Department of **Planning, Lands and Heritage**

GOVERNMENT OF WESTERN AUSTRALIA

Western Australian Planning Commission

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Dandaragan

Regional Land Supply Assessment

July 2020

Urban Development Program

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Published by the
Western Australian Planning Commission
140 William Street
Perth WA 6000

Locked Bag 2506
Perth WA 6001

Published July 2020
Data current as at April 2020

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1 Regional Land Supply Assessments and the Urban Development Program

The *Regional Land Supply Assessments* series sets out to assess land for future residential, industrial and commercial uses, providing context for the land use planning and infrastructure provision required to meet demand across selected regional centres in Western Australia. *Regional Land Supply Assessment* are prepared by the Department of Planning, Lands and Heritage (the Department) on behalf of the Western Australian Planning Commission (WAPC) to fulfil the requirements for tracking and monitoring land supply as outlined in Section 14 of the *Planning and Development Act 2005*. The role of the WAPC include developing models to better understand land supply and development, promote this understanding as part of the land use planning process, and better align the provision of infrastructure.

The *Regional Land Supply Assessments* series is one of a suite of products produced as part of the Urban Development Program (UDP). The UDP monitors land supply and promotes the timely delivery of residential, industrial and commercial land, targeted regional centres and areas of activity. The information presented in *Regional Land Supply Assessments* assists the State's infrastructure agencies, public utilities, local governments and the private sector in decision making and forward planning.

The reports include key information on:

- demand drivers specific to each regional centre, including the major economic factors that influence employment and population growth, and therefore, the demand for land and housing;
- zoned land supply for residential, commercial and industrial uses;
- development constraints;
- recent and future land development activity; and
- existing ad required physical infrastructure.

Regional Land Supply Assessments are the result of consultation with several stakeholders, including State Government agencies, local government and servicing authorities. Recent editions of *Regional Land Supply Assessment* publications can be accessed online at the Department's website.

2 Key points

Population

- The local government area of the Shire of Dandaragan (the Shire) covers 6,712 square kilometres of Western Australia's Wheatbelt region.
- The Shire is the Wheatbelt's eighth most populous local government area. It had an estimated resident population (ERP) of 3,270 at 30 June 2019. This accounts for 4.4 per cent of the Wheatbelt's total ERP at 30 June 2019.
- The Jurien Bay Urban Centre (UCL), which covers 10 square kilometres, is the Shire's largest settlement. The Jurien Bay UCL recorded a population of 1,425 at the 2016 Census.
- The Cervantes Locality (UCL) is the Shire's second largest settlement and covers 10 square kilometres. The Cervantes UCL recorded a population of 527 at the 2016 Census.
- Over the decade to 30 June 2019, the Shire's population grew at an average annual rate of 0.19 per cent. This is lower than the average annual growth rate for Western Australia (1.58 per cent) but higher than the rate for the Wheatbelt (0.16 per cent).

Distribution, occupancy and future trends

- The Shire's settlement pattern is characterised by two coastal towns (Jurien Bay and Cervantes) and two inland towns (Badgingarra and Dandaragan).
- Most of the Shire's residents (55 per cent) lived in the locality/suburb of Jurien Bay at the 2016 Census.
- At the 2016 Census, the Shire recorded a dwelling occupancy rate of 45 per cent, lower than the State average of 87 per cent. This can be attributed to many dwellings being used as holiday homes.
- Dwelling occupancy rates are higher in inland areas. The localities of Badgingarra, Dandaragan, Hill River and Yathroo recorded dwelling occupancy rates above 60 per cent.
- Dwelling occupancy rates for coastal areas are comparatively lower. The localities of Jurien Bay and Cervantes recorded dwelling occupancy rates of 51 per cent and 41 per cent respectively.
- Forty-two per cent of dwellings in the Shire were owned outright (without a mortgage) at the 2016 Census. This is higher than the State average of 29 per cent of dwellings owned outright.
- For the Shire, the latest WA Tomorrow medium-term forecasts (published in 2018) projects an average annual growth rate of 0.93 per cent from 2016 to 2031 based on the median (Band C) forecast.
- The Shire's draft local planning strategy sets out a plan to concentrate most of growth in Jurien Bay.
- Large-scale urban developments have been planned for the Turquoise Coast and North Head areas (south and north of the Jurien Bay townsite respectively). The developments of Turquoise Coast and North Head will provide for over 10,000 dwellings.
- Turquoise Coast has been partially developed, with around 600 lots already released for development.

Findings

- There are sufficient stocks of residential land to accommodate population growth into the long-term.
- The supply of land identified for residential development can support a population of approximately 15,000. This is based on current rates of dwelling occupancy and average household size.
- A significant amount of rural living development has been undertaken in the Shire. Approximately 4,690 hectares of land in the Shire is zoned for rural living development.
- Opportunities exist for additional rural living development in the Marine Fields area (south of the Jurien Bay townsite) where there are 830 hectares of undeveloped land zoned Rural Residential.

- Approximately 140 hectares of land in the Shire is zoned Industrial. These are located across the Shire's towns, with the largest being the Coalseam Road industrial area.
- There are 90 hectares of undeveloped Industrial zoned land at the Coalseam Road industrial area. Development beyond the current stage, however, is subject to environmental, infrastructure and native title assessments.
- The Turquoise Coast development contains an industrial component. Structure planning has identified an indicative yield of 43 industry and light industry lots on land zoned Special Development.
- Land zoned Commercial, Regional Centre and Tourist cover 45 hectares. These are predominantly located in Jurien Bay and Cervantes.
- The Jurien Bay commercial area is largely developed, however, there is capacity to expand commercial uses in the Cervantes commercial area.
- The Turquoise Coast and North Head developments will contain commercial components to service the residential population of these areas.
- There are several sites in Jurien Bay that can potentially be developed for tourism and related purposes.

3 Geography and population

3.1 Geography

The Shire is one of 42 local government areas within the Wheatbelt, and one of two local government areas within the Coastal Wheatbelt sub-region. The Shire covers an area of 6,712 square kilometres.

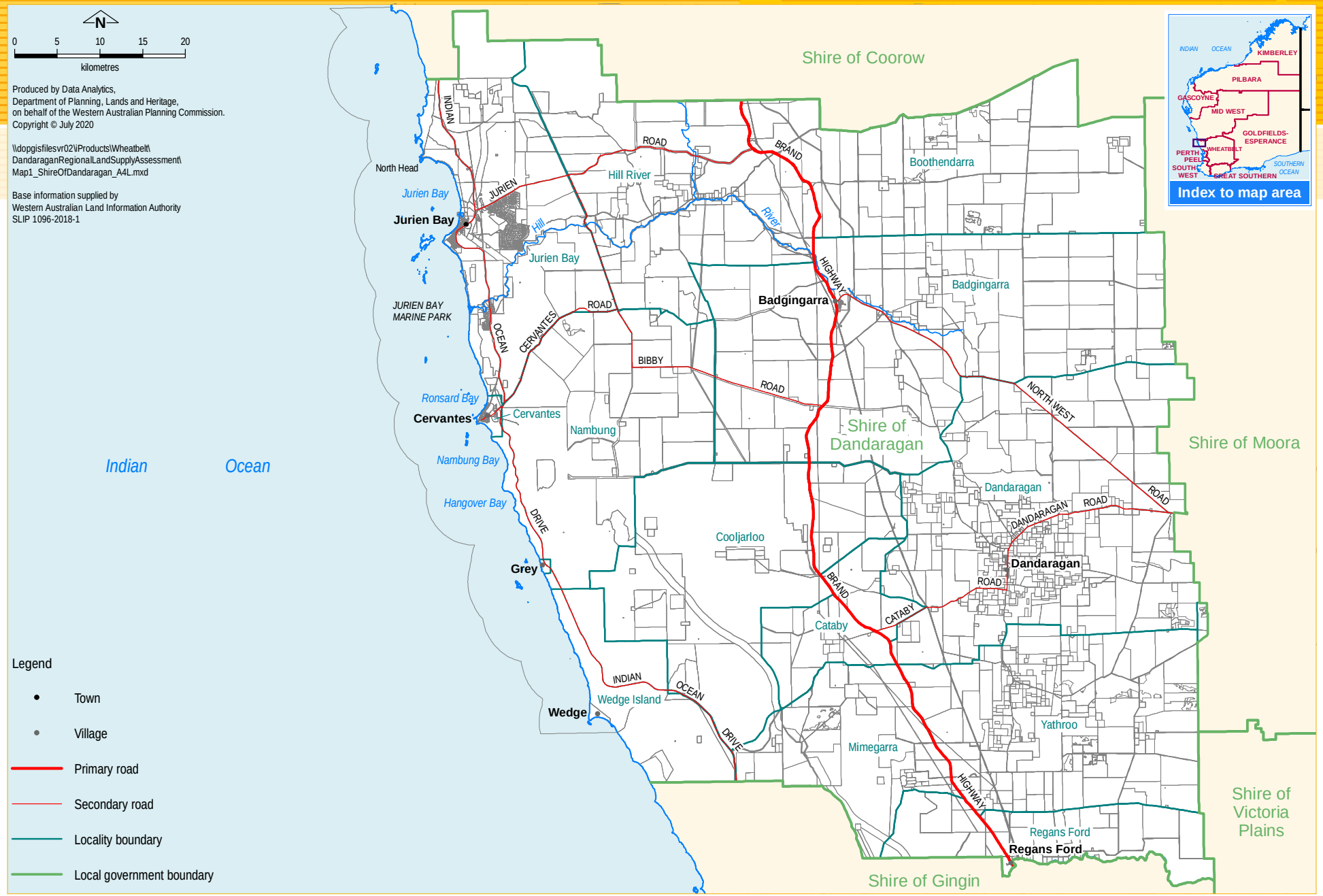
Jurien Bay is located approximately 220 kilometres north of Perth. It is the Shire's largest settlement, as well as its commercial and administrative centre.

This report refers to population and other indicator data relating to the Shire. Depending on the context and the source of data, different geographical extents are discussed. Regional and local geographical extents used to describe the Shire and its surrounds are shown in Table 1. Detailed descriptions and definitions of these geographical extents can be found in the Glossary.

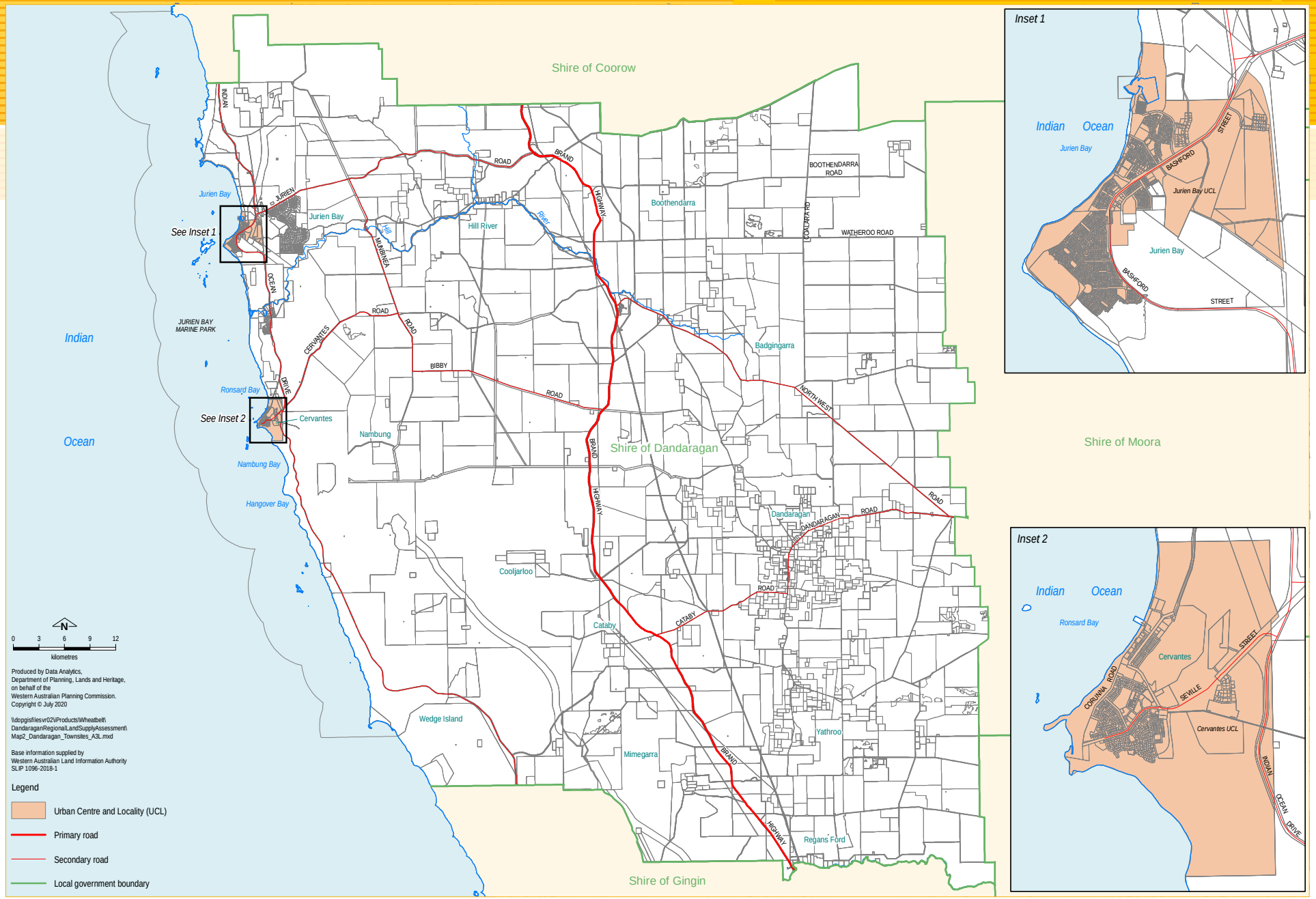
Table 1: Regional and local geographical extents

Geography	Description		Population at the 2016 Census	Area (km^2)
Australian Bureau of Statistics (ABS)	**Australia**	Australia	23,401,892	7,688,126 km^2
	State/Territory (S/T)	Western Australia	2,474,410	2,526,646 km^2
	Statistical Area Level 4 (SA4)	Western Australia – Wheat Belt	135,354	926,050 km^2
	Statistical Area Level 3 (SA3)	Wheat Belt - North	55,935	110,695 km^2
	Statistical Area Level 2 (SA2)	Gingin - Dandaragan	8,429	9,920 km^2
	Statistical Area Level 1 (SA1)	The SA2 of Gingin – Dandaragan is aggregated from 23 SA1s.	n/a	n/a
	Mesh Block (MB)	The SA2 of Gingin – Dandaragan is aggregated from 412 Mesh Blocks.	n/a	n/a
	Urban Centre and Locality (UCL)	Jurien Bay	1,425	10 km^2
		Cervantes (L)	527	10 km^2
Non ABS structures	**Local Government Area (LGA)**	Dandaragan (S)	3,213	6,712 km^2
	State Suburb (SSC)	Badgingarra	193	1,129 km^2
		Boothendarra	27	629 km^2
		Cataby	52	179 km^2
		Cervantes	527	10 km^2
		Cooljarloo	n/a	671 km^2
		Dandaragan	340	975 km^2
		Grey	8	2 km^2
		Hill River	93	623 km^2
		Jurien Bay	1,761	526 km^2
		Mimegarra	19	309 km^2
		Nambung	32	576 km^2
		Regans Ford	25	246 km^2
		Wedge Island	32	215 km^2
		Yathroo	97	625 km^2
Planning geographies	**State/Territory**	Western Australia	2,474,410	2,526,646 km^2
	Planning region	Wheatbelt	76,180	159,457 km^2
	Planning sub-region	Coastal Wheatbelt *Includes the shires of Dandaragan and Gingin*	8,429	9,920 km^2
	Wheatbelt Development Commission sub-region	Central Coast *Includes the shires of Chittering, Dandaragan and Gingin*	13,901	11,140 km^2
	Local government area	Dandaragan (S)	3,213	6,712 km^2

Source: Australian Bureau of Statistics



Map 1: Shire of Dandaragan

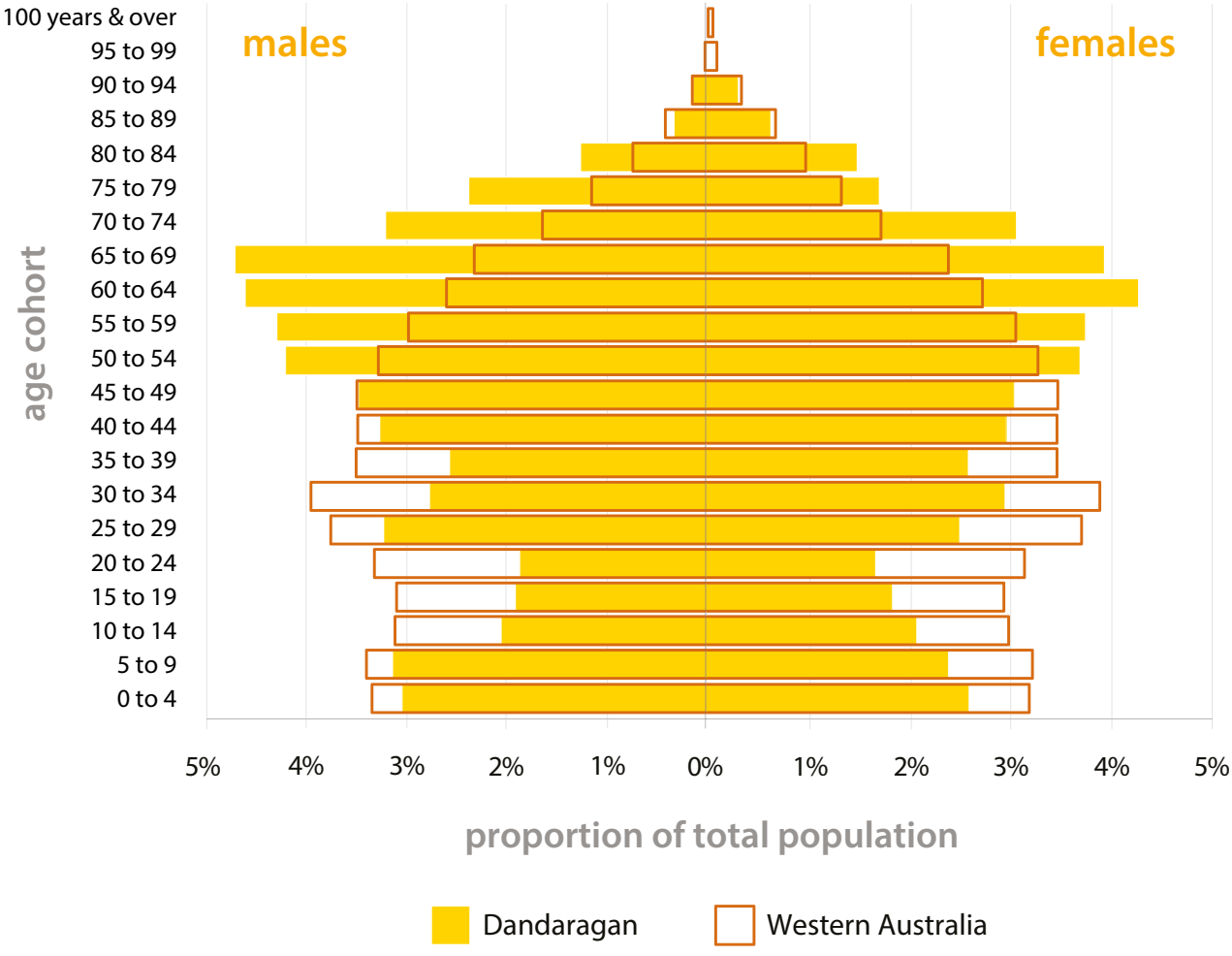


Map 2: Shire of Dandaragan – townsites

3.2 Population profile

At the 2016 Census, the median age for the Shire was 48 years, which is older than the median age for Western Australia (36 years) and the nation (38 years). There is a higher representation of persons aged 50 years and over in the Shire (47 per cent) compared to Western Australia (30 per cent) which is indicative of an ageing population (Figure 1).

Figure 1: Age by sex population profile (2016 Census) – Dandaragan (S) and Western Australia



Source: Australian Bureau of Statistics (2019) Census of Population and Housing 2016

Figure 2 shows an increasing proportion of persons aged 55 years and over in the Shire, as well as an increasing median age of the Shire's population over the past 20 years.

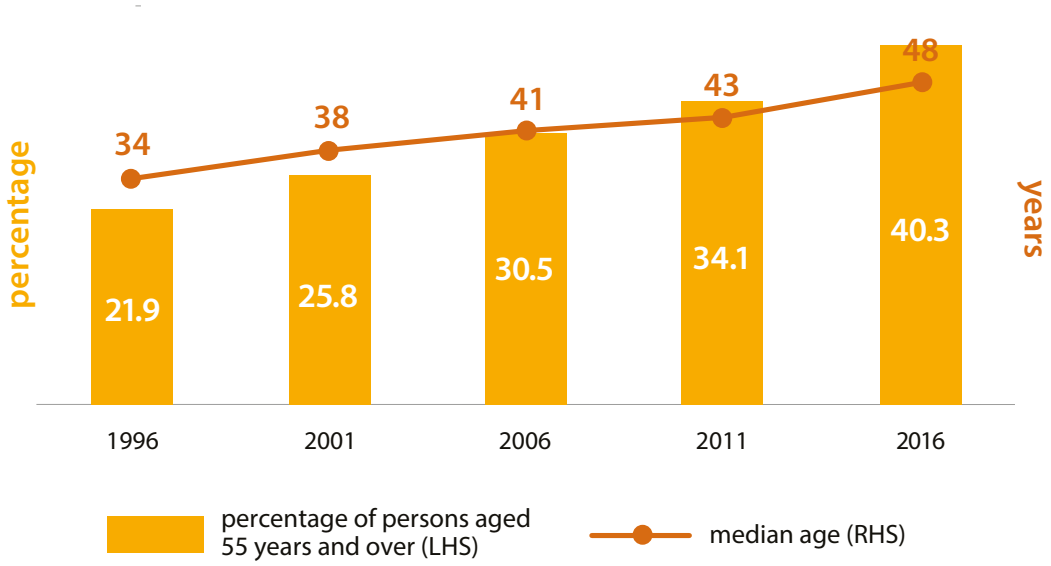
Map 3 shows population density by Mesh Block at the 2016 Census. It shows that the most densely population Mesh Blocks are in Jurien Bay and Cervantes.

