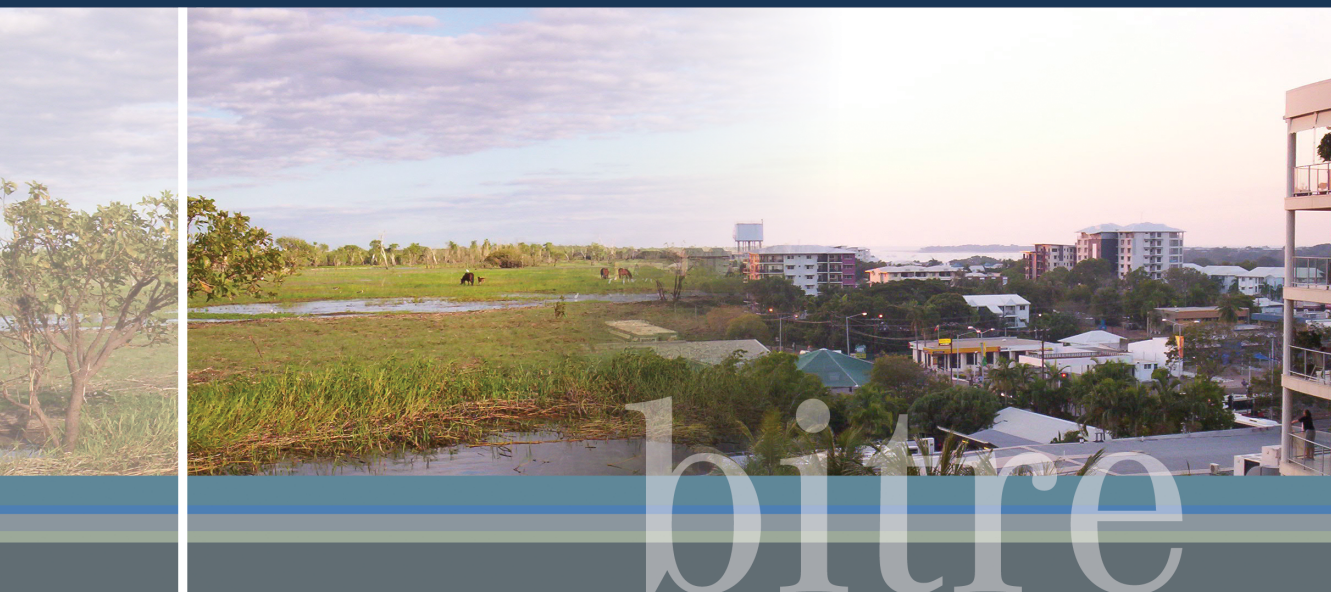




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Bureau of Infrastructure, Transport and Regional Economics



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statistical compendium
2009

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statistical compendium 2009**

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Foreword

The *Northern Australia Statistical Compendium 2009* was prepared by BITRE with the assistance of the Office of Northern Australia, with the aim of compiling a base of factual information that would contribute to improved understanding of the economic and social developments in this region. The compendium discusses essential characteristics of Northern Australia and offers comparisons with the rest of Australia, wherever possible. It provides information on population, the economy, employment, social conditions, education, transport, infrastructure, climate, land use and major industries for Northern Australia as a whole and for the regions within it.

The compendium is intended to support fact-based policy dialogue and formulation of policies conducive to economic development and social wellbeing. It is published in two formats: electronically and in print. The electronic version is available on the Internet and on compact disc. It includes detailed background data in addition to the overview paper. This allows for more detailed information to be provided on each of the regions, particularly at the statistical local area (SLA) and urban centre localities (UCL) level.

This project was led by Adam Malarz and Geoff Frost, with Jan Anderson-Muir and Olivia Waugh. Gary Dolman provided executive supervision and support.

Phil Potterton
Executive Director
May 2009

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At a glance

- Northern Australians represented 4.7 per cent of the total Australian population in 2006. The majority of people within Northern Australia live in the northern regions of Queensland.
- The population of many Northern Australian regions is younger than that of Australia as a whole.
- Indigenous people comprise a relatively large proportion of the Northern Australian population (14.3 per cent), as compared with the whole of Australia (2.3 per cent).
- Northern Australia's recent economic performance to 2005–06 can be broken down into three distinct phases: a growth phase from 1990–91 until 1995–96; a phase of stagnation and decline from 1995–96 until 2000–01; and then a phase of resource-driven growth from 2000–01.
- Employment grew faster in Northern Australia between the 2001 and 2006 census (11.4 per cent) than it did across Australia (9.7 per cent).
- In Northern Australia in 2006, 5.8 per cent of employees worked in mining, and 10.1 per cent of employees worked in government administration and defence. By comparison, across Australia as a whole, 1.2 per cent of employees worked in mining, and 5.5 per cent of employees worked in government administration and defence.
- In 2006, relatively few Northern Australians were employed in the manufacturing sector (7.0 per cent), and in finance, insurance, property and business services (9.1 per cent). By comparison, across Australia as a whole, the manufacturing sector employed 11.1 per cent of workers, and finance, insurance, property and business services employed 14.7 per cent of workers.
- Exports via Northern Australian ports grew faster than the total tonnage of Australia's exports and represented 56.3 per cent of total tonnage and 21 per cent of value of Australian exports via sea ports in 2007–08.
- In education, the proportion of people to have completed Year 12 or equivalent in Northern Australia (27.3 per cent) was well below the Australian average (33.9 per cent).
- The proportion of health workers is lower across Northern Australia (2775 per 100 000) than Australia as a whole (3102 per 100 000), especially in parts of northern Western Australia and northern Queensland.
- The availability of the Internet in Northern Australia (62.3 per cent of households had access) was lower than in the rest of Australia (64.6 per cent of households had access). Fewer Northern Australian households had broadband access (34.4 per cent) than across Australia generally (39.2 per cent). Meanwhile, more households had dial-up Internet access in Northern Australia (23.3 per cent) than across Australia (21.5 per cent).

- Regular passenger transport, charter and other flying services are used relatively more frequently in Northern Australia than in the rest of Australia due to large distances and specific employment practices in that region, such as 'fly-in, fly-out'.
- Electricity supply in Northern Australia is based largely on local gas-fired generators.
- Water resources and storage in Northern Australia are strongly concentrated around the coastline with major water reserves in the Kimberley Region and north-east Queensland.
- Fifty per cent of Australia's rain falls in Northern Australia.
- On average, 13 cyclones occur in Australia each year, although many do not make landfall. The majority of cyclone activity across Australia occurred within regions in Northern Australia, particularly around north-east Queensland and north-west Western Australia.
- Tourism is an important industry in Northern Australia. Although the region had 4.7 per cent of Australia's resident population in 2005, it also had a 16.9 per cent share of international tourist overnight stays and a 7.5 per cent share of domestic tourist overnight stays that year. Most tourist visits occurred in the northern regions of Queensland, followed by the Northern Territory.

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Executive summary



Executive summary

Background

This statistical compendium is a collection of data relating to that region north of the Tropic of Capricorn, named 'Northern Australia' by the Australian Government at the inception of its Office of Northern Australia. In addition to tabulated and graphed statistical data, the compendium discusses essential characteristics of the region and provides comparisons with the rest of Australia, wherever possible. The compendium provides information on population, economy and workforce, social conditions, education, transport, infrastructure, climate, land use and major industries in the region.

Population

1. Population, population growth rates and density

- Northern Australians represented 4.7 per cent of the total Australian population in 2006. The majority of people within Northern Australia (70.5 per cent) live in the northern regions of Queensland.
- Northern Australia exhibits a pattern of small, but relatively highly concentrated population areas, surrounded by large, sparsely populated areas. Within Northern Australia, Queensland is generally more densely populated than the northern regions of the Northern Territory and Western Australia.

2. Ethnicity, age and sex

- A relatively large proportion of the Northern Australian population is Indigenous (14.3 per cent) compared to that of the whole of Australia (2.3 per cent). In Northern Australia, 12.4 per cent of people were born overseas, compared with 22.2 per cent of Australians generally.
- There are more young people (22.9 per cent aged 0–14) and fewer old people (3.4 per cent aged 75 and over) within Northern Australia, compared with the rest of Australia (19.6 per cent and 6.2 per cent respectively), and working age males often outnumber working age females.

Economic activity

1. Economic growth

- Northern Australia's recent economic performance can be broken down into three distinctive phases: a growth phase from 1990–91 until 1995–96; a phase of stagnation and decline from 1995–96 until 2000–01; and then a final phase of resource-driven growth from 2000–01 until 2005–06.
- The economy of Northern Australia is strongly linked to the mining and natural resources markets.

2. Employment by industry

- Relative to Australia, the industries of mining, government administration and defence were larger employers in Northern Australia. Less people were employed by the industries of manufacturing, finance, insurance, property and business services in Northern Australia in comparison with the rest of Australia.
- In Northern Australia in 2006, 5.8 per cent of employees worked in mining, and 10.1 per cent of employees worked in government administration and defence. By comparison, across Australia as a whole, 1.2 per cent of employees worked in mining, and 5.5 per cent of employees worked in government administration and defence.
- An increase in employment was observed across almost all industries in Northern Australia between 2001 and 2006, the largest increase being in construction, primarily due to the substantial expansion of minerals projects in northern Queensland, the Pilbara Region (Western Australia) and LNG projects in Darwin-East Arnhem (Northern Territory).

3. Income

- The most frequently observed median individual income for Northern Australia (\$200–250 per week) indicates that many Statistical Local Areas (SLA) have a high number of people earning a low income.
- The income statistics also reveal a greater number of males earning a higher weekly income and a greater number of females earning an income in the lower income brackets.
- Broadly speaking, much of Northern Australia had a higher dependence on wage and salary income (84.5 per cent) than Australia as a whole (79.2 per cent) and a comparatively lower dependence on superannuation, annuities and investments (1.7 per cent in Northern Australia compared with 3.2 per cent in Australia).

Workforce

1. Employment, unemployment, labour force size and participation rates

- In 2006, labour force participation rates across Northern Australia (63.6 per cent) were all higher than the Australia labour force participation rate (60.4 per cent).
- Employment grew more in Northern Australia (11.4 per cent) between the censuses of 2001 and 2006 than it did across Australia. 'Fly-in, fly-out' and 'drive-in, drive-out' staff rotations were significant features of employment growth in many Northern Australian mining regions.

2. Qualification and school completion

- In terms of education, the proportion of people who had completed Year 12 or equivalent in Northern Australia in 2006 (27.3 per cent) was well below the Australian figures (33.9 per cent).
- Higher proportions of Certificate level qualifications were seen across Northern Australia (37.5 per cent), compared to Australia (31.8 per cent), in 2006. Lower numbers of Postgraduate and Bachelor degree level qualifications, as well as lower levels of Graduate Diploma and Graduate Certificates, were observed in that year compared to the rest of Australia.

Day-to-day living

1. Income support and wealth

- Between 1995–96 and 2000–01 dependence on government benefits increased in Northern Australia, more than it did across Australia as a whole.
- Household wealth was lower than that of Australian households generally in 2003–04. The average debt-to-asset ratio was also higher across Northern Australia (17 per cent) than across Australia generally (13 per cent).

2. Cost of living

- High grocery prices, nearly twice capital city prices, are characteristic of very remote and isolated places with large proportions of Indigenous people in the population.

3. *Schools, universities and TAFE institutions*

- School sizes and enrolments were often smaller within Northern Australia. In very remote regions, students wishing to study to Year 12 level often had to study outside their own local area. Of Australia's 9562 schools, 681 (7.1 per cent) were located in Northern Australia. Six hundred and fifteen Northern Australian schools offered up to primary school education, 137 offered up to junior secondary education (this figure includes some mixed primary/secondary schools), and 196 offered up to Year 12 education (this figure includes some mixed primary/secondary schools).
- There are four tertiary institutions that have a main campus located within Northern Australia. In 2006, there were lower proportions of people at university in Northern Australia (3.0 per cent) compared to the rest of Australia (4.7 per cent), with particularly low proportions seen in northern Western Australia (1.4 per cent).
- Northern Australian student enrolments at TAFE institutions (84 per 1000 people) were higher than across Australia as a whole (65 per 1000).

