uses and forms of developments could include:

- land uses associated with solid and liquid waste disposal, scrap yards, quarrying or mining;

- waste facilities at all levels, including landfill sites, waste treatment depots, sewerage facilities, and rubbish bin enclosures;

- some forms of industry;

- telecommunications and other utility structures in valued natural landscapes, urban heritage areas or mounted on a heritage building (Utility towers guideline); and

- areas of open space that retain their natural character.

Image 24: *The Bunker Bay Resort is located out of sight below the ridge in this highly valued view from the Cape Naturaliste lighthouse.*

Image 25: *Aquaculture development at Bremer Bay located in a swale behind the foredune where it is not visible from the beach.*

Image 26: *Transmission lines visible from Coogee Beach: an example of a land use that ideally would be not evident as seen from this popular recreation site.*

Image 27: *This simple timber structure at Red Bluff, north of Carnarvon, is not evident from a distance due to the similarity between its colours and textures and those of the surrounding landscape.*

(b) Blending

The term 'blending' was chosen for this specific visual management objective as it is commonly used in reference to development that is visible (or possibly prominent) however its appearance remains compatible with the surrounding landscape setting. Other terms that are often used synonymously include 'harmonise with', 'complement' or 'borrow from'.

To ensure that a development blends with existing landscape character, it is vital that the dominant visual components of the landscape are identified. Planners and designers need to know which landscape characteristics the development needs to blend with.

The 'blending' objective may be relevant in natural, rural or urban landscapes, particularly valued landscapes that are subject to pressures

for change. It may be chosen as an objective in instances when it would actually be preferable for a development to be not evident, but for certain reasons it may be inappropriate or not feasible to implement changes to ensure that development is not visible.

This objective is typically referred to in planning documents including town planning schemes, conditions of development approval and environmental assessments. Measuring the success or otherwise of this objective is more subjective than measuring whether a development is not evident. For this reason measures for blending development into its landscape setting should be included wherever feasible, for example, building heights to be structured below ridgelines and linking the proposed heights to the heights of nearby trees.

Image 28: *The colours of this ecotourism accommodation, and its siting amongst the vegetation that is taller than its roof, ensure that it blends well with its natural landscape setting.*

Image 29: *This walkway at Canal Rocks, Yallingup, blends with its setting as the colour of the timber matches that of the rock base and natural stone has been used for foundations.*

Image 30: *Prominently sited buildings may incorporate colour schemes that reflect their location, as in this club facility at Trigg.*

Image 31: *The Ecology Centre at Bold Park, City Beach, sits well against its vegetated backdrop.*

Case study: The Blowholes, Carnarvon Coast, Ningaloo (refer to Appendix 8)

In this open coastal landscape it is not feasible for development to be 'not evident', although it is appropriate to attempt to blend development into its landscape setting and to undertake actions designed to enhance the site. Natural landscape features should be maintained as such, with development sited and designed to minimise visual impacts.

Visual management objectives that are specific to individual key views include the following strategies that relate to views from the lighthouse:

- it would be preferable not to have structures silhouetted against the ocean and where this is not feasible, roofs should fit with the strong horizontal line of the top of primary dune ridge;

- no structures should appear silhouetted against either the island or rocky shore adjacent to the blowholes as visible from here;

- care will need to be taken if the new road crosses the foredune in a line between the island and this viewpoint, as the island is a prominent landscape feature in this view; and

- formal pedestrian trails should be aligned in a less intrusive fashion, that is, following contours, and greater use made of swales.

Image 32: *View from the lighthouse towards the point at The Blowholes, Carnarvon Coast, Ningaloo.*

(c) Prominent

There are many cases in which development is unintentionally prominent, however this objective refers to instances in which development is intended to comprise a new focus in a landscape, such as iconic community buildings or structures. Development still typically exhibits a connection to its setting, however, through colour, form or architectural style. An example is Cottesloe's Indiana Teahouse with its colour, texture and similarities to historic structures that previously occupied the site.

Image 33: *This building at Busselton jetty is prominent due to its location however its colour and form link it to the natural and cultural elements of its setting: the coastal landscape and historic jetty.*

Some forms of development, such as lighthouses, are required to be prominent. These uses may have strong cultural landscape linkages or important reasons why they need to be featured in the landscape.

In natural or rural landscapes, communities may accept the visual prominence of developments if they believe the benefits of the development outweigh adverse visual impacts, such as wind farms. However, prominent development would generally be considered inappropriate in a highly valued natural landscape.

Image 34: *Cottesloe's Indiana Tea House sits prominently behind the beach but it is set well into the slope and its colours, materials and overall design are visually appropriate it its setting.*

In urban areas it may be quite common for a structure to be intended as a prominent feature, especially where the original or valued landscape character has been removed, as in Perth's CBD.

Examples of urban prominent structures include:

- civic buildings such as concert halls, museums, art galleries, train stations, town halls, seats of state or local government;

- city centre high-rise buildings;

- bridges;

- churches; and

- public sculptures or memorials.

Image 35: *Lighthouses, like this one at Cape Naturaliste, may be prominent cultural features in an otherwise natural setting.*

Image 36: *Public sculptures are generally intended to be prominent, even in natural settings, as in this example at Cottesloe. Use of local materials provides a visual link to the landscape.*

Image 37: *As in this City Beach kiosk, bold colours that contrast with the surrounding landscape may be used. These colours may reflect a cultural connection, such as popular beach culture.*

Image 38: *Prominent structures are sometimes treated as an artist's canvas, acknowledging their prominence while still maintaining a link to the setting, as at this Greenough caravan park.*

3.2 Valued landscapes under pressure

Introduction

This guideline addresses major visual planning and management issues that occur in some WA landscapes which are both valued by the community and are under pressure for change. These are: coastal landscape, riverine and estuarine landscapes, prominent elevated landscapes and undulating rural landscapes. The landscapes discussed here were selected on the basis of anecdotal evidence of community concern, reflected in government policies such as Department for Planning and Infrastructure (DPI) State Planning Policies that focus on sensitive areas including the State's coastline and coastal areas, the Swan and Canning rivers and the Leeuwin-Naturaliste Ridge.

This manual provides examples of principles and strategies for addressing the major visual planning and management issues that are occurring in these landscape types. If comprehensive guidelines for any specific landscape are required, the methods for assessing visual landscape character (outlined in Part 2 of this manual) may be followed. The output of a visual landscape character assessment could comprise a set of siting and design guidelines relevant to a particular locality.

A number of natural landscapes or landscape features in WA, such as the gorges of the north and several mountain ranges, are not addressed in this guideline. Their significance has been recognised by their status as national parks, and as such these areas are subject to comprehensive management planning, in which visual management is addressed. They are not subject to major development pressures.

The intent and structure of this guideline differs from the other land use guidelines outlined in Part 3. Guidance applies to sensitive landscape types, rather than specific land uses. The

strategies are not detailed; however this guideline will assist users in recognising these visual elements of these landscapes that may be under pressure.

Key relevant agencies and existing policies and/or strategies

This guideline should be used in conjunction with existing policies and guidelines.

Coastal landscapes

Agencies - DPI, DEC, local authorities
Existing policies/guidelines:

- State Coastal Planning Policy 2.6 (WAPC 2003)

- Amendment to State Coastal Planning Policy (WAPC 2006)

- Coastal Planning and Management Manual (WAPC 2003)

- Perth Coastal Planning Strategy: Community Engagement Outcomes Report (WAPC 2006)

- Ningaloo Coast State Planning Policy 6.3 (WAPC 2004)

- Leeuwin-Naturaliste Ridge State Planning Policy 6.1 (WAPC 1998)

- Ningaloo Coast Regional Coast Strategy Carnarvon to Exmouth (WAPC 2004)

- Shire of Busselton Adopted Scheme Planning Policy (Town Planning Scheme 20) Combined Methodologies 413 Smiths Beach Road, Yallingup - Schedule 10, pursuant to Clause 103 2004)

- DEC management plans

- Coastal strategies and foreshore management plans

- Local planning strategies

Riverine and estuarine landscapes

Agencies - Swan River Trust (SRT), DEC, DPI, local authorities, estuarine management agencies
Existing policies/guidelines:

- Swan-Canning River System State Planning Policy Number 2.10 (WAPC 2006)

- Water Resources State Planning Policy Number 2.9 (WAPC 2006)

- Swan River Trust Policy SRT/EA1 – Conservation, land use and landscape protection (2002)

- Swan River Trust: Riverview 24: Protecting the Swan River Landscape (2001)

- The Swan and Canning Rivers Precinct Plan Handbook (SRT and WAPC 2002)

- Water notes 16 (W&RC 2001)

- Swan River System Landscape Description (SRT 1997)

- Local planning strategies

Prominent elevated landscapes

Agencies - DEC, DPI, local authorities
Existing policies/guidelines:

- DEC management plans relevant to elevated landscapes

- Darling Scarp Regional Park and Landscape Study (DPUD 1993)

- Draft Moresby Range Management Strategy (WAPC 1998)

- Local planning scheme provisions (development control areas),

- Local planning strategies

Undulating rural landscapes

Agencies - DPI, Agwest, local authorities
Existing policies/guidelines

- Agricultural and Land Use Planning State Planning Policy 2.5 (WAPC 2002)

- Historic Heritage Conservation State Planning Policy (WAPC 2007)

- Leeuwin-Naturaliste Ridge State Planning Policy 6.1 (WAPC 1998)

- Shire of Busselton Caves Road Visual Management Policy (1999)

- Avon Arc Sub Regional Strategy (WAPC 2001)

- Lower Great Southern Regional Strategy (WAPC 2007)

- Local planning scheme provisions (development control areas)

- Local planning strategies

Coastal landscapes

Guidelines for addressing coastal landscapes in Western Australia are to be published separately, in a more comprehensive format. The material below comprises a summary version.

Background

Coastal landscapes are probably more highly valued by the community than any other broad type of landscape in the State. A 2005 community survey conducted for the Perth coastal planning strategy found that the coast was the most likely place that residents would take visitors, especially at sunset. The survey also found that 77 per cent of respondents thought the coast is a major part of the character of Perth and 82 per cent thought that it was very or quite important that the coast offers 'a place to experience the natural environment'. Cottesloe was the location most frequently identified as a place that should definitely keep its existing character.

In relation to non-urban areas the public appears to prefer an undeveloped coastline. For example, the Shark Bay World Heritage Property Landscape Study (CALM, 2001) found that the places visitors thought were the most attractive were natural and the least attractive were human-modified. This finding was consistent with a large body of international research into people's perceptions of landscapes.

The coast is subject to enormous pressures for development, especially residential and tourist developments, including marinas, as well as port facilities and coast-dependent industrial development. Due to the open nature of coastal landscapes, it is very difficult to locate development along the coast without it dominating the landscape, thus altering the coast's natural character.

Visual elements

All coastal landscapes have the same two basic components, land and sea, with a boundary zone or edge between the two. The widely contrasting colours, textures, forms and lines between land and sea create an enormous visual diversity and interest.

Individual prominent coastal landform features include headlands, which are particularly visible locations as they are visible from along beaches fronting embayments. Other features include cliffs, beaches and dunes, as well as offshore features

Image 39: *Sugarloaf Rock, Shire of Busselton, is a prominent rock feature in a natural coastal landscape.*

Image 40: *Colour and texture diversity on a rocky beach.*

such as islands and reefs. Coastal vegetation is generally low-growing, fragile, difficult to establish unless the species naturally grow on the coast, and prone to wind-pruning. Soils commonly comprise infertile sand, or may be of a shallow depth over bedrock, on rocky coastline. Little natural screening is provided because coastal vegetation is typically low and open. There is little potential to provide new vegetation screening, as conditions are exposed and soils infertile. Natural landform screening is provided by swales in dune systems.

The coast is a particularly fragile and dynamic landscape, with constantly shifting shoreline and beaches, mobile dunes and steep, eroding cliffs. Natural landforms vary widely in their character, from mudflats, beaches, estuaries and inlets, to dune systems, headlands, cliffs and marine features such as reefs. Vegetation communities contain a vast diversity of species, notably in coastal heath and scrub communities.

Coastal landscapes provide a wide diversity of types of views. Long, unobstructed views may be obtained along straight or gently curved stretches of coast, or back towards the coastline from the ocean. High points such as headlands, cliffs and the tops of dune ridges provide panoramic coastal vistas. Views may be enclosed in small embayments, as at Rottnest, or views may be dominated by such features as cliffs, headlands, beaches or detailed close up features including individual plants, rock formations, shells or marine life on beaches or under water, and underwater rock features.

Image 41: *Cottesloe groyne is a unique vantage point along Perth's urbanised coast as it provides views back to the beach from nearshore waters as well as views along the coastline.*

Visual elements specific to coastal tourism developments to consider are siting and location of development, building design (colours, materials, height, reflectivity), parking areas, signage and entry statements, access from main roads and clearing of vegetation for development.

Issues and pressures

The community is particularly observant of changes to the natural character of coastal landscapes, especially in areas that are well used and admired. Potential changes to the character of coastal landscapes must be carefully assessed in terms of levels of impact that are acceptable to the community, taking into account the character of the site, the extent and type of use the site receives, and likely community sensitivity to changes. Major visual issues on coastlines include:

- modification of landforms and removal of vegetation for urban expansion;

- reduced visual access to the ocean as the number and height of coastal buildings increases;

- visual dominance of built elements in urban coastal landscapes;

- the wide variety of architectural styles, materials, heights and colours, which can result in an overall lack of visual coherence;

- visual dominance of built elements in natural or rural coastal landscapes, eg: isolated tourist or housing development nodes; and

- the need for careful siting and design of recreation facilities such as ablution blocks and car parks, given the prominence of coastal recreation reserves.

The principal issues identified in the 2005 community survey conducted for the Perth Coastal Planning Strategy comprised:

- high rise development;

- sprawl north and south along the coast;

- too many people living right on the coast;

Image 42: *The degradation of native vegetation downslope from this coastal carpark has reduced the visual diversity of vegetation. A few weed species now dominate an area which would have previously supported a myriad of native species.*

- damage to the coast caused by too many people using the area; and

- impact of traffic and parking.

Principles and guidelines

This guideline focuses on visual landscape management issues, complementing the recently published Coastal Planning and Management Manual (WAPC 2003), which covers a broader range of topics. It is also intended to assist local authorities to implement the State Coastal Planning Policy 2.6 (WAPC 2003).

Principles related to visual landscape management in any landscape may be applicable at regional, local or site levels, while specific guidelines mainly relate to detailed planning and design at a local or site level.

Urban coastal landscapes

Locate, site and design built elements near the coast in a way that minimises their visual dominance and acknowledges their coastal setting.

Retain green belts that incorporate coastal landscape features such as headlands, dune systems, coastal wetlands and waterways, and remnant coastal vegetation. These areas of open space can link the coast to inland natural landscape features such as rivers, ridges, ranges, estuaries or wetlands.

Image 43: *South of Scarborough, a wide dune system separates the coast from West Coast Highway and residential areas.*

Natural and rural coastal landscapes

It is assumed that the community would prefer the existing character of natural and rural coastal landscapes to remain visually dominant. Coastal development should be contained in existing areas and nodes, or other areas identified in endorsed regional planning strategies.

In natural and rural coastal settings strategies the aim should be to create a more natural and less formal appearance than in urban areas.

Built elements should be in locations that are:

- in less sensitive landscapes;

- less visible;

- able to be screened from view by planting; and

- where they can be sited and designed in a way that minimises their visual dominance.

Image 44: *This beach shelter on the North-West Cape exhibits an appropriate casual style.*

Natural landform and vegetation in coastal urban areas

Buildings may visually dominate the coastline, particularly in nodes of more intensive use. However, where feasible the character of the natural landform and vegetation should be acknowledged in the design of buildings, infrastructure and plant selection, such as in the choice of materials and colour.

The general contours of the landscape should be retained where feasible, rather than whole housing estates being levelled for building purposes.

Individual natural landform elements, such as prominent dunes and ridges, steep terrain, headlands, rock outcrops, river and creek corridors, should be retained. These features can be incorporated into open space or larger sized lots. Planning higher density development in less visually prominent parts of the estate may offset costs to developers.

Plant communities or individual plants of ecological, visual or cultural significance should be retained where feasible. Examples include communities that are visually diverse, unique or typical of the area.

Tourist or housing nodes in natural or rural coastal landscapes

Proposals for tourist and/or housing developments set in natural coastal landscapes that are highly valued by the community often generate much public debate. If government authorities consider that a location may be suitable for some form of development, then siting and design guidelines should form the basis of landscape and visual impact assessment criteria. These guidelines can also assist in addressing undesirable landscape and visual impacts.

Application of visual management guidelines may result in substantial alterations to development proposals, such as changes to the location of the developable area or the proposed density, scale

and appearance of development. Detailed assessment may result in the conclusion that a proposed development would have possible visual impacts and would require modifications.

Some visual planning and management principles to guide tourism and/or housing development proposals in coastal areas:

- avoid prominent sites such as elevated positions, coastal headlands, sites visible from recreation areas such as beaches;

- incorporate local natural building materials and colours that exist in the local landscape setting;

- reduce the mass and scale of buildings by developing a number of smaller buildings instead of a single larger one;

- screen by using local vegetation species where possible; and

- use setbacks and buffer strips along roads, although these need to be based on application of principles regarding visibility and screening available rather than arbitrary measures.

Image 45: *The dark, broken roofs of the Quay West Resort at Bunker Bay and its location behind the foredune, allow it to blend into its rural coastal landscape setting.*

Subdivision layout to maximise public access to coastal views

Roads in coastal suburbs and development nodes can be designed to provide view corridors to provide road users with ocean glimpses. Roads and pedestrian access ways orientated towards the coast create corridors for viewing the ocean. Buildings obstructing the line-of-sight to the horizon is a critical element to consider.

An individual set of guidelines and possibly planning conditions may be developed for each node, with input from the local community and professional advisers such as planners, landscape architects and urban designers to ensure that coastal development nodes are integrated into their natural or rural landscape settings.

Development should only be permitted when it can demonstrate:

- sensitivity to natural landform;
- no intrusion onto the ocean skyline from elevated viewpoints or land horizon from shoreline viewpoints; and
- colours and materials match or complement those of the natural landscape setting.

It is necessary to undertake design studies for new development nodes in natural landscapes, to determine the appropriate building height for each development area, and the results need to be incorporated into zoning controls or design guidelines. Factors to consider include:

- the height of existing buildings;
- the surrounding landforms; and
- the height of natural vegetation.

Buildings should not overshadow beaches and other coastal recreation sites. They may be designed to suit the scale of the tallest local trees, such as peppermints, Rottnest Island tea trees or coastal wattles, or the tallest introduced trees, such as Norfolk Island pine trees.

Each proposed lot should possess a suitable site for a building envelope and access driveway, to ensure that visual management objectives for the development node can be met. This can be achieved by analysis of each potential lot prior to finalisation of the lot layout.

Nodes need to be confined and to comprise only uses that are relevant to a coastal location.

Urban coastal frontage roads

Urban coastal frontage roads separating housing and commercial development from the foreshore reserve should be located:

- behind the primary dune, with minimal earthworks;
- at a setback distance which allows for coastal processes including shoreline recession;
- where ocean views can be provided from more elevated sections of road further from the coast, through gaps between the primary dunes, or from spur roads that access beaches;
- where opportunities exist for an undulating road alignment that uses natural peaks and troughs in the dune system.

Image 46: *Although roads such as West Coast Drive, north of Trigg, provide a valued viewing experience for motorists, the road and traffic dominate the coastal landscape.*

Coastal roads in natural landscapes

Continuous scenic roads parallel to natural shorelines are inappropriate as their disturbance to the landform creates a negative affect on the landscape. It is preferable to locate roads behind the primary dune as an edge to urban development and to provide access to coastal destinations from narrow loop roads or dead-end spur roads, which have the additional advantage of providing a more natural setting for coastal walks parallel to the coast.

Coastal access roads in natural landscapes need to be carefully sited and engineered to ensure that they do not dominate the natural character and views, and provide coastal access rather than high speed vehicle thoroughfare.

New roads constructed in the vicinity of the coast in natural or rural landscapes can be located to enhance the users' experience, by providing a variety of types of coastal views, and the experience of movement over the undulating ground form characteristic of dunes.

Vegetation planning and management in urban coastal landscapes

The vegetation component of the urban coastlines' unique character should be retained through the protection and restoration of natural vegetation characteristics.

Vegetation planting and management in development nodes in natural or rural coastal landscapes

Local indigenous vegetation should be retained or restored wherever possible, including vegetation in road reserves, open space, and on private property. Although a wider range of species may be acceptable for use in development nodes, the focus should remain on local species to provide visual linkages with the natural landscape setting.

Image 47: *Use of palm trees in this formal foreshore reserve at Broome links with cultural elements of the town's landscape.*

Buildings in foreshore reserves

The siting and design of public purpose buildings such as ablution blocks, surf clubrooms, search and rescue facilities, kiosks and restaurants should be visually compatible with the character of the reserve in which they are located. Roof forms, colours and textures are critical design considerations.

These buildings may be highly visible for functional reasons, or where the landscape lacks vegetation screening. They warrant particularly careful attention to both detailed siting and design aspects. They need to comply with the requirements contained in the State Coastal Planning Policy (WAPC 2003).

Image 48: *Restaurant at City Beach uses white roof materials and local limestone to provide visual links to its beachfront setting.*

Foreshore reserve site planning and design

Infrastructure in foreshore reserves is often highly visible. Visual clutter should be avoided in foreshore reserves and facilities and management structures should be well sited and designed to minimise the footprint and to reflect a sense of scale that accords with the surrounding landscape. Organic shapes may be more suitable than strong geometric forms.

In natural landscapes the style of built elements and landscaping should be more informal than in urban areas, with a greater emphasis on maintaining the visual dominance of natural landscape elements.

Specific components of reserves that need particular attention include: car parks, dual use paths, access paths and steps, power transmission poles, lighting and signs, recreation facilities including tables, shelters and play equipment, amenity planting, and access barriers including fencing and bollards.

Image 49: *Organic design of picnic shelters at City Beach with planting used to create shelter.*

Image 50: *Play equipment can create visual clutter in foreshore reserves unless it is carefully designed, as in this example at City Beach. Here the colours match the coastal setting, the equipment is placed below the natural ground surface and the overall design is of a high quality.*

Siting and design of buildings adjacent to urban coastline

The State Coastal Planning Policy (WAPC 2003) aims to ensure that land use and development adjacent to the coast is sited and designed to complement and enhance the coastal environment. Strategies are intended to assist in achieving this aim.

Local government, in conjunction with the local community, should develop an overall visual management strategy or theme for urban coastal development nodes, addressing such topics as a suitable range of materials and colours, the extent to which buildings and structures will visually dominate the landscape, key views to remain unobstructed by foreshore buildings, and appropriate building height, scale and appearance.

Buildings adjacent to urban coastline should be located on sites that are not visually intrusive as seen from the adjacent foreshore reserve, especially from beaches, lookouts, dual use paths and picnic sites. Visually intrusive sites include headlands, foredunes, and crests of dune ridges. It would also be desirable to avoid locating buildings in areas of visually significant coastal vegetation such as tuart woodland, or heath vegetation with rock outcrops.

The height of proposed new buildings should take into account:

- the existing streetscape, including the height of existing buildings and other visual landscape components;

- the type of settlement ie a lower permissible height for isolated individual buildings, hamlets and villages, and a higher height permitted in coastal regional centres and the Perth metropolitan area;

- the height of existing and new tall trees, such as Norfolk Island pines, so that buildings remain below the tree canopy, to allow these trees to continue to dominate the visual landscape;

- adjacent landforms, to allow landform to continue to dominate the setting;

- potential visibility from nearby coastal recreation sites; and

- other town planning scheme guidelines in relation to height.

The use of local styles of coastal architecture, including local materials, may be encouraged, as styles based on local conditions and architectural traditions may enhance the unique character of local urban coastal landscapes.

Image 51: *These Norfolk Island pines could soften the impact of buildings up to three or four storeys.*

Boating facilities and associated development

To minimise adverse impacts on valued natural landscape character, boating facilities should be located in safe, but less valued, less prominent locations, such as straight stretches of unvaried coastline.

Riverine and estuarine landscapes

Background

Riverine and estuarine landscapes are highly valued by the community. For example, the 2005 community survey conducted for the Perth Coastal Planning Strategy found that, in the morning at least, residents were almost as likely to take visitors to the river, as take them to the coast.

These landscapes are subject to development pressures, although probably to a lesser extent than coastal landscapes. Rivers and estuaries around the State's coastline are universally appreciated. Examples include:

- the tranquil south coast inlets such as Wilson's Inlet at Denmark, the Nornalup/Walpole Inlet and Hardy Inlet at Augusta;

- the extensive Murray/Peel/Harvey and Avon/Swan/Canning river systems on the south west coast; and

- gorges and extensive systems in the drier northern half of the state, such as the Murchison River at Kalbarri, the Ord River and the internationally-known gorges of Karijini National Park.

Visual elements

Natural waterform and landform features of riverine and estuarine landscapes include the water body, shoreline cliffs and rocky edges, steep slopes, banks, beaches, floodplains, oxbow lakes, sand bars, islands and delta formations. Edges of water bodies form a strong linear element, while texture diversity is created by the changing surface of water bodies, which varies from choppy to smooth and reflective.

Vegetation patterns are often simple and easy to interpret, with particular plants found in a sequence depending on the distance from waters edge. Typical components include reeds, tall, densely foliaged shrubs, paperbark trees and eucalypts. Some species, such as flooded gums and river red gum, are typically found along waterways over extensive regions, providing a visual link between these landscape features, regardless of their immediate landscape setting. Fringing vegetation may be reflected in the adjacent water and may feature branches that overhang the water, taking on unusual forms and branching patterns.

Prominent cultural features include watercraft, bridges, jetties and marinas, as well as structures

along the foreshores and in the viewshed of water bodies, such as buildings, roads and powerlines.

Riverine and estuarine landscapes provide view corridors along linear water bodies and open vistas across large water bodies. Along rivers, views may be enclosed or canopied by fringing trees. Rivers provide a sequence of places and landscape interpretations.

The prominence of foreshore locations, for example, as viewed across open water or from elevated viewpoints such as cliff-top lookouts, makes them visually sensitive locations.

Issues and pressures

Foreshore locations are valued for housing and particular forms of commercial development, such as tourist accommodation or restaurants, largely because of their river views. Due to the high property values of river front land this landscape type is under serious pressure from the land development industry. On the lower reaches of the Swan-Canning River system in Perth, land values and demand for property and development opportunities are very high, with numerous development proposals that are related to the riverside location.

Foreshore areas are often treated as the edge of a planned locality and therefore are not afforded sufficient consideration in the course of planning and development. They experience particular pressure for use by transport routes such as freeways, scenic roads and recreational trails.

Adjacent private development may impinge on public foreshores, in the form of overlooking, illegal removal of trees in the foreshore reserve, the dumping of rubbish, and the invasion of weed species into natural areas of the river foreshore.

The impact of too much light can affect feature-lit landmarks and interfere with fauna. Fringing vegetation may be damaged by human impacts such as storm water discharge, speeding watercraft, increasing salinity of the water, and digging for bait.

Management and planning needs to consider the character of each precinct yet also be mindful of whole of resource implications. The river is a composite of many parts; it may meander, or run straight, may include calm or turbulent open water or sedge land. Planning and management should respect this complex interrelationship by site-specific analysis and responsive design.

The pressures for public recreational use or commercial use of the river landscape can cumulatively degrade the intrinsic landscape qualities. It is important that development and land use in the riverine landscape unit be regulated and that sufficient land is set aside to buffer the river from adverse impacts.

Principles and guidelines

Principles and guidelines in relation to riverine and estuarine landscapes should address major or significant river and wetland systems throughout Western Australia, particularly those in or alongside urban areas and rural settlements. The following topics should be addressed:

River and estuarine systems in urban settings

- In residential areas, consider: shoreline housing density, street pattern, dominant housing style, age, bulk, scale, colours, building materials and roof forms.

- In commercial areas, consider: the scale and height of buildings, land use intensity, water and land interface and public infrastructure, including ferry terminals, public art and signage.

- In recreation areas, consider: water and land use, recreation facilities and amenities, kiosks, cafes, other commercial operations, signage, public access, introduced and native vegetation, landscaping treatments and public art.

River and estuarine systems in rural settings

In rural settings, consider the following factors:

- setback

- remnant vegetation, including the retention of trees and flood fringes

- roads and bridges

- public infrastructure

- flood levees

- intensity of agricultural use

- subdivision

- land clearing and fencing

- billabongs and oxbows

- wetlands and confluence areas

- environmental flow (impact of agricultural dams)

- stocking rates.

River and estuarine systems in natural settings

In natural settings, consider ways to retain landform and vegetation in a relatively unaltered condition, with minimal development suitable for passive recreation. Consider factors such as:

- public access

- retention of fluvial vegetation

- low key recreation facilities

- interpretation facilities

- amenities and signage

- low impact structures.

Protection of significant viewsheds

Most river systems are bounded by areas that offer views to the river and opposite banks. Riverine views are indicative of the area's local identity and are usually highly valued by local communities. Valued views are often associated with topographic high points, or areas with low vegetation. Examples of valued individual views in river viewsheds include panoramic views, such as views from elevated points overlooking a river, and linear views eg along a river corridor, as well as canopied and axial views. Valued views should be maintained or enhanced.

Image 52: *Public enjoyment of river views can be enhanced by the addition of facilities such as seating, as at Mosman Park.*

Image 53: *Orienting roads towards rivers and estuaries creates view corridors with the water body at the focal point.*

Development in the river and/or estuarine setting

Intrusive development on the water, foreshore and in the viewsheds of rivers and wetlands should be avoided.

Measures to reduce the intrusiveness of development include:

- the consideration of the skyline and shoreline as key visual elements;

- maximising the distance where development is set back from the foreshore or foreshore open space;

- using open style fencing along the boundary between private and public open space; and

- reducing the use of foreshore retaining walls.

There is a need to address the impact of:

- structures on or over the water, such as jetties, boat moorings, marinas;

- structures and planting on the foreshore, such as shelters, toilets, pathways, kiosks, yacht clubs, landscape treatment including planting with either exotic or native vegetation; and

- development in the broader viewshed.

Image 54: *Tall trees can reduce the visibility of riverside buildings.*

Protection of biophysical processes

The health and quality of water bodies has a direct impact on their landscape value. Strategies should address the impacts of stormwater runoff, pollutants, algal blooms, land and marine based conservation areas, modifications to the natural topography and fringing vegetation on river processes, erosion, accretion, flooding and protection of the benthic zone (seagrass and natural fish nurseries).

Places of cultural significance

Strategies need to take account of sites of cultural significance, as the presence of significant cultural features or places, including places significant to Aboriginal people, can be important features of the landscape. Places may be the subject of a story, a memory, a ceremony or just an inspiration.

Public access of the foreshore

In urban areas the acquisition of foreshore land for public access is a high priority, with land being obtained for public ownership. This enables public management of foreshore areas. In rural areas, public access is not a priority and foreshores are likely to remain largely in private ownership. Management strategies required by landowners need to address such issues as fencing, interruption of water flow and protection of fringing vegetation.

Image 55: *Construction of public pathways along foreshores may be particularly intrusive and difficult in steep locations as at Freshwater Bay on the Swan River.*

Siting and design of transport routes and river crossings

Strategies need to address the location and design of dual use paths, bridges, overpasses, railway lines and stations, bus ports, ferry terminals and jetties, as viewed from and to the water body. The design of these facilities needs to have regard to impacts on the skyline, shoreline and waterline.

