Forbes Shire Growth Management Strategy







EDGE LAND PLANNING

NSW GOVERNMENT
Department of Planning

Forbes Shire Council

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Forbes Shire Council

Forbes Shire
Growth Management Strategy

Prepared for Forbes Shire Council and the
Department of Planning
by

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Chapter 1: Introduction

1.1 Introduction

Forbes Shire is located in Central West of New South Wales and covers an area of 4,719 square kilometres and has a population of 9,727 at June 2007. The main industries include manufacturing, sheep and cattle farming, wheat, and various other crops.

The Shire is located on The Newell Highway and has become an increasingly popular tourist destination. Its heritage buildings, location on the Lachlan River and links to the bushranger, Ben Hall are some of the more prominent tourist drawcards.

The Shire has a diverse number of settlements of varying sizes and function. These range from rural localities with no services like Waroo and Daroobalgie, small settlements with limited services like Bedgerebong and Ootha to the Forbes township, which has a range of services and facilities. However, there are no typical village settlements with populations of 100 – 300 like a number of the surrounding Shires.

There are 2 basic landscapes in the Shire – the flat open river floodplains in the north, west and south and the steeper vegetated land to the east and north east as well as along the Jemalong Range in the centre of the Shire.

The land within the Shire provides an important resource, both for the Shire and the wider region. This resource consists of a number of components:

- Productive agriculture
- Rural landscapes
- Towns and villages
- Waterways
- Native vegetation
- Industry
- Community facilities and services
- Cultural heritage

The Growth Management Strategy will provide a future direction for the settlements and land within the Shire. It forms the second stage in the review of the current Local Environmental Plan (LEP). This project requires the preparation of a number of documents which are as follows:

- Stage 1: Forbes Comprehensive Land Use Strategy - Issues Paper (adopted March, 2006)
- Stage 2: Forbes Growth Management Strategy (this document);
- Stage 3: Forbes Local Environmental Plan 2009 (to be prepared based upon the finalisation of this Growth Management Strategy); and
- Stage 4: Forbes Development Control Plan 2009 (to be prepared on the basis of preceding investigations).

Forbes Comprehensive Land Use Strategy - Issues Paper provides the relevant background information and resource base as a prelude to the preparation of future development strategies for all major land uses within the Shire. It was prepared by Forbes Shire Council staff, exhibited in August 2005 and adopted by Council on 16 March, 2006. This Strategy builds upon the Issues Paper to provide an analysis of the issues to provide a set of options and recommended strategies for the future. It starts

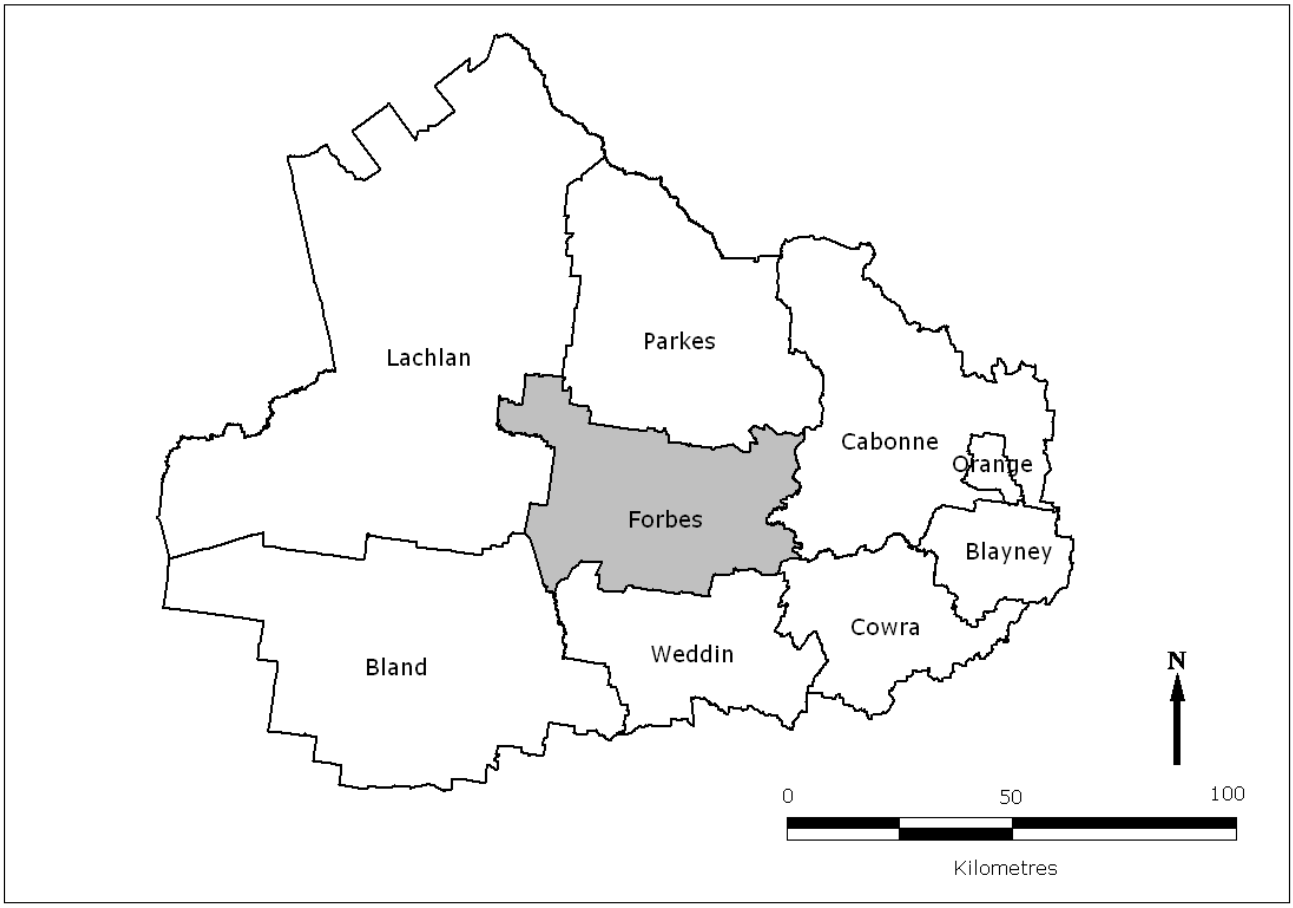
with a summary of the issues identified in the Comprehensive Land Use Strategy Issues Paper and a summary of the community workshops held to gain community input. It then discusses the matters that have to be addressed to achieve a sustainable future for the Shire. It addresses a number of matters that are all inter-related to providing future land for the development of the Shire. These include land use planning, growth management, social issues, economic development, infrastructure, catchment management, biodiversity, natural hazards, landscapes, heritage and culture.

This document was publicly exhibited in September and October 2007 and the Council considered a report on the exhibition at its meeting on 13 December 2007. At that meeting it was resolved to adopt the Strategy except for the provisions relating to the rural minimum lot size for dwelling houses and rural zoning. This was because of the release, during the exhibition period of the Central West Rural Lands Inquiry and the preparation of a Rural Lands State Environmental Planning Policy (SEPP) by the Department of Planning. This SEPP was gazetted on 9 May 2008. In response to this, the rural provisions have been reviewed and a revised minimum size for a dwelling was arrived at as well as other aspects of the rural zoning. The *Forbes Growth Management Strategy Draft Rural Lands Supplement* was subsequently prepared and exhibited in November and December 2008 and January 2009. The Draft Rural Lands Supplement was adopted by Council on 19 February 2009 and has been amalgamated with the previously adopted Growth Management Strategy and this document is the result of that amalgamation.

Council and the Department of Planning through the Planning Reform Fund have jointly funded this Growth Management Strategy. It has been developed in a manner consistent with the recently announced planning reforms as this strategy will lead to a review of the current Forbes LEP 1986, which will use the Standard LEP as a template for its preparation.

1.2 Location and Study Area

The Forbes Shire is located in the Central West of NSW. Surrounding Forbes is Parkes Shire to the North, Cabonne to the East, Cowra, Weddin and Bland Shires to the South and to the west is Lachlan Shire.



Map 1.1: Surrounding Shires.

The Shire has an area of 4,719 square kilometres. The settlements of the Shire include the following:

- Forbes
- Bedgerebong
- Ootha

There are also a number of rural localities with limited services which include Waroo, Wirrinya, Jemalong, Calarie, Daroobalgie, Corinella, Cookamidgera and Garema.

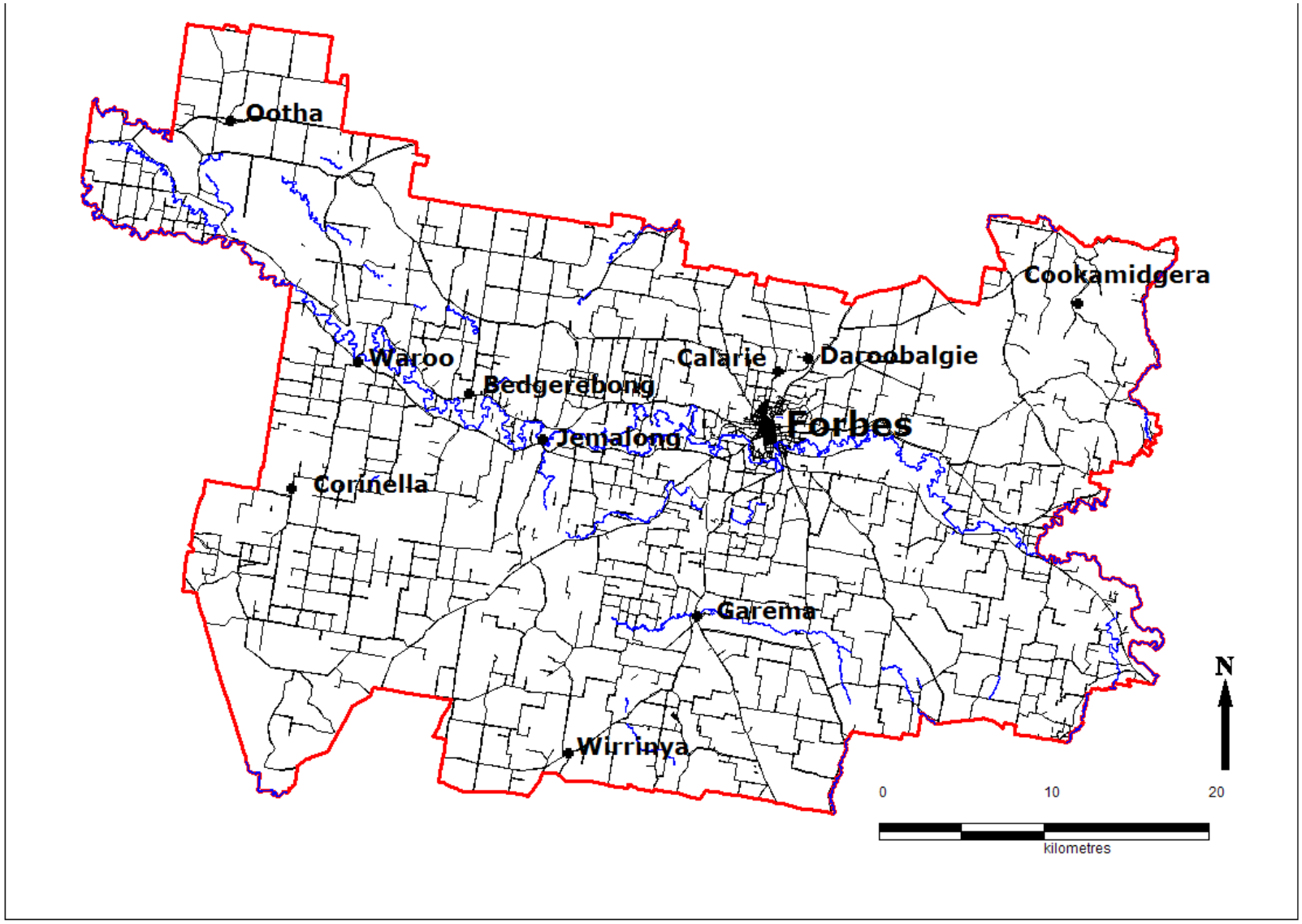
Map 1.2 shows the Forbes Shire and the location of these settlements.

1.3 Why Prepare a Strategy

The preparation of a strategy is a vital component in the future strategic planning for the sustainability of the Shire. It enables the Council to consider all of the aspects of the social, environmental and economic issues that interact and have to be considered for the future of an area. The strategy is an overarching document that provides the Council with guidance for the future of the area to ensure its sustainability. It also provides a basis for Government Departments and other organisations to plan for the provision of public and private infrastructure and services in the Shire. It will develop a clear statement of principles and a map that will be the strategic direction for growth management outcomes for the Shire over the next 20 years.

The preparation of a strategy enables the Council and other organisations to address the big picture issues as well as providing a road map for the future direction of the development of an area. It is important to recognise however, that this strategy also gives a direction for further work. It provides a framework and sets the direction for future work that will implement the strategy.

The measure of success of a strategy is its implementation by the Council and the acceptance of this by the community. The strategy will make a series of recommendations that will have an impact on the Council's resources. It should be recognised that the Council needs to devote a considerable amount of resources to achieve the outcomes that would be expected by the community if the strategies were to be implemented. If we are to achieve a sustainable future, this resource imbalance needs to be rectified. Costing of the strategies need to be considered in the context of the Council's budget and Management Plan.



Map 1.2: Forbes Shire

1.4 Methodology

The study has been prepared by the consultant based on discussions held with Council Officers, Government Departments and the Community. A review of all relevant literature has also been carried out, which was based on the *Forbes Shire Comprehensive Land Use Strategy Issues Paper, 2005*.

All Data was gathered based on secondary information except for a detailed landuse survey and lot and holding size analysis, assessment of allotment potential within existing zoned lands, and consideration of Department of Primary Industry Methodology to determine the minimum lot size for rural dwellings. This task was carried out by the Council in consultation with the consultant. The land use survey entailed utilising aerial photography dated December 2005 to gain an appreciation of the landuse, which was then field checked by a survey of all roads and properties in the Shire carried out in March 2006 and estimation of the location of rural dwellings utilising GPS positioning. This information was then coded, which enabled it to be mapped using a Geographical Information System (GIS). The holding sizes within the Shire were categorised and mapped. The Shire was inspected from the air in a light plane, which provided a valuable perspective on the issues such as catchments, vegetation and conflicting landuses. A detailed description of the methodology for the landuse survey is contained in Appendix 2.

Input has been given by the Community and the State Government Departments through formal and informal discussions. In addition, a series of community consultation meetings and target group workshops were held. These included farming, water users and the business sector.

Chapter 2: Development and Planning Issues

2.1 Introduction

This chapter presents a discussion of the issues that have to be considered when planning for the future of the Shire. They have been discussed in detail in the *Forbes Shire Comprehensive Land Use Strategy Issues Paper*.

The *Forbes Shire Comprehensive Land Use Strategy Issues Paper* provides a detailed description of the existing social, economic and environmental attributes of the Shire. This document has been separately published. It covers the following matters:

- Public Participation
- Existing Environmental attributes
- Demographic Analysis
- Infrastructure
- Environmental Hazards and Policy Responses
- Legislative Framework
- Existing Land Use
- Agriculture
- Rural Residential
- Urban Residential
- Commercial and Industrial
- Other Significant Land Users.

The table of contents of the Issues Paper is provided at Appendix 3. Reference should be made to the Issues Paper when reading this Strategy.

2.2 Key Issues for the Future

It should be stressed that, although it is a key issue, land use is not the only one to be addressed. There are a range of social, environmental and economic issues that have to be considered in conjunction with the future land uses.

The main issues affecting areas like Forbes Shire are the need to preserve the environment and manage land use in the catchment, strengthening the economy of the town and rural area, the retention of agriculture and the pressure for subdivision of agricultural areas for lifestyle living lots and increasing the population base.

The increasing trend towards the fragmentation of productive agricultural land across NSW is affecting its capability to produce agriculture in a sustainable manner. Once viable farming units are now being made into smaller less viable units and the use changed to residential type uses with no realisation about the impacts of this on such issues as land degradation, rural land use conflict or the cumulative impact of the loss to production of this good agricultural land. This trend is becoming evident in Forbes Shire. It should also be noted that fragmentation also affects commercial forestry and mineral exploration because of rural land use conflict.

Growth management strategies can provide a balance between the pressure of urban and rural residential growth and the need to protect this agricultural land from further

fragmentation and alienation. Sound strategic planning is best placed to provide for the future of the Shire.

There is a perception in the community that rural land is land that is in a holding pattern awaiting subdivision for urban or rural residential development or to be converted to some other use. This is not correct. Areas such as Forbes Shire have a vibrant and prosperous rural economy with a diverse community. Agriculture also provides a landscape that creates its own unique character, which when interspersed with the native vegetation and topography create a rural environment which is sought after by tourists which in turn contribute to the Shire's economy.

In order to understand the many issues associated with rural land, it is first necessary to define the terms rural land and rural character. This is a question that has as many answers as there are people who are involved in rural planning. The crudest definition is that rural land is all land that is not urban. However, that is too simplistic for any definition of rural land. Wide open land, farmland, forests, native vegetation, national parks, mountains, rivers, lakeshores, rural villages and rural residential areas all make up the landscape that we describe as rural. It is not any one landform or land use. It is the mixture of them that evokes the term rural land.

Rural Character is a term that is often misunderstood and misused when applied to rural land. The character of a place is the thing that distinguishes rural land from urban land. Rural character is made up of a number of components – the one thing they have in common is the feeling of openness. They include the following: open spaces, agriculture, grazing animals, market gardening, plantations, cropping, sheds, vegetation (trees, shrubs and grasses) – both native and exotic, houses and outbuildings, varying topography including rolling hills and steep gorges, rivers and streams. (Sinclair, 1999)

There are 2 broad forms of rural subdivision:

- Subdivision for farming purposes
- Subdivision for rural residential purposes

Subdivision for farming purposes will create lots that can be large enough to be used as a farm and is unlikely to cause land use conflict – with adjoining farming and the environment. The size of the lot depends on a number of issues which are discussed in chapter 3. Suffice to say, it depends on the type of farming – intensive agriculture can be sustained on smaller lots than extensive agriculture.

Subdivision for rural residential development purposes will create lots that have a residential basis, not farming.

> *"The residential use of rural land is called rural residential development; that is, people live on rural lots, but use the land primarily for residential rather than agricultural purposes. Although some engage in 'hobby farming', most derive their income from pursuits not carried out on the land. The main distinction between urban housing and rural residential housing is bigger lot size and larger distances between dwellings. This creates a sense of openness and of living in the landscape rather than in an urban area.*

> *Rural residential development can be divided into two main categories: rural fringe and rural living. Rural fringe development is characterised by single detached houses and dual occupancies on lot sizes of approximately 4000 square metres to 1 hectare laid out in an estate. This estate usually joins or is in close proximity to an urban area. Rural living, on the other hand, features single detached houses and dual occupancies on lot sizes between 1 hectare and 40 to 100 hectares and can adjoin farmland or vegetated areas. People living on these lots use the land primarily for residential purposes, although they may graze some cattle or have horses. This requires lot sizes of more than 2 hectares if land degradation is to be avoided. The lots do not adjoin townships or villages and are scattered throughout the rural landscape."* (Sinclair and Bunker, 2007 pp 163-164)

The land use survey showed that both of these are apparent in the Shire and that they are found mostly around Forbes. The rural fringe areas are currently zoned as rural 1(c) and they are located around the town of Forbes. Rural living uses are scattered throughout the rural area but are found closer to the town of Forbes. They have varying lot sizes ranging from approximately 2 ha to 40 ha.

The relevant issues for this Strategy can be grouped into 2 broad headings of:

- Environmental opportunities and constraints; and
- Social and economic factors

Underlying all of the issues is the philosophy of Ecologically Sustainable Development (ESD) and Total Catchment Management (TCM). It is shown graphically in Figure 2.1. The arrows on the figure show that all of the issues are interrelated and one cannot be considered in isolation from the other.

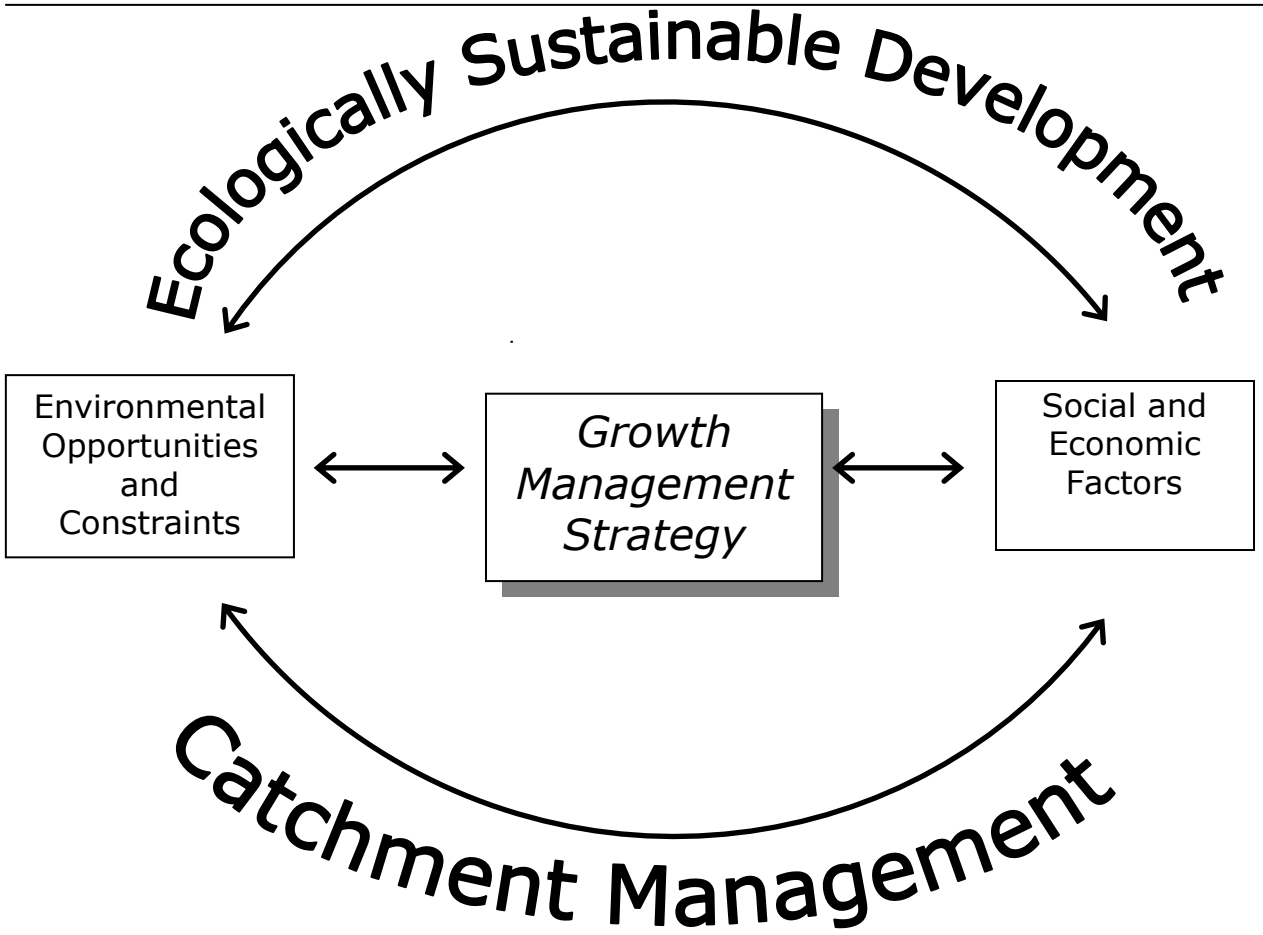


Figure 2.1: Issues and Themes for the Growth Management Study
Source: Sinclair 2002d

The *Forbes Shire Comprehensive Land Use Strategy Issues Paper* has dealt with the issues that have to be considered to achieve a sustainable outcome for the rural Shire. Each of the issues needs to be addressed in order to provide for a sustainable future for the Shire. They are outlined below:

Environmental Opportunities and Constraints

- Water Catchments
- Land degradation
- Native vegetation and biodiversity
- Topography
- Soils
- Landscape Character
- Bushfire hazard
- Flood prone land
- Salinity
- Contaminated land
- Weeds

Social and Economic Factors

- Land use
- Agriculture
- Forestry
- Non-agricultural uses (including mining)
- Rural Land Use Conflict
- Economic Development
- Tourism and recreational activities
- Extractive industry
- Agricultural water supply
- Urban growth
- Rural residential development
- Settlements
- Heritage
- Emerging social issues
- Infrastructure

2.3 Physical Constraints for Development

When considering the future development of an area, it is necessary to identify the constraints that have to be taken into consideration when identifying the land to be considered for development in the future. The main constraints for Forbes are as follows:

- Flooding
- Vegetation including riparian vegetation
- Water quality
- Salinity
- Slope
- Land degradation
- Groundwater
- Sewage Treatment Plan, Water Treatment Plant and Waste Disposal Depot
- Mineral Deposits

All of these (except for the groundwater vulnerability mapping which has recently become available) have been addressed in the *Forbes Shire Comprehensive Land Use Strategy Issues Paper* and it is not intended to discuss them in detail. Mapping has been done in a more comprehensive manner recently, especially flooding, groundwater vulnerability and vegetation. The flooding maps were prepared by Sinclair Knight Partners for the Forbes Shire Flood Management Study and the vegetation and groundwater vulnerability mapping has been prepared for the Lachlan Catchment Management Authority by the former Department of Natural Resources. Unfortunately there has not been any comprehensive salinity mapping done and so this is not able to be shown. Slope is not considered to be a constraint for the land immediately surrounding Forbes.

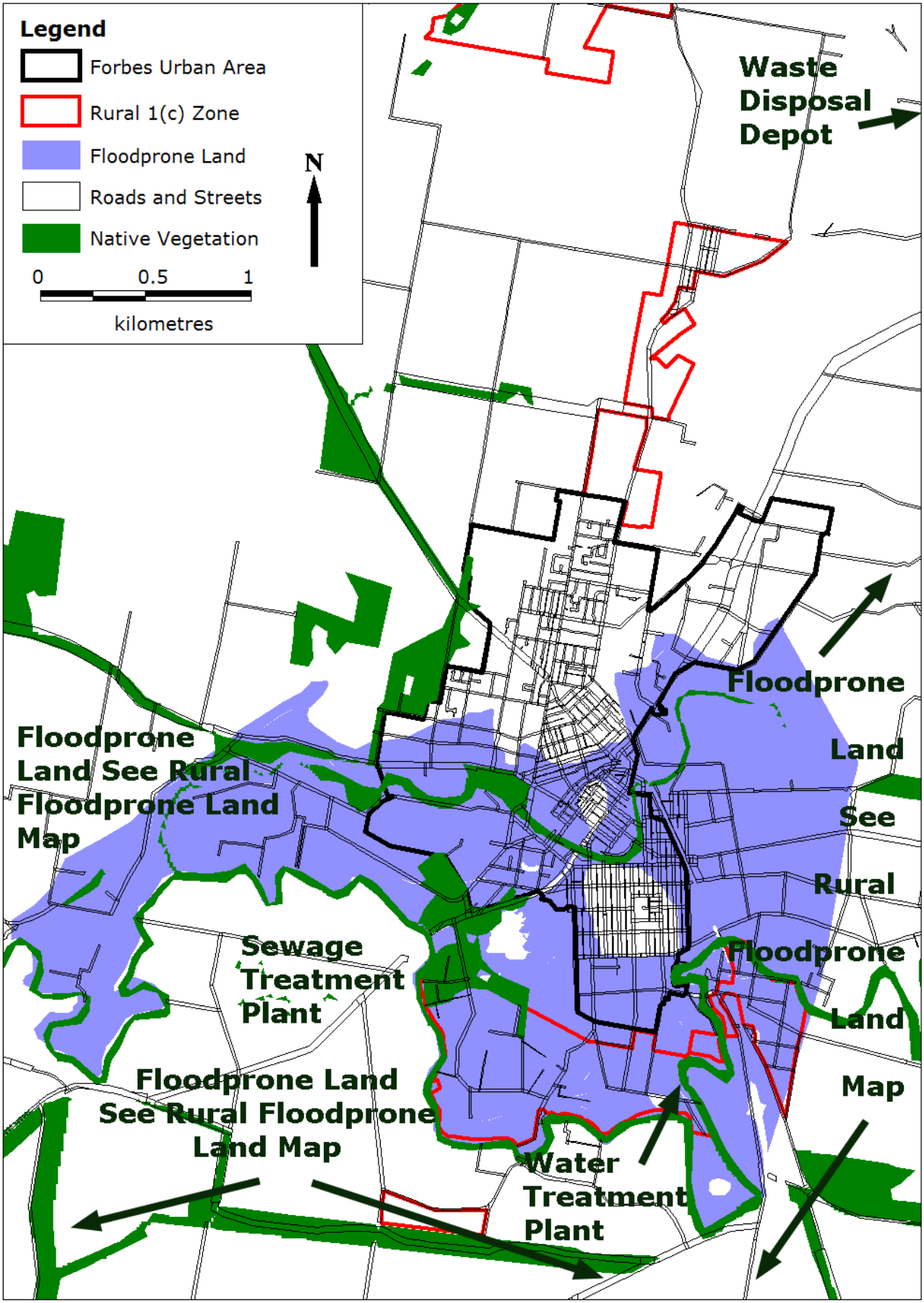
The purpose of identifying the constraints is to ensure that areas of future development take into account these constraints and do not exacerbate them. In short, future development should avoid areas which are floodprone and have high and moderately high groundwater vulnerability. Areas of significant vegetation should also be taken into account as well as salinity issues.

The Forbes Shire has had a long history of mining, particularly for gold, both alluvial and hard rock sources, mainly around the town of Forbes. There is also gold and copper potential in the southwestern part of the Shire. Construction materials are found throughout the Shire and dimension stone potential exists in the southeast and east. This is a constraint to development because of the potential to sterilise the resource by putting development on the land. It is noted that DPI Minerals are preparing a comprehensive resource audit of NSW and this should be available for Forbes Shire towards the end of 2009. This matter has been considered in the assessment of land for future development outlined in chapter 4.

Maps have been prepared for the town of Forbes as well as the Shire as a whole. Map 2.1 shows the flooding and vegetation for the town of Forbes as well as the location of the Sewage Treatment Plant (STP), Water Treatment Plant (WTP) and Waste Disposal Depot (WDD). It can be seen that the STP and WDD are located away from the urban area. The WTP is located on the river to allow for easy extraction and is located adjacent to playing fields. Map 2.2 shows the groundwater vulnerability map for the town of Forbes and map 2.3 shows the vegetation for the entire Shire and map 2.4

shows the area of maximum recorded flooding which has been extracted from the Forbes Shire Floodplain Management Study prepared by Sinclair, Knight Partners. Map 2.5 shows the groundwater vulnerability map for the Shire. It should be noted that the Vegetation and Groundwater Vulnerability mapping has been prepared at the Catchment wide scale and that when they are enlarged, some level of inaccuracy may be evident so care should be taken when interpreting them in relation to small areas.

It can be seen from map 2.1 that the floodprone land is to the south of the town and that the significant vegetation areas are along the Lachlan River and Lake Forbes as well as on the Travelling Stock Routes and roadsides to the west and northwest as well as some to the east of the town.



Map 2.1: Forbes Town Physical Constraints

Map 2.2 shows the groundwater vulnerability mapping for the town of Forbes and surrounding lands. The maps are to be used as a guide for the location of future development in a area to minimise the impact of development on the surrounding water resources. The Lachlan Catchment Groundwater Vulnerability Map notes document describes the 5 classes of vulnerability as follows:

- **High** vulnerability ranked groundwater resources are found predominantly in the upland to middle catchment along the Lachlan River to about fifty kilometres downstream of Forbes as well as along major tributaries such as the Belubula River and Mandagerry Creek. This classification has the characteristics of predominantly alluvial aquifers coupled with shallow watertables, high-moderate recharge potential and permeable soils. Other areas include the fractured rock areas west of Goulburn and sporadic fractured rock areas in the upland part of the catchment where the interaction between surface water and groundwater plays an important role in baseflow to streams. Small areas of high groundwater vulnerability in the western areas are associated with prior streams and permeable soils near Booligal and north of Lake Brewster.
- **Moderately high** vulnerability ranked groundwater resources are found in similar terrains as the *High* vulnerability class where high recharge potential, depth to watertable, geology and Vadose Zone play a very important role. These areas extend from the upper catchment all the way down to the southern edge of the catchment with minor discontinuities upstream of Lake Cargelligo and downstream of Hillston. The fan-shaped area west of Lake Brewster to Hillston is believed to be the major recharge area to the unconsolidated sediments of the Murray Basin; hence this area should be afforded a greater level of protection. This class is limited in the upland catchment to close proximity to major tributaries but broadens when slopes become flatter and deposits of alluvial sediments widen. Fractured Tertiary basalt terrain south of Orange and fractured granite terrain around Young also falls into this class as these areas are locally recharged through direct infiltration from the surface, and have seasonally variable watertables. Although saline watertable conditions prevail along the Bland Creek, the shallow nature of these watertables influences groundwater vulnerability in and around Nerang Cowal and Lake Cowal.
- **Moderate** vulnerability ranked groundwater resources are quite prevalent in the Lachlan Catchment. These areas include much of the unconsolidated sediments and colluvial cover west of Condobolin where low slope, relatively deep watertables and soil permeabilities are moderate to slow. In the upland areas, side slopes (2.10 %), deep watertables and fractured rock terrain are the dominant factors affecting this vulnerability class.
- **Low to moderate** vulnerability ranked groundwater resources along with *Moderate* make-up the largest areas of vulnerability in the Lachlan catchment. In the upland and middle catchment this class is characterised predominantly by moderate to steep slopes, deep watertable and fractured geology of meta-sedimentary and granite terrains. In the western half of the catchment, permeability, depth to watertable and the low potential for recharge play an important role. These characteristics also encompass the overlying alluvial sediments of the Murray Basin (West of Hillston) where the presence of clay rich mineralogy affects the permeability of these sediments.
- **Low** vulnerability ranked groundwater is the smallest in area of all the groundwater vulnerability classifications, this class is predominantly

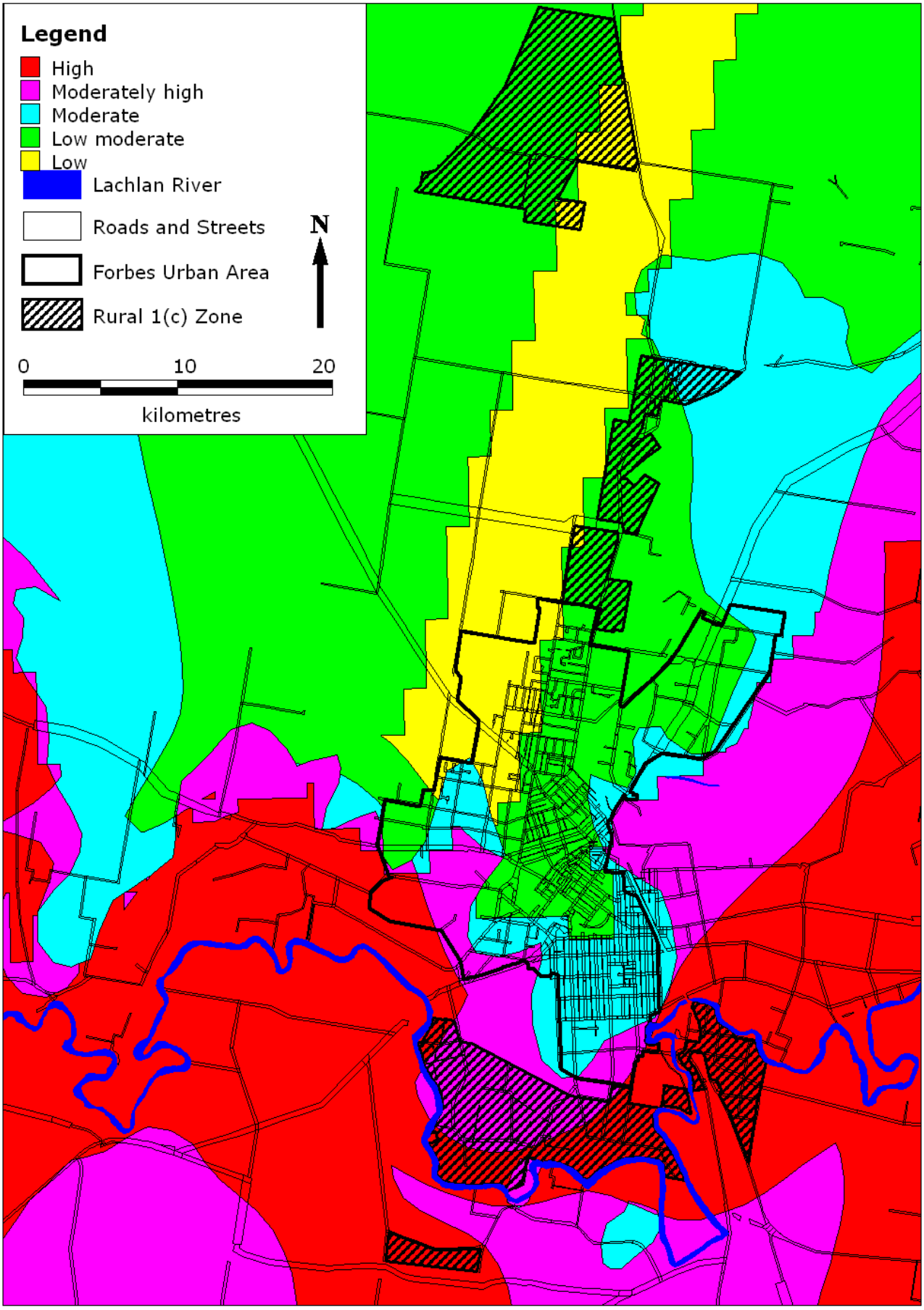
characterised by very steep slopes, deep watertables, low recharge potential and fractured metasedimentary and/or granite geology.

It can be seen from map 2.2 that the high and moderately high groundwater vulnerability areas are to the south of the existing urban area and along the Lachlan River. The areas of moderate groundwater vulnerability are south of the Lake and along the Newell Highway to the northeast of the town as well as along the drainage depression on the western side of town. The areas of low and low moderate groundwater vulnerability are to the north and northwest of the existing urban area and include the majority of the urban area north of Lake Forbes.

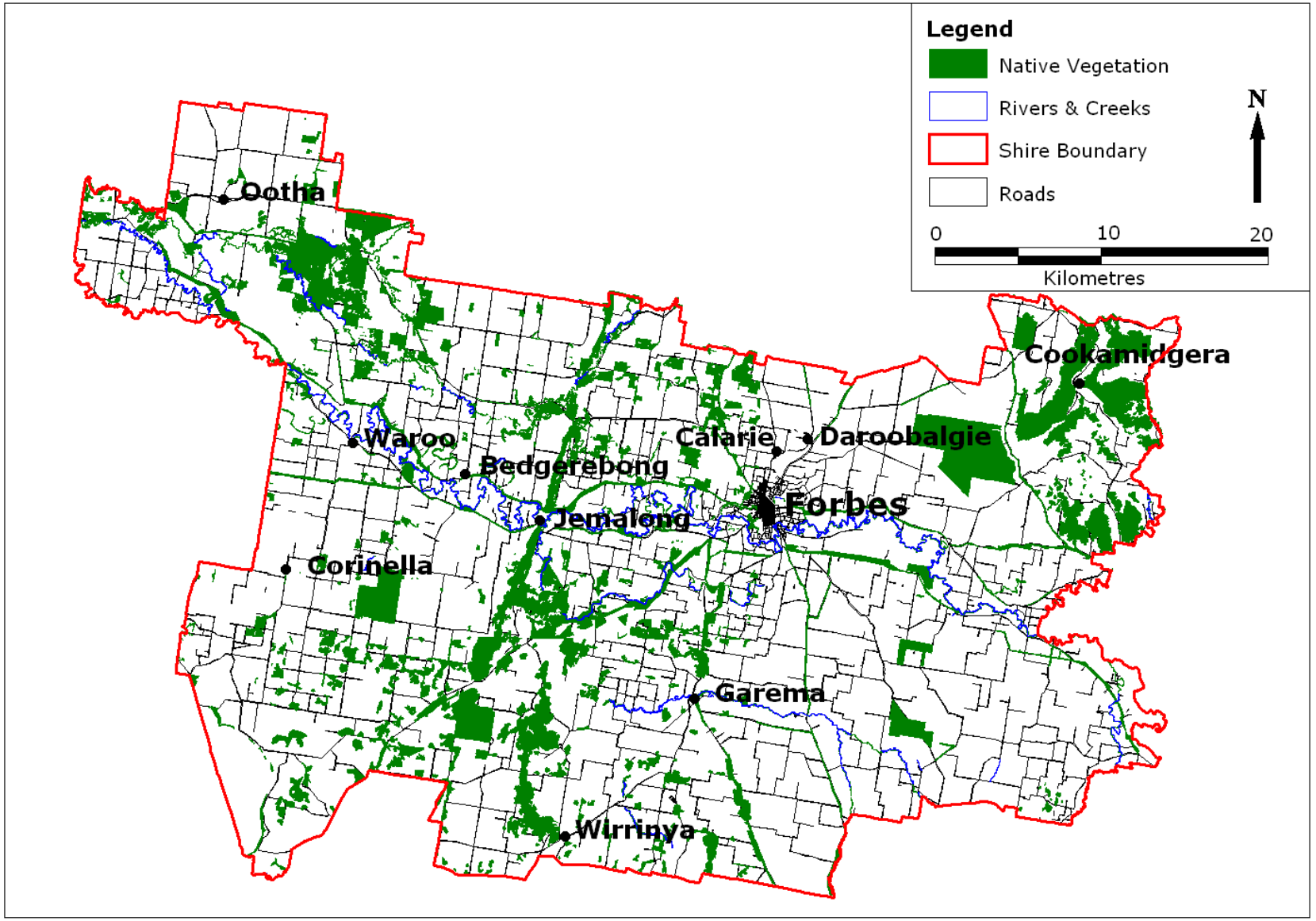
Map 2.3 shows the scattered nature of the vegetation. It is associated with the River and tributaries as well as steep land along the Jemalong Range and in the north east of the Shire. It is also associated with some roadside and TSRs.

Map 2.4 shows that a considerable part of the Shire is floodprone.

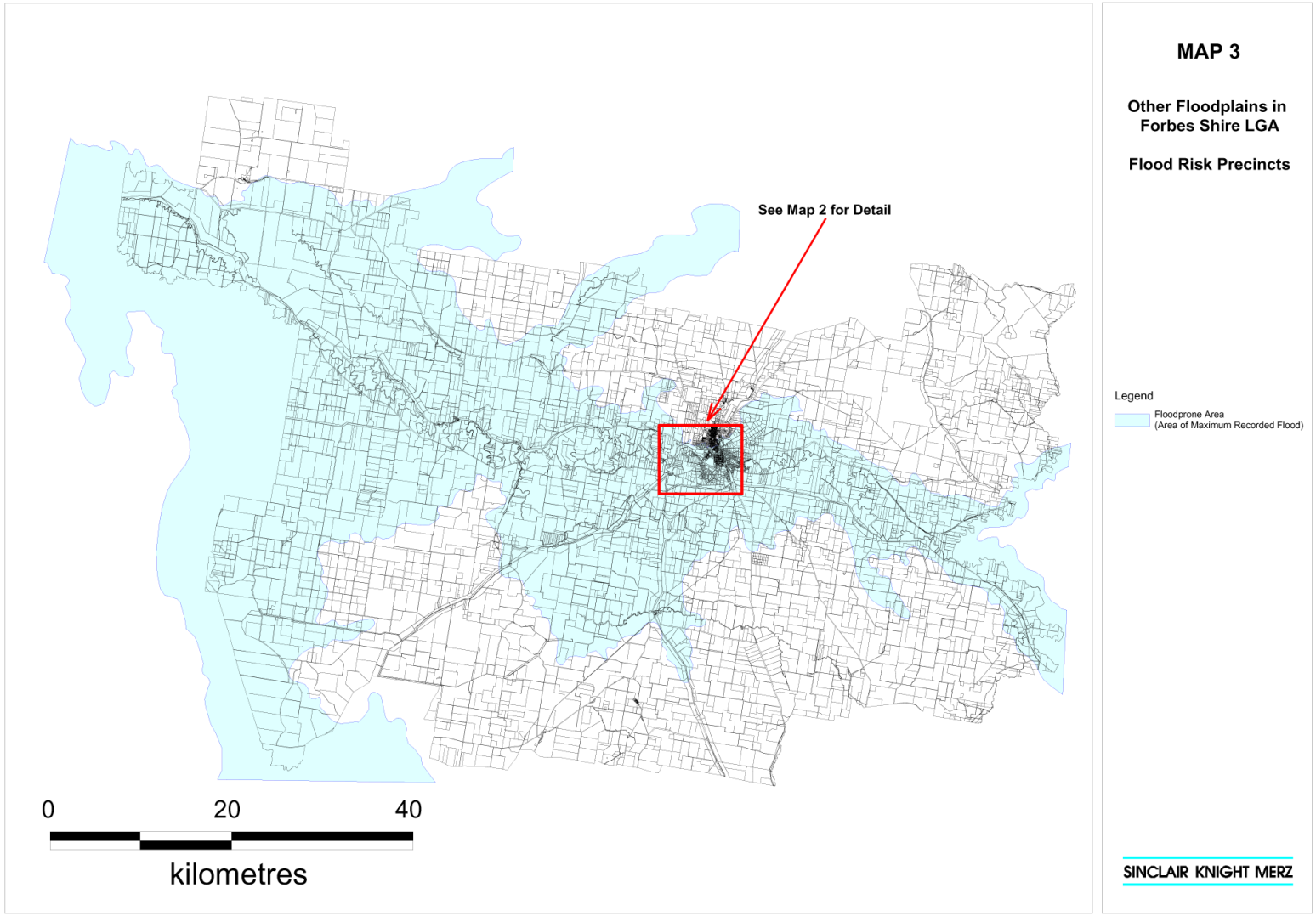
Map 2.5 shows that the areas of high and moderately high groundwater vulnerability follows the Lachlan River and catchment of Lake Cowal. The low and low moderate areas are found in association with the hilly and vegetated land along the Jemalong Range and in the northeast. The moderate areas cover the rest of the Shire.



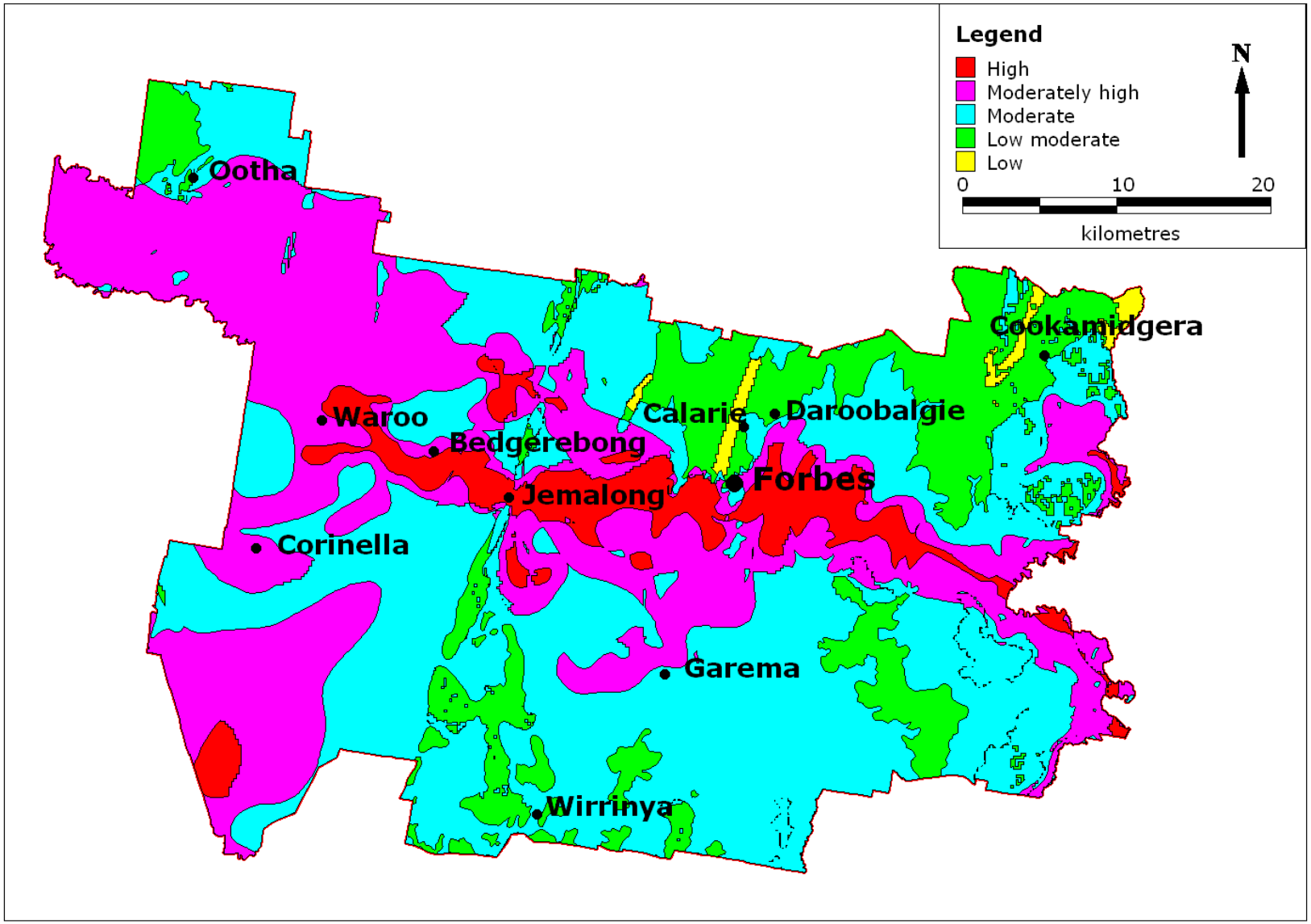
Map 2.2: Forbes Town Groundwater Vulnerability



Map 2.3: Forbes Shire Vegetation



Map 2.4: Forbes Shire limit of known flooding



Map 2.5: Forbes Shire Groundwater Vulnerability

2.4 Environmentally Sensitive Areas

The Departments of Environment & Climate Change, Primary Industries and Water & Energy have prepared a set of maps of environmentally sensitive areas to aid in the management of natural resources. This set of spatial information has been provided to assist Councils to identify environmentally sensitive land.

The maps show the location of areas which have significant land, water or biodiversity constraints. Development should avoid these environmentally sensitive areas and the maps can be used as a strategic tool when identifying areas for more intensive development – urban and rural residential as well as rural dwellings.

The Environmentally Sensitive Land maps can also be used when assessing development applications. The maps identify land that may require further assessment or investigation or that should be avoided.

The Environmentally Sensitive Land has been grouped into 3 categories of land, water and biodiversity. The mapping has been provided by Departments but its accuracy cannot be guaranteed for detailed application for overlays or zoning purposes in a LEP. It is understood that they have been prepared from base mapping that was captured some years ago using paper mapping and has not yet been verified or checked for accuracy using satellite or aerial photography. This means it cannot be used for zoning or overlay purposes because of the potential legal issues involved with using inaccurate mapping in a LEP which will create land use controls on land. However they are useful as a guideline for determining basic constraints which can be further investigated or as a guide in assessing a development application. The mapping will be considered by Council when it is preparing its DCP. It is considered that the DCP is the most appropriate document to place the information as it is meant as a guideline for the assessment of development applications. The mapping will provide guidance to Council when assessing applications, especially where more information may be required.

2.5 2006 Census of Population and Housing

The 2006 Census of Population and Housing data initial release of data occurred on 27 June 2007. The limitations on the data release do not allow for a comprehensive demographic profile. One major issue is that they have only been released as whole Shire data and not individual collector district which does not allow for separate analysis of the town of Forbes. The key indicators of population, occupied private dwellings and occupancy rate have been analysed.

The main points to be made are as follows:

- The population of the Shire was 9,360 in 2006 which is a decrease of 347 people from 2001.
- There were 3704 occupied private dwellings which is an increase of 44 dwellings from 2001.
- The occupancy rate (number of people per household) for the Shire was 2.53 which is a decrease from 2.65 from 2001.

These figures need to be considered in conjunction with each other. Figure 2.2 shows the population change from 1986 to 2006, figure 2.3 shows the dwelling change and figure 2.4 shows the how the occupancy rate has change between 1991 and 2006.

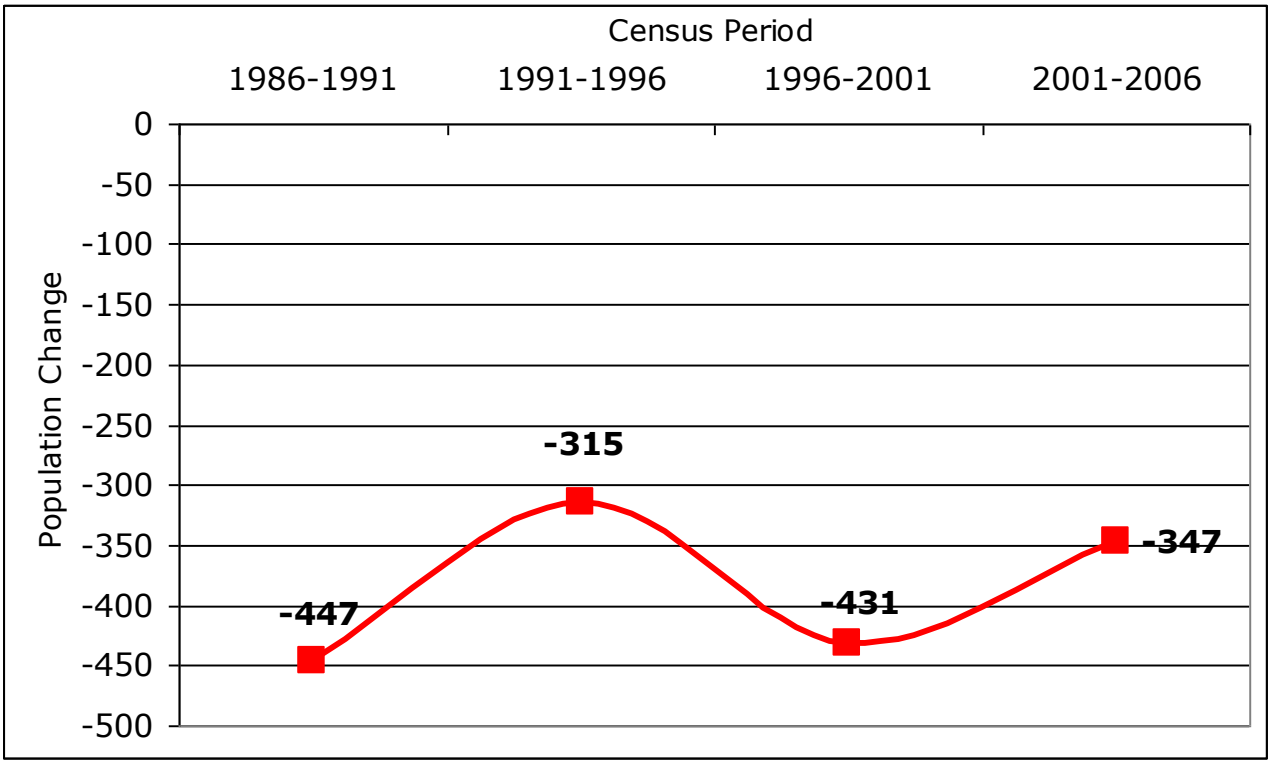


Figure 2.2: Population Change 1986 – 2006
Source: ABS Census of Population and Housing

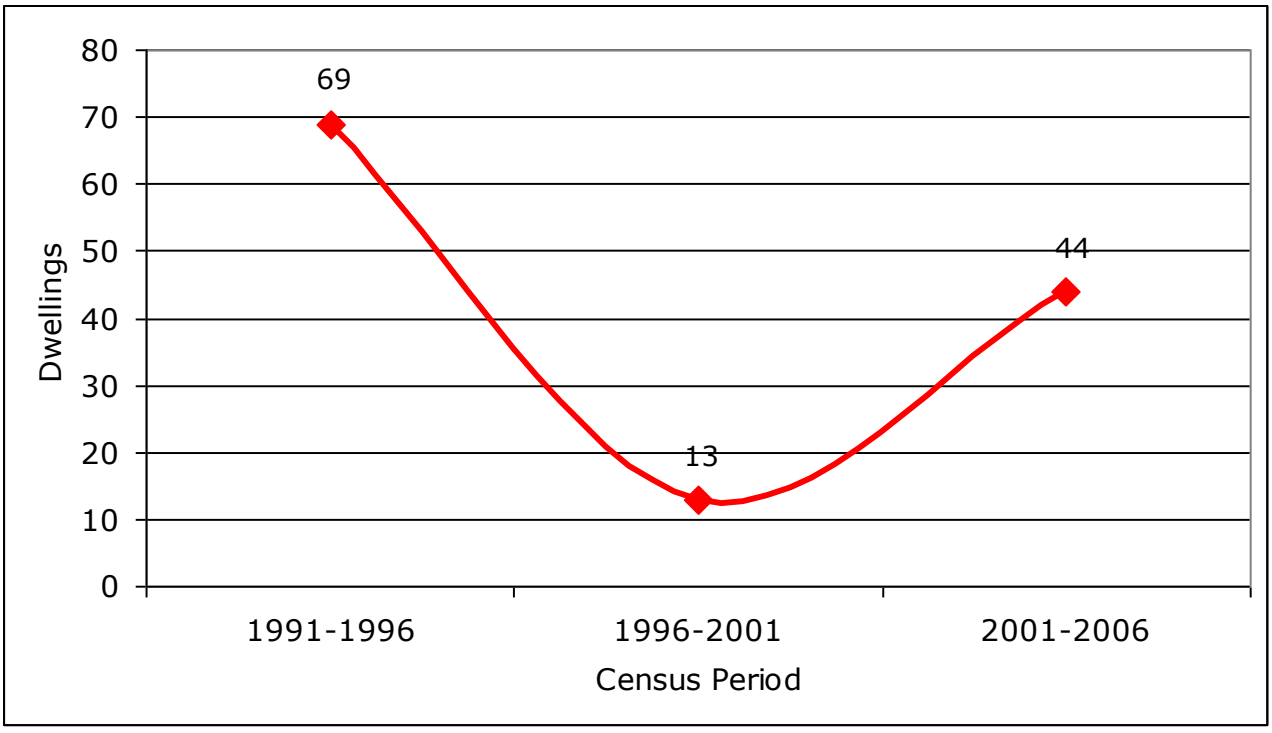


Figure 2.3: Dwelling Change 1991 – 2006
Source: ABS Census of Population and Housing

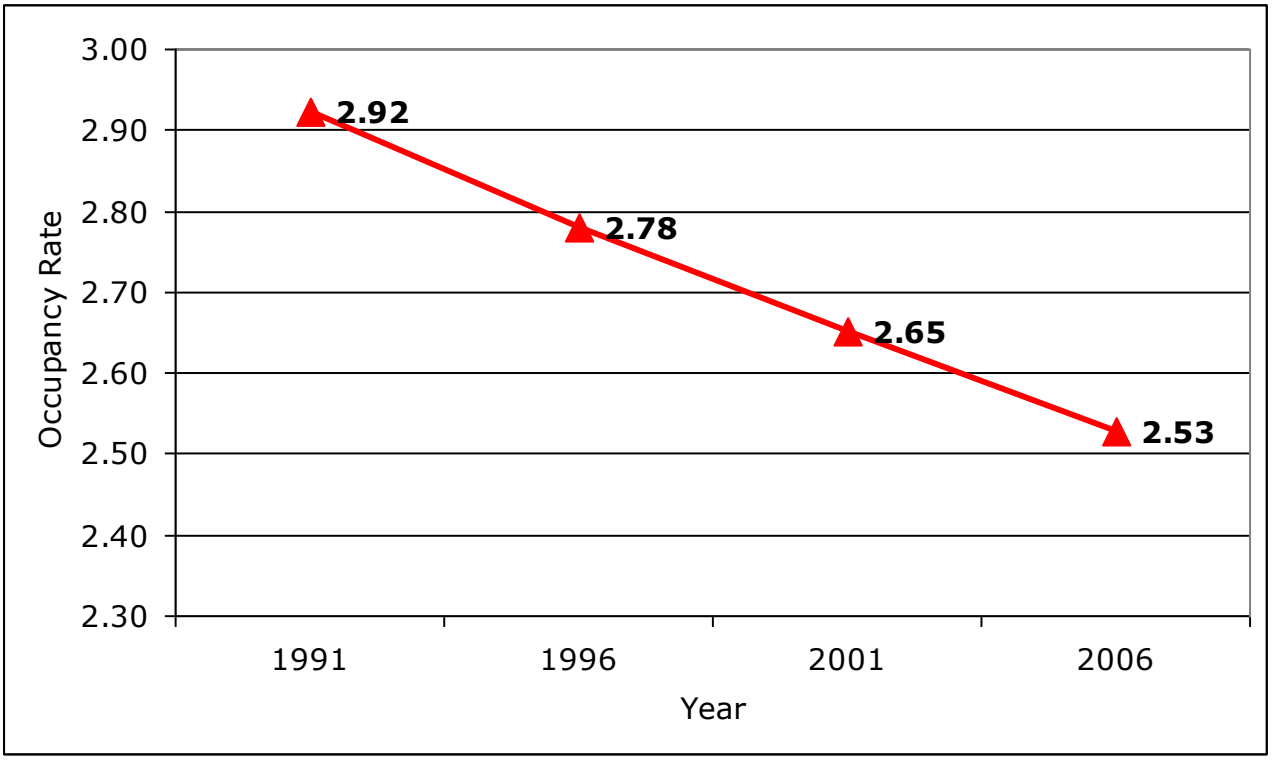


Figure 2.4: Occupancy Rate Change 1991 – 2006
Source: ABS Census of Population and Housing

The data can be explained by the following points:

- The population shows negative growth but this is not as high a number as 2001 and a trend of increasing population can be discerned;
- The impact of the drought is one reason for the decline in population. Figure 2.2 shows the cyclical change in population relates to the drought years of the early to mid 1980s and the most recent drought.
- The data is for the entire Shire and it is possible that the rural areas have lost population and the town of Forbes has increased;
- The occupied private dwellings are considerably higher than 2001;
- As with the population, it is possible that the rural areas have got more unoccupied private dwellings and the town of Forbes has more occupied private dwellings;
- The occupancy rate is declining which means that more dwellings will be needed each census to house the population;
- Other indicators like the number of vacant shops in the Main Street have not increased and new businesses are opening in the commercial centre and industrial area;
- There has been an exceptionally bad drought for a number of years and this has had an impact on all Shires throughout the State and Nation.
- Overall, it can be said that the outlook for the Shire and town shows an increasing economy and population base.

