



SHIRE OF WAROONA

Local Planning Strategy



March 2009

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SECTION 1 – STRATEGY CONTEXT

1 INTRODUCTION

The Town Planning Regulations require that if a local government “envisages the zoning or classification of land” then it shall prepare a Local Planning Strategy.

The Town Planning Regulations require that a Strategy shall:

- a. set out the long-term planning directions for the local government.
- b. apply State and regional planning policies.
- c. provide the rationale for the zones and other provisions of the Scheme.

1.1 Nature of the Strategy

The Strategy is a vehicle for:

- a. collating information that addresses the land use matters within the Shire for the next ten to twelve years; and
- b. formulating strategies to address land use matters.

The Strategy is a working document for all interested parties but particularly the Shire of Waroona. It is intended that it would be subject to review.

1.2 Target Length of Strategy

The target timeline of the Strategy is 15 years (2021), with consideration given to the longer term needs of the Shire (2025-2035).

1.3 Strategy Area

The Strategy area is the whole of the municipal district of the Shire of Waroona. The Shire of Waroona is located in the Peel Region of Western Australia and is bound to the west by the Indian Ocean, to the

north by the City of Mandurah and Shire of Murray, to the east by the Shire of Boddington and the south by the Shire of Harvey. The Shire extends in an east-west direction 50 kilometres and 20-25 kilometres from north to south. The Shire has a physical area of approximately 835km² and includes the townsites of Waroona, Hamel and Preston Beach plus the concentration of rural-residential or ‘hobby farm’ development in Lake Clifton.

A map detailing the locality of the Shire of Waroona in relation to its surrounding region is at Figure 1.

1.4 Structure of the Strategy

The structure of the Strategy is as follows.

Section 1 outlines the context to the Strategy. This includes the Regional Planning Context, the Local Planning Context, the Physical Context and the Socio-Economic Context.

Section 2 contains the Strategy. Chapter 6 contains the principles to guide the Strategy. Chapters 7-15 detail the issues and solutions to the major land use considerations. The final chapter is a precinct by precinct detailing of the Land Use Categories and the major considerations for each land use.

The Strategy Map is attached at the rear of the Strategy. (Appendix 1) The proposed arrangement of Land Use Categories is displayed, plus other significant land use features.

1.5 Nomenclature

This Local Planning Strategy shall be referred to herein as ‘the Strategy’.

The Strategy uses the word ‘Waroona’ for the town of Waroona. Where the information applies to the Shire of Waroona, then ‘Shire’ is used.

1.6 Monitoring and Review

The Strategy shall be monitored to ensure it is still reflective of the needs of the Shire and shall be reviewed if necessary, but not greater than five years after it is first effected.

2 STATE & REGIONAL PLANNING CONTEXT

One of the key requirements of the Strategy is to apply State and Regional planning policies, or provide a rationale for their non-application. There are several State and regional planning documents that apply to the Shire.

2.1 State Planning Strategy (1997)

This provides an overarching framework for other State policies and “provide(s) a strategic guide for land use planning through to the year 2029”. The Strategy sets out the following five principles to guide planning in Western Australia:

1. Environmental principle: To protect and enhance the key natural and cultural assets of the State and deliver to all Western Australians a high quality of life which is based on environmentally sustainable principles.
2. Community principle: To respond to social changes and facilitate the creation of vibrant, accessible, safe and self-reliant communities.
3. Economic principle: To actively assist in the creation of regional wealth, support the development of new industries and encourage economic activity in accordance with economic development principles.
4. Infrastructure principle: To facilitate strategic development by ensuring land use, transport and public utilities are mutually supportive.
5. Regional development principle: To assist the development of regional Western Australia by taking account of the region’s special assets and accommodating the individual requirements of each region.

The State Planning Strategy proposes that the South West Urban System (including the Shire) accommodate the expected growth in the South West Region over the next 25 years. Key aspects of the South

West Urban System, as proposed in the Strategy and as they relate to the Shire are as follows:

1. The identification of Waroona as an urban settlement, with an indicative population in 2029 of between 5,000 and 10,000.
2. The identification of the South Western Railway corridor as a commuter rail link.
3. The identification of the Old Coast Road/Peel Deviation and South Western Highway as strategic transport corridors.
4. The identification of the Wagerup Refinery as a strategic industrial area.
5. The identification of portions of the rural land in the Shire, principally the irrigation area, as agricultural resource priority management areas.
6. The identification of large parts of the Shire to the east of the Darling Escarpment, and in and around the coast and lakes in the west of the Shire, as either environmental area or state forest.

The vision outlined in the State Planning Strategy for the Peel Region is as follows:

“In the next three decades the Peel Region will continue to grow, with Mandurah being the major residential and commercial area. A series of lifestyle-based rural villages and development areas will be established. Emphasis will be placed on containing urbanisation, protecting estuarine and coastal areas and preserving the rural backdrop and environmental attributes to cater for lifestyle choices. The local economy will provide a range of employment opportunities for the expanded population, with significant areas of resource processing, mining, tourism, sustainable agriculture and other service industries. Peel will have strong and efficient inter-regional transport links, especially to the Perth and South-West regions.”

2.2 Statement of Planning Policy No.2.0 – Environment and Natural Resources Policy (2003)

This policy sets out the principles and considerations that will be applied by the Shire of Waroona to integrate environment and natural resource management within broader land use planning and decision making to protect, conserve and enhance the Shire's natural environment and promote and assist in the sustainable use and management of the Shire's natural resources.

2.3 Statement of Planning Policy No.2.1 - The Peel-Harvey Coastal Plain Catchment (1992)

This Policy sets out provisions to “ensure that land use changes within the Peel-Harvey Estuarine System likely to cause environmental damage to the estuary are brought under planning control and prevented.”

SPP2.1 applies to the portion of the Peel Harvey Catchment within the Shire, which is generally between the base of the Darling Escarpment and Old Coast Road. The area affected by SPP2.1 is identified in Figure 2.

The key implications of SPP2.1 for the Shire may be summarised as follows:

1. Unless alternative means of sewerage disposal are acceptable to the Environmental Protection Authority and Health Department, land rezoned for urban development, industrial or commercial development must be connected to reticulated sewerage.
2. Proposed changes in zoning and land use shall be assessed in the context that the change will have on nutrient flows into the Estuary.
3. Land used for intensive agriculture shall be managed to minimise the flow of nutrients into the Estuary and use of land for intensive agriculture should be subject to planning approval.

2.4 Statement of Planning Policy No.2.5 - Agricultural and Rural Land Use Planning (2002)

The fundamental principles of this Policy are:

- a. The State's priority agricultural land resource should be protected.
- b. Rural settlement opportunities should be provided if sustainable and of benefit to the community – that is, they benefit and support existing communities and have ready access to appropriate community services and infrastructure.
- c. The potential for land use conflict should be minimised.
- d. The State's natural resources should be carefully managed.

SPP2.5 sets out some specific requirements that the Strategy should address, as follows:

- a. Express the vision of the local government and identify proposals for future development of the district.
- b. Provide a mechanism for the community to contribute to land use planning.
- c. Plan to ensure compatibility of land uses.
- d. Identify and protect key natural resources, including water and its dependent ecosystem, vegetation, minerals and basic raw materials.
- e. Develop subdivision and development criteria for the identified agricultural, tourist and closer settlement areas.
- f. Provide guidelines for land planning and development in water catchments, water resource management areas and flood affected land.
- g. Provide a clear strategy for settlement.
- h. Identify areas suitable for closer settlement in rural areas.
- i. Providing a guide for future land use, zoning, subdivision and development within the settlement areas identified.

- j. Determine the preferred pattern of agricultural land use.
- k. Identify agricultural areas of state or regional significance.
- l. Provide a guide for future land use, zoning, subdivision and development within areas of agricultural significance.
- m. Make reference to relevant agricultural codes of practice which outline best practice for agricultural producers.
- n. Address any other local issues as appropriate.

SPP2.5 identifies two areas of the Shire that are deemed to be 'Agricultural Priority Management Areas', being the irrigation district and four lots on the Murray River adjacent to the Lane Poole Reserve. These areas are given further definition by the Peel Region Scheme Policy – 'Strategic Agricultural Resource Area'. For further comment on the Priority Area, see the section on the Peel Region Scheme Policy (Section 2.10.1).

Clause 5.3.2 of SPP2.5 provides that lots in the Rural Residential zone require the mandatory provision of reticulated potable water. The Strategy seeks a departure from the requirement under SPP 2.5 (Clause 5.3.2) for lots in Lake Clifton without reticulated water to have a minimum area of 4 ha. The Shire is concerned that adherence to this requirement is not feasible and would rapidly exhaust the supply of land set aside for Rural Residential and Rural Small Holding purposes in Lake Clifton.

2.5 Statement of Planning Policy No.2.6 - State Coastal Policy (2003)

The objectives of SPP2.6 are to:

- a. protect, conserve and enhance coastal values, particularly in areas of landscape, nature conservation, indigenous and cultural significance;
- b. provide for public foreshore areas and access to these on the coast;
- c. ensure the identification of appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities; and
- d. ensure that the location of coastal facilities and development takes into account coastal processes including erosion, accretion, storm surge, tides, wave conditions, sea level change and biophysical criteria.

The structure planning project for the proposed expansion of Preston Beach will demonstrate compliance with SPP2.6.

2.6 Statement of Planning Policy No.2.7 - Public Drinking Water Source Policy (2003)

SPP2.7 applies to areas proclaimed as 'Public Drinking Water Supply Areas' (PDWSA's) pursuant to either the Metropolitan Water Supply, Sewerage and Drainage Act 1909 or the Country Areas Water Supply Act 1947.