Prominent elevated landscapes

Background

A number of urban areas, including Perth and some regional centres, are located at the base of an elevated landform that forms a backdrop to the built up area. Examples include: the Darling Scarp behind Perth; Mt Eliza immediately behind Perth's CBD; the ridge behind Dunsborough; Mt Brown and Mt Bakewell at York; Mt Melville, Mt Clarence and ridges surrounding the harbour at Albany; the Moresby Range at Geraldton; and the coastal ridge behind Prevelly Park, Eagle Bay and Augusta.

Elevated areas may also be prominent in rural areas, such as the Leeuwin-Naturaliste Ridge, the lower slopes of the Porongurup Range, and the Darling Scarp north and south of Perth.

Prominent, elevated landforms are generally either part of an escarpment at the edge of a plateau, or comprise individual hills or ridges. They may also occur adjacent to the coast or along a river. Landform backdrops are highly visible and important features that help define the character of the landscape in which they are situated.

Visual elements

Elevated landforms could be considered more as features in a broader landscape, rather than a landscape in themselves. They are essentially a large landform element. Their key individual natural landscape features include steep side-slopes, ridgelines, drainage lines, geological features such as rock outcrops, cliffs and scree slopes, and remnant vegetation. The examples listed are generally vegetated. The steepness of the slopes may have limited their use for agriculture and settlement. In addition, clearing these slopes could result in soil erosion.

The skyline is a prominent visual element. Its exact position varies according to the viewer's location. From close to the base of the slope the skyline is further down-slope, whereas from greater distances from the ridge, the skyline is closer to the highest part of the landform.

These elevated landforms provide a location for viewing the landscape below and they provide a focal point for views from adjacent land at lower elevations.

Issues and pressures

Changes to the character of prominent elevated features will be noticed. Some pressures on these landform backdrops result from the elevation provided by the landform eg radio and TV masts, telecommunications towers, wind turbines, water storage tanks, housing, scenic drives, recreation nodes; lookout structures, and memorials. Pressures for hard rock quarrying results from the existence of hard rock at or close to the surface. Power lines, roads and fire-breaks are normal infrastructure found in any rural or natural landscape, but they are likely to be more prominent if located in elevated areas.

Image 56: *Flat-topped elevated landforms close to built up areas may come under particular pressure for development (Moresby Range, Geraldton).*

Principles and guidelines

Specific strategies in other chapters should be referred to, particularly those that address uses that may occur on these backdrops, such as rural residential uses, quarrying, telecommunications facilities and wind farms.

Some of the most important aspects to address in backdrop landscapes, to assist in retaining the visual prominence of natural landscape elements are:

- vegetation should be retained on ridgelines and skylines. Figure 2.25 in Section 2.4 Tools and Techniques for visual assessments, explains how to identify the location of skylines on the ground.

- careful analysis of views should identify those areas where structures should not be located, to avoid them being silhouetted on the skyline or on intermediate ridgelines.

If some development is considered acceptable on the backdrop, the most suitable development areas should be identified. Suggested selection criteria include:

- areas located below steeper slopes, on foothills;

- areas that are set back from individual natural features such as drainage lines and rock outcrops;

- areas selected on the basis of their vegetation types; and

- areas that will support planting desired for screening purpose, to reduce erosion, and so on.

Image 57: *Buildings located at the base of steep side slopes in the Moresby Range, Geraldton.*

Image 58: *Development on the side of the ridge behind Augusta is located below the ridge top.*

Undulating rural landscapes

Background

Rural landscapes may comprise hilly, enclosed, partly vegetated, undulating terrain. Where soils and water supply are suitable these areas may support horticulture such as orchards or vineyards. Examples include areas around Denmark, the Ferguson Valley near Bunbury, the Balingup-Bridgetown-Nannup portion of the Blackwood Valley, the Margaret River region, Mt Barker, Donnybrook, Chittering Valley and parts of the Swan Valley. The significance of these areas to the community is indicated by the value of tourism to the local economies, with a proliferation of tourist accommodation, restaurants, cafes and wineries.

Visual elements

These landscapes display a wide variety of forms, colours and textures, with a combination of both natural and cultural features.

The key individual visual components in these landscapes are:

- natural features such as hilly terrain, ridgelines, valleys and drainage lines and remnant native vegetation, particularly trees; and

- cultural features such as introduced vegetation in the strong linear grid pattern of planted crops such as vines and fruit trees, as well as individual buildings.

Valued views are likely to include a diversity of view types, including panoramic views from elevated positions in the landscape, enclosed views in deep valleys, focal views ahead of bends on undulating roads, canopied views across roads that support trees growing on either side, and the varied experience of driving through a landscape with a diverse range of natural and cultural features.

Image 59: *Undulating rural landscapes may display a combination of hilly vegetated terrain with prominent cultural elements, as at Bickley near Perth.*

Visual elements specific to tourism developments to consider in valued rural landscapes:

- siting and design of development;

- building design (colours, materials, height, reflectivity);

- parking areas;

- signage and entry statements;

- access from main roads; and

- clearing of remnant vegetation and agricultural land for development.

Issues and pressures

Pressures for change in these landscapes include more intensive horticultural, residential, tourist accommodation and commercial uses such as restaurants and wineries. With these developments come increased signage and upgrading of roads to deal with increased traffic. Plantations and large-scale farm forestry operations could lead to screening of views.

In urban fringe areas there may be a decline in horticultural use as land values and rates increase, favouring additional residential development. The result may be abandoned orchards and vineyards and structures falling into disrepair.

In regard to tourism developments in valued rural areas, the principal issue is achieving a balance between providing increased access and other facilities while maintaining the visual landscape

characteristics that attract tourists to the area. Tourism developments in rural areas usually create an activity node with increased vehicle movement, an increase in population and additional signage and access. These intensive use nodes may be seen as an urban element in an otherwise rural landscape.

The additional traffic generated by tourism developments may create pressure for nearby rural roads to be upgraded, including widening and clearing of roadside vegetation. There may also be powerlines and clearing for underground services. The siting and design of houses, sheds, tourist accommodation, restaurants, water tanks and other structures may result in them being prominent features in the landscape. This is more likely to occur if they are large, reflective, prominently sited or different in appearance from existing buildings and structures, and where they occur in landscapes that are valued for their existing character.

These issues and pressures discussed here for tourism in rural landscapes and rural areas can apply to the Rural Uses guideline also.

Principles and guidelines

- Retain remnant vegetation throughout the landscape.

- Ensure that structures are not located on the skyline as seen from important viewing locations.

- Revegetate cleared ridgelines, to maintain the sense of elevation of these features that becomes diminished when vegetation is lost.

- Develop a set of performance criteria in relation to building density, as outlined in the section on rural residential development in the rural issues chapter. These criteria should relate to the number of buildings visible in a landscape before its character is perceived to have changed from rural to urban in character.

- Valued views should be maintained by not siting buildings in locations that are prominent in views, for example, at focal points or from panoramic lookout points.

- View corridors should be maintained to important elements in views, such as a vista to a scarp, and not inadvertently screened by buildings, dense roadside planting or plantations.

In relation to tourism development some principles may consist of the following:

- avoid prominent sites such as elevated positions and areas visible from recreation sites including lookouts;

- incorporate local natural or traditional building materials and colours;

- reduce the mass and scale by constructing smaller buildings instead of single large buildings;

- reduce the mass and scale by dividing the landscape into lots that are sizable to retain remnant vegetation and to provide areas for further planting if needed;

- reduce extensive car parks associated with tourism nodes by breaking parking areas into a number of smaller parking areas; and

- use setbacks and buffer strips along roads based on principles regarding visibility and screening rather than arbitrary distances.

These principles listed here for tourism development in rural landscapes and areas can apply to the Rural Uses guideline as well.

Image 60: *Retention of remnant vegetation on ridges may provide a greater sense of enclosure to valleys.*

3.3 Guidelines for particular land uses

Urban uses

Background

In this guideline the term urban is used in its broadest sense, to include suburban. It refers to regional centres as well as Perth. The majority of Western Australians live in Perth or a regional centre and the appearance of urban areas, particularly our own neighbourhoods, is very familiar.

There is a vast array of urban landscape character, and a diversity of community expectations and responses to their home surroundings. People may value individual features such as heritage structures, parks or streetscapes and become emotionally attached to them. They may also value the existing character of particular vistas or views, such as views from elevated coastal or river foreshore locations, or city views from Kings Park.

Individual characteristics that the community is most likely to want to maintain may be the obvious features, as well as those that are distinctive or considered attractive. The community may also wish to retain the valued ways in which they experience, use and visualise their surroundings: to maintain or enhance valued movement corridors, nodes, boundaries and edges to areas, district character and landmarks.

This manual has been prepared to manage landscape change and assess potential visual impacts. The techniques and methods outlined in Part 2 are applicable to urban areas as well as other landscape types and land uses. As a result of increased population, and the majority of urban areas gravitating towards the coast of Western Australia there is pressure for increased urban development. However there is a wide range of urban settings requiring different evaluation aimed at reducing potential visual impacts on the existing landscape character.

The visual landscape planning methods outlined in Part 2 are applicable to those parts of the urban landscape that are dominated by natural landscape features, such as river, coast and scarp, or that comprise cultural heritage precincts. The methods are also relevant for managing precincts that are designated for viewshed protection, such as the Parliamentary precinct.

As urban areas include smaller regional settlements through to the metropolitan area, there are different focuses for the diversity of urban style areas in Western Australia. For smaller settlements the approach may include landscape assessments of new development in existing natural landscapes. New development proposals for these areas would take into account the significance of natural and rural landscape character. For larger country towns or regional centres, visual landscape planning may focus on achieving a balance between the built form and its natural setting. From regional centres through to large metropolitan areas typified in Perth, the structuring of urban form assumes significance. Although the natural features in the urban form remain key elements, the focus of the urban form in these larger areas is of great importance. As built characteristics of the urban landscape become more dominant the community's association with the built elements becomes stronger and therefore more important.

Objectives for managing visual impacts in urban areas should focus on achieving good design outcomes that consider the natural and built form simultaneously. Fitting development into the original natural setting is not a priority. In respect to visual landscape restoration, the impetus for improvement needs to come directly from the community.

The urban land use issues considered in this guideline were selected on the basis that many urban landscape issues are comprehensively covered in other publications.

Therefore this manual focuses on more broad generic guidance for protection of valued character, major arterial roads and prominent buildings as the major visual issues.

Use of this guideline

This guideline is intended for use by local authorities, state government agencies and local communities interested in identifying, enhancing and protecting the valued landscape characteristics of urban areas. It focuses on specific visual landscape issues and is not intended to be comprehensive.

Urban landscapes are the primary domain of several design professions: urban designers, civil engineers, architects and landscape architects. It is important to note that this guideline does not replicate or impinge on the guidance that these professions provide. Instead, it presents some broad principles that address several specific visual management issues pertinent to urban areas. The background section to this guideline also provides some context of how the visual landscape planning methods would apply to different types of urban areas and what the emphasis would be in areas ranging from small settlements through to the metropolitan regions. For the reasons outlined above, the structure of this guideline differs to others in this manual.

The development of broad principles that address visual management issues, and detailed siting and design principles, should involve both the community and design professionals working together through the planning and design processes, beginning with the establishment of a long-term vision and goals for desired character.

Agencies and groups

There are a number of agencies and groups that have the capacity to take action affecting urban landscape character. Some have a broad interest or mandate, such as local authorities, while others

have responsibility only for a particular site, or type of infrastructure.

Agencies and groups that have a direct, holistic interest in the character of the urban landscape include:

- local community groups eg townscape committees and/or heritage groups;

- local authorities;

- Department for Planning and Infrastructure; and

- Department for Local Government and Regional Development.

Agencies directly involved in land development, including major urban renewal projects, include:

- regional development commissions;

- LandCorp;

- Subiaco redevelopment authority;

- East Perth redevelopment authority; and

- Joondalup development commission.

State agencies with a responsibility for specific service infrastructure include:

- Main Roads WA;

- Department for Planning and Infrastructure;

- Transperth;

- Synergy and Western Power; and

- Water Corporation.

Existing policies and guidelines

This guideline should be used in conjunction with existing policies and guidelines.

- State Planning Strategy (WAPC 1996)

- Residential Design Codes State Planning Policy 3.1 (WAPC 2002)

- Urban Growth and Settlement State Planning Policy 3 (WAPC 2006)

- Historic Heritage Conservation State Planning Policy 3.5 (WAPC 2007)

- Liveable Neighbourhoods (WAPC Edition 1:1997, Edition 2:2000, Edition 3:2004)

- Liveable Neighbourhoods Review Task 1: Review of Changes in Design Approaches 1996-2002 (WAPC 2004)

- Liveable Neighbourhoods – Street Layout, Design and Traffic Management (WAPC 2000)

- Residential Design Codes (WAPC 2000)

- Network City: community planning strategy for Perth and Peel (WAPC 2004)

- Towards a vision for Perth in 2029 (WAPC 2000)

- Development control policies – addressing a wide range of topics including public open space and bicycle planning (WAPC)

- Development control guidelines, such as advertising on reserved land

- Designing Out Crime: Planning Guidelines (WAPC 2006)

- Central Railway Precinct Guidelines (WAPC 2004)

- A strategic plan for Perth's Greenways (Final Report) (Alan Tingay and Associates 1998)

- Townscape Guide (DPUD 1990)

- Easy Guide to Townscape (DPUD 1995)

- Bush Forever (WAPC 2000)

- Planning bulletins – various (WAPC)

- Local planning schemes and any associated precinct guidelines

- Local planning strategies.

Issues and pressures

In an urban context the landscape has often already been significantly altered from a natural or rural state and often the only natural characteristics that are evident are landform, topography and remnant vegetation. The main visual impacts are the result of incremental decisions and actions of a large number of private agencies and individuals. These might include private landowners; local government and service agencies that are involved in the decision making process that contribute to the appearance of the urban landscape.

Community experience in urban areas is typically as residents of a local community, at a workplace or educational institution, or moving through areas either as a pedestrian, cyclist or in a vehicle. At times visual awareness can be of a small or localised area, or it can be a large expanse of an urban landscape, depending on the topography.

From time to time development proposals raise community concern due to potential visual impact. The techniques outlined in this manual can contribute to improved coordination of decisions to achieve better design outcomes in response to community concern.

The majority of issues related to urban landscapes are primarily local level issues that would be addressed by local authorities, in response to community concern. There are several issues that would be raised as regional issues.

Loss of valued character

Valued landscapes are under pressure where development is proposed in sensitive locations such as scarp faces, coastline or river foreshores, or land situated in important individual views such as the view from Kings Park to the city or from Parliament House to the river.

Perceived loss of local landscape character over time is an issue, such as changes to such

Image 61: *Any development proposed for river foreshores in this valued view from Mosman Park would need to be assessed very carefully due to the significance of the view.*

components as property and house size, building design, mature gardens with large trees, streetscape character and open space, as well as loss of natural and cultural features such as remnant bush, mature original trees, wetlands, dunes, vineyards, orchards, market gardens and small neighbourhood centres and outstanding heritage trees such as sugar gums and stone pines. Overlooking private property from adjacent elevated roads, bridges and pedestrian overpasses are current issues. Solutions often comprise intrusive walls.

Poor neighbourhood maintenance where problems may include derelict industrial areas, unscreened scrap yards, unoccupied properties, graffiti, litter, broken or vandalised public facilities, and road verges, parks, and street trees that are poorly maintained.

Trees on river or coastal foreshore reserves may obscure views from adjacent private properties. Such trees are sometimes illegally removed and may be difficult for local authorities to maintain.

Major arterial roads

Light industry and commercial uses along major arterial roads can be a visual issue where roads approaching country towns and along major roads in Perth, such as Scarborough Beach Road and Great Eastern Highway, are often the location of strip development including light industry, large retail premises and car yards, fronted by roadside

parking lots. Trees and other plants are usually absent, as the focus is on the visibility of business premises to passing traffic. These strips are frequently criticised as being visually cluttered and discordant, and lacking connections to the surrounding landscape. They are seen as difficult to read from a moving vehicle. With urban expansion into rural areas, light industry and commercial uses may expand into older residential properties and small rural properties, creating blight, as land values increase and existing properties physically decline.

Image 62: *The appearance of Scarborough Beach Road, Innaloo, has been improved by removal of overhead powerlines. However there is still potential for further enhancement.*

Roadside advertising signs can be an issue including large urban billboards, such as those located along urban railway lines adjacent to major roads. Walls adjacent to roads: tall sound and visual barriers; retaining walls along freeways that create a stark, urban canyon effect, and are prone to graffiti are also an issue. Solutions include improved wall design and painting of murals to discourage graffiti.

Image 63: *The siting and design of this sculpture at North Cottesloe was the subject of much community debate when initially proposed.*

Prominent buildings

Prominent buildings may be considered to be out of scale with their surroundings, for example, stadium light towers in residential areas. High-rise development is usually an issue unless it is proposed to be located in a central business district. Community concern seems to focus on height, overshadowing and potential blocking of views.

The siting and design of cultural icons such as memorials, sculptures and new landmark buildings, such as Perth's bell tower, and the new foreshore convention centre can raise community concern.

Principles and guidelines

Protection of valued character

This guideline should be used in conjunction with existing policies and guidelines.

Visual landscape guidelines must relate to existing town planning schemes and residential design codes, and where necessary provide for scheme amendments.

The character approach to visual landscape planning begins with application of the methods set out in Part 2 of this publication. The output should include identification of urban landscape features valued by the community at a regional, local or site level. These features may be either natural (landform or vegetation) or cultural. At a larger scale whole areas or precincts may be identified as requiring protection, as opposed to just individual features. Valued individual viewsheds and key views also require specific attention.

Natural features

Landform

At a regional level in Perth, for example, valued natural landscape features could include the Darling Scarp, Mt Eliza, Swan and Canning rivers, the coastline, and wetland systems. Local level natural features may include limestone pinnacles or cliffs in coastal or river neighbourhoods, or enclosed valleys or granite outcrops in hills suburbs.

The reduction of natural topographic variations should be avoided wherever feasible, especially in relation to road design and levelling for housing estates. This would retain a more diverse topography.

Building setbacks from valued features such as the coastline, river and estuarine foreshores, wetlands and individual site features such as rock outcrops should be sufficient that these features maintain their prominence in the landscape.

Image 64: The Swan River is a major natural landscape feature in the urban landscape of Perth. The river's sinuous form creates great visual interest, with prominent sites at river bends.

Image 65: The re-introduction of water bodies at Langley Park and East Perth is breaking down the sharp demarcation between riverine and urban elements of Perth's landscape.

Images 66 and 67: Portions of Bannister Creek, Lynwood, have been reconstructed to a more natural configuration and revegetated. These portions contrast markedly with sections in which the creek is still maintained as an open, artificial drain.

Wherever feasible, natural watercourses and artificial drains should be located at natural ground level, situated in open space corridors and parkland, rather than being piped underground. These watercourses may be suitable as pedestrian spines through development areas. Water sensitive urban design principles may be used to harness scarce water resources, to ensure that open spaces continue to provide a green environment as a counterpoint to the typical hard surfaces of urban areas.

Vegetation

It is recommended that remnant bush be retained wherever feasible, as it provides a strong visual reminder of an area's original landscape character, thus forming a major component in an urban area's current expression of character.

Retention of regional scale remnant bush, such as regional greenway corridors, can provide a visual link across the entire fabric of an urban area, and can provide links to extensive bushland adjoining urban areas, such as water catchment areas or national parks.

It is important to protect even small remnants of urban bushland, such as those that are located in developed parkland. Such areas can be supplemented with additional planting and kept clear of weeds so their appearance is more compatible with their setting. Use of local species in open space, especially where these already exist in the park, will provide visual links with the original landscape character. Some areas of bush-style planting may be created using local native species.

Remnant individual native trees may provide important visual landscape clues or links in a local area, especially in areas that contain little remnant bushland. Inventories of remnant trees located on public land should be undertaken at a local level, including trees in land managed at a state level, such as in railway and freeway reserves. Remnant trees located on private land should also be inventoried, provided there is community support. Strategies for protecting these trees should be developed, with substantial community input.

The use of suitable local native trees and shrubs in public spaces including parks, and rail and road reserves, may help to emphasise a landscape's individual character. Consideration should be given to the use of a variety of local plants. Shrubs should be used with great care in parks and on road verges as they may provide cover for criminal activity (refer to Designing Out Crime: Planning Guidelines WAPC 2006).

Visually complementary plant species should be used in median strips and verge planting, rather than species that contrast markedly in form and colour (such as pines, palms, roses or petunias), unless these are valued for heritage or cultural reasons.

Cultural features

Valued regional level cultural landscape features could include the Swan Valley vineyards, market garden areas, historic built precincts such as Guildford and Fremantle, as well as locally valued individual features such as lime kilns.

Historic buildings, bridges, narrow roadways, railway infrastructure and other structures may be important to local landscape character and as

Image 68: *Remnant individual trees on private land such as this jarrah tree in Doubleview, provide a reminder of the landscape's original character.*

Image 69: *Median planting at Cottesloe provides visual links with nearby dune vegetation, and the traditional pines of the area.*

Image 70: *Mature sugar gums are a feature of Claremont.*

Image 71: *Lime kilns at Coogee are an example of cultural features retained in the urban landscape.*

such should be retained where feasible. Examples of other valued localised cultural landscape components include traditional building materials, colours and styles, placement of buildings on blocks and relationships of dwellings to garages.

Street trees may be important local features, providing cultural heritage links. Some towns become identified with one or two types of trees such as the Moreton Bay figs of Dongara, as do older metropolitan suburbs, for example, the peppermints of Peppermint Grove, the Norfolk Island pines of Cottesloe and the jacarandas of Applecross. New planting is required if these features are to remain in the long term.

Valued cultural landscape features should not only be retained, but should remain as visible, even prominent, features. Where possible they could be reinstated with new development, complementing the established character. For example, historic elements and themes may be incorporated into modern architecture, street furniture and public artwork.

Valued viewsheds and individual views

Individual viewsheds and views may be particularly valued by the community. Examples at a regional level include coastal or river viewsheds as seen from coastal roads and beaches and the view from Kings Park towards Perth's city centre. The siting and design of development in important views requires careful consideration, especially at focal points such as sites that are on a road bend or coastal headland.

Roads have the potential to provide significant view corridors, providing axial views along the road ahead to valued features such as the river, ocean, hills, parkland or provide panoramic general views from an elevated position. This potential should be realised where possible, for example, creation of axial views by aligning new roads towards these features. Road layouts should not allow buildings and roadside trees to

Image 72: *The Gosnells quarry is located directly ahead of a section of Albany Highway, Maddington. A building has recently been constructed across the same focal point. Careful attention to siting, design and planting could have reduced the visual impact of this building.*

Image 73: *Particular care should be taken in siting and design of foreshore development where it is located at the focal point of views provided by roads at right angles to the coast, as at Eric Street, Cottesloe.*

Image 74: *An important river glimpse remains at the end of Bay Road, Claremont.*

impinge on views and roadside planting requires careful planning to enable views to be retained. For example, trees may be set back from the roadside, or be of a species that filters or frames views or provides a canopy, but does not screen views to important features.

Design guidelines

Landscape design guidelines should be part of the local planning schemes. Where necessary a scheme amendment may be required to recognise or include the guidelines or to amend the scheme text to ensure that the landscapes or landscape features valued by the community are protected and/or enhanced. Many town planning schemes have very detailed precinct guidelines that recognise some values that the community has identified, often including landscape values.

Precinct guidelines relate to many concepts of precincts already incorporated in some town planning schemes and townscape plans. A landscape precinct may provide an overarching guide that addresses several land uses or cultural precincts in the one landscape precinct. Equally, a small landscape precinct may be incorporated in a larger built form precinct. Care will need to be taken to ensure that guidelines are complementary and do not confuse or add

unnecessarily to the burden of compliance on the part of the community. The value that the community places on the landscape will determine its value to local government and developers.

The guidelines could include:

- general principles in relation to building style, particularly the style of new buildings in relationship to existing character;

- means by which new design may reflect local landscape characteristics in the use of building materials and designs;

- suggested types of precinct entry statements or features, including signs, landmark features such as buildings or natural features, or prominent vistas;

- lists of those plants that are suitable for use in a range of public locations, due to their association with the valued characteristics of the precinct;

- attention to the visibility and role of mature trees on private land, where these are a valued landscape component;

- landscape treatments that promote local character and provide an interesting experience for pedestrians and motorists;

- application of townscape guidelines to enhance valued town centres;

- means by which public structures such as bus shelters and railway stations can exhibit visual connections to their valued landscape setting, through their design, artwork, and planting; and

Image 75: The landscape at Scarborough retains a green appearance, including a vegetated ridgeline profiled against the ocean. Design guidelines can work towards achieving this type of urban landscape.

Image 76: Precinct guidelines could be developed for prominent areas such as beachfront development at Scarborough, addressing such issues as building orientation and style.

- advice on signs, which should be in character with their precinct, not too visually prominent, and should not create overshadowing or visual clutter.

Some guideline principles may be the subject of policies and regulations, for example, those that address such aspects as building setbacks, height, front walls, signage (such as size, location, rules for vacant land, form and style).

Guidelines may also address the design of private development to ensure that development looks appropriate in its valued urban landscape setting. Characteristics to be considered may include height, bulk and proportion, control and design specifications.

Image 77: *The design of this coastal lookout at Naval Base reflects its industrial setting.*

Image 78: *Distinctive local trees, such as this boab in Broome, can be used to acknowledge local landscape character.*

Image 79: *The colouring of this City Beach bus shelter is a reminder of its coastal setting.*

Analysis of a valued landscape precinct's existing built character for input into design guidelines may take a thematic approach, addressing the critical development periods of an area, which the landscape should support or underscore.

Streetscape

The visual amenity of public areas, including streets and open space, is critical to our sense of safety, comfort and wellbeing. If these spaces are considered unattractive and are poorly maintained they may be under-used, thus impacting on community safety and well-being.

Building setbacks should be established taking account the space required to support the desired types of vegetation. To reduce the stark appearance of back lanes, the use of landscape treatment should be considered, especially in medium density housing areas.

In Western Australia's climate, trees and other forms of shade are vital amenity considerations, both for shade and for reducing heat retention in built up areas, in addition to their purely visual significance. The use of trees large enough to create canopies over streets should be considered, particularly for pedestrian-orientated residential and commercial precincts.

Existing established trees in inner city, built up and suburban areas should be retained where possible in light of new development, or redevelopment of established urban areas.

Images 80 and 81: *Drainage sumps in parkland at Scarborough are screened with large shrubs. Another option would be to plant the sump itself, as this example at Swanbourne.*

Image 83: *A canopy is created by the avenue of mature sugar gums on Bay Road, Claremont.*

Image 82: *The creation of median planting islands may enhance a small town's streetscape, as at Newdegate.*

Prominent buildings

The prominence of tall buildings in urban landscapes warrants particular care in their siting and design, including consideration of their relationship to other nearby tall buildings.

Tall buildings should be located together in clusters or nodes rather than strung out in a line, to contain their impact to a smaller area.

To create a more graduated profile, the tallest in a cluster of buildings should be located inside the node, not at a separate location or at the edge of the group. A varied and graduated skyline should be created, with a variety of building height and form.

Important view corridors should be maintained between buildings, such as where views are obtained to a major landscape feature such as the coast, river or scarp face. Examples in Perth's CBD include view corridors to Parliament House, the river or Kings Park. Guidelines for the central railway precinct, for example, note the need to retain view corridors linking central Perth to Northbridge.

Image 84: *The visual impact of isolated tall buildings such as Rendezvous Observation City, Scarborough, can be reduced by adjacent planting with tall-growing tree species, such as Norfolk Island pines.*

Major arterial roads

To address the busy, harsh appearance typical of commercial sections of urban highways and many town entries, consideration should be given to planting street trees to provide a living element that also adds visual cohesion to the landscape.

Establishing wider setbacks may provide space for additional landscape treatments in front of new business premises in less urbanised areas.

Strategies for signage and light poles along major highways should address the need to reduce visual clutter and the amount of visual distraction. Although these structures need to present a coherent appearance along the highways, it would also be desirable for them to reflect the local neighbourhoods through which they pass.

The placement of powerlines underground reduces visual clutter and provides opportunities for larger trees to be planted on roadsides, including trees that will provide a canopy across the road.

Guidelines for building frontages in commercial precincts that border major highways should address the need to reduce visual clutter. Such guidelines should protect existing façades that are more friendly to pedestrians and passing motorists. The building style of commercial precincts should be memorable, legible, and reflect local character.

Image 85: Visual clutter along West Coast Drive, North Beach, is being addressed by improved road treatment, fencing, lighting and the placement of underground power.

Rural uses

Background

The term 'rural' is used in the guideline to refer to non-urban landscapes that have been substantially modified, generally by clearing.

Significant tracts of uncleared land such as State forest, nature reserves, national parks and pastoral leases are excluded from consideration in these guidelines. For example, the location and design of new roads through tracts of uncleared land such as nature reserves or national parks are subject to rigorous planning processes and construction standards. Visual considerations are taken into account.

The rural land uses addressed in this guideline were chosen on the basis that their landscape impacts are currently of concern to the community. For this reason, some important rural uses, such as grain crops or grazing, are not discussed. Discussion focuses broadly on generic principles that address protection of rural character, remnant vegetation and/or clearing, revegetation and rural roads. In more detail this guideline addresses rural residential issues and plantations.

The visual impacts of some topical land uses that may be located in either urban or rural settings are addressed in detail in other guidelines. These comprise industry, mines, quarries, utility towers including telecommunications facilities, powerlines and wind farms.

Some issues addressed in the urban uses guideline apply to rural settlements. The guideline that addresses sensitive landscape types such as hills and scarps comprising urban backdrops may also be relevant.

Note: industrial uses, quarries and utility towers such as mobile phone towers and wind farms are addressed in separate guidelines (refer to utility towers, mining and industry).

Visual impact assessments should be undertaken for proposals with potential to affect rural landscapes, such as:

- rural residential subdivisions;

- remnant vegetation clearing, revegetation, and farm forestry, including plantations;

- major tourism developments (refer to valued landscapes under pressure: undulating rural landscapes);

- new roads, or major changes to character of existing roads with scenic value; and

- windfarms and other utilities (addressed in Utility towers guideline).

The scope of this guideline is restricted to visual landscape issues. There is a wide range of land planning issues relevant to rural development, such as soil conservation, soil salinity, flora and fauna protection, surface water quality, heritage protection and fire hazard reduction. Most of these have visual impacts however, and are referred to in this context. These issues are addressed comprehensively in other publications. The major issues that are addressed in terms of visual impact on rural landscapes comprise of broad generic issues.

It is assumed that the community would prefer natural and rural features to dominate rural landscapes, and that any changes from a rural to a more urbanised appearance are ideally not noticeable. Typically urban features that may occur in rural landscapes include curbed roads, large commercial signs or development with a commercial appearance.

Specific visual management objectives would ideally be established for sensitive rural landscapes through regional and local strategies, for application at regional, local or site levels.

It is assumed that the community is more likely to be concerned about maintaining the character of prominent rural landscapes that are adjacent to urban areas or valued natural landscapes such as national parks.

Use of this guideline

It is anticipated that this guideline will primarily assist:

- planners and consultants;

- local authorities (for example, assessing development proposals and determining approval conditions);

- local communities involved in rural improvement programs such as Landcare projects;

- private rural landowners; and

- developers.

Agencies and groups

The State and local level agencies and groups that may have an interest in the contents of this guideline include:

- Department for Planning and Infrastructure;

- Department of Agriculture;

- Department of Environment and Conservation;

- Main Roads WA;

- Western Australian Tourism Commission;

- Bush Fires Board;

- local government authorities; and

- Landcare, revegetation and catchment management groups.