Chapter 3: Community Consultation

3.1 Introduction

Community consultation is an integral component of the project. Consultation gives the Council an opportunity to listen to what the community desires for the future of the area as well as allowing the Council to explain to the community the development issues and wider context of policy development within the region and NSW. It is also important to recognise that the community is vitally interested in the future of the area and as such should have input into the development of policies for the future. The Council sees community consultation as a major component of the Strategy.

A number of public meetings and targeted workshops have been held with the community since the commencement of the project in 2004. These included the following meetings in late 2005:

- Inception meeting
- Values, Likes / Dislikes and Visioning meeting
- Government Agencies Meeting

These meetings culminated in the exhibition of the Issues Paper at the end of 2005.

There have also been 4 specific interest workshops to develop this strategy. They were as follows:

- Business and Industry Sector Workshop – 21 February 2006
- Environmental and Water Issues Workshop – 21 February 2006
- Farming Sector Workshop – 21 February 2006
- Community Workshop in Forbes – 6 March 2006

The 3 focus group discussions consisted of 5 – 10 invited participants and general community workshop was open to the entire community and there were in excess of 60 people in attendance. It focused on the issues for the town of Forbes and the rural areas.

It is important to engage the community in a way that allows them to identify the issues that affect the Shire as well as suggesting ways in which these issues can be addressed as possible outcomes. Consultation with the community is important as well as with the surrounding Councils and the State Government and infrastructure providers.

The community workshop used a technique of group consensus. The attendees were seated at tables in groups of 4 to 6 with other people from the same area. This enabled group discussion of the issues and provided a group focus for the workshop. Following the group discussion feedback from each table was written down on butcher's paper and shared with the rest of the workshop participants.

The workshop was facilitated by an independent facilitator who gave an overview of the workshop.

> *"Tell me and I'll forget,*
> *Show me and I may remember,*
> *Involve me and I'll understand"*
> Anon.

The next step in the workshop was to ask the participants to think about their vision for their part of the Shire in 10 to 20 years time. Questions to be answered to help define this vision were as follows:

- Should the town be planning for growth?
- Are there any services or facilities that you need in your area?
- What types of economic development should the Council focus on?
- Are there any environmental attributes that should be conserved? What are they?
- What types of future land uses would you like to see?
- Are there any uses that are inappropriate? Which ones?

The participants were encouraged to write down their own individual answers to these questions to identify for themselves their own vision. Then people were asked to discuss their vision within the group around their table to come up with a group consensus and to write the group consensus views down on the butcher's paper provided. These were then shared with the whole workshop by a group spokesperson.

The participants were then asked to consider the Action that could be taken to achieve the vision. They were asked specifically what they as a community could do to achieve the vision and what the Council could do. These were also written down on the butcher's paper and presented to the whole workshop.

In addition to the workshop participants providing their comments on the vision and Action for the future of the Shire, a technique was used to provide the Council with feedback on particular photographic images of elements of the Shire. The photographs were mounted on pieces of paper, which were placed on the walls. Participants were asked to write what the photographs meant to them on the paper surrounding the photographs during the workshop.

3.2 Workshop Outcomes

The detailed outcomes of the workshops are provided in Appendix 4. There are a number of themes that run through the workshop responses, which are listed in no particular order below:

- Manage Growth
- Tourism
- Rural residential and urban development
- Development to north and north west
- Rural residential on larger lots to south in floodprone land
- Development out of floodprone land
- Manufacturing
- Promotion of town and district
- Economic development through health and lifestyle
- Preserve agricultural land
- Support local businesses
- Better access to Sydney – improve road
- Aged care facilities
- Education – all levels

- Agribusiness
- Public transport –rail and bus
- Healthcare facilities
- Heritage
- Lake Forbes and Lachlan River
- Mix of land uses
- Positive attitude from community
- Participate and be proactive
- Water supply for town and agriculture
- Maintain minimum rural lot size at 40 ha
- Links to Parkes
- Communication
- Festivals
- Environmental improvement
- Encourage 'grey nomads'

The photo board technique was used to find out the community's views on a number of images that are representative of the Forbes Shire.

The images included:

- Hospitals
- Heritage buildings.
- Subdivisions
- Agricultural uses.
- Tourist uses
- Commercial uses
- Main Street
- Lake Forbes
- Industrial Uses
- Saleyards.
- Community facilities and schools.
- Shops.

The detailed responses from each of the photo boards is included as Appendix 4. As a general statement it can be said that the community wants to preserve heritage buildings and maintain the rivers and waterways, community facilities and schools. Existing agricultural uses should be encouraged. Existing shopping centres should be maintained and improved. Agricultural land should be preserved and economic development should focus on industrial uses. Tourism should be encouraged with more improvements made to the urban design of the town and its entrances.

Chapter 4: Strategic Environmental Analysis

4.1 Introduction

The urban and rural lands of Forbes Shire provide an important resource for the Shire as well as the wider region. This consists of a number of components:

- Productive Agricultural Lands
- Rural Landscapes
- Native Vegetation
- Habitat linkages
- Living Areas – towns, villages, rural residential and farm housing.
- Rivers and creeks as well as other water bodies

Each of these is important in its own right but it is the sum of them that provides the resource for the future.

This chapter presents a strategic environmental analysis of the issues identified in chapter 2 of this document as well as the separately published *Forbes Shire Comprehensive Land Use Strategy Issues Paper*. It discusses options that can be pursued as part of a strategy for the future. In essence, this chapter sets the framework for the Growth Management Strategy.

A strategic environmental analysis is an assessment of a set of strategic options. It can be defined as the formalised, systematic and comprehensive process of evaluating the environmental impacts of an action and its alternatives. (Therivel et al)

> *"Strategic environmental assessment is the term used to describe the application of environmental assessment to various stages in the planning process that occur prior to the consideration of specific projects. It may be given another name, depending on the nature of the planning stage involved.*
>
> *Regardless of the terminology used, strategic assessment primarily differs from project-specific assessment in terms of scale and timing. In regard to scale, strategic assessment:*
>
> > *i) incorporates a number of potential developments as opposed to a single project;*
> > *ii) considers a broader range of alternatives;*
> > *iii) involves a wider geographic area; and,*
> > *iv) addresses environmental impacts at a more aggregated level.*
>
> *In terms of timing, the period between the conduct of a strategic assessment and the resulting environmental impacts will be longer than is the case with project-specific assessments."* (OECD, 1999 p5)

In a recent book published by the United Nations Development Program (UNDP) and the Organisation for Economic Cooperation and Development (OECD) titled

Sustainable Development Strategies – A Resource Book, sustainability is described as being all about achieving "... positive economic and social development, with out excess environmental degradation, in a way that protects the rights and opportunities of coming generations and contributes to compatible approaches elsewhere." (Dalal-Clayton and Bass, p5). There is a need to take a strategic approach in order to achieve a sustainable outcome. This also needs to be " ... both long-term in its perspective and integrated or joined up in linking various development processes so that they are as sophisticated as the challenges are complex." (Dalal-Clayton and Bass, p6).

> *"At the heart of the concept is the belief that social, economic and environmental objectives should be complimentary and interdependent in the development process. Sustainable development requires policy changes in many sectors and coherence between them. It entails balancing the economic, social and environmental objectives of society- the three pillars of sustainable development - integrating them wherever possible, through mutually supportive policies and practices and making trade-offs where it is not."*(Dalal-Clayton and Bass, p12).

This is described in figure 4.1.

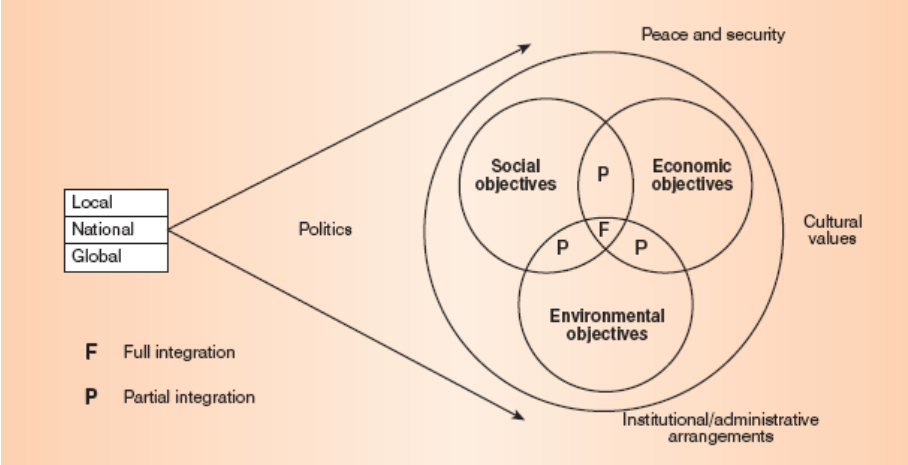


Figure 4.1: The System of Sustainable Development
Source: (Dalal-Clayton and Bass, p12).

Dalal-Clayton and Bass have described the practical outcomes of sustainable development processes in 2 categories:

1. *Institutions and mechanisms which produce decisions to balance social, economic and environmental objectives, and which ensure that they are implemented. For example: particular planning and policy processes and procedures such as environmental impact assessment and stakeholder participation.*
2. *Activities on the ground which add good environmental, social and / or economic practice to what might otherwise have been narrower goals. For example: new forms of natural resource management or integrated development projects.* (p12)

In achieving sustainability, there is a need to recognise the complimentary complexity of the issues – are all linked to each other and the policy responses need to be holistic and multi faceted and not single issue focused.

The following sections provide a discussion of the options available to achieve a sustainable future for the Forbes Shire. The discussion builds on the discussions in the previous chapters as well as the separately published *Forbes Shire Comprehensive Land Use Strategy Issues Paper*. They will lead onto the strategies for the future. It is acknowledged that land use is a key aspect of any strategy for the future of the Shire, however to achieve a sustainable outcome and ensure that all issues are addressed it needs to address a number of other interrelated matters. These can be grouped into 10 headings – 5 under the Social and Economic factors categories and 5 under the Environmental Opportunities and Constraints categories outlined in chapter 2. They are as follows:

Social and Economic Factors	Environmental Opportunities and Constraints
▪ Growth Management	▪ Water Catchments
▪ Land Use Planning	▪ Ecological Management and Biodiversity
▪ Community Services and Quality of Life	▪ Scenic Landscapes
▪ Economic Growth	▪ Heritage and Culture
▪ Infrastructure	▪ Natural Hazards

4.2 Growth Management

Growth Management is concerned with ensuring that the growth of an area occurs in such a manner that addresses the social, economic and environmental aspects – in other words, it is sustainable. It needs to be recognised, however, that managing growth does not mean that all parts of the Shire will grow. One aspect of sustainability is to ensure that adequate regard is taken of the constraints – social, economic and environmental. When the constraints are taken into consideration, it becomes evident that some areas will not have subdivision or growth because of physical limitations (productive agricultural land, flooding, slope, presence of native vegetation, etc) or provision of social services (health, education, community services, etc).

This section will deal with the settlement hierarchy and settlement sustainability.

4.2.1. Settlement Hierarchy

Forbes Shire has one major settlement being the town of Forbes and a number of smaller settlements that range in size from a cluster of houses around a grain silo like Wirrinya to slightly larger settlements like Bedgerebong and Ootha.

There are also a number of areas that have a community hall or bushfire shed which have a vital role as a focal point for the community which lives in the surrounding area.

In order to understand the relationship between the settlements and to provide a strategic context for them, it is appropriate to adopt a hierarchy of settlements. This should be based on the facilities provided in the settlement and the role that it plays, rather than purely population. The shopping facilities that are available are a good starting point. There are three basic shopping trips:

- *Convenience shopping* relates to the daily shopping needs of bread and milk as well as newspapers and emergency purchases not done at other times.
- *Weekly shopping* is for the basic food and household shopping needs and is usually done in a chain supermarket.
- *Comparison shopping* is the shopping trips done for larger items of household and personal items such as whitegoods, furniture and clothing.

A hierarchy of settlements can be based on this as well as other factors and for an area like Forbes Shire should take the following form:

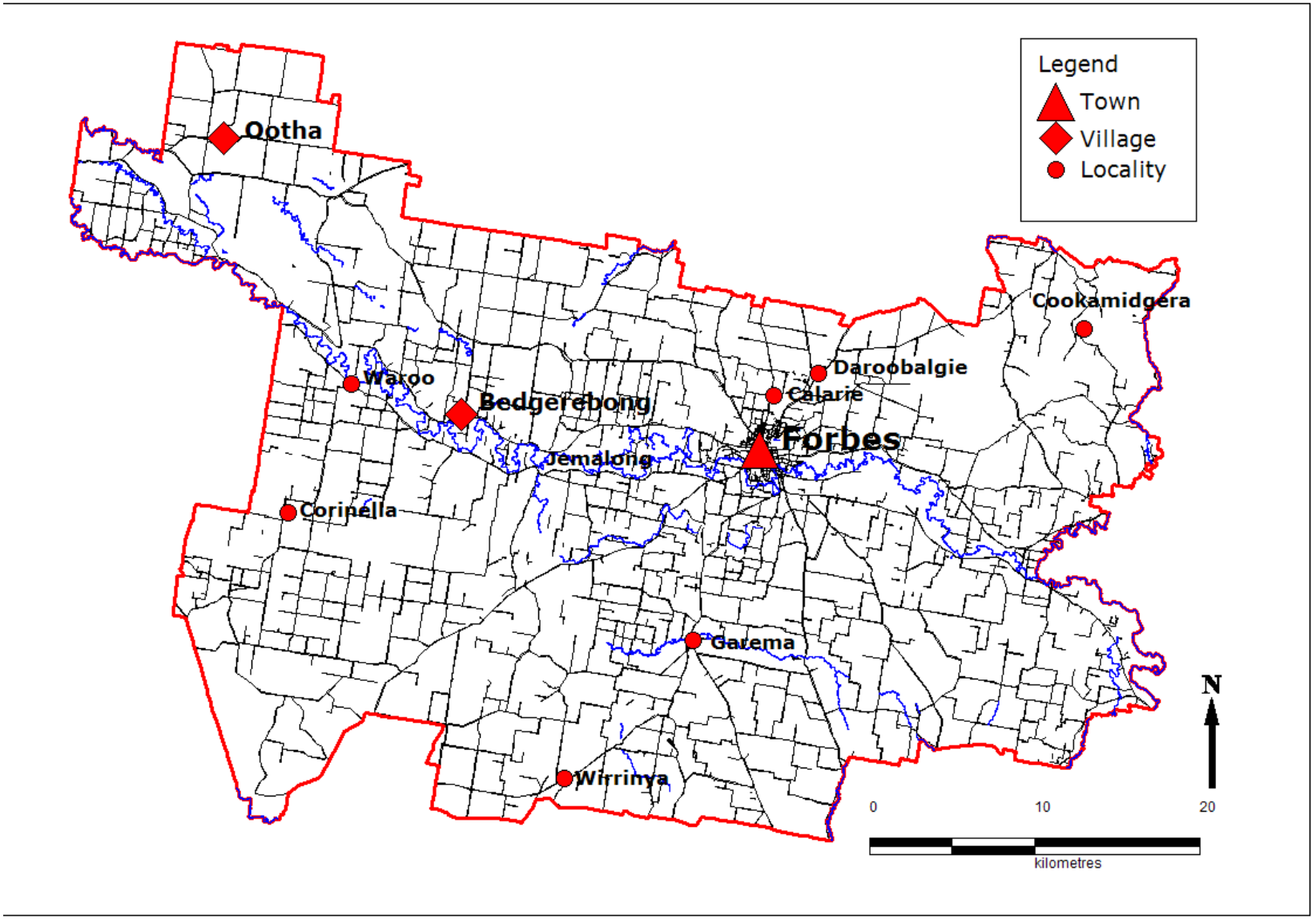
- *Regional Centre* This provides a wide range of employment, entertainment and recreational opportunities, a full range of local services and higher order services such as Major Hospital, TAFE College as well as a high school and major indoor recreation facility and often has a University campus. It also has regional offices of State Government Departments. It has a large mixed commercial area providing service, retail and office uses with a large chain supermarket and a discount department store. It caters for convenience, weekly and comparison shopping. It draws its catchment from the surrounding Local Government Areas and may not be in the Shire.
- *Sub-Regional Centre.* This provides a range of employment, entertainment and recreational opportunities, a full range of local services and some higher order services such as high school and health care as well as a major indoor recreation facility. It has a large mixed commercial area providing service, retail and office uses with a large supermarket and discount department store. It would cater for convenience, weekly and limited comparison shopping.
- *Town.* This provides a range of employment, entertainment and recreational opportunities, a full range of local services and some higher order services such as high school and health care as well as a major indoor recreation facility. It has a large mixed commercial area providing service, retail and office uses with a large supermarket. It would cater for convenience, weekly and limited comparison shopping.
- *Village*. This provides only for convenience needs and typically has only a general store / post office.
- *Rural Locality*. This is a focal point for the surrounding community and usually has a community hall, silo or bushfire shed. There are generally no shopping facilities or other services in this area.

A five-order hierarchy is suggested for Forbes Shire. It is based on the criteria listed above and is as follows:

Regional Centre	➡	Orange and Dubbo
↕		
Sub-Regional Centre	➡	Parkes
↕		
Town.	➡	Forbes
↕		
Village.	➡	Bedgerebong and Ootha
↕		
Rural Locality.	➡	Calarie, Cookamidgera, Corinella, Daroobalgie, Garema, Jemalong, Waroo and Wirrinya

Map 4.1 shows the hierarchy and photos 4.1 to 4.3 show some of the settlements in the Shire.

The purpose of the hierarchy is to acknowledge that some settlements because of their lack of services and facilities are not able to expand. For a settlement to be able to expand, there is a need for basic services and facilities including weekly shopping and a school. The size of a settlement and its ability to expand is also tied to the population in its catchment and smaller settlements. The regional centre and towns are usually able to grow with a mixture of rural residential and urban development subject to constraints and the villages and rural centres, because of the lack of services and facilities don't have the potential to grow.



Map 4.1: Recommended Settlement Hierarchy

Photo 4.1: Forbes– the town
Date of Photo: March 2006

Photo 4.2: Ootha – a village
Date of Photo: March 2006

Photo 4.3: Wirrinya – a rural locality
Date of Photo: March 2006

4.2.2. Settlement Sustainability

In order to ensure that a settlement is sustainable it should not have any adverse impacts on its social, economic and environmental aspects. This means that it should provide for an adequate level of social services and facilities so that the residents can enjoy an appropriate quality of life. It should also provide a broad base of economic activity as well as not causing pollution of surrounding waterways by ensuring that domestic effluent is disposed of in an acceptable manner and other sources of pollution are minimised. It is also necessary to ensure that there is not any significant impact on biodiversity. It should not be in an area susceptible to natural hazards such as on flood prone land or bushfire prone land.

The growth of a settlement can be both within the existing boundaries (infill development) and an expansion of those boundaries. In order for it to be sustainable, the growth should be a combination of both of these.

Having regard to this as well as the matters discussed in previous chapters and the *Forbes Shire Comprehensive Land Use Strategy Issues Paper*, the major issues for the potential of a centre to expand are as follows:

- Ability to provide for social services and facilities;
- Existing form and character;
- Diverse economic base with a range of commercial and retail uses;
- Provision of reticulated water and sewerage;
- Provision of adequate access to the higher order centres (road and public transport);
- Impact on scenic landscape amenity of the surrounding land;
- Presence of unconstrained land surrounding the settlement (no areas of native vegetation and biodiversity habitat, no flood prone or bushfire prone land, no steep land, etc); and

- Supply and demand of residential land.
- Proximity to agricultural uses

It should be noted that any expansion of the town boundaries will involve a rezoning of land. This will have to be accompanied by a Local Environmental Study which will investigate the specific issues in detail. The range of matters to be investigated would include the following:

- Ecological investigation
- Soil analysis
- Salinity investigations including testing to identify salt content (EM31);
- Traffic investigations;
- Drainage investigations;

It should be noted that all of the recommended rezonings in this document will have to have a Local Environmental Study prepared prior to the draft LEP being exhibited.

The provision of *social facilities and s*ervices is crucial for the future of a settlement. People should have access to things like schools, hospitals, community services and facilities. The main services and facilities in each settlement are shown in table 4.1.

Table 4.1: Facilities and Services Provided in each Settlement

Service and Facility	Bedgerebong	Corinella	Forbes	Garema	Ootha	Waroo	Wirrinya	Calarie	Jemalong	Cookamidgera	Daroobalgie
Government Offices			✓								
Hospital			✓								
Council Offices			✓								
Primary School	✓	✓	✓								
High School			✓								
Shopping Centre			✓								
General Store											
Post Office			✓								
Oval	✓		✓								
Community Centre / Hall	✓		✓		✓	✓	✓				
Clubs / Hotel			✓								
Bushfire Brigade	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water Reticulation			✓		✓						
Sewer Reticulation			✓								

* Note: Ootha has a non-potable water supply

The existing form and character of settlements in the Shire can be described as being one town with a few small villages and rural localities. This is one of the unique characteristics of the Shire and contributes to the country town / village atmosphere that was one of the themes that came out of the community consultation as being one of the things that people wanted kept in the future.

A *diverse economic base* is necessary to ensure that the area has sufficient capacity to generate employment. There should also be a sufficient range of shopping facilities within reasonable distance of travel. In addition, there should be a range of other economic activities such as service industrial and some tourism activities.

Water and sewerage reticulation is considered to be necessary. A reticulated water supply allows the residents to have access to a regular and reliable supply of potable water. Provision of reticulated sewerage is considered to be necessary for urban development because of the adverse environmental impacts of onsite effluent disposal on small areas of land.
Settlements should have adequate *access to the higher order centres* and this includes by road using private vehicles as well as by public transport – buses mainly.

The *landscape setting* of a settlement is important. This creates the character of the settlement and adds to its appeal as a living area as well as its tourist potential.

The capability of land to have residential development includes a number of matters. The main constraints are considered to be flooding and presence of native vegetation / bushfire risk. In Forbes Shire, the town of Forbes is affected by major flooding. This puts a major constraint on the future development of the town.

The vacant land stocks also need to be considered. The Issues Paper has provided basic data on the number of vacant lots as well as the subdivision potential of each lot. It can be seen from table 4.2 that there is a considerable amount of vacant land in Forbes. It should be noted that these figures are based on all of the vacant as well as the large lots being subdivided to a minimum of 1,000 m^2. They were prepared for the Issues Paper and can be considered preliminary estimates. A Residential Release Study is being currently being prepared by GHD which has undertaken detailed lot yield estimates for the Moreton St area, which will be outlined later in this chapter (section 4.2.3). The physical constraints (drainage, slope and flood prone land) of the land have not been taken into consideration when deriving the figures and when this has been done, the amount of land may be reduced. Further detailed analysis of the primary urban expansion area are currently being conducted including preparation of a strategy to facilitate its development.

Table 4.2: Forbes Vacant Residential land

Settlement	Total Potential Lots	Growth (Low)	Growth (High)	Supply in Years Low	Supply in Years High
Moreton St	300	20.0	30.0	15	10
North Forbes	100	20.0	30.0	5	3
Bedgerebong Rd	277	20.0	30.0	14	9
West Forbes	100	20.0	30.0	5	3
Camp Hill	30	20.0	30.0	2	1
Total	879			41	26

Source: Land Use Survey and Council GIS

Notes on Table

The above table shows the vacant land and the subdivision potential from each of the lots. This is the total additional lots. It has been derived using a subdivision size of 1,000 m^2 less 25% for servicing. It does not however, account for losses in development potential due to environmental constraints, variations in lot sizes etc. The growth figures have been derived by using the average growth over the past 10 years for the low growth and a higher rate for the high growth rate. This has then been divided into the total subdivision potential to derive the supply of residential land which is shown in number of years.

The supply of vacant land should be considered when assessing the potential for expansion of an urban area.

Demand for residential land can be measured by new dwelling house applications in the settlements. In Forbes, this has been 20 dwellings and 10 multi-unit dwellings on average per year over the past 10 years. It is acknowledged that the population of the Shire has been declining over the past 30 years. Data from the ABS as reported in the KPMG Population Growth Database 2006 and the Regional Population Growth 2007 is reproduced in figure 4.2.

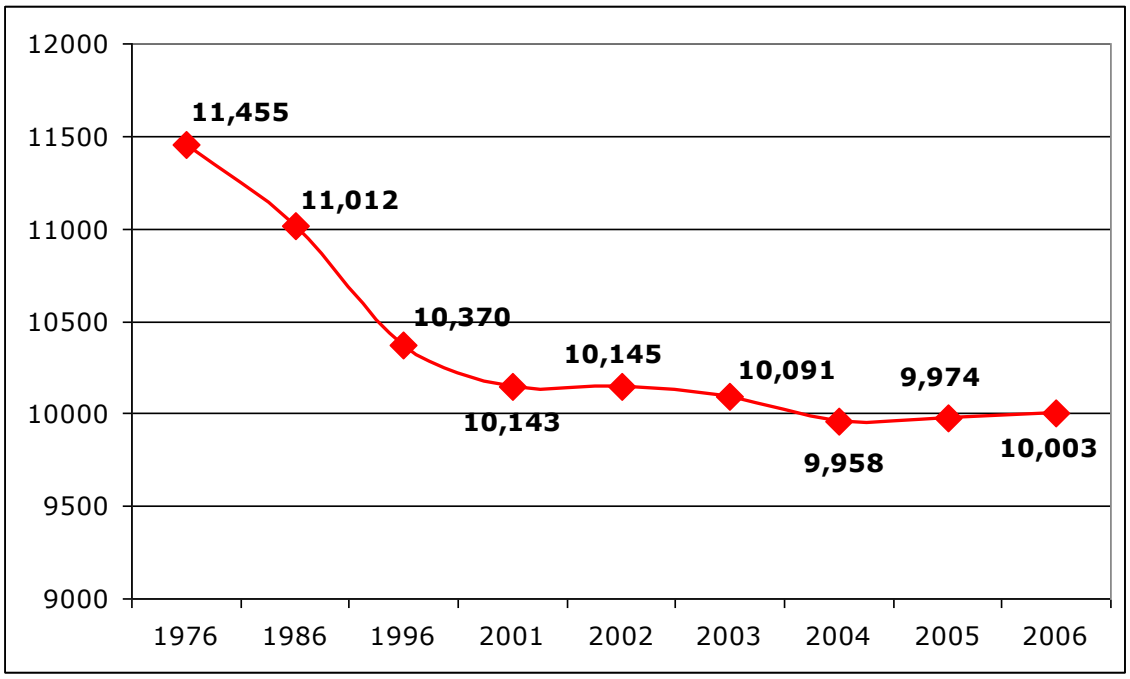


Figure 4.2: Forbes Shire Population Growth 1976 - 2006

Source: ABS and KPMG

The figures shown in this graph show that the population decline has decreased and has shown a small increase in 2004 – 06. However these figures are for the whole Shire. The dwelling growth figures for the town contradict this Shire wide trend. This can be explained by the fact that the population of the rural area is decreasing but the town is showing an increasing population but that the rural population has decreased more than the town has increased. Another reason for this increase in dwellings is that the occupancy rate (the number of people in each house) has decreased since 1976. This means that more houses are needed to house the population. The 2006 Census population data shows that the 2006 population is lower than the estimated population for the Shire. The information provided in chapter 2 is for the entire Shire only and the information has not yet been released to allow for analysis of the rural and urban areas separately (Collector District data). It is considered that the details shown here are adequate for the future as there has been increase in dwelling houses and a fall in the occupancy rate.

The proximity of good agricultural land and agricultural uses needs to be considered, particularly as it may cause rural land use conflict, which can cause problems with the continuation of the agricultural use if there are complaints.

The above criteria have been applied to each of the settlements of the Shire. This has shown that most of them are not considered suitable for expansion. However, they will retain the existing facilities and character, which is something that was mentioned in the consultations as being desired by some residents. The only settlement that has some potential is Bedgerebong (this is discussed in more detail in section 4.2.4). The settlements and the reasons for not expanding are provided in Table 4.3. Photos 4.4 and 4.5 show the villages of Ootha and Bedgerebong.

Photo 4.4: Village of Ootha
Date of Photo: March 2006

Photo 4.5: Village of Bedgerebong
Date of Photo: March 2006

Table 4.3: Settlements not suitable for expansion

Settlement	Constraints to Expansion
Garema	No services or facilities.
Ootha	No reticulated sewerage or potable water and minimal community or shopping facilities. Distance to Forbes.
Wirrinya	No services or facilities
Calarie	No services or facilities
Jemalong	No services or facilities
Waroo	No services or facilities
Cookamidgera	No services or facilities
Daroobalgie	No services or facilities
Corinella	No services or facilities

Note: Ootha has a water supply which is not potable, existing village zoned area to remain.

4.2.3. Forbes

This section considers the future planning for the town of Forbes. It discusses and provides recommendations on the following:

- Issues to be considered for future Development
- Future rural residential, residential, commercial and industrial uses
- Former Forbes Abattoir Site
- Forbes Vintage Village
- Forbes Saleyards
- Home Business and Special Use Areas

Each will be discussed in detail below.

Issues for Development – Flooding

The main constraint for the development of Forbes is the flooding of the Lachlan River. This basically cuts the town into 3 separate areas:

- North Forbes
- Central Business District
- Camp Hill / South Forbes

The Floodprone land is shown on map 4.2.

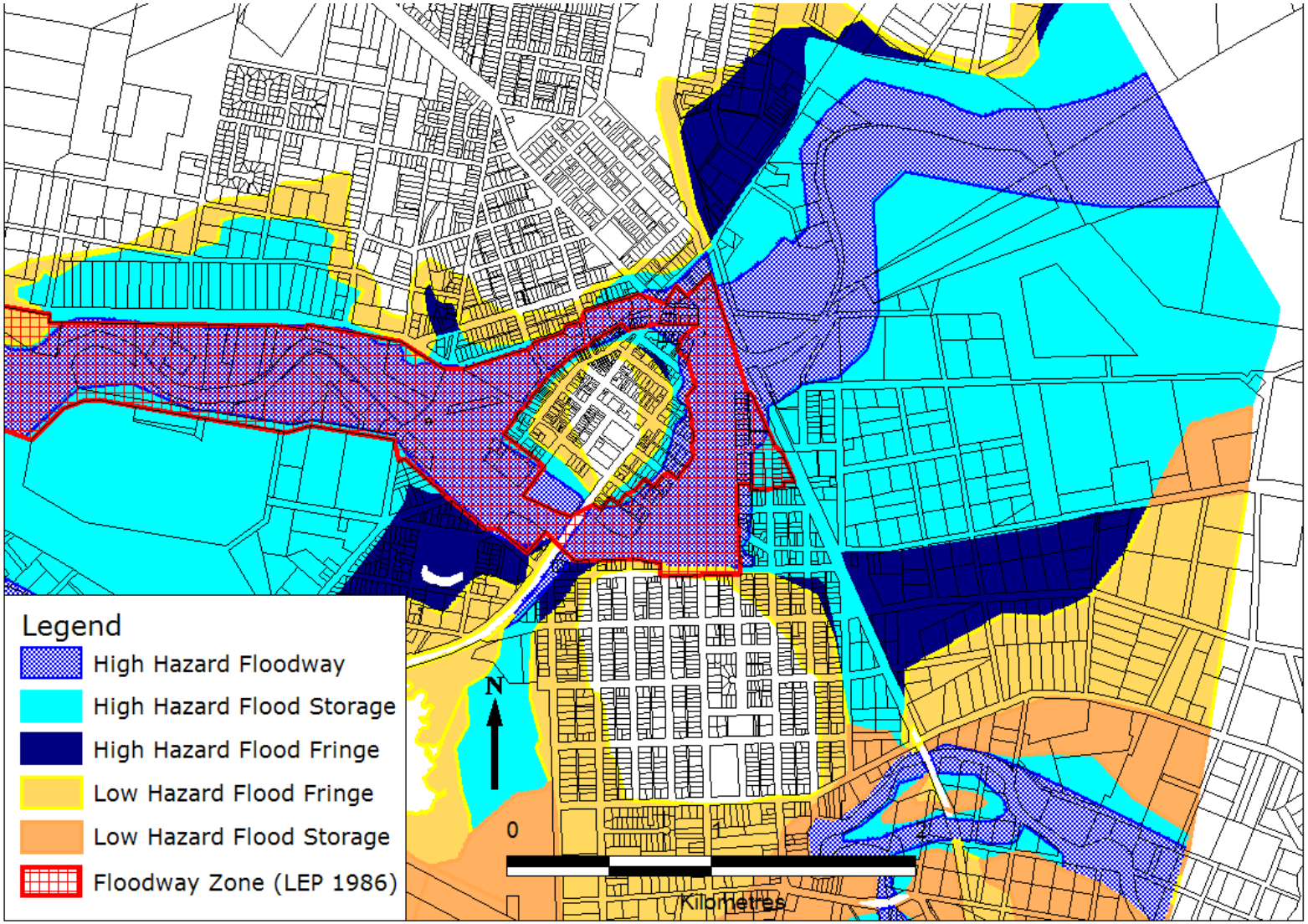
Currently the high hazard floodway generally reflects the existing zone titled Environmental Protection – Floodway, which is also shown on map 4.2. Under the newly adopted standard LEP Instrument, there is no provision for such a zone. It is necessary however, to ensure that the intent of the zone is carried forward in the new LEP. The floodway zone covers mostly public land with some private land on the edges of the Forbes Township. This consists of houses and some commercial and light industrial type uses. The floodway zone has been effective in educating the community about the severity of flooding in the town. However, as there is no provision for such a zone in the standard LEP, this presents a significant issue for the future management of such lands.

There are 3 options for dealing with this issue:

- Make representations to the Department of Planning to create a new zone in the Standard LEP that reflects the current Environmental Protection Floodway Zone;
- Use the underlying land uses to zone the land (commercial, residential, etc) and create an overlay which relates to the current floodway zone with a clause which has similar restrictions as the floodway zone.
- Retrofit one of the existing zones within the standard LEP.

It should be pointed out that the section 117 Directions issued pursuant to the provisions of the EP&A Act, state that draft LEPs should be consistent with the Government's Floodprone Land Policy and the principles of the Floodplain Development Manual 2005 and to ensure that the provisions of an LEP on floodprone land is match the flood hazard and the potential of flood impacts. It goes on to make the following specific provisions:

1. *A draft LEP shall include provisions that give effect to and are consistent with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual, 2005 (including the Guideline on Development Controls on Low Flood Risk Areas*).
2. *A draft LEP shall not rezone land within the flood planning areas from Special Area, Recreation, Rural or Environmental Protection Zones to a Residential, Business, Industrial or Special Area Zone*



Map 4.2: Forbes Floodprone Land
Note: This map has been derived using the 1% AEP Flood event.

3. *A draft LEP shall not contain provisions that apply to the flood planning areas which:*
   a) *permit development in floodway areas,*
   b) *permit development that will result in significant flood impacts to other properties,*
   c) *permit a significant increase in the development of that land,*
   d) *are likely to result in a substantially increased requirement for government spending on flood mitigation measures, infrastructure or services, or*
   e) *permit development to be carried out without development consent except for the purposes of agriculture (not including dams, drainage canals, levees, buildings or structures in floodways or high hazard areas) or exempt development.*

Each of the options outlined above will be discussed separately below.

It is noted that the standard LEP does not contain an appropriate zone that deals specifically with flooding. However, there are a number of towns throughout the State that have similar flooding issues to Forbes as well as similar zones in their LEPs that restrict development in the fast flowing floodways. Examples are Maitland, Narrabri and Tamworth. Such a zone would cover the high hazard floodways where the water is fast flowing and where any future buildings would be considered to be inappropriate (which is the same as the existing Environmental Protection Floodway zone for Forbes). This will have the effect of advising the community of the flooding issue by keeping the zone that currently exists.

The second option is similar to a zone but allows the Council a bit more flexibility by including the flooding restrictions in a clause that would be specific to Forbes. It would zone the land commercial for the commercial uses and residential for the residential uses. An overlay would be placed on the same land as the existing floodway zone that would have the same restrictions as the existing zone. The disadvantage of this approach is that the actual zoning does not reflect the fact that the land is in a high hazard floodway, however, there is the option of including an objective in the Business and Residential zone referring to the issues associated with building on flood prone land.

The third option is to try to 'fit' the existing zones contained in the Standard LEP Instrument. The zones which have a resemblance to the current Environmental Protection – Floodway zone are:

- E2 Environmental Conservation – Generally intended to protect land that has a high conservation value.
- E3 Environmental Management – Generally Intended for land that has environmental or scenic values or hazard risk permitting a range of development including dwelling houses.
- W1 Natural Waterways – Zone intended for waterways that are to be protected due to their ecological and scenic values.

The provisions of the Standard LEP do not allow the stated objectives to be amended, which would have to be done to give the best effect to the land use controls in the high hazard floodway. Having regard to this, it is not considered that any of these zones is considered appropriate for use in replacement of the existing Environmental

Protection – Floodway zone. Further, in considering Council's approach to the future management of high hazard floodway lands the provisions of the Section 117 Direction outlined above must be taken into account.

Therefore, it is considered that there is a need to provide specific land use controls for the high hazard floodway as well as floodprone land. It is noted that the Standard LEP does not have a good match for the current floodway zone and this matter should be resolved during the drafting of the draft LEP which is to occur at a later stage in the process. This zone should cover the land covered by the current floodway zone. It should also replicate the current zone provisions which are outlined below:

> *Zone 7 Environmental Protection (Floodway)*
>
> *The objectives of this zone are:*
>
> *a) to reduce the incidence of damage to areas subject to flooding by restricting the carrying out of development on flood liable land and prohibiting the carrying out of development in floodways, and*
> *b) to encourage detailed provisions to be made to achieve this by the use of development control plans.*
>
> *2 Without development consent: Nil.*
> *3 Only with development consent: Agriculture; drainage; landscaping and gardening; public open space; public recreation areas; roads; walkways and cycleways.*
> *4 Prohibited: Any purpose other than a purpose included in item 2 or 3 of the matter relating to this zone.*

It should be noted that uses that currently exist in the zone have existing use rights and can remain unaffected by these provisions.

There are some commercial uses in the floodway zone. These are a mixture of shops and some light industrial type uses. They can be seen from photo 4.6. These uses may wish to change to another use which could include the need to make minor alterations to the buildings. However these should not be an increase of more than 15% in the overall footprint (as required by Council's Flooding DCP). This should be clarified by a specific clause in the draft LEP.

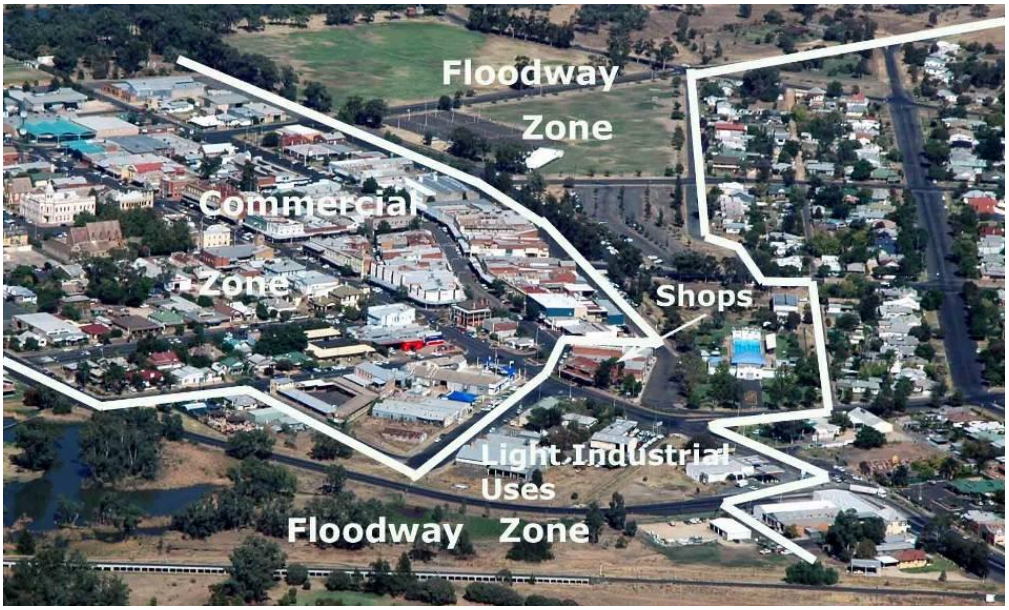


Photo 4.6: Forbes CBD and Floodway Zone
Date of Photo: March 2006

There are also some dwelling houses within the current floodway which have been in existence for some time. It is considered that, because of their location on the shores of Lake Forbes, the land should remain in a flood zone. However, similar to the commercial uses outlined above, they should be able to rebuild to an increase in floor area of 15%.

Designation of flood affected land should be in accordance with the Forbes Shire Flood Risk Management Development Control Plan. It would be appropriate for the Council to erect some flood level signage in the areas affected. It is noted that this had been done on an old building located in Lachlan Street, but this has recently been the subject of a large fire and the building subsequently demolished.

Issues for Development – Water Supply

Water reticulation is limited to the township of Forbes. An estimate of 3,035 residential and 356 non-residential individual water services are provided. The town water supply is pumped directly from the Lachlan River and treated at Council's Water Treatment Plant located in Flint Street. Bore water is also available as a separate raw source for parks and gardens. The water is then pumped to 4 reservoirs on 2 sties at Gale Street and Turner's Hill. Currently the system has an estimated total capacity of 29 megalitres which represents just over 1 days peak day demand. The Forbes water supply system also supplies water to Parkes and Trundle when required to supplement supplies.

Council is in the process of preparing plans to undertake major works associated with its water supply system in the next 2-3 years to better manage sludge produced at the water treatment plant as well as address a number of flow rate and water pressure problem areas across Forbes. In addition proposed residential and industrial developments will result in major extensions to the water supply network in the next year or so including the Mid-State Livestock Exchange, Daroobalgie industrial estate,

Alcheringa rural residential estate, Landrace Road industrial area and the relocation of the Jemalong Retirement Village.

All of the proposed rezonings will be connected to the reticulated water supply that serves the current town population. The future works to be done will cater for these proposed rezonings.

Issues for Development – Sewerage

An upgrade of the Forbes Sewage Treatment Plant has recently been completed. The new system has been designed to give a high degree of flexibility in the volumes of treated effluent discharged. The upgrade will result in positive environmental consequences by substantially reducing the nutrient flow into Gum Swamp, allowing flow alterations to mimic natural wet & dry cycles. The effects of effluent discharge into the Lachlan River will be minimal. Treatment to sensitive waters standard is consistent with the interim environmental objectives set by the Healthy Rivers Commission for the Lachlan River.

The new system has been designed with the capacity to fully treat 3 X the ADWF (average dry weather flow) of 100 litres per second and partially treat 7 X ADWF. Current practice requires full treatment of 1.5 X ADWF and partial treatment of 3 X ADWF. The capacity of the effluent treatment system is estimated to be in the order of 12,000 ETs whilst still having the capacity to treat commercial wastes.

Slope and distance are the major constraints to the expansion of the reticulated sewer system including the need to minimise the need for pumping stations. More recently small storage and grinding effluents systems are being marketed such as the "e-one sewer system" and provided to overcome these constraints. These systems are a storage and grinding device within a single unit, which is pumped under low pressure into the reticulated sewer system when necessary.

The proposed rezonings for residential, industrial and large lot residential development are all expected to connect to the existing sewerage reticulation system serving the current population of Forbes. The existing system can cater for these proposed rezonings.

Issues for Development – Dryland Salinity

Salinity is a long term problem evident throughout Forbes that once commenced is difficult to reverse. The Lachlan CMA have identified salinity as a major issue – particularly urban salinity in Forbes. The *Forbes Comprehensive Land Use Strategy Issues Paper* has a detailed section dealing with dryland salinity. It states that salinity occurs when rising water tables bring naturally occurring salts to the soil surface where they are concentrated by evaporation.

The NSW Salinity Strategy released in August 2000 is a response to the need for a coordinated strategy involving government, industry and the community. It seeks to slow down the increase in salinity and lay the foundations for salinity management.

To slow down the increase in salinity the Strategy identifies the need to:

- Protect and manage native vegetation;

- Use land so less water goes into the watertable;
- Use water more effectively & efficiently;
- Use engineering solutions;
- Make better use of land affected by salt; and
- Focus upon priority salinity hazard landscapes.

Urban Salinity is considered to be one of the major constraints to development in the town of Forbes. Urban salinity is caused by a combination of excess water being applied to an area which will raise the water table and will bring out the salts that are naturally occurring in the soil. The salt can break down concrete, cause bricks to erode and kill plants by preventing them from taking up water. It is important to recognise that salt is naturally occurring in soil, groundwater, rain and effluent. In addition to this, sources of salt in urban areas can include the following:

- Swimming pools
- Food products
- Fertilisers
- Soap and detergents
- Industry
- Building materials

The Department of Natural Resources have published a number of documents under the Local Government Salinity Initiative. One of these titled Introduction to Urban Salinity, states the following about the Salinity process:

> *"The key to salinity processes is that salts are soluble in water. As water gains access to our buildings and infrastructure, salts can be carried with it. The salts may then chemically react with the building materials causing rust for example. Or when the water evaporates, salt crystal formation leads to physical stress on the building material.*
>
> *Water from sources such as rain, leaking pipes and pools, and the overwatering of gardens, can add to the natural water cycle and conduct salts into building materials. Some building methods may also contribute to the development of salinity. Compacted surfaces can restrict groundwater flow and concentrate water and salts in one area. By cutting into slopes for building, groundwater or saline soil may be intercepted and exposed. In addition, fill used to build up an area may be a source of salts or be less permeable, preventing good drainage.*
>
> *Urban salinity can be a result of some or all of these changes to the storage and movement of salts and water in the urban environment."* DIPNR (2003) p 2

It can be seen therefore that it is a complex issue which has many solutions, the main one being appropriate land management. This can be included in a Local Environmental Plan and Development Control Plan, but this will only affect future developments. There is a need to address the existing problems.

A pilot project conducted in Forbes in 2003 resulted the preparation of a draft Discussion Paper. This discussion paper provided the basis for the strategic consideration of salinity in environmental planning and culminated in the preparation of a draft sample Local Environmental Plan for planning and regulation for urban salinity. The draft LEP provides principles, requirements, actions and management

guidelines for areas affected by various degrees of salinity and should be considered in planning controls resulting from this Growth Management Strategy. One of the components of this work was the installation of a network of piezometers to monitor groundwater levels and water quality. The ongoing monitoring of these will be critical in managing salinity in the future because of its dynamic nature.

There is a need to develop an overall Salinity Strategy for the Shire which will focus on the rural and urban areas. This needs to be done at the strategic scale because of the implications of development of land both on the site to be developed as well as the impacts on the surrounding lands. One aspect that is needed is to carry out an investigation into the extent of the issue in the town of Forbes in particular. This study will need to investigates the levels of salt present in the soils around the town. It would be appropriate to seek partnership with the Lachlan CMA and the Departments of Planning, Water and Energy and Environment and Climate Change to fund the preparation of such a Strategy.

In a town like Forbes where there are known salinity hot spots, one solution could be to identify these and put in place remediation measures. However, it is acknowledged that Salinity is an issue for the whole town of Forbes. Therefore, it is considered that salinity should be addressed in 2 ways. Firstly, with new developments, Council could require the implementation of building techniques that are appropriate for saline environments such as exposure grade concrete and bricks, higher grade dampcourse proofing, and requiring water wise landscaping that is salt tolerant. Secondly, the Council could enter into a partnership with the CMA to educate the community about the issue and solutions. This will encourage existing residents to consider addressing the issue on their own land.

Future Residential Development

The *Forbes Comprehensive Land Use Study Issues Paper* has analysed the supply and demand for residential development in the town. It makes the following observations about the current supply and demand for residential development:

> *"Forbes has experienced a small but steady rate of residential development. The average number of allotments created for urban residential dwellings is consistent with the number of dwelling approvals issued annually. New dwellings and residential allotment creation in the last 10 years has maintained a rate of 20- 30 allotments and new dwellings per year. In the order of 10 allotments and dwellings are located in the rural area or on the fringes of the urban area as rural residential land uses. A small yet consistent number of units are created annually averaging 12 per year over the last 10 years.*
>
> *This growth rate in residential housing has been maintained in spite of a declining population base in the order of 2-300 persons every 5 years. This residential growth rate can therefore be attributed to a reduced occupancy rate from 2.93 in 1991 to 2.66 in 2001 (as estimated by the ABS). It is predicted that this trend will continue in the short to mid-term and accordingly residential strategies should seek to provide development opportunities for 10 urban residential dwellings and 10 units annually. In the immediate time horizon for the preparation of this strategy (10 years) this equates to in the order of 100 residential allotments and 100 units."* (Forbes Shire Council (2005) p 300)

The amount of currently zoned residential land in Forbes is considered to be more than adequate for the next 10 or so years. The analysis has been based on a combination of potential resubdivision of existing land as well as vacant land. It should be noted that this analysis is based on the maximum potential achievable, particularly for the resubdivision of land that has a dwelling house on it at present. As can be seen from table 4.2 and map 4.3, the land is in 5 sectors as follows:

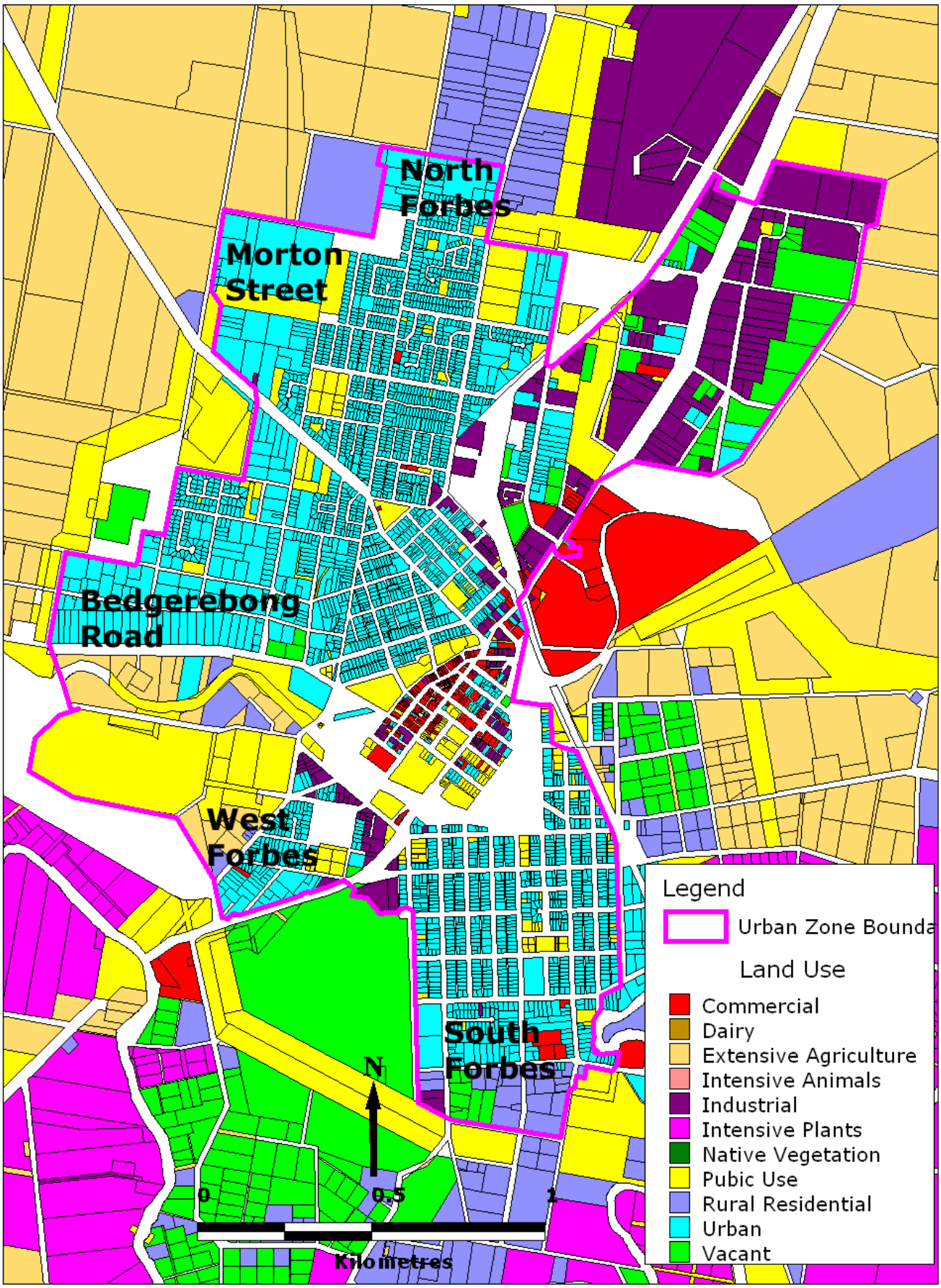
- Morton Street
- North Forbes
- Bedgerebong Road
- West Forbes
- South Forbes

The flood inundation shown in map 4.2 shows the Bedgerebong Road, West Forbes and South Forbes areas to be subject to flooding – high hazard flood storage and low hazard flood fringe. In addition, the Development Control Plan states that a number of the lots in the Bedgerebong Road area are not available for dwellings as it is a drainage depression which becomes inundated in regular rainfall events and acts as a natural flow path for receding flood waters. The current size of the land along Bedgerebong Road is approximately 8,000 m^2 and the land in west Forbes has a range of lots between 800 m^2 and 2.6 ha (9 lots in 5 ownerships) which is considered to be adequate for the location and flood affectation. The land in south Forbes is a mixture of residential sized lots with some large lots of 1 and 2 ha. It would be appropriate that this area be zoned as a large lot residential area with a specific clause in the draft LEP highlighting that the area should not be subdivided any further than at present but that dwelling houses will be permitted on each lot that currently exists provided that they can comply with the current planning provisions in the LEP and DCP.

One major constraint to the development of the lots on the western side of town south of Bogan Gate Road is a stormwater drainage depression between York and Kent Streets, which is considered to be undevelopable because of low frequency flooding. A drainage study of this area has been carried out by Rickard, Hails Moretti Pty Ltd, 2005. There is similar land to the north of Bogan Gate Road south of Morton Street. There are a number of options to deal with this:

- Clearly identify the boundaries of the drainage depression and zone it as an infrastructure zone. This land would be dedicated to Council as part of the subdivision of the surrounding land and be classified as community land.
- Maintain the status quo and leave the land zoned as residential. However, this may create an expectation of development permissibility, subject to a merit assessment by Council.
- Maintain the status quo and leave the land zoned residential as well as creating an overlay which will identify the drainage area and require additional considerations and standards be considered by Council when assessing any development applications.

Having regard to the fact that the area is clearly a drainage depression and the implications of allowing dwelling houses in this area, is recommended that the first option be adopted as the preferred course of action.



Map 4.3: Subdivisible Land Precincts

A detailed study has been carried out of the residential potential of the Bogan Gate Road south and Moreton Street precincts by GHD. This study has investigated the potential lot yield as well as recommending a road layout. This study also analysed the lot yield with 2 subdivision minima of 1,000 m^2 and 680 m^2. The results of this analysis show that there would be a total of 428 lots at 1,000 m^2 and 511 lots at 680 m^2.

There is also a small area at the lower end of this drainage channel, just north of Bedgerebong Road zoned 2(b) – Special Home Activities which would be appropriate to designate land in the same manner as the land as large lot residential with a minimum area of 8,000 m^2. This minimum is based on the size of the existing lots to limit subdivision and residential development in this area.

The land in the west of Forbes and the drainage line can be seen on photo 4.7.

Photo 4.7: Western Forbes Drainage
Date of Photo: March 2006

The supply and demand figures are reduced considerably when these 3 flood affected areas are taken out. The revised table is shown as table 4.4.

Table 4.4: Forbes Residential Supply and Demand

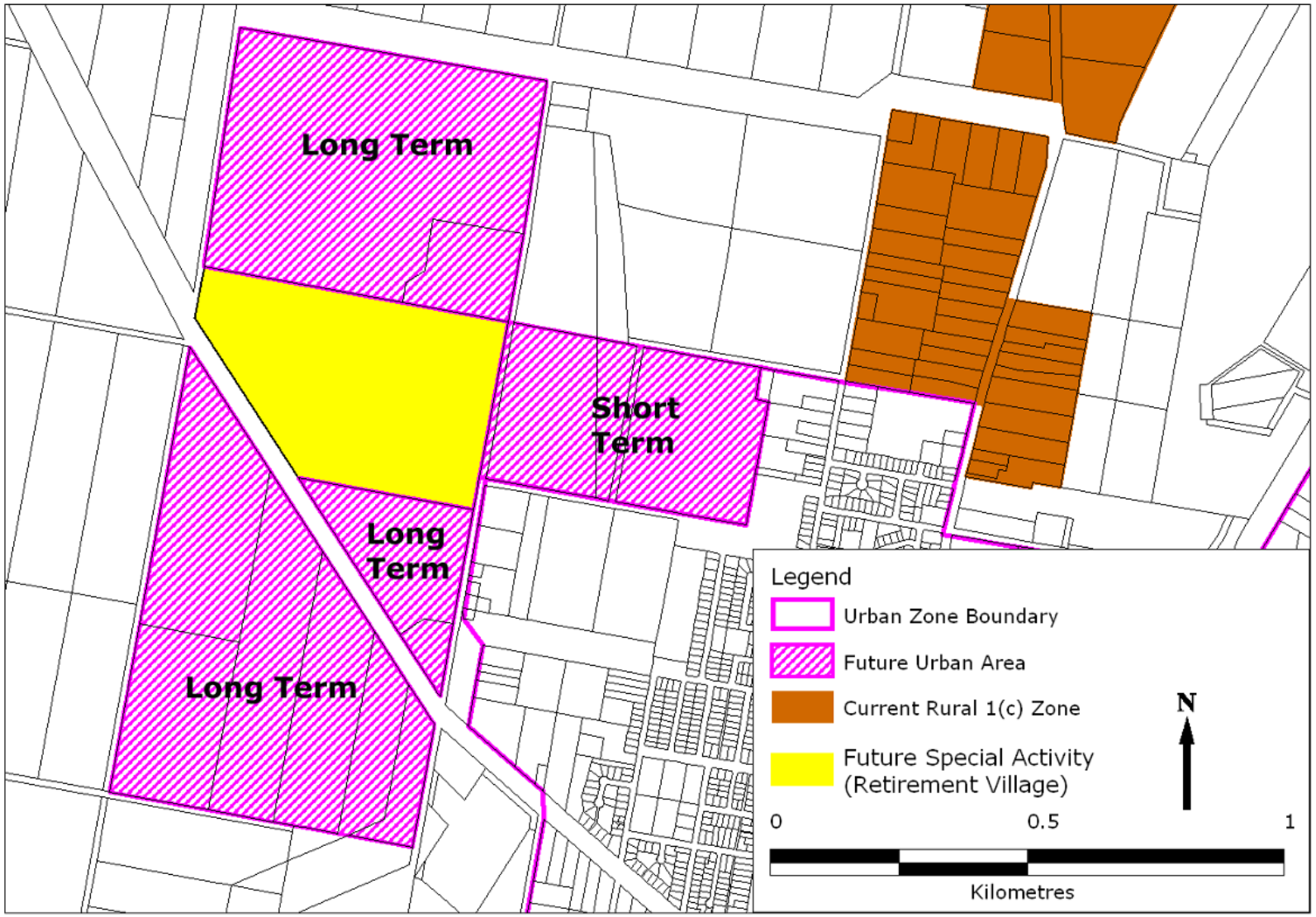
Settlement	Total Potential Additional Lots	Growth (Low)	Growth (High)	Supply in Years Low	Supply in Years High
Morton St / North Forbes 1,000 m^2	428	20.0	30.0	21	14
Morton St / North Forbes 680 m^2	511	20.0	30.0	26	17

Source: Land Use Survey and Council GIS

Whilst this reduces the current supply and demand figures there remains an adequate supply of residential land available for development in the short term based upon current growth rates. There is still a need however to identify land for future residential expansion of the town in the medium and longer terms. The land to the east, south and south west is flood prone and to north east is the industrial area. The land to the north of the town is currently zoned and used for large lot residential development. This leaves the land to the north west and west of the town as having few physical constraints. Land to the west of the town has the previous landfill and incinerator site, which has some potential contamination issues. The land to the north west of the town north of the Bogan Gate Road and fronting Farnell St, is therefore considered to be the most suitable. It should also be noted that the land to the east of the long term residential to the north of the proposed special activity zone is proposed to be future Large Lot Residential (this is discussed in the next section).It also has easy access to the CBD and other parts of the town. This land is shown on map 4.4 and photo 4.8. It should be noted that this land will not be rezoned until the supply of the existing land has been taken up. This is anticipated to be in approximately 10 years time. This rezoning will have to be accompanied by a Local Environmental Study which will have to address the matters outlined in section 4.2.2.