3.3 Population growth

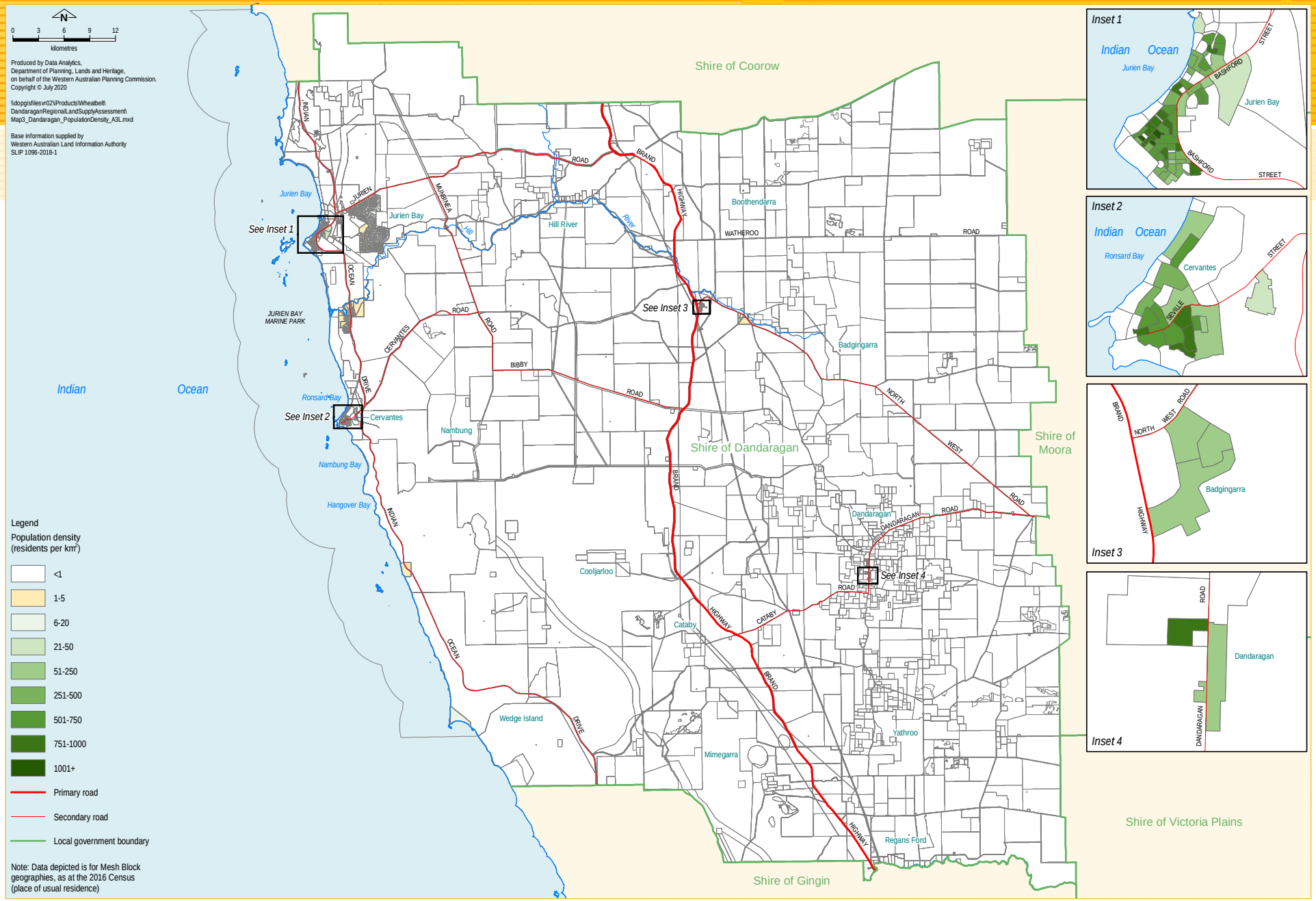
The population data discussed in this section refers to the Australian Bureau of Statistics (ABS) ERP. The ERP is the official measure of the population of Australia, based on place of usual residence. Estimates of the resident population are calculated as at 30 June of each year for selected Australian Statistical Geography Standard (ASGS) geographies, including sub-state areas such as Statistical Areas Level 2 (SA2) and local government areas.

Estimates of the resident population for census years (i.e. 2011 and 2016) are based on census counts of usual residence (excluding short-term visitors in Australia), with an allowance for census net undercount and Australian residents temporarily overseas at the time of the census.

Figure 2: Persons aged 55 years and over and median age (1996-2016) – Dandaragan (S)



Source: Australian Bureau of Statistics (2019) Census of Population and Housing 2016



Map 3: Population density – 2016 Census (Mesh Block)

Prior to 2017, sub-state population estimates for non-census years were previously updated using data inputs from a variety of sources, such as dwelling approvals, Medicare and Australian Electoral Commission enrolments. Since 2017, the ABS has adopted a new, component-based method to estimate resident population at sub-state level. Estimates of the resident population for 30 June 2017 and onwards are calculated by adding natural change (births minus deaths), net internal migration and net overseas migration to the base population. It is expected that the new component-based method will provide a greater understanding of why population has changed.

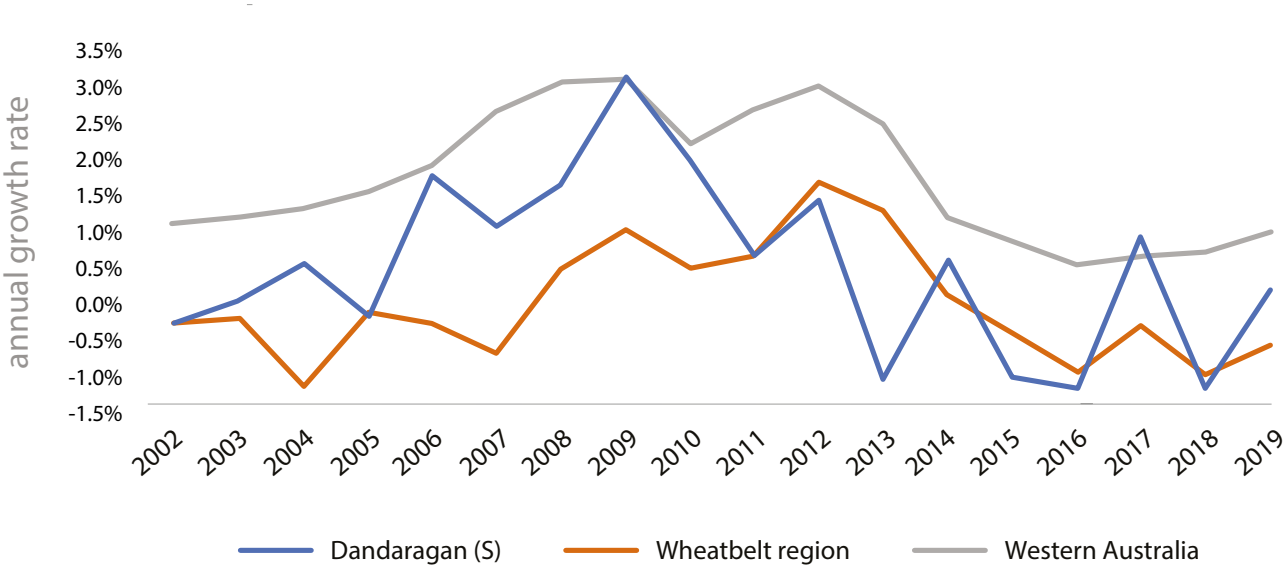
Over the decade to 30 June 2019, the Shire recorded an average annual growth rate of 0.19 per cent (average annual increase of 17 residents). This is lower than the average annual growth rate for Western Australia (1.58 per cent), but higher than the rate for the Wheatbelt (0.16 per cent). The Shire accounted for 5.4 per cent of the Wheatbelt's population growth over the decade to 30 June 2019.

Figure 3 shows the ERP annual change rates for the Shire, the Wheatbelt and Western Australia between 2002 and 2019. It shows that the Shire's population grew at high rates between 2006 and 2012, which can be attributed to significant internal migration into the Shire during that period. Since 2012, annual change rates have trended down, with population losses recorded in 2013, 2015, 2016 and 2018.

3.4 Population projections

WA Tomorrow is a series of trend-based population forecasts, by age and sex, for Western Australia and its sub-regions from 2016 to 2031. These forecasts represent a best estimate of future population size if trends in fertility, mortality and migration continue.

Figure 3: Annual change rates (2001-2019) – Dandaragan (S), Wheatbelt region, Western Australia



Source: Australian Bureau of Statistics (2020) Cat. No. 3218.0

WA Tomorrow forecasts are produced by the WAPC in collaboration with the Department of Treasury. They are produced every five years using the latest results from the five-yearly Census of Population and Housing and other data. WA Tomorrow forecasts are the official Western Australian Government forecasts to 2031.

Population projections or forecasts are not just a prediction of the future population. They also highlight opportunities or challenges that may need to be addressed. These population forecasts cannot foresee events that change trends. These include significant shifts in government policy, natural disasters and epidemics. Forecasts are best assessed on their effectiveness for the intended purpose, rather than just on their accuracy. In this case, the forecasts are primarily designed to give the demographic details of age and sex. They perform better in this case than they do when assessed only by total population size.

WA Tomorrow forecasts are distinct from government strategies, frameworks and scenarios which are based on a target population size and seek to guide future growth to deliver desired patterns of urban form.

The range of WA Tomorrow forecasts are grouped into five 'bands', based on the projected rate of population change produced by each simulation. Each band includes one-fifth of the permutations, with Band A representing the lowest quintile of projected population growth; Band C the median; and Band E the highest. The WA Tomorrow documents publish the median value of each quintile to give five forecasts for Western Australia and its sub-regions.

A more detailed description of the methods and outputs of the WA Tomorrow research are available online at

https://www.dplh.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts.

Table 2: Forecast population (2016-2031) – Dandaragan (S)

Year	Band				
	A	B	C	D	E
2016	3,215	3,215	3,215	3,215	3,215
2021	2,780	3,170	3,365	3,525	4,015
2026	2,800	3,305	3,545	3,750	4,310
2031	2,890	3,420	3,695	3,925	4,560

Source: Western Australian Planning Commission (2019) WA Tomorrow Population Report No. 11

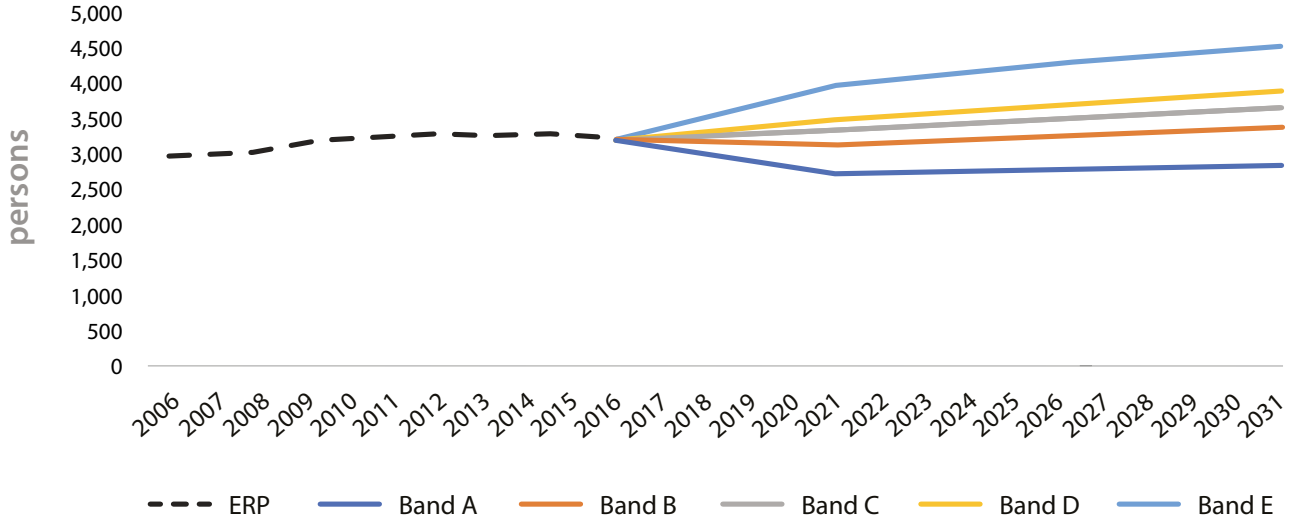
Table 3: Forecast average annual growth rate from 2016 – Dandaragan (S)

Year	Band				
	A	B	C	D	E
2016-2021	-2.87%	-0.28%	0.92%	1.86%	4.54%
2016-2026	-1.37%	0.28%	0.98%	1.55%	2.97%
2016-2031	-0.71%	0.41%	0.93%	1.34%	2.36%

Source: Western Australian Planning Commission (2019) WA Tomorrow Population Report No. 11

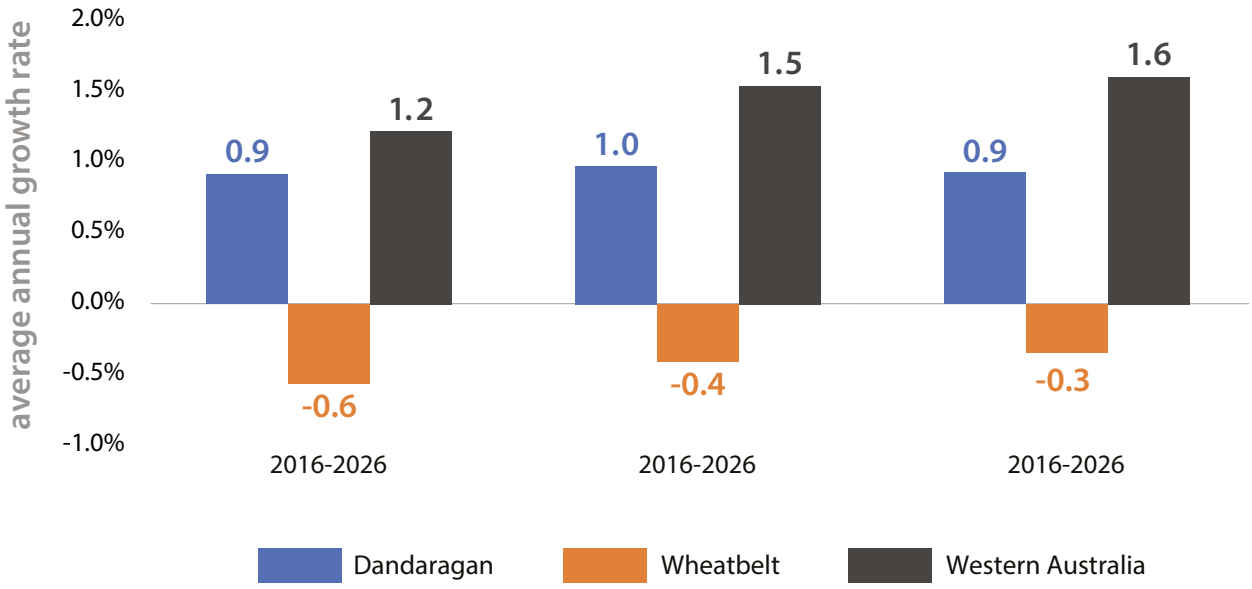
Figure 4 shows the WA Tomorrow forecast for the Shire for Bands A to E. The resulting projected population for the Shire under the median (Band C) forecast is 3,695 persons in 2031 (Table 2). Achieving this population from a 2016 baseline will require an average annual increase of 32 persons, or an average annual growth rate of 0.93 per cent (Table 3). Figure 5 compares the Shire's projected average annual growth rates to Wheatbelt and WA.

Figure 4: Total population (2006-2016 historical and 2016-2031 projections) – Dandaragan (S)



Source: Western Australian Planning Commission (2019) WA Tomorrow Population Report No. 11

Figure 5: Average annual growth rates comparison (Band C) – Dandaragan (S), Wheatbelt region and Western Australia



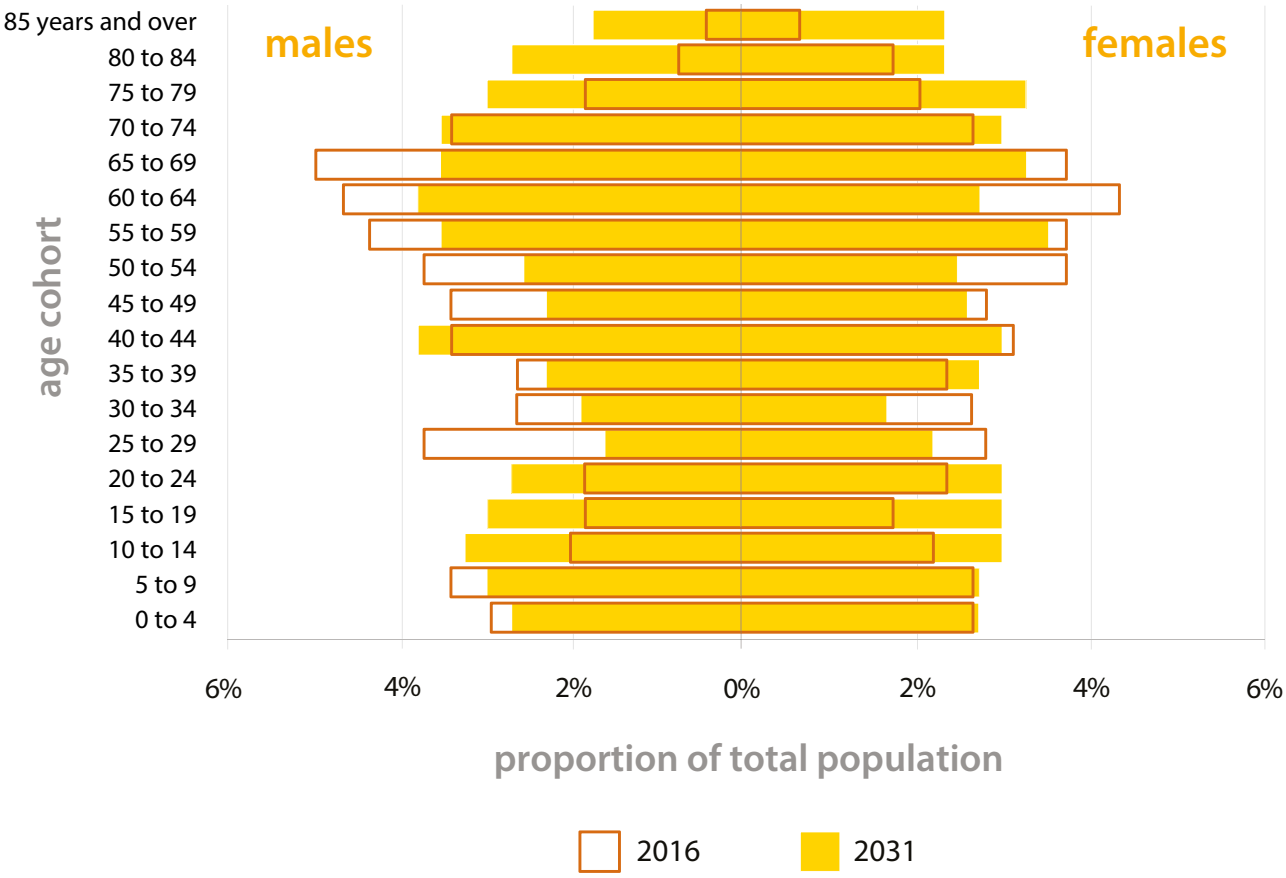
Source: Western Australian Planning Commission (2019) WA Tomorrow Population Report No. 11

The demographic profile of the Shire is anticipated to change by 2031. Figure 6 shows the age-sex population profile of the Shire at the 2016 Census and the WA Tomorrow median (Band C) forecast for the Shire's population at 2031.

For the Wheatbelt, Band D of the WA Tomorrow forecasts (which represent the second highest quintile of projected growth) projects a population of 76,660 at 2031. This would require an average annual growth rate of 0.2 per cent from 2016 to 2031, which is comparable to the rate of growth over the past decade (0.3 per cent). Bands A to C, which represent the lowest two and median quintiles of projected growth, forecast net population loss for the Wheatbelt between 2016 and 2031.

The Wheatbelt Blueprint (2015) sets a target for a more robust, aspirational rate of population growth. It envisages a population of 180,000 by 2050. This would require an average annual growth rate of 2.8 per cent from 2018 to 2050. Achieving this population outcome is contingent on the success of proposed local and regional economic development initiatives, including the delivery of key infrastructure, industry development and workforce attraction.

Figure 6: Age by sex population profile (2016 Census and 2031 WA Tomorrow Band C forecast) – Dandaragan (S)



Source: Western Australian Planning Commission (2019) WA Tomorrow Population Report No. 11

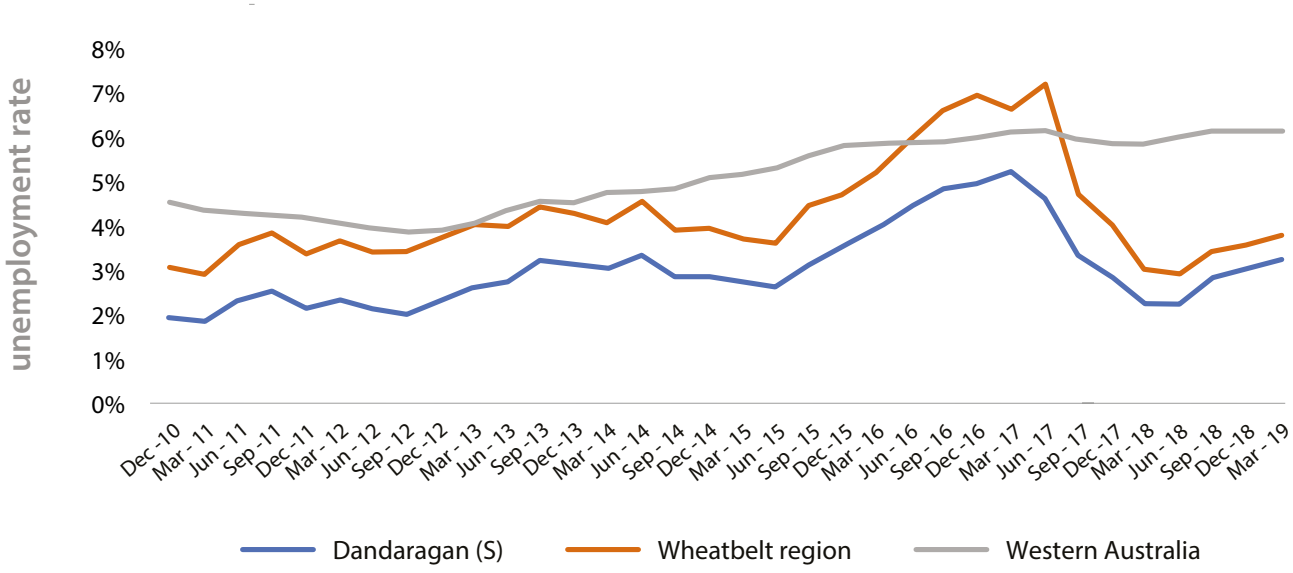
4 Economic demand drivers

Economic conditions and employment opportunities are fundamental drivers of population growth and demand for land and housing. The agriculture sector (sheep, beef cattle and grain farming) has been the backbone of the Shire's economy for many years, making significant contributions to the Shire's wealth, as well as employing a large proportion of the Shire's labour force. Other significant contributors to the Shire's economy include the sectors of tourism, mining, fishing and basic raw materials.

At the end of the March 2019[1] quarter, the Shire had a labour force of 1,832 and an unemployment rate of 3.3 per cent. This is substantially lower than the unemployment rate for Western Australia (6.4 per cent) and lower than the Wheatbelt (3.8 per cent).

Figure 7 shows the unemployment rates for the Shire, the Wheatbelt and Western Australia since the December 2010 quarter. It shows that the Shire has consistently recorded lower rates of unemployment than Western Australia and the Wheatbelt. The patterns of unemployment rates shown in Figure 7 show evidence of seasonal employment, which are typical of the agricultural and tourism sectors. Generally speaking, businesses in these sectors do not employ the same number of workers year-round. Rather, they increase their workforce during certain periods of the year as required, i.e. during harvest or high season.