Existing policies and guidelines

A number of the agencies listed above have produced policies and guidelines that focus specifically on rural uses and areas; and should be used in conjunction with this guideline:

- Agricultural and Rural Land Use Planning State Planning Policy 2.5 (WAPC 2002)

- Historic Heritage Conservation State Planning Policy 3.5 (WAPC 2007)

- Rural development control policies (WAPC)

- Development Control Policies Guidelines for the Preparation of Local Rural Strategies (2004)

- Shire of Busselton Caves Road Visual Management Policy (1999)

- Farm Forestry Policy Planning Bulletin 56 (WAPC 2003)

- Avon Arc Sub Regional Strategy (WAPC 2001)

- Draft Lower Great Southern Regional Strategy (WAPC 2007)

- State Planning Policy 4.3 Poultry Farms (WAPC)

- Local planning scheme provisions (development control areas, clearing controls)

- Local planning strategies.

Protection of valued character

Background

This section of this guideline focuses on three rural issues that relate to the protection of rural landscape character. The following issues are not discussed in as much detail as rural residential or plantations; however this section provides some broad guidance in addressing certain aspects of these rural uses, in light of potential visual character issues:

- remnant vegetation and clearing;

- revegetation; and

- rural roads.

The appropriate agencies and groups; and policies and guidelines for these issues are covered in the sections directly above. Please refer to these for policy guidance and relevant agencies when dealing with remnant vegetation and clearing, revegetation and rural roads.

Visual elements

Listed below are visual elements of remnant vegetation and clearing; revegetation and rural roads that may have an impact on the character of the rural landscape.

Visual elements specific to remnant vegetation and clearing; and revegetation:

- shape of vegetated area;

- height, density, form, colour, texture and diversity of plant communities and individual species;

- species appearance in relation to local native vegetation (revegetation);

- planting pattern and/or layout;

- shape of cleared area;

- edges of cleared area; and

- contrast of cleared area to surrounding native vegetation.

Visual elements specific to rural roads:

- road design speed;

- road width, including overtaking lanes;

- shoulder treatment, including barriers, drainage and curbing;

- elevation relative to surrounding landscape;

- alignment and/or configuration;

- surface markings;

- roadside signage; and

- roadside vegetation, including remnant vegetation and revegetation.

Issues and pressures

Remnant vegetation and clearing

Clearing of remnant native vegetation in rural areas is a major issue because of the negative impacts on a number of important environmental functions, including: minimising further land degradation, such as salinity, wind and water erosion, and nutrient loss; protecting and retaining

biodiversity values, wildlife linkages; addressing greenhouse effects; microclimate management; stock shelter; recreational enjoyment; lifestyle and cultural appreciation; and visual amenity.

Despite its benefits, landowners may view remnant vegetation as an operational constraint in terms of lost productivity and restrictions to machinery movement. Farmers may be unwilling to pay the cost of managing these areas, such as providing fire breaks, weed control and fencing designed to exclude stock and vehicles.

There are also problems with the retention of parkland cleared areas and isolated remnant trees in paddocks. These areas will disappear over time as regeneration is unlikely to occur without intervention.

Financial incentives are required to encourage landowners to protect remnant vegetation. These could include rate relief for remnant vegetation that would otherwise be under productive uses, fencing subsidies and government support in the form of research, advice and data being made available. Without such incentives, remnant vegetation will not be properly managed.

Image 86: *The retention of even small areas of remnant vegetation can help to maintain more visually diverse rural landscape character.*

Revegetation

Revegetation is an issue for many rural landowners, due to its expense and practical implications for farm management, for example, where a riparian system that requires revegetation results in paddocks being broken into areas that

are too small for cropping or grazing, or where movement of machinery is restricted.

There needs to be clear identification of those waterways and wetlands that constitute the basis of riparian areas and the scale of the riparian zone needs to be determined. Where the riparian zone is devoid of remnant vegetation, landowners may require assistance if they are expected to revegetate the area, as these areas may become a weedy fire hazard once grazing or cropping stops.

There is also the issue of identifying an appropriate person or agency to take responsibility for managing revegetated riparian areas and wildlife corridors on private land.

The planting of wind breaks and shelterbelts can assist in protecting soil, crops and stock. Such areas may take considerable effort and time to establish, with variable success.

Rural roads

The issue of conflict between engineering design safety standards and rural road appearance is difficult to address. Road design standards are primarily linked to traffic speed, so that problems are focussed on roads designed for higher speeds that are also used by motorists who may prefer to travel more slowly to enjoy the landscape. Strategies at a regional level should focus on these roads eg Brand Highway, South West Highway.

Image 87: *Difficulties may occur where rural roads are shared by heavy vehicles and tourist traffic.*

Main issues are whether the design speed allows for a road to fit into its landscape: the higher the speed, the harder it is to get a road that fits.

Road alterations such as widening, drainage upgrades, straightening and creation of passing lanes frequently have an adverse visual impact, due to the clearing of roadside vegetation and lack of subsequent rehabilitation and weed management. This is particularly an issue where the strip of vegetation was narrow to begin with, as the end result may be a roadside that is completely devoid of vegetation other than grass and weeds.

The proximity of trees to the sides of rural roads is an issue that is the subject of much community debate, couched in terms of user safety versus the environment and/or aesthetics. Road safety relates to design speed and road width, as well as the presence of safety barriers. Controversy appears to be focussed on tourist routes that also receive heavy volumes of local traffic, such as Caves Road or the old highway through Ludlow tuart forest, in Busselton.

There are also issues related to the maintenance of roadside remnant vegetation other than trees, for example, roadside vegetation that is valued for its annual wildflower display. Here issues revolve around fire and weed management.

Roadside planting may block views from roads if it comprises dense growth of medium to tall shrubs.

The deterioration of roadside remnant native vegetation over time results in a loss of visual diversity on roadsides, and a dry appearance in summer when annual weeds die off.

Principles and guidelines

Remnant vegetation and clearing

The visual impact of clearing of remnant vegetation should be a factor considered in the assessment of applications for clearing. Remnant vegetation is worthy of protection based on its visual landscape value regardless of whether it takes the form of entire remnant plant communities, remnant trees only with no understorey (known as parkland clearing), or just isolated individual trees remaining in paddocks.

Prominent sharp edges between cleared and uncleared bushland, for example, on hillsides visible from major travel routes, may be given a more natural appearance by supplementary planting in adjoining cleared areas to reduce the abruptness of the boundary, creating a more gradual transition zone.

Ridgelines that have been cleared look shorter and less dramatic than those that are vegetated. If ridgelines have been totally or partly cleared, they could be targeted in revegetation programs.

Revegetation

Planting may be used positively to emphasise existing natural and cultural features in the landscape, such as natural drainage lines, vegetated shorelines and naturally wet areas, ridgelines and roadsides.

Where practical, riparian zones and other landform features designated for revegetation should make use of natural factors such as soil or original vegetation types to define their boundaries.

Where vegetation reinforces natural linear elements such as creek-lines it is preferable for planting to be naturalistic in its pattern, age and species used, for example, planting in a random layout, in stages, using local native species.

Image 88: *The retention of shrubs at the edge of woodland creates a less abrupt boundary between remnant vegetation and adjacent agricultural areas.*

Planting that creates a cultural landscape feature, such as an avenue along a farm access track is best kept simple, with the same species used for each side. Avoid planting very different looking species side by side, such as alternating tall trees with mallees (see Image 90).

Promote natural regeneration where fencing is used to exclude stock, for example, along streams, around rock outcrops or on ridgelines.

Retain and provide buffers around natural features such as creek lines, rock outcrops and wet areas. Assistance should be provided to landowners to enable them to revegetate these buffers, or to erect fencing that will allow natural regeneration to occur.

Rural roads

Use design standards that are appropriate to usage type and compatible with landscape character and possibly site new roads to minimise the requirements for cut and fill.

Regional level strategies may include greater use of freight rail to reduce heavy haulage on tourist roads and separate, bypass routes to segregate fast from slow traffic, enabling the retention of a

Image 89: *This revegetation in the Chapman Valley, near Geraldton, would have contributed more to its setting if it created a link with the river and was more densely planted with random spacing.*

Image 90: *Planting should avoid locating different species side by side.*

slower speed, scenic route (such as the Ludlow tuart forest at Busselton).

Slower speed limits may be set for roads that only provide access to tourist destinations, such as the Treetop Walk at Walpole.

If it is considered unsafe to retain large trees on roadsides, an alternative may be the retention of shrubs only, presuming that shrubs do not inhibit visibility. Another option could be the selective removal of large trees such as those located on outside curves.

Roadside vegetation management issues need to be addressed, especially along roadsides that have tourism values. Woody weeds such as Victorian tea tree, Japanese pepper trees or boxthorn should be removed as they may block views from the road by creating a dense hedge effect. They also tend to reduce visual diversity by dominating roadside vegetation and reducing the natural variety of species.

Revegetation of roadsides may improve visual landscape character. Although care is needed to ensure that planting does not look alien to the landscape if non-local plants are used. Dense roadside planting of tall shrubs should be avoided to prevent the creation of a hedge effect that restricts open views.

Other weeds to be removed from along tourist routes include those species that dominate the roadsides, such as Watsonia and grasses, reducing the visual diversity of roadside vegetation and creating a bleak appearance in summer, when these plants die and are removed by burning.

Housekeeping is required at roadside stopping places, to remove litter, weeds and leftover road building materials. Planting trees and providing attractive picnic facilities may assist in improving the appearance of these areas.

Implement strategies to reduce the size, number, colour and style of large and prominent roadside signage on the approach and the entrance to country towns.

Rural residential development

Background

The guidelines below focus on rural residential use in landscapes that are essentially rural in character, although they may have large areas of remnant native vegetation. Much of the advice, however, would also apply to the development of rural residential areas in entirely natural landscapes.

Rural residential developments have traditionally been limited to minimum lot sizes of 1 ha or 2 ha, or sometimes more. As a result the layout has often comprised just a standard grid of lots at or marginally above that minimum permitted size and was unsympathetically imposed on the landscape with little consideration of physiographic features, landscape values or environmental constraints. There is now a greater awareness of the need for sustainable subdivisions and developments that respect and enhance natural resources. This awareness is not restricted to just the approval authorities, as local communities are also becoming more informed and better at articulating their values. Many lifestyle land purchasers are demanding a more environmentally responsive product.

By removing the arbitrary restrictions on lot sizes, subdivision layout can incorporate a wide range of concepts aimed at producing a more sustainable, attractive and acceptable development. For example, by clustering lots and/or dwellings, it may be possible to reduce lot sizes to that of just the building envelope. The remaining land could then be retained with its existing character, as common land, for example. This arrangement could facilitate the economic servicing of the subdivision, management of the lots, protection of landscape values and development of a theme for the estate. It would enable valued landscape features, viewsheds and areas to be protected.

Agencies and groups

- Department for Planning and Infrastructure;
- Department of Agriculture;
- local government authorities;
- Landcare groups; and
- rural residential communities.

Existing policies and guidelines

This guideline should be used in conjunction with existing policies and guidelines.

- Agriculture and Rural Land Use State Planning Policy 2.5 (WAPC 2002)
- Historic Heritage Conservation State Planning Policy 3.5 (WAPC 2007)
- Planning for Bushfire Protection (DPI and FESA) 2001
- Environment and Natural Resource State Planning Policy 2003 (WAPC)
- Residential Design Codes State Planning Policy 3.1 (2002)
- Rural development control policies (WAPC)
  - DC 3.4 Subdivision of Rural Land (2002)
  - DC 3.7 Fire Planning (2001)
  - Development Control Policies Guidelines for the Preparation of Local Planning Strategies (2004)
  - Guidelines: Rural residential development in the Perth Metropolitan area (1992)
- Local planning scheme provisions.

Visual elements

Listed below are visual elements of rural residential development that may affect the rural landscape. They are addressed in detail in the following section, principles and guidelines:

- developable area (site constraints and opportunities);

- number of lots and buildings, including water tanks and outbuildings;

- lot size and configuration;

- siting and design of buildings and other structures such as tanks;

- fencing and firebreaks;

- access roads and driveways;

- remnant vegetation and new planting; and

- site development/gardens/mini rural production.

Issues and pressures

Rural residential development may significantly alter rural character, producing a modified visual landscape with a number of built elements that are not necessarily in harmony with each other or their setting, such as driveways, fencing, buildings and a variety of introduced plants. They tend to be located prominently, in rural areas that are valued by the wider community for their landscape character. They may also be located in natural landscapes, which may in fact provide more opportunities than agricultural landscapes to locate buildings unobtrusively, depending on the character of the terrain and the native vegetation coverage.

Specific pressures for rural residential development are indicated by rising land values and taxes, generally in the urban and/or rural fringe areas. There is clearly an increasing market for people desiring a rural lifestyle while also enjoying the proximity to urban services such as

Image 91: *The footslopes of the Moresby Range, that provide a backdrop to Geraldton, are experiencing development pressure.*

hospitals, retail and employment. In other cases people are seeking a rural retreat for retirement and holidays. Pressure for rural development as holiday accommodation is more likely to occur further from urban areas, close to recreation areas or in areas suitable for hobby farms.

The landscape types addressed in the guideline under valued landscapes under pressure may experience particular pressure for rural residential use, for example; elevated backdrops to urban areas, and undulating rural landscapes.

Principles and guidelines

Regional and local level visual landscape character assessments may be used to determine how appropriate a general location is for rural residential use. Undertaking a formal visual landscape character assessment provides visual management objectives that apply to the site. Guidelines should address these objectives. All proposals to rezone and/or subdivide rural land for rural residential development should be accompanied by a visual landscape character assessment of the subject land and its relationship to the wider landscape setting, identifying all key landscape features, internal and external views, design responses and setting the management objectives.

Regional level visual landscape character assessments will identify important regional views and viewsheds that should be protected, and general areas that are likely to be more sensitive to changes resulting from rural residential development.

Rural residential development tends to be demanded in prominent areas near towns in which the existing residents value the landscape's existing character.

At a site level, visual constraints and opportunities should be identified and mapped.

Site **constraints** include areas that are:

- attractive features and their buffers such as rock outcrops, trees, heritage structures; and

- sensitive due to being prominently located in important views, or in areas of open character with little variation or existing or potential screening.

Site level **opportunities** include:

- areas that provide views in and from the site but are not sensitive sites as seen from external areas;

- areas that are less sensitive, for example, not prominent, and varied in character;

- areas that are not highly valued for their existing character;

- locations where natural topography can be used to screen development;

- locations where remnant vegetation can naturally screen development;

- areas that may support vegetation screen planting; and

- portions of the site able to support screening vegetation without blocking desirable views to the site from nearby viewpoints such as roads.

There is overlap between the visual significance of natural features and value attributed on the basis of ecological attributes. There is a similar

Image 92: *Rural landscapes with diverse terrain and vegetation are more suited to additional development than open, unvaried landscapes.*

overlap with cultural heritage features, which are assumed to be valued for their visual character, thus overlapping with the wide range of heritage criteria such as historic associations, rarity and architectural integrity.

Open space may incorporate watercourses and other landscape features that are desirable for public access, such as visually interesting vegetation, ridgelines, valleys, rocky areas and sites that provide panoramic views. Alternatively, these features may be retained in undeveloped condition but managed as common property or in private lots with suitable conservation or protection covenants.

Structures of heritage value should be located in an appropriate setting, such as being buffered from adjoining development.

Cleared portions of hillsides may be particularly prominent, especially if they are surrounded by remnant vegetation with the result that the cleared area takes on a distinctive shape. They may stand out due to the contrast with the darker appearance of the surrounding vegetation. Preferably buildings would not be located in these highly sensitive areas. If buildings are to be placed here, they should be at the edges, softened with additional planting to match the adjacent remnant vegetation. The whole cleared area may need to be planted to some degree, to reduce its prominence.

Most significant views of rural residential development on hillsides may not be obtained from immediately below the slope, but from up to several kilometres away, in the middle ground, where the whole context of the slopes on which development occurs is clearly seen. Steep slopes tend to look less dramatic from their base. From further away they look more vertical, more of a backdrop, and the entire slope, from base to top of ridge, is more likely to be visible. The top of the ridgeline itself is more likely to be visible on the skyline, rather than a position part way up the side of the ridge forming the skyline.

Rural residential development is likely to result in a more visually complex landscape, with a greater number of built features including buildings and roads, and more variety of tree species. Natural components may be less prominent and less obvious. Multiple ownerships may result in a variety of land management techniques and levels.

This may contrast with an original landscape that is simple and unified in character, with few fences, buildings and tracks, under single ownership, with almost entirely local native vegetation. The strategies described below aim to retain rural character where feasible; to keep the basic characteristics of simplicity and a minimum of visible built structures.

These principles relate to components of rural residential development that have a visual impact. They refer to actions that would be taken assuming that the site was broadly acceptable. The visual management objectives may be either for development to be not evident, or that development should blend with the landscape. Where the objective for a site as a whole may be for blending of development, there are likely to be individual components that are preferably not visible from specified viewpoints. Most of the strategies below would result in a development blending with its setting, rather than being entirely not evident. Strategies for screening and obscuring development are addressed in Part 3: Introduction.

Number of lots and/or buildings

The number of buildings in a subdivision is a key issue, as buildings are the most visible feature of rural residential developments.

Preferably the location of potential building envelopes should be agreed prior to subdivision approval, to ensure that each proposed lot has a suitable site.

The number of buildings visible over an entire site should resemble rural densities in the region, or at least not appear to be substantially denser to the degree that the appearance is considered more urban than rural. Higher visible densities will look more appropriate close to urban areas.

A starting point in deciding on the number of blocks is to consider how many buildings it is acceptable to see. The next step is to ascertain whether the landscape is capable of obscuring the balance of the number of buildings proposed. Factors such as screening potential should be considered, together with an assessment of the extent to which the strategies listed below can be used. Any requirement to screen particular buildings should be made clear to prospective purchasers prior to sale of the lots, unless this is considered as a desirable but not essential objective that landowners are encouraged to observe.
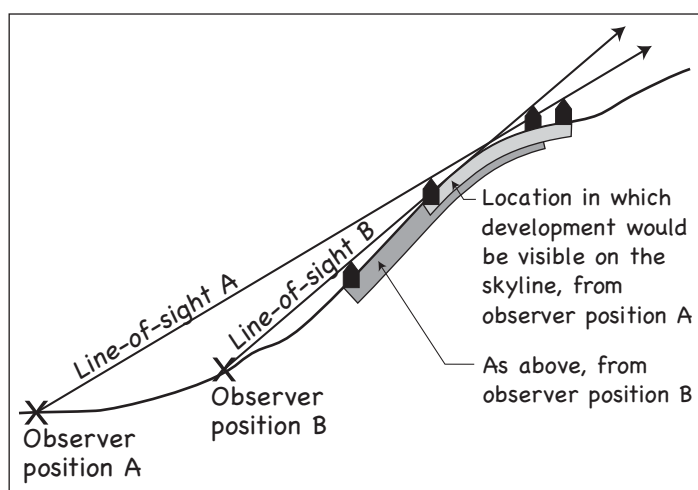

Figure 3.1: Hypothetical hillside profile, illustrating locations in which development would be visible on the skyline from several observer positions. Note – from the closer observer position, position B, land on which development would form the skyline is further down slope).

There should be an acceptable time frame for the growth of any required screen planting. Screen vegetation may be planted in advance, based on knowledge of likely desirable building sites.

Lot size and subdivision layout

Lot size and layout should ensure that individual landform features are incorporated in single lots, avoiding the need for fencing across or through features such as knolls or rock outcrops.

Subdivision layout should be designed to prevent the appearance of a regimented grid pattern, through road and driveway alignment, lot size, configuration of boundaries, and pattern of planted areas and likely building locations.

Lots need to be large enough to provide space for vegetation while still complying with fire safety regulations. Each proposed lot should have a house site on which the house and its access-way will be unobtrusive, depending on the visual management objective.

It is sometimes suggested that smaller lots are more visually attractive as they are easier for owners to maintain. People may be reluctant to plant trees close to their homes due to the risk of fire or overhanging limbs breaking, and they may not want to screen their views. The net result of a number of adjoining land owners being reluctant to plant trees could be fewer trees over the entire subdivision, compared to the number of remnant or planted trees if lots were larger. Smaller lots will have proportionately less area outside building envelopes and more of the entire site will comprise buildings. Owners are less able to retain remnant vegetation, due mainly to the fire prevention regulations.

Smaller lots may be appropriate if they enable the creation of some larger lots that contain protective covenants, or common land that incorporates important landscape features. The concept of clustering lots and/or building envelopes to protect landscape values represents a flexible approach to rural residential design that can be based on landscape assessment outcomes.

Some lots may only be the size of their building envelopes, while the remaining areas may be maintained in an undeveloped state, protected as public reserves or retained as common property under the control and responsibility of the landowners.

Use of strata titles or other similar form of title is another means to ensure that landscape or environmental features are contained in common land covered by specific bylaws or provisions that cover such issues as:

- areas to be protected;

- level of protection required;

- objectives of protection;

- management and maintenance actions required;

- specific responsibilities of the landowner group;

- the degree of responsibility of each individual landowner, the group collectively, and any other groups of agencies which have a degree of right, responsibility or interest in respect to the land; and

- the process involved in making modifications to those bylaws or provisions.

Clustered layout of lots leaves substantial areas of open space, which can be linked with adjoining uncleared public land to better integrate developed land into its setting. Corridors of remnant vegetation may be located where they provide linkages between important landscape features such as ranges, coastline, wetlands and estuaries. The obvious location for these linkages is along watercourses, in addition to linking large areas of remnant vegetation elsewhere.

Siting of buildings

Buildings or building envelopes should not be located on important landscape features such as rock outcrops, knolls, dunes, areas of vegetation visual interest such as heath or vegetation that contain visually distinctive individual species such as WA Christmas trees, or grasstrees. Vegetation

valued for other reasons such as ecological significance should also not be located in building envelopes.

Buildings need to be buffered from important landscape features, to ensure that they do not impinge on these features through impacts such as altered drainage patterns, soil erosion, introduction of weeds or increased frequency of bush fires, all of which would adversely impact on visual values.

The visual impact of buildings is reduced if they are sited adjacent to existing vegetation, or in areas that are to be planted. Planting around buildings near remnant vegetation can visually connect them to this landscape feature.

Preferred building sites are those that are:

- in the vicinity of remnant vegetation, including parkland cleared sites;

- in open areas that have been or will be revegetated;

- in low positions in the landscape, or on foot-slopes of ranges;

- in small, enclosed valleys; and

- at natural breaks in slope to minimise need for cut and fill.

Buildings may be clustered to allow space for larger, contiguous vegetated or agricultural corridors in between. Whether such areas are in private or public ownership is not important to the concept. Clustered buildings may be easier to screen in the landscape than isolated buildings. Clustering is an alternative to the appearance of buildings spread evenly across a landscape, possibly affecting a larger area.

Where building sites cannot be clustered they are better located at staggered elevations, rather than in a straight line along a contour, or otherwise a new, very strong linear visual element may be introduced into the landscape.
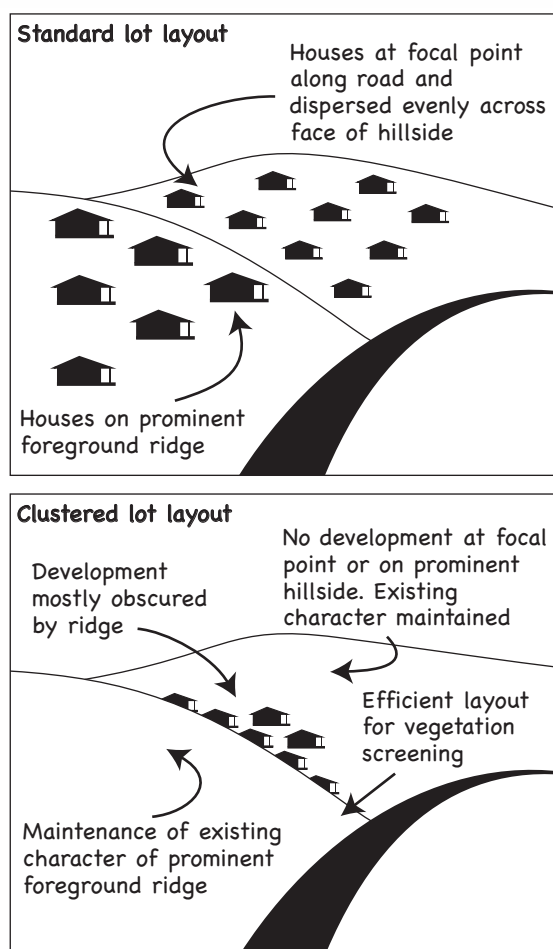

Figure 3.2: *Clustering of rural residential development enables development to be concentrated in less visually sensitive portions of the site, while the remainder maintains its existing character or may be revegetated.*

Panoramic views may be available from the top of a scarp or ridge into an adjacent valley. Buildings should be kept to the sides of these valleys, out of the main view corridor. They should preferably be screened from the more elevated viewpoints. Residents would retain their views down the valley.

Buildings should preferably not be located in the focal areas of views. If they are located in focal areas, the planting strategy should incorporate tree planting to screen development areas.

Buildings should not be visible on skylines, ridgelines or other highly visible locations in the subdivision such as knolls and heads of valleys, and not silhouetted against the skyline from sensitive roads and viewpoints.

Houses should be capable of being screened from view from specified viewpoints, while retaining desirable views from properties. It is acknowledged that landowners will want to build where they maximise the views from the house. It is usually possible to identify suitable buildings sites from which residents may obtain satisfactory panoramic views, perhaps in a particular direction, or framed by vegetation.

Building envelopes need to be of a practical shape and position on the lot, to allow reasonable opportunities for landowners to develop their property. They need to be of a size that allows for a permissible development to be sensitively designed and placed, with space for a large rural home and a number of outbuildings. A range from 2000 m² to 4000 m² is suggested, depending on individual circumstances. Building envelopes also need to be able to incorporate fuel-reduced buffers or other bushfire protection measures. If it is not feasible for building envelopes to be large enough to address these practical considerations then the design of the estate should be radically modified to cluster the lots or developable building envelopes into selected areas where the affect on landscape and vegetation can be tolerated.

Even when the position and size of building envelopes has been fixed, there needs to be a degree of flexibility to allow for modification or repositioning. Owners should demonstrate that they will still achieve the established landscape objectives for the estate, as determined by a comprehensive visual impact assessment that would have been carried out prior to the initial approval of the subdivision, together with the application of these guidelines.

Building design

Buildings should be designed to meet the subdivision site's overall visual management objective. The objective in relation to buildings may be: 1) buildings should be not evident; 2) buildings may be evident but should blend in, and not be prominent in the landscape; or 3) buildings may comprise prominent features that contrast with their visual landscape setting.

These objectives will contribute to choice of building site, building form, size, height, materials and colours. If the objective for the entire site is that the development should with its setting, it still may be appropriate for an individual building to be not evident, to reduce the overall impact of the subdivision.

The visual impacts of large terraced building pads with high retaining walls or exposed slopes below the house are difficult to address. Cut and fill techniques may be used to reduce the height of building pads.

Building form needs to fit the landform, usually horizontal rather than vertical. It may be easier to fit a series of smaller forms in to the landscape than a single large one. The bulk of dwellings may be broken up, for instance, by not incorporating the garage into the main body of the house.

Image 93: *Housing at Yallingup displays a range of styles that provide lessons for rural residential housing. For example, the house third from the right fits into its setting better than other houses, due to its dark roof and window treatment.*

Image 94: *Particular care is needed in the siting and design of ancillary structures in visually sensitive locations, such as rural land adjacent to the Stirling Range. The curved form of this simple shelter reflects the curved profile of the range backdrop.*

Building height limits need to be low enough to have a rural appearance and to allow screening where required.

Rooflines should reflect the angle of slope of the skyline. The visual impact of inappropriate rooflines such as steep pitch or abrupt changes can be softened by vegetation planted around the buildings, as plants redirect attention away from the buildings. Responsibility for such planting needs to be determined to ensure that it occurs.

Building materials should blend with the natural colours and textures of the landscape, such as soil colour, rocks and vegetation. Natural materials such as rammed earth, cement stabilised gravel, timber, hay bales or field rock may suit rural landscapes, as could traditional materials such as iron sheeting. Recycled materials may also be appropriate.

Cream or white walls or bright colours should be avoided as they usually draw attention in rural landscapes, by producing strong visual contrast. Colours or materials that may cause glare should be avoided, as should colours that are bright, light or reflective. Verandas and eaves will reduce reflectivity and glare by shading walls and windows.

Ancillary structures such as sheds, garages and tanks should be of similar materials, colours and style to the main house, although the appearance of a group of different looking structures can be unified by planting or a unified painting scheme. Structures have less impact if clustered together.

Fencing and firebreaks

It is preferable that fencing with associated firebreaks is not located in prominent positions such as at right angles up steep slopes. It may be preferable to locate these fences in open areas rather than through bush remnants, to prevent the need to clear vegetation either side of the fence. New planting can help to minimise the visibility of fencing and firebreaks in open areas. The ideal location may be at the edge of remnant bush, so

the fencing and firebreaks assist in vegetation protection. Additional planting can then take place on the paddock side of the fence.

Firebreaks are less intrusive if they follow contours. They may also comprise a slashed buffer strip, rather than exposed soil.

The least intrusive style of fencing is rural style, post and wire. Solid fencing near buildings looks less intrusive if darker colours and non-reflective, rough textures are used. Natural materials may be ideal.

Access roads and driveways

Location and alignment

Roads and driveways should be positioned where they are not orientated towards key viewpoints. They may be prominent where located through open areas on slopes facing major viewpoints such as adjoining roads. If the alternative location would involve vegetation removal, prominent roads could be placed at the edges of uncleared areas, with additional planting on the cleared side of the road.

Use an alignment that follows contours or runs gently across slopes. Avoid steep slopes, drainage lines and areas requiring extensive cut and fill.

Roads and driveways that follow contours on steep slopes result in a continuous cut above the road and continuous fill below. In these locations it may in fact be preferable to have a shorter section of road aligned upslope, if it can be done where it does not face major viewpoints and where drainage issues can be addressed.

The use of embankments and cuts should be minimised. They should look as natural as possible, for example, in their slope and vegetation cover.

The entrance to rural residential subdivisions should not be permanently highlighted by entry statements, as these are a feature that is typical of

urban, not rural, landscapes. Where it is necessary to have kerbing, attention should be given to strategies for reducing its prominence. Careful landscape treatment may assist in making these entry points attractive, but still rural and informal in character.

Design considerations

Roads and access drives that are most visible from a distance are gravel surfaces, with wide gravel shoulders, deep surface drains, culverts under driveways, and no vegetation on shoulders or edges. These types of surface and verge treatments should be avoided where visual prominence is an issue. Gravel surfaces generally provide a more rustic, typically rural appearance, but they are usually brighter or more reflective in colour than bitumen, unless a dark gravel material is used.

The least visible roads and access drives are those with a bitumen surface, no gravel shoulders, underground drainage and vegetation restored to shoulders. Kerbing may be prominent due to its light colour. However, tinted concrete, or use of local rock, are possible solutions. Kerbing with below-ground drainage may be beneficial as the surface can be vegetated to the pavement edge.

The width of roads and access driveways should be minimised to reduce their prominence.

Vegetation

Vegetation is often lost from the sides of access roads and driveways as a result of soil disturbance, placement of underground cables and power, and drainage construction. Attention to housekeeping and revegetation would address these issues.

Canopied vegetation across roads or driveways should be retained or introduced wherever feasible. Groundcovers are also suitable for planting on verges. Large shrubs may have safety implications, as well as blocking views.

Use of the dominant local tree species in roadside planting may assist in unifying the appearance of subdivisions, as roadside trees are particularly noticeable.

Vegetation may be used to screen driveways by being planted on the down-slope side.