4. *Health*

- Ninety-two of Australia's 795 public hospitals (approximately 11.6 per cent) were located in Northern Australia. Further, 17 of Australia's 549 private hospitals (approximately 3.1 per cent) were located across the region. Most of Northern Australia's hospitals were located in the more populous areas of northern Queensland.
- The proportion of health workers is lower across Northern Australia (2775 per 100 000 people) than Australia as a whole (3102 per 100 000 people) especially in parts of northern Western Australia and Queensland. As the remoteness of SLAs increased, the proportion of health workers decreased.
- The breakdown of nine key health professions indicated that there are smaller proportions of nurses, medical workers, dentists, pharmacists, optometrists, physiotherapists, chiropractors and psychologists within Northern Australia than across Australia generally.

Transport

1. *Trade via maritime ports*

- In 2007–08, exports via northern Australian ports grew faster than the total tonnage of Australia's exports and represented 56.3 per cent of the total tonnage of Australian exports via sea ports.
- Northern Australia's value of exports was \$74.1 billion or 21.1 per cent of the total Australian exports via sea ports in 2007–08. The Pilbara Region in Western Australia was the largest source of tonnage exported in Northern Australia. It was also the largest source of export value, with iron ore exports worth nearly \$30 billion in 2007–08.

- Import tonnages via Northern Australian ports are only a small fraction of those exported via these ports, with Darwin-East Arnhem in the Northern Territory and the Northern Region of Queensland being the largest importing regions in Northern Australia

2. Aviation, railways and roads

- Regular passenger transport, charter and other aviation services are used relatively more frequently in Northern Australia than in the rest of Australia due to large distances and specific employment practices, such as 'fly-in, fly-out' staff rotation.
- Railways in the northern regions of Western Australia are not dense or interconnected with the rest of the continent but carry very large tonnages of iron ore, coal and other minerals for exports via ports; Northern Territory and Queensland's Northern Region standard gauge railways are interconnected with the southern states.
- Northern Australia is joined to the rest of Australia via mostly all-season roads which are essential for passenger and goods transport.

Infrastructure

1. Electricity and gas

- Electricity supply in Northern Australia is based largely on local generators.
- Except for Queensland's eastern regions, most generators in Northern Australia are of relatively small capacity and use locally available gas and liquid fuels.
- Gas production and transmission is a large and growing industry in Northern Australia providing vital sources of heat and electricity for commodity production and processing in the region, as well as for use by the local population.

2. Water

- Water resources and storage in Northern Australia are strongly concentrated around the coastline with major water reserves in the Kimberley Region and north eastern regions of Queensland.
- The major water user is agriculture, as there are no population agglomerations over 200 000 people in Northern Australia.
- Artesian water is an important source for irrigation and other agricultural use.

3. Telecommunications

- The availability of the Internet in Northern Australia (62.3 per cent of households had access) was lower than in the rest of Australia (64.6 per cent of households had access). Fewer Northern Australian households had broadband access (34.4 per cent) than across Australia generally (39.2 per cent). Meanwhile, more households had dial-up Internet access in Northern Australia (23.3 per cent) than across Australia (21.5 per cent).

Natural resources

1. Land use

- The highest share of land use in Northern Australia was grazing natural vegetation (57.4 per cent) followed by conservation and natural environments (40.2 per cent).
- The largest part of area under grazing natural vegetation was in Queensland's North West Region (94.88 per cent). Dry cropping was proportionately highest in the Mackay Region (1.45 per cent).
- Mines are significant land users in the Pilbara, Darwin-East Arnhem, Mackay, Northern Queensland, Far North Queensland and Gladstone regions.

2. Rainfall and temperature

- Many of the regions within Northern Australia experience the majority of their rainfall during the wet season, from approximately November through April. Warmer temperatures are also experienced during this period, with some regions experiencing the highest average maximum temperatures in Australia.
- Fifty per cent of Australia's rain falls within Northern Australia.
- There is little rain during the dry season, from about May through October. Cooler temperatures are also experienced during this period.

3. Predicted rainfall and temperature

- According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO), based on modelling associated with current emission trends, by the year 2030 annual rainfall within Northern Australia is predicted to increase in parts of the Kimberley and Mackay regions, and in the Darwin-East Arnhem and Far North regions. It is predicted that most other parts of Northern Australia will experience a decrease in annual rainfall.
- The CSIRO predicts that there will be an increase in the average winter and summer temperatures across Northern Australia by 2030, particularly in inland areas.

4. *Cyclonic activity*

- On average there are about thirteen cyclones which form in the Australia region each cyclone season, although many do not make landfall. The majority of cyclone activity across Australia occurs within regions in Northern Australia, particularly in the regions around north-east Queensland and north-west Western Australia.

5. *Minerals and energy resources*

- Northern Australia's minerals and energy resources are abundant and diverse and include metal ores, gas, oil, uranium, coal, gold and diamonds.
- The resource base has been reassessed and new deposits are being discovered and documented continuously.

6. *Soil characteristics*

- Northern regions of Western Australia and Northern Territory types of soil support pastoral uses and some irrigated cropping while Queensland's northern regions are suitable for sugar cane cropping and other uses facilitated by higher water availability in most regions.

7. *Groundwater*

- Groundwater capacity varies considerably over the Northern Australian region. Across much of the Northern Territory's interior and the northern Kimberley in Western Australia, groundwater basins have a sustainable yield of less than 500 gegalitres per year. Meanwhile, much of the Arnhem and Gulf coastal area of the Northern Territory have underground reserves which can produce a sustainable yield of between 2000 and 2500 gegalitres per year.
- The Great Artesian Basin stretches across much of Queensland (particularly the North West and Far North regions within Northern Australia), with a sustainable yield of between 200 000 and 500 000 megalitres of water per year.

8. *Fisheries*

- Fisheries in Northern Australia are subject to the same management rules as the rest of Australia. The Australian Fisheries Management Authority manages more than twenty fisheries, nine of which include waters off Northern Australia. Of these nine, four fisheries are exclusively associated with Northern Australia.

Industries

1. Mining and minerals processing

- Australia's two largest scale mining operations are located in Northern Australia: mining of iron ore in the Pilbara and mining of black coal in eastern Queensland's MacKay Region.
- The value adding operations are small compared with the large scale of mining minerals, which are exported predominantly unprocessed.

2. Businesses

- Between 2004 and 2006, the total number of businesses grew more rapidly across much of northern Australia (4.8 per cent increase), more rapidly than it did in Australia as a whole (2.8 per cent increase).
- From 2001 to 2006, there was a slight decline in the proportion of businesses which were owner-operated (50.3 per cent), accompanied by a rise in the proportions of businesses with employees (35.9 per cent), in line with national trends.

3. Tourism

- Northern Australia had a very high share of tourist overnight stays (17.7 per cent of international overnight stays and 8.8 per cent of domestic overnight stays).
- The highest number of Northern Australian tourist visits occurred in the northern regions of Queensland, followed by the Northern Territory.

4. Service industries

- Relative to Australia, service industries such as finance, insurance, property and business services employ less people in Northern Australia.
- On the other hand, government administration and defence are larger employers within Northern Australia.

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Chapter 1

Introduction to Northern Australia



Chapter 1 Introduction to Northern Australia

Background

This is a statistical compendium of data relating to that region north of the Tropic of Capricorn, named 'Northern Australia' by the Australian Government at the inception of its Office of Northern Australia. In addition to tabulated and graphed statistical data, the compendium discusses essential characteristics of Northern Australia and provides comparisons with the rest of Australia. The compendium provides information on population, economy and workforce, social conditions, transport, infrastructure, climate, land use and industry in the region.

The compendium is published in two formats: electronic and print. The electronic version is available on the Internet and on CD. It includes detailed background data in addition to this overview document. This allows for more in-depth information to be provided on each of the regions, particularly at the statistical local area (SLA) and urban centres and localities (UCL) level.¹

Objectives of the study

The main objective of the compendium is to provide relevant statistical information and an overview of the basic characteristics of social and economic developments in Northern Australia. The compendium is intended to support fact-based policy dialogue and formulation of policies conducive to economic development and social wellbeing.

The data has been drawn from BITRE's own sources, the ABS and national and state statistical and administrative collections. This publication focuses on conveying the underlying data in as simple and effective a way as possible. Only limited commentary pointing to broad trends is provided, without an attempt to provide complex analysis or interpretation.

Scope and definitions

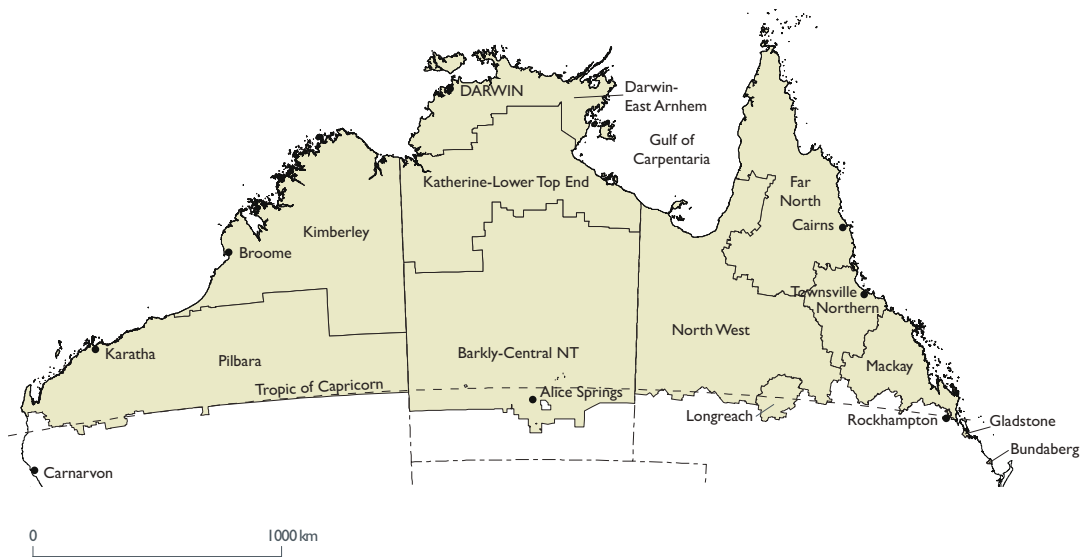
The scope of this compendium is limited to Northern Australia, which is defined to include that part of Australia which lies north of the Tropic of Capricorn. Where the data does not lend itself to meeting this definition precisely, approximations are given. For the purpose of illustrating important impacts on the developments in Northern Australia, the compendium includes some information on areas which are not regarded as part of Northern Australia, such as Alice Springs, Longreach, Rockhampton and Gladstone.

1. For regions SLAs data was aggregated and for major towns in those regions, UCL data was used wherever available.

The compendium conveys information about Northern Australia on a number of levels. It presents data for SLAs and UCLs, which are based on the Australian Standard Geographical Classification (ASGC).

Along with providing data for Northern Australia as a whole, this compendium provides information relating to a number of subregions within Northern Australia. These are the Pilbara and Kimberley regions in Western Australia; the Barkly Central NT, Katherine-Lower Top End and Darwin-East Arnhem regions in the Northern Territory; and the Longreach, Mackay, North West, Northern and Far North regions in Queensland (shown in Map 1.1). These are aggregations which BITRE created for the purpose of this compendium.