Public Drinking Water Source Areas (PDWSA) in the municipality are proclaimed to ensure the provision of a 'safe, good quality drinking water supply' to protect public health now and in the future. Drinking Water Source Protection Plans (DWSPP) are completed for PDWSA's to define the boundaries, identify existing and potential threats and provide risk management strategies and programs for the ongoing management/protection of the PDWSA.

Land within PDWSA's may be classified as 'Priority 1' (P1), 'Priority 2' (P2) or 'Priority 3' (P3) classifications. A P1 classification will generally apply over public land, a P2 classification over rural land and a P3 classification over urban land.

In the Shire the following five areas are proclaimed or proposed PDWSA's:

1. The catchment of the Samson Brook Pipehead Dam, which provides potable water to the Metropolitan area, Waroona and Hamel as part of the Integrated Supply Scheme. All of this land is publicly owned, mostly in the form of State Forest, and has a P1 classification over most the catchment, however a small area of P2 land exists in the north west of the catchment. A DWSPP has been completed for the Samson Brook Pipehead Dam (This catchment area is currently being amended; the new boundary data set can be obtained from the Department of Water; see below)
2. Part of the Bancell Brook catchment, which provides water for the Yarloop townsite. Most of this land is privately owned, a P2 classification applies to the private land and a P1 classification to the public land. A Drinking Water Source Protection Plan is being completed for the Bancell Brook catchment

3. An area of State Forest and pine plantation north of Johnston Road in Lake Clifton is part of the Preston Beach water reserve and has a P1 classification. A DWSPP has been completed for the Preston Beach water reserve
 4. A small area in the Preston Beach townsite itself, mostly consisting of golf course and residential land, is also part of the Preston Beach water reserve, and has a P3 classification.
 5. Part of the Stirling Dam catchment area, which provides potable water to the Integrated Water Supply Scheme. All of this land within the Shire of Waroona is publicly owned, in the form of State Forest, and has a P1 classification over this area of the catchment. A DWSPP has been completed for the Stirling Dam catchment (The draft LPS fails to acknowledge the portion of the proclaimed Stirling Dam catchment area that exists within the shire boundaries. This section of the Stirling Dam catchment is shown in Figure 3 of the LPS and highlights this area as a P1 protection area in crown land. The LPS should include the Stirling Dam catchment area).
- c. concentrate investment in the improvement of services and infrastructure and enhance the quality of life in those communities;
 - d. manage the growth and development of urban areas in response to the social and economic needs of the community and in recognition of relevant climatic, environmental, heritage and community values and constraints;
 - e. promote the development of a sustainable and liveable neighbourhood form which reduces energy, water and travel demand whilst ensuring safe and convenient access to employment and services by all modes, provides choice and affordability of housing and creates an identifiable sense of place for each community; and
 - e. coordinate new development with the efficient, economic and timely provision of infrastructure and services.

The Strategy recognises short-term urban infill opportunities and provides for long-term urban expansion to occur north, east and south of the Waroona townsite and also at Preston Beach.

Some land earmarked for Residential or Special Residential purposes in this Strategy would not likely be rezoned for these purposes in the short term, due to the existence of undeveloped land already zoned for these purposes and due to current sand mining operations.

2.8 Draft Statement of Planning Policy No.4.1 - State Industrial Buffer (2004)

The draft SPP4.1 will replace the existing 1997 version of the Policy once gazetted. The Policy seeks to:

- a. promote a sustainable and well planned pattern of settlement across the State, with sufficient and suitable land to provide for a wide variety of housing, employment, recreation facilities and open space;
 - b. build on existing communities with established local and regional economies;
- a. avoid conflict between industry and essential infrastructure and sensitive land uses.
 - b. protect industry and essential infrastructure from encroachment by incompatible land uses that would adversely affect their efficient operation.
 - c. provide for the development of industry and the provision of essential infrastructure in a way that minimises amenity and

Figure 3 shows the PDWSAs within the catchment and also shows the priority classification for these areas. The map shows the P1 and P2 source protection areas of the Samson Brook PDWSA.

Mapping of the Public Drinking Water Supply Areas is contained in Figure 3. These areas are reflected in the Strategy as Special Control Areas as discussed in Section 2, Part 15.

2.7 Statement of Planning Policy No.3.0 - Urban Growth and Settlement (2006)

The objectives of SPP3.0 are to:

health impacts on, and takes account of risk to, nearby sensitive land uses.

- d. promote compatible uses within areas affected by off-site impacts of industry and infrastructure.

There are several existing or proposed activities in the Shire that are seen as requiring consideration in the context of SPP4.1:

1. The Wagerup Alumina Refinery and associated infrastructure.
2. Water Corporation's Waroona wastewater treatment plant located on Drake Road, Waroona.
3. Water Corporation's Samson Brook pipe head chlorination plant on Weir Road, Waroona.
4. The abattoir site on Waterous Road, Waroona

2.9 Inner Peel Region Structure Plan (1997)

The Inner Peel Region Structure Plan is a Western Australian Planning Commission policy detailing broad land use for an area including the southern part of the City of Rockingham, the whole of the City of Mandurah, that part of the Shire of Murray west of the Darling Escarpment, as well as the north-western corner of the Shire. A copy of the Inner Peel Region Structure Plan is included in Figure 4.

One variation from the Inner Peel Region Structure Plan is the larger extent of Rural Residential land identified in Lake Clifton in the Strategy compared to the Inner Peel Region Structure Plan. Rural Residential is proposed south of Old Bunbury in the Strategy, which was not indicated in the Inner Peel Region Structure Plan

2.10 Coastal & Lakelands Planning Strategy (1991)

The Coastal & Lakelands Planning Strategy is a Western Australian Planning Commission structure plan detailing broad land use classifications for the area extending from Dawesville in the north to Binningup in the south. Within the Shire, the Planning Strategy applies to the localities of Lake Clifton and Preston Beach from the Harvey River to the coast. The Structure Plan from the Planning Strategy is contained in Figure 5.

One of the variations of land use in this Strategy from the Structure Plan contained in the Coastal & Lakelands Planning Strategy is the proposed residential expansion at Preston Beach, (shown as Rural Broadacre under the Inner Peel Region Structure Plan).

The Planning Strategy details average and minimum lot sizes for Rural Residential development in Lake Clifton. Within the Lake Clifton catchment, the average lot size is 5 hectares. In the Peel-Harvey catchment, the average lot size is 3 hectares, with a 2 hectare minimum lot size. Further discussion of minimum lot sizes for Rural Residential is contained in subsequent sections of this Strategy.

2.11 Peel Region Scheme (2003)

Gazetted in March 2003, the Peel Region Scheme is a State statutory document covering the City of Mandurah and Shires of Murray and Waroona. The Scheme maps provide broad zonings for all land within the Scheme area. The Scheme sets out the provision of regional facilities such as regional parks, regional road networks, rural and urban areas, major industrial estates, State Forest areas and controls over important drinking water sources.

Figure 6 contains the Peel Region Scheme maps as they pertain to the Shire.

The most significant implications of the Scheme are the identification and protection of the following areas:

1. The Perth to Bunbury Highway, including what is known as the 'Peel Deviation'.
2. Widening of sections of South Western Highway.
3. Regional Open Space along the Murray River, around the Peel-Harvey Inlet, the Yalgorup National Park and coastal foreshore reserves.
4. Industrial land associated with the Wagerup Alumina Refinery.

2.11.1 Peel Region Scheme Policy - Strategic Agricultural Resource Policy (2003)

The Strategic Agricultural Resource Policy has been adopted by the Western Australian Planning Commission as a Scheme Policy. The objectives of the Policy are as follows:

- a. To identify strategic agricultural land within the Peel Region Scheme area considered to be of State or regional significance.
- b. To protect the agricultural base of the Peel Region from the unplanned loss of high quality productive agricultural land due to permanent changes of land use.
- c. To minimise land use conflicts between agricultural activities and other land uses within and adjacent to the identified strategic agricultural areas.
- d. To ensure considerations relating to the protection of the identified strategic agricultural areas are taken into account in preparing amendments to the Peel Region Scheme, town planning schemes and scheme amendments, and in assessing subdivision and development applications.

There are two areas within the Shire identified as Strategic Agricultural Resource Areas under the Policy:

1. The South West Irrigation Area, excluding the Alcoa landholdings around their residue disposal areas.
2. A small pocket adjacent to the boundary with the Shire of Murray, which represents the southern extremity of the orchard area around Dwellingup.

These areas are identified on Figure 7.

The Policy provides that within the identified areas agriculture should be the priority land-use and that encroachment of other uses should be prevented.

The Strategy generally reflects the strategic areas identified in the Peel Region Scheme Policy, although some variations are proposed, as discussed in Section 7.2.

2.11.2 Strategic Minerals & Basic Raw Materials Policy

The Strategic Minerals & Basic Raw Materials Policy has been adopted by the Western Australian Planning Commission as a Scheme Policy. The objectives of the Policy are as follows:

- a. To identify land within the Peel Region Scheme area that contains mineral resources and basic raw materials of State or regional significance.
- b. To prevent mineral resources and basic raw materials of State or regional significance from being sterilised by incompatible development and land uses.
- c. To encourage the mining of mineral resources and extraction of basic raw materials in accordance with acceptable environmental standards.
- d. To promote rehabilitation and, where appropriate, restoration of mining and extraction sites in a way which is consistent with the orderly and proper long-term use of the land.
- e. To ensure considerations relating to the mining of mineral resources and extraction of basic raw materials of State or regional significance are taken into account in preparing amendments to the Peel Region Scheme, local government town planning schemes and scheme amendments, and in assessing subdivision and development applications.