Sewerage disposal, water supply, power

Underground power is preferable to above ground, to avoid a proliferation of overhead wires. The ground needs to be rehabilitated and revegetated following installation.

Placement of water storage tanks and sewage treatment facilities may be an issue. Water tanks may present particular problems if they need to be located at the highest elevations of the subdivision. Options may include sinking water tanks below the ground surface, and use of screen planting combined with painting to assist with camouflage.

Tanks should not be located where they will be seen silhouetted against the skyline or be visible from specified viewpoints.

Tank siting may be of sufficient concern to bring this method of water supply into question.

Remnant vegetation and new planting

A strategic planting plan should be prepared for each rural residential subdivision. This should address species and sites for planting, including screen planting and planting to reduce the prominence of individual buildings. Screen plantings and vegetated buffers may take many years to grow to an effective size, and it is difficult to predict how each individual specimen will grow. Plantings will need management to retain their effectiveness and provision needs to be made to prevent their removal or partial destruction. Implementation and maintenance tasks and responsibilities should be identified in relation to each component of the planting plan. Maintenance may include watering until

establishment, pruning and weed control. Plants will take some years to become established, requiring a long-term commitment.

The objectives of the planting plan would be to ensure that:

- planting looks natural where native plants are used;

- planting includes areas in which vegetation restoration would assist in addressing environmental degradation, such as on steep slopes, around wetlands, and in riparian zones;

- the choice of species to be used takes into account height, growth rate and characteristics likely to apply to these species when planted in the particular soil, slope and climatic conditions of the site;

- trees chosen are suitable for being pruned as required eg to allow for views;

- plants intended to soften the impacts of buildings and other structures will grow to the required dimensions and are located where they will achieve their landscape design objective; and

- screen planting:

  - looks natural (for example, by use of local species, natural planting layout, varied ages and plant forms);

  - is the required height and density;

  - is accurately located to provide a screen (also refer to strategies for screening in Part 3: Introduction);

  - screens views of houses while still providing desirable views from houses to landscape features;

  - does not become an intrusive element in itself; and

  - does not inadvertently draw attention to the built features which are to be made less obvious.

Landowners should be provided with lists of suitable species to use in implementing the strategic planting plan. They should also be provided with information on attending to matters such as weeds escaping from gardens, and weeds in general.

Remnant vegetation

There should be no clearing other than as required eg in specified building envelopes, for roads and fire control purposes. However, clearing for these purposes should be avoided wherever feasible by avoiding the location of structures or facilities in areas of remnant vegetation.

All remnant vegetation should be retained wherever feasible, whether it comprises bushland with an understorey, parkland cleared vegetation with no understorey, or simply scattered remnant trees or shrubs.

Natural revegetation should be encouraged by fencing to restrain stock, especially along drainage lines, on steep slopes and ridgelines, in areas prone to soil erosion and salt scalding and around rock outcrops. (If shade for stock is an issue, fast growing trees such as wattles may be planted outside the fenced regeneration areas to provide alternative shelter).

Example of a procedure for undertaking a strategic planting plan for a hypothetical rural residential proposal:

- identify the key viewpoints which are to be considered in analysis, including major regional vantage points from which the site is visible (such as lookouts), localised vantage points in which the site is a feature (such as bridges), and representative individual locations of views from publicly accessible areas such as nearby roads;

- obtain digitised contour information, ideally incorporating all land between the site-and off-site key viewpoints, but at least including the exact location of off-site viewpoints if there is no intervening landform which obstructs views;

- produce digitised information on remnant vegetation both on-site and off-site on adjacent land;

- produce digitised information on the subdivision, including known elements such as lot boundaries, roads, location of the water storage tank, and likely location of variable features such as buildings and access driveways;

- produce digitised information on maximum height of development features;

- develop three dimensional images incorporating all the above information, to indicate how the development would look from each of the key viewpoints;

- develop sets of visual management objectives to apply to each viewpoint, such as objectives which address major negative features that are apparent from individual viewpoints, and those features which comprise the major constraints to meeting the overall objectives listed above;

- using the three dimensional computer images, develop a planting plan by trialling locations and heights of vegetation required to meet the objectives listed for each viewpoint (note that using computer-generated images enables planting areas to be correctly located on the ground);

- once areas to be planted have been decided on, develop list of species to be used, taking into account height, growth rate and characteristics likely to apply when grown on this site, density of foliage, colour of foliage, plant form and so on, with the specific objective of using local native species wherever possible, but where plants from elsewhere are needed, to obtain the necessary height for example, these plants should be visually compatible with local native species growing naturally near the site, in terms of their form, colour and texture; and

- prepare information on obtaining, planting and maintaining the recommended species.

Siting of vegetation to enhance landscape character

Ridgelines may have lost their original vegetation, resulting in a loss of apparent ridge height. To restore the prominence of these sections of ridgeline, trees should be planted along the top of the ridgeline itself. It is insufficient to have a vegetated skyline comprising trees protruding from behind the ridge. This can result in a very distinct cleared ridgeline silhouetted against a backdrop of vegetation from behind the ridge.

Supplementary planting in adjacent cleared areas, using the same species as those that dominate the bushland, can reduce the abrupt edges to remnant vegetation. These planted edges are suitable locations for buildings, rather than in isolated locations in cleared spaces.

Existing remnant vegetation may be supplemented with additional planting in lots, such as along lot boundaries with additional planting inside these boundary strips, although only planting along property boundaries results in a rigid and unnatural appearance.
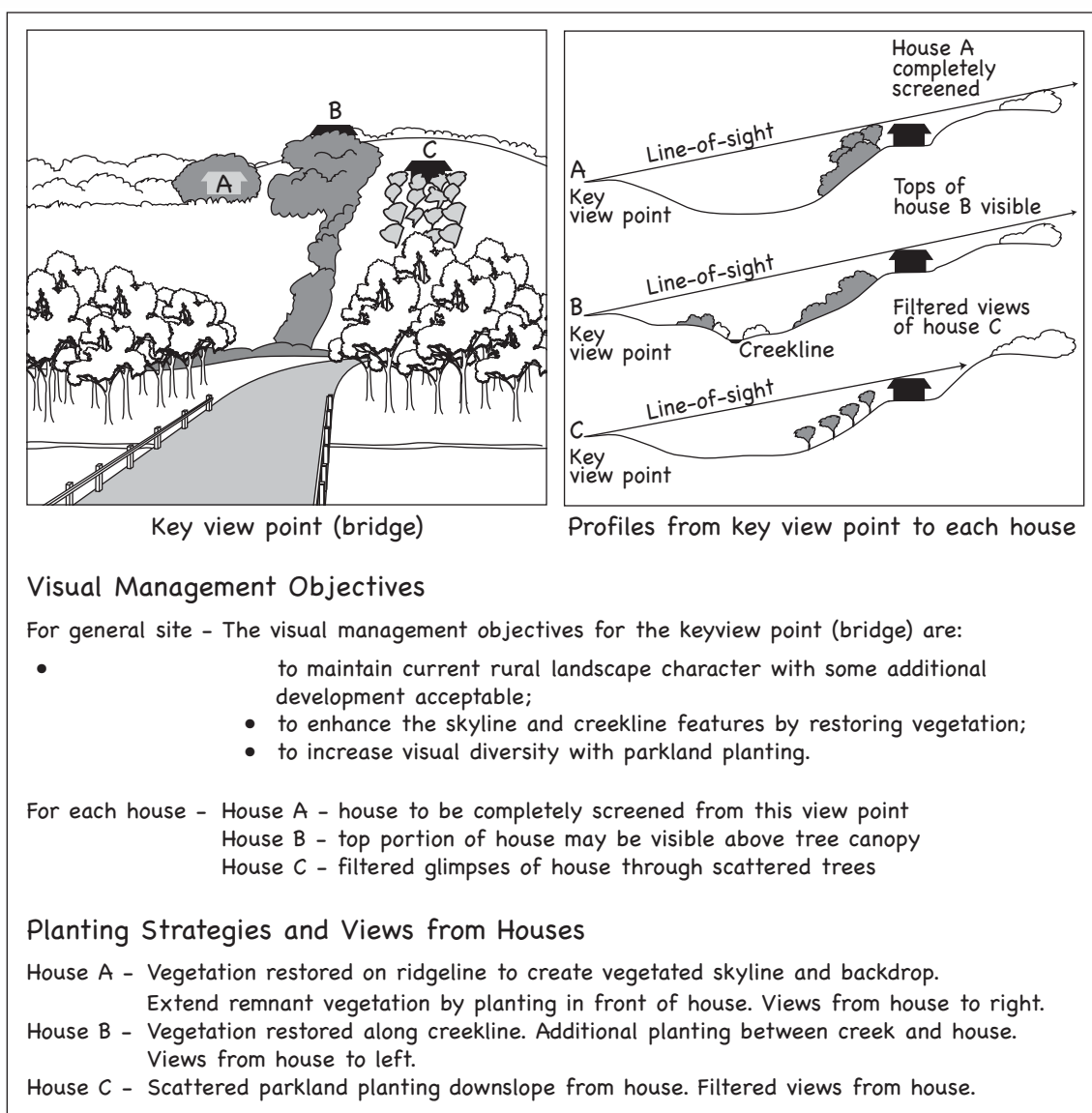
Key view point (bridge)

Profiles from key view point to each house

Visual Management Objectives

For general site – The visual management objectives for the keyview point (bridge) are:

- to maintain current rural landscape character with some additional development acceptable;
  - to enhance the skyline and creekline features by restoring vegetation;
  - to increase visual diversity with parkland planting.

For each house – House A – house to be completely screened from this view point
House B – top portion of house may be visible above tree canopy
House C – filtered glimpses of house through scattered trees

Planting Strategies and Views from Houses

House A – Vegetation restored on ridgeline to create vegetated skyline and backdrop. Extend remnant vegetation by planting in front of house. Views from house to right.
House B – Vegetation restored along creekline. Additional planting between creek and house. Views from house to left.
House C – Scattered parkland planting downslope from house. Filtered views from house.

Figure 3.3: *Hypothetical examples of the basic elements in a strategic planting plan for a rural residential development.*

Planting with local trees may be used to reduce the prominence of open areas. Trees should be located in groups or in a roughly linear pattern along watercourses, rather than in regimented, plantation-type shapes and layout.

Ensure that desirable views in, from and to the site are not inadvertently blocked by planting. Views may be altered, for example, from open panoramic views to canopied or partially enclosed panoramic views.

Use of non-local plants

It is probably considered acceptable for many rural residential developments to exhibit more vegetation diversity than in typical rural landscapes. Visually chaotic planting should be avoided by limiting the number of non-local species used. The visual dominance of key remnant vegetation species should be retained without them being overwhelmed by a wide variety of introduced species.

Appropriate non-local species may include plants that are traditional to the area and are valued for their contribution to the rural landscape.

Non-local vegetation that strongly contrasts with local vegetation in colour or form may detract from the natural character of the landscape.

Plants that are non-local may be needed in order to provide a screen of the required height or density. The species chosen should be visually compatible with local natives elsewhere on the site, in terms of form, colour and texture, and of a species that will not become weeds.

Non-natives may be appropriate as a feature in association with cultural elements such as driveways, groups of buildings, dams or intensive agricultural uses such as horticulture and aquaculture, presuming that there is no objective to blend these into the landscape. This is preferred to naturalistic or random planting of non-local species across the entire landscape, intermingled with local native species. Native vegetation is seen to be linked to the landscape as a whole, as opposed to non-local vegetation, which exhibits traditional cultural linkages.

Plantations

Background

The term farm forestry is a generic term that refers to all trees grown for commercial or farm management purposes on freehold rural land. It incorporates both tree plantations and agro-forestry. The principles and guidelines in this section focus specifically on plantations. Agro-forestry is discussed very briefly, however some plantation principles for minimising visual impact may be applied to areas planted for agro-forestry purposes.

Tree plantations are defined as commercial plantings greater than 10 ha in area, either hardwood such as Tasmanian blue gum or softwood, comprising pine trees. Agro-forestry involves planting trees to be managed in conjunction with other agricultural activities such as cropping or grazing. The general emphasis is on environmental or land-care benefits, although trees may be harvested on a rotational basis as part of a commercial exercise.

Pine plantations have been established and harvested in this state for over 100 years and hardwood plantations since about 1990. They are predominately located in the lower west coast and southern coastal areas.

Hardwood plantations are generally harvested as chip logs after 10 years and the stumps allowed to regrow to create up to two further harvests after consecutive eight-year periods. Rapidly improving rootstocks, and techniques for growing and site selection have seen many of the initial sites abandoned after the initial harvest and replanting being undertaken on new land.

Agro-forestry is more likely to be taken up in moderate to low rainfall areas. A wide range of trees is typically used, including eucalypts, pine, wattles and tagasaste.

Small to medium scale plantations can contribute positively to the kaleidoscope of rural visual landscape experiences by providing additional colours and textures, but large scale plantations are more likely to have a detrimental visual effect. In contrast to large plantations, agro-forestry is generally much more conducive to producing a varied rural landscape.

Existing policies and guidelines

This guideline should be used in conjunction with existing policies and guidelines.

- Farm Forestry Planning Bulletin 56 (WAPC 2003)

- Rural development control policies (WAPC)

- Guidelines for Managing Plantation Landscapes (CALM 1994)

- Guidelines for Integrated Forest Harvest Planning and Design (CALM 1994)

- Guidelines for Plantation Fire Protection (CALM & FESA 2001)

- Farm Forestry and Landscape Architecture: a feasibility study (Joint Venture Agroforestry Program) RIRDC Publication No. 04/187 (2004)

Visual elements

The elements below can apply to both plantations and agro-forestry. Some of the elements apply mainly to closer views such as shape of plots and the appearance of each species, and are therefore more relevant for consideration at a site or local level than a regional level.

Visual elements to be considered comprise:

- shape of vegetated area;

- species appearance in relation to local native vegetation;

- species variety;

- height and density of vegetation;

- planting pattern and/or layout;

- uniform shape of plantations;

- blocking major view sheds;

- obstructing key view locations from important travel routes;

- siting and locations of plantations in the landscape;

- height of plantation;

- species type;

- different shapes and colours; and

- impact of colour on local landscapes, particularly blue gums.

Issues and pressures

Plantations represent a significant change in agricultural land use in some regions. The transition has resulted from more intensive agriculture replacing more extensive, traditional broad-scale agriculture.

Planting to create windbreaks, shelter-belts and so on for agro-forestry purposes can have long-term visual impacts, although its impacts are less dramatic than plantations. Straight line planting may create new linear elements in specific landscapes that did not previously contain strong linear cultural elements, or existing lines created by fencing and firebreaks may be accentuated, such as in the landscape immediately inland from Dongara. Care is also needed to ensure that planting does not create a hedge effect along major routes, blocking important views.

Remnants of natural vegetation in plantations restrict planting, management and harvesting operations, and may increase the likelihood of fires, as properly managed hardwood plantations present a reduced fire risk.

When rural areas were first settled, crops and pasture resulted in major changes to the landscape, primarily an opening up of the previously vegetated landscape. These changes occurred some years ago, and the open appearance typical of rural landscapes has long since become accepted.

Plantations result in a return to a more enclosed, vegetated landscape. This change may be quite dramatic, especially where plantations are established in open landscapes. Crops and pasture allow the surface details of the terrain to be observed, including rock outcrops and drainage systems, whereas plantations obscure the terrain.

A major concern with plantations is the need to protect significant landscape features and individual landscapes where the current visual character is highly valued, especially if the existing character is a resource for the tourism industry.

The screening of significant views of landscape features as seen from major travel routes may also be an issue, for example, around the Porongurup Range. Road users may also be averse to the general enclosure of roadside views in a narrow, uniform corridor of trees, even if major specific views are not screened.

The use of narrow rural roads for heavy vehicles servicing plantations is clearly a safety hazard, but there may also be detrimental landscape impacts, such as the loss of amenity when road upgrades result in the clearing of roadside vegetation.

Landscapes that are dominated by plantations exhibit uniformity of land coverage, with small-scale natural terrain variations such as creek-lines and wetlands obscured from view.

Some phases of the harvest cycle are particularly unattractive, such as when trees are freshly harvested, leaving bare ground and stumps. The use to which land will be put following the final harvest also needs to be considered.

Principles and guidelines

Pine plantations have been a small-scale commercial land use in WA for about a century; however the industry has been through a rapid increase with hardwood plantations since about 1990. This increase has led to a transition in agricultural land uses in the regional areas from traditional broad-acre farming practices to more intensive agriculture such as viticulture, horticulture and plantations.

As this transition is occurring, planning at a local level is essential to accommodate this change particularly in regard to potential impacts on local visual landscape character and tourism.

Plantations bring substantial changes to local landscapes. Developing a good plantation proposal should protect significant landscape features, maintain key views from important travel routes and complement local visual landscape character, particularly adjacent to important travel routes.

Note: Each figure is placed directly underneath the relevant principles

Regional guidelines

- Ensure that existing valued character is maintained.

- Ensure that plantations do not dominate the roadsides of regionally important roads.

- Maintain permanent stands of trees or shelterbelts.

- Avoid burning close to important roads.

- Plantation size should borrow from the scale of the surrounding landscape, eg large open valleys can accommodate a greater area of plantation establishment and harvest area than smaller ones.

- The pattern of plantation blocks should reflect or imitate surrounding vegetation, landform and land use patterns.
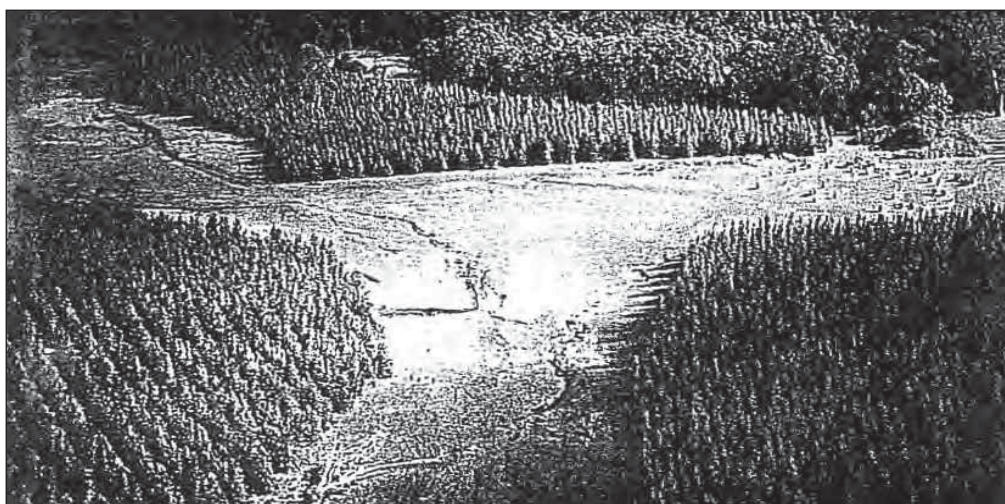

Figure 3.4: Pattern of the plantation areas

- Plantation shape and edges should follow existing landscape lines, created by trees, creeks, gullies, spurs, ridges, roads, fences etc. Avoid reinforcing lines if they are inconsistent with the surrounding landscape. For example, in a landscape setting that exhibits free flowing lines and has distinctive landform features, avoid straight vertical edges, breaking skylines, and reinforcing property and fence lines that are geometric in nature.

Figure 3.5: Plantation shape and edges

- Maintain, protect and enhance vegetation in major drainage lines to assist in the protection of the landscape's natural features.
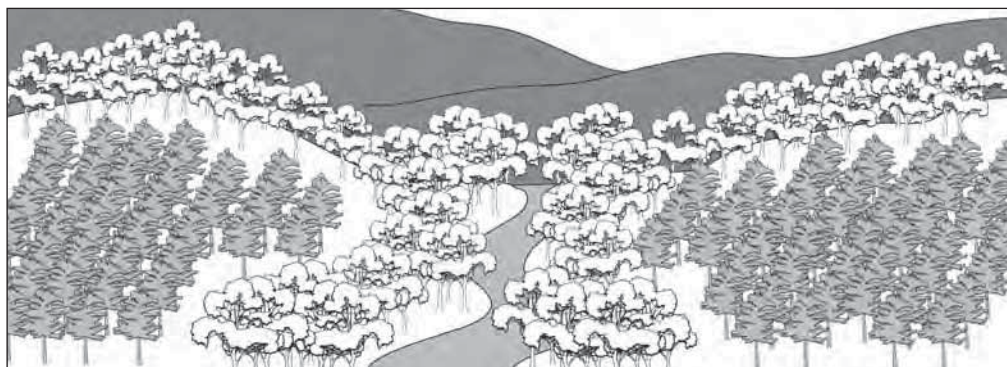

Figure 3.6: *Remnant vegetation*

- Complement local visual landscape character, particularly adjacent to important travel routes and use areas. Ensure that existing landscape character is well represented. Follow the visual expression of the surrounding landscape. For example, in colourful, geometric, foreground agricultural settings, the visual character of an exotic, regimented blue gum or pine plantation could enhance the local landscape.
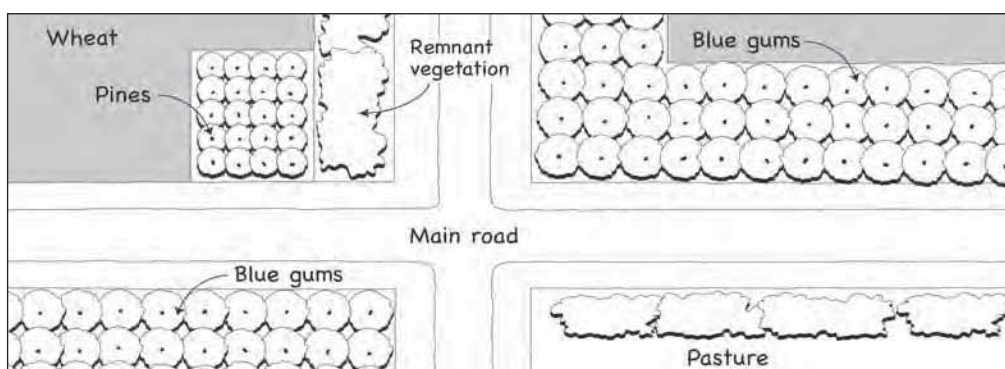

Figure 3.7: *Complementing local landscape character*

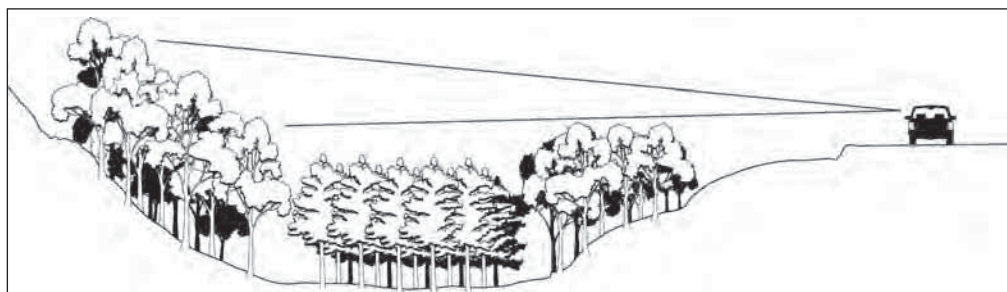- Maintain key views from important travel routes.

Figure 3.8: *Maintaining key views from travel routes*

- Avoid over-emphasis of maximum visual contrasts such as changes located on treelines or skylines. Ensure that such contrasts are refected in other contrasts in the surrounding landscape. For example, in natural settings, edges of vegetation types 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.
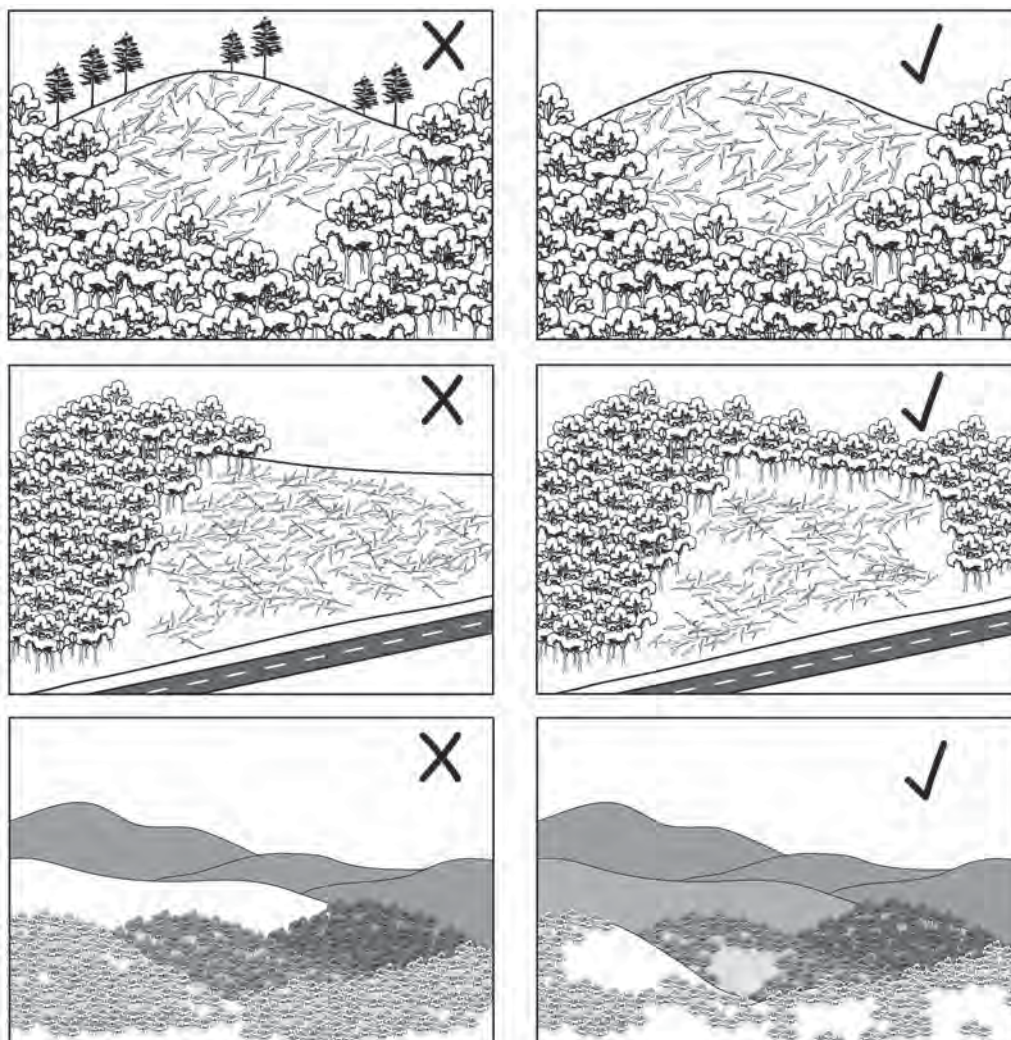

Figure 3.9: *Visual contrasts*

Local guidelines

- Disperse cutting areas across the plantation area.

- Keep cutting areas small.

- Sequence establishment and harvesting to reduce the contrast between adjacent stands.

- Avoid sites which have cleared easements aligned towards major roads, such as power line corridors.

- Use plantation buffer strips, harvested and established before (usually more effective) or after the main plantation stand.

- 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.
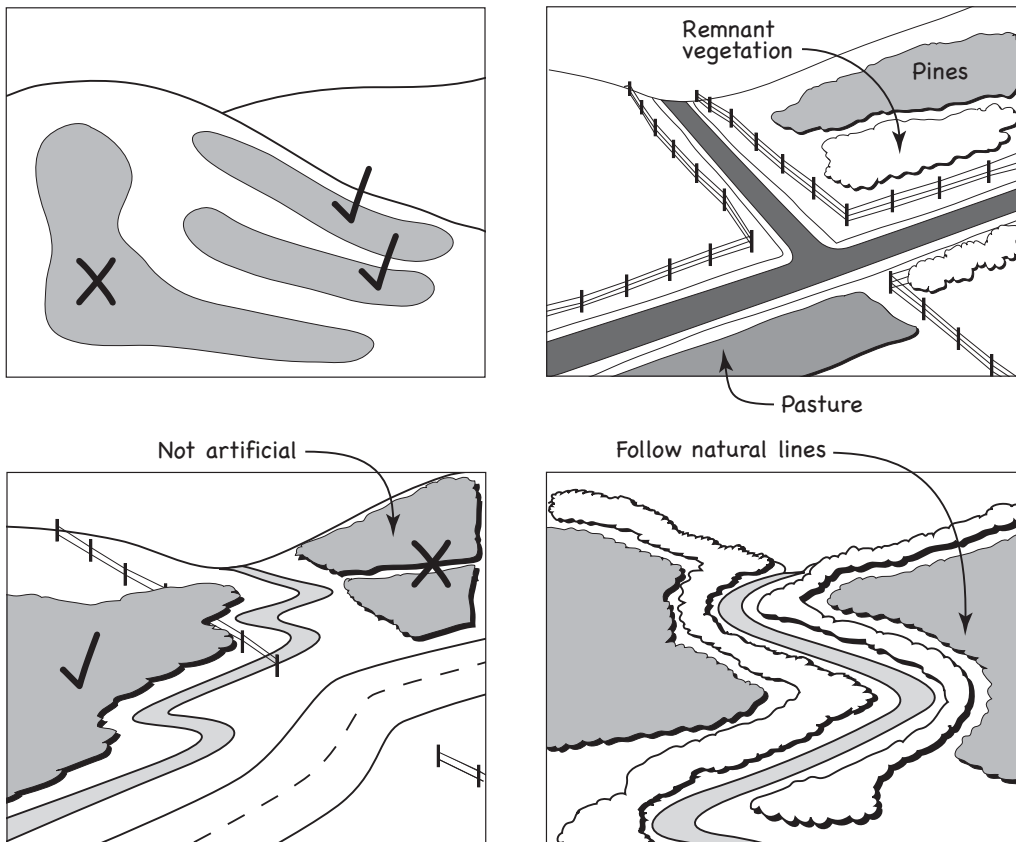

Figure 3.10: *Configuration of side boundaries*

- In landscapes of well-established agricultural land use patterns, plantation patterns may be stronger, for example, with geometric, regimented rows or belts.
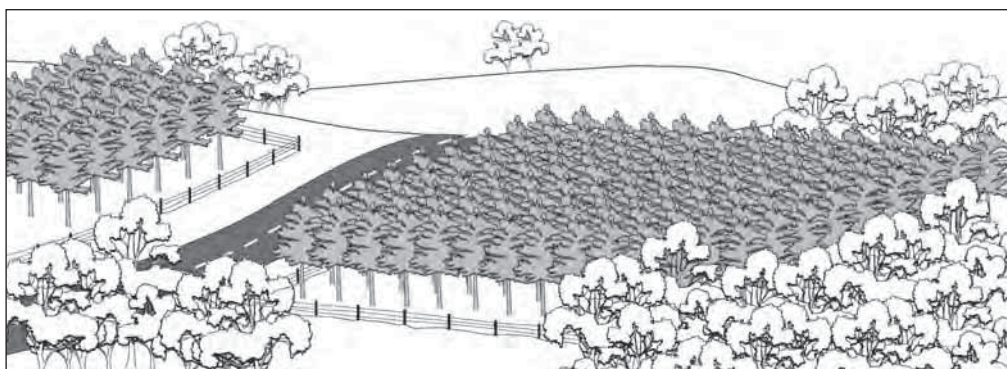

Figure 3.11: *Plantations in more intensive agricultural areas*

- Establish plantation stands on a gully-to-gully basis, rather than ridge to ridge, to reinforce natural line and form.
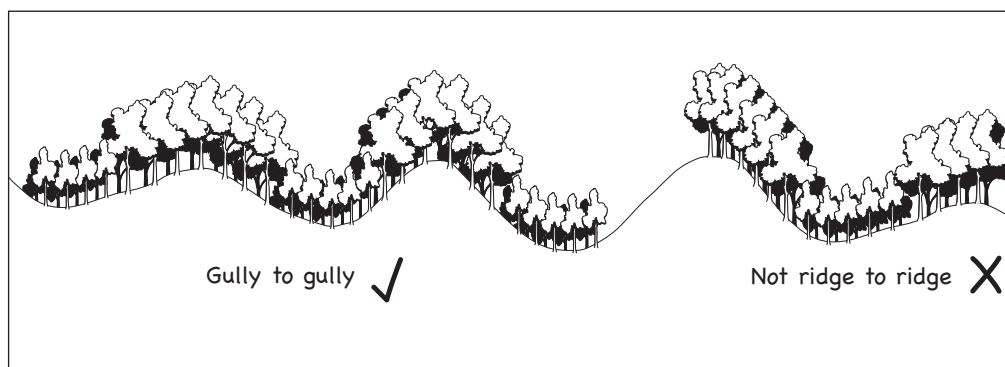
Figure 3.12: *Plantation siting in relation to topography*

- Plantation access roads and fire breaks should be designed and constructed to have low visual impact, preferably screened, with alignments following contours, existing road patterns, vegetation lines and so on, as opposed to artificial property boundaries.

