

A SOCIO-ECONOMIC OVERVIEW OF THE COASTAL COMMUNITIES ADJACENT TO THE NORTH-WEST MARINE REGION

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SUMMARY

This report presents an overview of recent demographic and socio-economic trends in the coastal communities adjacent to the North-west Marine Region, which stretches from Kalbarri in Western Australia to the Northern Territory / Western Australia State border.

The population of these communities has grown rapidly over the past 40 years, largely as a result of increasing activity in the minerals, petroleum, tourism and agriculture sectors. However, the rates of growth, and the drivers of change, vary considerably across the Region. In recent years, the most rapid rate of population growth has occurred in the Kimberley dominate in terms of population growth, reflecting expansion of the tourism industry and dynamic growth in indigenous communities. The report shows that up until the more recent Census (2001), the Pilbara and Gascoyne were characterised by more modest growth in line with or below the State average.

The importance of minerals, petroleum, tourism and agriculture as drivers of the economy were reflected in the analysis of employment trends. These sectors were the major contributors to employment, although again the Region did demonstrate considerable geographical variation according to the local resource base. Employment rates and incomes within the Region are above the State average. However, this obscures significant sub-regional differences, however, with competition for skilled occupations in the minerals sector driving wage levels higher in the Pilbara, whilst towns with a greater reliance on the service sector and higher indigenous populations are characterised by lower wages, lower educational performance levels and a higher dependency on welfare and benefits.

The Report also provides a separate analysis of indigenous communities within the Region. Whilst this population is minor in terms of overall numbers, the concentration in a small number of settlements gives rise to distinct demographic and socio-economic characteristics. These include a young, rapidly increasing population with a high dependence on the labouring sector for employment, although this is evident to a lesser degree in the urban centres of the Region. Employment levels are high, but

fluctuate, reflecting the presence of government-sponsored employment programmes as much as census accuracy. Educational performance within the indigenous community as a whole remains markedly below the Regional average.

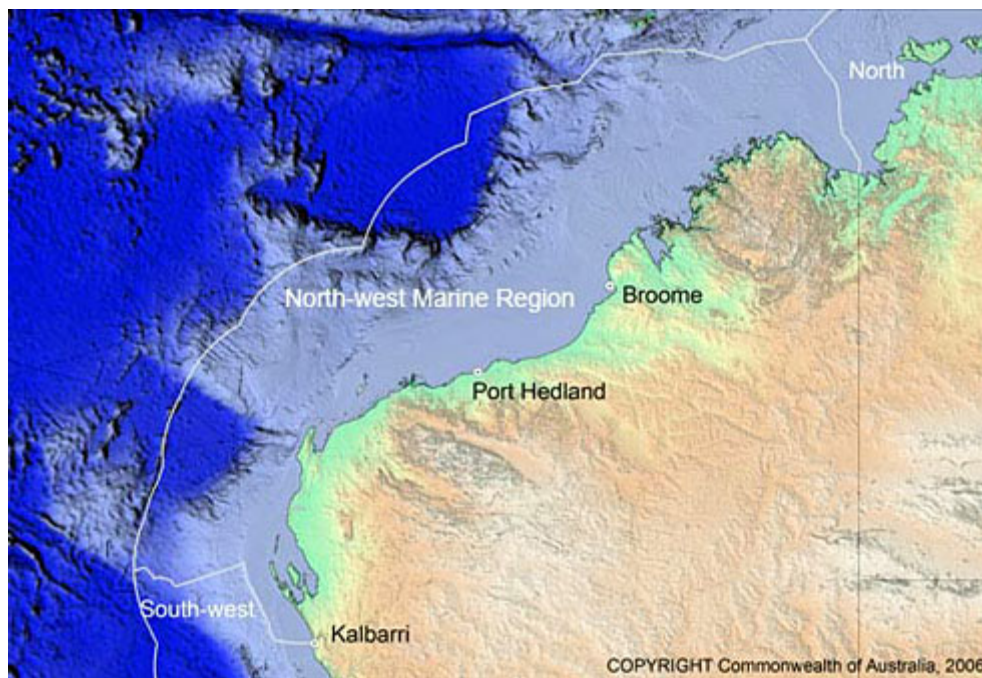
Forecasting future patterns of population growth and economic development is necessarily a problematic task with considerable degrees of uncertainty. The scenarios painted in this in this Report reflect this, yet indicate a diverging future for the sub-regions of the North-west Marine Region. Assuming continued stability of markets and the geopolitical situation, the mineral resources of the Pilbara should continue to attract private sector investment and attendant economic benefits. However, the extent of associated population growth is likely to be limited by the nature of employment within this sector. The Kimberley, with its broader economic base and established urban centres, is expected to undergo more rapid population growth and potential expansion into the minerals sector. By contrast, the Gascoyne is predicted to become progressively dependent upon tourism and will be characterised by an increasingly elderly population profile.

1 INTRODUCTION

1.1 Background and Project Rationale

The launch of Australia's Oceans Policy by the Australian Government in 1998 outlined a commitment to the sustainable management of ocean resources. A fundamental component of the Oceans Policy is ensuring that oceans are managed in such a way that the economic, social and ecological needs of future Australians are not compromised by current activities. To achieve the objective of sustainable oceans management, the Department of Environment and Water Resources is developing a series of regional marine plans to guide future and current uses. The geographic areas covered by these plans have been developed through a division of Australia's coastline and Commonwealth waters based on a combination of ecosystem characteristics and administrative boundaries. This report will focus on the North-west Marine Region, which stretches from Kalbarri in Western Australia to the WA/Northern Territory border (Map 1).

Map 1 The North-west Marine Region



The aim of marine regional plans is to integrate ecological and socio-economic needs and values in the management of Australia's oceans. An important first step in this process is to understand the nature of the communities living on the coastline adjacent to planning regions. This report has been commissioned by the Department of Environment and Water Resources to provide an assessment of the socio-economic characteristic of these communities along the North-west Marine Region's coastline. This assessment will provide planners with baseline data which will be useful when anticipating the effects of marine bioregional planning outputs on North-west coastal communities.

Specifically, the report:

- Provides an outline of the population trends and geography in the NWMR;
- Outlines the main demographic characteristics, including age, gender and ethnicity;
- Summarises the major characteristics of the labour force, including employment by industry sector, employment drivers, occupational structure and unemployment;
- Examines the socio-economic characteristics of the population in terms of income, welfare/benefit receipts, education, indices of advantage/disadvantage, and housing;
- Reviews the demographic and socio-economic characteristics of the indigenous population;
- Provides information on the main socio-economic trends in the North-west, including population and employment projections.
- Considers the impact of the likely expansion of the petroleum and minerals sector on the Region.

1.2 Data Sources

This report draws on data from a number of Commonwealth and State government sources. Much of the analysis is based on the Australian Bureau of Statistics' Census of Population and Housing for 1996 and 2001, though censuses as early as 1961 were consulted in order to develop an appreciation of change over longer time horizons.

One of the challenges with using census data is selecting the appropriate spatial units for analysis. In remote coastal areas this is particularly problematic given that one of the standard units for regional analysis, Statistical Local Areas, are often extremely large and capture not just coastal, but also inland communities. In order to avoid this problem, much of the analysis in this report has been completed at the Urban Centre and Locality (UCL) level. In essence, UCLs capture town sites, with Urban Centres defined as those settlements with 1000 people or more, and Localities as places with between 200 and 999 people.

The census provides a snapshot of the population at a given time, and provides an opportunity to analyse demographic characteristics such as age, gender, ethnicity, labour force and housing over time. However, one of the difficulties with the census is that it is collected every five years (recent censuses were conducted in 1996, 2001 and 2006), which means that in rapidly changing communities short-term intercensal variations are sometimes not captured in the analysis. Similarly, at the end of a census period, it can take some time for data to be published. In the case of this report, the 2006 data were not available at the time of writing. Accordingly, the focus is on 1996 and 2001. Despite these limitations, the census data provide the most appropriate means of identifying longer term trends and, importantly, the magnitude of change.

In addition to census data, this report utilises material from a number of other sources, including: Australian Taxation Office data on individual incomes and welfare payments; the Australian Bureau of Statistics' Integrated Regional Database, which compiles a range of socio-economic data on employment, economic activity, welfare and projected populations; Western Australian Planning Commission data on population projections; various regional development commission publications on development projects and socio-economic change.

1.3 The North-west Marine Region

The North-west Marine Region covers more than 1.07 million square kilometres of water under Commonwealth jurisdiction. The biophysical environment is characterised by considerable diversity. In the south of the Region, the narrow shelf

of the Ningaloo Reef contributes to a unique combination of deep and shallow water ecosystems located close to the shore supporting a range of marine life, including manta rays, abundant species of fin-fish, migrating whale sharks and dolphins. To the north of the North West Cape, the broad continental shelf encompasses a series of offshore islands, including the ecologically significant Barrow-Montebello-Lowendal complex. The Kimberly coast, stretching from Broome to the Northern Territory-Western Australian border incorporates extensive tidal flats, tropical mangroves, and offshore islands.

The NWMR and its adjacent coastline play an important role in the Western Australian and Australian economies. The Pilbara region contains some of the richest reserves of iron ore in the world. This is accompanied by reserves of copper, manganese and chromite ores, salt and a range of other minerals. The other major industry is the offshore oil and gas industry. This developed in the late 1960s with crude oil production on Barrow Island, followed by substantial expansion during the 1980s and 1990s. Production now exceeds the energy equivalent of 260 million barrels of crude oil per annum from 42 producing fields (SMEC, 2004). The coastal communities in the Pilbara play an important role in processing and exporting these mineral and petroleum commodities, and their expansion has contributed to substantial population and economic growth in the area's major towns. To provide some indication of the scale of the operations, on a tonnage basis, the port of Dampier, handling exports of iron ore, salt and liquid gas, processes the greatest volume of product of any port in Australia.

While the Pilbara dominates the NWMR's petroleum and mineral resource sectors, a number of other centres, including Carnarvon and Kununurra are linked to various resource industries. Other economic drivers in the region include coastal tourism, much of which is concentrated around the Ningaloo Reef area (with Exmouth and Carnarvon being important beneficiaries), Broome and to a lesser extent Kununurra. Commercial fishing is also spread throughout the region, with Western Rock Lobster prominent in the southern part of the region, prawning common along the Pilbara and parts of the Kimberly, and various fin-fish industries located throughout the Region. Two of the Region's centres are also important agricultural centres: Carnarvon and

Kununurra. Both of these towns grow a range of commodities under irrigation from the Gascoyne and Ord rivers, respectively.

The vibrant economy of the NWMR supports a growing population along the coast. There are currently seven towns along the coast with populations larger than 3,000. From south to north, these are: Carnarvon; Exmouth; Karratha; Port Hedland; Broome; Derby; and, Kununurra. There are also a number of smaller towns in the region that service local industries and or have specialised functions, such as mining or tourist towns.

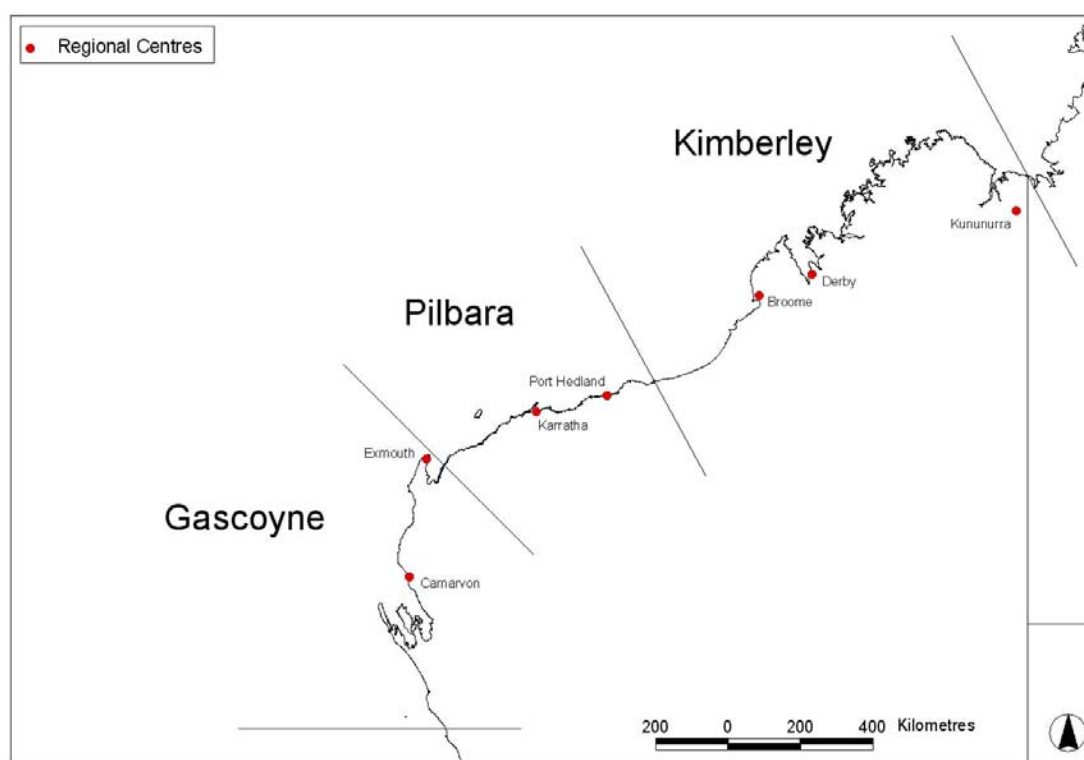
The Region is also home to a large indigenous population. Aboriginal occupation of the coastline of the NWMR can be traced back at least 40,000 years (Hallam, 1985). Aboriginal peoples made significant use of coastal and marine resources and in many cases still utilise these as part of their daily lifestyle and cultural practices (Trigger, 1992). The contemporary Aboriginal population of the NWMR live in both the Region's larger centres and towns, as well as in smaller indigenous settlements, such as Bardi, Beagle Bay and Kalumburu.

2 REGIONAL DEMOGRAPHIC TRENDS

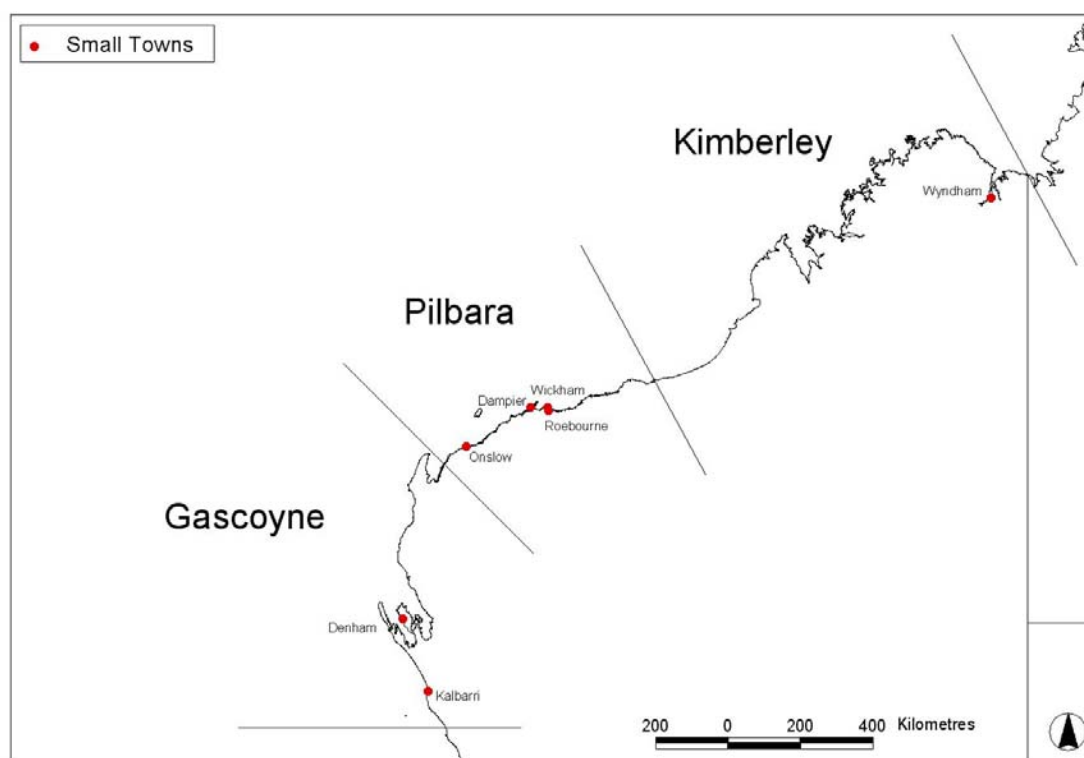
2.1 Introduction

The North-west Marine Region is extremely diverse in terms of its population structure and dynamics. The Region's demography is shaped by the geography and history of its economic resources and indigenous culture, incorporating resource-dependent service and port towns, tourism centres, and Aboriginal communities. This chapter examines the demographic structure of the Region, focusing on the size and distribution of the population, together with its age, sex and ethnic structure. In the context of marine bioregional planning, understanding these dynamics and characteristics provide insights into population related pressures and, of course, the nature of the communities to be engaged in the planning process. Maps 2 and 3 show the location of sub-regions, regional centres and smaller towns within the North-west Marine Region referred to in the text.

Map 2 Sub-Regions and Regional Centres in the North-west Marine Region



Map 3 Sub-Regions and Smaller Towns in the North-west Marine Region



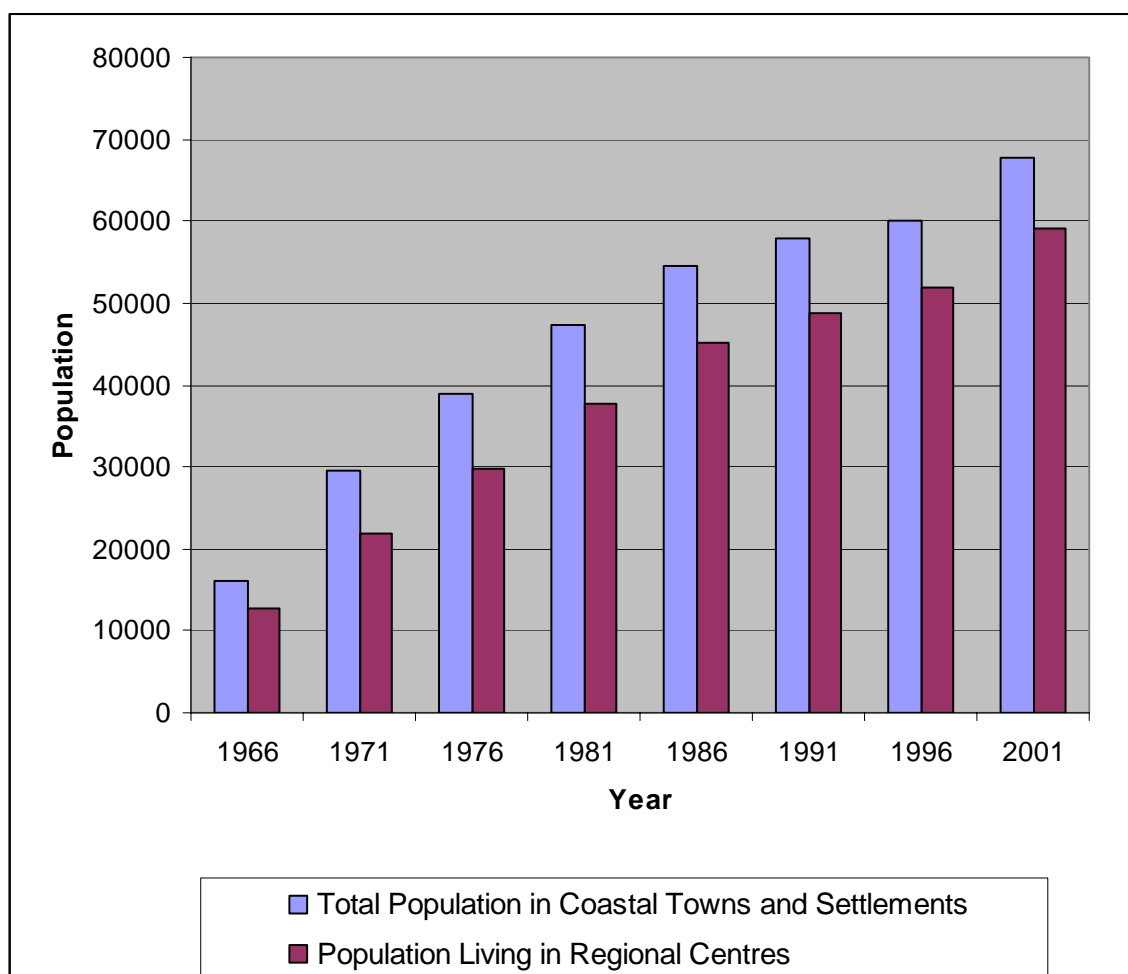
2.2 Population Trends

The population of the North-west Marine Region has grown rapidly since the 1960s, largely as a result of the expansion of, initially, the mineral resources sector, followed more recently by the expansion of the oil and gas industry. Prior to the 1960s, the Region was dominated by pastoralism, fishing and small-scale tourism. The population linked to these industries was small and sparsely distributed, consisting of a handful of service centres and port towns. The Region also had (and continues to have) a relatively large Aboriginal population, many of whom lived either in the established towns or in indigenous communities and missions. In the 1960s, the largest centres in the Region were Carnarvon and Broome, both of which had populations of around 3,000. The total Regional population in the early 1960s is estimated at less than 20,000¹.

¹ This estimate is derived from the 1961 Census. However, the data in this Census need to be used with some caution since it did not count Aboriginal people. The 1966 Census is the first that incorporates Aboriginal people in the final data tables.

The expansion of the minerals sector led to a period of rapid growth during the 1960s and 1970s (Figure 2.1). Between 1966 and 1976, the population living in towns along the NWMR coastline increased from 16,004 to 38,865; a rise of more than 140 per cent. Much of this growth was on the driven by the expansion of the iron ore industry in the Pilbara. The rate of growth in the Region slowed somewhat during the following decade, with the population increased by 15,627 between 1976 and 1986, representing an increase of 40 per cent. The 1980s and 1990s saw the population continue to grow, on the back of the expanding minerals sector, the emergence of the oil and gas industry and, to a lesser extent, tourism development. Between 1986 and 2001, the population increased by a little over 13,000, from 54,492 to 67,770; a rise of 24.4 per cent.

Figure 2.1 Population Growth in the Towns and Settlements on the NWMR Coast, 1966-2001



(Source: Australian Bureau of Statistics Census Reports, various issues)

In many of the regional centres of the NWMR, the rate of population growth has been exceptional. Between 1966 and 1986, Port Hedland increased its population by more than 200 per cent, while Karratha, which was gazetted in 1968 grew to have a population of nearly 10,000 within 20 years. The population of Port Hedland stabilized in the mid 1980s, and has remained close to 12,500 for much of the past two decades, while Karratha increased by around 13 per cent between 1986 and 2001. For all of the other regional centres, the rate of growth was also considerable between 1966 and 1986. Post-1986, the trends are more variable, with Broome continuing its expansion on the back of tourism, and Kununurra expanding as a result of mineral resources and irrigation agriculture. The only town to experience significant decline between 1986 and 2001 was Exmouth, largely as a result of the winding up of some military activities during the late 1980s and early 1990s. However, its role as the northern gateway to Ningaloo Reef and the Cape Range National Park have resulted in increased levels of tourism development, which is likely to be reflected in the results of the 2006 census.

Table 2.1 Population Change in Regional Centres in the NWMR, 1966-2001

	<i>1966</i>	<i>1976</i>	<i>1986</i>	<i>1996</i>	<i>2001</i>	<i>% Change 1966-1986</i>	<i>% Change 1986-2001</i>
Broome	1874	2920	5778	11369	15906	208.3	175.3
Carnarvon	3086	5341	6847	6354	7273	121.9	6.2
Derby	1843	2411	3258	3239	3688	76.8	13.2
Exmouth	881	2336	3514	3056	3137	298.9	-10.7
Karratha	0	4243	9533	10055	10796	n/a	13.2
Kununurra	975	1540	3137	4882	5485	221.7	74.8
Port Hedland	4144	11114	13069	12842	12776	215.4	-2.2

(Source: Australian Bureau of Statistics Census Reports, various issues)

Examination of population trends in recent census data provides a clear picture of growth in the Region between 1996 and 2001. When the demographic data for the regional centres, smaller towns and ‘unbounded’ residents are aggregated, the population living adjacent to the NWMR increased from 79,103 to 87,231; a rise of 10.3 per cent. At the time of writing the results of the 2006 census were not available, though most indications are that the population has continued to increase at a similar or higher rate (Department of Planning and Infrastructure, 2005). Within the Region, growth was strongest in the Kimberley between 1996 and 2001, where the population

rose by 27.3 per cent. Growth was more modest in the Gascoyne (7.2 per cent), while the Pilbara experienced a decline of 2.4 per cent. The decline in the Pilbara occurred against the backdrop of the Asian economic crisis in the late 1990s, and a brief reduction in investment during this period. Since 2001, however, the region has experienced considerable industrial expansion, largely as a result of investment in the minerals, oil and gas industries.

These regional trends are, to some extent, mirrored at the local level, where regional centres in the Kimberley (Broome, Derby and Kununurra) and the Gascoyne (Carnarvon and Exmouth) all experienced growth. In part, this is linked to the expansion of the tourism industry in the late 1990s, particularly in Broome, Exmouth and Carnarvon. In Kununurra and Derby the reasons are more complex, but include the expansion of agriculture in the case of the former and Aboriginal in-migration in the latter (see Taylor, 2003).

Table 2.2 Population Change in Areas Adjacent to the NWMR, 1996-2001

	<i>Population</i>		<i>Absolute change</i>	<i>% change 1996-</i>
	<i>1996</i>	<i>2001</i>	<i>1996-2001</i>	<i>2001</i>
Western Australia	1,726,095	1,851,252	125,157	7.3
NWMR	79,103	87,231	8,128	10.3
Gascoyne	12,524	13,419	895	7.2
Pilbara	36,853	35,961	-892	-2.4
Kimberley	29,726	37,851	8,125	27.3
<i>Regional centres</i>				
Carnarvon	6,357	7,273	916	14.4
Exmouth	3,058	3,137	79	2.6
Karratha	10,057	10,796	739	7.4
Port Hedland	12,846	12,776	-70	-0.5
Broome	11,368	15,906	4,538	39.9
Derby	3,236	3,688	452	14.0
Kununurra	4,884	5,485	601	12.3
<i>Smaller towns</i>				
Kalbarri	1,788	2,256	468	26.2
Denham	943	1,428	485	51.4
Dampier	1,424	1,490	66	4.6
Onslow	588	795	207	35.2
Roebourne	958	946	-12	-1.3
Wickham	1,649	1,371	-278	-16.9
Wyndham	868	787	-81	-9.3

(Source: Australian Bureau of Statistics, 1996; 2001)

The smaller towns of the Region, defined here as urban localities of less than 1500 inhabitants in 2001, experienced varying trends in population over the 1996-2001 period. The most noticeable decline occurred in Onslow in the Pilbara, whose reduction in population of 35% contrasts with the other similarly sized settlement of Dampier, whose population remained stable. Wickham in the Pilbara was the other smaller town experiencing a decline amounting to 17% over the period from 1996 to 2001, with the other settlements experiencing relatively minor fluctuations.

2.3 Population Mobility

One of the features of settlements in remote areas is the high level of population mobility. Indeed, population mobility is most evident in those centres that have large numbers Aboriginal people or that are dependent on natural resources or tourism. Essentially, mobility is linked to processes of migration and is an important determinant in population size and structure. Table 2.3 shows that the population of the NWMR is extremely mobile, with more than 27 per cent of people living at a different address one year prior to the 2001 Census. This compares with 17.6 per cent of the Western Australian population that moved over the same period. Five years prior to the 2001 Census, more than 46 per cent of people in the NWMR lived at a different address, compared with 41 per cent for Western Australia. There are a number of reasons for this high level of population circulation in the Region, including: i) the relatively harsh environmental conditions; ii) limited social opportunities; iii) limited opportunities for career progression; iv) extremely mobile Aboriginal populations (see Taylor, 2003).

While the level of mobility is high across the Region, there is some variation from town to town. Mobility is particularly high in the resource-dependent centres of Karratha, Port Hedland and Wickham. In large part, this is because of the highly cyclical nature of the resource economy, which often leads to significant temporal variations in the demand for labour. In addition, the workforce linked to the resources sector often views the industry, and North West more generally, as a short term employment and living arrangement, with the southern parts of the State (and Perth in particular) seen as a preferable living and working environment.

A number of towns have highly mobile populations across the one year timeframes, but are consistent with the State average over the five year mobility period. These towns include Carnarvon, Derby, Kununurra and Wyndham. This appears to be linked to the absence of a strong resource sector base in the centres, and the notion of a ‘dualistic’ population structure that consists of: i) short term ‘spiralists’ who spend less than five years in a centre often using local employment opportunities as a career stepping stone or means of building financial security; ii) longer term ‘stayers’, often engaged in local business and enterprise. These dualistic population structures in remote areas were the attention of research by Montague (1978) in central Queensland, and are consistent with trends reported in other research on Australian regional development (e.g. Jones and Tonts, 2003).