Map 1.1 Northern Australia—BITRE subregions



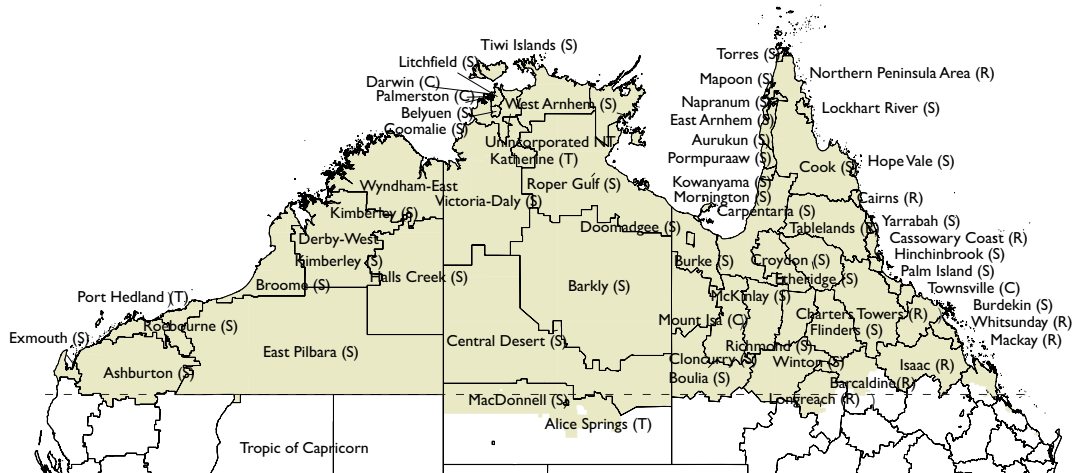
Source: Geoscience Australia (2008 unpublished).

Local Government Areas

There were 114 Local Government Areas (LGA) in Northern Australia in 2006. The current (2008) geography of LGAs within Northern Australia is shown in Map 1.2. LGAs represent the area of responsibility of a Local Government Council or an Aboriginal Council. Local government bodies perform a wide range of functions in the areas they administer, operating within the relevant state or territory legislation. The number of LGAs, as well as their boundaries and names, vary over time. LGAs may contain a number of Statistical Local Areas (SLA).²

2. Maps showing the SLAs within Northern Queensland, Western Australia and Northern Territory are included in the Appendix.

Map 1.2 Northern Australia—Local Government Areas, 2008

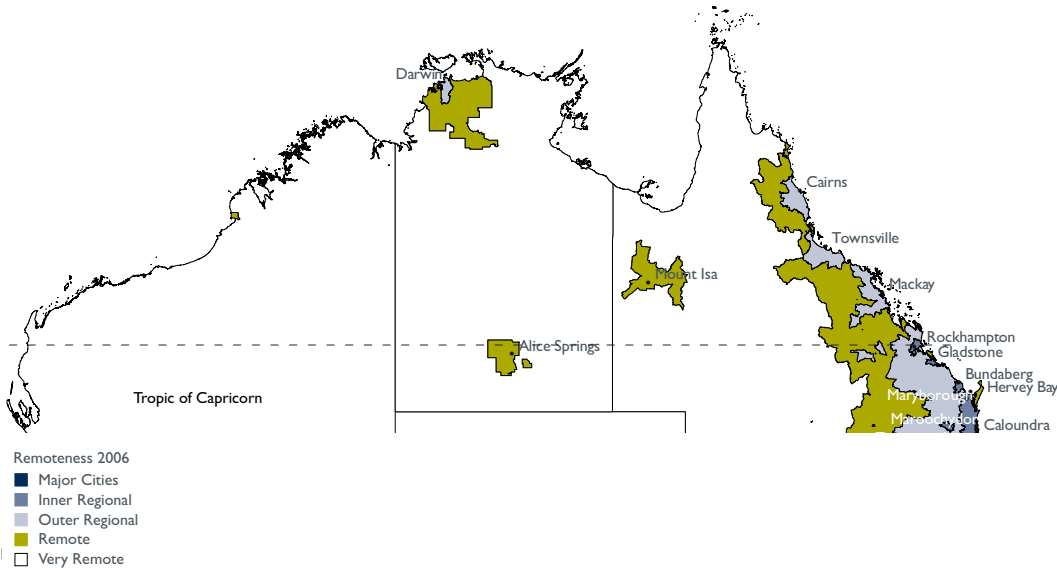


Source: ABS (2008a).

Remoteness Classes

As seen in Map 1.3 the majority of Northern Australia is classed as a very remote region. The remainder of Northern Australia comprises remote areas, and some outer regional areas in and around north-eastern Queensland and the Darwin-East Arnhem Region. Across Northern Australia there are no areas classified as major cities or inner regional areas. Furthermore, in many areas there is a large distance to the nearest major city. The largest urban centres in Northern Australia are: Townsville-Thuringowa with 128 807 people in 2006, Cairns (including Northern Beaches), with 113 843 inhabitants, Mackay with 66 874 and Darwin with 66 290 people respectively.

Map 1.3 Remoteness classes in Northern Australia, 2006



Source: ABS (2006a).

Land tenure

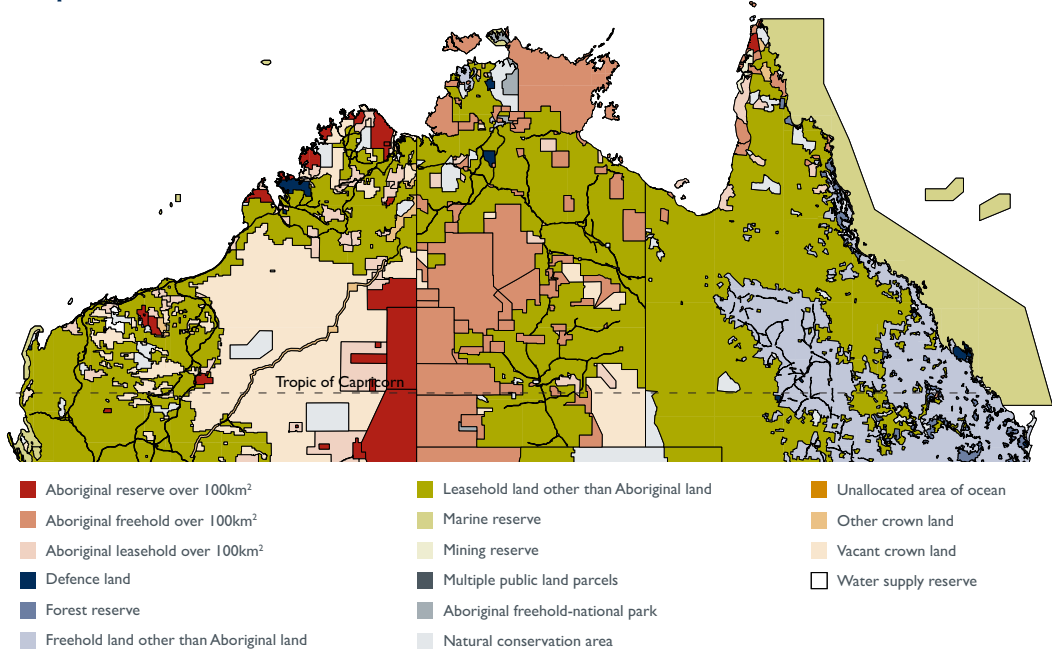
Land tenure in Northern Australia is very complex. Land tenure classes may differ between states and territories. Map 1.4 is based on a broad, nationally consistent master classification of land tenure which incorporates land tenure types currently in use by the relevant state and Commonwealth land administration agencies. For more information on each classification, see Geoscience Australia (2004).

Much of the land across Northern Australia is leasehold land. This is predominantly used for grazing, agriculture or pastoral purposes. A substantial part of the land in the north of the Northern Territory is owned by Aboriginal communities. There is also a large area owned collectively by Aboriginal communities within northern Western Australia, as well as in parts of Far North Queensland. Such land is held and controlled by designated Aboriginal communities, with special conditions attached to the titles.

Within northern Queensland, leasehold land is dominant. The second largest form of ownership is freehold. This reflects the large amount of privately-owned farms, homes and so forth within the area. Forest reserves are also present along the north-east Queensland coast, as are marine reserves along the Great Barrier Reef. Outside of northern Queensland, large proportions of forest reserves and freehold land other than Aboriginal land are not seen in Northern Australia.

Vacant crown land is seen across large parts of northern Western Australia and some parts of the Northern Territory. Defence land is found in the Kimberley Region, Northern Territory, and the Northern Queensland region.

Map 1.4 Northern Australia—land tenure, 1993



Note: Aboriginal land is land held collectively by Aboriginal communities; it does not include land which is owned under ordinary titles by individual Aboriginal people.

Source: Geoscience Australia (2004).

Native title

On 3 June 1992, the High Court of Australia recognised that the Meriam people of the Torres Strait held native title over part of their traditional lands. This decision called Mabo paved the way for Aboriginal and Torres Strait Islander people seeking to have their native title recognised under Australian law.

Native title is a set, or bundle, of rights and interests in relation to land or waters that has the following qualities: it is possessed under the traditional laws currently acknowledged, and the traditional customs currently observed, by the relevant Indigenous people. Those Indigenous people have a 'connection' with the area in question by traditional laws and customs. These interests are recognised and incorporated in the common law of Australia when determined and registered under the native title.

Native title:³

- is recognised through a determination made by the Federal Court, High Court or by some state and territory courts
- cannot be recognised: if native title has been extinguished over a particular area because of things the government has done, or allowed others to do, that are inconsistent with native title; if the claimants fail to prove that they have maintained their traditional laws and customs; or if the common law of Australia does not have the capacity to recognise the rights claimed
- may vary from group-to-group because it gets its content from the traditional laws and customs of the particular group
- may exist alongside non-native title rights. This is sometimes called 'coexistence'. However, native title rights and interests are always subject to the rights of other people who share the same area. People with leases, licences or a right of public access continue to have those rights. Native title rights and interests must give way to people exercising those other rights.

In April 2009, 120 determinations of native title were registered Australia-wide, with 85 determinations that native title exists and 35 that native title does not exist (see Table 1.1). Determinations that have found native title to exist in the entire or part of the determination area account for approximately 12.1 per cent of the Australian land area, with 26 per cent of Australia's determinations being in Western Australia. Queensland, Northern Territory and Western Australia accounted for 86 per cent of Australia's determined native title cases and 92 per cent of the determined native title.

3. Justice Brennan in Mabo described the nature of native title as a very complex legal concept: Native title has its origin in and is given its content by the traditional laws acknowledged by and the traditional customs observed by the indigenous inhabitants of a territory. The nature and incidents of native title must be ascertained as a matter of fact by reference to those laws and customs. The ascertainment may present a problem of considerable difficulty ... (after Altman, J C, Buchanan G J and Larsen, L 2007).

Table 1.1 Western Australia, Northern Territory and Queensland—native title cases

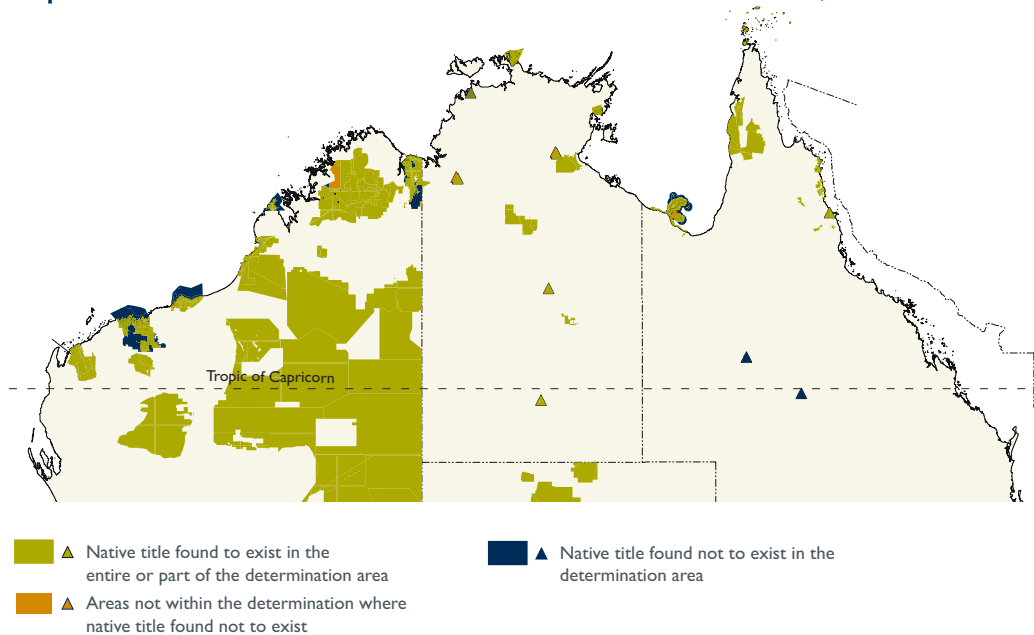
<i>Category/state</i>	<i>Western Australia</i>	<i>Northern Territory</i>	<i>Queensland</i>	<i>Australia total</i>
Native title found to exist (square kilometres)	791 865	20 634	29 772	914 824
Per cent of total	86.6	2.3	3.3	100.0
Native title exists in part of determination area	12	4	9	35
Native title exists in entire determination area	10	6	32	50
Total number of cases determined positively	22	10	41	85
Determinations that native title does not exist	1	1	2	35
Total number of cases submitted	23	11	43	120

Source: Native Title Tribunal (April 2009a).

