

What should I do with my property?

A land use planning guide to help Lockyer Catchment landholders identify the best land uses and land management practices for their properties



For use with the:
Futureprofit Property Management Planning Program
or the:
Living in the Lockyer Property Management Planning Kit

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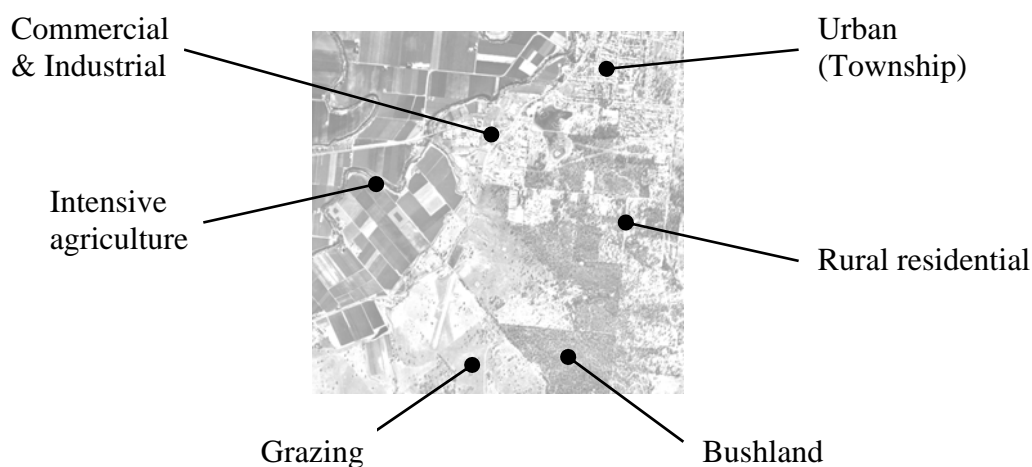
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Cover picture

The cover picture shows a ‘snapshot’ of some land uses in and around the Lockyer Catchment:



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Introduction

How can we care for our land?

Integrated Catchment Management (ICM) is a coordinated and cooperative approach to the management of natural resources in Queensland. The purpose of ICM is to integrate the management of land, water, vegetation and wildlife to achieve their sustainable and balanced use within a creek or river catchment. The catchment management approach is used throughout Australia and in many countries of the world to assist in effectively managing natural resources.

The Lockyer Catchment Association (LCA) manages ICM in the Lockyer Catchment. The LCA is fostering a cooperative partnership where the community and all levels of government are working together to sustainably manage the natural resources of the catchment through coordinated action. The LCA works through goodwill and influence only - it has no power to set regulations or legislation.

The Lockyer Catchment community is very proud of its rural lifestyle and the beauty of the catchment. Most people would not like to see the catchment developed in such a way that would degrade its natural resources, affect its viable agricultural industries or spoil its natural beauty. Most would like to see the catchment continue to prosper and develop in an orderly and sensitive way. The Lockyer Catchment community has decided that it is working together towards a common vision...

...to achieve and maintain a catchment which is environmentally sound, beautiful, prosperous and a good place to live, farm, work and play.

From extensive research and community consultation, the Lockyer Catchment Association (LCA) has prepared the *Land Use Planning Handbook for the Lockyer Catchment*. The handbook assists the Lockyer Catchment community to realise its vision by encouraging:

- Maintenance of sustainable cropping and grazing industries.
- Controlled and planned population growth and well managed housing, industrial, tourism, mining, extractive industry and recreation development.
- Planned, responsible and sustainable use of land, water, vegetation and other natural resources in the catchment.
- Maintenance of a healthy natural environment within the catchment.
- Responsible domestic, agricultural and industrial waste management.
- Maintenance and where appropriate improvement in water quality and efficient water use.
- Land used according to its suitability for specific uses where feasible.
- Responsible decision making on the development and implementation of renewed water use options in the catchment.
- Sound investment decisions by government and other stakeholders in salinity and other water quality relevant activities in the catchment.

The Lockyer Catchment community is very proud of its rural lifestyle and the beauty of the catchment

The handbook sets up three action processes to achieve these aims. The action processes are

1. Property management planning on individual properties.
2. Local government planning schemes and planning policies.
3. Agency and community actions.

The actions for ‘property management planning on individual properties’ have been reproduced in this Technical Note. By using these actions to prepare a property management plan, you will be able to determine the best land uses and land management practices for your property.

The management of natural resources is best achieved through the informed actions of individual landholders

How to use this Technical Note

Step 1 Read the remainder of the *Introduction* section (this section). This will give you:

- An overview of land use in the Lockyer Catchment.
- An introduction to the six ‘Lockyer land systems’. Each Lockyer land system has a characteristic pattern of landform, soils and vegetation, making each more suitable for some land uses and land management activities than others.
- A glossary that defines key terms used throughout this Technical Note.

Step 2 Read the *Land system profiles* section. This will give you:

- An overview of the landscape characteristics of each Lockyer land system.
- Recommended land uses and land management practices for each Lockyer land system.

Step 3 Read the *Actions* section. This will give you:

- Actions that can be implemented to incorporate the recommended land uses and land management practices from the *Land system profiles* section into your Property Management Plan.

How is land used in the Lockyer?

The Lockyer Catchment is situated in South-East Queensland and forms approximately one-quarter of the Brisbane River Catchment. The Lockyer Catchment has an approximate area of 295,400 hectares (2,954 square kilometres) located an hour’s drive west of Brisbane between the regional cities of Ipswich and Toowoomba. Approximately half of the original native vegetation of the Lockyer Catchment remains while half has been cleared for agriculture.

