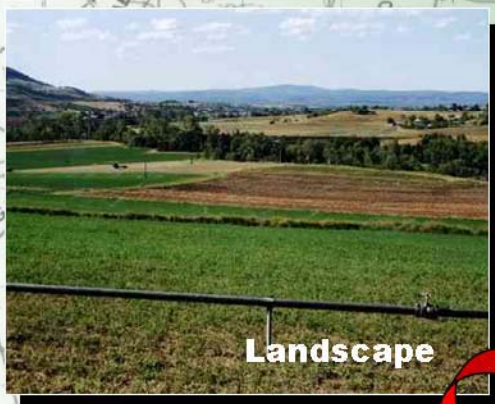
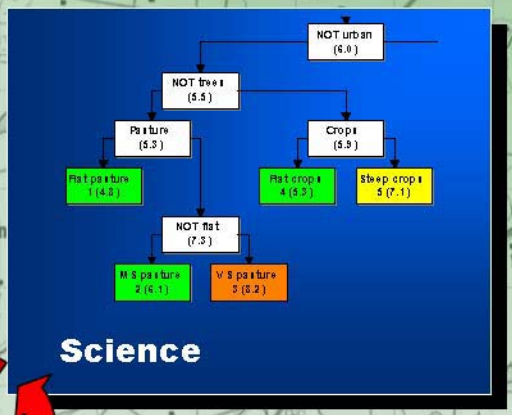
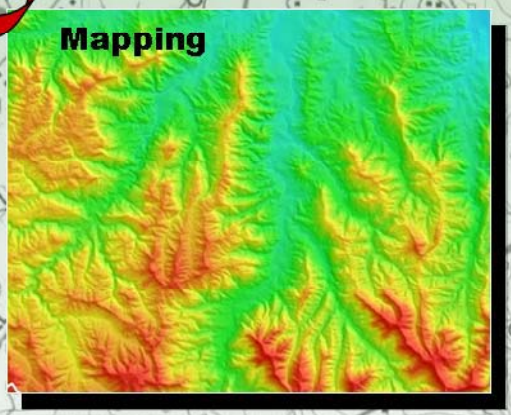
Scenic Amenity of the Lockyer

A community resource for the enjoyment of current and future generations







Regional partners

Gatton Shire Council – Growing Together

Laidley Shire Council

Shire of Esk

Regional Landscape Strategy Advisory Committee

Queensland Government – Environmental Protection Agency, Department of Main Roads

Powerlink Queensland

Project consultants

Forest Images Pty Ltd

Geo Mapping Technologies Pty Ltd

Buckley Vann Town Planning Consultants Pty Ltd

Petmond (Consulting) Pty Ltd

July 2002

Foreword

The fertile lands of the Lockyer Valley and adjoining parts of the Brisbane Valley are renown for the agricultural products they provide to people of South East Queensland and beyond. In years to come, I expect that the Lockyer will also be recognised as a leisure and tourism asset of our region and as an ecosystem that provides a range of essential services.

I am therefore pleased to introduce this report on the 'Scenic Amenity of the Lockyer', now released for public comment. Our rural scenery makes life more pleasant for us and is attracting increasing numbers of tourists and people interested in outdoor recreation. If we of the Lockyer manage our scenery carefully, I am confident it will provide us with social and economic benefits that will help secure our future.

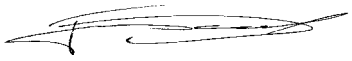
This report is the result of the support of my fellow Mayors and Councils of Laidley and Esk, who saw the advantages of working with the Regional Landscape Strategy, Powerlink Queensland, and other government agencies on this innovative study. On behalf of the three Councils, I congratulate the Regional Landscape Strategy Advisory Committee for developing this community-based approach to measure scenic amenity, now endorsed by the South East Queensland Regional Organisations of Councils.

I also acknowledge the work of the project's Steering Committee, particularly the chair, Cr. David Neuendorf of Gatton, and the deputy chair, Cr. John Miles of Laidley. I make special reference to Steve MacDonald and Mr Neil Young, both of whom carried this study forward, breaking new ground for their respective organisations. Powerlink Queensland has been a primary funder of this study while the Regional Landscape Strategy provided the underlying framework for the partnership and critical technical expertise. In addition, the three Councils, the Department of Main Roads, Queensland Rail, the Environmental Protection Agency, and the Department of Transport provided important financial and in-kind support. I also commend the consultants for their professionalism and diligence in undertaking a credible and thorough study.

This study has set new standards by using the community to assess the amenity of scenery for an extensive part of our region. Over 300 local residents and visitors ranked photos of the Lockyer. These surveys produced information on the average community preferences for scenery for a range of landscapes. This approach allows all people's opinions to have equal value. These techniques may have wider application.

The study's map of scenic amenity, after this next period of public consultation, may be used to support the planning schemes of each local government. So, I encourage residents to examine the information in this report, its maps, and to consider the draft planning guidelines. Your responses will assist us, the three Councils, to understand your opinions as we continue to cooperate with the community to manage the scenic amenity of the Lockyer.

As the Western Region Organisation of Councils representative on the Regional Landscape Strategy Advisory Committee I have been proud to be associated with this study and commend the report to you, for your consideration.



Jim McDonald
Mayor
Gatton Shire Council

Scenic Amenity of the Lockyer

Consultants Report for public comment
July 2002

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Lockyer Scenic Amenity Study

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Acknowledgements

Many people from participating government organisations, the community, and other consulting groups have provided important input to this report and the study.

People who have participated in meetings of the steering committee in addition to members of the steering committee (see previous page) include: Carmel Sciani (Powerlink Queensland), Robert Allen (Three Plus Pty Ltd), Cr. Danny O'Brien and Kate Imrie (Laidley Shire Council), Helen Ross (University of Queensland Gatton Campus), Angus McGuckian (Department of Main Roads), Peter Mackay (WESROC), Mick McNiven (Qld South Representative Body Aboriginal Corporation), Sharon Moller (Department of Transport), and Paul Grimshaw (QNPWS).

The contributions of Veronica Schilling (Gatton Shire), Neil Young (Powerlink Queensland), Michelle Booth (Laidley Shire), Jenny Rushbrook (Bicentennial National Trail) and Russell Holland (Regional Landscape Unit, EPA) in supporting and coordinating this study have been invaluable.

People who have attended meetings of the scenic amenity community consultation group include Don Neumann, Marg Smith, Marg Young, Kay Bell, Jim Kerr, Judy Whistler, Bill Flynn, Noel Nemeth, Stan Edwards, Sue Beardmore, Jenny Rushbrook, Greg Diete, Kate Diete, Rob Bauer, and Trude Townsend.

Information on viewing locations has been provided by Gatton, Laidley and Esk Shire Councils, the Department of Main Roads, and members of the study's Community Consultation Group. Chris Black entered GIS information about viewing location for Laidley Shire. Matt Schultz entered GIS data for Gatton. Maurie Wann provided GIS data for Esk Shire. Hayley Dixon and Shirley Briggs at Gatton Shire have assisted with administration of the study. Lorraine Walker (Lockyer Valley Tourism Office) and Gary Reynolds (Gatton Shire) also assisted with providing information on tourism locations in the region. The digital elevation model used for visual exposure and scenic preference modelling was provided by the Department of Natural Resources and Mines, as was data on tree and land cover.

Recruitment of people for random community interviews was conducted by Mandy Moreton, Sue Reinecke and staff of Sunstate Research. Caroline Penny, Lee Pousson, Gina Lofaro of Sunstate Research also conducted data entry. Collation of mapping data and generation of maps was conducted by Dan Dent and David Moore of Geo Mapping Technologies Pty Ltd. Jean Sandall (University of New England) and Ian Bishop (University of Melbourne) contributed suggestions to improve survey procedures. Peter Lawson of Petmond (consulting) assisted with taking photos, conducted the majority of community interviews, conducted the community engagement program, and contributed to coding of photos. Photo-montages were skilfully developed by Kris Briede of Keb Design. Anne Wiseman contributed to data entry, coding of photographs, and editing of this report. Rob Bauer and Trude Townsend of Lockyer Discover Tours provided transport for the community field day.

Voluntary interviews & interview facilities were organised by: Sheila Faulkner (Lockyer High School), Nicki Hughes (Laidley High School), Dyan Currie (Toowoomba City Council), Sue Gower (Qld Cancer Fund), Tim Anderson (University of Queensland), Andrew Davison (Lockyer Catchment Centre) & Wendy Johnson (Palace Backpackers).

Members of the Scenic Amenity Technical Working Group, including Brett Waring, Tony Prineas, Andrew Owen, Lindsay Mullins, and Michael Madden have contributed many useful ideas on improvements to the scenic amenity methodology during this study.

Robert Preston
Director, Forest Images Pty Ltd

Executive Summary

Background

Lands in the catchment of Lockyer Creek and adjoining sections of the Brisbane River are renowned for their agricultural productivity, recreational and tourism opportunities, and nature conservation values. They lie in close geographical proximity to Brisbane, Ipswich and Toowoomba.

Scenic amenity is an important community resource that contributes to the lifestyle of residents and the experience of visitors to the Lockyer. Scenic amenity is an objective measure of how much the community appreciates and benefits from the aesthetic value of these landscapes.

Scenic amenity is one of the important factors that need to be considered by local governments and the Queensland Government when deciding the best use of land and the nature of development. Other values that need to be considered in the planning decisions including agricultural potential, tourism, economic and social values, nature conservation, outdoor recreation, cultural, and water production.

New planning schemes being prepared by Gatton, Laidley and Esk Shires will provide the primary mechanism for governments to plan for future growth, and implement social, economic and ecological goals to provide balanced outcomes for local residents and visitors to the region.

The Regional Landscape Strategy Advisory Committee (RLSAC) has recently developed a structured method to measure scenic amenity that may be adopted by local governments for inclusion in planning schemes. This framework recognises that the assessment of scenic amenity requires consideration of two factors: scenic preference (how much the community likes the appearance of the scenery) and visual exposure (how much the community can see of the landscape from public viewing locations). Assessment of scenic amenity results in production of three separate maps: visual exposure, scenic preference, and scenic amenity.

This study has been initiated to assist the Gatton, Laidley and Esk Shires to develop strategies to manage scenic amenity, and to provide participating Queensland government agencies and other groups with valuable information that may assist the planning of future tourism opportunities, industry and infrastructure.

The study has been conducted within a broad cooperative framework of local government, Queensland Government, and community representatives. Whilst the breadth of this partnership has brought challenges, it has been necessary to face the range of issues surrounding the management of scenic amenity in the Lockyer. In particular, community understanding and involvement is a pivotal element of the assessment process and implementing study outcomes. The community consultation group has played an important role in influencing the direction of the study. Members of the group recognise the great potential of this study to enhance and maintain the vitality of the Lockyer, and have expressed both support for this report and concern that related scenic management issues are addressed with the involvement of community.

Community Surveys of Scenic Preference

Because of the diversity of community opinions about scenery and the practical limitations involved in conducting field assessment of scenery, the scenic amenity methodology developed by the RLSAC advocates the use of photos to depict and evaluate people's preference for scenery. Photos can be readily compared against each other and efficiently shown to large numbers of people.

In this study a total of 121 unique photos were shown to 326 people. This includes 207 people from the study area, 35 people from Toowoomba, 37 people from Brisbane, 30 tourists, and 17 participants from other parts of country Queensland. People were asked to rank the photos from 10 to 1 according to how much they would prefer to look at the scenery depicted by the photo. A sub-sample of people also recorded information about

their emotional responses to scenery, what they noticed about the scenery, and information about themselves.

These surveys found that

- Scenery with a very high or high community preference (ie. with an average rating of 10.0 to 8.1) is characterised by the absence of built structures. Major landscape elements include water, green pasture, and trees.
- Scenery with a moderately high community preference (ie. with an average rating of 8.0-7.1) is characterised by the absence of close or mid-distant built structures. Fences do not affect people's preferences. Major landscape elements include trees, crops, pasture, and forested hills.
- Scenery with a medium or varied community preference (ie. with an average rating of 7.0-4.1) is characterised by mid-distant built structures such as transmission towers, industrial sheds, houses, or billboards. Major landscape elements include dry pasture, crops, and mainly flat topography.
- Scenery with a moderately low community preference (ie. with an average rating of 4.0-3.1) is characterised by a moderate volume of evident built structures such as transmission towers, power poles, transport embankment, industrial sheds, towers, or billboards. Major landscape elements include dry pasture, crops, no forested hills and mainly flat topography.
- Scenery with a very low or low community preference (ie. with an average rating of 3.0-1.1) is characterised by a high volume of evident built structures such as transmission towers, power poles, transport embankment, or earthworks. Major landscape elements include dry pasture, cleared vegetation and exposed soil.

Most people said that they dislike scenery that has a community preference rating of 1 or 2. There is stronger agreement about what types of scenery people like, compared to the types of scenery people dislike. People said that preferred scenery is mainly peaceful or relaxing. Scenery that has a low preference was described as ugly, disgusting or distressing. These results reinforce the importance of attractive scenery to people's quality of life and the experience of visitors to the region.

There is a tendency for younger people to be more accepting of some development, and for older people to prefer moderately high scenery than other age groups. People from overseas tend to have a lower preference for steep pastures and for crops than people from Queensland. There does not appear to be any major differences in the preferences of people from the Lockyer compared to people from Brisbane or Toowoomba.

Each photo was evaluated with respect to topographic steepness (steep, flat); land cover (eg. trees, crops, pasture); the type of development (eg. quarry, road, transmission tower), and the apparent volume of evident development (high, moderate, low).

This analysis shows that photos of steep land are rated more highly than flat land; and that landscapes with water are rated more highly than those without. The three factors - topographic steepness, land cover, and volume of evident development are important factors that affect scenic preference. A high volume of evident development has a greater overall effect on scenic preference in a forest setting than other environments because of the higher community preference for forest and natural settings.

A simple statistical model based on the use of '"decision trees" has been developed to provide a general estimate of community preference for scenery based on the volume of evident development in photos and land cover setting.

The analysis suggests that the apparent volume of evident development has a major bearing on scenic preference. Put simply, larger developments close to viewing locations will have a stronger negative impact on scenic preference than smaller and more distant developments. This conclusions holds for all settings and all types of development, with the possible exception of refuse centres and billboards. Also, high volume developments result in a greater proportional reduction of scenic preference in forests because of high community preferences for natural settings.

Scenic Preference Mapping

A simple statistical model was also developed to predict scenic preference from current mapping and information about community ratings of scenery obtained from the photo surveys. This model segregates scenic preference ratings into 11 classes based on land cover and topographic classes that correspond with those available on maps.

The scenic preference map produced using this model shows scenic preference in the range 4 to 10. No developments lower than 4 are illustrated since limited mapping of these developments is available, and photos with a high volume of evident development were excluded from the model.

Areas of highest scenic preference occur on steep forested areas and along the Brisbane River. Areas of lowest scenic preference are urban townships. The scenic preference of 4 for urban areas indicates the influence of residential buildings and industrial buildings on the surrounding scenery.

Viewing Location Inventory

Information on the distribution of viewing locations was collated to indicate those public places used by the community to view scenery. This network includes roads, trails, and destinations such as schools, parks, and lookouts.

A map of viewing locations shows the importance of the Warrego Highway, the Brisbane Valley Highway, and the new 'Cobb and Co Way' as some of the most important viewing locations in the study area. Many other important viewing locations are centred on the major towns of the study areas, illustrating the importance of views from these localities. Other sites such as schools, local roads, lookouts, trails and tourism facilities also contribute to the pattern of landscape visibility throughout the study area. Aerial views were not taken into account in this study.

Whilst information on viewing locations has been compiled principally for the purpose of estimating visual exposure of places in the landscape seen from these locations, the viewing locations themselves, and the zone immediately adjacent to viewing locations, is particularly sensitive to developments. It is important to consider the special management of the zone up to about 400m from the viewing locations, depending on the nature of the landscape around the location, the overall importance of the viewing location, and the nature of the development.

Visual Exposure Mapping

A visual exposure map was prepared to highlight those places that people see most often in the Lockyer. The Geographic Information System used to calculate visual exposure calculates the approximate number of people and the time they spent looking at each place in the landscape. The value of each viewing location is reduced according to the distance between the viewing location and the landscape, and the attenuation of visibility due to the intervening land cover. This mapped information is then allocated to 10 classes of approximately equal area to indicate the 10% of the land area that is most seen, through the 10% of the land area that is least seen.

The visual exposure map of the Lockyer highlights the importance of ridges and hills visible from central parts of the valley. A large portion of the study area in the centre of the Valley has moderate visual exposure.

This study also highlights the high exposure of many built areas, particularly around the central parts of Gatton and Laidley, areas adjacent to highways, tourist routes, and other major roads.

Scenic Amenity Mapping

A scenic amenity map was produced by combining maps of scenic preference and visual exposure using a look-up table indicating how different levels of visual exposure and scenic preference combine to produce estimates of scenic amenity. Scenic preference is the primary determinant of scenic amenity, and is modified by visual exposure.

Areas of higher scenic amenity include forested ranges of in the west, north and south of the valley that face the central parts of the Valley. Much of the central Valley has moderate scenic amenity.

Conclusions of mapping

Community-based evaluation of maps highlighted the general nature of current mapping and the need for clear field procedures to support accurate assessments of scenic amenity. The reliability of scenic amenity maps is generally comparable to the reliability of other mapping of natural resource values at 1:50,000 to 1:100,000 scale.

Further investigations

The study has highlighted several important opportunities to improve the understanding and precision of scenic amenity estimates. These improvements include:

- Developing a more comprehensive scenic preference photo model based on photo-cell data, to predict community ratings of scenery at a "site" scale.
- Developing and testing field based procedures to verify scenic amenity mapping in the context of development proposals.
- Developing a 3-dimensional mapping model capable of predicting the quality of views of specific localities to a higher precision than has been achieved with current models and maps.
- Identifying ideal lookouts or scenic routes that would increase viewer experience of scenery.

These investigations would support the community, local governments and the Queensland Government in their management of scenic amenity.

Objectives for management of scenic amenity

A series of management objectives are proposed for each scenic amenity category. The proposed management objectives seek to *protect* areas with very high and high scenic amenity, *maintain* the values of areas with moderately high and moderate scenic amenity, and support programs to *enhance* the values of areas with moderately low or low scenic amenity.

Mechanisms for management of scenic amenity

A number of mechanisms are available to advance the management of scenic amenity of the Lockyer. These include:

- Promoting best practice. One of the preferred mechanisms for management of scenic amenity is to promote best practice landscaping and planning by local government, State Government, industry, and tourism organisations.
- Raising community awareness. Scenery is something that we all enjoy, but there is less awareness of the way scenic amenity is measured, and how it can be managed. It would be valuable to develop a community and government to explain scenic amenity and how we can best manage it.
- Increasing people's opportunities to enjoy scenic areas. Some areas of high scenic amenity and high scenic preference may be unseen or inaccessible. It may be possible to promote enjoyment of these areas by identifying existing routes and places with good views of these scenic areas, and promoting these places in conjunction with other agencies or organisations.
- Tourism marketing and promotion. The Lockyer Valley and Brisbane Valley contain many beautiful and peaceful areas that are promoted through existing brochures and publicity material. An opportunity exists for tourism bodies in the study area to review and discuss the findings of this study and consider opportunities to enhance current marketing strategies. There may also be value in reformatting some of the products of this study, especially mapping and photos, to contribute to a special promotion of some of the scenic assets of the area.

- Promoting adoption of common guidelines for regulating scenic impacts of development. General guidelines for minimising the impact of developments on scenic amenity are proposed. These guidelines outline general procedures for on-site assessment and general mitigation procedures. It would be possible to promote adoption of these guidelines and encourage all levels of government and industry to develop a uniform approach for managing the impact of development on scenic amenity. These guidelines could also be refined once the proposed scenic preference photo model is completed.
- Recognising scenic amenity in local government planning schemes. It would be possible for local governments in the Lockyer to address management of scenic amenity using a variety of mechanisms such as: adoption of a planning policy on scenic amenity, development of specific planning codes, local area planning, development control plans, or amendment to the planning scheme to include a separate thematic planning provision on scenic amenity.
- Establishing a Lockyer scenic amenity advisory committee, including both government and community representatives, to act as an advocate for scenic amenity and assist coordinated management of scenic amenity by local government and the Queensland government.

Conclusions

The Lockyer Scenic Amenity study provides the community and government with a comprehensive set of information about peoples preferences for different types of scenery, the range of opinions in the community about scenery, and how development effects peoples liking of scenery. It shows those public places were people view scenery, and those parts of the landscape that can be seen most often.

It provides a set of comprehensive mapping that shows the scenic characteristics of different localities in the Lockyer. This information is accessible to the community, local governments and the Queensland government.

The study proposes a series of management objectives that will protect, maintain, and enhance scenic amenity. A series of mechanisms to achieve these objectives are proposed.

This information will be of assistance to community and government organisations with an interest and responsibility for ensuring scenic amenity of the Locker remains a community resource for the enjoyment of current and future generations.

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1 Background

Lands in the catchment of Lockyer Creek and adjoining sections of the Brisbane River are renowned for their agricultural productivity, recreational and tourism opportunities, and nature conservation values. They lie in close geographical proximity to Brisbane, Ipswich and Toowoomba.

New planning schemes being prepared by Gatton, Laidley and Esk Shires will provide the primary mechanism for governments to plan for future growth, and implement social, economic and ecological strategies to provide balanced outcomes for local residents and visitors to the region.

Scenic amenity is one of the important values of landscapes to be addressed in these planning schemes, along with other values such as nature conservation value, water protection value, agricultural potential, and other economic and social values. These planning schemes are being prepared in accordance with the Integrated Planning Act (1997) and policies of the Department of Local Government and Planning.

The Regional Landscape Strategy Advisory Committee (RLSAC) has recently developed a structured method to measure scenic amenity that may be adopted by local governments for inclusion in planning schemes. This approach has been developed in response to the Regional Framework for Growth Management (RFGM) (SEQ2021, 2000).

Maps of scenic amenity can be included with background studies of other values to guide local governments in the formulation and implementation of development strategies to protect scenic amenity.

This study has been initiated to assist the Gatton, Laidley and Esk Shires to develop strategies to manage scenic amenity, and to provide participating Queensland government agencies and other groups with valuable information that may assist the planning of future tourism opportunities, industry and infrastructure.

2 Study area

The study area covers approximately 318,000 hectares measuring about 80km east west and 75km north south. The study area includes the catchment of the Lockyer Creek except where the catchment extends into Toowoomba City and Crows Nest Shire. The study area includes all of Gatton and Laidley Shires, south-eastern Esk Shire, and parts of Ipswich City and Cambooya Shire within the Lockyer catchment. The full extent of the study area is shown in Map 1.

The study area extends from the D'Aguilar Ranges north of Fernvale in Esk Shire, south to Minden on the Warrego Highway then Mt Mistake National Park in southern Laidley and Gatton Shires. The western boundary of the study area follows the Lockyer catchment through Cambooya Shire to Toowoomba, where it follows the Gatton Shire boundary north to Ravensbourne. It then follows the northern boundary of the Lockyer Catchment to include Buaraba Creek and the southern face of Mt Hallen before joining with the Brisbane River below Wivenhoe Dam.

The pattern of land use in this area follows the rich alluvial soils of most creek systems. Major crops grown in this district include grains, vegetables and lucerne pastures cut for hay. Much of the land in valleys has been cleared for cattle grazing, which is still an important industry. Large areas of remnant forest remain in upland areas of the Helidon Hills to the north west of the district, Mt Mistake in the south, and the D'Aguilar Range in the east.

Table 1. A break-down of the study area by Shire.

Shire	*Hectares*	*Percent*
Gatton	157,246	49.4%
Esk	76,363	24.0%
Laidley	70,107	22.0%
Cambooya	10,459	3.3%
Ipswich	3,853	1.2%
Total	318,029	100.0%

The Lockyer district is experiencing major population growth with urban expansion and increased rural-residential subdivision. The three Shires contained less than 2% of the population of South-East Queensland in 1996. The rate of growth, about 3% per year, is similar to the growth expected in other parts of the region. Population details are given in Table 2

Table 2. Current and forecast population for the three major Shires in study area.

Shire	*Population 1986*	*Population 1996*	*Forecast 2016*	*Population growth 86-96*	*Growth 96-16*
Esk	10,763	13,860	16,850	29%	22%
Gatton	12,653	15,090	17,340	19%	15%
Laidley	7,178	12,450	21,880	73%	76%
Combined	32,580	43,396	58,086	33%	34%

Source: DCILGP Population Projections 1998

The geographical proximity of the area to major population centres, combined with its natural and rural diversity, makes it attractive for residential settlement and tourism. A recent example of this growth is the opening of the Peppers Hidden Vale Lockyer Valley Retreat and Resort near Grandchester. The Glen Rock Regional Park in southern parts of Gatton Shire has also recently opened its gates for outdoor recreation.

The Lockyer area also contains important transport and infrastructure corridors that link western Queensland to Ipswich, the Gold Coast and Brisbane.

3 Study framework

3.1 What is scenic amenity

We all enjoy a good view. Rolling landscapes of tree and water are more pleasant to look at than areas with dense metallic buildings and other infrastructure. Commercial and industrial buildings have their place. As individuals and as a society we are reliant on the goods and services provided from businesses and utilities that have little visual appeal. But in some locations the beauty of the surrounding environment is greater than the functional values provided by industry and utilities.

We all tend our gardens and maintain our houses for both their functional values and their appearance. In many instances we may have chosen to live where we do because of the surrounding views, and we often holiday in places with magnificent scenery.

However, in deciding how to use and manage land at a broader scale, our community and government sometimes overlooks the need to achieve a balance of function and aesthetics across the landscape. We have collectively embraced the need to care for the natural

environment, and maintain our economic prosperity, but we have also missed opportunities to recognise the value of beauty in the countryside around where we live - our extended back yard.

The reasons for this situation are many, in particular the fact that we are a cross-cultural nation with many different views about what constitutes landscape beauty. Decisions about the best use of land often ignore scenic amenity because it is too ambiguous.

Whilst there are many instances where community and government have worked together to protect the appearance of landscapes, and minimise the effects of development, there are unfortunately more cases where landscape aesthetics has been given little consideration.

The approach developed and advocated by the Regional Landscape Strategy Advisory Committee (RLSAC) has taken a different approach to contemporary procedures for assessment of scenic values. Most other studies of scenic values assume that the weighting given to different elements of the landscape and the effects of development can be defined from existing theory on landscape values.

However, the RLSAC advocates that it is necessary and logical to determine the importance of difference landscapes by measuring the 'community preference' for particular types of scenery, and by objectively identifying those landscapes that we see most often. The philosophy and technical details for achieving this have been developed over the past 3 years in cooperative projects between the Regional Landscape Strategy Advisory Committee (RLSAC) and other local governments in South-East Queensland.

As explained in more detail in Appendix 1, the framework for assessing scenic amenity has been developed and tested at two different landscapes at Moggill, near Brisbane, and Glen Rock, south of Gatton.

This framework recognises that two factors need to be considered in evaluating the scenic value of any locality. These factors are scenic preference (how much the community likes the appearance of the scenery) and visual exposure (how much the community can see places in the landscape). Figure 1 indicates the interaction of these two factors.

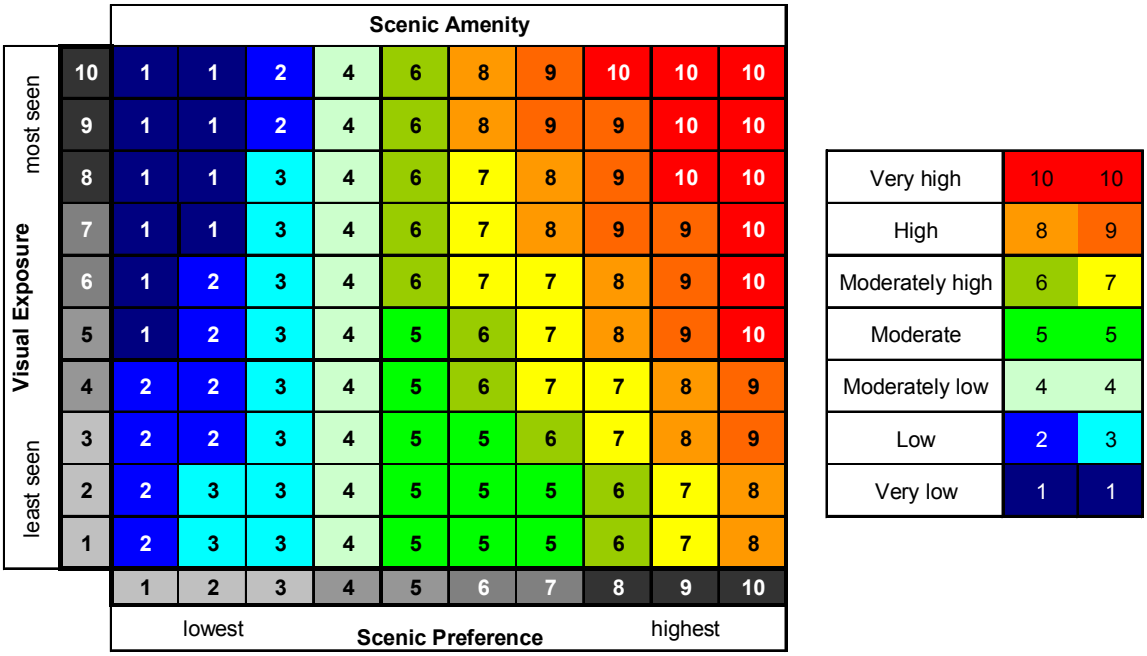


Figure 1. The scenic amenity of any locality is assessed by considering how much people prefer the appearance of that landscape (ie. scenic preference) and how much that place can be seen (ie. visual exposure).

The scenic amenity of any locality is primarily determined by its scenic preference and modified by its visual exposure. For example, a place in the landscape with a scenic preference of 5 may have a scenic amenity of 5 or 6, depending on whether it has a lower (1-5) or higher (6-10) visual exposure. In situations where the scenic preference is 5 or higher, increasing the visual exposure will increase its scenic amenity. However where the scenic preference is 3 or lower, increasing the visual exposure will decrease its scenic amenity. This is based on the logic that the community benefits more from seeing attractive areas, but experiences a loss of benefit from seeing more of unattractive areas.

The structure of this table recognises that the community can derive an equal level of benefit from high exposure to an area of moderate scenic preference as it does from low exposure to an area of high scenic preference. For example, an area of land with a scenic preference rating of 5 and a visual exposure of 10 will have a scenic amenity rating of 6, and an area of land with a scenic preference rating of 8 will also have a scenic amenity rating of 6 if the visual exposure is 1.

3.2 Stages in assessing scenic amenity

The Regional Landscape Strategy Advisory Committee (RLSAC) has defined five stages to the mapping of scenic amenity, as depicted in Figure 2 (Preston, 2001).

Community surveys (box 1 in Figure 2) provide information about community preferences for scenery of different types of landscapes. A statistical model developed from this information is applied during scenic preference mapping (box 2 in Figure 2), which relates people's preferences to maps of land cover and topography.

An inventory of viewing locations (box 3 in Figure 2) is used to identify important viewing locations and allocate a rating to each location based on an estimated viewing duration, number of viewers per day, and appreciation level for the different groups of viewers (eg. people riding bicycles, people on a picnic).

Visual exposure mapping (box 4 in Figure 2) relies on the use of a digital terrain model to assess how often a place in the landscape can be seen from different viewing locations. This assessment is weighted by the distance between a point in the landscape and the viewing location, and takes into account the orientation of the landscape to the viewer, and the importance of the location. Visual exposure mapping also takes into account the attenuation of visibility between the viewing location and the seen part of the landscape resulting from intervening land cover (eg. trees) and topography.

The final stage of mapping scenic amenity (box 5 in Figure 2) requires integration of the visual exposure map and the scenic preference map, to identify the relative contribution made by different places in the landscape to the collective community appreciation of scenery.

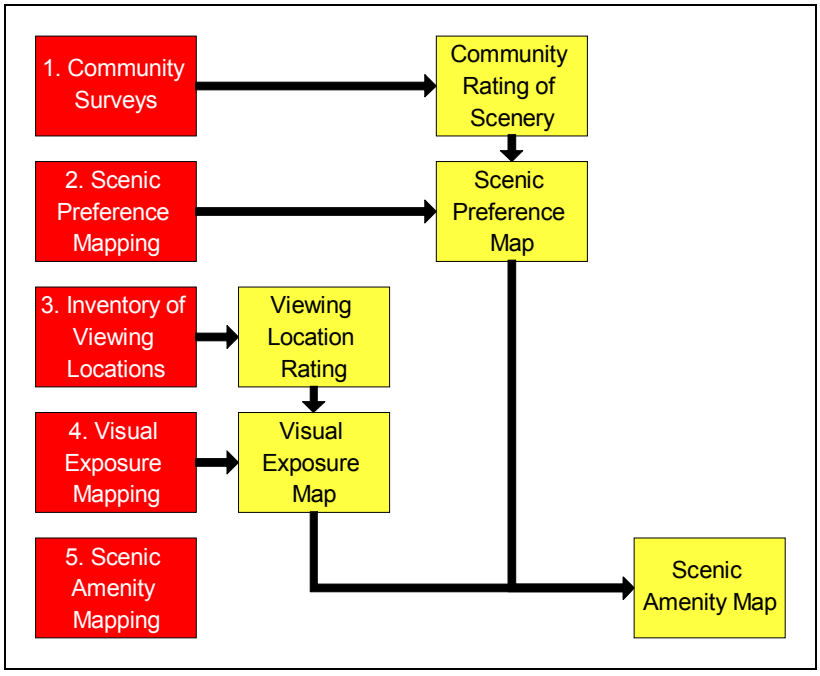


Figure 2. Mapping of scenic amenity requires implementation of five stages.

3.3 Regional cooperation

The Lockyer Scenic Amenity Study was initiated by the Regional Landscape Strategy Advisory Committee (RLSAC), Powerlink Queensland, and the Western Subregional Organisation of Councils (WESROC) to deliver a facility to the shires of Gatton, Laidley and Esk to use in their

planning schemes. Local governments in South East Queensland are required to consider scenic amenity in their planning schemes by the Regional Framework for Growth Management (RFGM) and the Integrated Planning Act (1991).

The study was also expected to provide Queensland government agencies with valuable information that may assist the planning of future tourism opportunities, industry and infrastructure.

Whilst the Regional Landscape Strategy Advisory Committee, Powerlink Queensland and WESROC initiated this study, it has been directed by a broadly based steering committee with the position of Chair and Deputy Chair held by Councillors from Gatton and Laidley Shire Councils respectfully. A range of other community organisations and Queensland Government agencies have been invited to participate on the Steering Committee. Since inception of the study, the Department of Main Roads, Queensland Rail, and the Department of Transport have joined the study as members of the Steering Committee.

The study has thus been implemented as a cooperative project between the Gatton Shire Council, Laidley Shire Council, Esk Shire Council, the Regional Landscape Unit of the Environmental Protection Agency, Powerlink Queensland, Queensland Rail, the Department of Main Roads, and the Department of Transport.

A team of consultants reporting directly to the Steering Committee has implemented the study. The consultancy team has had regular direct contact with members of the steering committee and the community throughout the project.

3.4 Community involvement

Since scenic amenity is about defining and managing a community resource, it is fair and appropriate to have substantial community involvement in the assessment process. The study has provided five different mechanisms for community involvement.

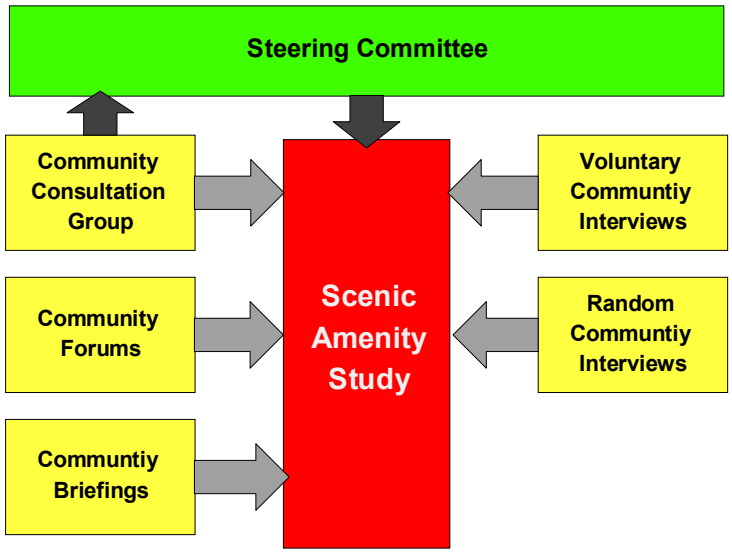


Figure 3. There were five opportunities for community involvement in the study. Most people were involved through the random community interviews.

These include:

- Random community interviews were the main vehicle for involving people in the study. People from Gatton, Laidley and Esk Shires were the main group involved in this part of the study. People from Toowoomba and Brisbane also participated in these interviews.
- Voluntary community interviews were held to involve interested community members, including school students, to contribute to defining a community rating of scenery.
- Community briefings. Presentations to seven different community groups across the Lockyer were made to inform people about the project and solicit their future involvement in the study. These groups included the Toowoomba Bushwalkers Association, the

Gatton Lockyer Reins Trail Horse Club, the Fernvale & Districts Progress Association, Laidley Shire Community Care, the Lockyer Valley Tourism and Development Association, the Brisbane Valley Tourism Association, and the Lockrose P& C Association.

- Community forums were conducted at Laidley and Gatton to generate knowledge and interest in the study. These forums generated a series of issues that were also discussed by the Steering Committee (see Appendix 2).
- Community consultation group. A group of residents has met several times towards the latter parts of the study. The group evaluated some of the inputs and map outputs of the study. Members of the group participated in a field evaluation of the final scenic amenity mapping, and have contributed information about viewing locations. Two members of the group represent community interests on the Steering Committee.

The study has been conducted within a broad framework of local government, Queensland Government, and community partners facilitated by the Regional Landscape Advisory Committee. Whilst the breadth of this partnership has brought challenges, it has been necessary to face the range of issues surrounding the management of scenic amenity in the Lockyer. In particular, community understanding and involvement is a pivotal element of the assessment process and implementing study outcomes.

The community consultation group has played an important role in influencing the direction of the study. Members of the group recognise the great potential of this study to enhance and maintain the vitality of the Lockyer, and have expressed both support for this report and concern that related scenic management issues are addressed with the involvement of community. A copy of a letter about this report from community representatives to the Steering Committee is included in Appendix 18.

4 Community surveys

4.1 Introduction

Scenic preference surveys were conducted by showing representative photos from the study area to a cross-section of people, including residents, people from neighbouring centres, and tourists. The interview technique is based on the use of photographs because of people's familiarity with this medium to represent scenery, and the high efficiency of this approach compared to on-site visits. This is an important consideration given people's varied response to scenery and the effect of development. Surveys allow collection of a suite of information that is useful to the assessment and management of scenic amenity. Information gained from the surveys includes:

- An average community rating of each photo and each type of scenery on a scale of 1-10.
- An indication of the strength of peoples liking for scenery and their emotional responses to scenery.
- An indication of things about scenery that people notice in the photos.
- Information about peoples age and experience that may help to understand the variation in peoples responses.

4.2 Representing scenery

Photos were taken to select a full range of open space landscapes and developments across the study area. Photos of urban landscapes were not included since this study is focussed to understand people's preferences for scenery in areas of open space. A total of 121 photos were selected to represent a range of open space landscapes and developments across the Valley. The following table illustrates the types of scenery included in the photo sets with respect to the type of development and the type of open space.

Table 3. Photos were selected to represent a range of developments and different types of open space.

Type of scenery	*Examples*	*Approx no. photos*
(1) Development in open space		
Industrial and commercial	Sheds, industry, commercial, mitigation, no mitigation	7
Transmission lines (existing)	Crops, pasture, forest, steep, flat, mitigation, no mitigation	22
Transmission lines (montage)	Transmission towers and lines	2
Signs	Information signs, advertising signs, around crops, around pasture, trees, no trees	6
Residential	Small block, large block, trees, trees, roof colour	4
Residential (montage)	Pasture	1
Other development	Extractive, refuse stations, railways, electricity distribution poles, other towers, sub-station	11
	Sub-total	66
(2) Undeveloped open space		
Crops	Ploughed, grass crops, vegetable crops, grain crops, flat background, steep background	15
River, creeks, dams	River, dam, steep banks, flat banks	7
Forest	Very steep, steep, flat, no clearing, some clearing, open forest, dense forest	11
	Sub-total	55
	TOTAL	121

The selection of the final photo set was agreed by a meeting of representatives from each Shire, State agencies, and community representatives.

These 121 photos were distributed across 10 different sets of photos with 20 photos in each set. Eight photos from a range of landscapes and developments were shared between the photo sets to standardise the sets (Figure 4).

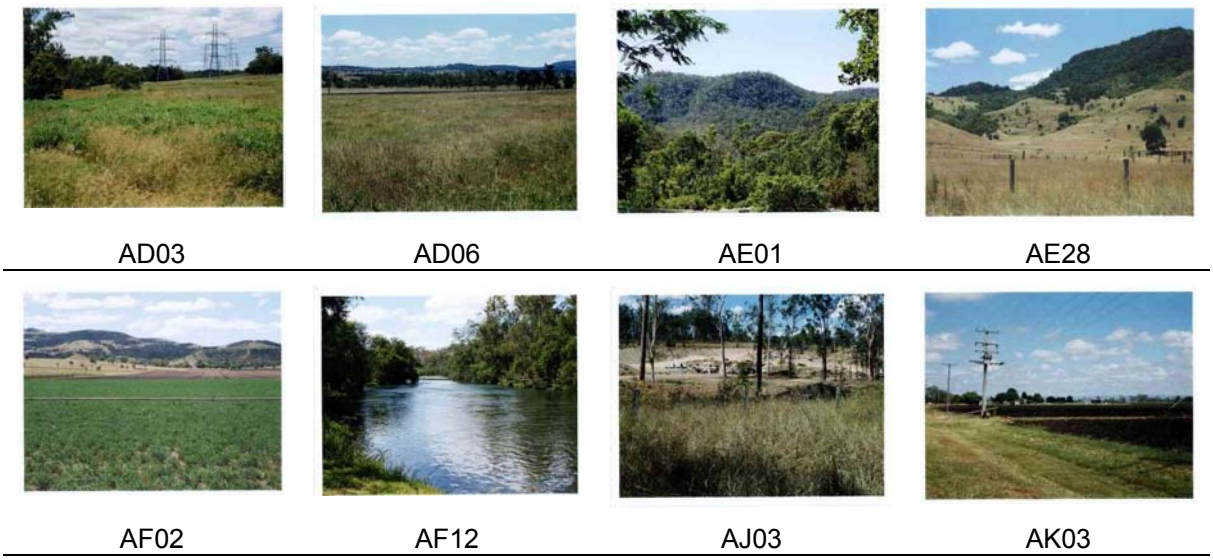


Figure 4. Photos shared between photo sets were carefully chosen to include an extended range of development types and types of open space.

Only twenty photos were included in each set because other studies have found that interview participants experience fatigue if a larger number of photos are sorted in any single session.

Table 4 illustrates how the different types of development were distributed across the 10 sets. At least two different forms of development were included in each set to enable comparison between various types of development. Transmission lines were chosen as the 'standard' form of development since they occur in many different landscape settings across the study area. A list of photos against each set is given in Appendix 5. This sampling design ensures that not less than 30 different people from a range of locations and ages were able to assess each photo.

Table 4. Photos were distributed between different sets to more than one type of open space and more than one type of development were represented in each photo set.

		Open space				Development in open space								
SET	Shared	River, creeks, dams	Forest	Crops	Pasture	Transmission (existing)	Transmission (montage)	Industrial and commercial	Transport corridors	Signs	Residential	Residential (montage)	Other development	TOTAL
1	8		1	2	2	2		5						20
2	8		1	1	2	2			6					20
3	8	1		1	2	2	1	1		4				20
4	8	1	1	1	3	2			2				2	20
5	8	1	1	2	2	2			2				2	20
6	8		1	1	2	2		5				1		20 *
7	8	1	1	2	2	2			4					20 *
8	8		1	1	2	2				4	2			20 *
9	8	1	1	2	2	2					4			20
10	8	1	1	1	2	2							5	20 *
Shared		*1*	*2*	*1*	*1*	*1*							*2*	
Total	80	7	11	15	22	21	1	11	14	8	6	1	11	200

* Note that sets 6,7,8,10 contain one or two photos that are also included in sets 1-5

4.3 Selecting people to represent communities

Australian Bureau of statistics data was obtained through the Department of Local Government and Planning to ensure the sample of people who were interviewed are proportional to the numbers of people in the study area within the Esk, Laidley and Gatton Shires. A total of 326 people were interviewed which included 17 other people from country Queensland. The following graphs (figure 5 and Figure 6) illustrate the number of people by location, age and gender that were included in the study. This sample included 230 people (140 from the Lockyer, 33 from Brisbane, 33 from Toowoomba, and 30 tourists) that were paid an incentive to attend the interviews.

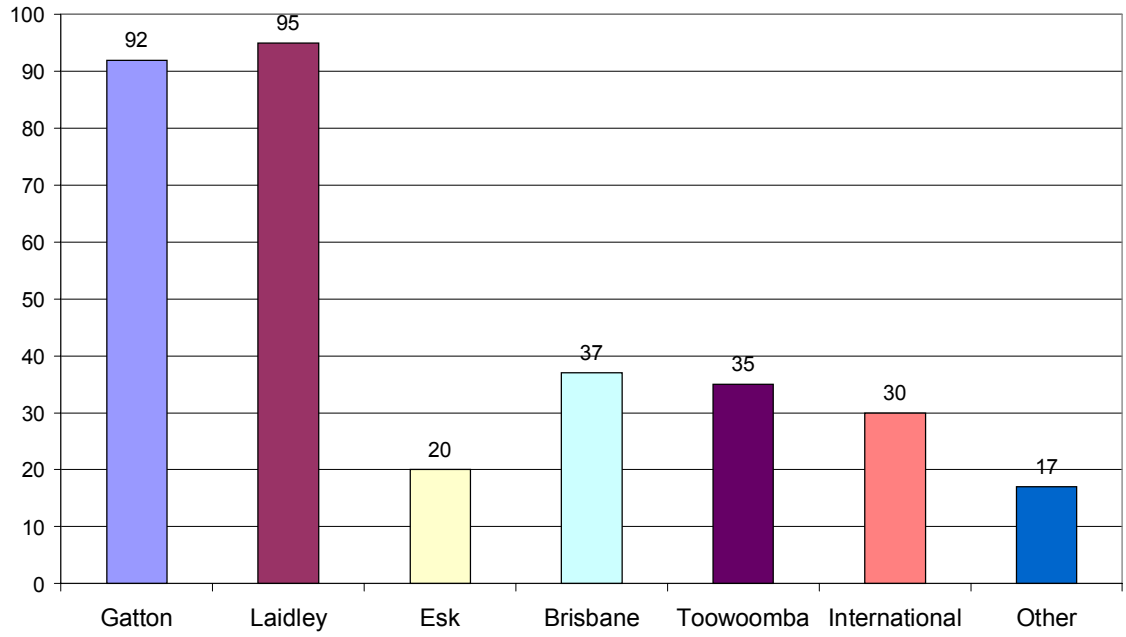


Figure 5. A total of 207 people from within the Shires of Gatton, Laidley and Esk were interviewed during community surveys.