Photo 4.8: Future Residential Area
Date of Photo: March 2006

The Jemalong Retirement Village are proposing to relocate from their current site adjacent to the Hospital. They are in the process of preparing a development application for a site that is within the proposed future residential area. It would be appropriate to change the zoning of the site to a special uses category once the Development application has been approved by the Council. This change of zoning should occur as part of the draft LEP that is to follow the preparation of this strategy.



Map 4.4: Future Residential Area

The development of this land will not be needed until a minimum of 10 – 15 years at the current growth rates. There is estimated to be approximately 300 to 400 lots capacity in the Morton St / Bogan Gate Road area and with the potential for some infill subdivision, this should last for some time. The Council should develop a land monitor that counts the new subdivisions and dwelling houses every 3 months so that there is enough lead time to carry out the rezoning studies necessary to rezone the land. The staging of it should begin at Farnell Street and then progress to Bogan Gate Road. There should not be any access to Bogan Gate Road. A masterplan should be prepared prior to it being rezoned.

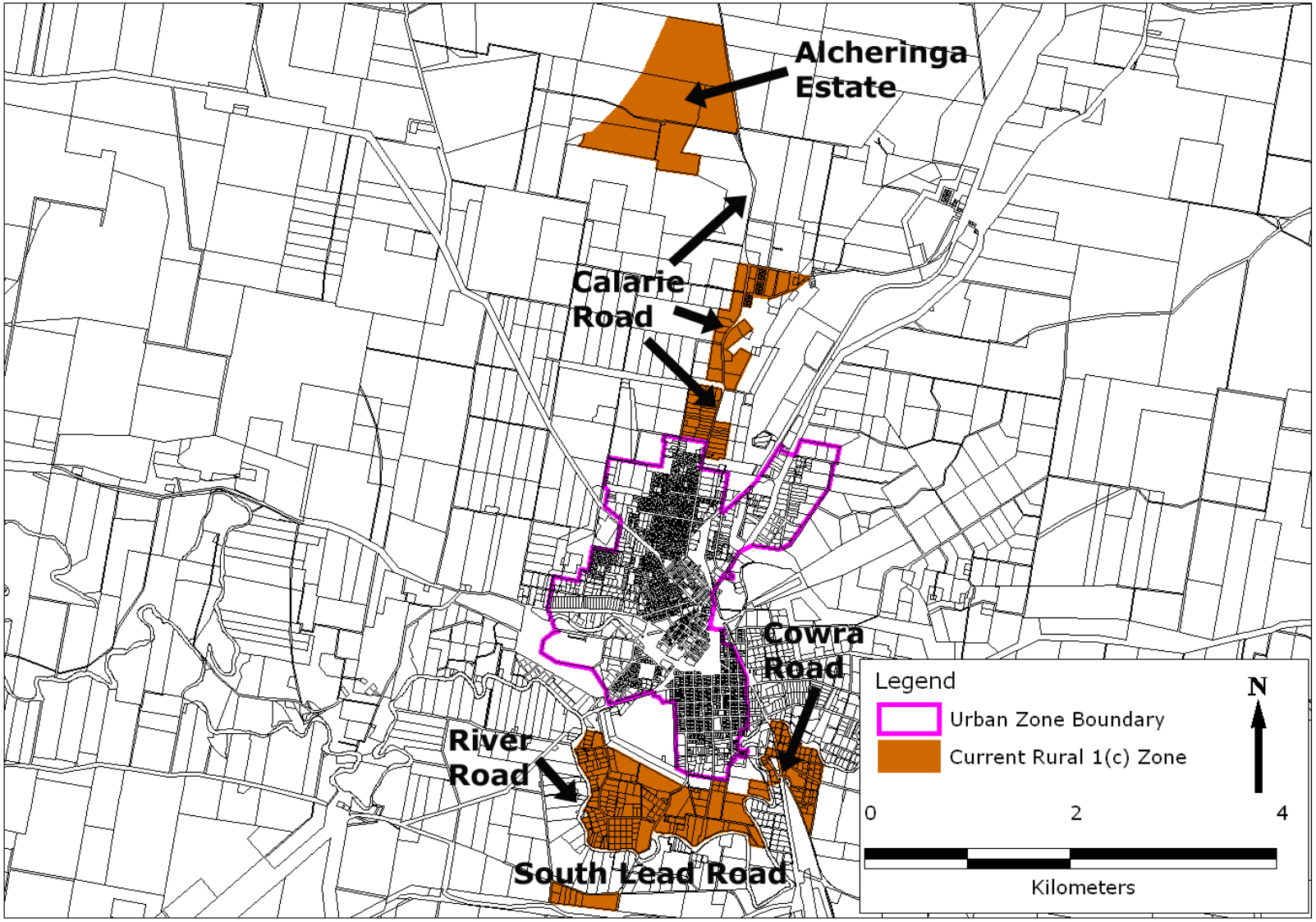
As a longer term strategic direction, all future development of the town should be in the north western sector. After the current area has been developed, it would be appropriate to consider the land to the south of the Bogan Gate Road. However this matter should be investigated by strategies into the future.

Rural Residential Development

> *"The residential use of rural land is called rural residential development; that is, people live on rural lots, but use the land primarily for residential rather than agricultural purposes. Although some engage in 'hobby farming', most derive their income from pursuits not carried out on the land. The main distinction between urban housing and rural residential housing is bigger lot size and larger distances between dwellings. This creates a sense of openness and of living in the landscape rather than in an urban area.*
>
> *Rural residential development can be divided into two main categories: rural fringe and rural living. Rural fringe development is characterised by single detached houses and dual occupancies on lot sizes of approximately 4000 square metres to 1 hectare laid out in an estate. This estate usually joins or is in close proximity to an urban area. Rural living, on the other hand, features single detached houses and dual occupancies on lot sizes between 1 hectare and 40 to 100 hectares and can adjoin farmland or vegetated areas. People living on these lots use the land primarily for residential purposes, although they may graze some cattle or have horses. This requires lot sizes of more than 2 hectares if land degradation is to be avoided. The lots do not adjoin townships or villages and are scattered throughout the rural landscape."* (Sinclair and Bunker, 2007 p)

The land use survey showed that both of these are apparent in the Shire and that they are found mostly around Forbes. The rural fringe areas are currently zoned as rural 1(c) and are shown on Map 4.5. It can be seen that it is located in 3 areas:

- North of Forbes along Calarie Road
- Alcheringa Estate along Calarie Road
- South of Forbes along River Road, Cowra Road and South Lead Road



Map 4.5: Current Rural Residential Zones

The current minimum size for subdivision is 4,000 m^2 where the land can be connected to the reticulated sewerage and 1 – 2 ha where there is on-site disposal. This has created 2 different areas to develop – close to the urban boundary north of Wyndham Avenue there are a few 4,000 m^2 lots and north of this are a mix of 1 and 2 ha lots as sewer has not yet been connected to this area. In the flood prone areas, (River Road, Cowra Road and College Road) the minimum is 10 ha. The newly released Alcheringa Estate is currently being developed on the basis of a 2 hectare minimum to cater for onsite effluent disposal.

In order to ensure that future large lot residential development is carried out in a sustainable manner, it is good planning practice to develop some criteria that can be applied to land to be identified in the future around the town of Forbes.

The criteria can be categorised into exclusionary and management criteria. Exclusionary criteria covers those issues considered to be of such magnitude that it should be used to exclude land from future rural residential development. Management criteria, however, covers issues that can be dealt with on a site by site basis.

Exclusionary criteria and the reasons for it being listed as such are as follows:

- *Proximity to Agricultural uses*. Agricultural uses and particularly intensive forms cause odours, noise, dust and other pollution that can be detected from a distance. These can also be offensive to people who wish to have a residential use of the land and therefore should be avoided.
- *Fragmentation of Agricultural Land*. Agriculture, particularly broad acre farming needs to have large holdings and not have residential uses nearby for potential rural land use conflict reasons.
- *Slope of land – greater than 20%*. Land with steep slopes is not considered appropriate for rural residential development because of erosion potential and scenic impact on the landscape. This includes land that has to access over 20 % slope.
- *Flooding and Drainage*. Land that is floodprone or poorly drained or close to a drainage line or creek is not considered appropriate because of potential flooding. Land that has its access over a stream that is susceptible to flooding should also be excluded. Land that is categorised as being in a low hazard flood fringe or storage area may be suitable having regard to the specific circumstances of the case.
- *Bushfire Prone Land.* Land that is identified as bushfire prone should not be identified because it is exacerbating the problem by putting more dwellings in an area that is at risk.
- *Native Vegetation*. Native vegetation provides a biodiversity and habitat resource and areas that are heavily vegetated should not be developed because of the potential impact on the biodiversity and habitat from the clearing of that land.
- *Proximity to Forbes*. The proximity to services is a key consideration for rural residential development. Land should be adjoining the urban area and have good road access to the town, particularly the commercial centre. It is considered that the Lachlan River forms a good boundary to the south for landscape as well as flooding reasons.
- *Utility servicing*. This includes water, sewer, electricity and telephone. Water is a key consideration. Sewerage is necessary for smaller lots.

- *Road surface*. All roads to be accessed by large lot residential and rural living development should be sealed. This includes all roads between the subdivision and the urban area of Forbes.

Management Criteria and the matters that have to be addressed are as follows:

- *Domestic Effluent Disposal*. The method of domestic effluent disposal has a major bearing on the size of the lot to be subdivided. A report by a suitably qualified consultant will be necessary to ascertain the minimum are for effluent disposal which in turn will impact on the size of the lot. For lots less than 1 ha, reticulated sewerage will be required.
- *Road Alignment and access.* The road alignment and access should have adequate sight lines so that any potential impact with other vehicles travelling on the road are minimised.
- *TSR.* The location and need of existing Travelling Stock Routes should be reviewed in conjunction with the Forbes Rural Lands Protection Board having regard to the relocation of the Forbes Saleyards and the sterilisation of significant tracts of land throughout the Forbes urban area and immediate surrounds.

Analysis of the current rural 1(c) zone shows that there is considerable capacity for future development. The opening of the new Alcheringa Estate to the north of Calarie has added to this capacity. This can be seen from table 4.5. It should be noted that the potential lots in Calarie Road have not been subdivided for some and that previous meetings with the owners of the land to discuss this issue has resulted in resistance of the majority of the landowners to consider subdivision of the land.

Table 4.5: Rural Residential Supply and Demand

Precinct	No. of Dwellings	Potential Additional Lots	Growth (Low)	Growth (High)	Supply in Years Low	Supply in Years High
Farnell St	25	69	10	15	7	5
Calarie Rd East	11	27	10	15	3	2
Total @ 4,000 m^2	**36**	**96**	**10**	**15**	**10**	**6**
Calarie Rd North	18	19	4	8	5	2
Alcheringa Estate	4	112	4	8	28	14
Total @ 2 ha	**22**	**131**	**4**	**8**	**33**	**16**

Source: Council GIS and Property System

The land adjacent to the Alcheringa subdivision is not considered to be satisfactory for further rural residential subdivision because of the distance to town (travelling at the speed limit it is a 5 minute drive to the High School and another 5 minutes to the CBD). The proximity to Forbes can be seen from photo 4.9. The costs associated with isolated rural residential development are well documented and discussed in detail in the Forbes Comprehensive Landuse Strategy – Issues Paper and include social, environmental, amenity loss, loss of the rural landscape and its scenic appeal, poor Natural Resource Management, effluent disposal, pollution of watercourses, erosion and land degradation such as overstocking, over fertilising, water diversion changes to catchments resulting in loss of habitat, loss of agricultural land and rural land use conflict.

Photo 4.9: Proximity of Alcheringa Subdivision to Forbes
Date of Photo: March 2006

The land at South Lead road which is currently zoned for rural residential is not considered appropriate for expansion for the same reasons as the Alcheringa Estate as well as being floodprone.

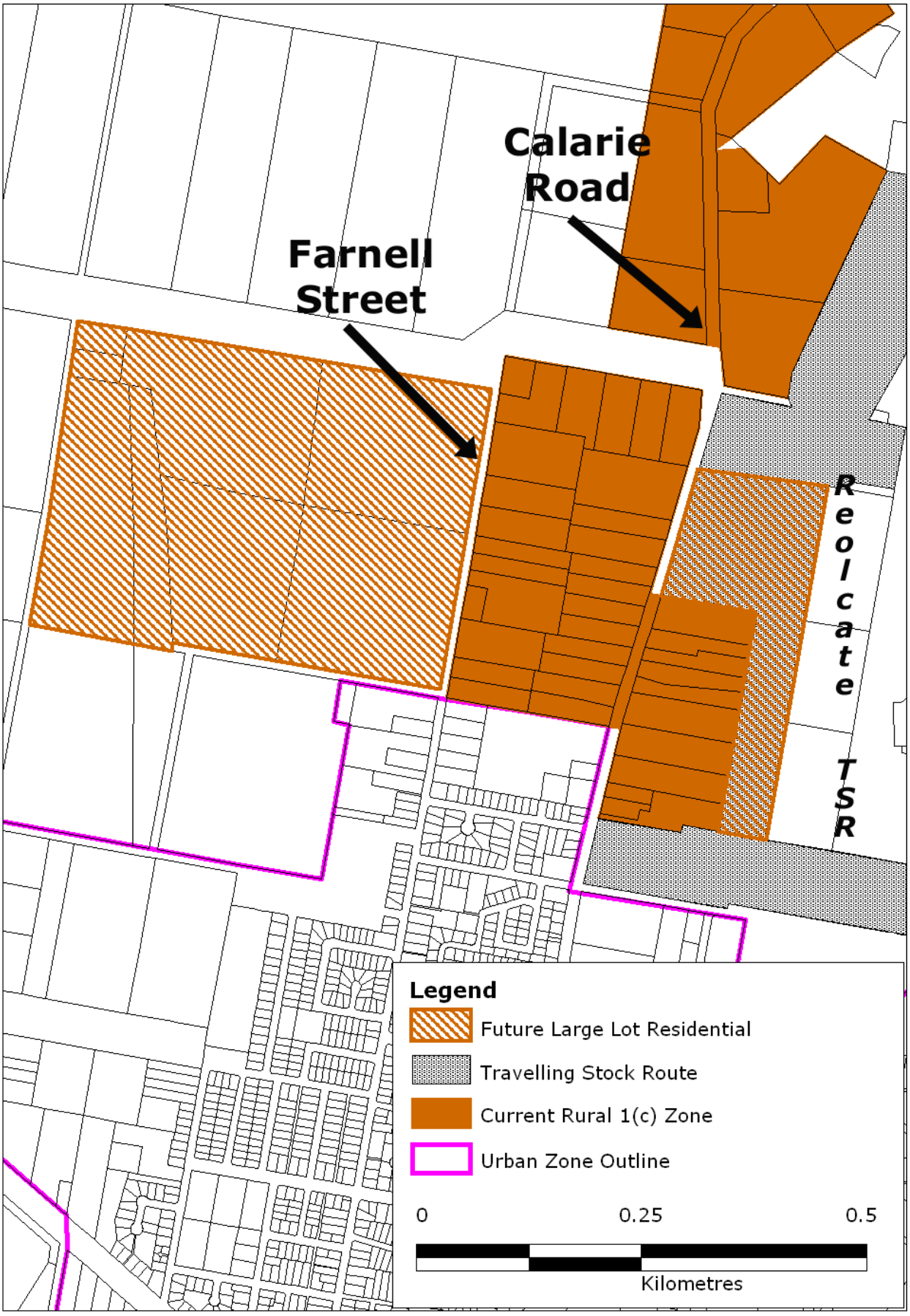
While theoretically there is sufficient capacity within the existing rural residential zoned lands, this land is held relatively tightly, there are few allotments available to purchase/vacant allotments nor developable land. Accordingly it is considered that there are little opportunities for rural residential expansion. In order to facilitate development of existing zoned land a masterplan and Development Control Plan are necessary to clearly identify opportunities and provide a plan for the orderly and economic development of the land.

The land that is currently zoned as rural 1(c) between Calarie Rd and Farnell Street has a mixture of lot sizes. With minor extensions to the local sewage network, there is an option to allow for more of this land to be developed for the smaller lot size of 4,000 m^2 by putting a road up the middle of the current lots and thereby opening up the land for future subdivision. The land on the east of Calarie Rd is similarly currently subdivided.

There is currently a Travelling Stock Route (TSR) which could be 'swapped' with the land owned by the abattoir. It is noted that the actual plant located some distance to the east. It is also noted that the abattoir is currently closed and is unlikely to reopen as an abattoir because of the high cost of environmental compliance (this is discussed in the next section). There is a possibility to create a large lot residential zone on the current TSR as well as part of the abattoir land to create connectivity with the current zone. This land swap would have to be subject to discussions with the Forbes Rural Lands Protection Board and a Masterplan and rezoning. There should also be a vegetated buffer on the eastern side to buffer the area from the Abattoir site. The land is shown on photo 4.10 and map 4.6. It can be seen that the eastern boundary of the proposed zone is the lot boundary between the abattoir land and the TSR.

Photo 4.10: Rural Fringe development – Calarie Rd / Farnell St
Date of Photo: March 2006

These 2 proposals will take some time to eventuate. In the mean time, there is a need to provide some areas of rural fringe development at 4,000 m^2, to meet the demand that is apparent in the town. The criteria discussed above has been applied to the land around the town and because of flooding to the south and east, direction of future residential land as well as the desire to have this style of development close to the urban area, the only land considered appropriate is the land on the western side of Farnell Street adjacent to the existing zone. This is considered appropriate because it adjoins the existing zone and has access to all urban services. It will also progress this style of development in an orderly and efficient manner. This area would yield approximately 160 4,000 m^2 lots, which using a demand figure of 10 per year for low and 15 per year for high, would provide between 16 and 11 years of supply. It is considered that this rezoning should proceed as soon as possible. Without this supply of land, there remains only one area for rural residential estate style living – Alcheringa estate which is a different lot size and is also further away from the town. It will require the preparation of an environmental study, which will have to be prepared to accompany the draft LEP or any subsequent amendment. This land is shown on map 4.6 and photo 4.11. This type of development is called Large lot residential in the standard LEP and this term has been used. The long term option is to progress this to the north of the proposed area, as it will provide for the orderly progression of development.



Map 4.6: Forbes Proposed Large Lot Residential Designations

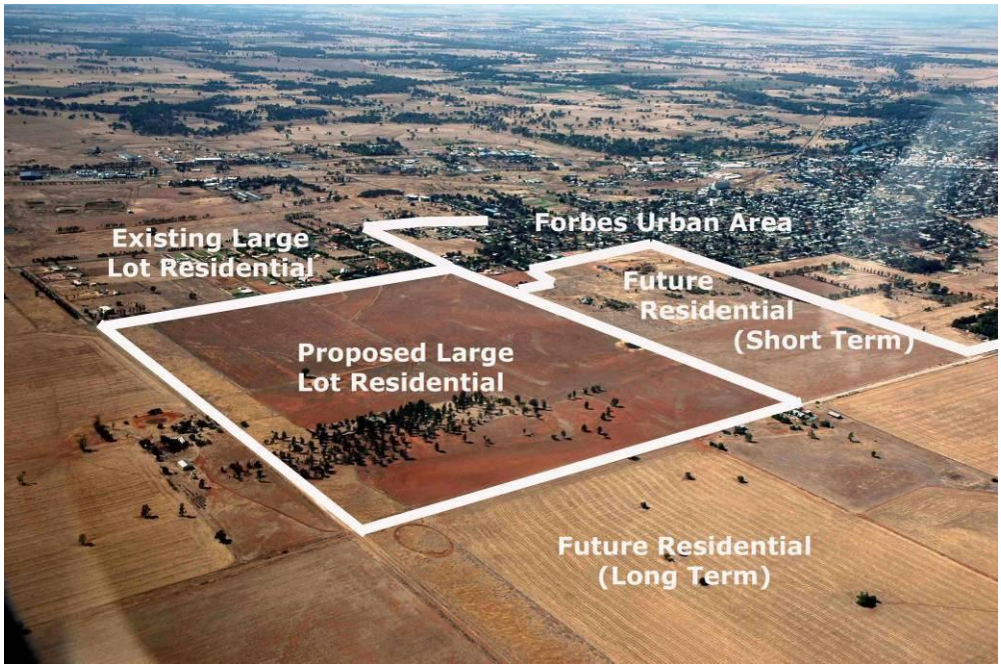


Photo 4.11: Proposed Large Lot Residential Area
Date of Photo: March 2006

The land south of Forbes around River Road is currently zoned for rural 1(c) but has a minimum of 10 ha for a dwelling house. The options for reducing the minimum lot size has been discussed with the Departments of Planning, Primary Industries and Water and Energy which has identified that the land has considerable constraints which are as follows:

- Floodprone
- Groundwater vulnerability
- Potential to increase surface water access
- Potential to reduce surface water quality
- Potential risk to riparian vegetation

At this stage, it is not recommended that the subdivision minimum be reduced because of the lack of detailed environmental investigations. A local environmental study would need to be undertaken of this area before any further consideration can be given to this matter.

It is recommended that the existing Residential 2(b) zone south of Raymond St be rezoned to Large Lot Residential to reflect the current lot sizes (which are larger than the current zone). However, vacant lots should be able to have a dwelling house built on them.

The community consultations showed that there was a demand for rural living type of development. This can be provided in two forms:

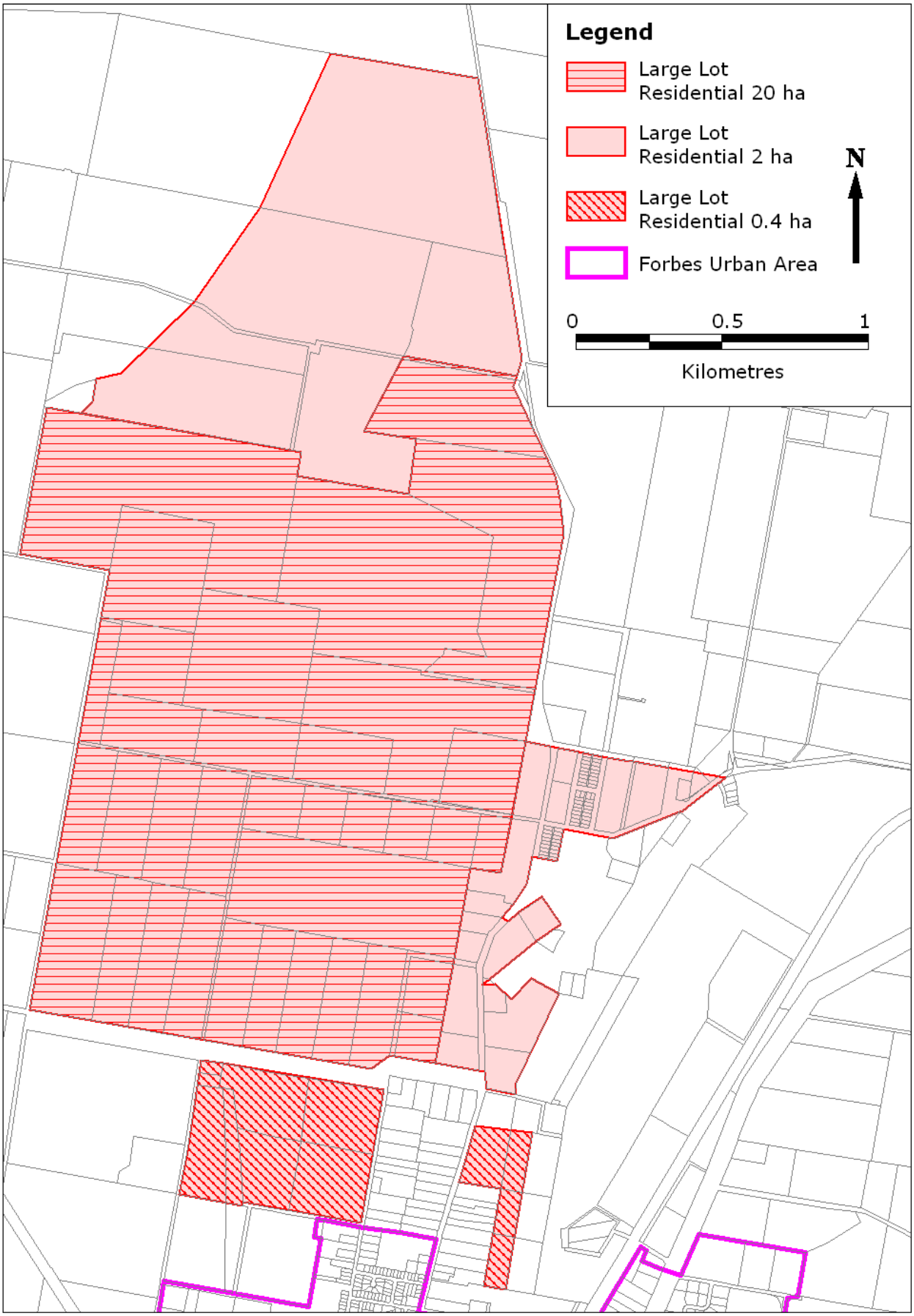
- Utilise existing lots close to Forbes
- Create a new area with a subdivision minimum of 40 ha and 20 ha.

There are a number of existing lots to the east and south of Forbes that are currently vacant and that range in size from 2 to 10 ha. This would include approximately 100 lots. The utilisation of these lots by giving building entitlements to existing holdings

would allow for some new rural living opportunities to be gained without lowering the minimum size for a dwelling house. However a great deal of the land is affected by High Hazard flooding which would make it unacceptable.

Another option is to provide for a specific area to be zoned to permit subdivision to 20 ha as well as providing the lots that are smaller than 20 ha with dwelling entitlements will allow for a range of lot sizes. In accordance with the criteria outlined above, these areas should have good access to Forbes and also be in close proximity to the town. It should also not be on prime agricultural land as much as possible. It is noted that the Alcheringa Estate north of Calarie has already created some fragmentation of this land. For this reason as well as the flood free status of the land this area has been chosen for the rural living development.

The land is shown on map 4.7 and extends from Edward Street in the west to Calarie Road. The land is mostly flat with some scattered vegetation. It has sealed access from Calarie Road. Edward Street is unsealed. There are 33 lots ranging in size from 3 ha to 98 ha. It is recommended that the area have a minimum lot size of 20 ha with dwelling entitlements being given to each of the smaller lots. This will yield 45 dwellings which will provide sufficient land for the next 5 – 10 years.



Map 4.7: Forbes Proposed Rural Small Holdings Designation

Commercial Development

A study of the commercial area was carried out by HillPDA Land Economists and Retail Consultants in November 2005 and has been discussed in the *Forbes Comprehensive Land Use Strategy Issues Paper*.

There are 3 areas that are zoned commercial in Forbes:

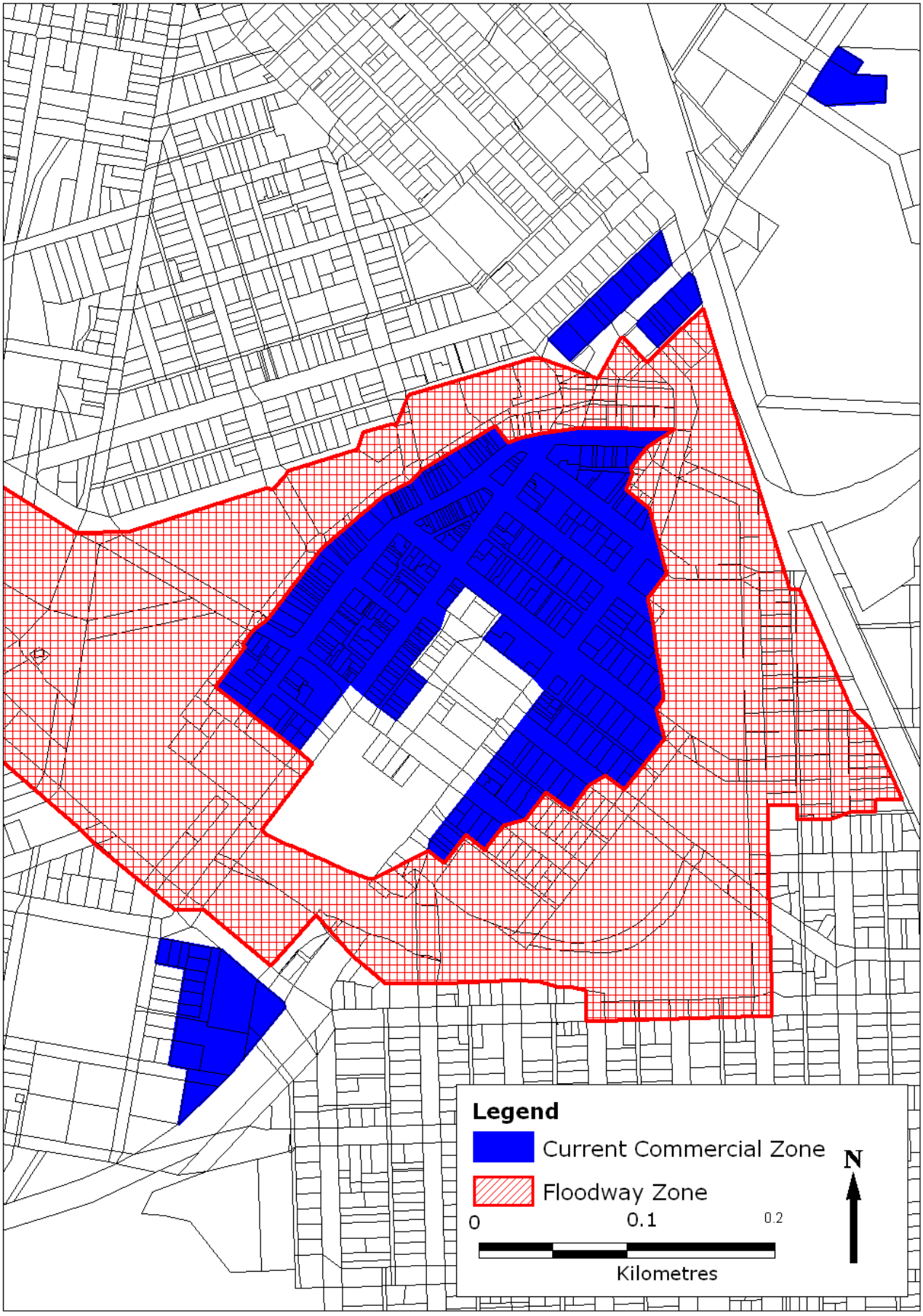
- The main CBD, which has a full range of commercial and office uses and older dwellings as well as some light industrial uses
- A small area adjacent to the Forbes Golf Club which has a motel and disused petrol station. There is a consent for a showroom on the petrol station site but it has not yet been commenced.
- A small area at Lynnette St south of Junction Street, which is mostly light industrial uses as well as a caravan sales use.

They are shown on Map 4.8. One major feature of the Forbes CBD and the commercial zoning is that it is surrounded by the High Hazard Floodway which has been zoned specifically to ensure that any new development is not permitted. This too is shown on map 4.8

The HillPDA report found that there was sufficient supply of commercial floor space to cope with the future population and role of Forbes. It also stated that it is important to retain the CBD within its current boundaries and not to allow any major retail development on land not in the current CBD. If this were to happen it would threaten the sustainability of the CBD by setting up a competing area (which would consist of a supermarket and associated specialty shops). The town does not have sufficient population to be able to maintain 2 commercial centres. The second commercial zone in Lynnette St has the potential to fragment the CBD because although it does not have any commercial uses in it at present, it is of a sufficient size that could attract a supermarket and specialty shops. This land should be rezoned to Industrial in line with its current usage.

Although there is sufficient commercial land in the Forbes CBD, there are some issues associated with the future development of the commercial area which are as follows:

- Need for an expanded &/or new supermarket
- Industrial type uses in the commercial area
- Residential uses in the commercial area
- Floodway zoning and commercial properties
- Bulky Goods Retailing



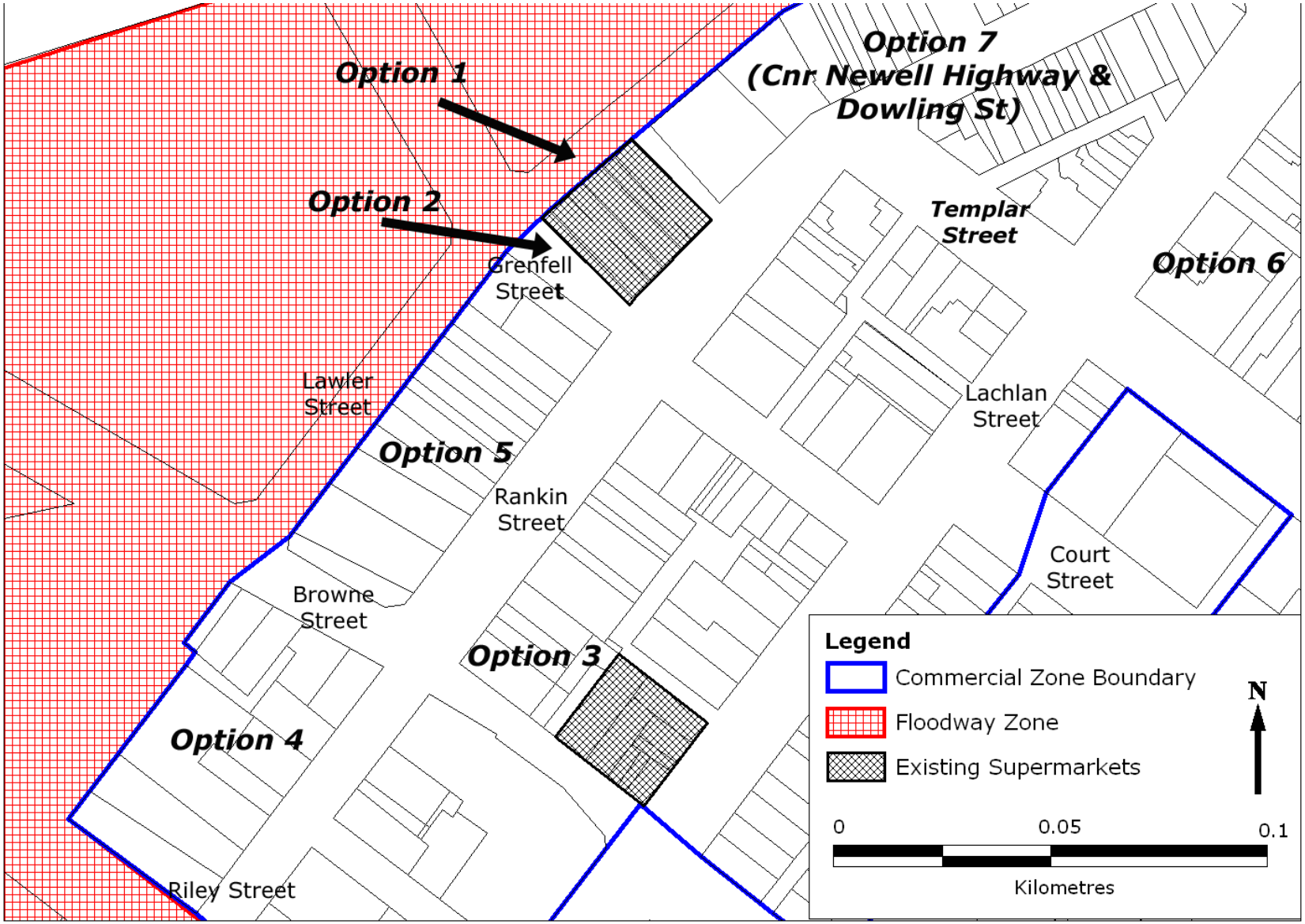
Map 4.8: Existing Commercial Zones

Currently there are 2 supermarkets in the CBD – Woolworths and Super IGA. The Woolworths is an ageing store and there is a wish to renew it. It is imperative for the survival of the CBD that any future supermarkets be located in the current commercial zoning of the CBD. However, the flood prone land surrounding the CBD presents some issues and does not allow for much vacant land. This means that there would have to be a redevelopment of other land within the commercial area. There are a number of options, all of which would necessitate raising the floor level above the flood height. A number of the options would also necessitate the demolition of current buildings. The options are as follows and are shown on map 4.9:

- Option 1: Existing Woolworths Supermarket to extend the existing site over Lawler Street and close Lawler Street;
- Option 2: Existing Woolworths Supermarket to extend the existing site over Grenfell Street and close Grenfell St;
- Option 3: Existing IGA to extend to the Rankin Street frontage;
- Option 4: Relocate to the block surrounded by Browne, Rankin, Riley and Lawler Streets;
- Option 5: Relocate to the block surrounded by Browne, Grenfell, Rankin and Lawler Streets;
- Option 6: Relocate to the land to the east of Lachlan Street.
- Option 7: Relocate to the 'Save On Fuel' site on the Newell Highway north of Lower Rankin St

Each of these has some issues that have to be addressed. The main one is flooding and the need to raise the development to be above the flood height. This has the benefit of allowing for undercover parking – something that is sought after during the hot summers.

There are a number of commercial uses in the CBD that are more akin to light industrial or bulky goods retail uses. These include the 3 tyre services, mechanical repair workshops, car yards, fuel station, wool stores etc. Apart from taking up commercial space, they also create some traffic issues with trucks and busses parking on the street and potentially causing a traffic hazard. These uses would be more suited to the industrial area. It is noted that this was an issue raised by the people who attended the community workshop. The Council could encourage these uses to relocate by selling its own industrial land at a reduced rate, thereby offering an incentive for these light industrial uses to be in the industrial area and not in the main part of the CBD. This would not be such an issue, but in an area like Forbes where the commercial area is constrained by flood prone land, these uses will over time become more suited to another location. It is not good practice to allow industrial uses in the commercial area if there is a separate industrial area. The main reason for this is that it can cause disruption to traffic movement and noise, dust and vibration. Whilst it is recognised that some of the retail uses assemble goods such as beds, wardrobes and bicycles, this is not considered to be manufacturing. The main thing to bear in mind when determining the use is the dominant use of the site. In the above example, retailing is the dominant use. Clarification of this matter should be made in the resulting LEP.



Map 4.9: Supermarket Options

The current CBD is quite large – extending to the east of Sheriff Street to the floodway. However, it is evident that this is not a well known fact in the community as there have been various calls to rezone more land to commercial – when there is land available but is currently being used for residential living. There is a need therefore to ensure that this land is used for commercial uses – particularly offices so that the existing main shopping streets (Lachlan and Rankin) are used for shopping and other uses can be located in the other areas.

The Council Chambers are currently zoned Special Uses, however it would be logical for the land to reflect the commercial zoning of land surrounding it.

The current commercial zone adjacent to the Forbes Golf Club has a motel and a vacant building located on it that was used as a service station. These are currently zoned commercial and Council has resolved, in response to submissions, to keep this as a commercial zone.

The Forbes Services Memorial Golf Club is currently zoned as Open Space. In response to a submission from the Club, the Council resolved that the land surrounding the Clubhouse be zoned Tourist. This means that course will remain as a Recreation Zone

Industrial Development

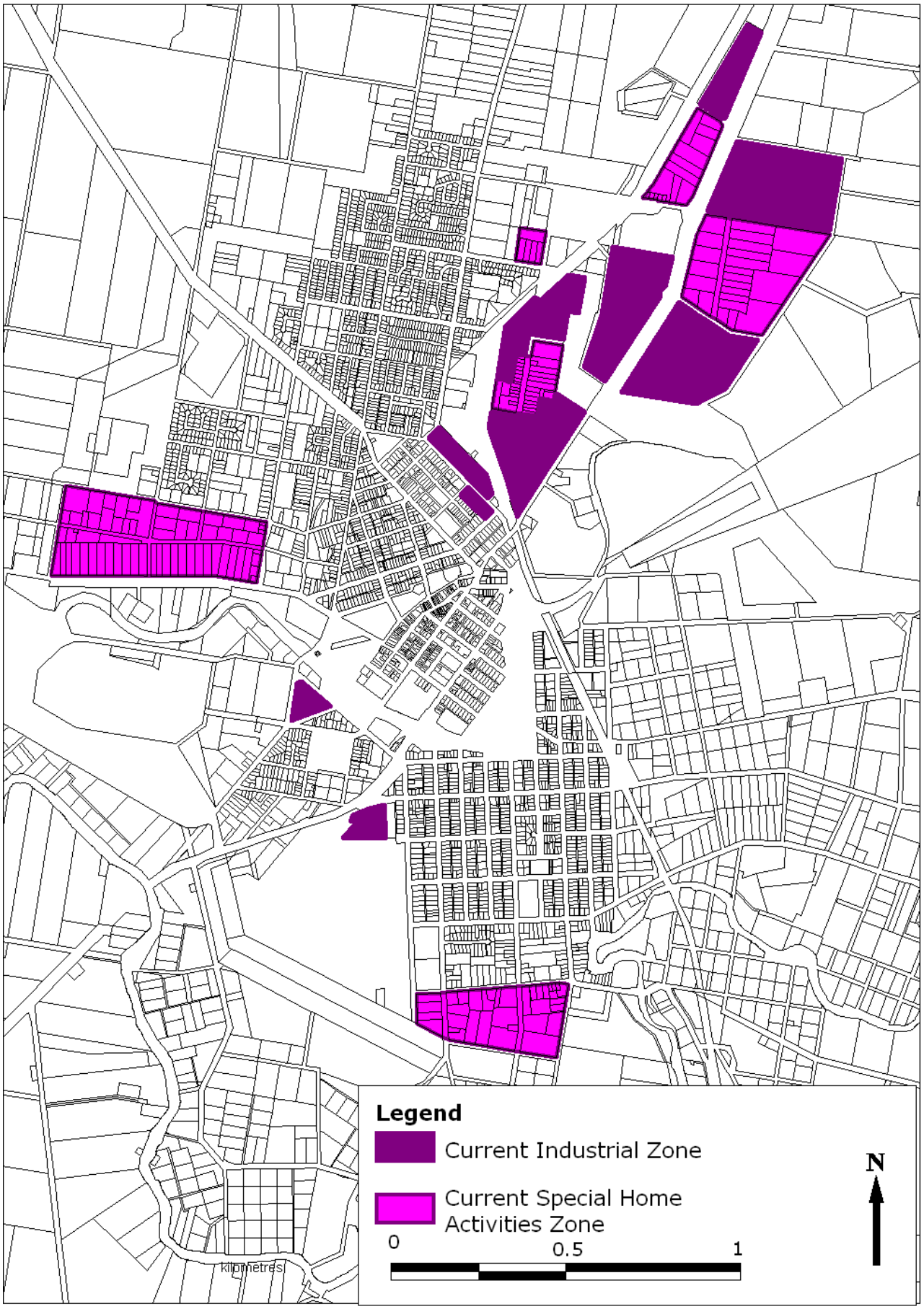
The current extent of zoned Industrial land is considered to be adequate. The location of the industrial zones is shown on map 4.10. There are 2 industrial zones in Union Street, one on the southern side and one on the northern side. The use on the southern side has recently relocated and the most appropriate future use of the land is for light industrial and the zoning should reflect this and be light industrial.

The LEP 1986 makes provision for a 'Special Home Activities Zone', which was intended to allow for light industrial uses to be used in conjunction with residential uses. The extent of the Industrial and Residential Special Home Activity Zone are shown on map 4.10 and can be seen from photo 4. 12.

There are 4 areas of special home activity zones within the industrial area of Forbes. They can be seen on map 4.10 and are as follows (from north to south):

- Wyndham Avenue
- Landrace Street
- Sam Street
- McDonnell Street

The other 2 areas (Bedgerebong Road and South Forbes) have already been dealt with by changing them to large lot residential and so are not relevant to this discussion.



Map 4.10: Industrial and Residential Special Home Activity Zones

Photo 4.12: Forbes Industrial and Residential Special Home Activity Zones
Date of Photo: March 2006

The title of the Residential Special Home Activity zone is inappropriate for the middle of an industrial area. The Wyndham avenue area however has industrial uses and should be zoned as such. The McDonnell Street area should be zoned for residential use consistent with surrounding lands. This leaves only the Landrace and Sam Street areas and there are a number of options to address this which are as follows:

- Zone the area Mixed Use under the provisions of the Standard LEP. However, this zone is aimed at commercial uses, which are not considered appropriate for this area which is distant from the existing commercial area.
- Use the Mixed Use zone and remove reference to commercial uses. The rules for implementing the Standard LEP do not allow for the removal of the standard objectives.
- Rezone to industrial. This could be confusing to the existing home owners in the Sam Street and Landrace St areas, however they would have existing use rights to continue with the residential use.
- Rezone to industrial and have a special overlay that links to a clause that permits light industrial uses in conjunction with residential uses. This would be similar to the mixed use zone in the Standard LEP.

It is considered that the best option is to zone the land as industrial with an overlay that indicates the special home activities provisions of the current LEP apply. This would include the replacement of the existing dwelling houses and permit home business, home industry and home occupations to be allowed in conjunction with the dwelling houses but not any other industrial uses. This would be similar to the Mixed Use Zone in the Standard LEP. The revisions to the industrial and special home activity zones are shown on map 4.11.

There are a number of bulky goods retailing uses in the town and this is expected to continue. Because of their size and the limited space in the CBD, it is not appropriate for them to be located there. They are currently clustered around Sam Street and the Newell Highway. It is considered appropriate to designate this land for bulky good retail. It is noted that most of this land is currently already built on and there should

be another site identified for future bulky goods uses. The current Forbes Saleyards are located directly north of this land along the Newell Highway. The Council have constructed a new Saleyards out of the town on the Back Yamma Rd and this is to be constructed in 2 stages with the sheep facility yet to be constructed and currently remaining on the existing site. It would be appropriate to designate the saleyards for future bulky goods retail once the saleyards have been removed. This is shown on map 4.11. It would be appropriate to prohibit bulky goods retailing from the rest of the industrial zone as well as the rural zones. However, this area has some current salinity issues and these will have to be investigated, especially the impact of having larger site coverage of buildings and the redevelopment of salinity affected areas.

The northern extent of the industrial zone is Landrace Road. Immediately to the north of this there is and industrial use (Pet Chef) and the land surrounding this has been recently acquired for another industrial use. It would be appropriate to rezone this land for industrial use to formalise its status. This land has been identified because it is free of flooding constraints as well as having no evidence of salinity problems. Access to the industrial use already existing is from Landrace Road and all future uses should also have access only from this road and no access should be permitted from the Newell Highway. The land is shown on photo 4.13.

Photo 4.13: Industrial Use north of Landrace Road
Date of Photo: March 2006

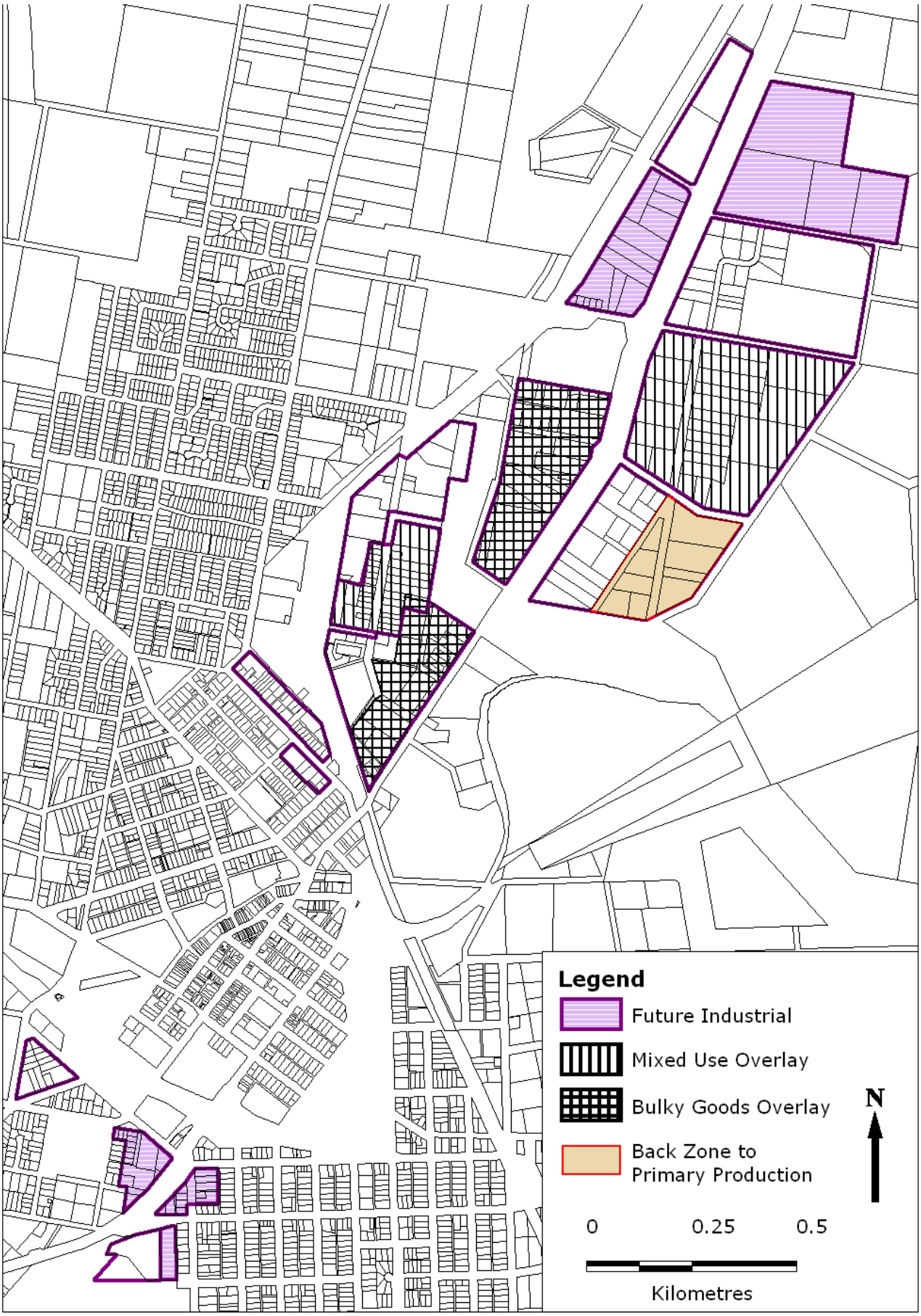
The land at Lynette Street south of the Lake is currently zoned as commercial, but as discussed above, its uses are industrial. It is appropriate therefore for it to be rezoned as industrial. This is shown on map 4.11.

The land on the corner of Oxford St and the Newell Highway currently is used for industrial use (paper recycling) but the land is zoned residential. It is considered appropriate to change the zoning of this site to industrial to recognise the current use of the land.

The existing Shire Depot is currently zoned as Special Uses but it would make its future usage easier if it was zoned to Industrial use. It is therefore recommended that this occur.
It is considered that there is sufficient land to cater for the light industrial needs for the foreseeable future, however, future zoning for such uses should be on the north of the town in the vicinity of the new saleyards area so that it is kept away from the town area.

The land bounded by Landrace, Hereford and Charolais Street although zoned as Industrial under the current LEP does not have any industrial uses on it and consists of 2 dwelling houses and vacant land. The land slopes to the southeast and so is on the other side of the hill from the industrial uses on the western side of Charolais Street. This can be seen from photo 4.14. The land has an outlook over the adjoining rural land and as can be seen from photo 4.14. It is therefore recommended that this land be rezoned to Primary Production Designation.

Photo 4.14: Landrace St Forbes
Date of Photo: May 2008



Map 4.11: Future Industrial Designations

Former Forbes Abattoir Site

The Forbes abattoir has had a varied history over the past 20 years having periods of being open and then closed because of the vagaries of the meat processing market. The site is currently closed and is unlikely to open again at its former capacity because of the issues associated with environmental compliance. The site's proximity to the urban and rural residential development in the north of the town will only exacerbate this because of the potential for odour complaints. It is understood that the current owners have surrendered the pollution operating license which has the impact of requiring a totally updated environmental compliance regime which would be akin to building a new plant.

The future of the site is complex and needs further discussion with the owner, Council and the community. Photo 4.15 shows the site and its surrounding uses. It can be seen that it has good access to the Highway without having to pass any residential uses, adjoins the railway line and has industrial uses to the east with a considerable buffer to the west. The distance from the buildings to Calarie road is approximately 1 km and to the edge of the TSR is approximately 500m. There is a small ridge that runs in a northerly direction from the water tower which acts as a barrier from the residential area and proposed Large Lot Residential zone. There are options for the site and the buildings to be reused for a transport related use utilising its location adjacent to the Newell Highway and railway line. There are significant cold storage facilities that were used as part of the abattoir operation and this part of the site could be used in conjunction with the growing and distribution of vegetables as an example. Consideration could be given to other uses, however this needs further discussion and evaluation.

Photo 4.15: Abattoir Site
Date of Photo: March 2006

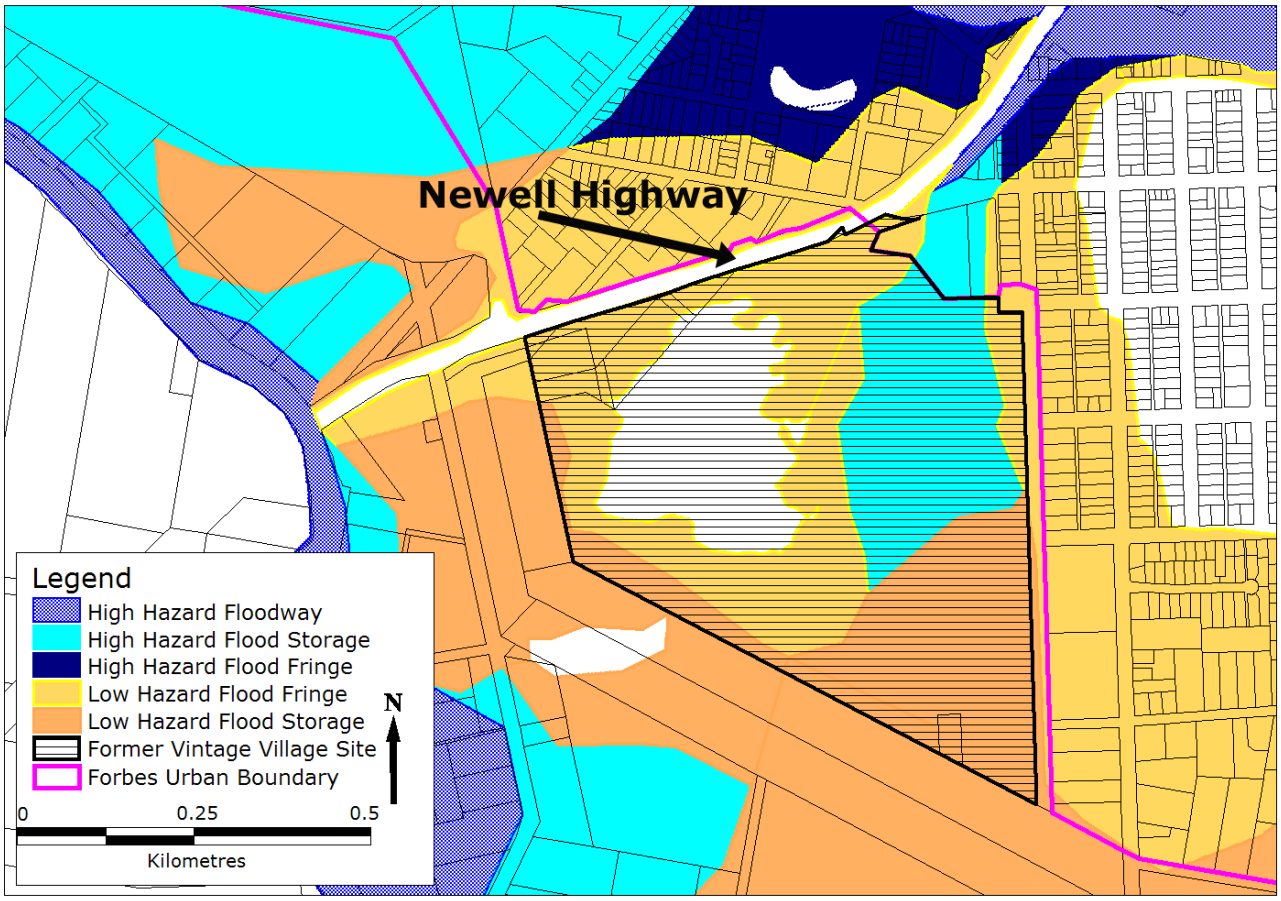
Forbes Vintage Village

The site of the former Forbes Vintage village is located on the Newell Highway to the south of the town and it adjoins the Forbes urban area. It has been operated as a tourist facility for a number of years but has been closed for 3 years. An Investigation into the landuse options for the site was prepared by Geolyse Consulting mid 2005, on behalf of the owner.

A large amount of the site is subject to flooding and it also has heritage items and abandoned mine shafts on it. There has been a moat constructed around the buildings which adds to the constraints of the site. The flood affectation can be seen from map 4.12.

These constraints limit the potential uses. The flooding and access prevents it being used for any future residential or rural residential use. The current use as a tourist attraction is the only really potential for the site. There is a need for a higher class of tourist resort / function / conference centre in the Shire and this could be promoted as the best possible future use for the site.

The Hill PDA report has noted that there is sufficient commercial zoned land and also the site is some distance from the CBD (approximately 1.3 km) and any commercial zoning would have an adverse impact on the integrity of the CBD, as noted by Hill PDA in their retail assessment. The current industrial zone is located to the north of Forbes and further industrial uses should stay to the north of town. So it can be seen that commercial and industrial uses are considered to be inappropriate and the most appropriate use is as a tourist related one for a resort style of development.

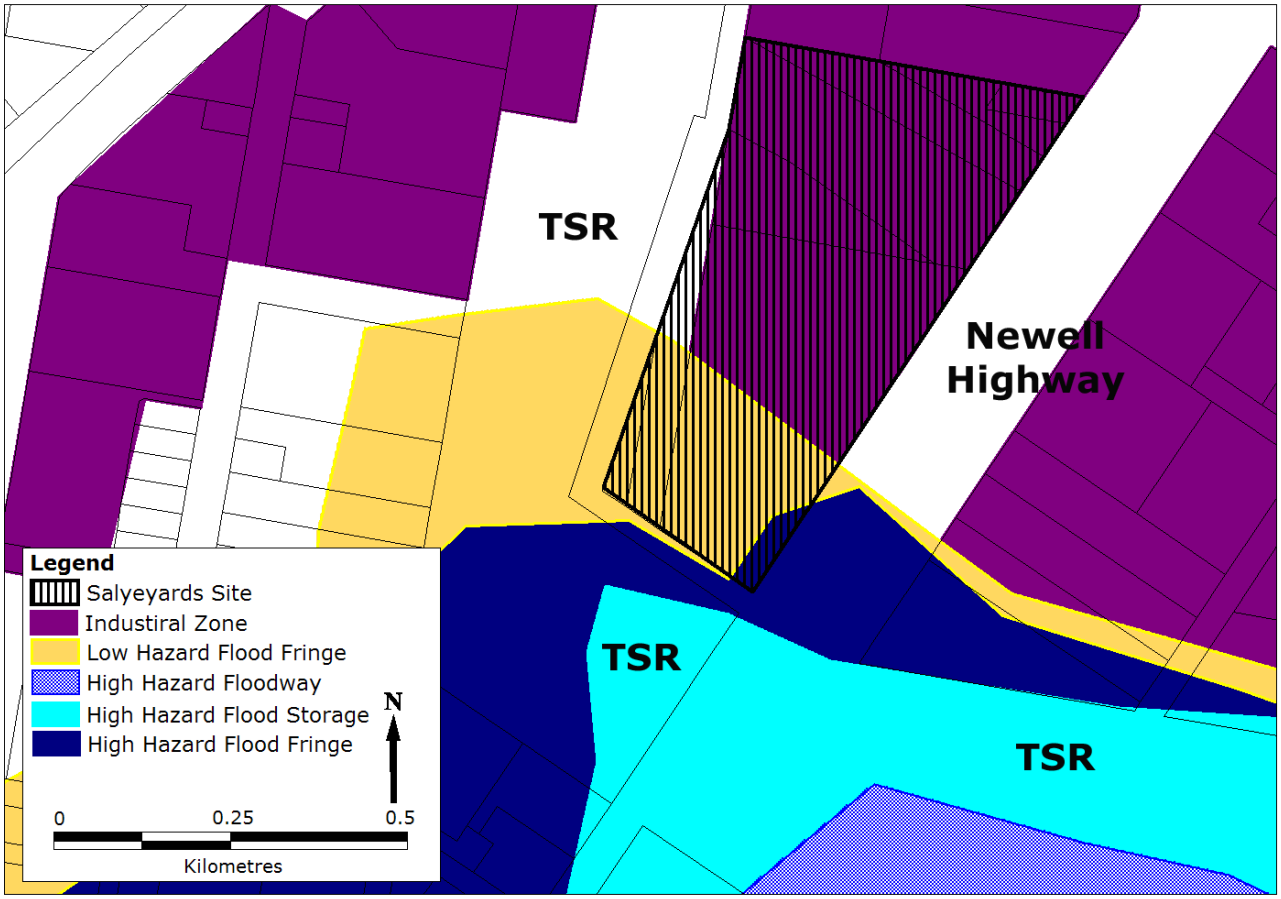


Map 4.12: Former Vintage Village Site

Forbes Saleyards

The current saleyards, or Central West Livestock Exchange is in the process of being relocated to a new site on the Back Yama Road at Daroobalgie, with the cattle facility already built and the sheep saleyards to be built within the next 5 years. This leaves the current site vacant and in need of redevelopment. It has an area of approximately 8 ha, and as can be seen from map 4.13 and photo 4.16, it is located on the Newell Highway and in the industrial area. It is some distance from the residential area of Forbes but approximately 400 m from the existing Special Home Activities zone. The southern part is flood affected – Low Hazard Flood fringe.