There are two main areas within the Shire identified as Strategic Minerals & Basic Raw Materials Areas under the Policy:

1. Areas near or along the Darling Escarpment that contain mineral sand deposits, in particular, a large area to the north of Waroona townsite.
2. Areas along Old Coast Road that contain limestone deposits.

These areas are identified on Figure 7 and are reflected on the Strategy maps.

The Policy provides that, within the identified areas, development inconsistent with extraction of the identified resources should, in broad terms, not occur until after the resources have been extracted.

Figure 2 – SPP2.1 Peel-Harvey Coastal Plain Catchment

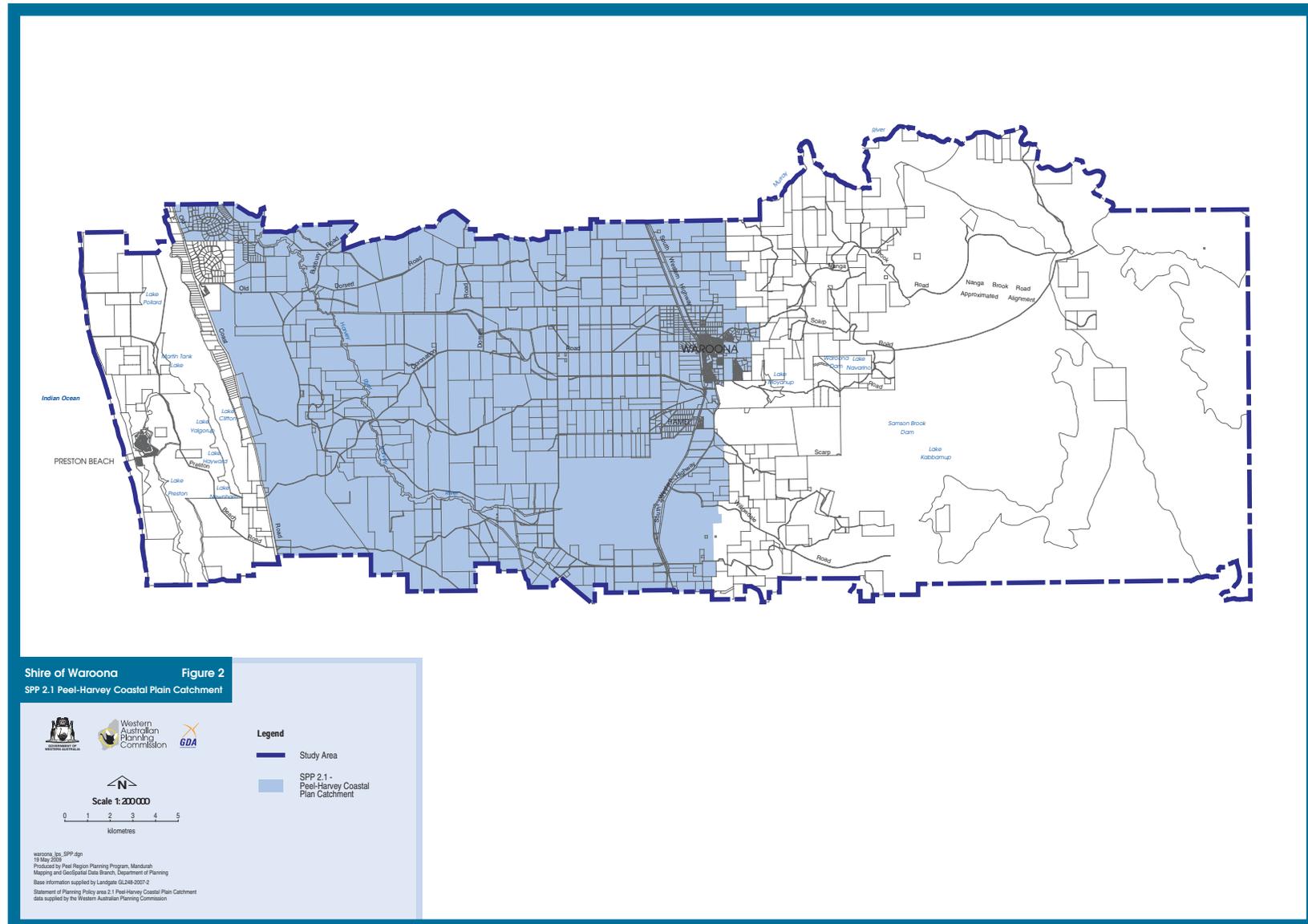


Figure 3 – Public Drinking Water Sources Areas

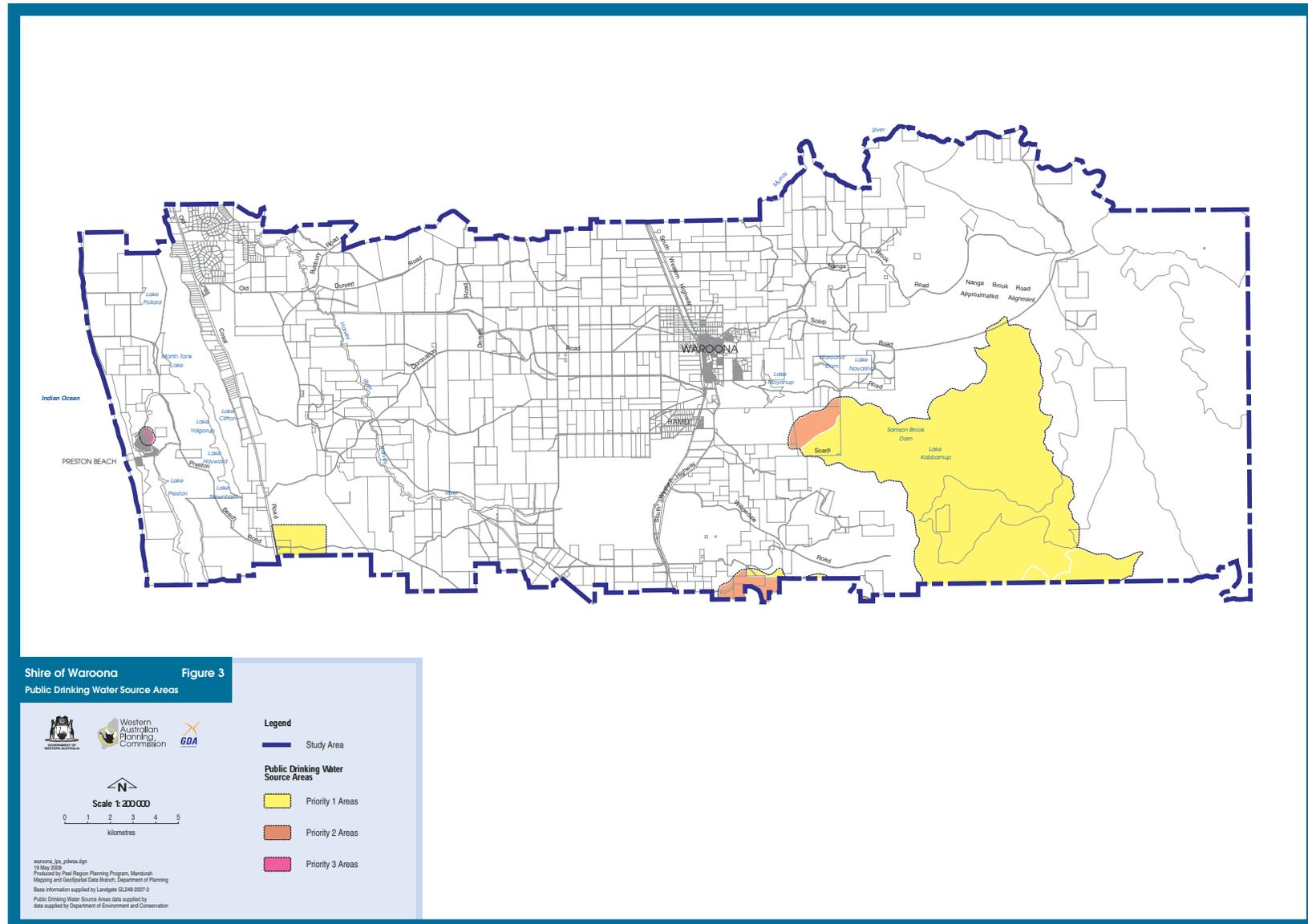


Figure 4 – Inner Peel Region Structure Plan (1997)