The tabulated numbers and Map 1.5 do not illustrate where and how much of Australia covered by native title determinations is actually held by Indigenous Australians in a manner that could be considered equivalent to landholdings. The strongest form of native title is found in determinations that recognise claimants’ right to possess, occupy, use and enjoy land to the exclusion of all others—that is, exclusive possession or possessory native title. These areas of exclusive possession native title are the closest equivalent to statutory freehold titles to land held by Indigenous Australians.

At present, the agencies entrusted with the native title determination and registration do not provide summary data on the number, area or location of exclusive possession native title determinations. However, some authors point out that determinations in Western Australia which provide the best indication of the contribution of exclusive possession native title areas to the Indigenous estate (Altman et al 2007 p.14).

Since Mabo, there has been much debate about the nature of native title as it might relate to ownership of land. It has been argued widely in the literature that the High Court’s decision in *Western Australia v Ward* (Ward) in 2002 confirmed the view of native title as a bundle of rights rather than an underlying title to land. Such a bundle could include rights to possess, occupy, use and/or enjoy an area as per the native title holders’ traditional laws and customs—for example, a bundle may include rights to live or to camp on land, to mine ochre, to hunt, fish and gather food, or to conduct ceremonies or to visit important sites. A bundle of rights may be so extensive as to amount to a right of exclusive possession, which includes the right to control access to, and use of, an area. From this perspective native title determinations (even individual native title determinations) may include rights and interests in land that span the entire spectrum mentioned above, from a strong right of exclusive possession through to weaker partial native title rights of, for example, visitation or hunting (Altman et al 2007 p.15–17).

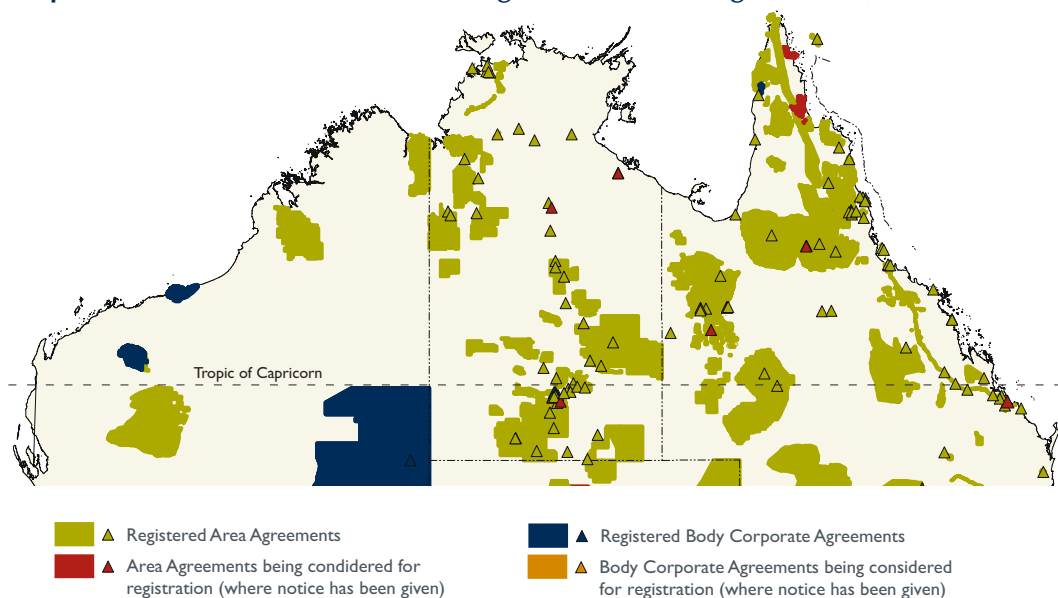
Map 1.5 Northern Australia determinations of native title, 2009

Amendments to the Native Title Act in 1998 introduced Indigenous land use agreements (ILUA). It is an agreement between a native title group and others about the use and management of land and waters. When registered with the Tribunal, ILUAs bind all parties and all native title holders to the terms of the agreement. The advantage of an indigenous land use agreement is its flexibility. It can be tailored to suit the needs of those involved and their particular land use issues. It is also a faster way of resolving native title issues: on average, it takes about two years longer to pursue a native title claim through the courts than it does to sit down and negotiate a settlement.

ILUAs cover a wide variety of subjects and may be used as part of the negotiations leading to a consent determination of native title. Alternatively, they may be entirely separate from the determination process. As of May 2009, the National Native Title Tribunal had registered 369 ILUAs nationally, including 200 in Queensland, 92 in Northern Territory and 12 in Western Australia (see Map 1.6). These three states accounted for 82 per cent of total Australian Indigenous land use agreements (National Native Title Tribunal, 2009b).

Native title claimants and those recognised as native title holders have the right to negotiate about some future acts, such as the grant of a mining lease or proposed developments. Claimants only gain this right if their native title claim satisfies all of the registration test conditions.

Map 1.6 Northern Australia Indigenous land use agreements, March 2009



Notes: Areas shown represent the geographic extent of the agreement.
 Small areas symbolised.
 Only those agreements which have either been registered or notified since 31 December 2008 have a label on this map.

Source: NNTT 2009.

Following chapters

The organisation of this compendium is as follows:

Chapter 2 presents information about the population of Northern Australia, paying attention to population size and growth rates; population density; ethnicity; age and sex profiles; and migration.

Chapter 3 evaluates economic growth, employment by industry, and income levels in Northern Australia.

Chapter 4 reviews the workforce of Northern Australia, by considering labour force participation rates; employment and unemployment; labour force size; and work qualifications and education levels.

Chapter 5 examines day-to-day living, paying attention to income support; wealth; the cost of living; schools, universities and TAFE institutions; and health services.

Chapter 6 reviews transport within Northern Australia, including trade via maritime ports, aviation, railways and roads.

Chapter 7 discusses Northern Australia's infrastructure, focussing on electric power, generation and supply networks, water storage and supply, natural gas deposits and telecommunication.

Chapter 8 presents data relating to natural resources in Northern Australia, including cyclonic activity, rainfall and temperature trends, ocean depths and soil types.

Chapter 9 examines industries within Northern Australia, paying particular attention to business activity over time, mining operations and tourism.

In addition to these chapters, detailed background data is provided in an online document (available at www.bitre.gov.au).

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Chapter 2

Population



Chapter 2 Population

This chapter discusses some key characteristics of the population of Northern Australia, paying particular attention to population size and growth rates; population density; ethnicity; age and sex profiles; and migration (namely migration into and out of the regions of Northern Australia, and population turnover by SLA).

With respect to population size, Northern Australians represented 4.7 per cent of the total Australian population in 2006. The majority of people within Northern Australia live in the northern regions of Queensland. The Australia Bureau of Statistics predicts that the proportion of Australians living in Northern Australia will remain roughly the same between 2006 and 2016. Within Northern Australia, the population is expected to grow fastest in the Mackay, Pilbara and Darwin-East Arnhem regions over the same ten year period.

Northern Australia exhibits a pattern of small but relatively highly concentrated population areas surrounded by large areas of sparse population. Within Northern Australia, Queensland is generally more densely populated than the northern regions of the Northern Territory and Western Australia.

Indigenous people comprise a relatively large proportion of the Northern Australian population (14.3 per cent) compared to the whole of Australia (2.3 per cent). The proportion of overseas born to non-overseas born people in Northern Australia is approximately half that of Australia as a whole.

The population of many northern Australian regions is younger than that of Australia, and working age males often outnumber working age females. There are more young people (aged 0–14) and fewer old people (aged 65 and over) within Northern Australia, compared with the rest of Australia.

Higher population turnover is common in some areas of Northern Australia, but in other areas the population is remarkably static. There are particularly high levels of population movement in the Darwin-East Arnhem and Pilbara regions; however, the ten Australian SLAs with the least turnover are also all from Northern Australia and contain high numbers of Indigenous Australians. This, however, does not take into account habitual movements of the Indigenous population which is not fully reflected in the official statistics such as population censuses.

2.1 Population and population growth rates

Table 2.1.1 shows that the population of Northern Australia in 2006 was in excess of 950 000 people and represented 4.7 per cent of the total population of Australia. The majority lived in northern Queensland, representing 16.7 per cent of the total population in that state. The second largest population in Northern Australia is that of the Northern Territory, which represents 1 per cent of the total population of Australia and nearly all of the population of the Northern Territory. Western Australia's Pilbara

and Kimberley region populations were, between them, only 0.38 per cent of the total population of Australia and 3.9 per cent of the population of that state in 2006.

Northern Australia is not intensively urbanised with only about half of the population living in towns. There are only four cities with population larger than 50 000 people. These are Townsville with about 128 800 inhabitants, Cairns (113 800), Mackay (66 800) and Darwin (66 300), in 2006 (ABS 2006b) (see Table 2.1(a) on the CD).

Northern Australia's population is expected to remain at roughly the same proportion of the Australian population from 2006 (4.7 per cent) to 2016 (4.8 per cent). However, Northern Australia's population is predicted to grow 0.4 per cent faster than Australia, during 2006–11. Northern Australia's population is expected to grow fastest in the Pilbara (Western Australia), Darwin-East Arnhem (Northern Territory) and Mackay (Queensland) regions. In those regions, the average population growth rates for 2011 and 2016 are expected to exceed rates for Western Australia and the Northern Territory. In the northern regions of Western Australia, the population is expected to grow faster than in the rest of the state. In the Northern Australian regions of Queensland, the population is anticipated to grow slower than in the rest of Queensland by about 0.2 of a per cent, with the Longreach region population numbers to decline between 2011 and 2016.

2.2 Population density

Northern Australia exhibits a pattern of small, but relatively concentrated population areas, surrounded by large areas of sparse population. This is particularly true of northern Western Australia and the Northern Territory. Table 2.2.1 shows that northern Queensland was generally more densely populated than the northern regions of the Northern Territory and Western Australia. The Northern Australian UCLs with the highest population densities were Townsville-Thuringowa and Darwin, and the regions with highest population densities were Barkly-Central NT and Longreach. The UCLs with the lowest population densities were Charters Towers and Weipa, and the regions with the lowest population densities were Katherine-Lower Top End and the Kimberley.