Figure 7: Unemployment rates (2010-2019) – Dandaragan (S), Wheatbelt and Western Australia



Source: Department of Employment, Skills, Small and Family Business (2019) Small Area Labour Markets

[1] The latest available data as at April 2020 (December 2019 quarter) is not available for the Shire of Dandaragan, due to a break in series caused by the shift from the 2011 to the 2016 Australian Statistical Geography Standard

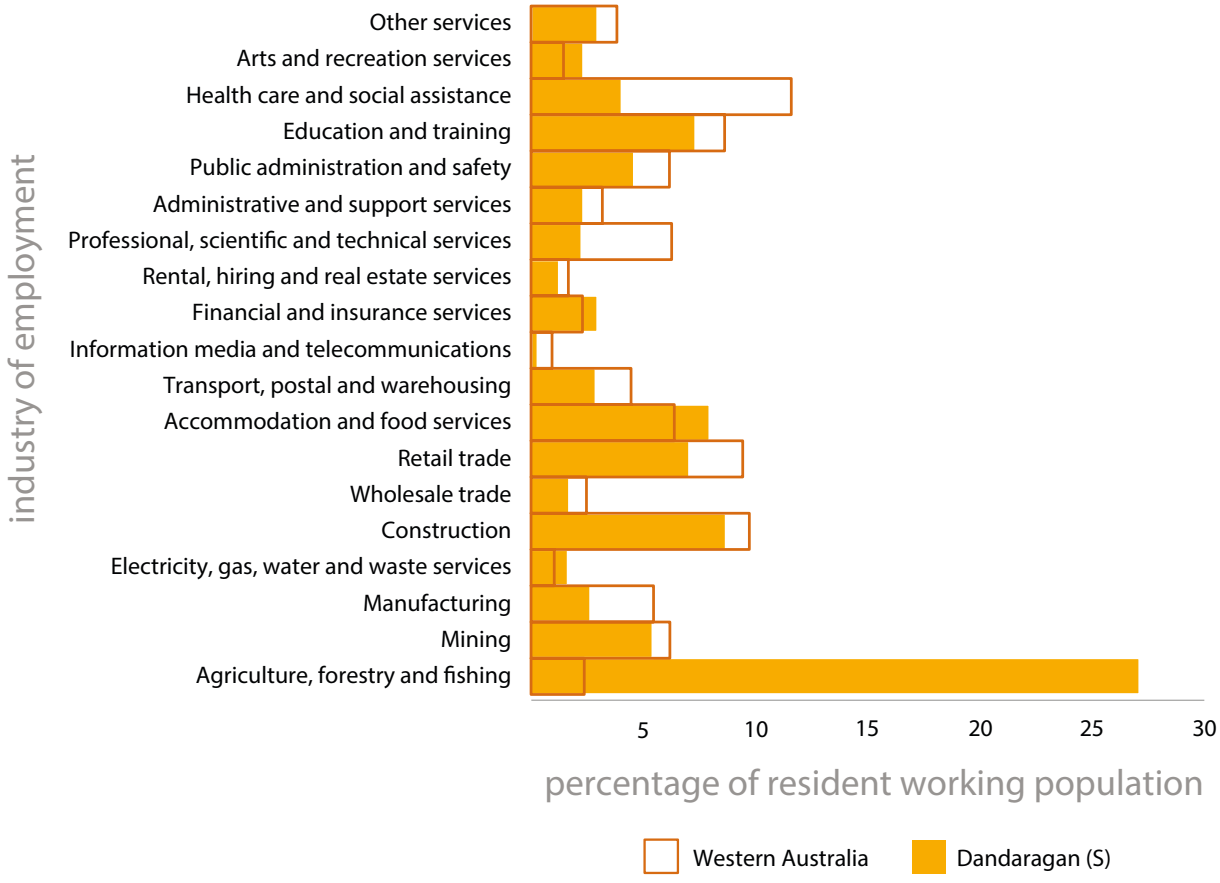
Figure 8 shows the industries of employment of the Shire's resident working population at the 2016 Census. The agriculture, forestry and fishing sectors employed 27 per cent of the Shire's resident working population, followed by construction (9 per cent), accommodation and food services (8 per cent), retail trade (7 per cent) and education and training (7 per cent).

At the 2016 Census, 58.3 per cent of the Shire's labour force were employed on a full-time basis; 30.2 per cent was employed on a part-time basis; 6.9 per cent was away from work; and 4.5 per cent was unemployed.

Median weekly incomes for the Shire are lower than Western Australia and the nation. At the 2016 Census, the median weekly personal income for persons aged 15 years and over in the Shire was $636. This compares to $724 for Western Australia and $662 for the nation.

The Shire's draft local planning strategy identifies opportunities for economy and employment growth. Industries identified for expansion include agriculture and tourism.

Figure 8: Industries of employment (2016 Census) – Dandaragan (S) and Western Australia



Source: Australian Bureau of Statistics (2019) Census of Population and Housing 2016

The Shire's proximity to the Perth metropolitan region, abundance of agricultural land and good growing conditions provide for the expansion of the agricultural sector. Agricultural activities traditionally undertaken within the Shire include cropping and grazing, however, opportunities exist for further development of more intensive and alternative forms of agriculture, such as agroforestry, aquaculture, floriculture and/or viticulture.

The Shire's horticultural sector is well-established. Although fruits and vegetables do not account for large shares of the Shire's gross regional product, the Shire is one of the State's most significant intensive agricultural areas. The Shire contains some of the State's largest citrus orchards and carrot farms. Value of agricultural commodities data from the ABS suggests that the Shire is a significant producer of the commodities listed in Table 4.

The Shire's draft local planning strategy recognises the need to protect agricultural land and proposes to identify areas of 'high quality agricultural land' in consultation with the Department of Primary Industries and Regional Development. The Shire's draft local planning strategy seeks to ensure the protection of these areas through several planning mechanisms, including the introduction of a Priority Agriculture zone to the local planning scheme, as well as the preparation of a local planning policy that sets out the objectives and development provisions of these areas.

In addition, the draft local planning strategy proposes to introduce greater flexibility into the Rural zone to allow for a wider range of land uses. These include land uses related to primary production and value adding of the sector (i.e. food production and/or manufacturing), small-scale tourism, environmental protection and biodiversity conservation. If these actions are progressed, they may assist in improving the viability of rural enterprises.

The draft local planning strategy identifies tourism as another major contributor to the Shire's economy, and anticipates growth of the sector over the coming years. Tourism Research Australia estimates that over the four years to 2017, an average of 312,000 visitors per annum visited the Shire, staying an average length of three nights. International visitors accounted for seven per cent of total visitors, staying an average length of two nights. The total tourism expenditure in the Shire is estimated at $84 million, with domestic overnight visitors contributing $62 million to the total tourism expenditure.

Table 4: Value of agricultural commodities, Shire of Dandaragan and Western Australia, 2015/16

Commodity	Gross value (Shire of Dandaragan)	Gross value (Western Australia)	Shire of Dandaragan's share of WA gross value
Lemons	$1,094,010	$2,065,378	53%
Lettuces	$9,790,989	$24,113,533	41%
Eggs	$24,676,877	$69,854,865	35%
Cauliflowers	$2,945,638	$8,558,166	34%
Blueberries	$570,158	$1,845,682	31%
Cabbages	$2,129,669	$8,165,331	26%
Carrots	$9,986,608	$39,246,317	25%
Cultivated turf	$6,831,770	$27,398,363	25%
Mangoes	$2,016,452	$8,088,451	25%

Source: Australian Bureau of Statistics (2019) Cat. No. 7513.0

Data from Tourism WA indicates that the numbers of international visitors from Asian countries (including China, Indonesia, Japan, India and the Philippines) to Western Australia have grown over the past three years. The numbers of international visitors from China and India to Western Australia are estimated to have grown by an average of 15 per cent and 17 per cent per annum over the past three years. These figures were expected to increase with the establishment of direct flights from Perth to China and Japan in early 2020. The outbreak of a novel coronavirus (COVID-19) in early 2020 is severely impacting the tourism industry throughout Australia. The extent of the ultimate impact of the COVID-19 pandemic on the economy and employment, as well as population growth, remains to be seen.

At April 2020, intrastate, interstate and international travel restrictions are in place in order to slow the spread of the coronavirus. In light of the travel restrictions, Tourism WA has paused all marketing activity. It will resume marketing activity to encourage holidaying in Western Australia, when it is safe and appropriate to do so.

Tourism Research Australia data indicates that most visitors to the Shire stay in camping grounds and caravan parks. The draft local planning strategy anticipates a demand for a greater variety of choice in tourist accommodations. There is ample supply of affordable accommodation (i.e. camping grounds and caravan parks), however, higher quality and branded short-stay accommodation options are lacking.

While there are several vacant sites zoned Tourist throughout Jurien Bay and Cervantes, it is considered that the provisions of the Shire's Local Planning Scheme No. 7 (LPS 7) are insufficient in ensuring the protection of tourist sites through zoning requirements that limit occupancy length and the proportion of the residential component of tourism developments.

The draft local planning strategy proposes to develop the tourism market based on the Shire's landscape and biodiversity values. Existing caravan and camping sites should be protected while planning for the growth of caravan and camping accommodation along the coast. In addition, there is an increasing market demand for holiday accommodation. The Shire has recently adopted *Local Planning Policy 8.3 Holiday Homes* (2018) which provides direction and guidance on the use of residential dwellings for holiday homes, particularly regarding the management of holiday homes and maintaining residential amenity.

Further employment opportunities in the health care and social assistance sector are expected to materialise because of the Shire's ageing population. Cervantes and Jurien Bay are considered attractive retirement communities, evident by the increasingly high proportion of persons aged 55 years and over compared to the State average. There may be an increasing demand for aged accommodation facilities and services, including leisure and health care facilities catering for the aged population.

5 Residential land and housing

5.1 Overview

At the 2016 Census, 55 per cent of the Shire's population lived in the locality of Jurien Bay. A further 16 per cent, 11 per cent and 6 per cent lived in the localities of Cervantes, Dandaragan and Badgingarra respectively. The Shire's draft local planning strategy sets out a plan to concentrate future growth in Jurien Bay, where there are large supplies of land zoned for residential development in proximity to services and amenities.

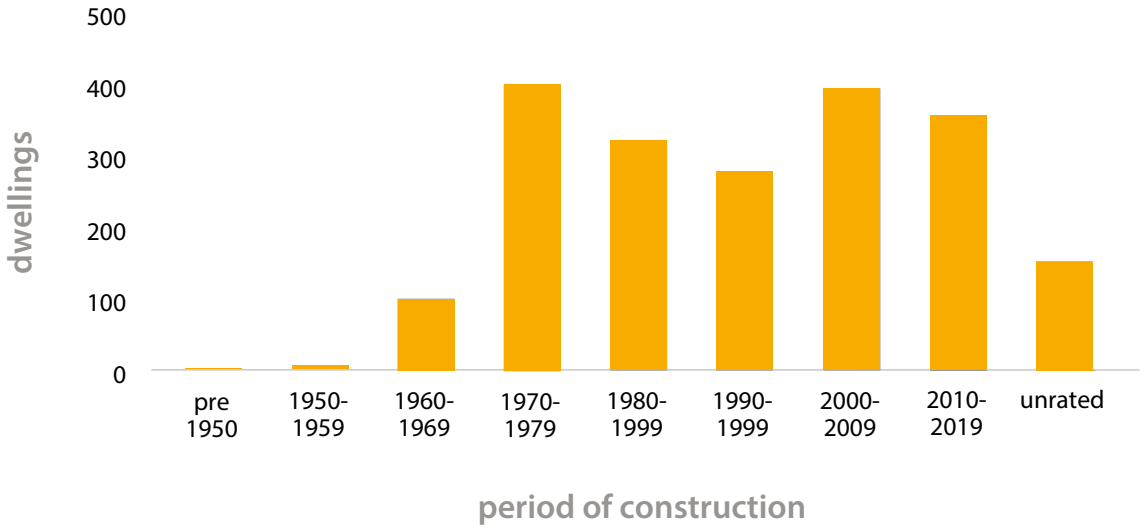
At the 2016 Census, a stock of 2,936 private dwellings was recorded in the Shire. Of these, 45.4 per cent were occupied. The Shire's rate of dwelling occupancy is lower than the State average (86.7 per cent), as there is a significant number of dwellings being used as holiday homes. Dwelling occupancy rates were higher across inland parts of the Shire, with the localities of Badgingarra, Dandaragan, Hill River and Yathroo recording dwelling occupancy rates above 60 per cent. Comparatively, dwelling occupancy rates for the Shire's coastal settlements were lower, with the localities of Cervantes and Jurien Bay recording occupancy rates of 41.1 per cent and 50.7 per cent respectively. This indicates that a high number of dwellings in Jurien Bay and Cervantes are being used as holiday homes.

Separate houses accounted for 92.6 per cent of the Shire's total occupied private dwellings at the 2016 Census. Comparatively, separate houses accounted for 79.1 per cent of Western Australia's total occupied private dwellings.

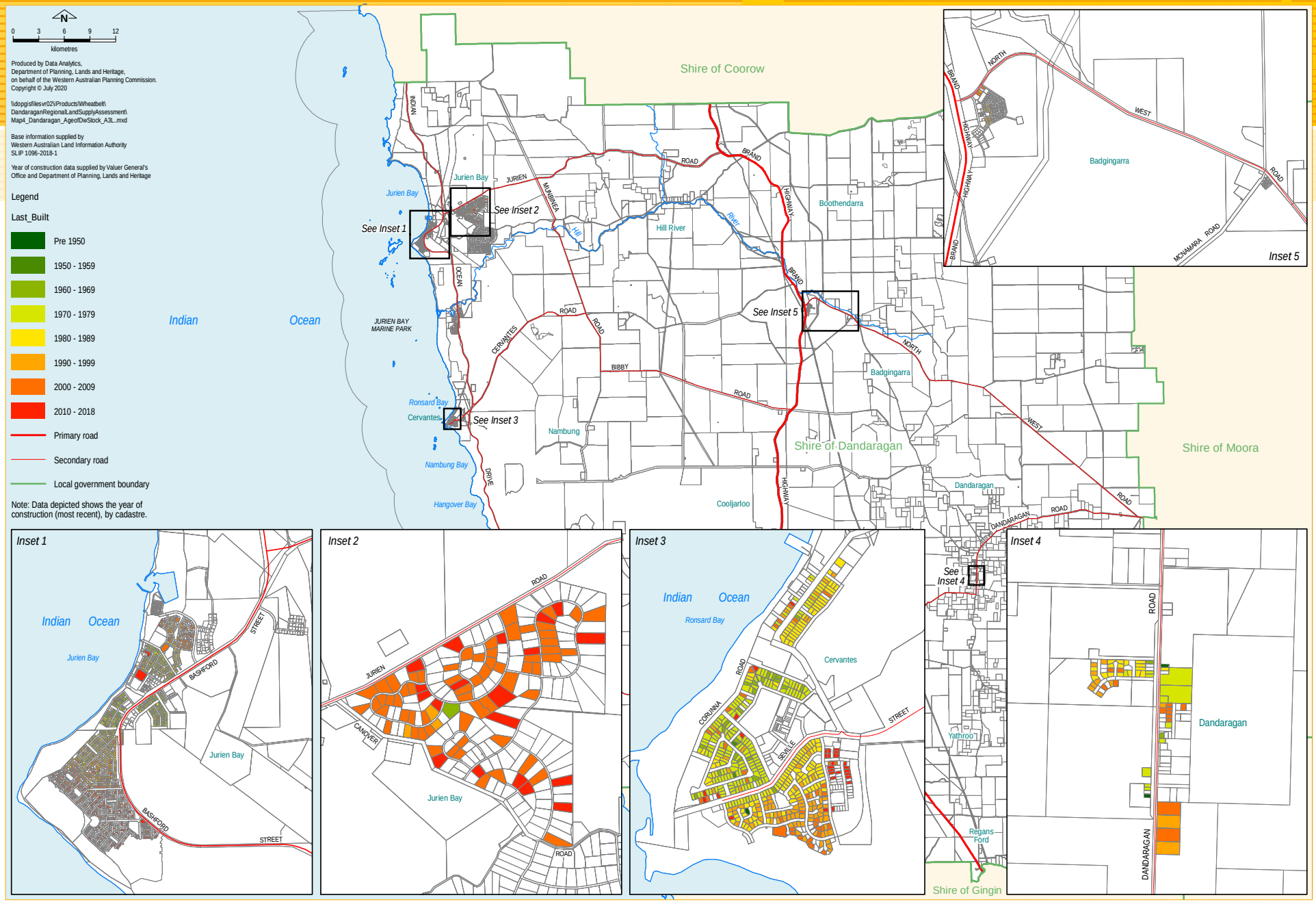
The age of the Shire's residential dwelling stock is quite varied (Figure 9). Twenty per cent of the Shire's residential dwellings were built between 1970 and 1979, and 38 per cent were built between 2000 and 2019 (to date).

Map 4 shows the distribution of residential dwellings by year of construction. It shows that the Shire's oldest stocks of dwellings are concentrated in the Jurien Bay town centre. The Shire's newest stocks of dwellings are located across the Turquoise Coast/Beachridge Estate area, as well as at the south east of the Cervantes townsite.

Figure 9: Age of dwelling stock – Dandaragan (S)



Source: Department of Planning, Lands and Heritage (2019) Integrated Regional Information System



Map 4: Age of dwelling stock – Dandaragan (S)

5.2 Land zoned for residential purpose

The following local planning scheme zones within the Shire's LPS 7 provide for residential development:

- Residential; and
- Special Development (Map 5).

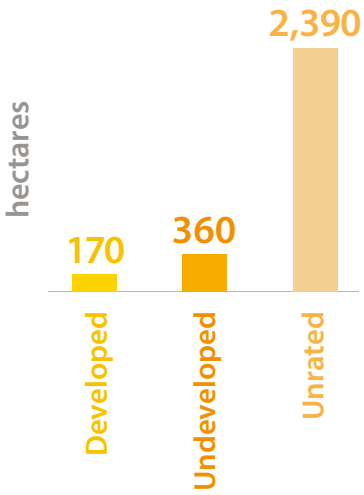
In addition to the above local planning scheme zones, limited residential development may occur on land zoned Commercial, Rural, Tourist and Regional Centre under the Shire's LPS 7. Several residential use classes including single house, grouped dwelling and multiple dwelling are listed as discretionary uses within these local planning scheme zones. Residential development may also occur within Special Use zones; development of a retirement village in Jurien Bay on land zoned Special Use – Aged Persons Accommodation has been partly progressed.

Using the Integrated Regional Information System (IRIS) land supply assessment model, areas of land zoned for residential purpose (including land zoned Residential, Special Development and Special Use – Aged Persons Accommodation) are grouped together and assessed to provide a snapshot of existing land stocks. Appendix B provides an in-depth description of the IRIS model and the methodology for its use.

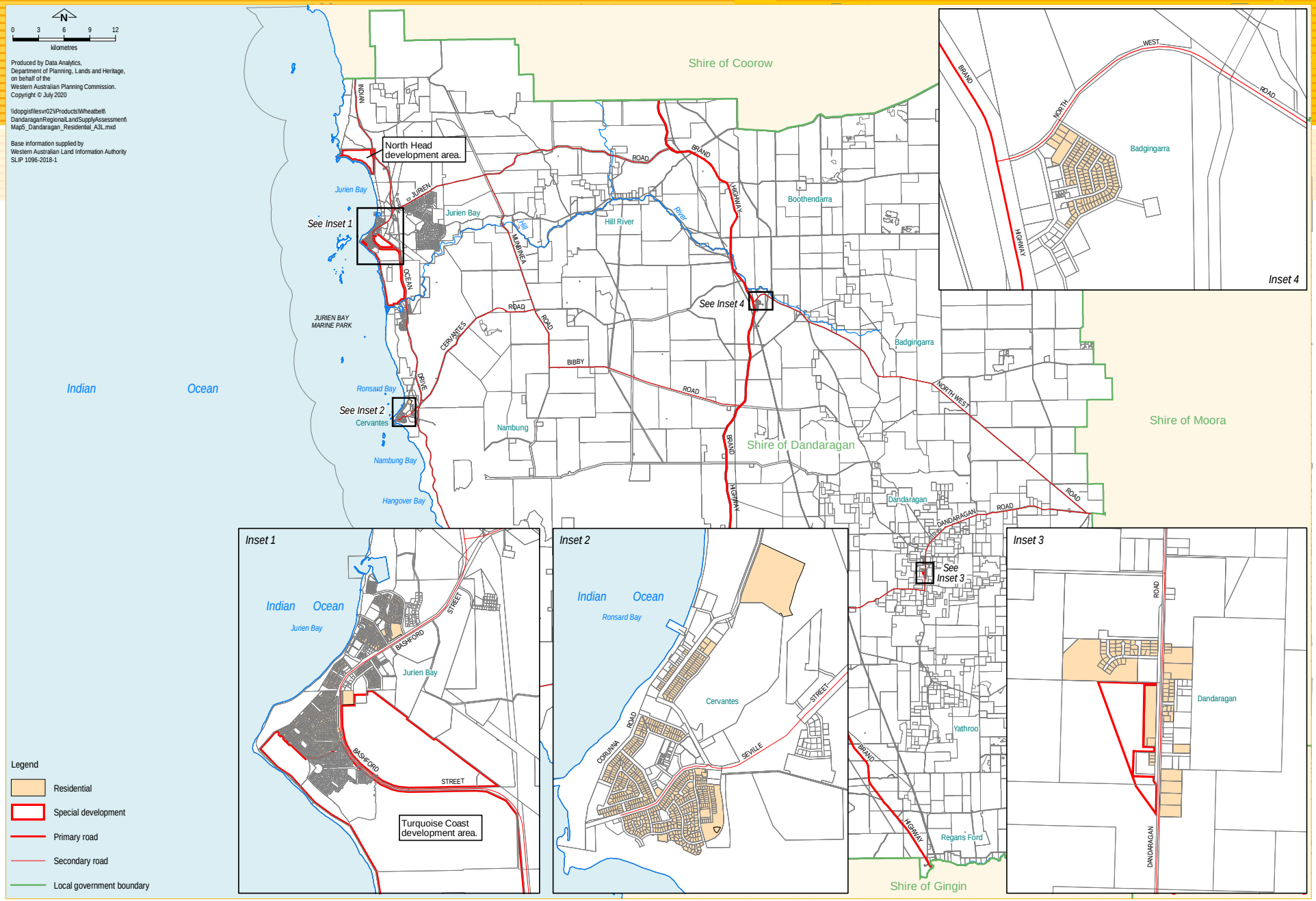
The IRIS model showed that, as at December 2018, there were 2,500 lots on land zoned for residential purpose, covering approximately 2,920 hectares. Just 170 hectares (6 per cent) and 360 hectares (12 per cent) were classified as developed and undeveloped respectively. Approximately 2,390 hectares (82 per cent) was classified as unrated (Figure 10).

Lots classified as unrated are those that are zoned for development for the purpose of the specified primary land use category for which no vacant land or premises valuation information has been captured in Landgate's property valuation database. The majority of the Turquoise Coast and the entirety of the North Head development areas were classified as unrated.