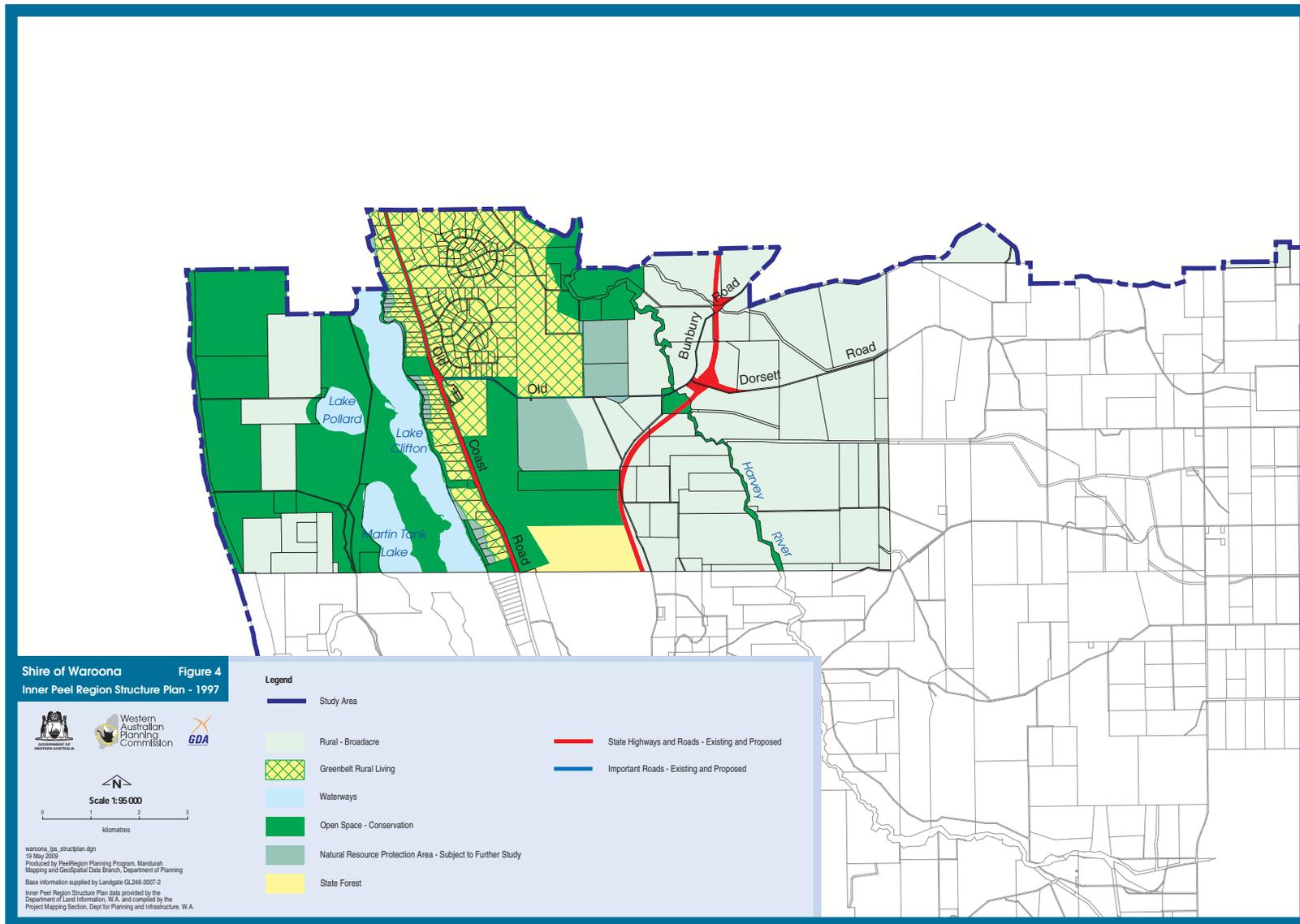


Figure 5 – Coastal & Lakelands Planning Strategy (1999)