The Lockyer Catchment hosts a major vegetable-growing industry. Being a major supplier of vegetable produce in Queensland and having significant markets both interstate and overseas, this

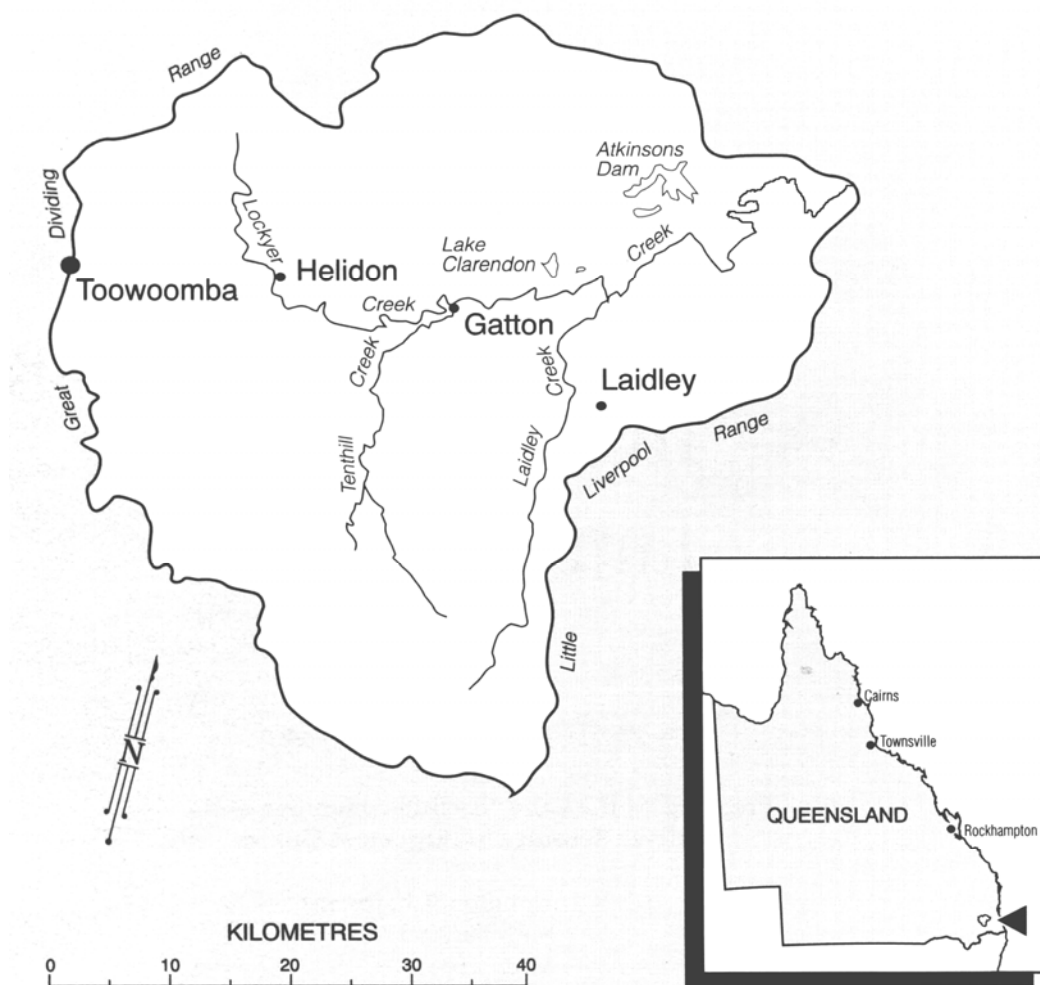
industry represents a large slice of the catchment's economic base. The catchment also supports an expanding fruit-growing industry.

Land use in the catchment has remained fairly constant over the years, however there has been recent growth in rural residential style developments. Rural residential development is also increasing with Laidley Shire in previous years being one of the fastest growing areas in the region.

Intensive agricultural activities and improved pasture pursuits are carried out on the fertile alluvial plains surrounding the creek systems within the sub-catchments and smaller catchments. These pursuits occupy around ten percent of the total area of the catchment. The major constraint in regards to agriculture in these areas is not the soil fertility but the limited supply of reliable, good quality water.

Surrounding these highly fertile areas are extensive areas of pasture on the lower hill slopes. These pasture areas generally have poorer soil quality and limited water supplies.

As you continue to move away from the creeks and alluvial plains, land uses change again to reflect different land characteristics. Land uses in these upper forested areas include grazing, timber extraction, rural retreats and conservation areas. Previous clearing activities on some of these areas has resulted in the development of erosion and landslip problems.



Lockyer Catchment

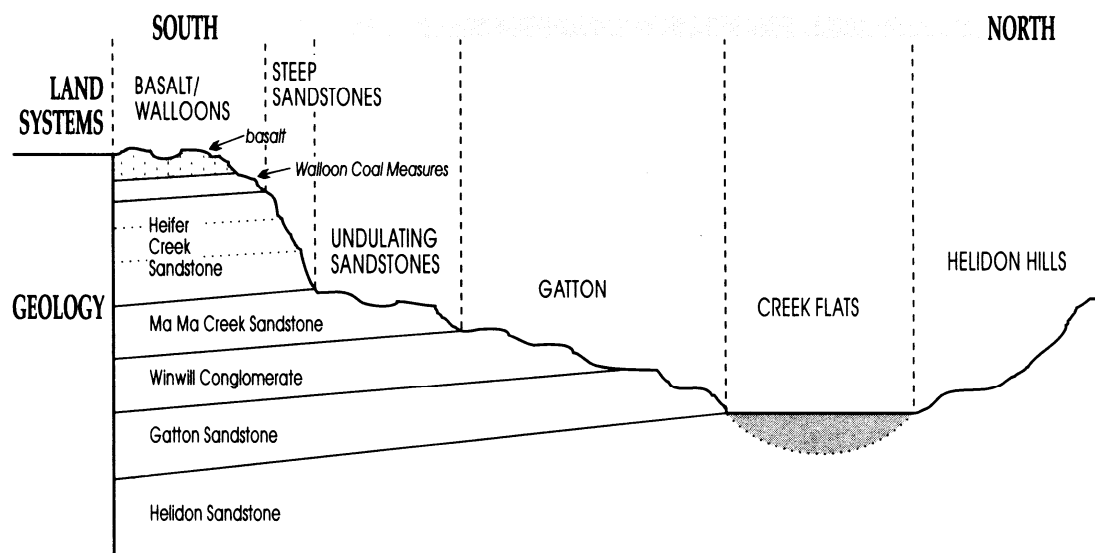
Rural residential developments, which combine urban style services with a rural character, have been a major growth area within the catchment for a number of years. However due to their sporadic nature and location and the need to protect good quality agricultural land, local authorities are attempting to better manage these developments.