Table 2.3 Population Mobility in the NWMR, 2001

<i>Location</i>	<i>% of population at different address to 1 year ago</i>	<i>% of population at different address to 5 years ago</i>
NWMR	27.5	46.4
<i>Sub-regions</i>		
Gascoyne	22.8	42.2
Pilbara	27.3	51.1
Kimberley	25.6	44.1
<i>Regional centres</i>		
Carnarvon	22.8	41.4
Exmouth	22.8	45.4
Karratha	28.5	54.1
Port Hedland	27.9	51.5
Broome	27.7	47.3
Derby	25.8	41.5
Kununurra	23.8	41.6
<i>Smaller towns</i>		
Kalbarri	29.1	60.5
Denham	20.9	40.4
Onslow	26.4	46.9
Dampier	21.0	45.0
Wickham	27.8	51.0
Roebourne	15.9	26.5
Wyndham	18.8	39.1
<i>Western Australia</i>	<i>17.6</i>	<i>41.0</i>

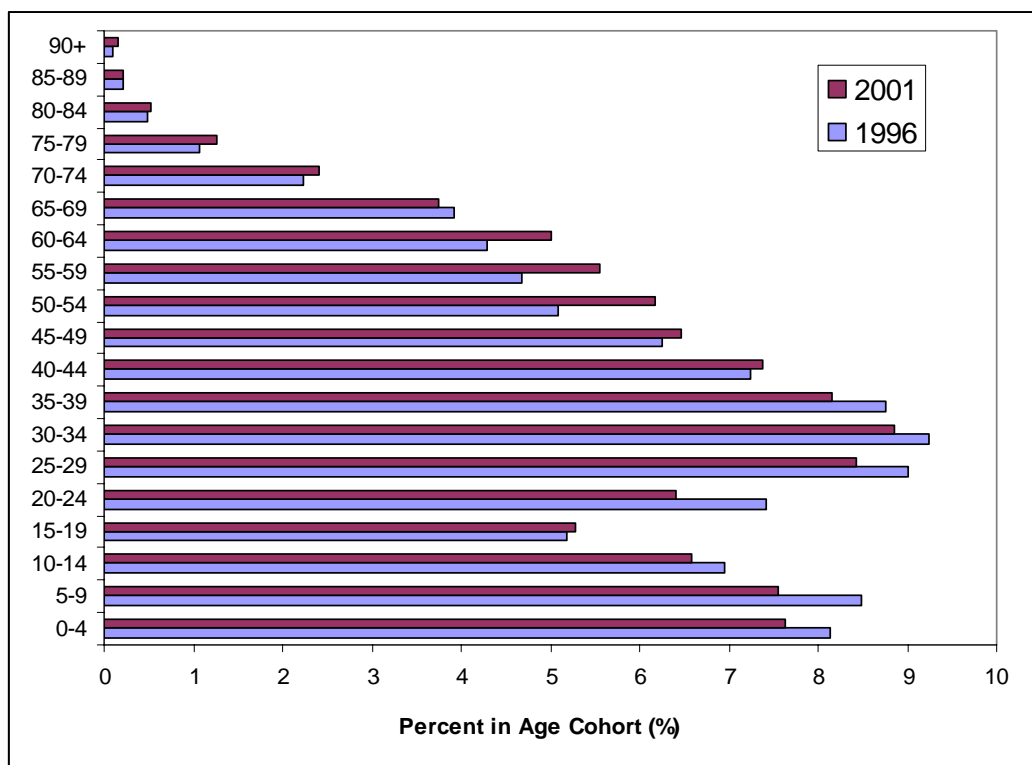
(Source: Australian Bureau of Statistics, 2001)

2.4 Age Structure

Population mobility is particularly important in determining the age structure of remote areas. There is a considerable body of evidence to show that certain age groups are more likely to migrate out of remote communities, and those others are more prone to in-migration (see Anderson, 1972; Montague, 1978; McKenzie, 1994; Hugo, 2005). Those most likely to leave remote areas are aged between 15 and 24, generally in order to pursue education, employment and social opportunities elsewhere (normally metropolitan regions). There is also a general movement of those aged 65+ out of remote areas, normally post-retirement and in order to pursue new lifestyle opportunities. In-migration is often dominated by those in the career-building or financial consolidation stages of their life cycle. As such, most remote communities experience in-migration by people aged between 25 and the mid 40s. Importantly, this is also the child bearing and raising age for many people, which generally leads to a corresponding increase in the number of people between the ages of 0 and 10. Of course, the child bearing cohorts also tend to contribute to an elevated birth-rate and, therefore, increased rate of natural population growth.

These general trends apply almost uniformly to the age structure of the North-west Marine Region. Figure 2.2 shows the impact of out-migration by people between the ages of 15 and 24, and after the mid 40s. However, it is also clear that the structure has shifted slightly between 1996 and 2001, with a decline in the 0 to 14 age cohort (-0.6%) and a slight increase in the population over the age of 65 (0.6%) (Figure 2.2). Much of this is the result of an aging population in the Gascoyne, together with some 'sun-seeking' retirement migration to Carnarvon (see below). The number of people aged between 20 and 39 years in the NWMR dropped by three per cent, whilst the population aged 40 to 65 years increased by three per cent.

Figure 2.2 Population Distribution in the North-west Marine Region, 1996-2001

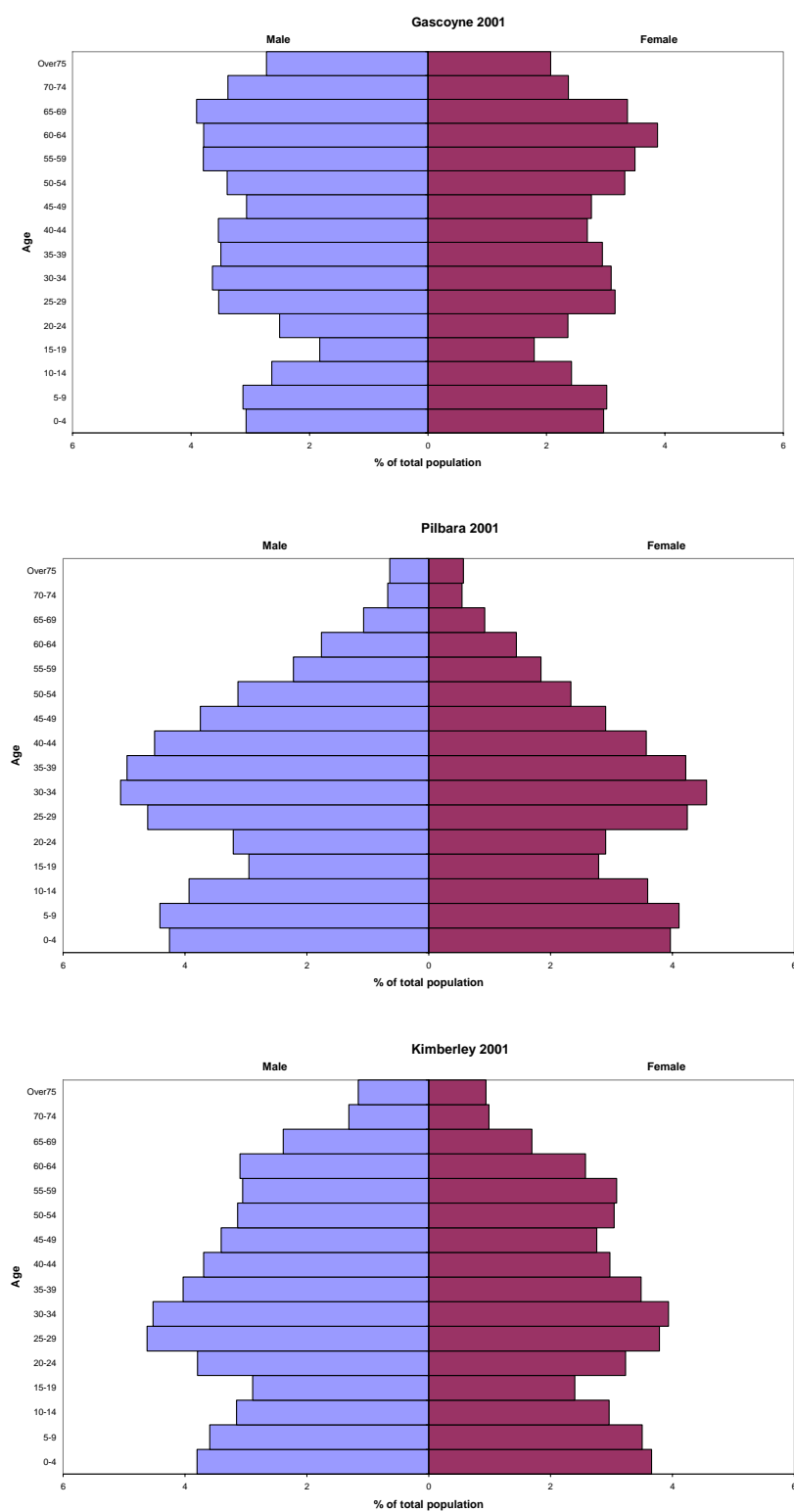


(Source: Australian Bureau of Statistics, 1996; 2001)

2.4.1 Sub-Regional Level

Figure 2.3 shows the distribution of age groups by sex in the three sub-regions of the NWMR at the 2001 Census. This demonstrates the relative abundance of both males and females in the 25-39 age group in the Pilbara and, to a lesser extent the Kimberley, in comparison to the Gascoyne, which is characterised by a relatively aged population distribution, linked in large part to retirement migration into the area.

Figure 2.3 Population Pyramids for the sub-regions of the NWMR 2001



(Source: Australian Bureau of Statistics, 2001)

Table 2.4 details key population characteristics from 1996 and 2001 for the three sub-regions. All sub-regions are characterised by a decline in the youth cohort over the 1996-2001 period. Both the Pilbara and Kimberley show a decrease in the working age group and the elderly cohort, in contrast to the Gascoyne. The Gascoyne exhibits the highest proportion of around 18% in the elderly cohort in both 1996 and 2001, contrasting significantly with both the Pilbara and Kimberley sub-regions. The Pilbara shows correspondingly higher percentages in the other age groups in comparison to the other two sub-regions.

Table 2.4 Percentage of Population in Age Groups in the Sub-regions of the NWMR 1996 and 2001

<i>Age</i>	<i>Gascoyne</i>		<i>Pilbara</i>		<i>Kimberley</i>	
	<i>1996</i>	<i>2001</i>	<i>1996</i>	<i>2001</i>	<i>1996</i>	<i>2001</i>
Under 15	18.0	17.2	25.9	24.6	23.0	20.7
15-64	63.4	62.1	69.1	70.0	66.3	67.5
Over 64	17.1	17.9	4.4	2.5	8.7	8.5

(Source: Australian Bureau of Statistics, 1996; 2001)

2.4.2 *Regional Centres*

In order to highlight population characteristics of the regional centres within the NWMR, Appendix 1 illustrates the age-sex structure of each town from 1996 and 2001. Over the period 1996-2001, the population of these urban centres in the NWMR increased overall by 14% to 59,061, exceeding the population increase for Western Australia as a whole over this time period which was 7.3%. However, this conceals significant variation between the towns, with Broome experiencing the greatest population increase of 40%. The remainder of the centres witnessed a population increase ranging from 2.6-14.4% in Exmouth and Carnarvon respectively. Port Hedland was the only centre to exhibit a decline which was in the order of 0.5%. Key population statistics derived from these figures are presented in Table 2.5.

Table 2.5 Changing Age Structure for Regional Centres and Smaller Towns in the NWMR, 1996-2001

	% under 15		% 15-64		% over 64	
	1996	2001	1996	2001	1996	2001
<i>Regional centres</i>						
Carnarvon	20.0	21.0	62.1	60.6	16.8	17.2
Exmouth	17.2	15.3	60.8	61.1	20.5	20.1
Karratha	26.7	25.5	69.3	70.6	3.5	3.3
Port Hedland	25.4	24.8	70.0	70.8	3.7	3.8
Broome	19.9	18.9	67.0	67.3	11.0	9.6
Derby	25.3	26.1	66.1	65.6	7.3	7.6
Kununurra	19.8	19.4	68.0	66.6	9.5	9.2
<i>Smaller towns</i>						
Kalbarri	16.2	14.4	65.1	64.4	18.7	21.2
Denham	11.9	12.1	62.8	61.4	25.3	26.7
Onslow	10.9	15.6	69.2	66.6	19.9	17.8
Dampier	25.8	23.9	69.1	71.2	5.1	4.2
Roebourne	27.3	26.5	63.2	64.2	9.5	9.3
Wickham	31.6	28.6	65.7	68.9	2.7	2.2
Wyndham	32.4	29.7	63.2	65.9	4.4	4.4

(Source: Australian Bureau of Statistics, 1996; 2001)

With the exception of Carnarvon and Derby, all the regional centres exhibit a decline in the proportion of the population aged under 15 between 1996 and 2001, ranging from 0.4% in Kununurra to 1.9% in Exmouth. All urban centres also experienced a decline in the proportion of adults aged between 20-39, varying from 0.7% in Exmouth to 5.1% in Kununurra. These patterns have potential implications for future trends in birth rate, particularly in Exmouth and Kununurra. However, the overall population increase in all urban centres over the 1996-2001 period reflects the impact of migration, whether for work or retirement reasons, on demographic characteristics of settlements in the NWMR.

2.5 Gender

The overall male-to-female ratio in the communities adjacent to the NWMR remained constant at 54:46 in both the 1996 and 2001 census. This represents a greater proportion of males than the State average, which has remained stable at 49.8:50.2. Similar trends are also evident at a sub-regional level, with the male-to-female percentage ratio in the Gascoyne and Pilbara remained constant between 1996 and 2001, with ratios of 53:47 and 55:45 respectively. The ratio of males to females in the

Kimberley increased from 52:48 to 53:47. The uneven gender balance in the NWMR is consistent with trends in other parts of rural and remote Australia (McKenzie, 1994). The structure of the economies in these regions tends to favour employment in roles that are still largely dominated by males. For example, in 2001 just 17.1 per cent of people employed in mining in Western Australia were female (ABS, 2004).

The regional gender distribution is largely replicated at the local level. Table 2.6 shows the ratio of males to females in each of the regional centres in the NWMR. Port Hedland and Karratha, both of which are essentially resource towns, represent the highest proportion of males in the urban centres. There is little consistent change in each regional centre over the 1996-2001 period.

Table 2.6 Gender Structure of Regional Centres and Smaller Towns in the NWMR, 1996-2001

	1996		2001		Change 1996-2001	
	Males	Females	Males	Females	Males	Females
<i>Regional centres</i>						
Carnarvon	51.4	48.6	52.2	47.8	0.8	-0.8
Exmouth	52.0	48.0	51.5	48.5	-0.5	0.5
Karratha	53.1	46.9	54.1	45.9	1.0	-1.0
Port Hedland	55.8	44.2	55.0	45.0	-0.7	0.7
Broome	50.4	49.6	50.7	49.3	0.3	-0.3
Derby	50.7	49.3	50.7	49.3	0.0	0.0
Kununurra	52.0	48.0	51.6	48.4	-0.3	0.3
<i>Smaller towns</i>						
Kalbarri	51.3	48.7	50.3	49.7	-1.0	1.0
Denham	52.0	48.0	50.6	49.4	-1.4	1.4
Onslow	53.9	46.1	51.4	48.6	-2.5	2.5
Dampier	54.0	46.0	57.9	42.1	3.9	-3.9
Wickham	53.2	46.8	55.6	44.4	2.4	-2.4
Roebourne	49.1	50.9	49.6	50.4	0.5	-0.5
Wyndham	49.4	50.6	48.3	51.7	-1.1	1.1

(Source: Australian Bureau of Statistics, 1996; 2001)

2.6 Ethnicity

2.6.1 *The Indigenous Population of the North-west Marine Region*

This section provides a brief overview of population change and distribution amongst the Region's indigenous population. A more detailed analysis of the demographic and socio-economic characteristics of this population is provided in Chapter 4.

Between the 1996 and 2001 censuses, the indigenous population within the NWMR increased by 11%, from 14,512 to 16,142. The proportion of the population classified as indigenous within the Region increased from 18.3% to 18.5% during this period. By comparison, the indigenous proportion of the total population of Western Australia increased from 3% to 3.5% between 1996 and 2001.

Table 2.7 summarises the numbers and proportions of the indigenous population of the NWMR by sub-region for 1996 and 2001. It demonstrates the significance of the indigenous population in the Kimberley sub-region, despite a decline in the overall proportion relative to the sub-regional population between 1996 and 2001. The proportion of the indigenous population in the other two regions is considerably lower at 10%, with an increase of almost 2% in the Pilbara between 1996 and 2001. During the same period a slight decline was evident in the Gascoyne.

Table 2.7 Indigenous Population of Sub-regions in the NWMR

<i>Sub-region</i>	<i>1996</i>		<i>2001</i>		<i>Change in % indigenous 1996-2001</i>
	<i>Total Indigenous</i>	<i>% Indigenous</i>	<i>Total Indigenous</i>	<i>% Indigenous</i>	
Gascoyne	1260	10.1	1184	8.8	-1.3
Pilbara	3733	10.1	4309	12.0	1.9
Kimberley	9519	32.0	10649	28.1	-3.9

(Source: Australian Bureau of Statistics, 1996; 2001)

Tables 2.8 and 2.9 provide a breakdown of the characteristics of the indigenous population for the NWMR's regional centres for 1996 and 2001 respectively. These data show that Derby contained the highest percentage of indigenous people,

exceeding 40% in 2001. This was double that of the next highest proportion found in Broome. Karratha and Exmouth contain the lowest proportion of indigenous people.

The total indigenous population of the regional centres within the NWMR increased by 27% to 8556 between 1996 and 2001. This compares to an increase in the total non-indigenous population of these regional centres of 12% over this time period. The increase in the percentage of indigenous people was most significant in the case of Derby and Kununurra, where the indigenous population increased by 4.2% and 2.2% respectively. The rate of increase in the other regional centres was below 2%. In the smaller towns, the number of indigenous people increased most in Denham, Roebourne, Wyndham and Wickham, while Onslow recorded a significant decrease.

Table 2.8 Characteristics of the Indigenous Community in Regional Centres and Smaller Towns in the NWMR, 1996

	<i>Total Aboriginal</i>	<i>Total Torres Strait Islander</i>	<i>Total both Aboriginal and Torres Strait Islander</i>	<i>Total Indigenous</i>	<i>% Indigenous</i>
<i>Regional centres</i>					
Carnarvon	922	16	11	949	14.9
Exmouth	18	0	7	25	0.8
Karratha	344	58	8	410	4.1
Port Hedland	1562	57	42	1661	12.9
Broome	1844	43	55	1942	17.1
Derby	1139	10	15	1164	36.0
Kununurra	582	6	9	597	12.2
<i>Smaller towns</i>					
Kalbarri	11	0	0	11	0.6
Denham	80	0	0	80	7.0
Onslow	70	0	0	70	11.9
Dampier	49	0	0	49	3.4
Roebourne	558	4	10	572	59.7
Wickham	145	30	3	178	10.8
Wyndham	357	0	0	357	41.1

(Source: Australian Bureau of Statistics, 1996)

Table 2.9 Characteristics of the Indigenous Community in Regional Centres and Smaller Towns in the NWMR, 2001

	<i>Total Aboriginal</i>	<i>Total Torres Strait Islander</i>	<i>Total both Aboriginal and Torres Strait Islander</i>	<i>Total Indigenous</i>	<i>% Indigenous</i>
<i>Regional centres</i>					
Carnarvon	1076	9	29	1114	15.3
Exmouth	36	0	3	39	1.2
Karratha	483	68	36	587	5.4
Port Hedland	1,729	35	65	1,829	14.3
Broome	2539	52	126	2717	17.1
Derby	1423	10	48	1481	40.2
Kununurra	778	3	8	789	14.4
<i>Smaller towns</i>					
Kalbarri	13	0	6	19	0.8
Denham	91	3	6	100	7.0
Onslow	175	7	0	182	22.9
Dampier	37	0	3	40	2.7
Roebourne	585	0	9	594	62.8
Wickham	169	17	8	194	11.2
Wyndham	392	0	15	407	51.7

(Source: Australian Bureau of Statistics, 2001)

2.6.2 Birthplace and Proficiency in English

Table 2.10 details the percentage of the population by place of birth and proficiency in English for the seven urban localities and five smaller settlements in the NWMR in 2001. It should be noted that these do not add up to 100% due to the proportion of non-responses.

Table 2.10 Birthplace and Language Characteristics for Population of Urban Settlements in the NWMR 2001

	% born in Australia	% born overseas	Language spoken at home		
			English	Indigenous	Other
<i>Regional centres</i>					
Carnarvon	74.1	16.7	83.1	0.5	8.2
Exmouth	76.2	16.0	90.3	0.0	3.0
Karratha	78.0	16.4	90.2	0.7	3.9
Port Hedland	68.4	21.5	77.1	1.1	8.8
Broome	75.3	11.9	83.0	1.4	3.4
Derby	79.7	8.9	82.5	4.4	2.2
Kununurra	68.9	11.0	74.0	3.3	2.5
<i>Smaller towns</i>					
Denham	74.4	16.5	88.0	0.0	2.9
Kalbarri	71.8	16.4	86.8	0.0	2.8
Dampier	74.88	17.5	88.6	0.4	4.0
Onslow	79.24	16.3	87.3	4.6	3.3
Roebourne	79.79	5.3	60.5	18.7	5.1
Wickham	70.67	19.2	85.0	1.1	4.8
Wyndham	72.35	5.3	78.4	1.4	1.1

(Source: Australian Bureau of Statistics, 2001)

Table 2.10 demonstrates that the percentage of the population born in Australia does not exceed 80% in any of the urban settlements analysed. The highest proportions of those born overseas are found in Port Hedland and Wickham, accounting for around 20% of the population. People born in the UK and New Zealand represent 46% and 63% of those born overseas in these settlements respectively. The highest proportion of non-English speakers was recorded in Roebourne, where almost 19% were Indigenous language speakers, which is by far the highest proportion of Indigenous language speakers in all the settlements detailed. The proportion of the population speaking other languages reached around 8-9% in Port Hedland and Carnarvon. In the case of Port Hedland, the most commonly cited other languages spoken at home included Macedonian (6%), Tagalog, Indonesian and German (4% each). With regard to Carnarvon, Vietnamese accounted for 24% of the other languages spoken at home. This is largely the result of increasing Vietnamese ownership of and employment on horticultural properties in the town. Also in Carnarvon, Croatian and Portuguese speakers each represented 16% and Italian speakers 8%, which is linked to the town's post-World War II immigrant population, many of whom were engaged in horticulture (Findlay, 1983).

2.7 Conclusion

This chapter has outlined the key changes in terms of population growth, mobility and demographic characteristics in the towns and sub-regions of the North-west Marine Region. It is evident that the Region has experienced rapid population growth as a result of the expansion of the minerals and oil and gas sectors since the late 1960s, this impetus being sustained in part by the recent expansion of the tourism sector. The rate of population growth varies considerably within the Region, however, with centres such as Broome and Kununurra experiencing sustained growth, whilst settlements such as Exmouth and Carnarvon have been relatively little affected by this dynamic. The growth of the minerals sector is also reflected in the mobility of the population as reflected in resource dependent centres including Karratha and Port Hedland with associated impacts upon the age structure of these settlements and the Pilbara sub-region as a whole. The extent to which the Indigenous population contributes to or is affected by these changes is a complex issue, partly due to the highly skewed distribution of the indigenous community as a whole and also due to the documented problems of adequate representation of the indigenous community in the census process. The presence of a significant indigenous population in the relatively small settlement of Derby is a case in point, resulting in a higher percentage of residents in the younger age cohorts. This ethnic diversity is accentuated by the presence of a range of other nationalities in certain settlements in the Region, particularly Port Hedland and Wickham, where the presence of foreign nationals is again largely associated with the extractive industries. These trends and their implications with respect to marine bioregional planning will be the focus of further discussion in Chapter 5.

3 SOCIO-ECONOMIC CHARACTERISTICS

3.1 Introduction

This chapter provides an overview of the socio-economic characteristics and conditions in the NWMR. It considers the economic structure of the communities adjacent to the Region's coast and examines how this affects employment and income. The chapter also provides an overview of social welfare, focussing particularly on Commonwealth support payments, indices of socio-economic advantage and disadvantage, and housing trends.

3.2 Employment by Industry Sector

Between 1996 and 2001, the total labour force of the towns and settlements adjacent to the NWMR increased from 25,233 to 29,612; a rise of more than 17 per cent (Table 3.1). This compares with an overall growth rate in the Western Australian labour force of 8.6%. This rate of growth reflects the general strength of the Region's economy. In 2001, the most significant employment sectors in the Region were Wholesale and Retail Trade (16 per cent of the labour force), Mining (9.1%), and Construction (8.9%). Of particular importance in the region are the service sectors, notably Education, Health and Community Services and Government Administration. Collectively, these sectors account for some 22 per cent of the labour force.

The intercensal period between 1996 and 2001 captures an economic period where the region's large resources sector had experienced a degree of upheaval. While still an important employer, it faced a number of challenges associated with the Asian economic downturn in 1997-98 and the redirection of much global and national capital into speculative high tech industries. As a result, the minerals sector did not grow significantly during the 1996-2001 period, expanding by just seven percent. By contrast, the most significant increases occurred in Agriculture, Forestry and Fishing (33.4%), Manufacturing (48.3%), and Government Administration (61.7%).

Table 3.1 Employment by Industry Sector in Towns and Settlements Adjacent to the NWMR, 1996-2001

	<i>1996</i>	<i>2001</i>	<i>Change</i>	<i>% Change</i>
Agriculture, Forestry and Fishing	1114	1486	372	33.4
Mining	2509	2685	176	7.0
Manufacturing	1166	1729	563	48.3
Electricity, Gas and Water Supply	343	341	-2	-0.6
Construction	2325	2646	321	13.8
Wholesale and Retail Trade	3910	4734	824	21.1
Accommodation, Cafes and Restaurants	1638	1852	214	13.1
Transport and Storage	1609	1676	67	4.2
Communication Services	292	320	28	9.6
Finance and Insurance	407	331	-76	-18.7
Property and Business Services	1751	2428	677	38.7
Government Administration and Defence	1213	1961	748	61.7
Education	1976	2223	247	12.5
Health and Community Services	2471	2319	-152	-6.2
Cultural and Recreational Services	321	417	96	29.9
Personal and Other Services	1106	1439	333	30.1
Non-classifiable/not stated	1082	1025	-57	-5.3
TOTAL	25233	29612	4379	17.4

(Source: Australian Bureau of Statistics, 1996; 2001)

In the Regional Centres on the NWMR's coast, there was generally a strong pattern of employment growth (Table 3.2). The strongest growth occurred in Carnarvon (47.1 per cent) and Exmouth (23.3 per cent). With the exception of Kununurra (3.7 per cent), the remaining towns experienced employment growth of between 16.8 per cent (Karratha) and 12.3 per cent (Derby). While all of the centres experienced an increase in the size of the labour force growth between 1996 and 2001, this growth was not distributed evenly across industry sectors. Table 3.3 shows that both Carnarvon and Derby experienced large increases in Agriculture, Forestry and Fishing sector employment (94.6% and 164.3%), while Kununurra recorded a significant decrease (-73.3%). In the mining sector, Carnarvon, Exmouth and Broome all had increases of more than 100 per cent over the 1996-2001 intercensal period. In the construction sector, Broome's new tourism developments underpinned an increase of 8.3 per cent, while Carnarvon, Exmouth and Port Hedland all underwent decreases, due in part to a reduction in resource industry activity. Tourism activity also helped underpin an increase in the wholesale and retail trade categories in Exmouth and Broome. Other significant growth sectors in the Region's main centres included: Government Administration and Defence in Carnarvon, Port Hedland and Broome; Health and

Community Services in Kununurra and Exmouth; Cultural and Recreational Services in Carnarvon, Karratha and Derby; and, Personal and Other Services in Derby.