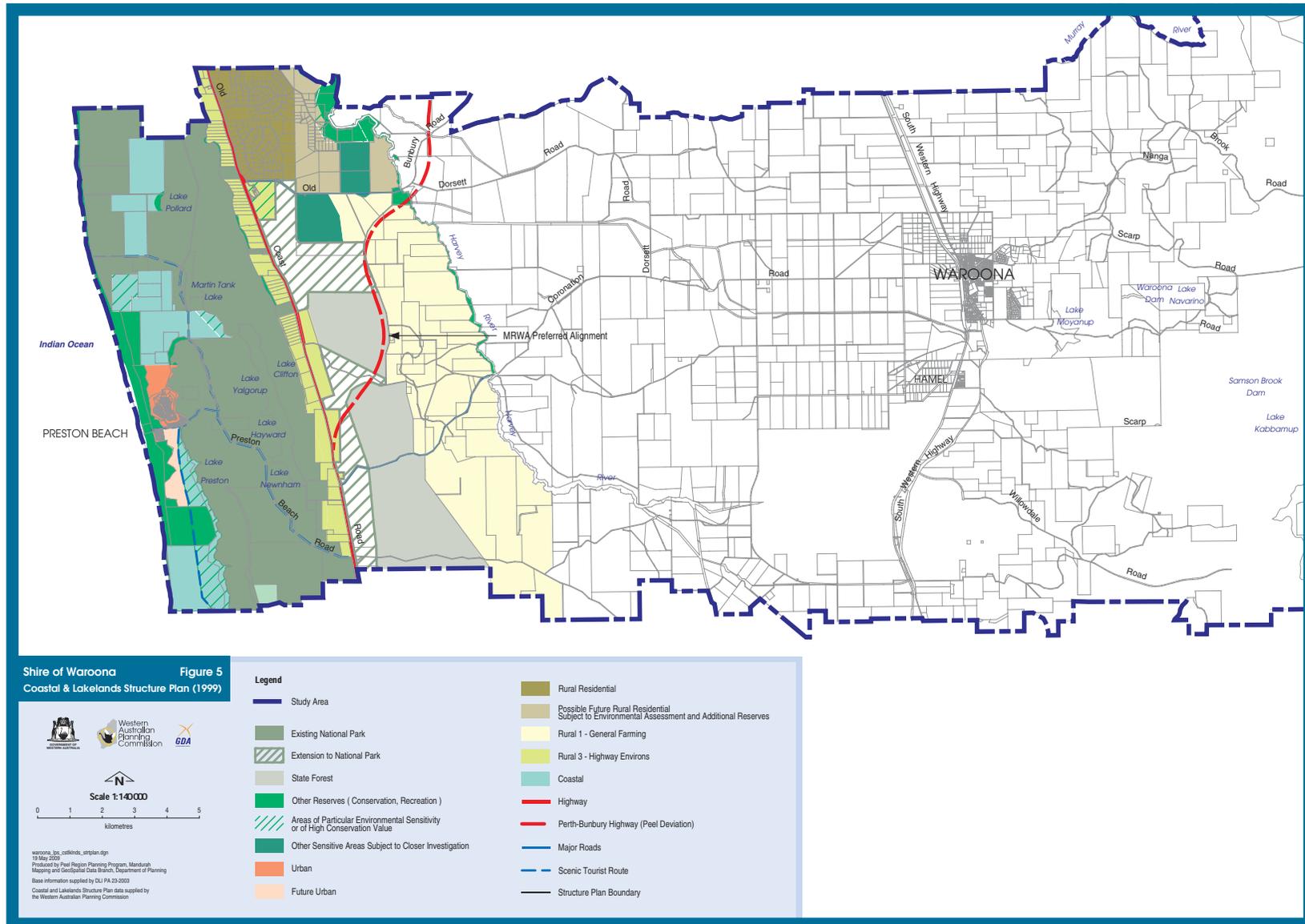


Figure 6 – Peel Region Scheme

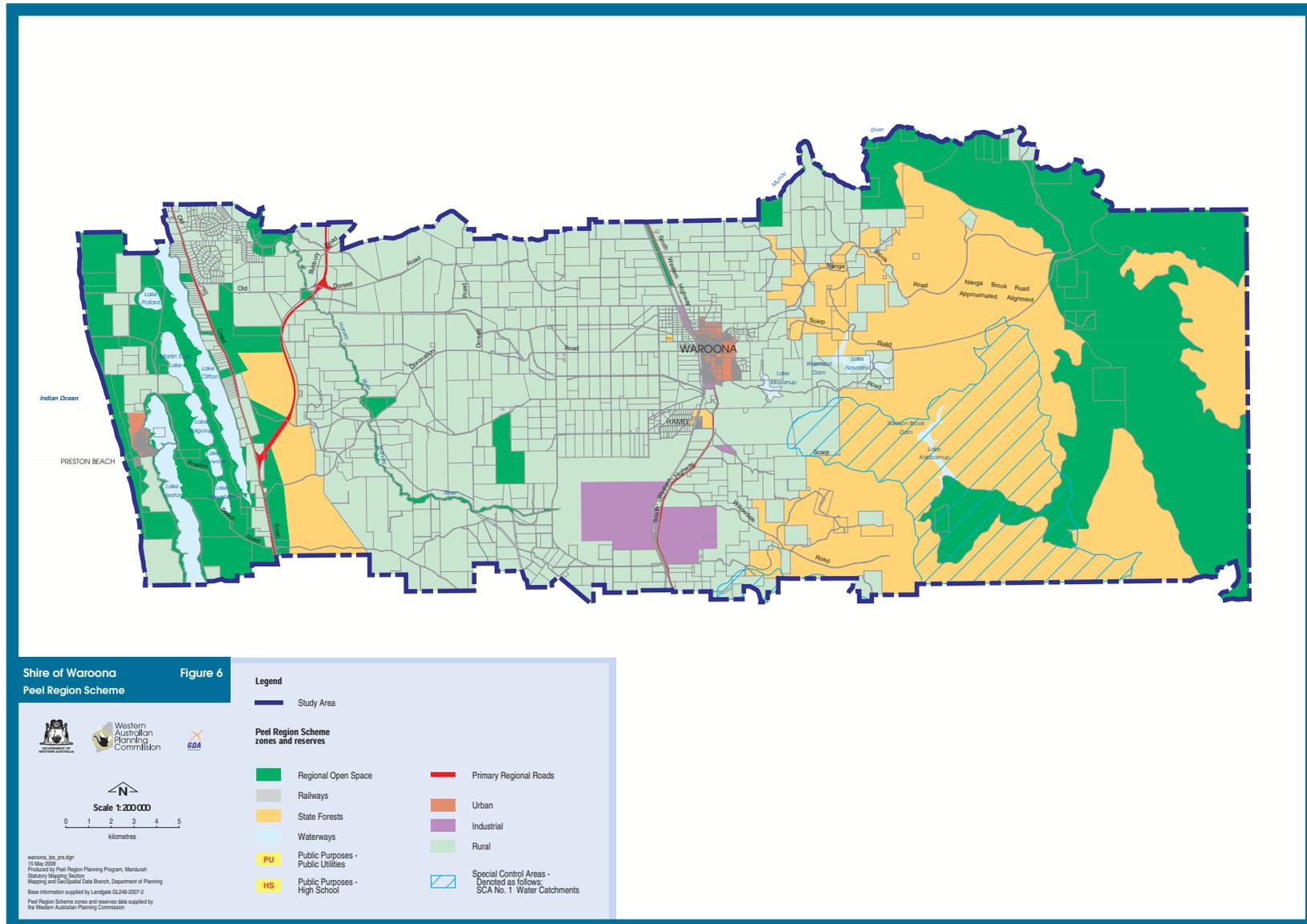
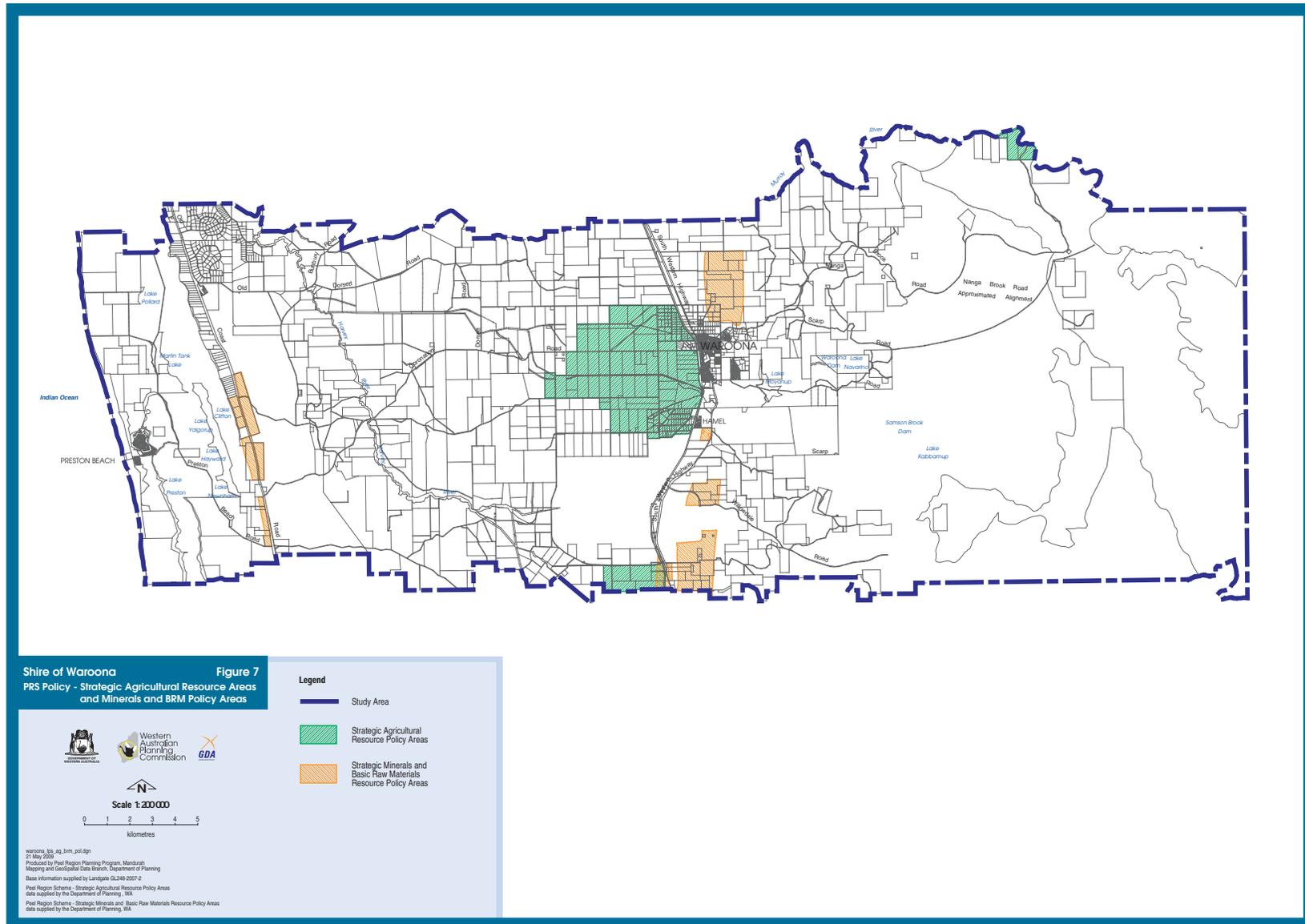


Figure 7 - PRS Policy – Strategic Agricultural Resource Areas and Minerals and BRM Policy Areas



3 LOCAL PLANNING CONTEXT

There are a number of existing local planning documents that have implications for the development of this Strategy.

3.1 Lake Clifton - Herron Structure Plan (2006)

A structure plan has been developed in a partnership between the Shire and the City of Mandurah to guide the future development of the Lake Clifton and Herron localities. The structure plan has been adopted as a Local Planning Policy under Town Planning Scheme No.7. A copy of the structure plan is contained in Figure 8.

The land use proposals in the Structure Plan are reflected in this Strategy.

3.2 Waroona North Structure Plan (2007)

The Shire has finalised a Structure Plan for the area north of the Waroona townsite between South Western Highway in the west and the escarpment in the east. The Structure Plan provides a broad landuse plan to guide development once mineral sands mining has been completed. The land use in the Structure Plan area has been incorporated into this Strategy. A copy of the structure plan is contained in Figure 9.

3.3 Waroona Town Centre Strategy (2003)

The Waroona Town Centre Strategy was completed in December 2003. The Strategy will guide the revitalisation of the Waroona Town Centre, including the development of a town square, underground power and verge enhancements to the Main Street, a new park in the commercial heart of the town, and enhancement of an existing recreation area adjacent to the railway line. A copy of the Master Plan is contained in Figure 10.

Further discussion of the implications of the Town Centre Strategy for the Strategy is contained in Chapter 9.

3.4 Waroona Industrial Sites Evaluation Study

The Waroona Industrial Sites Evaluation Study (WISES) was co-funded by the Shire and the Western Australian Planning Commission and was completed in February 2003. WISES was initiated because of long-standing difficulties in finding land to accommodate new, expanding or relocating businesses in Waroona due to the lack of available, zoned, serviced and appropriately located industrial land.

The preferred site (Site B) for an industrial estate was on the corner of Waterous Road and South Western Highway, Hamel. However, the landowner has advised that they are unwilling to provide the land for this purpose.

3.5 Draft Rationale for the Wagerup Refinery Buffer (2002)

In June 2002 the Wagerup alumina refinery operator released the Draft Rationale for the Wagerup Refinery Buffer document to outline the scientific rationale for a buffer around the Wagerup alumina refinery and to guide the local and state government in decisions on the zoning surrounding the Refinery. This draft document has not been finalised by the operator. The implications of the Wagerup Refinery buffer are detailed in Chapter 10 of this Strategy.

3.6 Preston Beach Townsite Strategy

In 2006 the Shire commenced the preparation of a broad structure plan for Preston Beach.

In October 2008, the Western Australian Planning Commission (WAPC) adopted a policy specifying the manner in which the ultimate size of the settlement at Preston Beach will be determined through the Preston Beach Townsite Strategy.

The ultimate size of the settlement will be determined by establishing the optimal form of development which:

- achieves material improvements in the quality of surface and groundwater flows into Lake Preston;
- avoids any further detrimental impacts on any of the lakes or wetlands and Yalgorup National Park and improves the long term biodiversity status of the park;
- attracts a specific demographic which maintains an economic base for the settlement and minimises long distance commuting;
- can be satisfactorily served solely by the existing Preston Beach Road as a two-lane, single-carriageway road and its intersection with the Perth Bunbury Highway;
- can be served by a single neighbourhood or local centre with a maximum net lettable area of 4500 m²;
- will be sufficient to support a single primary school without generating the need for an overflow to another primary school in the district; and
- will be defined by a permanent boundary between urban land and land set aside for long term biodiversity conservation.

Planning and environmental investigations are continuing for the Preston Beach Townsite Strategy.

The WAPC has resolved to support the deletion of the proposed scenic tourist route between Preston Beach and Myalup that is shown in the Coastal and Lakelands Planning Strategy. At the time of finalising this Strategy the deletion of this road had not yet be advertised.