Urban settlements have also grown in the catchment, incorporating residential, commercial and some light industrial activities. These areas now attract new residents from larger towns and cities.

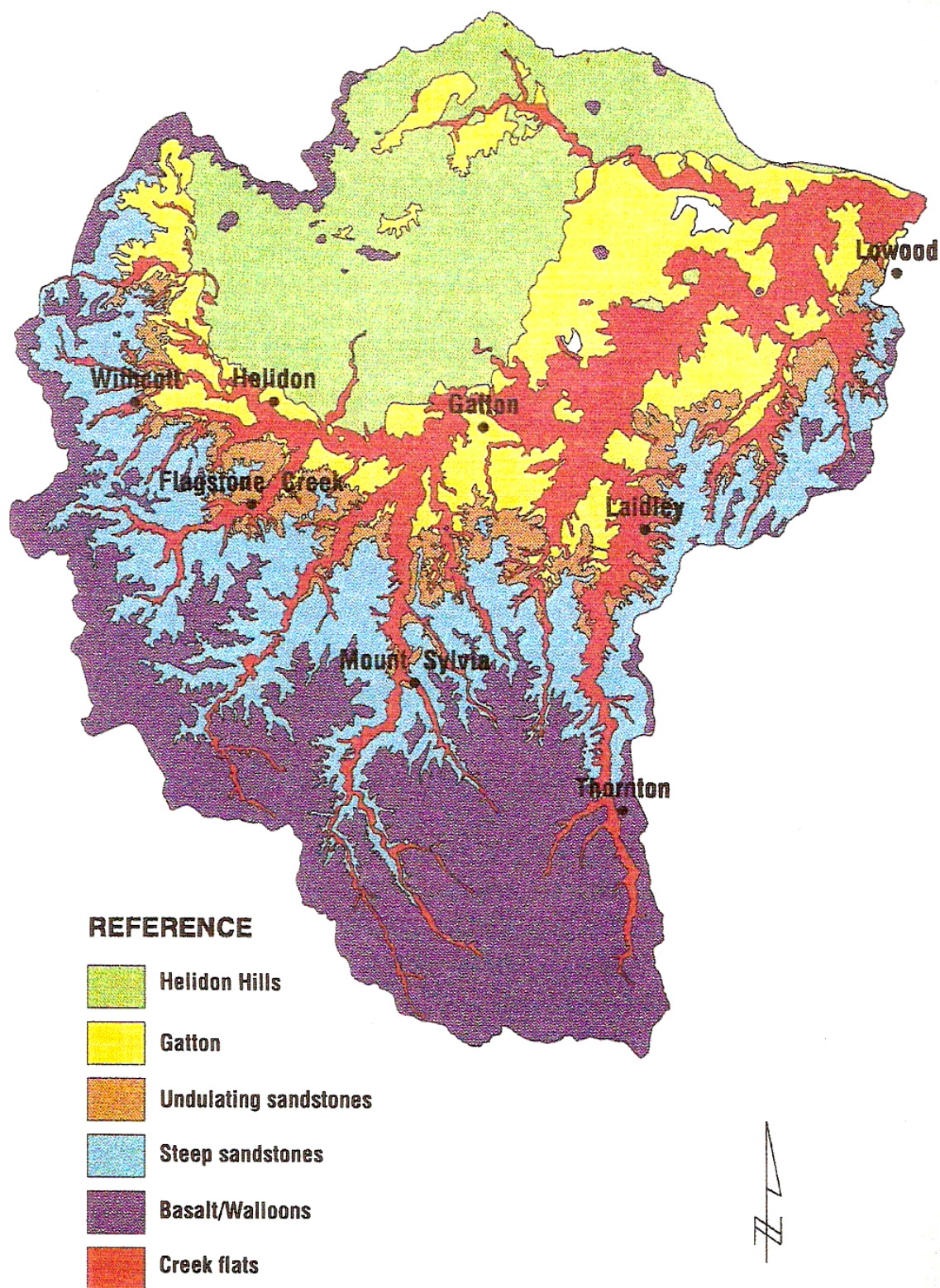
There has been a rapid growth in nature-based industries as areas of land are taken up by landholders establishing new rural opportunities such as nature-based tourism and ecotourism. Much of this activity is taking place in the upland areas and is generally considered a sustainable land use. The Helidon sandstone industry, which operates in the uplands north of Helidon, has seen a resurgence in recent years and now makes an important contribution to the Lockyer economy. A new explosives industry has also established in this area, adjacent to the Department of Natural Resources and Mines explosives magazine at Helidon.

What are the Lockyer land systems?

The Lockyer Catchment has been divided up into six 'land systems', each with distinct physical characteristics. These land systems are shown on the map on the next page and in the cross-section diagram below (detailed maps can be viewed at the Lockyer Catchment Centre). Each land system represents a group of areas with a characteristic pattern of landform, soils and vegetation. This makes the land systems a very useful tool for determining the best land uses and land management practices for different areas throughout the catchment.



LOCKYER LAND SYSTEMS



Glossary of terms

Aquaculture: The cultivation of live fisheries resources (live fish and marine plants cultivated in aquaculture) for sale other than in circumstances prescribed under a regulation (Fisheries Regulations 1995).

Clear felling: A form of logging for commercial wood production where a section of forest is fully cleared of millable timber (Note: this has never been allowed in the Lockyer and especially in the milling industry).

Community: Individuals and non-government groups and organisations, including landholders, farmers, graziers, community service organisations, industry groups, conservation groups, and other interest groups.

Good Quality Agricultural Land: Land capable of sustainable use for agriculture with a reasonable level of inputs, without causing degradation of land or other natural resources (Planning Guidelines: Identification of Good Quality Agricultural Land, 1993).