Figure 3.13: *Plantation access roads and fire breaks*

- Ensure that plantations do not dominate the roadside corridor (approximately 300 m either side) of important roads, where these roads provide valued views that would be screened.

Figure 3.14: *Visual access*

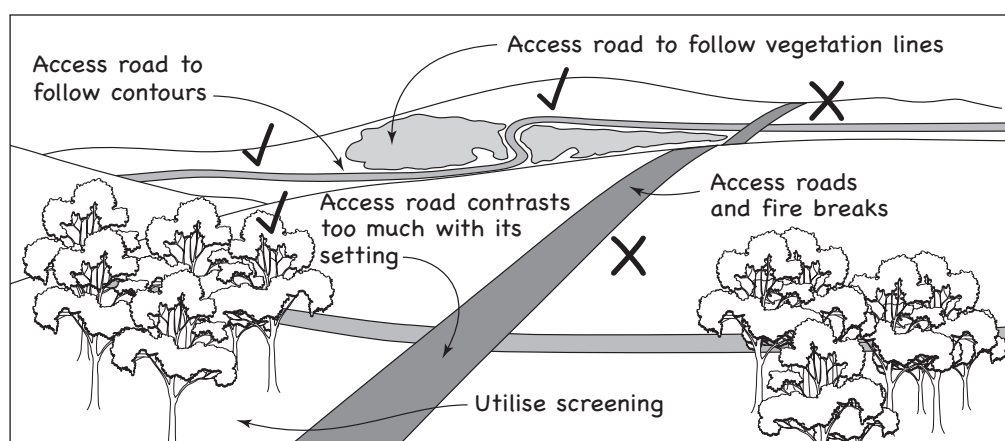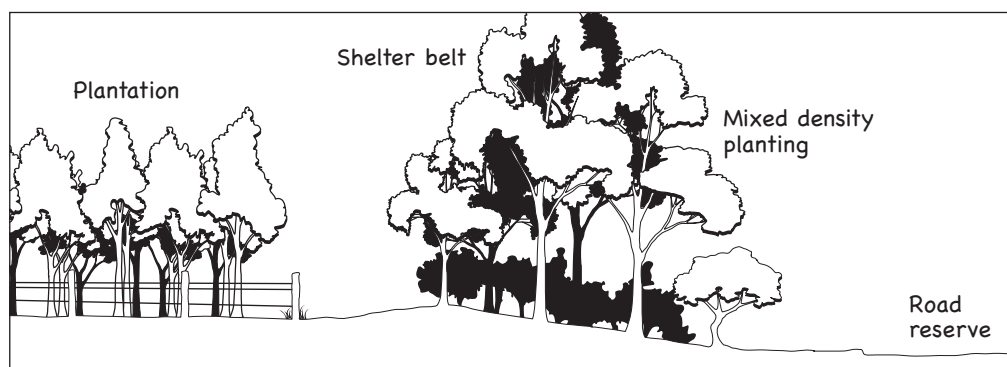- Maintain or establish permanent stands of trees and shelterbelts.

Figure 3.15: *Roadside shelterbelts*

- Use plantation buffer strips, harvested and regenerated either before (usually more effective) or after the main plantation stand.
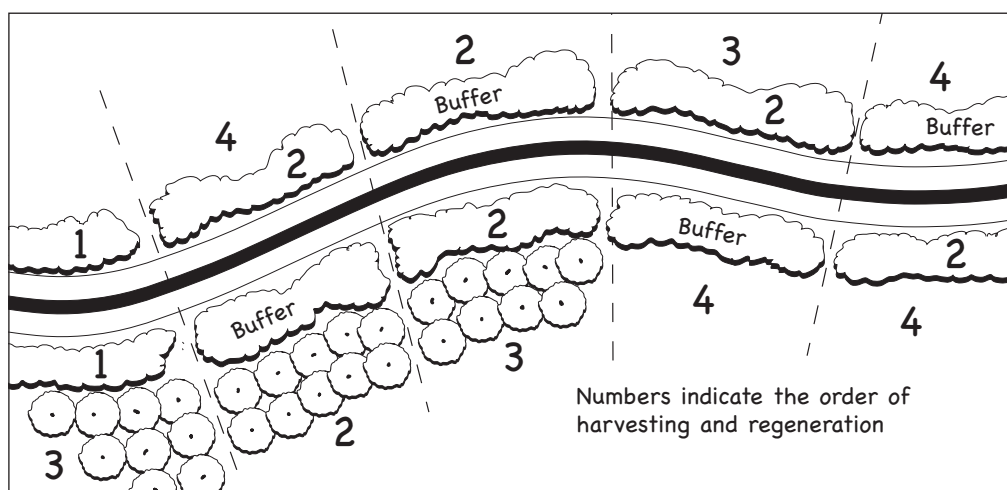
Figure 3.16: *Roadside buffer strips*

- Maintain or establish roadside vegetation corridors to reduce the visual impacts of adjoining clear-felled areas. Final harvesting of roadside vegetation should occur after surrounding coupes have been strongly regenerated or replanted to become a strong enough visual element.

- Naturally established vegetation should be retained in road reserves where possible.

- Reduce plantation impacts by enhancing and extending existing vegetation with similar species plantings. These plantings could be protected from future harvesting, thereby 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.

- For skyline edges, maintain ridges with species that typically dominate the surrounding landscape. For example, avoid pines on ridges in a native hardwood forest setting. If pines are necessary then locate them below the skyline and vary their age, class and planting density.
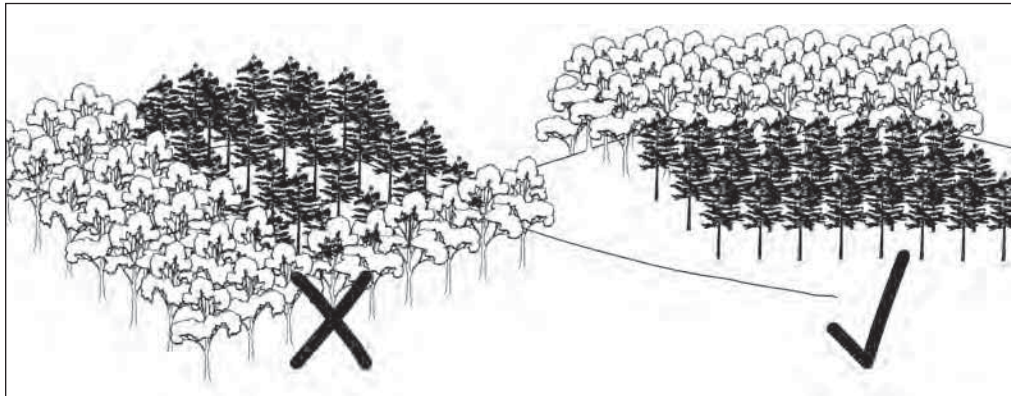
Figure 3.17: *Ridge-top plantations*

Site guidelines

- Maintain visual access through and into the plantation, to enhance the visual quality of the plantation landscape. This can be achieved by open or clumped planting density or through thinning techniques.
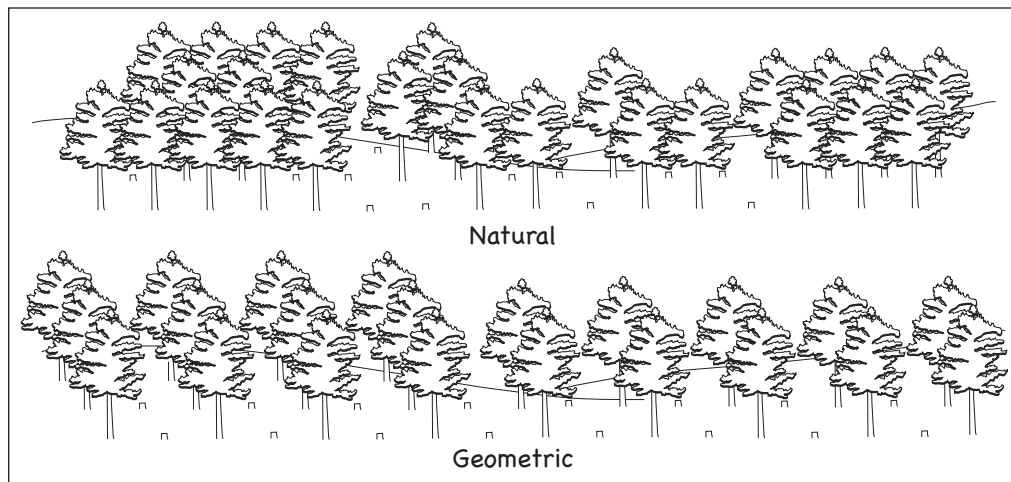
Figure 3.18: *Thinning regimes*

- Thinning regimes should be non-uniform in landscape settings that look predominantly natural. Conversely, in geometric or culturally dominated landscapes, thinning regimes should be regular and uniform.

- Plantation debris can cause significant visual impacts. Reduce impacts by screening, burning or scattering debris away from seen areas in foreground views.

- Harvest areas should be of minimal size in relation to the overall plantation. Felled areas should not dominate over unfelled areas. In sensitive areas, employ harvesting sequencing techniques.
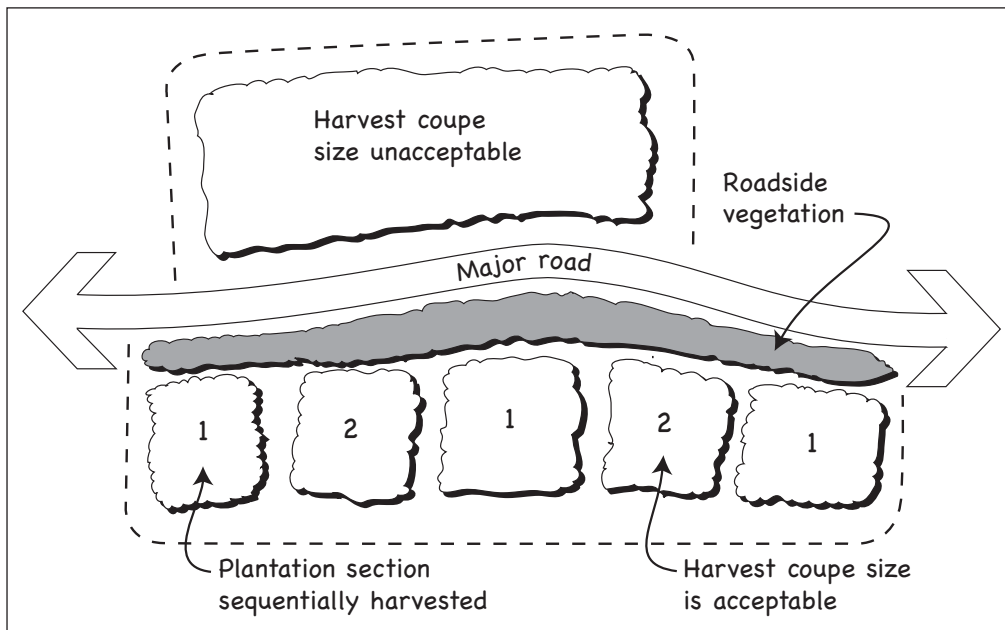
Figure 3.19: *Harvest areas should be of minimal size in relation to the overall plantation*

- Disperse harvest areas over the plantation area and stagger the time of rotation. Keep harvest areas small.
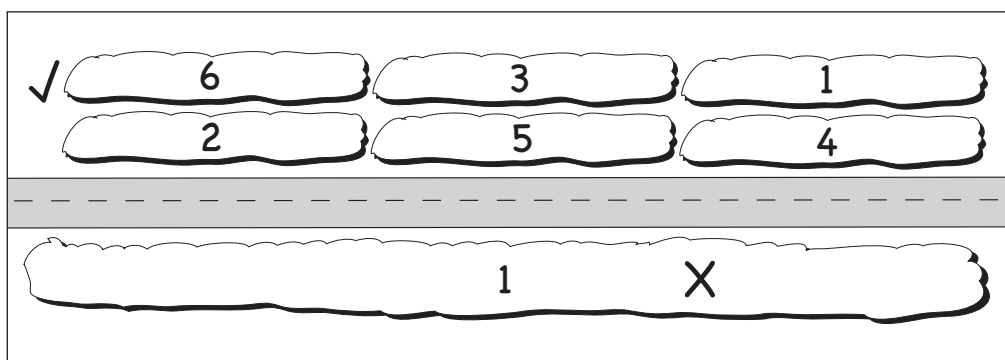
Figure 3.20: *Dispersion of harvest areas*

- Sequence harvesting of ridges or skylines to reduce the extent of clearing disturbance visible at any one time, or to enable adjoining areas to be successfully regenerated.

1st Harvest

2nd Harvest – Years later
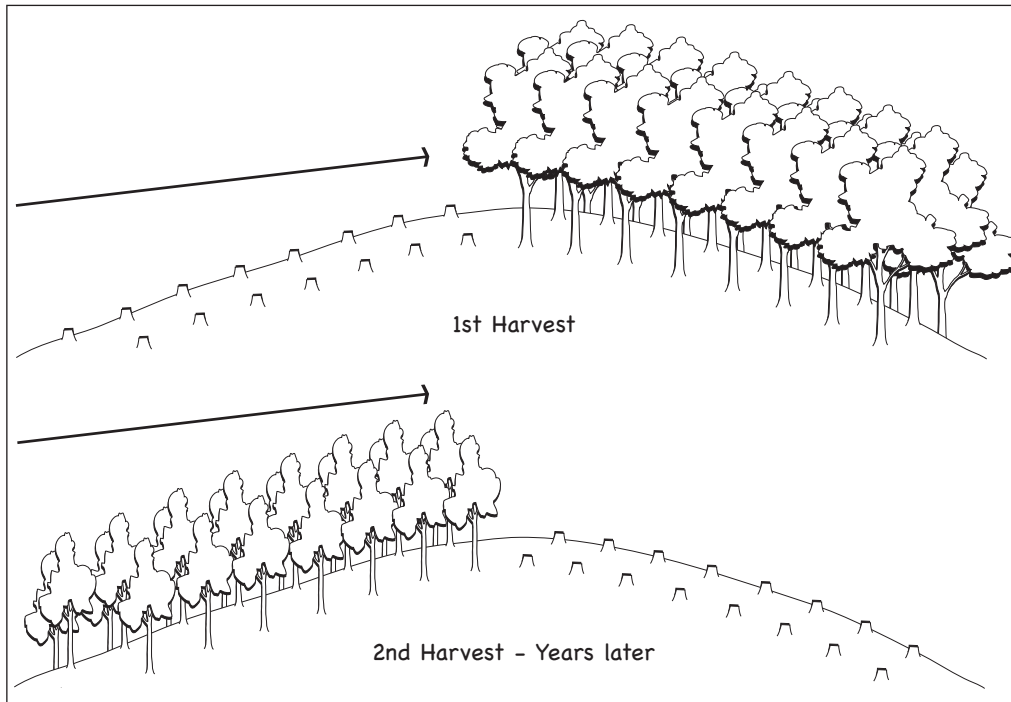
Figure 3.21: *Sequence of harvesting*

- Sequence establishment and harvesting to reduce the contrast between adjacent stands.
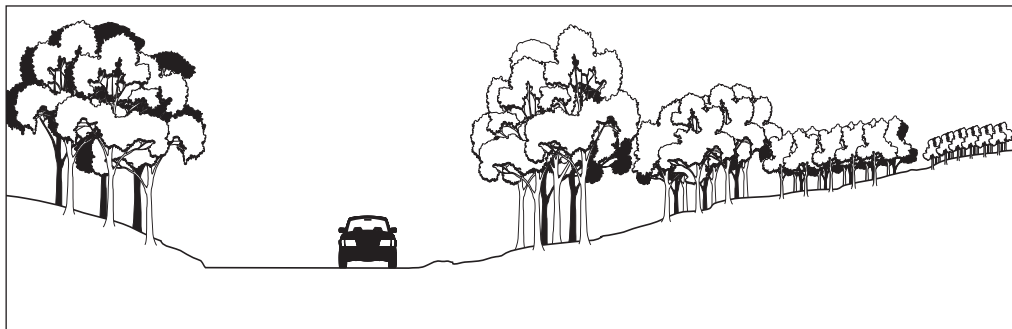
Figure 3.22: *Sequence establishment and harvesting*

Utility towers

Background

This guideline addresses the location, siting and design of towers erected for utilitarian purposes such as power generation or transfer, telecommunications and lighting. Utility towers considered in this guideline comprise:

- wind farms;

- telecommunications towers;

- transmission lines; and

- other utility towers (eg tall light stands, water storage tanks, airport communication towers, nautical navigation structures).

While opinions differ, the principles and guidelines presented below are based on the assumption that the community prefers that most types of utility towers are not readily visible, or that their visibility should be minimised.

It is assumed that towers are least tolerated in natural landscapes and are more likely to be considered acceptable in rural landscapes. Towers that are located in built landscapes are generally smaller than in non-urban settings as their scale may be considered too great for urban settings.

Regardless of the visual prominence of utility towers, the community's perception of the importance of their function may impact on their perceived visual impact and therefore on the extent of visibility that is acceptable. For example, towers designed to provide safety, including lighthouses and airport control towers, may be perceived favourably. Wind turbines may be perceived favourably in communities in which alternative energy is considered valuable. Public suspicion about potential health risks associated with mobile phone towers and power transmission lines may result in these being less tolerated. Industrial stacks may be perceived negatively other than in communities in which industry is a prime source of employment.

Agencies and groups

The utility towers guideline is intended for use in both the development of proposals for towers and the assessment of the visual impacts of towers.

Target user groups comprise industry and state and local government agencies. These include mobile phone companies, the Department of Environment, Department for Planning and Infrastructure, Western Power, Department of Environment and Conservation (DEC) and Sustainable Energy Development Office (SEDO).

Existing policies and guidelines

This guideline should be used in conjunction with existing policies and guidelines. It provides practical measures for taking visual landscape into account, as is generally required in overarching policies and broad guidelines.

Wind farms

- AusWEA: Best practice guidelines for implementation of wind energy projects in Australia (2002).

- WAPC (2004) Guidelines for Wind Farm Development – Planning Bulletin 67.

- Sustainable Energy Development Office (WA) Renewable Energy Handbook for Western Australia (2006).

- SEDA: NSW Wind Energy Handbook (2002)

- Planning NSW: Draft NSW Wind Energy EIA Guidelines (2002).

- Sustainable Energy Authority Victoria: Policy and Planning guidelines for development of wind energy facilities in Victoria (2002).

- Planning SA: Planning Bulletin – Wind Farms (2002).

- Australian Wind Energy Association and Australian Council of National Trusts, Wind Farms and Landscape Values: Stage One Final Report – Identifying Issues (2005).

- Local planning scheme provisions.

Telecommunication towers

- CALM Policy Statement No. 49 – Radio Communications Facilities Policy (1993).

- WAPC 2004 – Telecommunications Infrastructure State Planning Policy 5.2.

- WAPC 2004 – Guidelines for the Location, Siting and Design of Telecommunications Infrastructure (complementary to State Planning Policy 5.2).

- WAPC 1997 – Telecommunications Infrastructure Planning Bulletin 22.

- WAPC 2000 – Applications for Telecommunications Infrastructure Planning Bulletin 46.

- Mobile Carriers Forum Local Government Association Taskforce – Guidelines for Local Government ACIF Code: Deployment of Mobile Phone Network Infrastructure (2006).

- Local planning scheme provisions.

Transmission lines

- Utility Providers Services Committee 2002 - Utility Providers Code of Practice.

- Western Power – Transmission Plans 2003 - 2008 (5 year capital works plan).

- Local planning scheme provisions.

Wind farms

Introduction

The principles of sustainability in Western Australia reflect the importance of balancing environmental, social and economic factors in decision-making. The challenge in wind farm developments is to harness the wind resource and to design each wind farm so that it appropriately balances environmental, economic, technical and social considerations.

Wind farms have a context which is perhaps broader than that of other utility towers, for example, while wind farms involve planning

issues at a local level which are similar to other utility structures they also involve more global issues such as climate change. In this context the planning processes need to be cognisant of the broad context while dealing with the local planning considerations.

There are many planning and technical issues that need to be considered in planning for wind farm developments. Site selection for wind farms is not only driven by wind resource as construction logistics, land tenure and access to high voltage transmission lines can have as great an impact on viability. This lowers the number of potential sites available for such facilities and this adds complexity to the planning process given the broader global drivers mentioned above.

Like all utility towers, wind farms could have environmental effects and these also need to be considered in the planning process. Visual impacts on landscape are one of the most important considerations in planning for wind farms and have been the most controversial. While wind farms built in Western Australia are generally well accepted by communities, it is likely that as the number of wind farms increase community objections based on visual grounds may also rise.

This guideline addresses the visual impact considerations necessary for effective land use planning involving wind farm developments.

The number of development applications for wind farms received by local authorities in WA has recently increased as a result of both changes to federal legislation regarding the provision of renewable energy, and favourable climatic conditions. Prior to this wind farms were novel and limited in numbers with the result that a policy framework and scheme provisions have not consistently been established at this stage, for use across all local authorities.

As a result of the increasing number of companies lodging development applications for wind farms in this state, the WAPC released its Guidelines for Wind Farm Development (WAPC

Planning Bulletin 67 2004). This planning bulletin provides the planning context for this guideline.

Based upon visual impact assessment work already completed in WA for various sites (for example Esperance, Albany, Emu Downs, Scott River) and in the eastern states (for example, Bald Hill and Wonthaggi); as well as visual impact guidelines established in NSW, Vic and SA, this guideline is aimed at establishing consistency and a precedent for any future wind farm proposals in Western Australia.

Existing and proposed wind farms in WA apply to **natural, rural** and **built** landscape types. Examples of wind farms occur in each landscape type, in areas such as Albany (natural), Dandaragan (rural) and Fremantle (built). Visual landscape assessments need to take account of these different landscape types, as well as implications regarding site selection in **regional, local** and **site-specific** contexts.

Visual elements

The components of wind turbines that may have an impact on the surrounding landscape and visual character comprise:

- wind farm project area;
- layout of wind farm;
- turbine size (tower height and rotor size);
- turbine rotational speed;
- number of turbines;
- colour of turbines;
- reflectivity of rotating blades;
- access roads;
- ancillary features including associated buildings, signage, telecommunications infrastructure and transmission lines;
- extent of clearing required (eg vegetation removal);
- construction procedures; and
- rehabilitation measures.

Issues and pressures

This section of the guideline focuses on outlining the visual impacts of wind farm developments, including visual impact issues, components of wind farms that have potential impacts and the elements of landscape that will be affected. This will outline the issues for consideration for proponents and relevant agencies to conduct the appropriate assessments required and adhere to siting and design principles for regional, local and site level issues (outlined in the following section).

When planning for a wind farm proposal the aim is to minimise potential impacts where possible by establishing and identifying visual criteria and management objectives.

Coastal sites selected for wind farm proposals in WA warrant specific attention as the coastline has significant landscape values that justify the need for this guideline. The coast is a primary resource area for wind farms due to the typically high winds. Currently the greatest interest for coastal wind farms is for sites either close to wind energy markets (for example regional centres such as Esperance, Albany, Geraldton and Augusta) or close to existing power infrastructure that links into the main power grid.

Wind farms in coastal locations are likely to be more closely scrutinised by communities rather than those in inland areas. Coastal sites are often prominent with vegetation that is low in height. The siting and design of coastal wind farms needs to be undertaken with careful attention to landscape and visual impacts.

A major siting issue for coastal wind farms appears to be whether to optimise turbine sites from the perspective of nearby residents (for example with fewer, larger turbines closer to the coastline as at Sand Patch, Albany) or to give priority to recreational users of the coast, possibly resulting in a larger number of smaller turbines further from the shoreline (for example, Coronation Beach, north of Geraldton).

Important viewing locations to consider in relation to coastal wind farm proposals include sites where people spend time observing their surroundings such as beaches, near-shore waters, car parks overlooking the coast and lookouts at headlands.

Visual impact and landscape issues:

- site selection;
- landscape assessment at the appropriate scale of application (state, regional, local, site);
- identification of significant landscape character;
- visual impact assessment of wind farm components;
- visibility and sensitivity of the development site;
- development of individual wind farm siting and design guidelines; and
- community consultation.

Landscape components potentially visually affected:

- landscape character (topographic variation, presence of vegetation and water form);
- natural areas and features (eg ridgelines, valleys, waterfalls, rivers);
- land use character (including compatibility of existing and future land uses);
- sensitive coastal areas; and
- changes in future land use (eg proposed areas for future urban development).

Other considerations:

Factors affecting the availability of wind resource that may affect landscape:

- topographic variation;
- distance from the ocean; and
- surrounding vegetation.

Wind resource is higher in elevated areas such as:

- ranges;
- hilltops;
- escarpments;
- ridgelines; and
- close proximity to the coast.

Inland areas:

- flat open plains can increase wind speed; and
- vegetation and landform can hinder wind speed.

Factors affecting the choice of site that may impact on landscape:

- high wind resource;
- access to transmission lines;
- access to land (tenure, Native Title and construction logistics); and
- existing road infrastructure for transport movements.

Site selection is very important in terms of maximising the wind resource as well as reducing the impact of the wind farm on the surrounding landscape as much as possible.

Wind farm proposals require consideration at a state, **regional**, **local** and **site** level.

State issues:

- energy policy and the need for renewable energy.
- state strategies are required for the appropriate location of wind farms.

Regional issues:

- proposals in regionally important landscapes;
- proposals affecting regionally important landscape features; and
- cumulative impact of several wind farms in one area.

Local and site issues:

- site selection;
- site-specific layout and design of the wind farm; and
- community and stakeholder consultation.

Once the wind farm has been established, immediate commissioning of the turbines takes place. This involves a series of tests relating to issues such as turbine performance, transmission access and noise.

When decommissioning takes place, the contractors or land managers have to ensure that the landscape and surrounding environment is rehabilitated to its original condition. This involves revegetation, site rehabilitation to restore the pre-existing topography to avoid soil erosion and changes to surface water runoff. This in effect will restore the pre-existing landscape quality as well as address environmental issues.

Principles and guidelines

State level

- Use existing renewable energy policies, guidelines and incentives that avoid limiting potential wind farm sites to a few locations only.
- Adhere to such guidelines and policies that consider the impact upon the visual landscape character that may be significant at a state level.

Regional level

- Encourage wind farm development in rural locations with compatible land uses (eg expansive crop areas) and flat terrain.
- Locating wind farm developments in flatter landscapes would more likely reduce visibility due to shortening the visual perspective of the structures and the likelihood of obstruction (ie natural screening).

- Encourage the location of wind farm developments to be greater than 15 km from major vantage points (eg regional viewing platforms, significant land forms).
- Take into account the cumulative impact of other wind farms located in the region. This would involve the combined size and area and combined siting and design principles.
- Remoteness to the main power grid should be avoided to reduce the amount of additional infrastructure required for connection (eg transmission lines, pylons, access roads).
- The decision-making process by which the location of the wind farm is determined needs to achieve a balance between using high wind resources and minimising visual impacts in regionally significant landscapes.
- If high wind resources exist in significant landscapes then alternative sites should be considered for suitability.
- Avoid location of wind farms where sensitive skylines may be visually disrupted.
- Utilise existing infrastructure where possible so that construction for grid access does not compromise the regional character of an area (Image 96).

Local level

- Visibility from key view points (including roads and recreation sites) should be minimised as much as possible.
- Height of the overall wind farm in relation to height of turbines and topographic elevation need to be balanced to reduce overall visibility.
- Effect of distance must be considered in locating the wind farm in terms of the visibility of detail in the site and the structures it contains.
- The layout (eg grid pattern or clustered) of the wind farm should take into account the existing visual landscape character

(vegetation, waterform, landform and land use) and any variation in the topography of the site (Image 97).

- The number and size of the turbines require assessment for compatibility with the visual landscape character of an area.

- The number and size of the turbines require assessment for the impact on the area potentially visually affected.

- Avoid cluttering turbines along major view corridors.

- Any extensions to the power grid should consider the visual impact on the local landscape character and preference should be given to underground power lines.

- Access roads must be constructed with minimal clearing of vegetation and should follow the natural contours of the landscape (ie cross ridges along, rather than up and down the contours) to minimise their overall visibility.

- Access roads should avoid straight alignment and be responsive to land form and other landscape features.

- Reduce visual impact of additional infrastructure such as transmission lines, access roads and visitor facilities such as information kiosks, car parks and viewing platforms by using appropriate siting and design guidelines that are complementary to the surrounding visual landscape character.

- Additional infrastructure for tourism facilities (if required) should be developed to cater for the predicted number of visitors and to give consideration to the capacity of the landscape to carry such facilities.

- Where possible, site turbine towers against a skyline background rather than landform background.

- Avoid turbines cutting across different landscape types and elements; try and site the turbines with in one landscape type where possible.

Image 95: *Turbines located in flatter terrain.*

Image 96: *These wind turbines at Shark Bay blend with existing infrastructure of a radio tower, powerlines and signage.*

Image 97: *Sand Patch wind farm (Albany) reflects siting and design principles that account for the natural topography of the area (courtesy of Rolsh Productions, Western Australia).*

Site Level

Wind farm structure

- Individual turbines and structures should be appropriately coloured to minimise impact, which requires detailed assessment. The use of more than one colour, or uniformity in colour, may be appropriate subject to the development site and its surrounds.

- The number and size of turbines should be subject to the visual absorption capabilities of each individual development site and local community preference (ie either larger turbines and smaller in number, or smaller turbines and larger in number) (Image 98).

- Prevent blade glint and flicker, the reflection of sun off rotating blades, through the use of non-reflective materials.

- Avoid mixing tower and turbine types in a development site (ie uniformity in design, number of blades, rotational direction and blade to tower aspect ratio) (Image 99).

- Individual turbines should be sited off the tops of ridgelines, vantage focal points and prominent locations where possible.

- Wind turbine pad construction should avoid the creation of fill slopes, and should be constructed by cut. Fill requires removal from the site.

- The size of cleared areas at the base of the turbines should be minimised to reduce impact (Image 100).

- Avoid advertising or logos on the turbines.

- Ensure that lighting for the wind farm site is non-obtrusive when viewed from any residential areas that are in close proximity.

Image 99: *Uniformity of the tower and blades is effective in giving the overall turbines a simple appearance.*

Image 98: *Using larger, but fewer turbines may reduce their impact in an open, simple landscape.*

Image 100: *Sand Patch wind farm (Albany) displays minimal clearing at the base of the turbines.*

Vegetation, earthworks and access

- Minimise clearing and damage to vegetation during construction where possible.