Figure 9 – Waroona North Structure Plan

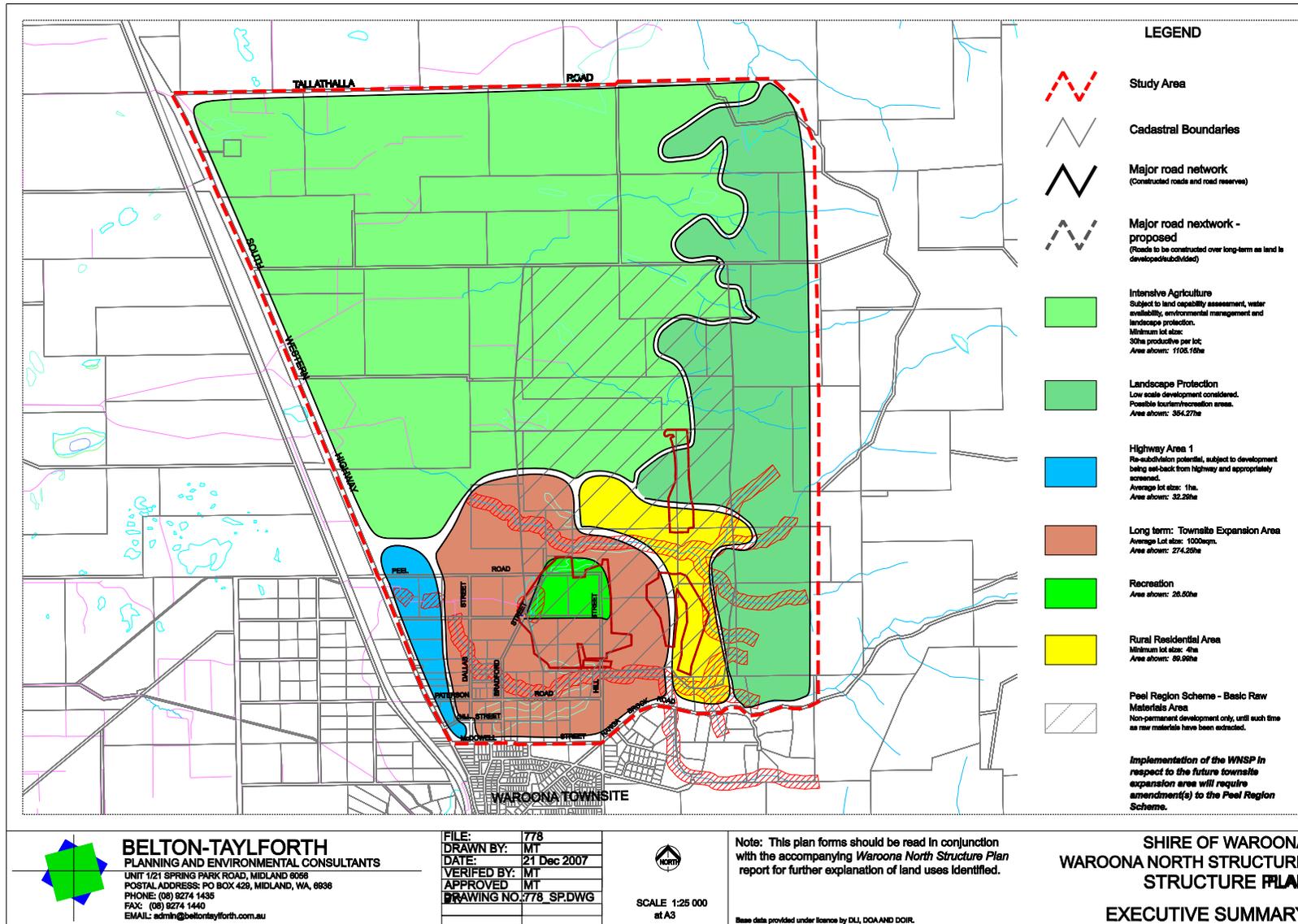


Figure 10 – Waroona Town Centre Strategy Master Plan



4 PHYSICAL CONTEXT

The Shire extends from the Darling Plateau in the east to the Indian Ocean in the west. Because of its breadth, the Shire contains a vast spectrum of physical environments.

4.1 Climate

The Shire has a warm temperate Mediterranean climate with an annual average rainfall of 840mm on the plains and 1100mm to 1200mm in the Darling Range.

4.2 Geology

The Darling Fault divides the geology into two parts:

1. Phanerozoic (540 to 2 million years old) sedimentary rocks of the Perth Basin to the west. These are overlain by younger sedimentary rocks consisting mainly of sands, limestones, clays and gravels that form the surface landforms of the Swan coastal Plain.
2. The much older, Archean (over 2500 million years old) granites and gneisses of the Yilgarn Craton to the east which form the Darling Plateau.

Millions of years of weathering of the granitic rocks of the Yilgarn Craton have produced an aluminium-rich or bauxitic laterite caprock that covers most of the Darling Plateau. The bauxite is processed to form alumina at Wagerup. The laterite is also a source of gravel for road construction. Granite can be crushed to form aggregate for building construction, or used as armour rock for sea wall or marina construction.

Former coastal shorelines along the Darling Scarp have concentrated heavy titanium-zircon bearing minerals along the foothills at Waroona and north of Wagerup. Sediments along the Swan Coastal Plain also provide a source of sand, limestone and clay.

The Perth Basin sedimentary rocks are many kilometres thick, contain large volumes of groundwater, have potential for petroleum, and may possibly provide a geothermal energy source.

Implications:

1. Bauxite deposits are primarily within Crown land where they are being mined under a State Agreement Act.
2. Some limestone deposits are protected from development that may prejudice the extraction of the resource under a policy relating to the Peel Region Scheme. Other potential deposits are primarily on Crown land.
3. Sand resources for use in the construction industry, whilst comparatively plentiful on the Swan Coastal Plain, are increasingly being constrained by conflicting land uses, particularly south of Perth. Due regard should be given to ensuring that adequate areas remain available for sand extraction.
4. Identified titanium-zircon mineralisation occurs in areas where there could be long term urban development, but until the resources are mined they are protected under a policy relating to the Peel Region Scheme. There is potential for new deposits to be identified on the Swan Coastal Plain.

4.3 Landform & Soils

The simplified landform and soils associations are shown in Figure 11 and the following is summarised from the Peel Region Plan (1990). Information was also obtained from the Department of Agriculture website and the AGMAPS Land Profiler CDROM (2001).

Quindalup Dune System

These dunes are coastal and have a high pH and very low water holding capacity. They have no agricultural value and when they are used for urban development, as is often the case, they need to be stabilised because they are susceptible to wind erosion. The dunes in the Waroona area act as barrier dunes that filter rain to replenish the underground water lens and to protect the Yalgorup Lakes.

Spearwood Dune System

This system comprises yellow/brown deep sands overlying limestone. Although this land has some areas of poor fertility and generally poor

water holding capacity it can be managed and is sought after for irrigated horticulture.

Bassendean Dune System

This system consists of a mosaic of low sand hills, sand flats and seasonal swamps. Although these soils are easily leached and have poor nutrient holding capacity, with proper land management they are suitable for grazing and areas are useful for perennial horticulture. The dominant soil association of this system is the Southern River association.

Pinjarra Plain System

The plain consists of distinct riverine deposits with the clays of the Serpentine and Cannington soil associations, the mottled duplex soils of the Guildford association and the loams of the Dardanup association. The latter two soil associations have a generally good nutrient holding capacity and although natural drainage can be poor, artificial drains have generally resolved these issues. They are suitable for grazing and seasonal and perennial horticulture.

Ridge Hill Shelf (Foothills)

This shelf lies along the foothills and comprises the Forrestfield association of duplex soils and gravels that are well drained and have good nutrient holding capacity. These soils are suitable for grazing and horticulture.

Scarp and Valleys

Soils in these areas generally depend on their position in the landscape – duplex soils on the moderate to steeper slopes, red earths on the colluvial slope deposits and gravely sands on the ridges and spurs. Gradient can be a major limitation to agricultural activity. These areas are generally suitable for grazing and small areas for perennial horticulture.

Darling Plateau

This comprises gently undulating lateritic uplands of duricrust, gravels and sands. They are suitable for grazing and there are small patches that are suitable for perennial horticulture.

Vasse Soils

These soils are formed from estuarine alluvia and are at about sea level. They are very variable soils, comprising layers of clay, shells, marine algae and coarse calcareous sand. Because they contain much organic matter, these were the first soils cleared in the area and were used to grow vegetables. They are now mainly pastured and used for grazing.

Acid Sulfate Soils

These soils are naturally occurring soils, sediments or organic substrates formed under waterlogged conditions that contain iron sulphide minerals. When exposed to air, these soils readily oxidise, releasing sulphuric acid and iron into the soil and groundwater, often in harmful quantities. This acid can, in turn, release aluminium, nutrients and heavy metals held within the soil matrix.

The Department of Environment and Conservation advises that the vast majority of the Shire consists of soils that have a moderate risk of containing acid sulfate. Acid sulfate soils risk mapping is contained in Figure 12.

Implications

Except for the Quindalup Dune System much of the land in the Shire is suitable for grazing.

The Guildford and Dardanup associations of the Pinjarra Plain System, the Ridge Hill Shelf and small patches of the Scarp and Valleys country are suitable for a range of horticultural activity.

Due regard will need to be given to acid sulphate soil investigations and management when making future zoning and land use decisions.

4.4 Remnant Native Vegetation

The remnant native vegetation is shown in Figure 13. Large areas of native vegetation still remain in the Darling Plateau/Scarp and along the coast. These areas are home to three commonwealth listed Threatened Ecological Communities (TECs), six listed plant species and numerous faunal species.

Implications

Where the native vegetation is on private property and is in isolated pockets, management measures including the following should be considered – fencing from stock, control of weeds and feral and native pests, preventing nutrient enrichment, retaining and increasing native species and buffering. Where drainage occurs, it should be ensured that there is minimal impact on the water balance of the area.

4.5 Wetlands and Waterways

Wetlands are recognised as being significant for their ecological, hydrological, social and economic values. Wetlands can include a multitude of environments but the most significant are:

- a. Harvey River basin.
- b. Yalgorup Lake System in particular Lake Clifton and Lake Preston.
- c. peripheral areas of the Harvey Estuary.
- d. numerous Environmental Protection Policy (EPP) wetlands (Figure 12).

Wetlands on the Swan Coastal Plain have been evaluated and assigned an appropriate management category, providing guidance on the nature of the management and the protection the wetland should be afforded. 'Conservation' category and 'Resource Enhancement' category wetlands are recognised as priority wetlands which should be protected and conserved. 'Multiple Use' category wetlands should be considered in the context of ecologically sustainable development.