Figure 10: Development status of land zoned for residential purposes (December 2018) – Dandaragan (S)



Source: Department of Planning, Lands and Heritage (2019) Integrated Regional Information System

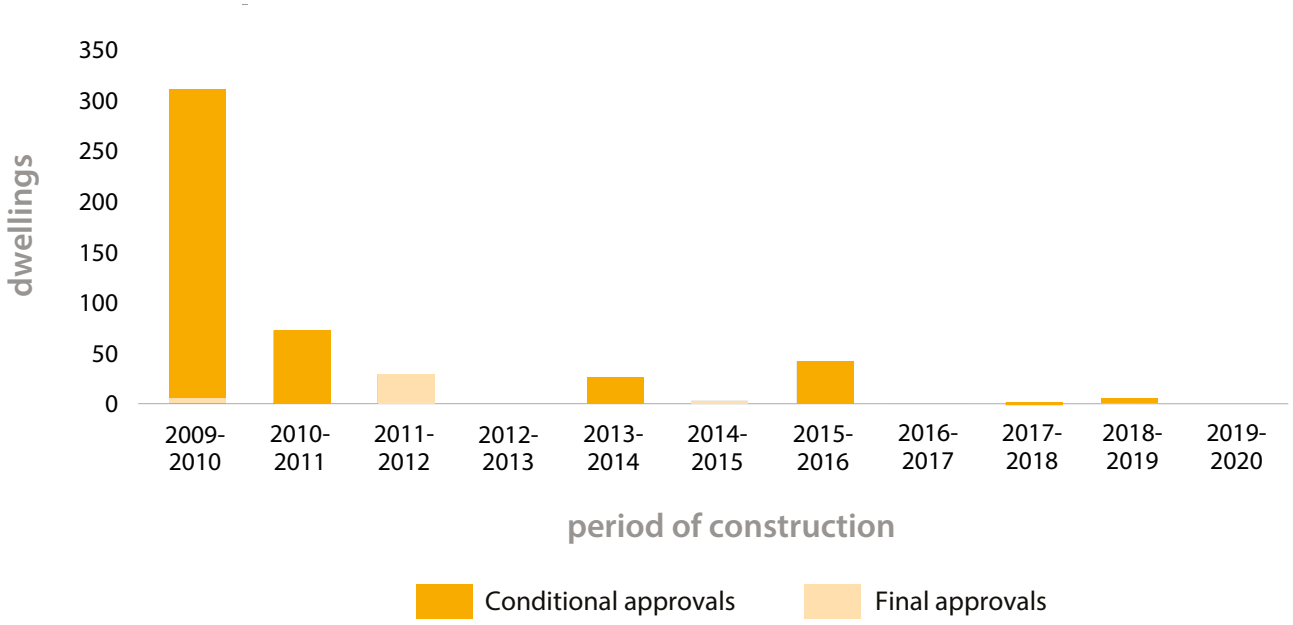


Map 5: Shire of Dandaragan – residential

5.3 Lot supply pipeline

Over the decade to June 2019, a total of 462 residential lots were granted conditional (preliminary) subdivision; however, just 36 lots were created (i.e. granted final approval) over this period.

Figure 11: Residential subdivision activity (2009-10 to 2019-20) – Dandaragan (S)



Source: Western Australian Planning Commission (2020) State Lot Activity

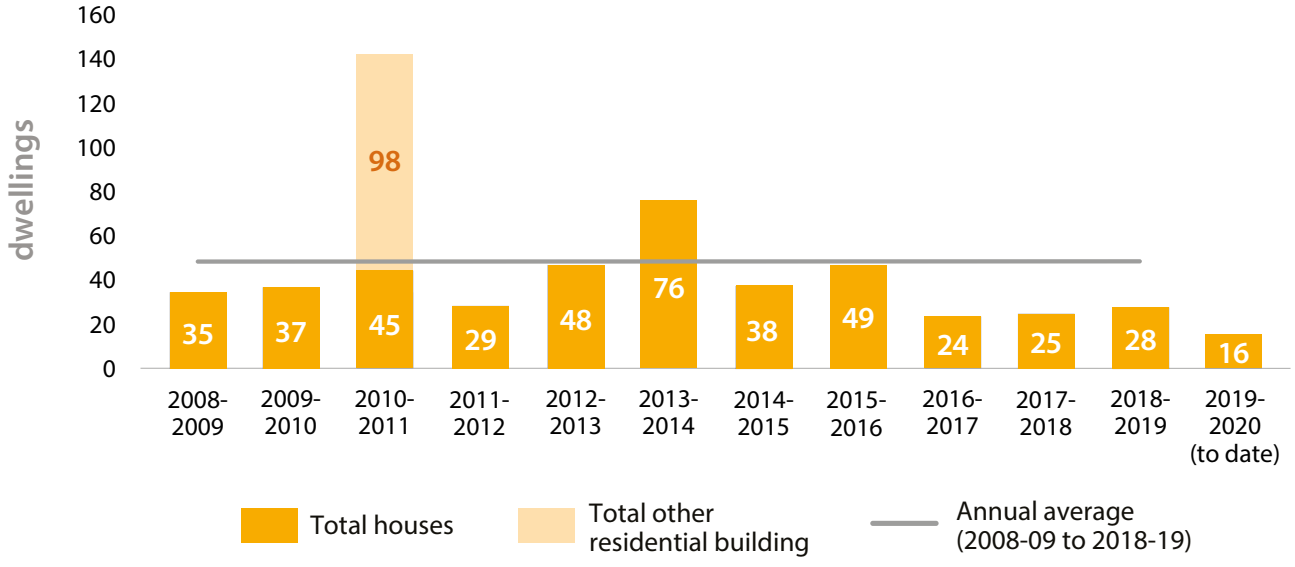
5.4 Dwelling approvals

Dwelling approvals are a key demand indicator, representing either owner-occupier demand or investor confidence. As most dwelling approvals proceed to construction and eventually completion, they also provide a leading indicator of dwelling supply.

Over the decade to June 2019, a total of 550 dwelling units were granted building approval. Eighty-two per cent were for houses. Ninety-eight 'other residential' dwelling units (see glossary for definition) were approved for construction in 2010/11.

Since 2014/15, the number of dwellings approved annually (during a financial year) have remained below the annual average for the decade to June 2019 (Figure 12).

Figure 12: Dwelling approvals (2008/09 to 2018/19) – Dandaragan (S)



Source: Australian Bureau of Statistics (2020) Cat. No. 8731.0

5.5 Development outlook

Table 6, Map 6 and Map 7 show possible development projects in the Shire. Projects are included where intent has been demonstrated (by government or the development industry) to develop the site at some point in the future. Projects are identified through a variety of means, including:

- local planning scheme zones and amendments;
- developer intentions;
- consultation with local stakeholders;
- subdivision applications/approvals;
- local government development applications/approvals;
- Development Assessment Panel (DAP) applications/approvals;
- structure planning; and
- strategic planning.

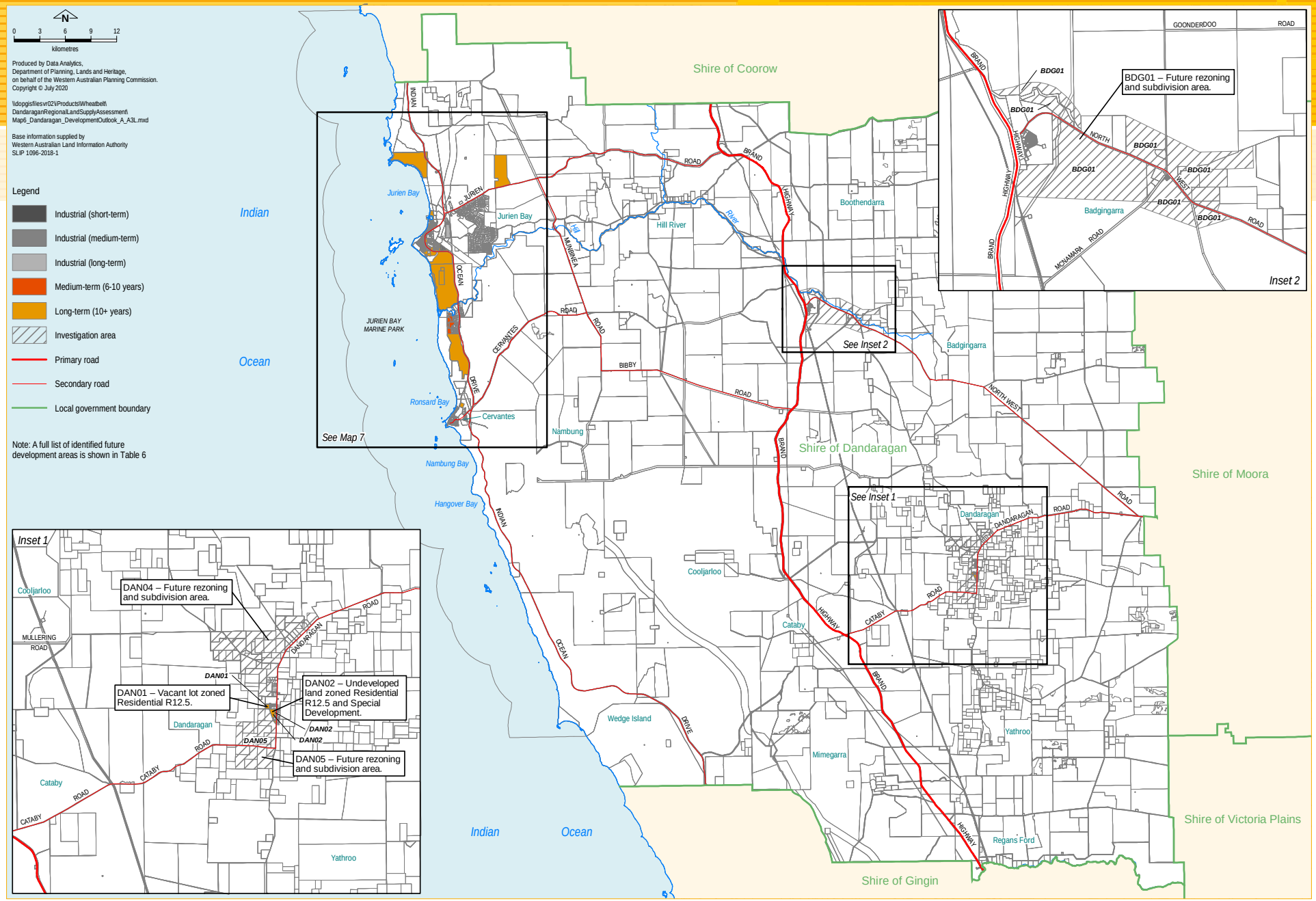
The Shire's draft local planning strategy sets out a plan to concentrate growth in Jurien Bay, where there are large stocks of land zoned for residential development in proximity to services and amenities. Development outlook analysis indicates that Jurien Bay accounts for almost all of the entire stock of proposed dwellings in identified future development areas (Table 5).

Large-scale proposed developments in Jurien Bay contribute significantly to the stock of proposed dwellings. The Turquoise Coast development area (site JB01) has been planned to deliver over 8,000 dwellings over eight stages of development. Development of stage one is underway, with approximately 600 lots already created. The North Head development area (site JB06) has been planned to deliver over 2,000 dwellings. An approved district structure plan applies over the North Head development area. Development is anticipated to be undertaken in stages, with timeframes dependent on market demand.

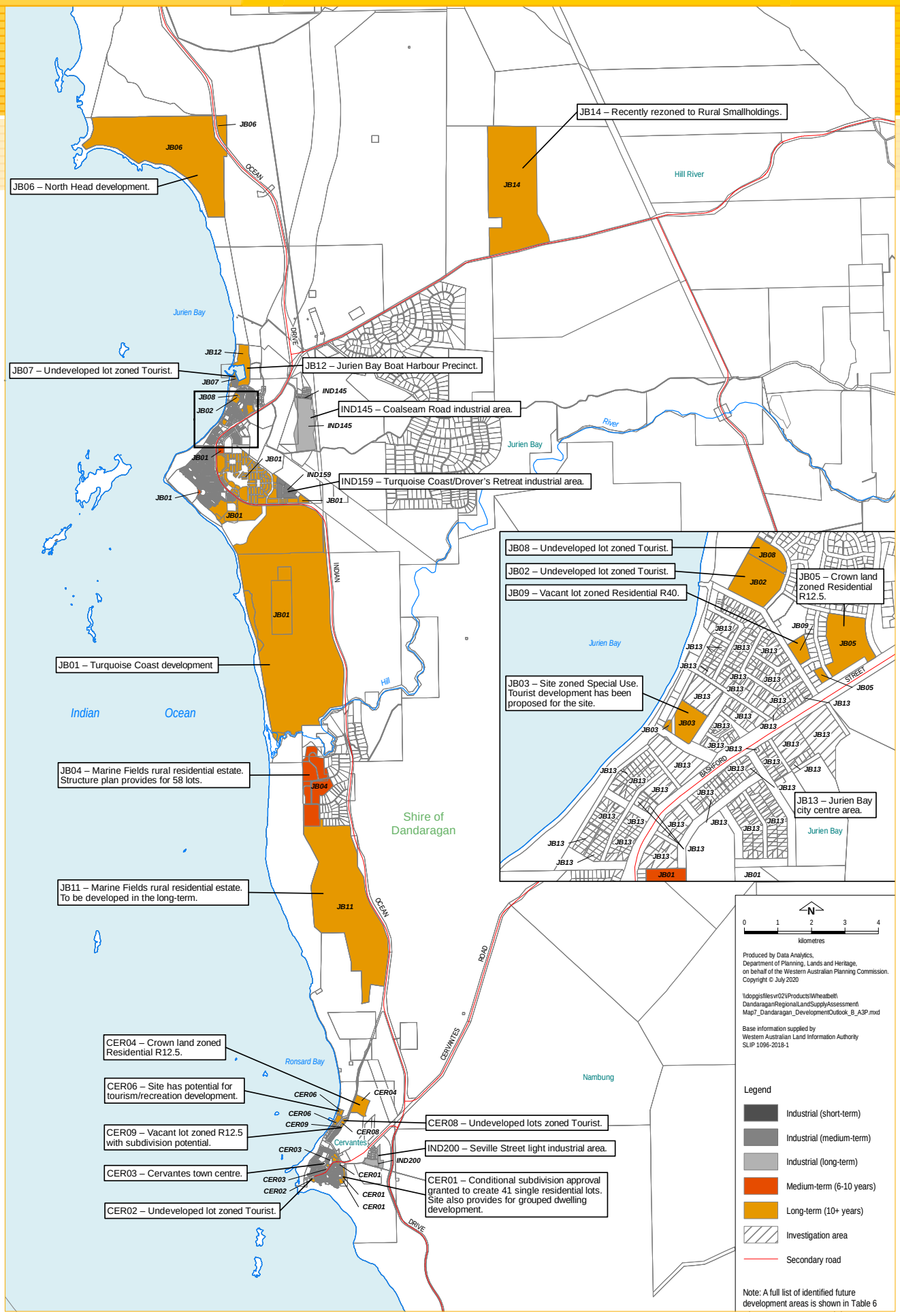
Table 5: Estimated dwelling yield from possible development areas – Dandaragan (S)

Locality	Short-term (0-5 years)	Medium-term (6-10 years)	Long-term (10+ years)	Total
Badgingarra	-	-	-	-
Cervantes	-	41	38	79
Dandaragan	-	-	42	42
Jurien Bay	-	1,900	9,093	10,993
Total	**-**	**1,953**	**9,173**	**11,114**

Source: Department of Planning, Lands and Heritage (2020)



Map 6: Development outlook (staging) A



Map 7: Development outlook (staging) B

Identifier	Location	Suburb	Map number in this document	Existing tenure[1]	Purpose	Zoning/planning			Area/yield[2]			Subdivision approvals[3]		Anticipated dwelling release[4] (commencing early 2019)			Constraints[5]			Comments
						Current local planning scheme zone/reserve	Amendment required	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Short-term (0-5 years)	Medium-term (6-10 years)	Long-term (10+ years)	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
BDG01	Numerous lots	Badgingarra		Numerous landowners	Future rezoning and subdivision area	Rural	Yes	n/a	2,047.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Investigation area. The site is comprised of numerous lots zoned Rural under the Shire of Dandaragan (the Shire) Local Planning Scheme No. 7 (LPS 7). The Shire's draft Local Planning Strategy (draft LPS) identifies the site for future rezoning and subdivision for residential and rural living uses within or adjacent to the Badgingarra townsite, as well as highway-related services and industry, other industry, composite mixed business or industry with residential uses. Any proposed development would be subject to land suitability assessments, logical extension of existing development, landscape protection adjacent to Brand Highway and minimising access points from Brand Highway.
CER01	Lot 93 Pamplona Cr, Lot 94 Valencia Rd, Lot 9501	Cervantes		Housing Authority, WA Land Authority	Residential (single houses and grouped dwellings)	Residential (R15), Residential (R50)	No	n/a	5.5	42	73	-	42	-	41	32	T, W	MC	-	The site is comprised of three lots zoned Residential under the Shire's LPS 7. Conditional subdivision approval has been granted to create 41 single residential lots and one grouped dwelling lot on Lot 9501. LPS 7 provides for the development of grouped dwellings on a portion of Lot 9501, as well as Lots 93 and 94. The majority of Lot 9501 has a density coding of R15, while the proposed grouped dwelling lot on Lot 9501, Lots 93 and 94 have a density coding of R50 under LPS 7.
CER02	Lot 861 Seville St	Cervantes		WA Land Authority	Tourist	Tourist	Yes	n/a	1.3	-	-	-	-	-	-	-	BP, E	MC	-	The site is comprised of a lot zoned Tourist under LPS 7. The draft LPS proposes that the site be rezoned from Tourist to Special Use, including additional site and development requirements. The draft LPS specifies, however, that any proposed development on the site should be predominantly for tourist purpose. The site has been identified as vulnerable to coastal erosion through the Shire's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).
CER03	Numerous lots bounded by Seville St, Weston St, Iberia St & Aragon St	Cervantes		Numerous landowners	Residential, Commercial	Residential (R35), Commercial	No	Cervantes Town Centre Future Land Use Plan	6.9	12	12	-	-	-	12	-	E, P	MC	-	The site is comprised of numerous lots at the centre of the Cervantes townsite. Lot 594 Weston Street is zoned Residential with a density coding of R35 under LPS 7, while a number of other lots are zoned Commercial. Lot 594 Weston Street could potentially accommodate up to 12 dwellings. For the balance of the site, the Cervantes Town Centre Future Land Use Plan (adopted by the Shire in 2012) provides for the development of a mix of commercial, tourist and public purpose uses.
CER04	Pt Lot 501 Cervantes Rd	Cervantes		State of WA	Residential	Residential (R12.5)	No	Cervantes Structure Plan	22.6	-	-	-	-	-	-	-	-	D, E, H, MC, NT, P, Pw, S, W, Z	-	The site is comprised of an area of Crown land zoned Residential with a density coding of R12.5 under LPS 7. The draft LPS identifies the site as an opportunity for further development and consolidation/expansion of the Cervantes townsite, subject to environmental and native title requirements.

Identifier	Location	Suburb	Map number in this document	Existing tenure[1]	Purpose	Zoning/planning			Area/yield[2]			Subdivision approvals[3]		Anticipated dwelling release[4] (commencing early 2019)			Constraints[5]			Comments
						Current local planning scheme zone/reserve	Amendment required	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Short-term (0-5 years)	Medium-term (6-10 years)	Long-term (10+ years)	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
CER06	Lots 617 & 618 Beach Road, Lots 897, 898 & 899	Cervantes		State of WA	Tourism/ Recreation	Marine Services	Yes	n/a	7.2	-	-	-	-	-	-	-	-	W	E, MC, P, S, Z	The site is comprised of a number of lots zoned Marine Services under LPS 7. The site was previously the subject of the Cervantes Keys proposal, which proposed significant development for tourism and recreation uses. The proposal did not proceed; however, the draft LPS acknowledges the site's potential for tourism and recreation. The site has been identified as vulnerable to coastal erosion through the Shire's CHRMAP.
CER08	Lot 645 Catalonia St, Lot 890	Cervantes		State of WA	Tourist	Tourist	No	n/a	2.2	-	-	-	-	-	-	-	-	S	E, MC, P	The site is comprised of two vacant, undeveloped lots zoned Tourist under LPS 7.
CER09	Lot 644 Green St	Cervantes		State of WA	Residential	Residential (R12.5)	No	n/a	0.8	6	6	-	-	-	-	6	-	E, MC, P, S	-	The site is comprised of a vacant lot zoned Residential with a density coding of R12.5 under LPS 7.
DAN01	Lot 57 Camm Rd	Dandaragan		State of WA	Residential	Residential (R12.5)	No	n/a	6.8	24	24	-	-	-	-	24	E, S	MC	-	The site is comprised of a vacant lot zoned Residential with a density coding of R12.5 under LPS 7. The site is covered in remnant vegetation and is rated as having a moderate bushfire risk. Conditional approval was granted to create 24 residential lots on approximately 3.8 hectares of the site area; however, this lapsed in April 2018. The site is unsewered.
DAN02	Pt Lot 600 & Lot 801	Dandaragan		Koodiewoodie Pty Ltd	Residential, Special Development	Residential (R12.5), Special Development	No	n/a	17.1	18	18	-	-	-	-	18	E, P, S	MC	-	The site is comprised of undeveloped land zoned Residential with a density coding of R12.5 and Special Development under LPS 7. Based on an average lot size of 1,000 square metres, the portion of site zoned Residential could potentially yield approximately 18 lots. For the portion of site zoned Special Development, a local structure plan is required to be prepared prior to development.
DAN04	Numerous lots north of the Dandaragan townsite	Dandaragan		Numerous landowners	Future rezoning and subdivision area	Rural	Yes	n/a	1,199.90	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Investigation area. The site is comprised of numerous lots north of the Dandaragan townsite zoned Rural under LPS 7. The draft LPS identifies the site as a future rezoning and subdivision area and proposes support for residential and rural living uses within and adjacent to the townsite, as well as industry, composite mixed business or industry with residential uses where land proves suitable; and intensive agriculture.

Identifier	Location	Suburb	Map number in this document	Existing tenure[1]	Purpose	Zoning/planning			Area/yield[2]			Subdivision approvals[3]		Anticipated dwelling release[4] (commencing early 2019)			Constraints[5]			Comments
						Current local planning scheme zone/reserve	Amendment required	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Short-term (0-5 years)	Medium-term (6-10 years)	Long-term (10+ years)	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
DAN05	Numerous lots south of the Dandaragan townsite	Dandaragan		Numerous landowners	Future rezoning and subdivision area	Rural	Yes	n/a	651.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Investigation area. The site is comprised of numerous lots south of the Dandaragan townsite zoned Rural under LPS 7. The draft LPS identifies the site as a future rezoning and subdivision area and proposes support for residential and rural living uses within and adjacent to the townsite, as well as industry, composite mixed business or industry with residential uses where land proves suitable; and intensive agriculture.
JB01	Lots 290, 792, 1556, 7377, 9016 & 9517	Jurien Bay		Ardross Estates Pty Ltd	Residential, Commercial, Special Use, Tourism	Residential (R40), Special Development	Yes	Turquoise Coast Structure Plan	1,757.94	8,502	8,502	-	-	-	1,842	6,700	E, P	MC	-	The site is comprised of a large area predominantly zoned Special Development under LPS 7; a small portion of the site (4.9 hectares) is zoned Residential with a density coding of R12.5. The Turquoise Coast Structure Plan and the draft LPS identify a yield of over 9,000 residential lots, to be delivered over eight stages of development. Local structure plans have been prepared for stages one to three of the development. Development of stage one (marketed as Beachridge Estate) is partially complete, with over 600 lots already created. Other proposed land uses within the Turquoise Coast Structure Plan area include special residential, residential/industrial composite lots, light industrial, indsustrial and commercial/tourist uses. The industrial component of the Turquoise Coast development has been identified separately within this table (site IND159).
JB02	Lot 1136 Casuarina Cr	Jurien Bay		Punt Holdings Pty Ltd	Tourist	Tourist	No	n/a	4	-	-	-	-	-	-	-	MC, P	-	-	The site is comprised of a vacant lot zoned Tourist under LPS 7. The draft LPS identifies the site as an opportunity for a major tourism development adjacent to the foreshore. The site has been identified as sewage sensitive as it is within two kilometres of the Jurien Bay coastal embayment.
JB03	Lot 62 Roberts St and portions of the Heaton Street and Roberts Street road reserves	Jurien Bay		Aliceville Pty Ltd	Tourist	Special Use	No	Draft Local Development Plan advertised by the Shire in 2016	2.2	-	-	-	-	-	-	-	E, MC, P	-	-	The site is zoned Special Use (SU4) under LPS 7. The site is predominantly vacant, with limited existing vegetation. A draft Local Development Plan was advertised by the Shire in 2016. An application for a mixed use tourism development was submitted to the Mid West/Wheatbelt JDAP in 2017; however, it was subsequently withdrawn as at the time, Amendment 34 to LPS 7 had yet to be gazetted. The application proposed a mix of short stay and permanent accommodation, as well as commercial and hospitality components of the mixed use tourism development. Amendments 33, 34 and 35 to LPS 7 have since been gazetted.