Table 2.1.1 Northern Australia—usually resident population numbers and growth rates, 2001–16

Region	2001 population			2006 population			Projected
	Actual	Percentage of total Australian usually resident population, 2001	Actual	Percentage of total Australian usually resident population, 2006	Population increase/decrease 2001–06	Average annual growth 2001–06 (per cent)	
Northern Australia (WA)	74 392	0.38	79 510	0.38	5 118	1.34	88 890
Pilbara Region	41 767	0.22	46 505	0.22	4 738	2.17	52 834
Kimberley Region	32 625	0.17	33 005	0.16	380	0.23	36 056
Western Australia state total	1 901 159	9.79	2 059 045	9.95	157 886	1.61	2 276 851
Northern Australia (NT)	193 466	1.00	206 347	1.00	12 881	1.30	226 493
Darwin-East Arnhem Region	135 100	0.70	146 266	0.71	11 166	1.60	163 962
Katherine-Lower Top End Region	17 791	0.09	18 646	0.09	855	0.94	19 838
Barkly-Central NT Region	40 575	0.21	41 435	0.20	860	0.42	42 693
Northern Territory total	197 768	1.02	210 674	1.02	12 906	1.27	230 893
Northern Australia (QLD)	616 058	3.17	683 184	3.30	67 126	2.09	750 546
Mackay Region	160 465	0.83	186 349	0.90	25 884	3.04	206 619
Northern Region	190 266	0.98	209 588	1.01	19 322	1.95	229 915
Far North Region	224 163	1.15	247 589	1.20	23 426	2.01	273 975
North West Region	37 207	0.19	35 900	0.17	-1 307	-0.71	36 463
Longreach Region	3 957	0.02	3 758	0.02	-199	-1.03	3 574
Queensland state total	3 628 946	18.69	4 091 546	19.77	462 600	2.43	4 528 815
Northern Australia subtotal	883 916	4.55	969 041	4.68	85 125	1.86	1 065 929
Australia total	19 413 240		20 697 880		1 284 640	1.29	22 319 066

(continued)

Table 2.1.1 Northern Australia—usually resident population numbers and growth rates, 2001 to 2016 (continued)

Region	2011 projected population			2016 projected population			
	Percentage of total Australian usually resident population, 2011	Population increase/decrease 2006–11	Average annual growth 2006–11 (per cent)	Projected	Percentage of total Australian usually resident population, 2016	Population increase/decrease 2011–16	Average annual growth 2011–16 (per cent)
Northern Australia (WA)	0.40	9 380	2.26	98 230	0.41	9 340	2.02
Pilbara Region	0.24	6 329	2.58	59 310	0.25	6 476	2.34
Kimberley Region	0.16	3 051	1.78	38 920	0.16	2 864	1.54
Western Australia state total	10.20	217 806	2.03	2 486 052	10.37	209 201	1.77
Northern Australia (NT)	1.01	20 146	1.88	246 709	1.03	20 216	1.72
Darwin-East Arnhem Region	0.73	17 696	2.31	181 921	0.76	17 959	2.10
Katherine-Lower Top End Region	0.09	1 192	1.25	20 983	0.09	1 145	1.13
Barkly-Central NT Region	0.19	1 258	0.60	43 805	0.18	1 112	0.52
Northern Territory total	1.03	20 219	1.85	251 157	1.05	20 264	1.70
Northern Australia (QLD)	3.36	67 362	1.90	812 892	3.39	62 346	1.61
Mackay Region	0.93	20 270	2.09	226 881	0.95	20 262	1.89
Northern Region	1.03	20 327	1.87	248 264	1.04	18 349	1.55
Far North Region	1.23	26 386	2.05	297 437	1.24	23 462	1.66
North West Region	0.16	563	0.31	36 901	0.15	438	0.24
Longreach Region	0.02	–184	–1.00	3 409	0.01	–165	–0.94
Queensland state total	20.29	437 269	2.05	4 955 943	20.68	427 128	1.82
North Australia subtotal	4.78	96 888	1.92	1 157 831	4.83	91 902	1.67
Australia total		1 621 186	1.52	23 966 982		1 647 916	1.43

Notes: This table shows actual usually resident population growth from 2001 to 2006, and projected usually resident population growth from 2006 to 2011. Population projections at SLA level were prepared by the ABS as consultant to DOHA. The projections are not official ABS data. With respect to population projections, in SLAs with total ERP under 500, estimated resident populations were generally held constant by ABS as reliable projections were not possible for the very small age/sex groups involved.

Sources: ABS (2007a); ABS (2008b); ABS for DOHA (2008).

Table 2.2.1 Northern Australia—usually resident population, area, and population density by region and selected UCL, 2006

<i>Region</i>	<i>Usually resident population</i>	<i>Area of region (square kilometres)</i>	<i>Population density</i>
Northern Australia (WA)	72 360	933 879	0
Pilbara Region	43 065	513 079	0
Exmouth	1 846	7	273
Port Hedland	11 558	119	97
Kimberley Region	29 295	420 799	0
Northern Australia (NT)	187 123	500 403	0
Darwin-East Arnhem Region	133 707	153 619	1
Darwin	66 290	78	845
Katherine-Lower Top End Region	16 463	346 143	0
Katherine	5 849	16	371
Barkly-Central NT Region	36 953	641	58
Alice Springs	21 623	30	726
Tennant Creek	2 920	19	156
Northern Australia (QLD)	639 878	901 837	1
Mackay Region	175 134	101 998	2
Mackay town	66 874	107	624
Northern Region	196 683	80 039	2
Townsville	128 807	156	828
Charters Towers	7 978	42	190
Far North Region	231 064	273 162	1
Weipa	2 830	10	292
Cairns	113 843	152	751
North West Region	33 474	446 494	0
Mount Isa	18 857	58	322
Longreach Region	3 523	144	24
Longreach	2 976	8	383
Northern Australia subtotal	899 361	2 336 119	0

Note: This table shows the population, area (square kilometres) and population density (persons per square kilometres). The population density figures provided above need to be approached with caution, given the differing sizes of each of the regions and UCLs in square kilometres.

Source: ABS (2006b).

2.3 Ethnicity

Indigenous people represent a relatively large proportion of the Northern Australian population compared to the whole of Australia (see Table 2.3.1 and Table 2.3.2). The highest proportion of Aboriginal and Torres Strait Islander people in Northern Australia was noted in the Northern Territory (27.3 per cent) and Western Australia (24.9 per cent). The proportion was relatively smaller in northern Queensland (8.3 per cent); however, this was still well above the rest of Australia (2.3 per cent).

In 2006, the largest proportions of the Aboriginal and Torres Strait Islander population in the total population were in the Katherine-Lower Top End and Kimberley regions. The lowest share of the Aboriginal and Torres Strait Islander population were in the Mackay Region, as well as in the Exmouth Urban Centre/Location (UCL) of the Pilbara Region.

The proportion of overseas-born people in the population in Northern Australia (12.4 per cent) is approximately half the proportion of overseas-born people in Australia (22.2 per cent). The highest proportions of overseas-born people in the population were noted in the Darwin-East Arnhem and Far North Queensland regions. At the UCL level, the highest proportion was in Darwin (21.4 per cent), followed by Alice Springs (16.8 per cent) and Exmouth (16.4 per cent). The highest proportions of Australian-born people in the population were observed in the Longreach, Katherine-Lower Top End, and Northern Queensland regions. At the UCL level, the highest proportions of Australian-born people were recorded in Charters Towers (89.0 per cent) and Longreach (84.9 per cent).

Table 2.3.1 Northern Australia—usually resident population by ethnicity, 2006

Region	2006 total population	Subtotal Indigenous	Aboriginal	Torres Strait Islander	Aboriginal and Torres Strait Islander	Born in Australia	Born overseas
Northern Australia (WA)	72 360	17 984	17 429	212	343	52 229	8 740
Pilbara Region	43 065	5 659	5 397	156	106	29 095	6 438
Exmouth	1 846	29	29	0	0	1 384	302
Port Hedland	11 558	1 525	1 440	31	54	6 637	1 713
Kimberley Region	29 295	12 325	12 032	56	237	23 134	2 302
Western Australia state total	1 959 086	58 712	56 650	1 057	1 005	1 279 222	531 743
Northern Australia (NT)	187 123	51 150	49 260	600	1 290	143 657	25 938
Darwin-East Arnhem Region	133 707	28 432	26 891	513	1 028	99 817	20 818
Darwin	66 290	6 233	5 350	271	612	45 411	14 187
Katherine-Lower Top End Region	16 463	8 269	8 087	46	136	14 007	915
Katherine	5 849	1 693	1 598	27	68	4 490	524
Barkly-Central NT Region	36 953	14 449	14 282	41	126	29 833	4 205
Alice Springs	21 623	3 615	3 526	26	63	15 952	3 631
Tennant Creek	2 920	1 424	1 405	9	10	2 222	247
Northern Territory total	192 898	53 664	51 707	610	1 347	148 166	26 539
Northern Australia (QLD)	639 878	59 720	38 936	13 673	7 111	509 842	76 865
Mackay Region	175 134	6 269	4 133	1 408	728	141 596	17 295
Mackay town	66 874	2 881	1 556	892	433	53 966	6 864
Northern Region	196 683	12 908	9 672	1 825	1 411	162 827	21 266
Townsville	128 807	7 360	5 103	1 367	890	104 874	14 917
Charters Towers	7 978	828	737	35	56	7 098	452
Far North Region	231 064	33 111	18 090	10 313	4 708	175 850	35 163
Weipa	2 830	482	224	121	137	2 266	283
Cairns	113 843	8 864	4 488	2 936	1 440	81 134	21 267
North West Region	33 474	7 277	6 908	122	247	26 557	2 922
Mount Isa	18 857	3 089	2 874	66	149	13 944	2 236
Longreach Region	3 523	155	133	5	17	3 012	219
Longreach	2 976	149	127	6	16	2 527	193
Queensland state total	3 904 534	127 580	98 716	18 376	10 488	2 935 260	699 448
Northern Australia subtotal	899 361	128 854	105 625	14 485	8 744	705 728	111 543
Australia total	19 855 288	455 027	407 700	29 516	17 811	14 072 950	4 416 032

(continued)

Table 2.3.1 Northern Australia—usually resident population by birth, 2006 (continued)

Region	2006 total population	Born in Australia	Born overseas	(did not answer this question)	Not stated
North Australia (WA)	72 360	52 229	8 740		11 391
Pilbara Region	43 065	29 095	6 438		7 532
Exmouth	1 846	1 384	302		160
Port Hedland	11 558	6 637	1 713		3 208
Kimberley Region	29 295	23 134	2 302		3 859
Western Australia state total	1 959 086	1 279 222	531 743		148 121
North Australia (NT)	187 123	143 657	25 938		17 528
Darwin-East Arnhem Region	133 707	99 817	20 818		13 072
Darwin	66 290	45 411	14 187		6 692
Katherine-Lower Top End Region	16 463	14 007	915		1 541
Katherine	5 849	4 490	524		835
Barkly-Central NT Region	36 953	29 833	4 205		2 915
Alice Springs	21 623	15 952	3 631		2 040
Tennant Creek	2 920	2 222	247		451
Northern Territory total	192 898	148 166	26 539		18 193
Northern Australia (QLD)	639 878	509 842	76 865		53 171
Mackay Region	175 134	141 596	17 295		16 243
Mackay town	66 874	53 966	6 864		6 044
Northern Region	196 683	162 827	21 266		12 590
Townsville	128 807	104 874	14 917		9 016
Charters Towers	7 978	7 098	452		428
Far Northern Region	231 064	175 850	35 163		20 051
Weipa	2 830	2 266	283		281
Cairns	113 843	81 134	21 267		11 442
North West Region	33 474	26 557	2 922		3 995
Mount Isa	18 857	13 944	2 236		2 677
Longreach Region	3 523	3 012	219		292
Longreach	2 976	2 527	193		256
Queensland state total	3 904 534	2 935 260	699 448		269 826
Northern Australia subtotal	899 361	705 728	111 543		82 090
Australia total	19 855 288	14 072 950	4 416 032		1 366 306

Notes: This table shows numbers of usually resident people who identified as Indigenous in the 2006 Census, and numbers of usually resident people who specified that they were born in Australia or overseas, by region. Note not all members of the population answered this question on the Census.