Table 3.2 Labour Force Change in Regional Centres on the NWMR Coast, 1996-2001

	<i>Carnarvon</i>	<i>Exmouth</i>	<i>Karratha</i>	<i>Port Hedland</i>	<i>Broome</i>	<i>Derby</i>	<i>Kununurra</i>
1996	2271	1103	5046	5770	4501	1330	1926
2001	2801	1251	5,780	5,984	6621	1554	2,163
Absolute Change	530	148	734	214	2120	224	237
% Change	47.1	23.3	16.8	13.4	14.5	12.3	3.7

(Source: Australian Bureau of Statistics, 1996; 2001)

Table 3.3 Change in Employment by Industry Sector in NWMR Regional Centres, 1996-2001

	<i>Carnarvon</i>	<i>Exmouth</i>	<i>Karratha</i>	<i>Port Hedland</i>	<i>Broome</i>	<i>Derby</i>	<i>Kununurra</i>
Agriculture, Forestry & Fishing	94.6	41.3	-25.9	12.5	25.1	164.3	-53.3
Mining	150.0	633.3	-2.2	17.8	111.3	50.0	0.9
Manufacturing	41.7	4.4	38.9	49.5	111.0	-5.9	-41.5
Electricity, Gas & Water Supply	-17.7	36.4	17.6	-22.2	19.6	-33.3	-18.0
Construction	-7.6	-32.1	42.3	-28.5	80.3	11.2	6.6
Wholesale Trade	-18.5	146.2	24.2	3.8	5.1	-10.7	41.6
Retail Trade	32.3	19.7	14.4	15.0	52.0	-2.0	14.5
Accommodation, Cafes & Restaurants	3.8	40.0	-0.4	-6.7	25.2	26.9	29.0
Transport and Storage	-4.5	21.7	-9.1	-31.7	46.3	50.9	25.0
Communication Services	6.5	-45.3	5.3	14.3	68.9	20.0	-14.3
Finance and Insurance	-35.7	0.0	-24.1	-38.7	27.7	-7.1	15.5
Property and Business Services	30.2	48.0	37.5	31.2	55.7	57.6	42.3
Gov't Administration & Defense	66.4	-7.3	26.5	52.3	72.3	21.9	1.2
Education	1.6	-2.9	-2.1	-6.2	100.3	3.7	28.6
Health & Community Services	-16.3	51.9	0.8	13.9	31.6	-19.9	94.7
Cultural & Recreational Services	55.6	33.3	97.3	-27.6	24.6	75.0	-30.5
Personal & Other Services	75.0	15.0	15.6	31.8	41.1	166.7	-55.9
Non Classifiable	78.6	-42.9	21.2	1.1	-36.4	-34.8	-6.5
Not Stated	-15.1	-47.9	27.8	-41.5	-35.8	103.2	-53.3
Total % Change	47.1	23.3	16.8	13.4	14.5	12.3	3.7

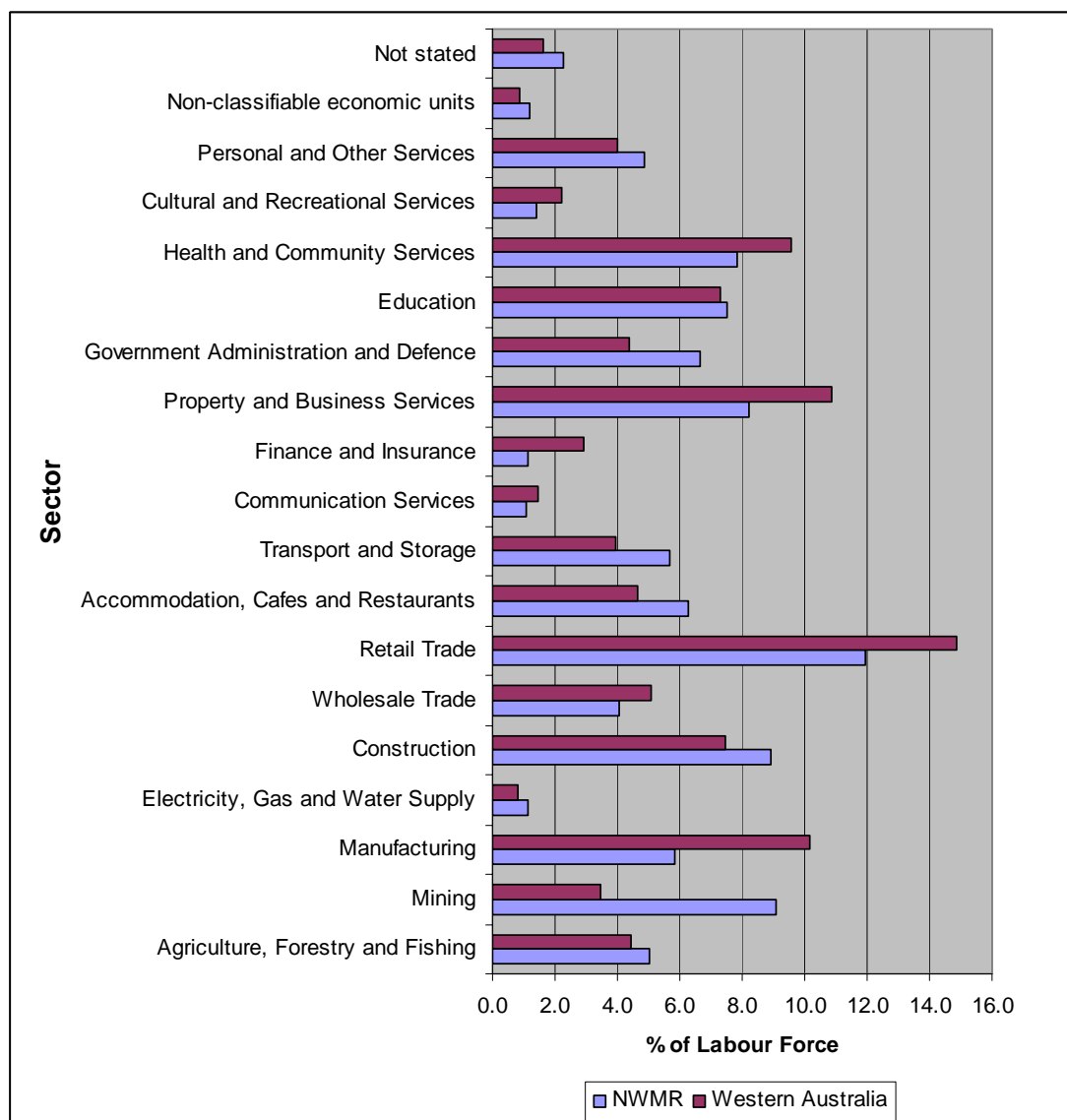
(Source: Australian Bureau of Statistics, 1996; 2001)

Not all sectors experienced increases between 1996 and 2001 in the NWMR's regional centres. Kununurra's contracting agricultural sector (-41.5%) was coupled with a decrease in manufacturing (-18.0%) and Cultural and Recreational Services (-30.5%). In Exmouth, the winding up of certain defence related communications facilities by the Australian and United States governments contributed to a decrease of 45.3 per cent in the Communications sector. Other declines included Exmouth's Construction sector (-32.1%) and Port Hedland's Finance and Insurance sector (-38.7%).

Figure 3.1 shows the percentage of people employed in different industry sectors in the communities adjacent to the NWMR and in Western Australia as a whole. As in the Western Australian labour force, the majority of people in the NWMR are employed in retailing. The NWMR has higher proportions of employees in the Mining (9.1% against 3.5% in WA), Transport and Storage (5.7% against 3.9%) and Government Administration and Defence (6.6% against 4.4%). However, it is under-represented in a number of sectors including Manufacturing (5.8% against 10.2% in WA), Property and Business Services (8.2% against 10.9%), and Health and Community Services (7.8% against 9.6%).

Within the Region's main centres, the distribution across different industry sectors varies considerably (Table 3.4). In 2001, employment in the Agriculture, Fisheries and Forestry sector was higher than the Regional average in Carnarvon (18.1%) and Kununurra (11.5%), largely as a result of irrigation agriculture along the Gascoyne and Ord rivers, respectively. In the Pilbara, Mining was clearly an important component of the labour force structures in Karratha (13.2%) and Port Hedland (18.2%), with the supporting Construction industry also significant. The importance of tourism to Exmouth (11.2%) and Broome (9.9%) was evident in relatively high levels of employment in the Accommodation, Cafes and Restaurants category. It is also apparent that a number of locations have considerable employment in the public sector, notably Derby and to a lesser extent Broome. The relatively high levels in employment in Government Administration, Education, Health and Community Services, and Personal Services is in part a reflection of their relatively large indigenous populations, and the comparative disadvantage experienced by this population on a range of socio-economic indicators (see Chapter 4).

Figure 3.1 Employment Distribution by Industry Sector in the NWMR and Western Australia, 2001 (%)



(Source: Australian Bureau of Statistics, 2001)

Table 3.4 Employment by Industry in Regional Centres, 2001

	<i>Carnarvon</i>	<i>Exmouth</i>	<i>Karratha</i>	<i>Port Hedland</i>	<i>Broome</i>	<i>Derby</i>	<i>Kununurra</i>
Agriculture, Forestry & Fishing	18.1	8.5	0.7	0.8	6.5	2.4	11.5
Mining	4.8	1.8	13.2	18.2	1.7	1.7	0.7
Manufacturing	4.9	5.8	7.0	7.2	6.4	2.1	5.4
Electricity, Gas & Water Supply	1.0	1.2	2.2	0.8	0.8	0.8	1.1
Construction	5.3	5.9	12.9	9.8	8.3	8.3	5.3
Wholesale Trade	5.7	5.1	4.8	4.6	2.5	1.6	4.5
Retail Trade	13.8	11.7	13.7	11.0	13.4	9.3	12.4
Accommodation, Cafes & Restaurants	4.9	11.2	4.1	4.4	9.9	4.3	7.3
Transport and Storage	3.8	6.7	5.7	5.1	6.3	5.2	8.2
Communication Services	1.2	2.3	1.0	1.1	1.2	0.8	1.2
Finance and Insurance	1.0	1.3	1.1	0.8	1.8	0.8	1.7
Property and Business Services	4.9	8.9	10.1	9.4	8.1	6.0	8.3
Gov't Administration & Defence	6.5	9.1	4.1	4.5	5.4	10.8	8.6
Education	6.7	5.4	6.6	6.9	10.1	9.0	7.6
Health & Community Services	7.7	6.3	4.2	8.1	7.9	18.3	8.7
Cultural & Recreational Services	1.0	2.2	1.3	0.7	2.4	1.4	1.7
Personal & Other Services	5.3	3.7	3.5	3.7	5.4	12.4	2.6
Non Classifiable	0.9	1.0	1.8	1.6	0.6	1.0	0.7
Not Stated	2.8	2.0	2.0	1.4	1.3	4.1	2.7

(Source: Australian Bureau of Statistics, 1996; 2001)

3.3 The Regional Employment Base

To provide a clearer insight into the drivers of the regional and local economies in the NWMR, location quotients were calculated for the region as a whole, and for the major regional centres. Location quotients (LQ's) are a simple means of determining which sectors can be regarded as forming the economic base of an area (see O'Sullivan, 2003). A quotient greater than 1.0 means that the area's labour force is usually biased towards that particular group, while a quotient of 2.0 means that the area has twice as many people in a given sector as expected, and a quotient of 0.5 means half as many.

At the Regional level, 10 of the 17 employment sectors in the NWMR have a LQ greater than 1.0. In general terms, these industries can be regarded as forming the

propulsive economic base of the NWMR. The most important industry is Mining, with a quotient of 2.6, closely followed by Government Administration and Defence (1.5). In the case of Mining, the LQ suggests that, in economic terms, the magnitude of this industry is exceptional. In essence, the industry is 2.6 times more important to the NWMR's economic base than it is to the Western Australian economy. The quotient for Government and Administration is also significant in understanding the employment base of the Region. In most regional economies, the public sector rarely has a quotient value of more than 1.0. This is because in the majority of regions it is not a driving force in the economy. However, in the case of the NWMR the public sector is a major economic contributor, largely as a result of the significant number of people in local government administration, indigenous affairs, defence, and public administration generally. Other drivers of the economy are Transport and Storage (1.4), Accommodation (1.4) and Construction (1.2). These are linked closely to the mining sector and the expanding tourism industry in the Region.

Figure 3.2 Location Quotients for Employment in Industry Sectors in the NWMR, 2001

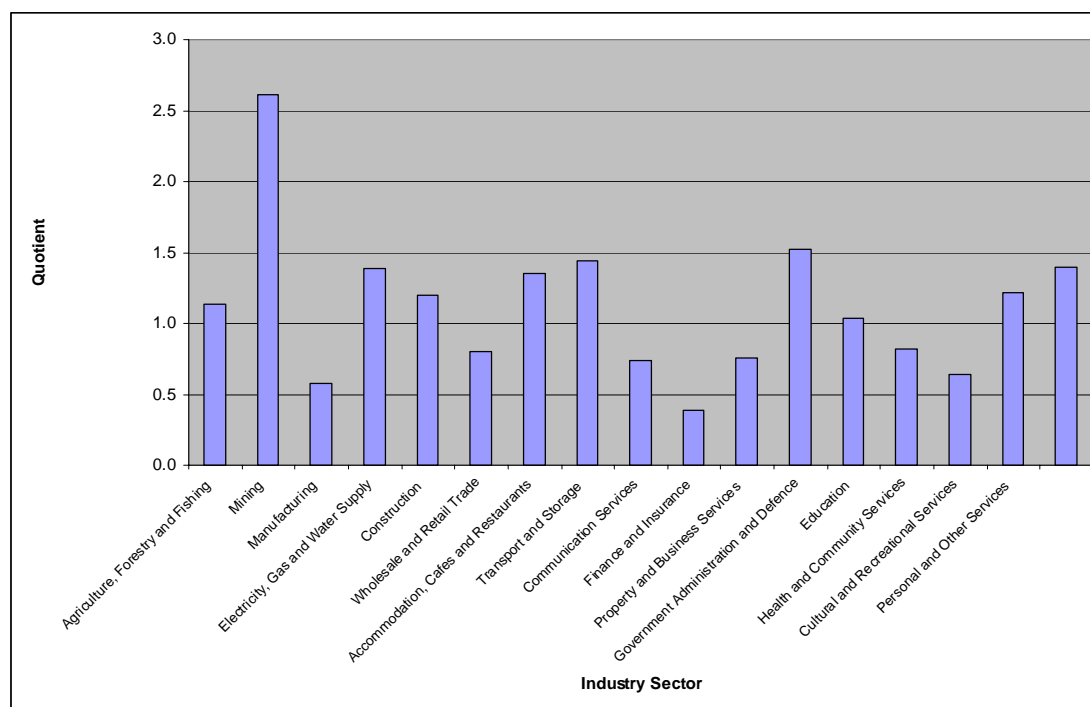


Table 3.5 summarises those industries with LQ's greater than 1.0 for each of the regional centres in the NWMR. This highlights those sectors that form the economic

base of the NWMR's regional centres, providing insights into the drivers of growth and change.

In Carnarvon, the role of the area's horticultural and fishing industries is evident in very high LQ's for Agriculture Forestry and Fishing (4.1). The next most important industries are Government Administration (1.5) and Mining (1.4). In Exmouth, the growing role of tourism is evident, with Accommodation, Cafes and Restaurant sector being the most important single sector. However, the combined role of Government Administration and Defence (2.1) and Communications (1.6) is of greater significance, given the town's defence role.

In the Pilbara towns of Port Hedland and Karratha, the magnitude of mining in the local economy is evidenced by the highest LQ's for this sector in the entire Region. Other important industries in these towns are Electricity Gas and Water, Construction and Transport and Storage. Indeed, this latter category is important across most of the regional centres in the NWMR, reflecting these centres roles as ports for a range of industries, including minerals, oil and gas, fishing and tourism.

In Broome, Accommodation Cafes and Restaurants are the most important driver of the local economy (2.1), followed closely by Transport and Storage (1.6), and Agriculture, Forestry and Fisheries (1.5). This latter sector is largely driven by the town's fishing industry, notably in pearling and prawns. The neighbouring regional centre of Derby has a vastly different set of economic drivers, with Personal Services (3.1), Government Administration and Defence (2.5) and Health and Community services (1.9) the main contributors to the local economy. This reflects the town's role in servicing a large indigenous population in a range of areas, spanning health, social and welfare services, and economic development.

The most northern town in the Region, Kununurra, has an important horticultural industry, reflected in the LQ for Agriculture, Forestry and Fishing. Its role as a transport hub in northern Australia is evident in the LQ for Transport and Services, while the importance of government services to the local economy is indicated by an LQ of 2.0 for the Government Administration sector.

Table 3.5 Location Quotients Greater than 1.0 in Regional Centres in the NWMR, 2001

Regional Centre	Industry Sector and Quotient (in order of importance)
Carnarvon	Agriculture, Forestry and Fishing (4.1) Government Administration and Defence (1.5) Mining (1.4) Electricity, Gas and Water (1.2) Accommodation, Cafes and Restaurants (1.1) Transport and Storage (1.0) Wholesale and Retail Trade (1.0)
Exmouth	Accommodation, Cafes and Restaurants (2.4) Government Administration and Defence (2.1) Agriculture, Forestry and Fishing (1.9) Transport and Storage (1.7) Communications (1.6) Electricity, Gas and Water (1.2)
Karratha	Mining (3.8) Electricity, Gas and Water (2.6) Construction (1.7) Transport and Storage (1.4)
Port Hedland	Mining (5.2) Construction (1.3) Transport and Storage (1.3) Accommodation, Cafes and Restaurants (1.0) Electricity, Gas and Water (1.0) Government Administration and Defence (1.0)
Broome	Accommodation, Cafes and Restaurants (2.1) Transport and Storage (1.6) Agriculture, Forestry and Fishing (1.5) Education (1.4) Personal and Other Services (1.3) Government Administration and Defence (1.2) Construction (1.1) Cultural and Recreational Services (1.1) Electricity, Gas and Water (1.0)
Derby	Personal Services (3.1) Government Administration and Defence (2.5) Health and Community Services (1.9) Transport and Storage (1.3) Education (1.2) Construction (1.1)
Kununurra	Agriculture, Forestry and Fishing (2.6) Transport and Storage (2.1) Government Administration and Defence (2.0) Accommodation, Cafes and Restaurants (1.6) Electricity, Gas and Water (1.3) Education (1.0)

3.4 Employment Structure by Occupation

In the five years from 1996 to 2001, the regional centres in the NWMR experienced relatively modest shifts in occupational structure. At the 1996 census, between 6 and 12 per cent of the regional centres' employed populations were classified as managers and administrators (Table 3.6). In general, between 12 and 18 per cent of the regional centres' employees were categorised as professionals, except for Derby where a high of 20.6 per cent was observed. This is linked to the high number of people employed in government administration, community services and health sectors of the town.

Moderate percentages of employed persons were categorised as associate professionals in the Region's main centres, with a low of 10.3 per cent in Port Hedland and a high of 16.2 per cent in Exmouth. Tradespersons and related workers made up 12 to 15 per cent of employed persons in most centres, with the exceptions of Karratha and Port Hedland, where approximately 20 per cent was the norm. Advanced Clerical and Service workers made up the smallest portion of employed workers in all centres, comprising between two and four percent. The percentage of persons employed as intermediate clerical, sales and service workers was similar in all of the regional centres, except for Broome where 17 per cent of the employed population were classified in this category (mainly as a result of the large tourism sector). Large variations in the percentage of persons employed as intermediate production and transport were observed, with a high of 16 per cent in Port Hedland (reflecting mining activity) and a low of 5.9 in Broome. Little variation was recorded in the percentage of persons employed as elementary clerical, sales and service workers across the region. Similarly, there were no significant differences found among persons categorised as labourers and related workers.

Table 3.6 Occupational Structure in NWMR Regional Centres, 1996 (%)

	<i>Carnarvon</i>	<i>Exmouth</i>	<i>Karratha</i>	<i>Port Hedland</i>	<i>Broome</i>	<i>Derby</i>	<i>Kununurra</i>
Managers & Administrators	9.1	9.7	6.8	6.8	10.1	6.3	11.6
Professionals	14.1	12.2	14.5	13.1	16.3	20.7	17.2
Associate Professionals	14.2	16.2	11.4	10.3	13.3	12.9	11.3
Tradespersons & Related Workers	12.0	14.6	20.14	19.4	13.5	12.3	12.1
Advanced Clerical & Service Workers	2.9	2.4	3.5	2.8	3.3	3.3	3.6
Intermediate Clerical, Sales & Service Workers	13.1	13.0	13.0	11.4	17.0	15.6	14.8
Intermediate Production & Transport Workers	12.5	9.1	11.4	16.0	5.9	6.2	8.6
Elementary Clerical, Sales & Service Workers	6.9	7.2	8.3	6.9	7.8	7.0	6.2
Labourers & Related Workers	11.9	12.1	8.2	9.9	9.5	11.9	10.8
Inadequately described	0.7	0.8	1.1	1.5	0.8	1.7	1.1
Not stated	2.6	2.7	1.7	1.9	2.5	2.2	2.7

(Source: Australian Bureau of Statistics, 1996)

In 2001, the percentage of employed managers changed little in most of the regional centres, with the exception of Carnarvon which experienced an increase of over seven per cent since 1996 (Table 3.6 and Table 3.7). The percentage of persons employed as professionals was relatively similar in each centre, with a high of 21.2 per cent in Derby and a low of 13.0 per cent in Carnarvon (Table 3.7). Again, the number of persons employed as associate professionals were similar across the Region's seven main centres, ranging from 9.9 to 14.9 per cent. The percentage of trades persons had a relatively greater range than other categories with a low of 10.8 per cent in Carnarvon and a high of 21.4 per cent in the mining centre of Karratha. In all of the region's centres, a small percentage of employed persons was categorized as advanced clerical and service workers. The same trend was observed for intermediate clerical, sales and service workers where the percentage of employed persons ranged from 11.4 to 15.9 per cent. The percentage of persons employed as intermediate production and transport workers were moderately different between the regional centres, where 5.8 per cent of Broome's employees selected this category and 14.2 in Port Hedland. The percentage of employees categorised as elementary clerical, sales

and service workers were generally similar in all centres, which was also the case with labourers and related workers.

Table 3.7 Occupational Structure in NWMR Regional Centres, 2001 (%)

	<i>Carnarvon</i>	<i>Exmouth</i>	<i>Karratha</i>	<i>Port Hedland</i>	<i>Broome</i>	<i>Derby</i>	<i>Kununurra</i>
Managers & Administrators	16.8	8.7	6.4	5.9	9.7	6.0	12.0
Professionals	13.0	14.1	13.2	14.6	17.3	21.2	17.4
Associate Professionals	10.0	15.0	11.9	13.6	13.4	11.6	12.7
Tradespersons & Related Workers	10.9	17.7	21.4	17.8	14.0	12.7	11.0
Advanced Clerical & Service Workers	3.5	4.2	2.4	2.2	3.4	2.6	3.8
Intermediate Clerical, Sales & Service Workers	11.5	14.0	13.3	11.9	15.9	15.8	15.2
Intermediate Production & Transport Workers	11.1	7.5	12.4	14.2	6.9	5.8	7.8
Elementary Clerical, Sales & Service Workers	7.1	7.1	9.1	7.9	9.2	5.4	6.5
Labourers & Related Workers	12.3	10.3	8.2	9.3	7.7	14.3	11.2
Inadequately described	1.5	0.5	0.9	1.3	1.2	2.7	1.2
Not stated	2.4	1.0	0.9	1.2	1.3	1.9	1.4

(Source: Australian Bureau of Statistics, 2001)

The number of persons employed in most occupational categories changed only marginally between 1996 and 2001 (Table 3.8). There were, however, a number of exceptions, including large increases in Managers and Administrators in Carnarvon (129.3%). A similar explosion although less dramatic occurred in Advanced Clerical and Service workers in Carnarvon, which rose by 88.9 per cent, and Clerical and Service workers, which increased by 48.48 per cent. Most notable however was the dramatic increase in the number of persons employed in each of the nine categories in Broome. These numbers range from a 19.2 per cent in the number of labourers and related workers to 74.4 per cent in the number of elementary clerical, sales and service workers.

Table 3.8 Changes in Occupational Structure in NWMR Regional Centres, 1996-2001 (%)

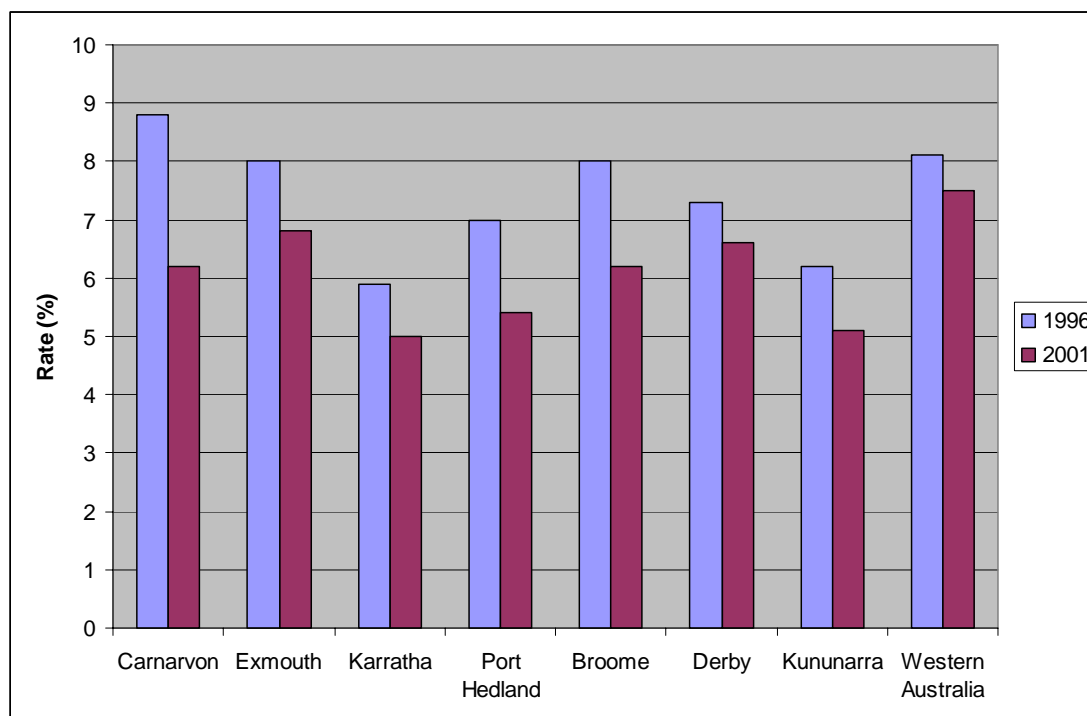
	<i>Carnarvon</i>	<i>Exmouth</i>	<i>Karratha</i>	<i>Port Hedland</i>	<i>Broome</i>	<i>Derby</i>	<i>Kununurra</i>
Managers & Administrators	129.3	-1.9	6.4	-9.0	42.1	9.4	16.0
Professionals	13.8	26.7	3.5	16.4	56.8	18.4	13.6
Associate Professionals	-13.4	0.6	19.1	36.4	49.5	4.1	26.6
Tradespersons & Related Workers	11.8	32.1	21.9	-4.6	53.6	18.7	2.2
Advanced Clerical & Service Workers	48.5	88.9	-20.5	-16.4	50.0	-9.1	18.6
Intermediate Clerical, Sales & Service Workers	8.4	17.4	16.6	8.6	38.3	16.2	14.6
Intermediate Production & Transport Workers	9.9	-9.9	25.2	-7.3	72.5	8.4	1.8
Elementary Clerical, Sales & Service Workers	27.4	7.5	25.8	18.3	74.4	-10.6	17.5
Labourers & Related Workers	28.6	-6.7	14.6	-2.3	19.3	38.1	16.3
Inadequately described	1.5	0.5	0.9	1.3	1.2	2.7	1.2
Not stated	2.4	1.0	0.9	1.2	1.3	1.9	1.4

(Source: Australian Bureau of Statistics, 1996; 2001)

3.5 Labour Force Status

In most of the regional centres in the NWMR, the unemployment rate was lower than the Western Australian average in both 1996 and 2001 (Figure 3.3). The unemployment rate also dropped across the Region over this period, in line with changes in the broader Western Australian labour force. In 2001, the lowest rates were concentrated in the Pilbara mining towns of Karratha (5 per cent) and Port Hedland (5.4%). Kununurra, with an economy based largely around agriculture and natural resources was also low, at just 5.1 per cent. The highest unemployment in the Region in 2001 was in Exmouth (6.8 per cent), which was still well below the Western Australian average of 7.5 per cent.

Figure 3.3 Unemployment Rates in the NWMR's Regional Centres, 1996-2001



(Source: Australian Bureau of Statistics, 1996; 2001)

3.6 The Employment Structure of Smaller Towns in the NWMR

The labour force in NWMR's smaller towns expanded between 1996 and 2001, with the most significant growth occurring in the tourism and fishing towns of Kalbarri and Denham (Table 3.9). More moderate growth was recorded by the mining centres of Wickham and Dampier, while Roebourne and Wyndham experienced a contraction in employment.