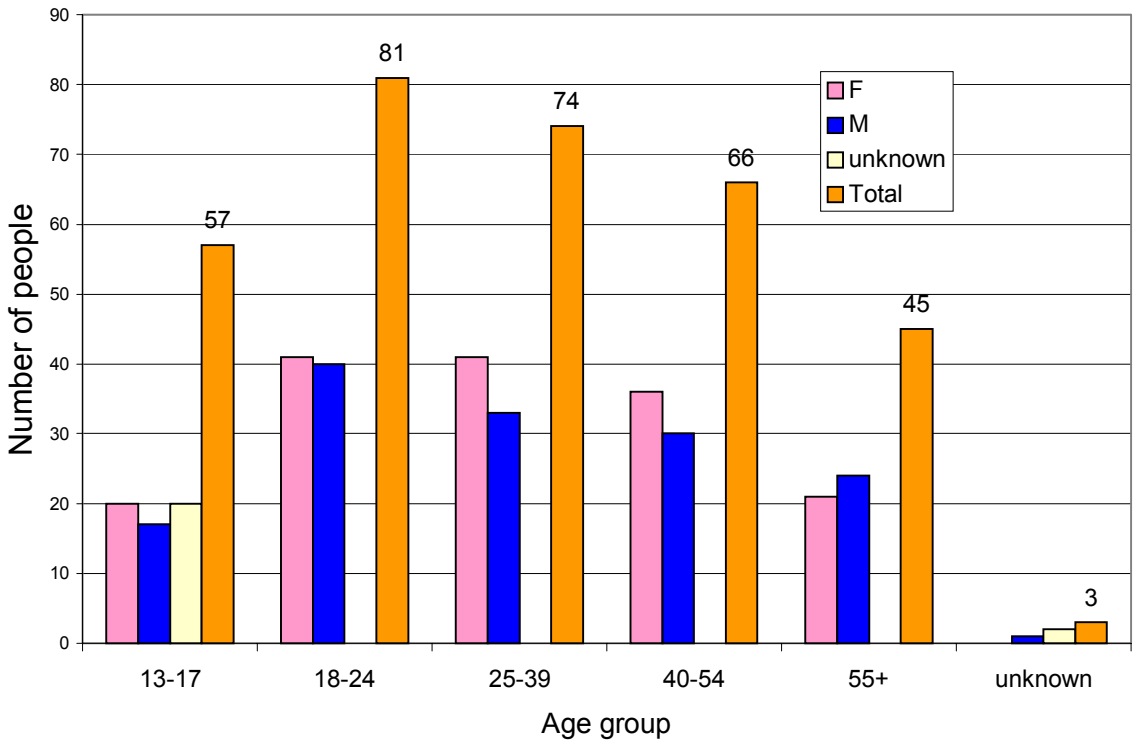


Figure 6. The community sample included a range of people of different ages and genders. Most people surveyed are from the 18-24 age group.

A list of all people interviewed, including age, occupation and location is given in Appendix 3.

4.4 Interview technique

People were interviewed in groups of up to six at a time. People completed all tasks individually. Interviews took between 50 minutes and 1hr 15 mins. Up to three primary tasks were undertaken during interviews. Only those people involved in random interviews and some volunteers were asked to complete all three tasks. All school students and international visitors only undertook

the first task of rating photos and recording information about themselves. Some students were not asked to record information about themselves.

Task A

Place the photos along the scale according to how much you like to look at this scenery. Record photo numbers on worksheet A.

Remember:

- rate photos according to the type of scenery the photo represents, not the quality of the photo, or conditions when it was taken.
- place at least one photo under '10' and one photo under '1'.
- place as many photos as you like in any one column.
- you may have gaps between columns of photos, to indicate major changes in how much you like the scenery.

Task B

Select one photo from each column 1-10 and record answers to the questions on worksheet B.

Q1. Do you like or dislike this scenery?

Q2. What are two things you noticed about the scenery that affect whether you like or dislike it?

Q3. How would you rate the scenery on four different scales.

Q4. Which one word best describes this scenery to you?

Task C

About you. There are 7 questions about how old you are, where you live, what you are involved in, and how much time you have spent in different landscapes. Record your answers to these questions on worksheet C.

Task A was repeated twice instead of task B for two thirds of the random interviews to provide a higher sample of preference data.

4.5 What people said about the interviews

People Feedback forms were made available to some participants from random interviews and most adult volunteers. Over 90% of people who responded said that they felt the interview was clear or particularly clear, interesting and useful.

Most participants provided constructive and encouraging comments on

- the intelligence clarity and objectivity of the interview process,
- their appreciation to Councils for being asked their opinion,
- their liking of scenery in the Valley,
- their concern about the effects of development on scenery and the environment.

Most participants provided constructive suggestions about

- maintaining the natural and rural beauty of the Valley,
- their appreciation for being asked their opinions, and
- keeping development (especially powerlines) away from scenic areas.

Comments collected from feedback forms are given in Appendix 4.

4.6 Survey results

4.6.1 Community rating of scenery

Basic statistics on the community's rating of scenery has been summarised for each photo in Appendix 6. Photos are arranged in order of decreasing scenic preference rating.

A selection of photos representing high to low scenic preference ratings is given in Table 6 to Table 10. These photos illustrate the main factors that affect scenic preference. The graph next to each photo in the table indicates the percentage of people who scored the photo under each rating form 1 to 10. For example, photo AF12 in Table 6 shows that almost 100% of people scored the photo '10'. This is consistent with the average rating of 9.9 out of 10.

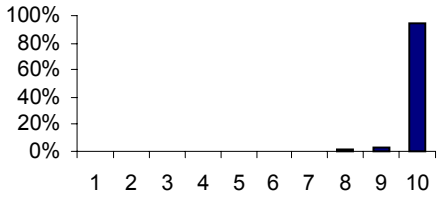
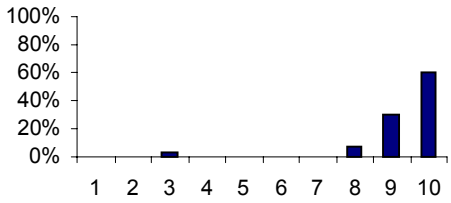
Each set of sample photos has been grouped according to its average rating or 'community scenic preference rating'.

Categories of scenic preference are outlined in Table 5.

Table 5. Ratings that correspond with scenic preference groups

Average rating	*Scenic preference group*
10.0 – 9.1	Very high scenic preference
9.0 – 8.1	High scenic preference
8.0 – 7.1	Moderately high scenic preference
7.0 – 4.1	Moderate scenic preference
4.0 – 3.1	Moderately low scenic preference
3.0 – 2.1	Low scenic preference
2.0 – 1.0	Very low scenic preference

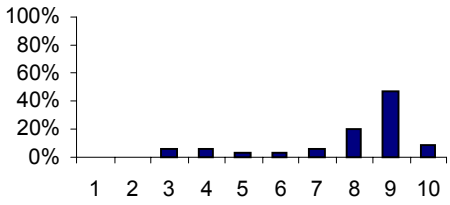
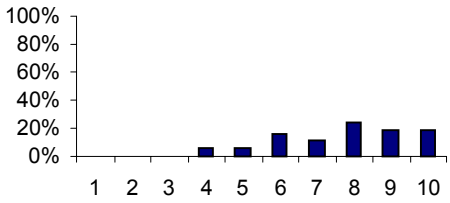
Table 6. Scenery with very high to high scenic preference.

Full rivers, creeks with trees 	AF12 ave 9.9 
Steep forested mountains and valleys 	AA07 ave 9.4 

Scenery with a very high or high community rating is characterised by:

- Absence of development except for fences.
- Major landscape elements: water, green pasture, trees.

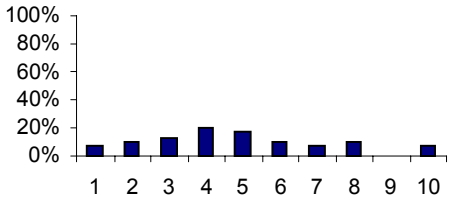
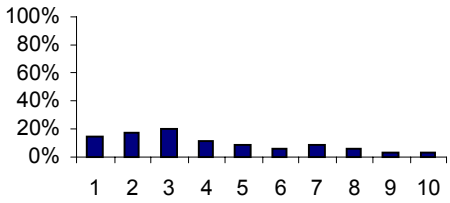
Table 7. Scenery with moderately high scenic preference.

Close views of open - sparse forest 	AE16 Ave 7.8 
Crops with views to forested hills 	AH23 Ave 7.5 

Scenery with a moderately high community rating is characterised by:

- Absent or distant development except for fences.
- Major landscape elements: trees, crops, pasture, forested hills.

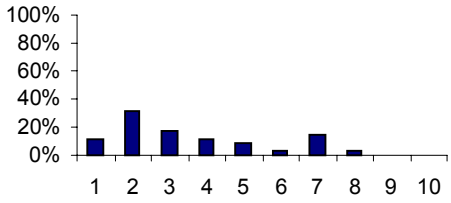
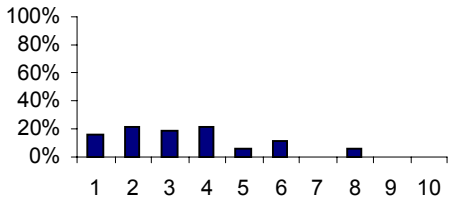
Table 8. Scenery with medium / varied preference.

Crops with mid-distant towers 	AM05 Ave 4.7 
Pasture with mid-distant industrial sheds 	AD07 Ave 4.2 

Scenery with a medium or varied community rating is characterised by:

- Mid-distant development (transmission towers, factory sheds, houses, signs).
- Major landscape elements: dry pasture, crops, no forested hills, mainly flat.

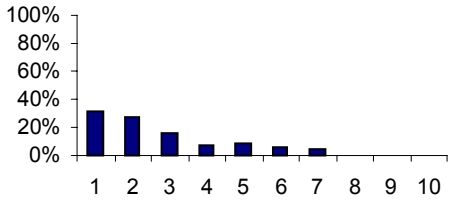
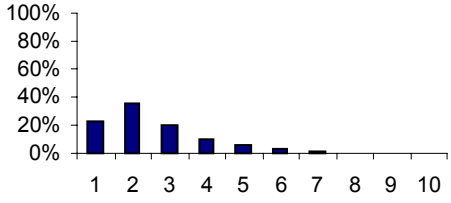
Table 9. Scenery with moderately low scenic preference.

Pasture with close transport embankment 	AH13 Ave 3.5 
Dry pasture with close billboard and trees 	AI15 Ave 3.5 

Scenery with a moderately low rating of scenic preference is characterised by:

- A moderate volume of evident development (transmission towers, power poles, transport embankment, industrial sheds, towers, signs).
- Major landscape elements: dry pasture, crops, no forested hills, mainly flat.

Table 10. Scenery with low scenic preference.

Pasture with several close towers 	AD03 Ave 2.7 
Pasture with close transport bridge 	AI05 Ave 2.5 

Scenery with a low community rating is characterised by:

- A high or moderate volume of evident development (transmission towers, power poles, transport embankment).
- Major landscape elements: dry pasture, cleared vegetation, exposed soil.

4.6.2 *Peoples emotional responses*

During the interviews a sub-set of people were invited to select one photo from each rating column (1-10) and describe their responses in more detail about that photo.

One of the first questions was for people to indicate whether they like or dislike looking at the scenery according to the following scoring system:

5 – really like this scenery

4 – like this scenery

3 – neither like or dislike this scenery

2 – dislike this scenery

1 – really dislike this scenery

People's responses to this liking question have been charted against the average community rating of photos to give an indication of the association between community rating and liking.

Figure 7 shows that most people strongly dislike photos with a rating of 1 or 2. Even photos with a rating of 2 are neither liked nor disliked by about 20% of people. There is stronger agreement on the positive side, where less than 5% of people neither like nor dislike scenery with a rating of 8.

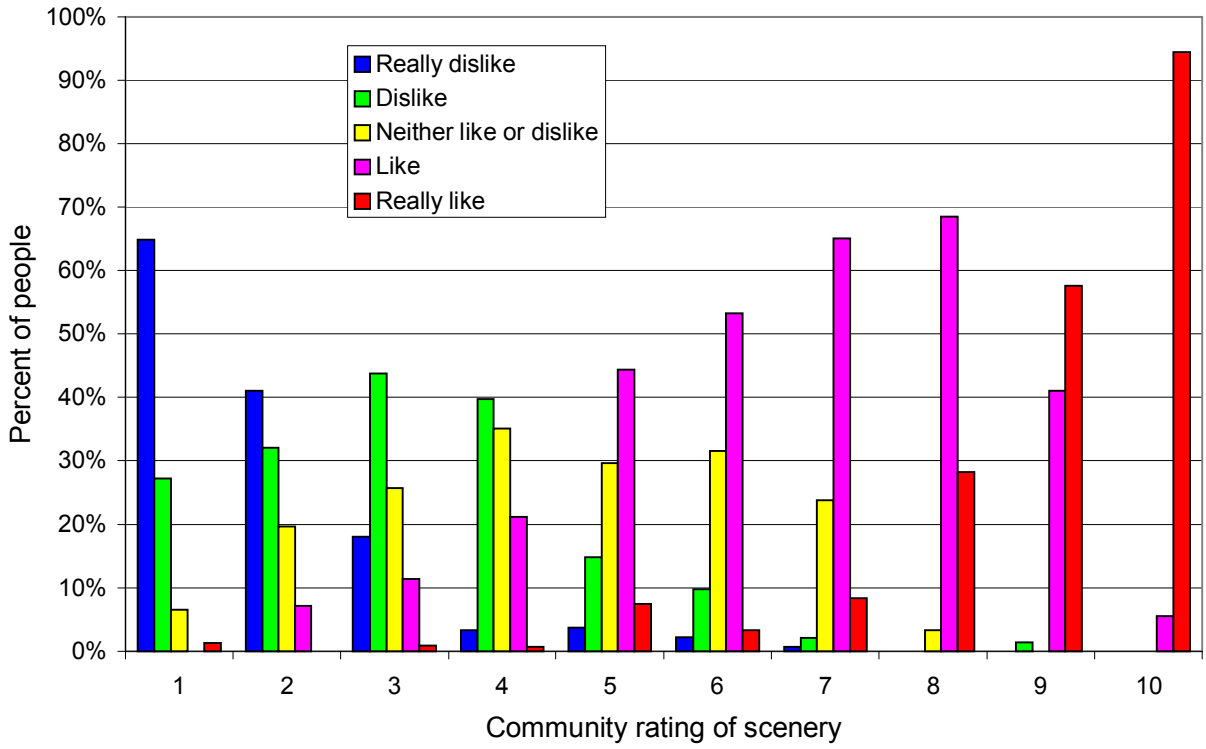


Figure 7. The percentage of scores by liking score graphed against community rating (1-10) illustrates that a larger proportion of people like photos with a rating of 5 or more, whereas photos with a rating of 4 or lower are disliked.

The relationship between peoples liking of scenery and their rating of scenery is also illustrated in Figure 8 which shows that, on average, people dislike scenery that has a rating of below 2.5.

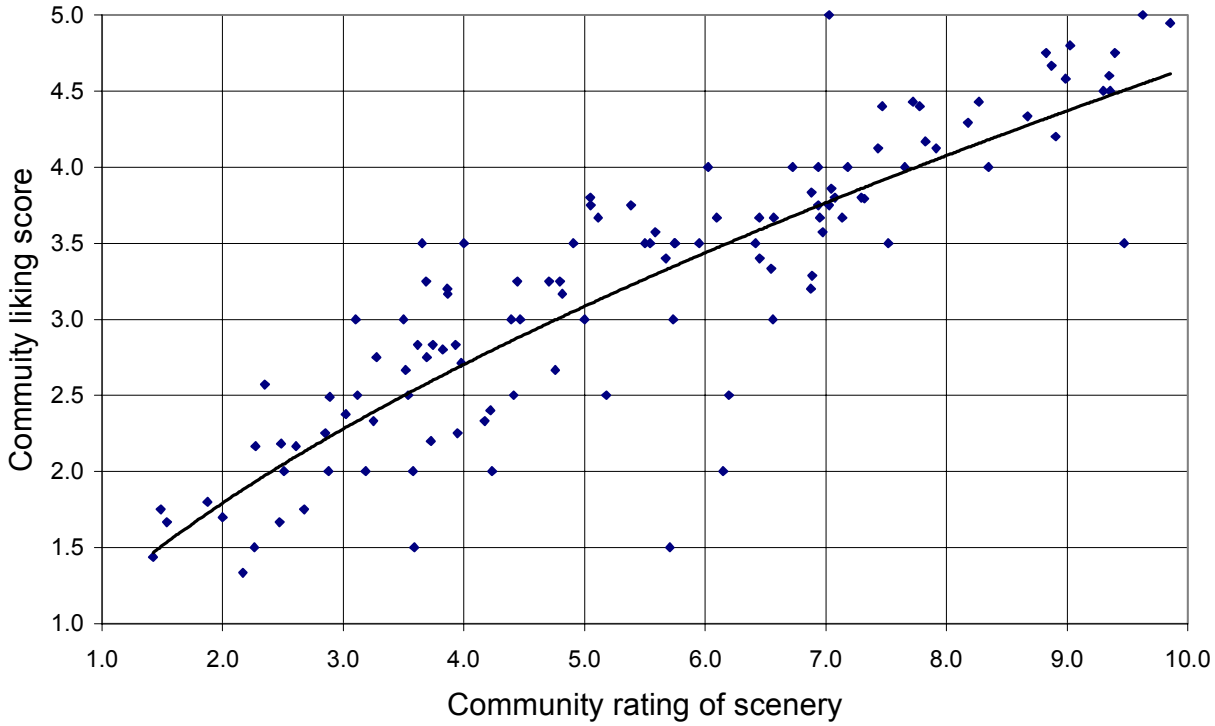


Figure 8. The relationship between liking score and community rating of scenery indicates that on average, people prefer scenery (liking > 3) with a rating of 5 or higher, and they like scenery (liking > 4) with a rating of 8 or more.

In addition to describing whether they like or dislike the scenery, people also described their emotional response according to four factors. Peoples original scores from 1-5 have been transformed to provide a clear negative (-2) neutral (0) or positive (+2) response for representation on graphs.

- Distressing or frightening (-2) to Peaceful or relaxing (+2)
- Slow or sleepy (-2) to Stimulating or dramatic (+2)
- Ugly or disgusting (-2) to Beautiful or enjoyable (+2)
- Boring or dull (-2) to Interesting or exciting (+2)

People's responses to these four factors are given in Appendix 8.

People's emotional scores in relation to whether they felt the photo was Ugly or Beautiful are illustrated for the 8 common photos in Figure 9.

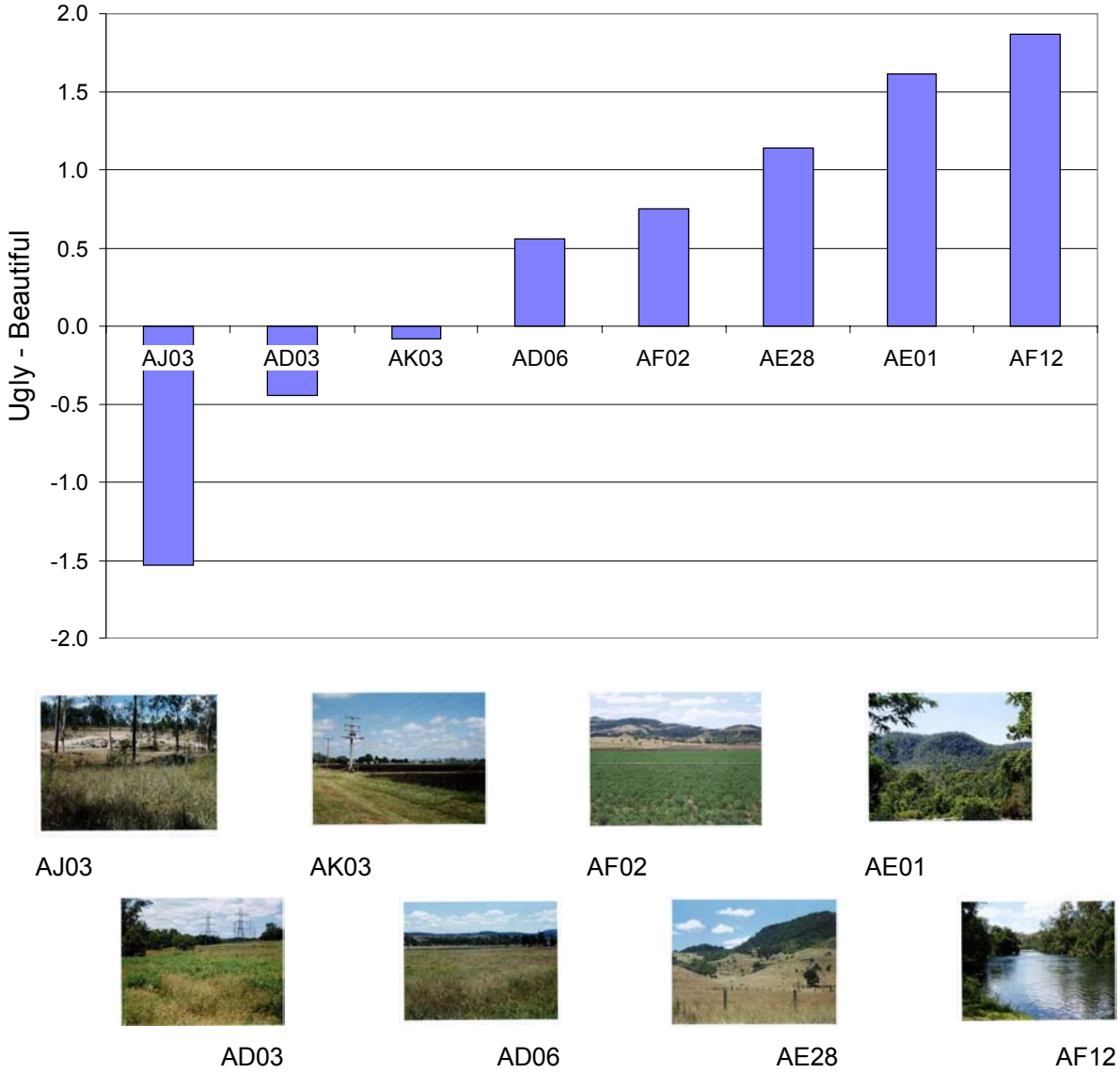


Figure 9. Beautiful – ugly emotional scores show that people associated the words beautiful and enjoyable with photos AF12, AE01 AE28 and AF02, and ugly or disgusting with photo AJ03.

Figure 10 illustrates the relationship between the emotional responses of peaceful - distressing combined with beautiful – ugly for the 8 common photos.

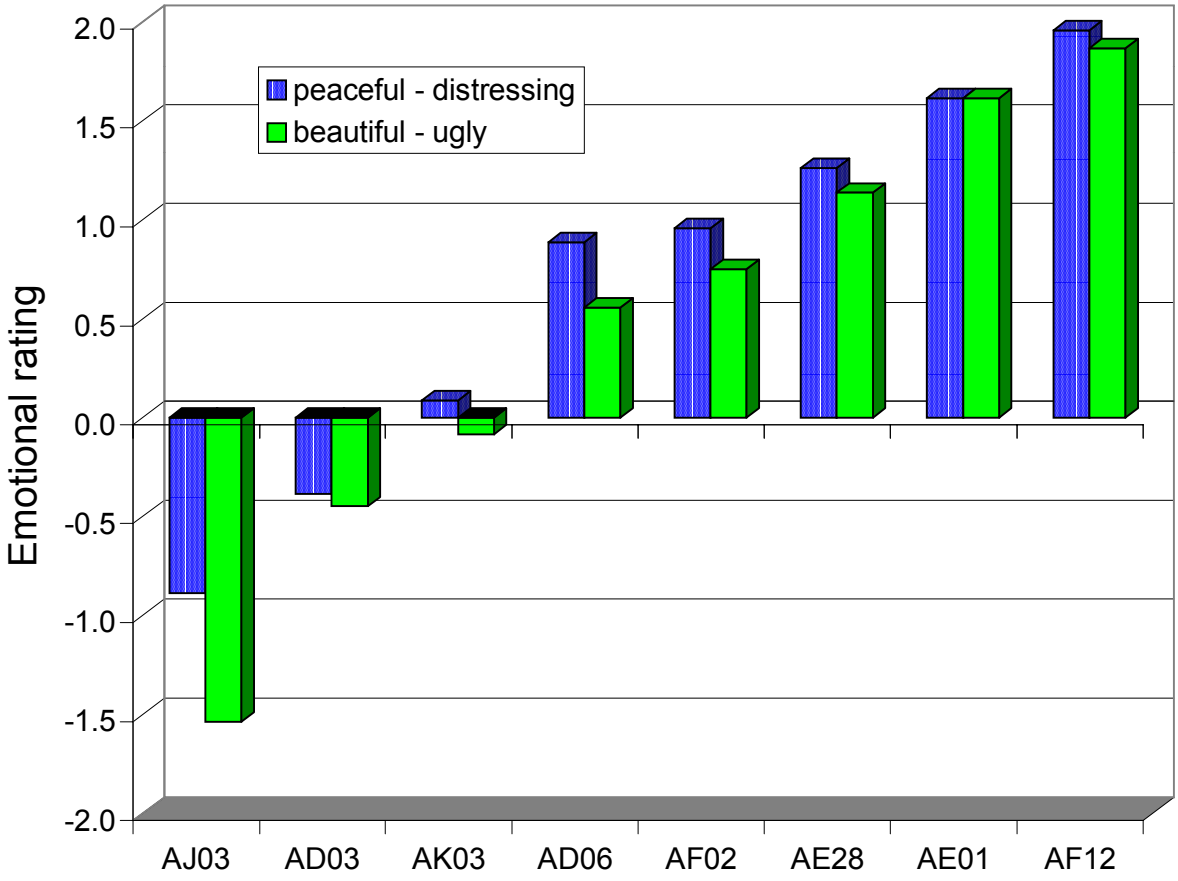


Figure 10. A comparison of the peaceful and beautiful emotional scores illustrates how moderately liked photos such as AD06 and AF02 are more peaceful than beautiful.

This diagram illustrates people's association of feelings of peaceful, relaxing and beauty with pleasant scenery. They also have a strong association of peaceful and relaxing than beauty, especially for scenery that has a moderately high community rating. People more readily associate ugly with unpleasant scenery than they do distressing.

People were also asked to write one word from the adjectives used to describe the emotional scales that best describes the scenery to them. The words most frequently used to described peoples emotional responses to photo AF12 (rating of 9.9) and AJ03 (rating of 1.4) are illustrated in Figure 11 and Figure 12. This analysis confirms analysis of emotional ratings (Figure 9, Figure 10) that people find scenery in photo AF12 peaceful and beautiful, and scenery in photo AJ03 ugly or disgusting. It is also interesting to note that for Photo AF12 the combined score of the two words peaceful and relaxing accounts for almost two thirds (61%) of the total "one word" responses for that photo.

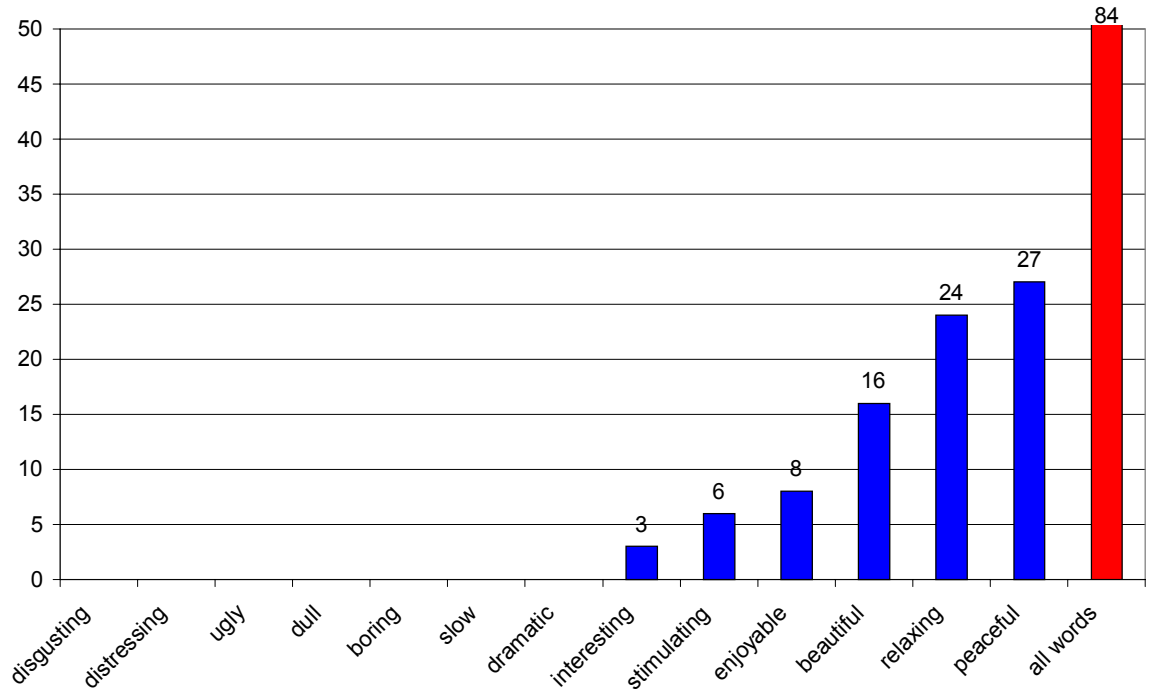


Figure 11. People frequently used the words peaceful and relaxing to describe photo AF12

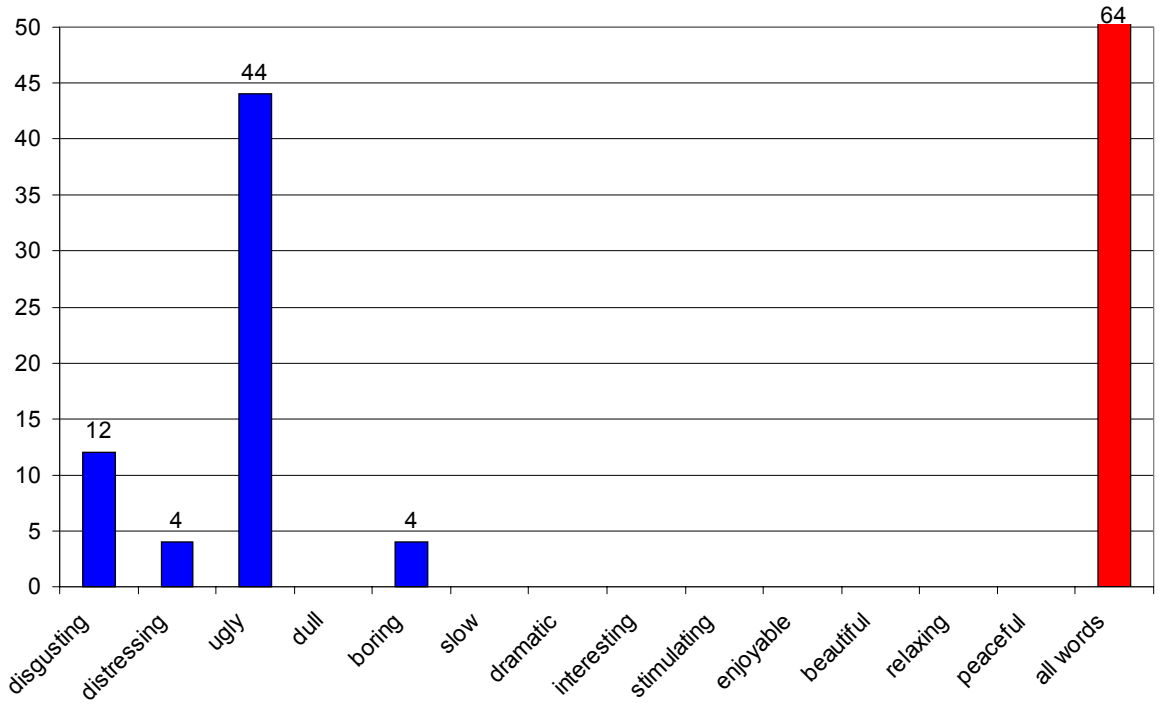


Figure 12. People most frequently used the word ugly or disgusting to describe photo AJ03.

4.6.3 *Variation between different groups of people*

Prior investigations into peoples preference for scenery indicate a range of factors may influence their liking of different landscapes and landscape elements. It has been possible to link peoples ratings of scenery (form A) with information on their background (recorded on survey form C). Some results are presented for the variation of people's preferences for the common set of 8 photos. Information on age, gender and locality has been investigated. It would also be possible to investigate other possible sources of people's preferences associated with their familiarity with different landscapes. Results of these comparisons are illustrated in Figure 13, Figure 14, and Figure 15.

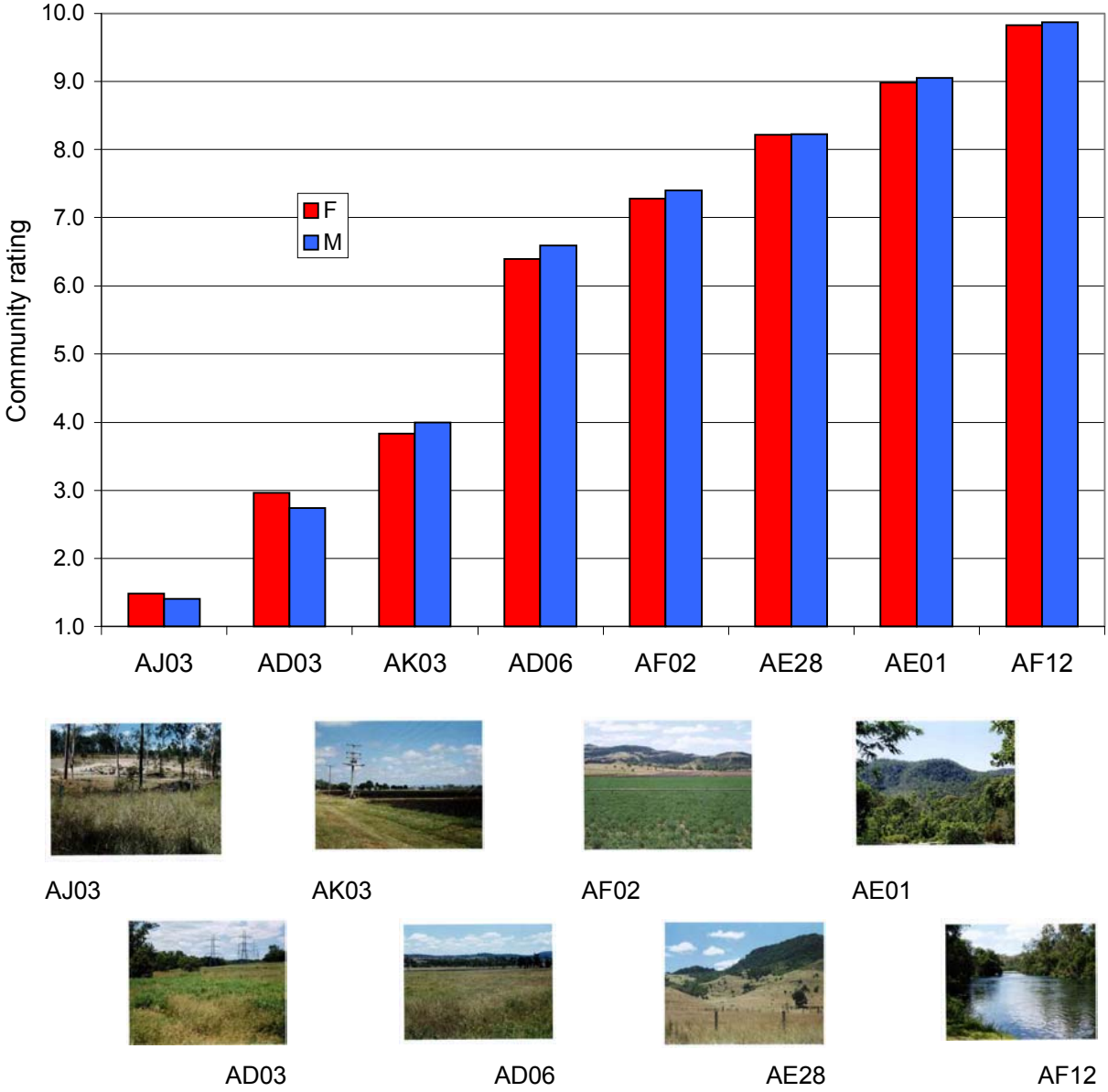


Figure 13. Peoples preference for common photos by gender. Gender seems to have relatively small effect on preferences.

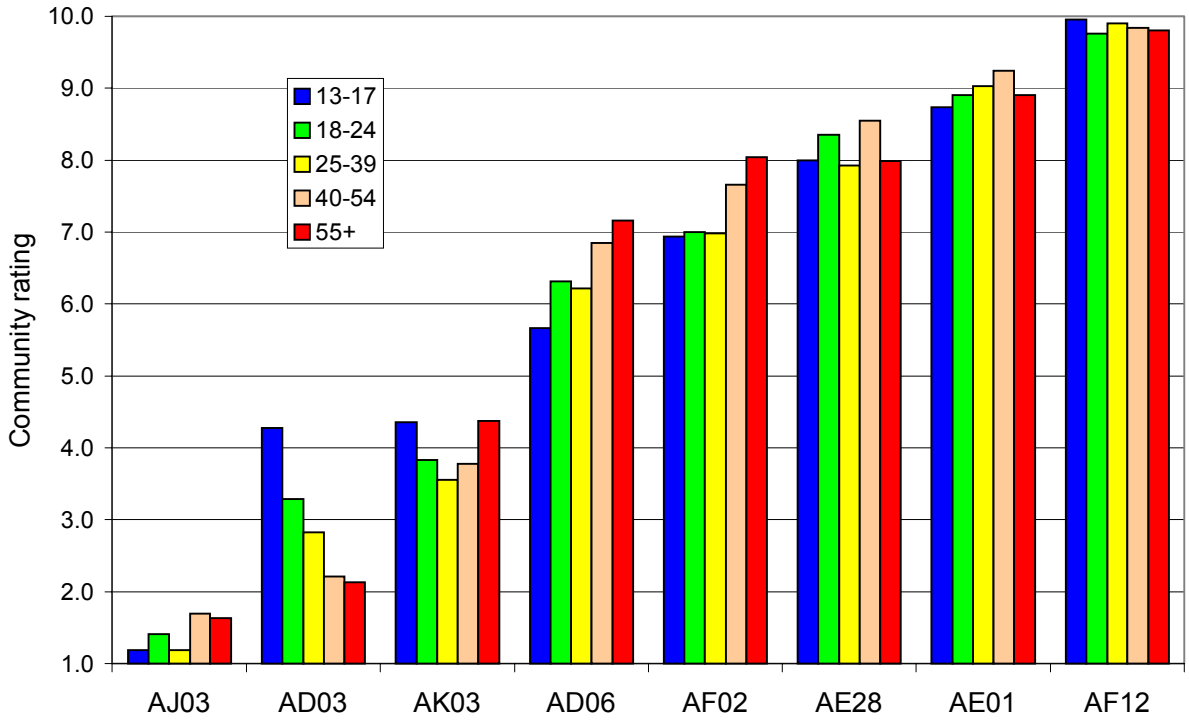


Figure 14 Peoples preference for common photos by age group. Younger people seem to be more accepting of photos that are less preferred by older age groups (photos AD03, AK03).

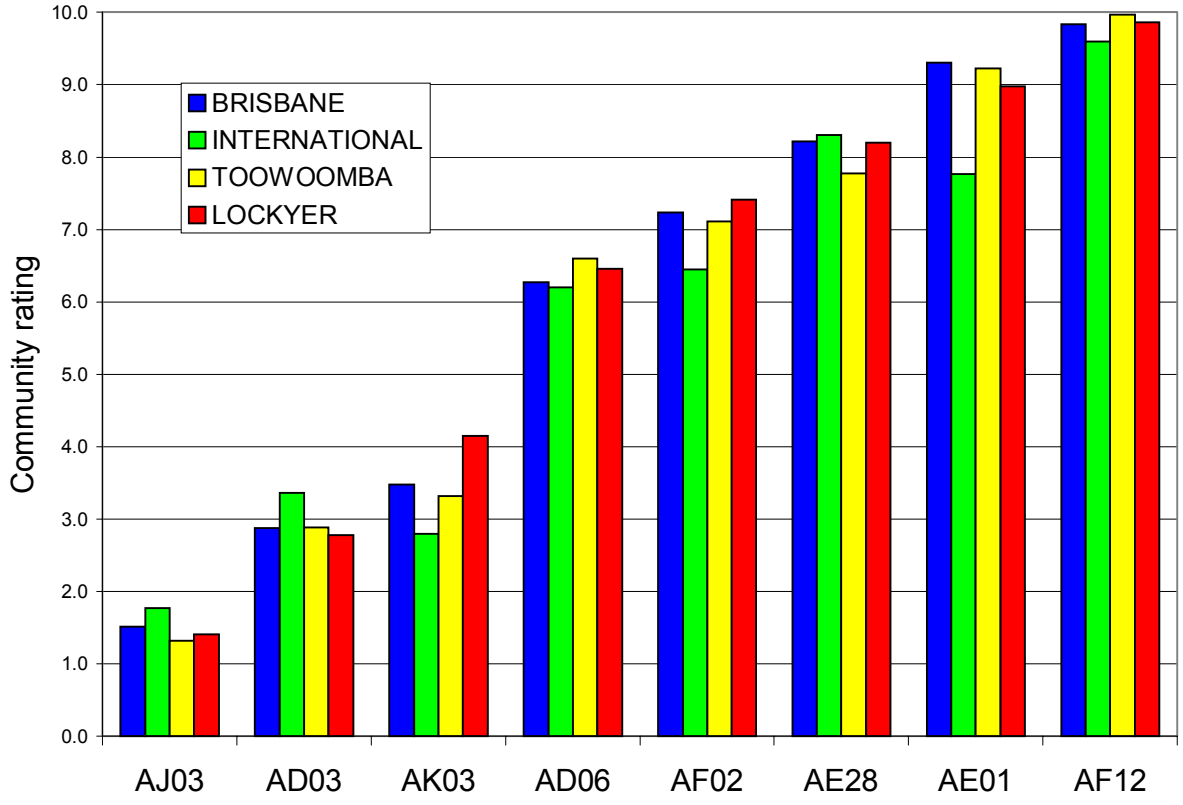


Figure 15 Peoples preference for common photos by place of residence. People from overseas seem to have a lower preference for steep pastures (AE01) and crops (AF02, AK03) than people from Queensland.

This analysis indicates that age and locality have a subtle effect on people's preferences for scenery. There is a tendency for:

- younger people to be more accepting of close development,
- older people to have greater preference for scenery with a moderately high scenic preference than other age groups, and
- people from overseas to have a lower preference for steep pastures and crops than people from Queensland.

4.6.4 Things people noticed about the scenery

People were asked to also describe two things that they noticed about the scenery that effected whether they liked it or not. This information is useful for developing an idea of priority elements for management of scenic amenity, and to assist in development of an understanding of people's responses. Words and phrases were entered into a database to assess those words that are most frequently used to describe scenery depicted by each photo. A listing of the 12 most highly repeated words used by people to describe each photo is provided in Appendix 7.

Table 11. Words used describe things noticed about the common photos

AF12	all words	water	trees	river	Green	Clean	natural	peaceful
	290	58	37	30	12	11	10	9
AE01	all words	trees	green	mountains	Hills	Fence	bushland	Flowers
	95	14	8	7	6	5	3	3
AE28	all words	hills	trees	fence	mountains	Green	rolling	farm
	176	28	15	12	11	6	6	5
AF02	all words	hills	crops	mountains	Green	irrigation	background	colour
	183	23	18	11	10	9	8	6
AD06	all words	hills	trees	grass	Open	Space	green	houses
	114	15	15	10	6	6	4	4
AK03	all words	powerlines	power poles	soil	Black	cultivation	farm	colour
	147	28	12	12	5	4	4	3
AD03	all words	powerlines	grass	tower	Trees	Green	overgrown	power poles
	184	72	13	9	7	6	4	4
AJ03	all words	rubbish	dump	tip	Untidy	bushland	soil	trees
	232	49	17	10	10	7	7	6

Words such as water, hills, trees green mountains are frequently used to describe scenery that people like.

People use the term powerlines to describe both low voltage powerlines and high voltage transmission lines and towers. For example, people frequently used the word powerlines to describe scenery in photo AD03, whereas only transmission lines are present in this photo. Transmission lines (usually described as powerlines) are often noticed compared to other landscape elements and development. Rubbish was frequently used to describe scenery in photo AJ03.

4.7 Modelling scenic preference from photo characteristics

It is possible to develop a close understanding of the relationship between people's preferences for scenery and detailed characteristics of the photos. As depicted in Figure 16, it is possible to develop a scenic preference model that relates people's preference ratings against detailed photo and topographic attributes. Examples of these attributes include, the percent of green grass and trees in the photo, or the number of transmission towers in the photo.

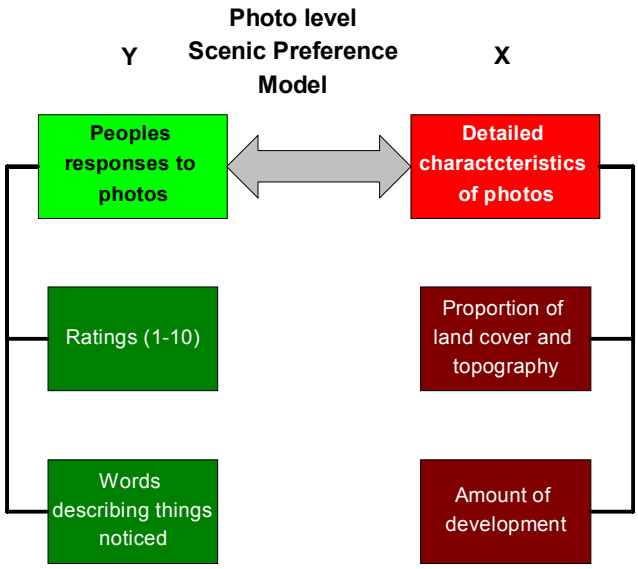


Figure 16. Photo level scenic preference model

The photo level scenic preference model is useful statistical approach for developing an understanding of why people prefer certain photos to others, for developing an understanding of the landscape properties (colour, landscape function) that affect people's preferences, and for developing an understanding of how people's preferences are affected by different levels of development. A photo-level scenic preference model is also a useful tool to support local government planning control measures.

Before developing this model, it is useful to examine the relationship between scenic preference and photo content to provide an indication of different types of development on different types of landscapes.

4.8 Basic relationships between community ratings and photo characteristics

The major characteristics of each photo have been described to provide a starting point for exploring the relationship between scenic preference, land cover, and the type of development.

Each photo was evaluated with respect to the following attributes:

- Topographic steepness (steep, flat)
- Land cover (eg. trees, crops, pasture)
- Development group (eg. earthworks, transport, electricity structures)
- Development type (eg. quarry, road, transmission tower).
- Percentage of the photo showing evident development (high, moderate, low)

Classifications of each photo are described in Appendix 9.

4.8.1 Topography

As would be expected, photos of mainly steep land are rated more highly than land that is flat. This observation encourages more detailed evaluation of topographic characteristics in any photo model, and development of a mapping model.