Government agencies: Government departments and authorities that are the administrative arm of Government, including Commonwealth and State Government departments, local governments and statutory authorities.

Hobby farms: A form of land use where agriculture is practiced on small to medium land holdings (5 to 40 hectares) but is not the primary source of income; typically cleared and fenced, with good soil and water.

Land and water resources: All land, soil, landscape, and surface and underground water components of a catchment, including related biological resources such as terrestrial and aquatic plants and animals that are dependent on or affected by the other resources in the catchment.

Management: The assessment, planning, allocation, control, care and use of natural resources.

Rural residential development: A form of land use where the emphasis is on residential development on larger than normal urban block sizes (0.4 to 5 hectares); often partially serviced, usually with good roads and electricity and possibly with water, but rarely sewered.

Rural retreats: A form of land use where accommodation can be built on existing land holdings where the emphasis is on retention of the natural environment and isolation from other residences.

Selective logging: A form of commercial wood production where a sustainable yield of millable trees are taken from the forest for sawlogs.

Wood chipping: A form of commercial wood production where all or part of the wood from a logging operation is used to produce woodchips.

Land system profiles

Land System 1: Helidon Hills

Landscape characteristics

Location	This land system is located north of Gatton, Grantham and Helidon.
Landform	It ranges from steep hills (greater than 25% slope) to low hills (5-10 % slope) with numerous rocky gorges. The area drains into several streams including Alice, Sandy, Redbank and Buaraba.
Soils	The soils are generally shallow, stony, low in fertility and sandy, with deeper red, white and yellow sandy soils on lower slopes.
Vegetation	The area has eucalypt forest/woodland with small areas of rainforest in moist sheltered valleys. Most of the area features a diverse, fire-sensitive shrubby understorey.
Water	Runoff water is of very high quality from a salinity point of view and could be used for urban purposes if suitable dam sites are available.
Special features	The Helidon Hills is one of the largest areas of mostly continuous bushland left in South-East Queensland and features a large number of rare and threatened flora and fauna species. The steep and rocky landscape is beautiful. There is also evidence of important Aboriginal and European cultural heritage.
Land degradation	This area is largely forest and has very few degradation problems. Over-clearing in the 1920's has resulted in excessive wattle growth and some erosion has occurred.
Present land use	One-third of the area is State Forest (currently under review under the Regional Forest Agreement) and two-thirds is privately owned. The land is currently used for sandstone mining, nature conservation, commercial timber production, grazing of native pastures, sand and gravel extraction, explosives industries, rural retreats, orchards on associated alluvium, and passive recreation (bushwalking, bird watching etc). Ecotourism, nature-based tourism and aquaculture are emerging land uses.

Land uses and land management practices

Principles

The area should be used and managed according to the principles of:

- Multiple sustainable use of freehold land.
- Land use and management focused on maintaining the area as a high-quality water supply catchment, and on retaining the natural and scenic characteristics of the area.
- Land use viability and sustainable resource use practices.
- Respect for Aboriginal and European cultural heritage.

Land uses encouraged

- Grazing.
- Commercial forestry practiced as selective logging for mill logs.
- Orchards on suitable soils and slopes.
- Mining industries, extractive industries and explosives industries in suitable areas.
- Flora and fauna habitat.
- Recreation and tourism, where activities are of low environmental impact.
- Rural retreats on existing holdings.

Land management encouraged

- Maintenance of ground cover in grazed areas to minimise erosion.
- Conservation of flora and fauna habitat.
- Cooperative management of National Park, Conservation Park and State Forest boundaries by Queensland Government agencies and landholders.
- Management of fire for the protection of life and property, the conservation of flora and fauna, the maintenance of grazing pasture and the protection of commercial forestry areas.
- Conservation of soil and vegetation by public authorities which provide services such as roads, telephone and electricity.
- Nature conservation, fire, waste, erosion control, cultural heritage, rehabilitation, vehicle impact management and social impact management plans for mining, extractive and explosives industries.
- Recreation and tourism managed to reduce human and vehicle impact on natural areas and roads, and to reduce impacts on private landholders.
- Nature conservation, fire, waste (sewage, garbage, household, industrial), erosion control and cultural heritage management plans for rural retreats and recreation and tourism developments.
- Rural enterprises that adopt a systems approach to the multiple use of key resources such as water and land.
- Agriculture and land management practices that are aware of water reuse issues; including salinity, water quality and community health.

Discouraged

- Commercial clear felling for logs or woodchips.
- Clearing or degradation of areas of significant flora and fauna habitat.
- Damage to Aboriginal and European cultural heritage.
- Inappropriate fire regimes.
- Development that does not comply with stringent social, environmental and scenic guidelines (subdivision should only be approved if there is a substantial community benefit e.g. the permanent setting aside of significant areas of flora and fauna habitat).
- Public removal of flora, fauna or landscaping material.

Land System 2: Gatton

Landscape characteristics

Location	Located adjacent to the Lockyer Creek flats on both sides but in scattered areas. The undulating rises of the town of Gatton are typical of this land system. The localities of Lockyer Waters and Coominya are also on this land system.
Landform	The land has undulating rises and low hills of 3-8% slope
Soils	Shallow loamy sands of low fertility overlie sandy clay subsoils. The subsoils are very susceptible to erosion. Underlying rock is relatively soft.
Vegetation	The area has eucalypt forest/woodland. Dominant species include narrow-leaved ironbark, spotted gum and Moreton Bay ash.
Special features	Generally close to existing urban development, transport, power and communication infrastructure and good water supplies, this land is very suitable for urban development.
Land degradation	Topsoil is susceptible to sheet erosion and subsoils are extremely susceptible to tunnel and gully erosion where topsoil is removed. Erosion leads to water turbidity. Saline outbreaks occur in lower areas of the landscape.
Present land use	The land is presently used for low intensity grazing of native pastures, rural residential development and urban subdivision with associated areas for waste dumps and recreation (e.g. golf courses). Areas of remnant bushland provide flora and fauna habitat. Sand and gravel are extracted in selected areas.