Table 3.9 Labour Force Change in the Smaller Towns of the NWMR, 1996-2001

	1996	2001	Absolute Change, 1996-2001	% Change, 1996-2001
Kalbarri	608	755	147	24.2
Denham	378	519	141	37.3
Onslow	240	274	34	14.2
Dampier	770	843	73	9.5
Roebourne	230	206	-24	-10.4
Wickham	726	802	76	10.5
Wyndham	277	266	-11	-4.0

(Source: Australian Bureau of Statistics, 1996; 2001)

The smaller towns in the NWMR are generally quite specialised in terms of their economic function, and have employment characteristics that reflect these roles (Table 3.10). In the fishing and tourism towns of Kalbarri and Denham, the majority of people were employed in Accommodation, Cafes and Restaurants, Retail Trade, and Agriculture, Forestry and Fishing, and Property and Financial Services (reflecting employment in the local real estate industry). In Dampier and Wickham, mining was the dominant industry, with the closely related Construction sector important. Those towns with relatively large indigenous populations tended to have employment structures oriented towards the public sector. Accordingly, in Roebourne, Onslow and Wickham employment in Health and Community Services, Education and Government Administration and Defence tends to be higher than for other towns of similar size.

Table 3.10 Employment by Industry Sector in Smaller Towns, 2001 (%)

	Kalbarri	Denham	Dampier	Onslow	Roebourne	Wickham	Wyndham
Agriculture, Forestry and Fishing	8.2	10.2	0.0	4.7	1.5	0.0	1.1
Mining	2.0	0.6	26.2	7.7	6.8	29.4	0.0
Manufacturing	5.6	6.2	5.8	3.3	0.0	4.4	0.0
Electricity, Gas and Water Supply	1.2	1.7	2.3	0.0	0.0	0.0	2.3
Construction	6.5	8.5	9.3	10.6	3.4	15.6	2.6
Wholesale Trade	2.5	3.7	6.2	2.2	1.5	5.9	2.3
Retail Trade	14.0	11.6	7.4	7.3	4.9	6.1	10.9
Accommodation, Cafes and Restaurants	19.5	13.3	5.8	4.7	2.9	3.4	3.4
Transport and Storage	4.2	5.2	6.3	8.4	2.9	2.6	8.6
Communication Services	0.4	0.6	0.7	0.0	1.5	0.7	0.0
Finance and Insurance	1.6	2.3	0.0	0.0	0.0	0.0	0.0
Property and Business Services	8.5	7.7	9.7	8.4	4.4	8.1	4.5
Government Administration and Defence	2.4	6.0	3.0	6.2	16.5	3.6	7.1
Education	5.8	5.6	6.2	6.2	6.3	4.9	14.3
Health and Community Services	6.9	6.6	3.9	12.8	21.4	5.4	28.2
Cultural and Recreational Services	2.0	3.9	1.2	0.0	1.5	0.7	3.4
Personal and Other Services	5.2	4.0	2.4	6.6	10.2	5.4	6.8
Non-classifiable economic units	2.0	0.6	2.8	0.0	4.4	0.7	2.3
Not stated	1.6	1.9	0.9	10.9	10.2	3.1	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(Source: Australian Bureau of Statistics, 2001)

In order to identify the drivers of employment in the smaller towns, Location Quotients were calculated for each settlement. The top three sectors for each town are presented in Table 3.11. This table shows that in Denham and Kalbarri, those sectors related to tourism and fishing recorded the highest quotient, well above the figure of 1.0 which is generally used as the lower benchmark for identifying propulsive industries. In Onslow, Dampier and Wickham mining is the most important component of the employment structure, with Transport and Storage, Electricity, Gas and Water or Construction also significant. In Roebourne, the public sector is the main driver of the economy, with Government Administration and Defence, Personal Services, and Health and Community Services recording the highest quotients.

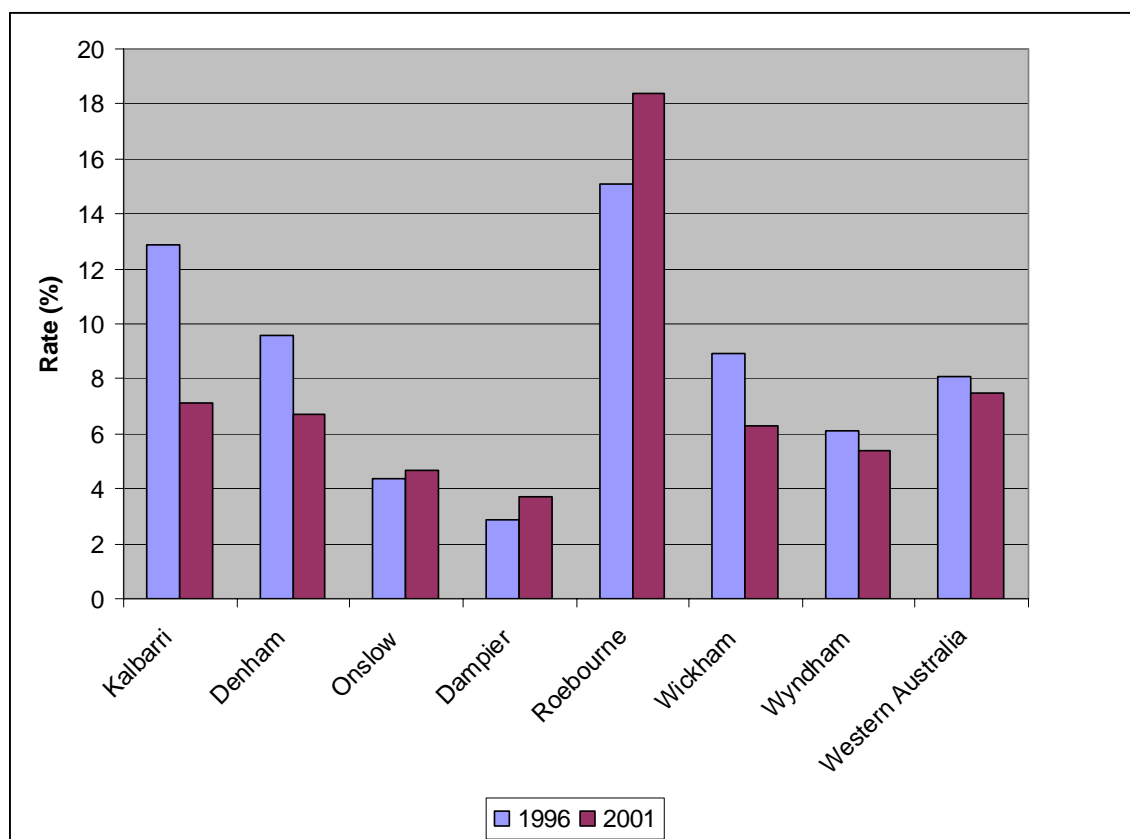
Table 3.11 Highest Location Quotient Scores in Smaller Towns in the NWMR, 2001

<i>Town</i>	<i>Industry Sector and Quotient (top three in order of importance)</i>
Kalbarri	Accommodation, Cafes and Restaurants (4.4) Wholesale and Retail Trade (3.7) Agriculture, Forestry and Fisheries (1.9)
Denham	Wholesale and Retail Trade (3.4) Accommodation, Cafes and Restaurants (3.0) Agriculture, Forestry and Fisheries (2.3)
Onslow	Mining (2.2) Transport and Storage (2.1) Construction (1.4)
Dampier	Mining (7.6) Electricity, Gas and Water (2.7) Transport and Storage (1.6)
Roebourne	Government Administration and Defence (3.8) Personal Services (2.6) Health and Community Services (2.2)
Wickham	Mining (8.5) Construction (2.1) Personal Services (1.3)
Wyndham	Health and Community Services (2.9) Electricity, Gas and Water (2.7) Transport and Storage (2.2)

In most of the smaller towns, the unemployment rate dropped between 1996 and 2001 (Figure 3.4). This reflects a similar trend in the Western Australian labour force,

which fell from 8.1 per cent in 1996 to 7.5 per cent in 2001. The most significant declines in unemployment were recorded in the rapidly growing towns of Kalbarri and Denham. Unemployment in the Region's smaller mining towns (Dampier, Onslow and Wickham) was uniformly low (6.3 per cent or less) in 2001, although minor increases were recorded on the 1996 figure in Dampier and Onslow. The most acute unemployment is concentrated in Roebourne, which increased from 15.1 per cent in 1996 to 18.4 per cent in 2001. This corresponds with high levels of welfare and low incomes, as reported later in this chapter.

Figure 3.4 Unemployment Rates in the Smaller Towns of the NWMR, 1996-2001



(Source: Australian Bureau of Statistics, 1996; 2001)

3.7 Income

Data from the Australian Taxation Office show that, in the 2004/05 financial year, individual taxpayers in the North-west Marine Region received a mean income of \$49,545, which is slightly higher than that of the Western Australian average of \$45,660. The disparity between the State and Regional individual incomes is a longstanding trend, with similar differences evident in the mid 1990s. In the 1997-98 financial year, the Region's mean average taxable income was \$35,640, compared to a State average of \$32,902. There are, however, considerable geographical variations in individual earnings along the North West Coast. In both 1997-98 and 2004-05, incomes in the Pilbara were substantially higher than those in the Gascoyne and Kimberly (Table 3.12). Indeed, both of these latter regions had incomes lower than the State average. By contrast, earnings in the Pilbara were more than 20 per cent higher than the Western Australian average in both 1997-98 and 2004-05. The expansion of the oil, gas and minerals sector in the Pilbara underpins these higher than average incomes.

Table 3.12 Mean Individual Income in the North West by Region, 1997-2004 (\$)

<i>Region</i>	<i>1997-98</i>	<i>2004-05</i>
Gascoyne	31,330	42,619
Pilbara	41,854	58,310
Kimberley	31,886	43,853
<i>WA Average</i>	<i>32,902</i>	<i>45,660</i>

(Source: Australian Taxation Office, 1998; 2005)

The geographical variations in individual earnings are even more evident at the local scale (Table 3.13). In both 1997-98 and 2004-05, Karratha and Port Hedland had the highest incomes of the regional centres, and were well above the State average in both years. These regional centres play a pivotal role in the oil, gas and minerals sector of the North West, and have a range of occupations that generally command much higher wages than other industries. In recent years, this wages growth has been fuelled by significant skills gaps in the industry, leading to considerable wage-based competition for labour. Similar processes have driven wages growth in the smaller resource towns of Dampier and Wickham, both of which had incomes well above

NWMR and State averages. Towns with relatively large low-income indigenous populations and service-based economies such as Carnarvon, Broome, Derby, Roebourne and Wyndham display average incomes below the State average in 2004-05. The smaller towns of Kalbarri and Denham also exhibit average incomes below the State average in both 1997-98 and 2004-05, reflecting the proportion of retirees and alternative lifestyle seekers in these settlements.

Table 3.13 Mean Individual Incomes in North West Localities, 1997-2004 (\$)

<i>Location</i>	<i>1997-98</i>	<i>2004-05</i>
<i>Regional Centres</i>		
Carnarvon	28,832	40,005
Exmouth	33,828	45,234
Karratha	41,912	59,230
Port Hedland	45,541	62,309
Broome	31,216	42,313
Derby	30,678	41,426
Kununurra	34,998	49,202
<i>Smaller Towns</i>		
Kalbarri	27,085	36,393
Denham	28,730	38,807
Onslow	32,184	46,264
Dampier	47,495	64,879
Wickham	42,142	58,870
Roebourne	28,205	42,343
Wyndham	30,652	42,471

(Source: Australian Taxation Office, 1998; 2005)

The extent of real wages growth in the North-west Marine Region is reflected in Table 3.14. This table removes the distorting effect of inflation by restating the 1997 and 2004 data in 1989 dollar values. Between the 1997-98 and 2004-05 financial years, the average individual taxable income in Western Australia rose by 10.6 per cent. In the oil and gas dependent North West regional centre of Karratha, average taxable incomes increased by 12.6 per cent, and were close to 20 per cent higher than the State average. The rate of growth in Port Hedland was slower, but again the centre had average incomes much higher than for Western Australia as a whole. Significant increases were also recorded in Onslow, Roebourne and Wickham, largely as a result of resource activities in surrounding areas. The towns of Broome, Carnarvon, Derby and Wyndham all experienced increases at a similar or lower rate than the State average, reflecting their dependence on industries such as tourism,

pastoralism and fishing; all of which pay lower wages than the resource sector. The large indigenous populations in these communities, together with their greater dependence on public sector service employment than other towns in the NWMR, also contribute to their lower than average incomes. Denham and Kalbarri are also characterised by below average increases in individual income for the reasons outlined above.

Table 3.14 Average Incomes in the North West Region Adjusted for Inflation (\$ = 1989)

Locations	<i>1997-98</i>	<i>2004-05</i>	<i>% Change</i>
<i>Regional Centres</i>			
Broome	26,013	28,096	8.0
Carnarvon	24,027	26,564	10.6
Derby	25,565	27,507	7.6
Exmouth	28,190	30,036	6.5
Karratha	34,927	39,329	12.6
Kununarra	29,165	32,671	12.0
Port Hedland	37,951	41,374	9.0
<i>Smaller Towns</i>			
Kalbarri	22,570	24,165	7.1
Denham	23,941	25,678	7.6
Dampier	39,579	43,080	8.8
Onslow	26,820	30,720	14.5
Roebourne	23,504	28,116	19.6
Wickham	35,119	39,090	11.3
Wyndham	25,544	28,201	10.4
WA Average	27,418	30,319	10.6

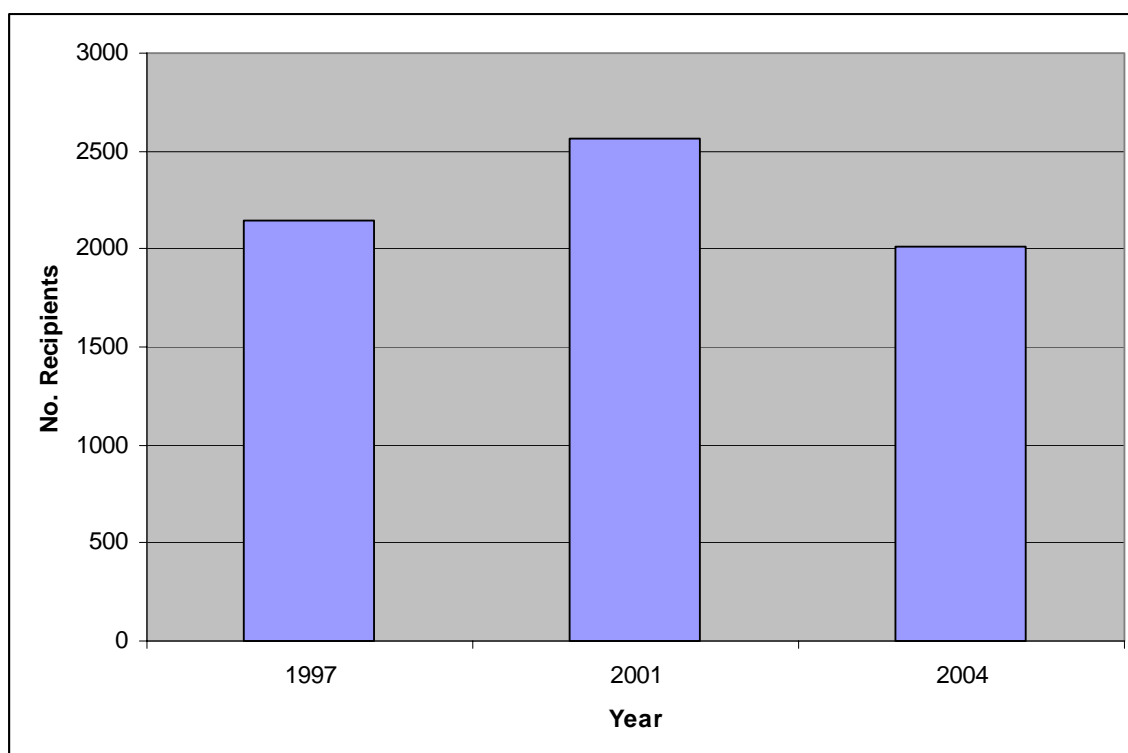
(Source: Calculated from Australian Taxation Office, 1998; 2005)

3.8 Commonwealth Government Support Payments

Between 1997-98 and 2001-02 financial years, the number of people in receipt of Commonwealth welfare and benefits in the NWMR increased from 2,145 to 2,566, before falling to 2,015 in 2004-05 (Figure 3.5). The overall decrease in welfare recipients coincides with a period of rising incomes and employment growth both within the NWMR and the broader Western Australian economy. While the absolute number of welfare and benefit recipients provides an indication of the total level of support in the Region, arguably of more importance is the proportion of the total income earning population that receive Commonwealth payments. In the 2004-05

financial year, 7.4 per cent of all income earners in the NWMR received Commonwealth government supports. By contrast, in Western Australia as a whole 6.2 per cent were in receipt of such benefits, suggesting a higher level of welfare dependence in the Region than at the State level.

Figure 3.5 Number of Recipients of Commonwealth Government Support Payments, 1997-2004



(Source: Australian Taxation Office, 1998; 2005)

Within the NWMR, the Gascoyne and Pilbara coasts have experienced a decrease in the number of welfare and benefit recipients between 1997-98 and 2004-05 (Table 3.15). This drop was strongest in the Pilbara (-32.6%), largely as a result of the ongoing expansion of the oil, gas and minerals sector and concomitant local economic growth. While the rate of decline in the Gascoyne was lower than the Pilbara, it still represents a substantial decrease in welfare and benefit payments. In part, this decrease is linked to a strong year-round tourism economy, coupled with increasing minerals activity in the area. It is also important to note the outcomes of some Community Development Employment Projects (CDEP) on these figures. In a

number of communities, CDEP has improved employment opportunities for Aboriginal people, particularly the Pilbara and Gascoyne. The combination of strong regional economies and the impact of CDEP have meant that levels of welfare dependence amongst Indigenous people have decreased over the past decade or so (see Chapter 5).

Unlike the Gascoyne and Pilbara, the Kimberley has experienced an increase in the number of welfare and benefit recipients. Indeed, between 1997-98 and 2004-05, the number of recipients increased by some 22 per cent. Much of this increase was amongst the indigenous population, and despite the impact of CDEP elsewhere, the Kimberly continues to represent a problem area in terms of welfare dependence. The Region's highly seasonal tourism economy and relatively small minerals sector have meant that it has not benefited from these industries to the same extent as the Pilbara and Gascoyne.

Table 3.15 Number of Commonwealth Welfare and Benefit Recipients in the North-West Marine Region, 1997-2004

<i>Region</i>	<i>1997-98</i>	<i>2004-05</i>	<i>% Change</i>
Gascoyne	490	360	-26.5
Pilbara	668	450	-32.6
Kimberley	947	1155	22.0
TOTAL	2105	1,965	-6.6

(Source: Australian Taxation Office, 1998; 2005)

The regional level variations in welfare and benefit recipients are also evident at a more local level. Between 1997-98 and 2004-05, five of the NWMR's larger centres experienced a decrease in the number of welfare and benefit recipients (Table 3.16): Carnarvon, Exmouth, Karratha, Kununurra and Port Hedland. Two of these towns are closely linked to oil, gas and minerals industries (Karratha and Port Hedland), one to diamond mining and an expanding horticulture industry (Kununurra), and two to rapidly expanding tourism sectors (Carnarvon and Exmouth). Amongst the smaller towns, Dampier also experienced a decrease in welfare and benefit recipients, largely as a result of its close links to the expanding resources sector. The impact of resources-led economic expansion on welfare expenditure as a proportion of income

earners is most evident in Karratha and Port Hedland, which are both well below the Western Australian average.

Table 3.16 Proportion of Income Earners in Receipt of Commonwealth Government Support, 1997-2004

Locations	1997-98	2004-05	Change
<i>Regional Centres</i>			
Broome	10.0	11.2	1.2
Carnarvon	10.7	8.9	-1.8
Derby	5.7	11.9	6.2
Exmouth	11.8	6.5	-5.3
Karratha	6.5	3.5	-3.0
Kununarra	8.2	7.8	-0.4
Port Hedland	5.7	4.1	-1.6
<i>Smaller Towns</i>			
Kalbarri	12.4	8.6	-3.8
Denham	6.8	9.2	2.4
Dampier	4.2	3.0	-1.2
Onslow	6.9	7.4	0.5
Roebourne	10.5	14.9	4.4
Wickham	6.0	5.1	0.9
Wyndham	6.4	17.6	11.2
Western Australia	8.5	6.2	-2.3

(Source: Australian Taxation Office, 1998; 2005)

The decreasing level of welfare support in some centres is in sharp contrast to a number of towns that have experienced an increase in the need for Commonwealth support. In terms of larger regional centres, this is most evident in Broome and Derby. Both of these towns recorded an increase in welfare dependence between 1997-98 and 2004-05, and have nearly double the proportion of income earners receiving support compared to the Western Australian average. Similar problems also affect a number of the Region's smaller settlements, notably Wyndham, Roebourne, and Onslow. There are a number of reasons for the high level of welfare and benefits payments in these centres, including: i) the presence of large Aboriginal population that remain economically and socially disadvantaged; ii) with the exception of Onslow, these towns have not experienced resource-led development, and are dependent on either tourism or on their regional and local service roles. There is little evidence to suggest that this situation will change in the near future.

3.9 Education

A considerable body of research literature suggests that, on a range of indicators, people living in remote areas have lower levels of education, and a more restricted range of educational opportunities, than their counterparts in other parts of Australia (Tonts and Larsen, 2002). This trend is also evident in the NWMR, though in many respects its educational profile is consistent with its resource-dependent economic structure and large indigenous population (Table 3.17). At the 2001 Census, just 1.2 per cent of the population had no schooling (compared to 0.9 per cent in Western Australia), while nearly 90 per cent had completed school to between years 9 and 12, with nearly half completing years 11 or 12 (49.4%). While those completing school to year 11 and 12 was slightly lower than the State average (54.2%), this was largely explained by the high number of people in the NWMR working in occupations linked to a trade, where training often commences at the end of year 10.

While the proportion of people completing years 11 and 12 was quite consistent across the Region's towns (ranging from 47.3 per cent to 49.9 per cent), the situation for those who had either not completed schooling, or finished before year 8 was somewhat different. In Carnarvon, Derby, Exmouth and Kununarra, more than 10 per cent of the population had not completed schooling beyond year 8. In some of the smaller towns the low levels of schooling were even more pronounced, with Onslow (14.4%), Roebourne (18.5%) and Wyndham (14.5%) all having relatively high proportions of the population having completed year 8 or less. These are all much higher than the State average of 8.8 per cent of people completing year 8 or less. As with high levels of welfare dependency in these centres, the low level of schooling reflects the large Aboriginal populations in these areas. Despite the ongoing efforts of government agencies, missionaries and other non-government organisations, increasing educational attainment remains a significant challenge in remote areas (see Young, 1995). While determining 'cause and effect' in socio-economic dynamics is always problematic, it is apparent that those centres in the NWMR with relatively low levels of education were also often those that had high proportions of residents in receipt of welfare payments.

Table 3.17 Highest Level of Schooling Completed for Persons Aged 15 and Over, 2001²

<i>Locations</i>	<i>No Schooling</i>	<i>Year 8 or below</i>	<i>Years 9- 10</i>	<i>Years 11- 12</i>	<i>N.</i>
<i>Regional Centres</i>					
Broome	0.6	8.5	41.2	49.7	10,224
Carnarvon	1.6	13.2	36.0	49.2	6,100
Derby	2.3	8.5	40.4	48.9	2,433
Exmouth	0.3	10.1	39.7	49.9	2,790
Karratha	0.3	4.4	45.5	49.9	6,547
Kununarra	1.4	9.1	40.2	49.3	3,328
Port Hedland	1.8	6.6	42.5	49.1	7,548
<i>Smaller Towns</i>					
Kalbarri	0.2	11.2	46.7	41.9	1655
Denham	0.6	18.7	48.5	32.2	1100
Dampier	0.3	5.1	44.7	49.8	883
Onslow	2.2	12.2	36.7	48.9	810
Roebourne	5.5	13.0	34.2	47.3	728
Wickham	0.3	5.2	44.7	49.9	1,059
Wyndham	1.9	12.6	36.4	49.1	538
Regional Balance	2.6	11.1	37.6	48.7	2,302
Regional Average	1.2	8.5	40.9	49.4	45,290
WA Average	0.9	7.9	37.1	54.2	1,293,374

(Source: Australian Bureau of Statistics, 2001)

In terms of post-school qualifications, in 2001 the NWMR was not vastly different from Western Australia as a whole (Table 3.18). The proportion of people with postgraduate and bachelors level qualifications was marginally below the State average, while the percentage of people with diploma or certificate level qualifications was higher than for Western Australia. This is not particularly surprising given the level of employment in the resources sector, where trade level qualifications (i.e. certificate or diploma) underpin large components of the labour force. Relatively high proportions of people with diploma/certificate level qualifications are most evident in the resource towns of Dampier (34.5%), Wickham (32.6%), Karratha (31.1%) and Port Hedland (25.8%); all of these centres are well above the State average for this level of qualification (23.2%). Those centres with relatively low proportions of post-school qualifications were also those that had low levels of schooling (see Table 3.17). In Carnarvon, Derby, Onslow, Roebourne,

² Excludes non-respondents and those still at school.

Wynham and the smaller localities in the Region, fewer than 30 per cent of the population held post school qualifications.

Table 3.18 Post-School Qualifications for Persons Aged 15 and Over, 2001

<i>Locations</i>	<i>Postgraduate Qualification</i>	<i>Bachelor Degree</i>	<i>Diploma / Certificate</i>	<i>Not applicable / Not stated</i>	<i>Number</i>
<i>Regional Centres</i>					
Broome	2.7	9.5	25.6	62.2	12,234
Carnarvon	1.3	5.2	19.6	73.9	5,663
Derby	2.5	7.9	19.6	70.0	2,700
Exmouth	1.8	5.3	27.2	65.7	2,548
Karratha	1.9	7.8	31.1	59.1	7,973
Kununarra	2.6	8.9	22.4	66.1	4,157
Port Hedland	1.8	7.3	25.8	65.0	9,527
<i>Smaller Towns</i>					
Kalbarri	1.4	7.4	28.3	62.8	1,798
Denham	0.5	5.4	22.9	71.3	1,215
Dampier	2.1	7.7	34.5	55.7	1,123
Onslow	0.9	5.2	21.7	72.3	678
Roebourne	0.9	1.6	11.3	86.2	698
Wickham	0.0	6.3	32.6	61.1	1,229
Wyndham	2.5	4.5	14.3	78.8	560
Regional Balance	2.0	5.5	18.7	73.7	2,082
Regional Average	2.0	7.5	25.1	65.4	51,172
WA Average	2.7	9.4	23.2	64.7	1,439,332

(Source: Australian Bureau of Statistics, 2001)

The extent to which people are engaged in education in a particular location is a function of a number of intersecting factors, including the availability of educational services, the characteristics of the local economy, and the local demographic structure. In 2001, the most common form of engagement with the educational system in the NWMR was at the primary or secondary level (Table 3.19). In most towns, more than 10 per cent of the population were at either primary or secondary school. Of course, these proportions are influenced by the proportion of young people within the wider population (see Chapter 2). Also important is the presence of educational facilities. The presence of senior high schools (which provide schooling to year 12) in most of the regional centres meant that the proportion of people completing secondary school tended to be higher than in more remote centres that

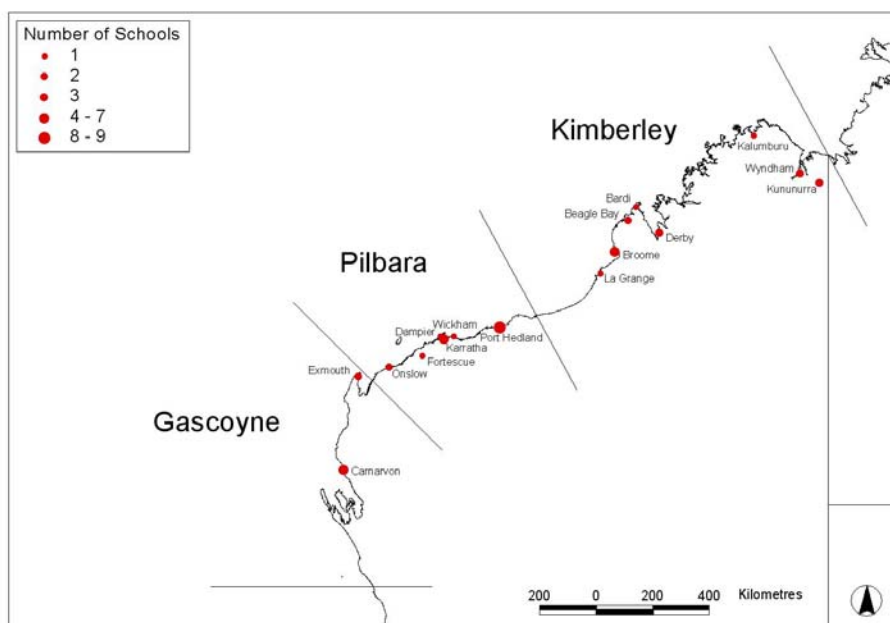
have district high schools (to year 10) (e.g. Kununurra, Onslow and Wyndham). TAFE, and to an even lesser extent, the university sector have a small presence in the Region, and this is reflected in the low levels of participation in tertiary education.