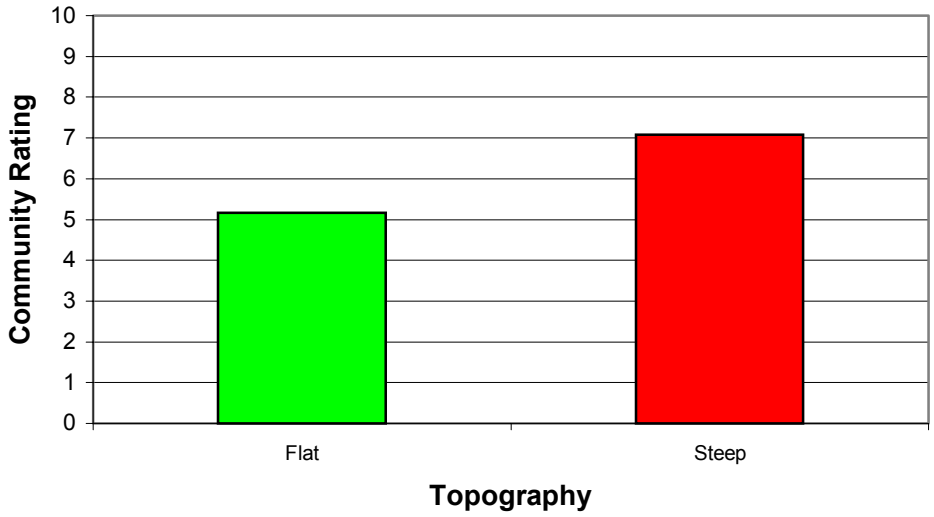


Figure 17. Basic relationship between topographic steepness and community rating of scenery.

4.8.2 Land cover

As illustrated in Figure 18, scenic preference scores are highest for water, second highest for areas with trees, third highest for crops, and lowest for pasture. Whilst this general trend is consistent with general observations of photo ratings, it is important to recognise that these average scores also include all development that occurs within the general land cover types.

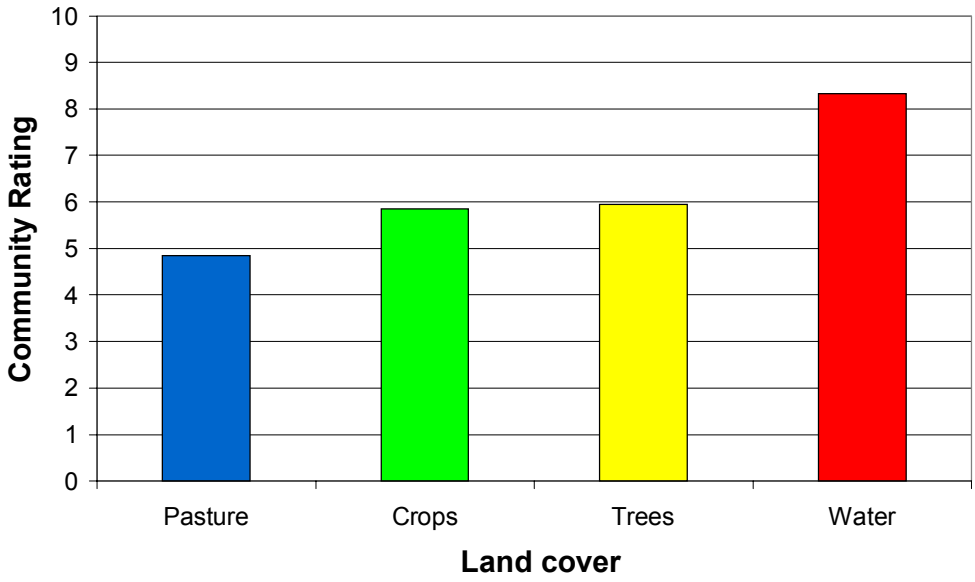


Figure 18. Basic relationship between land cover and community rating of scenery.

4.8.3 Percent of evident development

As seen in Figure 19, an increasing percentage of evident development provides a major drop in scenic preference. The average scenic preference of land with nil evident development is about 7.5, whereas the scenic preference of land with a high percent of evident development is about 2.5. This represents a decrease of about 65% compared to areas with nil development.

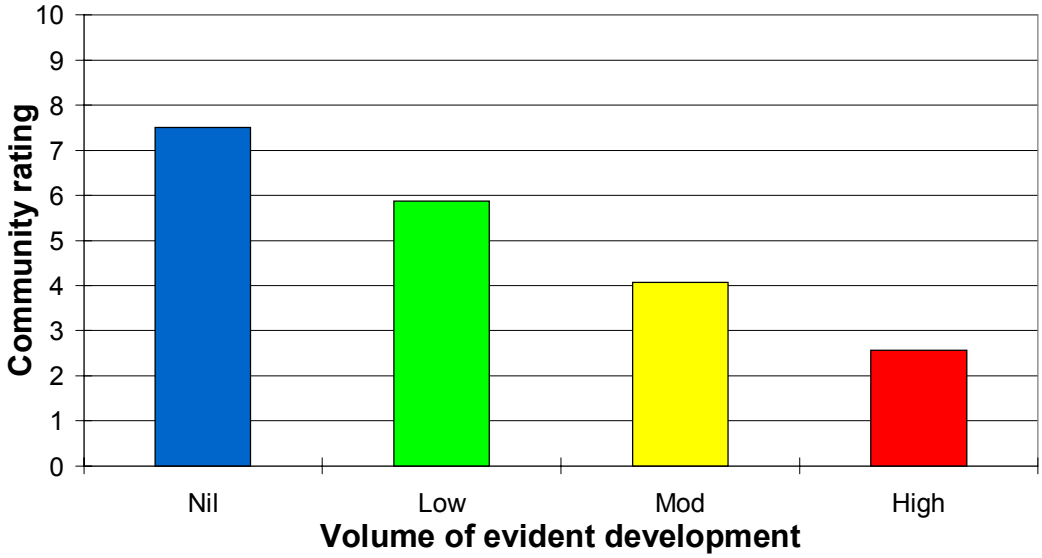


Figure 19. Basic relationship between community rating of scenery and volume of evident development

4.8.4 Effect of development type

Whilst there is a general trend for all types of development to have a consistent effect on scenic preference, information in Table 12 suggests that:

- Residential buildings have a lower impact on scenic preference than most other development.
- Billboards have a higher impact on scenic preference than most other development for a low volume of evident development.
- Electricity transmission cables have a lower impact than all other development.
- Industrial and Commercial Buildings, Transmission Towers, Railways, and Roads and Transport Infrastructure have a similar impact on scenic preference for a given volume of evident development.
- Earth works associated with refuse centres have a high impact on scenic preference.
- In general, the volume of development evident is more important than the type of development.

Table 12. Effect of development type and intensity on scenic preference

	Volume of evident development			
Development type	*Nil*	*Low*	*Mod*	*High*
Buildings Industrial / Commercial	7.5	4.8	4.1	3.1
Buildings Residential	7.5	**6.9**	**5.1**	
Earth works Quarry	7.5			1.8
Earth works Refuse centre	7.5		**2.9**	**1.4**
Electricity Metal power pole	7.5			3.1
Electricity Sub-station	7.5			1.5
Electricity Transmission cables	7.5	**7.7**	**5.9**	
Electricity Transmission tower	7.5	6.1	3.5	2.8
Electricity Wooden power pole	7.5	5.1		
Sign Billboard	7.5	**4.0**	3.5	
Transport Embankment	7.5		3.9	
Transport Railway	7.5	5.7	3.7	
Transport Road and infrastructure	7.5		3.4	2.9

4.9 Preliminary statistical model for predicting community ratings of scenery

Two broad groups of statistical techniques are suitable for development of scenic preference models. Regression analysis has been used in earlier scenic amenity studies at Moggill and Glen Rock. However the wide variation of responses for some photos raises the possibility that some statistical assumptions may invalidate the use of this approach.

Given these concerns a simpler and "non-parametric" statistical technique based on the use of "decision trees" is preferred. This technique is a rule-based statistical technique that can also take into account expert judgement in constructing the model. The approach does not make as many assumptions about the nature of the data as regression analysis. The Regional Landscape Strategy Advisory Committee (RLSAC) Scenic Amenity Technical Working Group has endorsed the use of this approach for developing scenic preference models.

The decision tree modelling approach iteratively partitions the data set to find groups of photos with similar characteristics and a similar scenic preference.

A simple model has been developed to develop an understanding of the general relationship between community ratings of scenery, the volume of evident development and the base landscape type. This model explains about 51% of the variation of people's scenic preference, which is a good result given the varied nature of people's responses.

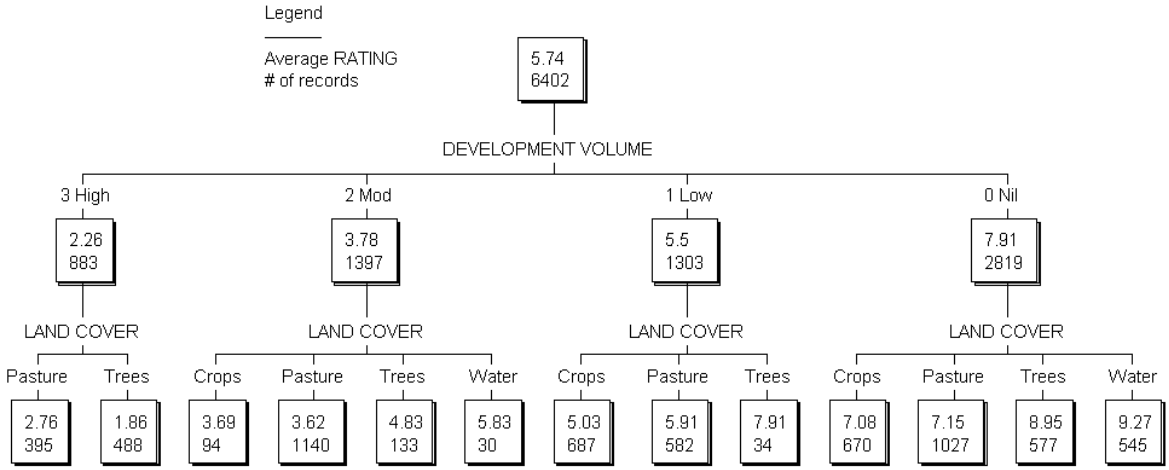


Figure 20. Community rating of scenery can be predicted from the volume of evident development and the land cover.

As seen in Figure 20, this model indicates that the most efficient means of describing people's response to scenery is to firstly assess the volume of evident development from photos. For example, photos with nil evident development have a community rating of 7.91 (see right hand branch of tree) and photos with a high volume of evident development have a community rating of 2.26 (see left hand branch of tree). The decision tree then breaks down each development class into three or four land cover classes. For example the 'nil development' branch of the tree divides further into four sub-types, crops (7.08), pasture (7.15), trees (8.95) and water (9.27). This model can also be illustrated in graphical form as seen in Figure 21. An expanded version of this model is given in Appendix 10.

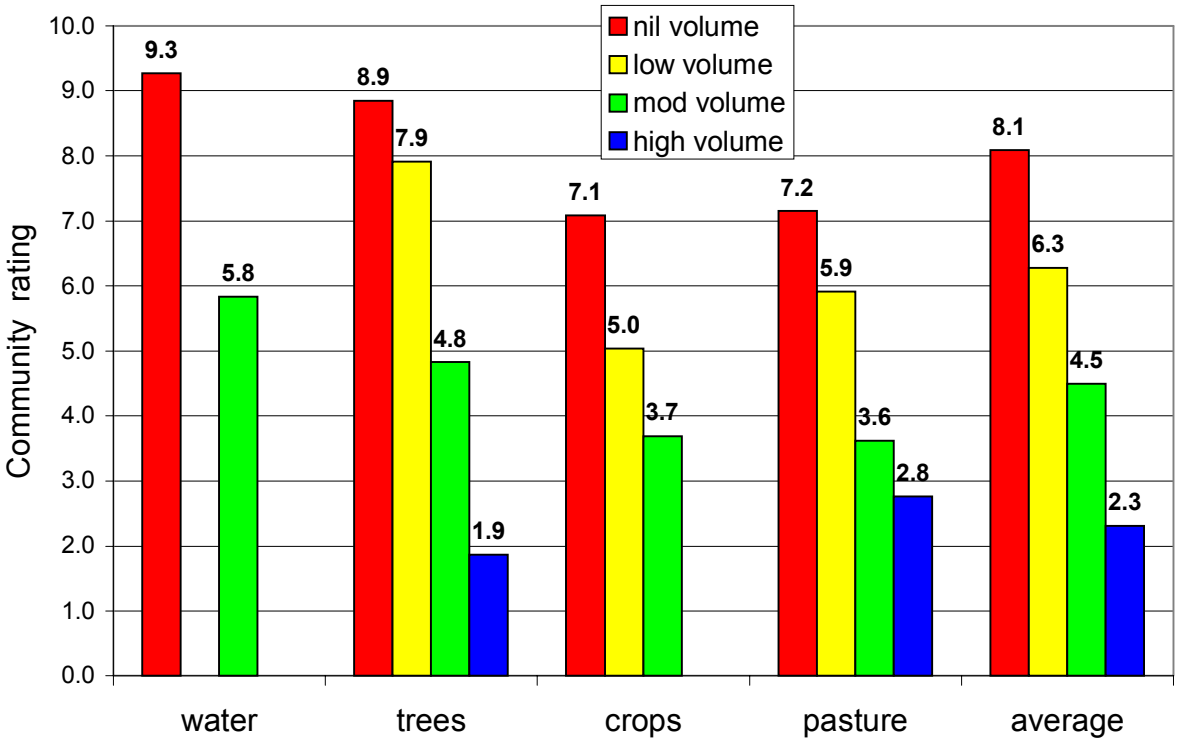


Figure 21. Water and trees have a higher community rating than crops and pastures but are also strongly affected by the volume of evident development.

Data from Figure 21 can also be formatted to highlight the percentage decrease of rating due to different levels of development. Table 13 outlines that a decrease of 22% of scenic preference is experienced on average for a low volume development, 44% for a moderate volume development, and 72% for a high volume development.

Table 13. Percentage decrease in community rating according to evident volume of development

	nil development	*low volume*		*mod volume*		*high volume*	
	Rating	*Rating*	*%*	*Rating*	*%*	*Rating*	*%*
Water	9.3			5.8	38%		
Trees	8.9	7.9	11%	4.8	46%	1.9	79%
Crops	7.1	5.0	30%	3.7	48%		
Pasture	7.2	5.9	18%	3.6	50%	2.8	61%
Average	8.1	6.3	22%	4.5	44%	2.3	72%

This analysis reinforces the trend discussed above for water and trees to have a higher preference than pasture and crops. It also reinforces the trend illustrated above that the level of development has a stronger effect on community preference than the type of landscape.

4.10 Interpretation of photo pairs to indicate effect of development

Several photos used in the community surveys were planned to provide controlled information on the effect of development by including paired photos in different photo sets. Three different types of pairs were included in the photo sets:

- Photos which were taken by slightly moving the orientation of the camera lens to exclude a development taken in a previous photo.
- Photos where a development was created by use of photomontage techniques.
- Enlargements of photographs to illustrate the effect of development volume.

Community ratings of scenery of these paired photos is illustrated in Appendix 11 and 12. Results of these paired comparisons is given in Table 14.

Table 14. Paired photo comparisons indicate the effect of development on community ratings

Pair	Without development	With development	Major changes	Rating decrease:
Introduction of development				
1. AC18 AC17	Photo AC18 Community rating: 6.2	Photo AC17 Community rating: 4.4	Moderate volume Residential housing	2.2 (33%)
2. AD06 AD07	Photo AD06 Community rating: 6.4	Photo AD07 Community rating: 4.2	Low volume Industrial / commercial buildings	2.2 (34%)
3. AD16 AM01	Photo AD16 Community rating: 6.4	Photo AM01 Community rating: 3.6	Moderate volume Transmission Towers	2.8 (44%)
4. AD21 AM05	Photo AD21 Community rating: 7.2	Photo AM05 Community rating: 4.7	Moderate volume Transmission Towers	2.8 (35%)
5. AE08 AE09	Photo AE08 Community rating: 5.7	Photo AE09 Community rating: 3.7	Moderate volume Transmission Towers	2.0 (35%)
6. AE16 AE18	Photo AE16 Community rating: 7.8	Photo AE18 Community rating: 3.9	Low volume Transmission Towers	.9 (50%)
7. AI14 AI13	Photo AI14 Community rating: 6.1	Photo AI13 Community rating: 4.5	Low volume Billboards	1.6 (26%)
Enlargements				
1. AE14	Photo AE14 Community rating: 3.1	Photo AE14C Community rating: 2.2	Increased volume of Transmission Tower	0.9 (29%)
2. AE22	Photo AE22 Community rating: 3.9	Photo AE22C Community rating: 3.5	Increased volume of Transmission Towers	0.4 (10%)
3. AF04	Photo AF04 Community rating: 6.7	Photo AF04C Community rating: 6.9	Increased volume of Transmission Towers	+0.2
4. AH11	Photo AH11 Community rating: 4.0	Photo AH11C Community rating: 3.6	Increased volume of Road and infrastructure	0.4 (10%)

The above comparisons reinforce conclusions of analysis that introduction of a moderate development causes a decrease of scenic preference by 20 to 50%. This is comparable with results of modelling set out in Table 13 that indicates an average decrease of scenic preference of 44%. There is a tendency for scenic preference to reduce more rapidly in forested landscapes than other landscapes.

4.11 Interpretation

4.11.1 Implications for assessing scenic preference

The above analysis indicates that the three factors, topographic steepness, land cover, and percent of evident development are important factors that effect scenic preference. The percent of evident development had a stronger effect on scenic preference than land cover or topographic steepness.

4.11.2 Implications for management and planning

These results indicate the importance of managing all types of development in an equitable manner. Billboards and refuse centres appear to have a strong effect on scenic preference and

may require specialised management and assessment procedures compared to other development.

These results suggest that the apparent size of development has a major bearing on scenic preference. Put simply, larger development close to viewing locations will have a stronger negative impact on scenic preference than smaller and more distant development.

Whilst these conclusions are consistent with existing landscape theory and practice, development of the suggested photo model would allow development of more specific measures of the effect of particular types and sizes of development at given distances from viewing locations.

5 Scenic preference mapping

5.1 Introduction

Scenic preference mapping is a two-stage process. The first stage involves development of a model that relates photo characteristics to people's preferences. The stage involves applying that model to the full landscape.

The scenic preference mapping model (see Figure 22) will need to be based on a set of characteristics which are shown on existing mapping.

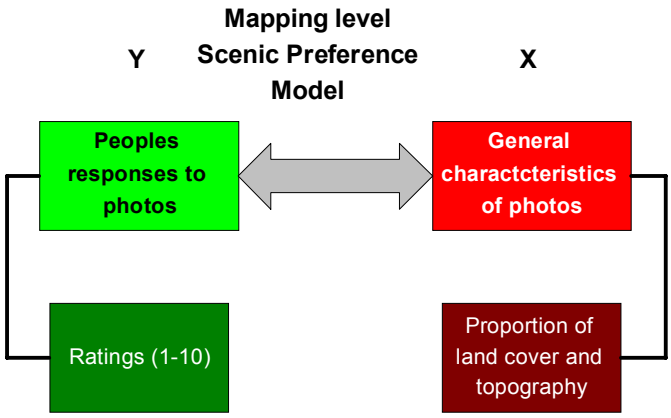


Figure 22. Mapping level scenic preference model

The mapping level scenic preference model seeks to identify the influence of different mapped land cover types and topographic types on people's preference for scenery.

The choice of photo characteristics used to develop the mapping model is influenced by the availability of land cover and topographic mapping available for the study area. The two primary data sets available for the study area are:

- A 30m cell resolution land cover information from the Department of Natural Resource and Mines 'Statewide Land cover And Trees Study (SLATS)' (DNR 2000). This data set if commonly referred to as the SLATS land cover data. Satellite imagery for this mapping was acquired in 1997.
- A 25m cell resolution digital elevation model for south east Queensland from the Department of Natural Resources and Mines.

The 1997 SLATS land cover data set, derived from Landsat satellite imagery, was summarised to produce five land cover types. One additional type was added to describe flowing rivers and creeks. The resulting six land cover classes used in this study are listed below:

- Dams. Lakes, waterholes (from SLATS).
- Flowing rivers and creeks (based on available mapping of the Brisbane River).

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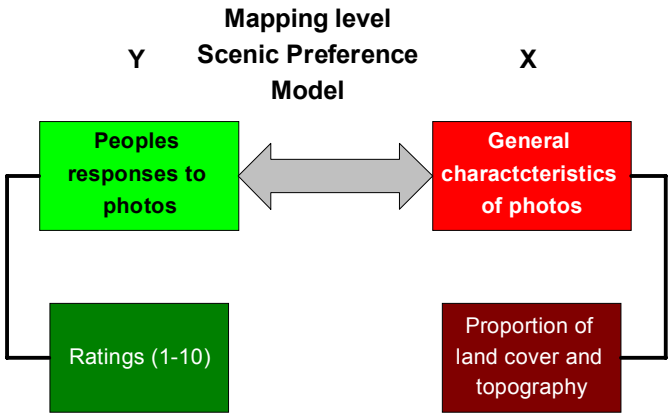

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- Dams. Lakes, waterholes (from SLATS).
- Flowing rivers and creeks (based on available mapping of the Brisbane River).

- Pasture. This is mainly native pasture but include minor areas of tree regrowth, scattered trees, and scattered housing, and roads.
- Trees (from SLATS forest and regrowth categories).
- Crops, including irrigated pasture.
- Urban, based on SLATS settlement.

A map illustrating the land cover map of the study area is given in Map 2.

The digital elevation model of the study area was used to create a map showing flat, moderately steep, and very steep areas. Three steepness classes were defined using the following criteria:

- Flat – areas with an elevation range of less than 60 m over a distance of 500m.
- Moderately steep – areas with an elevation range of between 60m and 139m over a distance of 500m.
- Very steep – areas with an elevation range of more than 140m over a distance of 500m.

The availability of these land cover and topographic classes influenced the choice of photograph characteristics to develop the scenic preference mapping model.

5.2 Photo characteristics

The proportion of the photo in each of the five land cover classes and three steepness classes listed above were visually estimated for each photo. A list of the approximate proportion of each class is listed in Appendix 13. These estimates were made with reference to available mapping to clarify the appropriate map classifications that are related to each photo. It is important to note that these photo attributes differ to those described above under the heading 'relationship between preference and photo characteristics'. Where the latter attributes described all development, only mapped types were considered in derivation of attributes used to derive the mapping model.

In addition, photos containing more than 25% of unmapped development or infrastructure were omitted from this next data set. The fourteen excluded photos were: AF26, AF13, AF36, AA03, AA04, AK18, AI08, AI12, AI09, AJ24, AE14C, AJ03, AJ21, AE09C. Most of these photos are in close proximity (within 300m) of development or infrastructure and have an average scenic preference of 3 or less. The effect of this development, whilst significant, needs to be recognised in a photo-level scenic preference model, rather than the mapping level scenic preference model.

These estimates were further simplified to indicate the dominant land cover or topographic class in each photo that corresponds most closely to the mapped class that is apparent in each photo. Percentage abundance data was thus converted into a table of binary (yes/no) attributes indicating the major land cover which both influences people's response, and which is available in mapping data.

5.3 Scenic preference mapping model

This mapping model segregates the photos into 11 different classes as illustrated in Figure 23. The average of all photos in the study area used to develop this mapping model is 6.6 out of 10. This score is about 1.1 higher than the average score for the full photo set including all development. . The first split separates photos with no water present (to the left) and photos with water present to the right. Photos without water have an average scenic preference of 5.9. Those with water have a preference of 9.2. Water photos are further separated into two final mapping classes, Dams (class 10) with an average scenic preference of 7.4, and River (class 11) with an average scenic preference of 9.8. The decision tree breaks down all non-water photos into smaller groups based on a combination of land cover and topographic classes. A full version of the mapping model is provided in Appendix 14.

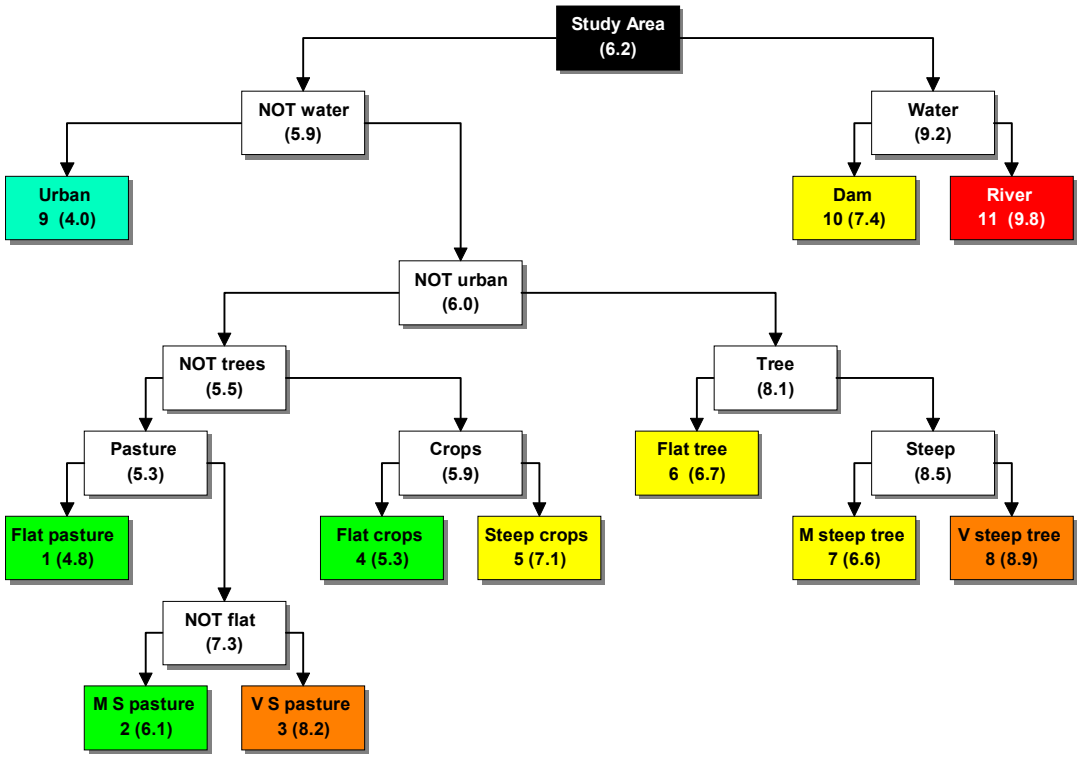


Figure 23. Scenic preference mapping model produced by decision tree analysis.

The characteristics of mapping classes derived from this analysis are given in Table 15 and Figure 24. For example, class 11 of flowing rivers has a scenic preference of 10, an average of 9.8, and a standard deviation of 0.7. This compares to class 9 (urban), which has an average scenic preference of 4.0, and a standard deviation of 2.1.

Table 15. Characteristics of scenic preference mapping classes.

		Community Rating of Scnery				
Class	Name	Rounded	Average	Std dev	Slope class	Land cover
1	Flat pasture	5	4.8	2.7	Flat	Pasture
2	Mod steep pasture	6	6.1	2.6	Mod Steep	Pasture
3	Very steep pasture	8	8.2	1.7	Very Steep	Pasture
4	Flat crops	5	5.3	2.5	Flat	Crop
5	Steep crops	7	7.1	2.3	Mod Steep	Crop
6	Flat trees	7	6.7	3.2	Flat	Tree
7	Mod steep trees	7	6.6	3.5	Mod Steep	Tree
8	Very steep trees	9	8.9	1.7	Very Steep	Tree
9	Urban	4	4.0	2.1	-	Urban
10	Dams, waterholes	7	7.4	2.6	-	Dam
11	Flowing river	10	9.8	0.7	-	River

The variability of people's responses is clearly lower for highly preferred classes 11 (river), 8 (very steep trees) and class 3 (very steep pasture).

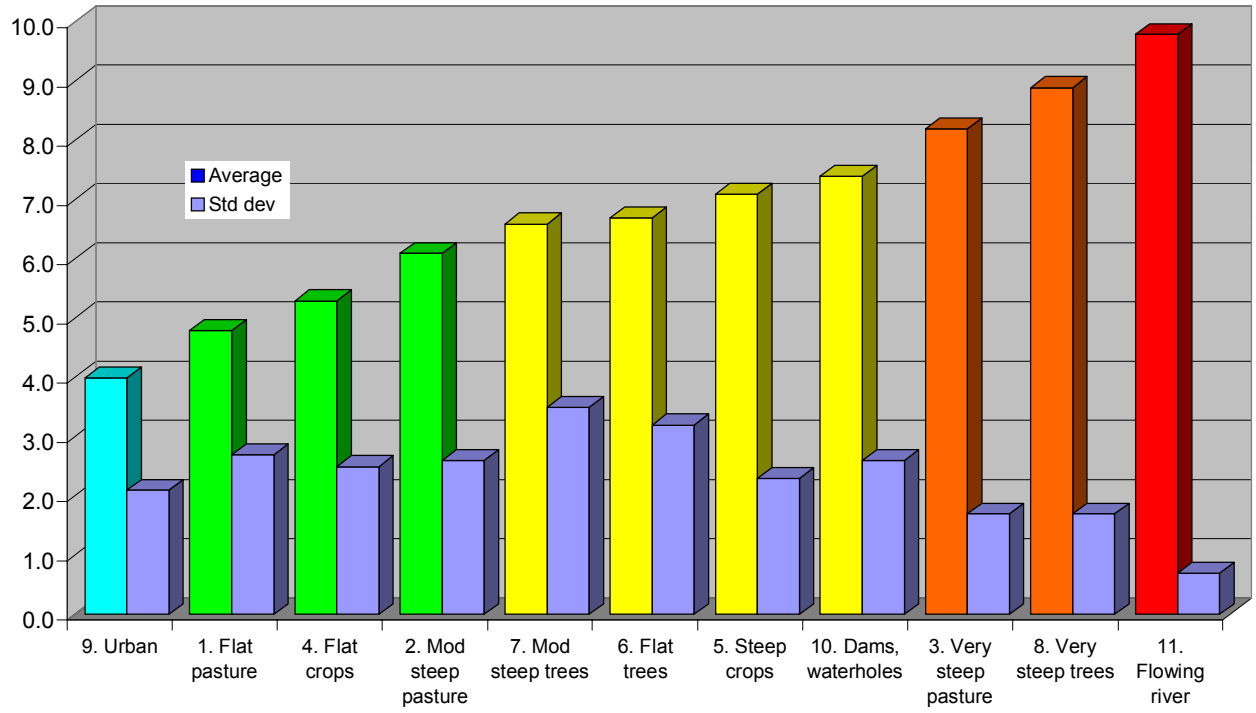


Figure 24. Average and standard deviation rating of scenic preference map classes.

A set of instructions is produced by the decision tree statistical package for application to the mapping layers in a Geographic Information System. A map showing each of the scenic preference classes is shown in Map 6.

5.4 Scenic preference map

The scenic preference map (Map 7) shows scenic preference in the range of 4 to 10. No development lower than 4 is shown since intensive development was excluded from the model. Areas of highest scenic preference occur on steep forested areas and along the Brisbane River. Areas of lowest scenic preference are urban townships. It is important to recognise that this map illustrates the effect of the land cover type on people's scenic preference for open space. The score of 4 for urban areas indicates the influence of townships on the surrounding scenery.

The area in each scenic preference class is shown in Table 16 indicates that only about 0.1% of the study area (in Esk Shire) has a scenic preference of 10. A large portion of the study area has a scenic preference rating of 7.

Table 16. Area of each scenic preference class by Local Government Area.

	Area (ha) by Scenic Preference Rating							
LGA	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*Total*
Cambooya		653	1,681	6,410	100	1,637		10,482
Esk	228	37,344	5,847	28,963	221	3,356	464	76,423
Gatton	1,160	36,458	14,956	72,039	3,685	29,044		157,343
Ipswich		988	814	1982	10	71		3,865
Laidley	568	35,827	6,316	17,157	1,180	9,131		70,180
Total	1,956	111,271	29,614	126,552	5,196	43,239	464	318,292
Percent	0.6%	35.0%	9.3%	39.8%	1.6%	13.6%	0.1%	100%

5.5 Interpretation

A three dimensional view of scenic preference for the study area is illustrated in Figure 25.

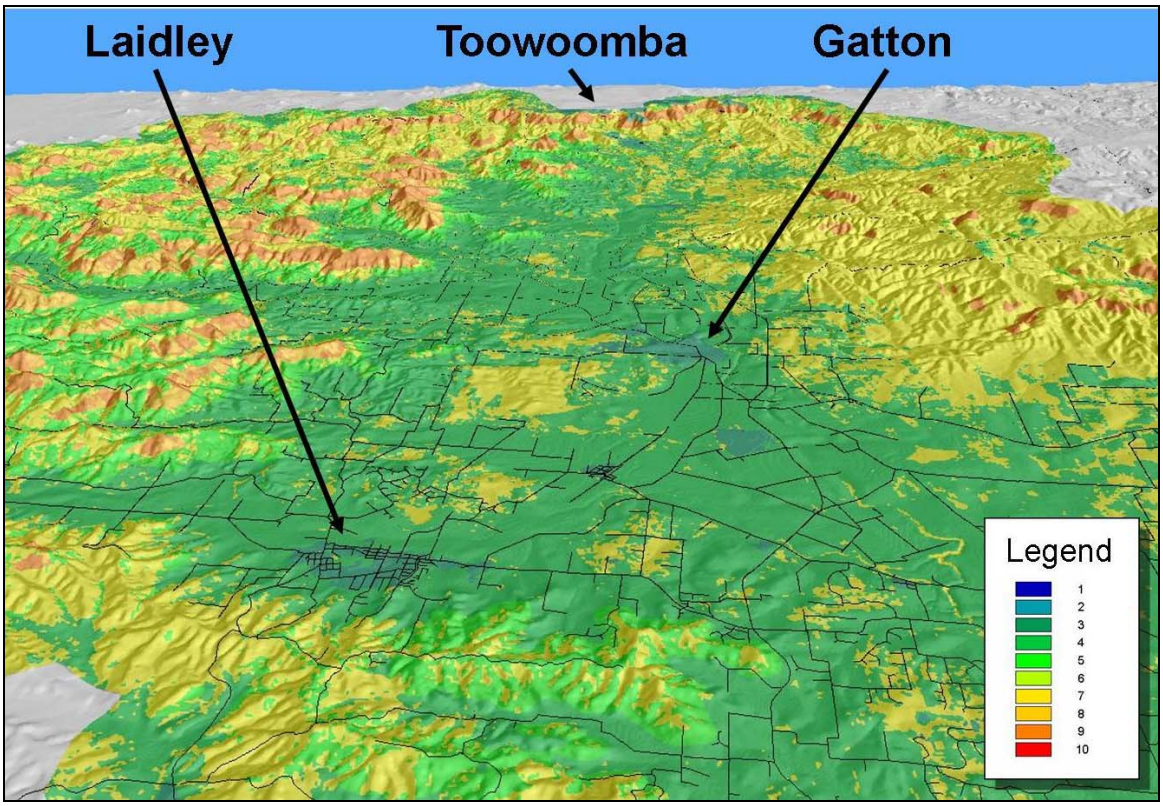


Figure 25. 3-dimensional diagram of scenic preference for the study area looking to the west

The map of scenic preference (Map 7) highlights areas according to their community preference rating. Some notable areas of high scenic preference include:

- Parts of the Great Dividing Range from Glen Rock to the vicinity of Toowoomba.
- The ranges around Mt Mistake and extending north into the Lockyer Valley.
- Parts of Helidon Hills near gorges and peaks.
- Some peaks and gorges of the D'Aguilar ranges.
- The Brisbane River below Wivenhoe Dam.
- Little Liverpool Range south of Laidley
- The headwaters of Buaraba Creek

Some of the areas of lower scenic preference in the study area include:

- Urban areas associated with townships.
- Flat pastures throughout the valley.

6 Inventory of viewing locations

6.1 Introduction

The procedure used to assess visual exposure is divided into two main steps:

- Collection of information about viewing locations. Staff from Gatton, Laidley, and Esk Shire Councils undertook this basic inventory. Members of the Community Consultation Group also contributed several important viewing locations. The consultant entered these maps and tables into a Geographic Information System.

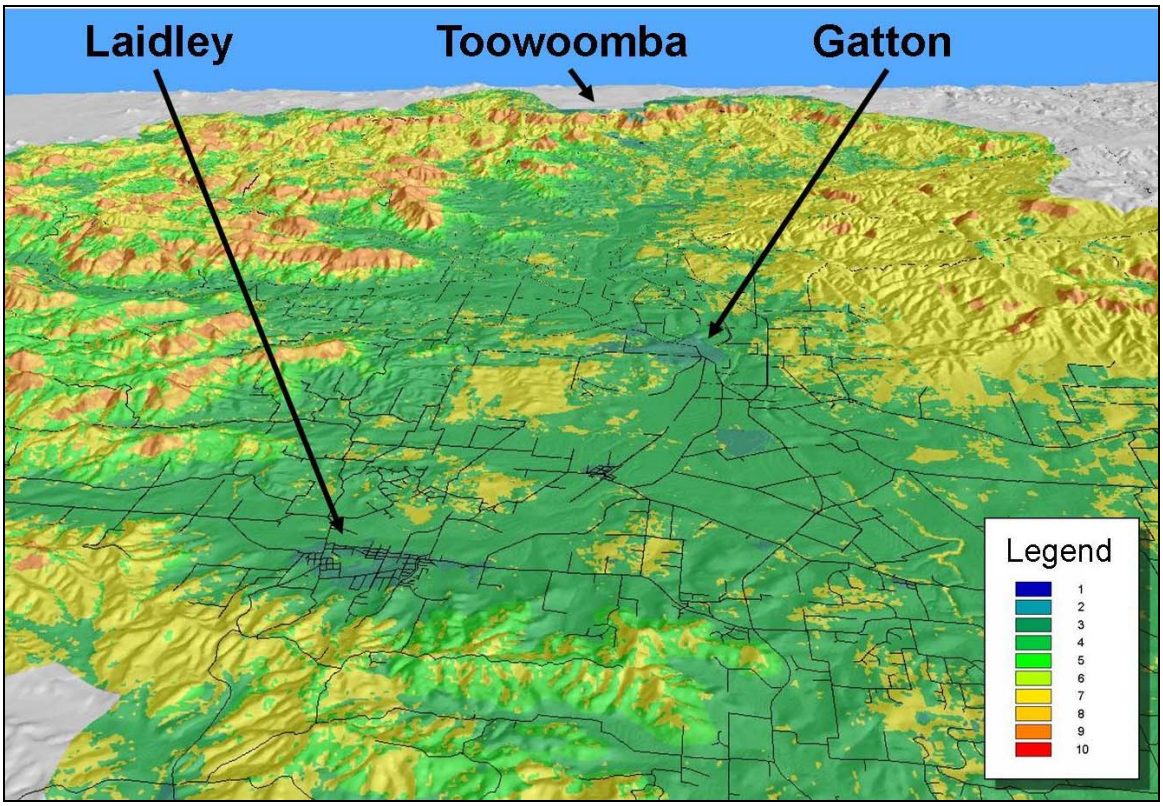


Figure 25. 3-dimensional diagram of scenic preference for the study area looking to the west

The map of scenic preference (Map 7) highlights areas according to their community preference rating. Some notable areas of high scenic preference include:

- Parts of the Great Dividing Range from Glen Rock to the vicinity of Toowoomba.
- The ranges around Mt Mistake and extending north into the Lockyer Valley.
- Parts of Helidon Hills near gorges and peaks.
- Some peaks and gorges of the D'Aguilar ranges.
- The Brisbane River below Wivenhoe Dam.
- Little Liverpool Range south of Laidley
- The headwaters of Buaraba Creek

Some of the areas of lower scenic preference in the study area include:

- Urban areas associated with townships.
- Flat pastures throughout the valley.

6 Inventory of viewing locations

6.1 Introduction

The procedure used to assess visual exposure is divided into two main steps:

- Collection of information about viewing locations. Staff from Gatton, Laidley, and Esk Shire Councils undertook this basic inventory. Members of the Community Consultation Group also contributed several important viewing locations. The consultant entered these maps and tables into a Geographic Information System.

- Calculating projected views from these locations to assess the level of exposure across the landscape.

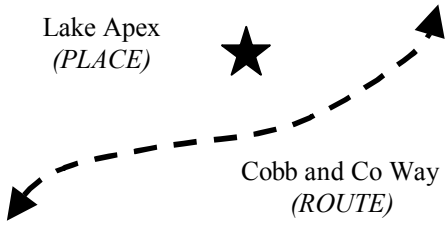
6.2 Collection of viewing location data

Viewing location information is collected as a viewing network in a Geographic Information System. The viewing network indicates the public places in the landscape where people observe scenery. It includes locations of community and cultural significance to residents. Attention is also given to travel routes and destinations used for leisure and tourism.

Information about viewing locations is represented as places (shown as points) and routes (shown as lines). Routes and places have a set of attributes that describe the average number of people at that location per day, the different types of activities undertaken at the location and the duration at that location.

6.3 Components

The viewing network consists of routes and places. For example:



Routes are locations which concentrations of people use on a regular basis to reach a routine destination (work, shopping), a holiday or recreational destination, or which they use as part of a leisure experience (bike path). By definition, people travel along routes at a particular average speed. All routes are represented as lines (vectors).

Places are destinations where people arrive at and spend a period of time, usually for a duration of at least 5 minutes. All places are represented as points.

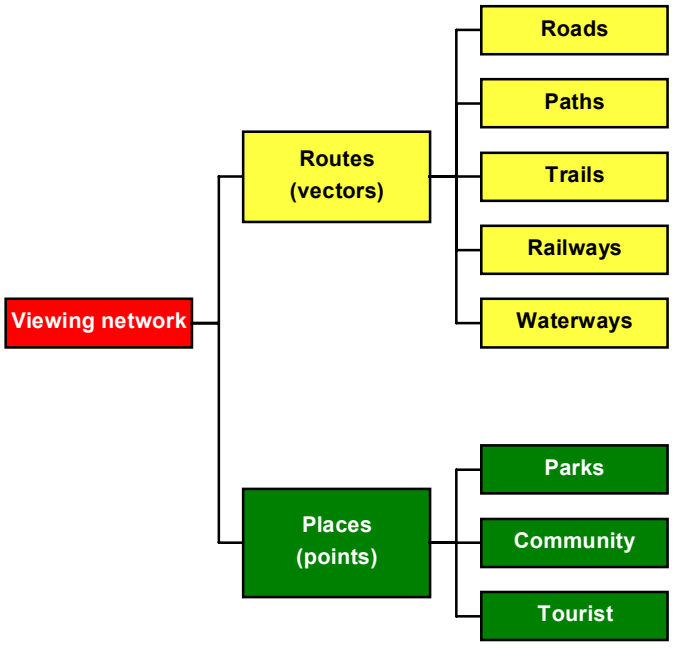


Figure 26. The viewing network consists of places and routes

6.3.1 Selecting viewing locations

The most important viewing locations are those where:

- large numbers of people experience scenery every day or most days of the year, and
- moderate or smaller numbers of people have a particularly high interest in the scenery when they visit that location.

Translation of these principles into practice leads us to adopt the procedure of identifying those locations that have a high use by residents or tourists, and which are principally used for some form of outdoor leisure activity. Important outdoor leisure activities include driving, walking, cycling, and travelling on boats.

6.3.2 Calculating location importance

A major goal of the inventory process is to estimate the importance of different viewing locations. This is achieved by estimating the number of people who use each location (on average per year), the duration they spend at that location, and the average interest level of all people who visit that location.

The importance of each viewing location measured in the units "People Viewing Time" is calculated as:

		A		*B*		*C*
Viewing Location Importance *(People Viewing Time)*	=	*Average number of people at location per day*	*X*	*Percentage interest in scenery*	*X*	*Average duration spent at that location*

The relative importance of each *type* of location, independent of the number of people at that type of location, is described by simply multiplying B x C from the above formula to give a "Standard Viewing Duration" (in minutes) for each type of viewing location.

		B		*C*
Standard Viewing Duration *(Viewing Time)*	=	*Percentage interest in scenery*	*X*	*Average duration spent at that location*

Each different viewing location is described using a 'Location Category", which infers that a group of activities is undertaken at that location. For example, one type of viewing location is a Ferry Route used mainly by commuters. This has the category "FC". Activities associated with this category are "Ferry commuters" and "Ferry tourists".

Each category is allocated an approximate viewing duration. For example, schools have an assumed viewing duration of 60 minutes, which is estimated to be the average time per day that students are outside. Appreciation of scenery is assumed however to peak at 5 minutes viewing duration (see Figure 27). It is recognised that there are considerable benefits in viewing of scenery beyond this period. The benefits of scenery beyond 5 minutes viewing duration are assumed to be recreational, which are another important yet separate social value of open space.

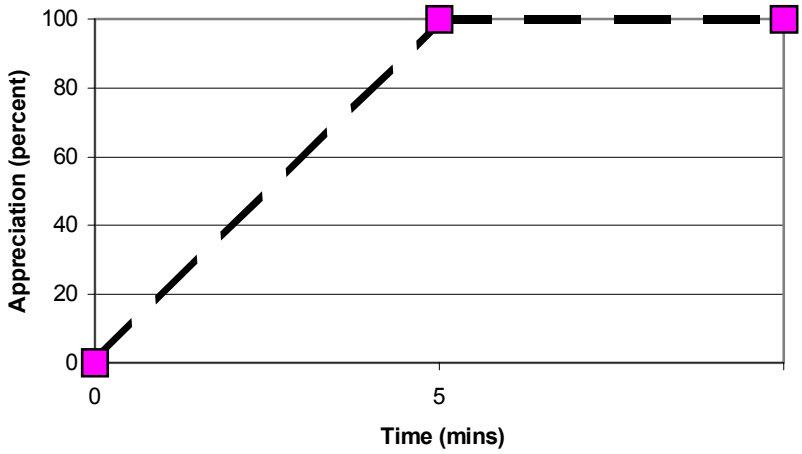


Figure 27. The maximum effective viewing time at any place is assumed to be 5 minutes

In the case of routes, duration is calculated as function of travelling speed. Duration is calculated as the period of time taken to travel 100 meters.

Some examples of different "Standard Viewing Durations" are as follows:

- Highways: 0.01 minutes
- Golf course: 2.00 minutes
- Formal Lookouts: 4.25 minutes

A summary of standard viewing times used in this project are listed in Appendix 15. Full details of the procedures used to weight viewing locations are provided in the report "Viewing Network GIS Data Guidelines" 14 December 2000, Regional Landscape Unit, Environmental Protection Agency. These standards have been applied to visual exposure mapping projects in Brisbane, Caboolture, Ipswich and southern Esk shire.

6.4 Viewing location map

The map of viewing location (Map 4) shows the distribution of viewing locations across the study area. It illustrates the importance of the Warrego Highway, the Brisbane Valley Highway, and the new 'Cobb and Co Way' as the primary viewing locations in the study area. Whilst the average time people are assumed look at scenery along these highways is less than 1 second every 100m, the large volume of traffic along these routes ensures they have high importance.

Many of the other important viewing locations are centred around the major towns of the study areas, illustrating the importance of views from these localities. Other sites such as schools, local roads, lookouts and tourism facilities also contribute to the pattern of visitation throughout the study area.