Identifier	Location	Suburb	Map number in this document	Existing tenure[1]	Purpose	Zoning/planning			Area/yield[2]			Subdivision approvals[3]		Anticipated dwelling release[4] (commencing early 2019)			Constraints[5]			Comments
						Current local planning scheme zone/reserve	Amendment required	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Short-term (0-5 years)	Medium-term (6-10 years)	Long-term (10+ years)	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
JB04	Lots 509, 2520 & Pt Lot 9005	Jurien Bay		Marthof Properties Pty Ltd	Rural Residential	Rural Residential	No	Marine Fields Local Structure Plan (endorsed by WAPC in November 2015)	129.4	58	58	-	-	-	58	-	D, E, P, T	-	-	The site is zoned Rural Residential under LPS 7. The Marine Fields Local Structure Plan was endorsed by the WAPC in November 2015, and identifies a yield of 58 rural residential lots.
JB05	Lot 1252 Aquilla St	Jurien Bay		State of WA	Residential	Residential (R12.5)	Yes	n/a	5.8	-	-	-	-	-	-	-	-	E, P	-	The site is unallocated Crown land zoned Residential with a density coding of R12.5 under LPS 7. The draft LPS states that the site provides an opportunity for the consolidation of urban form, given its strategic location.
JB06	Lot 8836	Jurien Bay		E Cavallari, L Cavallari, M Cavallari & Silverdeck Pty Ltd	Residential, Tourist	Special Development	No	North Head District Structure Plan	650.5	2,215	2,215	-	-	-	-	2,215	E, P, T	W	S	The site is comprised of a lot zoned Special Development under LPS 7. The North Head District Structure Plan and the Shire's draft LPS identify a a total yield of 2,215 single residential lots and 550 tourist rooms. It is anticipated that development will be progressed in stages, relative to market demand.
JB07	Lot 58 Oceanic Way	Jurien Bay		Seagate WA Pty Ltd	Tourist	Tourist	No	n/a	1.2	-	-	-	-	-	-	-	-	MC, P	E	The site is comprised of an undeveloped lot zoned Tourist under LPS 7. The site has been identified as vulnerable to coastal erosion through the Shire's CHRMAP.
JB08	Lot 1137 Casuarina Cr	Jurien Bay		State of WA	Tourist	Tourist	No	n/a	1.6	-	-	-	-	-	-	-	E	MC, P	-	The site is comprised of an undeveloped lot zoned Tourist under LPS 7. The draft LPS proposes for the consideration of a major tourism development adjacent to the foreshore.
JB09	Lot 480 Hasting St	Jurien Bay		M & N Developments Pty Ltd, Market Equity Pty Ltd & D H North	Residential	Residential (R40)	No	n/a	0.8	-	-	-	-	-	-	-	E, MC, P, S	-	-	The site is comprised of an undeveloped lot zoned Residential with a density coding of R40 under LPS 7. The site was previously zoned Tourist under LPS 7. The draft LPS proposes to increase residential densities in areas that are conducive to redevelopment and have adequate utility services, such as the area north of Hasting Street.

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						Current local planning scheme zone/reserve	Amendment required	Other planning under way	Area (ha)	Yield (lots)	Yield (units)	Approvals pending	Current approvals	Short-term (0-5 years)	Medium-term (6-10 years)	Long-term (10+ years)	Concern but resolution anticipated	Critical but resolution anticipated	Critical and resolution not definite	
JB11	Pt Lot 9005	Jurien Bay		Marthof Properties Pty Ltd	Rural Residential	Rural Residential	No	n/a	675.1	130	130	-	-	-	-	130	-	E, MC, P, Pw, S, W	-	The site is comprised of undeveloped land zoned Rural Residential under LPS 7 and forms the balance of the Marine Fields rural residential area. The draft LPS identifies potential for the creation of approximately 130 lots subject to detailed investigation. The site provides an opportunity for rural residential development on the corridor west of Indian Ocean Drive, between Jurien Bay and Cervantes. The staging of development will be dependent on market conditions, the take-up rate of zoned land in the Jurien Bay locality and population projections.
JB12	Lots 1225 & 1248	Jurien Bay		State of WA	Commercial, tourist, recreation	Harbour	Yes	Draft Master Planning Study Report - Jurien Bay Boat Harbour Southern Lands (2012)	38	-	-	-	-	-	-	-	E	-	-	Jurien Bay Boat Harbour Precinct. The draft Jurien Bay Boat Harbour Southern Lands Master Planning Study Report considers development of a six hectare area vested with the Department of Transport. It recommends staged development of the site, with the key elements being a chalet park, a water front mixed use complex and an iconic attraction. This report has not been subject to public consultation. The Harbour is a strategic infrastructure asset that is underutilised and there is significant potential to create a vibrant commercial, tourist and recreation precinct.
JB13	Numerous lots bounded by Hasting Street, Doust Street and Bashford Street	Jurien Bay		Numerous landowners	Residential, Tourism/Residential	Residential (R12.5), Residential (R12.5/25)	Yes	Jurien Bay City Centre Strategy Plan	11.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Investigation area. The Jurien Bay City Centre Strategy Plan divides the Jurien Bay City Centre area into six precincts, which form the basis for describing the role, land use, character and key development standards of height, bulk and the relationship of buildings and parking to the street for most land uses. Key elements of the Jurien Bay City Centre Strategy Plan include the retention of land for commercial and tourism uses, as well as the introduction of commercial/residential, office/residential and tourism/residential uses. The Jurien Bay City Centre Strategy Plan seeks to provide for increased residential development by upcoding Residential zoned land to a maximum density of R25. Amendment 35 to LPS 7 (gazetted) sought to introduce a dual density coding of R12.5/R25 to lots currently zoned Residential R12.5, thereby providing for increased residential development.
JB14	Lot 1 Jurien Rd	Jurien Bay		Kent D G	Rural Smallholdings	Rural	Yes	Amd. No. 27 under consideration by the Minister at September 2019	1429.20	48	48	n/a	n/a	n/a	n/a	48	E	P	n/a	Amendment No. 27 to the Shire's LPS 7 seeks to rezone the site from Rural to Rural Smallholdings, to facilitate the future creation of approximately 48 rural smallholdings lots.

Identifier	Location	Suburb	Map number in this document	Existing tenure[1]	Purpose	Zoning/planning			Area/yield[2]			Subdivision approvals[3]		Anticipated dwelling release[4] (commencing early 2019)			Constraints[5]			Comments
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IND145	Pt Lot 502, Pt Lot 1234 & Pt Lot 1242	Jurien Bay		State of WA	Industrial	Industrial	No	N/A	88.5	46	46	-	-	-	-	-	-	-	E, H, MC, P, PW, S, W	The site is comprised of an area zoned Industrial under LPS 7, spanning across three lots. The site has been identified for the future expansion of the Coalseam Road industrial area. Conditional subdivision approval was granted to create 11 lots for industry purposes on just under three hectares of the site area; however, subdivision was not progressed. The draft LPS identifies an additional yield of 34 lots. Development beyond the current stage is subject to native title, environmental and infrastructure assessments.
IND159	Pt Lot 9016	Jurien Bay		Ardross Estates Pty Ltd	Industrial, Light Industrial	Special Developme nt	No	Turquoise Coast Structure Plan	21.3	71	71	-	-	-	28	-	E	MC	-	The site is comprised of a part of lot zoned Special Development under LPS 7. It represents the industrial component and third stage of the Turquoise Coast/Drover's Retreat development (site JB01). A local structure plan has been prepared for the site proposes for the creation of 25 industrial lots and 18 light industrial lots.
IND200	Lots 350, 501 & 1117	Cervantes		State of WA	Industrial	Industrial	No	N/A	15.6	-	-	-	-	-	-	-	-	S	E	The site is comprised of undeveloped land zoned Industrial under LPS 7 and forms part of the Seville Street light industrial area. There is; however, limited potential for the expansion of this industrial area due to the high conservation value of the land adjacent to Lake Thetis. Bushfire prone and sewage sensitive area. Area not sewered.

1	Organisation or individual(s).
2	In some cases, the yield for the project is indicative only. Final lot/dwelling yields will be determined by further detailed planning.
3	Refers to the number of lots/units with current subdivision or strata approval, and the number of lots/units for which a subdivision/strata application has been lodged but which is yet to be determined (pending). Does not include local government development approvals.
4	Estimate only. In most cases, the precise timing of lot release is uncertain. This could be for reasons such as market conditions, demand/supply of services or a requirement to resolve issues and constraints.
5	Constraints and issues codes: bushfire prone (BP), drainage (D), environmental (E), heritage (H), land assembly (L), market conditions (MC), native title (NT), planning (P), power (Pw), sewer (S), water (W), topography and geology (TG), mining lease (M), zoning (Z) and transport (T).

5.6 Vacant lots and infill

Data from Landgate's property valuation database show that there is a substantial stock of vacant lots on land zoned for residential development in the Shire. As at December 2018, approximately 650 vacant lots were identified on land zoned for residential purpose. This accounts for 26 per cent of the total stock of existing residential lots.

Table 7 shows the stock of vacant lots on land zoned for residential purposes in the Shire. The distribution of vacant lots in the Shire's main settlements is shown on Map 8.

The Department's Integrated Land Information Database (ILID) is a net land use assessment and capability model that is generated at a cadastral (lot) level for the whole of Western Australia. The ILID model compares density outcomes with those set out by applicable density codes (R-Codes) under local planning schemes. Appendix A provides a detailed description of the ILID model and the methodology for its use.

Using the ILID model, the latent development capacity of residential land stocks can be measured based on existing lot sizes and applicable density codes. The spatial distribution of lots with additional dwelling potential is shown on Map 8. Where a dual density code applies to a lot, additional dwelling potential is shown based on the higher density code.

It must be noted that data depicted on Map 8 is indicative only and should not be used as a guide to development potential on a site-by-site basis. The ILID model does not take into account factors such as heritage, environmental and/or infrastructure constraints or other provisions of the local planning scheme. This may mean that the additional potential shown on Map 8 cannot always be fully realised.

A dual density code of R12.5/25 applies to approximately 290 Residential zoned lots in the Jurien Bay town centre area. Most of these lots are capable of being subdivided into two lots or more under the R25 density code. Development at the R25 density code, however, is subject to the provision of reticulated sewerage. In addition, corner lots with an applicable density code of R12.5/25 can be developed to an R30 standard, subject to meeting the provisions set out by LPS 7.

Table 7: Stock of vacant lots (December 2018) – Dandaragan (S)

Locality/suburb	Stock of vacant lots
Badgingarra	10
Cervantes	50
Dandaragan	10
Jurien Bay	580
Total	**650**

Source: Department of Planning, Lands and Heritage (2019) and Landgate (2019). Numbers have been rounded

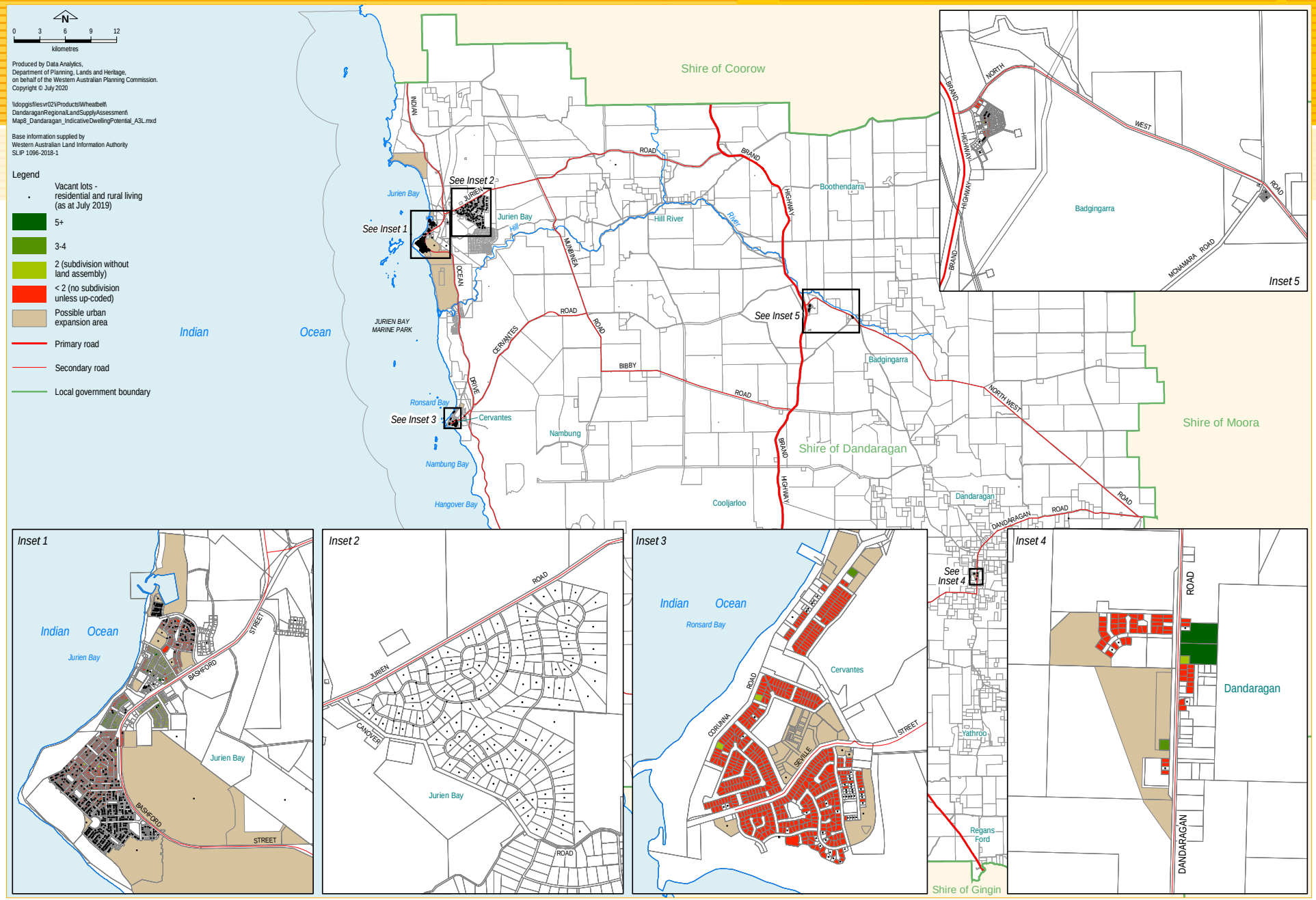
5.7 Adequacy of supply

Analysis on the adequacy of residential land supply for a given area considers the most likely scenario of projected population growth, the current average household size and the current rate of dwelling occupancy for that area.

At the 2016 Census, the average household size for the Shire was 2.3 persons per dwelling, which is lower than the State average of 2.6 persons per dwelling. The rate of dwelling occupancy for the Shire at the 2016 Census was 45.4 per cent, which is significantly lower than the State average of 86.7 per cent.

Band C of the WA Tomorrow forecast for the Shire projects an average annual growth rate of 0.93 per cent between 2016 and 2031 (average annual increase of 32 residents). Assuming an average household size of 2.3 persons per dwelling and a dwelling occupancy rate of 45.4 per cent, an average additional 31 dwellings per annum would be required in order to accommodate projected growth under this scenario.

Under the above scenario, a hypothetical temporal land supply of 100 plus years has been identified. This supply has the capacity to support a population of approximately 15,000. An increase in the dwelling occupancy rate and/or average household size can extend the temporal land supply and increase the population that can be supported by the current residential land supply.



Map 8: Vacant lots and indicative dwelling potential (high)

Table 8 shows the estimated dwelling requirement for the short, medium and long term under the Bands A, C and E growth scenarios. It shows that the identified dwelling yield exceeds the number of dwellings required under all bands. Therefore, there is a sufficient stock of residential land identified to meet population growth into the long term, even if the rate of population growth increases to a higher rate.

In addition to the identified dwelling yield shown in Table 5 and Table 8, development outlook analysis (Section 5.5) identifies several investigation areas. These are areas that have been identified for future rezoning and subdivision by the Shire's draft local planning strategy. Approximately 2,050 hectares of land adjacent to the Badgingarra townsite has been identified as an investigation area (site BDG01). In addition, approximately 1,850 hectares of land to the north and south of the Dandaragan townsite (sites DAN04 and DAN05) have also been identified as investigation areas.

Dwelling yields have not been identified for investigation areas, as further assessment is required to determine the suitability of these sites for residential land use. Once substantial planning has been undertaken for these investigation areas, and if such areas have been determined as suitable for residential land use, the temporal land supply may be extended.

5.8 South West Native Title Settlement

The South West Native Title Settlement is the most comprehensive Native Title agreement negotiated in Australian history. Negotiated between the six Noongar Agreement Groups, represented by the South West Aboriginal Land and Sea Council and the WA Government, the South West Native Title Settlement comprises the full and final resolution of all native title claims in the south west of Western Australia, in exchange for the South West Native Title Settlement Package.

Table 8: Adequacy of supply – Dandaragan (S)

Timeframe	Estimated dwelling requirement			Identified dwelling yield
	Band A (low)	Band C (median)	Band E (high)	
2016-2021	381	525	668	0
2021-2026	192	239	278	1,953
2026-2031	181	245	306	4,587
2031-2036	181	245	306	4,587
Total	**935**	**1,255**	**1,558**	**11,066**
Stock of vacant lots	753			

Source: Department of Planning, Lands and Heritage (2019)

The estimated dwelling requirements under Bands A, C and E have been predicated upon an average household size of 2.3 persons per dwelling and a dwelling occupancy rate of 45.4 per cent. The stock of vacant lots shown in this table includes vacant lots on land zoned for residential and rural living purposes.

[2] The Noongar Land Base Strategy can be found in Annexure J of the Indigenous Land Use Agreements.

The Department, in collaboration with the South West Aboriginal Land and Sea Council, is responsible for identifying and allocating land to facilitate the creation of the Noongar Land Estate, in accordance with the Noongar Land Base Strategy[2]. The Noongar Land Estate, as part of the South West Native Title Settlement, will be made up of up to 300,000 hectares of land allocated as reserve or leasehold, and up to 20,000 hectares of land allocated as freehold for cultural or economic development use. The Noongar Land Estate will be held by the Noongar Boodja Trust, and is intended to provide significant opportunities for the Noongar community to achieve sustainable economic, social and cultural outcomes.

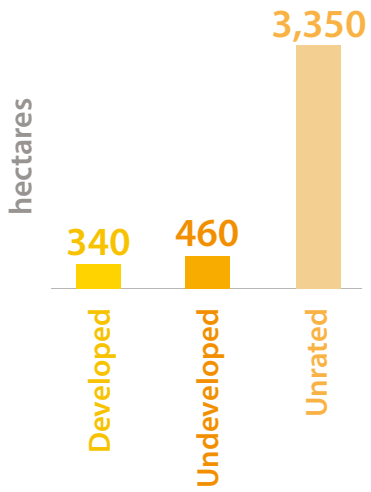
The areas of land shown in Map 6 and Map 7 (which show possible development projects in the Shire) amount to approximately 8,730 hectares. This includes possible development projects for residential, industrial and commercial purposes. Some of these areas include Crown land, which are currently being assessed for possible inclusion into the Noongar Land Estate for a range of purposes, including development.

6 Rural living

State Planning Policy 2.5 Rural Planning defines rural living as an umbrella term used to describe a range of local planning scheme zones that provide for low density residential uses in an estate or precinct, generally characterised by a grouping of lots in the order of one to 40 hectares. Rural living zones include, but are not limited to, rural living, rural retreat, rural residential, special rural, rural smallholdings, rural conservation and landscape protection.

Land zoned for rural living purpose in the Shire is divided into seven areas/estates, located across Badgingarra, Dandaragan, Hill River and Jurien Bay (Map 9), with the majority in Jurien Bay. As at December 2018, there were approximately 580 lots on land zoned for rural living purpose in the Shire, covering 4,150 hectares. The IRIS model classified 340 hectares (eight per cent) as developed; 460 hectares (11 per cent) as undeveloped; and 3,350 per cent (81 per cent) as unrated (Figure 13). Lots classified as developed and undeveloped are in the Alta Mare estate. All other rural living areas/estates in the Shire were classified as unrated by the IRIS model.

Figure 13: Development status of land zoned for rural living purposes (December 2018) – Dandaragan (S)



Source: Department of Planning, Lands and Heritage (2019) Integrated Regional Information System

Note: This chart refers to lots on land zoned for rural living purposes at 31 December 2018, and does not include land zoned rural smallholdings on Lot 1 Jurien Road, Jurien Bay.

A visual audit of unrated lots revealed that approximately half of existing (subdivided) lots were vacant. The Alta Mare and Jurien Bay Heights estates each contain over 200 existing lots; approximately half of these are vacant. The Marine Fields estate contains approximately 60 existing lots; half of these are also vacant. Nineteen out of 20 existing lots in the Hill River Heights estate are also vacant.

Virtually no subdivision has been undertaken on land zoned for rural living purpose over the past decade. Over the last decade, just one application was lodged for the resubdivision of one lot to create two new lots within the Alta Mare estate.

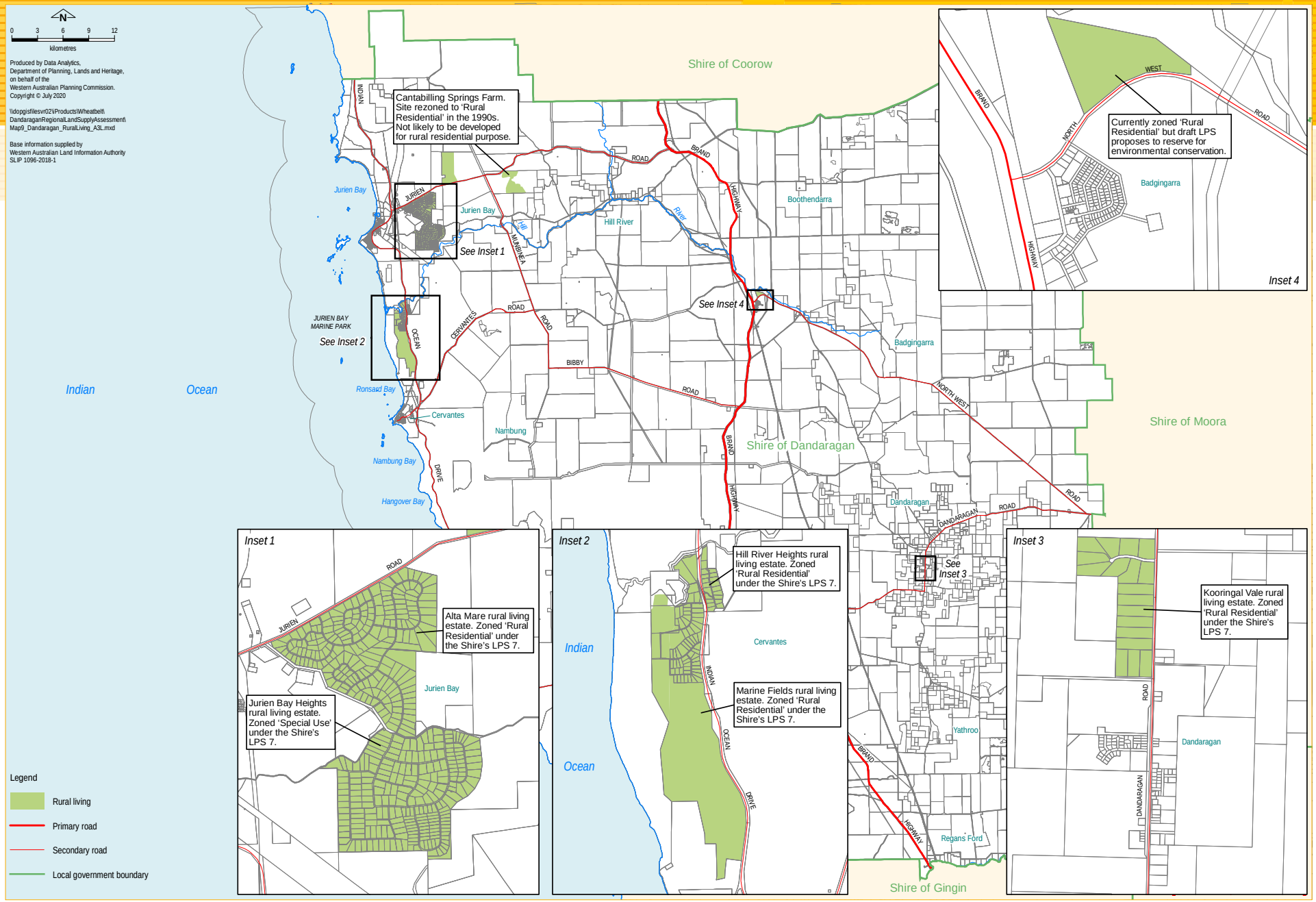
The Shire's draft local planning strategy proposes to locate future rural living development adjacent to existing townsites, where lots can be adequately serviced and are in proximity to services and amenities available at existing townsites. Consideration of any new proposals should consider the existing supply of rural living lots, development take-up rates and population projections.