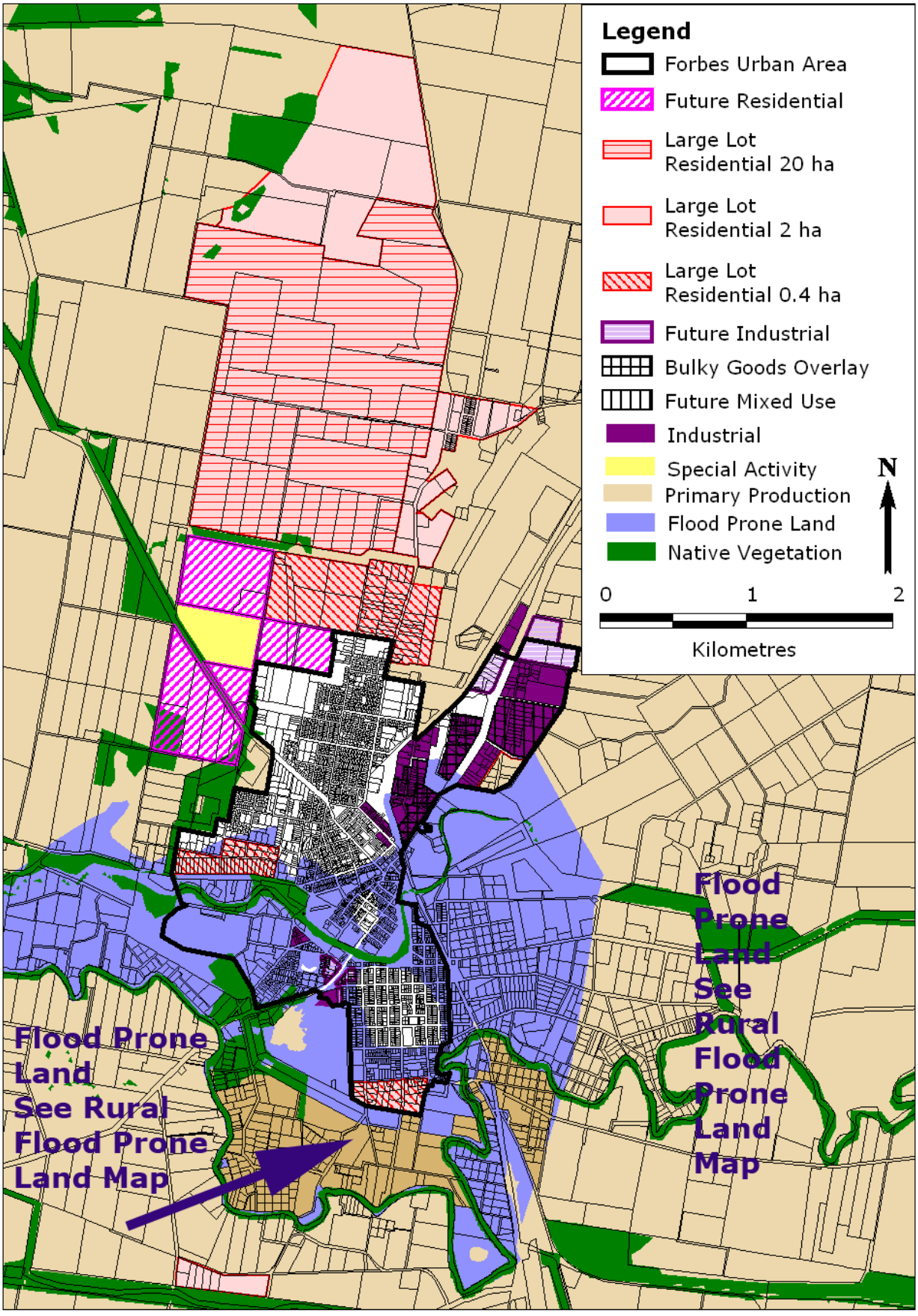
Future use opportunities should utilise the Newell highway. Options could include a truck stop with accommodation units for truck drivers, further industrial uses or a future area for Bulky Goods Retail after the current proposed area reaches capacity. This issue needs more investigation and discussion with the Council and community. As has already been discussed, bulky goods retail is the favoured use for the site after the sheep saleyards have been moved to the new facility on Back Yama Road. There may also be the potential to raise the site above the 1% AEP flood height to facilitate the development of the entire site. This would have to be the subject of a flood study to ascertain the impact on other areas. It would be permitted by DCP No. 6 – Managing Flood Risks, provided that existing drainage lines are maintained.



Map 4.13: Forbes Saleyards Site

Photo 4.16: Forbes Saleyards Site
Date of Photo: March 2006

A summary of the land use changes recommended for the town of Forbes is shown on map 4.14 . The map also shows the constraints identified in chapter 2 to show that the areas identified for development are not in areas identified as constraints to development.



Map 4.14: Proposed Forbes Land Use Changes and Constraints

4.2.4. Bedgerebong

Bedgerebong is a small settlement located on the northern side of the Lachlan River approximately 30 km west of Forbes. It has a number of dwellings and a school and church as well as a racecourse / playing fields and a community hall. There is an already subdivided settlement with 35 lots ranging in size from 2,000 m^2 to 6,000 m^2. The cluster of dwellings are located around the church and the racecourse. The playing fields and hall are on the northern side of the road adjacent to the church. The school is approximately 1.5 km to the west of the church and on the northern side of the road. There is no shop in the area.

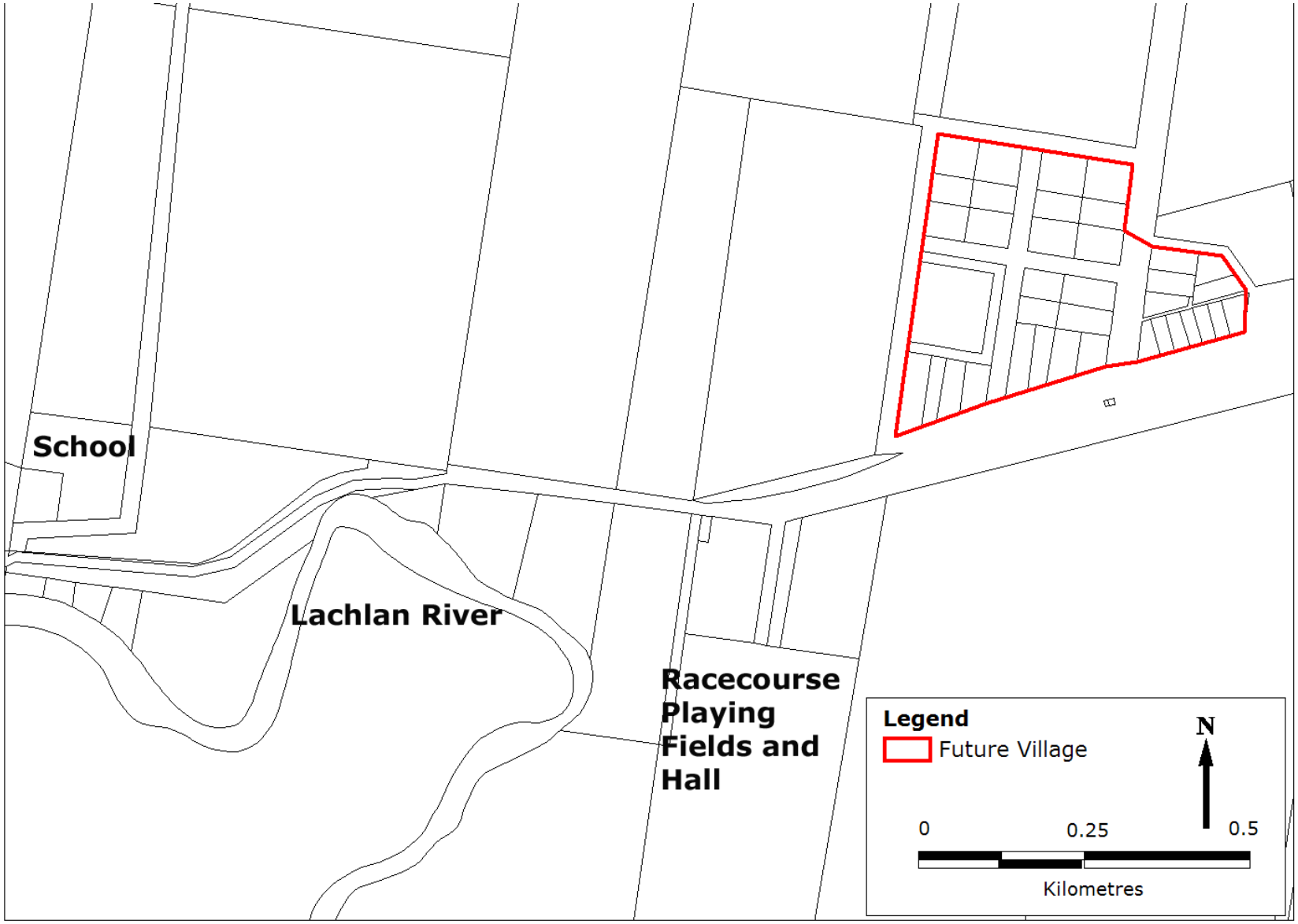
Bedgerebong is currently zoned as rural but has some potential to be zoned as a village. This would allow for a general store to be built to serve the area. The land use survey showed that there is an already subdivided area that has a few houses on it but that there are 22 'vacant' lots, that is, they do not have a dwelling on them and are used as gardens or are cropped. There are 12 dwellings in the already subdivided area. These can be seen on photo 4.17.

Photo 4.17: Bedgerebong
Date of Photo: May 2006

Provision of water is able to be by bore for each house and effluent disposal can be done by an onsite system.

The Lachlan River is close to Bedgerebong, and this could pose a flooding issue.

This concept has been included for discussion with the community and Government Agencies. If there is acceptance of it, appropriate investigations would have to be carried out, which would include flooding, water supply and onsite effluent disposal.



Map 4.15: Proposed Bedgerebong Village

4.2.5. Rural Land and Planning Policies

The State Government has 3 policies and a SEPP that are relevant to the future planning of the Shire. They are as follows:

- SEPP Rural Lands 2008
- Rural Land Use Policy
- Policy on Sustainable Agriculture
- NSW Policy for Protection of Agricultural Land, 2004

SEPP Rural Lands 2008

The *SEPP Rural Lands 2008* was gazetted on 9 May 2008. It applies to the State except for those Councils in the Sydney Metropolitan Region. The aims of the Policy are as follows:

(a) to facilitate the orderly and economic use and development of rural lands for rural and related purposes,
(b) to identify the Rural Planning Principles and the Rural Subdivision Principles so as to assist in the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State,
(c) to implement measures designed to reduce land use conflicts,
(d) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
(e) to amend provisions of other environmental planning instruments relating to concessional lots in rural subdivisions.

The Department have also released a Planning Circular (PS 08-002) to accompany and describe the SEPP. This states that the aims of the SEPP will be achieved by:

- introducing rural planning principles to provide guidance for local Councils when preparing new comprehensive LEPs or amending LEPs in respect to rural and environment protection zones
- introducing rural subdivision principles to provide guidance for local Councils which seek to vary existing minimum lot sizes in rural and environment protection zones
- enabling subdivision of rural land for the purpose of primary production below the minimum lot size without allowance for a dwelling
- introducing heads of consideration for the assessment of land use conflict when councils consider development applications in rural areas
- removing concessional lot provisions from LEPs to minimise land use conflicts and fragmentation of rural lands
- enabling the Minister to identify State significant agricultural land and limit certain types of development on such land
- enabling the Minister to establish rural lands planning panels to provide advice to the Director-General on developments that propose to vary development standards.

A set of Rural Planning Principles have been outlined in clause 7 of the SEPP and the Planning Circular provides an explanation of them. This is reproduced below:

(a) The promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas.
In planning for rural areas councils should ensure that zoning and development controls within LEPs protect the range of current rural uses, i.e. agriculture, forestry and extractive industries, which contribute to the local, regional and State economy. Planning controls should be flexible to provide opportunities for changes in agriculture, existing industries and potential economic activities. This can be achieved through adopting a range of appropriate zones, minimum lot sizes and land use that support current and future rural land uses.

(b) Recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State.
Economic activities in rural areas make a significant contribution to the NSW economy. Agriculture, itself, contributes approximately $7.3 billion to the economy of NSW (2006–07). Future planning for these areas is key to the social, economic and environmental sustainability of rural areas. Planning for rural areas should recognise the trends and ongoing change to agriculture including changing farm sizes, agricultural sector restructuring, and changes in farm practices and productivity and provide appropriate controls in LEPs to achieve this outcome.

(c) Recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development.
The proper management and development of rural areas have significant social and economic benefits to local rural communities and the broader State community. Planning for rural areas should recognise the significance of rural land uses and provide a range of planning responses, such as zoning, land uses and strategically planned housing opportunities that do not conflict with rural uses. The role of agriculture, including new and innovative forms, and appropriately located rural housing in facilitating the social and economic rejuvenation of local communities is an important factor to consider.

(d) In planning for rural lands, to balance the social, economic and environmental interests of the community.
Rural lands have a range of social, economic and environmental values including agriculture, extractive resources, water resources, environmental services (such as water quality management), tourism, housing, conservation, landscape values and sustaining rural communities. At times these values may compete with each other, however sound strategic planning can avoid conflict. For instance introducing appropriate farm-based tourism uses to rural zones can permit tourism activity and the associated economic benefits while at the same time complement the existing agricultural activity. Planning for these areas should seek to ensure a balance is achieved between these values to achieve the proper management of rural land and reinforce opportunities for rural communities.

(e) The identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land.

Planning for rural areas should ensure that appropriate environmental values and natural resources are identified in the planning process and protected appropriately through zoning and planning controls, including the use of environment protection zones to protect important rural landscapes where soundly justified. This includes protection, management and restoration of areas of high ecological, scientific, cultural or aesthetic values (such as areas of native vegetation, riparian areas and habitats of native flora and fauna, including threatened species, populations and ecological communities). The new Standard Instrument (Local Environmental Plan) Order 2006 reinforces the importance of environment protection zones in promoting and protecting environmental conservation and management. The range of land uses which are appropriate in environment protection zones should reflect the characteristics and capability of the land. The Department is drafting a practice note on the use of environment protection zones in Standard LEPs.

(f) The provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities.

Rural areas are increasingly under pressure for lifestyle housing opportunities. This demand for rural housing has both social and economic advantages and disadvantages for rural communities. Planning should identify a range of housing choices within rural areas including urban areas, rural lifestyle and housing associated with rural activities. Housing opportunities should be determined through a strategic planning process to avoid land use conflict, avoid constraints, fragmentation of rural land and provide access to appropriate infrastructure and services. The provision of a reasonable quantity of rural lifestyle development opportunities in strategically appropriate locations can be an important factor in reducing the pressure for lifestyle housing on important agricultural land.

(g) The consideration of impacts on services and infrastructure and appropriate location when providing for rural housing.

In planning for housing in rural areas the costs and impacts to the community, councils and State government of providing access to services and infrastructure needs to be considered. The costs to local councils for basic services such as roads (including maintenance), water, garbage collection etc, should be a significant factor in considering proposals in remote locations.

(h) Ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local Strategy endorsed by the Director-General.

Where an applicable regional strategy or endorsed local strategy provides outcomes and actions relevant to rural areas for the preparation of a LEP, councils should ensure LEPs are consistent with and implement those outcomes and actions.

A set of Rural Subdivision Principles have been outlined in clause 8 of the SEPP and the Planning Circular provides an explanation of them. This is reproduced below:

(a) Minimisation of rural land fragmentation.

Unplanned rural subdivision through inappropriate planning controls can result in fragmentation of rural lands which can result in lots sizes which do not reflect the needs of rural land uses, potential conflict with existing agriculture, and land prices reflecting residential demand rather than agricultural potential. Future planning should avoid controls which result in fragmentation of rural

lands. A range of lot sizes can be considered based on agricultural suitability and capability, trends in agriculture, land ownership patterns, commercial sustainability, impact of current lot sizes on future land uses, environmental constraints, and infrastructure provision.

(b) Minimisation of rural land use conflicts, particularly between residential land uses and other rural land uses.

Residential and non rural uses in rural areas often result in land use conflicts with existing rural uses, such as agriculture, extractive industry, forestry, food processing, or transport. Planning for rural areas should consider possible land use conflicts at both the land use planning (LEP) and development application stage. Consideration of the location of future urban and rural residential areas, existing rural uses, a range of lot sizes, permissible land uses within zones, setbacks and buffers should be undertaken when preparing new LEPs and reviewing lot sizes. The heads of consideration in clause of 10 of the SEPP are also relevant in this regard.

(c) The consideration of the nature of existing agricultural holdings and the existing and planned future supply of rural residential land when considering lot sizes for rural lands.

A review of lot sizes should consider the size and pattern of existing rural holdings and their related economic activities. A review may result in a range of lot sizes that meet the requirements for primary production, existing and future, and rural housing opportunities. Future opportunities for rural residential development should be strategically planned and located to avoid potential land use conflicts, be easily serviced and provide for a sufficient quantity and range of rural housing needs.

(d) The consideration of the natural and physical constraints and opportunities of land.

A review of rural lot sizes should have regard to existing environmental values and natural resources, including the agricultural viability of the land. Future controls for lot size should reflect such constraints and be developed to reflect these constraints and opportunities where appropriate.

These considerations should also aim to:

- *minimise impacts on the natural environment, including avoiding increased fragmentation of native vegetation and habitats of threatened flora and fauna (including threatened species, populations or communities)*
- *avoid inappropriate development in areas which may be constrained due to biodiversity, land and water values.*

(e) Ensuring that planning for dwelling opportunities takes account of those constraints.

Any review of minimum lot sizes that will permit the subsequent erection of dwellings should ensure that lot sizes are an adequate size to permit dwellings and manage any constraints, including the need for appropriate buffers to any surrounding agricultural uses.

The SEPP Rural Lands was one of the recommendations of the Central West Rural Lands Planning Panel which was established in February 2007. The Panel was formed to provide recommendations to the Minister for Planning for 13 Local Government areas within the Central West of New South Wales in relation to 5 specific terms of reference these being:

- Establish the extent, value and location of agriculture in the Central West Region of New South Wales.
- Identify the key land use planning threats to its ongoing viability.
- Assess the net benefits of agricultural land uses in terms of economic, social and environmental benefits.
- Advise on a preferred land use planning approach to ensure the continuation of agriculture, which takes into account social, economic and environmental factors. The approach is to identify an appropriate mix of strategic, statutory and incentive based mechanisms.
- Provide specific advice on establishing minimum lot sizes and/or subdivision constraints through the Local Environmental Plans and the appropriateness of the Department of Primary Industries methodology for determining minimum lot sizes, including the issue of off-farm income.

The Panel's findings can be summarised as follows:

- Agriculture is an important component of the Central West and that it is changing in its nature across the whole nation. It also found that farm incomes fluctuate with the varying commodity prices.
- The key land use threats to the ongoing viability of agriculture is the lack of understanding in some quarters of the changing face of agriculture. The uncertain planning environment, land use conflicts between rural residential uses and agriculture as well as the fragmentation and loss of rural land were also seen as threats.
- It was found that there were net benefits in terms of economic, social and environmental aspects.
- A new SEPP has been proposed as the preferred land use planning approach in association with the Standard LEP and Advisory Independent Hearing and Assessment Panels.
- The DPI methodology is considered inappropriate because it relies soley on the economic viability of agriculture. It was the Panel's recommendation that the existing minimum lot sizes in the region be maintained.

Rural Land Use Policy

The *Rural Land Use Policy* of the Department of Planning covers the following matters:

- The need to preserve the rural land as a resource including the following matters:
    - to minimise the loss or fragmentation of agricultural land or holdings
    - to maintain and promote agricultural activities and uses and to provide opportunities for a greater variety of agricultural uses in the future
    - to protect the productive capacity of agricultural land
    - to minimise landuse conflicts and environmental impacts
    - to protect and maintain the scenic and landscape values of rural lands
    - to protect and restore the natural resource base on which agriculture and other land uses depend

- Planning for settlements are to include the following:

- to ensure supply of new housing relates to demand
- to plan for rural residential development in the context of a rural release or settlement strategy
- to maximise use of existing infrastructure in the provision of urban and rural residential lots
- to conserve or use land in a way that will not prejudice future urban purposes
- to minimise impact on the existing and potential productivity of agricultural land
- to minimise landuse conflicts and environmental impacts
- to protect and maintain scenic landscape values
- to provide for a variety of urban and rural living opportunities
- to ensure settlement relates to the physical, social and service catchments
- to ensure coordination on a regional level and between adjoining local government areas

Policy for Sustainable Agriculture

The State Government's *Policy for Sustainable Agriculture* seeks to create an environment in which agricultural enterprises can contribute positively to the state's productivity and economy, protect the state's biological and physical resource base and thus support the State's rural people and communities. The purpose of the policy is to facilitate a coordinated approach to achieving an ecologically and economically sustainable agricultural sector in New South Wales. The Policy provides an agreed goal for sustainable agriculture in New South Wales, common objectives, and strategies that should guide a wide range of stakeholders towards this goal. It also provides a framework within which individual agencies and interest groups can develop specific position statements and action plans. The policy develops objectives and strategies for the following areas:

- Agricultural production
- Land management
- Water use and quality
- Nature conservation on farms
- Rural communities
- Integrated management

It is a whole of Government Policy which is to be implemented by all government departments.

Objectives of the Policy for Sustainable Agriculture relevant to strategic local planning are to:

- Ensure that there is the opportunity for the ongoing use of land for agriculture both in having lands available for the next generation of farmers to farm, as well as to undertake agriculture without hindrance. Conflict is one of the complications from allowing unplanned or poorly planned residential development in or next to agricultural lands. This addresses intergenerational equity as one of the principles of ecological sustainable development (ESD).

With any government process, all ESD principles should be adopted as basic principles.

- Facilitate the structural adjustment of agriculture industries and rural communities to enhance the sustainability of agriculture (i.e. facilitating farm adjustment and avoiding the speculation that comes with allowing other competing land uses). It also recognises that with increasing environmental regulation regarding noise, dust, odour and chemical use, the impacts of practising agriculture can be managed better on farm, and between farms. This can be achieved through having separate zones for agricultural production and ensuring that the integrity of agricultural areas are preserved.
- Provide opportunities for agricultural processing facilities to be located in rural areas and to strengthen supporting infrastructure

The former Departments of Agriculture and Urban Affairs and Planning (now part of the Department of Primary Industries and Department of Planning respectively) in 2001 developed the following policy on the development of LEPs for rural areas:

- Minimum lot sizes for subdivisions that may be eligible for a dwelling consent should be determined based on the area required to sustain a farming enterprise typical for that locality. This approach recognises the role of off farm income and that smaller parcels of agricultural land can be traded, however no dwelling rights are attached to these smaller lots.
- Concessional allotments are an inappropriate form of subdivision and should be progressively removed from plans across the State.
- Rural lifestyle opportunities should be provided for in a planned way, based on rural residential strategies and zones.
- Intensive forms of agriculture need to be catered for in the planning process. Determining allotment sizes for sustainable intensive agricultural developments will need to carefully consider potential environmental impacts as well as return on capital invested

This policy has been formalised in the 2001 report to the Premier of NSW by the NSW Sustainable Agriculture Review Group.

Policy for the Protection of Agricultural Land

The *Policy for Protection of Agricultural Land* was adopted in May 2004. It provides detail on the provision of advice concerning the preparation of Environmental Planning Instruments – State Environmental Planning Policies (SEPP), Regional Environmental Plans (REPs) and Local Environmental Plans (LEPs). It references the policy on Sustainable Agriculture. The document promotes a strategic approach to the preparation of planning instruments which is openly consultative with the local communities as well as being transparent.

There are 3 major policy focuses to protect agricultural land, according to the policy. They are as follows:

- Environmental planning instruments
- Conversion of land
- Minimum size of holdings for a dwelling entitlement

The Policy states that *Environmental Planning Instruments* should be structured to:

- promote the continued use of agricultural land, particularly prime crop and pasture land, for commercial agricultural purposes, where that form of land use is sustainable in the long term;
- avoid land use conflicts;
- protect natural resources used by agriculture;
- protect other values associated with agricultural land that are of importance to local communities, such as heritage and visual amenity;
- provide diversity of agriculture opportunities, including specialised agricultural developments, at appropriate locations to provide scope for development in rural areas; and
- allow for value adding and integration of agricultural industries into regional economies.

The *conversion of land* used by agricultural enterprises to other uses should only take place where fully justified and after consideration of alternative sites and options. Any decisions to convert agricultural land to non agricultural uses should consider the optimal agricultural use of the land and alternative ways to structure the agricultural business. This is to ensure that competing land uses are located so as to maximise the benefit to the community. It requires the determination of the economic, environmental and social contributions from agricultural land uses, preferably through a local or regional rural land study.

Criteria in environmental planning instruments to determine the *minimum size of holdings necessary for a dwelling entitlement* should be developed to suit local needs and conditions. The objective is to reduce opportunities for conflict with commercial agricultural enterprises by minimising residential uses that are not directly associated with commercial farms. The policy goes on to state that setting a large minimum is a disincentive to life style purchasers but the size also needs to allow for entry by young farmers and the criteria should also allow for more intensive forms of agriculture where appropriate. The policy also notes that specifying a minimum area for a dwelling entitlement has been an effective strategy that is easily understood and is efficiently implemented, Councils should also consider other approaches to achieving the goal of minimising conflict in agricultural production zones so that farms can operate without unnecessary restrictions.

The Policy states that the minimum area for a dwelling entitlement and other provisions in Environmental Planning Instruments to regulate subdivisions should take account of the following factors:

- the agricultural productivity and suitability of the land in question;
- the nature and requirements of agricultural industries in the area being considered;
- the risk of creating land use conflict;
- the current distribution of property sizes; and
- cumulative impacts.

4.2.6. Preserving Rural Land

Rural land has 3 productive components. It is a source of food and fibre, a biodiversity resource and a place for people to live. These relate to the three components of ESD in the following manner:

Source of food, fibre & resources	➔	Economic
Biodiversity resource	➔	Environment
Place to live	➔	Social Equity

There is a need to find the balance between of all three of these components to achieve a sustainable future.

Agricultural land is a finite resource, it is not a commodity. It is a resource that is dwindling in NSW as productive land is converted to residential and rural residential use. It is acknowledged that this is not happening to a large degree in the Shire, except for land around Forbes and to the east around Cookamidgera, where there have been some recent subdivision of land in to 40 ha lots as well as scattered subdivisions in other areas (this will be discussed in section 4.3.2). There is, therefore a need to allow farms to continue by not permitting unnecessary fragmentation of them.

> *"Prime agricultural soils represent the highest level of agricultural productivity; they are uniquely suitable for intensive cultivation with no conservation hazards. It is extremely difficult to defend agricultural lands when their cash value can be multiplied tenfold by employment for relatively cheap housing. Yet the farm is the basic factory - the farmer is the country's best landscape gardener and maintenance workforce, the custodian of much scenic beauty. The market values of farmland do not reflect the long-term value or the irreplaceable nature of these living soils. An omnibus protection of all farmland is difficult to defend; but protection of the best soils in a metropolitan area would appear not only the sensible, but clearly desirable." (McHarg, 1992 p 60)*

One major issue with planning for the preservation of agricultural land is the size of the holdings that currently exist. The smaller the lot the more likely it is to be used for a residential use and when there is a mixture of rural residential (this can range from 1 – 2 ha to 40 ha) and agriculture (both extensive and intensive). It can lead to rural land use conflict. Where there are a number of larger lots it is easier to protect the resource for agricultural use because of the ability to locate any dwellings away from the agriculture that is practiced on the adjoining land. There is also a higher probability that the land will be used for agriculture rather than rural residential if it is a larger size.

It should be recognised that this desire to subdivide is based on the farmers' belief that they should be permitted to subdivide the land or that they have a 'right' to subdivide. At no time has there been any indication from the Council or State Government that they would be able to subdivide some time in the future. It is a resource that can be utilised in the future if it is not subdivided. However, experience has shown that once land is subdivided, even into rural residential lots of 10 to 20 ha

to 40 ha and even up to 100 ha, the ability for it to be used for sustainable agricultural use is lost.

As planners seek to balance the needs of agricultural producers with those of rural residential dwellers and biodiversity habitat, they must also bear in mind the importance of preserving the rural landscape. In Australia, planning policy and regulation are the main mechanisms for doing this, but overseas research (Daniels and Daniels 2003) shows that there is a need to balance these mechanisms with incentives, economic development initiatives and farming infrastructure while encouraging community engagement, communication and education. There is also a need to understand and take advantage of the linkages between these three components. An effective policy regime for preserving important rural landscapes requires the application of all these elements, as outlined in figure 4.3.

It is not intended to discuss these aspects in detail here, suffice to say that to be effective, there is a need to address all of them and not only one or 2, as is the case at present where there has traditionally been an emphasis on zoning and regulation. The linkages to incentives, economic development and the need for farming infrastructure as well as techniques to engage the community, communicating with the community and educating the community of the benefits of preserving farmland also need to be addressed. Whilst it is acknowledged that Local Government can play a role in promoting farmers markets, for example or publishing information about the issues surrounding rural land use conflict, they are mostly issues of State Government responsibility.

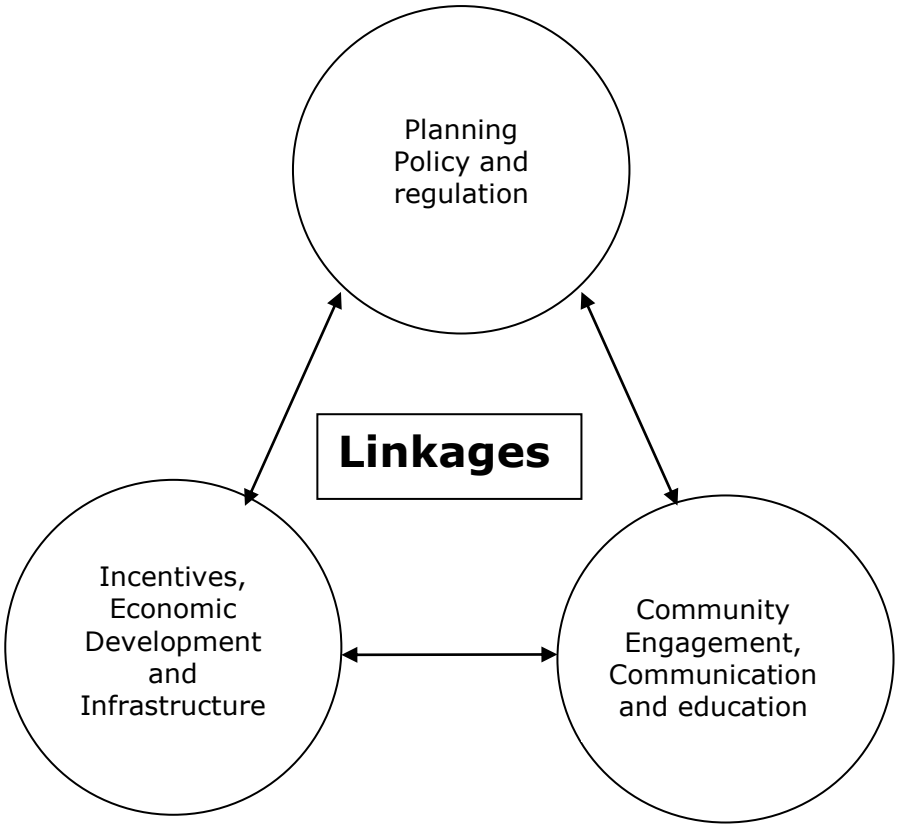


Figure 4.3: Policy responses to preserving rural landscapes
Source: Sinclair and Bunker (2007).

4.3 Land Use Planning

Land Use planning is one of the key aspects of this strategy. A land use survey has been carried out of all land within the Shire. This was done to give an understanding of the landuse pattern so that appropriate decisions can be made having regard to the mixture of landuses as well as to identify those localities that have a predominance of a particular landuse. The survey analysed the number of lots that were used and these were amalgamated into holdings which have also been counted. This survey was carried out in March to May 2006. A detailed description of the methodology used for the landuse survey is contained in Appendix 2. The landuses were categorised into the following landuse types which also have been defined in Appendix 2:

- Rural Residential
- Intensive Plants
- Intensive Animals
- Extensive Agriculture
- Vacant Cleared
- Native Vegetation
- Extractive Industries
- Public Use
- Urban

Within each of these categories there are a number of sub categories relating to the specific use of the land. These are also outlined in Appendix 2. It should be pointed out that the landuse survey categorised the primary use of the property and where a property had a number of uses, the dominant use was chosen.

The overall landuse for the Shire is shown in Figure 4.4. Map 4.16 shows the land use in broad terms. The urban, commercial and industrial uses have been excluded from the data as they would skew the figures because of the number of them. The purpose of this discussion is also to analyse the rural land uses to provide some basis for designation and future zoning of the land.

Analysis has also been carried out of the amount of land that is used by each land use and this is represented graphically in figure 4.5.

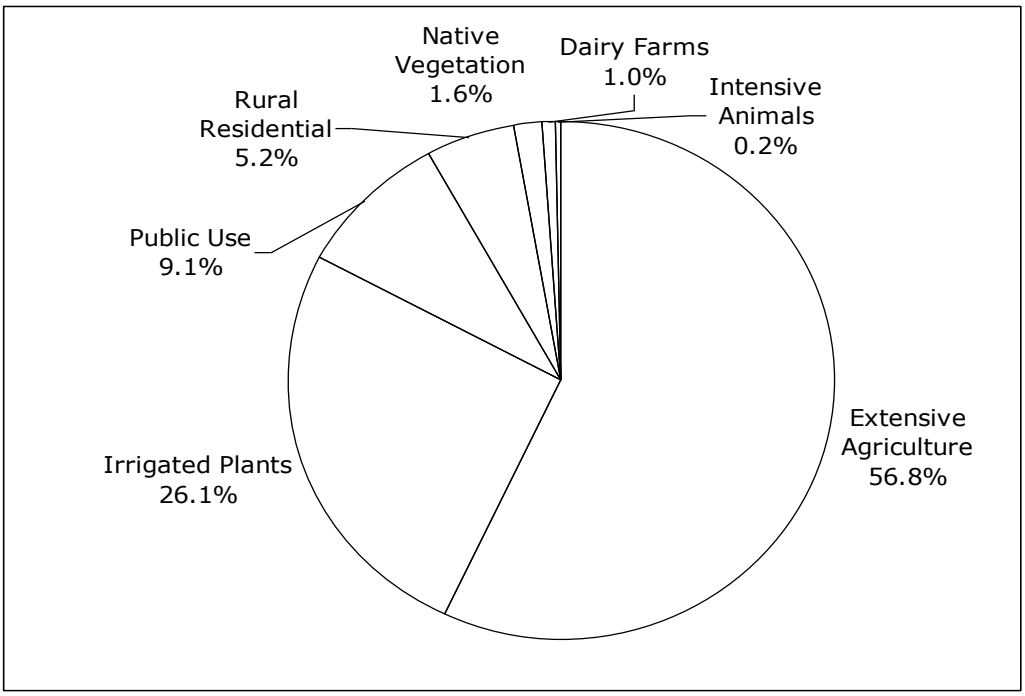


Figure 4.4: Land Use within the Rural Land
Source: Forbes Land Use Survey

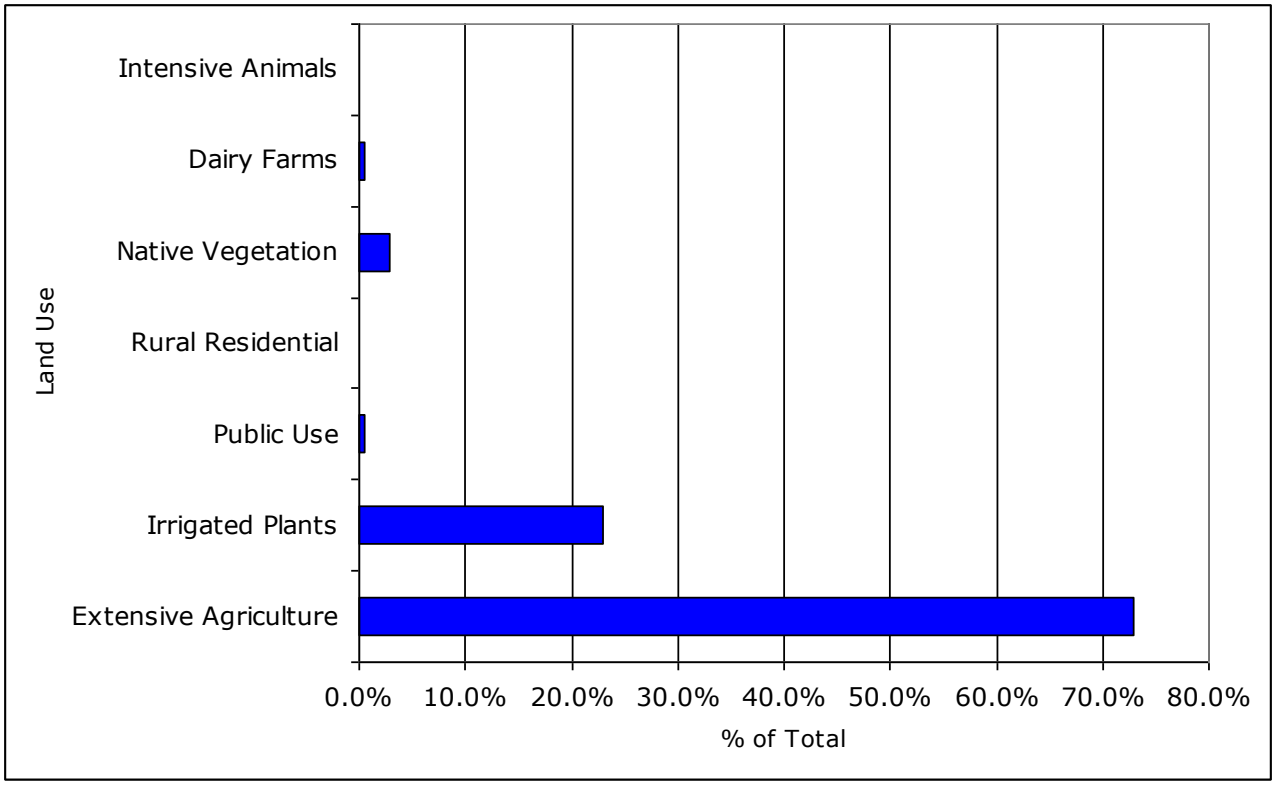


Figure 4.5: Area of Land Use
Source: Forbes Land Use Survey

The landuse survey has revealed the variety of uses in the rural area. They can be categorised in to agricultural uses, non-agricultural uses and rural residential uses. Table 4.6 lists the variety of uses observed in the rural areas.

Table 4.6: Variety of Rural land uses.

Agricultural Uses	Non-agricultural uses	Rural Residential Uses
Cattle and Sheep Cropping Irrigated cropping Cattle and sheep feedlots	Service Stations Caravan Parks Churches and Schools Cemeteries Tourist facilities	Dwellings Truck activities Home based businesses

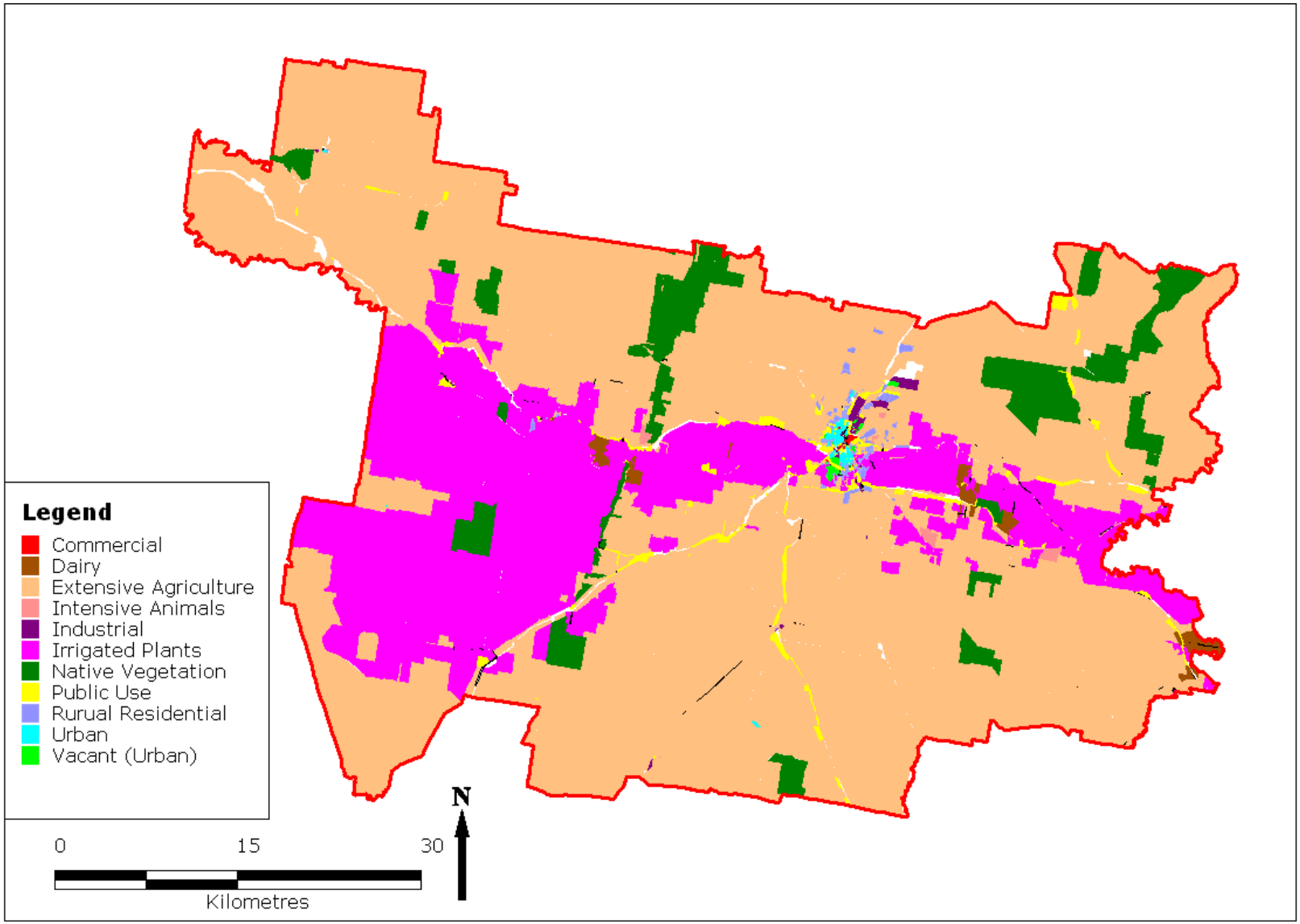
Table 4.7 lists the total number of uses and the percentages and figure 2.1 shows them in graphical form.

It can be seen from table 4.7 and figure 4.3 that extensive agriculture and irrigated plants are the dominant uses, as would be expected. Public uses including parks, reserves and TSRs are the third highest with rural residential uses having 5 % of the total rural uses. These are followed by native vegetation, dairy farms and intensive animals (cattle/sheep feedlots).

Table 4.7: Number of Primary Land Uses in the Shire

Uses	***Count of holdings***	***% of Total***
Extensive Agriculture	3,660	56.8
Irrigated Plants	1,679	26.1
Public Use	585	9.1
Rural Residential	333	5.2
Native Vegetation	105	1.6
Dairy Farms	66	1.0
Intensive Animals	12	0.2
Total	6,706	100.0

Source: Land Use Survey
Note: The land use survey counted holdings



Map 4.16: Rural Land Use

4.3.1. Designating Rural Land

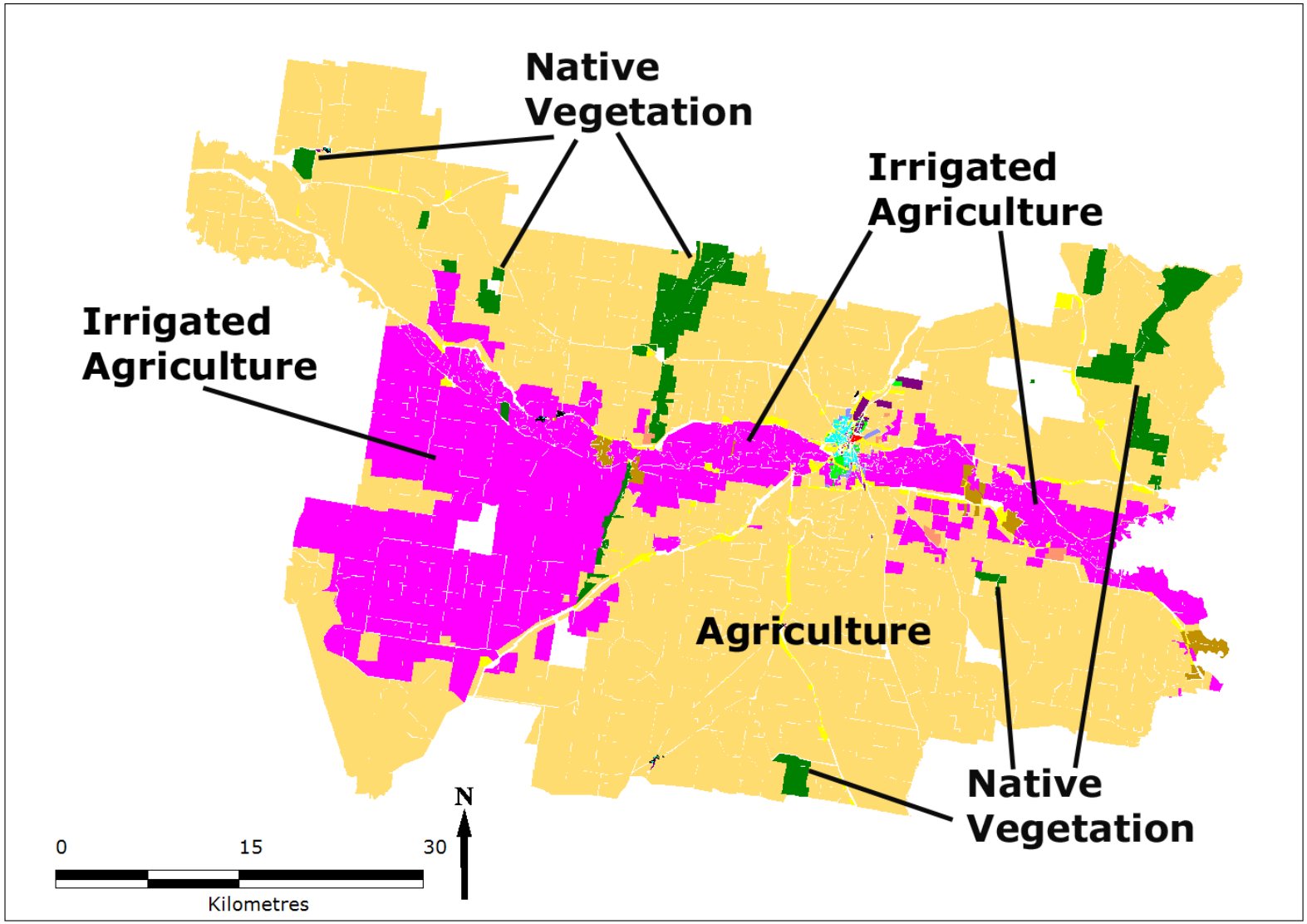
Rural Land Units

Landuse surveys and holding size analyses have been used to identify land with common features as a foundation for future zoning. The landuse survey is used because it provides an overview of the existing landuse pattern within an area and therefore gives an indication of the predominant landuses which should be conserved. It is important to consider the size of the lots and holdings within an area because the existing fragmented lot patterns contribute to rural land use conflicts and the ability of the area to be protected from such rural landuse conflicts.

The methodology used identifies a series of land units as the basis for the land use designations. These land units are areas, which are contiguous, have similar characteristics, reflect the existing land use pattern and are generally homogenous in nature. These characteristics can be topographical, the abundance of vegetation, the similarities in landuses, land tenure, landscape character or the like. They have also been based on an understanding of the issues affecting the Shire as well as a review of planning policies of other local government areas. Comments from the community were also taken into consideration. In particular is the desire of the community for lifestyle and conservation of vegetation and the natural features and environmental qualities of the area as well as the continuation of agriculture. It is important to note that these units are based on the existing land uses and landforms and that no attempt has been made at this stage to consider the policy and planning provisions that relate to the land. This is the next step.

The methodology is described in the Growth Management Strategy. Based on this methodology, there are 6 broad land units within the Shire. The land units are outlined on Map 4.17 and are as follows:

- Agriculture
- Rural Landscape
- Native Vegetation
- Rural Fringe
- Rural Living
- Towns and Villages



Map 4.17: Rural Land Units

The *Agriculture* land unit is based on the high class agricultural land, which covers most of the Shire. It is characterised by broad acre and irrigated cropping as well as grazing of sheep and cattle. It is also characterised by areas of native vegetation. Photo 4.18 shows the land unit.

Photo 4.18: Agriculture Land Unit
Date of Photo: March 2006

The *Rural Landscape* land unit is based on the hilly to steep land to the north east and south east of the Shire. This area is mostly used for grazing but does have some cropping. There are significant parts of this area that is covered by native vegetation which is in large areas as well as being scattered. Photo 4.19 shows the land unit.

Photo 4.19: Rural Landscape Land Unit
Date of Photo: March 2006

The *Native Vegetation* land unit consists of the land that is covered by a significant amount of native vegetation which is scattered across the Shire on both flat and steep land. The land has mostly poor soil quality which makes it unsuitable for agriculture. It does provide a rich source of biodiversity. There is also significant areas of native vegetation adjacent to the Lachlan River and its tributaries and this riparian vegetation is also significant. The land unit also includes areas of State Forest and National Parks and Nature Reserves. Photo 4.20 shows the land unit.

Photo 4.20: Native Vegetation Land Unit
Date of Photo: March 2005

The *Rural Fringe* land unit consists of the land that is currently subdivided into 4,000 m^2 to 2 ha lots and are found on the northern outskirts of town between Farnell St and Calarie Road. Photo 4.21 shows this land unit.

Photo 4.21: Rural Fringe Land Unit
Date of Photo: March 2005

The Rural Living land unit covers the rural residential areas that are not adjoining the urban area but are some distance from it. They are on lots of 2 ha to 40 ha and are

mostly around the town of Forbes. Photo 4.22 shows the rural living lots on South Lead Road.

Photo 4.22: Rural Living Land Unit
Date of Photo: March 2005

The *Towns and Village* land unit is the town of Forbes as well as the Villages of Bedgerebong and Ootha. Photo 4.23 shows the village land unit.

Photo 4.23: Town and Village Land Unit – Ootha
Date of Photo: March 2005

Rural Land Designations

The land units can be translated into future zones. However, as this is a strategy and does not zone the land, the term land use designation has been used to describe them.

The utilisation of landuse zoning to segregate landuses is a commonly used practice in New South Wales. In rural areas however there has generally been one or 2 generic type zones that have been called a "rural" zone. One of the major reasons for zoning an area is to preclude or regulate specific uses that are considered to be not in keeping with the general amenity of the area.

Zone names such as residential, commercial and industrial are used to identify a list of specific land uses that are permissible in a particular location. Rural zones are often less specific. The term rural describes a character, not a use. It is therefore appropriate to use a zone name that provides an indication of the uses that are carried out within that area. The recently gazetted Standard LEP provides a list of names that conforms to this but it is necessary to ensure that the zones are applied to the land in a logical manner.

Zoning can also be used to identify the major objective for any future as well as existing development in an area for example, if an area is of high conservation status then a zone name outlining this is also appropriate.

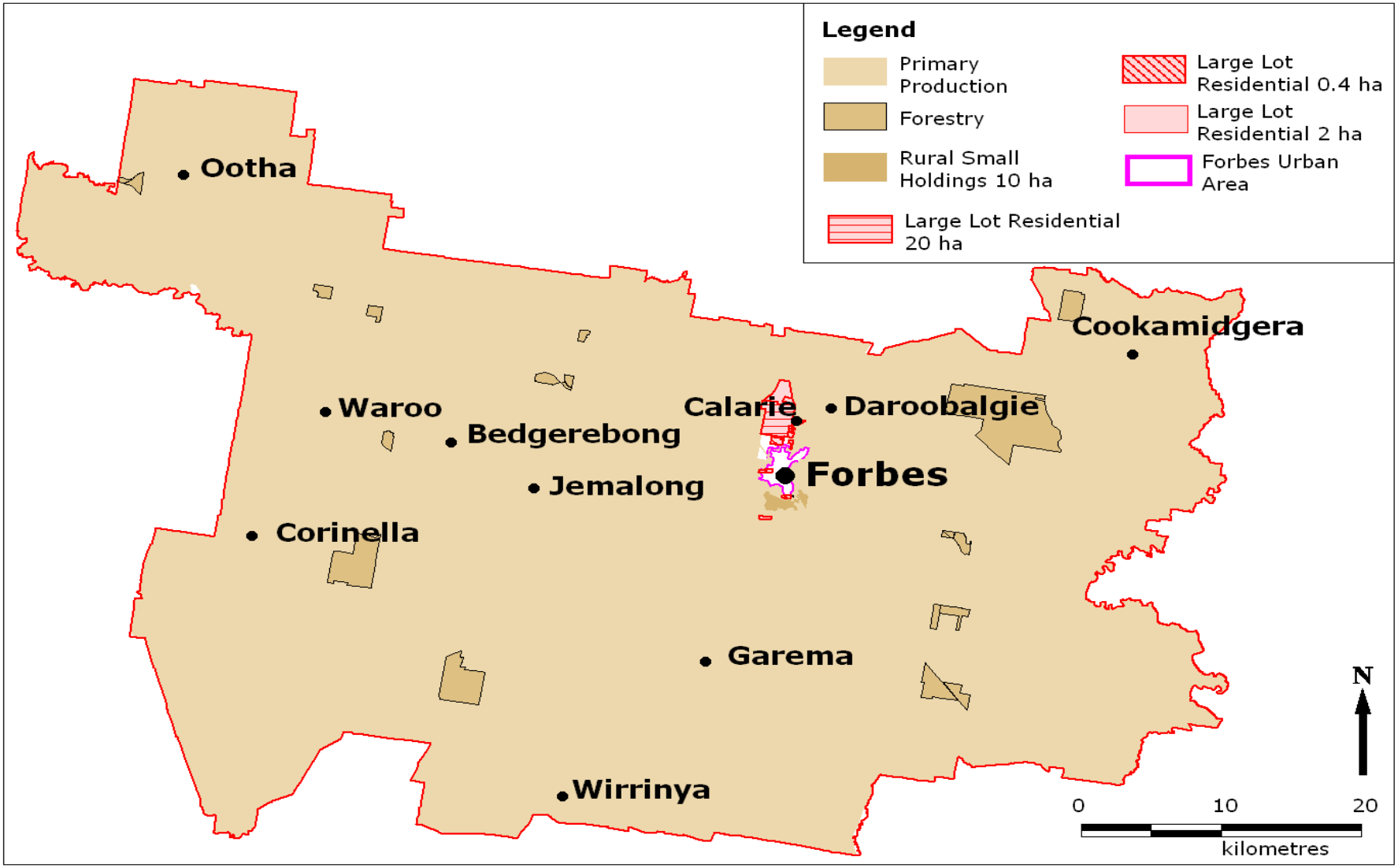
A sieve methodology has been used to determine the land use designations.

The recommended designations are as follows:

- Primary Production
- Forestry
- Large Lot Residential
- Rural Small Holdings
- Village

Whilst it is acknowledged that there is a significant area of native vegetation in the Jemalong Range and in the north eastern parts of the Shire, its status is not fully known and so it is not considered appropriate to recommend environmental protection designations at this stage. Once the status of it is known, it may be considered appropriate to create a specific zone, such as environmental management, to ensure that the vegetation is conserved and the biodiversity protected.

The rural designations are outlined on Map 4.18 and are discussed below.



Map 4.18: Land Use Designations

Primary Production

This is the majority of the Shire. The land is mostly class 2 and 3 and is used mostly for cropping and grazing.

Irrigated cropping will be encouraged because of the availability and security of the water resource and high soil quality. Agriculture is the main use to be practiced on this land and the vast majority of other uses are to be prohibited with the exception of low scale tourist facilities such as bed and breakfast style accommodation.

The subdivision minima would be 200 hectares for allotments seeking a dwelling entitlement. This would be reduced to 40 hectares where irrigated agriculture in the form of intensive plant horticulture as defined under the Standard LEP instrument is practiced fulltime. It is worthy to note that the definition of intensive plant horticulture does not include the growing of lucerne for hay production which currently encompasses a large proportion of irrigated agriculture in Forbes. A separate minimum of 100 hectares is proposed for this use. It is also not considered appropriate that the broad acre irrigation area serviced by the Jemalong Irrigation Scheme have the potential to fragment holdings to a minimum 40 hectares and therefore would also be subject to a 100 hectare minimum area of subdivision to be eligible for an accompanying dwelling entitlement. There would be no subdivision minima for the purposes of agriculture.

A set of desired future character statements (which can ultimately become the zone objectives) should be prepared for the designation and it should include the following matters (the first 4 are from the Standard LEP which are compulsory):

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within the zone and with adjoining zones.
- Protection and improvement of water quality.
- Preservation and enhancement of native vegetation, including habitat corridors.
- Protection of the amenity of existing residents.

It should be noted that these will be finalised when the Draft LEP is prepared.

Rural Small Holdings

This designation covers the current zone rural 1(c) zone at River Road and Cowra Road.

The subdivision minimum is 10 ha and this is also the minimum for a dwelling house..

A set of desired future character statements (which will ultimately become the zone objectives) should be prepared for the designation and it should include the following matters (the first 4 are the objectives as stated in the Standard LEP):

- To enable small-scale sustainable primary industry and other compatible land uses.
- To maintain the rural and scenic character of the land.
- To ensure that development does not unreasonably increase the demand for public services or public facilities.
- To minimise conflict between land uses within the zone and adjoining zones.

In addition, it is considered that the following should apply:

- To provide for a restricted range of employment generating development opportunities that are compatible with adjacent or nearby residential and agriculture development.
- To protect and enhance native vegetation and the quality of existing waterways and water resources.
- To ensure that development does not:
  - ⇨ generate significant additional traffic, or create or increase a condition of ribbon development on any road, relative to the capacity and safety of the road, and
  - ⇨ create unreasonable or uneconomic demands for the provision or extension of public amenities or services.
- To ensure that development has proper regard to the environmental constraints of land and minimises any off and on site impacts on biodiversity, water resources and natural landforms.

Controls should also be placed on the height of dwellings as well as the impact they have on the landscape by way of location and appearance. For example, they should be located below ridgelines and be of colours that blend in with the surrounding environment. This matter will be dealt with in the draft LEP, however it is mentioned here to give an indication of the intention.

Consideration should be given to placing controls on the clearing of land and preservation of areas of known biodiversity habitat and important habitat linkages. There is also a need to prohibit any further intensive forms of agriculture to minimise any future rural land use conflict.

It should be noted that these will be finalised when the Draft LEP is prepared.

Large Lot Residential 20 ha

This land covers land that has been identified as part of the process of reviewing the rural dwelling house minimum lot size and is discussed in section 4.3.2.

The mixture of rural uses is to be retained with controls placed on the location of houses so that they do not create a conflict by being too close to the boundaries, thereby creating rural land use conflict. Agriculture, particularly intensive forms of it are not to be encouraged as they have the potential to cause land use conflict with the predominately rural residential uses in the area.
Lot sizes are to be a minimum of 20 hectares, with a dwelling entitlement given to each of the existing lots that are less than 20 ha. This will provide a mix of lot sizes.

A set of desired future character statements (which can ultimately become the zone objectives) should be prepared for the designation and it should include the following matters:

- Preservation of the open rural landscape and its cultural heritage values.
- Buildings to blend into the landscape by having 'earthy' colours and low scale buildings.
- Protection and improvement of water quality.
- Preservation and enhancement of native vegetation, including habitat linkages.
- Protection of the amenity of existing residents.

Controls should also be placed on the height of dwellings as well as the impact they have on the landscape by way of location and appearance. For example, they should be located below ridgelines and be of colours that blend in with the surrounding environment. . This matter will be dealt with in the draft LEP, however it is mentioned here to give an indication of the intention.

It should be noted that these will be finalised when the Draft LEP is prepared.

4.3.2. Minimum Lot Size for a dwelling House

The SEPP Rural Land 2008 allows the Council to retain its existing rural subdivision provisions. It is noted that the current rural subdivision provisions allow for a minimum of 40 ha. This is considered to be too small for dryland farming and is likely to lead to rural land use conflict with adjoining farms.