Land uses and land management practices

Principles

The use and management of this land system should be based on:

- Suitability for urban development.
- Potential for a variety of non-agricultural uses.
- Land use viability and sustainable resource use practices.
- Encourage rehabilitation and control of erosion and salinity.
- Respect for Aboriginal and European cultural heritage.

Land uses encouraged

- Predominantly urban and village developments around existing service centres, including associated uses such as residential, commercial, industrial, recreational, landfill and sewage treatment.
- Limited areas of rural residential subdivision on the fringes of urban centres where water, sewerage and social services can be provided.
- Buffer areas between new residential areas and adjacent intensive horticulture, agriculture or industry, and grazing carried out in buffer areas where appropriate.
- Public open space including golf courses, parks, playing fields and natural forests, particularly associated with urban areas and used as buffers where appropriate.
- Flora and fauna habitat.

Land management encouraged

- Property management planning in affected sub-catchments to mitigate existing affects of salinisation.
- Grazing which is managed to maintain ground cover and prevent erosion.
- Controlled and planned development taking into account employment, social needs and provision of social and physical services.
- Management of litter, garbage, waste water and runoff.
- Conservation and reduction in the demand for energy (for transport, electricity etc) through urban and building design.
- Conservation and reduction in the demand for water through urban and building design.
- Planned development and subdivision design to ensure sufficient areas are used as open space.
- Erosion control and salinity control measures for all development and land uses.
- Planned siting, construction and maintenance of roads, tracks and other services to minimise land degradation and enhance fire management.
- Conservation of flora and fauna habitat.
- Rural enterprises that adopt a systems approach to the multiple use of key resources such as water and land.
- Agriculture and land management practices that are aware of water reuse issues; including salinity, water quality and community health.

Discouraged

- Rural residential subdivision into large blocks in inappropriate areas with no or only partial services.
- Ribbon commercial and residential development.
- Damage to Aboriginal and European cultural heritage.
- Inappropriate fire regimes.

Land System 3: Undulating sandstones

Landscape characteristics

Location	This land system occurs south of the Lockyer Creek. The localities of Woodlands and Plainlands are a part of it.
Landform	These sandstones form rolling, low hills with 5-15% slopes and are commonly known as the Ma Ma Creek sandstones.
Soils	The dominant soils are yellow-brown, earthy soils which are permeable and were initially fertile. They have been eroded in the past and are now shallow and less fertile.
Vegetation	The area has eucalypt forest/woodland, brigalow scrub and dry rainforest (softwood scrub), which have been substantially cleared in the past.
Water	Water is the limiting factor to productivity, management and development of this land system. This is a rainfall intake area for lower saline seepages. Seepage from this land system offers a threat to irrigation water supplies. There is little underground water in this land system.
Land degradation	Soils are extremely fragile and subject to erosion. Sheet erosion, which followed clearing and mixed farming many years ago, has removed much of the soil from these hills. When cultivation was abandoned and pastures were established, there was a decrease in runoff (reducing erosion) and an increase in the deep seepage of water below the root zone of plants. This increase in deep seepage has moved salts with it, resulting in some saline seepage break outs in the area and some saltpans on the flatter land below.
Present land use	The land is used for grazing of native and improved pastures, mainly by beef cattle and some dairy cattle. Cropping in small areas has principally given way to improved pastures and some rural residential development.

Land uses and land management practices

Principles

Much of this land system has experienced severe degradation in the past and should be managed to:

- Encourage rehabilitation and control of erosion and salinity.
- Maximise the use by plants of rainwater where it falls, and minimise deep seepage of water.
- Land use viability and sustainable resource use practices.
- Identify, retain and enhance any residual vegetation and fauna values in the area.
- Respect for Aboriginal and European cultural heritage.

Land uses encouraged

- Grazing of native and improved pastures.
- Part-time or hobby farm properties on present block sizes.
- Agroforestry.
- Flora and fauna habitat.

Land management encouraged

- Property management planning in affected sub-catchments to mitigate existing affects of salinisation.
- Self-monitoring and management of grazing pressures to maintain native and improved pastures and timber resources, and to avoid land degradation.
- Fencing of severely degraded areas and remnant vegetation areas for rehabilitation purposes.
- Planned siting, construction and maintenance of roads, tracks and other services to minimise land degradation.
- Use of reduced tillage and planting practices for introduction of improved pastures and short-term weed control.
- Retaining or replanting deep-rooted vegetation to reduce water/saline seepages and water-table salting
- Revegetation with native plants for wildlife habitat and corridors.
- Strategic removal and clearing of lantana.
- Management of fire for the protection of life and property, the conservation of flora and fauna, the maintenance of grazing pasture and the protection of commercial forestry areas.
- Identification and adoption of other viable land uses.
- Rural enterprises that adopt a systems approach to the multiple use of key resources such as water and land.
- Agriculture and land management practices that are aware of water reuse issues; including salinity, water quality and community health.

Discouraged

- Continuous cropping.
- Development that does not comply with stringent social, environmental and scenic guidelines (subdivision should only be approved if there is a substantial community benefit e.g. the permanent setting aside of significant areas of flora and fauna habitat).
- Damage to Aboriginal and European cultural heritage.
- Inappropriate fire regimes.

Land System 4: Steep sandstones

Landscape characteristics

Location	This land system occurs mainly south of Lockyer Creek. The steep slopes seen behind the townships of Tenthill, Ma Ma Creek Village, Blenheim, Stockyard, Flagstone and Withcott are typical of this land system. Landslips may be evident.
Landform	These steep sandstones often form slopes which exceed 20%. These sandstones cover a large part of the catchment and are commonly known as Heifer Creek sandstones.
Soils	This land has a range of scrub soils and forest soils, usually stony.
Vegetation	Naturally this land system supported a range of vegetation types including eucalypt forest/woodland, dry rainforest and brigalow. Much of the native vegetation has been lost or degraded as a result of land clearing, logging, inappropriate fire regimes and introduced species.
Water	Water availability is generally limited to surface water and underground supplies for stock use.
Special features	Areas of remnant vegetation provide habitat for a large number of rare and threatened flora and fauna species, are linked to larger habitat and wildlife corridor areas along the Great Dividing Range, and feature plants with commercial potential e.g. wildflowers.
Land degradation	This land is susceptible to gully erosion and landslip. The presence of shallow-rooted plants such as lantana does not reduce this risk.
Present land use	Grazing occurs on small original blocks which are rarely commercially viable units. There are some small areas of cultivated cropping on gentler sloping hill crests and ridge tops, and some reserves for conservation and recreation. Ecotourism and nature-based tourism are emerging land uses.
Significant issues	Landholders who sustainably manage their land and retain areas of remnant vegetation are incurring high and rising valuations because of the good condition of their properties. These valuation practices mean that good land managers are actually being penalised, rather than rewarded, for their efforts.