The Marine Fields estate covers over 1,000 hectares of land; 820 hectares of which is yet to be subdivided. Approximately 150 hectares of the yet-to-be subdivided land is subject to the Marine Fields Local Structure Plan (endorsed in 2015), which provides a planning framework for the development of 58 lots (site JB04). Subdivision of the balance of the Marine Fields estate (680 hectares) (site JB111) is not likely to occur until the medium to long term, given the plentiful supply of existing lots and low take-up rates of development.

The Shire's draft local planning strategy identifies over 1,800 hectares of land (currently zoned Rural) for future rezoning and subdivision to the north and south of the Dandaragan townsite (sites DAN04 and DAN05). The draft local planning strategy contemplates various land uses to be supported (including rural living) and proposes a graduation of lot sizes from one to 40 hectares. Rural living development in this area is not likely to be progressed in the foreseeable future.

Approximately 390 hectares of land in Hill River (part of Lot 10338 Jurien Road, Hill River), known as Cantabilling Springs Farm, is zoned Rural Residential. No development has been undertaken at Cantabilling Springs Farm since its rezoning to Rural Residential in the 1990s. There are currently no plans to subdivide this site. It is unlikely that Cantabilling Springs Farm will be developed for rural living purpose, as any proposal to develop this site would have difficulty meeting the requirements of SPP 2.5. In addition, there are 43 hectares of land zoned Rural Residential in Badgingarra; however, the draft local planning strategy proposes to amend LPS 7 to reserve the site for environmental conservation.

Amendment No. 27 to the Shire's LPS 7 proposed to rezone part of Lot 1 Jurien Road, Jurien Bay from the Rural zone to the Rural Smallholdings zone (site JB14). Lot 1 is located approximately 10 kilometres east of the Jurien Bay townsite. Amendment 27 was gazetted in October 2019, and will facilitate the creation of approximately 48 rural smallholdings lots.



Map 9: Rural living

7 Industrial

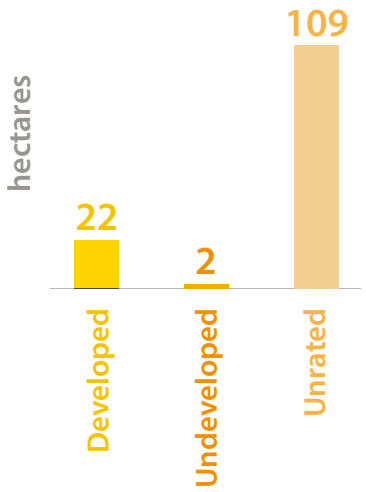
Land zoned for industrial purposes is divided into five areas/estates at Badgingarra, Cervantes, Dandaragan and Jurien Bay. As at December 2018, there were approximately 120 lots on land zoned for industrial purposes, covering 133 hectares (Map 10).

The IRIS model classified 22 hectares (16 per cent) as developed; 2 hectares (1 per cent) as undeveloped; and 109 hectares (82 per cent) as unrated (Figure 14). Lots classified as unrated included large parcels of Crown land located adjacent to the Seville Street and Coalseam Road industrial areas in Cervantes and Jurien Bay respectively.

Over the last decade, a total of 67 lots were granted conditional approval for industrial subdivision; however, only four lots were created during this period (Figure 15).

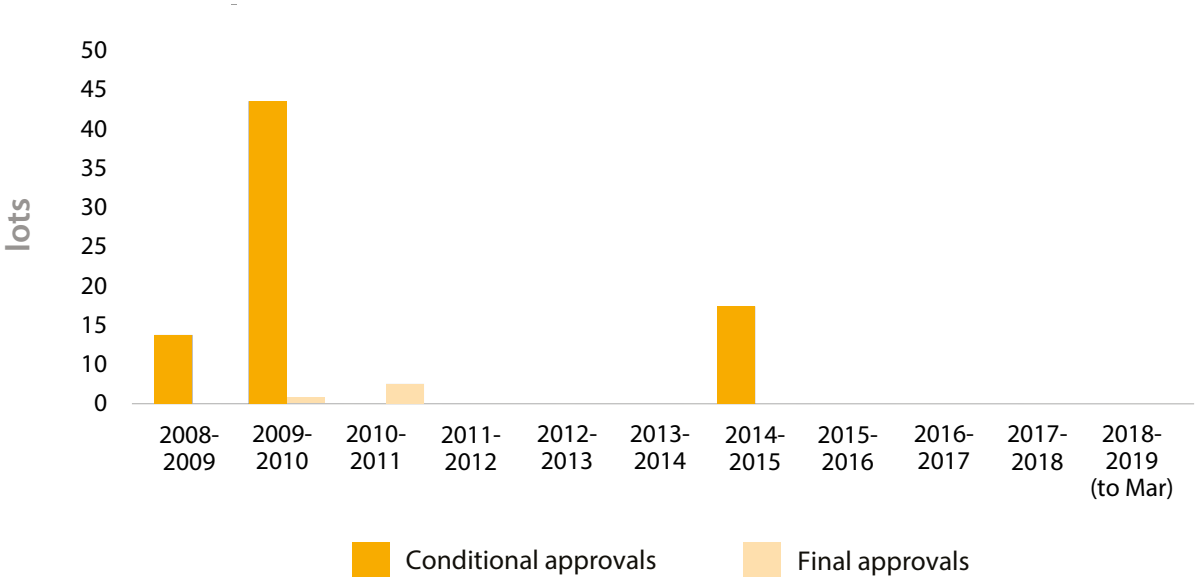
The Carmella Street light industrial area (in Jurien Bay) is comprised of 40 lots, almost all of which are developed. The Shire's draft local planning strategy does not propose expansion of the Carmella Street light industrial area.

Figure 14: Development status of land zoned for industrial purposes (December 2018) – Dandaragan (S)



Source: Department of Planning, Lands and Heritage (2019) Integrated Regional Information System

Figure 15: Industrial subdivision activity (2008/09 to 2018/19) – Dandaragan (S)



Source: Western Australian Planning Commission (2019) State Lot Activity

Data includes proposed industrial lots on land zoned Special Development (industrial component of the Turquoise Coast development).

The Coalseam Road industrial area is located approximately one kilometre east of the Carmella Street light industrial area, and is comprised of 29 existing lots. Almost all of the existing lots are developed. An application to create 11 new lots at the Coalseam Road industrial area was conditionally approved in 2014; however, subdivision was not progressed and the conditional approval has lapsed. An additional 90 hectares of Industrial zoned land has been set aside for the future expansion of the Coalseam Road industrial area. Expansion, however, is subject to further planning and assessments relating to native title, environmental and service infrastructure provision.

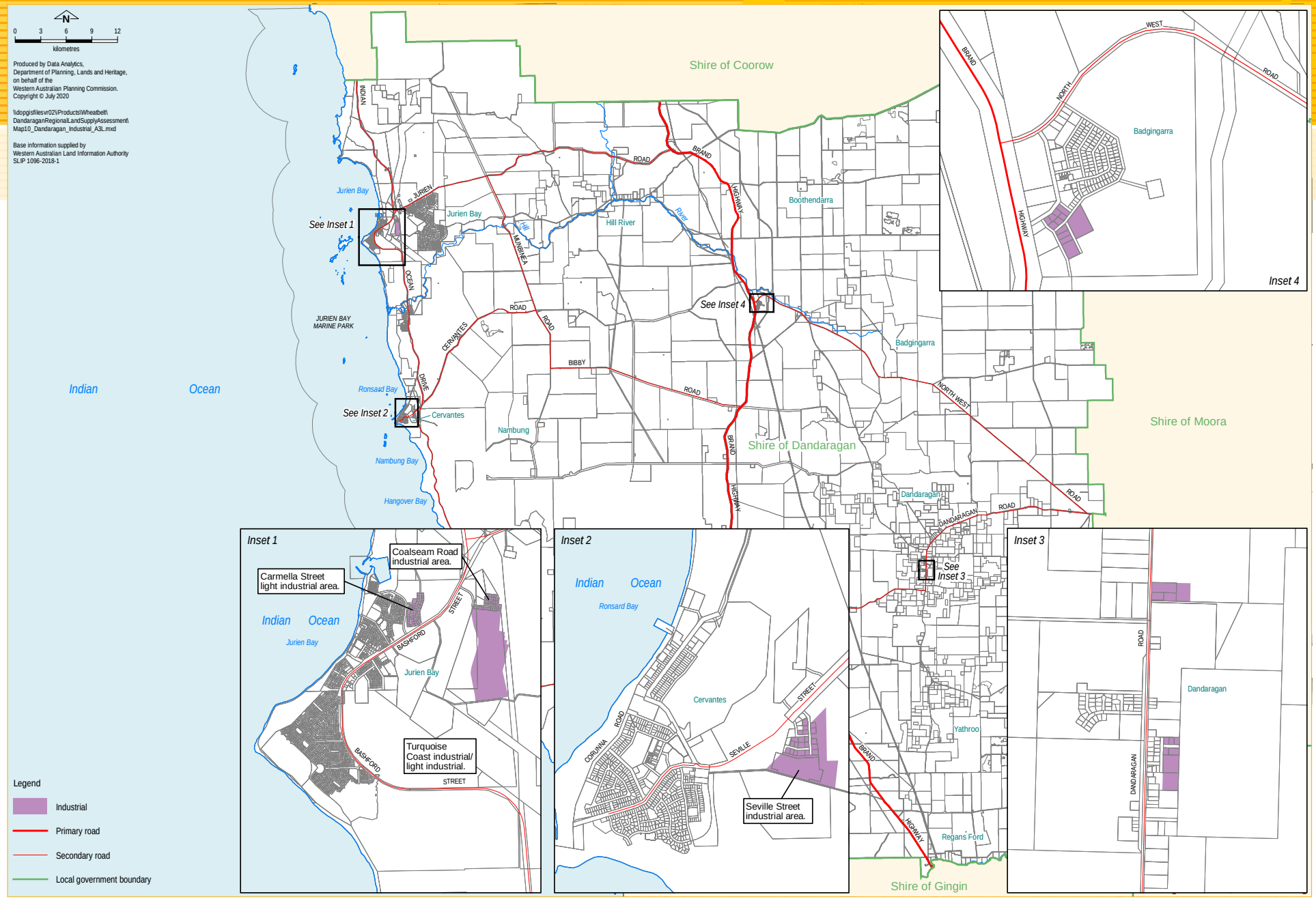
In addition to providing for over 9,000 dwellings, the Turquoise Coast development also provides for the creation of 25 industrial lots and 18 light industrial lots (site IND159). A subdivision application to create these lots was lodged and conditionally approved in 2010, however, the subdivision did not progress to final approval.

The Seville Street industrial area is located east of the Cervantes townsite. It is comprised of 21 existing lots, most of which are developed. Sixteen hectares of Industrial zoned land has been set aside for future expansion (site IND200). Although this land is zoned Industrial, the prospect of expansion is constrained by the high conservation value of land adjacent to Lake Thetis.

Twelve industrial lots are located at the southern end of the Badgingarra townsite, half of which are developed. The Shire's draft local planning strategy contemplates the development of a range of industry and mixed business uses to the east and south of the Badgingarra townsite.

There are 11 industrial zoned lots within the Dandaragan townsite, all of which are developed. The Shire's draft local planning strategy contemplates the development of small-scale commercial operations and allowing for composite mixed business and industry with associated residential development, subject to the provision of essential infrastructure.

Any demand for additional industrial lots that may arise in the short to medium term can be accommodated in the Coalseam Road industrial area. Existing lots within the Coalseam Road industrial area are serviced with reticulated water and wastewater; this infrastructure could be extended to proposed lots that adjoin existing lots.



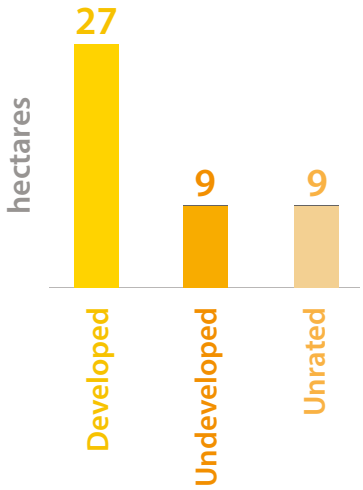
Map 10: Shire of Dandaragan – industrial

8 Commercial

Land zoned for commercial purposes are in the Jurien Bay, Cervantes, Badgingarra and Dandaragan townsites. As at December 2018, there were approximately 130 lots on land zoned for commercial purposes, covering 45 hectares (Map 11).

The IRIS model classified 27 hectares (60 per cent) as developed; nine hectares (20 per cent) as undeveloped; and nine hectares (20 per cent) as unrated (Figure 16). Lots classified as unrated included Crown land and lots owned by the Shire.

Figure 16: Development status of land zoned for commercial purposes (December 2018) – Dandaragan (S)



Source: Department of Planning, Lands and Heritage (2019)
Integrated Regional Information System

Virtually no commercial development has been undertaken in recent years. Over the last decade, no application to create new lots for commercial purposes was lodged.

Jurien Bay is the Shire's commercial centre, and contains half of the Shire's stocks of land zoned for commercial development. Jurien Bay has been identified as a regional centre with an aspirational population target of 20,000. The Jurien Bay City Centre Strategy Plan (2012) (the Strategy Plan) has been prepared to guide the future development of the Jurien Bay town centre and seeks to consolidate services, facilities and employment within the area. The Strategy Plan advocates for the redevelopment of the existing town centre with higher density mixed use development, as well as a redesign of roads within the area for improved safety and streetscape.

The Shire's draft local planning strategy identifies Booka Valley (within the Turquoise Coast development area) as a future district centre, to be developed once a population threshold of 10,000 has been reached.

Cervantes is identified as a local centre, serving the day to day needs of residents within the townsite as well as visitors. The Cervantes town centre is currently comprised of a small number of shops and businesses. There is capacity for the expansion of commercial uses in Cervantes, as there is a large stock of commercial zoned land that has not been developed. The Cervantes Town Centre Future Land Use Plan (2012) identifies limited opportunities for infill and intensification, and aims to provide a guide for the utilisation of developed and undeveloped land to provide for an integrated mix of uses.

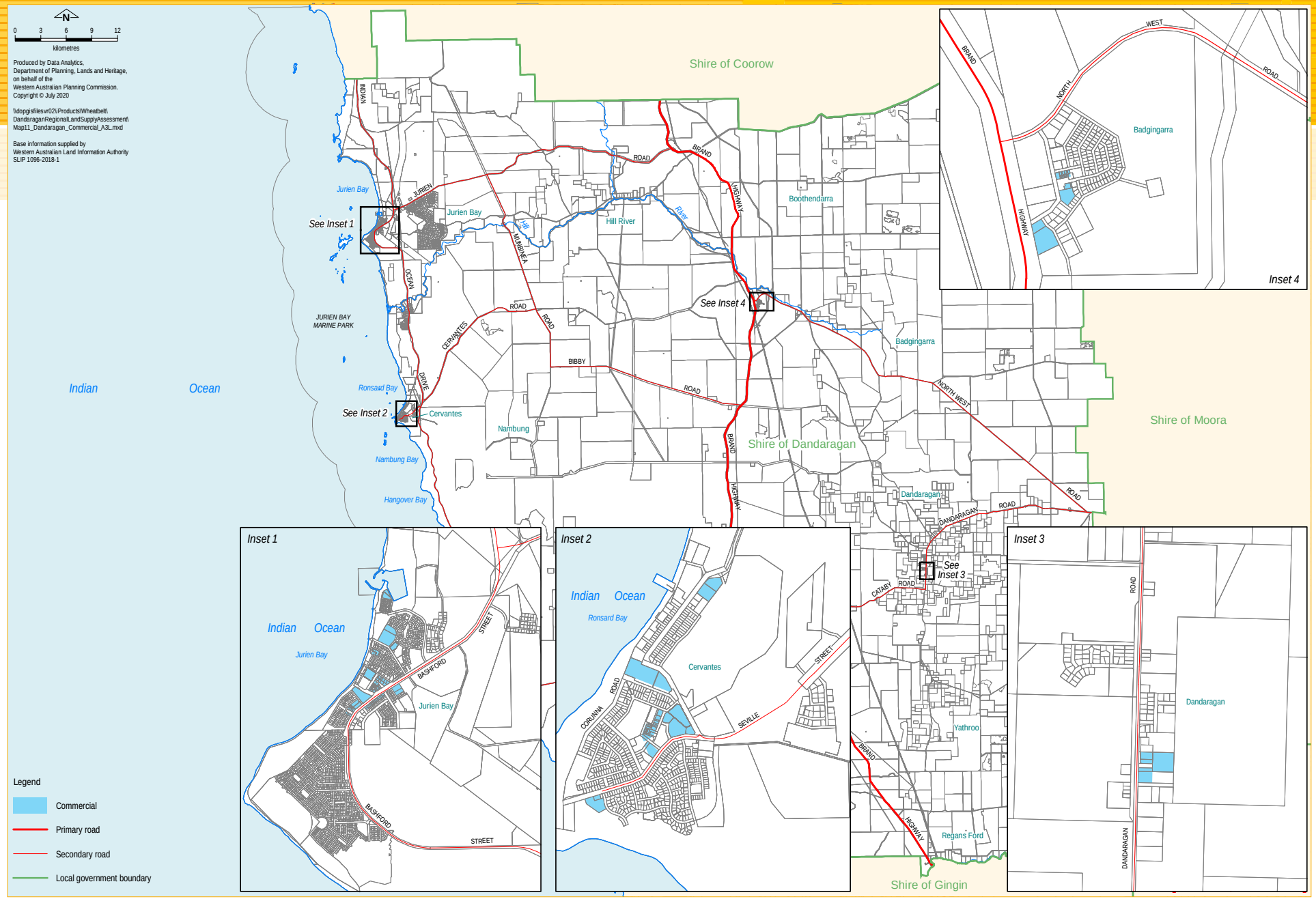
Badgingarra and Dandaragan are identified as service centres for the rural hinterland. The Shire's draft local planning strategy proposes to support small scale commercial operations, composite mixed business and similar uses, subject to adequate servicing and maintenance of amenity. Cataby and Regans Ford are identified as service centres for Brand Highway.

Tourism

There are approximately 30 hectares of land zoned Tourist under the Shire's LPS 7. Approximately half of this land has been developed, with existing uses comprising of various forms of short stay accommodation. There is already a significant supply of affordable accommodation, such as camping grounds and caravan parks. The Shire, however, anticipates a demand for greater variety of tourist accommodation, as the Shire currently lacks higher quality and branded short-stay accommodation options.

There are several vacant, undeveloped sites zoned Tourist in Jurien Bay and Cervantes (sites CER02, CER08, JB02, JB07, JB08). There are currently no known plans to develop these sites in the foreseeable future, however, the Shire proposes to protect these sites by amending LPS 7 to include provisions that set out occupancy and residential unit restrictions within the Tourist zone. These sites are likely able to cater for demand into the medium to long term.

In addition to the above sites zoned Tourist, development for tourist purposes are expected to occur on land zoned Marine Services, Special Use and Special Development. Lot 62 Roberts Street, Jurien Bay (site JB03) is zoned Special Use under LPS 7. A local development plan has been prepared for the site, which sets out the desired built form outcomes for the site. A concept development plan has also been prepared, which identifies a hotel, motel, retail and other commercial activities, short stay and permanent residential development as potential uses for the site. Furthermore, the North Head District Structure Plan, which covers Lot 8836, Jurien Bay (site JB06) proposes the development of 550 tourist rooms, in addition to over 2,000 single residential lots.



Map 11: Shire of Dandaragan – commercial

9 Service infrastructure

This section outlines the broad infrastructure capacity for the Shire and identifies upgrades that may be required to facilitate future residential, industrial and commercial growth in the Shire.

9.1 Water

The Water Corporation manages water supply to the Jurien Bay, Cervantes, Badgingarra and Dandaragan townsites. Access to reticulated water supply is limited to townsite areas. Lots within the Shire's existing rural living estates rely on rainfall captured in water tanks.

The Water Corporation is currently licensed to draw water from the Jurien wellfield to service the Jurien Bay townsite. The Jurien wellfield is located approximately four kilometres north east of the Jurien Bay townsite. Water is transported from the wellfield to the Jurien Bay townsite via a reticulated pipeline network (Map 12).

A substantial increase in Jurien Bay's population would require an increase in water supply. The Department of Water and Environmental Regulation has increased the size of the Jurien wellfield and identified potential locations for future borefields to cater for anticipated growth.

Similarly, water supply for the Cervantes townsite is obtained from a wellfield located four kilometres to the east. Water is transferred to a water tank located near the junction of Seville Street and Aragon Street, before being distributed to users. Water supply for the Badgingarra townsite is obtained from production bores located to the south east, while water supply for the Dandaragan townsite is obtained from a wellfield located to the north east of the townsites (Map 12).

Areas identified for future rezoning and subdivision adjacent to the Badgingarra and Dandaragan townsites (sites BDG01, DAN04 and DAN05) are well outside the extent of the Water Corporation's current water planning. Generally, groundwater bore sources in these areas tend to be limited by climate, hydrogeology and in some cases, groundwater quality. Future rezoning and subdivision of these townsites will require closer consideration and a review of the Water Corporation's planning for water sources.