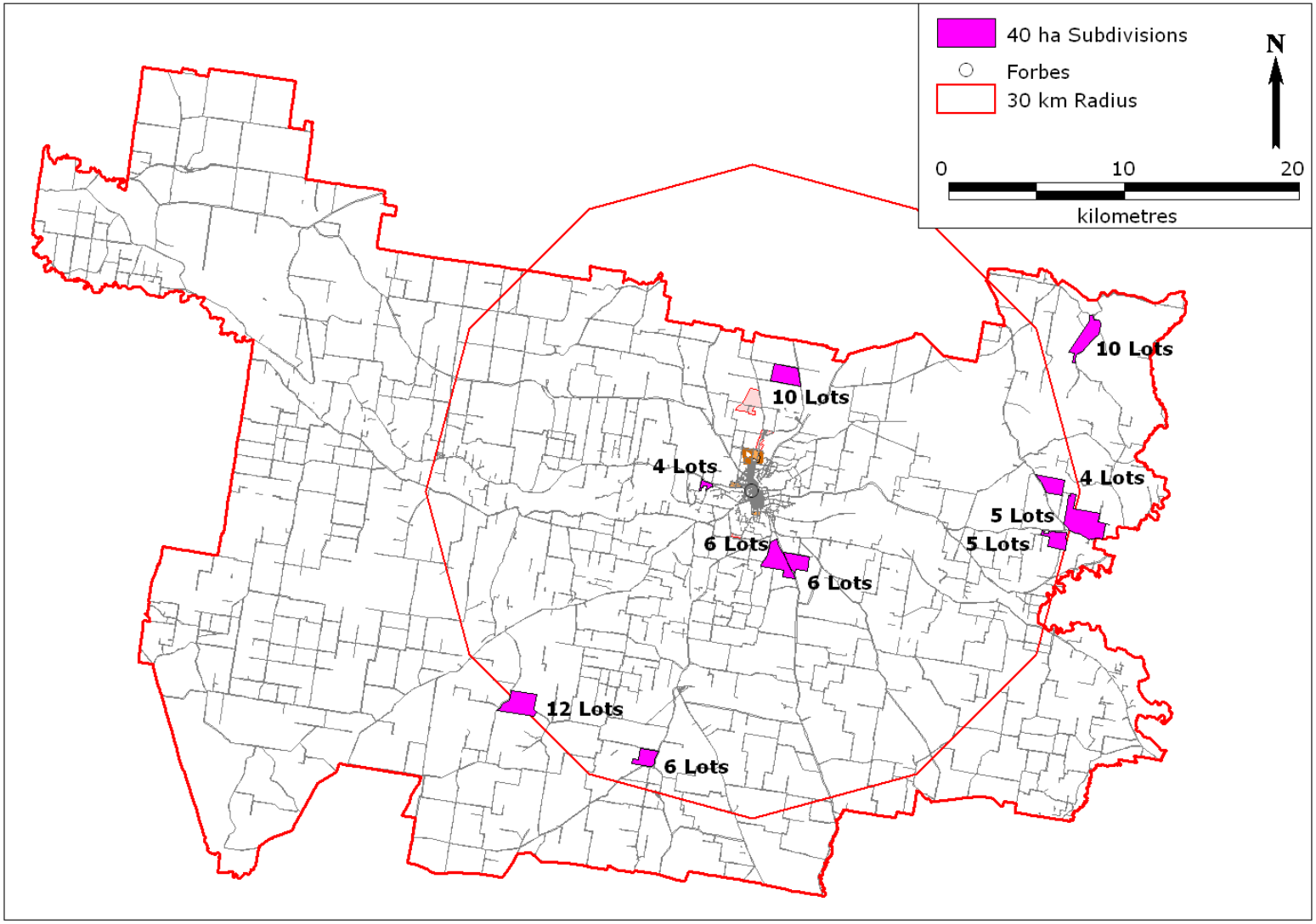
Existing Subdivision Controls

It is noted that over the past 2 years, there have been a number of subdivisions of larger properties into 40 ha lots. These lots are not being used for agricultural purposes and are being used for rural lifestyle (residential) and not farming. The subdivisions are shown on Map 4.19 and it can be seen that the majority of them are 20 to 30 km and more from Forbes. As outlined in section 2.2 this type of subdivision is rural residential and categorised as rural living (although the zoning will be Large Lot Residential). Whilst there are some of these lots with dwellings on them the majority of the lots have sheds and caravans erected. One such shed and caravan can be seen from photo 4.24.

Photo 4.24: Shed and Caravan on 40 ha Lot
Date of Photo: May 2008

The discussion about Rural Residential development in the Growth Management Strategy has highlighted the need for this type of development to be in close proximity to the urban area because of the need for access to services and facilities. It is clear from Map 4.19 that the existing 40 ha subdivisions are not close to the services and facilities provided in Forbes. It is acknowledged that Eugowra and Parkes are close to the Shire boundaries but Eugowra does not have the services and facilities that are provided in Forbes. It is unreasonable for residents of Forbes Shire to have to travel to Parkes for services and facilities that can be provided in Forbes. A more sustainable solution is to increase the minimum lot size for a dwelling house (which will facilitate farming and not rural residential development) and provide specific areas for rural living style of development in close proximity to the town of Forbes. The proliferation of 40 ha lots (which are expected to continue) will also artificially inflate land prices to the extent that land is valued more for its dwelling potential than its agricultural value. It also creates fragmentation of rural land which is difficult and costly to service. There are also potential impacts on natural resources and biodiversity.

The issues surrounding rural lot sizes can be categorised into the subdivision minimum and the minimum lot size for a dwelling house. It is important to make the distinction between them and to recognise that it is the minimum size for a dwelling house that is the most important aspect. It is also necessary to have regard to the provisions of the Rural Lands SEPP which have been outlined in Chapter 2.



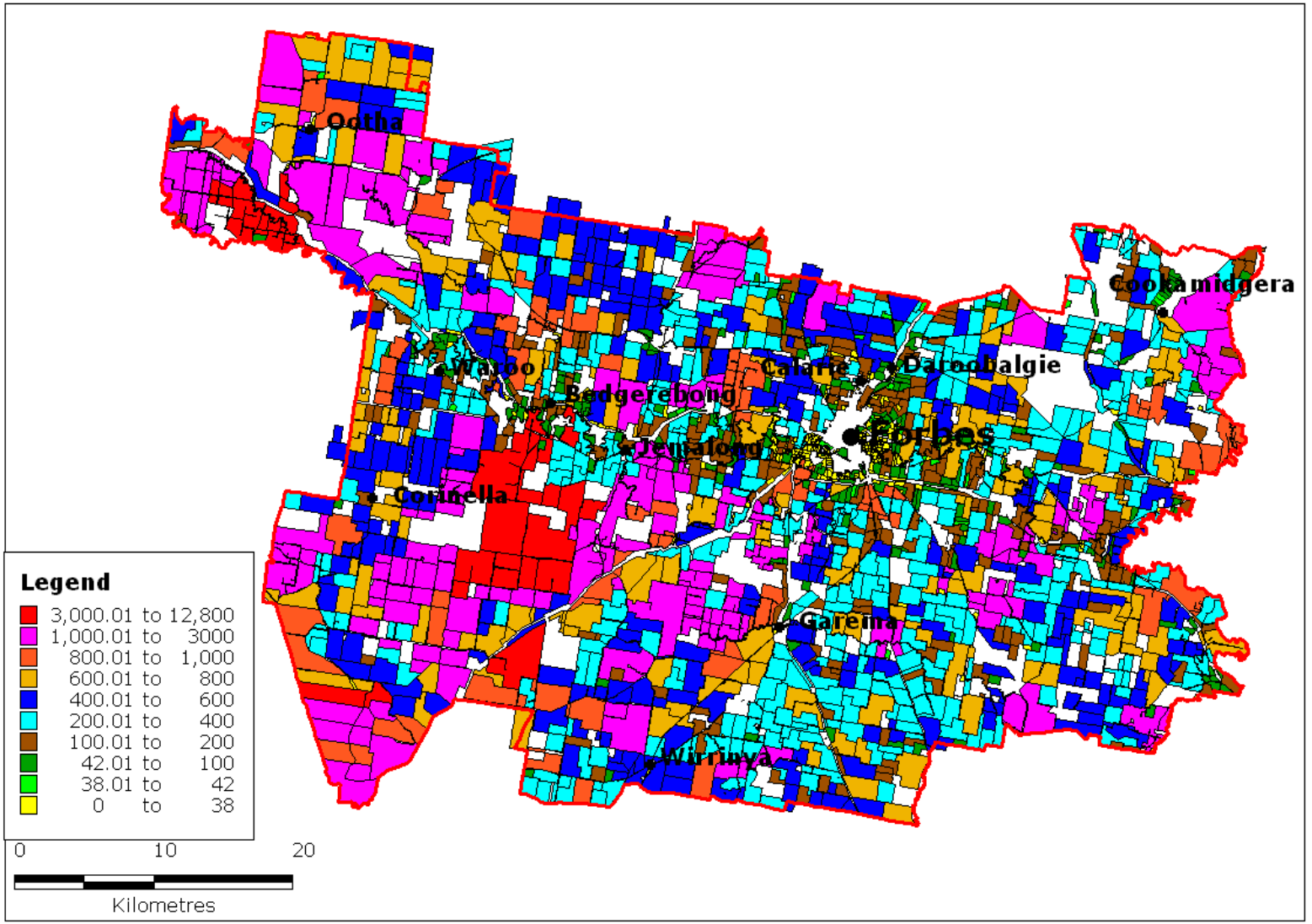
Map 4.19: 40 ha Subdivisions

There are a number of issues that have to be taken into consideration when considering the most appropriate subdivision minimum. They are as follows:

- Current fragmentation and holding pattern;
- Current subdivision & dwelling house minimum;
- Range of holding sizes;
- Current dwelling entitlements;
- Potential to increase the fragmentation;
- Number of potential subdivisions;
- Impact on services and facilities;
- Impact on traffic generation and road upgrading;
- Ability to do boundary adjustments; and
- The area of the land required to sustain a farming enterprise typical for the area
- Value of land in the Shire

There also has to be an acknowledgement that a number of farms in the Shire have an off farm source of income which supplements the income gained from agriculture. Anecdotal evidence suggests that this is an increasing trend in the Forbes Shire as well as all across the State.

An analysis has been carried out of the holdings for the Shire. Map 4.20 shows the holding size analysis. As can be seen from the map, the majority of holdings less than 38 ha are surrounding the town of Forbes and that holdings between 38 ha and 100 ha are along the Lachlan River. The 200 to 400 and 400 to 600 ha farms are scattered across the Shire but there are some areas like Garema to Wirrinya and Waroo – Bedgerebong – Ootha where they are the dominant holding size. The 600 to 800, 800 to 1,000 and 1,000 and above are mostly to the west in the Corinella – Jemalong and Ootha areas.



Map 4.20: Holding Size

Economic Assessment

The following assessment has been based on a methodology that was prepared by the Department of Primary Industries and Department of Planning and is included as Appendix 1 of the Growth Management Strategy. However, its status is as an advisory document and the methodology is now referred to as the former methodology. It has been used to provide a commercial farm size for the Shire. The steps in the methodology are outlined then the results of how it has been applied to the Shire are shown. The full workings are reproduced as Appendix 2 of the Growth Management Strategy.

Step 1 – Identify Key Agricultural Industries & Enterprises in the LGA:

- What are the Main Agricultural Industries?
- What is the Shire well known for?
- Has Agriculture in the Shire changed over time? If so, what has happened?

Step 2 – Identify the Characteristics of Farms in the Shire:

- What are the land use characteristics of major agricultural enterprises?
- Are there distinctly different patterns of agriculture in different areas across the Shire?

Step 3 – For Key Agricultural Enterprises identified:

- Determine the Existing Production Levels of key enterprises
    - ⇨ Crop yields
    - ⇨ Livestock Performance
    - ⇨ Carrying Capacity
- Determine Input/Production Costs

Step 4 - Determine Appropriate Gross Margins for key enterprises:

- Deduct Input costs from gross income.

Step 5 – Determine a target income for a commercial farming unit

(Break even point)

Step 6 – Calculate the Overhead Costs

- Rates, electricity, phone, farm maintenance, depreciation, family labour

Step 7 - Calculate the area needed to generate the breakeven level of income

- Gross margins multiplied by area of enterprise

The methodology has been applied to the Shire by Council and the following is the outcome. It has been arranged to answer the questions in the methodology outlined above.

*1. Key Agricultural Industries & Enterprises in the LGA***:**

1. Main Agricultural Industries?

   ⇨ Cereal Cropping and Sheep for Wool
   ⇨ Cereal Cropping & Beef Fattening
   ⇨ Lucerne Hay Production and Fat Lambs

2. What is the Shire well known for?

   ⇨ Sheep, Grain & Irrigated Agriculture

3. Has Agriculture in the Shire changed over time? If so, what has happened?

The agricultural base of Grains and Sheep has remained dominant with the coming and going of other agricultural uses including dairying, feedlots beef & sheep, orchards & vegetable production.

2. Identify the Characteristics of Farms in the Shire:

4. What are the land use characteristics of major agricultural enterprises?

   ⇨ Diversified farms 50/50 mix of livestock & cropping, lucerne & fat lambs, wheat and sheep, wheat and cattle, etc

5. Are there distinctly different patterns of agriculture in different areas across the Shire?

   ⇨ Irrigated and dryland agriculture. Carrying capacity reduces as one moves further west.

Economic Analysis

3. Production Levels of Key Enterprises on Farms

Determine the Existing Production Levels of key enterprises

⇨ Crop yields - Dry Land 2 tonnes per ha
- Irrigated 5 tonnes /ha

⇨ Livestock Performance Indicators:

Carrying Capacity	- Dry land	2.5 dse
	- Irrigated	10 dse

4. Gross Margins for key enterprises:

(source: DPI 2006)

	$/ha
Wheat – Long Fallow	244.80
Flood Irrigated Lucerne	1,855.83
Merino Eves (21 Micron)	215.42
1st Cross Ewes – Terminal Meat	223.41
Beef Grow Out Steers 240-460kg	182.25

Forbes Local Estimates

Option 1:

a. Cereal Cropping and Sheep for Wool

Option 2:

b. Cereal Cropping & Beef Fattening

Option 3:

c. Lucerne Hay Production and Fat Lambs

5. Target income for a commercial farming unit

Return on investment – Estimate $60,000 cropping enterprise, considered break even point

Step 6 – Calculate the Overhead Costs

Rates, electricity, phone, farm maintenance, depreciation, family labour, fencing, water supply machinery repairs

Estimated 40% of total farm costs

7. Area needed to generate income

Option 1:

a. Cereal Cropping and Sheep for Wool

Farm Size	Income
200ha	$28,682
300ha	$43,023
400ha	$57,364
500ha	$71,704
600ha	$84,332
800ha	$114,728
1,000ha	$143,410

Option 2:

b. Cereal Cropping & Beef Fattening

Farm Size	Income
200ha	$-7,966
300ha	$3,592
400ha	$4,788
600ha	$7,182
800ha	$9,576

1,000ha	$11,790

Option 3:

c. Diversified Cereal Cropping and Sheep for Wool having 1st Cross Fat Lambs

Farm Size	Income
200ha	$27,387
300ha	$41,066
400ha	$55,355
500ha	$68,445
600ha	$82,134
800ha	$109,513
1,000ha	$136,625

Option 4

d. Flood Irrigated Lucerne Hay Production and Fat Lambs

Farm Size	Income
40ha	$19,540
100ha	$48,865
150ha	$79,073
200ha	$97,722
300ha	$146,600
400ha	$195,467

Option 5

e. Spray Irrigated Lucerne Hay Production and Fat Lambs

Farm Size	Income
40ha	$29,359
100ha	$73,399
150ha	$115,872
200ha	$146,799
300ha	$220,199
400ha	$293,598

Therefore, it can be seen that agriculture in the Shire has varying levels of productive capacity. From an economic viewpoint, a farmer can make an income of $60,000 (as recommended by the DPI), which can be called a commercial or ideal farm size from:

- 100 - 150 ha of flood irrigated lucerne with fat lambs
- 40 - 100 ha of spray irrigated lucerne with fat lambs
- 400 – 500 ha of cereal cropping and sheep for wool
- 400 – 500 ha of diversified cereal cropping and sheep

Holding Analysis

The following methodology has been developed based on the current holding patterns, subdivision scenarios as well as the average holding patterns for the Shire. The first

matter to consider is whether the current minimum is adequate and whether it should be decreased or increased.
The total holding size range for the entire Shire is shown in figure 4.6. It shows the spread of holdings across the ranges from less than 0.8 ha to greater than 2,000 ha. It can be seen that there is a wide range of holding sizes throughout the rural parts of the Shire. The highest range is 100 – 200 ha, followed by 200 – 300 ha then 42 to 100 ha range. 400 – 600 is the 4th highest range.

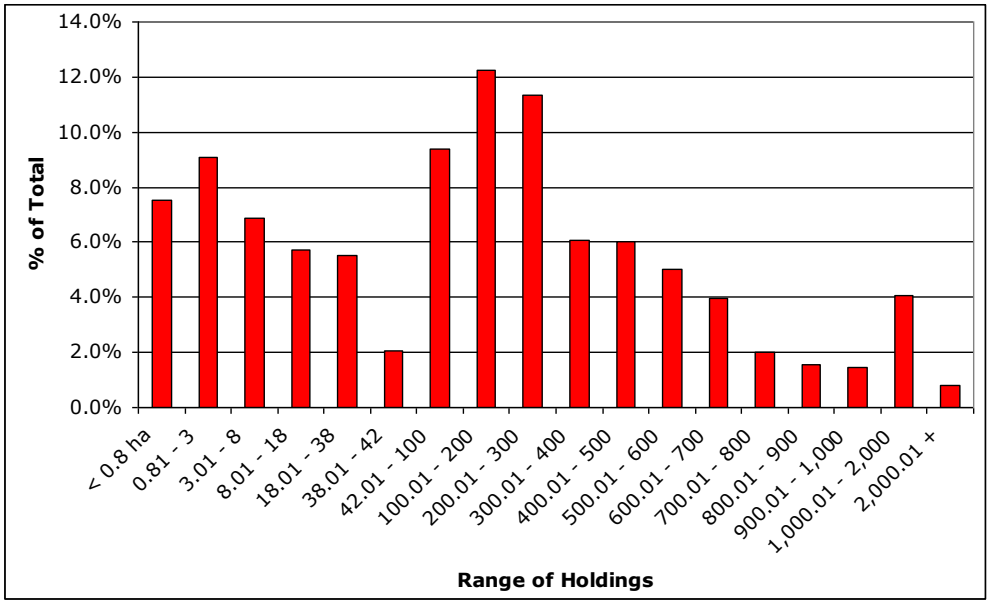


Figure 4.6: Holding size range for Shire

It can be seen that 40 ha does not represent most of the farms in the Shire. Further analysis shows that the percentage of holdings less than 40 ha (the current minimum) is 35.1%, between 42 and 300 ha is 34.2% and over 300 ha is 31.5%. It should be noted that the holdings less than 40 ha only represent 1.1% of the total area of the Shire and the holdings between 42 and 300 ha make up 18.8% and greater than 300 is 80.2% of the total Shire.

The current holding pattern is analysed to determine the current average holding size for the Shire. Table 4.8 shows this. It shows the average holding size for the entire Shire as being 279 ha with a median of 129 ha which suggests that there are a lot of small holding so some further analysis is needed. It is noted from the economic analysis that an economic return can be made from irrigated lucerne and that there are a number of these properties scattered along the Lachlan River on holdings of 20 to 40 ha. It can be assumed that most holdings less than 40 ha therefore are unlikely, from a general point of view, to be of a size to generate a sufficient income to be an economic holding for agriculture having regard to the Government policy. The holding size range shows that the peak of holdings is at 100 – 200ha, which suggest that this is an area where holdings not irrigated become sustainable. By choosing a 40 ha cut off, it will also negate the impact of any rural residential uses by countering any holding that are economical and less than 40 ha. For transparency with the analysis, it would be prudent to show the numbers of holdings at 100, 200 and 300 ha intervals. There are 68 holdings greater than 1,000 ha, 11 holdings greater than 2,000 ha and 3 greater than 3,000 ha, which are likely to be the large corporate style farming operations, which tend to skew the figures. For transparency with the analysis, again it would be prudent to use all 3 ranges. When this is done, it produces a number of

figures as can be seen in table 4.8. It can be seen that the figures range from 300 ha to 600 ha.

Table 4.8: Average Holding Sizes

Holding Ranges	Total Number of Lots	Total Number of Holdings	Total Area	Average Holding size	Median
All Holdings	5,266	1,405	392,664	279	129
40 ha to 1,000 ha	3,273	845	272,395	322	260
100 ha to 1,000 ha	2,927	693	263,208	380	315
200 ha to 1,000 ha	2,435	522	238,021	456	418
300 ha to 1,000 ha	1,994	364	198,754	546	519
40 ha to 2,000 ha	3,906	902	349,969	388	273
100 ha to 2,000 ha	3,560	750	340,782	454	348
200 ha to 2,000 ha	3,068	579	315,595	545	450
300 ha to 2,000 ha	2,627	421	276,327	656	553
40 ha to 3,000 ha	4,005	910	368,943	405	275
100 ha to 3,000 ha	3,659	758	359,756	475	351
200 ha to 3,000 ha	3,167	587	334,568	570	454
300 ha to 3,000 ha	2,726	429	295,301	688	557

Source: Council Property System
Note: * Holdings are made up of a number of individual lots.

The number of potential lots that could be created if all current holdings were subdivided to the existing minimum in the LEP has been assessed. A range of holding sizes below and above the current minima (which is 40 ha) has also been analysed. The results of this analysis is provided in figure 4.7.

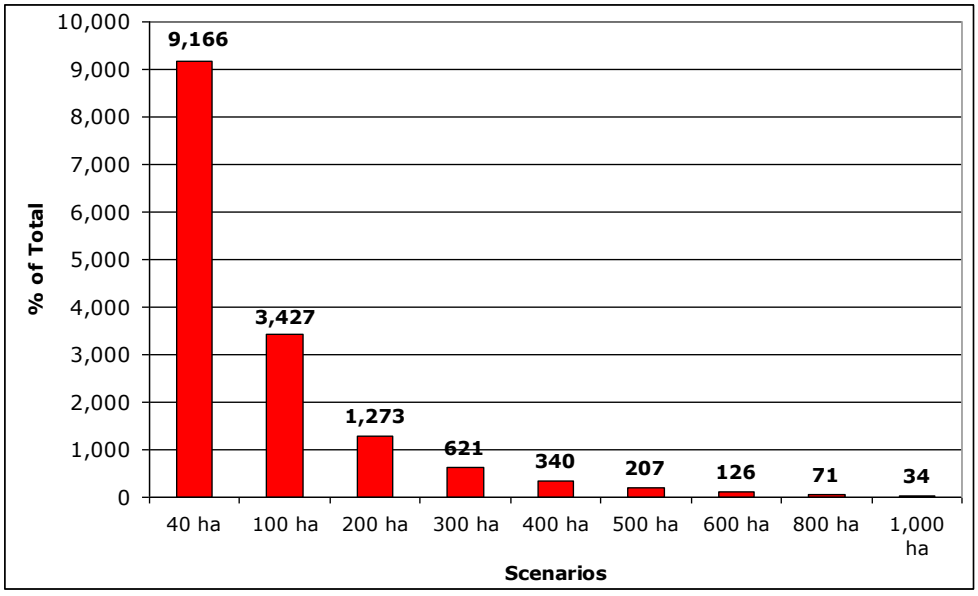


Figure 4.7: Subdivision Scenarios
Source: Council Property System

It can be seen from the above graph that at the current minimum of 40 ha there is potential for a total of 9,166 additional lots. At 100 ha it would be 3,427 and it is not until 400 ha that it becomes significantly less (340) and at 500 ha it is 207. At 1,000 ha, there would be 34 additional lots created in the Shire. It should be noted that the higher number of potential subdivisions can cause a drain of the Council's resources, particularly for road repairs and reconstruction. It should also be noted that the majority of the holding large holdings are on the plains where there has not been any subdivision of the land for some time.

The number of farms that are above a range of holding sizes has been analysed to provide an indication of the current number of farms that could be said to be sustainable. This data is presented in figure 4.8. It can be seen that at greater than 40 ha there are 913 farms, above 100 ha 761 farms, 300 ha there are 432 farms, 400 ha there are 347 farms and above 500 ha there are 263. At 1,000 ha there are 68 farms. The significance of this analysis is that it shows the number of farms deemed to be sustainable.

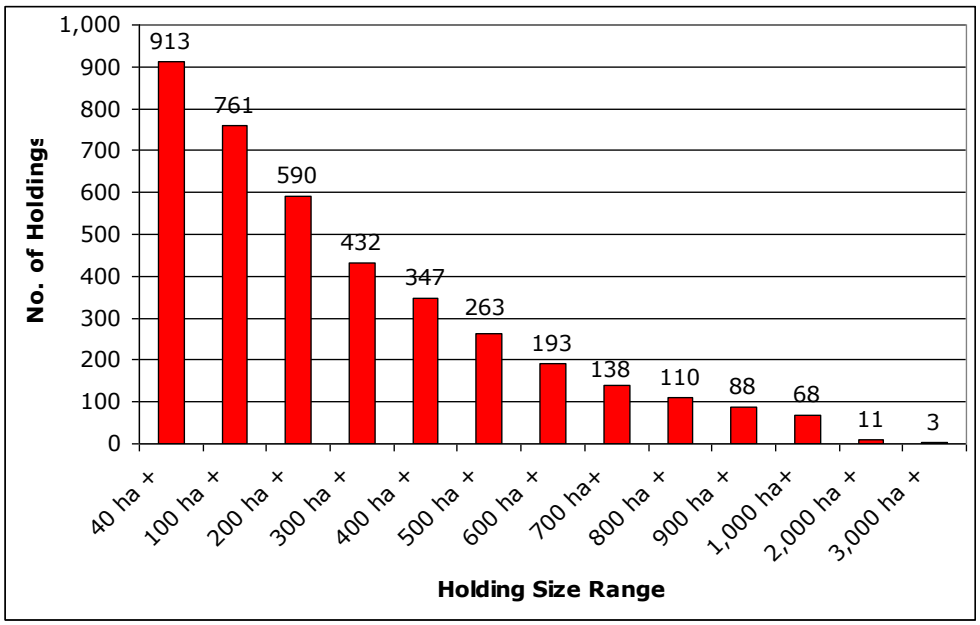


Figure 4.8: Number of Farms in holding size ranges

The ABS carry out an agricultural census every 5 years which counts the farms having an income of $20,000 and above. One aspect that needs to be considered when using the ABS figures is that the survey is voluntary and counts the information provided by the farmers with no checking of it for accuracy. The ABS figures show that in 2001 there were 445 agricultural holdings covering 403,053 ha of land. This gives an average of 907 ha.

Recommended Minimum Lot Size for a Dwelling House

The minimum holding size for a dwelling house needs to take into consideration a number of factors as follows:

- Commercial Farm size
- Current average holding size range
- Potential for future fragmentation
- Number of holdings above a range of potential minimums

- The number of farms counted by the ABS Agricultural Census

The above data has provided a number of figures. It should be noted that the method for estimating the commercial farm size is based on generic data and may vary having regard to local climatic, soil and management practices. It should also be noted that the typical farming enterprise in the Shire is sheep and wheat. Whilst it is acknowledged that some people have irrigated agriculture, they also may run sheep as well as some wheat or other type of dryland cropping. It is therefore difficult to set a range of holding sizes for the Shire. Therefore, one size has been recommended.

The analysis has shown that:

- The ideal commercial farm size for Forbes Shire is between 40 ha (for spray irrigated lucerne and fat lambs) and 500 ha (for cereal cropping and sheep).
- The average holding size for 40 to 3,000 ha farms ranges between 300 ha and 600 ha.
- When the potential fragmentation is considered, at 300 ha there would be 621 additional lots, at 400 ha there would be 340 additional lots created and there are 347 farms above this figure. At 500 ha there would be 207 additional lots and there are 263 farms above this and at 600 ha there would be 193 farms.
- Currently there are 432 farms greater than 300 ha and 193 farms greater than 600 ha.

The Council have considered this information and have resolved to adopt a 200 ha minimum for a dwelling house to increase the ability for young farmers to access smaller and more affordable lots to enable them to enter the farming profession.

Rural Subdivision Principles

In accordance with the provisions of the Rural SEPP and the recent Section 117 Direction, when changing the existing rural minimum lot size on land within a rural zone, the Council must adhere to the Rural Subdivision Principles outlined in the Rural Lands SEPP. The rural subdivision principles outlined in the Rural Lands SEPP have been complied with by this recommended minimum. The principles and reasons for compliance are as follows:

- *Minimisation of rural land fragmentation*. The 200 ha minimum for a dwelling house will achieve this by stopping any further fragmentation of the rural land. However it has to be recognised that 58.0% of all farms within the Shire are currently less than 200 ha which suggests that the Shire is already quite fragmented and any further fragmentation will be avoided.
- *Minimisation of rural land use conflicts*. The 200 ha minimum for a dwelling house will reduce rural land use conflicts because this is a large lot for people to use as a rural residential lot because of its size as well as the cost of purchasing such land. In addition, specific rural residential zones have been identified for 2 ha and 20 ha lots to cater for those people who wish to have these sized lots.
- *Nature of existing agricultural holdings and future rural residential land*. The majority of the larger agricultural holdings are located away from the Lachlan River and Forbes where there is minimal fragmentation when compared to the River frontage and around Forbes. The adoption of a 200 ha minimum for a dwelling house is not considered to have an impact on the existing rural holdings and their economic activities because it will allow farming to remain sustainable

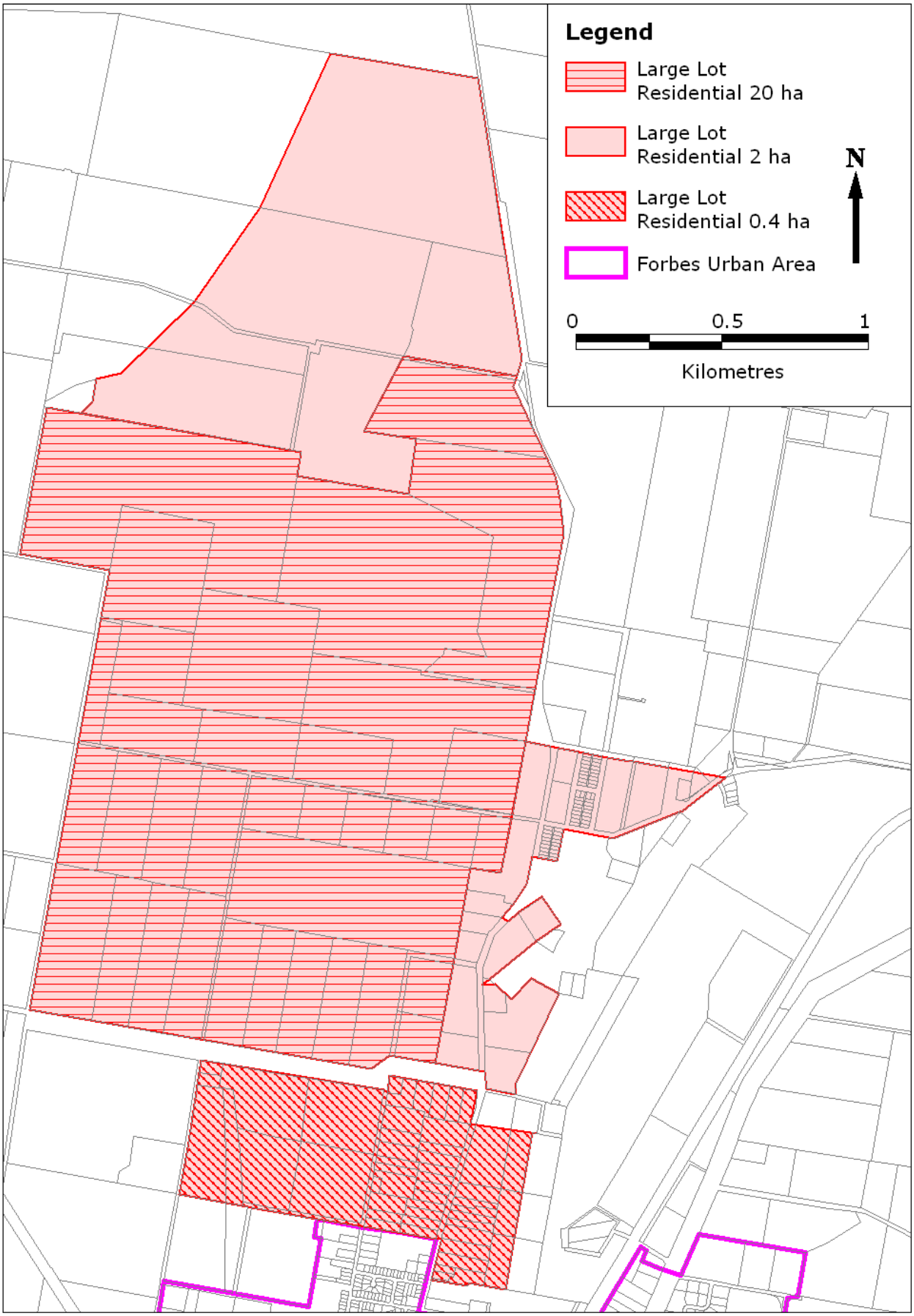
by not allowing any more fragmentation of this important resource. It should be noted that fragmentation can have the impact of increasing the price land which makes it difficult to purchase land. This Strategy recommends the establishment of a number of rural residential zones and lot sizes which will cater for the expected rural living and rural fringe demand. The 200 ha minimum for a dwelling house satisfies this requirement.

- *Natural and Physical constraints and opportunities*. The information on the natural environment and flooding provided in the *Forbes Shire Comprehensive Land Use Strategy Issues Paper 2005* and this Strategy shows that the main constraints are flooding, groundwater issues, salinity and native vegetation. A 200 ha minimum size for a dwelling house is not considered to have an impact on this as 200 ha is not considered an appropriate size for a rural residential lot in this area because of its cost as well as cost of maintenance.
- *Planning for dwelling opportunities*. A 200 ha minimum size for a dwelling house will allow for adequate separation of dwelling houses from adjoining land uses as well as allowing for onsite effluent disposal, vegetation and slope as well as potential impact on water quality.

4.3.3. Large Lot Residential 20 ha

The introduction of a higher minimum lot size for a dwelling house means that there are not any areas that cater for people who want a rural living lot. It is considered that this should be 20 ha because it is considered to be a suitable size for such a lot. The most appropriate zone in the Standard LEP is Large Lot Residential as they will be rural residential use and not agricultural as the main use of the property.

The rural residential criteria outlined in the Growth Management Strategy has been applied to the land around Forbes and the best land is the land between Limestone Road in the west, Calarie Road in the East, the Alcheringa Subdivision in the north and School Road in the south. The land is flood free and has good access to the town of Forbes via a mixture of sealed and unsealed roads. The land is gently undulating and there is not much vegetation present. It has lot sizes ranging from 1.8 ha to 98 ha and is in multiple ownerships. The lot size recommended is 20 ha but also all of the existing lots would be given a dwelling entitlement which will provide for a mixture of lot sizes. This would be done by listing each lot in Additional Permitted Uses clause of the Standard LEP. There are 5 existing dwellings in the area and there would be a total of 55 additional dwellings on the land. The Growth Management Strategy highlighted a demand of 4 (low) and 8(high) dwellings for 2 ha subdivision and this is considered to be adequate for this designation. This means that 7 and 14 years supply which is considered to be adequate. There is a low flow water pipeline that serves the Alcheringa Subdivision which is to the west of this area and this would be extended to include this area. Effluent disposal would be via on-site disposal. The land is shown on map 4.21.



Map 4.21: Large Lot Residential 20 ha

4.3.4. Existing Dwelling Entitlements

The current LEP makes provision for dwelling houses on parcels of land (adjoining or adjacent land held in the same ownership) as long as they meet the following criteria:

- has an area of more than 40 ha
- is a lot created by a subdivision permitted by the LEP (40 ha or concessional lot) and that subdivision has been consented to by the Council

The introduction of a higher minimum lot size for a dwelling will take away any current entitlement because it will now be 200 ha.

The SEPP Rural Lands 2008 has introduced new requirements for rural dwellings. The accompanying circular (PS08 002) makes the following statement in relation to dwellings in rural areas:

> *"The SEPP does not affect any provisions within an LEP that permit the erection of a dwelling within a rural or an environment protection zone, other than provisions that allow for the erection of a dwelling on a concessional lot."* (DoP Circular PS08 002 p3)

This statement is interpreted to mean that the current provisions allowing dwellings on all parcels over 40 ha are retained. This position has been resolved by the Council as its position in relation to dwelling houses on rural land. It includes lots that have been created under the current provisions as well as parcels that meet the current dwelling house provisions. The number of parcels that would fall within this is 405 and they are shown on map 4.22. It can be seen that these are scattered throughout the Shire.

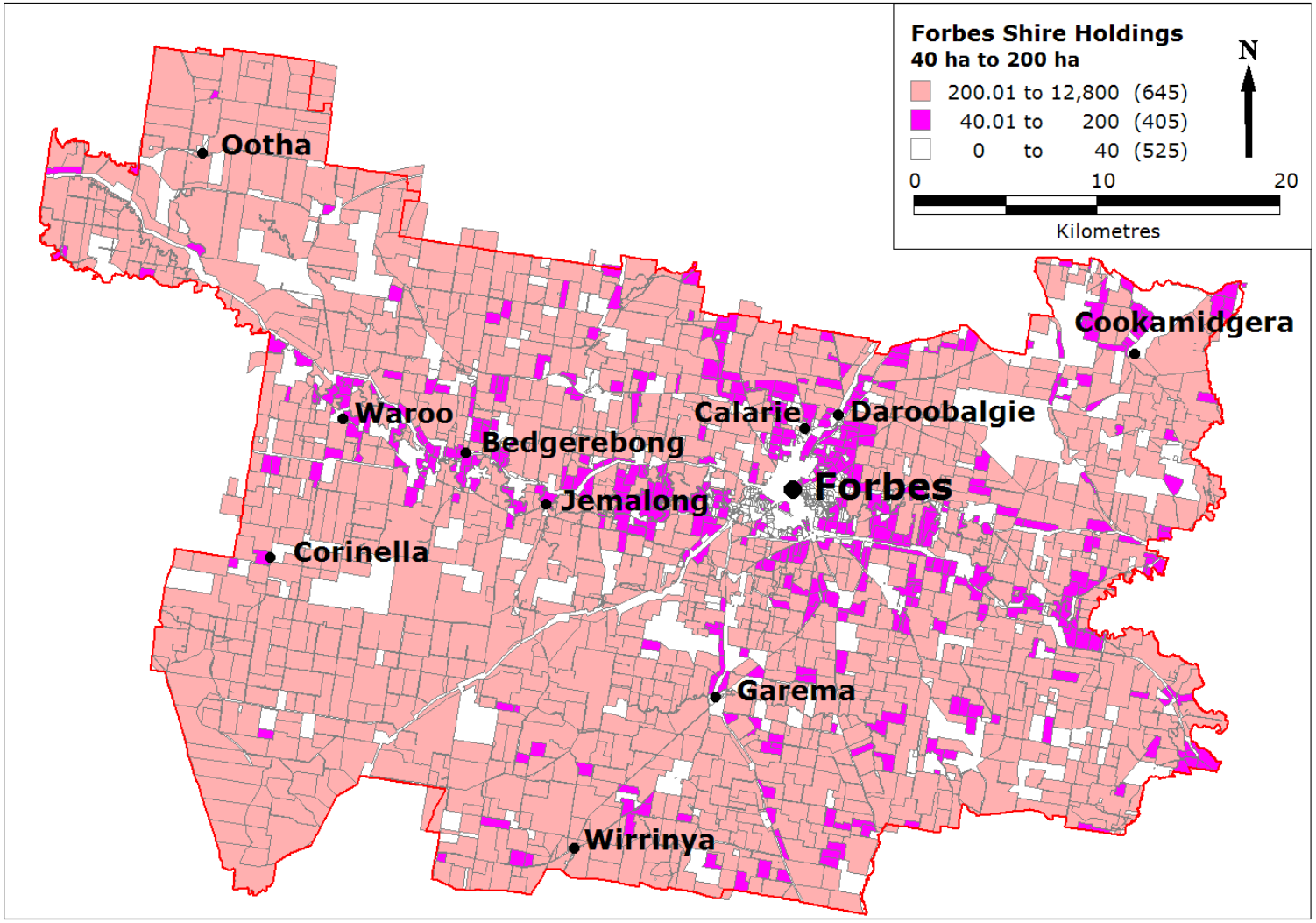
To achieve this it will be necessary to create an 'existing holding' clause in the draft LEP. An existing holding is defined as follows:

> *All adjoining land, even if separated by a road or railway, held in the same ownership:*
> *(a) on (insert date); and*
> *(b) at the time of lodging a development application for the erection of a dwelling under this clause*
> *and includes any other land adjoining that land acquired by the owner since (insert date above)*

The relevant date is the important and it would be appropriate to use the date on which this document is placed on public exhibition and the details of the controls become public.

This clause will have the effect of preserving any dwelling entitlement for vacant land between 40 and 200 ha so as not to disadvantage any current property owners.

It should be noted that the exact wording of this clause will be resolved in the draft LEP.



Map 4.22: Holdings between 40 and 200 ha

However, there are likely to be costs to the Council of introducing such a clause. The issues associated with scattered settlements have already been identified in section 4.3.2 and the 200 ha minimum lot size for a dwelling house has been recommended to alleviate these issues. It is difficult to quantify the actual costs to the Council but they would cover such issues as road upgrading, provision of community services. There would also be costs to the people residing on the land which would be proportional to the distance they are from the town of Forbes where all of the services are located. There would also be potential rural land use conflict between an essentially rural residential use and any adjoining agricultural enterprise. The creation of dwelling houses in a rural location could also have the impact of increasing the price of rural land because it may be more valuable for its residential use than its agricultural use.

The best way to ensure that those who have purchased land with the intention of constructing a dwelling house on it and also provide for the effective and efficient management of rural land in the medium to long term by alleviating any potential rural land use conflict and minimising future costs to Council and rural residential land owners is to put a time limit or 'sunset' provision on the existing holding provision. It is considered reasonable for this to be 5 years from the date of gazettal of the LEP. It is noted that dwelling houses consented to under this provision would have to be physically commenced within 5 years from the date of that consent. This means that the maximum time for a landowner to commence a dwelling house on an existing holding would be 10 years from the date of gazettal of the LEP, which is considered to be reasonable.

4.3.5. Subdivision for Intensive Plant Agriculture

It is acknowledged that not all agricultural uses will need such a large holding size. It is therefore proposed that a lesser minimum be established for irrigated and intensive plant horticulture (which does not include irrigated cropping) and a slightly larger minimum particularly for irrigated lucerne, however, there has to be some proof that the use has been established before a dwelling house can be constructed.

Intensive Plant Agriculture is defined in the Standard LEP as follows:

> ***intensive plant agriculture*** means any of the following carried out for commercial purposes:
>
> (a) the cultivation of irrigated crops (other than irrigated pasture or fodder crops),
>
> (b) horticulture,
>
> (c) turf farming,
>
> (d) viticulture.

It is proposed to set a 40 ha minimum for intensive plant agriculture and 100 ha for irrigated lucerne. That means that horticulture, turf farming and viticulture can occur on 40 ha lots and irrigated lucerne can only occur on 100 ha lots. The application would have to be accompanied by an assessment of the land by a suitably qualified person that the land can be used for an intensive plant agriculture purpose as well as evidence of the 2 types of irrigation license – the license to draw water as well as the access license to use it on the subject land prior to subdivision consent being granted. Further, prior to the granting of development consent for the construction of a

dwelling house, there will have to be evidence on the site of the irrigation installations including pump and reticulation as well as the licenses outlined above.

The provision of the above information will help the Council to assess the bona fides of the application. It is acknowledged that this could be provided by specifically creating a zone for intensive agriculture or by creating a separate minimum lot size in the lot size map. However this is not considered an appropriate measure because it is not anticipated that there will be a large demand for such subdivision and if a zone is created or a separate minimum lot size, the potential for creating lots that would have a rural residential rather than intensive agricultural use would be heightened. The intention is to create the ability for this sort of agriculture to occur in the future.

Initial consultations with Government Agencies have raised concern about the areas that this will be applied to, particularly the irrigated cropping in the Jemalong Wyldes Plain Irrigation District, which could yield a considerable amount of subdivision. The area envisaged for the intensive plant horticulture and irrigated cropping is generally that area along the Lachlan River and does not include the Jemalong Wyldes Plain Irrigation Area. The economic analysis indicates that flood irrigated lucerne and fat lambs could generate a sufficient income (using the DPI Methodology) for a farm size of between 100 and 150 ha. However, the Jemalong Wyldes Plain Irrigation District is a unique district in terms of the irrigation and the cropping systems involved. For these reasons, along with the potential impact of subdivision on land and water management issues the minimum for intensive plant agriculture at 100 ha only.

It is noted that the Standard Instrument LEP does not make provision for subdividing for intensive plant horticulture. This matter is considered to be in need of further investigation and discussion to be resolved during the drafting of the LEP.

4.3.6. Rural Workers Dwellings

The issue of rural worker's dwellings also needs to be discussed in light of the minimum holding size for a dwelling (as outlined above). It is noted that some properties require a worker to live on the farm for ease of workload as well as security and emergency. These are currently permitted in accordance with the minimum holding size, however, were a holding has dwellings in accordance with the minimum or a lower size, this should not penalise the opportunity for employing and housing workers on the property. Therefore rural workers dwellings should be permissible in close proximity to the existing dwelling without subdivision and on the same lot as the primary residence. Access to the rural workers dwelling should be from the same access road that serves the main dwelling on the property. It is considered that a plan and statement from a suitably qualified person should be required to justify the need for the rural workers dwelling house. It is also not considered necessary for the rural workers dwelling requirement to be tied to the minimum size for a dwelling house – the report and plan from the suitably qualified person should be able to justify this.

4.3.7. Rural Planning Principles

The designations for the rural land are consistent with the rural planning principles outlined in clause 7 of the Rural Lands SEPP. The principles and reasons for the consistency are as follows:

(a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas.

Comment: The land designations and recommended minimum lot size for a dwelling house provide for the continuation of the sustainable economic activities by providing 1 designation for the main rural areas of the Shire. This will ensure that the current range of rural uses such as agriculture, forestry and extractive industries are able to continue to prosper and also diversify as the times change in the future. This is reinforced by the recommended minimum lot size for a dwelling of 200 ha along with the provisions allowing subdivision to any size provided it is for purpose of primary production.

(b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State,

Comment: The land use designations, proposed mix of lot sizes and the provisions for subdivision of intensive agriculture recognise the importance of rural land as well as providing for changing trends in agriculture such as the one for smaller farms with the ability to have an irrigation license.

(c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development,

Comment: The recommended land use designations, proposed mix of lot sizes and specific provisions outlined in this document will encourage a diversity of rural land uses thereby ensuring that the future socio-economic makeup of the community is preserved.

(d) in planning for rural lands, to balance the social, economic and environmental interests of the community,

Comment: The provisions outlined above are consistent with balancing the social, economic and environmental interests of the community. It will allow for a range of farms to establish which will allow new and young farmers to purchase land at an affordable price. It will also ensure that there is minimal environmental impact because the large minimum lot size for a dwelling is sufficient to locate any improvements away from environmentally sensitive land.

(e) the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land,

Comment: The land use designations and the proposed minimum lot size of 200 ha for a dwelling will be large enough to ensure that natural resources will be protected. The proposed objectives of the zone will also ensure consistency.

(f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities,

Comment: This document and the adopted Growth Management Strategy provide for a mix of rural lifestyle and urban housing and is consistent with this principle.

(g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing,

Comment: The impacts on services and infrastructure has been taken into account by recommending a higher minimum lot size for dwelling houses in the rural areas of the Shire and providing rural residential housing in close proximity to the town of Forbes.

(h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.

Comment: At the time of writing there are no applicable regional or local strategies.

4.3.8. Rural Land Uses

This section provides a discussion on the following land uses that have been identified in the research and discussions conducted in the formulation of this study as requiring specific management due to particular issues:

- Agricultural Uses
- Tourist Development

Each will be discussed separately.

Agricultural Uses

The term "sustainable agriculture" has many connotations and is linked to the concept of Ecologically Sustainable Development, which embodies the 3 themes of Environment, Economics and Social.

A definition of sustainable agriculture in the ' Strategic Plan for Sustainable Agriculture - Sydney Region' is

> *"Agriculture that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends"*

Another definition is provided by the Standing Committee on Agriculture of the Australian Agriculture Council Working Group on Sustainable Agriculture:

> *"Sustainable Agriculture is the use of farming practices and systems which maintain and enhance the economic viability of agricultural production; the natural resource base; and other ecosystems which are influenced by agricultural activities*

All of these definitions embrace the concepts of environmental and economic issues, but do not consider the social aspects of sustainable agriculture. These include the capacity of agriculture to meet the demands of the population for healthy and fresh food and fibre products, as well as its ability to have a minimal impact on the amenity and peace of mind of community members, thus reducing rural land use conflict.

New definitions for sustainable agriculture should be incorporated and be as follows:

> Sustainable Agricultural use of land *means the use of land for animal boarding or training establishments, cattle feedlots, extensive agriculture, intensive horticulture, intensive livestock keeping*

establishments, opportunity feedlots or turf farming, which can be maintained and managed so that the land remains

- *environmentally sustainable (that is, environmental pollution and land degradation arising from the use is minimised);*
- *socially sustainable (that is, land use conflict and loss of amenity of the surrounding area arising from the use is minimised); and*
- *economically sustainable (that is, there is a capability of making a net farm profit from the use).*(Wollondilly Shire Council)

From a land use planning perspective, there are 3 broad agricultural uses in NSW: irrigated plants / horticulture, intensive animal keeping and extensive agriculture. It follows, therefore that there is a need define these uses separately. Both of the intensive uses should require consent and extensive agriculture should not as it is considered that it does not, generally, cause major land degradation or water quality problems (unless it is associated with major land clearing), it generally occupies land already cleared and used historically for that purpose and because it is considered to be an unreasonable and complex land use to be able to embody in a development application.

The Standard LEP which is to be used as the basis for the preparation of the Forbes Shire LEP makes reference to these 3 uses as follows:

"extensive agriculture" *means:*

(a) the production of crops or fodder (including irrigated pasture and fodder crops), or
(b) the grazing of livestock, or
(c) bee keeping,
for commercial purposes, but does not include any of the following

(d) cotton and rice cultivation,
(e) intensive livestock agriculture,
(f) aquaculture,
(g) turf farming,
(h) animal boarding or training establishments,
(i) farm forestry,
(j) horticulture or viticulture.

"horticulture" *means the cultivation of fruits, vegetables, mushrooms, nuts, cut flowers and foliage and nursery products for commercial purposes, but does not include retail sales or viticulture.*

"intensive livestock agriculture" *means the keeping or breeding of cattle, poultry, goats, horses or other livestock, that are fed wholly or substantially on externally-sourced feed, and includes operation of feed lots, piggeries, poultry farms or restricted dairies, but does not include the operation of facilities for drought or similar emergency relief or extensive agriculture or aquaculture.*

The current Forbes LEP adopts the Environmental Planning and Assessment Model Provisions 1980 which provide a definition of Agriculture which has been sourced from

the Local Government Act of 1919 (which has been replaced by the Local Government Act of 1993). This definition is reproduced below:

> *"Agriculture and 'Cultivation' include horticulture and the use of land for any purpose of husbandry including the keeping or breeding of livestock, poultry or bees and the growing of fruit, vegetables and the like and agricultural 'and cultivate' have a corresponding meaning."*

The new definitions will be in the LEP which is to be one of the outcomes of this process. It is recommended that extensive agriculture be permitted without consent in the agricultural areas and that horticulture and intensive animal establishments require consent. It should be noted that at present, only intensive animal establishments require consent (only feedlots, poultry farms or pig keeping establishments) The reasons for each will be outlined separately as follows:

- The **extensive agriculture** definition uses as its basis cropping and grazing for commercial purposes that does not need the continual application of water or feed not occurring naturally and also is practiced on a broad scale with the area being used being hundreds and in some cased thousands of hectares. Periodic feeding for drought and water application is considered to be included in this. Irrigated pasture (growing oats) and the growing of irrigated fodder crops (lucerne) are considered to be an extensive form of agriculture because the inputs and the extensive nature of the activity are not considered to be a major cause of nutrient export or land degradation when compared to market gardening or turf farming.

- The **horticulture** definition identifies forms of plant growing that traditionally uses can cause some form of external impact which has the potential to cause land degradation, water quality problems or land use conflict. Therefore there is a need to require development consent so that there is the ability to ensure that the impact can be minimised.

- The **intensive livestock agriculture** definition relies a feeding method using wholly or substantially on externally-sourced feed. This type of use is also traditionally intensive and can cause some form of external impact which has the potential to cause land degradation, water quality problems or land use conflict. Therefore there is a need to require development consent so that there is the ability to ensure that the impact can be minimised.

The definitions in the Standard LEP as outlined above are considered to be ambiguous because some of the agricultural systems are defined and others are not. This can lead to uncertainty and confusion, which could ultimately end up in the matter being determined by courts. It is noted that one of the objectives of the standard LEP was to reduce this confusion and ambiguity. Each of the definitions will be discussed below.
The *extensive agriculture* definition includes 3 agricultural systems that are included and a list of others that are not to be included. It is not considered that fodder (including irrigated pasture and fodder crops), the grazing of livestock, or bee keeping need to be separately defined because they are commonly used and understood agricultural terms. However, the term 'crops' can include both irrigated and dryland systems. Irrigated crops include wheat, sorghum and sunflowers. These are also included as dryland cropping. From the potential of land use impact on adjoining land or the environment, there is not such a difference between dryland or irrigated

cropping that would necessitate the need for development consent. The major impact from irrigated cropping is the water and how it is delivered or stored on the property. It is noted that irrigation water requires licensing under the provisions of the Water Act. It is also noted that irrigated cropping does not currently require consent. Therefore, it is recommended that the term 'crops' be clarified by inserting '(dryland and irrigated)'.

A review of the definitions in the Standard LEP (outlined above) reveals that some of the farming systems identified as being excluded from the extensive agriculture definition are defined (intensive livestock agriculture, aquaculture, turf farming, animal boarding or training establishments and horticulture). However cotton and rice cultivation, farm forestry and viticulture are not defined. Cotton and rice farming are not currently established in the Shire. The terms 'farm forestry' and 'viticulture' however need to be defined. This is to ensure that there is clarity of interpretation and also to ensure that only commercial vineyards require consent, without any definition, it could be concluded that all grape growing (which is how the Macquarie Dictionary defines viticulture) needs consent. Similarly with farm forestry, it will clarify the matter. It also provides consistency as all of the other terms are defined and these 2 are not.

Farm Forestry includes plantation forests for timber production. It has the impact of changing the landscape from one of openness to vegetated and in some parts of the State, can lead to a major change in the landscape. For this reason, some Councils require consent for farm forestry. Therefore there is a need to define it in the Standard LEP. In the case of Forbes Shire, however, it is not considered to be and issue because of the flatness of the terrain and therefore should not require consent.

Viticulture is the growing of grapes and in the NSW context this is grapes for wine production they are grown in vineyards. Vineyards that produce wine on a commercial basis are usually greater than 5 ha and mostly larger than this. They can cause some form of external impact especially at harvest time when they use mechanical harvesters and sprays – both of which are known to cause rural land use conflict. Therefore, they should require development consent. A suitable definition would be similar to that used for the Cessnock LEP 1989 (commercial vineyard) and is as follows:

> *"Viticulture means a plantation of grape vines, commercially grown for grape or wine production purposes"*

The definition of 'agricultural processing industry', whilst being the most appropriate for a winery, does not mention this. It mentions a number of processing uses as examples and by mentioning wineries, it would make it clearer where wineries are defined.

The definition of intensive livestock agriculture includes operation of feed lots, piggeries, poultry farms or restricted dairies. There are definitions of feed lots and restricted dairies but not piggeries or poultry farms. In order to stop any confusion, there should be definitions of these 2 uses – particularly as there are a number of these uses throughout NSW. It is noted that piggeries are present in the Shire and it is considered that poultry farms may be developed in the Shire. Appropriate definitions would be as follows:

Piggery means a place where pigs are raised using artificial feeding methods and the animals are kept in buildings or yards.

Poultry Farm means the rearing of all types of poultry where imported feed and water is provided as a whole or supplementary ration. The birds may be housed or free range.

Rural Tourist Development

It has been recognised that rural tourism can provide a boost to the economic development in the rural area. There is a need therefore to encourage it by ensuring that the planning controls have sufficient flexibility in them.

This issue has been considered by the Standard LEP where it has taken the approach to separately define the component parts rather than having one definition of 'tourist facility' as this can be too all encompassing. It is noted that definitions are provided for the following

- Bed and Breakfast establishment.
- Caravan Park
- Hotel (which includes motels)
- Restaurant
- Tourist and visitor accommodation

There are not any definitions for farmstay accommodation or ecotourism facilities. These are becoming increasingly popular types of tourist facilities in rural areas and should be defined in the Standard LEP. Recommended definitions are as follows:

Ecotourism facility means a facility for nature based tourism that is managed in an ecologically sustainable way to ensure that the facility and associated activities do not adversely impact on the environment or intentionally disturb wildlife or their habitats. It must include one or more tourist accommodation buildings and a building or buildings at which education about, and interpretation of, the natural and cultural environment are provided.

Farmstay means the provision of accommodation, provided within a tourist accommodation unit in association with a working farm. It can also include bed and breakfast establishments.

4.4 Social Issues and Community Well Being

An integral component of ESD is social sustainability. Defining social sustainability has been the subject of considerable debate but has broadly focussed on ensuring *quality of life* or *community wellbeing.* It is considered as being achieved through a balance of economic, social and environmental issues resulting in a better *quality of life* for the existing and future community. The NSW Office of Social Policy (see Office of Social Policy, *Quality of Life - A Social Policy Approach*, July 1994) recommends that the following factors are integral to achieving this balance:

- *Social justice* needs such as equal access to education, health, welfare, personal safety, housing and broader community and cultural services and facilities

- *Economic development* particularly in terms of employment, quality of working life and personal economic situation
- *Environmental policy* related to the physical aspects of communities such as liveability, community values and ecological sustainable development.

More recent work undertaken by Wills (2001) identifies seven key outcomes for achieving *quality of life* and *community wellbeing.* These focus on social/cultural, economic and environmental outcomes and are described as:

- *Livability* – natural and built environments for healthy and easy living
- *Equity* – equal opportunity for the development of human potential
- *Conviviality* – people living well together
- *Adequate prosperity* – consuming less but with sufficiency
- *Sustainability* – sufficient development without threatening viability
- *Viability* – remaining within the ecological limits and maintaining species diversity
- *Vitality* – resulting from activity, participation and interaction between people

For the rural areas of the Shire it is important to ensure that social sustainability is a key component of the strategic planning framework for this community. Quality of life and community wellbeing are key outcomes to be integrated into a holistic planning approach for this community. However, it should be pointed out that a lot of people move to the rural areas for a lifestyle knowing that certain facilities and services are not there.

To be socially sustainable, the Growth Management Strategy should to address the issues raised above and provide adequate level of services in the rural areas for those residents.

The housing needs of the Forbes Community include affordable housing. This is defined as housing that is appropriate to the needs of a household and within their means to pay for it. There is a need to address the provision of new affordable housing options as well as the retention of the existing affordable housing stocks. There is a need for the Council to investigate this matter in more detail than can be done in this Growth Management Strategy. It is recommended that the Council prepare an Affordable Housing Strategy to address this important issue.

4.4.1. Forbes Social Plan

The most recent social plan provides an analysis of the current quality of life issues within the Shire and is mainly focussed on the town of Forbes which is where all of the social services are provided or are based.

The social plan has identified a number of areas that require attention. They are:

- Continued availability of medical services;
- Continued availability of child care services;
- Support and facilities for youth;
- Continued operation of aged care services;
- Continued provision of services to the disabled;
- Aboriginal health, education and employment.

It is appropriate to include recommendations for these issues in the Strategy.

4.5 Economic Development and Tourism

Economic Development in the Shire is a very important aspect of its future. There are a number of matters that require to be addressed which can be considered under the following broad headings:

- Strengthening the Economic Base
- Tourism

4.5.1. Strengthening the Economic Base

The current economic base of the Shire is strong with a reasonable level of diversity. There is however, a strong reliance on agriculture. There will inevitably always be areas for improvement. The census data provides an indication of the current economy by showing the industry of employment for the workforce. This can be compared to NSW to provide a benchmark as to how Forbes compares to the state averages for the industry sectors. This information is provided in Table 4.8. It can be seen that there is dominance in the Agriculture, Forestry and Fishing industry – something to be expected. The Shire is lower than the State average for manufacturing, transport and storage – both of these are considered to be areas where the Shire and town have advantages. Retail trade and Accommodation, Cafes and Restaurants are slightly lower and are also an indicator of the tourism industry – another area where the Shire and town have strengths. Construction is also an indicator of a healthy economy because it signifies that things are being built – houses and other uses. This in turn provides for spending in the economy. Education is slightly higher and Health and Community Services are slightly lower than the State average, which is also considered to be satisfactory.

Table 4.9: Industry of Workforce Forbes and NSW

Industry	Percentage of Total	
	Forbes	NSW
Agriculture, Forestry and Fishing	23.7%	3.4%
Mining	0.2%	0.5%
Manufacturing	7.9%	11.5%
Electricity, Gas and Water Supply	0.9%	0.7%
Construction	5.4%	6.9%
Wholesale Trade	7.6%	5.6%
Retail Trade	13.3%	14.2%
Accommodation, Cafes and Restaurants	4.2%	5.2%
Transport and Storage	2.6%	4.6%
Communication Services	0.8%	2.0%
Finance and Insurance	1.6%	4.8%
Property and Business Services	4.4%	12.2%
Government Administration and Defence	3.4%	3.8%
Education	7.8%	6.8%

Health and Community Services	9.1%	9.4%
Cultural and Recreational Services	0.6%	2.5%
Personal and Other Services	2.9%	3.6%
Non-classifiable economic units	0.5%	0.5%
Not stated	3.2%	1.8%
Total	100.0%	100.0%

Source: ABS Census 2001.

There are ways to provide more diversity to the economic base of the Shire. This can be done in a number of ways.

- Continue the economic strength of the agriculture sector;
- Continue to broaden the economic base of the Shire. This can be done by developing larger markets that are not agriculture dependent;
- Preventing leakages of expenditure by Forbes residents and businesses;
- Providing a good level of service locally to prevent local residents and businesses from doing business elsewhere;
- Improving visitor services and amenities.