6.5 Sensitivity of the landscape near viewing locations

Whilst information on viewing locations has been compiled principally for the purpose of estimating visual exposure of places in the landscape seen from these locations, the viewing locations themselves, and the zone immediately adjacent to viewing locations, is particularly sensitive to development.

Figure 28 illustrates the relative exposure of an object at increasing distance from a viewing location. At 100m from the viewing location the relative exposure decreases to 50%, and decreases to 25% at a distance of 300m. Recognising that the impact of development is affected by a number of factors such as the slope of the terrain, the size and construction of the development, it is still important to recognise the sensitivity of the zone up to 400m around viewing locations, particularly the areas within 200m of viewing locations.

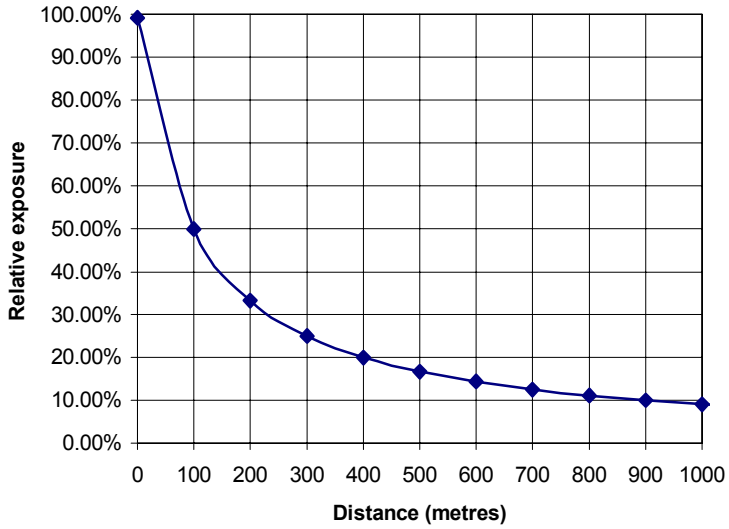


Figure 28. Relationship between exposure and the distance away from viewing location

6.6 Interpretation

The viewing location map for the study area (Map 4) highlight the large volume of use in the central parts of the valley, and the highly distributed nature of viewing places and roads across the district. This pattern of highlights the integrated commuter network across the study area used for commuting, leisure and tourism.

In addition to scenic preference and visual exposure criteria used to assess areas of high scenic amenity, it is important to also consider the special management of the zone around viewing locations, extending up to 400m from the viewing locations, depending on the nature of the landscape around the location, its overall importance, and the nature of the development.

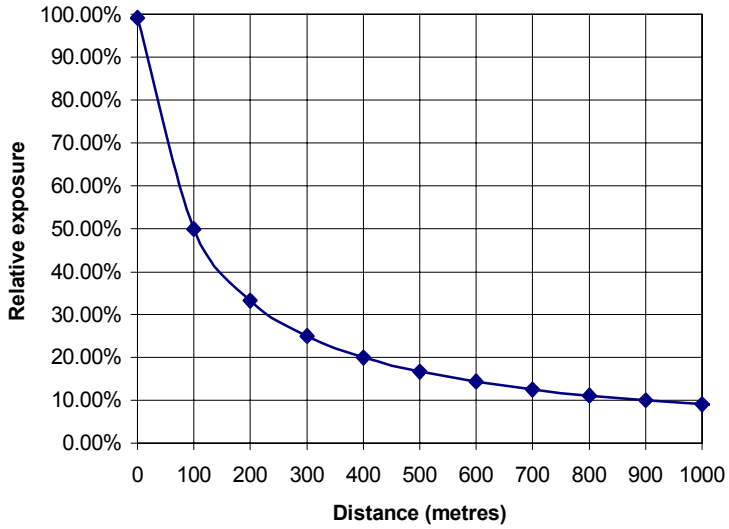
7 Visual exposure modelling

7.1 Introduction

Viewing location data is managed differently for routes and places. Places, which are represented as points, are loaded directly into the visual exposure modelling system. Routes, including roads, trails and paths, are converted from vectors (lines) into points by selecting a point every 100m along the route. All points, including their importance (PVT) are loaded into the modelling system with the terrain model and a surface representing visibility attenuation. A 50m resolution digital elevation model was used for this analysis. The 50m elevation model was derived from a 25m resolution DEM provided by the Department of Natural Resources and Mines.

The visual exposure modelling system calculates the sum of the importance values (PVT) for all locations that have a direct line of sight to each cell in the terrain model. The PVT value is also reduced according to the distance from the viewing location and the visibility attenuation characteristics of any intervening land cover.

Following is an example that illustrates the approach proposed to calculate Visual Exposure from multiple Viewing Locations.



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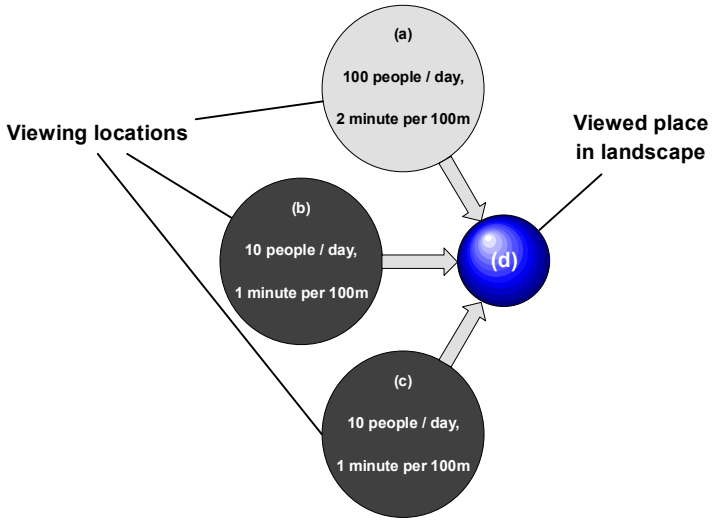

Figure 29. Schematic representation of how viewing locations contribute to calculation of visual exposure.

In this example, the Visual Exposure at a place in the landscape (d) is equal to the sum of the People x Standard Viewing Duration for Viewing locations (a) (b) (c). In this example, 220 (d) = 200 (a) + 10 (b) + 10 (c). Note that these figures have not been reduced because of distance, for the purpose of simplicity.

7.2 Visibility attenuation

The land cover adjacent to viewing locations has a major effect on the ability to see out from any point. For example, a viewing location on a river has a high visibility of surrounding lands, whereas a viewing location in a dense forest has a poor visibility of surrounding lands.

Land cover information available from the Department of Natural Resources and Mines (SLATS) was used to create a land cover map with different attenuation rates for different surfaces. A visibility decay factor was estimated for each land cover type base on experience of the characteristics of each land cover type in the study area. Views over water have a decay factor of 1.000, indicating that the visibility at 100m is the same at 500m.

The number of hectares by visual exposure class in each Shire is shown in Table 18 indicates that the area in each visual exposure class is about 10%.

Table 17. Visibility attenuation for different types of land cover with increasing distance from viewing location

		Distance away from viewing location (m)								
	Decay factor	*0m*	*25m*	*50m*	*75m*	*100m*	*200m*	*300m*	*400m*	*500m*
Water	1.000	100%	100%	100%	100%	100%	100%	100%	100%	100%
Urban	0.600	100%	60%	36%	22%	13%	2%	0%	0%	0%
Pasture	0.975	100%	98%	95%	93%	90%	82%	74%	67%	60%
Cropping	0.995	100%	100%	99%	99%	98%	96%	94%	92%	90%
Bare soil	0.995	100%	100%	99%	99%	98%	96%	94%	92%	90%
Low density trees	0.900	100%	90%	81%	73%	66%	43%	28%	19%	12%
Dense trees	0.750	100%	75%	56%	42%	32%	10%	3%	1%	0%
Very dense trees	0.500	100%	50%	25%	13%	6%	0%	0%	0%	0%

7.3 Visual exposure map

The map of visual exposure (map 5) indicates the area which is “most seen” through to the area which is “least seen”.

The number of hectares by visual exposure class in each Shire is shown in Table 18 indicates that the area in each visual exposure class is about 10%.

Table 18. Area of each visual exposure class by Local Government Area.

	Visual Exposure Class										
LGA	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*Total*
Cambooya	3,101	2,340	1,584	1,183	768	456	284	246	314	206	10,482
Esk	5,307	7,235	7,309	7,561	7,609	9,122	9,626	8,267	7,758	6,629	76,423
Gatton	10,172	15,517	16,315	16,182	16,543	15,689	14,422	15,265	17,734	19,505	157,343
Ipswich	170	233	431	621	536	378	293	272	315	616	3,865
Laidley	2,296	2,942	3,507	4,583	6,140	7,569	10,128	11,956	11,981	9,078	70,180
Total	21,045	28,267	29,146	30,131	31,595	33,214	34,753	36,006	38,103	36,033	318,292
Percent	6.6%	8.9%	9.2%	9.5%	9.9%	10.4%	10.9%	11.3%	12.0%	11.3%	100.0%

7.4 Interpretation

A 3-dimensional representation of visual exposure for the study area is given in Figure 30.

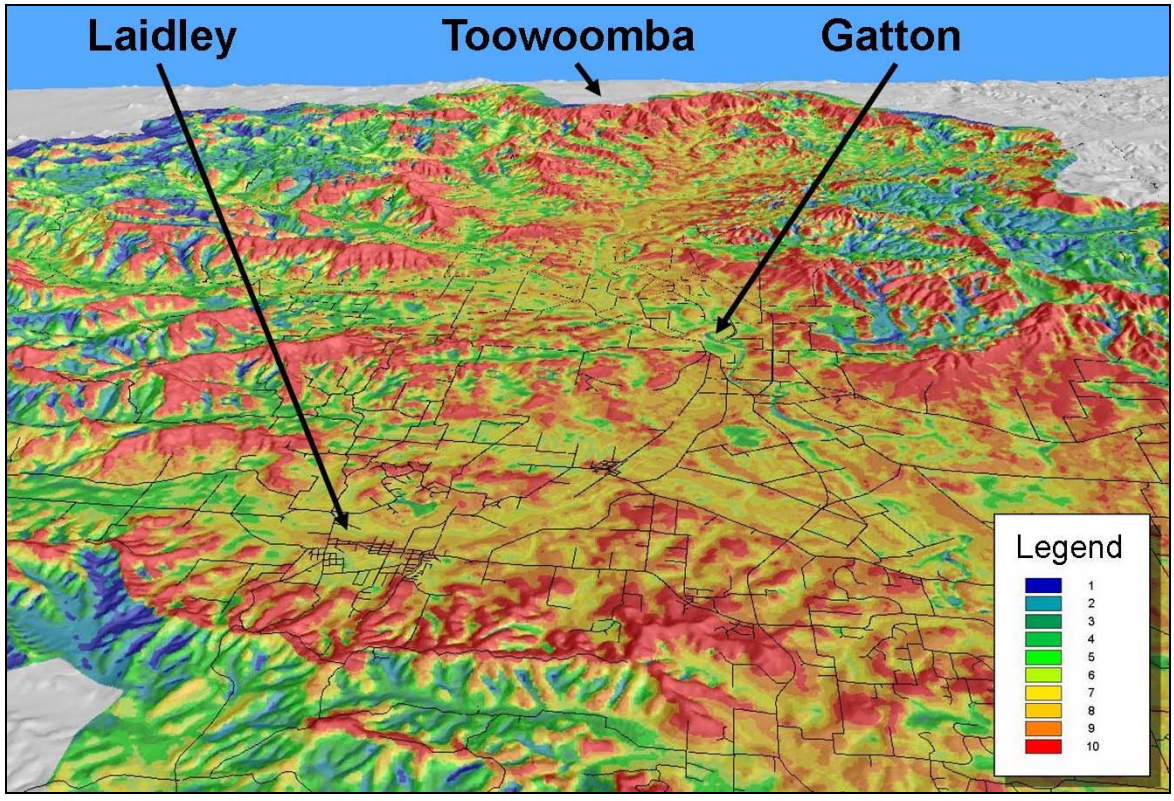

Figure 30. 3-dimensional view of the study area looking west that shows visual exposure

The map of Visual Exposure (see Map 5) highlights areas of the Lockyer that are most seen.

Some notable areas of high visual exposure include:

- Eastern escarpment of the Great Dividing Range near Toowoomba.
- Ridges extending east from the Great Dividing Range near Toowoomba.
- Foothills of the Great Dividing Range approaching the Helidon Hills

- Eastern and Southern aspects of the Helidon Hills.
- The Liverpool Range south of Lowood.
- The Little Liverpool Range between Plainlands and Lowood.
- Northern ridges of the Mount Mistake Mountains

Some of the least seen areas in the study area include:

- Creeks and valleys to the west of the Mt Mistake Mountains
- Much of the central and northern parts of the Helidon Hills.
- Creeks and valleys around the D'Aguilar Ranges.

A large portion of the study area for several kilometres either side of the Warrego Highway has moderate visual exposure.

This study also highlights the high exposure of many built areas, particularly around the central parts of Gatton and Laidley, areas adjacent to highways, tourist routes, and other major roads.

8 Scenic amenity mapping

8.1 Introduction

A scenic amenity map is produced by combining maps of scenic preference and visual exposure using a look-up table indicating how different levels of visual exposure and scenic preference combine to produce levels of scenic amenity. The GIS procedure uses the look up table in Figure 1 to combined scenic preference and visual exposure. Calculation of scenic amenity requires knowledge of the scenic preference rating and visual exposure for any point. For example, a scenic preference of 8 and visual exposure of 5 would result in a scenic amenity rating of 8.

8.2 Scenic amenity map

A 3-dimensional view of scenic amenity is given in Figure 31.

- Eastern and Southern aspects of the Helidon Hills.
- The Liverpool Range south of Lowood.
- The Little Liverpool Range between Plainlands and Lowood.
- Northern ridges of the Mount Mistake Mountains

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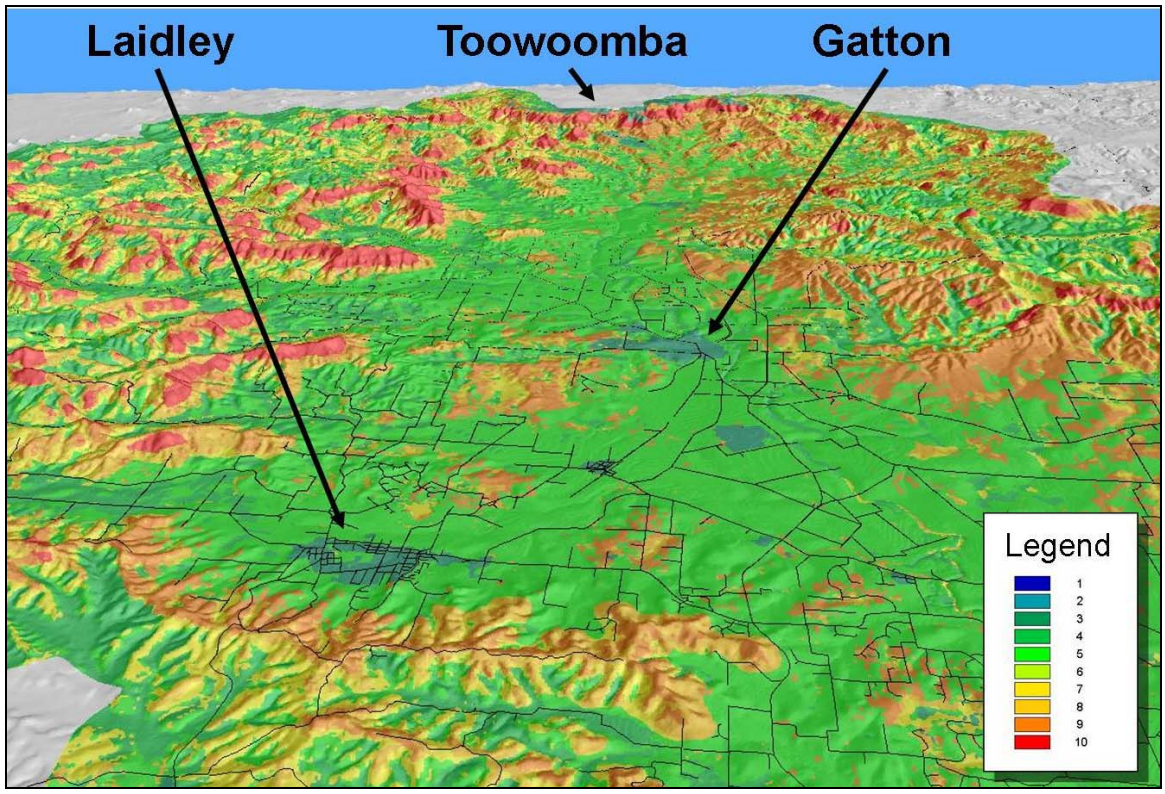

Figure 31. 3-dimensional view of the study looking west that illustrated scenic amenity

A map of scenic amenity (Map 8) has been produced by combining maps of visual exposure and scenic preference using the look-up table in Figure 1.

Table 19 shows that only about 5% of the study has a scenic amenity rating of 10, and that the most common scenic amenity class 6 occupies about 32% of the study area.

Table 19. Area in each scenic amenity class by Local Government Area.

	Area (ha) in each scenic amenity class							
LGA	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*Total*
Cambooya		5,456	1,266	2,146	601	574	416	10,459
Esk	228	23,160	27,945	9,859	6,706	6,575	1,890	76,363
Gatton	1,159	29,578	39,961	31,108	20,948	25,249	9,243	157,246
Ipswich		1,154	591	878	588	566	77	3,853
Laidley	570	9,974	31,762	8,225	7,590	7,267	4,718	70,107
Total	1,957	69,322	101,526	52,216	36,433	40,231	16,344	318,029
Percent	0.6%	21.8%	31.9%	16.4%	11.5%	12.6%	5.1%	100.0%

8.3 Interpretation

Some notable areas of high scenic amenity include:

- The Great Dividing Range in the vicinity of Toowoomba.
- The ranges around Mt Mistake and extending north into the Lockyer Valley.
- Parts of Helidon Hills near gorges and peaks.
- Some peaks and gorges of the D'Aguilar Ranges.
- The Brisbane River below Wivenhoe Dam.

Some of the areas of lower scenic amenity in the study area include:

- Urban areas associated with townships.

- Flat pastures throughout the Valley.
- Valleys in the ranges around Mt Mistake.
- Some of the valleys to the north of the Helidon Hills.
- Some of the valleys of the D'Aguilar Range.

9 Evaluation of mapping

9.1 Field evaluation

A field evaluation of maps was undertaken by the consultant and members of the community consultation group during a field excursion on Friday 31 May 2002.

The group of 8 people from the community consultation group visited eleven (11) sites and undertook a visual assessment of scenic preference, visual exposure, and scenic amenity in 2-3 compass directions at each site (eg. N,S,W). The assessment was conducted firstly for a vista, approximating the area that would be seen through a 50mm camera lens, and secondly for the area of land about 500m from the viewing point. These points were located on the three study maps and also compared against results from community surveys where the location was the same (or similar to) the photo that was used in formal interviews. Full results of the vista comparison for scenic preference, and point comparisons for scenic preference, visual exposure, and scenic amenity are given in Appendix 16.

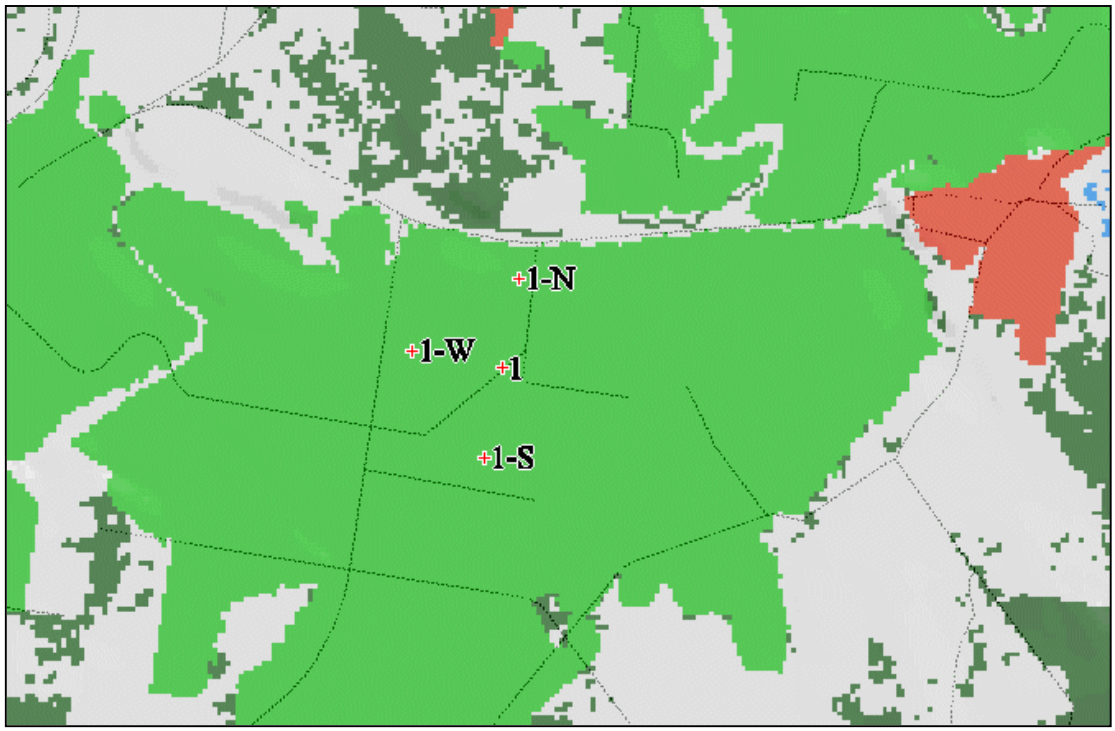

Figure 32. Diagram depicting the first site visited during the community field evaluation of scenic amenity mapping

This assessment indicates that

- There is a range of preferences for scenery among the members of the community consultation group. Preferences at the one site often ranged from 2 to 8. This range of preferences is also seen in results of the community surveys.
- A total of 9 field vistas had a comparable or identical photo used in the survey.

- Eastern and Southern aspects of the Helidon Hills.
- The Liverpool Range south of Lowood.
- The Little Liverpool Range between Plainlands and Lowood.
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Some of the least seen areas in the study area include:

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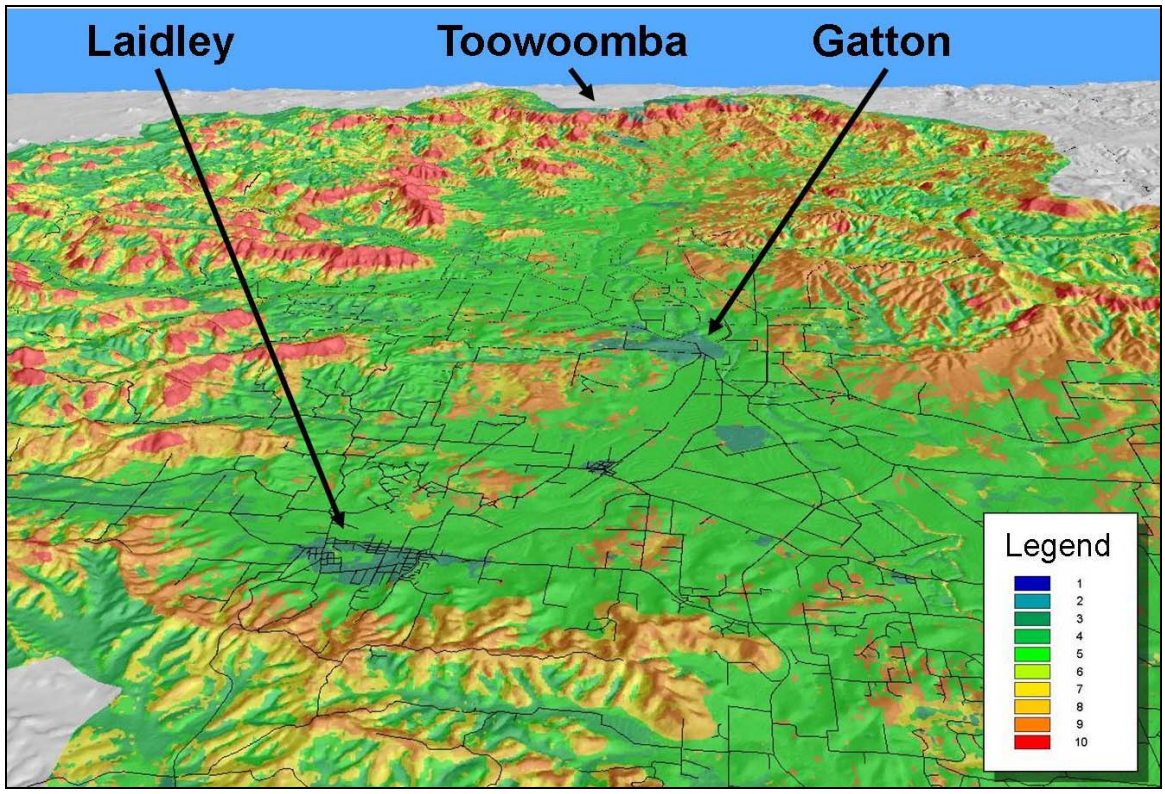

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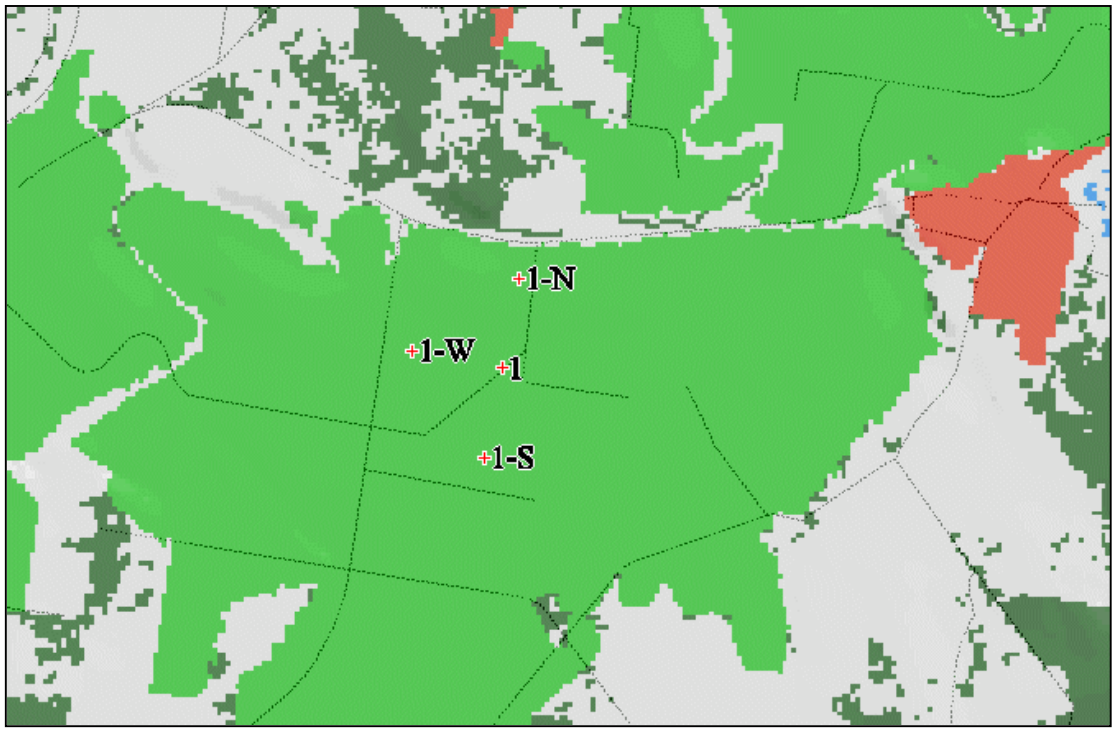

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- A total of 9 field vistas had a comparable or identical photo used in the survey.

- The greatest differences between the scenic preference estimates during the field evaluation and the community surveys were that (a) vistas that included transmission towers were scored lower on the field day (b) steep forest was scored lower on the field day, and (c) crops were scored higher.
- One vista receive the same average score during the field day as results from the community surveys using photos. The field assessment was generally within about 1 point of the formal survey results (with the exception of points mentioned).
- Point assessment of scenic preference was considerably different to mapping where the assessment point fell on unpleasant scenery (eg. sheds with an average field score of 1.7 compared to a mapped score of 7. This highlights the generalised nature of mapping. Areas of steep trees received a lower score than in mapping. Crops were scored more highly during the field evaluation.
- Mapping of scenic preference was generally within about 2 points of field assessments.
- Field assessments of visual exposure also varied considerably between different members of the group. People generally found estimation of visual exposure to be more difficult than assessment of visual exposure.
- Average field assessments were often about 4 points different to map values.
- Field estimates of scenic amenity were at greatest variance with map estimates of scenic amenity for sites with unpleasant development.
- Field assessments of scenic amenity were generally within 2-3 points of mapped scenic amenity scores.

In summary, the field evaluation of mapping indicates the varied nature of individual opinions about scenic preference and visual exposure. It also indicates the hight spatial variability of current mapping and the need for clear field based assessment procedures. Having recognised these issues, the reliability of mapping is generally comparable to the reliability of mapping that would be associated with 1:50,000 to 1:100,000 scale mapping of natural resource values.

9.2 Conclusions

An objective and comprehensive map of visual exposure, scenic preference, and scenic amenity of the Lockyer has been produced. These maps will contribute to plans by Local and State Governments to enhance, manage, and protect scenic amenity. The map is reliable to a scale of 1:50,00 to 1:100,000.

These maps have a strong underlying theoretical basis and are supported by comprehensive information on community preferences for scenery across the study area, and data compiled by Councils and community members on important viewing locations.

It is important to recognise the strategic role of mapping and the need for both improved resolution of mapping for critical areas, and the need for development of a reliable and repeatable field based assessment technique.

10 Further technical investigations

10.1 Introduction

The study has highlighted several important opportunities to improve the understanding and precision of scenic amenity estimates. These investigations would support the community, local governments and the Queensland Government in their management of scenic amenity.

10.2 Developing a photo-level scenic preference model

Investigations into the effect of land cover, topography, and development conducted for this study indicate that there is significant potential to develop a more comprehensive photo model, based on photo-cell data, for predicting scenic preference at a “site” scale.

Development of this model would require re-analysis of scenic preference data and photo coding data compiled for this study, using various statistical techniques including both decision tree analysis and regression analysis. These investigations would also investigate the relationship between scenic preference and demographic characteristics of people who undertook the surveys.

This model would also describe the effect of development on scenery in various landscape contexts, and indicate the relationship between size of development, proximity of viewing location, and mitigation options including altering the colour of any development, and the effects of tree screening.

It would be effective for this work to be undertaken in cooperation with other Local Governments of the region involved in similar work with support of the Regional Landscape Strategy Advisory Committee (RLSAC).

10.3 Improved modelling of scenic preference

Once a photo-level scenic preference model has been developed, it would be possible to develop a more comprehensive scenic preference model that integrates topographic and land cover attributes in a 3d modelling environment. This 3d mapping model would be capable of predicting the quality of views of specific localities to a higher precision than has been achieved to date with current mapping.

10.4 Identifying ideal scenic lookouts and scenic routes

Geographic information and models compiled for this study indicates those places in the landscape with highest scenic values from multiple viewing locations. A separate consideration is the identification of ideal lookouts of scenic routes that would maximise viewer experience of scenery. Re-engineering of models developed used in this study would allow identification of preferred scenic routes using existing roads or tracks, or new routes if required.

11 Objectives for management of scenic amenity

11.1 Introduction

The Integrated Planning Act (IPA, 1997) and the Regional Framework for Growth Management (RFGM, 2001) encourage Local Governments to identify areas of high scenic amenity and protect the values of these areas.

Whilst the IPA and the RFGM do not suggest the need for special management of any areas other than ‘high’ scenic amenity, management of areas with a scenic amenity of 5 or higher will contribute positively to the lifestyle of residents and visitors. Similarly, the lifestyle of residents and experience of visitors would be enhanced through raising the scenic amenity of areas with a rating of 1 or 2.

A series of management objectives is proposed for each scenic amenity category for evaluation and consideration by Local Governments and State land management agencies.

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A series of management objectives is proposed for each scenic amenity category for evaluation and consideration by Local Governments and State land management agencies.

11.2 Proposed framework

11.2.1 Scenic amenity

The scenic amenity look-up table that combines scenic preference and visual exposure provides a useful framework for formulating management objectives that relate to different levels of scenic amenity.

Because it is possible to have the same level of amenity with different combinations of scenic preference and visual exposure, it is useful to divide the scenic amenity rating of 1-10 into two additional sub-categories – a and b based on the general level of visual exposure. Scenic amenity ratings with a lower visual exposure (1-4) are grouped into sub-category 'a' and scenic amenity ratings with a moderate or higher visual exposure (5-10) are grouped into sub-category 'b'.

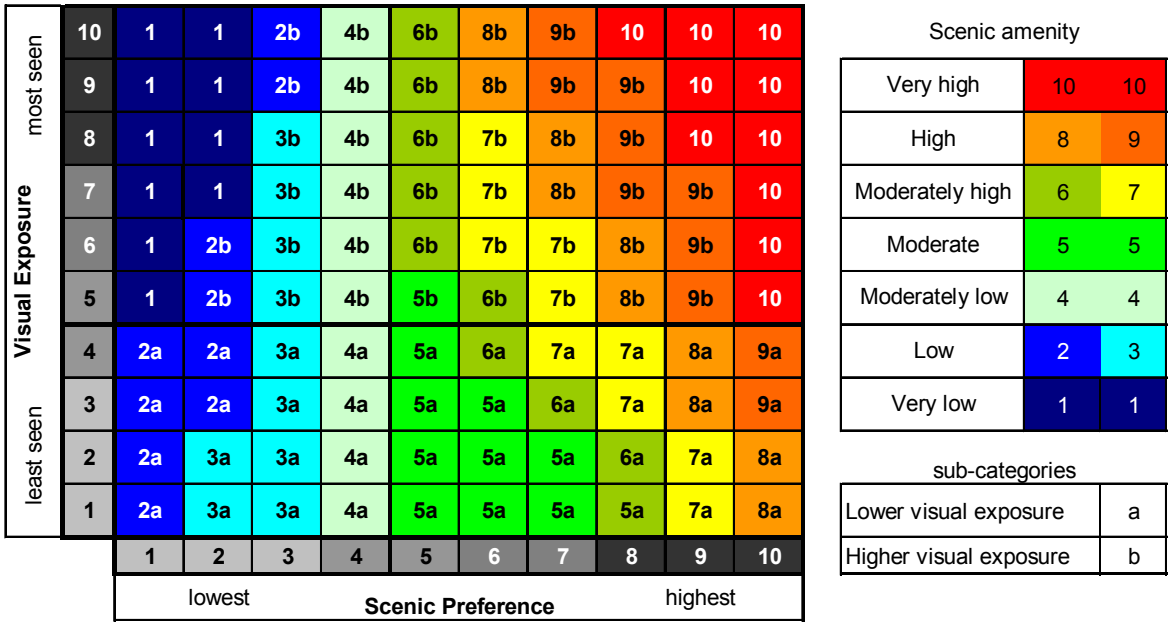

Table 20. Proposed structure for defining management objectives for scenic amenity

Category and rating	*Description*	*Proposed management objectives*

Very high scenic amenity
 	
Rating = 10
	Flowing rivers, very steep pastures, and very steep forests with moderate to high visual exposure	• *Protect* scenic amenity values.
		• Areas to be recognised as having regional significance.
		• May be nominated for recognition as having State significance.
		• Promote these locations for enjoyment by residents and visitors.
		• Development may not reduce scenic amenity below 10
		  ○ Visual exposure to be maintained at a high level
		  ○ Scenic preference to be maintained at a high level

Category and rating	*Description*	*Proposed management objectives*
High scenic amenity Rating = 8, 9	Generally	• *Protect* scenic amenity values. • Areas to be recognised as having regional significance. • Any development (including construction of residential buildings) to either maintain scenic amenity at level of 8 or 9, OR application to be accompanied by an impact study that addresses the impact on scenic amenity, economic, social, and environmental outcomes.
	8a, 9a. Flowing rivers, very steep pastures, and very steep forests with low to moderate visual exposure.	• Encourage managed opportunities to increase appreciation of this scenery.
	8b, 9b. Crops, pastures, and forests with moderate to high visual exposure.	• *Maintain* high exposure and scenic preference of these landscapes.
Moderately high scenic amenity Rating = 6, 7	Generally	• *Maintain* scenic amenity. • Areas to be recognised as having local significance. • Any significant development (ie. commercial or industrial structures) to either maintain scenic amenity at level of 6 or 7, OR application to be accompanied by an impact study that addresses the impact on scenic amenity, economic, social, and environmental outcomes.
	6a, 7a. Steep crops and pastures with low to moderate exposure	• Encourage managed access to increase appreciation and experience of this scenery.
	6b, 7b. Crops and pastures with moderate to high exposure	• *Maintain* high exposure and scenic preference of these landscapes.
Moderate scenic amenity Rating = 5	Flat pastures and crops with moderate to low exposure. May include low density residential housing and distant industrial structures.	• *Maintain* scenic amenity where feasible. • *Maintain* scenic preference of these landscapes at 5 or higher. • Any development that reduces scenic preference to 4 or less to be accompanied by an impact study that addresses the impact on scenic amenity, economic, social, and environmental outcomes.

Category and rating	*Description*	*Proposed management objectives*
Moderately low scenic amenity Rating = 3, 4	Urban, industrial and commercial areas	• Support initiatives to *enhance* scenic amenity. • Provide incentives to *enhance* scenic preference through tree-planting, alteration of colours etc. • Any development that reduces scenic preference to 3 or less to be accompanied by an impact study that addresses the impact on scenic amenity, economic, social, and environmental outcomes.
Low scenic amenity Rating = 1, 2	Large industrial, commercial structures	• Support programs to *enhance* scenic amenity by reducing exposure and improve scenic preference of these sites. • Reduce exposure to these sites through planning of travel routes. • Encourage development to conduct screening or other mitigation measures.

11.2.2 Options for enhancing scenic amenity

Whilst the proposed management framework advocates protecting or maintaining scenic amenity for several levels of scenic amenity, it is possible to also encourage improvement of scenic amenity for several different levels (especially low and moderately low scenic amenity). Figure 33 illustrates four possible management strategies for enhancing scenic amenity that may be appropriate under different situations.

Arrow (i) indicates how scenic amenity can be enhanced by reducing the visual exposure of areas with a low scenic preference rating. This can be achieved by encouraging people to travel via an alternative route or by screening of unsightly landscape features.

Arrow (ii) indicates that a rapid improvement of scenic amenity can be achieved by improving the scenic preference of highly visible areas.

Arrow (iii) indicates that a gradual improvement of scenic amenity can be achieved by improving the visual exposure of attractive areas.

Arrow (iv) shows that a slight gain in scenic amenity can also be achieved by increasing the scenic preference of areas. The gains in this situation are not as great as for strategy (ii).

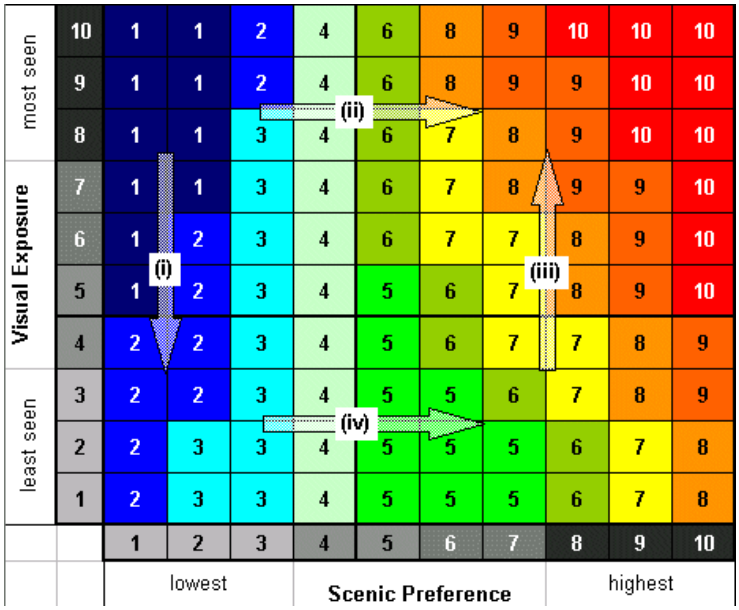

Figure 33. Strategies for enhancing scenic amenity.

11.2.3 Significant viewing locations

The management framework should also recognise the sensitivity of lands up to 400m from important public viewing locations. The exact distance from viewing locations is dependant on the size and characteristics of the development. Ratings of viewing locations are affected by the duration and number of people who use that location. A map that depicts the importance of viewing locations is shown in Map 4.

Table 21. Supplementary objectives for managing scenic preference around viewing locations

Category and rating of viewing location	*Description*	*Proposed management objectives*
High importance Rating = 8-10	Very high numbers of residents and visitors	• Any development (including construction of residential buildings) within 400m of viewing location to either maintain scenic preference at level of 5 or higher, OR application to be accompanied by an impact study that addresses scenic amenity impacts, economic, social, and environmental outcomes.
Moderate importance Rating = 5 - 7	Moderate use by visitors or residents	• Any significant development (ie. commercial or industrial structures) within 400m of viewing location to either maintain scenic preference at 5 or higher, OR application to be accompanied by an impact study that addresses scenic amenity impacts, economic, social, and environmental outcomes.
Other viewing locations Rating = 1-4	Some use by visitors or residents	• Any significant development (ie. commercial or industrial structures) to either maintain scenic preference at level of 6 or 7

12 Mechanisms for management of scenic amenity

12.1 Introduction

Scenic amenity is an important community resource that is recognised by Local Governments in the study area and Queensland government agencies with land management responsibilities in the region.

This study provides an opportunity for increased coordination between different government and private sectors to recognise and manage scenic amenity for the future. This is possible because of the greater consistency and rigour brought to this process than has been possible in other similar assessment work to date.

Whilst draft planning schemes in preparation by Gatton, Laidley and Esk Shires provide a sound administrative vehicle for adoption of these study outcomes, these schemes have yet to consider the contribution of this study and the most effective means to integrate these results into existing strategic plans and provisions.

In addition, land management agencies of the Queensland Government have yet to consider the contribution of this information to their planning procedures.

A series of mechanisms are available to Government and community stakeholders to advance the management of scenic amenity of the Lockyer.

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In addition, land management agencies of the Queensland Government have yet to consider the contribution of this information to their planning procedures.

A series of mechanisms are available to Government and community stakeholders to advance the management of scenic amenity of the Lockyer.

12.2 Promoting best practice

One of the preferred mechanisms for management of scenic amenity is to promote best practice landscaping and planning by Local Government, State Government, industry, and tourism organisations.

Development of a program for promotion of best practice could entail:

- Decision by key stakeholders to proceed with this strategy.
- Nomination of a panel of community and Government experts to manage this process.
- Call for nominations of best practice according to agreed criteria.
- Recognition of examples of best practice.
- Publicity of best practice to the community and other developers.

12.3 Raising community awareness

Scenery is something that we all enjoy, but there is less awareness of the way scenic amenity is measured, and how it can be managed.

It would be valuable to develop a community awareness program, which would also include government officers to explain scenic amenity and how we can take care to manage it.

This could entail:

- Nomination of an agency or group of agencies to take responsibility for this program.
- Deciding on resourcing, funding, and priority targets for this program.
- Development and distribution of resource materials.
- Review of the program.

12.4 Increasing opportunities for peoples enjoyment of scenic areas

Increasing people's opportunities to enjoy scenic areas. Some areas of high scenic amenity and high scenic preference may be unseen or inaccessible. It may be possible to promote enjoyment of these areas by identifying existing routes and places with good views of these scenic areas, and promoting these places in conjunction with other agencies or organisations.

This could entail:

- Developing agreed criteria for identifying scenic area.
- Nominating locations and preferred routes.
- Developing and implementing a communications program to promoting these locations and routes.

12.5 Tourism marketing and promotion

The Lockyer Valley and Brisbane Valley contain many beautiful and peaceful areas that are promoted through existing brochures and publicity material.

An opportunity exists for tourism bodies in the study area to review and discuss the findings of this study and consider opportunities to enhance current marketing strategies.

There may also be value in reformatting some of the products in this study, especially mapping and photos, to contribute to a special promotion of some of the scenic assets of the area.

This could entail:

- Discussion of the study results with tourism representatives.
- Identifying opportunities for reformatting and presentation of some of the study products to assist in a special promotion of scenic areas.

12.6 Promoting adoption of common guidelines for regulating scenic impacts of development.

General guidelines for minimising the impact of developments on scenic amenity are proposed (see Appendix 17). These guidelines outline general procedures for on-site assessment and general mitigation procedures. It would be possible to promote adoption of these guidelines and encourage all levels of government and industry to develop a uniform approach for managing the impact of development on scenic amenity. These guidelines could also be refined once the proposed scenic preference photo model is completed.

The guidelines could to apply to all forms of land development and all tenures.

The following steps could be considered for refining and testing of these guidelines.

- Establishing a working party of planning officers from interested organisations.
- Obtain access to any refined 'photo model' that summarises results of photo surveys.
- Refine proposed guidelines.
- Review and test these guidelines.
- Disseminate and promote these guidelines for adoption by Local and State Government.

12.7 Recognising scenic amenity in local government planning schemes.

It would be possible for local governments in the Lockyer to address management of scenic amenity using a variety of mechanisms such as: adoption of a planning policy on scenic amenity, development of specific planning codes, local area planning, development control plans, or amendment to the planning scheme to include a separate thematic planning provision on scenic amenity.

It is suggested that the following steps be considered by local governments

- Establishing a working party of planning officers from each local government.
- Review the status of current procedures to protect scenic values in planning schemes
- Identify options and priorities for including scenic amenity in planning schemes
- Each local government to implement strategies that are most effective for its planning scheme.
- Review progress in 12 months.

12.8 Institutional arrangements

Implementation of these and other strategies will be facilitated by adoption of appropriate institutional arrangements. The preferred option would be to establish a Lockyer scenic amenity advisory committee, including both Government and community representatives to act as an advocate for scenic amenity and assist coordinated management of scenic amenity by local government and the Queensland government.

It is suggested that the following steps be considered

- Define objectives, terms of reference and membership guidelines of this group
- Secure sponsorship for operation of this group
- Recruit members to this group
- Support ongoing activities
- Review progress in 12 months.

13 Conclusions

The Lockyer Scenic Amenity study provides the community and government with a comprehensive set of information about peoples preferences for different types of scenery, the range of opinions in the community about scenery, and how development effects peoples liking of scenery. It shows those public places were people view scenery, and those parts of the landscape that can be seen most often. It also provides a set of comprehensive mapping that shows the scenic characteristics of different localities in the Lockyer. This information is accessible to the community, local governments and the Queensland government.

The study proposes a series of management objectives that will protect, maintain, and enhance scenic amenity. A series of mechanisms to achieve these objectives are proposed.