- Vegetation edges resulting from removal during construction should refect the existing local patterns.

- Access roads should have minimal visibility and width.

- Avoid high colour contrast of access road materials.

- Access roads should traverse as low as possible on slopes and follow existing land contours.

- Reduce visual impact of earthworks during construction by minimising cut and fill where possible.

- Ensure that fill is not pushed up onto any sloping areas.

- Avoid the movement of soil from one area to another.

- Edges of earthworks should be of gentle slope and reflect the surrounding landform.

- Allow for the removal of soil from the turbine pad sites and other areas that have steep slopes.

- Allow for the stockpiling of topsoil for areas that will require rehabilitation, as well as the promotion of using local materials for the site.

Buildings and other structures

- Minimise visual impact of ancillary buildings, structures, signage and lookouts by using site-sensitive design, where height, colour, form and line are complementary to the surrounding visual landscape character.

- Colour of ancillary structures should not be of high contrast, and surface finishes should be non-reflective.

- Heights of buildings should be minimised where possible, and placed beneath ridgelines.

- Roof forms of buildings should avoid prominent landform ridges, designed to minimise visual bulk and avoid sharp angles.

Power connection

- Promote the use of underground cabling for power connection to the grid where possible, but ensure minimal impact on highly vegetated areas during construction. Rehabilitation of earthworks and vegetation should be undertaken to re-establish the natural form of the landscape prior to construction of underground cabling.

- Where overhead cabling is used, minimise impact on the surrounding landform by designing the powerlines to follow the natural land contours (ie gullies or valleys) and be coloured to blend with the character of the site.

- Overhead powerlines should avoid traversing highly vegetated areas.

- Overhead powerlines should be sited below ridgelines where possible.

Rehabilitation

- Vegetation that has been removed or cut during construction should be retained and reused on rehabilitation areas where possible.

- All temporary access roads and tracks to be fully rehabilitated with fill and revegetated to re-establish the natural land features that existed prior to construction.

- The edges of newly established access roads to be revegetated to minimise impact.

- Construction depot and other temporary structures to be removed and the area to be fully rehabilitated with stockpiled earthworks and vegetation.

- Create screening (if necessary) by selective planting. Opportunities for planting at selected locations on certain roads, or at specific locations to create foreground closure or visual buffers in order to screen portions of the wind farm that otherwise may be visible from other vantage points. Negotiation with local authority, other relevant agencies and local residents is required (if planting is to be done off-site).

- Implement a reinstatement programme for planting and other associated landscape works to ensure that the short, medium and long-term impact of the development is minimised.

Telecommunication towers

Introduction

The importance of telecommunications services in Western Australia is recognised in the WAPC State Planning Strategy that advocates the provision of an effective statewide telecommunications network in a manner consistent with the state's sustainability objectives (environmental, economic and social planning objectives).

Over the previous 15 years mobile telecommunications have increased to every day use for Western Australians, leading to a large increase in mobile phone towers. There are many styles and designs of mobile phone towers that accommodate for additional elements that are attached to the mobile phone tower itself.

Prior to the 1990s Australia only had one telecommunication carrier and since then the industry was deregulated following the *Telecommunications Act 1991*. This allowed alternate carriers to construct facilities on any area of land or other structures (including buildings) however State planning and environmental legislation had not included such facilities in the Act. This has been resolved with

the endorsement of the Telecommunications Infrastructure State Planning Policy 52 (WAPC 2004).

Telecommunication towers are generally perceived as structures that are necessary for today's fast moving society. However, community preference is that the towers be camouflaged, coloured or sited with similar visual infrastructure. There is a substantial amount of perception research that indicates that communities dislike utility towers for aesthetic reasons. This is usually in regard to their height, size, incompatibility with surrounding land uses and the general visual clutter that is associated with them.

This section addressing telecommunication towers includes the following utilities:

- mobile phone towers; and

- radio and television transmission towers.

Visual elements

The components of telecommunication towers that are likely to affect the surrounding landscape and visual character comprise:

- location of the tower;

- height of the tower;

- additional structures on the tower;

- visible bulk of the structure; and

- colour of the tower.

Issues and pressures

There are several issues that relate directly to the siting and design of telecommunication towers.

Location and siting of mobile phone towers: the number of mobile phone towers are increasing rapidly. There has been a perceived consensus among local communities that although more towers are required, there needs to be more care by the companies in regard to the location and siting of the towers.

Design of mobile phone towers: the design of towers can produce contention, especially if the towers are bulky with additional structures. Colour does not appear to be a design option with the recently constructed towers.

Structures installed on roofs of existing buildings: additional structures appended to buildings (on top of, or at the side of) tend to be visually intrusive. Design and placement of such structures on buildings is most important.

Prominent locations: telecommunication towers are often located prominently in the landscape, for example on hilltops, ridgelines, escarpments or in long view corridors, to maximise reception.

Camouflaging towers: disguising mobile phone towers as pine trees, palm trees or chimneys has occurred in the past, in Australia and particularly in other parts of the world. There have been local proposals for such designs.

Inappropriate scale: structures may be considered out of scale with their surroundings. For example, mobile phone towers sited on roofs of service stations and other service buildings may be disproportionate in height in reflection to the surrounding landscape.

Inappropriate general location: structures may be considered foreign to their landscape setting. For example, towers in natural landscapes characterised by low vegetation such as coastal heath.

Multiple towers in one location: different telecommunication companies appear to be reluctant to use the same structure, resulting in multiple towers in the same location.

Ancillary facilities: any additional facilities must be consistent with any siting and design guidelines for the telecommunication tower proposal, to ensure the maintenance of the surrounding visual landscape character.

Principles and guidelines

There are many strategies that can mitigate location, siting and design issues in regard to the construction of telecommunication towers.

Location

- Assess the potential location of the tower and comply with management standards for the area.

- When locating and siting telecommunication towers avoid significant features, travel routes and recreation areas where possible.

- Locate towers where there is similar infrastructure in the surrounding landscape and proposed construction area.

- High points in the landscape vary in their prominence as viewed from different locations. Where possible choose higher points that appear less prominent from key views and/or travel routes.

- To reduce impacts on key views, there are two options: locating further up a slope is better for short distance views, and for long distance views choose locations back from the top of the ridge or further down the slope (Figure 3.24).
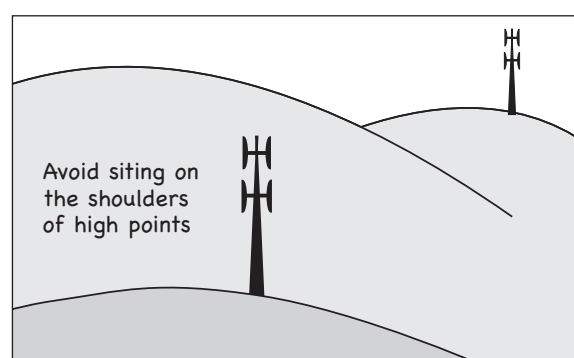

Figure 3.23: *Avoid siting telecommunication towers on the shoulders of the high points.*

Source: CALM (2001)
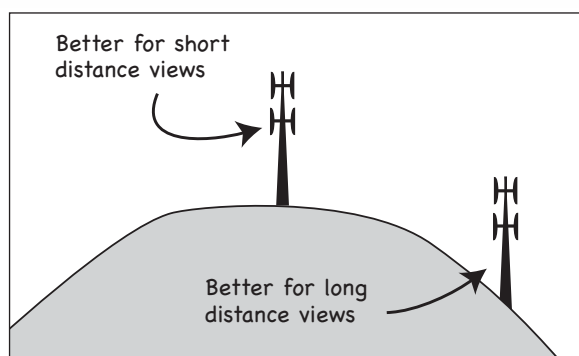
Figure 3.24: *Short and long distance views.*
Source: CALM (2001)
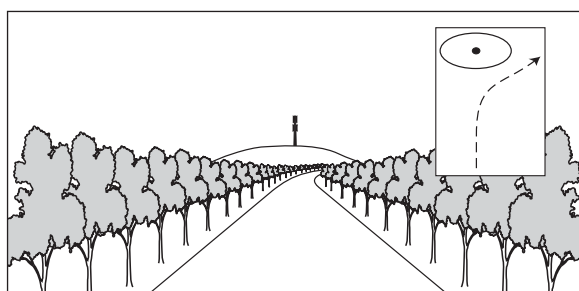
Figure 3.25: *Avoid locating towers directly in the focus of the view.*
Source: CALM (2001)
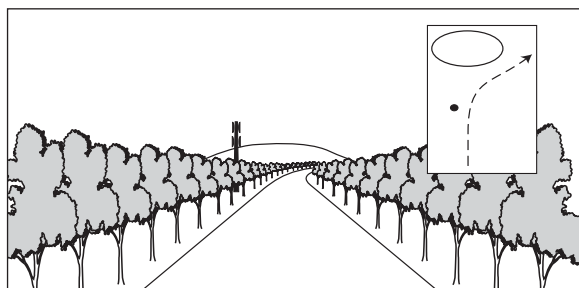
Figure 3.26: *Keep towers away from direct focal areas.*
Source: CALM (2001)
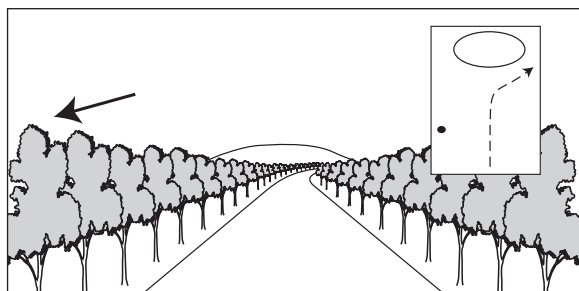
Figure 3.27: *Use existing vegetation to screen towers from focal views.*
Source: CALM (2001)

Siting

- Avoid siting towers directly on a focal area (ie the focus of the view), particularly where they are in line with travel route line-of-sight (Figure 3.25).

- Keeping the towers away from potential focal areas will reduce the overall visual impact (Figure 3.26)

- Towers that are sited sufficiently away from travel routes can be completely screened from view. This is possible and is the most desirable option (Figure 3.27)

- Minimise the height of the tower by assessing the local topography or height of buildings for the proposed area. Choose the site that minimises the height of the tower most effectively (Figure 3.28).

- Siting telecommunication towers close to objects of a similar scale (whether they are natural, such as trees, or built features such as other infrastructure) will reduce their prominence and hence their potential visual impact (Figure 3.29).
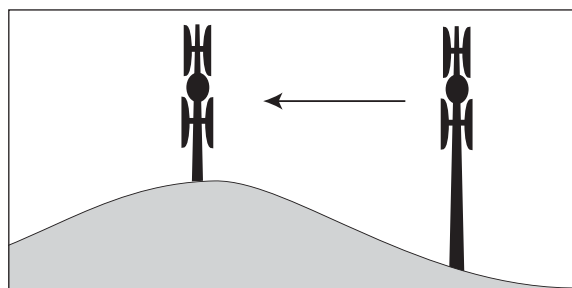
Figure 3.28: *Use local topography to reduce the overall height of towers.*
Source: CALM (2001)
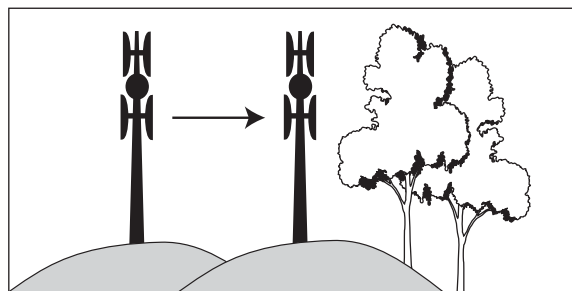
Figure 3.29: *Locate towers close to existing features of a similar scale.*
Source: CALM (2001)

- Siting towers on existing buildings; there are many designs and strategies to site towers on existing buildings to reduce the overall visual impact.

Design

- Use an appropriate colour scheme to harmonise with the surrounding landscape in any given situation (natural, rural, built areas) (Image 101).

- Using colour will reduce glare and reflectivity. If the towers are not painted, the steel is more reflective in the light and will draw more attention.

- Avoid clutter on individual towers. Combine all additional elements in the most streamlined way possible (Figure 3.30).

- Combine several towers that are in the same location. This avoids duplication and consolidating the facilities on to one tower reduces the overall visual impact on multiple towers in one location (Figure 3.31).

- Reduce the visible bulk of the entire structure. Lattice web towers are usually less intrusive than solid towers. This applies with wide to slim design towers (Figure 3.32).

- In regards to the overall design of telecommunication towers, check height requirements in the proposed construction

area. Towers can often come in standard sizes and may be taller in height than necessary. Minimise height wherever possible.

- Camouflage towers: this technique is popular, and if designed sensitively can be very effective in reducing potential visual impact (Images 102 and 103).
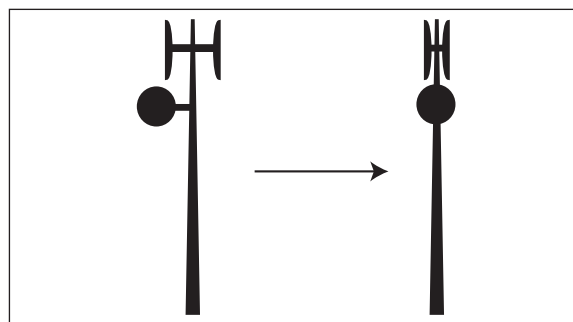
Figure 3.30: *Avoid clutter that is not streamlined with the tower.*
Source: CALM (2001)
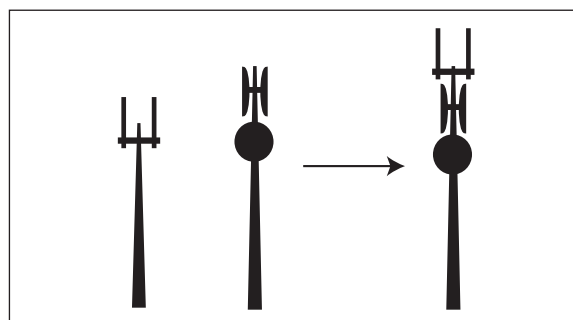
Figure 3.31: *Combine several towers into one, to reduce visual clutter.*
Source: CALM (2001)

Image 101: *This telecommunication tower located just before the Narrows Bridge in Perth is harmonised with its setting by being coloured complementary green.*
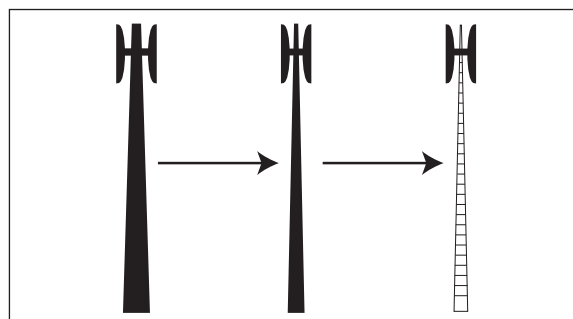
Figure 3.32: *Reduce the visible bulk of the tower.*
Source: CALM (2001)

Image 102: *This car wash in Doubleview has effectively camouflaged the mobile phone structures on the top of the building.*

Image 103: *The art-deco Windsor Theatre in Nedlands is another good example of effective camouflage of mobile phone towers. Equipment is located within a false extension to the tower.*

Transmission lines

Introduction

Transmission lines are a large utility structure that will inevitably have a visual impact on the landscape it traverses through.

There are many environmental impacts to be considered with proposals for new transmission line routes. The focus of this guideline is to address visual impact, and it may be considered that the actual impact on the ground is greater as the towers themselves are elevated above the landscape surface.

This utility land use exists in rural, natural and built landscapes. Transmission line routes usually span over many kilometres in length and traverse across several landscape types. The proposed routes are usually assessed at a regional scale.

Previous studies show that community concern exists when new proposals are developed for transmission line routes, due to their size (the towers) and length (the route). As the towers traverse a long distance, communities in different regions and urban areas may be affected.

Visual elements

The components of transmission lines that would be likely to affect the surrounding landscape and visual character:

- transmission line **route**;
- transmission line **corridor**;
- height of the towers;
- design of the towers;
- colour of all transmission line components;
- transformers;
- conductors;
- wires;
- ancillary components (substations); and
- easements (vegetation clearing).

Issues and pressures

Selection of the transmission line route and corridor: the choice of the route and corridor for a new transmission line proposal is based upon planning restraints, and the capacity of the landscape types to carry transmission lines. The significance of these criteria will vary greatly from one area to another, and will vary between different communities.

Land use conflict: as transmission lines traverse several landscape types, conflict regarding different land uses may arise. The types of land uses that the proposal may traverse will be a determinant for the extent of visual impact.

Size and height of the overall utility structure: transmission line developments are very large and require careful consideration when planning the desired route.

Length of transmission lines as they pass through different landscapes, issues arise as different visual management objectives need to be accounted for in one proposal.

Transmission lines in prominent locations: they may be especially visible where they are located on ridges, escarpments, across valleys, across or parallel to roads.

Width of transmission line corridor: the width of the corridor to contain the transmission line requires careful consideration, as this will directly affect the extent of clearing required.

Clearing for access: transmission lines in particular are likely to be located in corridors in which all substantial vegetation has been removed. In natural landscapes this may create visual impacts such as soil erosion and damaged vegetation.

Components of the transmission line development: the siting and design of the towers, wires, conductors and transformers are an important part of assessing the extent of visual impact.

Principles and guidelines

- Route and corridor analysis: this must be undertaken to ensure that the route and corridor of the proposed transmission line is determined using the outcomes of a visual impact assessment as well as other environmental assessments.

- Assessment of alternative routes (including use of existing corridors): identification of a number of alternative routes will be another outcome of the visual impact assessment. These should be explored and assessed against each other to determine the route that has the least visual impact.

- Alignment (land use boundaries): the easement must protect the character of each landscape area that forms the edge between different landscape types and/or land use types.

- Alignment (line): transmission lines should run parallel to the contours of the land (ie changing direction with the scale and flow of topographic change).

- Alignment (line): where the lines cannot avoid cutting across major land use boundaries the impact of the transmission lines passing from an open landscape to an enclosed landscape should be minimised by alignment choice and screening the point of entry with appropriate vegetation.

- Routes should avoid crossing elevated areas at right angles to contours especially where the easement is centred on a hillcrest; this draws attention to the easement. The line running against the natural pattern of the landscape becomes intrusive.

- Locate the towers at the edge of a valley: if sited in the centre of a valley, focus is drawn to the transmission line. Towers should be placed below the crest of a hill or horizon line that reduces the impacts against the skyline (Figure 3.33). Scenic viewpoints may be affected in such a situation.

- Avoid road intersections: they require open views for safety, they receive high attention from motorists and it is very difficult to reduce the impact once placed at road intersections.

- Access roads for construction and maintenance require careful siting and design, otherwise attention will automatically be drawn to the easement.

- Where specific landscape types and land use are dominant, the route should run parallel to the land use and in a similar direction; the edge of the landscape type or land use will provide a suitable background for the easement, while providing easy access for maintenance.

- Where a transmission line crosses a highway, or any road, the alignment should

be as perpendicular as possible to allow for maximum setbacks of towers for low visibility from the highway or road.

- Existing vegetation should be retained where possible to be used as foreground screening, and to provide a backdrop for the transmission line alignment. Foreground screening can block the view of the intrusive upper portion of towers. Background screening such as trunks and branches can assist in reducing the overall visual impact of the tower webs (ie poles and wires).

- Alignments should consider possible future patterns of growth (ie proposed urban development).

- Joint use of the easement corridor for additional utilities (road, railway, gas and electric) is often encouraged to reduce the visual impact of having several easements.

- Siting transmission lines along or next to water forms such as streams, rivers and lakes is not encouraged. Streams and rivers have a non-conforming linear shape that is not complementary to the straight linear nature of transmission lines. Lakes or water bodies should be avoided in terms of recreation and visual impact, as the reflective nature will magnify the presence of transmission lines.

- The visual impacts of the easements are increased if placed near buildings and houses due to the comparison between their relative sizes.

- The design of the individual transmission towers should reflect the surrounding landscape as much as possible. There are many designs for transmission towers where alternatives and options are available (Figure 3.34).
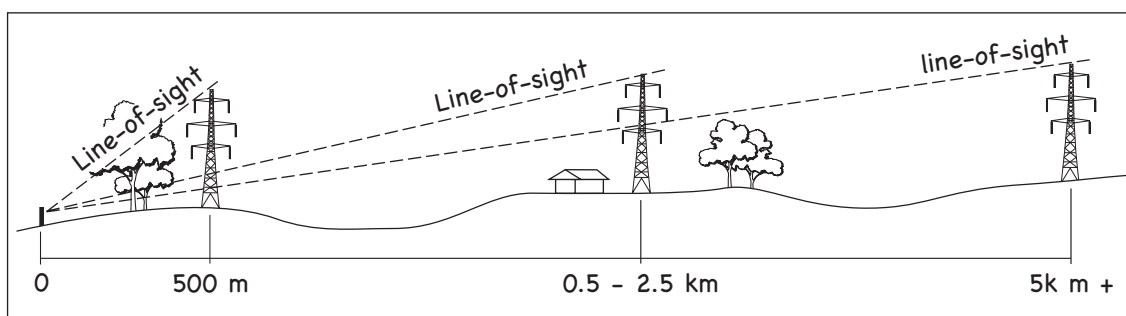
Figure 3.33: *Towers should be placed below the crest of a hill or horizon line to reduce the impacts against the skyline.*

Source: Grierson (1994)
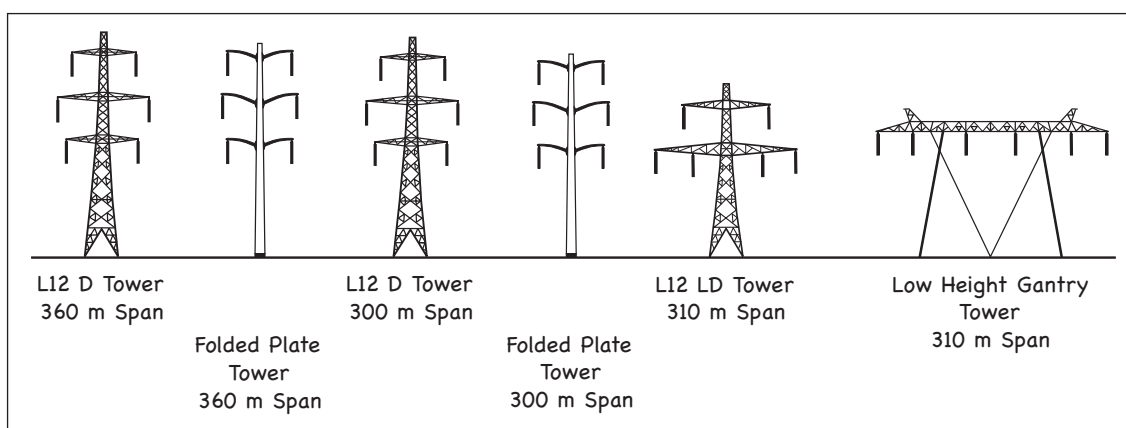
Figure 3.34: *Many designs for transmission line towers are available.*

Source: Grierson (1994)

- Avoid bisecting areas that have potential for future urban development as an easement slicing through a cohesive land unit prevents harmonious expansion and can cause conflict between land uses.

- If vegetation is cleared for an easement then the natural form and placement of the vegetation needs to be maintained, the trees and shrubs should appear to flow through and counter to the alignment of the easement. The land use can continue underneath the lines without a break.

- Easements can form an appropriate buffer between different land uses such as extractive, agricultural or forestry uses.

- Screening: dense trees are more effective than open heath or scrub.

- Construction: ensure during construction that vegetation removal and access is undertaken carefully to minimise visual impact.

- Any additional works such as new substations, conductor and/or transformer replacement require consideration for assessment depending on scale of additional works.

- Produce transmission line route alternatives in light of impact upon visual landscape character; including using existing utility corridors, rail and road reserves, as well as creating new corridors.

Other towers

Proposals for other types of towers that may also require visual impact assessment:

- wastewater treatment stacks;

- industrial chimneys;

- water storage towers;

- water storage tanks;

- airport control towers;

- banks of large light towers; and

- navigation beacons and lighthouses.

Mining and industry

Background

This guideline addresses the location, siting and design of mines, quarries and extraction pits (including roadside borrow pits, gravel pits, sites for extracting limestone, limesand and sand), industry and waste landfill sites.

It is assumed that the general community considers these uses to be unattractive landscape features and considerable effort is typically put into rehabilitating and screening these sites. People whose livelihoods depend on these uses or live in nearby communities are not likely to find them offensive. Certainly night views of well-lit industry may be considered attractive, and large open pit mines may be of interest to tourists.

Government guidelines reflect assumptions about public preferences. For example, the 1994 quarry guidelines produced by the Department of Minerals and Energy states that 'it is important that unattractive elements such as bare soil, rock-faces and intrusive buildings are softened or hidden by topographic and vegetative screening'. The Department of Minerals and Energy 1994 quarry guidelines are to be revised by the Department of Industry and Resources to enhance the guidelines by addressing current visual amenity issues.

It is recommended that development proposals for mining and industrial land use discuss and project the **potential cumulative visual impacts** of progressive stages of development through inception to closure and rehabilitation.

Agencies and groups

State and local agencies, and other groups associated with the uses covered in this guideline topic include:

- Chamber of Minerals and Energy;
- Department of Industry and Resources;
- Chamber of Commerce and Industry;
- CSIRO Exploration and Mining;
- Department of Environment and Conservation;
- Department for Planning and Infrastructure;
- Main Roads WA;
- Department of Local Government and Regional Development; and
- The Minerals Institute of WA.

It is recognized that the guidance provided below may not be feasible on the grounds of cost implications and practical operational needs. The extent to which recommended principles are applied will depend on decisions reached by controlling agencies and may reflect the degree of likely community concern, which in turn relates to the sensitivity of each site.

Existing policies and guidelines

The guideline should be used in conjunction with relevant existing policies and requirements. It provides practical assistance in implementing policies and broader guidelines. A number of technical guidelines provide advice on rehabilitation of disused mines and quarries. Those listed below focus on visual aspects rather than ecological or pragmatic aspects such as increasing germination rates, although there is clearly an overlap.

- Environmental management of quarries: development, operation and rehabilitation guidelines, Department of Minerals and Energy (1994)

- Coal Mines and Associated Infrastructure EIS Guideline, Department of Urban Affairs and Planning, NSW (2000)

Visual elements

Any principles or specific guidelines for addressing visual management objectives or issues should focus on those components of each land use that have a direct visual impact. Those listed below relate to the specific nature of the land uses in question. Aspects that apply to any land use, such as the visibility of the site, distance from viewpoints or changes to landscape character, are covered by application of the visual impact process outlined in Part 2.

Mines and quarries:

- size of footprint;
- depth;
- configuration of outer boundary;
- angle of faces;
- length of time faces are exposed before being re-contoured and re-vegetated;
- time sequence for planting exposed surfaces;
- planting programs, including screen planting;
- siting, design and maintenance of plant and buildings;
- location of powerlines, pipelines and other services;
- alignment and design of access roads and rail links;
- changes to original landscape, especially landform and vegetation; and
- lighting.

Landfill and mining residue mounds:

- height above surrounding landscape;
- size of footprint;
- configuration of footprint;
- steepness of the angle of outer slopes;
- regularity and angularity of outer slopes (both vertical and horizontal profile);
- length of time the outer slopes are exposed before they are vegetated;
- time sequence for vegetation of separate mounds;
- success of vegetation programs; and
- distance to nearest public viewpoints.

Industry:

- size of area covered by buildings and plant;
- siting and design of large individual elements such as stacks or tanks;
- configuration and design of plant, including colour and reflectivity;
- alignment and design of access roads and rail links, especially embankments and bridges;
- fencing;
- design of entry statements and signs;
- location and planting of parking areas;
- screen planting;
- lighting; and
- extent of alteration of original landscape across the entire site, such as the extent of vegetation removal.

Issues and pressures

Location of mines or industry in sensitive landscapes

The location of industry, mines or quarries may be an issue for the community where these are proposed for location in landscapes that have high cultural values, such as the Burrup Peninsula or historic areas of Kalgoorlie-Boulder, or valued natural landscapes such as coastal dunes at Lancelin.

Prominent siting of old mines and quarries

Contemporary policy in relation to prominent mining and quarry operations ensures that they are at least partly obscured from public view. Prominently sited older mine and/or quarry faces may be of concern when on elevated sites such as scarp faces or hill-sides, for example, quarries on the Darling Scarp in the Perth metropolitan area. Poor siting may provide little potential for screening.

Siting and design of roadside borrow pits

Roadside gravel pits may be prominent where road-base material has been obtained immediately adjacent to the road, without screening or subsequent rehabilitation. They may be particularly noticeable along scenic roads or roads to recreation sites.

Design of rehabilitation earthworks

Earth bunds constructed to obscure views of mine-sites and quarries, rehabilitated mine or quarry slopes and mounds comprising mining residue or waste may draw attention due to their unnatural overall form and slopes. These features make it less likely that the sites will be unobtrusive, even if the rock surfaces exposed by mining or quarrying operations are no longer visible.

Design of rehabilitation planting

Rehabilitation exercises may have reduced effectiveness when the plant species used are not local to the area, as this may result in poor growth and an obviously unnatural appearance. Planting may also look unnatural if planted in a regimented pattern.

Principles and guidelines

The principles and guidelines outlined below are intended for use in the development of proposals for industry, mines, quarries or extraction pits, and in the assessment of their visual impacts and actions to ameliorate negative impacts. The aim in many instances is to ensure that these uses are not evident in the landscape, at least following eventual rehabilitation. This objective is more likely to apply to mines and quarries in sensitive landscapes such as on elevated land near settlements.

Industry, however, is more likely to be part of a landscape that has already been modified, for example, adjacent to port facilities or urban areas. In these cases, the aim is more likely to reduce the prominence of the site in its industrial landscape context.

The focus is on addressing visual landscape issues. There is overlap with other issues such as environmental concerns, as these have an effect on visual landscape character.

Image 104: *Maintaining a tidy site is important in industrial sites adjacent to major roads.*

Rehabilitation following the closure of mining, extraction and land fill can improve land resources, with land eventually being reused for agriculture, rural residential or recreation uses, for example. The aim of rehabilitation should be to restore the land to its original form, or to prepare it for alternative land uses. The timing of rehabilitation should be addressed, to avoid delays. Interim rehabilitation may be appropriate where works have ceased for an unknown length of time.

These uses should be located where they are less likely to have negative effects on landscape values; for example, sites that lack natural vegetation or landform diversity or are already degraded, although it must be stated that it may be difficult or visually inappropriate to establish dense vegetation on such sites. For example, if climatic conditions are harsh or vegetation may be out of character in a naturally open landscape. Mining and extractive uses should avoid sites that are prominent in important views, especially where they are located at the focal point of views.

The visibility of mines, quarries and industry should be assessed from the property boundaries, from near and distant residences and from neighbourhood vantage points such as public roads. Detailed analysis of views should be undertaken to determine if there are specific measures that could be tailored to individual viewing locations. Terrain cross sections may assist.

The siting of a quarry or mine is likely to be primarily related to the operational needs of obtaining the resource. Buildings, fixed plant and stockpiles should be located and designed to reduce their visibility. This may entail using natural topography and existing vegetation for screening purposes, planting more vegetation to enhance screening or careful selection of building materials and colour.

The working faces of mines or quarries may be oriented to minimise their public visibility. Faces oriented towards the south may be less noticeable, as less sunlight will reflect off the exposed surfaces.