This can be done by 2 actions:

- Firstly, existing businesses that have products and services that can be supplied into other markets (particularly major city markets) should be identified and assisted to expand. An 'economic gardening' program could be initiated supported by both Council and the Forbes Promotion and Development Incorporated. Some further details are provided on a possible program in Appendix 8.
- Secondly, if there are few businesses with growth potential, then business attraction will be necessary. To be successful, business attraction has to evolve from a broad economic development strategy and be carefully focused, planned and implemented. Few businesses are prepared to relocate. Thus, businesses have to be attracted on the basis that it is part of an overall business/industry development strategy that is built on competitive advantage and has growth potential.

4.5.2. Tourism

A strategy to capitalise on the existing and future traffic on the Newell corridor should be developed as a key aspect of any strategies addressing tourism.

The town and district have great heritage values. The Lake and environs also provides a picturesque place for travellers to stop and rest. This is especially true for the 'grey nomads' who travel along the Newell Highway. The dual main streets also provide an interesting feature. Further north along the Newel Highway is the town of Moree, which is also a significant heritage town – it could be said that Forbes and Moree are the most significant heritage towns along the Newell Highway. This is something that both towns could jointly promote each other.

These 2 aspects should be capitalised on to give the town a unique attraction. This could also be a selling point for the future marketing of the Shire. A slogan along the

lines of 'Forbes – the heritage and garden town on the Newell' could be adopted. This would build on the natural assets of the town.

There is also a need to improve the entrances to the town. It is important to provide a good impression as the visitor enters the town –"you never get a second chance at a first impression". This includes some urban design treatment and landscaping along the Newell Highway north of the town as well as to the south. Signage needs to be addressed. This signage should be simple and portray the slogan outlined above.

The marketing of the town and Shire, public domain works and capital works needs to capatilise on these aspects of the heritage, the dual main streets, lake and parkland setting of the town.

4.6 Infrastructure

The provision of infrastructure is an important aspect of any Strategy for the future. This includes roads, water and sewer, community and recreation facilities, transport, telecommunications and electricity. These are outlined in Council's management plan, which provides for the management of the current resources.

The current level of infrastructure is mostly adequate for the needs of the current population, with the exception of public transport.

The Roads and Traffic Authority has responsibility for State and Regional Roads / Main Roads within the Shire. These have been identified in the *Forbes Comprehensive Land Use Strategy Issues Paper*. There is a need to protect these roads by minimising development along them that will cause an increase in traffic generation and potential for accidents. To this end, there is a need to not allow ribbon development along these roads and ensuring that any development adjacent to them takes into consideration their main objective of moving traffic in the most effective and efficient manner and reducing the potential for road accidents with those vehicles travelling on them.

Council manages a large number of roads within the Shire, a number of which are unsealed. There is a need to ensure that the road system is utilised to its maximum capacity and that development occurs in areas that have good access and preferably sealed roads. There are a large amount of roads and bridges that need to be continually repaired and upgraded.

The water and sewerage reticulation systems for the town of Forbes is considered to be adequate for the present and will need to be monitored over the coming years to ensure that demand is managed. Council has identified low water pressure in some areas. A recent Sewage Treatment Plan upgrade has been constructed for 12,500 equivalent populations. The current demand management systems will provide the Strategy for future development and upgrades to occur.

Community and recreation facilities are considered to be adequate for the current population. There will be a need to continually manage and improve the level of community and recreation facilities to ensure that they meet the needs of the future populations.

Telecommunications and internet access is a key issue in rural NSW. Broadband internet access is something that is more commonly required for businesses, Councils, Government Agencies, health and educational institutions as well as for personal use. This is currently only available in the town of Forbes and not in the rural areas.

Public Transport provision to the Shire and within it are barely adequate. The only form of public transport is buses and taxis within the Shire. One of the major problems with bus transport in rural communities is that there are often not sufficient paying passengers for the distance travelled to make it viable. Concentrations of population which are easy to service are an important requirement for bus transport. For older people and people with a disability this access to bus transport and quality pedestrian and cycle facilities within the town is important. This includes the provision of dropped kerbs, road crossing facilities and bus stop infrastructure (e.g. shelters, seating, timetable information and lighting) with all facilities to meet access guidelines and be suitable for motorised scooters.

Public transport services from outside the Shire are also limited. Interurban Buses stop in the town and there is a Countrylink bus service which connects with the Interurban trains.

4.7 Catchment Management

All land is within a catchment and the impact of development on the land downstream has to be considered. Forbes Shire is in the Lachlan River Catchment. The river and its many tributary creeks and drainage lines flow through the Shire and town of Forbes. It is a source of water for the town as well as for irrigation. There are many irrigators who have access to the river and the water is used to irrigate many crops as well as being used for stock and domestic water supplies.

Water Quality in the river and its catchments is very important and there is a need to ensure that development does not have any adverse impact on the water quality. One strategy that could be employed is to ensure that all development has a net improvement in the quality of the water downstream. This would ensure that development is striving to achieve the principles of sustainable development. Domestic effluent disposal and urban and rural runoff and pollution have the potential to adversely impact on the water quality. To ensure that development is sustainable, it should be setback from the river and creeks and effluent disposal and other pollutants should not be permitted to drain into the river and creek system. It is also important to reduce sediment loadings in the system by ensuring that erosion does not occur. This can be prevented by ensuring that there is an adequate riparian buffer strip of grass and other vegetation to slow down the water and sediment, thus capturing it before it enters the river system.

The Shire is part of the Lachlan Catchment Management Authority (CMA). One of the CMA's main functions is to prepare a Catchment Action Plan (CAP). The sets the direction for the next 10 years for the provision of incentives for projects, education, planning and partnership development for natural resource management in the catchment. It has 4 main themes which are as follows:

- Biodiversity and Native Vegetation
- Water and Aquatic Ecosystems
- Land Management

- People and Community

The CAP has a number of Catchment Targets which relate to these themes and are as follows:

- CT1: By 2016 there is an increase of 145,000 hectares of terrestrial native vegetation that is being actively managed for biodiversity conservation.
- CT2: By 2016 the highest priority terrestrial and aquatic threatened flora and fauna species, endangered populations and significant species will be managed for conservation.
- CT3: By 2016 restrict the extent of priority pest animals and environmental weeds.
- CT4: By 2016 riverine and aquifer ecosystem condition and quality is maintained and improved.
- CT5: By 2016 soil health has improved on 870,000 ha of agricultural land.
- CT6: By 2016 the Lachlan community is actively involved in sustainable NRM with the capacity and motivation to achieve sustainable landscapes.

This Growth Management Strategy can be used to help implement the CAP where appropriate.

The NSW Government has developed a set of Water Quality Objectives which are the agreed environmental values and long-term goals for NSW's surface waters. They set out the following:

- the community's values and uses for the State's rivers, creeks, estuaries and lakes (i.e. healthy aquatic life, water suitable for recreational activities like swimming and boating, and drinking water); and
- a range of water quality indicators to help us assess whether the current condition of our waterways supports those values and uses.

The Water Quality objectives for the Lachlan River Catchment have been developed by the Department of Environment and Climate Change. They have been developed to ensure the long term health of the waterways of NSW so that there can be a healthy future for both the environment and the economy. Environmental problems are widespread in the river systems and, in many cases, can also affect economic development of the areas adjoining the rivers. These problems include algal blooms, rising salinity, carp and declining numbers of native fish. NSW also needs to meet its inter-governmental obligations to improve river health, such as in the Murray-Darling basin. There are a number of water quality objectives that apply. Each is based on providing the right water quality for the environment and the different uses people have for water. They are based on measurable environmental values for protecting aquatic ecosystems, recreation, visual amenity, drinking water and agricultural water. Each of the inland River Flow Objectives deals with how water moves down rivers and streams. Each objective aims to improve river health by recognising the importance of natural river flow patterns. The Objectives are based on achieving improved environmental results from managing the riverine system. The objectives for Water Quality and River Flow are outlined in Table 4.10. The information provided in the table is the heading for the objectives that apply. For the detail of the objectives reference should be made to the list of detailed objectives contained in appendix 9.

Table 4.10: Water Quality and River Flow Objectives

Priority Area	Water Quality Objectives	River Flow Objectives
Town water supply sub catchments	Aquatic ecosystems:	Protect pools in dry times
	Visual amenity:	Protect natural flows
	Drinking water	Manage ground water for ecosystems
		Minimise effects of weirs and other structures
Mainly Forested Areas	Aquatic ecosystems	Protect pools in dry times
	Visual amenity	Protect natural flows
	Primary and secondary contact recreation	Maintain natural flow variability
	Aquatic foods	Manage ground water for ecosystems
		Minimise effects of weirs and other structures
Waterways Affected by urban development	Aquatic ecosystems	Protect pools in dry times
	Visual amenity	Protect natural flows
	Primary and secondary contact recreation	Mimic natural drying in temporary waterways
		Maintain natural flow variability
		Maintain natural rates of change in water levels
		Minimise effects of weirs and other structures
Waterways affected by irrigation drainage	Aquatic ecosystems	Maintain wetland and floodplain inundation
	Visual amenity	Mimic natural drying in temporary waterways
		Maintain natural flow variability
		Manage ground water for ecosystems
		Minimise effects of weirs and other structures
Uncontrolled Streams	Visual amenity	Protect pools in dry times
	Primary and secondary contact recreation	Protect natural flows
	Livestock water supply	Protect important rises in water levels
	Irrigation water supply	Maintain wetland and floodplain inundation
	Homestead water supply	Manage ground water for ecosystems
	Drinking water	Minimise effects of weirs and other structures
	Aquatic foods	
Major regulated rivers	Aquatic ecosystems	No river flow objectives recommended
	Visual amenity	
	Primary and secondary contact recreation	
	Livestock water supply	
	Irrigation water supply	
	Homestead water supply	

	Drinking water	
	Aquatic foods	
Controlled rivers with altered flow patterns	Aquatic ecosystems	Protect pools in dry times
	Visual amenity	Protect natural flows
	Primary and secondary contact recreation	Mimic natural drying in temporary waterways
	Livestock water supply	Maintain natural flow variability
	Irrigation water supply	Minimise effects of weirs and other structures
	Homestead water supply	
	Drinking water	
	Aquatic foods	
Artificial Channels	Aquatic ecosystems	No river flow objectives recommended
	Visual amenity	

These Objectives should be carried forward as primary objectives to be achieved by the land use strategy and amended Local Environmental Plan.

The *Forbes Comprehensive Land Use Strategy Issues Paper* has highlighted other issues with the catchment that should be addressed. They are as follows:

- Algal blooms;
- Decline in native fish species and an increase in exotic species;
- Increasing salinity – both riverine and dryland;
- Loss of native vegetation
- Decline in the health of wetlands
- River regulation and its impact on the native biota (particularly fish) and wetland ecosystems.

4.8 Native Vegetation and Biodiversity

Biodiversity and native vegetation have been discussed in detail in the *Forbes Comprehensive Land Use Strategy Issues Paper*. Recent mapping of the vegetation has been carried out by the Lachlan CMA and includes remnant native vegetation plus wetlands. This mapping is shown in map 4.23. It can be seen that there is a large amount of vegetation in the north east of the Shire as well as being associated with the Jemalong Range. There are also scattered areas throughout the rest of the Shire which is mostly associated with waterways or Travelling Stock Reserves. These contain significant areas of remnant native woodland and some areas of native grasslands. Of particular note is the Box Gum Woodland which has been declared as an Endangered Ecological Community (EEC) under the provisions of the Threatened Species Conservation Act.

It is important therefore to provide a policy framework in which the biodiversity of the Shire can be conserved. This needs to apply to both the aquatic and terrestrial lands of the Shire. Biodiversity conservation, like preservation of rural landscapes needs to have a multifaceted approach. The matters outlined in section 4.3 and figure 4.2 are just as relevant to biodiversity conservation.

The Council is legally obliged under the provisions of the Local Government Act to consider Ecologically Sustainable Development (ESD) in the carrying of its duties and that biodiversity conservation is a key component of ESD.

First of all there needs to be an assessment of the value of the biodiversity. Once this has been done the Council can consider the implementation of a number of policy options, which are as follows:

- A specific zone in a Local Environmental Plan (LEP).
- Provisions within a Development Control Plan (DCP).
- Identification of linkages.
- Education and Incentives

Each will be discussed as options to be considered. However, there is the potential to put an overlay over the areas of dense vegetation which have been identified in the land use survey to act as an initial step towards a more comprehensive biodiversity conservation mechanism.

4.8.1. Zone in LEP

An Environmental Conservation / Management Zone within an LEP could contain certain provisions that would ensure the preservation of significant habitats with identified biodiversity values. It could also relate to the riparian vegetation. This zone could place restrictions on the clearing of land, and the uses that would be permissible to be carried out on such land. This could be seen as being a drastic step and could have a significant impact on the future use of the land. It would have to be backed up by a specific study of the area that would identify the land and its biodiversity value. The identification of land as an environmental conservation / management zone could also be used as a requirement for some form of incentive scheme that will be discussed below.

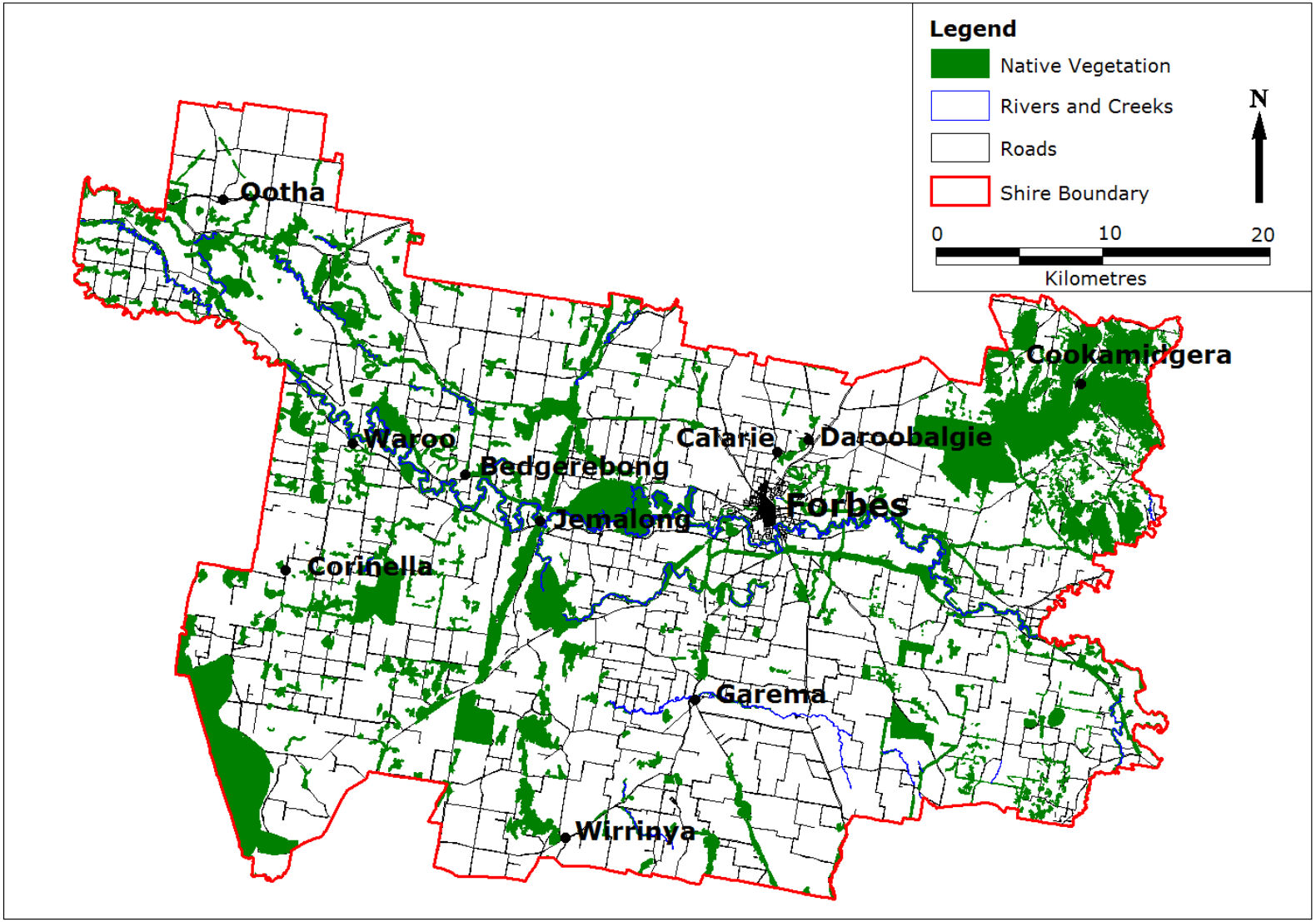
One issue that needs to be considered is that extensive forms of agriculture (grazing and cropping) do not require consent in most zones and should a zone be introduced, it would be difficult to prove that these uses, especially grazing would constitute a new use requiring consent, rather than a continuing use. It must be recognised that land use controls can only affect future uses, not uses that are currently undertaken or have been undertaken in the past.

An alternative way to conserve the biodiversity and not specifically zoning the land is to have a zone that reflects use or character of the land – Primary Production for example – and create an overlay hatching of the significant biodiversity areas. This would be tied to a clause in the LEP that would have restrictions on the uses and activities that can be carried out on the land. This has the advantage of not creating a specific zone, but the disadvantage of not highlighting the biodiversity significance of the land in question.

The boundaries of these zones or hatchings need to recognise the topography and vegetation boundaries rather than merely following a cadastral (lot) boundary. The benefit of this approach is that it allows the land to be protected and the other land to be used for appropriate agricultural uses, rather than restricting a large part of land or

allowing significant vegetation areas to be degraded by inappropriate land management practices.

Consideration could be given to implementing such zoning restrictions as part of the consideration for the draft LEP. However, the need to require consent for all uses (including extensive cropping and grazing) and the problems outlined above need to be recognised.



Map 4.23: Remnant Vegetation
Source: Lachlan CMA

4.8.2. Environmental Sensitivity Overlay

There are parts of the Shire that are environmentally sensitive such as wetlands, endangered ecological communities and areas of native vegetation as well as wetlands and waterways. These are scattered throughout the Shire and zoning may not be considered to be an appropriate tool to conserve them. The option exists to create an overlay map which will highlight them and a specific clause can be included in the LEP that places restrictions on the use of the land or clearing of the vegetation.

At present this is not considered to be an option that Council should include in its revised LEP but it should be discussed with the Lachlan Catchment Management Authority and Department of Environment and Climate Change to undertake the appropriate studies to investigate this for consideration with future LEPs.

4.8.3. Provisions in a DCP

Provisions within a Development Control Plan could provide specific details on the preservation of biodiversity within the area. This could include issues such as the construction of fences, the proximity of buildings to native vegetation areas as well as clearing of land.

4.8.4. Habitat Linkages

It is noted that there are a number of existing habitat linkages within the Shire. The presence of these linkages provides the ability of wildlife to move between one area and another and therefore contribute to the preservation of biodiversity within the Shire and wider region. The conservation of biodiversity within the Shire is integral to the future of the rural land and the wildlife linkages therefore are also integral with any rural planning policy to be prepared. The identification and protection of these linkages via a LEP would be a mechanism and would also put the wildlife linkages in the context of the rural landuses within the whole of the Shire. There is also a need to provide some detail as to how these linkages can be preserved and maintained as well as identifying specific ones that may need to be enhanced. This can be done by way of specific provisions within a DCP.

Incentives for biodiversity conservation are discussed in the next section, which deals with the whole issue of incentives.

It should be pointed out that one mechanism alone will not achieve the desired end of preservation of biodiversity and that a combination of two, three or all four of the above mechanisms may be required.

4.8.5. Education and Incentives

Education of the community about the need for biodiversity conservation and incentives to encourage farmers and other land users to conserve areas of biodiversity are key components of any policy response to biodiversity conservation.

The range of incentive mechanisms include conservation easements, funding for conservation works, taxation and other matters. Education can include preparing information about the importance of biodiversity in the form of brochures that can be made available to landowners to conducting workshops on the ground about such

things as riparian vegetation and threatened species. This is something that needs to be discussed in detail with the relevant agencies.

Education and incentives are best done in partnerships – between Council and the State Government Agencies (Departments of Environment and Climate Change as well as Natural Resources and the CMAs can all play a role. These agencies have access to more resources – both staff and data than Council.

4.9 Natural and Working Landscapes

The landscapes within the Shire can be divided into natural landscapes and working landscapes (Daniels and Daniels 2003). The natural landscapes include the vegetated hills as well as the river and its associated vegetation. The working landscapes are those that have been cropped or that grow pasture for animals to graze on. Photos 4.25 and 4.26 show the different landscapes in the Shire.

Photo 4.25: Rural Landscapes in the East
Date of Photo: March 2005

Photo 4.26: Rural Landscapes in the West
Date of Photo: March 2005

The unique landscape character of the Shire is a visual resource as it generates tourism, development and environmental management. The visual resource also plays an important role in promoting environmental awareness and well being for residents and visitors. This varies from steep vegetated areas to the simplicity of grazing lands and formal patterns of agricultural crops.

The retention of roadside vegetation is an issue which may require future negotiations with service providers.

Controls which may be considered for retaining the landscape and minimising impact of development include:

- Planting controls for screening undesirable building elements and incorporating buffers to significant environmental communities,
- Building controls for siting and advertising,
- Planning controls for lot sizes, the design and siting of residential dwellings and ancillary buildings, in relation to the visual amenity of road corridors.

It is also important to recognise the visual amenity of open paddocks, post and wire fencing, distant views, heritage items and rural activities.

It can be seen therefore that the preservation of the landscape character of the Shire is of importance.

4.10 Heritage and Culture

The heritage and cultural resources of the Shire include both Aboriginal and European heritage.

The Aboriginal people who first inhabited the Shire were the Wiradjuri. Little is known about the details of Aboriginal settlement of the area. The *Forbes Comprehensive*

Land Use Strategy Issues Paper states that there are 126 sites within the Shire that are recorded on the NSW Aboriginal Sites Register. These sites include the following:

- Open camp sites
- Shelter cave art
- Carved Trees
- Scarred trees
- Burial sites
- Stone arrangements
- Middens and isolated finds

There is the potential for these sites to become disturbed by development proposals – either knowingly or unknowingly. A process can be implemented whereby the Council enters into an Aboriginal Cultural Heritage Planning Consultation Protocol with the Local Aboriginal Land Council. Such a protocol has been established by the Local Aboriginal Land Councils of Purfleet-Taree and Forster and Greater Taree City Council. The Protocol aims to improve long term protection of Aboriginal cultural heritage within the Greater Taree LGA and achieve a range of outcomes which includes:

- Formalising the consultation procedure on planning matters between Greater Taree City Council and the Local Aboriginal Land Councils of Purfleet Taree and Forster, as well as the Department of Environment and Climate Change.
- Greater communication between Aboriginal individuals, communities and Council
- Heightened awareness within Aboriginal Communities of the planning process.
- Heightened awareness within Council of the range of Aboriginal Heritage values and interests through training and awareness seminars.
- Greater understanding of constraints faced by both Aboriginal People and Council and the pressures under which both operate.
- A strategic approach to identification of potential cultural heritage management issues within the planning context and integrating appropriate new ideas and concepts.
- Fostering forward planning that can integrate heritage considerations early in the planning process.
- Introducing standards of heritage assessment which meet with both statutory and community needs.
- Implementation of a Precautionary Principle whereby if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent potential degradation.

The European heritage resources are more well known and documented. They add to the economic development of the town and Shire by being a major component of the tourism attractions. The area was first settled in the 1820's. Then in the 1860's the town was a gold mining town and then became a prosperous agricultural centre. There are many significant civic and private buildings – in the towns and rural area. A Heritage Study was prepared in 1988 and an additional study of the Main Street was undertaken in 1994. Since 2001, the Council has utilised the services of a Heritage Advisor and in 2004 undertook a Community Based Heritage Study. The current LEP gazetted in 1986 does not have any heritage provisions or list of heritage items. There is a need for such provisions to ensure that the unique heritage resources of the Shire are protected. The Community Based Heritage Study has made a preliminary list of items which, after consultation should be incorporated into the new LEP. Council should also consider incorporating a conservation area over sections of the CBD to provide a consistent approach to managing the heritage significance of the CBD. A

DCP for this area should also be formulated to provide guidenance to property owners for issues such as colour schemes, advertising signs and conservation methods.

The Council has initiated 2 promotion activities aimed at giving Heritage a higher profile. They are the Heritage Trail – a list of 24 heritage buildings and sites accompanied by a map. The Council has also sponsored the inaugural Heritage Festival in 2004, 2005 and 2006.

4.11 Natural Hazards

Natural Hazards include the following:

- Flooding
- Bushfire Risk
- Salinity

Of these, flooding is the most severe in both extent and impact on the town and surrounding rural land. The Council has undertaken a series of Floodplain Management Studies and plans. This has culminated in the preparation of a Development Control Plan (DCP) in 2002. The extent of the flooding has been shown on maps included in the *Forbes Comprehensive Land Use Strategy Issues Paper.* The current LEP has a specific zone titled 'Environmental Protection Floodway' which covers the High Hazard Floodway. This provision should be replicated in the new LEP to be prepared and the area to include all of the High Hazard Floodway. The introduction of the new NSW Government document titled The Management of Flood Liable Land in 2005 has necessitated some changes to the current DCP and this should also be updated as part of the new DCP to be prepared in conjunction with the new Forbes LEP 2007.

Bushfires are a natural hazard that has an impact on development of the Shire. The bushfire prone land map shows that there are only some small areas of the Shire that are subject to bushfire, being along the Jemalong Range and in the north east corner of the Shire. The fact that there is so little of the Shire subject to bushfire does not mean that there can be no fires in the other parts of the Shire. Grass fires can have a major threat to property and life in the summer as bushfires. The relevant provisions of Planning for Bushfire Protection should be incorporated into both the LEP and DCP to be prepared.

Salinity is a threat to the health and productivity of many catchments, and to the rural and urban communities that live in them. It is affecting rural landholders, urban developments, infrastructure (roads and bridges), water users and the environment. In Forbes it is an issue in the town as well as in the rural areas. A project was undertaken in 2003 which investigated Urban Salinity in the Town of Forbes. This project though not completed indicated that Council should incorporate some LEP provisions dealing with principles, requirements, actions and management guidelines which should be included in the LEP and DCP that is to be prepared.

Chapter 5: Strategy

5.1 Vision

The vision for the Shire as stated in the current Forbes Shire Council Management Plan, which is also considered appropriate to adopt it for the Growth Management Strategy, is as follows:

> *A prosperous rural community where residents and visitors enjoy a clean, safe environment enhanced by our unique heritage and country lifestyle*

The preparation of a set of specific strategies for the Shire will help to achieve the stated vision of the Council.

This vision can be achieved by the adoption of the growth management philosophy, development principles, objectives, implementation strategies and policy actions that have been provided in this document.

5.2 Growth Management Philosophy

Growth Management is the mechanism by which the growth of an area can be managed. It has to consider the rural and urban areas. The growth management philosophy should consider the broader policy framework of plans and policies affecting land use. It also must consider Ecologically Sustainable Development and Total Catchment Management.

The growth management philosophy for the Shire is as follows

- Provide suitable areas for all types of housing within the Shire;
- Limit expansion to those areas of the town which have the environmental capacity to sustain growth;
- Encourage a wide range of agricultural and other complimentary rural uses such as tourism having regard to environmental impact.
- Encourage the attraction of industry and services to the Forbes township;
- Encourage and promote a diverse range of agricultural and other rural uses; and
- Ensure that communities have an adequate level of facilities a services to ensure a good quality for all residents
- Embody the concepts of:
  - Ecologically Sustainable Development
  - Catchment Management, including the Actions in the Lachlan Catchment Action Plan

5.3 Conservation and Development Principles

When considering the preparation of a strategy for the future of the Shire, it is necessary to outline a series of principles under which development should take place. These are intended to be used by Council when it is considering development applications and proposals for the rezoning of land. They are set out below and are

grouped into categories that match the categories for the strategies outlined later in this chapter.

Growth Management

- Embody the concepts of Ecologically Sustainable Development;
- Provide a choice of living opportunities and types of settlement;
- Establish and adhere to a settlement hierarchy;
- Limit expansion to those settlements that have the capacity for growth;
- Avoid development in areas of conservation significance;

Land Use Planning

- Develop a land use framework that provides certainty for the residents;
- Allow for there to be flexibility in the implementation of land use policies;
- Reduce the incidence of land use conflict with neighbours by ensuring that new development does not have a detrimental impact on existing ones;
- Ensure that there are sufficient land stocks to meet the residential needs of the community;
- Establish a retail hierarchy that retains the regional significance of Orange whilst allowing for appropriate levels of retail use in other centres in accordance with the settlement hierarchy;

Community Services and Quality of Life

- Ensure that settlements have access to an appropriate level of community services and facilities

Economic Growth

- Provide for a diversity of employment opportunities which capitalise on the economic strengths of the Forbes Shire;
- Develop strategies to retain the existing businesses;
- Ensure that the current diversity of economic activity continues;
- Build on the industry sectors that have been identified as the drivers of the future economy;
- Encourage a wide range of agricultural and other complimentary rural uses such as tourism having regard to environmental impact;
- Target job opportunities and education that allows for the retention of young people in the community;

Infrastructure

- Ensure that there is appropriate infrastructure provided to the town of Forbes and villages as outlined in the settlement hierarchy;
- Plan for population growth to minimise the impact of development on the road system;
- Ensure that where necessary, adequate upgrading of roads, recreation and community facilities occurs in association with development;
- Coordinate with the relevant Government Authorities to ensure provision of Police, Ambulance, Health and Education services and facilities in association with development;

Water Catchments

- Embody the concept of Catchment Management, including the actions in the Lachlan Action Plan.
- Ensure that all developments contribute to achieving the most current Government endorsed water quality and river flow objectives for the Lachlan River Catchment;

Ecological Management and Biodiversity

- Enhance and maintain the ecological integrity of the Shire;
- Recognise that biodiversity conservation includes both aquatic and terrestrial environments;
- Protect and conserve the biodiversity of the region;
- Ensure that habitat of flora and fauna is conserved;

Scenic Landscapes

- Protect the integrity of both working and natural landscapes;
- Ensure that development has regard to the natural values and features;

Heritage

- Preserve the heritage and culture of Forbes Shire

Natural Hazards

- Avoid the impact of natural hazards on the future settlement pattern and rural land uses.
- Ensure that potential land contamination from former uses are taken into account when considering a change of use.

5.4 Strategies

The strategies listed below outline the matters that need to be considered when looking at the future of the Forbes Shire. They incorporate objectives, implementation strategies and policy actions.

The strategies have been grouped into the two categories outlined in Chapter 2 and are as follows:

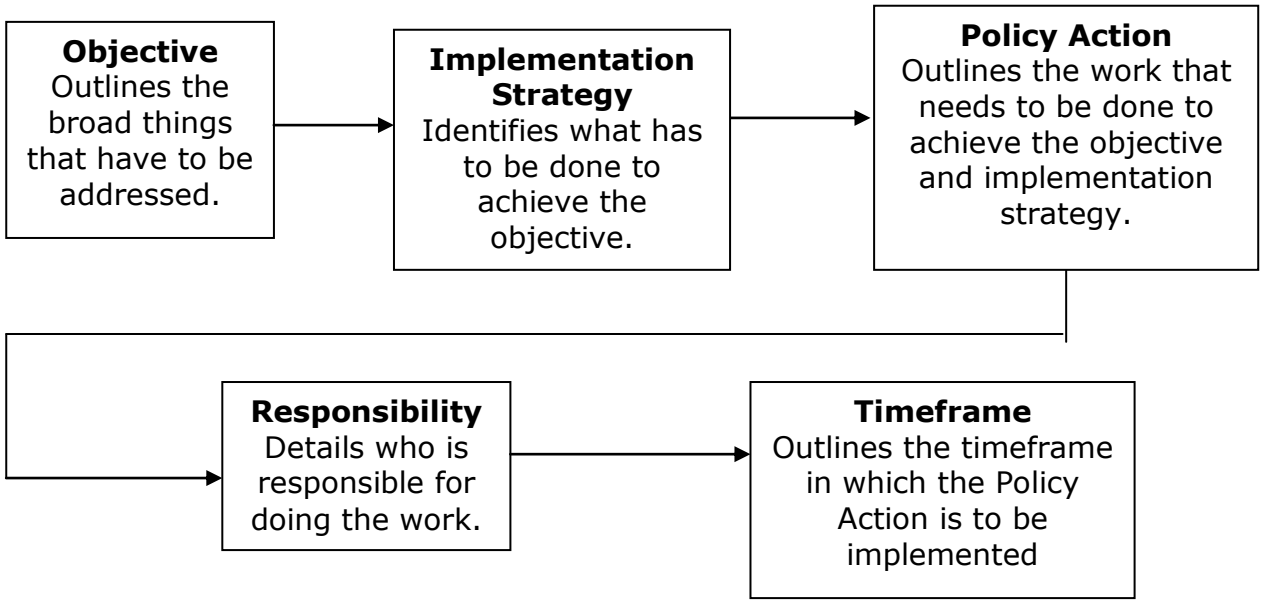
Social and Economic Factors	**Environmental Opportunities and Constraints**
▪ Growth Management ▪ Land Use Planning ▪ Community Services and Quality of Life ▪ Economic Growth ▪ Infrastructure	▪ Water Catchments ▪ Ecological Management and Biodiversity ▪ Scenic Landscapes ▪ Heritage and Culture ▪ Natural Hazards

The implementation strategies contained in this section expand on the objectives and state how they are to be achieved and point towards the policy and actions that are required to carry out the strategy. The policy actions outline the detail of the strategies and provide an indication of what work is required.

This section is laid out so that it is easy to identify what actions are required for the strategies which are outlined. The following chart shows how it is to be read.

The timeframe has been selected to allow them to be built into the State and Local political processes and are broken into three sections:

- *short term* which is nought to two years,
- *medium term* which is two to five years, and
- *long-term* which is five years and beyond.



5.5 Social and Economic Factors

5.5.1. Growth Management

Objective: Provide for coordinated and effective and sustainable growth of the economic, social and environmental aspects of the Shire.

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
1. Promote a balanced approach to growth that provides for sustainable growth management.	1.1 Adopt the growth management philosophy and development principles outlined in section 5.2 and 5.3 of this document 1.2 Control the growth of settlements by using zoning, rural minimum lot sizes as well as including provisions in DCPs.	Council	Short term and ongoing
2. Prepare a hierarchy of settlements.	2.1 Adopt the settlement hierarchy outlined in section 4.2 of this document and as outlined below: *Regional Centre:* Orange and Dubbo *Sub-Regional Centre* Parkes *Town:* Forbes *Villages:* Bedgerebong, Ootha *Rural Localities:* Jemalong, Waroo, Corinella, Garema, Wirrinya, Daroobalgie, Cookamidgera 2.2 Allow for the growth and future development of Ootha within the existing zoned boundary and provide for village zoning for Bedgerebong. 2.3 Provide a mix of housing opportunities which	Council and Government Agencies	Short to medium term Ongoing

Implementation Strategy	*Policy Action*		*Responsibility*	*Time-frame*
		includes urban, and farm housing.		
3. Provide for the economic, social and cultural growth and in particular, maintain and enhance rural job opportunities.	3.1	Prepare Strategies for the economic and social growth in Forbes Shire.	Council	Ongoing
4. Ensure that rural settlements opportunities are able to adapt to the emerging constraint of climate change.	4.1	Ensure that opportunities are provided for intensification of settlements within realistic commuting distances of employment, education and community services	Council and Government Agencies	Ongoing
5. To ensure that the strategy takes into consideration changes over time.	5.1	Conduct 5 yearly reviews of the document, based on receipt of Census of Population and Housing Data.	Council	Ongoing
6. Ensure that land is released in an effective and efficient manner.	6.1	Prepare a land release monitor for residential land.	Council and Government Agencies	Short to medium term

5.5.2. Land Use Planning

Objective: Develop a land use framework that will give a level of certainty to the people who live in the Forbes Shire

Implementation Strategy	***Policy Action***	***Responsibility***	***Time-frame***
2. Develop a new suite of land use designations.	2.1. Adopt the following rural land use designations as outlined on maps 4.17, 4.18, and 4.19: ▪ Primary Production ▪ Rural Small Holdings ▪ Large Lot residential ▪ Village 1.2 Prepare a draft LEP to formalise these as statutory zones, in accordance with the Standard draft LEP.	Council and DoP	Short term
3. Include in each land use designation a set of desired future character statements which will provide the basis for the objectives of each zone.	3.1. Prepare a set of desired future character statements for each of the land use designations which address the following matters: *3.1.1. Primary Production* ▪ Preservation of high class agricultural resources ▪ Promotion and maintenance of sustainable agriculture. ▪ Reduction of rural land use conflict. ▪ Protection and improvement of water quality. ▪ Preservation and enhancement of native vegetation, including habitat corridors. ▪ Protection of the amenity of existing residents. ▪ Buildings to blend into the landscape. ▪ Protection of the amenity of existing residents.	Council	Short term

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
	3.1.2. Rural Small Holdings ▪ Preservation of the open rural landscape and its cultural heritage values. ▪ Buildings to blend into the landscape by having 'earthy' colours and low scale buildings. ▪ Protection and improvement of water quality. ▪ Preservation and enhancement of native vegetation, including habitat linkages. ▪ Protection of the amenity of existing residents. *3.1.3. Large Lot Residential* ▪ Protection of the amenity of existing residents. ▪ Uses to be compatible with residential living areas. ▪ Buildings to blend into the landscape ▪ Protection and improvement of water quality; ▪ Prohibit intensive agricultural pursuits. *3.1.4. Village* ▪ Retain rural village character. ▪ Ensure that new dwellings respect the character of surrounding dwellings. ▪ Ensure new residential development has regard to the scale and form of existing development. *3.1.5. Floodway* ▪ to reduce the incidence of damage to areas subject to flooding by restricting the carrying out of development on flood liable land and prohibiting the carrying out of development in floodways, and ▪ to encourage detailed provisions to be made to achieve this by the use of development control plans.		

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
4. Identify minimum lot sizes that will enable the continuation of the use of the land for agriculture.	4.1. Adopt a minimum lot size for subdivision and dwelling houses of 600 ha 4.2. Permit agriculture on smaller lots as long as it is in conjunction with an agricultural use and that the use must be commenced before a dwelling house can be constructed on the property.	Council	Short term
5. Protect the biodiversity resources of the Shire	5.1. Consider applying environmental management / conservation zoning or overlays to the significant vegetation and key fish habitats of the Shire.	Council and Relevent Government Agencies	
6. Make provision for the future development of the town of Forbes	6.1. Adopt the revised residential, large lot residential and rural small holdings designations as outlined on maps 4.4, 4.6 and 4.7. 6.2. Adopt the revised industrial designations as outlined on map 4.11.	Council	Short term
7. Ensure that development in floodprone areas recognises the level of flood hazard.	7.1. Within high hazard floodways, flood storage and flood fringe limit new development so that it does not provide a higher flood risk than currently exists. 7.2. Allow development in low hazard flood fringe and low hazard flood storage provided it meets the appropriate LEP and DCP provisions.	Council	Short term
8. Ensure that development takes into consideration the impact on salinity	8.1. Incorporate into the DCP a section dealing with building techniques that are appropriate for a saline environment	Council and CMA	Short term
9. Ensure that there is adequate provision for tourist facilities	9.1. Provide for tourist accommodation in urban areas ensuring that they do not detract from the amenity of the area.. 9.2. Provide for tourist accommodation and resort style development and for small-scale bed and breakfast accommodation and tourism activities in Rural zonings which are consistent with the environment	Council	Short term

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
	capacity of the area.		
10. Prepare management guidelines for land uses in the Shire.	10.1. Prepare a Development Control Plan to provide effective and appropriate land use management guidelines for rural and urban land.	Council	Short term
11. Ensure that uses and activities that may cause conflict with adjoining activities and uses effectively separated.	11.1. Prepare land use controls to provide effective buffers from potential incompatible uses including those that hold Environment Protection licenses.	Council	Short term

5.5.3. Community Services and Quality of Life

Objective: Ensure that residents have adequate access to and equity for the provision of services and facilities.

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
1 Assess the adequacy of the services and facilities provided to the people who live in Forbes Shire.	1.1 Carry out a survey and consultation program with the people living in rural areas to ascertain their needs. This is to be done in conjunction with the Social Plan.	Council and Government Agencies	Short to medium term
2 Ensure that there is adequate levels of service for senior living developments	2.1 Prepare a strategy to provide for seniors living facilities.	Council	Short to medium term
3 Improve the delivery of services and facilities to provide for an adequate quality of life for residents	3.1 Improve the amount of aged accommodation, public transport, youth employment opportunities.	Council	Short to medium term
4 Recognise and support the cultural diversity of Forbes Shire.	4.1 Develop plans to ensure that the cultural diversity of the Forbes Shire is preserved and fostered.	Council and Government Agencies and Community	Short to medium term

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
5 Ensure that there are adequate stocks of affordable housing.	5.1 Prepare an affordable housing strategy	Council	Short
6 Monitor the provision of services and facilities for the people who live in rural areas to ensure that they are receiving adequate level of service.	6.1 Prepare a set of Quality of life indicators which can be measured and used to assess the level of service provided to the people of rural areas. This is to be done in conjunction with the Social Plan.	Council and Government Agencies	Short to medium term

5.5.4. Economic and Employment Opportunities

Objective: To provide for economic development opportunities that is in keeping with the character of Forbes Shire

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
1 Prepare an Economic Development Strategy for the Shire	1.1 Focus economic development on the key sectors of Retail, Tourism, Industrial use, and Agriculture.	Council and Community	Short term and ongoing
2 Recognise the unique tourism opportunities that the Shire and town have	2.1 Promote the tourism assets of the town. 2.2 Discuss the joint promotion the town of Forbes with the Town of Moree	Council and Community	Short term and ongoing
3 Collaborate with local organisations to develop a plan for the future economic prosperity of the Shire	3.1 Liaise with the local community business groups to identify common issues that can be pursued together	Council and Community	Short term and ongoing
4 Continue to promote and support the existing businesses	4.1 In conjunction with Regional Business Enterprise services and Forbes Promotion and Development Incorporated advise the existing businesses of relevant opportunities and provide updates on best business practices, funding opportunities, etc.	Council, and Government Agencies	Short term and ongoing

5.5.5. Infrastructure Requirements

Objective: Provide an adequate level of infrastructure for the people who live and work in the Forbes Shire.

Implementation Strategy	***Policy Action***		***Responsibility***	***Time-frame***
1 Provide adequate levels of service for public transport	1.1	Encourage the use of busses and airlines.	Council, State Government and Transport operators	Medium term
2 Provide development only in areas that have adequate road access	2.1	Prepare a plan to ensure that there are adequate levels of access to the villages and rural localities in the settlement hierarchy	Council	Short term
	2.2	Ensure that development along the State, Regional and Main Roads allows for the most effective and efficient use of those roads		
3 Ensure that the most appropriate sewage disposal system is provided for all land in the rural areas	3.1	Adopt a policy of not permitting subdivision of land for rural small holdings or large lot residential less than 1 ha unless it can be connected to a reticulated sewerage system.	Council	Short to medium term
4 Ensure that there are adequate Community facilities to house the required level of social services.	4.1	Develop and implement action plans for the town of Forbes as well as rural villages and centres to ensure that the appropriate levels of infrastructure are provided.	Council and Government Agencies	Short to medium term
5 Ensure that Recreation facilities are adequate to serve the needs of the residents of rural areas.	5.1	Develop and implement action plans for the town of Forbes as well rural villages and centres to ensure that the appropriate levels of infrastructure are provided.	Council and Government Agencies	Short to medium term
6 Ensure effective waste collection and recycling services can be provided to rural settlements	6.1	Provide intensification of rural settlements to ensure the effective provision of waste collection and recycling services.	Council	Short to medium term

5.6 Environmental Opportunities and Constraints

5.6.1. Water Catchments

Objective: Ensure that all development contributes to achieving the Water Quality and River Flow objectives for the Lachlan River Catchment

Implementation Strategy	*Policy Action*		*Responsibility*	*Time-frame*
1. Ensure development does not increase the sedimentation or nutrient load in surrounding water bodies.	1.1	All development is to utilise best management practices for soil and water management on the site.	Council	Ongoing
2. Ensure new development is located so it does not have a detrimental impact on nearby watercourses.	2.1	All development to be located an appropriate distance from waterways and develop means of protecting riparian zones.	Council	Ongoing
3. Ensure Domestic and other forms of Effluent Disposal does not have a detrimental impact on water quality.	3.1	On-site effluent disposal is to be in accordance with NSW Environment and Health Protection Guidelines for On-site Sewage Management for Single Households.	Council	Ongoing

5.6.2. Ecological Management and Biodiversity

Objective: To ensure that the ecological integrity of the rural lands are enhanced and maintained.

Implementation Strategy	***Policy Action***	***Responsibility***	***Time-frame***
1 Protect, recognise and understand the biodiversity values of the Shire.	1.1 Prepare plans linking core areas of remnant vegetation to facilitate species migration. 1.2 Establish a land use and management approach consistent with State, regional, local biodiversity goals, including the recommendations of the Lachlan Catchment Action Plan 1.3 Consider the implementation of environment protection zones and other measures to protect significant biodiversity areas. 1.4 Utilise the E1 National Parks and Nature Reserves zone for National Parks and Nature Reserves within the Shire.	Council and Government Agencies in partnership with the community	Short term and ongoing
2 Preserve the existing biodiversity habitat on private lands throughout rural areas.	2.1 Identify and protect significant linkages of native vegetation. 2.2 Ensure that the expansion of settlements does not impact on areas targeted by the Lachlan CMA for native vegetation expansion, remnant buffering and reconnection. 2.3 Consider protection of these significant linkages by future LEPs	Council, DECC and Catchment Management Authority	Short term
3 Encourage the State Government to continue to investigate and identify the biodiversity values of Forbes Shire	3.1 Implement actions in the NSW Government Biodiversity Strategy and Australian Local Government Biodiversity Strategy that have identified Forbes Shire Council as a lead organisation.	Council and Government Agencies in partnership with the community	Short term and ongoing

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
4 Increase awareness and involvement in identifying, protecting and enhancing biodiversity.	4.1 Prepare guidelines for tree / vegetation evaluation including use of the 7 part test for significance under the provisions of the Threatened Species Conservation Act (for DA Assessment)		

5.6.3. Scenic and Landscape

Objective: Ensure that development has a minimal impact on the natural and modified scenic landscape of Forbes Shire

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
1 Incorporate the preservation of landscape into a development control plan for the Shire.	1.1 Ensure that dwelling houses in rural areas are classified as local development under the provisions of the Environmental Planning and Assessment Act. 1.2 Develop guidelines for the siting and design of buildings in the rural landscape and incorporate into the DCP for the Shire	Council	Short term and ongoing

5.6.4. Heritage and Culture

Objective: To preserve the European and Aboriginal heritage and culture of Forbes Shire.

Implementation Strategy	***Policy Action***	***Responsibility***	***Time-frame***
1 Ensure that the heritage resources of Forbes Shire are protected.	1.1 Implement the recommendations of the Community Based Heritage Study	Council	Short term
2 Protect and enhance the recognised heritage values.	2.1 Prepare guidelines to ensure that the heritage values of Forbes are preserved and not harmed by development and incorporate these into a LEP and / or DCP	Council	Short term
3 Identify and protect the Aboriginal Heritage significance of Forbes Shire	3.1 Carry out an assessment of the Aboriginal Heritage of the Shire, in consultation with local Aboriginal groups, with the aim to prepare planning guidelines to ensure that it is protected 3.2 Guide settlement expansion and development away from areas of Aboriginal cultural heritage significance,	Council, DEC and Local Aboriginal Groups	
4 Promote and support the rural culture of the Shire.	4.1 Publish information on heritage items and include in community and tourist information 4.2 Support cultural and tourist activities which promote local heritage eg local shows, agricultural days, heritage tourist trails etc	Council	Short term and ongoing
5 Provide incentives to protect the heritage values	5.1 Provide a Heritage advisory service and Local Heritage Fund for Items of Heritage significance.	Council	

5.6.5. Natural and other Hazards

Objective: Recognise the impact of natural hazards on future land use and settlement.

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
1. Ensure bush fire risk is considered in all future settlement areas.	1.1 Ensure that all future development of land adheres to the principles of Planning for Bushfires 2006. 1.2 Ensure that settlement expansion and other developments are not in areas of bushfire hazard. 1.3 Provide information on the Bushfire regulations covering Forbes Shire. 1.4 Provide information on the Emergency Services Disaster Management and Response Plan.	Council and Government Agencies	Short term
2. Ensure that land degradation is minimised.	2.1 Do not allow development to occur on land where vegetation clearing will result in unacceptable levels of erosion. 2.2 Ensure developers and residents are aware of best land management practices for maintenance of ground cover and thus minimising erosion.	Council and Government Agencies	
3. Minimise the potential of salinity to cause a hazard	3.1 Prepare a Salinity Strategy for the Shire in conjunction with the Departments of Planning, Water and Energy and Environment and Climate Change. 3.2 Require all new development to implement salt tolerant building techniques 3.3 Liaise with Lachlan Catchment Management Authority to promote the community on the impacts of salinity.	Council and Government Agencies	
4. Identify the flooding of land as a constraint to future development.	4.1 Implement the provisions of the Forbes Shire Floodplain Risk Management Plan 4.2 Ensure that localised flooding is taken into account	Council and Government Agencies	

Implementation Strategy	*Policy Action*	*Responsibility*	*Time-frame*
	when assessing DAs for dwellings that have access over watercourses. 4.3 Identify flood prone lands within the Shire and particularly those areas where flooding poses a significant risk to new development or productive land management. 4.4 Identify areas where flooding could be exacerbated by inappropriate development in the locality or upstream. 4.5 Provide information on the Emergency Services Disaster Management and Response Plan.		
5. Avoid inappropriate development on areas of land contamination	5.1 Manage the development of contaminated land in accordance with the principles of SEPP 55 Managing Land Contamination.		

Chapter 6: Conclusion

Forbes Shire has traditionally been an agricultural area based on the cropping and grazing forms of agriculture.

There is a need to plan for the future of the Shire to ensure that it is conserved for future generations and so that the environmental, social and economic issues can all be addressed to achieve a balanced and sustainable future.

This document builds on and provides some more analysis of the matters discussed in the Forbes Comprehensive Land Use Strategy Issues Paper.

The document also includes a series of strategies which are aimed at ensuring that the Shire has a sustainable future – both for the town of Forbes as well as the rural land.

Bibliography

Australian Government Department of Industry Tourism and Resources – March, 2004

Bossel, H. (1999)*, Indicators for Sustainable Development: Theory, Methods and Applications*, International Institute for Sustainable Development, Canada.

Briggs, G, & Whitehead, R, March 2000, *Agricultural Buffers and Land Use Planning*, NSW Agriculture, Tocal, Paterson.

Bureau of Transport and Regional Economics (2003) *Industry Structure Database*, Department of Transport and Regional Services, Canberra.

Burnley, I and Murphy P (2004) *Sea Change – from Metropolitan to Arcadian Australia*, University of NSW Press, Kensington.

Daniels, T and Daniels, K (2003) *The Environmental Planning Handbook – for sustainable Communities and Regions*, American Planning Association, Chicago.

Department of Infrastructure, Planning and Natural Resources (2004a) *NSW Statistical Local Area Population Projections 2001 – 2031, 2004 Release*, DOP, Sydney

Department of Infrastructure, Planning and Natural Resources (2004b) *NSW State and Regional Population Projections 2001 – 2051, 2004 Release*, DOP, Sydney

Department of Infrastructure, Planning and Natural Resources (2005) *Floodplain Development Manual – The Management of Flood Liable Land*, DOP, Sydney

Faullding, M, Kelly, AHH, Bateson, P, Donovan, I, (2001) *Biodiversity Planning Guide for NSW Local Government, Edition 1*, NSW National Parks and Wildlife Service, Hurstville

Forbes Shire Council (2005) *Forbes Comprehensive Land Use Strategy Issues Paper*, Forbes Shire Council, Forbes

McHarg, I.L. (1992) *Design With Nature*, John Wiley and Sons, New York.
Sinclair, I.W. (1999a), *What is Sustainable Agriculture*, in New Planner, Number 38. Royal Australian Planning Institute (NSW), Sydney

NSW Department of Infrastructure, Planning and Natural Resources (2003) *Introduction to Urban Salinity*, NSW Government, Sydney.

NSW Department of Infrastructure, Planning and Natural Resources (2005) *Land Use Planning and Urban Salinity*, NSW Government, Sydney.

Organisation on Economic Cooperation and Development (1999) *Coherence in Environmental Assessment*, OECD, Paris

Piscopo(2001) *Groundwater Vulnerability Map Explanatory Notes – Lachlan Catchment*, Department of Land and Water Conservation, Parramatta.

Salt, B (2006) *Population Growth Database 2006*, KPMG, Melbourne

Sinclair, I.W and Bunker R. (2007) *Planning for Rural Landscapes* in Thompson, S (ed), Planning Australia , Cambridge University Press, Melbourne.

Sinclair, I.W. (1999b), *What Rural Land*, in New Planner, Number 39. Royal Australian Planning Institute (NSW), Sydney

Sinclair, I. W. (2000), *From Strategy to Plan – Planning for Rural Land in Australia*, Paper presented to the American Planners Association Conference, New York City April 2000.

Sinclair, I. W. (2001a) *Incentives as a Planning Tool*, in New Planner, Number 46, Royal Australian Planning Institute (NSW), Sydney

Sinclair, I. W. (2001b) *Rural Residential Development*, in New Planner, Number 47, Royal Australian Planning Institute (NSW), Sydney

Sinclair, I. W. (2001c) *Rural Residential Development Impact*, in New Planner, Number 48, Royal Australian Planning Institute (NSW), Sydney

Sinclair, I. W. (2001d) *Lifestyle Living*, in New Planner, Number 49, Royal Australian Planning Institute (NSW), Sydney

Sinclair, I.W. (2002a) *Bushfire Risk* in New Planner, Number 50, Royal Australian Planning Institute (NSW), Sydney

Sinclair, I. W., (2002b), *Growth Management and Rural Land*, Paper presented to UNSW Planning Law and Practice Short Course, Kensington.

Sinclair, I.W., (2002c) *Preserving Rural Land in Australia*, Paper presented to Joint Royal Australian Planning Institute / New Zealand Planning Institute Conference, Wellington.

Sinclair, I.W. (2002d) *Smart Growth or Smart Living* in New Planner, Number 51, Royal Australian Planning Institute (NSW), Sydney

Sustainable Seattle (2000) Sustainable Seattle Website, www.scn.org/sustainable

Therivel R., Wilson E., Thompson S., Heaney D &Pritchard D., (1992) *Strategic Environmental Assessment*, Earthscan Publications Ltd., London,

Williams, J., Hook, R.A. & Gascoine, H.L. (1998) *Farming Action Catchment Reaction – the effect of dryland farming on the natural environment*, CSIRO Publishing, Melbourne.

World Wildlife Fund, United Nations Environment Program and the Global Footprint Network (2004) *Living Planet Report 2004*, World Wildlife Fund, Switzerland.

Appendix 1: Brief

STUDY BRIEF

FOR THE COMPREHENSIVE LANDUSE REVIEW ND DEVELOPMENT STRATEGIES FOR THE FORBES SHIRE LOCAL GOVERNMENT AREA

Prepared by the Environmental Services and Planning Division

Forbes Shire Council
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FORBES NSW 2871

FORBES COMPREHENSIVE LAND USE STRATEGY

1.0 Forbes Local Government Area

The Forbes Shire is located on the Central Western Slopes and Plains of New South Wales within the heart of the Lachlan Valley of New South Wales. Forbes is the major urban centre, villages exist only as localities with limited or not supporting services.

The Shire has an area of approximately 4800 square kilometers, with the Forbes urban area having approximately 4089 private dwellings (including flats, town houses etc.) which house 94% of the Shire population of 10138 persons (ABS 1996). The Shire predominantly relies upon its agricultural production and support services there to. It is located upon the Newell Highway which provides a focus for commercial, industrial and residential development.

Development within the Shire is typically of a low-density nature with residential allotments averaging an area of 800/900 square metres. Forbes town provides a diversity of educational, recreational and cultural support to the community enabling a good quality of life for all inhabitants. The rural area of Forbes contains a variety of dry land and irrigated forming activities. The Lachlan river flows through the Shire providing a rich agricultural resource that supports a strong commercial and industrial base.

The town and surrounding district is rich in history and has many unique features to offer the visitor, including the tranquility of our lake and parklands in the centre of town, rural landscapes and heritage buildings.

2.0 Introduction

Forbes Shire Council is committed to a comprehensive review of its existing land uses with a desire to update its strategic development strategies to facilitate long term land use planning in the Forbes Local Government Area.

The purpose of the strategy is to provide Council with the strategic direction in terms of existing and future development within the Shire, in a manner consistent with the broader environmental planning framework, State Government Direction and having regard to current best planning practice for sustainable development, natural resource management, ESD and current and future land use management trends

3.0 Background

The Forbes Urban Area performs as a major service centre serving the Lachlan Valley. The town centre located upon The Newell Highway, surrounded by a wide variety of agricultural practices. As such Forbes has traditionally performed a service function to the surrounding agricultural industries. Increasing development pressures have necessitated a review of current development strategies which have become outdated. Land use planning within the Forbes shire is currently based upon the Forbes Local Environmental Plan 1986. Forbes Shire Council recongnises that the fundamental strategic directions and land use development strategies need to be reviewed and updated in light of new development pressures, evolving State Government Policy changing expectations and demands of the community and emerging environmental concerns.

4.0 Land Use Review and Forbes Strategic Plan

The comprehensive Land Use Planning Strategy will be required to consider existing development in light of current urban and rural land use planning issues.

These matters primarily consist of, but are not limited to, the following:

- Public participation and community ownership
- Involvement of principal Authorities/Agencies including state planning and policy initiatives and their implementation at a local level
- Strategic planning framework
- Residential development/Rural residential development and its various forms
- Existing Commercial development and future trends
- Industrial development
- Home business
- Agricultural
- Natural and built heritage
- Recreation and tourism
- Village development
- Special use corridors including floodway and TSR's
- Transport and Servicing
- Rural development and future trends
- Overland drainage, flooding and salinity
- ESD principles & natural resource management matters
- Environmental/conservation strategies

Support of the Department of Infrastructure Planning and Natural Resources for any resultant strategy should be considered as an integral part of its formulation. Analysis underpinning resultant planning strategies should be sufficient to perform the Local Environmental Study requirements for the preparation of revised prevailing planning instruments.

5.0 Outcomes

The desired strategic outcome is a planning strategy and strategic plan to be adopted by the Community and Council, which will form the basis for strategic decision making for the Forbes Shire. Any strategic outcome shall assess the opportunities and constraints for sustainable development having regard to the economic and natural resource management issues.

A 10, 20 and 50 year plan should be adopted to prioritise decision making and indicate the most appropriate areas for long term expansion and protection.

To achieve the desired strategic outcomes the following tasks are considered (as a minimum) necessary to underpin the resultant strategy:-

- Undertake extensive consultations with relevant stakeholders including the community, Authorities and Agencies identifiable to Forbes to ascertain existing and future values, ideals, needs, demands and expectations. Consultation with stakeholders should be ongoing throughout the entire land use strategy.

- Consideration of community values and local issues in developing strategies for key land uses.

- Identify and consider recent policy development and State Government Initiatives and their impact upon the future development considerations throughout Forbes.

- Consideration of primary environmental policy objectives including Ecologically sustainable development and natural resource management.

- Undertake land capability/suitability assessments for the range of urban and rural land uses with particular consideration to flooding, salinity and the urban storm water network.

- Assess the physical characteristics of the Shire area and produce an environmental constraints and opportunity/SWOT analysis.

- Identify opportunity and constraints linkages with the neighbouring communities such as Cowra and Parkes including the compatibility of adjoining development.

- Identify and assess the current and future trends for significant land use activities such as agricultural, residential, rural residential, industrial, commercial and recreational.

- Review the appropriateness of current land use provisions and zones for future urban and rural needs.

- Assess and consider servicing requirements including sewerage, water, access, electricity, telecommunications and gas for the various types of urban and rural development.

- Identify suitable land resources to meet future demands for all land use categories relative to the perceived time frame for development.

- Consider the minimum lot sizes for agricultural land, rural dwellings, rural residential dwellings and the connections between dwelling entitlements and rural/agricultural use of land, including the removal of traditional concessional allotment provisions.

- Identify the potential for tourism within the Forbes town center, surrounding villages and rural areas.

- Identify land uses that Council should be actively encouraging and that could be suitably located in the Forbes Local Government Area.

- Consider the strategic direction for land use development throughout the Forbes Shire

- Develop a Structure Plan to identify areas suitable for the future growth of the Local Government Area over the next 10, 20 and 50 years.

- Liaise with Council's Heritage Advisor to ensure the conservation of natural and built heritage to provide for the inclusion of the Community Based Heritage Study currently being undertaken.

- Liaise closely with Council and DOP to maintain focus of study.

- Achieve support of Council, the community, DOP and other relevant Authorities and Agencies for the resultant strategy.

6.0 The Process

Council will give preference to innovative approaches that will promote efficient achievement of the desired outcomes of the strategy. It is expected that close consultation will be required with Council staff and that the consultant will develop a thorough understanding of the local issues. To this end it is envisaged that the majority of the study will be conducted in Forbes.

It is expected that the consultant will submit a detailed study approach to the strategy identifying individual project tasks. Approaches to the study can be further refined in consultation with Council Staff upon appointment of the suitable consultant and should allow flexibility for variation as studies unfold. In preparing this brief Council considers the following tasks as integral to the process.

6.1 Consultation

Consultation with the Community and relevant Government Agencies is seen as a pivotal to the formulation of the development of a land use strategy for Forbes. In this regard it is requested that the consultant prepare a Public Consultation Strategy, to be separately approved by Council and DOP.