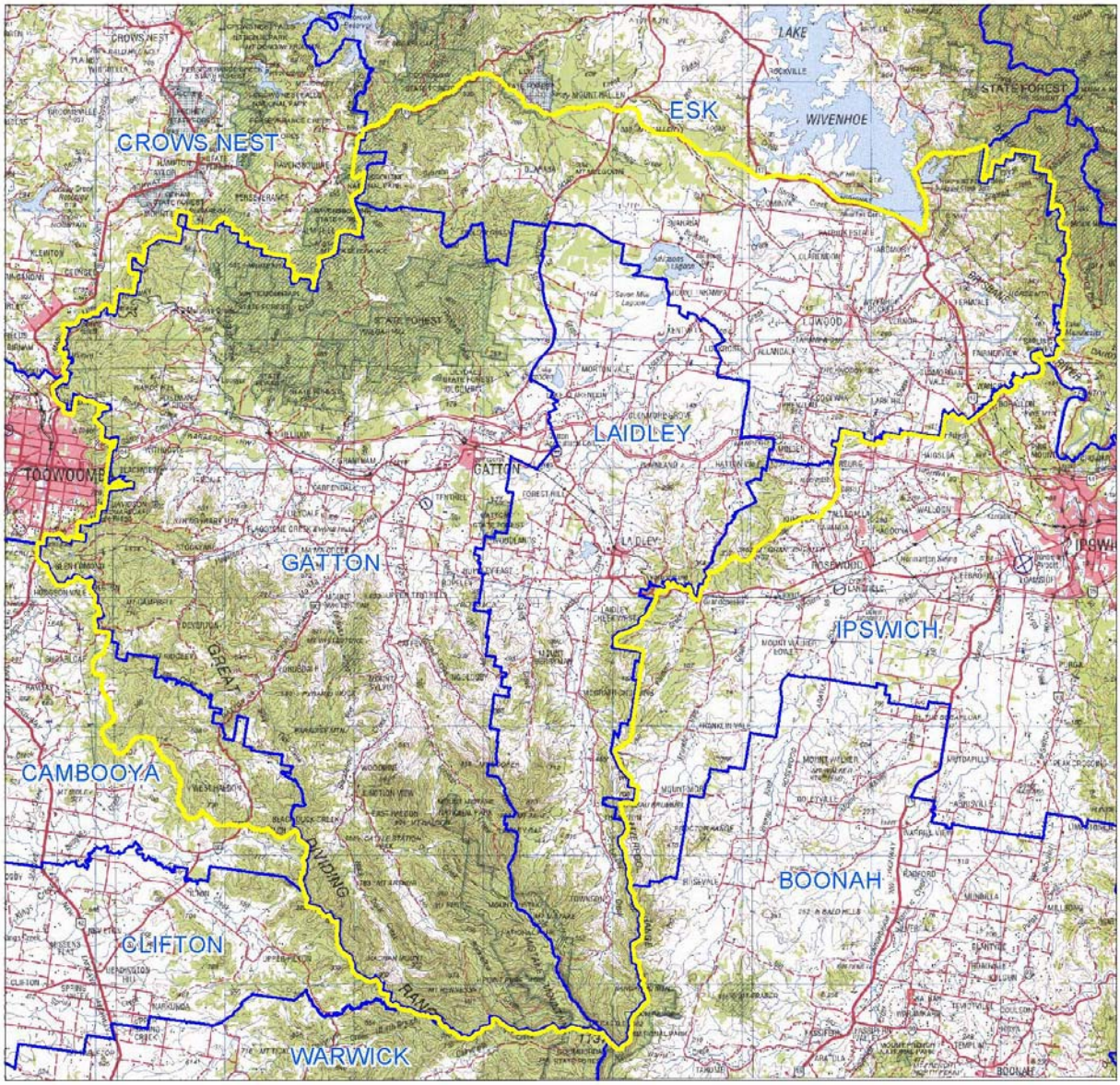
This information will be of assistance to community and government organisations with an interest and responsibility for ensuring scenic amenity of the Locker remains a community resource for the enjoyment of current and future generations.

14 References

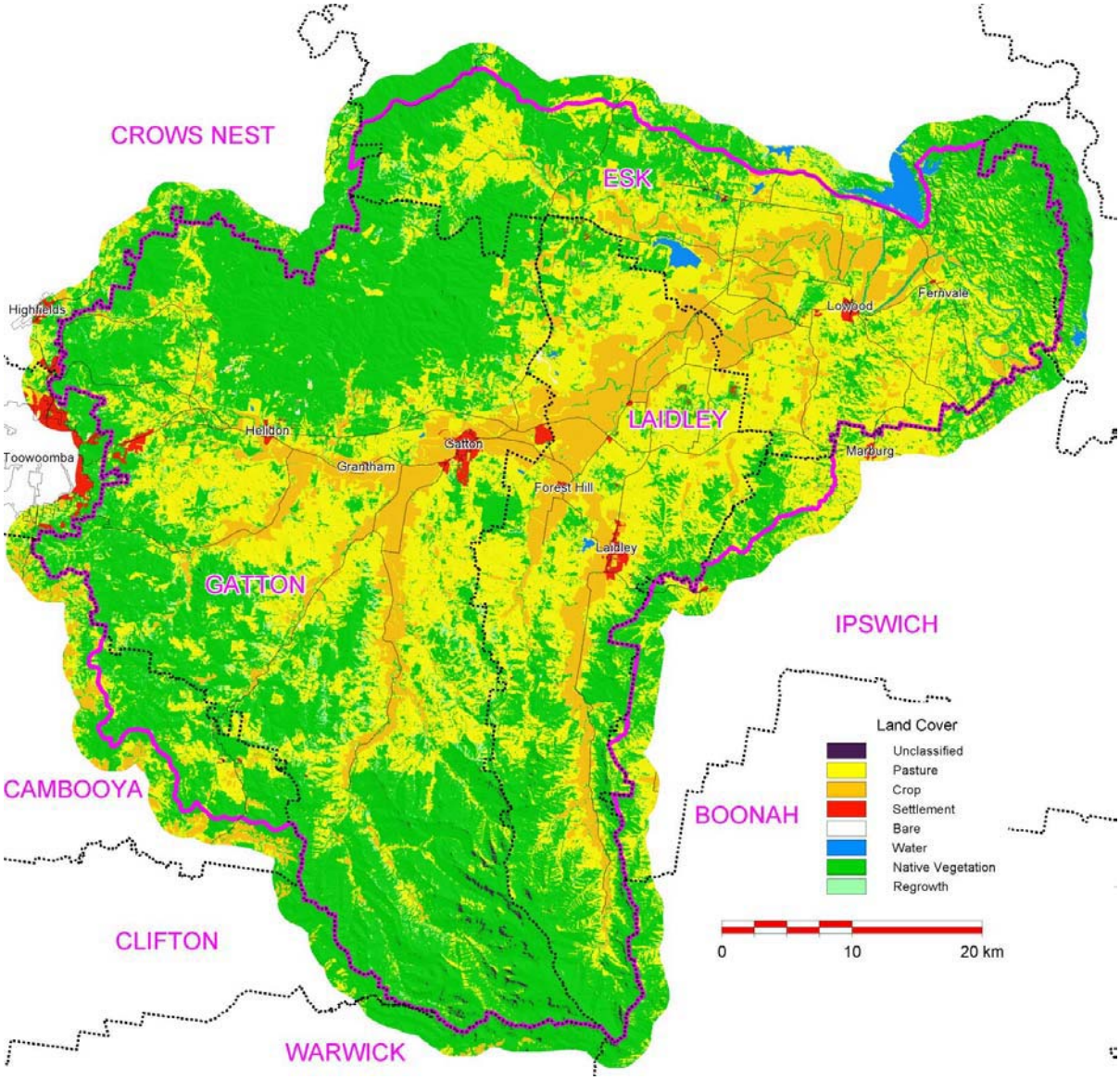
Department of Natural Resources and Mines (2000) Land Cover Change in Queensland 1997-1999, Resource Sciences and Knowledge, Queensland Department of Natural Resources, Natural Sciences Precinct, 80 Meiers Road, Indooroopilly, 4068, http://www.dnr.qld.gov.au/slats

Preston, R.A. (2001) *Scenic amenity: measuring community appreciation of landscape aesthetics at Moggill and Glen Rock*. Department of Natural Resources and Mines, Environmental Protection Agency, Brisbane. http://www.env.qld.gov.au/environment/environment/landscape.

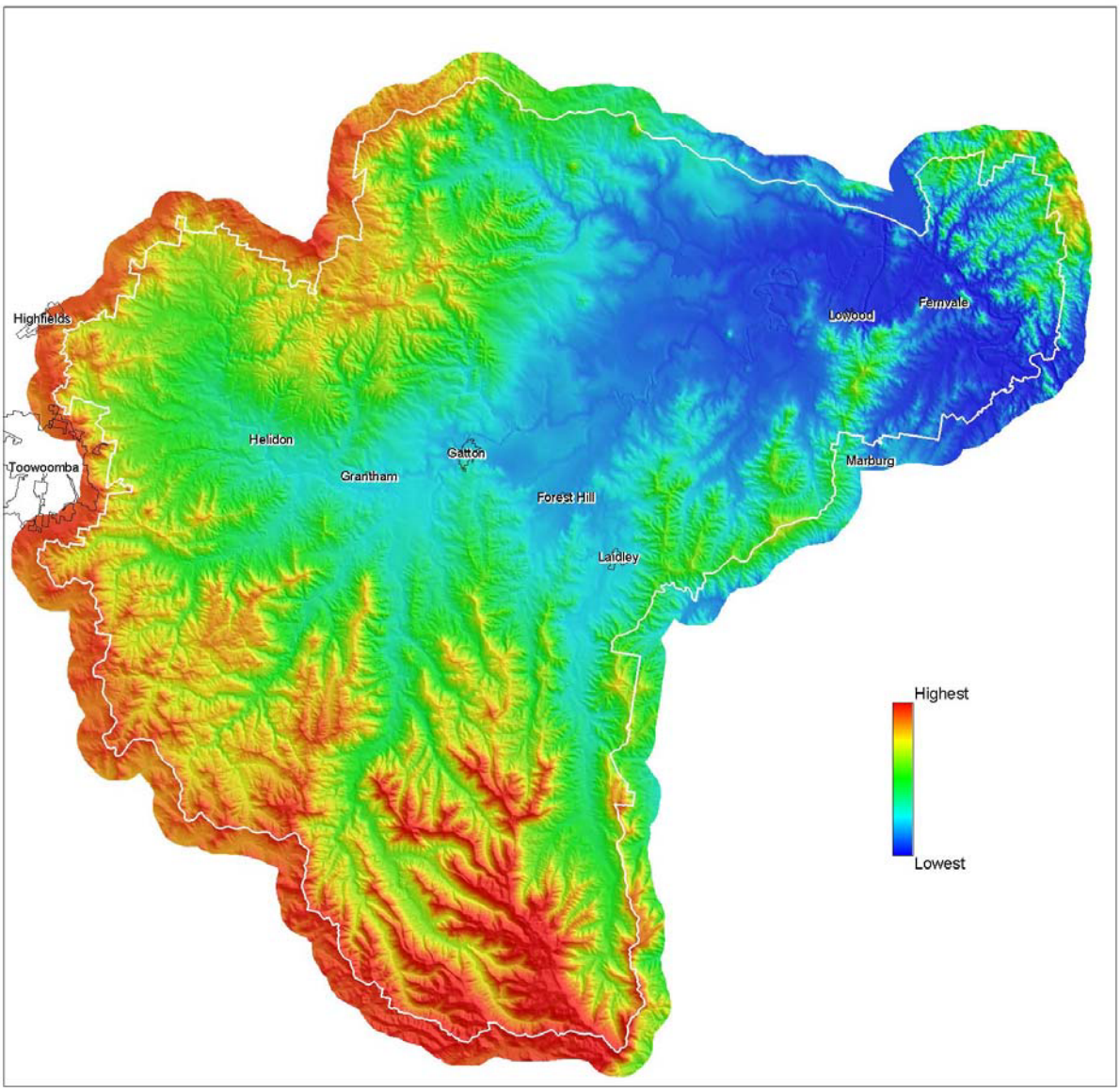
Map 1. Study area



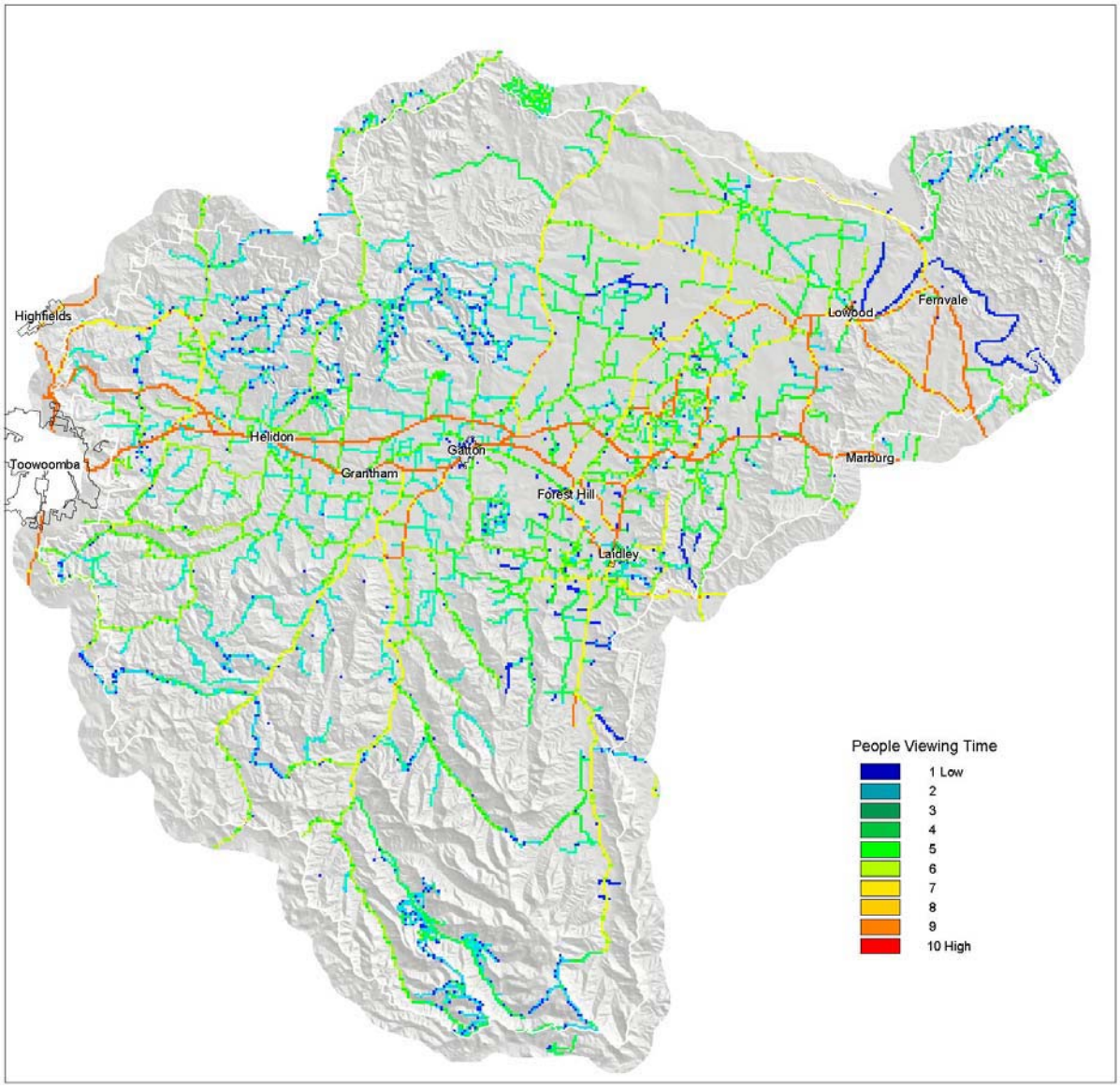
Map 2. Land cover



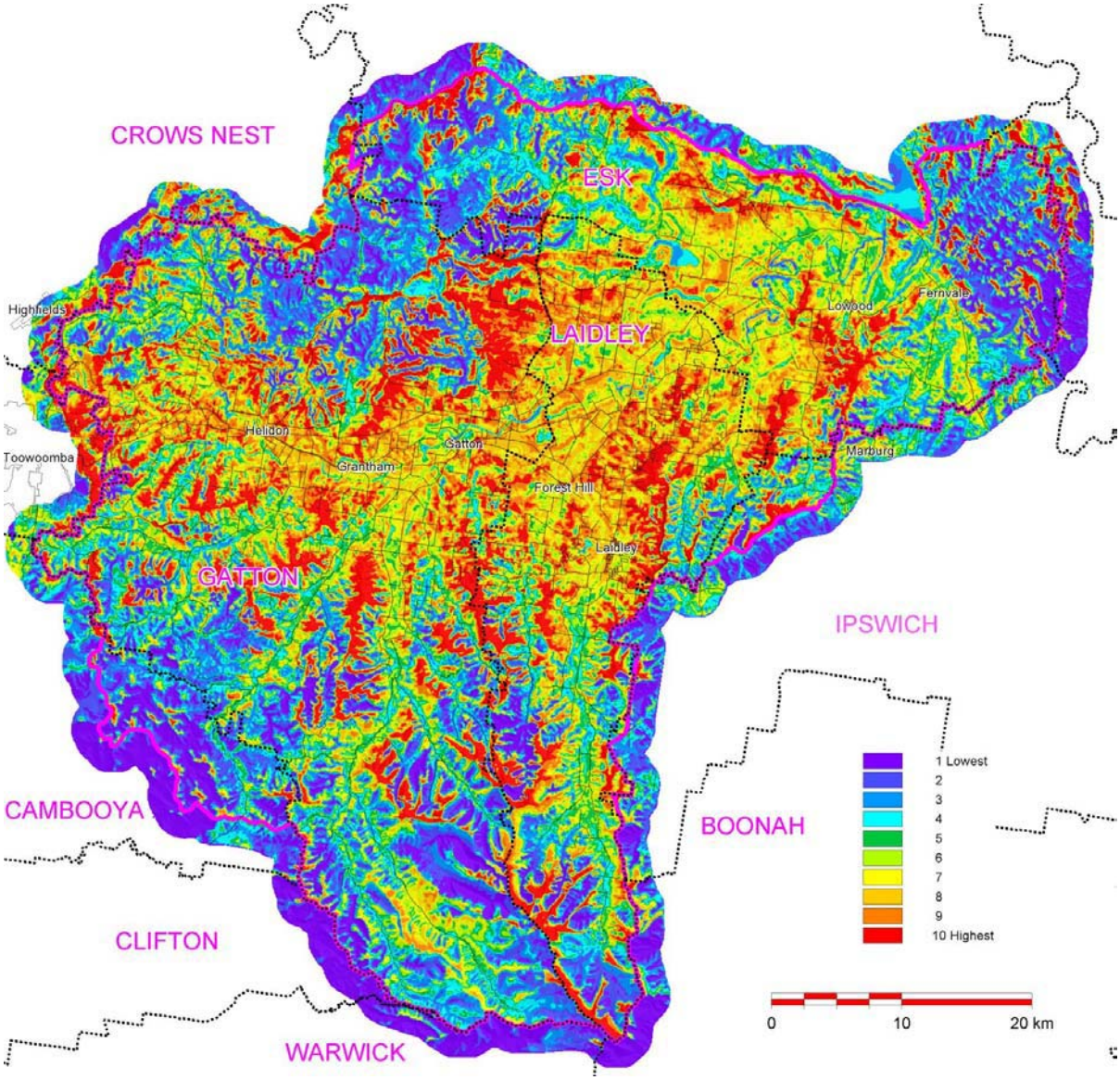
Map 3. Topography



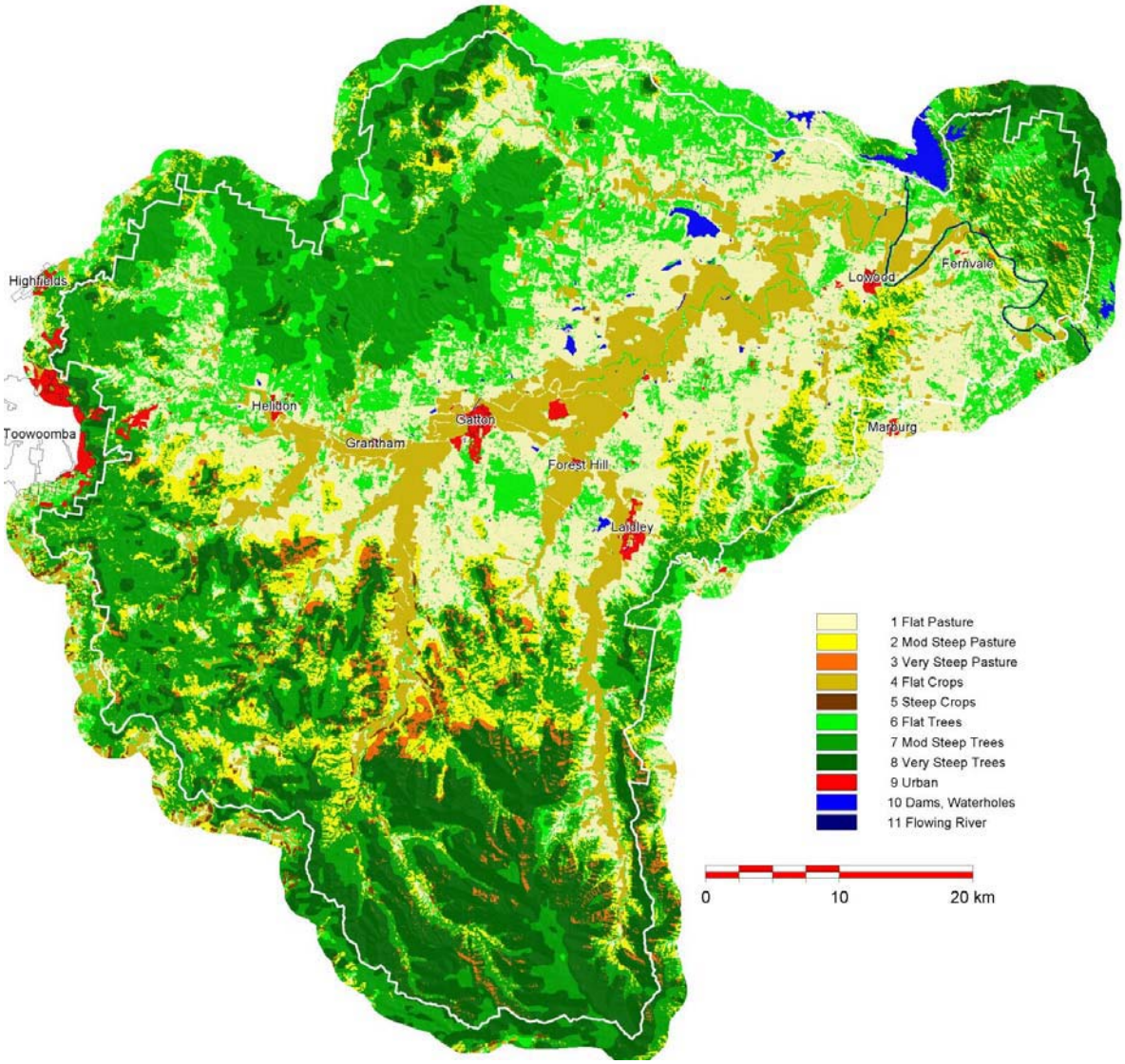
Map 4. Viewing locations



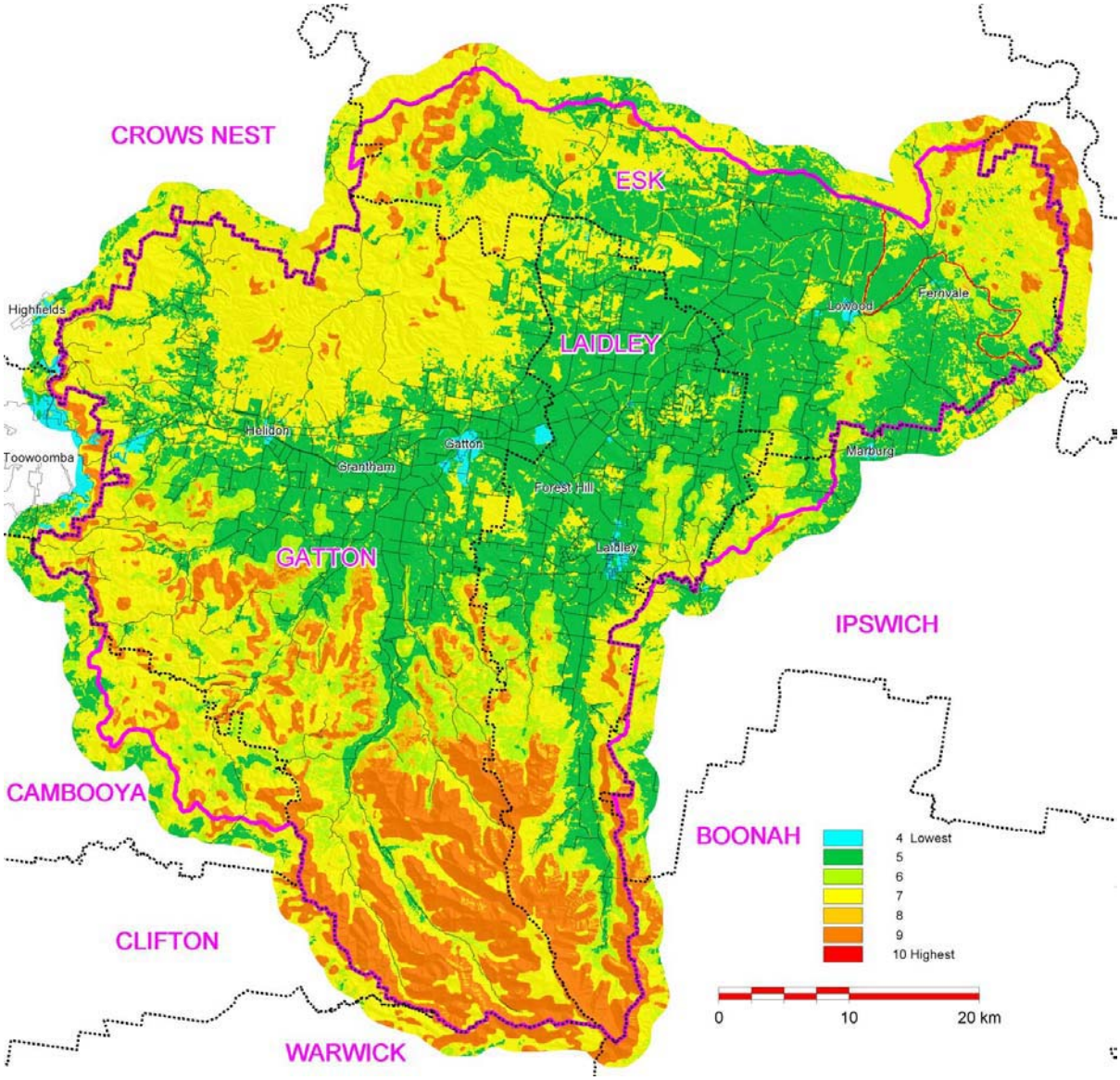
Map 5. Visual Exposure



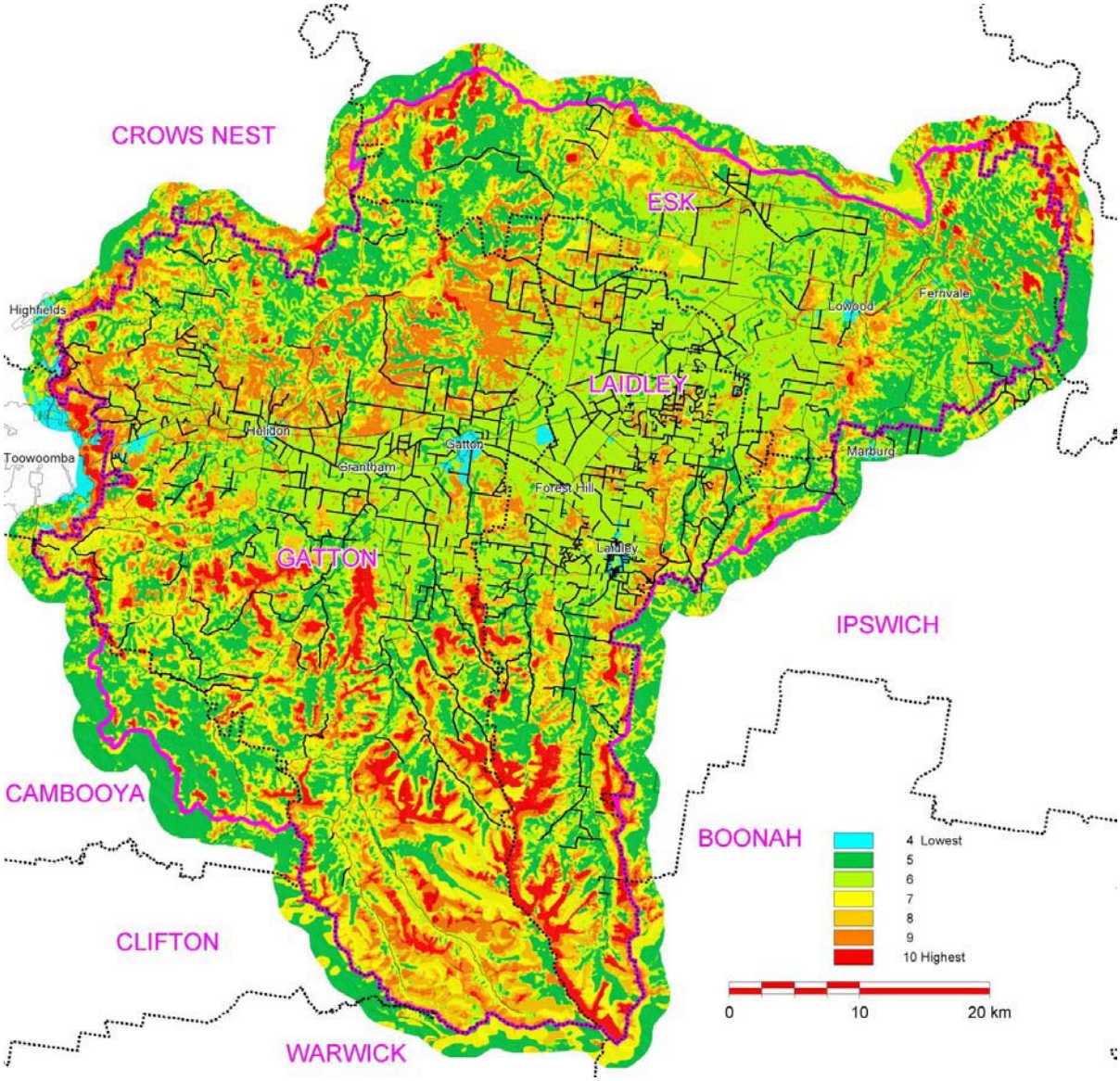
Map 6. Scenic preference types



Map 7. Scenic preference



Map 8. Scenic amenity



Appendix 1 Background to the scenic amenity methodology

The methodology used to map scenic amenity of the Lockyer has been developed and tested over the past three years by the Regional Landscape Strategy Advisory Committee (RLSAC) and the Brisbane City Council. The approach is based around market research of community preferences for scenery and objective GIS mapping of seen areas. This approach was adopted because of the need to reduce ambiguity and argument about what constitutes high scenic amenity.

A report about this methodology has been published by the Environmental Protection Agency:

Preston, R.A. (2001) Scenic amenity: measuring community appreciation of landscape aesthetics at Moggill and Glen Rock. Department of Natural Resources and Mines, Environmental Protection Agency, Brisbane.

This report can also be accessed at the following EPA web site: http://www.env.qld.gov.au/environment/environment/landscape.

The scenic amenity methodology described in the above report has been adopted by the South East Queensland Regional Organisation of Councils (SEQROC) as the preferred technique for sub-regional and shire-wide assessment of scenic amenity, and is also currently being applied in the Caboolture Shire. The approach used to map 'seen areas' has also been applied by the Brisbane City Council and the Ipswich City Council.

The information reproduced in this appendix has been copied from pages 1-10 and the executive summary of the above report.

Background to the Moggill study

Because of government and community concern about the environmental, economic and social impacts of population growth in south-east Queensland, the Queensland Government has established a regional framework for growth management (RFGM) (SEQ2021, 2000). This program provides 'a framework for cooperative and coordinated arrangements to manage the growth for the benefit of residents in the region'. The Regional Landscape Strategy (RLS) is a program under the RFGM. The objective of the RLS is to 'protect, though equitable processes, the regionally significant open space of South-east Queensland for present and future generations'.

In particular, high (and regionally significant) scenic amenity is recognised as a regional landscape value to be protected by local authority planning schemes in south-east Queensland. This principle is set out in the regional landscapes section of the RFGM (SEQ2021, 2000).

In April 1999, the Regional Landscape Strategy Advisory Committee (RLSAC) identified a need to improve the understanding of scenic amenity and develop an assessment method that would have community credibility. Soon after, in about June 1999, Brisbane City Council also identified a requirement for a method for identifying important scenic landscapes. In July 1999, the RLSAC and the BCC agreed to undertake the Moggill Scenic Amenity Pilot Study to develop an approach for assessing and mapping scenic amenity. The method was to have community confidence, withstand the rigors of current government planning processes, and be capable of being readily applied to other areas of Brisbane or south-east Queensland.

The BCC and the RLSAC agreed to conduct a pilot project to test and evaluate a new mapping approach because of the difficulty of obtaining adequate community and political support for studies that identify areas of high scenic value. Some of the difficulties with earlier approaches included identifying areas as being of high scenic value which were considered by residents to have low scenic value, and identifying areas as 'sensitive to change' which were not considered by residents to be sensitive to change. The approaches used in the past have been largely based on 'expert' approaches, and these have not had adequate political or community credibility.

Review of definitions used in other studies

The term 'scenic amenity' has not been widely used in south-east Queensland, or in Australian or overseas studies. Thus, whilst there is a general understanding that the term is intended to describe the value which the community gives to scenery, there are no reports available that provide a more complete understanding an interpretation of its meaning. To assist in this process, a review of some associated definitions has been undertaken. The definitions discussed below are:

- scenic beauty
- visual quality and scenic quality
- landscape value or landscape quality
- aesthetic significance
- landscape class
- landscape character
- scenic character
- visual amenity.

The term 'scenic beauty' is widely used in United States studies of visual preference of forest scenes (Rosenberger & Smith, 1998). Scenic Beauty was first described by Daniel and Boster (1976) as a relative measure of public visual preference for a landscape. Scenic beauty strictly excludes other cultural or ecological values. It is also driven by community preferences, rather than expert opinion or the application of landscape theory, and is measured on a 10 point scale. Respondents are asked to rate a scenes beauty. Recent studies on mapping scenic beauty have used the term 'vista scenic beauty' to describe the beauty of the seen landscape, instead of the intrinsic value of the landscape (e.g. Meitner & Daniel, 1999). Scenic beauty and vista scenic beauty are relevant to the current study because they objectively assess community preferences rather than rely on expert knowledge or theory, and they allow for the use photographs of the landscape as a stimulus.

The terms 'visual quality' and 'scenic quality' are widely used terms that are generally synonymous with scenic beauty, except that there is no explicit effort to assess the beauty of a landscape, compared to other values. In some cases, assessment is based on expert theory (Bergen, 1993), and in other cases it relies on public surveys (e.g. Prineas & Allen, 1992). The Visual Resource Management System and Scenic Management System used by the US Department of Agriculture (USDA) Forest Service (see review in Brannock Humphreys, 1997) is based on the notion of visual quality. These programs use the term visual quality to establish a clear separation between people's visual responses and non-visual responses to the landscape.

The term 'landscape value', or 'landscape quality', is used to describe a composite of the scenic value, and other cultural and environmental values. The UK Countryside Commission (1993) suggests that the landscape value includes the scenic or visual dimensions of the landscape, plus other dimensions including geology, topography, soils, ecology, anthropology, landscape history, architecture, and cultural associations. In assessing the coastal environment of Queensland, Brannock Humphreys (1997) defined landscape quality as 'the visible landscape of the coastal zone, its aesthetic attributes and cultural associations'. The main difference between these terms and the term scenic amenity is that, in the former, 'landscape' includes expert assessments of the combined visual, cultural, and environmental values of landscapes.

The term 'aesthetic significance' is commonly used in Australia as one of the components of cultural heritage value (Australian Heritage Commission, 1998). Aesthetic significance is also used as one of the criteria to assess the heritage significance of a site under the *Queensland Heritage Act 1992*. A major study to identify areas of high aesthetic value was completed for the Queensland Comprehensive Regional Assessment (CRA)/Regional Forest Agreement (RFA) Steering Committee (Lennon & Townsley, 1998). Aesthetic significance is oriented towards an expert based assessment based on specific criteria. It is also oriented toward the experiential elements of landscape (e.g. sight, smell) as well as the visual. Aesthetics can be evoked by the use of photographic stimuli, though to a lesser extent than experiential assessment. The accepted definition of 'aesthetic value' is clearly inclusive of other non-visual responses to the landscape: Ramsay and Paraskevopolous (1993) define aesthetic value as:

> the response derived from the experience of the environment or of particular cultural and natural attributes within it. This response can be either to the visual or to non-visual

elements and can embrace emotional response, sense of place, sound, smell and any other factor having a strong impact on human thought, feelings and attitudes.

The term 'landscape class', indicating the level of naturalness of a landscape, has recently been applied by the joint project in south-east Queensland to assess outdoor recreation opportunities (Department of Natural Resources, Department of Sport Tourism and Racing, 1999). This system is an adaptation of the Clark and Stankey (1979) recreation opportunity spectrum, which has also been used as the foundation for other landscape mapping studies in Queensland (e.g. Loder & Bayly, 1993; Brannock & Humphreys, 1997). Landscape class is relevant to the assessment of recreation potential, rather than visual appeal. It contains several assumptions about the relationship between the level of human alteration and community recreation preference which may not be relevant to community preferences for scenery.

'Landscape character' is a term in which there is growing interest and acceptance (e.g. Countryside Commission, 1993; Brabyn, 1996) that gives recognition to the local context or setting, and to the landscape characteristics distinctive to a particular area. Landscape character is also more widely applied to modified landscapes containing a range of natural, rural, and built landscape elements. It is relevant to current study but again relies on expert rather than assessment.

The term 'scenic character' has been used in recent assessment of Airlie Beach (Green, 2000). Scenic character is very similar to the notion of scenic preference adopted in this study, because it is based on a qualitative survey of people in the community using photographs to evoke people's responses. However, scenic character was not scored using a 1–10 rating.

The term 'visual amenity' has been used by the Maroochy Shire Council (1992) in its plan for the Blackall Ranges as an all-embracing term that includes scenic quality, character, and community value. In this context, the Maroochy study defines visual amenity as pleasant visual and physical components of the landscape, which have social validity (i.e. are accessible, useful, and relevant). Visual amenity explicitly recognises the importance of community values. It relies, however, on expert, rather than community, assessment of preference.

The term vista scenic beauty, whilst rarely used, is closest to the requirements of this study because it reflects two important elements: the relative impact of a place in the landscape because of the distance to and number of viewers, and the community's appreciation of that scenery as measured through community surveys.

Definition of scenic amenity

Given the variety of meaning associated with other terms, it is appropriate to develop new and explicit working definitions for use in this study and subsequent projects in south-east Queensland. Based on the above review and an understanding of current community and government expectations, it is appropriate to recognise scenic amenity as a measure of the relative contribution of different places in the landscape to the community's appreciation of landscape aesthetics. In order to encourage precise measurement of scenic amenity, the following working definition has been adopted as follows.

Scenic amenity is a measure of the relative contribution of each place in the landscape to the collective community appreciation of open space as viewed from places that are important to the public.

In this context, there are two elements to the concept of 'community appreciation'. Firstly, it is appropriate to consider the community's relative liking or preference for different types of scenery. The term 'scenic preference' is suggested instead of 'scenic beauty' or 'scenic quality', as used in other studies. This term represents a measure of peoples overall liking for landscape aesthetics, where landscape aesthetics is assumed to represent a range of people's responses to various types of open space, evoked by viewing photographs of the landscape. These responses include people's visual responses, as well as other sensory and emotional responses. Whilst this definition is a more limited that the definition of aesthetics by Ramsay and Paraskevopolous (1993), it is more readily quantified. As with scenic amenity, a working definition of scenic preference has been adopted as follows.

Scenic preference is a rating of the community's liking for scenery of open space compared to areas occupied by built structures, measured using photographs. It includes people's visual responses, as well as other sensory and emotional responses.

The second part of the equation needed to assess 'community appreciation' of scenery is a relative measure of how often and how much a place in the landscape is seen by the community, regardless of their liking of that landscape. The term 'visual exposure' is appropriate to reflect the number of people in a community who see a place in the landscape, and the impact it has on their viewing experience. The following working definition of visual exposure has been adopted in this study.

Visual exposure is a measure of the extent to which a place in the landscape is seen from important public viewing locations (e.g. roads, recreation areas, schools, golf courses).

Visual exposure takes into account the number of people who can see a place in the landscape, the number of locations it can be seen from, and the relative impact of that place on peoples viewing experience.

In an operational sense, scenic amenity is a simple combination of scenic preference and visual exposure, as indicated by Figure 1.

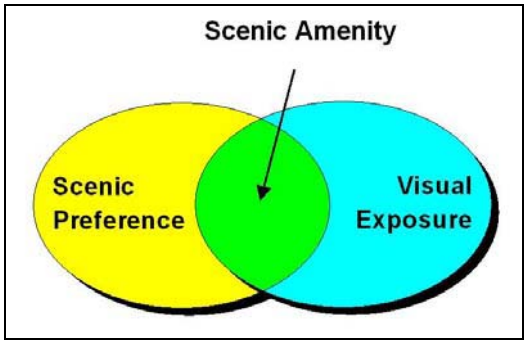


Figure 1. Components of scenic amenity

Whilst scenic amenity is separate to other values of open space, as depicted in Figure 2, it is linked to them because of memories, knowledge, values, and emotions evoked by the visual images of open space. In particular, scenic amenity will be partly affected by people's expectations and experiences of areas for recreation, nature conservation, or cultural heritage.

For example, a person's response to an image of a eucalypt forest may be partly influenced by the beliefs they hold about conservation of eucalypt forests, and conservation of the natural environment in general. Similarly, a person may respond positively to a view of a fresh-looking running creek because it evokes thoughts about the sound of the running water and birds singing.

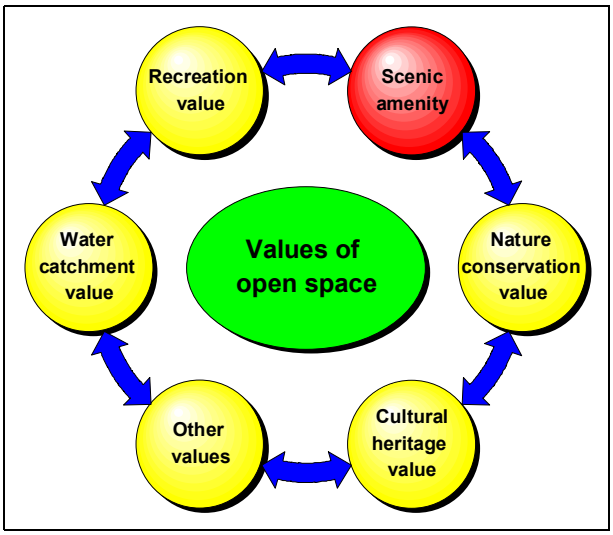


Figure 2. Scenic amenity is linked to other values of open space

Previous studies in south-east Queensland

Three contemporary studies were reviewed to assess their relevance to the current study. The Visual Assessment of South-East Queensland (Loder & Bayly, 1993) was initiated in SEQ2001, the precursor to the RFGM. The project worked from classical theory that visual quality increases with increasing relief and topographic ruggedness, vegetation, the presence of natural landscapes, the absence of unnatural landscapes, and water forms, water edges, and water area. Because of the time frame and resources made available for the study, mapping was conducted at a scale of 1:100,000 using published topographic maps, and some recent aerial photographs where necessary. The project differs substantially from the current pilot study in that it was based on professional judgments, and the scale of mapping was at a broader scale than that called for in this study.

The Landscape Assessment of Tambourine Mountain (Loder & Bayly, 1994) was more detailed than the 1993 visual assessment of SEQ, in which Tambourine Mountain was identified as a landscape of high regional significance. Visual aspects of the landscape were a primary consideration. Other values included in the analysis were historical significance, natural environmental significance, and social significance. This study of Tambourine Mountain is different to the current study because it also relied on professional judgments rather than community responses, and it mapped landscape value rather than scenic amenity.

Coastal Landscapes of Queensland (Brannock Humphreys, 1997) is the most contemporary and widely accepted study of its type. The project has produced maps for use by State and local governments that show the location of highly valued coastal landscapes. The method is 'expert based', and used stakeholder workshops (including discussion of photographs) to verify maps, which included discussion of photographs. These workshops highlighted the range of views in the community about how people value landscapes. The project assumed that natural landscapes are more highly valued or preferred by the community. Other factors used to measure landscape value were built form and human activity, vegetation and wildlife, landform character and diversity, shoreline and water character and diversity, and pattern. The study provides a set of important reference material for the current project, but also differs substantially because of the qualitative approach used to investigate community perceptions.

Assessing peoples responses to scenery

In broad terms, four different methods adopted from Zube, Sell and Taylor (1982) can be used to assess how people respond to the landscape. The methods, which are described below, are:

- expert techniques
- quantitative surveys
- focus groups
- individual experiential approaches.

Expert techniques are methods that are often applied by experienced landscape architects and are based on previous experience and formal landscape theory, taking into account features such as line, form, colour, and texture. The majority of applied landscapes mapping studies in Queensland have used expert techniques to describe community responses to landscape. A major reason for this approach has been the emphasis on map outputs and the limited budgets made available for landscape-preference research. In general, these studies have been based on establish landscaped theory. In some instances these mapping projects have conducted stakeholder workshops to seek broader community input to the measurement and mapping process (e.g. Lennon & Townsley, 1998; Brannock Humphreys, 1997).

Expert techniques have the advantage that they do not require an assessment of community preferences. This allows users to avoid the complex tasks of assessing what the community prefers, and associating community preferences with areas on maps. Whilst cost effective, it is difficult to know if the maps produced using this technique concur with the full spectrum of community values.

In quantitative survey methods researchers seek to use quantitative social research techniques to measure the relationship between human responses to the environment and physical features of the landscape through testing of observers' preferences. Assessment of people's visual preferences for different types of scenery is used widely in United States-based research of scenic beauty estimation procedures, which were initially promoted by Daniel and Boster (1976). Other examples of the use of quantitative surveys are the work by Prineas and Allen (1992) and the recent study by Green (2000).

There is a good deal of debate in the landscape profession about whether these techniques are useful. The quantitative survey approach, which relies on showing people photographs of scenery, are challenged as suffering from an inadequate theoretical base, which can lead to over-simplification of the mapping and to misleading conclusions (Lamb, 1993). The technique is said to be insensitive to changes in the landscape. If poorly applied, the technique can mask important differences in perception between different viewing groups. The technique also has not been embraced by practitioners in south-east Queensland.

The technique is most suitable for assessing people's visual responses. It can be used to assess other non-visual aesthetic values only to the extent that these values are evoked by the photographs.

Quantitative survey techniques are designed for and intended as means of measuring people's preferences for different types of scenery. Some criticisms have been levelled at the approach because of the difficulty of mapping outcomes. This second step, linking people's responses to photos to maps, is a complex process, but one which does not invalidate the importance of the technique for understanding and documenting people's visual preferences.