Source: ABS 2006 Census DataPacks, basic community profile release 2 (Cat. 2069.0.30.001)

Table 2.3.2 Northern Australia — percentage share of usually resident population by ethnicity, 2006

Region	2006 total population	Subtotal Aboriginal and Torres Strait Islander (per cent)	Aboriginal (per cent)	Torres Strait Islander (per cent)	Aboriginal and Torres Strait Islander (per cent)
Northern Australia (WA)	72 360	24.9	24.1	0.3	0.5
Pilbara Region	43 065	13.1	12.5	0.4	0.2
Exmouth	1 846	1.6	1.6	0.0	0.0
Port Hedland	11 958	13.2	12.5	0.3	0.5
Kimberley Region	29 295	42.1	41.1	0.2	0.8
Western Australia state total	1 959 086	3.0	2.9	0.1	0.1
Northern Australia (NT)	187 123	27.3	26.3	0.3	0.7
Darwin-East Arnhem Region	133 707	21.3	20.1	0.4	0.8
Darwin	66 290	9.4	8.1	0.4	0.9
Katherine-Lower Top End Region	16 463	50.2	49.1	0.3	0.8
Katherine	5 849	28.9	27.3	0.5	1.2
Barkly-Central NT Region	36 953	39.1	38.6	0.1	0.3
Alice Springs	21 623	16.7	16.3	0.1	0.3
Tennant Creek	2 920	48.8	48.1	0.3	0.3
Northern Territory total	192 898	27.8	26.8	0.3	0.7
Northern Australia (QLD)	639 878	9.3	6.1	2.1	1.1
Mackay Region	175 134	3.6	2.4	0.8	0.4
Mackay town	66 874	4.3	2.3	1.3	0.6
Northern Region	196 683	6.6	4.9	0.9	0.7
Townsville	128 807	5.7	4.0	1.1	0.7
Charters Towers	7 978	10.4	9.2	0.4	0.7
Far North Region	231 064	14.3	7.8	4.5	2.0
Weipa	2 830	17.0	7.9	4.3	4.8
Cairns	113 843	7.8	3.9	2.6	1.3
North West Region	33 474	21.7	20.6	0.4	0.7
Mount Isa	18 857	16.4	15.2	0.4	0.8
Longreach Region	3 523	4.4	3.8	0.1	0.5
Longreach	2 976	5.0	4.3	0.2	0.5
Queensland state total	3 904 534	3.3	2.5	0.5	0.3
Northern Australia subtotal	899 361	14.3	11.7	1.6	1.0
Australia total	19 855 288	0.02	0.02	0.00	0.00

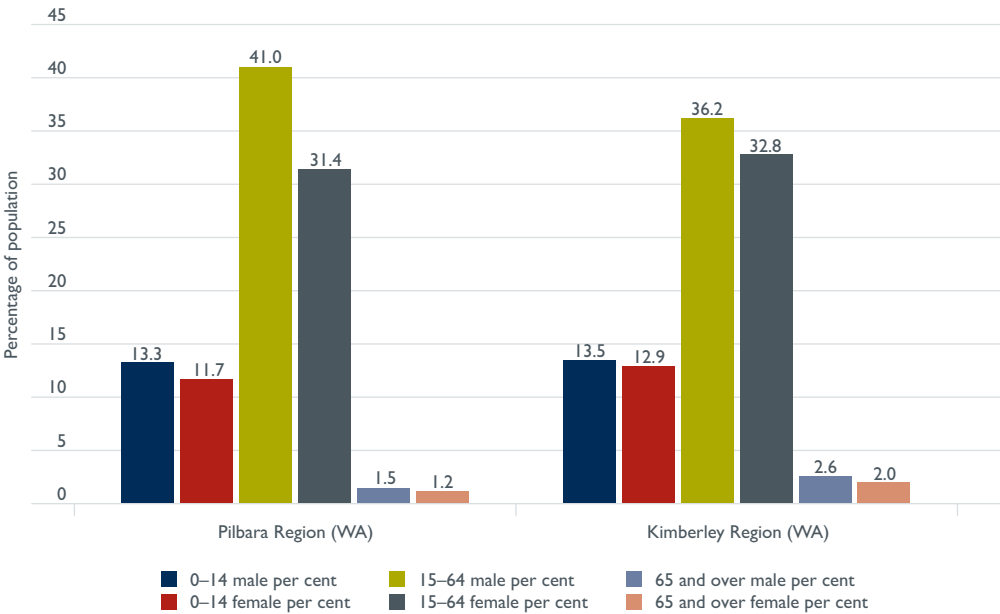
Notes: This table shows percentages of usually resident people who were Indigenous, and numbers of usually resident people who were born overseas, by region.
Source: ABS (2006b).

2.4 Population by age and sex

In the majority of northern regions, the working-age male population outnumbers females in the same age group. The highest proportion of working-age males was noted in the Pilbara and Kimberley regions of Western Australia, as well as in the Darwin-East Arnhem Region (Northern Territory) and North-West and Mackay regions of Queensland (for male-to-female ratios by SLA see Table 2.4 (j) on the CD).

By contrast, the proportion of people aged over 65 years among both sexes was smallest in the northern regions of Western Australia (2.0 per cent male and 1.5 per cent female), as compared with the totals for Australia (5.8 per cent male and 7.1 per cent female). In the northern regions of Queensland, the proportion of people aged over 65 years (at 4.9 per cent of males and 5.2 per cent of females) was also lower than in Australia, although the proportions were not as low as in other areas in Northern Australia. Many of Queensland's northern regions are a destination of retired people, especially those from the eastern coast.

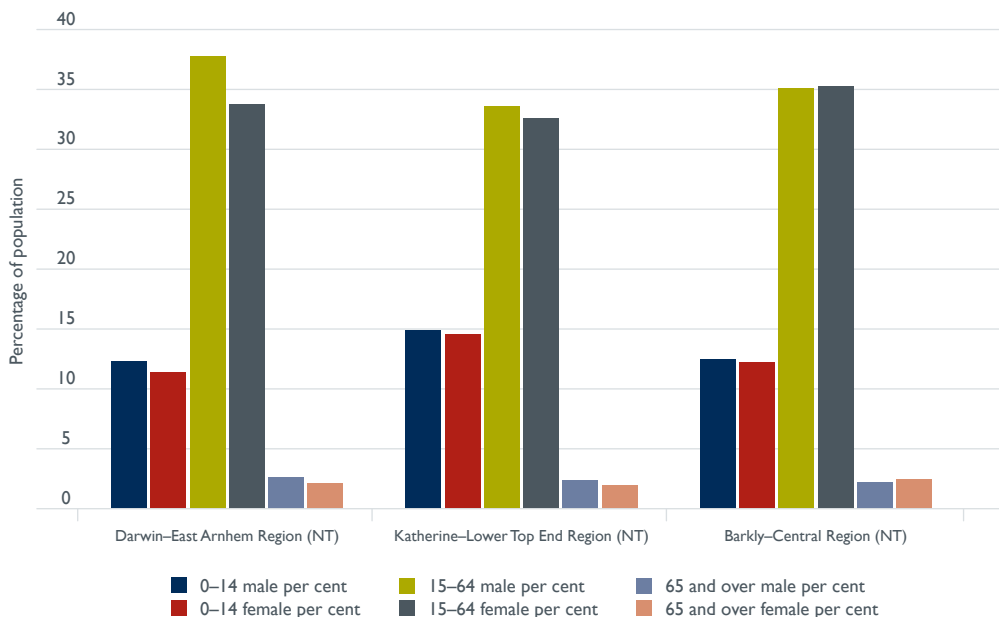
Figure 2.4.1 Northern Australia—population distribution by age group and sex, by region, 2006 (Western Australia)



Notes: This graph shows population profiles by selected age bracket by northern Australian region in Western Australia.

Sources: ABS (2006b); ABS (2007b).

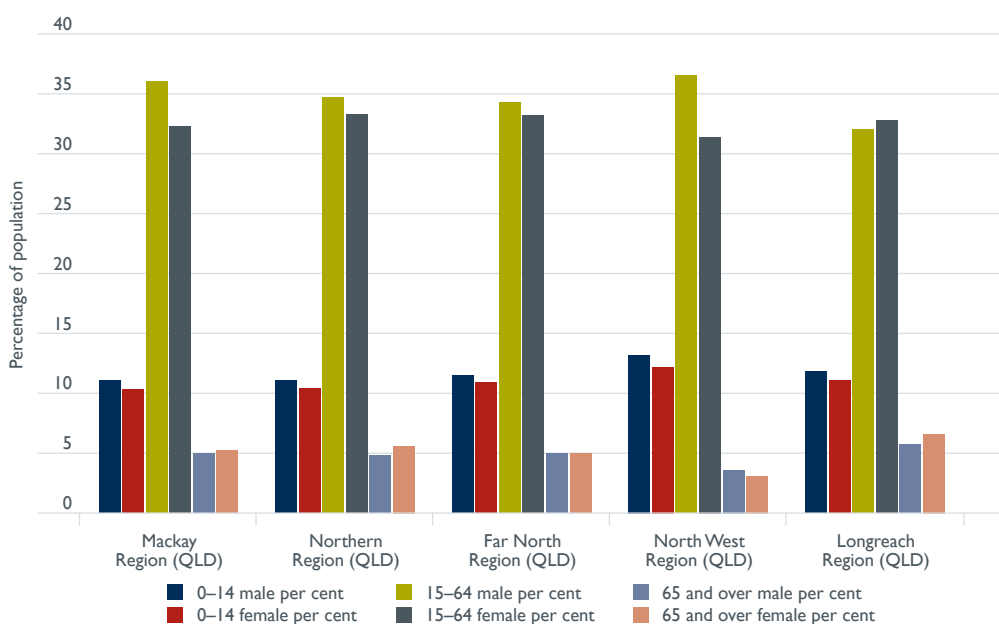
Figure 2.4.2 Northern Australia—population distribution by age group and sex, by region, 2006 (Northern Territory)



Notes: This graph shows population profiles by selected age bracket by northern Australian region in the Northern Territory.

Sources: ABS (2006b); ABS (2007b).

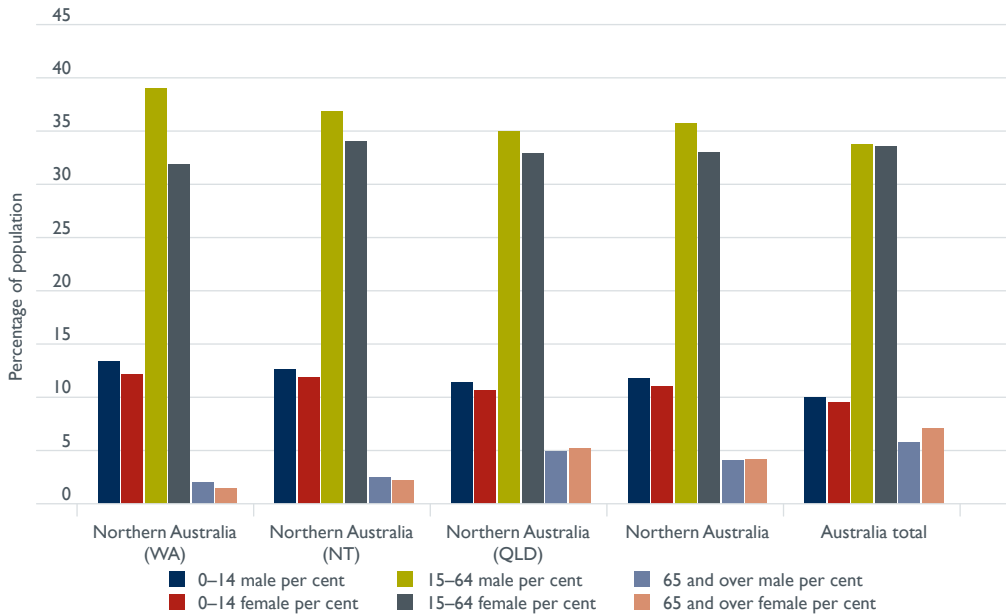
Figure 2.4.3 Northern Australia—population distribution by age group and sex, by region, 2006 (Queensland)



Notes: This graph shows population profiles by selected age bracket by northern Australian region in Queensland.

Sources: ABS (2006b); ABS (2007b).

Figure 2.4.4 Northern Australia—population distribution by age group and sex, by region, 2006



Notes: This graph shows population profiles by selected age bracket and gender for Northern Australian in comparison to Australia.

Sources: ABS (2006b); ABS (2007b).

The dominance of working age adults in the population of certain Northern Australian regions is partly related to people moving away from those areas as they reach retirement. Another reason for proportionately lower numbers of people aged 65 years in some regions is a relatively low life expectancy among Indigenous males and females generally. As Table 2.4.1 illustrates, Indigenous life expectancy is rarely above 65 years of age in Northern Australia, Western Australia, Queensland and Australia as a whole by the 1996 to 2001 period.