The consultant will be required to coordinate, facilitate and participate in public meetings and planning workshops. Internal workshops will be necessary to brief staff and Councillors and the various aspects of the study. Public meetings will be necessary to provide for the exchange of information and ideas to promote community The following consultations are considered to be crucial:

- Land holders, general community and environmental groups
- Local Developers and real estate agents
- Major commercial and industrial leaders
- Local designers and developers
- State Government Agencies and Public Utility Authorities

6.2 Highest and Best Use of Land

The physical characteristics of Forbes may result in a number of land uses being suitable for a particular area or areas that are not suitable for development. In this regard Council would prefer the formulation of a clear set of criteria, perhaps in a matrix format, to provide a transparent means of determining the highest and best use of a particular site or area.

6.3 Funding

State Government funding is available under the Plan-first initiative administered by the Department of Infrastructure, Planning and Natural Resources for the Preparation of Land use Strategies. It is expected that the consultant will make the appropriate applications for funding to offset the actual costs of this project to the community.

7.0 Indicative Timetable

It is envisaged that the strategy will commence on ___ and be completed by __.

8.0 Redefinition of Study Parameters

This study brief has been prepared as a review of the Consultancy Brief prepared For the Preparation of a Land use Strategy for Forbes Shire Council Local Government Area, Terra Consulting, August 2002.

Due to deficiencies identified in the current strategy review process the study has been revisited. While the primary elements of the study are now to be conducted in house a review and update of the study brief was considered necessary to redefine the terms of the comprehensive land use review and resultant planning strategies.

Appendix 2: Land Use Survey Methodology

A major component of this study has been a land use survey of all of the land within the rural parts of the Shire. The purpose of the land use survey is to gain an indication of the land use trends.

The preparation of a land use survey is one of the most important components when zoning rural land. Each parcel of land within the Shire has been inspected and given a land use designation. This has been entered into Council's Property Information database and mapped using a GIS.

The first step was to identify a set of spatial boundaries which would form the basic level of data representation. The geographical localities were used. This has two benefits, the first being that the area is generally mapped and can be identified easily and secondly it is easier for the public to understand the data once it has been collected and published.

The next step is to identify the categorisation of the land uses to be surveyed. The land use has been categorised into primary and secondary land use categories. The primary land use categories are as follows:

Rural Residential
Intensive Plants
Intensive Animals
Extensive Agriculture
Vacant
Commercial
Extractive industries
Public Use
Village
Native Vegetation

The detailed categorisation is presented in the following table:

LAND USE SURVEY CODES

PRIMARY		**SECONDARY**	
Description	**Code**	**Description**	**Code**
Rural Residential	RR	Dwelling	DW
Vacant	VA	Cleared Land	CL
Native Vegetation	NV	Native Vegetation	NV
		National Park	NP
Intensive Plants	IP	Irrigated	IR
		Orchard	OR
Intensive Animals	IA	Cattle Feedlot	CF
		Horse Stud	HS
		Piggery	PI
		Poultry	PO

PRIMARY		SECONDARY	
Village	VI	Urban	UR
Extractive Industry	EI	Hard Rock	HR
		Limestone	LI
Extensive Agriculture	EA	Grazing	GR
Public Use	PU	Bushfire Brigade	BF
		Church	CH
		Council	CL
		Crown Land	CR
		Electricity	EL
		Hall	HL
		School	SL
		Telstra	TL
		Travelling Stock Route	TS

There are 3 components to the carrying out of the land use survey as follows:

Preliminary identification of land use.
Study area inspection.
Data entry and mapping.

Preliminary identification of land use occurred in the office prior to the field inspection. Aerial photography was used to identify the land use. The major things to be picked out are extensive Agriculture, intensive plant, dairies, feedlots, dwellings on small lots, vacant land, lots which are totally covered with native vegetation, and extractive industries. Only one major land use was identified. An assumption can be made that a dwelling house indicated rural residential uses except where they are in conjunction with an alternative predominant use or vacant. An assumption was also made that lots less than 20 ha which did not have an intensive agricultural or commercial, industry, public or government use were rural residential.

This information was entered into the database using the coding that has been identified for the primary and secondary land uses.

The study area inspection was carried out by windscreen survey of all of the roads within the rural parts of the Shire. This was done to check the primary land use categories and also to enter secondary ones that could not be identified from the aerial photos. As each road is driven on the land use is clarified against the preliminary identification. Signage, which gives an indication that the property may be use for a secondary use such as a home business or a commercial use was also noted.

The data was entered into the Council property information database using the coding. However this was not always possible because of the lack of street numbering in the database and only those uses, which could be identified from the database,

were entered. This did not affect the integrity of the data as the primary uses are the ones used in the identification of the land use designations.

Appendix 3: Forbes Shire Issues Paper Table of Contents

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Appendix 4: Community Workshop Outcomes

Introduction

Forbes Shire Council are in the process of preparing a strategy for the future of the town and the rural areas of the Shire. One community workshop was held in Forbes on 7 March. This workshop was facilitated by Ian Sinclair, Principal Consultant with EDGE Land Planning.

The participants were asked to sit in groups to answer 2 questions. The first gives a vision and the second provides the actions to implement the vision:

- What sort of place do you want your area and the Shire to be in 10 to 20 years time?
  - ⇨ Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?
  - ⇨ Do you want to see more economic development? If so, what types?
  - ⇨ Are there any services or facilities that you need in your area?
  - ⇨ Are there any environmental attributes that should be conserved? What are they?
  - ⇨ What types of future land uses would you like? What don't you want?
  - ⇨ Are there any uses that are inappropriate? Which ones?

- What actions can be taken to make your preferred future happen?
  - ⇨ What actions can you as a community member do to achieve your vision for the future?
  - ⇨ What should the Council and State Government do to achieve your vision for the future?

All answers were written down on butcher's paper. The following is a transcription of those answers.

A number of photos were taken of the variety of scenes around the town and rural parts. Participants were asked to write their responses to these photos. The responses and photos are also included.

Workshop Outcomes

Vision

Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?

- Rural residential-yes. South Forbes - River Road, South Lead Road, College Road. Flood restrictions should be revised. Lot of existing small blocks that will become redundant if you can't build. Easy to extend services. Should consider use of water/lack of available water to sustain development.
- Urban-no "Kellyville" estate housing. Keep out of flood. Northwest of town. Issues-rezoning rural land to urban use.

Do you want to see more economic development? If so, what types?

- Yes. Decentralisation of major city businesses into the bush. Creation of our own decentralisation plan.
- Encourage growth.
- Tourism. Targeting schools, universities (agricultural theme).
- Agricultural development - ethanol / biofuel opportunities.
- Complimentary industry that supports existing business.

Are there any services and facilities that you need in your area?

- Public transport-direct transport, if sustainable an air service.
- Medicare office.
- Attention to law and order. Consider private security guards. Locally manned Police Station.

*Are there any environmental attributes that should be conserved? What are they?*Heritage buildings.

- Lake Forbes in a natural and pristine condition. Don't concrete the lot. Boom gates on stormwater.
- Incentive to keep median strips green.

What types of future land uses would you like to see?

- Mix of rural, rural residential, urban, industrial. Must be quick turnaround method to rezoning areas. Must be able to adapt to change.
- Utilise existing airport facilities.

*Are there any that are inappropriate? Which ones?*No toxic dumps.

- No Gaols - downgrades area.
- Not to be a retirement town.
- No more Department of Housing properties.

Action – Community

- Positive attitude.
- Form groups of common interest.
- Participate.
- Need debate.
- Be pro-active.

Action – Council and State Government

- Council should lobby on behalf of community members.
- Be active, be interested, be involved with the community.
- General Manager, Mayor and Councillors should attend all community meetings (from start to finish)
- Demonstrate a positive interest - more cohesion to achieve common goals.
- State Government to differentiate between metropolitan and rural areas. Treat each differently but on their own merits

Vision

- Develop industrial land.
- Give incentives to attract business to Forbes. Reduce rates. Delayed payments.
- Manufacturing to create employment.
- Building in Flood area according with an understanding of Council's rules.
- Zoning issues with regard to light industry in commercial centre. Expansion where - saleyards
- Promotion of Forbes with Parkes.
- Services required include additional accommodation to cater for sporting groups.
- Upgrading of pool to 8 lanes. Utilising existing open spaces.
- Lake and ski dam - continuation of walking path.

Action – Community

- As a community member we believe that we need to sell our town to the broader community and surrounding districts.
- Lobby local businesses / community groups / Council to help upgrade and further develop services / facilities.
- Contacting large interested parties to help the community in developing the initial needs.
- Get solid action happening in local activities.
- Be pro-active in Local Government issues.
- Researching grants / loans for local concerns.
- Get a lot more support from local community - without it there is no hope.
- Bring all of our ideas and visions for future to the Council.

Action – Council and State Government

- Will only help when lobbied by localised interested groups.
- Budget needs to be reviewed regarding health / security / transport, without the correct structures in place small towns have no chance.
- Locate Government based jobs out to the less populated areas. The cost of living is less and their area a lot of lower running costs overall with the introduction of Government jobs the local economy will grow and the follow-ons will follow.
- Local Council needs to have a salesman to sell our town to industry and the general sector. They need to be totally town focused and push to sell our town.
- The Forbes council needs to rethink their zonings in rural areas to help and promote small businesses such as tourist attracting coffee shops, cafes, galleries, places to visit and relax and enjoy in the bush.

Vision

Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?

- Yes. Rural residential close to town.
- Urban contained within a given area. Appropriate development in flood area.

Do you want to see more economic development? If so, what types?

- Yes to economic development.
- Business that use local resources.
- Manufacturing and engineering service which attract big jobs.
- Health / lifestyle.
- Tourism / heritage.
- Agribusiness.
- Industry - labour intensive agriculture such as orchards and market gardens and dairies.

Are there any services and facilities that you need in your area?

- Local police
- Health
- Sports grounds okay but not state-level standard.
- Hospital upgraded.
- Pool upgraded.

*Are there any environmental attributes that should be conserved? What are they?*Conserve Lake, river and wetlands including Gum Swamp.

What types of future land uses would you like to see?

- Want separate areas.
- Land set aside for industry only.
- Preserve agricultural land.

*Are there any that are inappropriate? Which ones?*Don't want gaol.

- Industrial uses in CBD.

Action – Community

- Shop and deal locally, but first support new businesses.
- Attend community meetings to inform Council of our wants.
- Speak to Councillors and staff privately to let them know our ideas.
- Respond to draft LEP.
- Involve ourselves with local organisations.
- Go out of our way to be helpful and friendly to tourists and everybody.

Action – Council and State Government

- Develop land able to accommodate next 20 years.
- Incentives to relocate.
- Council officers to never say no - don't stonewall.
- Encourage a helpful attitude. Find alternatives.
- Council support their committees.
- Evening Council meetings to encourage community participation and more people to nominate for the Council.
- Advertise more and earlier for meetings such as this.

Vision

Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?

- Yes to urban and rural residential development in the north and northwest .
- Rural residential close to town (20 to 25 kilometres) along the Lachlan River and South Lead Road and Red Bend / Wirrinya Road area developed for lifestyle.

Do you want to see more economic development? If so, what types?

- Population growth to entice business.
- Economic development.
- Population growth to entice retirees.
- Value add primary produce. The abattoir?
- Anything that creates employment. High import labour-intensive industry such as Pet Chef, Mountain Bulk, Auswest, Hoeys.
- Lucerne cubes.
- Charlie Carp.
- Tourism.
- Heritage marketing.
- Unique attractions - heritage walk established.
- Upgrade Forbes forestry employment.

Are there any services and facilities that you need in your area?

- Skate park
- Much improved road and rail to the Seaboard.
- Train - Melbourne Sydney Brisbane.
- Fast rail to the seaboard and Brisbane.
- Aged care facilities upgraded and expanded.
- Access to first-class hospital and medical services.
- Education. Re-establish TAFE. Maintain high standards at primary and secondary education.

*Are there any environmental attributes that should be conserved? What are they?*Cleanup River.

- Clean air.
- Natural habitats conserved.
- Control chemical wash and runoff to rivers and streams.

What types of future land uses would you like to see?

- No cropping necessitating high volumes of chemicals.
- More fruit and vegetable production.
- Expansion of existing agriculture.
- Water security.

*Are there any that are inappropriate? Which ones?*No gaols.

- No nuclear waste dump.

Action – Community

- Work as a volunteer for heritage / tourism, Landcare, sport.

- Canvas local Council and support them in positive actions.

Action – Council and State Government

- State Government should not have despotic powers over our Councils.
- Autonomous legislation for town without the interference from State Government.
- Streamline development applications.
- Federal Government for construction of all highways and railways.
- State Government should allocate more money to country west of great dividing range.
- State Government does not practise decentralisation. Examples are closing of abattoir, Murrumbidgee agriculture which is a pathetic attitude young aspiring rural workers.
- State Government should allocate more money to country west of great dividing range. Example students pay necessary for all education excessive to major city nothing in the country and no financial help.

Vision

Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?

- Yes.
- Rural residential. West and northwest 5, 10, 20, 50 acres.
- On the outskirts not 15 kilometres out.
- Urban development. Ideal to have inner zone for retail and business no residential. North landlocked so-saleyards and old abattoirs. Future bulky goods retail business.
- Rural development-strongly oppose proposal on rural. Keep current LEP minimum 100 acres / 40 hectares.

Do you want to see more economic development? If so, what types?

- Yes definitely. Get it right first. All excluding Gaols, nuclear waste etc.

Are there any services and facilities that you need in your area?

- Better specialist / Health.
- Better Police
- Police station always open.
- Education - too many travelling for TAFE.
- Not enough relevant TAFE courses / Teachers.
- Traffic lights at Camp Street and Sheriff Street.

*Are there any environmental attributes that should be conserved? What are they?*Conserve lake and heritage buildings.

What types of future land uses would you like to see?

- Prefer smaller unit developments - maximum ideal for the block.

- Maintain broadacre farms

Are there any that are inappropriate? Which ones?

Vision

Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?

- yes.
- Urban: Flood free areas north northeast of town.
- Rural residential: northeast of town off Newell Highway. Calarie and Farnell area. 10 hectare blocks on poor soil.

Do you want to see more economic development? If so, what types?

- Yes.
- Manufacturing (maybe on old saleyards site), market gardens.
- Abattoirs,
- Stable businesses not affected by the weather.
- Businesses to encourage youth employment with apprenticeships.
- Aged care.
- Tourism to create dollars and employment.

Are there any services and facilities that you need in your area?

- Large conference centre.
- Better public transport system including Forbes and Parkes as well as Brisbane and Canberra.
- Better TAFE programmes for apprenticeships.
- Better tourism promotion - especially historic and heritage.
- Footpath improvements for both young and old people. Some areas have no footpaths such as Calarie Rd, Farnell and Flint streets.
- Need covered outdoor areas (sails shade cloth)
- Caravan park and needed.

*Are there any environmental attributes that should be conserved? What are they?*The river, the lake

- preserve stock routes.
- Preserve forests.
- Hospital incinerator alternative (smoke not good).

What types of future land uses would you like to see?

- Market gardens and value adding.
- Roadside stalls selling locally produced products.
- Parkes rail hub.
- Table grapes.
- What is happening to vintage village? Perfect place for market gardens and retail outlets. Winery and tasting room and restaurant. Hotel motel and fishing are all worthy of this site.

*Are there any that are inappropriate? Which ones?*Over the use of ground water irrigation.

- No toxic waste or chemical dumps.
- Overuse of Lions park by caravans as well as need toilets locked up at night

Action – Community

- Support existing businesses in Forbes and Parkes - don't shop out of town unless desperate for best prices.
- Actively promote the town when you out of town.
- Sell Forbes agriculture and horticulture by specific branding.

Action – Council and State Government

- Get a freeway to Sydney - don't mind paying a reasonable toll. Upgraded goat tracks are unsatisfactory.
- Get the railways moving more freight. Get the trucks off the road. Reopen closed to rail lines.
- Get behind the Parkes transport hub and freight airport.
- Council should encourage conference facilities for 300 to 400 persons.
- Council should encourage filmmaking and tourism.
- Encourage photography groups for more tourism.
- More town activities to bring people into the town.
- Murals on buildings depicting local life.
- Tourism New South Wales website need Forbes site referred to.

Vision

Urban/residential areas

- Medical services retirement and crematorium (Within walking distance of public transport.)
- Heated pool and good amenities
- 24 hour police Station.
- Excellent education for all students including tertiary.
- Twin town development between Forbes and Parkes such as hospital.
- Look after own backyard.
- Apprenticeships / trade / tertiary education.
- Cultural centre amphitheatre with modern amenities-theatre exhibition Art Gallery.
- Meeting place for creative people equivalent to export amenities.
- Museum and interpretation of diverse heritage and tourist centre including local produce.

Economic development.

- Small industry to employ 5 to 15 employees including manufacturing and non-rural but rural compatible.
- Make solar cheaper to install and manufacture solar cells.
- Boats on the lake.
- Tourism – promote & exploit Newell Highway.
- No lawns but have native plants to conserve water.
- Conserve heritage.

- Walkability and urban design and planning i.e. everything within walking distance.
- Rain tanks and recycle grey water.
- Hold a big festival Wiradjuri culture and heritage for cultural tourism.
- Tours of homesteads and woolsheds.
- Software industries and computer design.
- Environmental and service industries, eco design energy services.
- Cultural trade links with China and India superpowers to buy clean green produce and tourism.
- Busking in the streets.
- Cultural tourism.
- Insist on six-star building regulations which are eco-friendly.
- Prison for Forbes some want it some don't want it.
- Provide amenities for tree changes.
- Zoning Flood zone so buildings are allowed on stilts.

Rural

- Clean green with no GMOs.
- No toxic waste or nuclear.
- Encourage organic farming.
- Solar energy-beyond fossil fuel.
- No residential on good farming land. Conserve fertile soils for food example along river.
- Sheep yards built.
- Rail transport - keep lines open.
- Develop Cootamundra line and Melbourne and Brisbane.
- New rural industries and crops for dry climate.
- No cotton farming.
- When the dams under 40% water allocated farmers and not towns.
- Ecotourism.
- Re-establish wetlands and native grasses and woodlands on unviable farms for environmental services.
- Environmental services payment to farmers to conserve biodiversity.
- Native vegetation revegetation with native plants.
- No genetically modified crops.
- Biofuel.
- Restore the riparian zones of river.
- Commitment to ESD and triple bottom line accountability.

Action

- Rejoin Arts West and other community supported services
- use Internet-calendar on web site updating what's happening
- Communication-newspaper, community radio, ABC and commercial radio, commercial TV, Internet, newsletter, personal telephone calls.
- Tourist officer / cultural development officer to phone every group every month to find out what's happening and maintain communication and consultation.
- Be open to new ideas & think creatively, laterally and regionally.
- Use the Information Centres for advertising your events.
- Communicate with all parties example Council, ratepayers, State government
- work together

- Lobby correctly with all parties.
- Be prepared to physically work
- Be assertive but not bossy.
- Council should work on the insurance issues because this holds things back

Vision

Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?

- Yes also in outlying communities especially rural residential in 2 hectare blocks.

Do you want to see more economic development? If so, what types?

- More economic development in the tourism area, utilising traffic on the main highway.
- More Value added industry, capitalising on our existing facilities, i.e. saleyards and meat processing facility.
- Dragon boat races etc.
- Lights on the fountains.

Are there any services and facilities that you need in your area?

- Health precinct centre containing all the health services (dentist, doctors, centre care, HACC centre, all medical services).
- Aged care facilities

*Are there any environmental attributes that should be conserved? What are they?*Get rid of lipia (at least control it)

- Clean up Gum Swamp - restored to original State
- keep Lake filled with bore water. More fountains to kill algae up other end of the Lake

What types of future land uses would you like to see?

- Sustainable farming
- more intensive farming practices
- horticulture (market gardening)
- nurseries
- viticulture
- yabby farming
- no nuclear waste dump
- no chemical waste dump

*Are there any that are inappropriate? Which ones?*Cotton farming

- the amount of dog poo around the Lake

Action – Community

- Shop locally

- be active in community affairs
- sell Forbes by branding produce - the best promotion.

Action – Council and State Government

- the freeway to Sydney
- support Parkes freight centre
- Support Parkes airport
- Council make sure their is land and facilities available for new businesss and residents.
- Council to employ skilled cultural development person - developed good communication processes and be informed.

Vision

Do you want to see Rural Residential and Urban Development in and around Forbes? If so, where should it go?

- De-silting of the Lake. Use floodgates at each weir. Railway viaduct and Salisbury crossing. Johnny Woods crossing.
- Dead and fallen timber in the floodplain - discuss it (flood damage) this comes down in the floods
- Forbes should grow to north west, leave rural farms to the south
- Rural residential and urban development to north west. Keep each separate so no conflicting interests
- Development of town and district. Decentralise Sydney in a fair dinkum way. Attract people here - jobs and culture. Something besides Ben Hall. Develop facilities. Forbes was founded on gold and it could be the salvation so mine it.

Do you want to see more economic development? If so, what types?

- Put all balconies back on the pubs so the town can be used for a movie set.
- The more trees around town.
- More native trees around the Lake.
- Yes to more economic development. The buildings to be used in the movie productions include ANZ bank, Post Office Hotel, Courthouse Hotel, PP Board and Police Station.

Are there any services and facilities that you need in your area?

- Bus to Orange and Dubbo weekly community bus. Gives medical access without the need for your own car for aged people.
- Tenpin bowling for young teens.
- Canowindra has monthly bus to Orange. People are attracted to Forbes from Parkes, for example to go to the Mezzanine coffee shop.
- Medical centre at the hospital to be built in preference to $1 million spent on second hand pool.
- Leave pool as it is.
- More police less crime, no pokies. Declare Forbes alcohol free zone for all of it.
- Better library. More computers.
- More entertainment example dancing

*Are there any environmental attributes that should be conserved? What are they?*Cottons weir needs regular cleaning and could be used for tourism.

- More fish in River. Keep in the Lake.
- Put another 2 fountains to get the algae out of each section of the Lake.

What types of future land uses would you like to see?

- Nothing dangerous example nuclear waste.
- No gaol.
- Keep current tourist office at the railway station no new one.

Are there any that are inappropriate? Which ones?

Action

- City country links-people had cousins from the city once. Method of personal contacts not just the scenery and things to look.
- Historical, friendly, inviting.
- Parking area for grey nomads at the lions park
- Study experience in Western Australia town approximately our population is nice area high suicide and lack of jobs. They turned it around
- Young, Cootamundra, Temora joint cooperative stock selling centre in future
- Joining with twin towns - Forbes and Parkes.
- Transport to Canberra.
- Forbes should be part of book titled Where to retire in Australia published by Weeks
- Keep arable farmland
- Driver reviver that is a good friendly personal contacts 4 times a year on the first Saturday of the school holidays. People look forward to it and can meet people from Melbourne and other interstate people.

Photo Boards

- Provide parking
- General nursing standards very ordinary.
- Needs modernising.
- Heritage site.
- New hospital, keep the heritage.
- I'd say yes to that.
- Maternity ward pretty ordinary.
- More development.
- New maternity ward. Very ordinary. Expand.
- New hospital.
- Make a great health precinct.
- Let's expand whole precinct and close off roads if necessary.
- Streamline facilities.
- Maternity design is dreadful but hospital is fabulous.
- The new development of this building is excellent.
- Encourage more specialists to come from Sydney Canberra etc. Ageing population here now plus tree changes will need it.
- Go for it.

- Great.
- Great
- Great-variety of sizes better.
- Too expensive.
- Too expensive. Too far from main thoroughfare.
- A good idea.
- Too small blocks.
- Lots of new buildings and businesses needed.
- Needs to be affordable.
- Get ready for the increase in city retirees.
- To dear.
- Okay.
- We need these in certain areas-plan for 20 years ahead

- Should not be so far out. Destroyed good farmland.
- Nice views of the tip! Wrong area.
- More areas as such close to town.
- Too far out of town.
- Well placed-a great development.
- Good luck to it.
- Good idea.
- Great initiative.
- Public transport?
- Too far and dry.
- Too dry.
- Great. Right place not on river.
- Long way out, bit expensive.
- Good area-more needed. Make sure you have a decent public transport system.
- Not sure how arable this farmland is but let's not lose our arable farmland to lifestyle people.
- Too far removed from town. Not a good environmental area. Trees should have been established before release.
- A well surveyed estate.
- Isolated from town.

- Catches the eye. Would like to know more

- There is a big demand for more intensive agriculture. The sheep are in good condition.
- More of these needed for quality meats.
- An industry of the future.
- More trees.
- Need shade.
- Much more of this.
- Needs to be well out of town.
- Feedlot of drought sheep-out of town. Good tourist attraction.
- Sheep need bigger area.
- Bored sheep-manure stinks.
- Drought, lot feeding.

- Better here than at the 4 mile.
- Needs controlling.
- Fuel is not getting cheaper. Give them a break.
- Good, they spend in town.
- Don't lock them out - spending in town.
- Getting out of control.
- Needs control.
- Good on them.
- Establish facilities five kilometres out.
- Our caravan parks should be supported
- Let them stay 1 night only.
- Don't agree-should stay in caravan park or out on road.
- Good luck to them expensive enough to travel.
- Needs controls.
- As a retiree cost of accommodation is not cheap (inflated by GST). The poorer tent people don't use our nomad area. An opportunity for nomad's to meet locals as they walk around the

as viable town businesses.

lake. Travellers always interested in meeting locals.

- To be encouraged.
- Looks good.
- Oh dear (Ambulance station).
- A nice streetscape-some buildings need a facelift.
- Attractive streetscape.
- Gardens and roundabouts are all very pretty in Forbes.
- Good streetscape.
- Good look.
- Great gardens.
- Well done.
- A pretty town. How about some murals?
- Keep gardens better watered-roundabouts are big improvement on before.
- Great streetscape.
- Don't spoil this.
- Visually pleasing impression on roundabouts.
- Good Street Gardens.
- Dilapidated enough now for paintball area.
- Get a good signage policy.

- Neat, tidy. Certainly attracts attention.
- Well done.
- This type of service should be located further from CBD.
- Great promotion.
- Stand out.
- Bright.
- Positive promotion for business.
- Right in centre of town-would be more attractive somewhere else.
- I agree.
- Motor tourism.

- Very helpful people work there.
- Well up kept.
- Attract attention. Draws the eye to it.
- Move to edge of town.
- Ugly colour.
- Each to his own.

- A facility that should be utilised more.
- More carp fishing contests.
- Keep filled up with bore water.
- Save the Willows.
- Replace the Willows.
- The willows won't affect lake but they look good-save them.
- Deepen the lake to control weeds.
- More fountains.
- Great, keep it up.
- Less algae.
- Great tracks.
- Forbes greatest asset-develop it more.
- Great attraction.
- Boom gates needed on stormwater.
- Fountains achieve nothing-only cost ratepayers for installation and running.
- Photography. Towns of the area. Excellent tourism.
- I love our lake. The boat races on Australia Day were great. Kids could have canoeing on the lake any time. Waterspout is wonderful.
- No dog poo, less algae, more fountains.
- Make this an attraction.
- Best asset Forbes has. Utilise more-and promote it.
- The way it should look all the time.
- Forbes' greatest asset.
- The lake and walking and precincts are fantastic asset to Forbes, loved and increasingly utilised by townsfolk. I feel a great film/video to promote Forbes could be made (10 minutes or so), featuring heritage townships and lake. The vistas and changing light seen when walking around the lake at different times of the day, different weather and levels allow for good photography. (Here's hoping)

- Well done
- Congratulations. There should be an award for new businesses that get it right.
- Excellent vision and enterprise.
- Heritage tourism.
- A wonderful attraction.
- Another heritage building.
- Excellent restoration work.
- Good attraction for the town.
- Heritage buildings need to be preserved.
- Heritage in action.
- A great old building with lots of potential.
- Well done.
- Keep these heritage buildings going.
- Great use of heritage building.
- Excellent renovation in heritage style.
- Need more.
- Wonderful work. Great
- Asset to our tourism and heritage

- Need more similar buildings in CBD.
- No place for tourist centre.
- Great.
- Needs some landscaping and trees.
- Not a good spot for tourists to stop.
- Great building.
- Yuk.
- Awful.
- Good design for position-functional.
- Well done-attracts attention, looks good.
- Great place for a good restaurant.
- Not tourist centre.
- Tourist centre.
- A nice modern contrast to our wonderful heritage buildings.
- More facilities like this. Need to attract more jobs.
- Cheap building.
- Well done.
- Best place for professional tourist centre.
- Will develop into future.
- Parking and turning and Highway difficult.

- Okay but not tourist centre.
- Agreed.
- Attention grabbing.

- No need for 1000 acres of this.
- Forbes' economic future.
- 300 acres is enough for building entitlement.
- Good crops-minimum water usage please.
- Excellent.
- Efficient water use.
- How much water?
- Very productive.
- Need more of-don't block by short-sighted DIPNR sending water out to ducks.
- Ideal.
- Peaceful.
- Don't cut our farmland up just for the yuppies.
- Water use.
- Keep water coming we have the land.
- Need more.
- Warms the heart after the drought.
- Good farming land-keep.
- Idyllic production.

- Not for urban development.
- Sustainable farming.
- Keep for farming.
- Good farming country.
- Cropping.
- Well developed country.
- Good crops.
- Great Forbes rural country.

- Attract bushfires.
- Great for subdivision.
- No subdivision less than 20 kilometres from town.
- Balanced rural development.
- Keep as is.
- Keep the open land.
- More trees

- A great job to all concerned.
- Excellent.
- Bring on sheep yards. Excellent improvement.
- Futuristic. Congratulations (a townie raised in Sydney). More town planning vision like this required.
- Full marks to the Council. Just get sheep yards there within two years.
- Good facility. Too close to Parkes.
- Should have been closer to Forbes.
- Great.
- A wise investment.
- Long way out.
- Too far out of Forbes.
- High expectations. Hope it lives up to them. Certainly has given Forbes a lot of great publicity.
- Too far out of town for people to shop in Forbes.
- A visionary project, trust it succeeds.
- Well-designed but a long way out.
- Excellent. Need sheep now.
- Where are the sheep yards?
- Turn off the lights. Think it can be seen from space now.
- People coming from north drop into Parkes to shop.
- Get sheep yards going.

- Fantastic-lets have 20 more.
- More of this type of light industry-more employment.
- Landscaping needed.
- Employment.
- Local employment.
- Good employment-needed.
- Need more industries like this.
- Working for Forbes.
- Good industrial development. Labour intensive-uses our natural products.
- Produces jobs.
- Landscaping.
- Ditto.

- More trees.
- Promote more businesses like this.
- Provides jobs.
- A good business in a good spot

- This could do with some improvement.
- These places are a dying breed.
- Need more of these-less supermarkets.
- Good decentralisation.
- Fish and chips.
- Very lonely shop.
- Handy shops for the elderly, busy working. Supports for emergency supplies.
- Done well.
- Great.
- Good to see old corner store functioning.
- Good location.
- Good business great service.
- Good service for town.
- Good shop.

- More village centres required.
- An ageing population, importance will increase.
- Very caring.
- Good facility employs lots of people.
- Growth industry.
- Excellent good facility and service to the town.
- Excellent facility.
- Necessary facility-building looks temporarily.
- A much-needed facility.
- More needed.
- Great place.
- More aged care needed for the future.
- Excellent.
- We need more of these.
- We need more medical facilities (doctors, nurses, specialists) to keep the good quality care.

- Promote schools-fence is fine will stop spontaneous vandalism.
- Forbes can be education Centre.
- Good schools in town.
- Pity it needs to be locked in.
- Good schools in Forbes.
- Looks like a gaol.
- Safer for the kids.
- Totally enclosed front needs to be open. Looks like a gaol.
- Better the fence than wanton vandalism. Maybe some shrubs would soften the looks.
- The fence is a total waste of money. It created an ideal area for vandalism (no witnesses). All school grounds should be open to public 24/7.
- Good education essential-State and private and boarding schools and TAFE. Safer for the kids

- The Dish is now old hat.
- Clean up grass.
- Need new display sign promoting lake.
- Needs upgrading.
- Some of our entrances are tatty. Need imagination. Signage okay.
- Put a more attractive sign.
- See the Borenore sign.
- The Dish is passé not that important.
- Not very welcoming. Need to let people know whats on in Forbes.
- Needs tidy up.
- Not very attractive needs tidying up.
- Okay.
- Crap.
- Ugly.
- Not very vibrant.
- Entrances to town need to beautify it-trees on Cowra Road a great but dying.
- Needs friendly sign.
- Would be good to have another movie made locally.
- Sign very ordinary. Check Grenfell for ideas

Appendix 5: Methodology to Assess the most appropriate Land Use Designation for Rural Land

The following method is used to identify the land units and designations discussed in chapter 3.

Data Gathering

- Land Use Survey
- Lot size analysis
- Slope mapping
- Fauna And Flora Study / Vegetation cover
- Soils mapping
- Drainage and Catchments
- Agricultural land classification
- Landscape features
- Water quality and quantity

Identify Constraints

- Urban expansion areas
- Rural residential areas
- Intensive agricultural uses
- Land use conflicts
- Native vegetation areas
- Water courses
- Steep land

Identify Land Units

- Similar topographic features
- Clusters of land uses

Assess Agricultural Potential

- Identify high class land
- Rank areas for land uses
- Identify lot sizes and land uses

Consider the Appropriate Zone

- Agriculture
- Mixed Use / Agricultural landscape
- Nature conservation
- Rural living
- Rural urban fringe

Appendix 6: Methodology to Determine a Minimum Lot Size

PLEASE NOTE THAT THIS METHODOLOGY HAS BEEN PROVIDED BY THE DPI AND DoP AS A DRAFT

Minimum Lot Sizes
How to use the framework

The following framework provides two options that may be used to identify or determine minimum lot sizes. They provide a realistic snapshot of what could be regarded as a commercial farm size for a locality.

The fi rst option (A) depends on the current activities in an area and provides a macro approach, while the second option (B) builds on this through a detailed economic approach. It is recognised that this framework is not a science as agriculture itself is open to many variables, including climate and market returns. It does, however, provide a way to arrive at a representative number that considers the economic realities of a typical commercial farm in an area based on the best available knowledge at the time of assessment.

Option A (steps 1 and 2) can assist local and State government to determine an acceptable minimum lot size without detailed analysis. This is the recommended approach to determining a minimum allotment size for an entire LGA.

Alternatively, by 'drilling down' through a more detailed economic analysis, (Option B, Steps 1 through 7) and compiling data for subdistricts, local government will be able to determine minimum allotment sizes appropriate for the promotion of sustainable agriculture in that locality. This will enable councils, with the assistance of agricultural specialists, to establish appropriate minimum allotment sizes where landuse strategies identify distinct precincts within which certain types of agriculture are proposed to be undertaken. For example, these include dryland enterprises specifically associated with particular soil or landscape features or more intensive irrigated agriculture.

Councils are encouraged and it is strongly recommended that in using the framework to determine a minimum allotment size, agricultural professionals, including the local Agricultural Environmental Officer (DPI), are consulted.

Where the framework Option B is taken, there is allowance for up to a 20% variation from the agreed minimum determined (using Option A) for the area. This takes into account the assumptions made in relation to this process which include:

• the full costs of establishment can be met;
• equity of the costs associated with loan repayments can be met;
• the level of income used is adequate (based on ABARE estimations); and
• the full costs of production can be met, for example, environmental impacts can be managed on the holding.

Minimum Lot Sizes

Option A: Basic assessment

Step 1: Identify the key agricultural industries and enterprises in the LGA
What are the main agricultural industries in the LGA?

These may include the type and mix of crops, the grazing enterprises, and horticultural or vegetable crops.

What is the LGA well-known for? Most LGAs have economic development reports that provide a detailed account of agriculture in the area, and which can be used to contribute to this procedure.

Has agriculture in the LGA changed over time and if so what has happened? It is important to look at the changes in crops or livestock over time and the number and size of holdings that make up the enterprises. While holding size may be fairly stable, factors such as drought and seasonal variability, or fluctuating commodity prices, will affect economic returns, and should all be considered. In some areas changes in enterprises may occur due to technological change, or new market opportunities.

It is important to identify any major shifts and trends in enterprises as a result of technological, market or environmental influences.

Industry organisations, government agencies such as the Australian Bureau of Statistics (ABS) and ABARE and the farm service sector may be able to provide information on key enterprises and trends across the LGA. Once the major agricultural enterprises have been identified across the LGA, the process of undertaking some case studies can begin.

Step 2: Identify the characteristics of farms in the LGA

What are the land use characteristics of the major existing agricultural enterprises in the area?

The mix of crops and livestock enterprises across the LGA may vary according to factors such as locality, topography, soil type and climate.

Are there distinctly different patterns of agriculture in different areas across the LGA? Different areas may need to be considered for special provisions where the potential for conflict may arise, i.e. intensive agriculture.

In cropping areas, several crop options may need to be investigated, while grazing enterprises may operate both sheep and cattle enterprises, for example.

Assessment of holding size and pattern. The size of existing commercial holdings may be a useful indication of a realistic holding size in the area. It is important to recognise that some farmers are constantly adjusting their holding size and enterprise selection in response to economic conditions, so this may be a factor in determining the base size of a holding considered to be reflective of commercial farms in an area. An estimate of a realistic holding size can be determined at this point.

Care should be taken in looking at holdings. Many farmers lease or share farm production on other land held in different ownership. Hence land ownership is not always indicative of an area that would be considered to be a commercial farm. The farming community is often the best source of information in relation to what area is required for a commercial farm.

DPI is also developing a suite of farm models systems across the state that reflects different farming systems and has been developed to examine enterprise change. The farm models systems also examine sizes of the farms in their analysis which can be useful for this work (Davies & Mullen, 2004).

Local government cadastral and rates information may be used to provide a précis of holding(s) held by one owner, which may give an indication of holding size.
Note: Local government cadastral information is useful to establish lots and portions held by individual owners and therefore provides *an indication* of the holding sizes in an LGA. However, it is imperative that holding size and ownership information is lawfully collected, stored and used in accordance with the *Privacy and Personal Information Protection Act* 1998.

Option B: Using economic analysis to determine basic commercial farm size

The following steps build on the previous section and using economic analysis, provide an additional way of considering the many facets of farming practice that will help local government plan for commercial farming.
Whilst recognising that each commercial farm operation is unique, this analysis uses a general approach that considers a typical farm in an area that is commercial in its operation. A number of assumptions are made throughout this procedure, and although not complex, the process will benefit from the assistance of an agricultural farm management consultant, agricultural economist or farm business specialist. It is important that Council staff involved in planning for sustainable agriculture gain a good understanding of the factors affecting agricultural production and viability across the local government area.
Steps 1 and 2 from Option A are used, then the following:

Step 3: Determine the existing production levels of key enterprises on farms

Useful guides on production levels, such as crop yields and livestock performance, can be sourced from:
• Australian Bureau of Statistics (ABS);
• Australian Bureau of Agricultural and Resource Economics
4 (ABARE);
• Department of Primary Industries (DPI);
• Rural Lands Protection Boards (RLPBs); and
• industry sources.
It is essential to account for the variability in production across the area resulting from seasonal fluctuations and due to agronomic conditions such as soil type and topography.
Information on the LGA's biophysical characteristics, if available, is useful for determining variation in production. For example, soil maps may indicate the different types of soils across an area, and their suitability to different enterprises.
For the purposes of determining the size for a sustainable farming operation, it is suggested that a conservative estimate of production be used, to account for the considerable variation in skills and levels of farmers and farm managers and operators.
In the case of livestock enterprises, a key index is the carrying (stocking) capacity of the land, often recorded as DSEs (dry sheep equivalents) per hectare. The carrying capacity will vary according to many factors including the soils, climate, level of pasture improvement and season, for example. Understanding seasonal variation is critical and the impact of drought and markets is especially

important for grazing enterprises. Statistical information is available to determine district averages, but information from local and expert sources is recommended, such as RLPBs, stock agents, farm service firms, and industry experts, should provide some typical ranges.

It is critical to note that although an LGA may have variability in the quality of agricultural land in terms of soil type, landform and other attributes that lowers its agricultural capability; it is accordingly often seen as unsuited to agriculture. However, it may be suited to specific forms of agriculture or require a larger area and/or different management techniques to be sustainable as a commercial farm. Such land is also not automatically suitable for subdivision for lifestyle purposes as it may be sensitive to erosion, effluent disposal, and have servicing, access, biodiversity and bushfire issues.

Agricultural suitability mapping that was produced by the previous Department of NSW Agriculture (now Department of Primary Industries), considered specific agricultural limitations that encompassed biophysical, market and climate parameters at the time of mapping. It is a guide to local government to indicate the potential land suitability across an LGA at the time and helped define areas of prime crop and pasture land as Class 1, 2 or 3. These maps have and continue to be improperly used in the assessment of individual properties in some LGAs, contrary to their intended use and the State Government Policy for Sustainable Agriculture (1999). Lands classed as 4 or 5 still have potential for agriculture but again this has been regarded as reason to its allocation to other landuses rather than recognising that it has value to a number of agricultural uses such as low density grazing and/or forestry.

Step 4: Determine appropriate gross margins for the key enterprises

Gross margin budgets are a simple cost and return analysis of a farm activity, at a given time. The gross margin is calculated by deducting input and production costs from gross income based on an estimated yield or production level and the prevailing market prices. Gross margin budgets are a useful way of comparing farm enterprise activities, and can also be used to provide an indication of the productivity of farming land when appropriate yield or production levels and realistic commodity prices are used.

It is important to note that a gross margin budget does not contain costs of general farm overheads that are incurred regardless of choice of enterprise, and typically they do not make an allowance for the farmer's labour. This must be accounted for separately (see below).

The Department of Primary Industries provide annually typical gross margin budgets for the major broad scale agricultural enterprises in NSW. The most recent versions are available on the Department's web site: http://www.dpi.nsw.gov.au/reader/dpi.

A gross margin budget is only a snapshot of enterprise performance and when being used for estimating longer term economic performance, it is important that an average yield or production level is chosen which reflects seasonal variation under average management. Similarly, prices should be those which are

realistic for the market, not based on short term peaks.
Using the key enterprises identified in Option A, Step 1, the gross margin budgets should be adjusted to the productivity levels identified in Option A, Step 2. Local expertise from agricultural advisers, economists or farm management consultants can help to refine such gross margins to the local situation.
In order to derive a "whole" farm gross margin, the farm can be proportionally allocated to provide the area of each enterprise. The enterprise gross margins can then be multiplied by the enterprise areas and totalled to provide a whole farm summary. For example, in a given year a mixed farming operation with rotational cropping may have 50% of the farm under crops, and 25% under grazing and 25% fallow (as part of a three in five year rotation). The cropping area may consist of 40% wheat, 40% sorghum and 20% canola. On a 1000 ha property, this would mean annually, 250 ha grazed, 250 in fallow (with some grazing value), 200 ha in wheat, 200 in sorghum and 100 ha in canola. A purely livestock property may need to allocate proportions to various cattle and sheep enterprises and perhaps fodder production.
In practice it is also important to identify areas of the property 6 which are not contributing directly to or being used for agricultural production, but are typical components of the property, such as roads, water bodies, rocky ridges, buffer areas and conservation areas such as riparian zones, shelter belts, wildlife corridors and densely timbered areas. Farm gross margins should reflect sustainable land use, that is, enterprises and production levels that are within the capability of the land and its natural resources.
An alternative approach is to base the total farm production on the type of farm, where total farm production needs to be proportionally allocated to each enterprise gross margin. For example, a typical cropping enterprise may gain its income from an area consisting of 40% wheat, 40% sorghum and 20% canola across a range of land types. Likewise, a grazing property may contain different grazing areas and types as well as enterprises e.g. sheep and cattle.

Step 5: Determine a target income level for a commercial farming unit

A reasonable estimate of the level of net income needed to indicate economic sustainability is required. The following is suggested as a starting point.
The Australian Bureau of Agricultural and Resource Economics (ABARE) publishes each year a report on its long running survey of major broad scale agricultural industries or specialist industry reports in partnership with industry groups.
A selection of farms is surveyed across the major agricultural zones, to provide an indication of the economic performance of those industries. Results are typically reported according to industry, state or zone (pastoral, wheat-sheep, or high rainfall). Comprehensive cost and income data is collected to determine a range of farm economic performance parameters. In particular, farm cash income is adjusted for asset and stock changes and family labour costs to estimate farm business profit, which is further adjusted according to debt levels to provide farm business profit at full equity. This

profit when divided by farm capital and assets gives a rate of return on capital for the farm (ABARE 2003, 2004). The ABARE reports typically cover a 3 year period so that the recent level of performance of various industries can be gauged.
A farm 'business' should generate an acceptable return on invested capital and assets, but what is an appropriate rate of return for agriculture varies according to different expectations. The ABARE reports show the range of economic performance of farms in the survey. As a starting point, it is suggested that the 'break even point' is a suitable baseline from which to consider an acceptable rate of return. The break even point occurs when farm business profit is zero, that is, when income covers production costs, family labour and overheads. This point can be gleaned from the ABARE data by deducting farm business profit (at full equity) from farm cash income. The ABARE data can thus provide a picture of the average farm income
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needed before a return on capital is generated.
The ABARE information also illustrates the variability of farm cash income, further reinforcing the need to use such information carefully in its use.
Table 1 shows ABARE data for the years 2000/01 to 2002/03 for broad acre cropping in NSW. The third year is preliminary data only. The break even income ranges between $38,000 and $65,000 (preliminary) at 100% equity. For the purposes of the example below, $60,000 has been selected as a starting point for a target income on a cropping enterprise.
Table 2 shows the equivalent data for the beef industry. The break even point ranged between $44,000 and $66,000. These are the target incomes that would need to be reached before a profit is generated, assuming full equity and when overhead costs have been considered.

Step 6: Calculate the overhead costs

Gross margin budgets do not include many farm fixed costs or costs that are incurred regardless of which crop or enterprise is undertaken, or indeed whether there is any production such as during a drought. Examples are Council rates, electricity and phone costs, and farm maintenance such as fencing, water supply, and machinery repairs. Depreciation is another important item. These costs are typically referred to as overhead costs. Often family labour or income is regarded as an overhead cost, but in this exercise it is accounted

2000/01 (e) 2001/02 (p) 2002/03 (s)
Farm Cash Income ($) 39,513 44,470 8,800
Farm Business Profit (at 100% equity) ($) - 6,300 530 - 57,100
Rate of Return (%) 0.6 0 -4.3
Break Even Income ($) 45,813 43,940 65,900
Average Equity (%) 97 98 n.a.

Table 2: NSW Beef Industry
Source: ABARE (2003)
(e) Final estimate
(p) Preliminary estimate
(s) Provisional estimate

2000/01 (e) 2001/02 (p) 2002/03 (s)
Farm Cash Income ($) 124,183 186,710 - 17,600
Farm Business Profit (at 100% equity) ($) 69,619 148,180 - 82,200
Rate of Return (%) 4.0 7.4 -4.1
Break Even Income ($) 54,564 38,530 64,600
Average Equity (%) 79.6 81.0 n.a.

Table 1: NSW Wheat and other crops
Source: ABARE (2003)
(e) Final estimate

(p) Preliminary estimate
(s) Provisional estimate

for by the target income.) However, any additional farm labour such as permanent staff should be included either in gross margin or overhead costs.

It is not easy to find published information on overhead costs because they are so variable. Discussion with industry experts and farmers is probably the best guide. DPI experts (L. Davies, pers. comm.) suggest that overhead costs can be significant relative to those costs included in gross margin budgets, often approaching 50% of total farm costs. Overheads for cropping enterprises are often higher than for livestock enterprises because of the greater investment in machinery and corresponding maintenance and depreciation costs. For the purpose of determining a commercial farming size, it is suggested that a conservative figure of 40% be used, unless more accurate local data is available.

The gross margin budgets discussed above include a summary of variable costs on a hectare or DSE basis. The overhead costs can be estimated as a percentage of these, and can be totalled for the farm as per Step 7 below.

Overhead costs may vary from district to district because of a range of local factors. Where available, the expertise of a local agricultural economist, farm business accountant or farm management advisor should be sought.

Step 7: Calculate the area needed to generate the break even level of income

This step involves the selection of a farm with a typical mix of enterprises for a locality or selecting a particular case study farm, as discussed in Step 2. By dividing the farm area proportionally into the various enterprises and selecting suitable gross margin budgets for these enterprises as per Step 4, the gross margin for the whole property can be determined by multiplying the area of each enterprise by the relevant gross margin budget on a per hectare basis.

Similarly, the overhead costs for the property can be accounted for by determining a percentage of the total farm costs, and calculating them by comparison with gross margin costs. These overhead costs should then be deducted from the whole farm gross margin to estimate net farm income.

This income level can then be compared with that selected in Step 5 as being required for break even point, the benchmark above which a commercial operation can be considered profitable.

This net farm income is that which provides the farm operators with their income and living expenses (eg. for a farm family) and which is the starting point for generating a return on investment and assets.

It should be noted that the above procedure makes no allowance for interest and repayment of farm debt, as it assumes a full equity situation. In reality most farms will be below 100% equity and a higher level of farm income will need to be generated to cover this. The ABARE survey reports provide a snapshot of farm equity levels for various industries.

Case Study: Cropping/cattle enterprise in Northern NSW

After assessing the case study with

Option A, the recommendation is made to establish the minimum lot size for a new farm at 800 ha.

For the purpose of illustrating the procedure, take a simplified case of a mixed farming enterprise in northern NSW using two alternative approaches.

Option A: Step 1

Agricultural enterprises in the sample LGA are typically mixed farming enterprises, in this example, growing wheat and cattle.

Option A: Step 2

An assessment of the Council's cadastre and holdings data, and after speaking to agronomists in the district, indicate that commercial farms in this area average 800+ ha.

Option B: Step 3

Looking at the area, a simplified farm operation is worked out. It is located in an area typified by heavier grey clays on the floodplains and lighter red soils on the adjacent slopes and hills. The heavier soils in the locality are mainly used for cropping while the lighter soils are more sustainable under grazing enterprises. Our case study farm consists of approximately 60% of heavy clay soils almost totally used for wheat cropping and 40% of lighter soils used for cattle grazing.

On this sample farm, the only cropping enterprise is dryland wheat production grown continuously using short fallow and minimum or zero tillage techniques. Around 55% of the farm is under wheat, i.e. 440 ha. Around 35% of the farm (280 ha) is used for raising and fattening cattle, typically turned off at 15-20 months. The remaining 10% of the farm is non-productive area, including roads, house paddock, water areas, ridge top, and some dense timber.

Assume that typically in the locality, yields for this form of wheat growing average around 2.5 tonnes per hectare, taking into account seasonal effects.

For the cattle enterprise let's assume a stocking capacity of 3 DSE per hectare. There are some small areas of semi improved pasture which help with fattening.

Option B: Step 4

Use the DPI Farm Enterprise Budget for Dryland Wheat (Northern Zone – East, Winter 2004) (http://www.dpi.nsw.gov.au/reader/dpi), assuming average wheat yields of 2.5 t/ha and a wheat prices of $172/t (AH12 on farm).

The Gross Margin for wheat is $201.81 per hectare, say $200/ha.

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Total variable costs in the budget are shown as $228.19 per hectare, say $230.

For cattle, the Farm Enterprise Budget for young cattle (15-20 months) indicates a Gross Margin of $26.68 per DSE. At a carrying capacity of 3 DSE/ha, this means a Gross Margin of $80.04 per hectare, say $80/ha.

The variable costs can be determined from the budget at $5.89 per DSE or $17.67 per hectare, say $18/ha. Note that this is for a self replacing herd.

Option B: Step 5

A target income is required that covers the livelihood of this family farm.

The ABARE data in Tables 1 and 2 suggests that break even incomes in recent years have been in the $40,000 to $60,000 range.

For this case study assume a target income level of $60,000 as the starting point for considering farm viability.

Option B: Step 6

As this is a mixed farm, the greater proportion of farm costs are associated with the cropping

enterprise, as indicated by the variable costs in Step 4.
Assume that overhead costs are 40% of total farm costs.

Option B: Step 7

The net farm income for our simplified farm is itemised in the following Table 3.
So after deducting the overhead costs ($70, 827) from the total costs, after gross margin ($177, 067-

Table 3: Eight hundred ha wheat and cattle farm in Northern NSW

Note: In Table 3, the overhead costs are 40% of total costs. Therefore the gross margin costs ($106,240) are 60% of total costs ie. total costs are $177,067. So 40% of 177,067 is $70,827.

Enterprise Dryland
wheat Cattle
Non-productive
land
Total
Area (ha) 440 280 80 **800**
GM/ha ($) 200 80 0
Total GM ($) 88,000 22,400 0 **110,400**
GM variable costs ($) 101,200 5,040
106,240
GM variable costs
(% of total costs) **60**
Total costs ($) **177,067**
Overhead
(% of total costs) **40**
Overhead costs (%) **70,827**
Net farm income ($) **39,573**

Table 4

Enterprise Dryland
wheat Cattle
Non-productive
land
Total
Area (ha) 550 350 100 **1000**
GM/ha ($) 200 80 0
Total GM ($) 110,000 28,000 0 **138,000**
GM variable costs/ha
($) 230 18 0
GM variable costs ($) 126,500 6,300 0
132,800
GM variable costs
(% of total costs) **60**
Total costs ($) **221,333**
Overhead
(% of total costs) **40**
Overhead costs (%) **88,533**
Net farm income ($) **49,467**

Table 5

Enterprise Dryland
wheat Cattle
Non-productive
land
Total
Area (ha) 660 420 120 **1200**
GM/ha ($) 200 80 0
Total GM ($) 132,000 33,600 0 **165,600**
GM variable costs/ha
($) 230 18 0
GM variable costs ($) 151,800 7,560 0
159,360
GM variable costs
(% of total costs) **60**
Total costs ($) **265,600**
Overhead
(% of total costs) **40**
Overhead costs (%) **106,240**
Net farm income ($) **59,360**

$70,827=$106,240), the net farm income is only approaching $40,000 per annum, not quite the target income level of $60,000 sought.
In this simplified case, the operator may attempt to improve income levels by diversifying into more profitable crops or enterprises, increasing yield levels, or by **expanding the size of the farm**.
Where more rotational cropping is introduced then crop areas need to account for the fact that land is periodically in fallow and may not produce a crop every year.
Comparing existing holding sizes as identified in Step 2 will also help to identify the current range of farm sizes in the local government area. If holding sizes are greater for these typical types of enterprises, it suggests the estimated farm size is conservative and perhaps should be larger to meet current trends and long term expectations for profitable agriculture.
The above example of an 800 ha property does not achieve the

current target income. The exercise may be repeated by increasing farm size until the target income is reached. Tables 4 and 5 show the same method for farm sizes of 1000 and 1200 hectares respectively, with corresponding increases in areas for the enterprises. The target income is reached with a property size of 1200 hectares for this particular financial period.

The above example is based on recently published budgets for common broad scale enterprises in NSW. Because markets and prices vary, such budgets are only a snapshot and they should be reviewed regularly using the most reliable data. It is recommended that above and below average scenarios be tested to indicate the sensitivity of net farm incomes to prices and seasonal impacts on yield, particularly during droughts. For example, for the above case study in Option B, if the equivalent DPI Farm Enterprise Budget for dryland wheat for 2005 was used, a much different estimate would have resulted, since the decline in wheat price to $150/t pushed the gross margin down to $127/ha, while costs increased slightly. While this was offset marginally by improved results for beef cattle, the net farm income estimate declines to around $6,000. That is, a much larger farm area would have been required.
In other words, the target income needs to be robust enough to buffer landholders against below average seasonal conditions or price troughs. It is important that the percentage of the farm available for productive enterprises be realistically quantified. Parts of the farm not in production may include house and infrastructure areas, areas for conservation, tree plantings, ridges, dams and riparian areas. This can be around 30% of a holding, especially with landholder's efforts in conserving areas of remnant vegetation, or sacrificing land for salinity control or other landuses e.g. forestry.
The budget could be reworked to identify what scale of enterprise is required to generate incomes above the target level. However, estimating the value of the farm and assets and determining an acceptable rate of return is a challenging task and should be left to farm management specialists. Hence the approach used here is to provide a benchmark to indicate what scale of enterprise is needed to start defining an appropriate commercial farm size, and ultimately a minimum allotment size that is reflective of protecting land in holdings of an adequate size for agriculture.
In the above discussion and example, farm debt has not been considered. The ABARE survey reports provide a picture of average farm equity and the majority of farms are likely to have some indebtedness. So the net farm income will also have to be raised to cover the servicing of farm debt, in addition to generating a rate of return. Increasing the size of a farm is one way of dealing with this.
This approach is reflective of the way farms that conduct multienterprise or farming systems are structured (Davies & Mullen 2004). NSW DPI is developing whole farm models that are representative of a range of farming systems across the state for assessing enterprise change impacts. This information is also another potential source of providing a picture of a

Interpreting the Budget Information

representative farm in a region. In the case of horticultural and agroforestry enterprises, estimates of target income may require more consideration since there is often a considerable lag time between tree establishment and full production, sometimes well over a decade. This delay in reaching a profit must be factored into the target income level. Furthermore, with tree crops, farmers have less flexibility to switch between enterprises, and so their operation must be based on a sustainable sized operation to withstand seasonal and market fluctuations. It is recommended that specialist economic advice be sought when planning sustainable holding sizes for horticulture and agroforestry.

Conclusion

The above procedure attempts to provide a reasonably simple method of understanding the economics associated with farm productivity and commercial returns, and the relationship with estimating a commercial holding size. From here a minimum allotment size can be determined with other considerations that may affect the long term needs of agricultural landuse in an area. It is important to consider the trends associated with increasing holding size and the opportunities associated with agriculture.

References

ABARE, 2003, *Australian Farm Surveys Report 2003*, November 2003. ABARE, Commonwealth of Australia, Canberra.

ABARE, 2004, *Australian Farm Survey Results*, ABARE, Commonwealth of Australia, Canberra.

Davies, L. and Mullen, J., 2004, 'Farming Systems in NSW: Representative farm models developed by NSW Department of Primary Industries', Proceedings of Conference Papers, Australian Farm Business Management Network Conference 2004, at http://www.afbmnetwork.orange.usyd.edu.au/conferences/2004 Proceedings/index.htm (after 1 December 2004).

Davies, L., 2004, *Recent beef production and management system trends in NSW*, NSW Department of Primary Industries. at http://www.agric.nsw.gov.au/reader/beefbudinfo/beef-bud-infosystems-trends.htm

Davies, L., Wilkins, J., Arnott, R. and Rayner, A., 1999, *Review of the store cattle industry in NSW 1998*, Animal Industries Report, No. 7. NSW Agriculture, 1999.

Hooper, S., Martin, P., Love, G., and Fisher, B.S. 2002, *Farm size and productivity: where are the trends taking us?* Australian Commodities, Vol. 9(3), September quarter 2002.

McDonald, W., and Orchard, P., 2004, *Using DSEs and carrying capacities to compare beef enterprises*, NSW Department of Primary Industries, http://www.agric.nsw.gov.au/reader/beefbudinfo/dse-carryingcapacity.htm

NSW Department of Agriculture, 1999, *Policy for Sustainable Agriculture in NSW*

NSW Department of Infrastructure, Planning and Natural Resources, 2003, *Section 117(2) Direction for the Protection of Agricultural Land (North Coast)*

NSW Department of Primary Industries, 2004, *Farm Enterprise Budgets for September 2003*, at http://www.agric.nsw.gov.au

NSW Department of Primary Industries - Agriculture, *Policy for the Protection of Agricultural Land*, 2004

NSW Department of Urban Affairs and Planning, 2000, *Rural Lands Policy*

Appendix 7: Economic Holding Size Analysis

DPI Methodology for Minimum Allotment Size of Agricultural Allotments

BASIC ASSESSMENT

Step 1 – Identify Key Agricultural Industries & Enterprises in the LGA:

- What are the Main Agricultural Industries?
- What is the Shire well known for?
- Has Agriculture in the Shire changed over time
    - If so, what has happened?

Step 2 – Identify the Characteristics of Farms in the Shire:

- What are the land use characteristics of major agricultural enterprises?
- Are there distinctly different patterns of agriculture in different areas across the Shire?

DETAILED ANALYSIS

Step 3 – For Key Agricultural Enterprises identified:

- Determine the Existing Production Levels of key enterprises
    - Crop yields
    - Livestock Performance
    - Carrying Capacity
- Determine Input/Production Costs

Step 4 - Determine Appropriate Gross Margins for key enterprises:

- Deduct Input costs from gross income.

Step 5 – Determine a target income for a commercial farming unit

Step 6 – Calculate the Overhead Costs

- Rates, electricity, phone, farm maintenance, depreciation, family labour

Step 7 - Calculate the area needed to generate target income

- Gross margins multiplied by area of enterprise

Forbes Shire Agriculture

OPTION A – BASIC ASSESSMENT

1. Key Agricultural Industries & Enterprises in the LGA:

(Based upon investigations conducted by Council with local Farmers, Agencies, Stock & Station Agents, Rural Suppliers & Local Finance Institutions)

Main Agricultural Industries?

- ⇒ Cereal Cropping and Sheep for Wool
- ⇒ Cereal Cropping & Beef Fattening
- ⇒ Mixed Cropping Including Wheat, Oats & Canola, Wool & Fat Lambs
- ⇒ Lucerne Hay Production and Fat Lambs

What is the Shire well known for?

Sheep, both wool & lambs, Grains & Irrigated Agriculture

Has Agriculture in the Shire changed over time
If so, what has happened?

Agricultural base of Grains and Sheep has remained dominant with the coming and going of other agricultural uses including dairying, feedlots beef & Sheep, Orchards & Vegies

2. Identify the Characteristics of Farms in the Shire:

A. What are the land use characteristics of major agricultural enterprises?

Diversified farms incorporating a mix of livestock & cropping, lucerne & fat lambs etc

B. Are there distinctly different patterns of agriculture in different areas across the Shire?

Irrigated and dry land agriculture. Carrying capacity reduces as move further west.