An important aspect in designing a quantitative survey is finding a efficient, cost-effective and reliable means of representing scenery during surveys. Users of quantitative survey techniques usually use photographs or slides to evoke responses to scenery. The choice of medium is one of the critical methodological considerations in the study of people and their settings (Craik 1971). Many studies in the field of environmental perception have used photographic media. Following a meta-analysis (which covered 11 previous relevant studies, 152 environments evaluated by 2,400 respondents), Stamps (1990) found a correlation of 0.86 between preferences obtained in situ and preference obtained through photographs. These results support the use of photographic stimuli.

Focus group methods use social research techniques to understand and describe the feelings and perceptions of groups of people who interact with the landscape. It is usual to seek to describe the meaning that landscapes can hold for people. They are usually led by a person trained in psychology.

The focus-group approach can be used to explore people's opinions and feelings about a landscape. This technique can be used as a starting point to understand people's preferences for landscape, or it can be used to support expert or quantitative survey studies. Australian behaviour research scientists prefer this technique (e.g. Lamb & Purcell 1990) because it can take account of experiential as well as purely visual responses to the landscape. It is also possible to reach a greater understanding of people's responses to the environment.

A criticism of the technique is that, without good management of the focus group processes (e.g. appropriate management of dialogue, selection of participants), the opinions can be unrepresentative of the broader community. Outcomes of the method lead to better understanding of people's responses. The method cannot by itself be used to produce maps.

Individual experiential approaches are methods based on understanding the individual experience in the human–landscape interaction, a person's subjective feelings, expectations, and their interpretations of an encounter with the landscape. Although experiential methods are often conducted on site and with individuals, therefore avoiding the approximations and assumptions inherent in all other techniques, their use comes at a cost: these methods have been rarely used because they have been seen as providing an unrepresentative sample of people's preferences and they are seen as being time-consuming and costly. However, this approach is ideally suited to achieving detailed responses about how and why people prefer and value scenery.

In conclusion, the quantitative survey technique was considered the most appropriate for this study because it provides a scientific basis for assessing community preferences. It was also seen as important, however, to also complement quantitative surveys with qualitative focus group

discussions or individual interviews, to ensure that the language being used to evaluate preferences is appropriate to the community and landscape being assessed.

Sources of variation in community preferences

Prior studies have shown that while there is general agreement between different groups of people about which types of scenery are preferred, there are also major and important differences between different groups of people. Factors that have been demonstrated in overseas studies (e.g. Dearden, 1981) to affect people's responses to landscapes include:

- familiarity with the landscape - for example, farmers and long-term residents appreciate farms, whereas non-farmers and recent residents prefer natural landscapes
- education level - people with a higher education level tend to place higher value on natural landscapes
- professionals compared to residents - the scenic preferences of people employed as landscape architects, planners and related practitioners differ significantly from the preferences of the general public
- ethnicity, age, distance from the landscape, and income.

The study by Prineas and Allen (1992) indicated that people older than 25 years considered human disturbance (e.g. roads, buildings, and clearings) to detract from an area's scenic quality more than younger people (i.e. those aged 18–25 years).

The outdoor recreation demand study in south-east Queensland (Department of Natural Resources, 1998) was primarily directed at assessing the nature of recreation expectations and experiences in SEQ based on telephone surveys. A sub-study compared community rankings to expert rankings of a set of photographs of landscapes showed that community members repeatedly scored pictures of landscape naturalness lower than an expert panel. Community members consistently recorded mixed rural and natural landscapes as 'very natural'. The study suggests that people of SEQ may respond to landscapes in a manner different to experts.

In conclusion, it is considered important to involve a range of people with different backgrounds, age groups, and education levels in assessing scenic amenity, in order to avoid any potential bias in measuring community preferences for scenery.

Measuring people's responses to scenery

Whilst our primary interest is in measuring peoples degree of liking or dislike for a landscape, it is helpful to identify those features of scenery that evoke the strongest responses. To achieve this, it is also helpful to track the type of emotional response people have to an image. The failure to address the full dimensions of peoples responses has been one of the criticisms made of quantitative survey techniques (such as scenic beauty estimation), which require people to record only one score of 10–1 for photographs.

A universal model to describe people's responses to environment has been developed by Russell, Ward and Pratt (1981). The model was developed both using empirical data and is supported by psychological theory. It presents an approach for explaining the variety of people's emotional (or affective) responses to the environment. This is a circular model, where peoples responses to the environment exist as a continuum, and where any response can be plotted according to the strength of association with four main axes (see Figure 3). The model also recognises that it is possible to have more than one response to a single environment.

This circumplex model was originally developed to describe peoples 'in-situ' responses to all environmental settings, including those where people and vehicles are present. In the study of scenic amenity, it is considered inappropriate to assess peoples responses to images of people interacting with the environment, since this would bias the study toward assessment of the recreational, cultural, social, or economic values of the landscape.

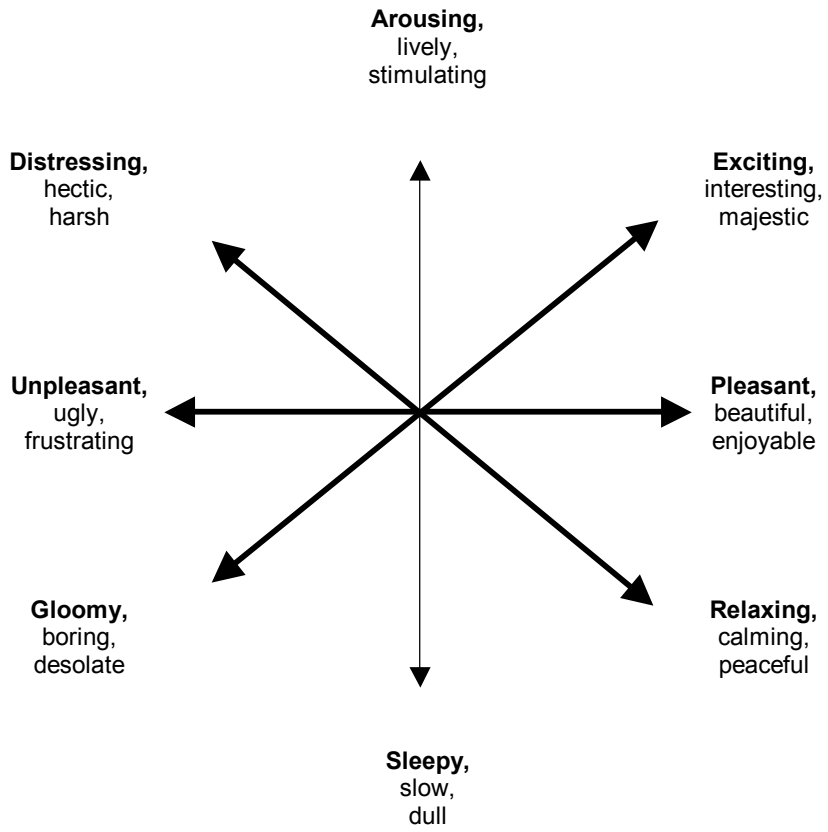


Figure 3. Dimensions of emotional responses

(Source: Adapted from Russell, Ward & Pratt 1981)

Thus, the vertical axis (arousing – sleepy) is less relevant than the other three axes for describing people's responses to scenery. This deduction is relevant in developing a language set to describe peoples response to scenery. The model provides both a structure for developing an expanded set of questions about peoples responses to scenery, and for analysing and interpreting survey results.

Mapping community preference for scenery

The most common method used to allocate community preferences for different types of scenery to locations on a map is for a professional to directly allocate the value to the map unit based on the observed features, such as was used by Loder and Bayly (1993).

A second approach is to use a statistical model of scenic preferences to allocate preferences to maps, based on aerial estimates of land cover for particular land units (e.g. Prineas & Allen, 1992; Bishop & Hulse, 1994; Bishop, 1996). In this second approach, there are a variety of possible mechanisms that are able to be used to implement models. A major consideration in this second approach is whether to use a polygon approach, which involves delineation of boundaries between different landscape units (e.g. Prineas & Allen, 1992), or to use a continuous mapping approach, which uses a 3D geographic information system (GIS) approach to draw all possible viewsheds from all possible viewing locations (e.g. Bishop & Hulse, 1996).

A third approach is to allocate scenic preferences to land units, based on predicted ratings for photographs at a representative number of points across each land type. Whilst this is not as sophisticated as other GIS methods, it can be readily implemented and does not require massive GIS processing.

Mapping visual exposure

The mapping of visual exposure can be manually produced from topographic maps, or, in more recent times, by analysis of a digital elevation model in a GIS. Maps of the 'seen area' require the identification of particular vantage points (e.g. lookouts, picnic spots, roads) so that a map can be produced that takes account of the number of viewers from multiple locations and the duration of viewing (e.g. Bergen, 1993).

A number of procedures have been developed to automate the process of 'seen area' analysis, by taking into account the distance between observation points and places in the landscape, as well as the orientation of the landscape to the viewing location (e.g. Bishop, 1996; Wang, Robinson & White, 2000).

Overview of the Moggill study

A study area of about 5,554 ha was chosen to demonstrate the assessment techniques. The area, centred on the Brisbane suburb of Moggill, about 15 km west of the Brisbane city centre, was selected because it has a landscape character that is comparable with other 'urban fringe' locations in south-east Queensland. The area contains significant areas of farmland, bushland, and semi-rural and urban areas.

Structure. The assessment of scenic amenity is conducted in five stages. A scenic preference survey is undertaken to develop a statistical model that expresses community preferences for different types of landscapes. Of the various methods that can be used to assess scenic preference, a quantitative survey technique is considered the most appropriate for these studies because it provides a scientific basis for assessing community appreciation of scenery.

The model is applied during scenic preference mapping, which relates peoples preferences to maps of land cover and topography.

A viewer appreciation inventory identifies all important public viewing locations and allocates a weighting to each location based on assumed duration, appreciation level, and estimated number of viewers per day. This provides an importance value for viewing locations as an input to visual exposure mapping.

Visual exposure mapping relies on the use of a digital terrain model to assess how often a place in the landscape can be seen from viewing locations. This assessment is weighted by the distance between a location in the landscape and the viewing location. It also takes into account the visibility from the viewing location and the orientation of the landscape to the viewer.

The final stage to map scenic amenity requires integration of the visual exposure map and the scenic preference map, to identify the relative contribution made by different places in the landscape to the collective community appreciation of open space scenery.

Scenic preference survey at Moggill. A total of 52 photos were used to represent all land types and land features from different viewing positions. These photos were show to a total of 210 people including farmers, urban residents, people on rural residential blocks, people who live inside and outside the study area, government professionals, and visitors to the region.

The study showed some significant differences in responses from different sample groups. Government natural resource professionals expressed a stronger preference for 'natural appearing scenery' than other sample groups. On the other hand, rural-residential residents respond favourably to rural and slightly modified landscapes. Rural residential and agricultural residents have a high preference for agricultural scenery.

A total of 78 basic attributes (e.g. the percentage of trees in the foreground) were recorded to describe photo content. An additional 32 combined attributes were also calculated, to give a total of 110 photograph attributes.

A simple robust model was developed to predict scenic preference from photo content. Responses from all demographic groups were included in the final model. The scenic preference

model explains about 72% of the variation in people's responses to six attributes. Transmission lines and buildings have a strong negative effect on scenic preference. Trees have a positive effect on scenic preference. Powerlines, bare soil, and bitumen roads also detract from scenic preference. The effect of different agricultural land use was not significant. This approach has demonstrated that it is possible to develop a community consensus model for predicting scenic preference.

Scenic preference mapping at Moggill. This involved the application of the scenic preference model to land units by: (a) adding new land types, identified in the scenic preference model, to base mapping of land units; (b) estimating land cover proportions for land types based on photo content; (c) applying the scenic preference model to land units; and (d) interpreting output maps to ensure that they were logical.

Scenic preference ratings were applied to a map of land units to produce a scenic preference map. This map illustrates that the areas with highest scenic preference are those with high forest cover and low building density, including the river . Other areas of high scenic preference include areas of open grassland that have a low level of housing. The areas of lowest scenic preference are the flat urban area and land units with transmission lines.

Viewer appreciation inventory at Moggill. This involved: (a) conducting an inventory of public places which are important viewing locations, and estimating the number and type of viewer groups who use that location; (b) developing a viewer weighting system to take into account the effect of number of viewers, their appreciation level, and duration of viewing on overall view point importance; (c) applying viewing weightings to viewing location data to derive viewing location importance; and (d) allocating a 'visibility from viewing locations' based on estimated data from land unit maps. Viewing location weightings were allocated to all viewing locations. This map illustrates that the most important viewing locations at Moggill are the main roads, and major recreation areas.

Visual exposure mapping at Moggill. These maps represent how often parts of the landscape can be seen from important public places. Major factors that affect the visual importance of a place in the landscape have been incorporated into a visual exposure model. This model accepts viewing locations as input (and an estimate of visibility) and a digital elevation model. The output is a visual exposure map. The map shows that areas of highest visual exposure are the ridge tops to the mid-north of the study area, towards to Mt Crosby Road and around Moggill State Forest. Other areas of high visual exposure are hills close to and facing Moggill Road, the banks of the Brisbane River, and areas adjacent to busy roads. Areas of lowest visual exposure are the valleys in the north of the study area and other deep gullies in the lower half of the study area.

Scenic amenity at Moggill. A scenic amenity map was produced by combining scenic preference and visual exposure. Four importance categories of scenic amenity (i.e. high, medium, low, very low) have been developed to synthesise information to a level which can be used in planning.

Overview of the Glen Rock study

Glen Rock is a property of about 6,400 ha located about 100 km west of Brisbane. The property was purchased by the State Government in 1996 to provide for a range of community uses. The Glen Rock study was initiated by the RLS to develop a better understanding of people's appreciation of the scenery of the property and to provide input to the development of a management plan for the property. A suite of other values (e.g. nature conservation, water protection) will be taken into account in the development of this management plan, which will focus on recreation and grazing strategies for the property. This Glen Rock study is the first application of the methodology developed at Moggill.

The Glen Rock scenic preference survey used a total of 21 photos to represent land types and land features from different viewing positions. These photos were show to 60 people, including members of outdoor recreation groups, local residents, international backpackers, and government natural resource professionals. In a slight departure from the Moggill methodology, respondents were asked to score photos according to three emotional response ratings:

interesting, calming, and beautiful. People were also invited to record their response to the scenery, and what they noticed about the scenery.

The most attractive scenery in Glen Rock was described as ‘peaceful running water’. The least attractive scenery was described as a ‘dry rocky creek bed’. This emphasises the importance of running water to people’s appreciation of scenery. Words used to describe other preferred scenery include ‘beautiful view of escarpment through trees’ and ‘expansive view down to mountain valley’. Other scenery with a low preference was described as an ‘uninviting weed infested hillside’ and ‘barren cleared flats’. These responses indicate the importance of intact vegetation and views down into valleys from mountain tops.

Scenic preference map for Glen Rock was developed by integrating vegetation maps, topographic maps, and information on the location of running streams. This map illustrates that areas with highest scenic preference are around running creeks, and at tops of the mountains where there are dense stands of shady trees. The area of lowest scenic preference is the flat and undulating areas of sparse trees along the edges of the valley.

The viewer appreciation assessment entailed undertaking an expert appraisal of the potential location, number and type of recreation users across the property, based on the use of current access tracks. This assessment indicates the importance of the current picnic and camping area.

Modelling of visual exposure required the combination of viewing location data with a digital elevation model to model how often parts of the landscape can be seen. The final visual exposure map shows areas of highest visual exposure as the sides of mountains in the northern half of the property. The areas of lowest visual exposure are the valleys in the far south of the study area.

A scenic amenity map was produced by combining scenic preference and visual exposure. Maps of scenic amenity show the strong effect of relief on scenic amenity. The highest scenic amenity score at Glen Rock of 5.5 (out of 10) indicates only moderate regional significance; this is due to relatively low visitation numbers. The scenery from tops of mountains and around the semi-permanent creeks is among the best in south-east Queensland, with scenic preference ratings of 8–9 on a 10-point scale.

The management and development of recreation facilities at Glen Rock must be sensitive to people’s preference for natural landscapes without built structures. This study has demonstrated that the methodology developed at Moggill is transferable to other locations, and that it can provide valuable information to a multiple-use planning process.

Conclusions from the Moggill and Glen Rock Studies

Despite the breadth of opinions in our society about what constitutes beautiful scenery, the scenic preference model developed by the Moggill study was able to predict about 72% of the variation of preferences for different types of scenery. This is a promising result and points the way to having an informed basis for the assessment of scenic amenity using an approach which has community and professional credibility.

It is clear from the Moggill model that loss of open space, by the placement of buildings, and powerlines or other transmission lines, decreases the value of natural and rural areas. This indicates the importance of open space to maintaining scenic amenity. The models for Glen Rock also indicate the importance of running water and the steepness of the terrain in predicting people’s preference for scenery in natural and rugged areas.

The main difference between the methodology applied at Moggill and Glen Rock, and previous approaches, is that the new approach follows an objective and open pathway for evaluating and mapping scenic amenity. The main strength of this approach is that it enables planers to readily identify and remedy any limitations in the assessment process.

These studies illustrate that it is possible to implement a rigorous, objective, and open process to rate and map community appreciation of scenery. The method is suitable for use by local governments in south-east Queensland to progressively assess the regional significance of scenic amenity, in partnership with the Queensland Government.

Appendix 2 Issued raised at scenic amenity community forums

Summary of Group Comments - Gatton Community Forum, 19 March 2002

GROUP 1

- To appreciate scenery, we need to access those areas. Access can mean destruction of those areas, which in turn can lead to those areas having less value in the eyes of those who originally liked to visit. ACCESS = IMPACT
- If a place is inaccessible, does it reduce its value as a scenic amenity? Example given of the Three Sisters, which are visible and accessible, so have a high value in the eyes of tourists but the Two Sisters cannot be easily seen or accessed but still have inherent beauty.
- Education can change attitudes. We need to educate children at home and school about conservation and respect for the environment.
- There was a discussion about total clearing versus selective clearing and a need to change the "chain saw attitude" in the Lockyer. Pioneers were responsible for destruction of the landscape – under direction from "the authorities". They could purchase land, provided they cleared a minimum area each year. Current landholders need to address this problem by re-planting.
- Can we have tree lined railway lines? One participant felt that train lines are a blot on the landscape and would be enhanced by growing trees along the lines. It was counter argued that people travelling in trains enjoy seeing the countryside unimpeded. Trees could also be a fire hazard.
- Should toilets be built underground so that they are not an eyesore?
- Photos which reflected a rustic feel (pump sheds, old machinery, farms scenes) generated a positive response from participants, while large "chook" sheds and piggeries led to a negative allocation of a 3 or 4 by participants.
- Is the Gatton Council going to accept and acknowledge the results of the study and consider people's opinions in formulating the Town Plan? David Neuendorf (Gatton Shire Councillor) responded with a definite "YES!" The ideas generated by the study would be instilled in the Town Plan for future generations. A consultative approach needs to occur before the planning stage and before developments happen.
- The question arose as to whether there would be an incentive approach or punitive approach to encourage residents to adhere to the Town Plan. The group hoped that pride of ownership would result in landscaping and maintenance of footpaths and gardens. It was felt that the community does not need laws, laws and more laws and that in fact we are already over-governed.
- Concern was expressed about power lines. It was acknowledged that they are necessary (a population need) but the more stark they are (eg at the tops of hills), the less they are liked. It was felt that they could be painted green, even if they needed to be re-painted on a regular basis.
- There was the belief that beauty is in the eye of the beholder and what one resident may appreciate another may dislike. The term "beauty in utility" was offered as a way of explaining that some people may see useful items (trucks, sheds, etc) as aesthetically pleasing.
- Pride in crops versus water conservation was raised. We need to protect the waterways!
- The Tyco Shed which has been built at Withcott is an example of an environmentally friendly approach to construction, with design and colour being considered.
- The fact that this is a static study doesn't consider the on-going changes within the valley. The micro changes which occur constantly throughout the valley: the soil being ploughed, the crops growing, the various stages of harvesting, etc are considered to be important aspects of living in the Lockyer.

- No photos of urban areas were included in the study, yet that is where a large proportion of Gatton residents live. Robert Preston commented on the complexity of such inclusions. The idea is that the study considers what's happening in open spaces, then perhaps look at urban areas.

GROUP 2

Firstly each group member put forward an idea of what they did and didn't like in our local scenery, or concerns they had about the project. The issues raised were as follows [with most points being agreed to by other members and no strong rejection of the suggested issues by any]:

- Billboards were disliked because they detract from the view when driving;
- There was concern that control or legislation arising from the project could impact on personal rights and expectations;
- Two members put forward concerns that the implementation of this project should not lead to the erosion of farming procedures and rights to farm land;
- Water quality and salinity was raised – both for the visual impact it creates and the environmental degradation;
- Visually industrial maxi sheds in the landscape were disliked. It was recognised that these were needed but that they shouldn't stand out in the scenery as a glaring blot on the landscape;
- Management of public land to protect scenery was raised – there was discussion on the extent of the area in the locality held in public ownership.
- Wildlife present in the area and habitat they rely on were suggested as a valuable feature of our community.

The group then looked at how these items could be refined and collated to a TOP 4 issues and came up with the following:

1. Billboards and unregulated signage should be addressed.
2. There is a need for reasonable regulation of individuals rights for the benefit of all local people
3. Waterways management, especially vegetation along waterways need to be addressed. Buffer zones should be established.
4. Integrated public land management must be implemented

Appendix 3 Characteristics of people interviewed

PersonID	*Gender*	*Age Group*	*Occupation*	*Suburb / Town, Country*
1	F	55+	Home Duties	Toowoomba
2	F	25-39	Soft Furnishings Wholesaler	Toowoomba
3	M	40-54	Soft Furnishing Wholesaler	Toowoomba
4	F	25-39	Student	Lockyer Study Area
5	F	13-17	Student	Toowoomba
6	F	18-24	Graphic Artist	Toowoomba
7	F	40-54	Home Duties	Toowoomba
8	M	55+	Cattle Station Manager	Toowoomba
9	F	55+	Medical Secretary	Toowoomba
10	F	25-39	Student	Toowoomba
11	M	25-39	Unemployed	Toowoomba
12	M	25-39	Behavior Management Worker	Toowoomba
13	F	13-17	Retail Floor Assistant	Toowoomba
14	M	25-39	Fitter	Toowoomba
15	M	25-39	Admin Officer	Toowoomba
16	M	55+	Retired	Toowoomba
17	M	40-54	Truck Driver	Toowoomba
18	M	18-24	Student	Toowoomba
19	F	25-39	Admin Assistant	Toowoomba
20	F	13-17	Student	Toowoomba
21	M	18-24	Delivery Driver	Toowoomba
22	M	25-39	Retired	Toowoomba
23	M	40-54	Pensioner	Toowoomba
24	F	55+	Home Duties	Toowoomba
25	F	25-39	Home Duties	Toowoomba
26	M	18-24	Assistant Manager	Toowoomba
27	F	25-39	Chef's Assistant	Toowoomba
28	M	18-24	Student	Toowoomba
29	M	40-54	Grounds person	Toowoomba
30	M	13-17	Student	Toowoomba
31	M	55+	Computer Service Engineer	Toowoomba
32	F	18-24	Sales	Toowoomba
33	M	25-39	Correctional Officer	Lockyer Study Area
34	F	25-39	Paramedic	Lockyer Study Area
35	F	55+	Pensioner	Lockyer Study Area
36	F	25-39	Unemployed	Lockyer Study Area
37	F	40-54	Home Duties	Lockyer Study Area
38	M	40-54	Resource Planner	Lockyer Study Area
39	M	25-39	Storeman	Lockyer Study Area
40	F	25-39	Home Duties	Lockyer Study Area
41	M	40-54	Multimedia Developer	Lockyer Study Area
42	F	55+	Shop Assistant	Lockyer Study Area
43	M	40-54	Motor Mechanic	Lockyer Study Area
44	F	40-54	Machinist	Lockyer Study Area
45	F	13-17	Student	Lockyer Study Area
46	M	40-54		Lockyer Study Area
47	M	25-39	Sales Representative	Lockyer Study Area
48	F	40-54	Sales Representative	Lockyer Study Area
49	F	25-39	Kitchen Hand	Lockyer Study Area

PersonID	*Gender*	*Age Group*	*Occupation*	*Suburb / Town, Country*
50	M	18-24	Student	Brisbane
51	F	18-24	Teacher	Brisbane
54	F	40-54	Sales Assistant	Lockyer Study Area
55	M	40-54	Computer Technician	Lockyer Study Area
56	M	40-54	Retired	Lockyer Study Area
57	M	55+	Driller	Lockyer Study Area
58	F	55+	Retired	Lockyer Study Area
59	F	40-54	Cleaner	Lockyer Study Area
60	F	25-39	Lecturer	Lockyer Study Area
61	M	25-39	Wardsman	Lockyer Study Area
62	M	25-39	Truck Driver	Lockyer Study Area
63	F	25-39	Bar Attendant	Lockyer Study Area
64	M	55+	Farmer	Lockyer Study Area
65	F	55+	Home Duties	Lockyer Study Area
66	F	13-17	Home Duties	Lockyer Study Area
67	M	40-54	Printer	Lockyer Study Area
68	F	13-17	Student	Lockyer Study Area
69	F	40-54	Relief Teacher Aid	Lockyer Study Area
70	M	55+	Musician	Lockyer Study Area
71	F	25-39	Marketing Manager	Lockyer Study Area
72	F	18-24	Child Care Admin	Lockyer Study Area
73	F	18-24	Student	Lockyer Study Area
74	F	18-24	Receptionist	Lockyer Study Area
75	F	18-24	Home Duties	Lockyer Study Area
76	M	18-24	Welder/Boilermaker	Lockyer Study Area
77	F	13-17	Student	Lockyer Study Area
78	F	55+	Aged Care Nurse	Lockyer Study Area
79	M	55+	Retired	Lockyer Study Area
80	F	55+	Home Duties	Lockyer Study Area
81	M	55+	Computer Programmer	Lockyer Study Area
82	M	40-54	Aircraft Technician	Lockyer Study Area
83	F	40-54	Nursing Support Staff	Lockyer Study Area
84	F	25-39	Home Duties	Lockyer Study Area
85	M	25-39	Export Logistics	Lockyer Study Area
86	F	25-39	Home Duties	Lockyer Study Area
87	F	55+	Tourism Operator	Lockyer Study Area
88	M	55+	Retired	Lockyer Study Area
89	F	25-39	Community Dev'mnt Worker	Lockyer Study Area
90	M	55+	Retired	Lockyer Study Area
91	M	13-17	Student	Lockyer Study Area
92	F	40-54	Home Duties	Lockyer Study Area
93	M	40-54	Retired	Lockyer Study Area
94	M	25-39	Student	Lockyer Study Area
95	M	55+	Retired	Lockyer Study Area
96	M	40-54	Flower Grower	Lockyer Study Area
97	F	13-17	Student	Lockyer Study Area
98	F	55+	Health Industries	Lockyer Study Area
99	M	40-54	Psychologist	Lockyer Study Area
100	F	40-54	Teacher	Lockyer Study Area
101	F	18-24	Shop Assistant	Lockyer Study Area
102	M	40-54	Farm Hand	Lockyer Study Area
103	F	40-54	Home Duties	Lockyer Study Area

PersonID	*Gender*	*Age Group*	*Occupation*	*Suburb / Town, Country*
104	F	13-17	Kitchen Hand	Lockyer Study Area
105	M	18-24	Slaughterman	Lockyer Study Area
106	F	25-39	Hospitality	Lockyer Study Area
107	M	40-54	Labourer	Lockyer Study Area
108	M	13-17	Electrician	Lockyer Study Area
109	F	40-54	Home Duties	Lockyer Study Area
110	M	40-54	Teacher	Lockyer Study Area
111	F	40-54	Teacher	Lockyer Study Area
112	F	25-39	Kitchen Hand	Lockyer Study Area
113	F	25-39	Bar Attendant	Lockyer Study Area
114	M	55+	Arts Orientation	Lockyer Study Area
115	M	25-39	Bar Supervisor	Lockyer Study Area
116	F	25-39	Bank Officer	Lockyer Study Area
117	M	55+		Lockyer Study Area
118	M	55+	Pensioner	Lockyer Study Area
119	F	25-39	Home Duties	Lockyer Study Area
120	M	40-54	Salesman	Lockyer Study Area
121	F	18-24	Painter & Sculptor	Lockyer Study Area
122	M	18-24	Painter & Sculptor	Lockyer Study Area
123	M	25-39	Single Parent	Lockyer Study Area
124	F	40-54	Mail Contractor	Lockyer Study Area
125	F	40-54	Teacher Special Ed	Lockyer Study Area
126	F	25-39	Home Duties	Lockyer Study Area
127	F	55+	Farmer	Lockyer Study Area
128	M	40-54	Foster Carer	Lockyer Study Area
129	M	18-24	Cabinet Maker	Lockyer Study Area
130	M	18-24	Cabinet Maker	Lockyer Study Area
131	M	25-39	Meat Process Worker	Lockyer Study Area
132	M	13-17	Student	Lockyer Study Area
133	F	18-24	Student	Lockyer Study Area
134	F	25-39	Home Duties	Lockyer Study Area
135	M	40-54	Builder	Lockyer Study Area
136	M	40-54	Volunteer	Lockyer Study Area
137	F	40-54	Bank Officer	Lockyer Study Area
138	M	13-17	Student	Lockyer Study Area
139	F	25-39	Lecturer	Lockyer Study Area
140	M	25-39	Student	Lockyer Study Area
141	M	55+	Farmer	Lockyer Study Area
142	F	13-17	Supermarket Assistant	Lockyer Study Area
143	F	25-39	Nursery Attendant Plants	Lockyer Study Area
144	M	55+	Retired Engineer	Lockyer Study Area
145	M	25-39	Horticulturalist	Lockyer Study Area
146	F	18-24	Asst Property Manager	Lockyer Study Area
147	F	13-17	Student	Lockyer Study Area
148	F	40-54	Home Duties	Lockyer Study Area
149	F	40-54	Teacher	Lockyer Study Area
150	F	55+	Antique Dealer	Lockyer Study Area
151	F	18-24	Admin Officer	Lockyer Study Area
152	M	25-39	Electrician	Lockyer Study Area
153	M	55+	Farmer	Lockyer Study Area
154	F	55+	Farmer	Lockyer Study Area
155	M	18-24	Auto Electrician	Lockyer Study Area

PersonID	*Gender*	*Age Group*	*Occupation*	*Suburb / Town, Country*
156	M	40-54	Electrical Linesman	Lockyer Study Area
157	M	55+	Bus Driver	Lockyer Study Area
158	F	40-54	Educator	Lockyer Study Area
159	F	25-39	Teacher	Lockyer Study Area
160	M	25-39	Police Officer	Lockyer Study Area
161	F	25-39	Library Assistant	Lockyer Study Area
162	M	25-39	Environmental Planner	Lockyer Study Area
163	F	40-54	Manager Fitness Centre	Lockyer Study Area
164	F	13-17	Secretary	Lockyer Study Area
165	F	55+	Home Duties	Lockyer Study Area
166	M	55+	Semi-Retired Farmer	Lockyer Study Area
167	M	55+	Cattle Breeding Technician	Lockyer Study Area
168	F	25-39	Florist	Lockyer Study Area
169	M	13-17	Student	Lockyer Study Area
170	F	40-54	Admin Officer	Lockyer Study Area
171	M	55+		Lockyer Study Area
172	M	25-39	Contracts Officer	Lockyer Study Area
173	F	40-54	Literacy Tutor	Lockyer Study Area
174	F	55+	Catering Assistant	Lockyer Study Area
175	M	55+	Veg Contractor	Lockyer Study Area
176	F	40-54	Assembly Detonator	Lockyer Study Area
177	M	40-54	Store Manager	Lockyer Study Area
178	M	25-39	Farm Labourer	Lockyer Study Area
179	M	40-54	Plant Operator	Lockyer Study Area
180	M	18-24	Student	Brisbane
181	F	40-54	Admin Clerk	Brisbane
182	F	25-39	Receptionist	Brisbane
183	M	13-17	Student	Brisbane
184	F	40-54	Home Duties	Brisbane
185	M	55+	Hospitality	Brisbane
186	F	40-54	Office Admin	Brisbane
187	F	55+	Home Duties	Brisbane
188	M	18-24	Student	Brisbane
189	F	25-39	Clerical Assistant	Brisbane
190	F	18-24	Student	Brisbane
191	M	18-24	Student	Brisbane
192	F	25-39	Student	Brisbane
193	F	40-54	Home Duties	Brisbane
194	F	40-54	Trichologist	Brisbane
195	M	18-24	Unemployed	Brisbane
196	M	18-24	Finance Support Officer	Brisbane
197	F	55+	Home Duties	Brisbane
198	M	25-39	Public Servant	Brisbane
199	F	18-24	Waitress	Brisbane
200	F	18-24	Student	Brisbane
201	M	25-39	Storeman	Brisbane
202	F	13-17	Student	Brisbane
203	M	25-39	Webpage Designer	Brisbane
204	M	25-39	Unemployed	Brisbane
205	M	25-39	Disc Jockey	Brisbane
206	M	55+	Driver/Storeman	Brisbane
207	F	25-39	Bank Officer	Brisbane

PersonID	*Gender*	*Age Group*	*Occupation*	*Suburb / Town, Country*
208	F	40-54	Photographer	Brisbane
209	M	13-17	Student	Brisbane
210	F	40-54	None Listed	Lockyer Study Area
211	F	55+	Cattle Grazing & Land Development	Lockyer Study Area
212	F	25-39	Mother / Co Director	Lockyer Study Area
213	F	55+	Retired -Sales Manager	Lockyer Study Area
214	F	40-54	Professional Musician/Furniture Consultant	Lockyer Study Area
215	M	25-39	Interstate Truck Driver	Brisbane
216	F	18-24	Administrative Officer	Lockyer Study Area
217	F	40-54	Retired	Lockyer Study Area
218	F	25-39	Administrative Clerk	Lockyer Study Area
219	F	55+	Records Coordinator	
221	F	40-54	Volunteer	Lockyer Study Area
222	F	25-39	Environment Officer	Brisbane
223	F	40-54	Student/Office	Lockyer Study Area
224	M		Farmer	Lockyer Study Area
225	M	40-54	Student	Lockyer Study Area
226	M	25-39	Mechanic	Lockyer Study Area
227	M	40-54	Surveyor	Toowoomba
228	F	40-54	Primary School Principal	Lockyer Study Area
229	F	40-54	Teaching	Lockyer Study Area
230	M	40-54	Flower Grower	Lockyer Study Area
231	F	18-24	Administrative Officer	Lockyer Study Area
232	M	40-54	Councillor	Lockyer Study Area
233		13-17	Student	Lockyer Study Area
234		13-17	Student	Lockyer Study Area
235		13-17	Student	Lockyer Study Area
236		13-17	Student	Lockyer Study Area
237		13-17	Student	Lockyer Study Area
238		13-17	Student	Lockyer Study Area
239		13-17	Student	Lockyer Study Area
240		13-17	Student	Lockyer Study Area
241		13-17	Student	Lockyer Study Area
242		13-17	Student	Lockyer Study Area
243		13-17	Student	Lockyer Study Area
244		13-17	Student	Lockyer Study Area
245		13-17	Student	Lockyer Study Area
246		13-17	Student	Lockyer Study Area
247		13-17	Student	Lockyer Study Area
248		13-17	Student	Lockyer Study Area
249		13-17	Student	Lockyer Study Area
250		13-17	Student	Lockyer Study Area
251		13-17	Student	Lockyer Study Area
252	F	13-17	Student	Lockyer Study Area
253	M	13-17	Student	Lockyer Study Area
254	M	13-17	Student	Country Qld
255	M	13-17	Student	Lockyer Study Area
256	M	13-17	Student	Lockyer Study Area
257	M	13-17	Student	Country Qld
258	F	13-17	Student	Lockyer Study Area
259	F	13-17	Student	Lockyer Study Area
260	F	13-17	Student	Lockyer Study Area

PersonID	*Gender*	*Age Group*	*Occupation*	*Suburb / Town, Country*
261	M	13-17	Student	Lockyer Study Area
262	M	13-17	Student	Country Qld
263		13-17	Student	Country Qld
264	F	13-17	Student	Lockyer Study Area
265	M	13-17	Student	Lockyer Study Area
266	M	13-17	Student	Lockyer Study Area
267	F	18-24	Student	Toowoomba
268	M	25-39	Student	Lockyer Study Area
269	F	18-24	Student	Toowoomba
270	F	18-24	Student	Lockyer Study Area
271	F	18-24	Student	Toowoomba
272	M	18-24	Student	Lockyer Study Area
273	M	40-54	Academic Staff	Lockyer Study Area
274	F	25-39	Physiotherapist	Lockyer Study Area
275	F	25-39	Student	Lockyer Study Area
276	M	18-24	Student	Country Qld
277	M	18-24	Student	Brisbane
278	F	18-24	Student	Country Qld
279	F	18-24	Student	Country Qld
280	F	18-24	Student	Lockyer Study Area
281	F	13-17	Student	Country Qld
282	F	18-24	Student	Lockyer Study Area
283	F	18-24	Student	Lockyer Study Area
284	F	18-24	Student	Lockyer Study Area
285	F	18-24	Student	Lockyer Study Area
286	M	18-24	Student	Lockyer Study Area
287	F	18-24	Student	Brisbane
288	F	13-17	Student	Lockyer Study Area
289	M	18-24	Student	Country Qld
290	M	18-24	Student	Country Qld
291	M	18-24	Student	Country Qld
292	M	18-24	Student	Country Qld
293	M	18-24	Student	Country Qld
294	M	18-24	Student	Lockyer Study Area
295	F	18-24	Student	Country Qld
296	F	18-24	Student	Lockyer Study Area
297	F	25-39	Emergency Medical Technician - Ambulance	Ireland
298	F	18-24	Student	England
299	F	18-24	Occupational Therapist	International
300	M	18-24	Flight Dispatcher	UK
301	F	18-24	Shop Assistant	International
302	F	25-39	Secretary	England
303	M	18-24	Mechanic	UK
304	M	18-24	Student	UK
305	F	18-24	Traveller	Canada
306	M	25-39	It Technician	International
307	F	25-39	Teacher -Primary	International
308	M	18-24	Driver	England
309	F	18-24	Student	Denmark
310	F	18-24	Student	Denmark
311	M	25-39	Tool Maker (Mould Construction)	International
312	F	25-39	It Manager	Ireland

PersonID	*Gender*	*Age Group*	*Occupation*	*Suburb / Town, Country*
313	F	18-24	Student	U.S.A.
314	M	18-24	Web Designer	England
315	F	18-24	Sports Psychologist	UK
316	M	18-24	Teacher	Sweden
317	F	18-24	Traveller	Germany
318	M	18-24	Fencer/Construction	International
319	M	25-39	Computer Programmer	Ireland
320	M	18-24	Student	Canada
321	F	18-24	Student	Norway
322	M	18-24	Labourer	Canada
323	M	18-24	Refrigeration Technician	International
324	M	18-24	Student	England
325	M	18-24	Student	England
326	M	18-24	Graduate (It)	UK

Appendix 4 Comments about the survey from people interviewed

4.1 The interview was useful because …

Comment	
1	I have learnt a lot about scenery
2	I like to live in Lockyer valley
3	Made me use my memory
4	It helps recognise change and different areas
5	Clear instructions, interesting process, good to see the shire is serious about landscapes
6	It shows us that there is a process going on that is considering a random view of residents in the Lockyer valley.
7	It will find out a lot more about the people in the Lockyer Valley and what they like.
8	There was a clear idea of each scene
9	It might help other people see things through our eyes
10	I like to have my say in things and i like to be heard
11	It shows the beauty of the valley
12	The areas need to look better around here.
13	It cross-referenced our views on topics, provided an interesting demographic viewpoint from this group of participants.
14	The process made me analyse more thoroughly what it is in scenery which actually appealed to me.
15	The process was interesting and may help to define the way in which the results of the study are affected.
16	It's easy and understanding and helps to work out the public view on things.
17	There was a range of scenery. Cross-referencing of a few photos was particularly interesting.
18	I hope it will be helpful in promoting our shire for tourism and transport.
19	Everything was explained clearly and properly.
20	I hope my opinions will be of some use.
21	I could see what the point behind it would be, happy to do it.
22	There was a broad selection of photos
23	Addressing the concerns of many about the environment and its impact on our lives.
24	Allowed individuals to give their view.
25	Because they can see what could be improved.
26	Challenged me to consider my perspective and why I have that perspective.
27	It gives the community a chance to have their say.
28	I think that it is great that they are asking for the community's input.
29	I can see that the links between childhood and adult values can be linked and used to plan better for the future.
30	Finding out if people's childhood or more recent lifestyle influences their choice of landscapes.
31	For the benefit of the community at large.
32	We can have a say into the planning for the future.
33	Gave me a better appreciation of scenery in the area.
34	I play a part in promoting the area i live in and love to live here.
35	Gives a good overall sense of responsibility to the community.
36	This should help the valley to expand their tourist options.
37	The scenes were interesting and covered a wide variation of the valley.
38	Often residents do not get the opportunity to collaborate on these projects.
39	Proactive process is always better than picking up the pieces.

	Comment
40	We could see places in the valley that we haven't seen before.
41	I could state my likes and dislikes.
42	With future planning in mind so reserve consensus of opinion is important.
43	This way the council knows what the people think, get the people involved.
44	It is good to be able to participate in the planning process.
45	It also helps the public to understand how things are chosen in the community ie. Signs, zonings, etc.
46	It made me look at the surrounding environment and address many of the problems i perceived.
47	It gave ordinary people an opportunity to comment on what they feel is important in the natural environment that surrounds them.
48	I think the Lockyer valley is a pretty place and needs further promotion.
49	It gives different views of people's likes and dislikes.
50	I'd like to know more about the rating system / process from here on in (even though this is not my role in the process). The aesthetics of all environments should be of paramount consideration.
51	This info maybe used to work towards establishing a preferred living surrounding (environment).
52	I had the chance to participate in this exercise and hope the results are a help.
53	Giving residents the opportunity to voice their opinion and to be part of this process.
54	Hopefully the steering Committee will gain whole of community values on scenic amenity.
55	Gives feedback about the types of scenery ordinary people like.
56	I appreciate community involvement in planning.
57	The surveys take a wide range of individual perspectives and opinions into account.
58	Allowed to express my own views on the landscape.
59	Although it was explained I'm still not sure what the final outcome will be. Will it be of some practical use? Gave me some idea of what is involved in this type of consultation process.
60	Covered a full variety of the Lockyer Valley scenery.
61	It gives the general public a chance to have input into our local areas with regards to progress either + or - .
62	Conducted in pleasant and convivial atmosphere, gave insight.
63	Councils taking notice of public opinions and hopefully acting on them.
64	Very interesting, may learn something from it.
65	It gave me a chance to have a say in the community.
66	I have been given an opportunity to give my opinion on the landscape of the Lockyer valley.
67	It gave me a gauge of what I like about the Lockyer.
68	In a small way I've had a say.
69	It gave me an understanding of what the study group is hoping to achieve.
70	It got the views of a wide range of people.
71	Is this just a peace-keeping exercise? At least we have had a chance to voice our view about our beautiful valley, let us hope it will be kept that way.
72	It allows the community and interested people to have input into the process of the scenic amenity study.
73	It gives people a voice!
74	Because it concerns different areas of the community of the Lockyer.
75	It gives the council a better view of what we like about our valley and what we do not want to be spoiled.
76	It gives the council an opportunity to determine the future look of the Lockyer, with its residents being consulted.
77	Gives you ideas about what is going on in the Lockyer valley.
78	With people from different age groups & areas it gives a broad view with certain aspects sure to stand out.

4.2 My message to the scenic amenity steering committee is …

Comment	
1	More underground power lines, more trees and cut the grass from sides of road
2	Keep it up
3	More effort is needed for natural landscapes
4	Keep up the great work and thanks for the cash
5	An 'other comments' section would be useful. the 'neutral' category wasn't suitable. if no words suited, i couldn't put another.
6	Keep an open view for future generations. We need to have landscapes left untouched for lots of reasons.
7	Keep at it and ensure that the report does not fester in a filing cabinet.
8	This is a simple, enjoyable process
9	Call me again if I can help
10	Keep going with the study, make sure the community is aware and encouraged to participate.
11	To formalise a plan for the Lockyer so that its natural beauty is retained for future generations and that industrial -
12	Keep going, you're doing a great job and it was interesting.
13	Keep it simple.
14	Keep up such a professional approach.
15	It was a pleasure.
16	It was very interesting and you have done a good job so far.
17	Keep it up.
18	Very good idea to have local people's interests involved.
19	Look after our beautiful scenery.
20	Good luck with your project, questions easy to understand.
21	Good luck, I have no particular barrow to push, but I do think a great number of view points need to be considered.
22	To keep our rural outlook
23	Please consider ways to help bring back the 'paradise' garden of Eden as per genesis.
24	Please take note.
25	Thank you for involving me and it was a pleasure.
26	A very valuable exercise that was easy to follow, and well run.
27	I hope you choose my liked photos.
28	Asking people from outside the area their opinion, you will have a wider range of thoughts and opinions.
29	Continue the useful studies.
30	Happy analysing, I hope the study will be worthwhile.
31	That i think that it was useful and interesting.
32	I like a peaceful rural setting.
33	I prefer the beauties of nature, rather than mass produced items. Excellent idea to look at this though.
34	Keep up the good work.
35	I think that it is good to receive public input to studies.
36	I would like to see the roadway kept in a better state eg. Grass kept at a reasonable manner and papers picked up.
37	Your approach was very clear, friendly and approachable.
38	We like taking visitors for drives to see what's avail. In the area. We'd like a good map to make most of our local area
39	Keep pushing ahead.

40	You will need to get the views of people visiting the area. A more objective view.
41	Keep the valley beautiful, Make older untidy establishments tidy up their act. Eg. New paint, gardens etc.
42	The study allows people to give their thoughts & views on simple issues & i feel people will appreciate & enjoy the opportunity.
43	Look at the small pictures. Treat the area along the roads special, don't just knock it down. Put some thought into each area.
44	Thank you for the opportunity to be a part of this survey. Presented in an interesting way.
45	Provided good maps of the whole area. Available at council offices & tourist info centres.
46	Maintaining a peaceful and tranquil environment throughout rural areas provides much appeal to newcomers etc.
47	Make sure something comes out of this. Too many studies get shelved!
48	Open space is an asset to the Lockyer Valley where development needs to occur. It's important to plan to keep the feeling of open space.
49	Good unbiased approach.
50	Our Environment is our future.
51	Please consider environment impacts when making decisions.
52	Remember to keep the country looking like country & don't let it be overshadowed by progress. Definitely a worth-while process.
53	Hope the results of the survey provide consistent and useful outcomes.
54	Some development is important , but protection of our landscape is the quality of life which attracted me to this area.
55	I hope a broad cross section of the community has viewed the photographs and responded.
56	Thank you for giving me the opportunity to contribute.
57	Keep up good work, ever mindful that often forethought can vastly improve what could be a difficult environmental issue.
58	To leave earth as is, stop messing with it as you'll only ever spoil it. Natural is beautiful. Community vote a good idea.
59	I'd be glad to participate again.
60	If anything at all, make sure the continued consultation and results are advertised and published in an open forum.
61	We have a beautiful and picturesque valley & it is important that we keep it that way.
62	Large monster powerlines look terrible. Keep them away from scenic areas.
63	Carry on and listen to the voice of the people.
64	Listen, consider, act.
65	Congratulations for taking the initiative on such a vital aspect of life - Follow through further.
66	We had our say but will you listen or still do what you want?
67	No power lines please!!
68	We have much beautiful scenery in the Lockyer valley which should be shown more often.
69	Good work.
70	Very useful information.
71	A genuine balance is essential - not just a rubber stamping built on the back of a shallow process.