Access roads should be aligned to avoid providing a direct view of operations from nearby public view locations such as roads, lookouts or recreation sites. Screen planting may assist, if access roads are prominent (Figure 3.35).

Ideally, industrial, waste or mining structures and operations, including tall stacks, would not be visible from important local view locations such as beaches. As a minimum objective they should not be highly visible or dominant. Structures may become valued as orientation or landmark features, but this function can be maintained while portions of the structures, such as their base, are screened from view.
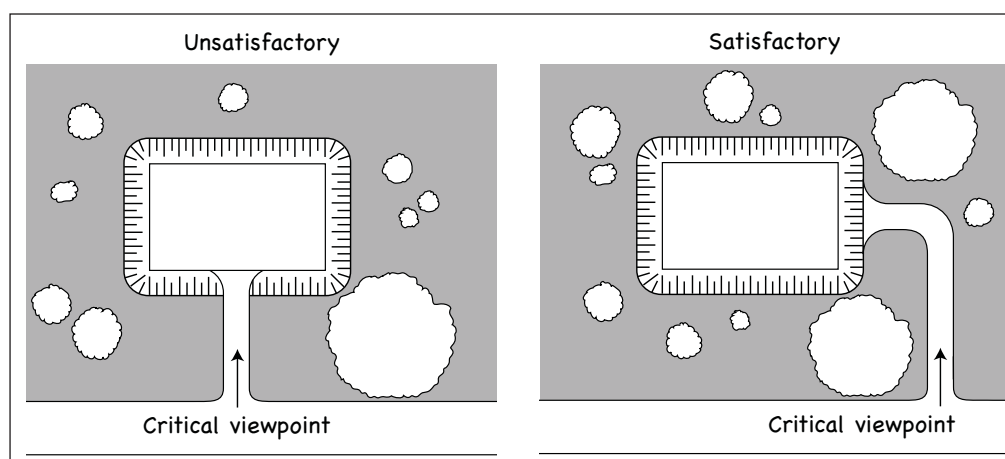

Figure 3.35: *Screening access roads.*

Efforts should be made to improve the appearance of old mines or quarries that were not subject to current standards for screening and rehabilitation. Screening may not be feasible but there may be other appropriate measures, such as site cleanups and buffer planting.

Sites should be kept tidy, for example, stockpiles should be contained, spills cleaned up promptly, and material and equipment kept in defined areas.

Pipelines and powerlines should be located underground where feasible, but the ground surface will require rehabilitation.

Adverse environmental impacts, such as sedimentation of watercourses or spread of dieback disease, should also be avoided on the basis of their visual impact. This may apply to off-site areas.

Lighting may alter the nighttime landscape. In locations where this is considered undesirable, for example where lit mine sites are visible from a nearby natural recreation site used at night for camping, lights can be angled and shaded away from view locations, and away from the sky in general.

Vegetation and landform in the site

Retain natural landform features and vegetation wherever feasible in industrial, mining, quarry or waste management sites; for example, remnant trees could be incorporated in parking areas.

Image 105: *Retention of natural landscape features in the vicinity of industry assists in integrating industrial uses into the general landscape.*

Visually prominent local plant species should be used around and in the site, for example, in boundary planting, median strips in adjacent roads, entry statements and in car parks.

It is preferable to retain as much remnant vegetation at sites as feasible, to assist in providing a buffer and screen. This will help in the long-term rehabilitation of the site and in maintaining visual links with the landscape setting. In particular, visual integration will be assisted by the retention of large individual trees and areas of feature species such as grass trees, zamia palms or species of wattles. Planting around the immediate base of prominent industrial structures such as tanks may reduce the starkness of their appearance.

Buffer zones that incorporate remnant vegetation should be retained to provide extra distance from nearby public viewpoints.

Ornamental species such as pines, palms or bottlebrushes are visually inappropriate for use at mining, quarrying or industrial sites that are located in natural landscapes. In agricultural landscapes there may be some non-indigenous species that are traditional to the area that may be used in association with structures, such as avenue planting along an access road.

The retention of remnants of the original landform and vegetation in mining, quarry, waste disposal or industrial sites may assist in maintaining visual links with the local landscape. They may eventually be integrated with the rehabilitated landform and vegetation.

Quarry or mining operations may expose visually interesting rock formations such as limestone pinnacles. These should be retained where feasible, even if this results in the retention of steeper slopes than would be typical in the original landscape. Some exposed slopes may be left in this condition to weather naturally over time.

Earthworks

Earthworks under consideration in this section comprise bunds for screening, mounds of residue and waste material and landfill mounds and earthworks to rehabilitate a site. Some of the strategies below could also be applied to the rehabilitation of quarry or mine faces.

Re-contouring to rehabilitate a mined site should re-establish the original landform character and natural vegetation diversity wherever technically feasible. There may be a tendency to simplify contours and to reduce topographic extremes, but this may result in a site that stands out from its surrounding landscape due to its low-key character.

The gradients of the top and side-slopes of large bunds and rehabilitated soil or waste mounds should be typical of those naturally found in the local landscape.

The stability of the final landform using mine waste material may require a different approach than recreating natural landforms. In terms of the stability of the landform to undertake such rehabilitation, it is strongly recommended that this be assessed prior to commencement of rehabilitation. Where it is not technically feasible for earthworks to replicate original contours, slopes should still be naturalistic in appearance, using such measures as irregular cross-slope and down-slope profiles.

Large residue or landfill mounds should be treated to make them appear less extensive, for example by indenting the edges, or even breaking large single mounds into several smaller ones. However, this is not always cost-effective.

The form and profile of earthworks should be as natural in appearance as feasible throughout each stage in the establishment of these structures; for example, as measured at two or five year intervals. It is inadequate for only the final stage of rehabilitation to look naturalistic, particularly if the rehabilitation is to take place over a long time frame.

Planted earth bunds may provide a screen if local plants alone cannot provide the desired height and density of screening. Ideally earthworks would not be used for screening as they are visually prominent unless vegetated, and they rarely emulate natural landforms.

Terrain cross-sections can be used to determine the required height of screening earthworks and vegetation planted on the mounds. Cross-sections should be compiled from major viewpoints such as roads and lookouts to the components to be screened.

To facilitate plant growth on the sides of mounds or on mine or quarry faces, terraces may be created. These would contain deeper soil, in a dish or channel formation to enhance retention of natural surface water runoff. Taller, more deep-rooted trees may survive better on the terraces, with lower, more shallow-rooted plants on the steeper, intervening slopes. Due to terraces or contour drains causing water to accumulate, this may lead to erosion. Prior evaluation of the stability of such areas for regrowth is strongly recommended.

Stockpiles of topsoil may be mulched and planted with groundcovers to reduce weed invasion until used for rehabilitation purposes.

Rehabilitation planting

Stockpiles, mining residue and mounds of landfill should be vegetated. They may also be used as bunds to provide screening. Local provenance species are encouraged for rehabilitation planting.

Rehabilitation should use a range of species with a variety of growth rates, such as planting fast-growing wattle species together with slower growing plants. The fast growing species will provide short-term screening while longer-lived, slower growing species are becoming established.

Benches on rehabilitated slopes may provide deeper soil for more intensive planting and enable deeper-rooted plants such as trees and larger

shrubs to be established. Again, the stability of the soil needs to be assessed prior to any rehabilitation plans.

It may be appropriate for tall trees to be used in revegetation, for example, if they are typical of the landscape setting. They should be located close to the base of slopes with shorter vegetation higher upslope. It is preferable not to plant tall trees on the upper sides of mounds or on the top, as will this will increase the apparent height of the mound. Restricting tall trees to the lower slopes or land adjacent to the base of mounds and bunds may have a more natural appearance and plants are more likely to survive than if trees are planted on the entire side slope.

Vegetation health across entire sites should be monitored for one year and over the long term to ensure that screening and rehabilitation are effective.

Screen planting

Care is needed to determine the best location for screen planting and the dimensions and planting density required to provide the desired screen. Screen planting is typically located close to the feature being screened. Screen planting may also be effective if it is located: close to offsite viewpoints, such as near roads or other major viewpoints; at sites where it screens operations that are at a focal point viewed from a road bend; to screen views from recreation sites such as beaches. These screen-planting locations may be some distance from the operation.

The required height of screen planting may be determined by using cross sections between the industrial or mine site, and important viewpoints. The height required for screening will be lower when viewed from closer viewpoints and taller where planting is nearer to the object to be screened.

Screen planting should look as natural as possible; for example, by planting in a random pattern, incorporating plants of various heights including understorey shrubs and canopy trees where these are found in the local landscape, and using a selection of plants that have a variety of growth rates. A variety of vegetation species should be used, representing a variety of plant forms and sizes, such as trees and shrubs and plants that grow at a variety of rates. Domination by a single species such as fast-growing acacia species or other local disturbance species should be avoided.

Off-site planting

Additional planting beyond the actual industrial, waste or mine site may assist by drawing viewers' attention away from these operations. For example, planting may be located along roadsides or watercourses, and at the edges of areas of remnant vegetation, as well as scattered in paddocks.

Feature plants such as grass trees may be used in foreground locations.

Increased general planting along local roads will make the landscape appear more enclosed, reducing the likelihood of an operation being visible.

Use of textured, dark coloured material may assist in reducing glare from light-coloured rock faces.

Image 106: *Roadside gravel pits require restoration of vegetation or pasture.*

Roadside extraction pits

Roadside extraction pits should be buffered from roads and be rehabilitated as soon as possible, using local native plants or converting to agricultural uses, as appropriate.

Ensure that access tracks do not provide direct visual access into borrow pits.

Sites and their buffers should be kept tidy throughout their use; for example, with surplus materials such as concrete footings, disused equipment and small stockpiles removed, and vehicle tracks minimised.

Hygiene measures should be used to reduce the risk of spreading plant diseases such as dieback.

Any weeds introduced by extraction activity in natural settings should be removed promptly, to minimise spreading into adjoining native vegetation.

Structures

Structures associated with industry, mining and quarry sites may be easier to screen if they are located at lower sites in the landscape and kept low in height. They may be sited to make use of any natural screening provided by landform.

Buildings and other structures should be painted according to a simple colour scheme that visually unifies the variety of structures at a site, providing a cohesive appearance. For example, a single colour may be used for exterior elements such as tanks, stairs, platform railings and elevated pipes.

Colours used for buildings and other structures should be those found in the local landscape, such as vegetation colour in a well-vegetated landscape, and earth tones in more sparsely vegetated landscapes. Darker colours are generally less prominent than lighter colours, and duller textures less prominent than smooth or reflective surfaces. Where local earth tones are likely to appear from dust from operations, a

neutral or functional colour could be chosen; for example, unpainted metal or concrete surfaces, to allow structures to naturally take on the local earth colour.

Large objects such as tanks and towers generally appear smaller and therefore less prominent if coloured in darker shades. It may be preferable to use the same colour as other adjacent structures to assist in their visual integration.

Tall towers are more likely to be seen against the sky rather than against a vegetated backdrop, so greys are more likely to be an appropriate colour choice than greens.

Particular care is required when choosing a shade of green for structures, because commonly used greens such as emerald green, forest green or teal are rarely found in natural Western Australian landscapes. The light grey-green metal sheeting colour known as mist green is often suitable in coastal areas, but may be too light for other landscapes. It is more likely that the appropriate green will be a drab, dark grey-green or olive. Greens should be carefully colour-matched to dominant local vegetation.

The use of reflective surfaces such as zincalume should be minimised where the objective is to reduce the visibility of structures. It is preferable to use surfaces that can dull readily and take on the natural colours of the local landscape.

Image 107: *The colour for industrial facilities in natural landscapes should be chosen with care to ensure they blend with their setting. The colour scheme should also be simple as in this facility near Broome.*

Mining operations or industrial complexes may look less prominent if structures are grouped together as seen from major viewing points, rather than being spread out. Large structures such as cooling towers, tanks or stacks may be less dominant if integrated with other structures at a site by being placed centrally and at the back of a group of structures as viewed from major viewpoints, rather than at the outer edge, at the front, or isolated from the main group of structures.

The natural profile of prominent landforms such as ridgelines should be retained where feasible by not locating structures on ridgelines or skylines.

Local, natural materials or colours should be used for infrastructure such as entry statements, paths and internal roads visible from principal viewpoints.

The use of black for boundary fencing is likely to reduce its visibility. Green fencing is usually more visible, because the shades of green commercially available are usually brighter than local vegetation. Boundary fencing should be located inside any perimeter screen planting, so that fencing can be obscured by the screen planting.

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Appendices

Appendix 1

Table 1: Types of plans that are relevant to each scale of application and detail required at each level of application

	Regional	**Local**	**Site**
Indicative scale	1: 25 000 to 1: 100 000	1: 1000 to 1: 25 000	Less than 1: 1000
Plan type	Regional strategies, regional plans, sub-regional strategies. Example from DEC: framework plans.	Local planning schemes, local planning strategies, local rural strategies. Example from DEC: area management plans.	Subdivision plans, development applications, outline development plans. Example from DEC: site plan.
Detail required	• Broad inventory and assessment of regional scale patterns and landscape characteristics. • Understanding of visual landscape character, community perceptions, values and issues is needed. • Recommendations to address broad-scale landscape issues and generalised community attitudes and values.	• Comprehensive understanding required. • Inventory and evaluation of visual landscape character, issues and community values. • Provision of context and visual management objectives.	• Comprehensive knowledge of site-specific landscape characteristics and issues. • Comprehensive knowledge of regional and local contextual information. • Assessments usually undertaken in response to a specific development proposal. • Detailed inventory, assessment and planning solutions.
Professional expertise	Is required (at least consulted); but may not be essential at this level depending on the scope of each project and community member skills.	Is required; some assessment techniques in the visual impact assessment require technical expertise.	Is required; simulations of development proposals must be accurate and a number of inventory and assessment techniques require specialist expertise.

Table 5: Levels of significance for viewing locations and viewer experience

Level 1: national/state significance

- State highways and other main roads (sealed or unsealed) with high levels of vehicle usage;
- designated tourist routes, scenic drives;
- recreation, conservation, cultural or scenic sites, areas, viewpoints and lookouts of state or national significance, including their access routes;
- walking, cycle or bridle tracks of national or state significance;
- towns, settlements or residential areas;
- passenger rail lines;
- navigable waterways of national or state recreation importance;
- ocean sites of national or state recreation importance eg surf breaks; and
- views of national or state importance.

Level 2: regional significance

- main roads with moderate levels of vehicle usage (sealed or unsealed);
- recreation, conservation, cultural or scenic sites, areas, viewpoint, and lookouts of regional or high local significance (including their access routes);
- navigable waterways of regional recreation significance;
- walk, cycle or bridle paths of regional significance; and
- views of regional importance.

Level 3: local significance

- all remaining roads with low levels of vehicle usage;
- locally significant roads or tracks;
- recreation and other use areas of local significance;
- navigable waterways of local recreational significance;
- walk, cycle or bridle paths of local significance; and
- views of local importance.

Explanatory note - Significance increases with the:

- importance of views, including type, features, rarity;
- volume of use of roads, trails and navigable waterways;
- degree of sensitivity of viewers; those who are more likely to be more sensitive include wilderness users, other recreational users, tourists, people who choose to live in an area because of its landscape character and views (eg assessed by noting how vocal observers are about specific travel routes or use areas, indicated in letters, protests etc);
- degree to which experiencing the landscape is integral to enjoyment of a travel route or site. Is it the focus of the use, as in recreational use, or just incidental, as is more likely with people using a route to work? and
- length of duration of a view; range could include glimpses from a high speed road, longer duration views obtained from roads used for sightseeing or from recreation sites and lookouts and very long and frequent views from the main living areas of homes.

Appendix 2

Existing planning mechanisms

Policy development – Western Australian Planning Commission

The WAPC has produced the Environment and Natural Resource State Planning Policy 2 (ENR SPP) (Sept 2002), which includes several policy measures that recognise the significance of landscape.

The policy sets out general measures that recognise:

- the diversity of landscapes that exist in WA;

- a growing community appreciation of natural landscapes;

- a recognition that unique landscapes in WA provide opportunities for recreation and tourism; and

- that landscapes change in response to existing land use demands and future land use planning.

The State planning policy guides the protection and restoration of WA landscapes by advising that planning strategies, schemes and decision making should:

- identify and protect landscapes with high natural resource values (such as ecological, aesthetic or geological) and encourage the restoration of degraded landscapes;

- consider the capacity such landscapes have to absorb new land uses and give careful consideration to the planning, siting and design of proposed development so that it is sensitive to the character of the landscape; and

- consider the need foe a landscape, cultural or visual impact assessment for development proposals that may impact upon sensitive landscapes.

These are broad, statewide statutory policy measures that can guide landscape protection, maintenance and enhancement at regional, local and site levels of land use planning and management.

Policy development: State government agencies and local government authorities

The Department of Environment and Conservation (DEC) (previously the Department for Conservation and Land Management CALM) developed one of the first policies for visual landscape management in Western Australia (1989) to ensure that all land uses managed by DEC are planned and conducted in a way that protects and sustains the quality of landscape character: Policy Statement 34 – Visual Resource Management on Land and Waters Managed by CALM.

The Environmental Protection Agency has produced a guidance note on various environmental considerations under EPA policy, with visual amenity being one component (EPA Environmental Guidance for Planning and Development, Guidance Note 33, 2006). This has statutory and non-statutory status where, for example, a proposal is referred to the EPA and results in a non-formal assessment, resulting in non-binding advice for the protection of landscape amenity. If a referral requires a formal assessment, where visual amenity is a component, then this results in legally binding ministerial conditions that may include landscape protection advice.

Some local authorities have developed policies to protect certain landscape character areas. For example, the Shire of Busselton has developed two policies – the Caves Road Visual Management Policy (1999) and the Yallingup Special Character Policy (1996). These assist in the protection of existing visual landscape character when development proposals are being considered in those areas.

Existing non-statutory mechanisms

Strategic planning mechanisms such as the State planning strategy, regional strategies, sub-regional strategies and local planning strategies can be powerful tools to guide the protection and restoration of landscape values. Strategic planning mechanisms usually apply to regional and local scales of application, but can also guide local town planning scheme preparation for site level applications.

Regional strategies are useful to protect broad scale landscapes that may have regional or local significance. Landscape values can be included in environmental strategies along with other natural resources, by the identification of portions or features of the landscape that are significant to the wider community or require restoration. An example of a regional strategy that considers landscape values is the draft Lower Great Southern Regional Strategy (WAPC 2007).

Sub-regional strategies are developed under the same planning process but are applied at a smaller scale than regional strategies. Visual landscape assessments are then undertaken at the smaller scale. The Avon Arc Sub-Regional Strategy (WAPC 2001) is an example of the consideration of landscape values in addition to strategies developed for other natural resources and future land use planning.

The most effective planning tool to incorporate landscape values at a local level, which then in turn guides site level planning, is the **local planning strategy** prepared by local governments. This level of strategic planning can identify local landscape values and direct inappropriate development away from areas of high sensitivity at an early stage. Visual landscape assessments of such areas can be undertaken at the preparatory stages of the strategy. This would provide local governments with more accurate information about the existing landscape character of the area and assist in the development of appropriate objectives to protect landscape areas of high significance, as well as restoring landscape areas that are degraded.

In the preparation of local planning strategies, the Department for Planning and Infrastructure provides local governments with mapped data sets including information such as remnant vegetation and topography. A landscape character map sourced from Reading The Remote – Landscape Characters of WA (CALM 1994) and further divided into smaller landscape character types could also be provided at this draft stage, in areas where landscape is regarded as a significant issue. This landscape information is useful for designating appropriate areas for future growth and development, inclusion of provisions in local planning schemes for landscape protection and in the assessment of rezoning and subdivisions.

Planning bulletins are another type of non-statutory document that may provide guidance for the protection of landscape. An example is the Guidelines for Wind Farm Development – WAPC Planning Bulletin 67 (2004), where visual landscape guidelines are stated in consideration for the siting and design of wind farms in Western Australia to ensure minimal affect on existing landscape character.

Existing statutory mechanisms

There is a wide range of existing statutes and statutory mechanisms that may provide authority for landscape protection and enhancement. Examples are as follows:

Legislative mechanisms

- State planning legislation *(The Planning and Development Act 2005)*.

    Local planning schemes

    - zoning, designation or zoning of land for landscape protection or landscape protection with limited development, reservation of land for Conservation of Parks and Recreation, special control areas requiring criteria to be addressed and/or consultation sought for this purpose;

- scheme provisions which may include criteria for assessing applications for subdivision and development in specific areas or for specific types of development;

- requirements for outline development plans which address landscape protection, and conditions relating to rehabilitation and preservation;

- Crown reserves (those vested in local authorities); and

- identification of heritage areas.

WAPC State planning policies

- State Planning framework (Variation No.2) 1;

- Environment and Natural Resources State Planning Policy 2;

- State Coastal Planning Policy 2.6;

- Amendment to State Planning Policy 2.6;

- Agriculture and Rural Land Use State Planning Policy 2.5;

- Water Resources State Planning Policy 2.9;

- Swan-Canning River System State Planning Policy 2.10;

- Historic Heritage Conservation State Planning Policy 3.5;

- Leeuwin-Naturaliste Ridge State Planning Policy 6.1;

- Urban Growth and Settlement State Planning Policy 3;

- Ningaloo Coast State Planning Policy 6.3;

- Residential Design Codes State Planning Policy 3.1; and

- Telecommunications State Planning Policy 5.2 (including guidelines for the location, siting and design of telecommunications infrastructure).

- reservation of land for parks and recreation (under the Metropolitan, Peel and Bunbury Region Schemes);

- Bush Forever sites (Perth region);

- declaration of planning control areas for heritage conservation, special control areas;

- environmental protection legislation (eg mine site rehabilitation) ;

- Department of Environment and Conservation legislation (eg national parks, nature reserves, marine parks, regional parks);

- WA Register of Heritage Places (eg individual trees, streetscapes, towns);

- Regional Forest Agreement (areas of State Forest protected from logging);

- Botanic Gardens and Parks Authority (Kings Park, Bold Park);

- Rottnest Island Authority (Rottnest Island); and

- legislation protecting rare and endangered native flora and wildlife habitat.

Non-legislative mechanisms

- buffers around industries (eg quarries);

- dieback control measures including quarantine areas; and

- Crown reserves or vacant Crown land (eg coastal and foreshore reserves).

Appendix 3

Relevant policy measures

Excerpt from Environment and Natural Resources Policy: State Planning Policy 2 (WAPC 2003):

5.9 Landscape

Western Australia has a diversity of high value landscapes and scenic areas, many of which are unique to Australia. These range from the unmodified semi-arid and subtropical landscapes of the north and east of the State to modified rural farming landscapes in the south-west, and encompass a diversity of natural coastal landscapes, vast flat plains, mountain ridges and forested areas.

There is an increasing appreciation and valuing of natural landscapes by the community. These landscapes provide opportunities for recreation and tourism and fulfil a psychological need in providing a contrast to the urban environments in which the majority of Australians live.

It is recognised that landscapes change in response to demands for primary products, recreation and tourism as well as for rural living. The values of the community with regard to landscapes also change over time. As the State grows, it will be increasingly important to ensure that those landscapes that are valued by the community are protected. To do this it is necessary to identify the landscape types and features requiring special attention, and to develop appropriate management and planning policies that can positively contribute to their maintenance and enhancement.

Planning strategies, schemes and decision-making should -

(i) Identify and safeguard landscapes with high geological, geomorphological or ecological values, as well as those of aesthetic, cultural or historical value to the community, and encourage the restoration of those that are degraded.

(ii) In areas identified in 5.9 (i) above, consider the level or capacity of the landscape to absorb new activities and incorporate appropriate planning and building design and siting criteria to ensure that new development is consistent and sensitive to the character and quality of the landscape.

(iii) Consider the need for a landscape, cultural or visual impact assessment for land use or development proposals that may have a significant impact on sensitive landscapes.

Appendix 4

Implementation and planning applications

Visual landscape evaluation enables goals and directions for landscape protection to be incorporated in regional and local strategies. This in turn enables criteria and rules to be included in region and local planning schemes. Through visual impact assessment during the normal assessment of a development application the proposal can be measured against these rules.

The WAPC expects visual landscape considerations to be included along with many other considerations in plan making and development assessments, as it has been in the examples cited below. It is not generally appropriate for planning authorities to impose new requirements relating to the visual landscape when a development applicant is submitted. If a visual landscape evaluation has not been made, and if visual landscape criteria are not included in the planning scheme, requirements and conditions relating to the visual landscape should be confined to matters already provided for in the scheme.

Appendix 2 identifies a range of relevant planning mechanisms that the Western Australian Planning Commission may use to implement planning and environmental objectives such as landscape protection.

The mechanisms that exist can incorporate landscape protection, and possibly also assist in landscape enhancement and restoration requirements. The choice of appropriate mechanisms will depend on the particular circumstances ie whether visual landscape evaluations are undertaken for a region, locality or site; or the status of the landscape in the planning process as well as the determining authority (eg state government or local government).

Working examples where landscape considerations have been incorporated into planning documents

Regional	Landscape Background Report (2006) prepared for the Lower Great Southern Regional Strategy (WAPC 2007); Avon Arc Sub-Regional Strategy (WAPC 2001)
Local	The Swan and Canning River Planning Precinct Handbook (WAPC Swan River Trust 2002); Caves Road Visual Management Policy (Shire of Busselton 1999)
Site	'Combined Methodologies – February 2004' for Sussex Location 413 Smiths Beach Road, Yallingup adopted as a policy pursuant to clause 103 (2) (c) of the Shire of Busselton Town Planning Scheme 20.

Integration of outcomes into planning exercises

This section describes how visual landscape planning outcomes and landscape considerations can be integrated with planning exercises at regional, local and site level applications.

Regional level

Strategic plans at a regional level may locate discussion of landscape under various umbrella headings, such as environment, heritage, tourism or social factors.

Strategies related to landscape are integrated with other strategies for example, treatment of rural roadsides addressed with transport strategies, ensuring that relevant agencies are aware of the strategies. It may be appropriate to also have a separate section that addresses visual matters throughout the region. This may entail broad regional strategies, or strategies

specific to landscape planning, such as studies to investigate community preferences and concerns.

Visual landscape strategies and mapping can be integrated into any units used as a framework in regional planning, such as planning precincts or catchment areas. Planning precincts may be based on landscape character units.

Regional level landscape evaluations provide visual management objectives that can be used to develop specific strategies such as the Shire of Busselton's Caves Road Visual Management Policy (1999) (Figure 1 of this appendix), or may be applied to individual planning precincts.

Local level

Visual landscape evaluations may provide the basis for definition of local level planning precincts, using landscape character units, viewshed boundaries, or general visual absorption levels, for example. Regional or local level visual landscape strategies may then feed into the appropriate precinct or unit.

Local planning schemes may include provisions that are based on visual landscape evaluation, such as landscape protection zones that encompass areas or features identified as highly valued for their landscape character. The identification of these areas for protection may be further used in the development or review of local planning strategies where relevant.

Decisions regarding land uses may take into account the desirability of protecting valued general character or specific individual features eg by creating buffers adjacent to individual features such as mountain ranges.

Site level

Visual landscape evaluations for sites will assist in the development of proposals that reflect the character of the site and acknowledge viewing opportunities. For example, individual landscape features may be retained, and subdivision roads and open space may provide corridors for viewing landscape features such as roads orientated towards the coastline, a water body or hills.

Visual impact assessments provide guidance on evaluating and undertaking proposed developments, including identification of measures to minimise potential impacts under the planning scheme, these assessments may be a requirement as part of a development application, for example if the visual management objective of a site is protection and maintenance of existing character. They may be prepared by proponents and undertaken by external consultants.

Site level visual landscape planning and standard methodologies may be adopted by local government and implemented as policy for sensitive sites, such as the methodologies adopted by the Shire of Busselton for Smiths Beach.

Where there are multiple constraints for development with water issues, land capability, statutory measures can include landscape protection for a site. Examples include building envelopes, special control areas and landscape protection areas identified in local planning scheme provisions.

At a site level, visual impact assessments may result in siting and design criteria being developed. When incorporating into a planning scheme these may be implemented as conditions of development approval.

Consultation

Community consultation for visual landscape evaluation should be a component of the wider planning process (eg community workshops that may include landscape issues).

Preferably, consultation between the developer and planners is conducted at the earliest stage, to avoid any potential negative visual impacts, disagreements about methodology and approach and community concern. Discussion before the submission of major development proposals is
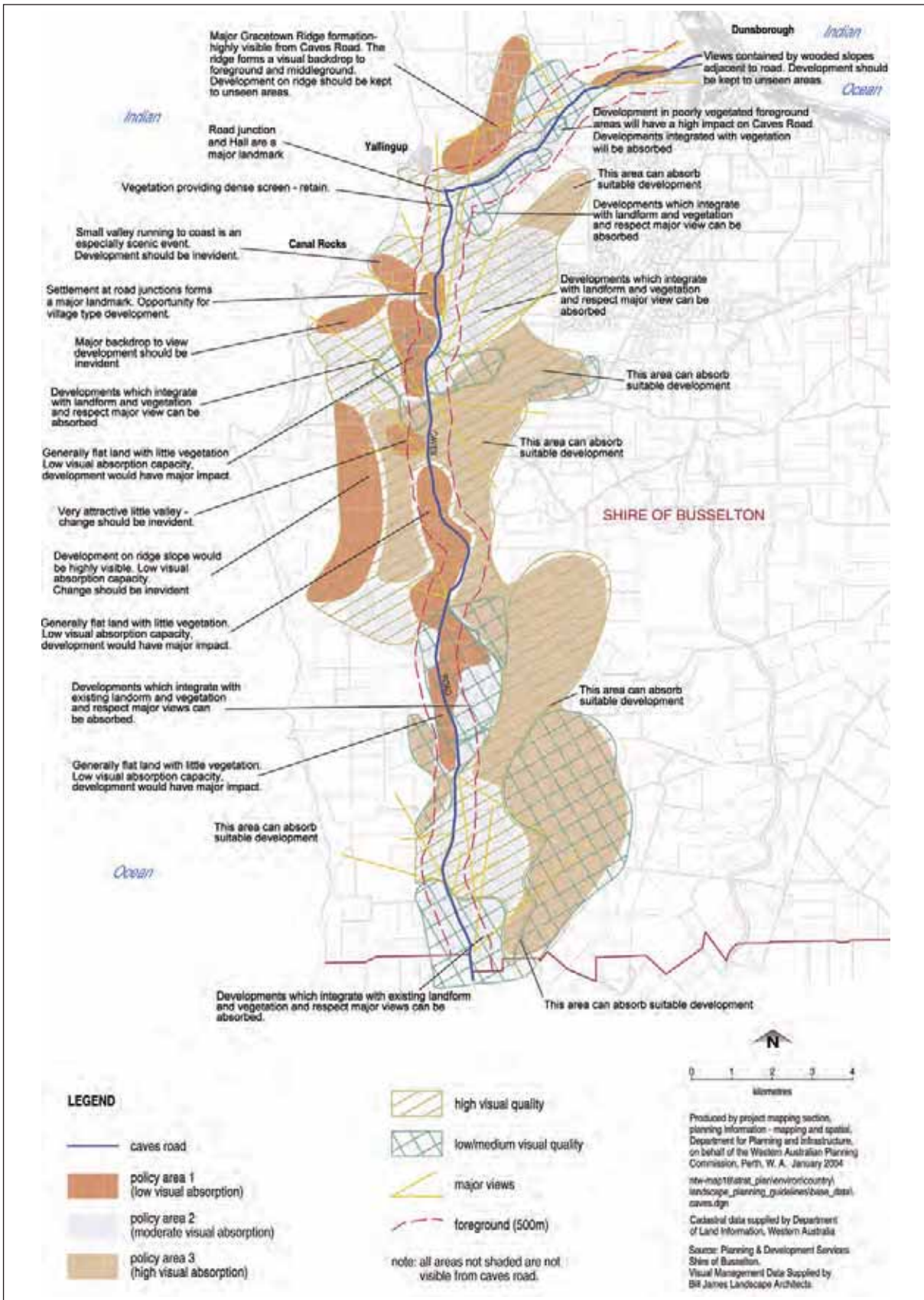
Appendix 4, Figure 1: *The Shire of Busselton has developed a policy for the Caves Road viewshed, taking into account visibility from the road, visual absorption capacity and landscape character.*

essential for implementation of landscape considerations to be effective.