ASSESSMENT OF HOLDING SIZE

OPTION B – ECONOMIC ANALYSIS

3. Production Levels of Key Enterprises on Farms

(Based upon discussions with local RLPB, local DPI officers, farmers and farm merchandisers)

Determine the Existing Production Levels of key enterprises

- Crop yields - Dry Land 2 tonnes per ha
  - Irrigated 5 tonnes /ha

Livestock Performance Indicators:

- Carrying Capacity - Dry land 2.5 dse
  - Irrigated 10 dse

(Conservative)

6. Gross Margins for key enterprises:

Sources:

1. NSW DPI Farm Enterprise Budget Series for Long Fallow Wheat – Central Zone – West, Winter 2006

2. NSW DPI Farm Enterprise Budget Series for Oats/Wheat: Grazing/Grain (Short Fallow) – Central Zone – East, Winter 2006

3. NSW DPI Farm Enterprise Budget Series for Canola: Long Fallow – Central Zone – East, Winter 2006

4. NSW DPI Farm Enterprise Budget Series for Beef Cattle: Growing Out Steers 240kg – 460kg in 12 Months, June, 2006

5. Merino Ewes (21 micron) – Merino Rams, whether lambs sold as trade lambs, January, 2006

6. NSW DPI Farm Enterprise Budget Series for 1st Cross Ewes – Terminal Meat Rams, January, 2006

7. NSW DPI Farm Enterprise Budget Series for Flood Irrigated Lucerne - Maintenance – Summer 2005/2006

8. NSW DPI Farm Enterprise Budget Series for Spray Irrigated Lucerne – Northern Zone – Summer 2005/2006

Forbes Local Estimates

Option 1:

Long Fallow Wheat and Merino Sheep for Wool

Option 2:

Long Fallow Wheat & Beef Fattening (Grow Out Steers)

Option 3:

Wheat, Oats, Canola & Merino Ewes for Wool with 1st Cross Fat Lambs

Option 4:

Flood Irrigated Lucerne Hay Production and Fat Lambs

Option 5:

Spray Irrigated Lucerne Hay Production and Fat Lambs

5. Target income for a commercial farming unit

Return on investment – **SUGGESTED TARGET INCOME $ 60,000**

Step 6 – Calculate the Overhead Costs

Rates, electricity, phone, farm maintenance, depreciation, family labour, fencing, water supply machinery repairs

Estimated 40% of total farm costs

Step 7 - Area needed to generate the target income

Option 1 - Long Fallow Dryland Wheat & Merino Sheep for Wool Production & Fat Lambs

Source:

NSW DPI Farm Enterprise Budget Series for Long Fallow Wheat – Central Zone – West, Winter 2006
Income: 2.4 tonnes / ha @ $175 / tonne = $420.00 per ha
Costs: $175.20 / ha
GM 244.80 / ha

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Merino Ewes (21 micron) – Merino Rams, whether lambs sold as trade lambs, January, 2006
1000 ewes @ 2.4dse/ewe & 10dse/ha = 240ha
Income: $91,137.23 / 1000 = $91.14/ewe
$91,137.23 / 240 = $379.74/ha
Costs: $39,435.57 / 1000 = $39.44/ ewe
$39,435.57/240 = $164.31/ha
Gross Margins: = $51.70 per ewe
= $215.42/ha
Assume 2.5dse/ha
2.4dse/ewe

Enterprise	Dry -land Wheat – Long Fallow	Sheep - Wool	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 150ha@ = 156 sheep	10% Dwelling, shedding & protected land	
Area (ha)	100	150	20	200
GM/ha($)	$244.80	$215.42	0	
Total GM ($)	$24,480	$32,313	0	$56,793
GM Variable Costs/ha ($)	$175.20 x 100ha = $17,520	$164.31 x 150 = $24,646	0	$42,166
GM Variable Costs (% of total costs)				60
Total Costs ($)				$70,277
Overhead (% of total costs)				40
Overhead Costs				$28,111
Net farm Income				$28,682

Enterprise	Dry -land Wheat – Long Fallow	Sheep - Wool	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 225ha@ = 234 sheep	10% Dwelling, shedding & protected land	
Area (ha)	150	225	30	300
GM/ha($)	244.80	215.42	0	
Total GM ($)	$36,720	$48,469	0	$85,189
GM Variable Costs ($)	$175.20 x 150ha = $26,280	$164.31 x 225 = $36,969	0	$63,249
GM Variable Costs (% of total costs)				60
Total Costs ($)				$105,415
Overhead (% of total costs)				40
Overhead Costs				$42,166
Net farm Income				$43,023

Enterprise	Dry -land Wheat – Long Fallow	Sheep – Wool	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 300ha@ = 312 sheep	10% Dwelling, shedding & protected land	
Area (ha)	200	300	40	400
GM/ha($)	244.80	215.42	0	
Total GM ($)	$48,960	$64,626	0	$113,586
GM Variable Costs ($)	$175.20 x 200ha = $35,040	$164.31 x 300 = $49,293	0	$84,333
GM Variable Costs (% of total costs)				60
Total Costs ($)				$140,555
Overhead (% of total costs)				40
Overhead Costs				$56,222
Net farm Income				$57,364

Enterprise	Dry -land Wheat – Long Fallow	Sheep – Wool	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 375ha@ = 390 sheep	10% Dwelling, shedding & protected land	
Area (ha)	250	375	40	500
GM/ha($)	244.80	215.42	0	
Total GM ($)	$61,200	$80,782	0	$141,982
GM Variable Costs ($)	$175.20 x 250ha = $43,800	$164.31 x 375 = $61,616	0	$105,416
GM Variable Costs (% of total costs)				60
Total Costs ($)				$175,693
Overhead (% of total costs)				40
Overhead Costs				$70,277
Net farm Income				$71,704

Enterprise	Dry -land Wheat – Long Fallow	Sheep - Wool	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 450ha@ = 469 sheep	10% Dwelling, shedding & protected land	
Area (ha)	300	450	60	600
GM/ha($)	244.80	215.42	0	
Total GM ($)	$73,440	$96,939	0	$170,379
GM Variable Costs ($)	$175.20 x 300ha = $52,560	$164.31 x 450 = $73,939	0	$126,499
GM Variable Costs (% of total costs)				60
Total Costs ($)				$210,831
Overhead (% of total costs)				40
Overhead Costs				$84,332
Net farm Income				$86,046

Enterprise	Dry -land Wheat – Long Fallow	Sheep – Wool	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 600ha@ = 625 sheep	10% Dwelling, shedding & protected land	
Area (ha)	400	600	80	800
GM/ha($)	244.80	215.42	0	
Total GM ($)	$97,920	$129,252	0	$227,172
GM Variable Costs ($)	$175.20 x 400ha = $70,080	$164.31 x 600 = $98,586	0	$168,666
GM Variable Costs (% of total costs)				60
Total Costs ($)				$281,110
Overhead (% of total costs)				40
Overhead Costs				$112,444
Net farm Income				$114,728

Enterprise	Dry -land Wheat – Long Fallow	Sheep - Wool	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 750ha@ 2.5dse/ha = 180 sheep	10% Dwelling, shedding & protected land	
Area (ha)	500	750	100	1000
GM/ha($)	244.80	215.42	0	
Total GM ($)	$122,400	$161,565	0	$283,965
GM Variable Costs ($)	$175.20 x 500ha = $87,600	$164.31 x 750 = $123,232	0	$210,832
GM Variable Costs (% of total costs)				60
Total Costs ($)				$351,386
Overhead (% of total costs)				40
Overhead				$140,554

Costs				
Net farm Income				$143,410

APPROXIMATE AREA TO ACHIEVE TARGET INCOME OF $60,000:

Approx 400 - 500 HA

Option 2 - Long Fallow Wheat & Beef Fattening (Grow Out Steers)
Source:

NSW DPI Farm Enterprise Budget Series for Long Fallow Wheat – Central Zone – West, Winter 2006
Income: 2.4 tonnes / ha @ $175 / tonne = $420.00 per ha
Costs: $175.20 / ha
GM 244.80 / ha

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NSW DPI Farm Enterprise Budget Series for Beef Cattle: Growing Out Steers 240kg – 460kg in 12 Months, June, 2006
100 steers on 106ha
Income: $92,029 / 100 = $920.29/head
= $653.46/ha
Costs: $61,080 / 100 = $610.80/head
= $433.70/ha
Gross Margins: = $309.49 per steer
= $219.76/ha
Assume 2.5dse/ha
Dry Stock to 450 kg @ 6.0 dse/steer

Enterprise	Dry -land Wheat – Long Fallow	Beef	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 150ha @ 2.5dse/ha & 6 dse/steer = 62 steers	10% Dwelling, shedding & protected land	
Area (ha)	100	150	20	200
GM/ha($)	$244.80	219.76	0	
Total GM ($)	$24,480	$32,964	0	$57,444
GM Variable Costs ($)	$175.20 x 100ha = $17,520	$433.70 x 150ha = $80,595	0	$98,115
GM Variable Costs (% of total costs)				60
Total Costs ($)				$163,525
Overhead (% of total costs)				40
Overhead Costs				$65,410
Net farm Income				$-7,966

Enterprise	**Dry -land Wheat – Long Fallow**	**Beef**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 225ha @ 2.5dse/ha & 6 dse/steer = 93 steers	10% Dwelling, shedding & protected land	
Area (ha)	150	225	30	300
GM/ha($)	244.80	219.76	0	
Total GM ($)	$36,720	$49,446	0	$86,166
GM Variable Costs ($)	$175.20 x 150ha = $26,280	$433.70 x 225ha = $97,582	0	$123,862
GM Variable Costs (% of total costs)				60
Total Costs ($)				$206,436
Overhead (% of total costs)				40
Overhead Costs				$82,574
Net farm Income				$3,592

Enterprise	**Dry -land Wheat – Long Fallow**	**Beef**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 300ha @ 2.5dse/ha & 6 dse/steer = 125 steers	10% Dwelling, shedding & protected land	
Area (ha)	200	300	40	400
GM/ha($)	244.80	219.76	0	
Total GM ($)	$48,960	$65,928	0	$114,888
GM Variable Costs ($)	$175.20 x 200ha = $35,040	$433.70 x 300ha = $130,110	0	$165,150
GM Variable Costs (% of total costs)				60
Total Costs ($)				$275,250
Overhead (%				40

of total costs)				
Overhead Costs				$110,100
Net farm Income				$4,788

Enterprise	Wheat	Beef	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 450ha @ 2.5dse/ha & 6dse/steer = 187 steers	10% Dwelling, shedding & protected land	
Area (ha)	300	450	60	600
GM/ha($)	244.80	219.76	0	
Total GM ($)	$73,440	$98,892	0	$172,332
GM Variable Costs ($)	$175.20 x 300ha = $52,560	$433.70 x 450ha = $195,165	0	$247,725
GM Variable Costs (% of total costs)				60
Total Costs ($)				$412,875
Overhead (% of total costs)				40
Overhead Costs				$165,150
Net farm Income				$7,182

Enterprise	Wheat	Beef	Non-Productive Land	Total
	50% crop/pa in rotation	75% grazed in rotation 600ha @ 2.5dse/ha & 6 dse/steer = 250 steers	10% Dwelling, shedding & protected land	
Area (ha)	400	600	80	800
GM/ha($)	244.80	219.76	0	
Total GM ($)	$97,920	$131,856	0	$229,776
GM Variable Costs ($)	$175.20 x 400ha = $70,080	$433.70 x 600ha = $260,220	0	$330,300
GM Variable Costs (% of total costs)				60

Total Costs ($)				$550,500
Overhead (% of total costs)				40
Overhead Costs				$220,200
Net farm Income				$9,576

Enterprise	**Wheat**	**Beef**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 750ha@ 2.5dse/ha & 6 dse/steer = 312 steers	10% Dwelling, shedding & protected land	
Area (ha)	500	750	100	1000
GM/ha($)	244.80	219.76	0	
Total GM ($)	$122,400	$164,820	0	$287,220
GM Variable Costs ($)	$175.20 x 500ha = $87,600	$433.70 x 750ha = $325,275	0	$412,875
GM Variable Costs (% of total costs)				60
Total Costs ($)				$688,125
Overhead (% of total costs)				40
Overhead Costs				$275,250
Net farm Income				$11,970

APPROXIMATE AREA TO ACHIEVE TARGET INCOME OF $60,000:

> 1,000 HA

Option 3 - Wheat, Oats, Canola & Merino Ewes for Wool with 1st Cross Fat Lambs

Source:

NSW DPI Farm Enterprise Budget Series for Oats/Wheat: Grazing/Grain (Short Fallow) – Central Zone – East, Winter 2006
Income: Oats: $587.00 / ha
Wheat: $724.60 / ha
Costs: Oats $300,67 / ha
Wheat $313.76
GM; Oats $286.33 / ha
Wheat $410.84

&

NSW DPI Farm Enterprise Budget Series for Canola: Long Fallow – Central Zone – East, Winter 2006
Income: 2.4 tonnes / ha @ $300 / tonne = $720.00 per ha
Costs: $414.94 / ha
GM $305.06 / ha

&

Merino Ewes (21 micron) – Merino Rams, whether lambs sold as trade lambs, January, 2006
1000 ewes @ 2.4dse/ewe & 10dse/ha = 240ha
Income: $91,137.23 / 1000 = $91.14/ewe
$91,137.23 / 240 = $379.74/ha
Costs: $39,435.57 / 1000 = $39.44/ ewe
$39,435.57/240 = $164.31/ha
Gross Margins: = $51.70 per ewe
= $215.42/ha

Assume 2.5dse/ha
2.4dse/ewe

Enterprise	Wheat – Grazing & Grain	Oats – Grazing & Grain	Canola	Sheep - Wool	Non-Productive Land	Total
	20% crop/pa in rotation	15% crop/pa in rotation	15% crop/pa in rotation	75% grazed in rotation 150ha@ 2.5dse/ha & 2.4dse/ewe = 156 sheep	10% Dwelling, shedding & protected land	
Area (ha)	40	30	30	150	20	200
GM/ha($)	410.84	286.33	305.06	215.42	0	
Total GM ($)	$16,433	$8,590	$9,151	$32,313	0	$66,497
GM Variable Costs ($)	$313.76 x 40ha = $12,550	$300.67 x 30ha = $9,020	$414.94 x 30ha = $12,448	$164.31 x 150ha = $24,646	0	$58,664

GM Variable Costs (% of total costs)						60
Total Costs ($)						$97,774
Overhead (% of total costs)						40
Overhead Costs						$39,109
Net farm Income						$27,387

Enterprise	**Wheat – Grazing & Grain**	**Oats – Grazing & Grain**	**Canola**	**Sheep - Wool**	**Non-Productive Land**	**Total**
	20% crop/pa in rotation	15% crop/pa in rotation	15% crop/pa in rotation	75% grazed in rotation 225ha@ 2.5dse/ha & 2.4dse/ewe = 234 sheep	10% Dwelling, shedding & protected land	
Area (ha)	60	45	45	225	30	300
GM/ha($)	410.84	286.33	305.06	215.42	0	
Total GM ($)	$24,650	$12,884	$13,727	$48,469	0	$99,730
GM Variable Costs ($)	$313.76 x 60ha = $18,825	$300.67 x 45ha = $13,530	$414.94 x 45ha = $18,672	$164.31 x 225ha = $36,969	0	$87,996
GM Variable Costs (% of total costs)						60
Total Costs ($)						$146,660
Overhead (% of total costs)						40
Overhead Costs						$58,664
Net farm Income						$41,066

Enterprise	**Wheat – Grazing & Grain**	**Oats – Grazing & Grain**	**Canola**	**Sheep - Wool**	**Non-Productive Land**	**Total**
	20% crop/pa in rotation	15% crop/pa in rotation	15% crop/pa in rotation	75% grazed in rotation 300ha@ 2.5dse/ha = 312 sheep	10% Dwelling, shedding &	

					protect ed land	
Area (ha)	80	60	60	300	40	400
GM/ha($)	410.84	286.33	305.06	215.42	0	
Total GM ($)	$32,867	$17,179	$18,303	$64,626	0	$132,975
GM Variable Costs ($)	$313.76 x 80ha = $25,100	$300.67 x 60ha = $18,040	$414.94 x 60ha = $24,896	$164.31 x 300ha = $48,393	0	$116,429
GM Variable Costs (% of total costs)						60
Total Costs ($)						$194,048
Overhead (% of total costs)						40
Overhead Costs						$77,619
Net farm Income						$55,355

Enterprise	**Wheat – Grazing & Grain**	**Oats – Grazing & Grain**	**Canola**	**Sheep – Wool**	**Non-Productive Land**	**Total**
	20% crop/pa in rotation	15% crop/pa in rotation	15% crop/pa in rotation	75% grazed in rotation 375ha@ 2.5dse/ha = 390 sheep	10% Dwelling, shedding & protected land	
Area (ha)	100	75	75	375	50	500
GM/ha($)	410.84	286.33	305.06	215.42	0	
Total GM ($)	$41,084	$21,474	$22,879	$80,782	0	$166,219
GM Variable Costs ($)	$313.76 x 100ha = $31,376	$300.67 x 75ha = $22,550	$414.94 x 75ha = $31,120	$164.31 x 375ha = $61,616	0	$146,662
GM Variable Costs (% of total costs)						60
Total Costs ($)						$244,436
Overhead (% of total costs)						40
Overhead Costs						$97,774
Net farm Income						68,445

Enterprise	Wheat – Grazing & Grain	Oats – Grazing & Grain	Canola	Sheep – Wool	Non-Productive Land	Total
	20% crop/pa in rotation	15% crop/pa in rotation	15% crop/pa in rotation	75% grazed in rotation 450ha@ 2.5dse/ha = 469 sheep	10% Dwelling, shedding & protected land	
Area (ha)	120	90	90	450	60	600
GM/ha($)	410.84	286.33	305.06	215.42	0	
Total GM ($)	$49,300	$25,769	$27,455	$96,939	0	$199,463
GM Variable Costs ($)	$313.76 x 120ha = $37,651	$300.67 x 90ha = $27,060	$414.94 x 90ha = $37,344	$164.31 x 450ha = $73,939	0	$175,994
GM Variable Costs (% of total costs)						60
Total Costs ($)						$293,324
Overhead (% of total costs)						40
Overhead Costs						$117,329
Net farm Income						$82,134

Enterprise	Wheat – Grazing & Grain	Oats – Grazing & Grain	Canola	Sheep – Wool	Non-Productive Land	Total
	20% crop/pa in rotation	15% crop/pa in rotation	15% crop/pa in rotation	75% grazed in rotation 600ha@ 2.5dse/ha = 625 sheep	10% Dwelling, shedding & protected land	
Area (ha)	160	120	120	600	80	800
GM/ha($)	410.84	286.33	305.06	215.42	0	
Total GM ($)	$65,734	$34,359	$36,607	$129,252		$265,952
GM Variable Costs ($)	$313.76 x 160ha = $50,201	$300.67 x 120ha = $36,080	$414.94 x 120ha = $49,792	$164.31 x 600ha = $98,586	0	$234,659
GM Variable Costs (% of total costs)						60
Total Costs ($)						$391,098
Overhead (% of total						40

costs)						
Overhead Costs						$156,439
Net farm Income						$109,513

Enterprise	**Wheat – Grazing & Grain**	**Oats – Grazing & Grain**	**Canola**	**Sheep - Wool**	**Non-Productive Land**	**Total**
	20% crop/pa in rotation	15% crop/pa in rotation	15% crop/pa in rotation	75% grazed in rotation 750ha@ 2.5dse/ha = 180 sheep	10% Dwelling, shedding & protected land	
Area (ha)	200	150	150	750	100	1000
GM/ha($)	410.84	286.33	305.06	215.42	0	
Total GM ($)	$82,168	$42,949	$45,759	$161,565		$332,441
GM Variable Costs ($)	$313.76 x 200ha = $62,752	$300.67 x 150ha = $45,100	$414.94 x 150ha = $62,241	$164.31 x 750ha = $123,232	0	$293,725
GM Variable Costs (% of total costs)						60
Total Costs ($)						$489,541
Overhead (% of total costs)						40
Overhead Costs						$195,816
Net farm Income						$136,625

APPROXIMATE AREA TO ACHIEVE TARGET INCOME OF $60,000:

400 – 500 HA

Option 4 – Flood Irrigated Lucerne & Fat Lambs (1st Cross Ewes – Terminal Meat Rams)

Source:

NSW DPI Farm Enterprise Budget Series for Flood Irrigated Lucerne - Maintenance – Summer 2005/2006
Income: 15 tonnes / ha @ $180 - 250 / tonne = $3,330.00 per ha
Costs: $1,474 / ha
GM 1,855.83 / ha

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NSW DPI Farm Enterprise Budget Series for 1st Cross Ewes – Terminal Meat Rams, January, 2006

1000 ewes @ 2.6dse/ewe & 10 dse/ha	=	260ha
Income: $118,131.44 / 1000	=	$118.13/ewe
$118,131.44 / 260	=	$454.35/ha
Costs: $60,044.32 / 1000	=	$60.04/ ewe
$60,044.32 / 260	=	$230.94/ha
Gross Margins:	=	$58.09 per ewe
	=	$223.41/ha

Assume 10.0dse/ha
2.6dse/ewe

Enterprise	**Irrigated Lucerne - Flood**	**Fat Lambs 1st X (160 sheep**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 30ha @ 10dse/ha & 2.6 dse/ewe = 115 ewes	10% Dwelling, shedding & protected land	
Area (ha)	20	30	4	40
GM/ha($)	1,855.83	223.41		
Total GM ($)	$37,116	$6,702		$43,818
GM Variable Costs ($)	$29,480	$6,928		$36,408
GM Variable Costs (% of total costs)				60
Total Costs ($)				$60,680
Overhead (% of total costs)				40
Overhead Costs				$24,272
Net farm Income				$19,546

Enterprise	**Irrigated Lucerne - Flood**	**Fat Lambs 1st X (300 Sheep)**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 75ha @ 10dse/ha & 2.6 dse/ewe = 288 ewes	10% Dwelling, shedding & protected land	
Area (ha)	50	75	10	100
GM/ha($)	1,855.83	223.41		
Total GM ($)	$92,791	$16,755		$109,546
GM Variable Costs ($)	$73,700	$17,320		$91,020
GM Variable Costs (% of total costs)				60
Total Costs ($)				$151,700
Overhead (% of total costs)				40
Overhead Costs				$60,680
Net farm Income				$48,865

Enterprise	**Irrigated Lucerne - Flood**	**Fat Lambs 1st X (300 Sheep)**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 112.5ha @ 10dse/ha & 2.6 dse/ewe = 433 ewes	10% Dwelling, shedding & protected land	
Area (ha)	75	112.5	15	150
GM/ha($)	1,855.83	223.41		
Total GM ($)	$139,187	$25,133		$164,320
GM Variable Costs ($)	$110,550	$17,320		$127,870
GM Variable Costs (% of total costs)				60
Total Costs ($)				$213,117
Overhead (% of total costs)				40

Overhead Costs				$85,247
Net farm Income				$79,073

Enterprise	**Irrigated Lucerne - Flood**	**Fat Lambs 1st X (700 Sheep)**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 150ha @ 10dse/ha & 2.6 dse/ewe = 577 ewes	10% Dwelling, shedding & protected land	
Area (ha)	100	150	20	200
GM/ha($)	1,855.83	223.41		
Total GM ($)	$185,583	$33,511		$219,094
GM Variable Costs ($)	$147,417	$34,641		$182,058
GM Variable Costs (% of total costs)				60
Total Costs ($)				$303,430
Overhead (% of total costs)				40
Overhead Costs				$121,372
Net farm Income				$97,722

Enterprise	**Irrigated Lucerne - Flood**	**Fat Lambs 1st X (700 Sheep)**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 225ha @ 10dse/ha & 2.6 dse/ewe = 865 ewes	10% Dwelling, shedding & protected land	
Area (ha)	150	225	20	300
GM/ha($)	1,855.83	223.41		
Total GM ($)	$278,374	$50,267		$328,641
GM Variable Costs ($)	$221,100	$51,961		$273,061
GM Variable Costs (% of total costs)				60
Total Costs ($)				$455,102

Overhead (% of total costs)				40
Overhead Costs				$182,041
Net farm Income				$146,600

Enterprise	**Irrigated Lucerne - Flood**	**Fat Lambs 1st X (1400 Sheep)**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 300ha @ 10dse/ha & 2.6 dse/ewe = 1153 ewes	10% Dwelling, shedding & protected land	
Area (ha)	200	300	40	400
GM/ha($)	1,855.83	223.41		
Total GM ($)	$371,166	$67,023		$438,189
GM Variable Costs ($)	$294,800	$69,282		$364,082
GM Variable Costs (% of total costs)				60
Total Costs ($)				$606,803
Overhead (% of total costs)				40
Overhead Costs				$242,721
Net farm Income				$195,467

APPROXIMATE AREA TO ACHIEVE TARGET INCOME OF $60,000:

100 -150 HA

Option 5 – Spray Irrigated Lucerne & Fat Lambs (1st Cross Ewes – Terminal Meat Rams)

Source:

NSW DPI Farm Enterprise Budget Series for Spray Irrigated Lucerne – Northern Zone – Summer 2005/2006
Income: 15 tonnes / ha @ $3.00 - $8.50/bale & 40 bales / tonne = $4,127.00 per ha
Costs: $1,658 / ha
GM $2,469.15 / ha

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NSW DPI Farm Enterprise Budget Series for 1st Cross Ewes – Terminal Meat Rams, January, 2006

1000 ewes @ 2.6dse/ewe & 10 dse/ha	=	260ha
Income: $118,131.44 / 1000	=	$118.13/ewe
$118,131.44 / 260	=	$454.35/ha
Costs: $60,044.32 / 1000	=	$60.04/ ewe
$60,044.32 / 260	=	$230.94/ha
Gross Margins:	=	$58.09 per ewe
	=	$223.41/ha

Assume 10.0dse/ha
2.6dse/ewe

Enterprise	**Spray Irrigated Lucerne**	**Fat Lambs 1st X (160 sheep**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 30ha @ 10dse/ha & 2.6 dse/ewe = 115 ewes	10% Dwelling, shedding & protected land	
Area (ha)	20	30	4	40
GM/ha($)	2,469.15	223.41		
Total GM ($)	$49,383	$6,702		$56,085
GM Variable Costs ($)	$33,160	$6,928		$40,088
GM Variable Costs (% of total costs)				60
Total Costs ($)				$66,813
Overhead (% of total costs)				40
Overhead Costs				$26,725
Net farm Income				$29,359

Enterprise	**Spray Irrigated Lucerne**	**Fat Lambs 1st X (160 sheep**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 75ha @ 10dse/ha & 2.6 dse/ewe = 288 ewes	10% Dwelling, shedding & protected land	
Area (ha)	50	75	10	100
GM/ha($)	2,469.15	223.41		
Total GM ($)	$123,457	$16,755		$140,212
GM Variable Costs ($)	$82,900	$17,320		$100,220
GM Variable Costs (% of total costs)				60
Total Costs ($)				$167,033
Overhead (% of total costs)				40
Overhead Costs				$66,813
Net farm Income				$73,399

Enterprise	**Spray Irrigated Lucerne**	**Fat Lambs 1st X (160 sheep**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 112.5ha @ 10dse/ha & 2.6 dse/ewe = 433 ewes	10% Dwelling, shedding & protected land	
Area (ha)	75	112.5	15	150
GM/ha($)	2,469.15	223.41		
Total GM ($)	$185,186	$25,133		$210,319
GM Variable Costs ($)	$124,350	$17,320		$141670
GM Variable Costs (% of total costs)				60
Total Costs ($)				$236,116
Overhead (% of total costs)				40

Overhead Costs				$94,446
Net farm Income				$115,872

Enterprise	**Spray Irrigated Lucerne**	**Fat Lambs 1st X (160 sheep**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 150ha @ 10dse/ha & 2.6 dse/ewe = 577 ewes	10% Dwelling, shedding & protected land	
Area (ha)	100	150	20	200
GM/ha($)	2,469.15	223.41		
Total GM ($)	$246,915	$33,511		$280,426
GM Variable Costs ($)	$165,800	$34,641		$200,441
GM Variable Costs (% of total costs)				60
Total Costs ($)				$334,068
Overhead (% of total costs)				40
Overhead Costs				$133,627
Net farm Income				$146,799

Enterprise	**Spray Irrigated Lucerne**	**Fat Lambs 1st X (160 sheep**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 225ha @ 10dse/ha & 2.6 dse/ewe = 865 ewes	10% Dwelling, shedding & protected land	
Area (ha)	150	225	20	300
GM/ha($)	2,469.15	223.41		
Total GM ($)	$370,372	$50,267		$420,639
GM Variable Costs ($)	$248,700	$51,961		$300,661
GM Variable Costs (% of total costs)				60
Total Costs ($)				$501,101

Overhead (% of total costs)				40
Overhead Costs				$200,440
Net farm Income				$220,199

Enterprise	**Spray Irrigated Lucerne**	**Fat Lambs 1st X (160 sheep**	**Non-Productive Land**	**Total**
	50% crop/pa in rotation	75% grazed in rotation 300ha @ 10dse/ha & 2.6 dse/ewe = 1153 ewes	10% Dwelling, shedding & protected land	
Area (ha)	200	300	40	400
GM/ha($)	2,469.15	223.41		
Total GM ($)	$493,830	$67,023		$560,853
GM Variable Costs ($)	$331,600	$69,282		$400,882
GM Variable Costs (% of total costs)				60
Total Costs ($)				$668,136
Overhead (% of total costs)				40
Overhead Costs				$267,254
Net farm Income				$293,598

APPROXIMATE AREA TO ACHIEVE TARGET INCOME OF $60,000:

40 - 100 HA

Appendix 8: Economic Gardening Concept

Economic gardening has evolved as an economic development strategy over the past decade. The idea arose in the 1980s from the confluence of two thoughts. One was the possibility that many businesses and the people working in them would not find a new (sometimes remote) location attractive for a variety of reasons. Second, most communities have unique skills and knowledge that can underpin marketable products and services if they are nurtured in the right way.

As a result, the business recruitment strategy (or 'economic hunting') was challenged by one based on nurturing local businesses and talents ('economic gardening'). This evolution of thinking about economic development parallels that of our society from 'hunting and gathering' to the structure we know today where many identify with their location.

In economic development, economic gardening formally began in 1989 by Chris Gibbons, the director of economic development for the City of Littleton, Colorado. Chris remains at the leading edge of refining the approach, and has been joined by a growing army of economic gardeners.

Economic Gardeners is the bringing together of knowledge, information and technology to support the use of economic gardening throughout regional Australia. At the local level the program is designed to:

- Build better businesses,
- Build better economic development programs, and
- Build better communities.

The main components on the program from a business perspective is to assist businesses to get the basics right and then to nurture and entrepreneurial approach to growing the business.

The approach involves a comprehensive approach to business development based on periodic 'health checks' to establish business strengths and weaknesses. The results of the health checks are used to direct the business operators into an internet-based learning program supported by personal contact to prepare a business development plan. The implementation of the plan is then followed by on-going consultation and guidance.

At the local level, the approach can involve an economic gardening group of non-competing businesses. This facilitates group learning, problem solving and idea development all focused on building each others businesses. Such an approach is suggested for Forbes.

To find out more about the economic gardening program visit the website:
www.economicgardeners.com.au

Appendix 9: Lachlan River Water Quality and River Flow Objectives

Lachlan River
Water Quality Objectives explained

This appendix explains each of the eleven Water Quality Objectives (WQOs) developed for NSW rivers and estuaries, and provides guideline levels to assist water quality planning and management. Guideline levels are not provided for industrial water supplies as requirements are industry specific. It has been sourced from the Department of Environment and Climate Change website at http://www.environment.nsw.gov.au/ieo/Lachlan/report-02.htm#P87_15014

See the WQOs that apply to each part of the Lachlan River catchment.

Achieving each WQO will mean improving poor water quality or maintaining existing good water quality.

Objectives consist of three parts: *environmental values*, their *indicators* and their *guideline levels*. For example, if the objective is to protect s*econdary contact recreation* (environmental value), we need to keep the *faecal coliform levels* in the water (the indicator) below a *specified number* or guideline level.

The objectives comprise community-based environmental values and their associated national criteria drawn from the ANZECC 2000 Guidelines. They provide the statewide context for taking this work forward into catchment action plans, regional strategies and local environmental plans.

Tailoring Water Quality Objectives to local conditions

Local water quality varies naturally because of various factors, including the type of land the waters are draining (e.g. soils, slope), or rainfall and runoff patterns (e.g. ephemeral or permanent streams). Different land use and land management practices also affect water quality. Local WQOs must take account of these variations, particularly for the environmental value of aquatic ecosystems.

The ANZECC 2000 Guidelines move away from setting fixed single number water quality criteria, and emphasise water quality criteria that can be determined on a case by case basis, according to local environmental conditions. This is done through the use of local reference data and risk based decision frameworks — see section 2.2.1.4 *Tailoring guidelines for local conditions (ANZECC 2000 Guidelines)*. The ANZECC 2000 Guidelines establish *default trigger values* that are set conservatively and can be used as a benchmark for assessing water quality. Further refinement of the trigger values may be needed to take account of local conditions, especially for aquatic ecosystems and particularly in places, or for issues, requiring priority action.

Trigger levels that have been locally refined must still protect the environmental value and drive local protection or improvement of water quality. This should be consistent with the approach advocated by the ANZECC 2000 Guidelines of focusing on the actual issue (or process) that is a risk or potential risk to the Environmental Value(s). The selection of the indicator and derivation of the trigger value should trigger action or investigation before the Environmental Value is compromised.

One example of refinement of trigger values for local or catchment conditions is the development of salinity targets for rivers. These are given in catchment plans (see www.cma.nsw.gov.au), and considered within the frameworks of the NSW Salinity Strategy and the Murray-Darling Basin Salinity Management Strategy.

The key indicators and trigger values used here are examples of some of the indicators listed in the *ANZECC 2000 Guidelines.* Key indicators for each environmental value are listed below.

Downstream impacts

Planning and management decisions need to recognise that activities and decisions made upstream affect water quality downstream. Where this involves cumulative impacts for nutrients and sediments, the best approach may be to develop load targets for the catchment (see ANZECC 2000 Guidelines).

Water Quality Objectives

Meeting water quality levels suitable for local ecosystems is generally the basis for protecting the other environmental values, which are the uses people have for water.

Aquatic ecosystems

Maintaining or improving the ecological condition of waterbodies and their riparian zones over the long term

Where the objective applies

- This objective applies to all natural waterways.
- High level protection of aquatic ecosystems applies to waters in and immediately upstream of national parks, nature reserves, state forests, drinking water catchments and high-conservation-value areas. This reflects their largely unmodified aquatic ecosystems, value in providing natural sources of high-quality drinking water, and high levels of recreational use.
- Even in areas greatly affected by human use, continuing improvement is needed towards healthier, more diverse aquatic ecosystems.
- Water quality in artificial watercourses (e.g. drainage channels) should ideally be adequate to protect native species that may use them, as well as being adequate for the desired human uses. However, full protection of aquatic ecosystems may not be achievable in the short-term in some artificial watercourses.
- Artificial watercourses should meet the objectives (including protection of aquatic ecosystems) applying to natural waterways at any point where water from the artificial watercourse flows into a natural waterway.

Examples of key indicators and their numerical criteria (default trigger values)

The following table includes examples of some of the key water quality indicators and related numerical criteria (default trigger values) selected from the ANZECC 2000 Guidelines, relevant to assessing and monitoring the health of aquatic ecosystems. To use and interpret these guidelines, see supporting information below and the ANZECC 2000 Guidelines. The booklet "Using the ANZECC Guidelines and Water Quality Objectives in NSW" explains key terminology and concepts used in the guidelines, in the context of NSW policy.

Aquatic ecosystems	
Indicator	**Numerical criteria (trigger values)**
Total phosphorus	Upland rivers: 20 µg/L Lowland rivers: 25 µg/L for rivers flowing to the coast; 50 µg/L for rivers in the Murray-Darling Basin Lakes & reservoirs: 10 µg/L Estuaries: 30 µg/L
Total nitrogen	Upland rivers: 250 µg/L Lowland rivers: 350 µg/L for rivers flowing to the coast; 500 µg/L for rivers in the Murray-Darling Basin Lakes & reservoirs: 350 µg/L Estuaries: 300µg/L
Chlorophyll-a	Upland rivers: not applicable Lowland rivers: 5 µg/L Lakes & reservoirs: 5 µg/L. Estuaries: 4 µg/L.
Turbidity	Upland rivers: 2–25 NTU (see supporting information) Lowland rivers: 6–50 NTU (see supporting information) Lakes & reservoirs: 1–20 NTU Estuaries: 0.5–10 NTU
Salinity (electrical conductivity)	Upland rivers: 30–350 µS/cm (see supporting information) Lowland rivers: 125–2200 µS/cm (see supporting information)
Dissolved oxygen	Upland rivers: 90–110% Lowland rivers: 85–110%

	Freshwater lakes & reservoirs: 90–110% Estuaries: 80–110% Note: Dissolved oxygen values were derived from daytime measurements. Dissolved oxygen concentrations may vary diurnally and with depth. Monitoring programs should assess this potential variability.
pH	Upland rivers: 6.5–8.0 Lowland rivers: 6.5–8.5 Freshwater lakes & reservoirs: 6.5–8.0 Estuaries: 7.0–8.5 Changes of more than 0.5 pH units from the natural seasonal maximum or minimum should be investigated. See supporting information
Temperature	See ANZECC 2000 Guidelines, table 3.3.1.
Chemical contaminants or toxicants	See ANZECC 2000 Guidelines, chapter 3.4 and table 3.4.1.
Biological assessment indicators	This form of assessment directly evaluates whether management goals for ecosystem protection are being achieved (e.g. maintenance of a certain level of species diversity, control of nuisance algae below a certain level, protection of key species, etc). Many potential indicators exist and these may relate to single species, multiple species or whole communities. Recognised protocols using diatoms and algae, macrophytes, macroinvertebrates, and fish populations and/or communities may be used in NSW and interstate (e.g. AusRivAS).

Supporting information

- The ANZECC 2000 Guidelines advocate a risk-based approach to water quality assessment and management. That is, the intensity of assessment of current water quality status or impacts on water quality should reflect the risk of impacts on the achievement/protection of the water quality objective.

- Trigger values are the numeric criteria that if exceeded indicate potential for harmful environmental effects to occur. The default trigger values provided in ANZECC 2000 Guidelines are essentially conservative and precautionary. If they are not exceeded, a very low risk of environmental damage can be assumed. If they are not exceeded, further investigation is "triggered" for the pollutant concerned. Assessing whether the exceedance means a risk of impact to the Water Quality Objective requires site-specific investigation, using decision trees provided in the Guidelines.

- For Protection of Aquatic Ecosystems in NSW, the ANZECC 2000 Guidelines provide default trigger values for major physico-chemical stressors in Tables 3.3.2 and 3.3.3 (pages 3.3-10 & 11) and for Toxicants in Table 3.4.1 (page 3.4-5).

- The ANZECC 2000 Guidelines define upland streams as those above 150m altitude. However, recent information suggests that for the NSW Murray-Darling Basin 250m may be a scientifically more appropriate altitudinal trigger to distinguish between lowland and upland rivers.

- Note that salinity levels vary widely, both within and between systems. Locally applicable salinity concentration and load targets are given in catchment plans, within the frameworks of the NSW Salinity Strategy and the Murray-Darling Basin Salinity Management Strategy 2001-2015.

- Note for turbidity trigger values: In general values in the lower part of the range will be found in rivers and streams during low flows and/or in more vegetated catchments. Values in the higher part of the range will be found in rivers and streams in high flows and lower in the catchment (particularly inland catchments). For lakes and reservoirs, in general the higher values will be found in waterbodies that are shallow or in areas with dispersive soils.

- Note that pH varies naturally. Whilst 6.5-8.5 is the default trigger range, values outside this range should be investigated to assess whether they reflect natural variation. For example, some streams in sandstone areas have natural pH ranges as low as 4.5.
- The approach to protecting the aquatic ecosystem should consider the whole range of interacting factors - such as variability of water quality over time, sediment interactions, river flow, local geology, land use, the needs of sensitive habitats, and people's uses for water.
- Assessing ecosystem health also requires using a range of indicators and considering local modifying factors-such as basalt soils that result in naturally higher nutrient levels, or estuary opening patterns that affect water quality. However, information on a full range of indicators may not be available from regular monitoring.
- Although modified, many non-pristine environments contain important aquatic ecosystems. Well-functioning aquatic ecosystems also benefit people using these waters, such as by reducing blue-green algal blooms.
- Reducing diffuse pollutant loads during rainfall and runoff periods should be a key focus for improving water quality. It is also important in managing longer term impacts, such as sedimentation and polluted sediments.
- The choice of toxicant indicators for use in each management situation is related to known past or current activities. Impacts are detected by measuring water, sediment or biota. Natural sources should also be considered.
- Protecting aquatic ecosystems requires mimicking natural river flow patterns as closely as possible (see Section 5).

Visual amenity
Aesthetic qualities of waters

Where the objective applies

- The objective applies to all waters, particularly those used for aquatic recreation and where scenic qualities are important.

Examples of key indicators and their numerical criteria

Indicators used to assess and monitor visual amenity are summarised in the table.

Visual amenity	
Indicator	**Numerical criteria (trigger values)**
Visual clarity and colour	Natural visual clarity should not be reduced by more than 20%. Natural hue of the water should not be changed by more than 10 points on the Munsell Scale. The natural reflectance of the water should not be changed by more than 50%.
Surface films and debris	Oils and petrochemicals should not be noticeable as a visible film on the water, nor should they be detectable by odour. Waters should be free from floating debris and litter.
Nuisance organisms	Macrophytes, phytoplankton scums, filamentous algal mats, blue-green algae, sewage fungus and leeches should not be present in unsightly amounts.

Supporting information

- Visual amenity will be improved by protecting aquatic ecosystems and improving stormwater management.
- Visual amenity also needs to be protected to maintain water quality for primary and secondary contact recreation.

Secondary contact recreation
Maintaining or improving water quality for activities such as boating and wading, where there is a low probability of water being swallowed

Where the objective applies

- This objective applies to all waters but may not be achievable for some time in some areas.
- Secondary contact recreation applies in waterways where communities do not require water quality of a level suited to primary contact recreation, or where primary contact recreation will be possible only in the future.

Examples of key indicators and their numerical criteria

Indicators used to assess and monitor water for secondary contact recreation are summarised in the table.

Secondary contact recreation	
Indicator	**Numerical criteria (trigger values)**
Faecal coliforms	Median bacterial content in fresh and marine waters of < 1000 faecal coliforms per 100 mL, with 4 out of 5 samples < 4000/100 mL (minimum of 5 samples taken at regular intervals not exceeding one month).
Enterococci	Median bacterial content in fresh and marine waters of < 230 enterococci per 100 mL (maximum number in any one sample: 450-700 organisms/100 mL).
Algae & blue-green algae	< 15 000 cells/mL
Nuisance organisms	Use visual amenity guidelines. Large numbers of midges and aquatic worms are undesirable.
Chemical contaminants	Waters containing chemicals that are either toxic or irritating to the skin or mucous membranes are unsuitable for recreation. Toxic substances should not exceed values in tables 5.2.3 and 5.2.4 of the ANZECC 2000 Guidelines.
Visual clarity and colour	Use visual amenity guidelines.
Surface films	Use visual amenity guidelines.

Primary contact recreation
Maintaining or improving water quality for activities such as swimming in which there is a high probability of water being swallowed

Where the objective applies

- This objective applies in the immediate future to waters within and immediately upstream of recognised recreation sites. For many other waters, this is a long-term objective.
- Secondary contact recreation levels should apply in areas where primary contact recreation, such as swimming, is unlikely to be achieved in the immediate future, owing to pollution.

Examples of key indicators and their numerical criteria

Indicators used to assess and monitor water for primary contact recreation are summarised in the table.

Primary contact recreation	
Indicator	**Numerical criteria (trigger values)**
Turbidity	A 200 mm diameter black disc should be able to be sighted horizontally from a distance of more than 1.6 m (approximately 6 NTU).
Faecal coliforms	Beachwatch considers waters are unsuitable for swimming if:

	the median faecal coliform density exceeds 150 colony forming units per 100 millilitres (cfu/100mL) for five samples taken at regular intervals not exceeding one month, or the second highest sample contains equal to or greater than 600 cfu/100mL (faecal coliforms) for five samples taken at regular intervals not exceeding one month. ANZECC 2000 Guidelines recommend: Median over bathing season of < 150 faecal coliforms per 100 mL, with 4 out of 5 samples < 600/100 mL (minimum of 5 samples taken at regular intervals not exceeding one month).
Enterococci	Beachwatch considers waters are unsuitable for swimming if: the median enterococci density exceeds 35 cfu/100mL for five samples taken at regular intervals not exceeding one month, or the second highest sample contains equal to or greater than 100 cfu/100mL (enterococci) for five samples taken at regular intervals not exceeding one month. ANZECC 2000 Guidelines recommend: Median over bathing season of < 35 enterococci per 100 mL (maximum number in any one sample: 60-100 organisms/100 mL).
Protozoans	Pathogenic free-living protozoans should be absent from bodies of fresh water. (Note, it is not necessary to analyse water for these pathogens unless temperature is greater than 24 degrees Celsius).
Algae & blue-green algae	< 15 000 cells/mL
Nuisance organisms	Use visual amenity guidelines. Large numbers of midges and aquatic worms are undesirable.
pH	5.0-9.0 (see supporting information)
Temperature	15°-35°C for prolonged exposure.
Chemical contaminants	Waters containing chemicals that are either toxic or irritating to the skin or mucus membranes are unsuitable for recreation. Toxic substances should not exceed the concentrations provided in tables 5.2.3 and 5.2.4 of the ANZECC 2000 Guidelines 2000.
Visual clarity and colour	Use visual amenity guidelines
Surface films	Use visual amenity guidelines

Supporting information

- Maintain water quality in all areas where water quality levels for swimming are currently achieved.
- The immediate focus should be on improving swimming water quality at recognised recreation sites, with an emphasis on meeting targets during the bathing season.
- Over the longer term, water quality will need to improve to meet swimming objectives at more locations.
- Bacterial water quality tests are used to indicate the possible presence of human pathogens. DEC considers that the use of faecal coliforms and enterococci as indicators provides a suitable expression of the disease risks presented by contaminated bathing waters and allows for international comparisons to be made. It will, however, monitor closely scientific developments in this area.
- Achieving water quality levels that are safe for swimming will also result in safer water quality for non-potable uses in homesteads.
- Note that pH in ambient waterbodies varies naturally across the landscape and with time. The goal should be to retain the natural range of pH.

- The National Health and Medical Research Council released new guidelines for recreational water quality in 2005. However, these have not yet been adopted for use in NSW. Contact Beachwatch or NSW Health public health units for current information on recommended guidelines.

Livestock water supply

Protecting water quality to maximise the production of healthy livestock

Where the objective applies

- This objective applies to all surface and groundwaters used to water stock.

Examples of key indicators and their numerical criteria

Indicators used to assess and monitor water for livestock water supply are summarised in the table.

Livestock water supply	
Indicator	Numerical criteria (trigger values)
Algae & blue-green algae	An increasing risk to livestock health is likely when cell counts of microcystins exceed 11 500 cells/mL and/or concentrations of microcystins exceed 2.3 µg/L expressed as microcystin-LR toxicity equivalents.
Salinity (electrical conductivity)	Recommended concentrations of total dissolved solids in drinking water for livestock are given in table 4.3.1 (ANZECC 2000 Guidelines).
Thermotolerant coliforms (faecal coliforms)	Drinking water for livestock should contain less than 100 thermotolerant coliforms per 100 mL (median value).
Chemical contaminants	Refer to Table 4.3.2 (ANZECC 2000 Guidelines) for heavy metals and metalloids in livestock drinking water. Refer to Australian Drinking Water Guidelines (NHMRC and NRMMC 2004) for information regarding pesticides and other organic contaminants, using criteria for raw drinking water.

Supporting information

- Poor water quality can limit livestock productivity.
- This objective is generally attainable if aquatic ecosystems are protected.

Irrigation water supply

Protecting the quality of waters applied to crops and pasture

Where the objective applies

- This objective applies to all current and potential areas of irrigated crops, both small- and large-scale.
- Local requirements for irrigation water quality, such as salinity, apply.

Examples of key indicators and their numerical criteria

Indicators used to assess and monitor water for irrigation water supply are summarised in the table.

Irrigation water supply	
Indicator	**Numerical criteria (trigger values)**
Algae & blue-green algae	Should not be visible. No more than low algal levels are desired to protect irrigation equipment.
Salinity (electrical conductivity)	To assess the salinity and sodicity of water for irrigation use, a number of interactive factors must be considered including irrigation water quality, soil properties, plant salt tolerance, climate, landscape and water and soil management. For more information, refer to Chapter 4.2.4 of ANZECC 2000

	Guidelines.
Thermotolerant coliforms (faecal coliforms)	Trigger values for thermotolerant coliforms in irrigation water used for food and non-food crops are provided in table 4.2.2 of the ANZECC Guidelines
Heavy metals and metalloids	Long term trigger values (LTV) and short-term trigger values (STV) for heavy metals and metalloids in irrigation water are presented in table 4.2.10 of the ANZECC 2000 Guidelines.

Supporting information

- Long-term effects of irrigation with saline water on soils need to be considered.
- A major consideration for irrigation water supply is the sodium adsorption ratio (SAR), which indicates the level of excess sodium in the water. If the SAR is high, the water may have an adverse effect on soil structure, even though the total salinity of the water may be low.
- A variety of plant pathogens can be distributed by irrigation water including nematodes, fungi, viruses and bacteria. However, in the absence of sufficient data, there are no guidelines for controlling plant pathogens.

Homestead water supply

Protecting water quality for domestic use in homesteads, including drinking, cooking and bathing

Where the objective applies

- The objective applies to all homesteads that draw water from surface and groundwaters for domestic needs, including drinking water.
- The NSW Health Department advises that water for domestic use in homesteads should comply with the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004) at the point of use, regardless of source.

Examples of key indicators and their numerical criteria

Key indicators for drinking water quality at the point of use in the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004) are set out below. Monitoring should also be considered for health-related parameters of local concern. Communities should refer to the *Australian Drinking Water Guidelines* (and updates) [www.nhmrc.gov.au/publications/synopses/eh19syn.htm] for information on additional parameters.

Homestead water supply	
Indicator	**Numerical criteria (trigger values)**
Blue-green algae	Recommend twice weekly inspections during danger period for storages with history of algal blooms. No guideline values are set for cyanobacteria in drinking water. In water storages, counts of < 1000 algal cells/mL are of no concern. >500 algal cells/mL - increase monitoring. >2000 algal cells/mL - immediate action indicated; seek expert advice. >6500 algal cells/mL - seek advice from health authority
Turbidity	5 NTU; <1 NTU desirable for effective disinfection; >1 NTU may shield some micro-organisms from disinfection. (see supporting information)
Total dissolved solids	< 500 mg/L is regarded as good quality drinking water based on taste. 500-1000 mg/L is acceptable based on taste. >1000 mg/L may be associated with excessive scaling, corrosion and unsatisfactory taste.
Faecal coliforms	0 faecal coliforms per 100 mL (0/100 mL). If micro-organisms are detected in water, advice should be sought from the relevant health authority. See also the Guidelines for Microbiological Quality in relation to Monitoring, Monitoring Frequency and Assessing Performance in the *Australian Drinking Water Guidelines* (NHMRC & ARMCANZ 2004).

pH	6.5-8.5 (see supporting information)
Chemical contaminants	See Guidelines for Inorganic Chemicals in the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004).

Supporting information

- For an individual water supply, the emphasis should be on selecting the best quality source water available, and on protecting its quality by the use of barrier systems and maintenance programs. Whatever the source (ground, surface or tank water), householders should assure themselves that the water is safe to drink.
- Information on the quality of surface or groundwater may be available from state and local governments conducting monitoring programs. If not, individuals should consider having the water tested for the indicators above and any key health characteristics identified as being of local concern. Where raw water quality does not meet the requirements of the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004), a point-of-use device may be needed to treat the water.
- The NSW Private Water Supplies Guidelines provide information regarding monitoring and treatment of private supplies serving the public. These are available from NSW Health.
- In many cases it will not be possible for water at individual homesteads to comply with the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004) without some form of treatment. Many homesteads traditionally take drinking water untreated from local streams. Even in pristine areas there are health risks associated with this practice. The Government recommends that drinking water, including water for cooking and bathing, is at least disinfected before use.
- Effective communication and education strategies may be needed to ensure that householders understand that when water is not of a potable quality, precautionary measures should be taken (e.g. avoiding ingestion, boiling drinking water). Such water may be of sufficient quality to be used for washing clothes, gardening, toilet-flushing and other non-potable uses.
- Many homesteads rely on tank water for drinking and cooking. The enHealth Council's, *Guidance on the Use of Rainwater Tanks* (enHealth 2004) is endorsed by the NSW Health Department and provides useful information on the safe operation of rainwater tanks. Information is also available in the NSW Health Rainwater Tanks Brochure (PDF 98KB, from www.health.nsw.gov.au/pubs/r/pdf/rainwater020067.pdf).
- Turbidity and pH in ambient waters are likely to vary outside the criteria above. Treatment at the point of use is likely to be necessary to achieve criteria above. It is advisable to maintain pH within this range to protect plumbing and fittings from corrosion and scale.


Drinking water - Disinfection only, or


Drinking water - Clarification and disinfection


Drinking water - Groundwater

Refers to the quality of drinking water drawn from the raw surface and groundwater sources before any treatment

Where the objectives apply

- These objectives apply to all current and future licensed offtake points for town water supply and to specific sections of rivers that contribute to drinking water storages or immediately upstream of town water supply offtake points. The objective also applies to subcatchments or groundwaters used for town water supplies.

Examples of key indicators and their numerical criteria

Key indicators for raw water for drinking water supply that is to undergo coarse screening only are listed below. These indicators are drawn from the National Health and Medical Research Council *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004).

Note that a wide range of treatment technologies are available (e.g. coagulation, flocculation, filtration, ion exchange, reverse osmosis, carbon adsorption columns) that enable the production of acceptable drinking water from almost any raw water. The ANZECC 2000 Guidelines do not specify criteria for the many types of water quality that could be involved.

Refer to the NSW Groundwater Protection Policy, (DLWC 1998b) for information on the management of groundwater quality.

All drinking water should comply with the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004) at the point of use. Refer to the Summary in the *Australian Drinking Water Guidelines*.

Drinking water	
Indicator	**Numerical criteria (trigger values)**
Blue-green algae	Recommend twice weekly inspections during danger period for storages with history of algal blooms. >500 algal cells/mL - increase monitoring. < 2000 algal cells/mL - water may be used for potable supply. >2000 algal cells/mL - immediate action indicated; seek expert advice. >6500 algal cells/mL - seek advice from health authority. >15 000 algal cells/mL - may not be used for potable supply except with full water treatment, which incorporates filtration and activated carbon. *Source: Australian Drinking Water Guidelines (NHMRC & NRMMC 2004).*
Turbidity	Site-specific determinant.
Salinity (electrical conductivity)	<1500 µS/cm > 800 µS/cm causes a deterioration in taste.
Faecal coliforms*	0 faecal coliforms per 100 mL (0/100 mL)
Total coliforms*	95% of samples should be 0 coliforms/ 100 mL throughout the year. Up to 10 coliform organisms may be accepted occasionally in 100 mL. Coliform organisms should not be detected in 100 mL in any two consecutive samples.
Dissolved oxygen	> 6.5 mg/L (> 80% saturation)
pH	6.5-8.5
Chemical contaminants	See ANZECC 2000 guidelines, section 6.2.2.

* Values given are NHMRC criteria for raw waters before disinfection or clarification. Raw waters can have concentrations of faecal coliforms above the NHMRC criteria, even in pristine ecosystems. Slightly greater faecal coliform or total coliform contamination, may therefore be acceptable in raw waters that are to be disinfected before delivery to the consumer. (Faecal coliform criteria used in Victoria have suggested that for raw waters requiring only low-level treatment, natural background levels of 95% of samples should have <10 faecal coliforms/100 mL. For high-level treatment, 95% of samples should have <100 faecal coliforms/100 mL.) For a full discussion of drinking water system management and criteria, see the *Australian Drinking Water Guidelines* (NHMRC & NRMMC 2004).

Supporting information

- Refer to the summary of guideline values in the *Australian Drinking Water Guidelines* (section 10.8)
- While the *Australian Drinking Water Guidelines* 2004 do not recommend a specific raw water quality for treatment, the Framework for Management of Drinking Water Quality has been developed as a preventative risk management approach for the management of water quality from catchment to consumer.

- The Guidelines advocate "barrier systems" involving catchment management, appropriate treatment and monitoring to verify quality.
- The focus is on improving the quality of raw drinking water sources to protect public health and minimise treatment costs. In some cases, this will require controlling or removing pollutants from dedicated drinking water subcatchments, from upstream of river offtakes and from groundwater systems used for drinking water.
- Protection of zones upstream of raw water or reservoir inlets is essential, but may be feasible only over limited distances. The location and size of offtake zones will need to be defined based on further local community consultation. Upstream conditions will also need to be considered (e.g. existing land use, pollutant sources, climatic and river flow factors).
- The existence of an offtake zone acts as an indication of the need to protect drinking water at the point of supply and to identify upstream threats to those supplies.
- Some waterbodies used as a raw drinking water source may provide water of high quality that needs only disinfection before use. These waterbodies should be regarded as having a high environmental value and should be protected.
- Many town water supplies rely on pumping groundwater from aquifers or river alluvium.
- Water quality tests for faecal coliform bacteria are used as an indicator of the possible presence of human pathogens. Improved tests are being developed.
- The NSW Health Private Water Supplies Guidelines provide information regarding monitoring and treatment of private supplies serving the public.
- It is advisable to maintain pH within the range above at the point of supply, to protect plumbing and fittings from corrosion and scale.

Aquatic foods (cooked)

Refers to protecting water quality so that it is suitable for the production of aquatic foods for human consumption and aquaculture activities.

(Note: The ANZECC 2000 Guidelines lists this environmental value as Aquaculture and human consumption of aquatic foods)

Where the objective applies

- The objective applies to all waters where aquatic foods are taken for non-commercial and commercial harvesting.

Examples of key indicators and their numerical criteria

Indicators used to assess and monitor water quality so that it is suitable for the production of aquatic foods are summarised in the following table. Other indicators are listed in the ANZECC 2000 Guidelines and Food Standards Code (ANZFA 1996 and updates available at www.anzfa.gov.au).

Aquatic foods	
Indicator	**Numerical criteria (trigger values)**
Algae & blue-green algae	No guideline is directly applicable, but toxins present in blue-green algae may accumulate in other aquatic organisms.
Faecal coliforms	*Guideline in water for shellfish:* The median faecal coliform concentration should not exceed 14 MPN/100mL; with no more than 10% of the samples exceeding 43 MPN/100 mL. *Standard in edible tissue:* Fish destined for human consumption should not exceed a limit of 2.3 MPN *E Coli* /g of flesh with a standard plate count of 100,000 organisms /g.
Toxicants (as applied to aquaculture activities)	Metals: Copper: less than 5 µgm/L.

	Mercury: less than 1 µgm/L. Zinc: less than 5 µgm/L. Organochlorines: Chlordane: less than 0.004 µgm/L (saltwater production) PCB's: less than 2 µgm/L.
Physico-chemical indicators (as applied to aquaculture activities)	Suspended solids: less than 40 micrograms per litre (freshwater) Temperature: less than 2 degrees Celsius change over one hour.

Supporting information

- To protect the health of human consumers of aquatic foods (whether derived from aquaculture, commercial, recreational or indigenous fishing) the ANZECC 2000 Guidelines are intended to be used in conjunction with the Food Standards Code (ANZFA 1996 and updates available at www.anzfa.gov.au).

- The indicators are to assist managers to minimize the exposure of human consumers of aquatic food species (eg recreational fishermen) to bacteria-borne disease. In the case of commercial harvesting and cultured species the relevant requirements of NSW SafeFoods and the NSW Shellfish Projects Operations Manual need to be met. Also NSW Health recommends against the consumption of raw shellfish harvested on a non-commercial basis. All such shellfish should be thoroughly cooked to kill pathogens and minimize the risk of food poisoning. Cooking, however, cannot remove the risk of algae toxins or chemical contaminants.

- There is a need to identify all aquatic food sources to ensure that appropriate management is in place to protect the human consumer.

- The condition of the waterway must be suitable for both individual species and their habitats and must protect consumers from chemical contaminants that may accumulate in the tissues of aquatic foods or from human pathogens. Many waterways in NSW produce aquatic foods that are suitable for eating after cooking.

- NSW Health should be consulted about issues that have a direct public health impact and concerns about the safety of aquatic foods should be brought to the attention of local public health units.

- The potential for members of the public, including those in Aboriginal communities, who gather shellfish for subsistence or non-commercial purposes to be exposed to pathogens by eating raw shellfish needs to be considered.

- The potential presence of microbial pathogens (faecal bacteria, viruses, *Cryptosporidium*), algal and biotoxins and chemical contaminants needs to be considered when assessing the risks associated with shellfish consumption. In addition, an understanding of the catchment and actual and potential pollution sources that may impact on the water quality is essential.

- Water quality tests for faecal coliform bacteria are used as an indicator of the possible presence of human pathogens. Improved tests are being developed.

Industrial water supplies

The high economic value of water taken from rivers and lakes for use by industry needs recognition in water quality planning and management. It has been identified as an important environmental value through community consultation.

As industry water supply needs are diverse, relevant water quality criteria are not summarised here and the ANZECC 2000 Guidelines do not provide guidance on the water quality needed for various industries. Sources of water used for industry invariably have other environmental values, which mostly need water of a higher quality than that needed by industry. Further, individual industries generally have the capacity to monitor and treat the available water resources to meet their own needs.