Land uses and land management practices

Principles

Much of this land system has experienced past degradation and should be managed to:

- Encourage rehabilitation and control of erosion and salinity.
- Maximise the use of rainwater by plants where it falls and minimise deep seepage of water.
- Conserve flora and fauna habitat.
- Land use viability and sustainable resource use practices.
- Respect for Aboriginal and European cultural heritage.

Land uses encouraged

- Grazing of native and improved pastures.
- Recreation and tourism (ecotourism, nature-based tourism) on public land and private land where owners permit.
- Flora and fauna habitat.
- Rural retreats on existing holdings.

Land management encouraged

- Management of grazing pressures to maintain ground cover, and revegetation with deep rooted vegetation and shrub legumes in grazing systems.
- Recreation and tourism managed to reduce human and vehicle impact on natural areas and roads, and to reduce impacts on private landholders.
- Nature conservation, fire, waste (sewage, garbage, household, industrial), erosion control and cultural heritage management plans for recreation and tourism developments.
- Identification and adoption of other viable land uses.
- Planned siting, construction and maintenance of roads, tracks and other services to minimise land degradation.
- Conservation of flora and fauna habitat, and revegetation of cleared areas where appropriate.
- Managed regrowth on cleared land to reduce erosion.
- Strategic removal and clearing of lantana where it can be replaced by improved pastures or deep rooted vegetation.
- Management of fire for the protection of life and property, the conservation of flora and fauna, the maintenance of grazing pasture and the protection of commercial forestry areas.
- Management of feral animals, and management of problem native fauna where they are causing degradation or production problems.
- Cooperative management of National Park, Conservation Park and State Forest boundaries by Queensland Government agencies and landholders.
- Rural enterprises that adopt a systems approach to the multiple use of key resources such as water and land.
- Agriculture and land management practices that are aware of water reuse issues; including salinity, water quality and community health.

Discouraged

- The mass removal of timber.
- Clearing or degradation of flora and fauna habitat.
- Damage to Aboriginal and European cultural heritage.
- Inappropriate fire regimes.
- Land valuation practices that penalise landholders for good land management.
- Development which does not conform with stringent social and environmental guidelines (subdivision should not be approved unless there is a substantial community benefit e.g. the permanent setting aside of significant areas of flora and fauna habitat).

Land System 5: Basalt/Walloons

Landscape characteristics

Location	This land system comprises Mt Mistake, the Great Dividing Range and its offshoots.
Landform	This land system typically forms steep slopes often exceeding 20% and high, mountainous ridges. Flat-topped mountains and rocky outcrops are also common. The geology of the area is commonly known as tertiary basalt and Walloon coal measures.
Soils	Shallow, stony soils are dominant, with some deep black and grey clays and red soils.
Vegetation	This land system retains much of its natural vegetation, comprising eucalypt forest/woodland and areas of rainforest.
Water	This is an important irrigation water supply catchment for the aquifers of the Creek Flat alluvium. Ground water and surface water supplies in this area are limited. Some useful seepages and springs occur at the basalt-Walloon interface.
Special features	This area has special scenic qualities, featuring Mount Mistake National Park, Glen Rock Regional Park, and other reserves.
Land degradation	Lantana and other woody weeds are a problem. Erosion is not considered widespread although there is some severe, localised gully and sheet erosion.
Present land use	The dominant use is grazing. Some of the flatter areas are cleared but the area is mostly vegetated. Some cultivation of forage crops (winter oats) occurs in flatter areas with suitable soils. Some selective logging, natural revegetation, recreation and tourism occurs.
Significant issues	Landholders who sustainably manage their land and retain areas of remnant vegetation are incurring high and rising valuations because of the good condition of their properties. These valuation practices mean that good land managers are actually being penalised, rather than rewarded, for their efforts.

Land uses and land management practices

Principles

The land system should be used and managed according to the principles of:

- Multiple use of freehold land.
- Land use and management focused on maintaining the area as a high-quality water supply catchment, and on retaining the natural and scenic characteristics of the area.
- Land use viability and sustainable resource use practices.
- Respect for Aboriginal and European cultural heritage.

Land uses encouraged

- Grazing of native and improved pastures.
- Forage cropping on flatter slopes with suitable soils, managed for erosion control (mainly Walloons).
- Strategic cultivation to control lantana and other weeds and to prepare for pastures.
- Recreation and tourism in public areas and on private land where owners permit.
- Selective logging.
- Flora and fauna habitat.
- Rural retreats on existing holdings.
- Mining in existing areas (eg. diatomite).

Land management encouraged

- Management of grazing pressures to maintain grazing cover.
- Managed timber regrowth to reduce erosion, and selective tree thinning for agroforestry.
- Sustainable vegetation management to ensure the supply of good quality underground water to other land systems.
- Recreation and tourism managed to reduce human and vehicle impact on natural areas and roads, and to reduce impacts on private landholders.
- Nature conservation, fire, waste (sewage, garbage, household, industrial), erosion control and cultural heritage management plans for recreation and tourism developments.
- Conservation of flora and fauna habitat.
- Cooperative management of National Park, Conservation Park and State Forest boundaries by Queensland Government agencies and landholders.
- Planned siting, construction and maintenance of roads, tracks and other services to minimise land degradation.
- Management of feral animals and weeds on public and private land.
- Management of fire for the protection of life and property, the conservation of flora and fauna, the maintenance of grazing pasture and the protection of commercial forestry areas.
- Best practice management of mine operations.
- Rural enterprises that adopt a systems approach to the multiple use of key resources such as water and land.
- Agriculture and land management practices that are aware of water reuse issues; including salinity, water quality and community health.