There is no point in seeking comments if it is too late in the planning process for the proposal to be modified.

Consultation at an early stage will ultimately bring together the developer's concepts with the appropriate planning authorities that can advise on:

- what is required for landscape protection; if a visual landscape evaluation has been conducted, then agreement can be reached on what outcomes will be useful for the development proposal; and

- if an evaluation has not been completed, then guidance can be given on what approach will be the most useful.

Informing the relevant community about a particular development (particularly if it is potentially sensitive) may be helpful in obtaining information regarding local opinion. It may also be a tool for developers and planning authorities to gain a perspective on the community's sense of regional identity and local character of the area in question.

Contact details of landscape evaluation experts, consultants, government representatives (strategic and statutory) that have an interest in landscape considerations is helpful to have on hand. Any problems in implementation or required changes to a proposal will be easier to manage with the appropriate contact details of all experts who can assist with such problems.

Role of determining authorities

The determining authority has a very specific role in obtaining the most effective outcome for development proposals that require landscape input. Considerations include how to encourage the best results from the developer, how to review the visual landscape component of the planning issue, and how to modify the outcomes if necessary.

Most effective visual landscape planning is realised at a local level. Guidance is required for local governments in regard to planning for areas of high landscape value, and specific development applications that may be a local community issue.

Region and sub-region strategies

Visual landscape strategies developed at a regional and sub-regional level (regional strategies, sub-regional strategies) can give guidance to local governments in planning for areas of landscape significance. The strategies at the regional level need to be clear and concise to ensure ease of implementation at the local planning level. The determining authority may provide local government with specific recommendations on how each of the landscape strategies can be implemented in strategic and statutory outcomes (Appendix 2).

Regional visual landscape evaluations and strategies can provide a clear framework for the consideration of landscape issues in development control and allow local government to guide development to suitable areas. They can advise on existing landscape character, areas identified for landscape protection and restoration and on any key issues that need to be addressed such as urban fringe restoration.

Specific development proposals

There are a number of ways in which planning authorities and others can give support and guidance to those responsible for the planning, design and assessment of new development proposals. It is the developer's responsibility to seek this guidance.

It would be most helpful, if the developer can seek professional advice on any landscape matters to complement the formal standard planning context of the development proposal. At this detailed level landscape design guidance can help encourage local distinctiveness in building layout, style, materials and choice of plant species.

Regarding the **content** of the visual landscape evaluation and visual impact assessment it is good practice for the developer to work closely with relevant professionals in regard to the scope and method required. Developers should seek guidance on the level of detail required for the consideration of landscape issues such as the protection of certain features (such as trees or historical features), contents of the proposal such as scale and implementation ideas, planting design, earthworks, drainage, infrastructure and boundary treatments.

A **review** of the completed visual landscape evaluation and/or visual landscape assessment by the developer and the relevant authority is desirable for the particular development proposal. If the outcomes and recommendations (eg strategies, cross-sections, character mapping, assessment of impacts) are inadequate, then the authority may consider requesting the developer to supply additional information.

Review

Planning documents such as regional strategies and schemes undergo a review process. Any landscape management objectives and actions that are included in such documents can be reviewed at this time.

Landscapes are naturally dynamic and community sentiments change over time. Monitoring would ideally continually assess change and the effectiveness of measures taken to reduce the impacts of unwanted change. Some changes may be incremental, so they may not be recognised in the short term. They may be unforeseen and therefore not addressed in initial landscape management recommendations.

Planning and management strategies based on community values may also require re-assessment over time as social structures and perception of landscapes evolve.

Local governments have the authority for enforcement, where conditions are imposed to meet particular landscape planning objectives. Conditions of planning approval can specify the stages at which the landscape recommendations are implemented.

Appendix 5

Glossary

The term **visual landscape**, as applied in this manual, refers to the appearance of an area of land, incorporating the combination of elements such as landform, vegetation, water bodies and human land use. The emphasis is on visual characteristics.

Visual landscape character refers to the appearance of those landscape elements such as landform, vegetation, water bodies and human land use that makes an area identifiable or unique.

Landscape character units refers to areas of homogenous (similar) patterns of visual characteristics such as landform, vegetation, water form and land use as well as individual features.

Landscape protection refers to actions taken to ensure that valued individual characteristics of landscapes, or landscapes in their entirety, are maintained.

Landscape values describes those landscape characteristics that the community considers are significant for reasons such as their aesthetic (predominately visual), social, environmental and heritage values.

Landscape design is the process of locating and designing landscape works at a local or site level. Components include site planning, site design and detailed design. The visual elements of form, line, colour and texture are important considerations.

Visual landscape planning applies at a broader scale than landscape design. It is concerned with minimising visual impact on valued landscape character by identifying appropriate types of land uses and careful location and design of development.

Visual landscape evaluation is the process of evaluating the character of areas of land, usually by reference to an agreed set of criteria based primarily on community preferences. This manual focuses on visual landscape evaluation, which relates to the visual appearance of a landscape.

Landscape impacts are changes in the character and quality of the landscape that occur as a result of development, while **visual impacts** relate to the appearance of these changes.

Visual impact assessment is the analysis of changes in the appearance of the landscape as a result of development. Impacts may be either negative or positive.

Landscape features are visually dominant, easily identified or significant characteristics in a landscape.

'View' comprises a portion of a landscape seen by an observer.

Viewshed or **seen area** is a portion of the landscape that can be seen from one or more observer positions. The extent of area that can be viewed is normally limited by landform, vegetation and distance.

Observer position is the placement and relationship of a viewer to the landscape that is being viewed.

Viewpoint the point from which a view is observed.

Key view an area, especially a broad landscape or panorama that is in constant sight from the observer's viewpoint either in motion or standing still, that is of high value.

View significance a portion of a landscape seen by an observer that is highly valued.

Visibility can be defined in two ways:

- whether a feature and/or landscape can be seen or not; and

- how far away the feature and/or landscape is from the observation point.

Visual absorption capacity refers to an area's ability to visually absorb or sustain change as a result of new development, without altering the overall character of the landscape, based on variables such as landform, vegetation pattern and height, and existing land use.

Diversity in a landscape can be assessed in terms of how much variety there is in a particular landscape character unit, as well as the degree of diversity that is typically displayed.

Unity relies on the repetition of similar elements and the balance between elements, proportion, scale and enclosure. The degree to which contrasting elements may disrupt unity in a landscape depends on the context; a single new and different feature in an otherwise unified landscape may cause a high degree of discontinuity.

Form refers to the shape and volume of landscape features. Form may be identified at different levels, from the form of mountain ranges to that of typical tree species. The edges of forms may be considered separately as lines, eg the top of a ridge form may be identified as a prominent line in the landscape.

Enclosure is created if landscape elements are located so that they enclose space, eg remnant vegetation in paddocks, buildings at the edge of open space.

Texture refers to visual characteristic of a surface when looked at (ie rippled, smooth, rough).

Community refers to the residents who are affected by decision-making processes, as well as interest groups and stakeholders, ranging from government bodies, business and industry organisations and the media.

Community values comprise the values that residents as well as various interest groups such as government bodies, business and industry organisations and the media, place upon their environment and surrounds.

Appendix 6

Status of visual landscape planning in Western Australia – state and local government

Both State and local government agencies have taken specific action to protect landscape values over the past few decades. State agencies that have taken a role include the Department of Conservation and Land Management, the Department for Planning and Infrastructure, the Department of Environmental Protection, Main Roads Department, Swan River Trust and the Western Australian Heritage Council.

The previous Department for Conservation and Land Management (CALM), now the Department of Environment and Conservation (DEC) developed a system of broad-scale landscape evaluation, known as the Visual Landscape Management System, derived from a similar system pioneered in the 1960s by the US Forest Service. This system is applied to DEC-managed lands and waters, and has been used in town planning tribunal cases to substantiate assessment of the visual impact of development proposals. A landmark case was the 1994 proposal for a subdivision at Wyadup Rocks, in the Shire of Busselton. CALM has made a major contribution by producing 'Reading the Remote: Landscape Characters of Western Australia' (1994). This document divides the State into 39 major landscape units, which are described in terms of their physical character, land use, aesthetic character and visual quality. DEC's Visual Landscape Management System is currently under review to accommodate a wider range of land uses and the mapping done for the South-West is being updated.

The Department for Planning and Infrastructure has developed broad policies to promote landscape protection. Landscape protection has also been incorporated into regional level policy, in the case of the Leeuwin-Naturaliste area. Regional strategies have also addressed landscape as a natural resource for protection. Developers have been encouraged to consider landscape values, and visual landscape evaluation has been included in regional planning exercises. The agency has led the development of this visual landscape planning manual, to assist in the implementation of landscape protection into the planning process.

The Environmental Protection Authority (EPA) has been a long-term promoter of landscape protection through its efforts to protect biodiversity, and soil, air and water quality. The EPA has also required development proponents to address the visual impacts of their proposals, such as the Ten Mile Lagoon wind farm at Esperance. In a landmark case in 1991, Palace Verdes Pty Ltd was deemed by the EPA to have caused visual pollution in its illegal clearing of access roads on the Nullaki Peninsula, opposite the town of Denmark. Provisions in the new Act will have a substantial positive effect on rural landscapes by reducing the amount of native vegetation being cleared.

The Main Roads WA requires the assessment of potential visual impacts (eg intrusion, overlooking) as part of the environmental investigations for roadwork projects. The agency also puts considerable effort into revegetation of roadsides and into the design of roads and bridges to enhance visual quality and reduce visual impacts on adjacent landholders.

Appendix 5, Image 1: *Landscape planners and architects representing CALM (now DEC), DPI and Main Roads meet to discuss cross-agency landscape planning concerns.*

The Swan River Trust has undertaken an inventory of Swan and Canning River landscapes, as a first step in assisting local authorities to establish planning and design guidelines and policies for landscape precincts along the river system.

State heritage agencies, such as the Heritage Council and the National Trust WA, are primarily concerned with protecting buildings and their immediate surrounds. Some attention has been given to broader landscapes that are highly valued on natural and cultural heritage grounds.

Local authorities have increasingly included provisions in their local planning schemes or in conditions attached to subdivision approvals that are designed to protect landscape quality. Examples include: provision of landscape protection zones in town planning schemes; specification of non-reflective roofing materials in some special rural subdivisions; building height limits along the coast; and restrictions on clearing of remnant native vegetation. In urban areas councils have made determinations of proposed new residences based primarily on the degree to which the proposed building is considered to fit into the existing streetscape.

Appendix 7

Visual landscape character preference indicators

Effective planning and management of visual landscapes must be based on a comprehensive understanding of community perceptions, preferences and values. This knowledge can be gained from various sources including a large body of existing perception research, surveys and community testing, workshops and personal interviews.

Where comprehensive project based perception studies are not available, assumptions should be based on community workshops and surveys. In addition, perception research conducted in WA and elsewhere in Australia indicates substantial agreement as to indicators of visual landscape character in natural, rural and built landscapes.

The list opposite suggests some of the key character indicators that provide a basis for classification of landscape and features into two preference categories: **most preferred**; and **least preferred**.

Every project will be different. Project managers should use the character indicator lists during the community consultation process to stimulate discussion and as guidelines to be modified and/or refined to suit local conditions and preferences.

The character indicators have been established for the three land categories: **natural**, **rural** and **built** landscapes.

Visual landscape character preference indicators

"Most preferred":

> Character indicators for **most preferred** can be defined as landscapes and features that are highly valued by the community, and that contribute to the visual character of the landscape.

Natural landscape character:

- high degrees of perceived naturalness;

- high degree of topographic variety or vertical relief (dramatic relief, ruggedness, rock outcropping, outstanding ridgelines and beach forms);

- vegetative diversity (distinctive patterns, species composition, height, colour and texture);

- diversity of vegetation age and density (structural complexity);

- unusually expansive landforms or vast horizontal scale (desert landscapes, beach and dune fields, rolling hills);

- presence of water bodies (waterfalls, rivers, estuaries, oceans, lakes, inundated areas);

- distinctive displays of colour: soils, vegetation (often seasonal), topography, rock formations or water bodies;

- distinctive landscape features (waterfalls, unique plants, reefs, geological formations such as ranges, cliff faces and granite outcrops);

- outstanding combinations of landform, vegetation patterns and water features in one area;

- seascapes (combinations of ocean, reefs, beach, dune formation, coastal rocks, coastal vegetation); and

- areas or sites frequently prone to ephemeral features (fauna, water or wave conditions, beach erosion scarps, climatic conditions).

Rural landscape character

- unusual diversity in agricultural landscapes (colour and contrast or species diversity of cropping);
- agricultural patterns, colours and textures that complement natural features;
- gradual transition zones between agricultural land and natural landscape;
- topographic variety and ruggedness;
- presence of water bodies (dams, lakes, inundated areas) that borrow location, shape, scale and edge configuration from natural elements;
- areas or sites frequently prone to ephemeral features (presence of fauna, distinctive crop rotations, water conditions and climatic conditions);
- significant landscape features (trees and tree stands, historic relics, some windmills and areas of unusual topographic variation);
- settlement patterns and individual structures that strengthen the local rural character (silos, windmills, water tanks, historic buildings, bridges, hay bales and dams);
- historic features and land use patterns that strengthen the local rural character (historic farm machinery, old shearing sheds, windmills and historic buildings); and
- distinctive remnant vegetation located along streamsides, roadsides and in paddocks (parkland cleared paddocks).

Built landscape character

- presence of trees, greenery, parks and gardens, street trees, canopied streets, median strip vegetation;
- complementary building styles in neighbourhoods;
- diverse building styles in neighbourhoods;

- built developments that do not impinge on dominant natural features (for example, the Darling Scarp, river foreshores and coastal landscapes);
- coherence of industrial buildings in one area (eg industrial parks and buffers);
- elevated landforms and undulating terrain;
- presence of water bodies;
- presence of natural rock features (eg limestone cliffs, granite outcrops);
- historic features including land uses that strengthen the local urban character;
- well maintained gardens (native and exotic);
- incorporation of significant cultural and environmental features into urban design;
- urban water management (water bodies that are well maintained, and open drains with a complementary appearance to the surrounding built form);
- development sites supporting and enhancing the urban context in which they are located;
- development sites designed so they strengthen local character and promote a sense of community;
- design which takes account of landscape features, vegetation and landform;
- services being underground to reduce cabling and severance of street trees;
- unobtrusive mobile phone towers and other utility towers;
- unobtrusive advertising;
- presence of community artworks;
- multi-storey buildings that maintain the CBD character (graduated skyline and gaps between clusters of buildings to allow views).

Visual landscape character preference indicators

"Least preferred":

> Character indicators for **least preferred** can be defined as landscapes and features that are not valued by the community, and to detract from the visual character of the landscape.

Natural landscape character

- disturbed areas with little evidence of naturalness;
- areas of diseased, dead or dying vegetation;
- areas with severe weed infestations in a natural landscape;
- areas of soil erosion (especially where human-induced);
- water bodies with degraded banks, weed infestations, stagnation, eutrophication, algae or litter; and
- evidence of mining (gravel pits, sand mines, limestone).

Rural landscape character

- areas of soil salinity/salt scalds or dead, dying or diseased vegetation;
- areas of extensive weed infestation;
- eroded areas;
- tips, dumps and landfill areas;
- recently harvested areas (stumps, debris, abandoned off-cuts);
- land use areas that contrast significantly from natural landscape characteristics (can include plantations, mines, rural settlement and/or housing, utility towers, roads and fencing);
- abandoned structures in a state of disrepair or destruction;
- unmanaged roads and access tracks;
- farm structures and buildings in a state of disrepair;

- jetties and other marine structures that are either closed or not maintained; and
- eutrophied dams, lakes and water bodies.

Built landscape character

- derelict industrial areas (junkyards);
- large carparks without trees;
- run-down residential areas (dead grass, bare sand, dead vegetation, derelict housing and/or buildings, abandoned and/or trashed cars)
- graffiti;
- intrusive billboards (particularly along roads and railway reserves);
- buildings which contrast sharply from the surrounding built character (large isolated shopping centres, apartments, hotels);
- arterial highways with strip commercial and light industrial developments, lacking trees and other vegetation;
- utilities (towers, transmission lines, overhead powerlines);
- severed or badly pruned street trees;
- lack of vegetation;
- degraded areas prone to depreciative uses and unregulated vehicle activities;
- poorly maintained waterways and drains prone to stagnation, pollution and littering;
- extensive areas of urban sprawl lacking vegetation or public open space;
- extensive retaining walls which result in concrete canyon effects on roadways;
- buildings that create a solid wall effect (no gaps to allow views between buildings).

Appendix 8

Methods case study

Case study: methods application at a site level: "The Blowholes" Carnarvon Coast, Ningaloo.

Introduction

This example is an evaluation of The Blowholes, a popular coastal location north of Carnarvon.

A site level evaluation was undertaken, based on several hours' field inspection. Visual landscape character is described in terms of features only. The site could have been broken into character units but this would not be essential at a site level. Natural features are described in order: landform; waterform; and vegetation. Introduced vegetation is described under land use. The land use features could also be termed cultural or built features.

Key views are described in terms of accessibility of each view location, viewshed extent, prominent features and distance to each and visual characteristics. Visual management objectives are integrated with the view description, although they could have been listed separately. The objectives take into account the need to retain the visual dominance of existing natural features, based on the assumption that the suitable overall objective at this site is to maintain the natural character. Landscape sensitivity to change is addressed.

Finally, a discussion of future development is provided. This integrates all topics already raised and suggests future directions.

Principal landscape features

Natural

- Dune ridges running north–south, with interdunal swales. Exposed white sand on upper parts of ridges.

- Shoreline dunes parallel to the coast in a narrow band, cutting off the seaward end of the linear dunes. Some blowouts on windward slopes.

- Beach south of the point; fairly narrow.

- Rocky shoreline from the point northwards; horizontal rock platforms, black undercut surfaces. Pale orange, heavily pitted marine limestone.

- Island off the point; same character as rocky shoreline. Low elevation with adjoining rock platforms.

- The aquarium point; Promontory opposite the island, comprising low rock platform of deeply dissected and weathered pale orange limestone.

- Low grasses and heath vegetation throughout the site. Predominance of grey tones, due to the dominance of *Olearia axillaris* over the entire site, and *Attriplex* on the foredune.

Land use

- Lighthouse as landmark cultural feature. White sides with red cap above light component. Unsympathetic addition of platform near top.

- Road; flush with adjacent land, little cut and fill or camber.

- Toilets; very prominent, vertical structures of treated pine, located adjacent to extensive parking areas.

- Shacks in a variety of states of repair, age and style. Some strong colours, including mid range greens, bright blue, red.

- Beach shelters comprising timber frame with palm fronds for roofs.

- Introduced shrubs and trees amongst the shacks; tamarisks, Brazilian peppers. Darker and brighter greens than the majority of native plants.

Visual management objectives for principal landscape features

In this landscape it is not feasible for development to be 'not evident', although it is appropriate to attempt to blend development into its landscape setting and to undertake actions designed to enhance the site. Natural landscape features should be maintained as such, with development sited and designed to minimise visual impacts. Some development may need to be located on either the north-south dune ridges or the dunes that run parallel to the shore across the southern bay. All other natural feature should remain free of development. Every land use feature requires enhancement of some type, to reduce their prominence and to enable greater protection of the natural features.

Key view locations and possible visual management objectives for each view

Lighthouse

*   ***Description:*** Access is currently up a steep four-wheel drive track located on the spine of the ridge. Excellent panoramic views inland and along the coast. Inland views to Lake MacLeod and salt works. Middle-ground views of blowholes; spout visible. High dunes to south-east, dominance of low, grey-green vegetation, with good ground cover in swales. Little of the shoreline itself is visible, except for a short section of beach near Black Rock, and the rock island off the point. Existing pedestrian tracks are an intrusive foreground element. Some immediate foreground interest is created by banksias near the view location and along the track.

*   ***Objectives:*** Existing shacks are barely visible from this location. Development at the new node will be visible if located on top of the dune ridge that backs the existing settlement area. It would be preferable not to have structures silhouetted against the ocean. Where this is not feasible, roofs should fit with the strong horizontal line of the top of primary dune ridge. No structures should appear silhouetted against either the island or rocky shore adjacent to the blowholes as visible from here. Care will need to be taken if the road crosses the foredune in a line between the island and this viewpoint, as the island is a prominent landscape feature in this view. Formal pedestrian trails should be aligned in a less intrusive fashion ie following contours, and greater use made of swales.

Beach at boat ramp

*   ***Description:*** Views along the south-east coast and to island and reef platform. Dune backdrop.

*   ***Objectives:*** Structures in the existing settlement area and on the ridge behind this will be prominent above the foredune, requiring careful design. Preferable if buildings on the dune behind the settlement do not break the horizon line.

The aquarium point

*   ***Description:*** Important viewing position and/or destination where people are likely to sit and enjoy the view; to the island, to the southeast coast and westwards out to sea. Existing shacks are visible from here, seen above the foredune.

*   ***Objectives:*** Preferable not to see development from this point as it is a recreation site focussed on the natural landscape, but this will not be possible. Locations on the backdrop dune ridge further west of the shacks may be less prominent, as the foredune is higher here and development would be located to the side of the main viewing direction.

Newly aligned entry road to tourism focus area

*   ***Description:*** First views of the southern bay will be obtained from this road.

*   ***Objectives:*** A viewing opportunity should be created where the road crosses the dune ridge to the southern bay.

The Blowholes

- **Description:** Unusual foreground attraction of waterspout rising from weathered, fissured, orange marine limestone.

- **Objectives:** The land immediately adjoining the rock platform is very flat and open. It is preferable to minimise the visibility of vehicles. Since vegetation screening is not possible, vehicles should be kept as far from the rock platform as possible by realigning the road further inland and shifting the parking further from the coast. The road could pass on the inland side of the toilet, with parking adjacent to the toilet.

Black Rock beach

- **Description:** Long views back to the island, rock platforms at the point, beach and dunes. Dune ridge close to the shore with well-vegetated swale between main ridge and small foredune.

- **Objectives:** Development opportunities in the swale area, especially where undulating swale terrain provides partial screening and/or softening. It would be preferable if buildings near the existing shacks were not located against the horizon line as seen from this beach. The distance will reduce visibility. Buildings at higher elevations would look less prominent if located nearer to the point, as the taller dune would provide a landform backdrop rather the buildings being silhouetted against the sky.

Future development

Identifying a new road alignment should be an integral, early step. Possible new road alignment: leaving the existing road south of Blowholes toilet car park, swinging south easterly through lower lying ground, and ending at a T-junction between the proposed day use area and accommodation area. Alternative departure point could be 100-200 m inland from a T-junction, which would provide space for the toilet and parking on the ocean side of the road. If possible the new road should include an elevated section that would provide views to the southern bay, although care needs to be taken to ensure that this portion of the road is not prominent as viewed from the lighthouse.

Where the road approaches the southern bay at right angles to the coast, the land directly ahead (between the road and the sea) should be left as open space with no visible development. Otherwise the structures will become a focus of attention.

Locate chalets on lower south-facing slope of dune in tourism focus area. This would keep them out of the storm surge area and would provide them with ocean views.

The caravan park area could be located in storm surge area, although if it were located below the chalets this would disrupt seaward views from the chalets. A solution could be to segment the day use, caravans and chalets areas along the coast, beginning with the day use area on the west, next the chalets, then the caravan park to the east. The problem with this arrangement would be that all traffic to the caravan park would pass through the chalet area. Ideally, traffic to the day use area and caravan park would not pass through the chalet area.

Another option would be to locate the chalets on the ridge behind the day use area, to the west of a T-junction, with caravans to the east, and remote tent camping further along the beach towards Black Rock. Here there are several extensive, fairly level, sheltered areas on the inland side of the track. It would work better if the track were relocated to the inland side of any camping nodes, although vehicular use would not be so high that conflicts between pedestrians and vehicles would be a problem.

Appendix 9

Strategies for location, siting and design to achieve each specific visual management objective

Not evident

Strategies

Development should be located and sited where it will not be evident in the landscape. It is risky to depend on design alone to ensure that development is not evident, although design strategies may be effective when used in conjunction with locational or siting strategies.

Location

Development may be evident if it is located where it is visible from roads, paths, recreation sites, especially if it is in the foreground of views. Locational strategies involve ensuring that development is not located in these viewsheds.

Siting

Development may be located in a viewshed but could be carefully sited so that it is not seen from designated viewpoints. This usually entails use of landform or vegetation screening. Another option would be to site development below the normal ground level.

Measures to ensure that development is sited to be not evident may include, (in order of priority):

1. using existing screening provided by natural landform;

2. using existing screening provided by natural vegetation (either on-site or off-site, such as road verges);

3. planting a new screen located on-site;

4. planting a new screen located off-site eg in road reserve; and

5. constructing a new screen using earthworks such as bunds.

Design

Some design strategies may result in development being not evident. These focus especially on colour and texture, including:

- shading of building walls and windows with eaves and verandas;

- use of camouflage colour, usually darker tones;

- use of non-reflective surface materials; and

- use of local materials.

Blending

Strategies

Success in meeting this objective is more difficult to quantify than the objective that development should be not evident. Specific performance criteria may be identified, against which planning and design proposals can be measured. The community could assist in developing performance criteria and in measuring success against these. Criteria examples include:

- how much development is it acceptable to see from designated viewpoints (for example, how many additional buildings in a rural residential development may be visible from an adjacent scenic drive, before the landscape begins to look urban in character);

- how much canopy clearing can occur before a bushland landscape loses its natural character;

- how tall and/or large should development be, relative to features such as natural landform and tree height (such as: height of a building to be below the tallest trees nearby, height of a landfill mound to be no higher than natural high points in the area); and

- position in relation to landform features (for example, is it acceptable for development to be located on particular landform features and if not, how close, how far upslope, width of buffers around rock outcrops).

Strategies need to be developed that refer to the general landscape setting, specific landscape features and important views available in or towards the landscape. For example, strategies that relate to views may include ensuring that development is not positioned directly in the line of view or focal area of an important view.

Location

A decision about whether a particular landscape character unit is a visually acceptable location for a form of development rests largely on whether the landscape provides sufficient opportunities for siting and design strategies. For example, partly vegetated, undulating rural terrain may be a suitable general location for rural residential development, as it may contain sites that are obscured by ridges and remnant vegetation.

Siting

Siting strategies should focus on avoiding prominent locations in landscapes, or in important viewsheds.

The use of strategically sited planting is a particularly useful tool to employ when screening is considered desirable but not feasible, for example, tall transmission pylons visible from a road, or a new railway through a valued rural landscape. The aim of strategic planting is not to screen development, but to draw viewers' attention away from the development, to give additional emphasis to existing natural and rural landscape features or to alter the landscape character so that it becomes more diverse, with the result that development may be less obvious.

Natural or cultural vegetation patterns can be reinforced with additional planting so that the landscape looks more diverse and the structures are less obvious. Planting of ridges, drainage lines, damp areas, roadsides can supplement existing vegetation and reinforce the visual dominance of these features, thus downplaying the development.

Design

The blending objective may be addressed by application of best practice design principles, focussing on visual elements such as form, line, colour, texture, scale and architectural style, for example:

- use colours that are:
  - prominent in the landscape, such as soil, vegetation, rock;
  - different to those that are prominent in the landscape, but complement each other; and
  - dark in tone, thereby reducing their overall visibility;
- use materials that are:
  - prominent in the landscape, for example rock, rammed earth comprising local soil or rock; and
  - complementary to local materials, even if their appearance is contrasting;
- vegetation that is local or its appearance complements local vegetation.

Prominent

Strategies

Location

A prominent development may be considered inappropriate anywhere in a landscape that is highly valued for its existing visual character.

Siting

Prominent status is largely based on the dominance of the structure's site in the landscape. Prominent sites may include:

- elevated sites that comprise or are adjacent to a natural landscape feature such as a coastal headland, cliff-top or hill;
- sites that comprise or are adjacent to a cultural landscape feature such as sites in the centre of a business district;

- sites that are prominent because of their position in a view, such as

  - in front of a backdrop, such as a river foreshore site;

  - at a focal point, such as at a traffic roundabout; and

  - at the end of an axis;

    - natural axis, for example, formed by a stretch of river ending at a bend or promontory,

    - built axis, such as a view ahead along a road.

Design

There are a number of Western Australian examples of prominent structures. Those that the community appears to generally support often have strong visual links between major design elements and their setting, for example Busselton's town jetty (timber heritage structure), new Fremantle maritime museum (sail forms), Dingo flour mill at North Fremantle (heritage icon) and the Narrows Bridge (low, graceful curves linking low-lying land at both ends).

Appendix 10

Deciding on location, siting and detailed design

Location:

Decisions about the general location for specific development proposals, or types of use such as wind farms or plantations, may be made in regional or local and/or district level landscape planning exercises.

Location strategies

Identify general types of location where the proposed type of development or use is visually appropriate or inappropriate. For example:

- urban, rural or natural portions of a landscape;

- particular landscape character units or sub-units;

- areas occupied by individual landscape features such as natural landforms of remnant vegetation that should be unaltered could be identified;

- views, viewsheds and view experiences that should be unaltered could be identified; and

- locations that have been the subject of previous community concern in relation to the type of use being considered.

Siting:

Siting decisions generally involve a greater level of detail than location decisions. They are made at a local or district level, or in relation to a specific site. It is assumed that the general location is acceptable.

Siting strategies

Identify specific sites where the development may be visually appropriate or inappropriate, using a similar checklist to the list provided for location strategies. Siting strategies may also address such components as:

- overall development footprint size and position;

- vegetation planning and management;

- planning and siting in relation to open space; and

- siting of individual structures.

Design:

Design decisions are made at a site level, but need to be consistent with higher level siting and location objectives. Design relates to the detailed appearance of components of a development. The traditional visual elements of form, line, colour and texture are relevant, as are general image and architectural style.

Design strategies

Design strategies suitable for the specific site need to be developed to address components such as:

- the visual elements of form, line, colour and texture;

- design of structures;

- vegetation retention; and

- landscape treatment design (landscaping), including planting and hard surfaces.

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Feedback Form

Why provide comments on the visual landscape planning manual?

We have tried our best to produce effective, workable methods for visual landscape evaluation and visual impact assessment as well as guidance for several landscape types and uses. However, not all issues related to visual landscape planning have been addressed.

We would like to hear about your experiences on implementing the methods presented and ideas on the material that has been provided.

How to provide comments on the visual landscape planning manual

The comments you provide can be as brief or as lengthy as you see necessary. Your use of the manual and any suggestions on how to improve the material is most important.

To ensure that your submission is as effective as possible, it is best to clearly state your suggestion and the part of the manual you are referring to, and provide reasons for your comments, if possible. We would also be grateful for comments on parts of the manual that worked for you, and are appropriate to your area of work.

Comments can be posted or faxed to:

> Project manager: Visual landscape planning manual
> Environment and Sustainability Directorate
> Department for Planning and Infrastructure
> Albert Facey House
> 469 Wellington St
> PERTH, Western Australia 6000
> Fax: (08) 9264 7566

Name: ....

Organisation: ....

Address: ....

Phone: ....
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Comments: ....
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