Table 3.19 Educational Institution Being Attended, 2001

<i>Locations</i>	<i>Pre-School</i>	<i>Primary School</i>	<i>Secondary School</i>	<i>TAFE</i>	<i>University</i>	<i>Other, N/A</i>	<i>Number</i>
<i>Regional Centres</i>							
Broome	1.4	8.4	3.3	2.5	2.0	82.4	15,241
Carnarvon	1.4	9.4	3.7	1.7	0.7	83.1	7,186
Derby	1.7	11.1	3.4	1.9	1.4	80.6	3,662
Exmouth	1.4	7.4	3.6	2.8	0.6	84.3	3,029
Karratha	1.8	12.2	6.5	3.4	1.0	75.0	10,728
Kununurra	1.0	7.2	2.4	1.7	1.1	86.6	5,223
Port Hedland	1.7	10.6	4.7	3.6	1.5	77.9	12,696
<i>Smaller Towns</i>							
Kalbarri	1.2	6.5	1.9	0.8	0.6	78.7	2,253
Denham	1.2	5.5	1.9	1.0	0.7	82.3	1,429
Dampier	1.8	12.5	6.0	3.0	1.6	75.1	1,474
Onslow	1.6	5.7	2.2	1.0	0.4	89.1	789
Roebourne	1.9	9.6	4.7	3.6	0.0	80.2	946
Wickham	2.0	12.5	5.6	3.7	1.0	75.1	1,726
Wyndham	1.3	10.2	3.4	0.8	1.3	83.0	784
Regional Balance	1.6	10.3	3.9	0.8	1.0	82.5	2,788
Regional Average	1.6	9.8	4.2	2.7	1.3	80.4	66,272
WA Average	2.0	13.2	8.5	3.7	5.1	67.5	1,832,366

(Source: Australian Bureau of Statistics, 2001)

There are a total of 23 public and private primary schools, 9 primary/lower secondary schools (though some of these offer limited upper school studies), six senior high schools, 10 TAFE outlets and one university campus in the coastal towns of the North-west Marine Region (map 4). Education facilities tend to be concentrated in the larger towns of Carnarvon, Karratha, Port Hedland and Broome. There are also a number of indigenous schools located throughout the Region. The location of these educational institutions is detailed in table 3.20.

Map 4 Educational Institutions in the North-west Marine Region**Table 3.20 Details of Educational Institutions in the North-west Marine Region**

<i>Location</i>	<i>Primary</i>	<i>Primary /Lower Secondary</i>	<i>Full Secondary</i>	<i>TAFE</i>	<i>University</i>
<i>Regional Centres</i>					
Carnarvon	3	0	1	1	0
Exmouth	0	1	0	1	0
Karratha	5	0	2	1	0
Port Hedland	5	0	1	1	0
Broome	4	0	2	1	1
Derby	0	1	0	1	0
Kununurra	1	2	0	1	0
<i>Smaller Towns</i>					
Kalbarri	0	1	0	0	0
Denham	1	0	0	0	0
Onslow	1	0	0	1	0
Dampier	1	0	0	0	0
Wickham	1	0	0	0	0
Wyndham	0	1	0	1	0
<i>Indigenous Communities</i>					
Bardi	0	1	0	0	0
Beagle Bay	0	1	0	0	0
Fortescue	1	0	0	0	0
La Grange	0	1	0	0	0

3.10 Indices of Socio-Economic Advantage and Disadvantage

The Socio-Economic Indexes for Areas (SEIFA) are derived from the census to quantify aspects of socio-economic conditions. Due to changes in collection district boundaries, comparable data for 1996 and 2001 are only available at the SLA level which will be discussed in this section. Only those SEIFA indices relating to disadvantage, economic resources and education and occupation are similar in methodological terms in both 1996 and 2001. In all cases, a higher index score represents a lesser degree of disadvantage.

When analysing the SEIFA data, it should be borne in mind that the actual scores of these indices are not comparable over time due to the manner in which the scores are standardised and weighted. This section will therefore rank the SLA's of the North-west Marine Region according to their score for each index in both 1996 and 2001 and will then focus on the 2001 SEIFA indices for a more detailed discussion. In accordance with SEIFA practice and to allow ranking and comparison over time, the SLA with the highest score for each index was awarded a score of 8 and the lowest a score of 1. These rankings were summed to provide the overall ranking in 1996 and 2001 detailed in Tables 3.21-3.23.

Table 3.21 Ranking of each SLA using 1996 SEIFA Indices

<i>Index of Disadvantage</i>	<i>Index of Economic Resources</i>	<i>Index of Education and Occupation</i>
Roebourne	Ashburton	Wyndham East Kimberley
Ashburton	Roebourne	Roebourne
Port Hedland	Port Hedland	Broome
Wyndham East Kimberley	Carnarvon	Port Hedland
Broome	Exmouth	Ashburton
Exmouth	Broome	Exmouth
Carnarvon	Wyndham East Kimberley	Carnarvon
Derby West Kimberley	Derby West Kimberley	Derby West Kimberley

(Source: ABS, 1997)

Table 3.22 Ranking of each SLA using 2001 SEIFA Indices

<i>Index of Disadvantage</i>	<i>Index of Economic Resources</i>	<i>Index of Education and Occupation</i>
Exmouth	Roebourne	Broome
Roebourne	Port Hedland	Wyndham East Kimberley
Ashburton	Ashburton	Exmouth
Port Hedland	Broome	Roebourne
Broome	Wyndham East Kimberley	Port Hedland
Carnarvon	Exmouth	Carnarvon
Wyndham East Kimberley	Carnarvon	Derby West Kimberley
Derby West Kimberley	Derby West Kimberley	Ashburton

(Source: ABS, 2002)

Table 3.23 Overall SEIFA rank positions 1996 and 2001

<i>Overall ranking 1996</i>	<i>Overall ranking 2001</i>	<i>Change in rank position 1996-2001</i>
Roebourne	Roebourne	-
Ashburton	Port Hedland	+2
Wyndham East Kimberley	Broome	+3
Port Hedland	Exmouth	+1
Exmouth	Ashburton	-3
Broome	Wyndham East Kimberley	-3
Carnarvon	Carnarvon	-
Derby West Kimberley	Derby West Kimberley	-

(Source: ABS, 1997; 2002)

These tables demonstrate that Roebourne SLA maintains the primary rank position of the SLA's within the North-west Marine Region according to SEIFA indices in both 1996 and 2001. Port Hedland and Broome improved their rank position by two and three places respectively, whilst Ashburton and Wyndham East Kimberley declined by three places. Carnarvon and Derby West Kimberley occupy the least advantaged positions in both 1996 and 2001.

The primary position of Roebourne indicates that this SLA is characterised by attributes such as the highest proportions of skilled workforce, high incomes, rental expenditure, large houses and a higher concentration of people with skilled qualifications. Roebourne SLA includes the urban centre of Karratha which was noted earlier in this chapter as being characterised by a high dependence on the mining sector in terms of employment, high growth in incomes adjusted for inflation and,

together with Dampier and Wickham, a high proportion of the population holding post-graduate qualifications. Taken together with the fact that Roebourne SLA is relatively small in comparison to the other SLA's in the North-west Marine Region, which will enhance the homogeneity of the population and thereby add value to the SEIFA indices, this ranking is reflective of the data discussed previously in this Report.

The low ranking of Carnarvon could reflect the effects of a relatively mobile population combined with an increasing number of retired people resident in the area. The latter will negatively impact upon factors associated with economic resources, as the retired population will be characterised by lower incomes and smaller dwellings overall. In addition, the increasing significance of the horticultural sector as evidenced with respect to employment data and a concomitant working population of overseas origin described previously could serve to depress the indices of economic resources and education and occupation.

The low position of Derby West Kimberley also merits comment as this reflects a variety of factors highlighted earlier in this chapter including the proportion of low-wage earners such as labourers, the low increase in average incomes between 1996 and 2001 adjusted for inflation and the high proportion of recipients of welfare support. These will be connected to some extent with the relatively high numbers of Indigenous Australians in the town of Derby, this group being generally associated with more acute indicators of social and economic deprivation (Young, 1995).

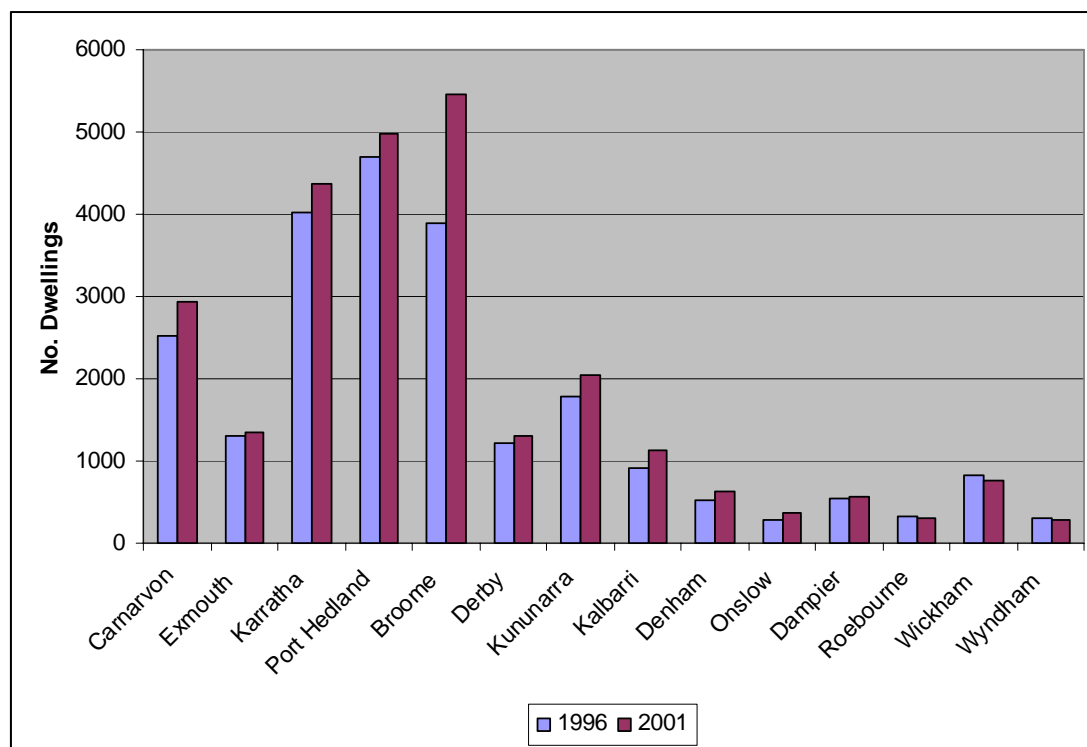
3.11 Housing

3.11.1 The Changing Housing Stock

Between 1996 and 2001, the total number of dwellings in NWMR Regional Centres and Towns increased from 23,152 to 26,479; a rise of 14.4 per cent. Figure 3.6 shows that all of the larger Regional Centres experienced an increase in the number of dwellings, with the most significant rises occurring in Broome (3,894 to 5,358), Carnarvon (2,521 to 2,931), and Karratha (4,012 to 4,371). Most of the smaller towns in the Region also experienced increases, although the number of dwellings fell

marginally in Roebourne (324 to 305), Wickham (826 to 751) and Wyndham (311 to 291).

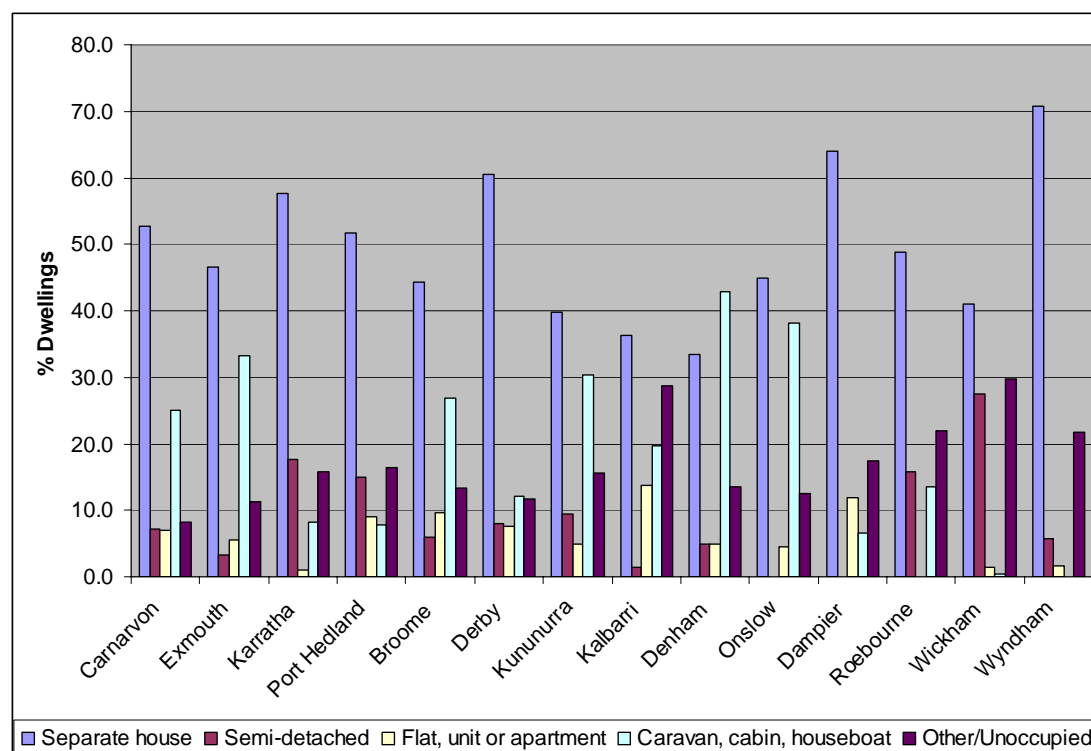
Figure 3.6 Change in the Number of Dwellings in NWMR Regional Centres and Smaller Towns, 1996-2001



(Source: Australian Bureau of Statistics, 1996; 2001)

In terms of the type of dwellings in the Region, Figure 3.7 shows that separate houses represent between 35-80% of the dwellings within each regional centres and smaller towns. In some cases, such as Denham, Exmouth, Kununurra and Onslow, the proportion of separate houses and caravans, cabins or houseboats are almost equal, reflecting the role of tourism and temporary forms of accommodation in these centres. Semi-detached dwellings were most common in Wickham, representing around a quarter of the housing stock, indicating the importance of company and other mining accommodation.

Figure 3.7 Different Dwelling Types in NWMR Regional Centres and Towns, 2001



(Source: Australian Bureau of Statistics, 2001)

Details of the tenure type for housing at the Regional level for 2001 is presented in Table 3.24 along with data for the State as a whole. This highlights the variation in tenure type between the sub-regions of the NWMR. Levels of outright home ownership were highest in the Gascoyne, where the percentage of houses fully owned or in the process of being purchased approached those of the State as a whole. By comparison, property purchases were much lower in both the Kimberley and to a greater extent the Pilbara, where rentals represented almost half of all tenure types which was approximately double the State average. Rent/buy schemes were of marginal significance except in the Pilbara, where they still only constituted less than 8% of tenure types.

Table 3.24 Tenure Type for Housing in the North-West Marine Region 2001

<i>Region</i>	<i>% fully owned</i>	<i>% being purchased</i>	<i>% being purchased under rent/buy scheme</i>	<i>% rented</i>	<i>% other tenure type</i>
Gascoyne	42.01	12.58	0.59	29.34	7.37
Pilbara	13.79	17.22	7.76	47.01	5.73
Kimberley	27.88	11.22	0.50	40.64	7.38
WA	35.89	30.90	0.80	24.85	3.09

(Source: Australian Bureau of Statistics, 2001)

3.11.2 Monthly Loan Repayments

Table 3.25 shows the percentage distribution of monthly loan repayments for properties in the communities adjacent to the NWMR between 1996 and 2001, having accounted for properties for which no data was returned. The median monthly repayment increased from \$200-\$399 in 1996, to \$600-\$799 in 2001; a rise in the order of 130%. This reflects the rising cost of housing in the North West, brought about largely as a result of increasing economic activity in the area and the inability of the housing market to keep pace with demand. The increase in the higher repayment categories helps to explain the marked decrease in the proportion of residences where monthly repayments were in the \$200-\$300 range. The proportion of residences involving repayments of \$1000 or more also increased markedly from 18.3% to 35.1% over the five year time period.

Table 3.25 Percentage Distribution of Monthly Loan Repayments for the NWMR, 1996 and 2001

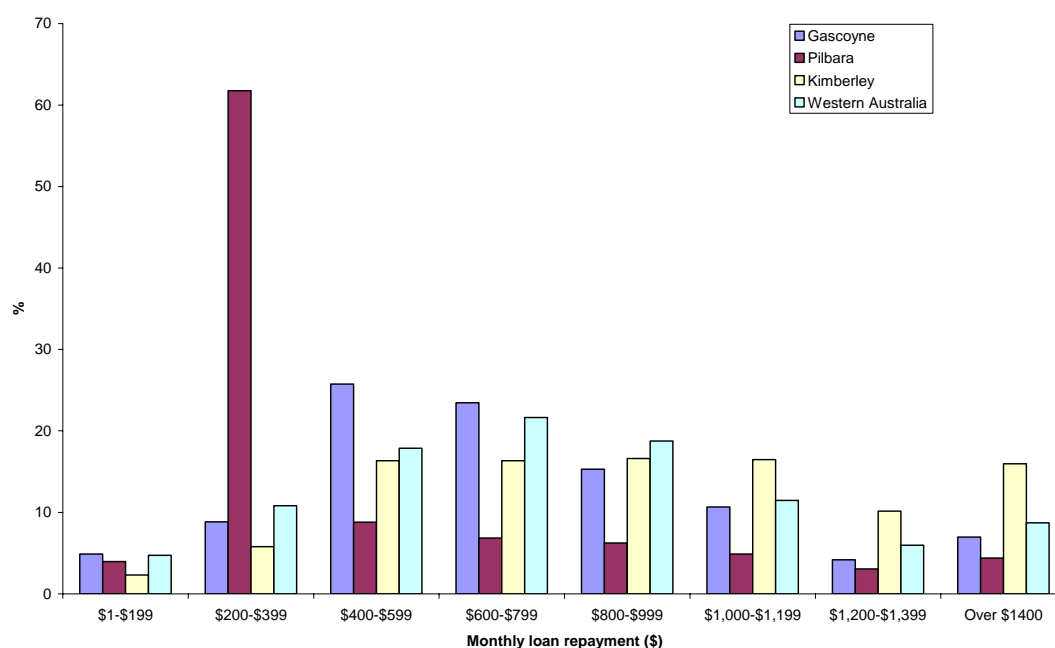
<i>Monthly loan repayment (\$)</i>	<i>1996</i>	<i>2001</i>	<i>Change 1996-2001</i>
\$1-\$199	3.78	2.24	-1.54
\$200-\$399	47.37	28.80	-18.58
\$400-\$599	11.66	10.30	-1.36
\$600-\$799	10.01	11.91	1.90
\$800-\$999	8.84	11.70	2.86
\$1,000-\$1,199	7.38	11.20	3.82
\$1,200-\$1,399	4.37	8.86	4.49
Over \$1400	6.58	14.99	8.41

(Source: Australian Bureau of Statistics, 1996; 2001)

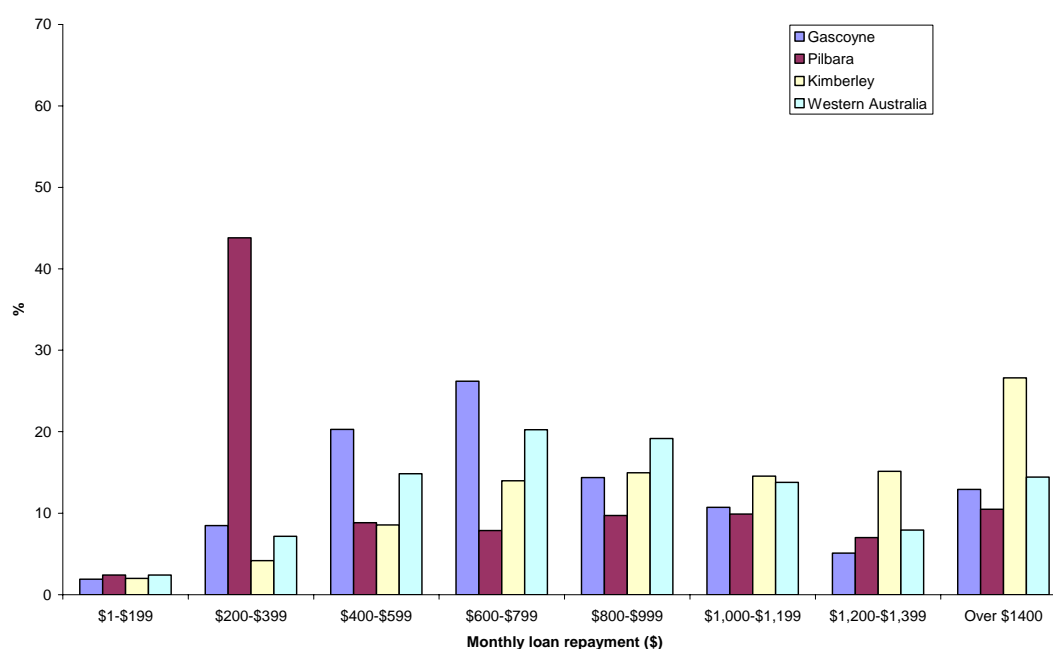
At the sub-regional level, there were considerable geographical variations in monthly loan repayments between 1996 and 2001 (Figures 3.8-3.9). The Pilbara region was

particularly marked by a predominance of repayments in the \$300-\$399 category, representing 62% and 44% of all purchased properties in the Pilbara in 1996 and 2001 respectively. Further analysis indicates that this skewed distribution derived largely from data collected in some of the smaller towns in the region, many of which were dominated by company housing with rental support schemes in place. The Gascoyne sub-region tended to exhibit a greater proportion of properties than the State average associated with repayments below \$799 in both 1996 and 2001. Details of the changes in the percentage of properties in each category between 1996 and 2001 are summarised in Table 3.26.

Figure 3.8 Monthly Loan Repayment Data for 1996 by Sub-region



(Source: Australian Bureau of Statistics, 1996)

Figure 3.9 Monthly Loan Repayment Data for 2001 by Sub-region

(Source: Australian Bureau of Statistics, 2001)

Table 3.26 Changes in Percentage of Monthly Loan Repayments 1996-2001 by sub-region and State

	<i>\$1-\$199</i>	<i>\$200-\$399</i>	<i>\$400-\$599</i>	<i>\$600-\$799</i>	<i>\$800-\$999</i>	<i>\$1,000-\$1,199</i>	<i>\$1,200-\$1,399</i>	<i>Over \$1400</i>
Gascoyne	-3.0	-0.4	-5.5	2.8	-0.9	0.0	0.9	6.0
Pilbara	-1.6	-18.0	0.0	1.0	3.5	5.0	4.0	6.1
Kimberley	-0.3	-1.6	-7.8	-2.4	-1.6	-1.9	5.0	10.7
WA	-2.3	-3.7	-3.1	-1.4	0.4	2.3	2.0	5.7

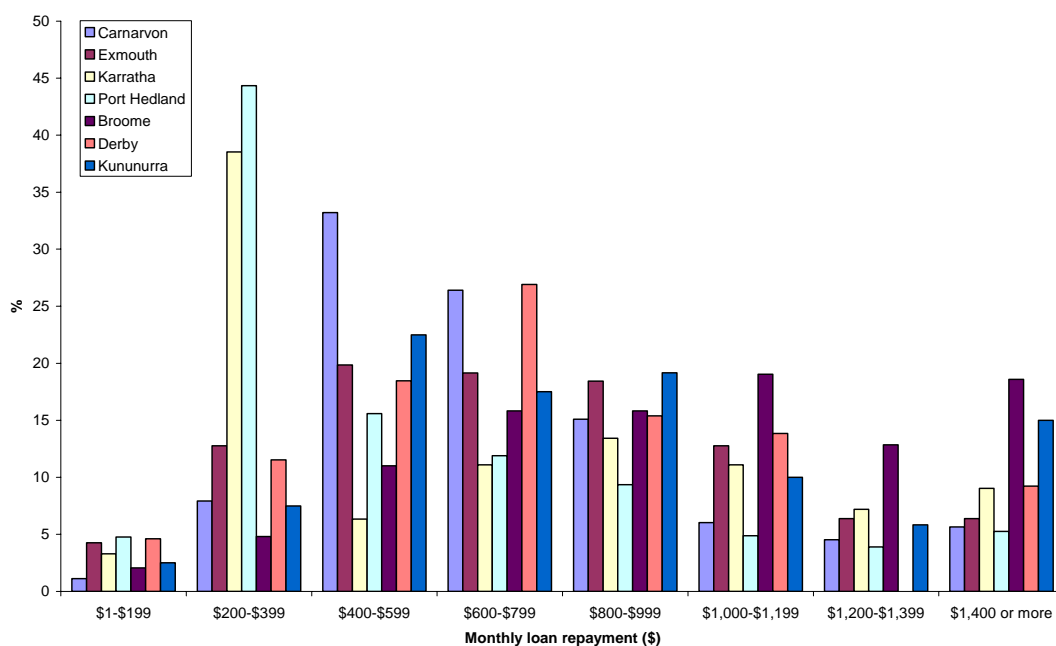
(Source: Australian Bureau of Statistics, 1996; 2001)

Table 3.26 underlines the extent of the decline in the proportion of residences falling in the \$200-\$399 repayment category in the Pilbara, although these still dominate the distribution of repayments as a whole in this sub-region. The increase in properties in the Kimberley associated with higher repayments is also apparent, with a rate of increase in categories over \$800 being more than double the State average.

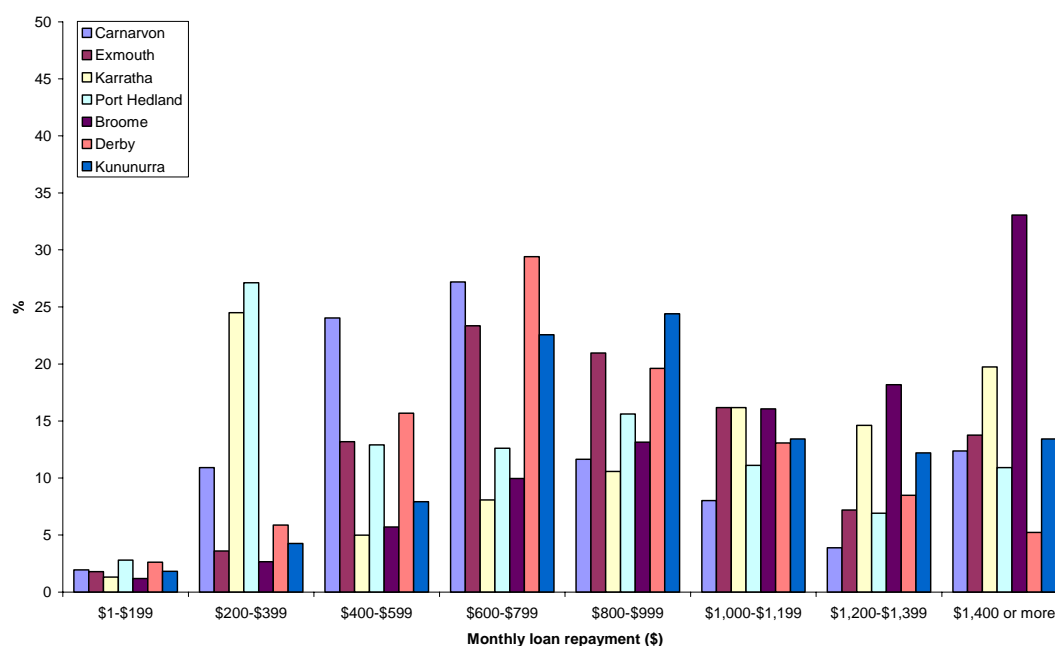
Figures 3.10 and 3.11 illustrate the distribution of monthly loan repayments for properties in the UCL's of the NWMR for 1996 and 2001 respectively. These figures exclude properties for which no information was returned in the 1996 and 2001

censuses, which ranged between 5-14% of all properties. The number of properties for which information was returned ranged from over 1000 in Port Hedland to around 130 in Derby. Port Hedland was characterized by the lowest overall value of loan repayments in both 1996 and 2001, whilst Broome recorded the highest overall value in both censuses.