Discouraged

- Development that does not conform to stringent social, environmental and scenic guidelines (subdivision should not be approved unless there is a substantial community benefit e.g. the permanent setting aside of significant areas of flora and fauna habitat).
- Damage to Aboriginal and European cultural heritage.
- Clear felling.
- Land valuation practices that penalise landholders for good land management.
- Permanent cultivation on steep slopes.
- Removal of flora, fauna and landscape materials from roadsides and public areas.

Land System 6: Creek flats

Landscape characteristics

Location	This area is made up of the major creeks in and their alluvial flats. The towns of Helidon, Laidley and Forest Hill are built on the creek flats.
Soils	Deep black cracking-clay soils and dark brown clay loams are dominant.
Vegetation	The original vegetation on the creek flats was eucalypt open woodland with a grassy understorey. The creek flats are now largely cultivated and only small areas of native vegetation remain. These remnants host several rare and threatened frog, bird and grassland plant species.
Water	This land system has extensive aquifers containing underground water which is suitable for irrigating a wide range of crops. The underground water varies considerably in both supply and quality, depending on the geology of the catchment area.
Special features	The soils of the Lockyer Creek flats are some of the most fertile in the world. This land system is the largest single area of good agricultural land in the Moreton region. The location of the Lockyer Catchment close to Brisbane markets is also an added advantage. Creek lines, watercourses and wetlands are important areas for ground water recharge, sources of surface water and natural habitat.
Land degradation	Problems are relatively minor except for soil compaction and some erosive flooding. Creek lines are sometimes used as dumping grounds for household and industrial waste and are often infested with weed species.
Present land use	This land system is primarily used for intensive, irrigated agriculture, including many vegetables, lucerne, silage, maize, sorghum, barley and soy beans. There are also some orchards and some areas of residential, rural residential and recreational development.

Land uses and land management practices

Principles

This land system should be used and managed according to the following principles:

- The preservation of good quality agricultural land for agricultural use.
- Rehabilitation and management of watercourses and wetlands.
- Land use viability and sustainable resource use practices.
- Respect for Aboriginal and European cultural heritage.

Land uses encouraged

- Intensive agriculture on high-quality soils, including rotational cropping and the use of cover crops or green manure.
- Grazing on less productive soils.
- Orchards in suitable areas.
- Flora and fauna habitat.

Land management encouraged

- Management of grazing pressures to maintain ground cover.
- Subdivision for the purpose of aggregation of agricultural properties.
- More efficient irrigation practices.
- Management of watercourses and wetlands to achieve improved stability, including reduction of flood, silting and erosion risk; control of inappropriate vegetation and enhancement as flora and fauna habitat and corridors.
- Management practices which will reduce the impact of using domestic and agricultural chemicals and fertilisers.
- Natural levees to be maintained or restored and constructed levee banks to be well planned and licensed on a sub-catchment/sub-regional basis.
- Management practices that maintain underground water qualities.
- Planned siting, construction and maintenance of roads, tracks and other services to minimise land degradation.
- Conservation of flora and fauna habitat including wetlands.
- Rural enterprises that adopt a systems approach to the multiple use of key resources such as water and land.
- Agriculture and land management practices that are aware of water reuse issues; including salinity, water quality and community health.

Discouraged

- Rezoning and subdivision of good quality agricultural land.
- Permanent alienation (eg subdivision) of good quality agricultural land through activities such as aquaculture. Freshwater aquaculture should be located on areas of lesser agricultural quality where possible. The proposal should be assessed against SPP 1/92 in terms of alternative sites and possible land use conflicts. Refer to the LCA Policy Paper on Aquaculture available through the Lockyer Catchment Centre.
- Damage to Aboriginal and European cultural heritage.
- Inappropriate levee banks.
- Ribbon development along the Warrego Highway and other major roads.
- Non-agricultural land uses and uses which have adverse impact on agricultural production.
- Waste disposal in and along creek lines.
- Inappropriate fire regimes.

Actions

Land System 1: Helidon Hills

Land use actions

Property management plans can include (subject to any necessary approvals from relevant State and/or Local Government Departments):

- ☐ Grazing.
- ☐ Commercial forestry practiced as selective logging for mill logs.
- ☐ Orchards on suitable soils and slopes.
- ☐ Mining industries, extractive industries and explosives industries in suitable areas.
- ☐ Flora and fauna habitat.
- ☐ Recreation and tourism, where activities are of low environmental impact.
- ☐ Rural retreats on existing holdings.

Land management actions

Property management plans:

- ☐ Should include grazing regimes that will maintain ground cover.
- ☐ Should include actions to conserve flora and fauna habitat.
- ☐ Should include actions to manage boundaries with National Parks, Conservation Parks and State Forests.
- ☐ Should include a fire management plan component prepared using the South-East Queensland Fire & Biodiversity Consortium's *Individual Property Fire Management Planning Kit*.
- ☐ For mining, extractive and explosives industries should include nature conservation, fire, waste, erosion control, cultural heritage and rehabilitation management components.
- ☐ For recreation and tourism developments should include vehicle impact management and social impact management components.
- ☐ For rural retreats and recreation and tourism developments should include nature conservation, fire, waste (sewage, garbage, household, industrial), erosion control and cultural heritage management components.
- ☐ Should consider cultural heritage in all activities and development.

Land System 2: Gatton

Land use actions

Property management plans can include (subject to any necessary approvals from relevant State and/or Local Government Departments):

- ☐ Predominantly urban and village developments around existing service centres, including associated uses such as residential, commercial, industrial, recreational, landfill and sewage treatment.
- ☐ Limited areas of rural residential subdivision on the fringes of urban centres where water, sewerage and social services can be provided.
- ☐ Buffer areas between new residential areas and adjacent intensive horticulture, agriculture or industry, and grazing carried out in buffer areas where appropriate.
- ☐ Public open space including golf courses, parks, playing fields and natural forests, particularly associated with urban areas and used as buffers where appropriate.
- ☐ Flora and fauna habitat.