Lake Clifton has national and international significance, including listing under the Ramsar Convention and is part of the Peel-Yalgorup Ramsar

site which includes the land and 10 lakes of the Yalgorup National Park as well as the Harvey Estuary and lower reaches of the Harvey River. It is an important waterbird habitat and also has the "largest known example of living thrombolites in a lake environment in the southern hemisphere" (Environmental Protection Authority Guidance Note No.28 'Protection of the Lake Clifton Catchment' 1998). The hydrology of the lake and all lakes and damplands in the Peel-Yalgorup system is complex and the proper management of hydrology, geomorphology, flora, fauna and wetland buffers is crucial to the health of these wetlands.

Much of the Pinjarra Plains is naturally poorly drained and seasonally waterlogged and has been drained to facilitate agriculture. The result is a network of waterways and artificial drains that discharge into the Peel-Harvey Estuary.

These artificial drains and waterways also convey excess nutrients from the land uses within the Peel-Harvey catchment. It is considered that excess amounts of nutrients in the Estuary are the result of increased nutrient in-flows resulting from land clearing, agriculture and urban development in the catchment.

Implications for Planning and/or Land Management

There has been general degradation of wetlands and watercourses over many years. The principle management measures are:

1. retain and restore the natural drainage system;
2. better fertiliser, irrigation water management, nutrient management and proposed procedures to reduce excessive runoff from the land into adjacent watercourses and wetlands;
3. rehabilitation of riparian vegetation and wetland vegetation including fencing from stock; and
4. buffering of land use and development, including wetland buffers where appropriate.

The protection and management of wetlands shall be taken into consideration when making future zoning and land use decisions. Part of the consideration is the determination of an appropriate buffer to the

wetland. Wetlands require a buffer to protect them from potential adverse impacts and maintain ecological processes and functions within the wetland. Buffers also act to protect the community from potential impacts such as nuisance midge and mosquito problems. In determining an appropriate wetland buffer distance, the values of the wetland and the threats associated with the surrounding or proposed land use requires consideration.

4.6 Fauna

The native fauna in the Shire is dependent on the native vegetation that once covered the area. The populations of many species have declined significantly since European settlement. However, there are numerous of mammals, birds, reptiles, amphibians, inland fish, invertebrates and subterranean fauna within the Shire.

Implications

There is a strong link between the health of remaining vegetation and waterways, which provide the habitats, and the maintenance of a wide variety of fauna species. Measures outlined in this Strategy to preserve the vegetation and waterways will have a positive impact on fauna retention. A further measure for consideration is the use of ecological linkages, in particular vegetation sequences or corridors, within appropriate developments.