Figure 3.10 Monthly Loan Repayments by UCL, 1996



(Source: Australian Bureau of Statistics, 1996)

Figure 3.11 Monthly Loan Repayments by UCL, 2001

(Source: Australian Bureau of Statistics, 2001)

Table 3.27 Changes in the Percentage of Monthly Loan Repayments on Properties by UCL 1996-2001

Regional centre	\$1-\$199	\$200-\$399	\$400-\$599	\$600-\$799	\$800-\$999	\$1,000-\$1,199	\$1,200-\$1,399	Over \$1,400
Carnarvon	0.8	3.0	-9.2	0.8	-3.4	2.0	-0.6	6.7
Exmouth	-2.5	-9.2	-6.7	4.2	2.5	3.4	0.8	7.4
Karratha	-2.0	-14.0	-1.3	-3.0	-2.8	5.1	7.4	10.7
Port Hedland	-2.0	-17.2	-2.7	0.7	6.3	6.2	3.0	5.6
Broome	-0.9	-2.2	-5.3	-5.9	-2.7	-3.0	5.3	14.5
Derby	-2.0	-5.7	-2.8	2.5	4.2	-0.8	8.5	-4.0
Kununurra	-0.7	-3.2	-14.6	5.1	5.2	3.4	6.4	-1.6

(Source: Australian Bureau of Statistics, 1996; 2001)

Comparison of Figures 3.10 and 3.11 indicates the scale of increase in the value of loan repayments over the five year time period. These are detailed in Table 3.27. All the regional centres exhibit a significant decline in the percentage of properties involving monthly repayments below \$399, which amounts to 20% and 16% of all properties in the cases of Port Hedland and Karratha respectively. Carnarvon is the only regional centre recording a slight increase of just under 4% in the proportion of residences in this category. Broome and Karratha exhibit the highest increase in the

proportion of residences involving monthly loan repayments of over \$1200, amounting to 20% and 18% respectively.

3.11.3 Weekly Rent

Table 3.28 details the distribution of weekly rent in the Region between 1996 and 2001, having accounted for properties for which no data was returned. Whilst table 3.28 indicates the scale of the decrease in the proportion of rented properties in the \$0-\$99 category, this remained the median rental payment for both 1996 and 2001 in the NWMR. Furthermore, around 80% of properties for which data were returned involved weekly rental payments of less than \$199 in both surveys.

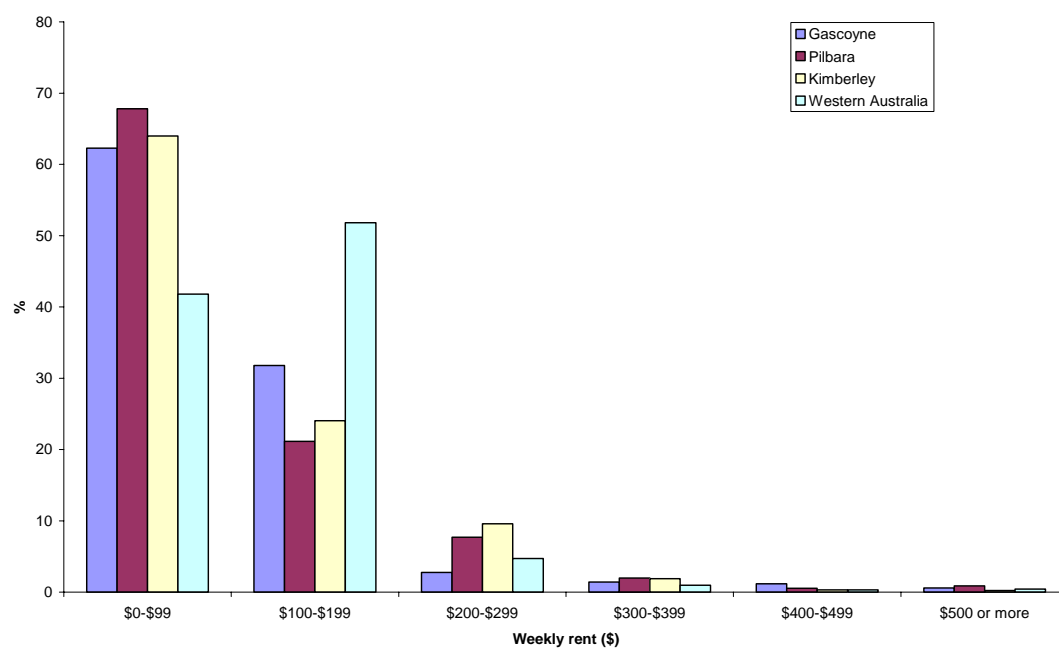
Table 3.28 Percentage Distribution of Weekly Rental Payments for all SLA's in the NWMR 1996 and 2001

<i>Weekly rent (\$)</i>	<i>1996</i>	<i>2001</i>	<i>Change 1996-2001</i>
\$0-\$99	65.6	50.9	-14.7
\$100-\$199	23.7	30.0	6.3
\$200-\$299	7.7	11.9	4.2
\$300-\$399	1.9	3.7	1.8
\$400-\$499	0.5	1.2	0.7
\$500 or more	0.6	2.3	1.7

(Source: Australian Bureau of Statistics, 1996; 2001)

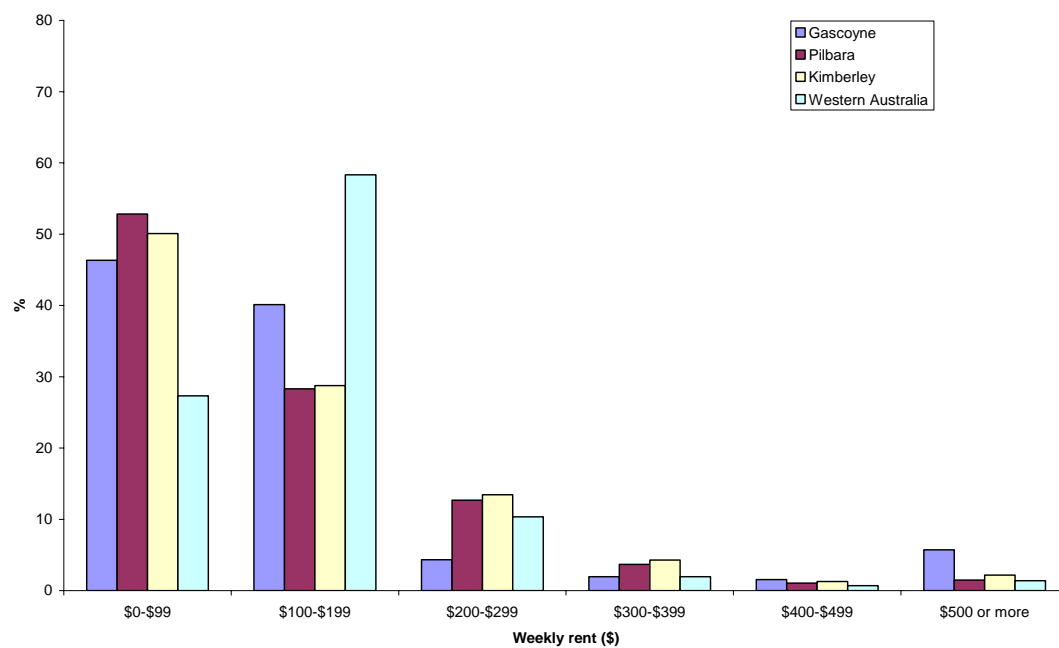
Figures 3.12-3.13 illustrate the distribution of weekly rental payments for 1996 and 2001 respectively according to sub-region, including the State data for Western Australia as a whole for comparison. These figures illustrate the fact that the proportion of properties involving the lowest weekly rent of under \$99 in the NWMR greatly exceeds that of the State as a whole in both 1996 and 2001. This is particularly evident with regard to the Pilbara and Kimberley, whilst properties in the Gascoyne sub-region, though still generally lower than those of the State as a whole, are more reflective of the distribution of rental payments for Western Australia.

Figure 3.12 Weekly Rent Data for 1996 by Sub-region



(Source: Australian Bureau of Statistics, 1996)

Figure 3.13 Weekly Rent Data for 2001 by Sub-region



(Source: Australian Bureau of Statistics, 2001)

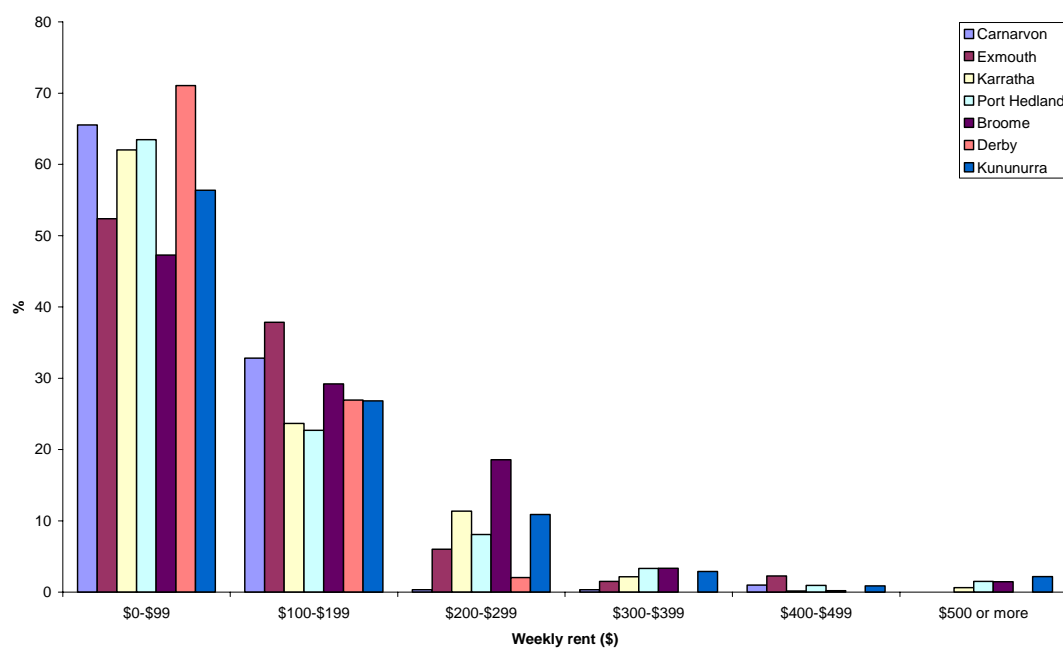
Table 3.29 Changes in Percentage of Weekly Rent Payments 1996-2001 by sub-region and State

	<i>\$0-\$99</i>	<i>\$100-\$199</i>	<i>\$200-\$299</i>	<i>\$300-\$399</i>	<i>\$400-\$499</i>	<i>\$500 or more</i>
Gascoyne	-16.0	8.3	1.6	0.5	0.4	5.1
Pilbara	-15.0	7.2	5.0	1.7	0.5	0.6
Kimberley	-13.9	4.7	3.9	2.4	1.0	2.0
WA	-14.5	6.5	5.6	1.0	0.4	1.0

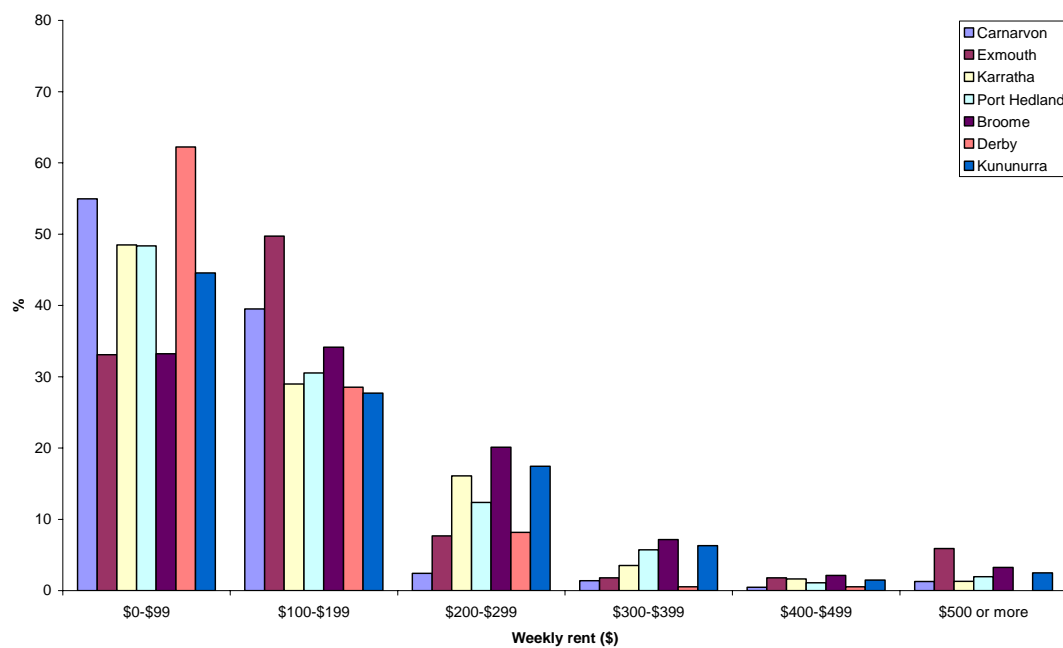
(Source: Australian Bureau of Statistics, 1996; 2001)

Details of the changes in rental payments between 1996 and 2001 are provided in Table 3.29. This highlights the relative growth of rental properties at the high end of the market in the Gascoyne, which far exceeded that elsewhere in the NWMR and the State as a whole. Whilst rental properties at the lowest end of the scale still dominated the market, all three sub-regions exhibited a decline in the proportion of the cheapest rental properties which are reflective of trends at the State level over this period.

Figures 3.14 and 3.15 illustrate the distribution of weekly rental payments for the seven regional centres for 1996 and 2001 respectively. The figures above exclude properties for which no information was returned in the 1996 and 2001 census surveys, which ranged between 4-7% of all properties. The number of rental properties for which data were returned ranges from 390 in Exmouth to 2000 in Port Hedland. Derby and Carnarvon are characterized by the highest proportion of residences in the lowest rental category in both 1996 and 2001, whilst Broome exhibited the fastest growth of properties in the highest rental category. Details of the scale of increase in rental payments are provided in Table 3.30.

Figure 3.14 Weekly Rental Payments by UCL, 1996

(Source: Australian Bureau of Statistics, 1996)

Figure 3.15 Weekly Rental Payments by UCL, 2001

(Source: Australian Bureau of Statistics, 2001)

Table 3.30 Changes in the Percentage of Weekly Rental Payments on Properties by UCL, 1996-2001

<i>Regional Centre</i>	<i>\$0-\$99</i>	<i>\$100-199</i>	<i>\$200-\$299</i>	<i>\$300-\$399</i>	<i>\$400-\$499</i>	<i>\$500 or more</i>
Carnarvon	-10.6	6.7	2.1	1.1	-0.5	1.3
Exmouth	-19.3	11.9	1.7	0.3	-0.5	5.9
Karratha	-13.6	5.3	4.7	1.4	1.5	0.7
Port Hedland	-15.1	7.8	4.3	2.4	0.2	0.5
Broome	-14.0	4.9	1.6	3.8	1.9	1.8
Derby	-8.8	1.6	6.1	0.5	0.5	0.0
Kununurra	-11.8	0.9	6.6	3.4	0.6	0.3

(Source: Australian Bureau of Statistics, 1996; 2001)

Table 3.30 demonstrates that the major change in rental payments involves a consistent decrease in the proportion of weekly rents less than \$99, although the magnitude of this varies from 9% in Derby to 19% in Exmouth. The vast majority of other rental payment categories exhibited a concurrent increase between 1996 and 2001, these being concentrated in the \$100-\$300 rental category. Only Exmouth and to a much lesser extent Broome exhibited an increase in the proportion of residences falling into the highest rental category.

3.11.4 Building Approvals

Data relating to building approvals are not available for urban centres and localities, but are available at the SLA level. Table 3.31 details building activity in the eight coastal SLA's of the NWMR from 2000-04. This is expressed in Table 3.32 as a percentage of building activity in the State as a whole.

The number of new dwelling units built in the NWMR displays little consistent trend over time, averaging 425 per annum between 2000-04. The decline in new dwelling units in the period following 2000 will reflect the fact that many approvals were brought forward due to the prospect of the introduction of GST in 2000, leading to a relative decline in building activity after this period. Residential building accounted for between 49%-75% of the value of total building activity in the NWMR between 2000-04, again with apparent trend over time.

Table 3.31 Building Activity in the NWMR, 2000-04

	2000	2001	2002	2003	2004	TOTAL
Number of total dwelling units	472	315	451	481	406	2125
Value of total residential building (\$M)	74.0	51.1	77.9	93.9	85.8	382.7
Value of total non-residential building (\$M)	44.0	53.4	26.3	40.6	80.2	244.5
Value of total building (\$M)	118.0	104.4	104.1	134.4	165.8	626.7

(Source: Australian Bureau of Statistics, 2004)

Table 3.32 Building Activity in the NWMR as a Percentage of Building Activity in Western Australia 2000-04

	2000	2001	2002	2003	2004
Number of total dwelling units	2.1	2.1	2.21	2.21	1.7
Value of total residential building (\$M)	2.5	2.4	2.7	2.8	2.2
Value of total non-residential building (\$M)	3.7	4.2	2.7	2.6	5.3
Value of total building (\$M)	2.9	3.0	2.7	2.8	3.1

(Source: Australian Bureau of Statistics, 2004)

Comparison with the building figures for the State as a whole indicates that the NWMR accounted for between 2-3% of the number and value of new residential buildings constructed between 2000 and 2004. However, investment in non-residential building in the NWMR increased by a factor of three in 2004, representing over 5% of the total State building activity.

Table 3.33 summarises the total building activity over the 2000-04 period within each sub-region as a percentage of the building activity within all the coastal SLA's of the NWMR. This highlights the significance of building activity within the Kimberley, particularly with regard to residential building activity which accounted for almost two thirds of all residential buildings constructed between 2000 and 2004 in the coastal SLA's of the NWMR. Non-residential building activity was relatively equally divided between the Pilbara and the Kimberley which together represented almost 90% of this activity. The Gascoyne accounted for around 10% of residential and non-residential building activity over the 2000-04 period. Further analysis of data from the Kimberley underlines the significance of building activity in the Broome SLA, which accounted for 68% of new dwelling units, 67% of the value of residential building and

59% of the value of non-residential building activity in the Kimberley between 2000 and 2004.

Table 3.33 Percentage of Total Building Activity 2000-04 within the NWMR by Sub-region

	<i>Gascoyne</i>	<i>Pilbara</i>	<i>Kimberley</i>
Number of total dwelling units	10.9	27.8	61.3
Value of total residential building	10.2	29.1	60.6
Value of total non-residential building	11.5	42.6	45.9
Value of total building	10.7	34.4	54.9

(Source: Australian Bureau of Statistics, 2004)

3.12 Conclusion

This chapter has provided an outline of the key changes in the socio-economic characteristics of the North-west Marine Region between 1996 and 2001. This period witnessed a sustained growth in economic activity which was associated in large part with the minerals sector. However, diversification and expansion was also evident within the Region with regards to agriculture, forestry and fishing, tourism and government services, which served to maintain employment rates in many of the Regions' settlements. These have been particularly evident in larger towns of the Pilbara such as Karratha and Port Hedland as well as the smaller settlements of Dampier and Wickham, which were characterised by the highest individual incomes. Elsewhere, growth was evident but this has taken place more in line with the State average, with the service-based economies of the Gascoyne and Kimberley experiencing more modest rates of growth driven largely by the tourism and government services sector. Furthermore, in the larger centres of the coastal Gascoyne and Kimberley such as Broome and Derby, as well as smaller settlements including Wyndham, Roebourne and Onslow, there remains a high level of dependency upon welfare support which increased over the 1996-2001 period.

Analysis of data relating to educational attainment within the Region indicates that there were areas characterised by levels of schooling and educational qualifications below the State average, including larger settlements such as Derby and Carnarvon as well as smaller towns such as Onslow, Roebourne and Wyndham. These reflect trends

generally associated with concentrations of Indigenous population as well as the prevalence of trade as opposed to professional occupations in these areas. Towns where a higher than average educational profile was evident, such as the proportion holding post-school qualifications, tended to be those associated with the minerals sector and it is reasonable to assume that a significant proportion of these individuals are relatively recent arrivals to the Region employed in this sector. The provision of educational facilities is also shown to be concentrated in the regional centres.

The characteristics of home ownership are again largely influenced by the economic trends within the Region. The cost of homes, both rented and privately owned, has increased overall in line with State trends, but this has been accentuated in the Pilbara towns in particular as demand for employees has led to increases in the value of housing stock and a greater prevalence of rental properties tenanted by employees of the mining sector. The increase in value of property as indicated by monthly loan repayments was particularly marked in tourist destinations such as Broome, although the contrasting nature of tourism activity was manifest in the prevalence of caravan and similar accommodation in centres such as Carnarvon.

Building activity displayed little overall trend in the 2000-04 period with regard to residential properties, although towns within the Kimberley such as Broome in particular underwent the most rapid expansion within the Region. Non-residential building activity experienced a marked increase in 2004, which again was distributed preferentially towards the Kimberley and Broome in particular although an increase of similar magnitude took place in the Pilbara.

4 CHARACTERISTICS OF INDIGENOUS AUSTRALIAN COMMUNITIES

4.1 Introduction

This chapter will use the term ‘indigenous Australian’ to refer collectively to individuals of both Aboriginal and Torres Strait Islander descent. The four predominantly indigenous Australian settlements in the North West Marine Region are Bardi (also known as One Arm Point), Beagle Bay, Kalumburu and La Grange, all of which are located in the Kimberley region. It should be noted that the census for these predominantly indigenous communities does not consistently differentiate according to ethnic origin, hence the data presented in this chapter describes the population as a whole in these settlements. However, as the population in these settlements is almost entirely composed of indigenous individuals, it is reasonable to assume that the data presented herein is representative of the characteristics of the indigenous community in each case.

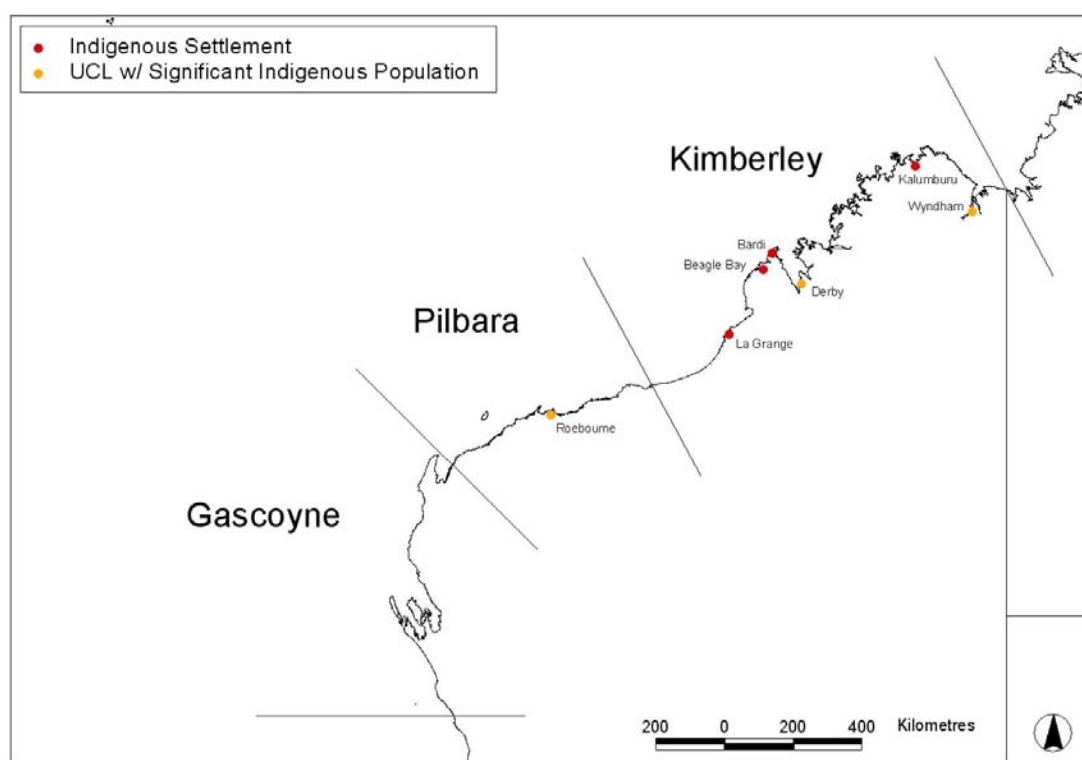
There are three other locations in the North West Marine Region with an indigenous Australian population greater than 25% in the 2001 census, which is categorized in this report as a significant indigenous Australian population. These are Derby and Wyndham in the Kimberley and Roebourne in the Pilbara region. Data relating specifically to the indigenous population of these urban localities were sourced from the Indigenous Profile survey conducted at the UCL level as part of the 2001 census. However, as this survey was not undertaken in 1996, analysis of these data is limited to 2001. Summary details and locations of these settlements are provided in Table 4.1 and Map 4.

Table 4.1 Summary Data for Predominantly Indigenous Settlements and Towns with Significant Indigenous Population in 1996 and 2001

<i>Name</i>	<i>Total population 1996</i>	<i>Total population 2001</i>	<i>% indigenous Australian 1996</i>	<i>% indigenous Australian 2001</i>
Bardi	288	305	89	95
Beagle Bay	295	300	89	92
Kalumburu	370	333	92	85
La Grange	568	499	92	94
Derby	3236	3688	36	40
Roebourne	958	946	60	63
Wyndham	868	787	41	52

(Source: Australian Bureau of Statistics, 1996; 2001)

Map 5 Location of Indigenous Settlements and Towns with Significant Indigenous Population in the North-west Marine Region



4.2 Demographic Characteristics

Details of the age sex structure of the seven settlements discussed in this chapter are provided in Appendix 2. Key population statistics derived from these figures are presented in Table 4.2. The proportion of individuals under 15 years of age in the four indigenous Australian communities ranges from 35%-43%, with those of working age and persons over 65 accounting for between 53%-61% and 1-7% of the population respectively in these communities. In all but one of the census surveys (La Grange, 1996) all individuals are under 80 years of age. Data relating to Derby, Roebourne and Wyndham shows that the proportion of indigenous Australians under 15 years of age in these localities in 2001 ranged from 32-38%, with those of working age and persons over 65 varying from 55-63% and 3-7% respectively. The median age for all four predominantly indigenous settlements ranged from 18-22 years old in the 1996 census and 19-21 years old in the 2001 census. The median age group of the indigenous Australian communities in the urban localities in 2001 was 20-24 years for Derby and Wyndham and 25-29 years for Roebourne.

Table 4.2. Key Population Statistics for Predominantly Indigenous Settlements and Urban Localities with Significant Indigenous Population in 1996 and 2001

<i>Settlement</i>	<i>% under 15</i>		<i>% 15-64</i>		<i>% over 64</i>	
	1996	2001	1996	2001	1996	2001
Bardi	41.7	36.4	53.1	57.7	5.2	5.9
Beagle Bay	39.0	38.3	58.0	59.7	3.1	2.0
Kalumburu	43.2	36.9	55.9	56.8	0.8	6.3
La Grange	35.7	34.9	57.4	61.3	6.9	3.8
Derby	n/a	38.2	n/a	55.0	n/a	6.8
Roebourne	n/a	31.8	n/a	62.6	n/a	5.5
Wyndham	n/a	33.8	n/a	63.1	n/a	3.1

(Source: Australian Bureau of Statistics, 1996; 2001)

All four predominantly indigenous settlements exhibited a decrease ranging from 1-6% in the proportion of people under 15 years of age between 1995 and 2001. In both the 1996 and 2001 surveys, the percentage of males outnumbered females by ratios of 52:48 and 51:49 respectively. With regard to individual settlements, the proportion of males increased by 3.9% and 0.5% in Beagle Bay and Kalumburu respectively, whilst the proportion of females increased by 2.7% and 2.8% in Bardi and La Grange

respectively. The male:female ratio was 46:54 in Derby and Wyndham, whilst the ratio in Roebourne was slightly more equal at 48:52.

The percentage of individuals speaking English only has increased in all four predominantly indigenous settlements over the period 1996-2001. This has been most marked in Kalumburu, where the proportion has increased from 17% to 92%, whilst in Bardi the proportion has increased from 51% to 90%. In La Grange, the percentage has increased from 45% to 70%, whilst in Beagle Bay the proportion of English language speakers has remained high, increasing from 91% in 1995 to 98% in 2001. The percentage of indigenous Australians speaking English only in 2001 was 57% and 91% in Roebourne and Wyndham respectively. Language data for Derby's indigenous community was not published in the 2001 Indigenous Profile.

4.3 Socio-Economic Characteristics

4.3.1 Industry and Occupation Structure

Details of the industry and occupation structure of the indigenous Australian communities in the four settlements for 1996 and 2001 and the three urban localities for 2001 are provided in Appendix 3. It should be noted that Indigenous Profile data for Derby relating to industry and occupation were not available.

With regard to the four predominantly indigenous settlements, the industry structure indicates a high reliance on particular sectors, notably the health and community and government administration and defence sectors as well as personal and other services, which includes industries such as personal health care, laundry, religious and professional associations. These three sectors account for over 60% of the population in each settlement at any one time. The apparent shift from health care and community services in 1996 towards government administration and defence in 2001 is an artefact of the census system with regard to the classification of those employed in Community Development Employment Projects (CDEP) projects. In the 1996 census, these were included in the health sector and in 2001 these were enumerated under the government sector (Kimberley Development Commission, 2006). With an estimated two thirds of Indigenous adults in the West Kimberley being employed in

CDEP programmes (Taylor, 2006), the implications of this alteration are clearly significant.