Land management actions

Property management plans:

- ☐ Should include grazing regimes that will maintain ground cover.
- ☐ Should include actions to conserve flora and fauna habitat.
- ☐ Should consider cultural heritage in all activities and development.
- ☐ Should include a fire management plan component prepared using the South-East Queensland Fire & Biodiversity Consortium's *Individual Property Fire Management Planning Kit*.

Land System 3: Undulating sandstones

Land use actions

Property management plans can include (subject to any necessary approvals from relevant State and/or Local Government Departments):

- ☐ Grazing of native and improved pastures.
- ☐ Part-time or hobby farm properties on present block sizes.
- ☐ Agroforestry.
- ☐ Flora and fauna habitat.

Property management plans should not include:

- ☐ Continuous cropping.

Land management actions

Property management plans:

- ☐ Should include grazing regimes that will maintain ground cover.
- ☐ Could include reduced tillage and planting practices.
- ☐ Could include actions to retain or replant deep-rooted vegetation.
- ☐ Could include actions to revegetate with native plants.
- ☐ Could include actions to remove and clear lantana.
- ☐ Should include a fire management plan component prepared using the South-East Queensland Fire & Biodiversity Consortium's Individual Property Fire Management Planning Kit.
- ☐ Should consider the adoption of other viable land uses.
- ☐ Should consider cultural heritage in all activities and development.

Land System 4: Steep sandstones

Land use actions

Property management plans can include (subject to any necessary approvals from relevant State and/or Local Government Departments):

- ☐ Grazing of native and improved pastures.
- ☐ Recreation and tourism (ecotourism, nature-based tourism) on public land and private land where owners permit.
- ☐ Flora and fauna habitat.
- ☐ Rural retreats on existing holdings.

Land management actions

Property management plans:

- ☐ Should include grazing regimes that will maintain ground cover; plans could include actions to revegetate with deep rooted vegetation and shrub legumes in grazing systems.
- ☐ For recreation and tourism developments should include vehicle impact management and social impact management components.
- ☐ For rural retreats and recreation and tourism developments should include nature conservation, fire, waste (sewage, garbage, household, industrial), erosion control and cultural heritage management components.
- ☐ Should consider the adoption of other viable land uses.
- ☐ Should include actions to conserve and/or revegetate flora and fauna habitat.
- ☐ Could include actions to manage regrowth on cleared land to reduce erosion.
- ☐ Could include actions to remove and clear lantana where it can be replaced by improved pastures or deep rooted vegetation.
- ☐ Should include a fire management plan component prepared using the South-East Queensland Fire & Biodiversity Consortium's Individual Property Fire Management Planning Kit.
- ☐ Should consider cultural heritage in all activities and development.

Land System 5: Basalt/Walloons

Land use actions

Property management plans can include (subject to any necessary approvals from relevant State and/or Local Government Departments):

- ☐ Grazing of native and improved pastures.
- ☐ Forage cropping on flatter slopes with suitable soils, managed for erosion control (mainly Walloons).
- ☐ Strategic cultivation to control lantana and other weeds and to prepare for pastures.
- ☐ Recreation and tourism in public areas and on private land where owners permit.
- ☐ Selective logging.
- ☐ Flora and fauna habitat.
- ☐ Rural retreats on existing holdings.
- ☐ Mining in existing areas (eg. diatomite).

Property management plans should not include:

- ☐ Permanent cultivation on steep slopes.

Land management actions

Property management plans:

- ☐ Should include grazing regimes that will maintain ground cover.
- ☐ Could include actions to manage regrowth on cleared land to reduce erosion; plans could include actions to carry out selective tree thinning for agroforestry.
- ☐ Could include actions to manage remnant vegetation to reduce salinity.
- ☐ For recreation and tourism developments should include vehicle impact management and social impact management components.
- ☐ For rural retreats and recreation and tourism developments should include nature conservation, fire, waste (sewage, garbage, household, industrial), erosion control and cultural heritage management components.
- ☐ Should include actions to conserve flora and fauna habitat.
- ☐ Should include actions to manage boundaries with National Parks, Conservation Parks and State Forests.
- ☐ Could include actions to manage feral animals and weeds on public and private land.
- ☐ Should include a fire management plan component prepared using the South-East Queensland Fire & Biodiversity Consortium's Individual Property Fire Management Planning Kit.
- ☐ Should include best practice mining operations (where relevant).
- ☐ Should consider cultural heritage in all activities and development.

Land System 6: Creek flats

Land use actions

Property management plans can include (subject to any necessary approvals from relevant State and/or Local Government Departments):

- ☐ Intensive agriculture on high-quality soils, including rotational cropping and the use of cover crops or green manure.
- ☐ Grazing on less productive soils.
- ☐ Orchards in suitable areas.
- ☐ Flora and fauna habitat.

Land management actions

Property management plans:

- ☐ Should include grazing regimes that will maintain ground cover.
- ☐ Could include actions aimed at more efficient irrigation.
- ☐ Should include actions to manage watercourses and wetlands to achieve improved stability, including reduction of flood, silting and erosion risk; control of inappropriate vegetation and enhancement as flora and fauna habitat and corridors. Refer to Queensland Fruit and Vegetable Growers Farmcare Code of Practice.
- ☐ Could include management practices which will reduce the impact of using domestic and agricultural chemical and fertilisers.
- ☐ Could include the maintenance or restoration of existing levee banks and plans for the construction of any new levee banks.
- ☐ Should include management practices that maintain underground water qualities.
- ☐ Should include actions to conserve flora and fauna habitat.
- ☐ Should include a fire management plan component prepared using the South-East Queensland Fire & Biodiversity Consortium's *Individual Property Fire Management Planning Kit*.
- ☐ Should consider cultural heritage in all activities and development.