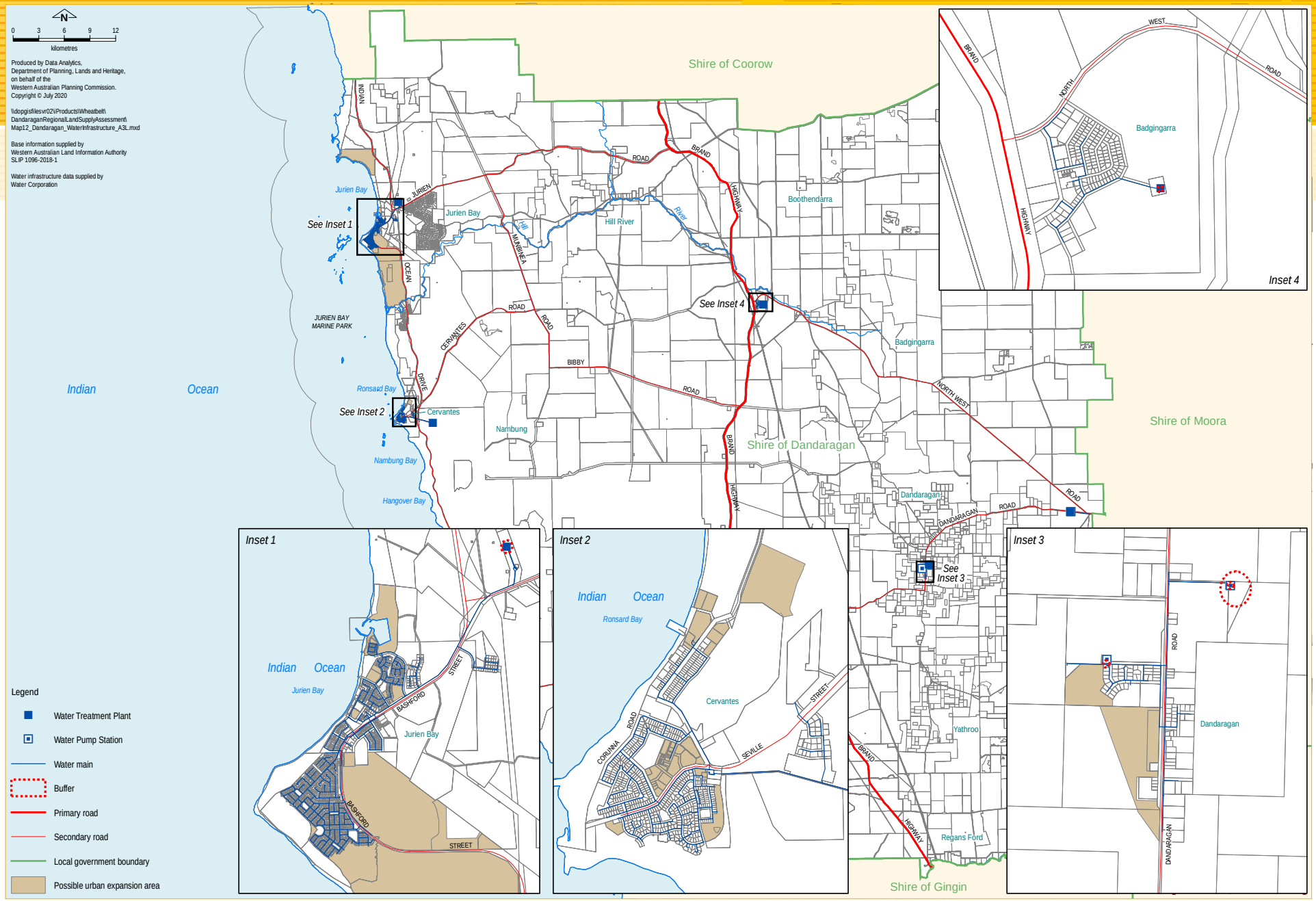
SPP 2.5 generally requires that rural living lots of four hectares or less in area are to be provided with reticulated water supply by a licensed provider. If, however, it has been demonstrated that a reticulated water supply is not available, consideration may be given to an alternative, fit-for-purpose domestic potable water supply that is sustainable and consistent with standards for water and health.

The Shire is covered by two groundwater areas proclaimed under the *Rights in Water and Irrigation Act 1914*: the Jurien groundwater area (which covers the northern half of the Shire area and includes the Jurien Bay, Cervantes and Badgingarra townsites); and the Gingin groundwater area (which covers the southern half of the Shire area and includes the Dandaragan townsite). The *Jurien Groundwater Allocation Plan* (2010) sets out a plan for the management of groundwater systems for the Jurien groundwater area.

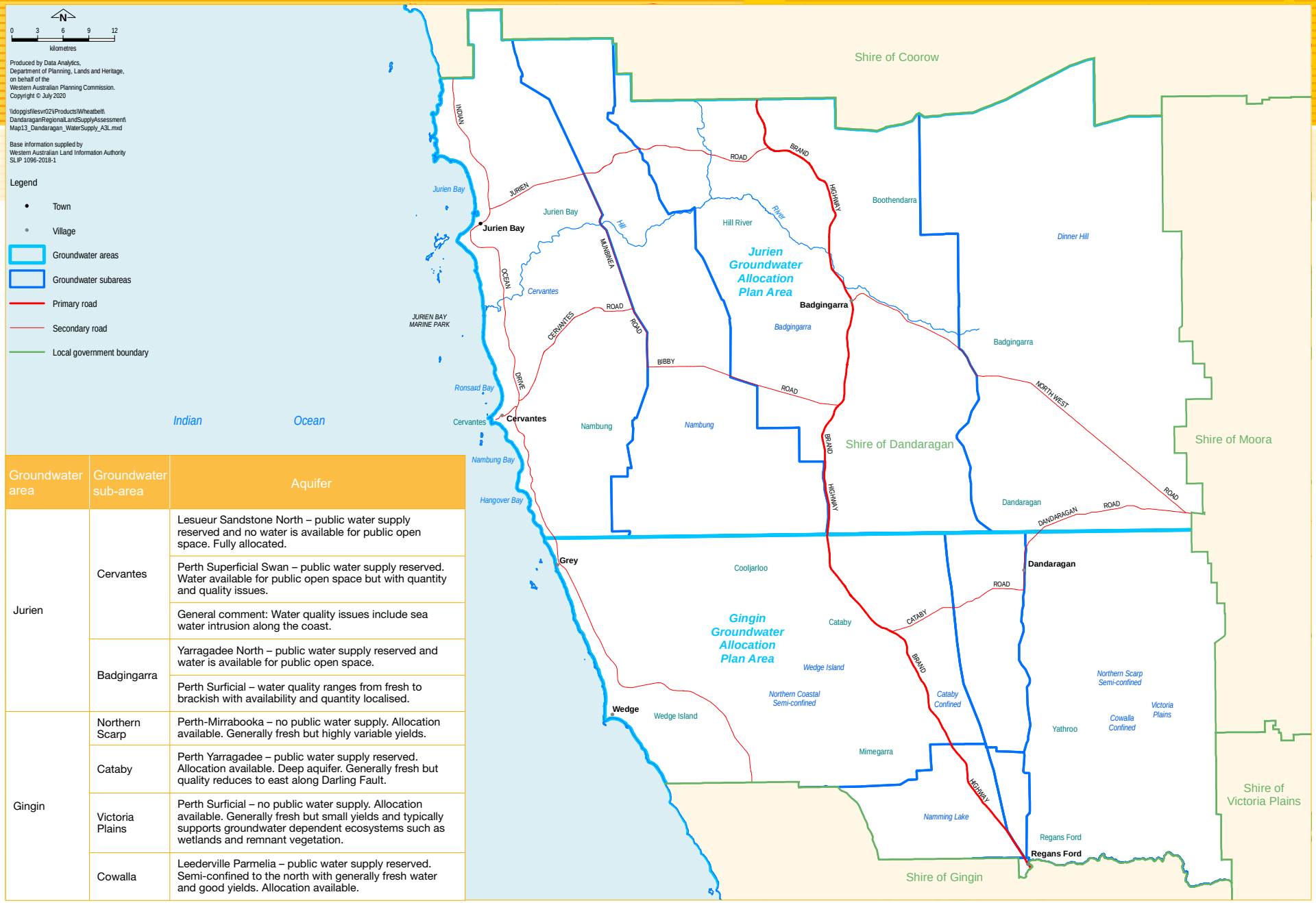
Water sources for the Shire's townsites are limited. Groundwater levels and stream flows are declining, due to reduced rainfall and growing land use pressures in the area. The aforementioned allocation plans have accounted for a 'drier' future in the management responses. The drying climate has placed increased pressure on ground and surface water resources, particularly in the upper reaches of the catchments.

The Perth Superficial Swan, Surficial and Mirrabooka aquifers are recharged directly by rainfall. Therefore, they are more responsive to the drying climate. The Lesueur Sandstone North aquifer is mostly confined and impacted by large volumes of water abstraction. Confined groundwater availability varies throughout the area, however, water may be available through trading. Water is currently available in the Superficial, Surficial and Fractured Rock aquifers, however, the quality and yield is highly variable. Onsite investigations to determine the viability of water as a potable or non-potable water source would be required.

Major land uses in the Jurien and Gingin groundwater areas are associated with irrigated agriculture and horticulture. Demand for groundwater in this area is expected to increase over the coming years, due to increasing urban development in coastal areas and growth and expansion of the agricultural sector. As water supply becomes more constrained, there will be a need to investigate alternative water sources and viable supply solutions.



Map 12: Water infrastructure



Groundwater area	Groundwater sub-area	Aquifer
Jurien	Cervantes	Lesueur Sandstone North – public water supply reserved and no water is available for public open space. Fully allocated.
		Perth Superficial Swan – public water supply reserved. Water available for public open space but with quantity and quality issues.
		General comment: Water quality issues include sea water intrusion along the coast.
	Badgingarra	Yarragadee North – public water supply reserved and water is available for public open space.
		Perth Surficial – water quality ranges from fresh to brackish with availability and quantity localised.
Gingin	Northern Scarp	Perth-Mirrabooka – no public water supply. Allocation available. Generally fresh but highly variable yields.
	Cataby	Perth Yarragadee – public water supply reserved. Allocation available. Deep aquifer. Generally fresh but quality reduces to east along Darling Fault.
	Victoria Plains	Perth Surficial – no public water supply. Allocation available. Generally fresh but small yields and typically supports groundwater dependent ecosystems such as wetlands and remnant vegetation.
	Cowalla	Leederville Parmelia – public water supply reserved. Semi-confined to the north with generally fresh water and good yields. Allocation available.

Map 13: Water supply

9.2 Wastewater

There is limited access to reticulated sewerage within the Shire. Within the Jurien Bay townsite, access is limited to lots fronting Bower Street, as well as the residential area west of the Carmella Street light industrial area. Residential lots within the Turquoise Coast development are also provided with reticulated sewerage. For the Cervantes townsite, access to reticulated sewerage is limited to a small area at the south east of the townsite (Map 14).

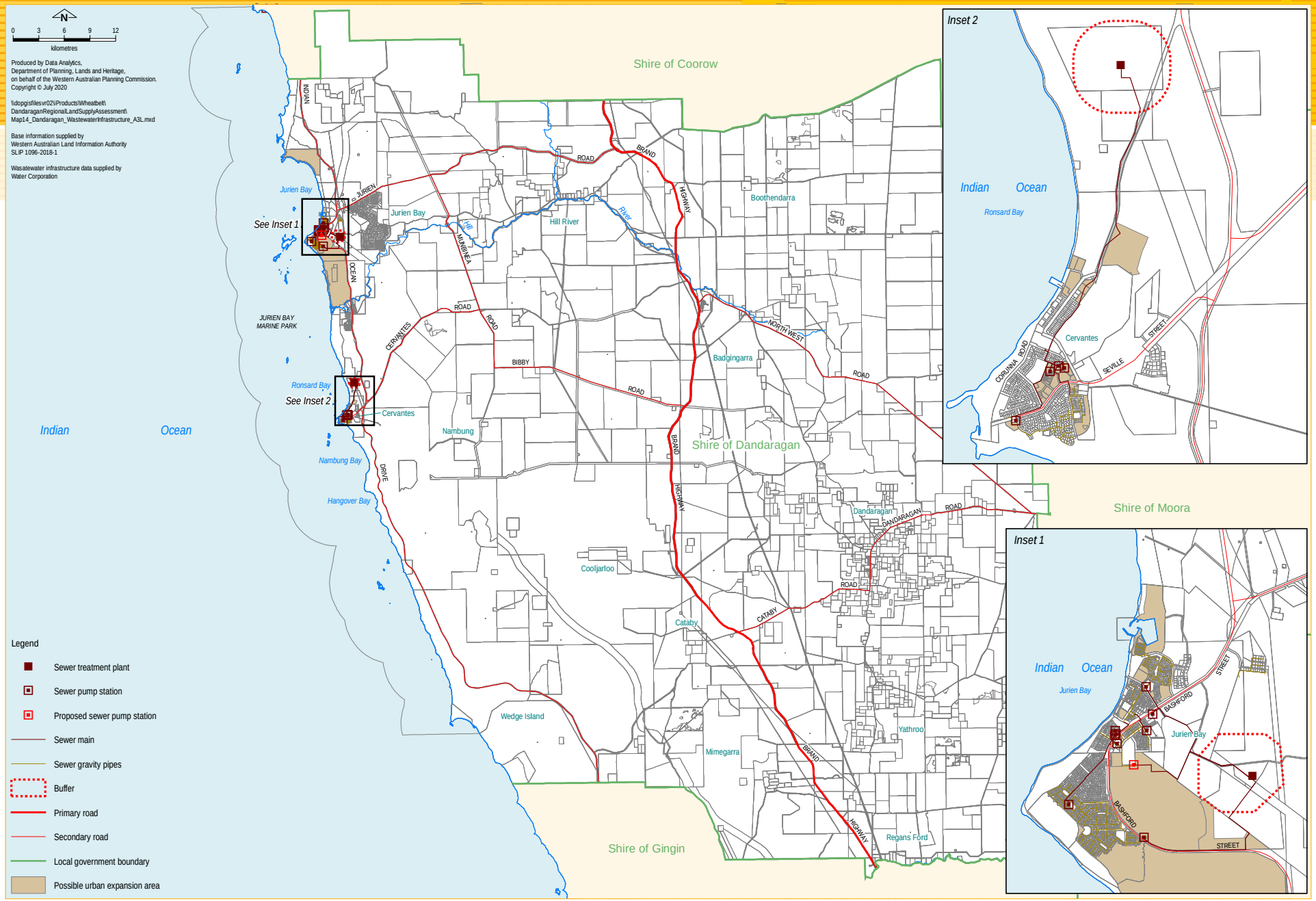
The Water Corporation operates two wastewater treatment plants within the Shire: one to the east of the Jurien Bay townsite; and one to the north of the Cervantes townsite. The Jurien Bay wastewater treatment plant was upgraded in 2015 to double the treatment capacity. The Water Corporation operates four sewer pump stations within the Shire, three of which are in Jurien Bay, with the other located in Cervantes.

Water Corporation long term wastewater planning seeks to cater for the anticipated growth of Jurien Bay. Growth beyond the current serviced areas may require capital investment works to construct pump stations and pressure mains.

The Shire's draft local planning strategy and the *Jurien Bay City Centre Strategy Plan* (2012) identifies certain residential areas within Jurien Bay as having significant infill potential, subject to density coding changes. Most of these areas, however, are currently not provided with reticulated sewerage. Therefore, for infill potential to be realised, an extension to the current reticulated sewerage network would be required. In the absence of the Infill Sewerage Program, there may be a need for the private sector (i.e. developers) to invest in the provision of reticulated sewerage to lots and extend the reticulated sewerage network to service proposed development areas.

The townsites of Dandaragan and Badgingarra are not currently serviced with reticulated sewerage. There are currently no plans for the provision of reticulated sewerage to these townsites. In addition, the North Head development area in Jurien Bay is outside of the Water Corporation's servicing area. There are currently no plans to service the area with reticulated water or sewerage.

Some areas within the Shire have been identified as sewage sensitive, due to numerous environmentally sensitive resources. To protect the environment, Western Australia's water and land resources, public health and amenity, the Government Sewerage Policy (2019) recommends new lots and development be provided with a reticulated sewerage service, unless exempt under the policy. It may not, however, be possible to provide such a service to all areas identified as suitable for more residential development. Where this is the case, the policy provides for the consideration of onsite sewage disposal, on the condition that it does not compromise public health or the environment and where minimum site requirements can be met.



Map 14: Wastewater infrastructure

9.3 Energy

Western Power manages energy supply to the Shire through the South West Interconnected System (SWIS). The SWIS extends across an area bounded by Kalbarri to the north, Kalgoorlie to the east and Albany to the south. The Shire is covered by the North Country load area, which extends from Pinjar and Muchea at the northern edge of the Neerabup load area to Kalbarri at the northern extremity of the SWIS and the Western Power network. Electricity in Jurien Bay and Cervantes are supplied via a network of 33 kilovolt (kV) overhead distribution lines that extend from Eneabba substation, which is currently energised at 132 kV (Map 15).

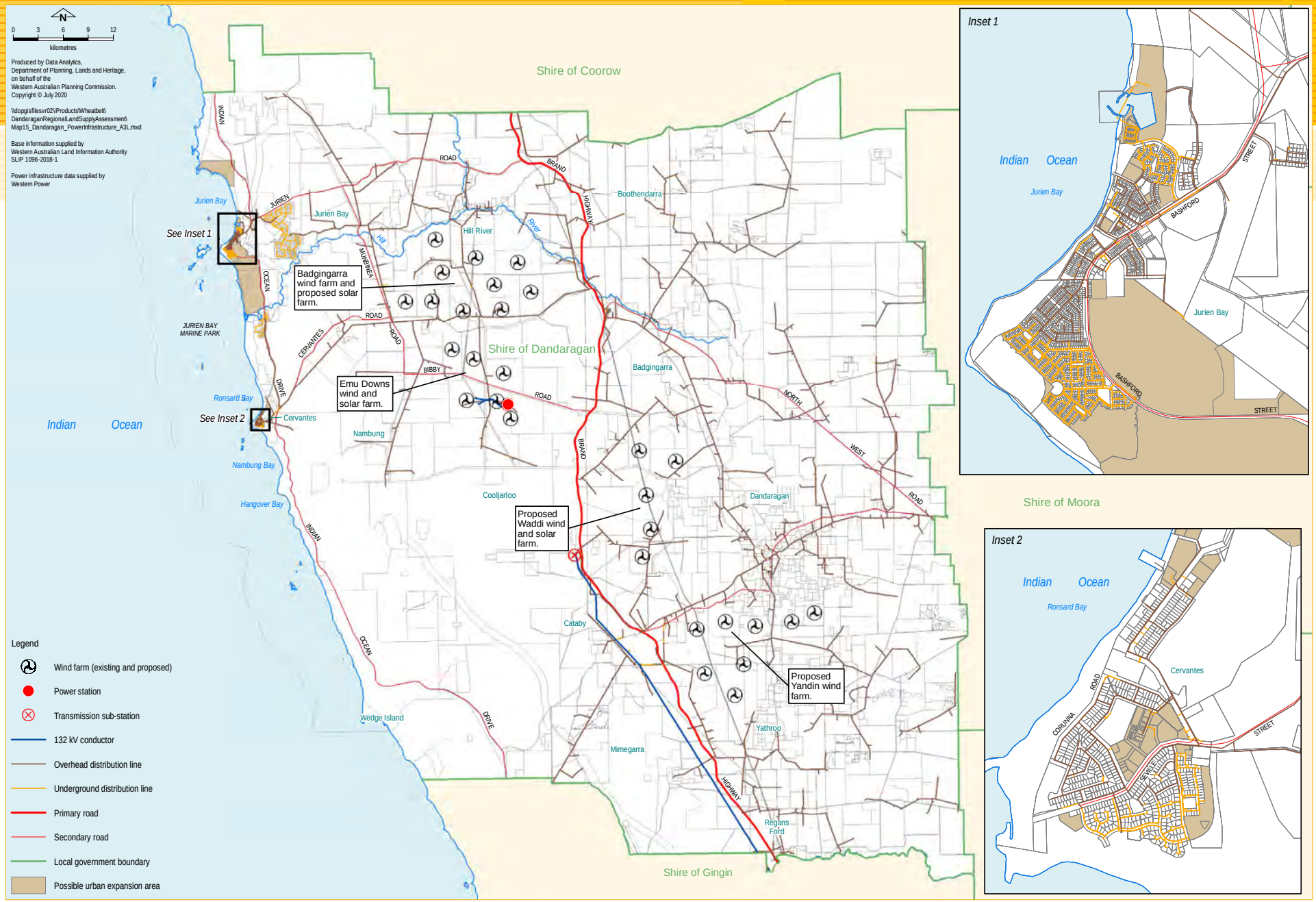
Western Power completed Stage 1 of the Mid West Energy Project (MWEP) Southern Section in 2015. Stage 1 of the MWEP Southern Section included a new 330 kV terminal at Three Springs and a double circuit 330 kV transmission structure from Pinjar to Three Springs. Western Power has proposed to expand the MWEP as the need arises. Stage 2 of the MWEP Southern Section includes a new 330 kV terminal at Eneabba and energising the second side of the double circuit transmission structure to 330 kV.

Western Power's Network Capacity Mapping Tool shows a constrained supply at 2020 for the eastern half of the Shire area at less than 5 megavolts ampere (MVA). Comparatively, energy supply for the Shire's coastal areas is less constrained, with an identified remaining capacity of 20 to 25 MVA at 2020.

There is potential for the Shire to become an important area for renewable energy generation projects. The Emu Downs wind and solar farm is located 30 kilometres east of Cervantes. It is the State's first co-located wind and solar farm, and is comprised of 48 turbines and 75,000 photovoltaic panels that can generate a collective 100 megawatts (MW) of electricity at peak.

There are current plans to develop additional wind and solar farm facilities within the Shire. The Badgingarra wind farm is being constructed directly north of Emu Downs, and will comprise 37 turbines that can generate 130 MW of electricity at peak. Additionally, approval was granted in January 2018 by the Mid West/Wheatbelt Joint Development Assessment Panel for a 50 MW solar farm to be co-located with the Badgingarra wind farm.

The proposed Waddi wind and solar farm is located 15 kilometres north west of the Dandaragan townsite. It will comprise of 57 turbines, which can generate up to 105 MW of electricity at peak. The solar farm can generate up to an additional 40 MW of electricity. The proposed Yandin wind farm is located four kilometres south of the Dandaragan townsite. The facility will comprise of up to 94 turbines. When complete, Yandin will be the State's largest wind farm.



Map 15: Power infrastructure

9.4 Transport

Roads

The Shire is served by two primary distributor roads; Brand Highway and Indian Ocean Drive. Brand Highway provides connections to Perth via Gingin, Muchea and Bullsbrook, and to Geraldton via Eneabba and Dongara/Port Denison. Indian Ocean Drive is a scenic coastal road, providing alternative connections to Perth and Geraldton via coastal towns including Lancelin, Ledge Point, Seabird, Guilderton, Green Head, Leeman, Coolimba and Illawong. The section of Indian Ocean Drive that traverses Jurien Bay (Bashford Street) serves as Jurien Bay's main thoroughfare.

The Shire is also served by a network of regional distributor roads, which include Jurien Road, Cervantes Road, Badgingarra Road and Dandaragan Road. These roads connect the Shire's townsites to one another, as well as Brand Highway and the towns of Moora and Watheroo.

There are long term plans for a bypass around Jurien Bay for the Indian Ocean Drive. The timing for the construction of the bypass will depend on growth in traffic and availability of funding. Therefore, an alignment for the bypass is yet to be determined. The volume of traffic on Bashford Street has increased following the opening of Indian Ocean Drive. As such, modifications to the design of the road may be required to ensure safety for all users.