Industry and occupation data for the indigenous population of Derby were not provided in the 2001 Indigenous Profile. Indigenous Australians resident in the towns of Roebourne and Wyndham were employed in a greater range of sectors, although the majority were classified in the same two sectors of health and community services and government administration and defence. There was, however, a greater representation in the education, property and business services and mining sectors in these towns than in the four predominantly indigenous settlements.

With respect to occupation, the 1996 census showed a predominance of employment as labourers and related workers in the four indigenous settlements, accounting for over 50% of the workforce across all communities. Intermediate and elementary clerical, sales and service workers represented between 10-25% of the remainder, with 10-18% being classified as managers, administrators, professionals or associate professionals. The proportion of the workforce categorized as labourers and clerical workers remained similar or slightly higher in 2001, with a general decrease in managers, administrators, professionals and associated professionals to 5-20%.

Indigenous Australians in Roebourne and Wyndham were employed in a wider range of occupations. Labourers accounted for a much lower proportion (14% and 22%) of the workforce than in the four predominantly indigenous settlements. There was a higher (22-29%) proportion employed in the clerical and service workers, this increase being more marked in the intermediate and advanced categories, whilst a greater proportion (22-29%) were employed as administrators, professionals and associated professionals than was noted in the four predominantly indigenous settlements.

4.3.2 Labour Force and Employment Status

Table 4.3 summarises the labour force and employment characteristics for the four predominantly indigenous settlements from the 1996 and 2001 census surveys. Data

from the Indigenous Profiles is limited to 2001 unemployment rates. The labour force is defined for this purpose as the percentage of individuals over the age of 15.

Table 4.3 Labour Force and Employment Status in 1996 and 2001

<i>Name</i>	<i>Unemployment rate as % of labour force</i>		<i>Employment characteristics as % of labour force</i>			
	1996	2001	% full time 1996	% full time 2001	% part time 1996	% part time 2001
Bardi	7.9	0.0	36.5	17.9	60.9	69.5
Beagle Bay	2.9	2.1	34.6	38.9	62.5	50.7
Kalumburu	2.8	11.5	31.4	26.4	65.7	62.0
La Grange	3.0	5.1	16.0	13.5	84.0	61.2
Derby	n/a	15.8	n/a	n/a	n/a	n/a
Roebourne	n/a	28.7	n/a	n/a	n/a	n/a
Wyndham	n/a	11.7	n/a	n/a	n/a	n/a

(Source: Australian Bureau of Statistics, 1996; 2001)

With the exception of Kalumburu in 2001, the unemployment rate is lower than the State average of 8.1% and 7.6% in 1996 and 2001 respectively in the predominantly indigenous settlements. Unemployment rates are consistently much greater in the three urban localities than in the predominantly indigenous settlements in 2001. These data demonstrate the volatility of the labour force in the predominantly indigenous settlements, with unemployment fluctuating considerably over the 5 year period. This partly reflects the relatively small sample size and also the nature and extent of the CDEP programmes which will influence employment rates, particularly in the predominantly indigenous settlements. The data were consistent in indicating the relatively small proportion of workers employed full time in all predominantly indigenous settlements in both 1996 and 2001, with part time employees accounting for over 50% of the working population in all cases.

4.2.3 Level of Schooling Completed

Table 4.4 shows the percentage of individuals over the age of 15 at the time of the census who had not completed a full programme of schooling. This is represented by the proportion that left school before Year 10 combined with the proportion who did not attend school from the 1996 and 2001 census surveys for the four indigenous settlements and the 2001 Indigenous Profiles for the three urban localities. It should

be noted that at the time of both census surveys the legal requirement was for students to complete 10 years of compulsory education, i.e. the legal leaving age was 15.

Table 4.4 Percentage of Individuals over the age of 15 Not Completing a Full Programme of Education in 1996 and 2001

<i>Name</i>	<i>% left before Year 10 1996</i>	<i>% left before Year 10 2001</i>	<i>% not attended school 1996</i>	<i>% not attended school 2001</i>	<i>Total 1996</i>	<i>Total 2001</i>
Bardi	35.1	31.6	1.6	5.7	36.7	37.3
Beagle Bay	37.1	20.9	3.6	0.0	40.7	20.9
Kalumburu	33.3	61.2	2.9	3.8	36.2	65.1
La Grange	29.3	23.7	13.8	12.3	43.1	35.9
Derby	n/a	0.0	n/a	5.6	n/a	5.6
Roebourne	n/a	0.0	n/a	12.8	n/a	12.8
Wyndham	n/a	0.0	n/a	4.3	n/a	4.3

(Source: Australian Bureau of Statistics, 1996; 2001)

The total percentage that did not complete 10 years of school education increased dramatically in the case of Kalumburu but decreased or remained constant in the other three indigenous settlements. However, in all cases this represented over a third of all individuals over the age of 15. With regard to the three urban localities, a relatively small fraction was recorded as not attending school in 2001 and there were no records of individuals leaving before the legal age of 15.

4.3.4 *Post-School Qualifications*

Tables 4.5 and 4.6 summarise the post-school qualifications held by individuals over the age of 15 in the predominantly indigenous settlements and the urban localities using the 2001 Australian Standard Classification of Education. It should be noted that data for the indigenous community in Derby were absent from the 2001 Indigenous Profiles.

The percentage of individuals over the age of 15 holding a post-school qualification shows a slight increase over the 1996-2001 period in the majority of predominantly indigenous settlements, with the exception of Bardi where post-school qualifications are limited to the Certificate level, which in the census includes certificates awarded at the I, II, III and IV Level.

The total percentage holding non-school qualifications in the towns of Roebourne and Wyndham was similar to the indigenous communities. The percentage of individuals over the age of 15 holding a post-school qualification in Western Australia as recorded by the census increased from 30.7% in 1996 to 34.7% in 2001. It can therefore be seen that the overall level of educational attainment shown above was well below the State average in both 1996 and 2001.

Table 4.5 Non-school Qualifications as Percentage of Population aged 15 or over 1996

<i>1996</i>	<i>Postgraduate degree</i>	<i>Graduate diploma / certificate</i>	<i>Bachelor degree</i>	<i>Advanced diploma / diploma</i>	<i>Certificate</i>	<i>Total</i>
Bardi	0	0	0	1.8	7.1	8.9
Beagle Bay	0	1.7	3.9	3.3	0	8.9
Kalumburu	1.4	0	1.4	0	4.3	7.1
La Grange	0	0	4.1	0.8	0.8	5.7

(Source: Australian Bureau of Statistics, 1996)

Table 4.6 Non-school Qualifications as Percentage of Population aged 15 or over 2001

<i>2001</i>	<i>Postgraduate degree</i>	<i>Graduate diploma / certificate</i>	<i>Bachelor degree</i>	<i>Advanced diploma / diploma</i>	<i>Certificate</i>	<i>Total</i>
Bardi	0	0	1.5	0	1.5	3.0
Beagle Bay	0	1.6	4.9	2.2	1.6	10.3
Kalumburu	2.9	0	3.8	1.4	3.3	11.4
La Grange	0.9	0.9	0.9	0	6.2	8.9
Roebourne	0	0	0	0	5.2	5.2
Wyndham	0	0	1.0	1.0	5.0	7.0

(Source: Australian Bureau of Statistics, 2001)

4.4 Conclusion

This chapter has presented an outline of the demographic and socio-economic characteristics of the Indigenous community within the North-west Marine Region as reflected by census profiles. Notwithstanding the potential errors associated with this method of enumerating the Indigenous population, there are certain characteristics which are evident from these data. All Indigenous profiles indicate a relatively young population distribution, particularly in the four Indigenous communities studied, although the proportion of individuals aged 15 or under remained constant or

decreased slightly between 1996 and 2001. Deriving conclusions from employment data is rendered problematic by the role of the CDEP and the classification of employment within these programmes, but it is evident that these programmes involve a large proportion of the Indigenous workforce in all locations. Indigenous residents of urban centres tend to be employed in a wider range of occupations with a higher degree of skills and training. However, educational attainment is shown to be problematic, with between a quarter and a third of school leavers under the age of 15.

5 REGIONAL FUTURES

5.1 Introduction

This chapter considers the future population scenarios for the Region against the background of economic expansion in a number of key sectors. It offers a brief review of the main drivers of economic development in the Region, before considering how these might shape the future size and distribution of the population. Of particular significance within the Region are three industries: Minerals and Petroleum, Agriculture and Tourism. The chapter also considers the role of the public sector activities and employment in driving population change, as well as some of the fledging industries.

5.2 Economic Development

5.2.1 Minerals and Petroleum Industries

Chapter 3 of this report suggested that the minerals and petroleum sector represented the single most important propulsive industry in the communities adjacent to the NWMR. It also indicated that there is a distinct geography to these industries, with much of the activity concentrated in the Pilbara. While other communities in the Gascoyne and the Kimberley have some minerals and petroleum activity, this is significantly overshadowed by the size and scope of activities in the Pilbara. In 2004, a study commissioned by the Western Australian Department of Industry and Resources provided insights into the expansion and future scenarios for minerals and petroleum in the Pilbara (see SMEC, 2004).

This report found that iron ore production has grown at around 13% per annum and is likely to double over the next 20 years. Iron ore processing is considered likely to expand in the next decade, although the majority of ore will still be exported in a raw state. Oil and gas production, which currently exceeds the equivalent of 260 million barrels per annum will continue to increase. In terms of natural gas, growth in production of between 3% and 7% per annum is likely. By 2020, LNG production is

expected to rise to around 33 million tonnes per annum (from around 11 million tonnes per annum in 2005). The report found that the economic and social impacts of the expansion of minerals and petroleum industries were likely to be concentrated in the towns of Karratha, Port Hedland and Dampier, with some spill-over effects contributing to growth in Wickham and Roebourne.

In addition to the new ammonia plant on the Burrup Peninsula, there is potential for a range of gas processing industries, including a gas-to-liquids plant, a dimethyl ether plant and a methanol plant. More than 5% of the world's salt supply is from the Pilbara, though this is likely to remain steady. Other small but expanding minerals industries include manganese and chromite ores, copper and nickel.

In the Kimberley, the level of minerals and petroleum activity is more modest, though still has the potential to have a significant impact on the population and socio-economic structure of communities adjacent to the coast. The Region has small reserves of copper, tungsten, tin, gold, zinc and lead, with more substantial iron ore, bauxite and diamond deposits. Indeed, the Argyle diamond mine near Kununurra is arguably one of the country's most well known mineral resources. In terms of other current and future activities, the most significant include the expansion of iron ore mining on Cockatoo and Koolan islands, the existence of significant undeveloped bauxite resources on Cape Bougainville, the Mitchell Plateau and East Kalumbaru and significant zinc and lead deposits at Admiral Bay, south of Broome. There is also significant potential for the development of petroleum resources in the Browse and Bonaparte basins, off the Kimberley coast. These resources are estimated to be around half the volume of those in the Carnarvon Basin off the Pilbara coast (ACIL Tasman Pty Ltd and Worley Parsons, 2005). Finally, the Ellendale Diamond Project, near Derby produces around 200,000 carats per annum.

The Gascoyne region is generally regarded as having extremely modest minerals and petroleum potential. In 2006, it produced just 0.2% by value of that extracted in the Pilbara (Department of Industry and Resources, 2007). The bulk of the income in the Region was derived from salt and gems, with small deposits of gypsum and limestone also extracted. While there have been numerous efforts to identify petroleum

resources in the area, there has been no identified commercially recoverable reserves in the coastal region of the Gascoyne.

5.2.2 *Agriculture*

The agricultural sector on the coast adjacent to the NWMR is dominated by two forms of production: extensive pastoralism and intensive irrigation agriculture. Extensive pastoralism is a mature industry that has experienced increasing economic and environmental challenges over the past two decades (Holmes, 2002). The response of many pastoralists has been to diversify production in order to decrease their dependence on the staples of sheep (particularly in the Gascoyne and Pilbara) and, to a lesser extent, cattle. There has been a corresponding increase in the production of goats and some native animals, such as kangaroos and emus (Holmes, 2002). The industry's main interaction with coastal settlements is as service centres or as avenues for the export of commodities through ports. In 2005-6, for example, the Port of Broome exported 22,306 tonnes of livestock to destinations in South-east Asia, representing the fourth largest livestock exporting port in Australia (Association of Australian Ports and Maritime Authorities, 2007). In general terms, the industry is unlikely to change to any significant degree in terms of its size or structure.

Intensive irrigation agriculture is concentrated in Carnarvon on the Gascoyne River and in Kununurra on the Ord River. In Carnarvon, there are approximately 161 holdings occupying 1,020 hectares of land. Vegetables are grown on about 570ha, 350ha are planted to bananas, and 100ha to tree fruits (Shire of Carnarvon, 2007). The diversity of the produce grown in the area is considerable, some being tropical fruits, paw paw, mangoes, citrus, stone, avocados, grapes and vegetable crops such as tomatoes, beans, capsicums and asparagus. The gross value of production in the area is around \$51.3m per annum. Intensive agriculture in Carnarvon is a mature industry, and is unlikely to experience significant changes in size or scope over the foreseeable future.

In contrast to Carnarvon, the irrigation industry in Kununurra is likely to expand considerably over the coming decades with the implementation of Stage 2 of the Ord River Irrigation Area scheme. This will increase the area under production from

around 11,500 hectares to more than 30,000 hectares, of which just over 53 per cent lies in Western Australia (Department of Industry and Resources, 2007). In addition to vegetables, fruit, sugar, and cotton, the area has the potential to support livestock on irrigation fed pasture, plantation forestry, and broadacre crops such as leucaena. The development of this scheme is likely to contribute to continuing population and economic growth in Kununurra and, to a lesser extent, Wyndham through the presence of port facilities. Two other proposed agricultural activities in the Kimberly include the development of a tropical timber plantation at Beagle Bay, with logs to be transported to the Port of Broome and irrigation agriculture on the Fitzroy River, with cotton being the main commodity. The latter proposal was rejected by the State government in 2004, yet it is still regarded as a long term prospective industry (ACIL Tasman Pty Ltd and Worley Parsons, 2005).

5.2.3 *Tourism*

Tourism is a major growth industry in many of the coastal communities adjacent to the NWMR. The Gascoyne has experienced modest growth, with the number of tourists expected to increase from 1.82 million visitor nights in 2005 to 2.27 million visitor nights in 2007 (Tourism Western Australia, 2006a). Much of this growth will be concentrated around the Ningaloo coast, with considerable development affecting Exmouth and Carnarvon. Coastal tourism in the form of camping is likely to remain extremely popular between Carnarvon and North West Cape (Lawrie, 2007). Growth is also expected in the Shark Bay and Kalbarri areas. Growth in the Pilbara is likely to be more limited than in the Gascoyne, with Tourism Western Australia (2006b) expecting an increase from 2.3 million visitor nights in 2005 to 2.57 million in 2015. Limited 'hallmark' tourism attractions is one of the resources for the low rate of growth. Tourism expansion in the Kimberly is expected to be higher than in the Pilbara, increasing from 2.3 million visitor nights in 2006 to 2.61 million in 2015 (Tourism Western Australia, 2006c). Much of the expected growth will be concentrated in Broome, with some expansion likely in Kununurra.

5.2.4 *Other Industries*

There are a number of other industries that are likely to play a role in shaping the future of the coastal communities in the North-west Marine Region. Commercial fishing is concentrated in the larger settlements of the Region. Much of the evidence suggests that employment in commercial fishing is relatively stable, or experiencing gradual decline (Huddleston, 2006). Accordingly, commercial fishing is unlikely to be a major force in driving population change in the Region.

Aquaculture has expanded in a number of areas in the Region (Fletcher and Head, 2006). In the Gascoyne, aquaculture licenses are concentrated in the Shark Bay and Exmouth Gulf areas, with pearl farms also prominent in the latter. In the Pilbara, aquacultural activity is concentrated around Onslow, Dampier and Port Hedland. Pearl farming is concentrated around the Montebello Islands. In the Kimberley, aquaculture is an expanding industry and scattered along much of the coast, while pearl farms are concentrated in the Buccaneer Archipelago and in Roebuck Bay. While in overall terms the industry is small, there does appear to be some scope for modest expansion in the future.

The public sector, while not strictly speaking an industry, is an important component of the economy. Continuing growth in other sectors will fuel further expansion in the public sector employment base, particularly in health, education, social services and local government. Much of this employment growth is likely to be concentrated in the larger regional centres.

5.3 **Future population trends**

Given the growing economic and social complexity of the NWMR, forecasting future population growth is extremely problematic. Longer term growth patterns will be determined by a range of factors, including global commodity prices, international and national competition, global and national interest rates, exchange rates, trade policy, and geopolitics. Local factors will also be significant, such as the availability of high quality services in the Region, infrastructure constraints, the extent to which employment is on a fly-in/fly-out basis, and the cost of transport.

Notwithstanding these issues, population predictions are available for the Planning Regions and Local Government Areas (LGA) within Western Australia from 2004 to 2031 (Western Australia Planning Commission, 2005) based upon the medium scenario projections calculated by the Australian Bureau of Statistics. The Planning Regions are equivalent to the sub-regions and the LGA boundaries in these projections are contiguous with the SLA boundaries used elsewhere in this report. Tables 5.1 and 5.2 detail the forecasted population at 5 year intervals for the sub-regions of the North-west Marine Region derived from the WAPC report.

Table 5.1 Forecasted Population Totals by Sub-region within the North-west Marine Region

<i>Sub-region</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>
Gascoyne	10500	11100	11200	11400	11500	11300
Pilbara	42100	44200	46200	48000	49000	50000
Kimberley	37200	43600	50100	56600	63000	69200
<i>Western Australia</i>	<i>2016500</i>	<i>2177600</i>	<i>2343400</i>	<i>2503800</i>	<i>2651900</i>	<i>2778100</i>

(Source: Western Australia Planning Commission, 2005)

Table 5.2 Forecasted Percentage Change in Population by Sub-region within the North-west Marine Region

<i>Sub-region</i>	<i>2005-10</i>	<i>2010-15</i>	<i>2015-20</i>	<i>2020-25</i>	<i>2025-30</i>
Gascoyne	5.7	0.9	1.8	0.9	-1.7
Pilbara	5.0	4.5	3.9	2.1	2.0
Kimberley	17.2	14.9	13.0	11.3	9.8
<i>Western Australia</i>	<i>8.0</i>	<i>7.6</i>	<i>6.8</i>	<i>5.9</i>	<i>4.8</i>

(Source: Western Australia Planning Commission, 2005)

These forecasts underline the differing projected population trends within the Region, with the Gascoyne being marked by a stable or declining population, the Pilbara undergoing growth slightly below the State average whilst the Kimberley is forecast to experience higher than average growth over the next 25 years, increasing its share of the Region's population from 41% to 53%. The average rate of annual population growth in the Kimberley of around 3% is exceeded at the State level only by the Peel region. Table 5.3 summarises the percentage change in age cohorts from the 2001 census to the predicted age distribution in 2030 for each sub-region.

Table 5.3 Forecasted Change in Percentage of Population within Age Groups by Sub-region 2001-2030

<i>Sub-region</i>	<i>% of population</i>		
	Under 15	15-64	Over 64
Gascoyne	1.4	-1.6	2.6
Pilbara	0.7	3.3	1.9
Kimberley	1.0	4.9	0.7
<i>Western Australia</i>	<i>-5.0</i>	<i>-3.0</i>	<i>8.0</i>

(Source: Western Australia Planning Commission, 2005)

This highlights the growth in the population of working age in the Kimberley and, to a lesser extent, the Pilbara, whilst the Gascoyne and the Pilbara indicate an increase in the proportion of the population over 64 years of age. The increase in the population of working age in the Kimberley and the Pilbara is in stark contrast to predictions for Western Australia as a whole, whilst the predicted ageing of the State population overall is present to a lesser extent in the sub-regions of the NWMR.

At the State level, forecasted trends in population over the period up to 2030 are associated with factors such as proximity to coastal areas and urban centres and the presence of significant numbers of Indigenous people. The latter factor is evident at the sub-regional level with regards to the Kimberley, which contains an estimated 47% Indigenous population as a whole (Kimberley Development Commission, 2006). This sub-region also exhibits the lowest median age of around 28-29 and an associated higher child dependency ratio than all other planning regions in the State.

Table 5.4 Forecasted Population Totals in SLA's within the North-west Marine Region

<i>SLA</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>
Ashburton	5,900	6,000	6,000	6,000	5,800	5,700
Broome	15,100	17,500	20,100	23,200	26,200	29,200
Carnarvon	6,700	7,100	7,200	7,300	7,300	7,200
Derby West						
Kimberley	9,300	11,300	13,300	14,800	16,400	17,700
Exmouth	2,400	2,500	2,500	2,500	2,500	2,500
Port Hedland	13,300	14,300	15,000	15,700	16,300	16,700
Roebourne	15,400	16,200	17,700	19,100	20,300	21,300
Wyndham East						
Kimberley	8,300	9,600	10,600	11,600	12,700	13,600
<i>Western Australia</i>	<i>2,016,500</i>	<i>2,177,600</i>	<i>2,343,400</i>	<i>2,503,800</i>	<i>2,651,900</i>	<i>2,778,100</i>

(Source: Western Australia Planning Commission, 2005)

Table 5.5 Forecasted Percentage Change in Population in SLA's within the North-west Marine Region

<i>SLA</i>	<i>2005-10</i>	<i>2010-15</i>	<i>2015-20</i>	<i>2020-25</i>	<i>2025-30</i>
Ashburton	1.7	0.0	0.0	-3.3	-1.7
Broome	15.9	14.9	15.4	12.9	11.5
Carnarvon	6.0	1.4	1.4	0.0	-1.4
Derby West Kimberley	21.5	17.7	11.3	10.8	7.9
Exmouth	4.2	0.0	0.0	0.0	0.0
Port Hedland	7.5	4.9	4.7	3.8	2.5
Roebourne	5.2	9.3	7.9	6.3	4.9
Wyndham East Kimberley	15.7	10.4	9.4	9.5	7.1
<i>Western Australia</i>	<i>8.0</i>	<i>7.6</i>	<i>6.8</i>	<i>5.9</i>	<i>4.8</i>

(Source: Western Australia Planning Commission, 2005)

Tables 5.4 and 5.5 summarise population predictions at the SLA level using data published in the WAPC report. These figures indicate that Broome, Derby West Kimberley and Wyndham East Kimberley are forecast to undergo the most significant increases in population, amounting to 93%, 90% and 63% respectively over the period 2005-30. Ashburton, Carnarvon and Exmouth are predicted to experience negligible increases in population amounting to around 5% over this period, in comparison to an increase of 37% for Western Australia as a whole. The rate of growth is forecast to decline in all cases after 2015.

These population predictions are not replicated by the WAPC at the urban locality level, owing to the increased uncertainties associated with forecasting population in smaller centres, which are magnified by economic activity and migration at the local scale. However, broad estimates can be made using the 2001 census figures for each urban locality and applying the relevant factor of population increase derived from the appropriate SLA. This generates indicative population totals outlined below.

Table 5.6 Forecasted Population of Urban Localities in the North-west Marine Region. Data from 2005 onwards are predictions

	<i>2001</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>
Broome	15,906	16,564	19,197	22,049	25,450	28,740	32,031
Carnarvon	7,273	7,273	7,707	7,816	7,924	7,924	7,816
Derby	3,688	3,811	4,630	5,450	6,065	6,720	7,253
Exmouth	3,137	3,273	3,410	3,410	3,410	3,410	3,410
Karratha	10,796	10,867	11,431	12,489	13,477	14,324	15,030
Kununurra	5,485	5,691	6,582	7,268	7,953	8,707	9,325
Port Hedland	12,776	13,071	14,054	14,742	15,429	16,019	16,412

It must be stressed that the above figures represent hypothetical population data. This is underlined by the fact that there are dissimilarities in data presented in tables 5.4 and 5.6 with regards to urban locality and SLA population predictions, with the former often exceeding the latter. This is due to predictions at the SLA level for 2004-2030 being based upon estimated resident population data for 2003, which is not available at the urban locality level. In order to derive data at the urban locality level, the rate of population increase calculated for each SLA from 2004-05 was applied to the most recent population data for the urban localities which is the 2001 census, which will inevitably lead to different predicted population totals. However, this does give some indication as to the likely comparative populations of settlements and their rankings within the North-west Marine Region, but should not be interpreted as quantitatively reliable.

Bearing these caveats in mind, table 5.6 demonstrates that the overall ranking of urban localities by population remains largely the same, but there is an increasing primacy of urban centres, with Broome becoming the major urban settlement within the Region. Karratha and Port Hedland are predicted to be equivalent in population terms by 2030. Although smaller localities such as Derby and Kununurra are predicted to experience a significant increase in population, they remain relatively small in comparison to Broome, Karratha and Port Hedland. Carnarvon and Exmouth are predicted to remain static in total population terms.

These trends in population distribution will have significant impacts for regional planning in terms of housing and service provision, with increasing pressure for housing development and tourism-related facilities in Broome in particular. Locations such as Port Hedland which are characterised by a higher proportion of short term or fly in fly out workers will experience continuing increased demand for company housing rental, with associated costs impacting upon the cost of private rental. The natural ageing of the population in association with retirees will be increasingly evident in the towns of Carnarvon and Exmouth, with associated demands on service provision for this cohort. The proportion of indigenous population in centres such as Derby will continue to increase under current trends in birth rates, with implications for employment and service provision.

5.4 Conclusion

It is evident that the minerals sector will continue to provide the base for economic activity within the Region as a whole, although its scope and effects will continue to be largely focused within the Pilbara. The prospects for expansion of the iron ore and offshore oil and gas sectors in terms of resource availability, prices and markets are encouraging, particularly for the iron ore sector, and are reflected in the plans for private sector investment in this sub-region. There is scope for diversification and expansion of the minerals base in the Kimberley, which will be augmented by the agricultural benefits associated with the Ord River irrigation scheme. By contrast, the Gascoyne is considered to be increasingly reliant on tourism as a driver of economic growth, although this continues to rely largely upon the attractions of a limited number of hotspots which are already under considerable visitor pressure, underlining the need for careful management to maintain their position. Population growth is forecast to result in an increasing primacy of Broome as the Regional centre, whilst industrial towns such as Port Hedland and Karratha will continue to benefit from investment associated with the minerals sector. By contrast, the major coastal towns of the Gascoyne are predicted to experience a relative decline in population, which will have evident implications in terms of maintaining levels of service provision in these settlements.

6 CONCLUSION

This Report has provided an overview of the demographic and socio-economic characteristics of the North-west Marine Region. It is anticipated that these diverging patterns of development will be reinforced and in some cases accentuated following the publication of data from the 2005 census. Overall, this Report underlines the consequences of the recent expansion of the minerals sector and iron ore in particular on the demographic and economic attributes of the Pilbara, which are reflected in various indices of welfare, affluence and occupational structure. However, the fact remains that this growth is largely based upon private sector investment in a narrow resource base and as such is inevitably susceptible to uncertainty in terms of future levels of growth. The Kimberley sub-region is characterised by a broader economic base supported by the presence of service industries which is driven to a large extent by the primacy of Broome as the Regional centre. Future population growth in this sub-region is also sustained to some extent by the presence of a significant Indigenous population. By contrast, the coastal towns of the Gascoyne are characterised by a stable, non-Indigenous and ageing population, with an employment base centred largely upon agriculture, tourism and related industries.