Table 2.4 Life expectancy estimates—Indigenous population, selected states, 1996–2001

	<i>Life expectancy estimates (years)</i>
Queensland	
Male	59
Female	63
Western Australia	
Male	59
Female	67
Northern Territory	
Male	58
Female	65
Australia (Indigenous persons)	
Male	59
Female	65
Australia (total persons)	
Male	77
Female	82

Note: Indigenous data is from the period 1996–2001, as at the time of publication no Indigenous life expectancy estimates have been calculated later than this point. For comparative purposes, Australian data for the period 1998–2000 was used. Life expectancy refers to the average number of years a person of a given age and sex can expect to live if current age-sex specific death rates continue to apply throughout his or her lifetime. To measure life expectancy and mortality, data is required on the births and deaths of the total population. The accuracy of the estimates depends on the completeness of this data. Due to uncertainty about the estimates of these components for Aboriginal and Torres Strait Islander peoples, indirect experimental methods are used to calculate life expectancies for the Indigenous population. These experimental life expectancies should only be used as an indicative summary measure of the level of mortality of the Indigenous population. (ABS and AIHW 2008, p.180). Caution should be exercised when undertaking analysis of Indigenous mortality and, in particular, trends in Indigenous mortality. Some of the issues affecting the reporting of Indigenous mortality include coverage of Indigenous deaths, unexplained changes in the number of people identified as Indigenous in different data collections and over time, the use of a standard Indigenous status question, and not stated Indigenous status (ABS 2007c).

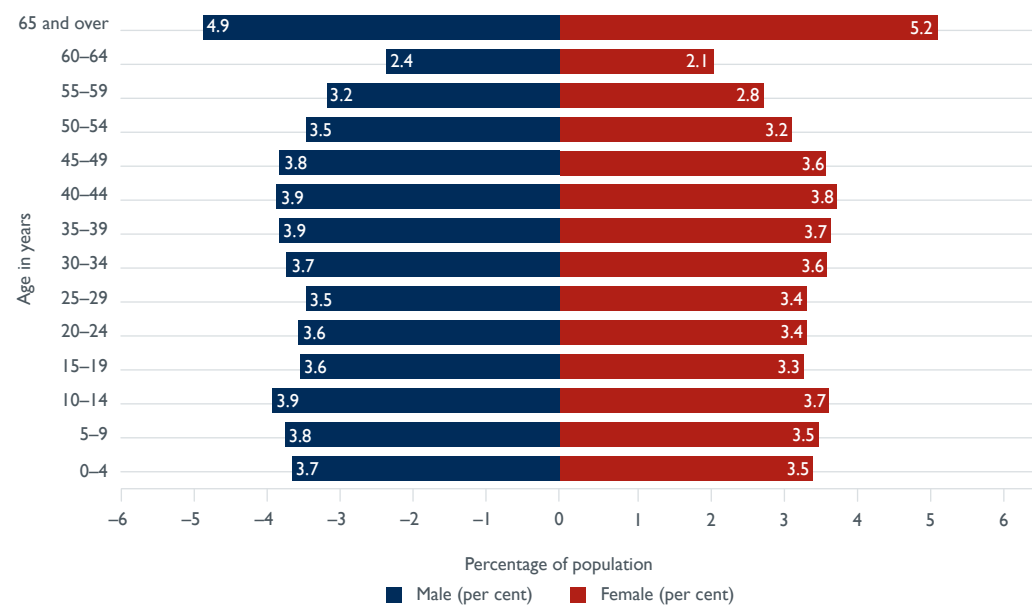
Source: ABS (2007c).

Across Northern Australia, higher percentages of males and females within the working age of 15–65 were observed. The population pyramids in Figures 2.4.5, 2.4.6, 2.4.7 and 2.4.8 indicate that although Australia's population (Figure 2.4.8) is aging, this is not the case within Northern Australia, which has a much younger population. For example, in Western Australia, 9 per cent of the population were aged between 0–9 years (compared with 6.3 per cent of Australia's population). At the other end of the scale, very low percentages of females aged over 70 were seen in northern Western Australia (0.2 per cent) and the Northern Territory (0.4 per cent), compared to Australia (2.3 per cent).

Whilst the indigenous population is much younger than the non-Indigenous, at older ages the proportions of people reverse and the non-indigenous older generations become more numerous. A shorter life expectancy among Indigenous people has an effect of reducing the proportions of older generations below those of the non-Indigenous group. It is obvious from Figure 2.4.9 that there was no corresponding 'baby boom' and 'aging' effect on the Indigenous population, which are visible from the shape of the plotted distribution.⁴

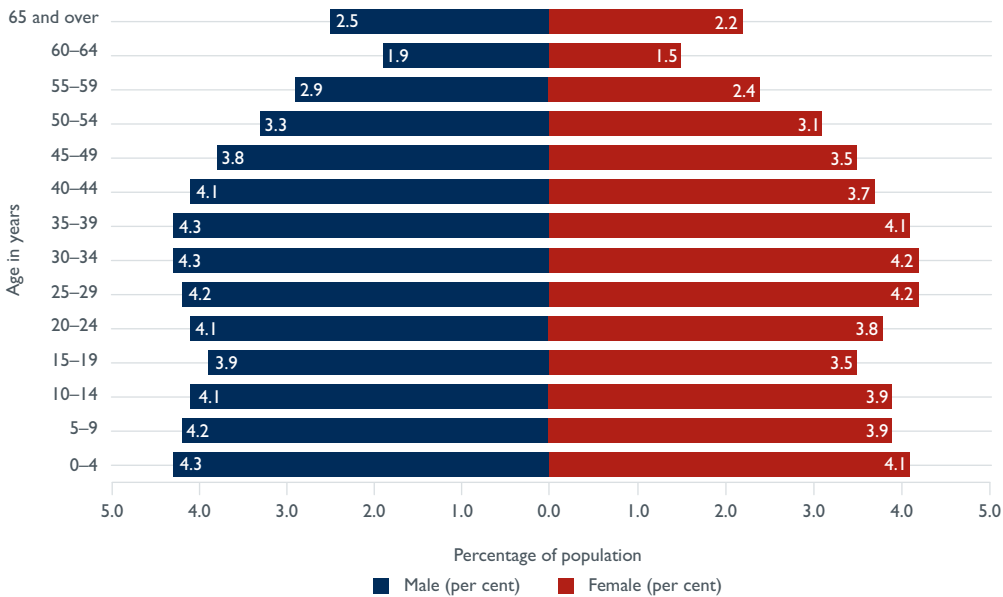
4. The last two figures are based on a different format of data presentation by ABS from those in Figures 2.4.5 to 2.4.8, where the top age bracket was '85 years and over'.

Figure 2.4.5 Northern Australia (Queensland)—population, by age and sex, 2006 (per cent)



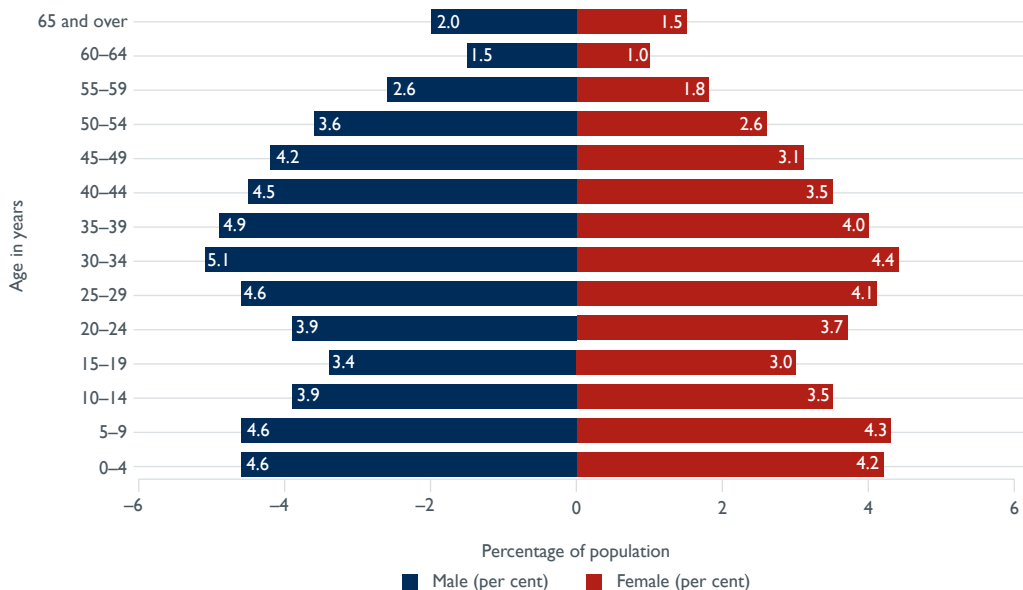
Sources: ABS (2006b); ABS (2007b).

Figure 2.4.6 Northern Australia (Northern Territory)—population, by age and sex, 2006 (per cent)



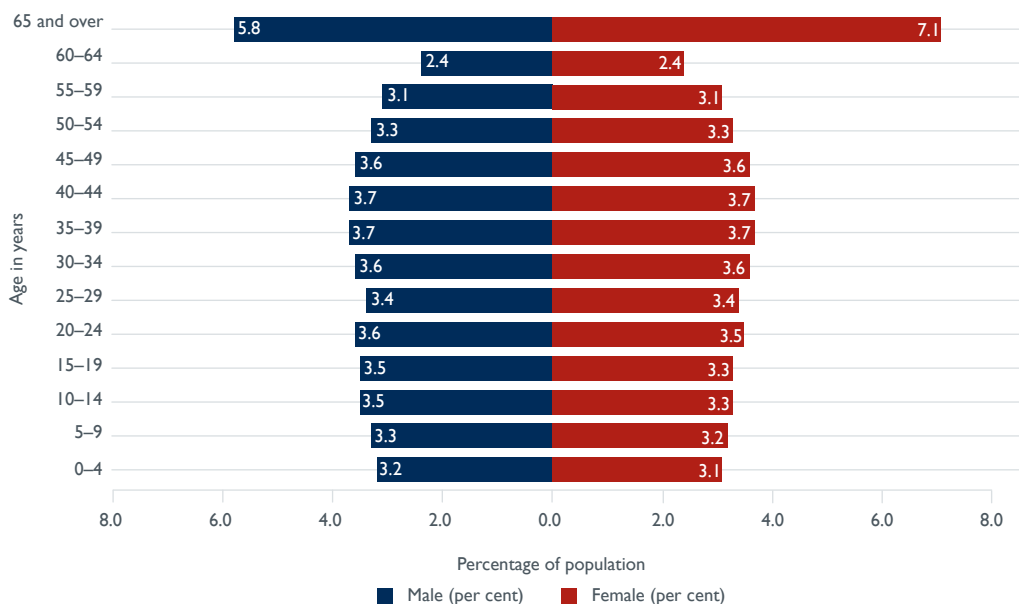
Sources: ABS (2006b); ABS (2007b).

Figure 2.4.7 Northern Australia (Western Australia)—population, by age and sex, 2006 (per cent)



Sources: ABS (2006b); ABS (2007b).