Appendix 5 List of photos

PhotoNO	PhotoID	Set	PhotoNO	PhotoID	Set
1	AA03	4	62	AF11	8
2	AA04	5	63	AF12	COMMON
3	AA07	7	64	AF13	4
4	AA12	3	65	AF18	4
5	AA17	5	66	AF21	7
6	AA18	2	67	AF22	1
7	AA20	6	68	AF23	7
8	AA22	8	69	AF24	7
9	AB06	1	70	AF26	10
10	AB08	1	71	AF27	9
11	AB12	6	72	AF30	6
12	AB13	9	73	AF36	10
13	AB14	9	74	AG04	3
14	AB15	8	75	AG06	10
15	AB16	9	76	AG09	9
16	AB24	1,10	77	AG10	4
17	AB24A	2	78	AG12	1
18	AC07	3	79	AG13	2
19	AC08	4	80	AG19	6
20	AC09	1	81	AG21	3
21	AC10	8	82	AG25	7
22	AC17	9	83	AH05	8
23	AC18	4	84	AH11	2
24	AC20	5	85	AH11C	7
25	AD02	2	86	AH12	2
26	AD03	COMMON	87	AH13	5
27	AD06	COMMON	88	AH14	4
28	AD07	3	89	AH16	9
29	AD09	7	90	AH18	6
30	AD10	1	91	AH18C	8
31	AD11	1	92	AH21	9
32	AD15	10	93	AH23	3
33	AD16	1	94	AH24	7
34	AD17	5	95	AH25	6
35	AD21	6	96	AI01	1, 6
36	AE01	COMMON	97	AI05	2, 7
37	AE08	6	98	AI08	2, 10
38	AE09	3	99	AI09	5
39	AE09C	7	100	AI12	1, 10
40	AE12	1	101	AI13	3, 8

PhotoNO	PhotoID	Set	PhotoNO	PhotoID	Set
41	AE14	2	102	AI14	8
42	AE14C	10	103	AI15	3
43	AE16	2	104	AJ03	COMMON
44	AE18	3	105	AJ07	7
45	AE18C	9	106	AJ08	2
46	AE19	5	107	AJ09	9
47	AE22	6	108	AJ10	3
48	AE22C	10	109	AJ14	4
49	AE24	4	110	AJ16	5
50	AE27	5	111	AJ21	2
51	AE28	COMMON	112	AJ24	8
52	AE31	3	113	AK03	COMMON
53	AE33	4	114	AK05	10
54	AE34	9,10	115	AK06	6
55	AE37	5	116	AK14	5
56	AF02	COMMON	117	AK18	4
57	AF04	5	118	AK23	8
58	AF04C	8	119	AM01	7
59	AF05	4	120	AM05	9
60	AF09	6	121	AM18	10
61	AF10	8			

Appendix 6. Community ratings of scenery

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AF12		9.9	1	439	0.60	0%	2%	98%
AF27		9.6	2	40	0.93	0%	3%	98%
AF23		9.6	3	38	0.59	0%	0%	100%
AA22		9.5	4	34	1.13	0%	9%	91%
AA07		9.4	5	38	1.24	3%	0%	97%
AE33		9.4	6	45	0.88	0%	2%	98%
AB06		9.3	7	43	0.78	0%	2%	98%
AJ16		9.3	8	40	1.24	0%	8%	93%
AA20		9.0	9	45	1.41	2%	7%	91%
AE01		9.0	10	441	1.64	2%	11%	88%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AA18		8.9	11	51	1.59	0%	14%	86%
AE34		8.9	12	85	1.7	1%	15%	84%
AA17		8.8	13	40	1.69	0%	20%	80%
AA12		8.7	14	58	1.39	0%	16%	84%
AJ14		8.3	15	46	2.05	0%	26%	74%
AK06		8.3	16	45	2.13	2%	24%	73%
AE28		8.2	17	434	1.7	2%	25%	73%
AF13		7.9	18	46	2.01	4%	26%	70%
AE16		7.8	19	51	2.01	4%	24%	73%
AG04		7.8	20	58	2.05	3%	28%	69%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AD10		7.7	21	43	2.68	12%	21%	67%
AC07		7.7	22	58	2.2	7%	28%	66%
AE31		7.5	23	58	2.15	7%	33%	60%
AH23		7.5	24	58	1.99	3%	38%	59%
AB24A		7.4	25	51	1.95	2%	37%	61%
AF02		7.3	26	435	1.99	4%	43%	53%
AB15		7.3	27	34	2.04	6%	44%	50%
AD21		7.2	28	45	1.85	4%	47%	49%
AB12		7.1	29	45	1.8	0%	58%	42%
AB14		7.1	30	41	1.99	5%	44%	51%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AB24		7.0	31	87	2.01	5%	46%	49%
AH24		7.0	32	39	1.99	8%	51%	41%
AK14		7.0	33	40	1.97	8%	48%	45%
AC20		7.0	34	40	1.91	8%	45%	48%
AB16		7.0	35	41	2.28	12%	37%	51%
AF18		6.9	36	46	1.79	0%	57%	43%
AF05		6.9	37	46	2.15	7%	46%	48%
AG12		6.9	38	43	1.95	9%	47%	44%
AF04C		6.9	39	34	2.32	12%	41%	47%
AD17		6.9	40	40	1.99	5%	58%	38%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AF04		6.7	41	40	2.06	8%	53%	40%
AD15		6.6	42	44	2.04	7%	52%	41%
AB13		6.6	43	41	2.41	20%	37%	44%
AG06		6.5	44	44	2.67	16%	36%	48%
AE27		6.5	45	40	2.07	10%	55%	35%
AD06		6.4	46	441	2.19	13%	47%	40%
AD16		6.4	47	43	2.41	14%	49%	37%
AH05		6.2	48	34	2.23	15%	53%	32%
AC18		6.2	49	46	2.16	17%	43%	39%
AI14		6.1	50	34	2.12	15%	53%	32%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AH16		6.1	51	41	2.18	15%	56%	29%
AF21		6.0	52	39	2.08	15%	59%	26%
AF24		5.9	53	39	2.74	28%	38%	33%
AK05		5.8	54	44	1.79	11%	66%	23%
AE12		5.7	55	43	2.16	19%	63%	19%
AE08		5.7	56	45	1.99	9%	69%	22%
AC10		5.7	57	34	2.32	21%	47%	32%
AC08		5.7	58	46	1.92	11%	72%	17%
AG13		5.6	59	51	2.14	16%	63%	22%
AE24		5.5	60	46	2.28	13%	67%	20%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AG10		5.5	61	46	2.3	22%	57%	22%
AD09		5.4	62	39	2.16	18%	62%	21%
AG25		5.2	63	39	2.46	28%	56%	15%
AM18		5.1	64	44	2.54	30%	50%	20%
AG21		5.1	65	58	2.24	31%	48%	21%
AG09		5.0	66	41	2.64	32%	49%	20%
AH21		5.0	67	41	2.54	29%	51%	20%
AF26		4.9	68	44	2.68	36%	41%	23%
AC09		4.8	69	43	2.1	28%	60%	12%
AF11		4.8	70	34	1.97	29%	59%	12%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AH18		4.8	71	45	2.17	31%	56%	13%
AM05		4.7	72	41	2.23	27%	59%	15%
AH18C		4.6	73	34	2.42	29%	50%	21%
AI13		4.5	74	92	2	38%	52%	10%
AF09		4.4	75	45	2.27	38%	51%	11%
AH12		4.4	76	51	1.95	39%	53%	8%
AC17		4.4	77	41	2.47	41%	46%	12%
AF10		4.2	78	34	2.18	41%	53%	6%
AF30		4.2	79	45	1.7	36%	58%	7%
AD07		4.2	80	58	2.49	52%	34%	14%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AH11		4.0	81	51	1.95	49%	45%	6%
AB08		4.0	82	43	1.87	42%	56%	2%
AE18		3.9	83	58	2.05	47%	47%	7%
AK03		3.9	84	441	2.07	48%	45%	7%
AE22		3.9	85	45	2.29	51%	40%	9%
AJ08		3.9	86	51	2.17	53%	41%	6%
AJ21		3.8	87	51	2.21	53%	37%	10%
AD11		3.7	88	43	1.92	49%	49%	2%
AE09		3.7	89	58	2.14	50%	48%	2%
AJ07		3.7	90	39	2.25	51%	38%	10%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AH25		3.7	91	45	1.68	56%	42%	2%
AJ10		3.7	92	58	1.93	50%	45%	5%
AH11C		3.6	93	39	2.07	54%	41%	5%
AM01		3.6	94	39	2.01	51%	46%	3%
AG19		3.6	95	45	2.35	53%	42%	4%
AH13		3.5	96	39	1.98	62%	36%	3%
AI15		3.5	97	58	1.93	55%	40%	5%
AE22C		3.5	98	44	2.22	64%	27%	9%
AI09		3.3	99	40	2.39	65%	25%	10%
AE19		3.3	100	40	1.6	58%	43%	0%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AF22		3.2	101	43	2.66	72%	21%	7%
AE14		3.1	102	51	2.3	59%	33%	8%
AE09C		3.1	103	39	1.86	62%	38%	0%
AI01		3.0	104	88	1.7	69%	30%	1%
AD03		2.9	105	437	1.84	70%	28%	2%
AE18C		2.9	106	41	1.73	71%	27%	2%
AE37		2.9	107	40	1.86	75%	23%	3%
AI12		2.7	108	87	1.65	74%	25%	1%
AD02		2.6	109	51	1.47	78%	22%	0%
AI05		2.5	110	90	1.38	80%	20%	0%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AI08		2.5	111	95	1.87	80%	17%	3%
AJ24		2.5	112	34	1.86	74%	24%	3%
AH14		2.3	113	46	1.73	78%	20%	2%
AF36		2.3	114	44	2.05	86%	9%	5%
AK23		2.3	115	34	1.54	91%	6%	3%
AE14C		2.2	116	42	1.62	83%	14%	2%
AA03		2.0	117	46	2.05	85%	9%	7%
AJ09		1.9	118	40	1.2	93%	8%	0%
AA04		1.5	119	37	1.61	92%	5%	3%
AK18		1.5	120	45	1.14	93%	7%	0%

Photo ID	Picture	Average community rating 1-10	Rank position (first to last)	Number of times photo was rated	Variation in rating (std dev)	Percent of times people rated the photo as either		
						Low 1-3	Medium 4-7	High 8-10
AJ03		1.4	121	440	1.24	95%	4%	1%

Appendix 7 Words that people used to describe what they noticed about the scenery

PhotoID	*Rating*	*Number of times a word was used (top 12 words)*												
AF12	9.9	all words	water	trees	river	green	clean	natural	peaceful	banks	beautiful	greenery	flowing	vegetation
		290	58	37	30	12	11	10	9	8	7	7	6	5
AF27	9.6	all words	bush	green	river									
		3	1	1	1									
AA22	9.5	all words	beautiful	inviting	rainforest	road	vegetation							
		5	1	1	1	1	1							
AA07	9.4	all words	bush	fire	high	hills	natural	open	rock	space	untouched	vast		
		11	2	1	1	1	1	1	1	1	1	1		
AE33	9.4	all words	hills	trees	beautiful	bush	country	green	rugged	wild				
		10	2	2	1	1	1	1	1	1				
AB06	9.3	all words	hills	mountains	rolling	trees	bush	development	fields	great	green	horses	landscape	many
		17	3	2	2	2	1	1	1	1	1	1	1	1
AJ16	9.3	all words	trees	water	banks	bush	creek	man	river	surrounding	terrain	untouched		
		14	3	3	1	1	1	1	1	1	1	1		
AA20	9.0	all words	mountains	green	trees	view	beautiful	elevated	greenery	hills	look	range	valley	vegetation
		17	3	2	2	2	1	1	1	1	1	1	1	1
AE01	9.0	all words	trees	green	mountains	hills	fence	bushland	flowers	undisturbed	vegetation	beautiful	bush	foliage
		95	14	8	7	6	5	3	3	3	3	2	2	2
AA18	8.9	all words	trees	bushland	farm	healthy	natural	scenery	scrub	straight	thick			
		10	2	1	1	1	1	1	1	1	1			
AE34	8.9	all words	trees	view	valley	beautiful	blue	bushland	countryside	foreground	horizon	spacious	terrain	thick
		18	4	3	2	1	1	1	1	1	1	1	1	1
AA17	8.8	all words	trees	green	covered	greenery	look	mountains	natural	present	relaxing	vegetation	view	
		14	3	2	1	1	1	1	1	1	1	1	1	
AA12	8.7	all words	ferns	fence	grass	green	greenery	lush	trees	view				
		9	2	1	1	1	1	1	1	1				
AJ14	8.3	all words	creek	banks										
		3	2	1										
AK06	8.3	all words	cattle	trees	cows	green	shade	Australian	good	grass	lush	positive	red	
		22	5	5	2	2	2	1	1	1	1	1	1	
AE28	8.2	all words	hills	trees	fence	mountains	green	rolling	farm	yards	erosion	grass	rugged	country

PhotoID	*Rating*	*Number of times a word was used (top 12 words)*												
		176	28	15	12	11	6	6	5	5	4	4	4	3
AF13	7.9	all words	bridge	creek	trees	dirt	gravel	river	rock	area	background	clean	foreground	pleasant
		29	5	3	3	2	2	2	2	1	1	1	1	1
AE16	7.8	all words	trees	fence	animals	bush	cattle	country	environment	grazing	gum	inviting	land	natural
		22	5	3	1	1	1	1	1	1	1	1	1	1
AG04	7.8	all words	water	beautiful	brown	clean	fence	good	grass	hills	lake	mountains	range	scenery
		15	3	1	1	1	1	1	1	1	1	1	1	1
AD10	7.7	all words	trees	forest	hills	straight	Australian	dense	distant	fauna	mountains	natural	rugged	terrain
		20	6	2	2	2	1	1	1	1	1	1	1	1
AC07	7.7	all words	trees	contours	fence	grass	green	hills	wire					
		8	2	1	1	1	1	1	1					
AE31	7.5	all words	powerlines	hills	trees	vegetation	green	high	man	native	natural	present	tension	
		18	4	3	2	2	1	1	1	1	1	1	1	
AH23	7.5	all words	colour	contrast	farm	grass	hills	irrigation	land	lucerne	natural	paddocks	trees	
		11	1	1	1	1	1	1	1	1	1	1	1	
AB24A	7.4	all words	dam	mountains	hills	powerlines	scenery	water	buildings	cool	distant	farm	fence	grass
		30	5	4	3	2	2	2	1	1	1	1	1	1
AF02	7.3	all words	hills	crops	mountains	green	irrigation	background	colour	contrast	paddocks	different	pipes	powerlines
		183	23	18	11	10	9	8	6	5	5	4	4	4
AB15	7.3	all words	buildings	country	covered	grass	greenery	hills	hollow	homes	looks	natural	open	space
		17	1	1	1	1	1	1	1	1	1	1	1	1
AD21	7.2	all words	green	hills	powerlines	trees	covered	cultivation	fields	growth	lovely	lush	open	paddocks
		19	3	2	2	2	1	1	1	1	1	1	1	1
AB12	7.1	all words	hills	open	green	houses	powerlines	space	buildings	country	many	peaceful	sparse	tranquil
		22	3	3	2	2	2	2	1	1	1	1	1	1
AB14	7.1	all words	green	houses	valley	bare	deep	earth	everywhere	grass	hills	landscape	mountains	view
		15	2	2	2	1	1	1	1	1	1	1	1	1
AB24	7.0	all words	grass	trees	hills	pasture	beautiful	green	mountains	open	paddocks	shade	soft	space
		21	5	3	2	2	1	1	1	1	1	1	1	1
AH24	7.0	all words	bushland	paddocks	pasture	quiet	road	trees	variation					
		7	1	1	1	1	1	1	1					
AK14	7.0	all words	cattle	cows	appealing	grass	green	native	nice	pasture	sky	trees	vegetation	
		13	2	2	1	1	1	1	1	1	1	1	1	
AC20	7.0	all words	colour	crops	productive	trees	dead	dry	grass	open	plant	powerlines	space	used
		19	3	2	2	2	1	1	1	1	1	1	1	1

PhotoID	*Rating*	*Number of times a word was used (top 12 words)*												
AB16	7.0	all words	green	hills	natural	open	peaceful	space	vegetation	wide				
		8	1	1	1	1	1	1	1	1				
AF05	6.9	all words	powerlines	hills	crops	grass	green	power poles	rolling	tower				
		12	4	2	1	1	1	1	1	1				
AF18	6.9	all words	mountains	agriculture	area	big	cut	farm	fence	green	land	lucerne	nice	peaceful
		15	2	1	1	1	1	1	1	1	1	1	1	1
AG12	6.9	all words	crops	farm	agriculture	boring	buildings	different	dirt	dying	flat	grass	green	hills
		23	4	3	1	1	1	1	1	1	1	1	1	1
AF04C	6.9	all words	hills	trees	green	mountains	pasture	covered	crops	farm	houses	powerlines	pylon	rolling
		22	4	4	2	2	2	1	1	1	1	1	1	1
AD17	6.9	all words	hills	agriculture	bush	cleared	covered	crops	dry	greenery	ground	land	mountains	surrounding
		15	2	1	1	1	1	1	1	1	1	1	1	1
AF04	6.7	all words	area	grass	green	greenery	hills	large	mountains	range	regrowth	rolling	sparse	
		11	1	1	1	1	1	1	1	1	1	1	1	
AD15	6.6	all words	crops	hills	irrigation	sprayline	cleared	green						
		11	3	2	2	2	1	1						
AB13	6.6	all words	green	hills	lack	lush	rubbish	trees	undulating					
		7	1	1	1	1	1	1	1					
AG06	6.5	all words	water	bare	blue	boring	brown	dam	empty	expanse	flat	hills		
		11	2	1	1	1	1	1	1	1	1	1		
AE27	6.5	all words	hills	rolling	scattered	trees	bare	dry	flat	grass	native	open	regrowth	space
		17	3	2	2	2	1	1	1	1	1	1	1	1
AD06	6.4	all words	hills	trees	grass	open	space	green	houses	land	mountains	flat	contrast	dry
		114	15	15	10	6	6	4	4	4	4	3	2	2
AD16	6.4	all words	mountains	cultivation	paddocks	backdrop	background	crops	dry	ground	houses	ploughed	powerlines	productive
		20	4	2	2	1	1	1	1	1	1	1	1	1
AC18	6.2	all words	flat	grass	overgrown									
		3	1	1	1									
AI14	6.1	all words	fence	Australian	barbedwire	billboard	bush	countryside	grass	natural	overgrown	paddocks	powerlines	scene
		15	2	1	1	1	1	1	1	1	1	1	1	1
AH16	6.1	all words	colour	crops	mountains	powerlines	background	contours	different	distant	hills	interesting	lucerne	lush
		25	2	2	2	2	1	1	1	1	1	1	1	1
AF21	6.0	all words	open	space	crops	cultivation	distant	fields	green	greenery	healthy	looks	peaceful	variation
		15	2	2	1	1	1	1	1	1	1	1	1	1
AF24	5.9	all words	hills	powerlines	lake	overhead	rolling	water	wires					

PhotoID	*Rating*	*Number of times a word was used (top 12 words)*											
		9	2	2	1	1	1	1	1				
AK05	5.8	all words	green	brown	colour	crops	different	grass	nice	trees			
		9	2	1	1	1	1	1	1	1			
AE12	5.7	all words	powerlines	trees	creek	tower	transmission	vegetation	big	fauna	fields	grass	green	land
		27	5	3	2	2	2	2	1	1	1	1	1	1
AE08	5.7	all words	green	powerlines	power poles	trees								
		4	1	1	1	1								
AC10	5.7	all words	brown	dry	flat	grazing	land	open	paddocks					
		7	1	1	1	1	1	1	1					
AC08	5.7	all words	appearance	green	open	background	clean	features	flat	foreground	lack	nice	space	trees
		17	2	2	2	1	1	1	1	1	1	1	1	1
AG13	5.6	all words	boring	flat	land	soil	trees	black	brown	cultivation	dirt	dry	fence	fertile
		25	2	2	2	2	2	1	1	1	1	1	1	1
AE24	5.5	all words	dry	foreground	grass	nice	powerlines	tower						
		6	1	1	1	1	1	1						
AG10	5.5	all words	features	grass	paddocks	plain	productive							
		5	1	1	1	1	1							
AD09	5.4	all words	road	hills	rolling	country	countryside	mixture	mountains	pasture	powerlines	power poles		
		14	3	2	2	1	1	1	1	1	1	1		
AG25	5.2	all words	country	bare	boring	dry	fence	flat	ground	lack	relaxing	spacious		
		11	2	1	1	1	1	1	1	1	1	1		
AM18	5.1	all words	houses	hills	countryside	green	terrain	distant	grass	lovely	scattered	untidy	view	
		19	4	3	2	2	2	1	1	1	1	1	1	
AG21	5.1	all words	sign	colour	crops	fields	advertising	agriculture	barren	farm	houses	interesting	lack	neatness
		23	4	2	2	2	1	1	1	1	1	1	1	1
AG09	5.0	all words	colour	country	fence	grass	appealing	beautiful	character	dead	dying	full	mixture	mountains
		19	2	2	2	2	1	1	1	1	1	1	1	1
AH21	5.0	all words	mountains	trees	barren	buildings	different	dirt	dry	fields	paddocks	texture		
		12	2	2	1	1	1	1	1	1	1	1		
AF26	4.9	all words	powerlines	wall	dam	green	rock	trees	bushland	earth	fresh	manmade	natural	structure
		22	4	3	2	2	2	2	1	1	1	1	1	1
AC09	4.8	all words	buildings	land	roof	colour	fire	flat	grass	open	overgrown	plain	reflections	shed
		16	2	2	2	1	1	1	1	1	1	1	1	1
AF11	4.8	all words	trees	fence	grass	billboard	dry	natural	necessary	paddocks	wire			
		13	3	2	2	1	1	1	1	1	1			

PhotoID	*Rating*	*Number of times a word was used (top 12 words)*												
AH18	4.8	all words	blue	crops	dry	fields	land	mountains	ploughed	powerlines	power poles	trees		
		10	1	1	1	1	1	1	1	1	1	1		
AM05	4.7	all words	powerlines	green	hills	tower	appealing	grass	greenery	overhead	pasture	spoilt	vegetation	
		20	6	3	2	2	1	1	1	1	1	1	1	
AI13	4.5	all words	billboard	sign	dry	grass	hills	overgrown	trees	Australian	barbedwire	countryside	fence	landscape
		32	4	3	2	2	2	2	2	1	1	1	1	1
AF09	4.4	all words	buildings	clean	grass	service	shed	shop	station	tidy	trees	untidy		
		11	2	1	1	1	1	1	1	1	1	1		
AH12	4.4	all words	road	banks	expanse	grass	posts							
		7	3	1	1	1	1							
AC17	4.4	all words	green	houses	shade	silos								
		4	1	1	1	1								
AF10	4.2	all words	grass	dry	dull	houses	tall							
		6	2	1	1	1	1							
AF30	4.2	all words	trees	animals	bare	buildings	detract	dry	flat	grass	industrial	land	large	plantation
		16	2	1	1	1	1	1	1	1	1	1	1	1
AD07	4.2	all words	shed	clearing	animals	barren	beautiful	buildings	dry	farm	fields	grass	hills	industrial
		19	3	2	1	1	1	1	1	1	1	1	1	1
AH11	4.0	all words	bitumen	cutting	grass	grassland	road							
		5	1	1	1	1	1							
AB08	4.0	all words	dirt	track	untidy	advertising	billboard	buildings	calm	country	grass	green	hills	looks
		23	2	2	2	1	1	1	1	1	1	1	1	1
AE18	3.9	all words	powerlines	forest	clearing	cutting	fence	trees						
		15	9	2	1	1	1	1						
AK03	3.9	all words	powerlines	power poles	soil	black	cultivation	farm	colour	drum	electricity	fields	old	pipes
		147	28	12	12	5	4	4	3	3	3	3	3	3
AE22	3.9	all words	powerlines	power poles	trees	buildings	contrast	dry	old	positive	road	rural	scrub	side
		24	6	2	2	1	1	1	1	1	1	1	1	1
AJ08	3.9	all words	powerlines	railway	grass	mountains	area	open						
		19	9	4	2	2	1	1						
AJ21	3.8	all words	powerlines	horses	animals	electricity	fence	greenery	high	open	pleasant	power poles	spoilt	tension
		33	16	6	1	1	1	1	1	1	1	1	1	1
AD11	3.7	all words	farm	buildings	grass	silos	brown	crops	dry	equipment	intrusive	land	landscape	long
		20	3	2	2	2	1	1	1	1	1	1	1	1
AE09	3.7	all words	powerlines	bushland	driveway	dry	fence	high	horses	numerous	overgrown	power poles	pump	tension

PhotoID	*Rating*	*Number of times a word was used (top 12 words)*												
		20	8	1	1	1	1	1	1	1	1	1	1	1
AJ07	3.7	all words	railway	boring	equipment	interesting	looks	mountains	old	powerlines	rundown	track	ugly	unattractive
		15	4	1	1	1	1	1	1	1	1	1	1	1
AH25	3.7	all words	dry	grass	trees	cut	open	quiet	shed	space				
		11	2	2	2	1	1	1	1	1				
AJ10	3.7	all words	grass	mown	billboard	sign								
		6	2	2	1	1								
AH11C	3.6	all words	road	trees	bare	green	junction	banks	bushland	cutting	foreground	grassland	landscape	scar
		21	5	3	2	2	2	1	1	1	1	1	1	1
AM01	3.6	all words	powerlines	crops	healthy	land	large	ploughed						
		8	3	1	1	1	1	1						
AG19	3.6	all words	road	side	sign	advertising	crops	McDonalds	rubbish	sorghum	unkept			
		12	2	2	2	1	1	1	1	1	1			
AH13	3.5	all words	barren	dry	grass	agriculture	bare	dead	fence	mixture	road	space	terrain	travel
		17	3	2	2	1	1	1	1	1	1	1	1	1
AI15	3.5	all words	billboard	grass	long	sign	trees	advertising	green	powerlines	power poles	spoilt	tall	untidy
		20	4	3	2	2	2	1	1	1	1	1	1	1
AE22C	3.5	all words	powerlines	yards	grass	dry	fence	old	scene	spoilt	tower	trees		
		20	8	3	2	1	1	1	1	1	1	1		
AI09	3.3	all words	powerlines	bitumen	cared	fact	farming	highway	life	nothing	road			
		12	4	1	1	1	1	1	1	1	1			
AE19	3.3	all words	powerlines	clearing	bushland	development	trees							
		10	5	2	1	1	1							
AF22	3.2	all words	powerlines	tower	hills	obtrusive	transmission	trees	artificial	cleared	clearing	dead	erosion	features
		40	14	4	2	2	2	2	1	1	1	1	1	1
AE14	3.1	all words	powerlines	tower	trees	bush	native	setting						
		12	5	2	2	1	1	1						
AE09C	3.1	all words	powerlines	power poles	electricity	equipment	hills	old	pump	rolling	tower	transmission	ugly	
		14	3	2	1	1	1	1	1	1	1	1	1	
AI01	3.0	all words	buildings	industrial	powerlines	bare	barren	big	clean	dull	foreground	grass	lack	landscape
		23	3	2	2	1	1	1	1	1	1	1	1	1
AD03	2.9	all words	powerlines	grass	tower	trees	green	overgrown	power poles	electricity	land	large	weeds	bush
		184	72	13	9	7	6	4	4	3	3	3	3	2
AE18C	2.9	all words	powerlines	trees	bushland	clearing	greenery	lack	natural	power poles				
		13	5	2	1	1	1	1	1	1				

PhotoID	*Rating*	*Number of times a word was used (top 12 words)*												
AE37	2.9	all words	bins	powerlines	rubbish	appealing	backdrop	clean	detract	garbage	hills	trees	vegetation	
		15	3	2	2	1	1	1	1	1	1	1	1	
AI12	2.7	all words	bare	dirty	dusty	grass	untidy	bitumen	bright	buildings	colour	dead	dirt	driveway
		29	3	2	2	2	2	1	1	1	1	1	1	1
AD02	2.6	all words	fence	grass	barrier	detract	dry	large	light	long	noise	road	rural	trees
		21	4	4	2	1	1	1	1	1	1	1	1	1
AI05	2.5	all words	powerlines	BP	bridge	McDonalds	grass	overhead	road	stop				
		14	4	2	2	2	1	1	1	1				
AI08	2.5	all words	road	highway	traffic	black	busy	cars	McDonalds	service	sign	station	bitumen	BP
		38	5	4	3	2	2	2	2	2	2	2	1	1
AJ24	2.5	all words	powerlines	appearance	clearing	flat	power poles	ugly						
		10	5	1	1	1	1	1						
AH14	2.3	all words	fence	dry	grass	dead	dusty	highway	light	noise	old	plain	power poles	road
		21	5	4	2	1	1	1	1	1	1	1	1	1
AF36	2.3	all words	trees	burnt	brown	bushland	black	cleared	dead	destruction	dry	ground	growth	lack
		21	4	3	2	2	1	1	1	1	1	1	1	1
AK23	2.3	all words	billboard	blot	brown	cared	character	dry	flat	lack	landscape			
		9	1	1	1	1	1	1	1	1	1			
AE14C	2.2	all words	powerlines	tower	cables	environment	manmade	paddocks	spoilt	structure				
		10	2	2	1	1	1	1	1	1				
AA03	2.0	all words	crane	quarry	ugly	background	foreground	messy	scenery	site	dry	location	mountains	sandstone
		30	4	3	3	2	2	2	2	2	1	1	1	1
AJ09	1.9	all words	powerlines	lack	dry	grass	green	greenery	ground	overhead	posts	white		
		19	9	2	1	1	1	1	1	1	1	1		
AA04	1.5	all words	dirt	vegetation	background	bare	barren	bushland	destruction	dusty	excavation	hills	industrial	lack
		28	2	2	1	1	1	1	1	1	1	1	1	1
AK18	1.5	all words	powerlines	beautiful	industrial	space	spoilt	station						
		10	5	1	1	1	1	1						
AJ03	1.4	all words	rubbish	dump	tip	untidy	bushland	soil	trees	bush	grass	messy	overgrown	scar
		232	49	17	10	10	7	7	6	5	5	5	5	5

Appendix 8 Peoples emotional response scores

			Emotional response scores (averages)					
Photo	Community rating	No. of people who chose photo	Dislike - Like (1-5)	Variation of liking (std)	Peaceful - Distressing (1-5)	Ugly - Beautiful (1-5)	Slow - Stimulating (1-5)	Boring - Interesting (1-5)
AF12	9.9	90	4.9	0.2	5.0	4.9	3.7	3.6
AF27	9.6	1	5.0	-	5.0	5.0	4.0	3.0
AA22	9.5	2	3.5	2.1	3.5	3.5	2.5	3.0
AA07	9.4	4	4.8	0.5	4.3	4.5	3.8	3.5
AE33	9.4	4	4.5	0.6	4.5	4.5	4.5	3.8
AB06	9.3	5	4.6	0.5	4.4	4.4	2.4	2.8
AJ16	9.3	4	4.5	0.6	4.8	4.5	3.0	3.0
AA20	9.0	5	4.8	0.4	4.6	4.2	2.8	3.7
AE01	9.0	31	4.6	0.5	4.6	4.6	3.8	2.5
AA18	8.9	5	4.2	0.4	4.4	4.4	3.8	3.5
AE34	8.9	6	4.7	0.5	4.5	4.7	3.8	3.8
AA17	8.8	4	4.8	0.5	4.8	4.8	2.8	2.5
AA12	8.7	3	4.3	0.6	4.3	4.3	4.3	1.0
AJ14	8.3	1	4.0	-	5.0	5.0	4.0	3.4
AK06	8.3	7	4.4	0.5	4.3	4.1	3.0	4.0
AE28	8.2	51	4.3	0.5	4.3	4.1	3.2	3.0
AF13	7.9	8	4.1	0.4	4.1	3.6	2.8	2.5
AE16	7.8	6	4.2	0.4	4.3	4.0	3.0	2.5
AG04	7.8	5	4.4	0.5	4.4	4.2	3.4	2.3
AD10	7.7	7	4.4	0.5	4.1	4.6	4.0	2.8
AC07	7.7	3	4.0	0.0	4.3	4.7	3.7	2.0
AE31	7.5	4	3.5	0.6	3.3	3.3	3.5	2.5
AH23	7.5	5	4.4	0.5	4.6	4.4	3.8	4.0
AB24A	7.4	8	4.1	0.4	4.6	4.4	3.0	2.3
AF02	7.3	48	3.8	0.8	4.0	3.8	3.3	4.4
AB15	7.3	5	3.8	0.4	4.2	3.0	3.0	2.5
AD21	7.2	6	4.0	0.0	3.8	4.0	2.8	2.5
AB12	7.1	6	3.7	0.5	3.3	3.7	2.7	3.1
AB14	7.1	5	3.8	0.4	3.8	3.6	3.6	4.0
AB24	7.0	7	3.9	0.4	3.9	3.6	2.7	2.8
AH24	7.0	2	5.0	0.0	4.5	4.5	3.0	2.0
AK14	7.0	4	3.8	0.5	4.0	3.5	2.3	3.8
AC20	7.0	7	3.6	0.5	3.6	3.9	3.0	2.7
AB16	7.0	3	3.7	0.6	4.3	4.0	3.7	2.2
AF05	6.9	4	3.8	0.5	4.0	2.8	2.5	3.0
AF18	6.9	4	4.0	0.0	4.0	3.8	3.0	4.0
AG12	6.9	7	3.3	0.5	3.1	2.9	2.9	2.0
AF04C	6.9	6	3.8	0.4	4.3	3.7	3.0	1.0
AD17	6.9	5	3.2	0.4	3.4	3.4	3.0	1.7
AF04	6.7	3	4.0	0.0	3.7	3.0	3.0	2.3
AD15	6.6	3	3.7	1.2	3.3	3.3	3.0	3.5
AB13	6.6	2	3.0	1.4	3.0	3.0	3.5	4.0
AG06	6.5	3	3.3	0.6	3.7	3.3	2.3	3.3
AE27	6.5	5	3.4	0.9	3.6	3.2	2.8	3.3

			Emotional response scores (averages)					
Photo	Community rating	No. of people who chose photo	Dislike - Like (1-5)	Variation of liking (std)	Peaceful - Distressing (1-5)	Ugly - Beautiful (1-5)	Slow - Stimulating (1-5)	Boring - Interesting (1-5)
AD06	6.4	36	3.7	0.6	3.9	3.6	2.7	3.0
AD16	6.4	6	3.5	0.5	3.0	3.3	3.7	1.9
AC18	6.2	2	2.5	0.7	3.0	1.5	1.5	2.8
AI14	6.1	4	2.0	0.8	3.5	2.5	2.3	2.5
AH16	6.1	6	3.7	1.0	3.8	3.8	3.3	3.0
AF21	6.0	4	4.0	0.0	4.3	4.5	3.3	4.3
AF24	5.9	2	3.5	0.7	4.0	2.5	2.5	3.7
AK05	5.8	2	3.5	0.7	3.0	3.5	2.5	3.5
AE12	5.7	6	3.5	0.5	3.5	3.2	3.0	2.3
AE08	5.7	1	3.0	-	4.0	4.0	3.0	4.0
AC10	5.7	2	1.5	0.7	3.0	3.0	3.0	1.8
AC08	5.7	5	3.4	0.5	3.6	3.2	2.6	2.3
AG13	5.6	7	3.6	1.0	3.3	3.4	2.7	3.3
AE24	5.5	2	3.5	0.7	5.0	3.5	2.0	5.0
AG10	5.5	2	3.5	0.7	3.5	3.0	2.5	3.3
AD09	5.4	4	3.8	1.0	4.0	4.0	2.8	4.0
AG25	5.2	4	2.5	0.6	3.3	2.8	2.3	2.2
AM18	5.1	6	3.7	0.5	4.2	3.8	2.7	2.6
AG21	5.1	8	3.8	0.9	3.5	3.6	3.3	2.3
AG09	5.0	5	3.8	1.6	4.0	3.8	3.4	2.0
AH21	5.0	4	3.0	0.8	3.5	3.0	3.0	4.4
AF26	4.9	6	3.5	0.5	3.3	3.0	2.8	3.4
AC09	4.8	6	3.2	1.2	3.2	3.0	2.0	2.8
AF11	4.8	4	3.3	1.0	4.0	2.3	2.3	3.0
AH18	4.8	3	2.7	1.2	3.0	3.3	2.3	3.2
AM05	4.7	4	3.3	1.0	3.8	3.5	4.0	2.1
AI13	4.5	10	3.0	1.1	3.1	2.4	2.6	2.0
AF09	4.4	4	3.3	1.0	3.5	3.0	2.3	2.5
AH12	4.4	2	2.5	0.7	3.0	2.5	3.0	3.2
AC17	4.4	2	3.0	1.4	3.0	3.0	2.5	1.8
AF10	4.2	2	2.0	0.0	2.5	2.5	1.5	3.2
AF30	4.2	5	2.4	0.5	3.2	2.4	2.6	3.0
AD07	4.2	6	2.3	1.0	3.2	2.7	2.0	4.5
AH11	4.0	2	3.5	0.7	3.0	4.0	3.5	3.0
AB08	4.0	7	2.7	1.0	3.3	2.7	2.3	2.0
AE18	3.9	4	2.3	0.5	2.8	2.3	3.0	3.4
AK03	3.9	36	2.8	0.8	3.1	2.9	2.7	4.4
AE22	3.9	6	3.2	1.0	3.0	2.8	2.7	3.0
AJ08	3.9	5	3.2	0.8	3.6	3.2	2.8	3.6
AJ21	3.8	10	2.8	0.8	3.0	2.6	3.0	2.7
AD11	3.7	6	2.8	0.8	3.0	2.7	3.0	3.0
AE09	3.7	5	2.2	0.4	3.0	2.0	2.2	2.3
AJ07	3.7	4	2.8	1.5	2.8	2.3	2.3	3.6
AH25	3.7	4	3.3	1.0	3.3	3.0	2.3	3.0
AJ10	3.7	2	3.5	0.7	3.0	3.0	2.5	3.0
AH11C	3.6	6	2.8	0.4	3.3	2.8	2.7	4.2
AM01	3.6	2	1.5	0.7	2.0	3.0	3.0	4.3

			Emotional response scores (averages)					
Photo	Community rating	No. of people who chose photo	Dislike - Like (1-5)	Variation of liking (std)	Peaceful - Distressing (1-5)	Ugly - Beautiful (1-5)	Slow - Stimulating (1-5)	Boring - Interesting (1-5)
AG19	3.6	4	2.0	0.8	3.0	2.3	3.0	3.3
AH13	3.5	6	2.5	0.5	2.8	1.8	2.5	2.8
AI15	3.5	6	2.7	0.5	3.0	2.5	2.7	2.8
AE22C	3.5	5	3.0	0.7	3.4	3.4	2.2	2.2
AI09	3.3	4	2.8	0.5	2.5	2.5	2.5	0.5
AE19	3.3	3	2.3	0.6	2.7	2.0	2.7	3.6
AF22	3.2	11	2.0	1.3	2.4	2.0	3.5	3.5
AE14	3.1	4	2.5	1.3	3.0	2.8	3.5	2.7
AE09C	3.1	3	3.0	1.7	3.0	2.0	2.7	3.0
AI01	3.0	8	2.4	0.9	2.6	2.8	2.9	2.6
AD03	2.9	47	2.5	0.9	2.6	2.6	2.7	2.1
AE18C	2.9	3	2.0	1.0	2.0	2.0	3.7	2.3
AE37	2.9	4	2.3	0.5	3.0	2.5	3.0	3.8
AI12	2.7	8	1.8	0.7	2.6	2.3	2.9	2.5
AD02	2.6	6	2.2	0.8	2.5	1.7	3.0	1.5
AI05	2.5	4	2.0	0.0	2.8	2.3	2.3	1.5
AI08	2.5	11	2.2	1.3	2.2	2.4	3.8	3.6
AJ24	2.5	3	1.7	0.6	3.3	2.3	2.7	1.9
AH14	2.3	7	2.6	0.5	2.9	2.4	2.3	3.5
AF36	2.3	6	2.2	1.2	2.2	2.0	3.5	2.5
AK23	2.3	2	1.5	0.7	2.5	2.0	2.0	4.0
AE14C	2.2	3	1.3	0.6	2.0	1.7	2.7	3.0
AA03	2.0	10	1.7	0.7	2.1	1.6	2.9	3.3
AJ09	1.9	5	1.8	1.1	2.6	2.4	2.6	3.7
AA04	1.5	9	1.7	1.0	2.0	1.7	3.0	3.0
AK18	1.5	4	1.8	1.0	2.3	1.5	2.0	4.3
AJ03	1.4	73	1.4	0.7	2.1	1.5	2.8	4.0

Appendix 9 Landscape & development characteristics of photos

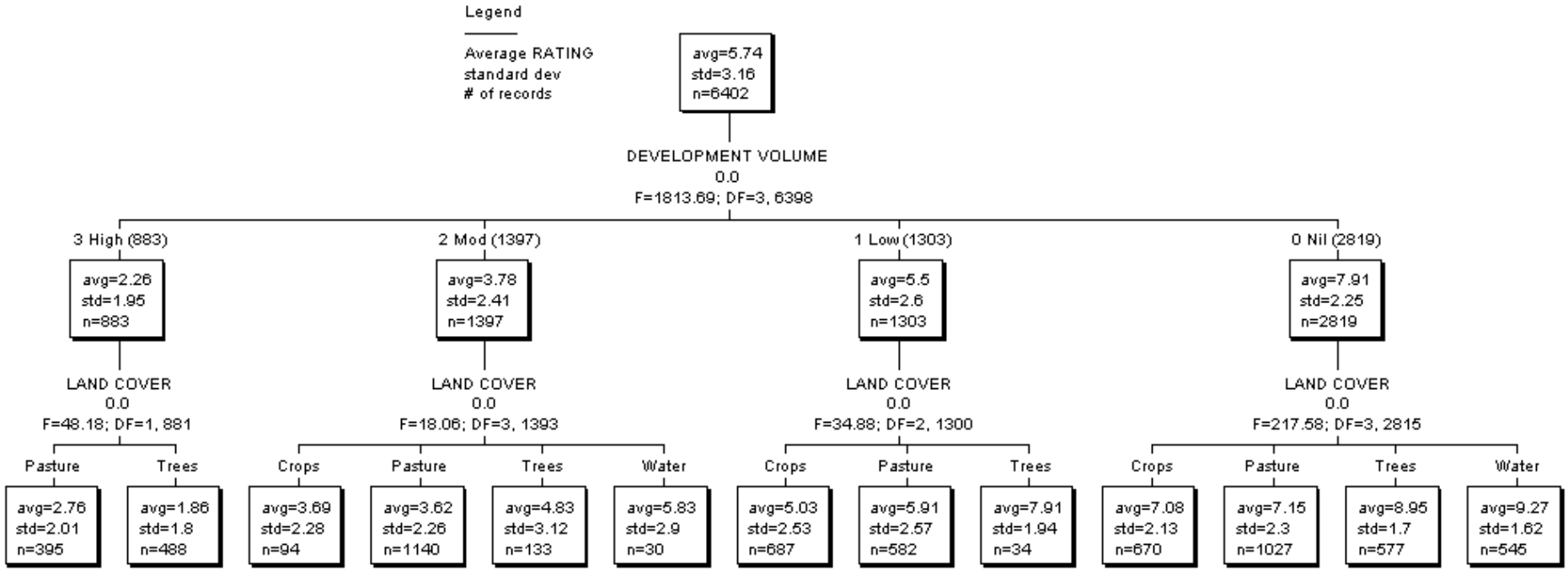
PhotoID	*Rating*	*Major topographic setting*	*Major land cover setting*	*Development type*	*Development sub-type*	*Development proportion*
AF12	9.9	Flat	Water	Nil		Nil
AF27	9.6	Flat	Water	Nil		Nil
AF23	9.6	Steep	Water	Nil		Nil
AA22	9.5	Flat	Trees	Transport	Track	Mod
AA07	9.4	Steep	Trees	Nil		Nil
AE33	9.4	Steep	Trees	Nil		Nil
AJ16	9.3	Flat	Water	Nil		Nil
AB06	9.3	Flat	Pasture	Nil		Nil
AA20	9.0	Steep	Trees	Nil		Nil
AE01	9.0	Steep	Trees	Nil		Nil
AE34	8.9	Steep	Trees	Nil		Nil
AA18	8.9	Steep	Trees	Nil		Nil
AA17	8.8	Steep	Trees	Nil		Nil
AA12	8.7	Flat	Pasture	Nil		Nil
AK06	8.3	Flat	Pasture	Nil		Nil
AJ14	8.3	Flat	Water	Nil		Nil
AE28	8.2	Steep	Pasture	Nil		Nil
AF13	7.9	Flat	Water	Nil		Nil
AE16	7.8	Flat	Trees	Electricity	Transmission cables	Low
AG04	7.8	Flat	Water	Nil		Nil
AC07	7.7	Flat	Pasture	Electricity	Transmission cables	Low
AD10	7.7	Steep	Trees	Nil		Nil
AE31	7.5	Steep	Pasture	Electricity	Transmission tower	Low
AH23	7.5	Steep	Crops	Nil		Nil
AB24A	7.4	Flat	Pasture	Buildings	Residential	Low
AB15	7.3	Flat	Pasture	Buildings	Residential	Low
AF02	7.3	Flat	Crops	Nil		Nil
AD21	7.2	Flat	Crops	Nil		Nil
AB12	7.1	Flat	Pasture	Buildings	Residential	Low
AB14	7.1	Steep	Pasture	Buildings	Residential	Low
AB16	7.0	Steep	Pasture	Buildings	Residential	Low
AC20	7.0	Flat	Crops	Nil		Nil
AH24	7.0	Steep	Crops	Nil		Nil
AB24	7.0	Flat	Pasture	Nil		Nil
AK14	7.0	Flat	Pasture	Nil		Nil
AD17	6.9	Flat	Crops	Buildings	Residential	Low
AF04C	6.9	Flat	Crops	Electricity	Transmission tower	Low
AF05	6.9	Flat	Crops	Electricity	Transmission tower	Low
AF18	6.9	Flat	Crops	Nil		Nil