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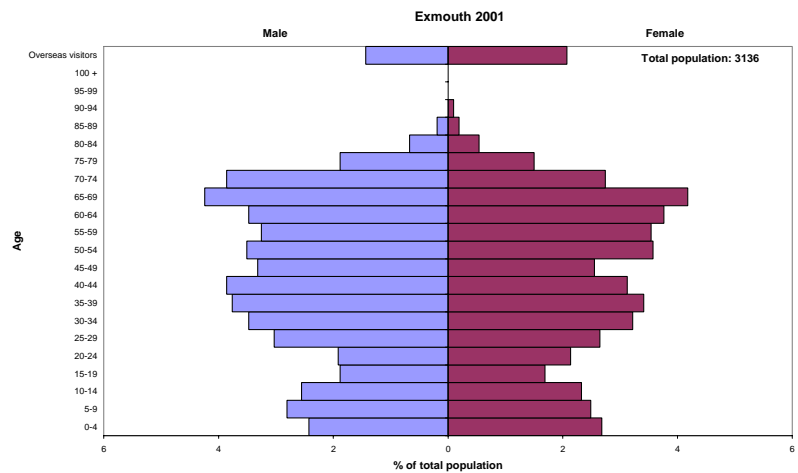
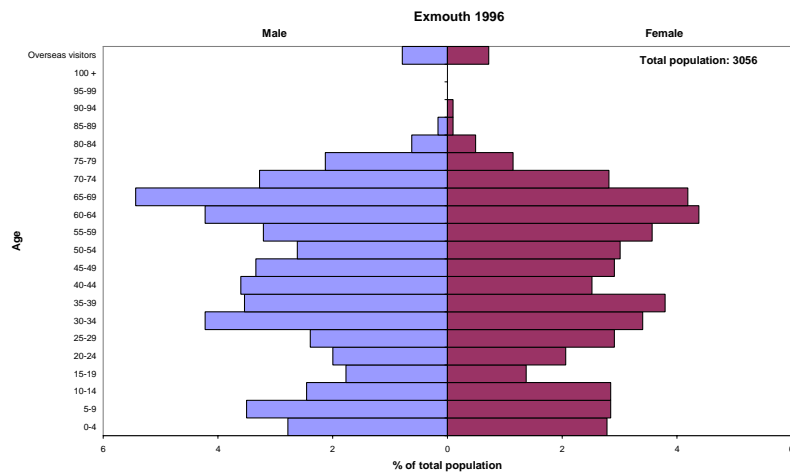
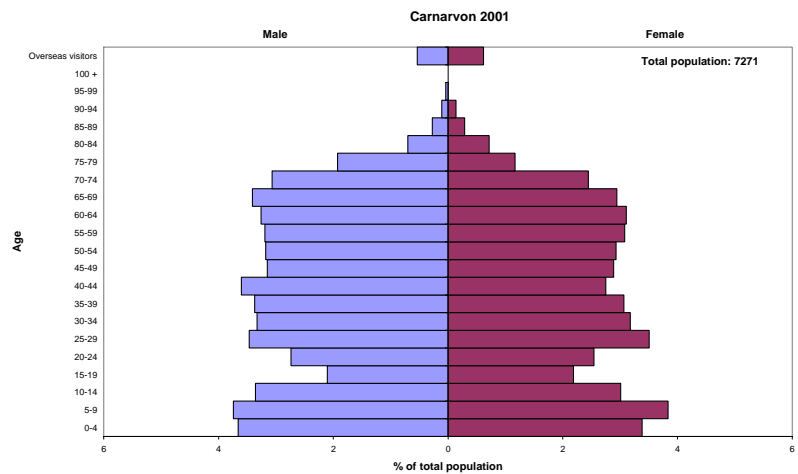
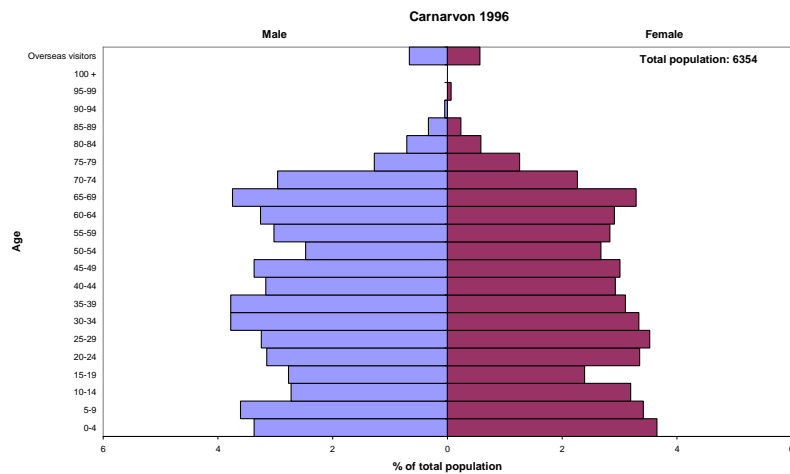
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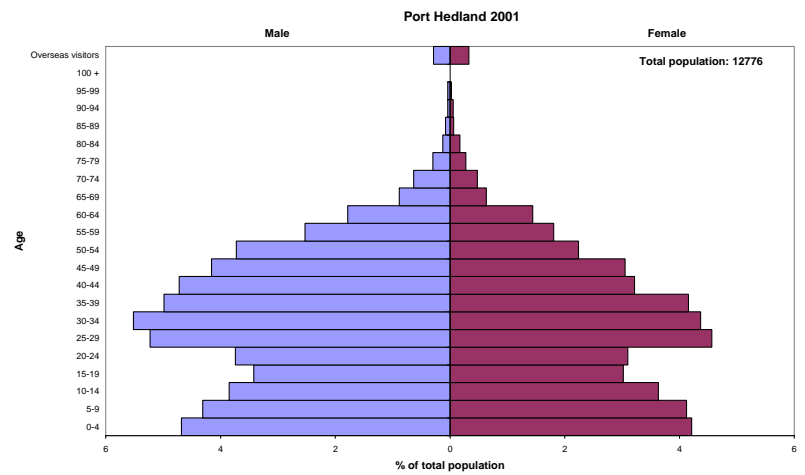
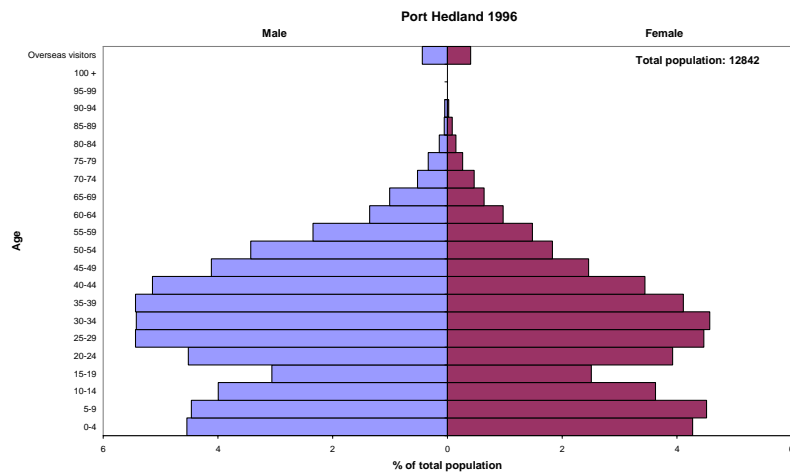
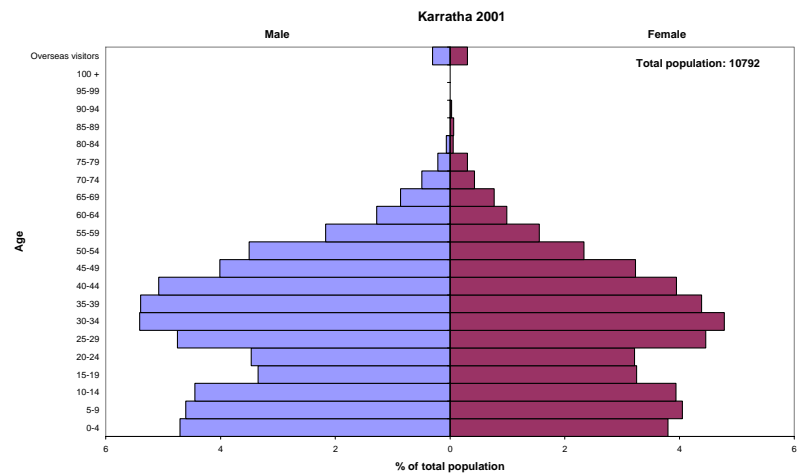
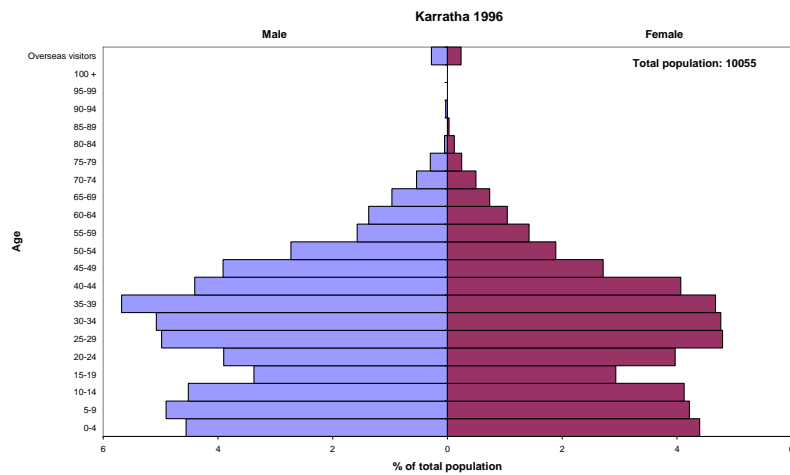
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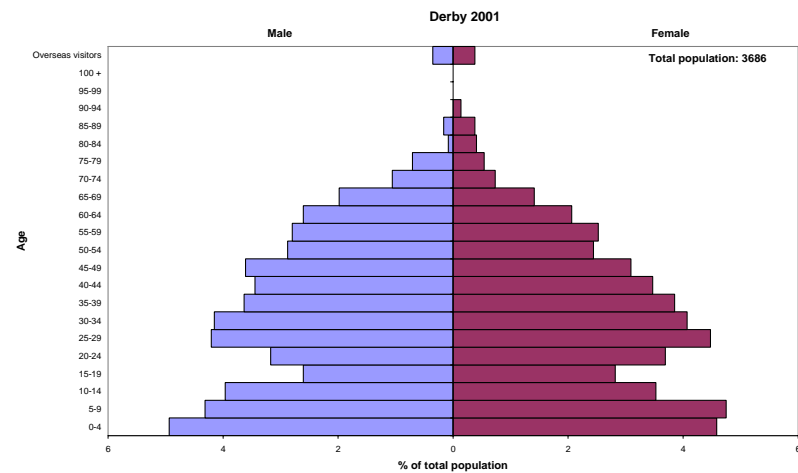
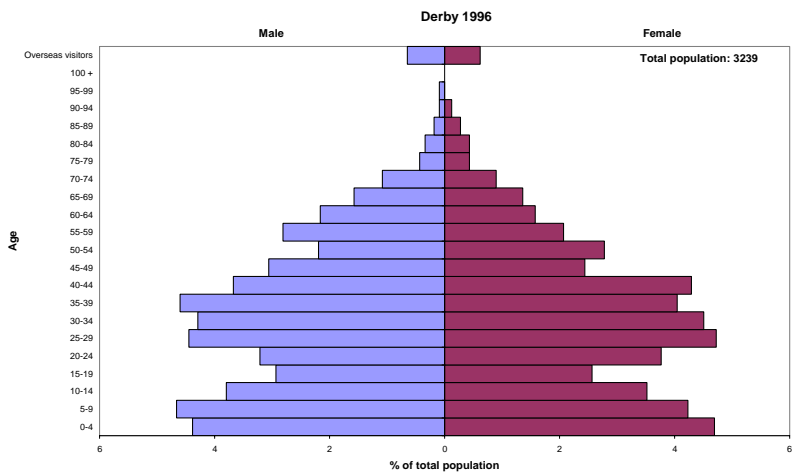
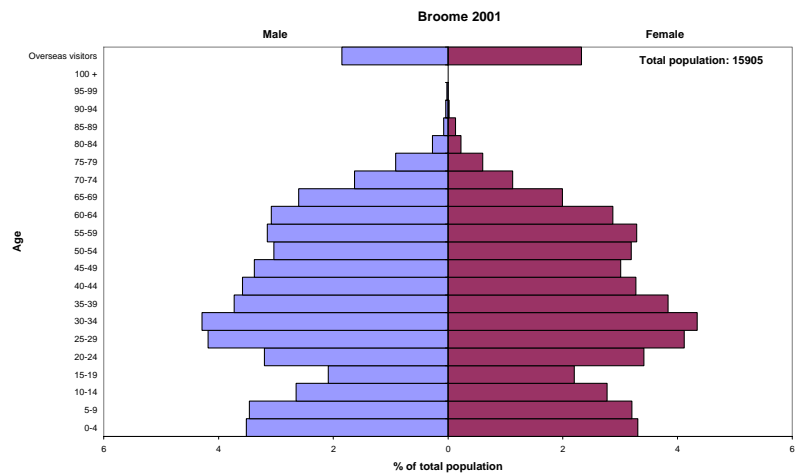
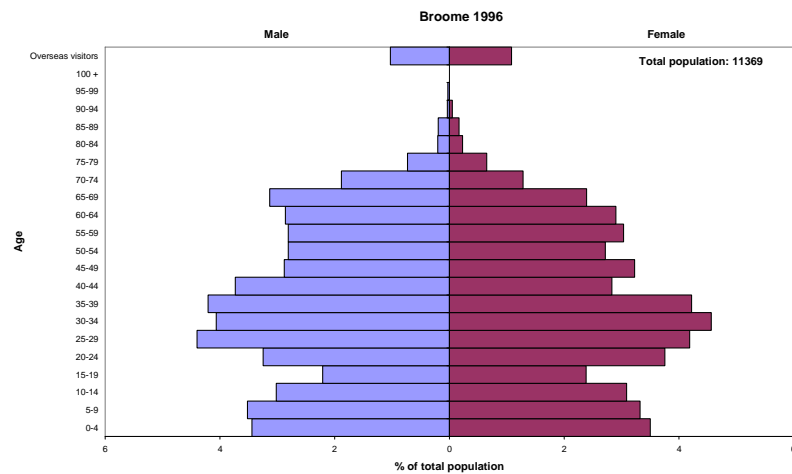
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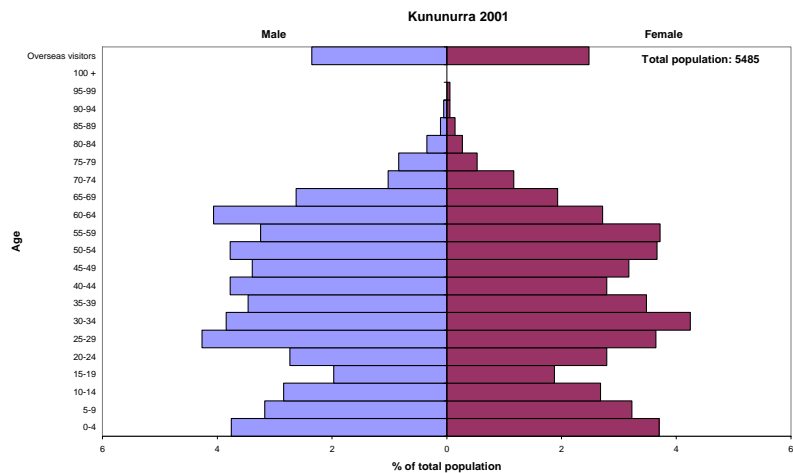
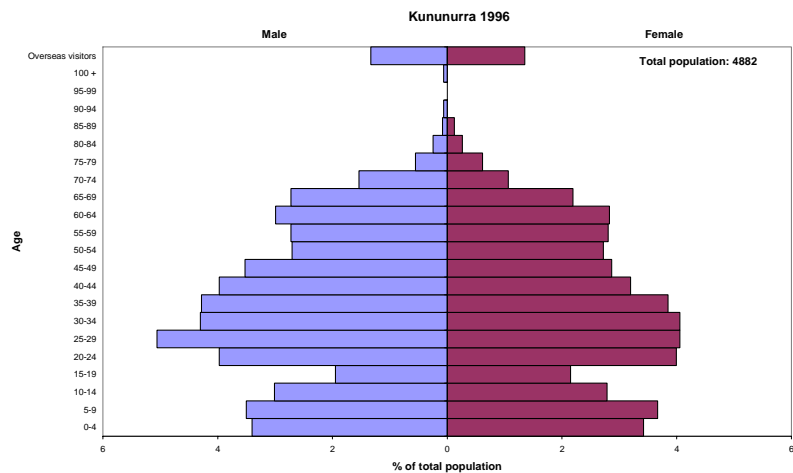
APPENDIX 1

POPULATION PYRAMIDS FOR REGIONAL CENTRES IN THE NWMR



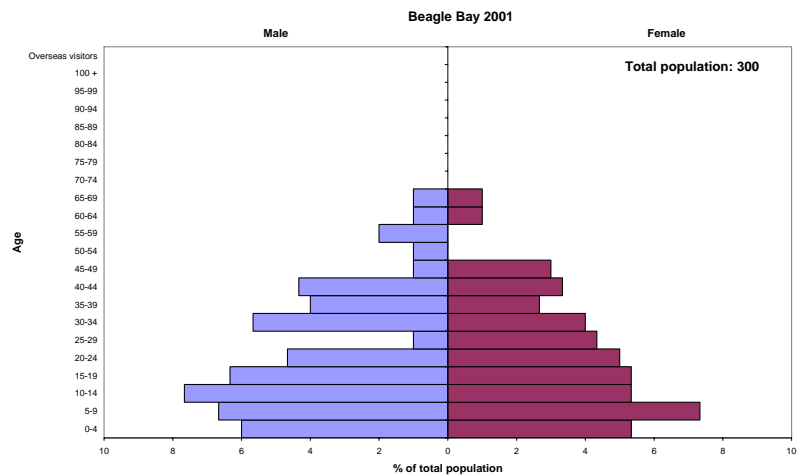
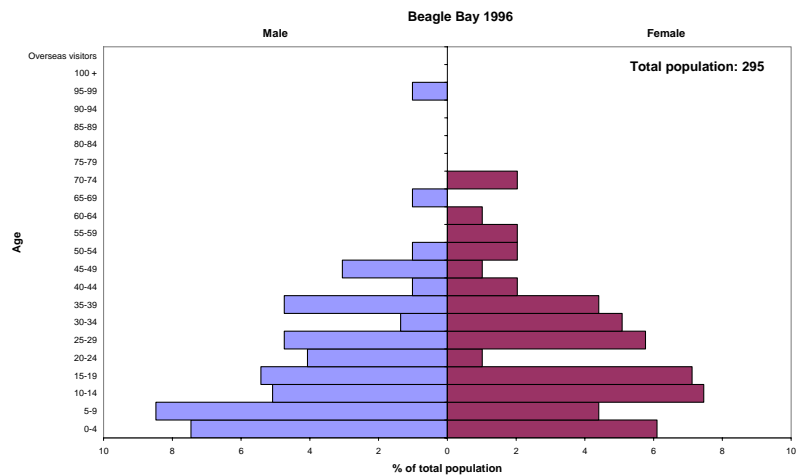
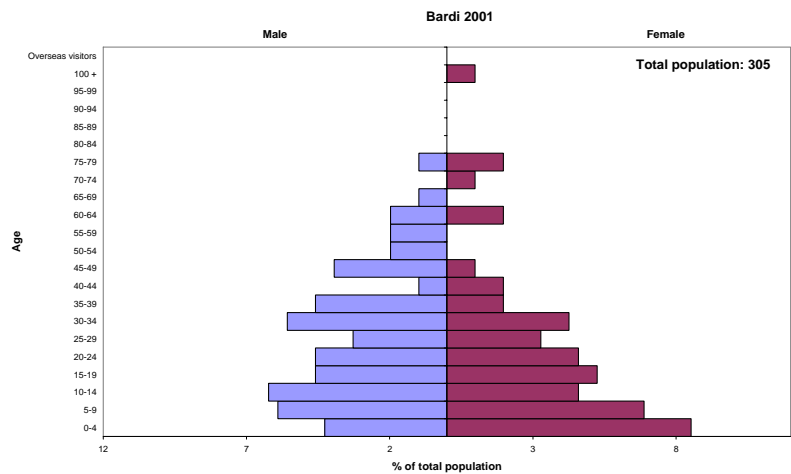
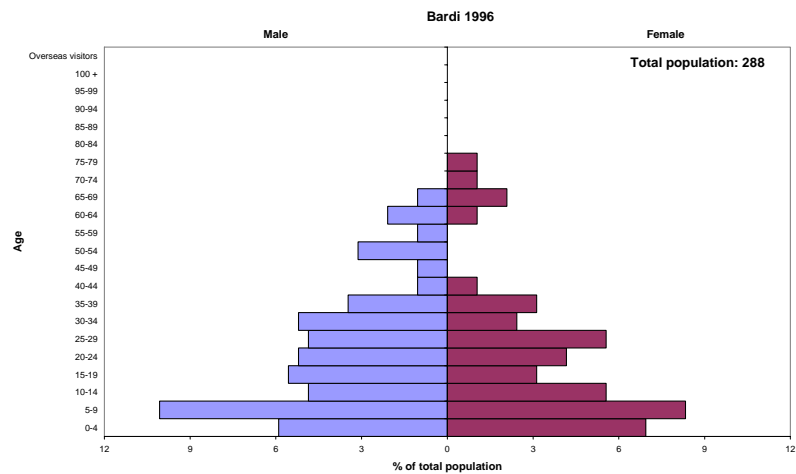


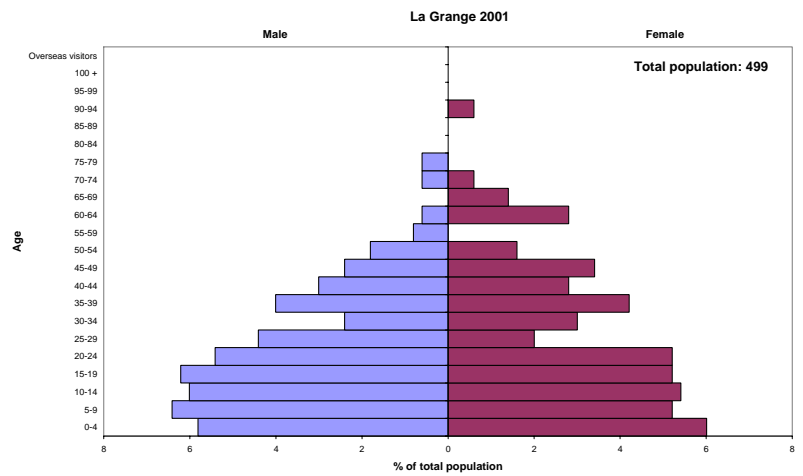
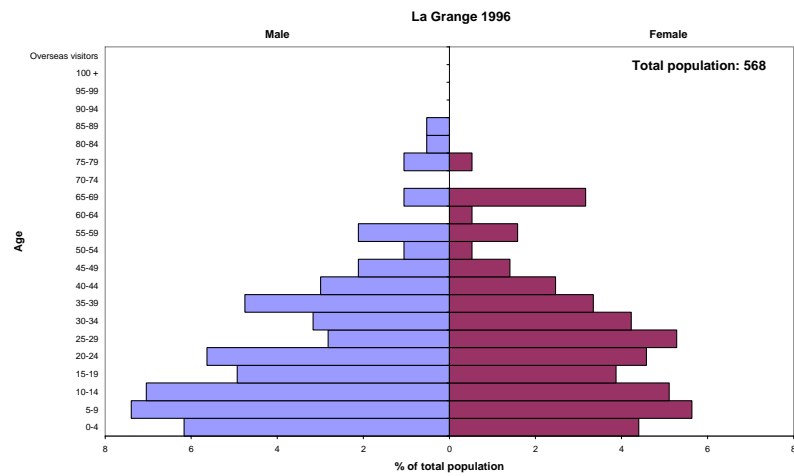
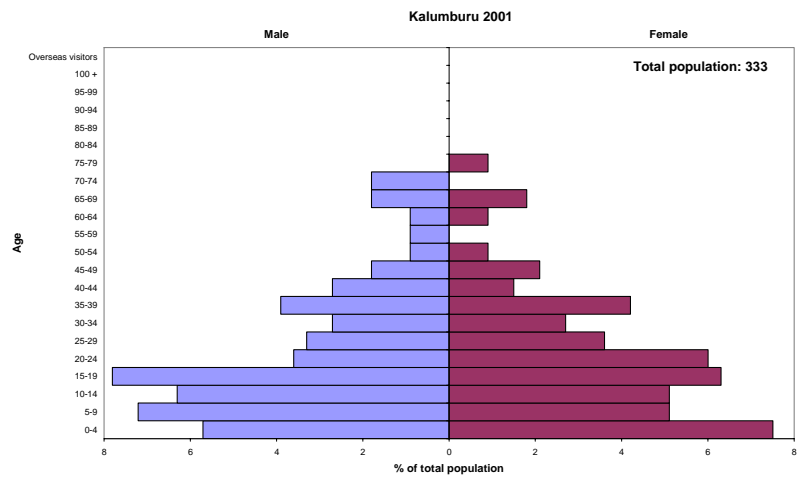
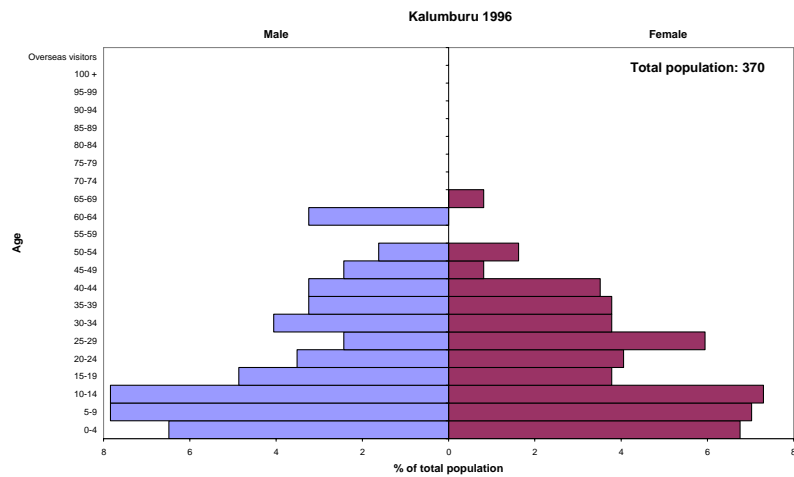


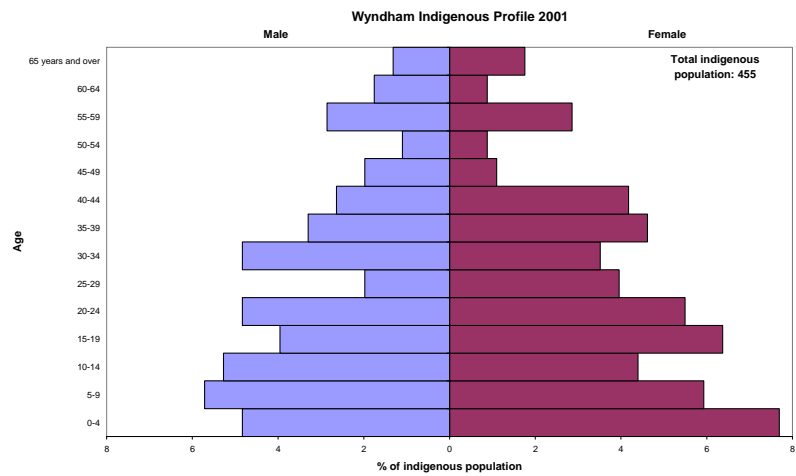
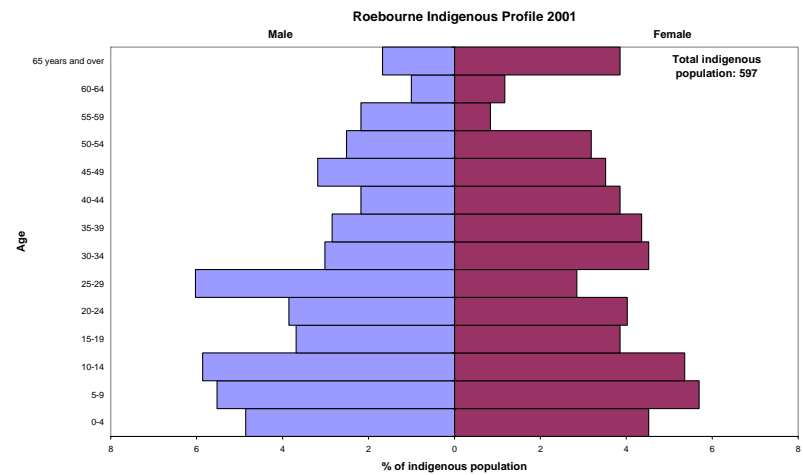
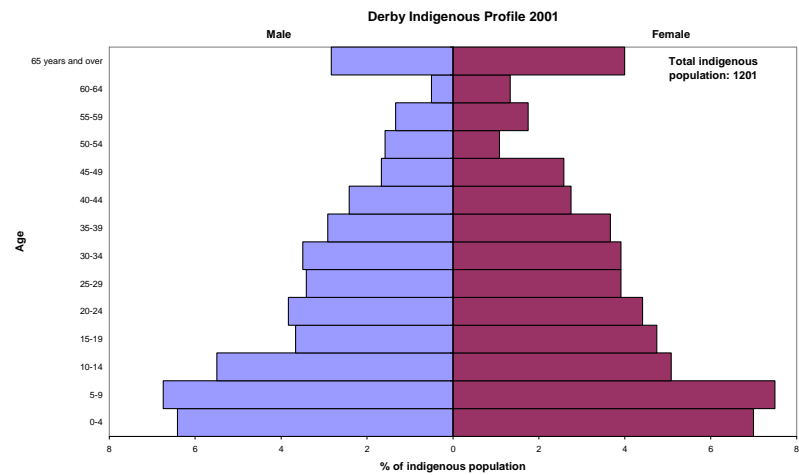


APPENDIX 2

POPULATION PYRAMIDS FOR INDIGENOUS COMMUNITIES IN THE NWMR







APPENDIX 3

INDUSTRY AND OCCUPATION STRUCTURE FOR PREDOMINANTLY INDIGENOUS SETTLEMENTS AND URBAN LOCALITIES WITH SIGNIFICANT INDIGENOUS POPULATION 1996 AND 2001