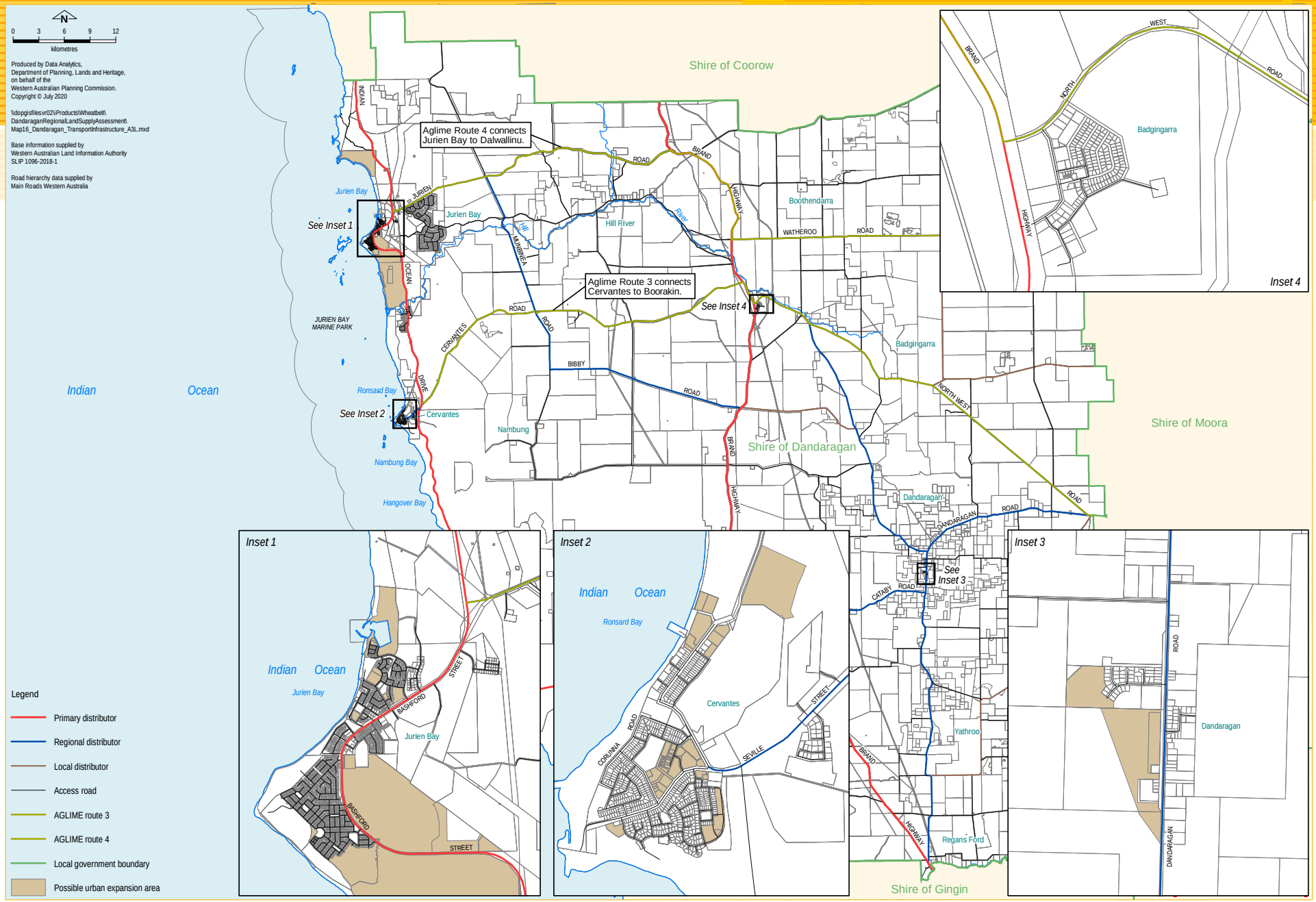
Limesand is transported in heavy vehicles from coastal quarries to inland agricultural areas. There are six identified agricultural lime (aglime) routes within the Wheatbelt and Mid West regions, two of which traverse through the Shire area. Aglime Route 3 connects Cervantes to Boorakin via Cervantes Road, Cadda Road and North West Road. Aglime Route 4 connects Jurien Bay to Dalwallinu via Jurien Road, Watheroo Road and Watheroo West Road. Sections of Aglime Route 3 require upgrades to a higher standard to cater for increasing growth and mix of traffic, including tourist traffic and heavy haulage vehicles. At present, Cadda Road is an unsealed, Type 3 Gravel Road; it is required to be upgraded to a Type 5 Sealed Road (7 metre Seal Width).

Other roads identified as requiring upgrades include Barberton West Road, in the locality of Yathroo. Barberton West Road is currently an unsealed road. It is required to be sealed in order to accommodate increasing heavy haulage and commuter traffic. In addition, certain sections of the Dandaragan-Jurien route (which is comprised of Badgingarra Road, Cervantes Road, Koonah Road, Munbinea Road and North West Road) also require upgrading to provide a uniform Type 5 Sealed Road for the entire length of the route. The Regans Ford–Carnamah route (Coalara Road, Dandaragan Road and Muthawandery Road) also requires upgrading of certain sections to provide a uniform Type 5 Sealed Road to adequately cater for heavy haulage vehicles.

Aviation

The existing Jurien Bay airstrip is located off Bashford Street, between the Coalseam Road industrial area and the Carmella Street light industrial area. It is comprised of a single, sealed runway measuring 1,200 metres long and 20 metres wide. The airstrip is predominantly used for recreational purposes (i.e. sky diving and scenic flights). The Royal Flying Doctor Service also uses the airstrip. The airstrip is also used for flight training, corporate and government use and emergency services (i.e. water bombing for fire fighting purposes).

The Jurien Bay Aerodrome Development Plan (2010) indicates that the existing Jurien Bay airstrip has adequate capacity to accommodate operational growth for the foreseeable future. It is envisioned, however, that in the longer term, the region will require improved airport facilities. A study has been undertaken to identify potential sites for a proposed Turquoise Coast Regional Airport, with one site (Lot 10600 Jurien Road, Jurien Bay) identified as the preferred site.



Map 16: Transport infrastructure

Abbreviations and acronyms

Aglime	Agricultural lime
ABS	Australian Bureau of Statistics
ASGS	Australian Statistical Geography Standard
the Department	Department of Planning, Lands and Heritage
DAP	Development Assessment Panel
ERP	Estimated resident population
ILID	Integrated Land Information Database
IRIS	Integrated Regional Information System
kV	kilovolt
LGA	Local government area
MVA	megavolt ampere
MW	megawatt
MWEP	Mid West Energy Project
MB	Mesh Block
LPS 7	Shire of Dandaragan Local Planning Scheme No. 7
SPP	State Planning Policy
SSC	State suburb
SA1	Statistical Area Level 1
SA2	Statistical Area Level 2
SA3	Statistical Area Level 3
SA4	Statistical Area Level 4
the Shire	Shire of Dandaragan
SWIS	South West Interconnected System
UCL	Urban Centre and Locality
WAPC	Western Australian Planning Commission

Glossary

Building approvals

Building	A building is a rigid, fixed and permanent structure which has a roof. Its intended purpose is primarily to house people, plant, machinery, vehicles, goods or livestock. An integral feature of a building's design is the provision for regular access by persons to satisfy its intended use.
Dwelling	A dwelling is a self-contained suite of rooms, including cooking and bathing facilities, intended for long-term residential use. A dwelling may comprise part of a building or the whole of a building. Regardless of whether they are self-contained or not, rooms within buildings offering institutional care (e.g. hospitals) or temporary accommodation (e.g. motels, hostels and holiday apartments) are not defined as dwellings. Such rooms are included in the appropriate category of non-residential building approvals. Dwellings can be created in one of four ways: through new work to create a residential building; through alteration/addition work to an existing residential building; through either new or alteration/addition work on non-residential building; or through conversion of a non-residential building to a residential building.
Dwellings excluding houses	Dwellings in other residential buildings and dwellings created in non-residential buildings.
Flats, units or apartments	Dwellings not having their own private grounds and usually sharing a common entrance, foyer or stairwell.
House	A detached building primarily used for long-term residential purposes consisting of one dwelling unit. Includes detached residences associated with a non-residential building, and kit and transportable homes.
Non-residential building	Buildings primarily intended for purposes other than long-term residence.
Other residential building	Buildings other than houses which are primarily used for long-term residential purposes. Other residential buildings includes: semi-detached, row or terrace houses or townhouses; and flats, units or apartments.
Residential building	Buildings primarily used for long-term residential purposes. Residential buildings are categorised as houses or other residential buildings.
Semi-detached, row or terrace houses, townhouses	Dwellings having their own private grounds with no other dwellings above or below.
Total residential building	Total residential building is comprised of houses and other residential building. It does not include dwellings in non-residential buildings.

Geography

Australian Statistical Geography Standard (ASGS)

The ASGS brings all the regions for which the ABS publishes statistics within the one framework and has been in use for the collection and dissemination of geographically classified statistics since 1 July 2011. It is the current framework for understanding and interpreting the geographical context of statistics published by the ABS.

Mesh Blocks (MB)

Mesh Blocks are the smallest geographical area defined by the ABS and form the building blocks for the larger regions of the ASGS. All other statistical areas or regions are built up from, or approximated by whole Mesh Blocks. They broadly identify land use such as residential, primary production and parks, etc. There are 358,122 Mesh Blocks covering the whole of Australia without gaps or overlaps.

Statistical Area Level 1 (SA1)

SA1s are geographical areas built from whole Mesh Blocks. SA1s have generally been designed as the smallest unit for the release of census data. SA1s have a population of between 200 and 800 people with an average population size of approximately 400 people. There are 57,523 spatial SA1 regions covering the whole of Australia without gaps or overlaps.

Statistical Area Level 2 (SA2)

SA2s are medium-sized general purpose areas built from whole SA1s. Their purpose is to represent a community that interacts together socially and economically. SA2s generally have a population range of 3,000 to 25,000 persons. SA2s have an average population of about 10,000 persons. There are 2,310 SA2 regions covering the whole of Australia without gaps or overlaps.

Statistical Area Level 3 (SA3)

SA3s are geographical areas built from whole SA2s. They have been designed for the output of regional data. SA3s create a standard framework for the analysis of ABS data at the regional level through clustering groups of SA2s that have similar regional characteristics. They generally have a population of between 30,000 and 130,000 people. There are 358 spatial SA3 regions covering the whole of Australia without gaps or overlaps.

Statistical Area Level 4 (SA4)

SA4s are geographical areas built from whole SA3s. SA4 regions are the largest sub-state regions in the main structure of the ASGS and have been designed for the output of a variety of regional data. These areas represent labour markets or groups of labour markets within each State and Territory. There are 107 SA4 regions covering the whole of Australia without gaps or overlaps.

Urban Centre and Locality (UCL)

UCLs represent areas of concentrated urban development with populations of 200 people or more. They are defined using SA1 areas that meet objective 'Urban Character' criteria, including census population and dwelling density measures.

Significant Urban Area (SUA)

SUAs represent significant towns and cities of 10,000 people or more. They are based on the UCLs but are defined by the larger SA2 areas, which mean they often include some adjacent rural residential settlement.

Region

The **Wheatbelt** region is one of the nine regions of Western Australia, as defined by the *Regional Development Commissions Act 1993*. The Wheatbelt region is comprised of 42 local government areas, including the Shire of Dandaragan.

Planning sub-region

The Wheatbelt region is divided into seven planning sub-regions: Avon Arc, Coastal Wheatbelt, Great Eastern Wheatbelt, North Eastern Wheatbelt, Outer Arc, South Eastern Wheatbelt and South Western Wheatbelt. The Shire of Dandaragan, together with the Shire of Gingin, makes up the **Coastal Wheatbelt** planning sub-region.

Wheatbelt Development Commission sub-region

The Wheatbelt Development Commission divides the Wheatbelt region into five sub-regions: Avon, Central Coast, Central East, Central Midlands and Wheatbelt South. Each sub-region (as defined by the Wheatbelt Development Commission) is serviced by a sub-regional centre (Northam, Jurien Bay, Merredin, Moora and Narrogin) and has unique economic and population drivers. The Shire of Dandaragan, together with the Shire of Gingin, makes up the **Central Coast** sub-region.

Population

Estimated resident population (ERP)

The official measure of the population of Australia based on the concept of usual residence. It refers to all people, regardless of nationality, citizenship or legal status, who usually live in Australia, with the exception of foreign diplomatic personnel and their families. It includes usual residents who are overseas for less than 12 months over a 16-month period. It excludes overseas visitors who are in Australia for less than 12 months over a 16-month period.

Sub-state estimates of the resident population are prepared on an annual basis by adding natural change (births minus deaths), net internal migration and net overseas migration occurring during the period to the population at the beginning of each period. This is known as the component method.

Population growth rate

Population change over a period as a proportion (percentage) of the population at the beginning of the period.

Subdivision

Developer lodged applications

Refers to those applications received by the WAPC for the purpose of subdivision.

Applications under assessment

The number of applications under assessment for conditional approval by the WAPC and includes those which have been deferred.

Conditional approval

Conditional approval is granted by the WAPC for subdivision to begin, subject to certain conditions being met. The approval is preceded by an assessment of the proposed subdivision plan in consultation with servicing agencies. On receipt of conditional approval, the proponent may commence subdivision development in accordance with the conditions of approval. A conditional approval remains valid for three years where five lots or less are approved, and four years where six or more lots are approved.

Current valid conditional approvals

Refers to those conditional approvals that are still valid but have not yet been issued with final approval. In general, these are approvals for which construction/servicing has not yet commenced or is currently underway (see active conditional approvals).

Active conditional approvals	Refers to conditionally approved lots where a servicing agreement (agreement to construct) has been signed between the Water Corporation and the developer. These are termed 'lots on non-cleared agreements'.
Inactive conditional approvals	Where conditional approval has been granted and the approval is still valid, but where a servicing agreement (agreement to construct) has not been signed between the Water Corporation and the developer.
Lapsed conditional approvals	Where conditional approval has expired and the conditions of the approval have not been met.
Final approval	Final approval is the WAPC's endorsement of the proponent's submitted deposited plan or strata/survey strata plan describing the now complete subdivision, constructed in accordance with the conditions set down in the conditional approval. Deposited plans/strata plans that have final approval are registered with Landgate, where certificates of titles for the newly created lots can be issued. The characteristics difference in lot numbers seen between conditional and final approvals arises from proponents choosing not to proceed with the subdivision in the specified three/four year period in accordance with the conditions of the conditional approval; either at all, only in part, or via another conditional approval incorporating a new plan for the subject land.

Planning

Planning and Development Act 2005	The *Planning and Development Act 2005* is the primary piece of legislation governing development and subdivision in Western Australia. Its stated purposes are to provide for an efficient and effective land use planning system in Western Australia, and to promote the sustainable use and development of land in Western Australia.
Planning and Development (Local Planning Schemes) Regulations 2015	The Planning and Development (Local Planning Schemes) Regulations 2015 prescribe the procedures by which local planning strategies, local planning schemes and amendments to local planning schemes must be prepared and adopted by local government, the WAPC and the Minister for Planning; and establish a Model Scheme Text for local planning schemes; and introduced a set of deemed provisions that form part of all local planning schemes in Western Australia.
State Planning Strategy	The State Planning Strategy is an integral part of the Western Australian planning system and is intended to inform planning and development policies and decisions throughout the State.
State Planning Policies (SPPs)	Provides the highest level of planning policy control and guidance in Western Australia. SPPs establish the key principles for land use planning and development that should apply in Western Australia.
State Planning Policy 7.3 – Residential Design Codes – Volume 1 (the R-Codes)	The R-Codes outlines the residential design codes that apply to all residential development in Western Australia. The R-Codes include standards for lot sizes, required dwelling setbacks from lot boundaries, requirements for private open space and the proportion of built form permitted on each lot (plot ratio), amongst other things. Volume 2 of the R-Codes includes provisions for multi-unit development.

Local planning strategies

Local planning strategies establish the planning framework for each local government, and provide the strategic basis for local planning schemes. Local planning strategies set out the local government's objectives for future land use planning and development, and include a broad framework by which to pursue those objectives. Local planning strategies need to address the social, environmental, resource management and economic factors that affect, and are affected by, land use and development.

Local planning schemes

Local planning schemes are the principal statutory tool for achieving a local government's aims and objectives with respect to the development of its local area, subject to compliance with the State Government's statutory and strategic planning framework. Local planning schemes deal mainly with land use, development control and infrastructure coordination, and are formulated based on the strategic framework established in the supporting local planning strategy.

Local planning scheme amendments

A local government may resolve to amend its planning scheme, and may do this at its own initiative, at the request of all or any of the relevant landowners, or if directed to do so by the Minister for Planning. An amendment would generally be initiated to bring the local planning scheme into line with: changes in planning procedures; to reflect changes to a State or regional planning policy; or to allow for a different use of land.

Regional planning and infrastructure frameworks

Regional planning and infrastructure frameworks are regional strategic planning documents that provide an overview of regional planning issues and a basis for ongoing planning and development. They provide an overview of the major regional economic, social, cultural and environmental issues; identify the priority actions required to enable comprehensive sub-regional planning and to guide local planning processes; and identify the regional infrastructure priorities to facilitate economic and population growth in a region.

Sub-regional structure plans

Sub-regional structure plans are strategic spatial plans providing a broad framework for planning at a sub-regional level. They cover planning issues including location of urban growth and consolidation, population trends, employment areas, major commercial centres, transport links, infrastructure and servicing requirements, environmental protection and regional open space. Sub-regional structure plans are prepared by the WAPC, in liaison with local government.

District structure plans

A district structure plan shows in more detail the general pattern of development in a particular part of a sub-region, and provides guidance on future land use, employment, density targets and the coordination and provision of major infrastructure at a district level. This may include the location of high schools, district water management requirements, movement networks, refinement of regional land use boundaries, coordination or regional and district infrastructure provision, location and distribution of regional or district open space, land use buffers, environmental assets and activity centres.
District structure plans identify matters that will require further refinement through the more detailed investigations involved in preparation of local structure plans.

Local structure plans A local structure plan is a statutory spatial plan, prepared by local government, a landowner, or a landowner representative, and approved under the provisions of a local planning scheme. Local structure plans provide more specific detail on the proposed pattern of land use for a certain area, such as a residential neighbourhood or industrial area. They provide a framework for the assessment of detailed scheme amendments, subdivision and development proposals. These plans include details of location and density of housing, road layout, pedestrian and cycle network, public open space, school sites, servicing infrastructure, community purpose sites and activity centre locations.

Temporal land supply Temporal land supply is an estimate of the number of years it will take to completely consume land that is currently zoned for urban development. Temporal land supply can vary based on different development scenarios, particularly where different rates of density and infill are applied.

Underlying housing demand Refers to the need for additional dwellings that will satisfy the requirements of a population (and population growth), irrespective of the demand actually expressed by the market.

Vacant lots Vacant lots refers to those lots that are undeveloped (i.e. have no premises constructed) and that are located on residential or special zones as designated under various local planning schemes in Western Australia. The base information is provided by Landgate's property valuation database.

Water licensing terms

Source: Department of Water and Environmental Regulation

Allocation limit Annual volume of water set aside for licensed use from a water resource.

Aquifer A geological formation or group of formations able to receive, store and transmit significant quantities of water.

Entitlement The quantity of groundwater permitted to be abstracted by a well licence, usually specified in kilolitres/year (kL/year).

Groundwater The water that occurs in pore spaces and fractures in rocks beneath the ground surface. Groundwater is contained in the following types of aquifer:

The **unconfine**d aquifer (also referred to as a 'superficial' or 'surficial' aquifer) is the aquifer nearest the surface, having no overlying confining layer. The upper surface of the groundwater within the aquifer is called the watertable.

A **confined** aquifer is an aquifer lying between confining layers (such as clay, coal or rock) containing water under pressure.

An **artesian** aquifer is a confined aquifer under hydraulic pressure that causes water levels to rise naturally to the ground surface.

Groundwater and surface water areas All the boundaries that are proclaimed under the *Rights in Water and Irrigation Act* and used for water allocation planning and management.

Groundwater resource area	All the boundaries that are proclaimed under the *Rights in Water and Irrigation Act* and used for water allocation planning and management.
Non-artesian well	A well, including all associated works, from which water does not flow or has not flowed naturally to the surface but has to be raised or has been raised by pumping or other artificial means.
Subarea	A sub-division within a proclaimed groundwater resource area, defined for the purpose of managing the allocation of groundwater resources.

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Appendices

Appendix A: Integrated Land Information Database

ILID 2016 – Background:

The Integrated Land Information Database (ILID) is a net land use assessment and capability model that is generated at a cadastral level for the whole of Western Australia. The database can be used to identify the current range of land uses within a number of predefined boundaries. It can also model future capability based on what is known about the current (or proposed) planning policies and statutory planning instruments.

The model is produced within a geographic information system by overlaying a variety of layers to compute the coincidence of two or more parameters. For example, if a dataset containing the locations of school sites is overlaid with another dataset that shows the areas that are within two kilometres of the coast, it is possible to generate a single dataset with schools that are within two kilometres of the coast. This process can be repeated with a variety of datasets in endless combinations to help with multi-criteria decision analysis through the process of elimination.

The ILID model works by linking the spatial extent of many different input layers with all the unique cadastral identifiers that exists at a particular point in time. The result of this overlay process creates many versions of the cadastre attributed with discrete pieces of information, i.e. cadastre version of the local planning scheme zones, region schemes, density coding (R-Code) and so on. The 'integrated' component of the database means that once all of the individual inputs have been identified, they can all be joined together using a tabular join through the common parcel identification number (PIN) across all datasets.

For this document, the ILID model has been used to identify the lot potential and additional dwelling potential of all residential lots (with a density coding (R-Code) identified in the *Shire of Dandaragan Local Planning Scheme No. 7*) in the Shire of Dandaragan. Vacant lots were not included in this analysis.

ILID analysis in this document includes three key inputs: lot size, R-Code and dwelling count/location. Constraints to subdivision such as bushfire risk, heritage, infrastructure provision and environment are variables that are not included in this analysis, and as such, a significant proportion of the development potential may not be realised.

Definitions:

Lot potential is used to determine how many potential lots the R-Code intends to yield as a maximum. For example, a lot that has an R-Code of R20 has a planned density of a single 450 square metre lot. Or, a 900 square metre lot has the potential to create two 450 square metre lots. In any case, the lot potential can only be calculated if there is an existing R-Code present.

Net dwellings, also known as additional dwelling potential, identifies the extra amount of dwellings a single lot can add on (disregarding the location of the current dwelling footprint and has a hundred per cent take-up rate). This is determined by the size of the lot and the current lot potential based on the R-Code planning and any existing dwellings..

Appendix B: Integrated Regional Information System

The sections of this report discussing the development status of land zoned for residential, industrial and commercial purposes draw heavily on the tiered land supply assessment model. The tiered land supply assessment model is the central output of the Integrated Regional Information System (IRIS). The IRIS land supply model is a geographic information system based tool that is used to assess key measures of land use dynamics across Western Australia.

The IRIS land supply model groups local planning scheme zones into primary, secondary and tertiary categories. The grouping of local planning scheme zones forms the zone 'catchment' for each IRIS land supply model category.

Tier one of the IRIS land supply model groups local planning scheme zones into primary categories for analysis. The table below shows the IRIS land supply model primary and secondary categories and the local planning scheme zones (under the Shire of Dandaragan Local Planning Scheme No. 7) that fall into the primary and secondary categories.

IRIS LPS categories			Local planning scheme	
IRIS primary category	IRIS secondary category	IRIS tertiary category	Zone	Label description
Residential	Other residential	Aged accommodation	Special use	Aged persons accommodation
	Residential	Residential	Residential	
	Residential development	Residential development	Special development	
	Rural living	Rural residential	Rural residential	
			Special use	
Industrial	General industry	General industry	Industrial	
Commercial	Commercial/business	Centres	Commercial	
	Commercial/business - tourist	General tourist	Regional centre	

Tier two of the IRIS land supply model addresses the development status of each lot within the specified primary land use category. Each cadastre (lot) within each primary land use category is attributed one of three values (developed, undeveloped or unrated), based on information from Landgate's property valuation database.

Developed refers to lots that are zoned for development for the purposes of the specified primary land use category for which premises valuation information is captured in Landgate's property valuation database.

Undeveloped refers to lots that are zoned for development for the purposes of the specified primary land use category that are recorded as vacant in Landgate's property valuation database.

Unrated refers to lots that are zoned for development for the purpose of the specified primary land use category for which no vacant land or premises valuation information has been captured in Landgate's property valuation database. This may include State or local government owned lots or premises exempt from rates, Crown allotments, common property within lots on survey, newly created lots on survey, land otherwise exempt from rates and some public roads which are zoned for the primary land use category under the local planning scheme.

Tier three of the IRIS land supply model refers to the nature of development by assessing the premises type against the land use as indicated by the local planning scheme. Tier three of the IRIS land supply model has not been included in analysis for this report, as sites with identified development potential are described in Table 6, Map 6 and Map 7 of this document.