PhotoID	*Rating*	*Major topographic setting*	*Major land cover setting*	*Development type*	*Development sub-type*	*Development proportion*
AG12	6.9	Flat	Crops	Nil		Nil
AF04	6.7	Flat	Crops	Electricity	Transmission tower	Low
AB13	6.6	Steep	Pasture	Buildings	Residential	Mod
AD15	6.6	Flat	Crops	Buildings	Residential	Low
AE27	6.5	Steep	Pasture	Nil		Nil
AG06	6.5	Flat	Water	Nil		Nil
AD16	6.4	Flat	Crops	Buildings	Residential	Low
AD06	6.4	Flat	Pasture	Nil		Nil
AC18	6.2	Flat	Pasture	Buildings	Residential	Low
AH05	6.2	Flat	Crops	Nil		Nil
AH16	6.1	Flat	Crops	Nil		Nil
AI14	6.1	Flat	Pasture	Nil		Nil
AF21	6.0	Flat	Crops	Nil		Nil
AF24	5.9	Steep	Water	Electricity	Transmission cables	Mod
AK05	5.8	Flat	Crops	Electricity	Wooden power pole	Low
AE08	5.7	Flat	Pasture	Electricity	Wooden power pole	Low
AE12	5.7	Flat	Pasture	Electricity	Transmission tower	Low
AC08	5.7	Flat	Pasture	Nil		Nil
AC10	5.7	Flat	Pasture	Transport	Railway	Low
AG13	5.6	Flat	Crops	Nil		Nil
AE24	5.5	Flat	Pasture	Electricity	Transmission tower	Low
AG10	5.5	Flat	Pasture	Nil		Nil
AD09	5.4	Flat	Pasture	Transport	Road and infrastructure	Mod
AG25	5.2	Flat	Pasture	Nil		Nil
AM18	5.1	Steep	Pasture	Buildings	Residential	Mod
AG21	5.1	Flat	Crops	Sign	Billboard	Low
AH21	5.0	Flat	Crops	Nil		Nil
AG09	5.0	Flat	Pasture	Nil		Nil
AF26	4.9	omitted				
AC09	4.8	Flat	Pasture	Buildings	Industrial / Commercial	Low
AH18	4.8	Flat	Crops	Electricity	Transmission tower	Low
AF11	4.8	Flat	Pasture	Sign	Billboard	Low
AM05	4.7	Flat	Crops	Electricity	Transmission tower	Mod
AH18C	4.6	Flat	Crops	Electricity	Transmission tower	Low
AI13	4.5	Flat	Pasture	Sign	Billboard	Low
AF09	4.4	Flat	Pasture	Buildings	Industrial / Commercial	Mod
AC17	4.4	Flat	Pasture	Buildings	Residential	Mod
AH12	4.4	Flat	Pasture	Transport	Embankment	Mod
AD07	4.2	Flat	Pasture	Buildings	Industrial /	Mod

PhotoID	*Rating*	*Major topographic setting*	*Major land cover setting*	*Development type*	*Development sub-type*	*Development proportion*
					Commercial	
AF30	4.2	Flat	Pasture	Buildings	Industrial / Commercial	Mod
AF10	4.2	Flat	Pasture	Buildings	Residential	Mod
AB08	4.0	Flat	Pasture	Buildings	Industrial / Commercial	Mod
AH11	4.0	Flat	Pasture	Transport	Road and infrastructure	Mod
AE22	3.9	Flat	Pasture	Electricity	Transmission tower	Mod
AE18	3.9	Flat	Trees	Electricity	Transmission tower	Mod
AK03	3.9	Flat	Crops	Electricity	Wooden power pole	Low
AJ08	3.9	Flat	Pasture	Transport	Embankment	Mod
AJ21	3.8	Flat	Trees	Electricity	Metal power pole	High
AD11	3.7	Flat	Pasture	Buildings	Industrial / Commercial	High
AH25	3.7	Flat	Pasture	Buildings	Industrial / Commercial	Mod
AE09	3.7	Flat	Pasture	Electricity	Transmission tower	Mod
AJ10	3.7	Flat	Pasture	Sign	Billboard	Low
AJ07	3.7	Flat	Pasture	Transport	Railway	Mod
AM01	3.6	Flat	Crops	Electricity	Transmission tower	Mod
AG19	3.6	Flat	Crops	Sign	Billboard	Low
AH11C	3.6	Flat	Pasture	Transport	Road and infrastructure	Mod
AE22C	3.5	Flat	Pasture	Electricity	Transmission tower	Mod
AI15	3.5	Flat	Pasture	Sign	Billboard	Mod
AH13	3.5	Flat	Pasture	Transport	Embankment	Mod
AE19	3.3	Flat	Trees	Electricity	Transmission tower	Mod
AI09	3.3	Flat	Pasture	Transport	Road and infrastructure	High
AF22	3.2	Steep	Trees	Electricity	Transmission tower	High
AE14	3.1	Flat	Pasture	Electricity	Transmission tower	High
AE09C	3.1	Flat	Pasture	Electricity	Transmission tower	Mod
AI01	3.0	Flat	Pasture	Buildings	Industrial / Commercial	High
AE37	2.9	Flat	Crops	Earth works	Refuse centre	Mod
AD03	2.9	Flat	Pasture	Electricity	Transmission tower	Mod
AE18C	2.9	Flat	Trees	Electricity	Transmission tower	Mod
AI12	2.7	Flat	Pasture	Buildings	Industrial /	High

PhotoID	*Rating*	*Major topographic setting*	*Major land cover setting*	*Development type*	*Development sub-type*	*Development proportion*
					Commercial	
AD02	2.6	Flat	Pasture	Transport	Road and infrastructure	Mod
AJ24	2.5	Flat	Trees	Electricity	Metal power pole	High
AI08	2.5	Flat	Pasture	Transport	Road and infrastructure	High
AI05	2.5	Flat	Pasture	Transport	Road and infrastructure	Mod
AK23	2.3	Flat	Pasture	Sign	Billboard	Low
AH14	2.3	Flat	Pasture	Transport	Road and infrastructure	Mod
AF36	2.3	omitted				
AE14C	2.2	Flat	Pasture	Electricity	Transmission tower	High
AA03	2.0	Steep	Trees	Earth works	Quarry	High
AJ09	1.9	Flat	Pasture	Electricity	Wooden power pole	High
AA04	1.5	Steep	Trees	Earth works	Quarry	High
AK18	1.5	Flat	Pasture	Electricity	Sub-station	High
AJ03	1.4	Flat	Trees	Earth works	Refuse centre	High

Appendix 10 Statistical model describing development impact on scenic preference



Appendix 11. Paired comparison of development impacts

Pair	Without development	With development	Major changes
1. AC18 AC17	 Photo AC18 Community rating: 6.2	 Photo AC17 Community rating: 4.4	Moderate volume Residential housing Pasture setting Rating decrease: 2.2 (33%)
2. AD06 AD07	 Photo AD06 Community rating: 6.4	 Photo AD07 Community rating: 4.2	Low volume Industrial / commer- cial buildings Pasture setting Rating decrease: 2.2 (34%)
3. AD16 AM01	 Photo AD16 Community rating: 6.4	 Photo AM01 Community rating: 3.6	Moderate volume Transmission Towers Crop setting Rating decrease: 2.8 (44%)
4. AD21 AM05	 Photo AD21 Community rating: 7.2	 Photo AM05 Community rating: 4.7	Moderate volume Transmission Towers Crop setting Rating decrease: 2.8 (35%)

Pair	Without development	With development	Major changes
5. AE08 AE09	 Photo AE08 Community rating: 5.7	 Photo AE09 Community rating: 3.7	Moderate volume Transmission Towers Pasture setting Rating decrease: 2.0 (35%)
6. AE16 AE18	 Photo AE16 Community rating: 7.8	 Photo AE18 Community rating: 3.9	Low volume Transmission Towers Forest setting Rating decrease: 3.9 (50%)
7. AI14 AI13	 Photo AI14 Community rating: 6.1	 Photo AI13 Community rating: 4.5	Low volume Billboards Pasture setting Rating decrease: 1.6 (26%)

Appendix 12. Effects of increased development volume

Pair	Base photo	Increased volume	Major changes
1. AE14	 Photo AE14 Community rating: 3.1	 Photo AE14C Community rating: 2.2	High volume Transmission Tower Pasture setting Rating decrease: 0.9 (29%)
2. AE22	 Photo AE22 Community rating: 3.9	 Photo AE22C Community rating: 3.5	Low volume Industrial / commercial buildings Pasture setting Rating decrease: 0.4 (10%)
3. AF04	 Photo AF04 Community rating: 6.7	 Photo AF04C Community rating: 6.9	Low volume Transmission Towers Crop setting Rating decrease: +0.2
4. AH11	 Photo AH11 Community rating: 4.0	 Photo AH11C Community rating: 3.6	Low volume Road and infrastructure Pasture setting Rating decrease: 0.4 (10%)

Appendix 12. Effects of increased development volume

Pair	Base photo	Increased volume	Major changes
1. AE14	 Photo AE14 Community rating: 3.1	 Photo AE14C Community rating: 2.2	High volume Transmission Tower Pasture setting Rating decrease: 0.9 (29%)
2. AE22	 Photo AE22 Community rating: 3.9	 Photo AE22C Community rating: 3.5	Low volume Industrial / commercial buildings Pasture setting Rating decrease: 0.4 (10%)
3. AF04	 Photo AF04 Community rating: 6.7	 Photo AF04C Community rating: 6.9	Low volume Transmission Towers Crop setting Rating decrease: +0.2
4. AH11	 Photo AH11 Community rating: 4.0	 Photo AH11C Community rating: 3.6	Low volume Road and infrastructure Pasture setting Rating decrease: 0.4 (10%)

Pair	Base photo	Increased volume	Major changes
5. AH18			Low volume Transmission Towers Crop setting
	Photo AH18 Community rating: 4.8	Photo AH18C Community rating: 4.6	Rating decrease: 0.2 (5%)

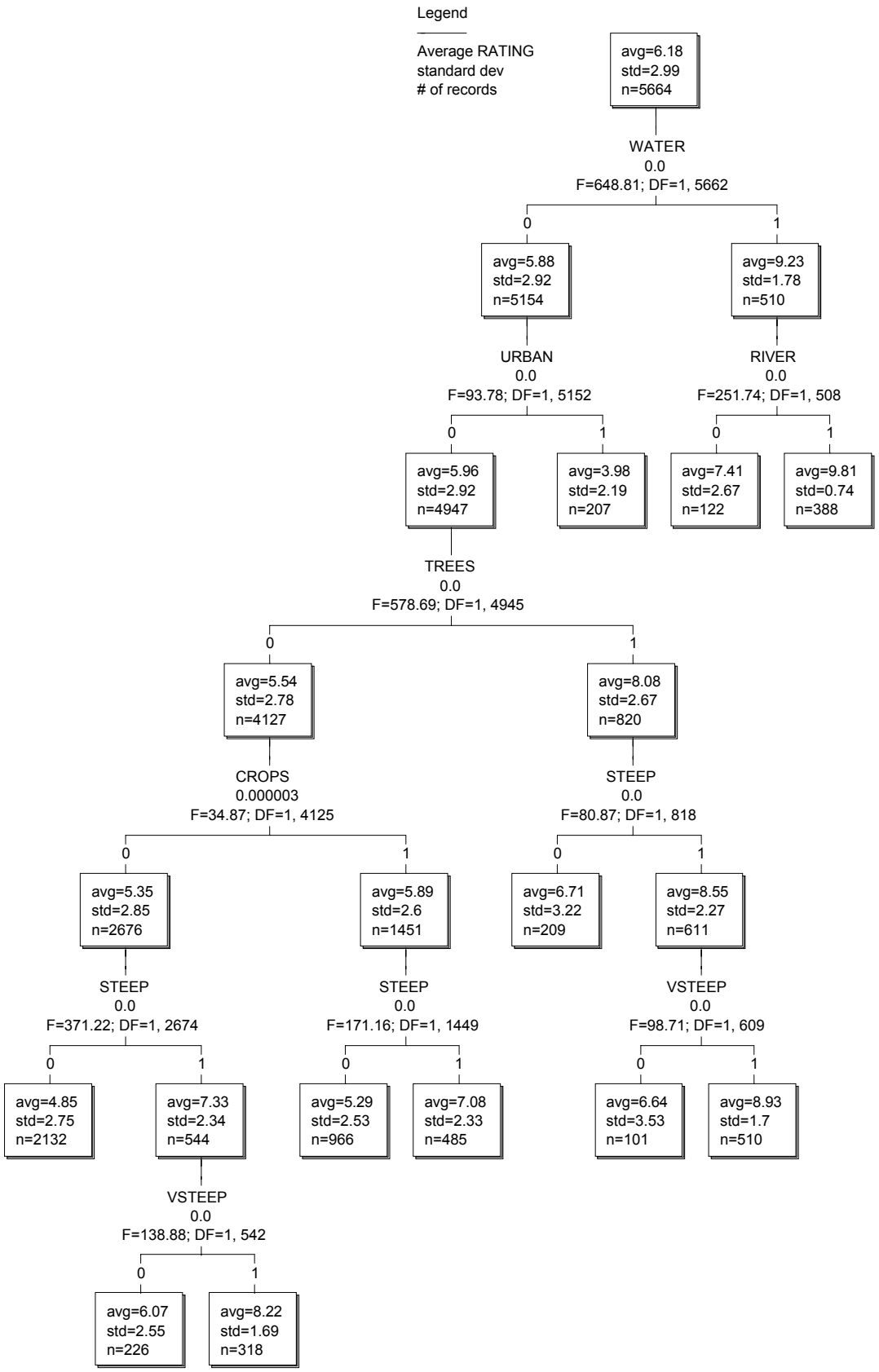
Appendix 13 Characteristics of photos related to mapping

	Estimated percent of photo by land cover (development excluded)							*Estimated percent of photo by steepness class*			
PhotoID	*Crops*	*Pasture*	*Trees*	*Urban*	*River*	*Dam*	*Water*	*Flat*	*Mod Steep*	*Very Steep*	*Steep (M+V)*
AA03	0	0	15	0	0	0	0	85	5	10	15
AA04	0	0	15	0	0	0	0	85	15	0	15
AA07	0	5	95	0	0	0	0	0	20	80	100
AA12	0	80	20	0	0	0	0	85	15	0	15
AA17	0	0	100	0	0	0	0	0	20	80	100
AA18	0	0	100	0	0	0	0	95	5	0	5
AA20	0	0	100	0	0	0	0	70	20	10	30
AA22	0	0	90	0	0	0	0	100	0	0	0
AB06	0	70	30	0	0	0	0	80	15	5	20
AB08	0	60	10	30	0	0	0	90	10	0	10
AB12	0	80	15	0	0	0	0	80	10	10	20
AB13	0	80	10	0	0	0	0	10	80	10	90
AB14	0	85	15	0	0	0	0	50	40	10	50
AB15	0	70	30	0	0	0	0	90	5	5	10
AB16	0	75	20	0	0	0	0	60	30	10	40
AB24	0	90	10	0	0	0	0	90	5	5	10
AB24A	0	85	15	0	0	0	0	80	10	10	20
AC07	0	60	40	0	0	0	0	100	0	0	0
AC08	0	90	10	0	0	0	0	100	0	0	0
AC09	0	85	10	0	0	0	0	100	0	0	0
AC10	0	85	15	0	0	0	0	100	0	0	0
AC17	0	65	20	15	0	0	0	100	0	0	0
AC18	0	95	5	0	0	0	0	100	0	0	0
AC20	60	30	10	0	0	0	0	95	5	0	5
AD02	0	75	15	0	0	0	0	100	0	0	0
AD03	0	70	10	0	0	0	0	100	0	0	0
AD06	0	80	20	0	0	0	0	80	20	0	20
AD07	0	80	10	0	0	0	0	80	20	0	20
AD09	0	70	15	0	0	0	0	90	0	10	10
AD10	0	0	100	0	0	0	0	0	100	0	100
AD11	0	70	15	0	0	0	0	100	0	0	0
AD15	65	20	10	5	0	0	0	90	0	10	10
AD16	70	15	15	0	0	0	0	80	0	20	20
AD17	70	15	15	0	0	0	0	80	20	0	20
AD21	85	5	10	0	0	0	0	85	15	0	15
AE01	0	0	100	0	0	0	0	10	30	60	90
AE08	0	70	25	0	0	0	0	70	20	10	30
AE09	0	60	25	0	0	0	0	60	30	10	40
AE09C	0	50	25	0	0	0	0	60	40	0	40
AE12	0	70	30	0	0	0	0	90	10	0	10
AE14	0	30	55	0	0	0	0	90	10	0	10
AE14C	0	25	40	0	0	0	0	80	20	0	20
AE16	0	20	80	0	0	0	0	100	0	0	0

	Estimated percent of photo by land cover (development excluded)							*Estimated percent of photo by steepness class*			
PhotoID	*Crops*	*Pasture*	*Trees*	*Urban*	*River*	*Dam*	*Water*	*Flat*	*Mod Steep*	*Very Steep*	*Steep (M+V)*
AE18	0	20	75	0	0	0	0	100	0	0	0
AE18C	0	50	40	0	0	0	0	100	0	0	0
AE19	0	50	40	0	0	0	0	100	0	0	0
AE22	0	80	15	0	0	0	0	100	0	0	0
AE22C	0	60	30	0	0	0	0	100	0	0	0
AE24	0	70	25	0	0	0	0	80	20	0	20
AE27	0	85	15	0	0	0	0	10	80	10	90
AE28	0	70	20	0	0	0	0	20	10	70	80
AE31	0	35	60	0	0	0	0	10	40	50	90
AE33	0	0	100	0	0	0	0	0	50	50	100
AE34	0	15	85	0	0	0	0	10	60	30	90
AE37	50	20	30	0	0	0	0	70	30	0	30
AF02	70	10	20	0	0	0	0	70	30	0	30
AF04	70	10	20	0	0	0	0	70	20	10	30
AF04C	60	20	15	0	0	0	0	60	20	20	40
AF05	70	0	30	0	0	0	0	70	10	20	30
AF09	0	20	60	20	0	0	0	100	0	0	0
AF10	0	75	15	10	0	0	0	100	0	0	0
AF11	0	55	40	0	0	0	0	100	0	0	0
AF12	0	5	25	0	70	0	70	95	5	0	5
AF13	0	0	0	0	0	0	0	0	0	0	0
AF18	85	0	15	0	0	0	0	90	10	0	10
AF21	90	0	10	0	0	0	0	95	5	0	5
AF22	0	15	65	0	0	0	0	0	100	0	100
AF23	0	5	65	0	0	30	30	50	50	0	50
AF24	0	5	75	0	0	20	20	10	90	0	90
AF26	0	0	0	0	0	0	0	0	0	0	0
AF27	0	10	75	0	15	0	15	85	15	0	15
AF30	0	90	5	0	0	0	0	100	0	0	0
AF36	0	0	10	0	0	0	0	100	0	0	0
AG04	0	70	15	0	0	15	15	90	10	0	10
AG06	0	70	5	0	0	25	25	90	5	5	10
AG09	0	95	5	0	0	0	0	95	5	0	5
AG10	0	95	5	0	0	0	0	95	5	0	5
AG12	50	40	5	0	0	0	0	95	5	0	5
AG13	60	20	20	0	0	0	0	100	0	0	0
AG19	35	55	5	0	0	0	0	95	5	0	5
AG21	35	50	10	0	0	0	0	95	5	0	5
AG25	5	75	20	0	0	0	0	95	5	0	5
AH05	20	75	5	0	0	0	0	95	5	0	5
AH11	0	85	10	0	0	0	0	100	0	0	0
AH11C	0	65	25	0	0	0	0	100	0	0	0
AH12	0	75	10	0	0	0	0	100	0	0	0
AH13	0	80	0	0	0	0	0	100	0	0	0
AH14	0	70	10	0	0	0	0	100	0	0	0
AH16	80	0	20	0	0	0	0	80	20	0	20

	Estimated percent of photo by land cover (development excluded)							*Estimated percent of photo by steepness class*			
PhotoID	*Crops*	*Pasture*	*Trees*	*Urban*	*River*	*Dam*	*Water*	*Flat*	*Mod Steep*	*Very Steep*	*Steep (M+V)*
AH18	50	40	5	0	0	0	0	95	5	0	5
AH18C	65	15	10	0	0	0	0	100	0	0	0
AH21	75	20	5	0	0	0	0	80	20	0	20
AH23	75	10	15	0	0	0	0	80	15	5	20
AH24	50	10	40	0	0	0	0	60	30	10	40
AH25	0	75	10	15	0	0	0	90	10	0	10
AI01	0	75	5	20	0	0	0	100	0	0	0
AI05	0	75	5	0	0	0	0	100	0	0	0
AI08	0	30	10	0	0	0	0	100	0	0	0
AI09	0	40	5	0	0	0	0	90	95	5	100
AI12	0	30	10	0	0	0	0	90	10	0	10
AI13	0	75	20	0	0	0	0	90	10	0	10
AI14	0	80	20	0	0	0	0	100	0	0	0
AI15	0	75	15	0	0	0	0	100	0	0	0
AJ03	0	0	70	0	0	0	0	100	0	0	0
AJ07	0	50	30	0	0	0	0	90	10	0	10
AJ08	0	60	25	0	0	0	0	90	10	0	10
AJ09	0	80	10	0	0	0	0	100	0	0	0
AJ10	0	70	25	0	0	0	0	100	0	0	0
AJ14	0	10	85	0	5	0	5	100	0	0	0
AJ16	0	0	70	0	30	0	30	100	0	0	0
AJ21	0	40	30	0	0	0	0	100	0	0	0
AJ24	0	30	30	0	0	0	0	100	0	0	0
AK03	55	30	5	0	0	0	0	95	5	0	5
AK05	55	25	15	0	0	0	0	100	0	0	0
AK06	0	50	50	0	0	0	0	100	0	0	0
AK14	0	95	5	0	0	0	0	100	0	0	0
AK18	0	20	5	0	0	0	0	100	0	0	0
AK23	0	75	10	0	0	0	0	100	0	0	0
AM01	65	15	10	0	0	0	0	85	15	0	15
AM05	65	15	10	0	0	0	0	80	20	0	20
AM18	0	75	15	0	0	0	0	20	70	10	80

Appendix 14 Statistical model for mapping scenic preference



Appendix 15 Viewing locations used to map visual exposure

15.1 Roads

Location Category / Description		Standard Viewing Duration (minutes)
Highways		
HV	Major hwy v high tourism & leisure	0.02
HH	Major hwy high tourism & leisure	0.02
HM	Major hwy mod tourism & leisure	0.01
HL	Major hwy low tourism & leisure	0.01
HY	Highway v low tourism & leisure	0.01
Major roads		
MV	Major road v high tourism & leisure	0.03
MH	Major road high tourism & leisure	0.02
MM	Major road mod tourism & leisure	0.02
ML	Major road low tourism & leisure	0.02
MR	Major road / Inter-community link	0.01
Other tourist and leisure roads		
TV	Other road with v high tourism & leisure	0.03

15.2 Paths

Location Category / Description		Standard Viewing Duration (minutes)
BC	Bicycle Path (commuter)	0.13
BR	Bicycle Path (recreational)	0.21
HW	Heritage Trail (walking)	0.84
PW	Pedestrian Walkway (urban)	0.43

15.3 Trails

Location Category / Description		Standard Viewing Duration (minutes)
TB	Trail - bush walking	1.28
TM	Trail - multi use	0.26

15.4 Railways

Location Category / Description		Standard Viewing Duration (minutes)
RC	Railway commuter	0.02
RT	Railway tourist	0.04

15.5 Waterways

Location Category / Description		Standard Viewing Duration (minutes)

Location Category / Description		Standard Viewing Duration (minutes)
FC	Ferry commuter	0.10
FT	Ferry tourist	0.20
RA	River - fully accessible	0.17
RM	River - motorised & non motorised use	0.24
RN	River - non-motorised use only	1.10

15.6 Parks

Location Category / Description		Standard Viewing Duration (minutes)
Bushland parks		
BP	Bushland park general	2.65
CA	Bush camping area	2.90
PB	Picnic spot - bush	2.75
Urban parks and sport areas		
ES	Equestrian sports	0.75
GC	Golf course	2.00
PG	Playground	1.25
PU	Picnic spot - urban park	2.75
SA	Special activity park	2.50
SF	Sporting fields/courts (participants)	0.25
SP	Swimming pool	0.25
SV	Sporting venue (spectators)	0.75
UP	Urban park general	1.95
Waterside Parks		
WL	Waterside - limited facilities	2.75
WP	Waterside - picnic facilities	2.75
WR	Waterside - boating/recreation facilities	1.40
SH	Swimming hole	2.00

15.7 Community facilities

Location Category / Description		Standard Viewing Duration (minutes)
CC	Pre School, Kindergarten	0.95
CH	Churches	2.25
CE	Cemeteries	2.25
CS	Combined pre-primary school	0.95
HA	Community hall	2.00
HE	University, TAFE	0.75
HS	High School	0.95
LI	Library	2.00
PS	Primary School	0.95
SS	Special School	0.95

15.8 Tourist facilities

Location Category / Description	Standard Viewing Duration (minutes)

Location Category / Description		Standard Viewing Duration (minutes)
FL	Formal lookouts	4.25
IF	Informal lookouts	4.25
OA	Other tourist attractions	0.75
TA	Tourist accommodation (urban)	0.75
TR	Tourist accommodation (rural)	1.75

Appendix 16 Community field assessment of mapping

The following tables indicate four different comparisons:

A. Field vista assessment of scenic preference V results from interviews with photographs
B. Field point estimate of scenic preference V mapped scenic preference
C. Field point estimate of visual exposure V mapped visual exposure
D. Field point estimate of scenic amenity V mapped scenic amenity

A. Field vista assessment of scenic preference V interviews with photographs						**Field estimate of "vista" scenic preference**								**Interviews with photos**		
Site	***Point***	***location***	***subject***	***development***	***photoID***	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**ave**	**ave**	**difference**	**photoID**
1	1-N	Zische's shed	crops	pole & shed	AL05	5	4	5	4	6	4	6	4.9			
	1-S		crops	nil	AL03	4	5	7	6	7	5	8	6.0	5.0	1.0	AH21
	1-W		crops	nil	AL06	6	4	5	6	7	6	3	5.3			
2	2-N	Murphy's ck	flat pasture	small t-tower	AL08	2	2	3	3	3	5	2	**2.9**	5.7	**-2.8**	AE12
	2-W		flat pasture	shed railway	AL09	2	2	3	4	2	2	1	**2.3**			
	2-E		flat pasture	nil	AL10	4	6	4	6	4	3	5	4.6			
3	3-N	back of Tabletop	steep pasture	nil	AL11	5	5	8	5	5	4	6	5.4	6.5	-1.1	AE27
	3-W		steep pasture	nil	AL12	4	7	8	6	6	8	7	6.6	8.2	-1.6	AE28
	3-E		trees	nil	AL13	3	5	8	4	2	2	4	4.0			
4	4-S	Silver Pinch	steep trees	nil	AL14	5	4	9	6	7	5	7	6.1	9.4	**-3.3**	AE33
	4-N		steep pasture	small t-tower	AL15	6	4	9	6	8	7	5	6.4	7.5	-1.1	AE31
	4-W		trees	nil	AL16	5	4	4	4	6	7	5	5.0			
5	5-N	Windee	steep pasture	nil	AL17	9	8	9	8	9	9	8	8.6			
	5-W		steep pasture	small t-tower	AL18	7	-	9	-	-	7	7	7.5			
6	6-S	Seemore Park	pasture	nil	AL19	6	7	8	7	7	6	8	7.0			
	6-E	Upper Tenthill	trees & pasture	nil	AL20	8	8	8	7	8	7	7	7.6			
	6-SE		pasture	t-tower	AL21	7	4	8	4	8	8	6	6.4			
7	7-NW	Cape Horn	crops	nil	AN02	9	9	9	9	9	9	8	**8.9**	7.5	1.4	AH23
	7-N	Caffey's	crops	nil	AN01	8	9	9	7	8	6	8	7.9	7.0	0.9	AH24
	7-W		crops trees	nil	AN03	7	9	9	9	7	7	8	8.0			
8	8-NE	Jackwitz	trees & pasture	nil	AN05	9	8	8	8	9	8	9	**8.4**			
	8-W	view to Forest Hill	pasture	nil	AN06	5	5	7	5	8	6	7	6.1			
	8-S		trees & pasture	nil	AN07	5	8	8	8	8	6	7	7.1			
9	9-E	Schultz's	trees & pasture	t-corridor	AN08	7	5	8	5	8	4	6	6.1			
	9-SE	lookout	crops hills	nil	AN09	7	9	8	9	8	7	8	8.0			
10	10-NW	Laidley Ck w	crops	nil	AN10	-	5	-	5	8	5	7	6.0			AD21
	10-W		trees & hills	nil	AN11	7	8	8	-	7	7	6	7.2	7.2	0.0	
11	11-S	Thornton	pasture & hills	nil	AN12	-	7	8	-	7	4	6	6.4			
	11-E		pasture & hills	nil	AN13	7	8	8	8	7	8	8	7.7			
					Ave	6	6	7	7	5	7	8	6.6			

B. Field point estimate of scenic preference V mapped scenic preference						***field estimate of scenic preference (point)***								***map***	
site	***Point***	***location***	***Subject***	***development***	***photoID***	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**ave**	***map***	***difference***
1	1-N	Zische's shed	crops	pole & shed	AL05	7	6	4	6	8	8	6	6.4	5.0	1.4
	1-S		crops	nil	AL03	4	6	4	6	6	3	8	5.3	5.0	0.3
	1-W		crops	nil	AL06	5	6	4	6	8	8	3	5.7	5.0	0.7
2	2-N	Murphy's ck	flat pasture	small t-tower	AL08	6	1	6	3	3	6	2	3.9	7.0	-3.1
	2-W		flat pasture	shed railway	AL09	1	2	4	1	2	1	1	***1.7***	7.0	***-5.3***
	2-E		flat pasture	nil	AL10	6	7	4	7	2	3	5	4.9	5.0	-0.1
3	3-N	back of Tabletop	steep pasture	nil	AL11	5	5	8	4	6	4	6	5.4	6.0	-0.6
	3-W		steep pasture	nil	AL12	4	7	8	4	6	7	7	6.1	9.0	-2.9
	3-E		trees	nil	AL13	3	5	8	5	1	3	4	4.1	6.0	-1.9
4	4-S	Silver Pinch	steep trees	nil	AL14	2	8	3	8	3	5	7	5.1	***9.0***	***-3.9***
	4-N		steep pasture	small t-tower	AL15	3	8	5	8	3	3	5	5.0	7.0	-2.0
	4-W		trees	nil	AL16	2	8	4	8	2		5	4.8	7.0	-2.2
5	5-N	Windee	steep pasture	nil	AL17	3	7	8	6	8	2	8	6.0	6.0	0.0
	5-W		steep pasture	small t-tower	AL18	2		8			6	7	5.8	7.0	-1.3
6	6-S	Seemore Park	pasture	nil	AL19	3	5	8	6	7	4	8	5.9	6.0	-0.1
	6-E	Upper Tenthill	trees & pasture	nil	AL20	3	4	8	4	6	2	7	4.9	5.0	-0.1
	6-SE		pasture	t-tower	AL21	3	1	8	1	7	1	6	***3.9***	5.0	-1.1
7	7-NW	Cape Horn	crops	nil	AN02	7	9	9	8	8	8	8	***8.1***	5.0	***3.1***
	7-N	Caffey's	crops	nil	AN01	9	9	9	8	8	7	8	***8.3***	5.0	***3.3***
	7-W		crops trees	nil	AN03	7	7	9	7	6	8	8	7.4	5.0	2.4
8	8-NE	Jackwitz	trees & pasture	nil	AN05	7	6	7	6	7	6	9	6.9	5.0	1.9
	8-W	view to Forest Hill	pasture	nil	AN06	3	5	6	5	5	5	7	5.1	5.0	0.1
	8-S		trees & pasture	nil	AN07		4	6	4	4	5	7	5.0	5.0	0.0
9	9-E	Schultz's	trees & pasture	t-corridor	AN08	3	5	7	5	3	2	6	4.4	5.0	-0.6
	9-SE	lookout	crops hills	nil	AN09	3	5	7	4	3	3	8	4.7	5.0	-0.3
10	10-NW	Laidley Ck w	crops	nil	AN10	6	7	8		5	7	6	6.5	5.0	1.5
	10-W		trees & hills	nil	AN11		6	6		2	5	6	5.0	5.0	0.0
11	11-S	Thornton	pasture & hills	nil	AN12	7	7	8	8	3		8	6.8	5.0	1.8
	11-E		pasture & hills	nil	AN13	6	4	7	6	2		8	5.5	7.0	-1.5
					Ave	4.4	5.7	6.6	5.5	4.7	4.7	6.4	5.5	5.8	-0.3

C. Field point estimate of visual exposure V mapped visual exposure							***field estimate of visual exposure (point)***								***map***	
site	***Point***	***location***	***bearing***	***subject***	***development***	***photoID***	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**ave**	***map***	***difference***
1	1-N	Zische's shed	N	crops	pole & shed	AL05	8	5	6	4	4	10	8	6.4	9.0	-2.6
	1-S		S	crops	nil	AL03	3	9	6	8	5	9	8	6.9	8.0	-1.1
	1-W		W	crops	nil	AL06	1	9	6	6	5	9	3	5.6	8.0	-2.4
2	2-N	Murphy's ck	N	flat pasture	small t-tower	AL08	5	1	6	6	2	2	5	3.9	4.0	-0.1
	2-W		W	flat pasture	shed railway	AL09	1	6	4	6	2		6	4.2	6.0	-1.8
	2-E		E	flat pasture	nil	AL10	4	5	4	6	3	5	5	4.6	4.0	0.6
3	3-N	back of Tabletop	N	steep pasture	nil	AL11	8	8	6	7	5	7	6	6.7	7.0	-0.3
	3-W		W	steep pasture	nil	AL12	8	8	2	8	6	6	7	6.4	10.0	-3.6
	3-E		E	trees	nil	AL13	5	8	2	8	6	6	6	5.9	8.0	-2.1
4	4-S	Silver Pinch	S	steep trees	nil	AL14	1	5	3	4	5	1	2	***3.0***	6.0	-3.0
	4-N		N	steep pasture	small t-tower	AL15	1	6	3	6	4	2	2	3.4	3.0	0.4
	4-W		W	trees	nil	AL16	1	6	4	6	4		2	3.8	5.0	-1.2
5	5-N	Windee	N	steep pasture	nil	AL17	3	5	8	5	8	1	2	4.6	7.0	-2.4
	5-W		W	steep pasture	small t-tower	AL18	3		4			2	2	***2.8***	8.0	***-5.3***
6	6-S	Seemore Park	S	pasture	nil	AL19	4	5	4	7	7	5	4	5.1	10.0	-4.9
	6-E	Upper Tenthill	E	trees & pasture	nil	AL20	5	7	4	7	5	5	4	5.3	7.0	-1.7
	6-SE		SE	pasture	t-tower	AL21	4	5	4	7	5	1	4	4.3	9.0	-4.7
7	7-NW	Cape Horn	NW	crops	nil	AN02	7	8	9	7	8	6	5	***7.1***	7.0	0.1
	7-N	Caffey's	N	crops	nil	AN01	7	8	9	8	8	6	5	***7.3***	7.0	0.3
	7-W		W	crops trees	nil	AN03	7	7	7	8	7	6	5	6.7	7.0	-0.3
8	8-NE	Jackwitz	NE	trees & pasture	nil	AN05	2	5	4	5	5	4	4	4.1	10.0	***-5.9***
	8-W	view to Forest Hill	W	pasture	nil	AN06	2	4	4	4	4	4	4	3.7	6.0	-2.3
	8-S		S	trees & pasture	nil	AN07		5	6	5	4	4	4	4.7	9.0	-4.3
9	9-E	Schultz's	E	trees & pasture	t-corridor	AN08	8	4	5	5	4	7	7	5.7	6.0	-0.3
	9-SE	lookout	SE	crops hills	nil	AN09	8	4	5	3	4	3	7	4.9	6.0	-1.1
10	10-NW	Laidley Ck w	NW	crops	nil	AN10	5	5	6		5	5	4	5.0	8.0	-3.0
	10-W		W	trees & hills	nil	AN11		6	6		3	5	4	4.8	7.0	-2.2
11	11-S	Thornton	S	pasture & hills	nil	AN12	6	7	7	5	4		7	6.0	5.0	1.0
	11-E		E	pasture & hills	nil	AN13	7	6	7	7	3		7	6.2	7.0	-0.8
						Ave	4.6	6.0	5.2	6.1	4.8	4.8	4.9	5.2	7.1	-1.9

D. Field point estimate of scenic amenity V mapped visual exposure							***field estimate of scenic amenity (point)***								***map***	
site	***Point***	***location***	***bearing***	***subject***	***development***	***photoID***	**A**	**B**	**C**	**D**	**E**	**F**	**G ***	**ave**	***map***	***difference***
1	1-N	Zische's shed	N	crops	pole & shed	AL05	7	9	4	6	6	9	8	7.0	6.0	1.0
	1-S		S	crops	nil	AL03	4	6	4	7	6	2	7	5.1	6.0	-0.9
	1-W		W	crops	nil	AL06	4	8	4	6	6	9	3	5.7	6.0	-0.3
2	2-N	Murphy's ck	N	flat pasture	small t-tower	AL08	6	1	6	3	2	5	2	3.6	7.0	-3.4
	2-W		W	flat pasture	shed railway	AL09	1	4	4	1	1		1	***2.0***	6.0	***-4.0***
	2-E		E	flat pasture	nil	AL10	5	4	4	6	1	3	5	4.0	5.0	-1.0
3	3-N	back of Tabletop	N	steep pasture	nil	AL11	7	5	6	5	3	5	6	5.3	7.0	-1.7
	3-W		W	steep pasture	nil	AL12	4	8	7	6	3	7	7	6.0	10.0	***-4.0***
	3-E		E	trees	nil	AL13	4	5	7	5	1	3	4	4.1	7.0	-2.9
4	4-S	Silver Pinch	S	steep trees	nil	AL14	1	8	3	6	3	3	7	4.4	9.0	-4.6
	4-N		N	steep pasture	small t-tower	AL15	2	7	3	7	2		5	4.3	6.0	-1.7
	4-W		W	trees	nil	AL16	1	5	4	5	1		5	3.5	7.0	-3.5
5	5-N	Windee	N	steep pasture	nil	AL17		6	8	6	8		8	***7.2***	7.0	0.2
	5-W		W	steep pasture	small t-tower	AL18			4				7	5.5	8.0	-2.5
6	6-S	Seemore Park	S	pasture	nil	AL19	3	5	4	6	5		8	5.2	8.0	-2.8
	6-E	Upper Tenthill	E	trees & pasture	nil	AL20	3	4	4	4	4		7	4.3	6.0	-1.7
	6-SE		SE	pasture	t-tower	AL21	3	1	4	2	4		6	***3.3***	6.0	-2.7
7	7-NW	Cape Horn	NW	crops	nil	AN02	7	9	9	8	6	8	8	***7.9***	6.0	***1.9***
	7-N	Caffey's	N	crops	nil	AN01	8	7	9	8	6	7	8	7.6	6.0	***1.6***
	7-W		W	crops trees	nil	AN03	7	7	7	7	5	8	8	7.0	6.0	1.0
8	8-NE	Jackwitz	NE	trees & pasture	nil	AN05	4	6	4	6	5		9	5.7	6.0	-0.3
	8-W	view to Forest Hill	W	pasture	nil	AN06	2	5	4	4	4		7	4.3	6.0	-1.7
	8-S		S	trees & pasture	nil	AN07		6	6	5	3		7	5.4	6.0	-0.6
9	9-E	Schultz's	E	trees & pasture	t-corridor	AN08	5	5	5	5	4		6	5.0	6.0	-1.0
	9-SE	lookout	SE	crops hills	nil	AN09	5	5	5	4	4		7	5.0	7.0	-2.0
	9-N		N					5		5	4		8	5.5	6.0	-0.5
10	10-NW	Laidley Ck w	NW	crops	nil	AN10	5	8	6		3	7	6	5.8	6.0	-0.2
	10-W		W	trees & hills	nil	AN11		6	6		2	5	6	5.0	6.0	-1.0
11	11-S	Thornton	S	pasture & hills	nil	AN12	6	7	7	6	3		8	6.2	5.0	1.2
	11-E		E	pasture & hills	nil	AN13	6	7	3	7	2		8	5.5	6.0	-0.5
						Ave	4.4	5.8	5.2	5.4	3.7	5.8	6.4	5.2	6.5	-1.3

Appendix 17 Proposed guidelines for evaluating visual impacts

17.1 Introduction

These guidelines outline general procedures for on-site assessment and general reduction and reporting of visual impacts.

17.2 Scope of these guidelines

These guidelines are intended to apply to all new developments on all land tenures. Government bodies with different jurisdictions and responsibilities are encouraged to develop or refine the technical or procedural elements of these guidelines to simultaneously reflect the cross-tenure coordination functions of the integrated planning act and other specific requirements of other legislation and policy.

17.3 Assessing impact of proposed developments

17.3.1 Assessing possible impact on scenic preference

The effect of proposed developments would ideally be evaluated using a "scenic preference photo model" that would indicate the percentage reduction of scenic preference from a series of photographs depicting the development within the surrounding landscape.

An interim approach to evaluation and recommendation of possible impacts will entail:

- Assess the mapped scenic amenity rating (1-10) for the proposed development site.
- Undertake a site assessment to verify the basic land cover type (eg. crop, forest, pasture) and topography (flat, steep) and visual exposure to confirm or refine the mapped scenic amenity class.
- Determine the appropriate management objectives for this scenic amenity class.
- Identifying important viewing locations. It is necessary to identify the lines of sight from all major locations that view the landscape where the structure may be located.
- Acquire photos of the development site from the most frequently used viewing locations.
- Sketching the development on the photos, including landscaping.
- Evaluate the proportion of the photo (low, moderate, high) where development would be evident.
- Refer to photos and tables in this report to evaluate approximate reduction in scenic preference or visual exposure.
- Provide assessment advice to development approvals officer indicating approximate reduction of scenic amenity that would result from proposed development.
- Provide advice on methods that would reduce visual impacts.

17.4 Options for reducing impacts

17.4.1 Modifying location and volume of evident development

The most effective mechanism to reduce the volume of evident development is to locate the development to reduce the apparent size of the infrastructure from important viewing locations.

This may entail either:

- Increasing the distance between the development and important viewing locations.

- Locating the structure in a topographic location that is partly hidden from important viewing locations.
- Reducing the height and width of the structure which presents to the viewing locations.

17.4.2 Altering the colours to make it less obtrusive

Where movement of the structure is only partly possible, it is desirable to reduce the colour contrast of the structure and the main background seen from viewing locations.

The main requirement is to firstly assess the dominant colours of the surrounding landscape that will be seen as the main background to the structure from the principal viewing location. It may be best to take a photo of the landscape from this location so that this colour can be assessed against the possible colours of the structure.

The most important objective is to ensure the colours have a low difference in luminosity or brightness (ie. use dark colours for development if background is generally dark).

Secondly, colours should be compatible where possible (ie. occupy adjacent locations on a colour wheel) (eg. if background is green, use colours which have green, grey, or blue).

It is possible to gain assistance from the EPA or a landscape consultant to select colours that have low colour contrast and luminosity difference.

17.4.3 Use of screening trees and vegetation

Trees and other vegetation can be used to reduce the volume of evident structure, and decrease the colour contrast against the background. Species should be chosen that are of adequate height and density to screen the development within the shortest period of time. Trees should be selected to meet visual mitigation objectives and other objectives wherever possible (eg. biodiversity, shade, low risk to drainage pipes, low fire risk).

It is preferable to use existing vegetation to screen the structures rather than plant new trees because of the time involve in waiting for growth of the new trees. It is preferable to supplement existing remnant trees where possible.

Care should also be taken to ensure that maximum efficiency is gained in careful placement of trees. It may be that trees can be most effectively planted part way between the viewing location and the structure, rather than immediately adjacent.

Tree planting schemes should be accompanied by a watering and maintenance plan.

17.4.4 Choice of appropriate architectural style

In addition to choice of colours that are complimentary to the surrounding landscape, it is possible to minimise impacts through choice of a design that is in keeping with the rural or bushland character and the cultural heritage of the district. Good design elements can be incorporated into even functional structures at minimal cost.

17.5 Context specific suggestions for different landscapes

17.5.1 Forests

Steep forests provide many opportunities to ‘hide’ the development in depressions away from major viewing locations or use existing trees to screen the development.

A buffer of 50 m to 200m of existing native vegetation is often required to effectively completely a highly contrasted development.

Under-plantings of compatible and dense canopy species can reduce the width of the required buffer.

17.5.2 Crop lands

Crop lands are difficult environments to mitigate visual impacts because of the open landscape and low abundance of existing trees. Careful placement of structures and some screen planting can be effective in reducing the impact of the development.

17.5.3 Pastures

Pastures are also challenging but may have more undulations to locate the structure. Trees or regrowth is more common in these landscapes.

17.5.4 Waterways

Water provides a major distraction to any development but care must be taken to ensure the structure does not detract from peoples experience of the water body. This can be achieved by sensible location and screening.

17.6 Other considerations

17.6.1 Ensuring views to areas of high visual exposure are maintained.

Any development proposal should also recognise the views that may be lost by building the structures or mitigation trees in the landscape. For example, it may be possible to move a structure to allow road users to still view mountains in the background. This requirement may be greater than the need to mitigate the impact of the structure itself.

Appendix 18 Letter from community representatives

11 July 2002

From: Greg Diete and Jenny Rushbrook,
Community Representatives,
Lockyer Scenic Amenity Study Steering Committee.

To: Robert Preston,
Director,
Forest Images.

All individuals and groups involved with the Lockyer Scenic Amenity Study Community Consultation Committee are very appreciative of the opportunity for community input to this project, and recognise the potential value of formulating a structured method for measurement of scenic amenity, once the project is completed.

The methodology should then be suitable for adoption by state government departments, local governments, industry, and business, in planning safeguards for our Valley landscapes for future generations.

The Lockyer Valley is a unique and complex blend of inter-related and interdependent factors, dynamically evolving to meet the challenges to its varied population, industries, and landscapes. All community groups recognise the need for correct data to enable correct decision making, and that decisions affecting individual livelihoods also impact on our community livelihood.

The Consultants for the Lockyer Scenic Amenity Study are commended for the breadth and depth of the Draft Report, and the Community Consultation Committee accepts the Report, and asks that this Response be Attached to the Report, with these following notes:

- The CCC agrees that a minimum six week period for further public consultation on the Report will be adequate.
- A Memorandum Of Understanding must be established between any funding source and Councils, to eliminate the possibility - or perceptions of the possibility - of 'strings attaching' to use of such funds.
- While Map 3, Land Cover, remains contentious in relation to the accuracy of the SLATS data, and the agreed difficulty in ability to differentiate between the percentage of true forest, regrowth forest, and lantana cover, by satellite imagery, the default use of this mapping is accepted.
- Some individuals and groups express concern in relation to possible negative implications in the identification of 'remote' or 'invisible' areas in the Valley, as these areas are currently used for ecotourism and recreation.
- It is considered essential that any future study continue to assess the area of the Lockyer as a whole, and not as separate sections or cells.

Concern is expressed regarding the need to safeguard the Valley's beauty, tourist attraction, and liveability - including prime agricultural land - with the possible connection of electric train services to the Lockyer and the Range, in the foreseeable future. This will bring more commuter residents to the Valley, as a 'dormitory suburb' of Greater Brisbane.

As Lockyer residents, we all have a marvellous and diverse area - dormitory suburb or tourism 'product' - that we present to residents and visitors in the touring public, and this Study is helpful in identifying areas in which the respective Valley Councils, small businesses, and community groups will now work to 'value add'.

All community groups agree that establishing a Scenic Amenity Implementation Group, including the current Community Representatives from the existing Steering Committee of the Community Consultative group, has merit.

The choice of the Gatton Campus of the University of Queensland, for the launch of the project is also welcomed.

Sincerely,
Greg Diete,
Jenny Rushbrook.