Figure 11 – Soil Landscape Systems

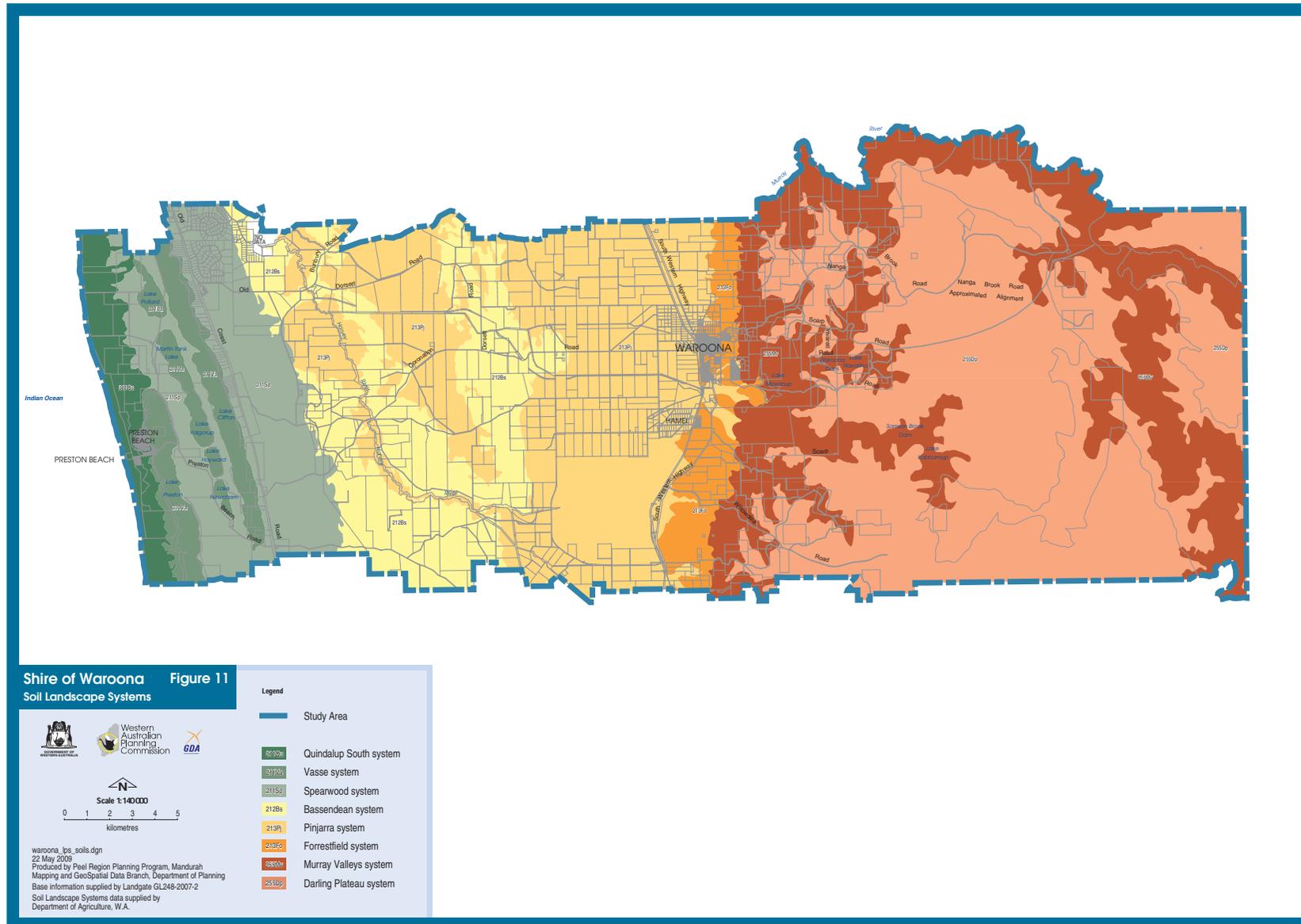


Figure 12 – Acid Sulfate Soils

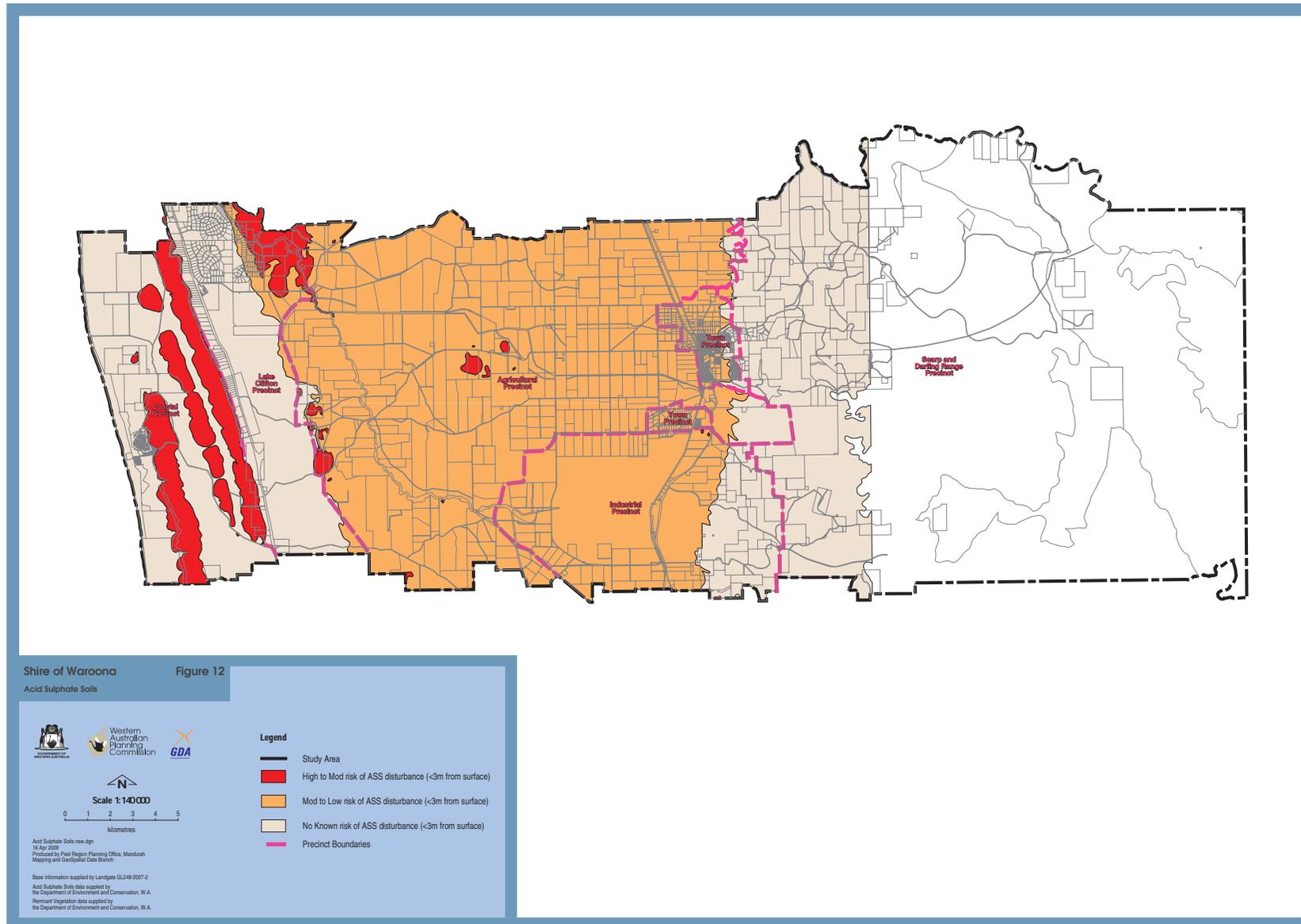
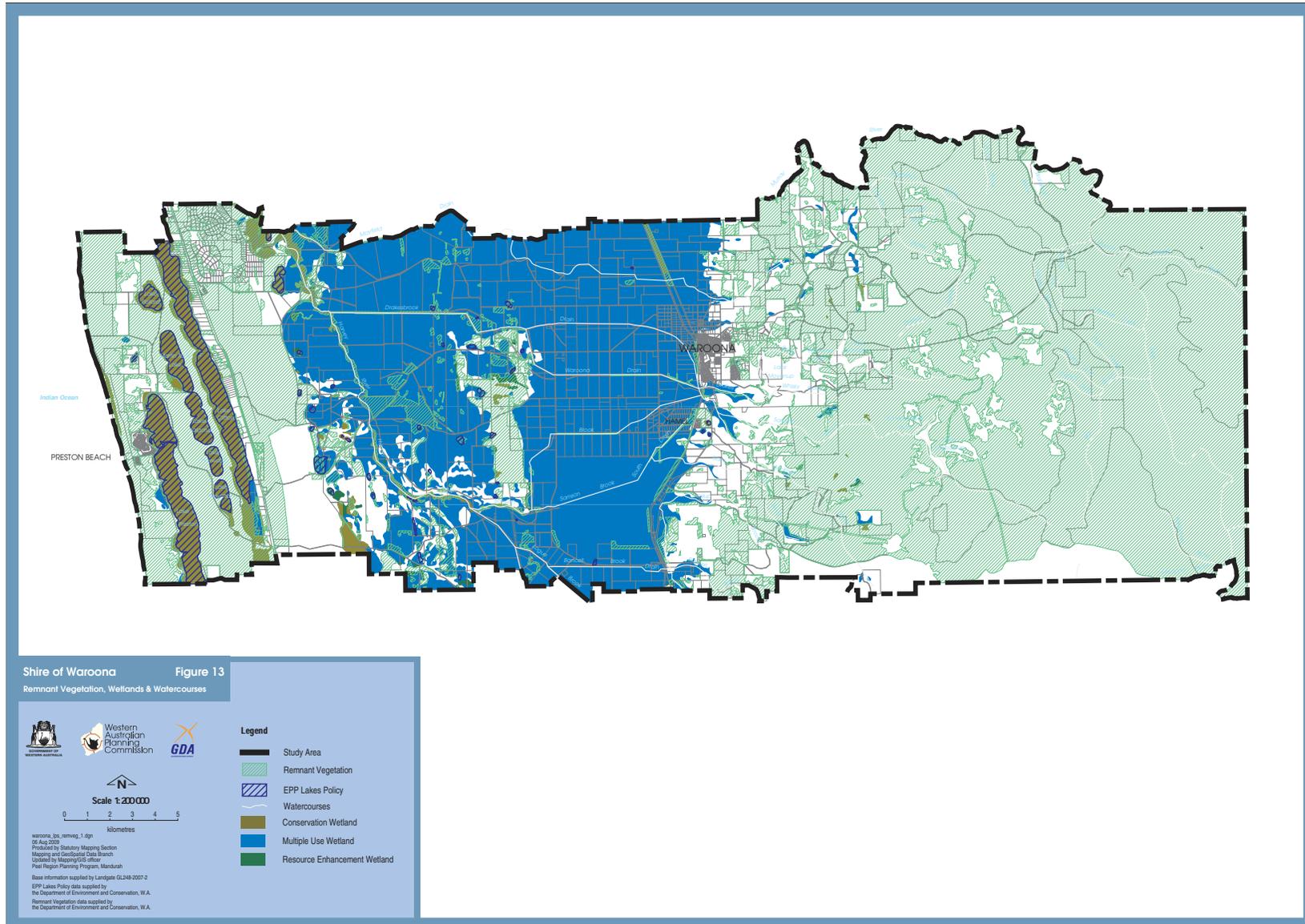


Figure 13 – Remnant Vegetation, EPP Wetlands & Watercourses



5 SOCIO- ECONOMIC CONTEXT

5.1 Population

Over the period 1981 to 2001 there has been an increase in the estimated resident population from 2,460 to 3,524 persons. This is not spectacular growth but the expectations for the future are brighter with increased population likely to come from the expansion of Mandurah and the relocation of people from the Perth metropolitan area.

With the ageing of the population in the future, there is likely to be a larger pool of potential 'empty nesters' and retirees who could shift to the Shire for lifestyle reasons. These population increases will help provide additional consumers for the retail and commercial sector and for the very good range of community and recreational facilities that exist in Waroona.

If these population increases are to be realized it will be necessary for the Shire to have available land that has high amenity value that will satisfy the lifestyle aspirations of these people. Also, these living environments will need to have a satisfactory range of commercial and community facilities.

The Shire offers four distinct living environments. Waroona is the administrative, civic and commercial centre of the Shire and is sited on the foothills beneath the Darling Scarp. Settlement has been spreading out from the town towards and into the Darling Scarp country as people seek residential lifestyle opportunities. A few kilometres south of the town is the small hamlet of Hamel. On the coast is the small urban settlement of Preston Beach. Originally only a holiday and weekender settlement, it now has a permanent population of approximately 210 people. Since the early 1990s, rural residential settlement has occurred at Lake Clifton which is located around the southern end of the Harvey Estuary.

5.2 Economy

The exploitation and development of natural resources as well as resource processing has underpinned the local economy from the beginning of settlement. Timber harvesting and milling, agriculture with

dairying and horticulture and a condensed milk factory of the past have given way to the alumina refinery at Wagerup and the associated mining and earthmoving businesses as well as agriculture, retailing and services.

Employment by Industry

The employment by industry of the population in 2001 provides a snapshot of the economy.

The agricultural, mining and manufacturing sectors make up about 38% of the total employed workforce. This is a high percentage compared to the State (18%) and the resource rich South West Region (26%). It reflects the dominance of the Wagerup alumina refinery and bauxite mining.

As a result of mining and agriculture, industries including earthmoving, engineering and stock transport have developed. A major abattoir was operating close to Waroona between 1957 and 1999.

The retail and commerce sector accounts for 19% of the workforce compared to 25% in the South West Region. The comparative weakness in this service role is probably explained by the competition from the larger centres.

Waroona's service role is well represented in government, community, cultural, recreational and personal services. These contribute 19.5% to the Shire employment. These include local government administration, Department of Agriculture offices, Police Station, recreation and aquatic centre, two primary schools, a district high school, self care units for aged persons and a hostel and nursing home.

Tourism is an economic activity that is not directly identified in the employment data although it is part of the accommodation, cafes and restaurants category. Bush walking, observing nature, camping, water skiing, swimming and marroning are popular and are based on the natural assets of the hills and lakes areas particularly Lake Navarino, Lake Moyanup, Lane Poole Reserve, the Yalgorup Lakes and Munda Biddi mountain bike trail and numerous walk trails.

Specific visitor data for the Shire is not available. General information shows most visitors are from the Perth area, many are regular visitors, and there is increasing interest in adventure and active recreation activities. There is a range of accommodation available including rustic cabins, on-site vans and tents, bunk style accommodation for groups and bed and breakfast places.

Future Economic Opportunities

Alcoa has applied for and received environmental approval to expand the Wagerup Refinery with a third production unit. At this point there has not been an announcement from the operation on whether or when the expansion will occur. If it proceeds there will be a substantial increase in the construction workforce. However, this will be a temporary increase and the permanent increase is expected to be approximately 150 workers.

Assuming about 25% of the additional workers live in the Shire (between 1999 and 2004 22% of Wagerup employees lived in Waroona: Alcoa analysis of employment records) then there is the potential for an additional 38 workers. This would contribute an additional 90-120 persons within the Shire including families.

Mining of heavy mineral sands will occur over the next ten years at Wagerup and north of Waroona. Workforce increases will be temporary.

The Shire has three characteristics that provide future opportunities for agricultural activity, particularly higher value intensification and horticultural activity. They are reasonable soils, a reliable and sustainable irrigation water supply that can deliver water to specific sites and comparatively close proximity to markets, abattoirs and export facilities.

There is a long term potential for an increase in the intensification of beef and fodder production and the expansion of horticulture within the existing and expanded irrigation area.

A recent study (Waroona Industrial Site Evaluation Study, 2003) of industrial uses and sites at Waroona concluded that the following were potential future industries:

1. support industries for local mining and manufacturing industry;
2. downstream processing of agricultural products;
3. feed manufacturing; and
4. transport.

It is hoped that the Waterous Raod abattoir will reopened in the future, providing substantial employment opportunities.

Tourism also has future development opportunities primarily in low key accommodation, retreats and organised recreation activities in the Darling Range.

The long term growth potential of the retail, commerce and personal services sector in Waroona town is dependent on the population of the trade area and the patronage of that population of businesses in the Waroona Town Centre.