Figure 2.4.8 Australia—population, by age and sex, 2006 (per cent)

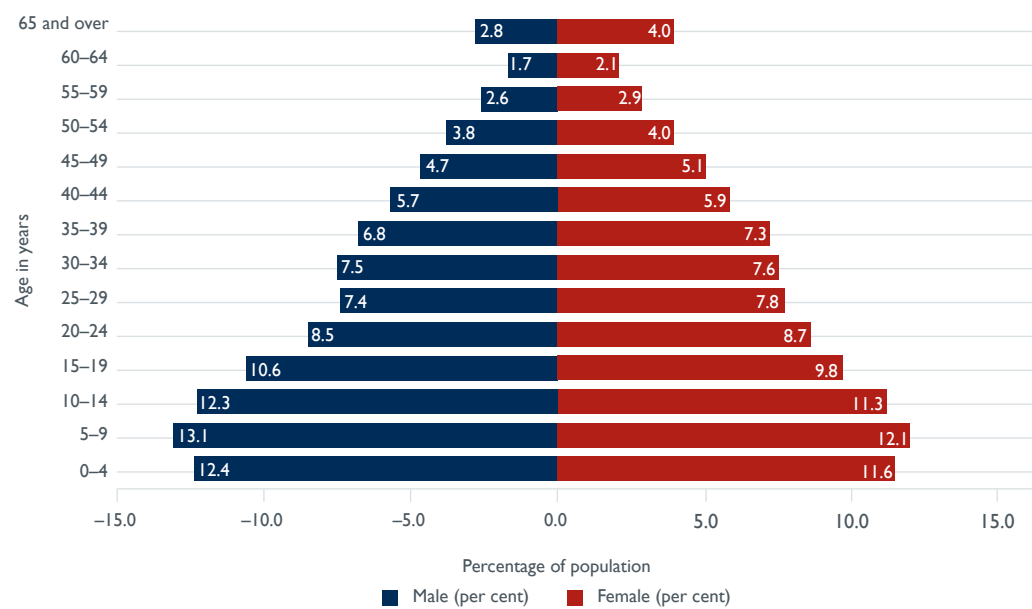


Notes: These population pyramids compare population profiles, by age and gender, for northern Western Australia, the northern Northern Territory, northern Queensland, and Australia, in 2006.

Sources: ABS (2006b); ABS (2007b).

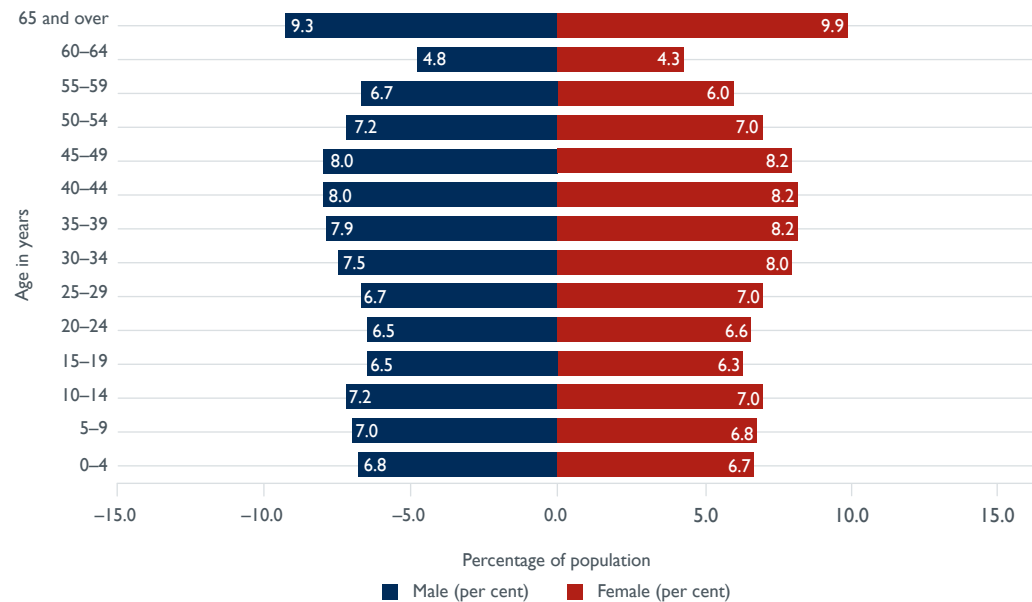
Figures 2.4.9 and 2.4.10 illustrate differences between the Indigenous and non-Indigenous population of Northern Australia.

Figure 2.4.9 Northern Australia—Indigenous population by age and sex, 2006 (per cent)



Source: ABS (2006c).

Figure 2.4.10 Northern Australia—non-Indigenous population by age and sex, 2006 (per cent)



Source: ABS (2006c).

2.5 Migration and population turnover

Population movements in Northern Australia stem from various activities, such as migration, tourism, work in the region on short-term basis (construction workers), 'fly-in, fly-out', 'drive-in, drive-out' and other forms of mobility, which may not be well-recorded in the official statistics. Table 2.5.1 indicates the level of migration which occurs within or between regions in Northern Australia. There is a large population flow around Northern Australia, as registered by the 2006 Census. This movement does not necessarily suggest that people have left a particular region (or the country) but instead indicates those people who have changed where they live; in some cases, people have moved around a lot within the same region, such as in the Mackay and Longreach regions (see Table 2.5.1). There were particularly high levels of population movement by those living in the Darwin-East Arnhem and Pilbara regions. As the Pilbara Region has a strong mining industry, this may reflect a high fluctuation of employees in a dynamic employment market. Population movement within Northern Australia may be driven by people adjusting their housing situation in order to fit with their changing needs, as they progress through the life cycle. For example, younger people within Northern Australia may move in order to follow jobs or to access educational facilities, while older residents may move in order to be closer to health services, et cetera.

Population turnover is discussed here as a further measure of migration in Northern Australia. A table of population turnover across Northern Australian SLAs is provided in the electronic versions of this publication. It shows the effects of both in-migration and out-migration on the population, by adding the two together to calculate 'turnover'.

There was significant diversity among SLAs with respect to population turnover in Northern Australia, which paradoxically has some of the highest and lowest turnover SLAs across the whole of Australia. Of the ten SLAs with the highest population turnovers in Australia between the 2001 and 2006 censuses, four were located in Northern Australia. Of the ten SLAs with the highest population turnovers in Northern Australia over the same period, seven were located in and around Darwin (Nightcliff—118.0 per cent; Driver—120.7 per cent; The Gardens—120.9 per cent; Larrakeyah—126.3 per cent; Litchfield Shire Part A—129.3 per cent; Gunn-Palmerston City—134.2 per cent; and Jabiru—146.9 per cent); two were located in Townsville (Rosslea—118.9 per cent and Vincent—115.1 per cent); and one was located in Alice Springs (Alice Springs-Stuart—122.1 per cent).

Table 2.5.1 Northern Australia—population movement, by region, 2001–06

<i>Region</i>	<i>Usually resident population, 2006</i>	<i>Total number of migrants (into or out of the SLA)</i>	<i>Migrants who moved within the same SLA</i>	<i>Migrants who moved within the same SLA (per cent)</i>
Northern Australia (WA)	79 510	55 128	31 207	39
Pilbara Region	46 505	31 841	16 253	35
Kimberley Region	33 005	23 287	14 954	45
Northern Australia (NT)	206 347	148 818	87 790	43
Darwin-East Arnhem Region	146 266	105 430	60 000	41
Katherine-Lower Top End Region	18 646	13 262	8 883	48
Barkly-Central NT Region	41 435	30 126	18 907	46
Northern Australia (QLD)	683 184	505 639	340 046	50
Mackay Region	186 349	135 209	98 697	53
Northern Region	209 588	157 873	97 107	46
Far North Region	247 589	180 380	124 708	50
North West Region	35 900	28 804	17 470	49
Longreach Region	3 758	3 373	2 064	55
Northern Australia subtotal	969 041	709 585	459 043	47
Australia total	20 697 880	19 143 365	11 430 910	55

Notes: This table shows the number of people who migrated to an SLA, the number of people to have migrated but stayed within the same SLA, and the number to have left an SLA during or before 2006.

Source: ABS (2008c).

All of the ten Australian SLAs recorded as showing the lowest population turnovers between the 2001 and 2006 censuses were located in Northern Australia. All of these areas were also predominantly Indigenous but this indicates that the official population statistics do not adequately register the migratory movements so typical among these groups of population.⁵

Data relating to population available in the online compendium

2.1 Population and population growth rates

- Northern Australia—usually resident population numbers and growth rates, by SLA, 2001 to 2016.

2.2 Population density

- Northern Australia—usually resident population, area, and population density by SLA and selected UCL, 2006.

2.3 Ethnicity

- Northern Australia—usually resident population by ethnicity, by SLA, 2006.

5. Seven of the SLAs were in the Northern Territory (Angurugu—7.5 per cent; East Arnhem Balance—14.1 per cent; West Arnhem—15.3 per cent; Thamarurr—16.9 per cent; Yugul Mangi—17.2 per cent; Numbulwar Numburindi—18.8 per cent; and Kunbarlanjinja—20.6 per cent); the remaining three communities were located in Queensland (Yarrabah—16.2 per cent; Aurukun—18.3 per cent and Kowanyama—19.3 per cent).

2.4 Population by age and sex

- Northern Australia—Pilbara Region, usually resident population by age and sex, 2006
- Northern Australia—Kimberley Region, usually resident population by age and sex, 2006
- Northern Australia—Western Australia, usually resident population by age and sex, 2006
- Northern Australia—Darwin-East Arnhem Region, usually resident population by age and sex, 2006
- Northern Australia—Katherine-Lower Top End Region, usually resident population by age and sex, 2006
- Northern Australia—Barkly-Central NT region, usually resident population by age and sex, 2006
- Northern Australia—Northern Territory, usually resident population by age and sex, 2006
- Northern Australia—Mackay Region, usually resident population by age and sex, 2006
- Northern Australia—Northern Region, usually resident population by age and sex, 2006
- Northern Australia—Far North Region, usually resident population by age and sex, 2006
- Northern Australia—North-West Region, usually resident population by age and sex, 2006
- Northern Australia—Longreach Region, usually resident population by age and sex, 2006
- Northern Australia—Queensland, usually resident population by age and sex, 2006
- Northern Australia—usually resident population by age and sex, 2006
- Western Australia—usually resident population by age and sex, 2006
- Northern Territory—usually resident population by age and sex, 2006
- Queensland—usually resident population by age and sex, 2006
- Australia—usually resident population by age and sex, 2006
- Northern Australia—usually resident population by age and sex, by SLA, 2006.

2.5 Population turnover

- Northern Australia—population migration, by SLA, between 2001 and 2006.

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Chapter 3

Economic activity



Chapter 3 Economic activity

This chapter discusses economic growth, employment by industry, and income levels in Northern Australia over the period of 1990–91 to 2005–06. As gross regional product in Australia is not available at a disaggregate level suitable for assessing the economic activity in Northern Australia, a ‘surrogate’ but practical measure is used here instead.

Firstly, based on data from the Australian Taxation Office, it considers Aggregate Real Taxable Income (ARTI) by region in order to discuss related growth (or decline) in these over time. This parameter is a useful indicator of economic growth over time. No data is available for the most recent period of 2007–09, therefore the impact on Northern Australia of the recent global economic downturn could not be illustrated.

In general, Northern Australia’s recent economic performance can be broken down into three distinctive phases: a growth phase from 1990–91 until 1995–96; a phase of stagnation and decline from 1995–96 until 2000–01; and then a final phase of resource driven growth from 2000–01 until 2005–06 (the final year for which figures are available). This three phase growth pattern is evident through the analysis of each of the measures available in BITRE’s *Regional Economic Growth Database*. This is in contrast with the broader Australian growth pattern, where during the middle phase of stagnation and decline in Northern Australia, Australia as a whole still grew strongly. In addition, during Northern Australia’s growth phases, the Australian economy was growing, but at lower rate than Northern Australia.

The decline in the economic performance of Northern Australia appears to begin in 1997–98, which corresponds to the Asian financial crisis and the subsequent reduction in minerals exports from Australia to the affected countries. Also, the final phase of economic growth from 2000 corresponds to the most recent mining boom in Australia. This is consistent with the economy of Northern Australia being closely linked to the mining and natural resources markets.

The chapter then considers employment by industry, and growth (or decline) within industries between 2001 and 2006. In 2006, relative to Australia, the industries of mining and government administration and defence were larger employers in Northern Australia. On the other hand, less people were employed by the industries of manufacturing, and finance, insurance, property and business services in Northern Australia in comparison with the rest of Australia.

There were a greater number of people employed in Northern Australia in 2006 than there were in 2001. An increase in employment was observed across almost all industries in Northern Australia, the largest being in construction, primarily due to the substantial increase in building activity within northern Queensland.

The chapter then analyses individual incomes for all adults by region as captured in the 2006 Census, covering low income earners and recipients of government allowances as well as all taxpayers. The median individual income for Northern Australia shows many SLAs having a high number of people earning a low income.

These figures also reveal a greater numbers of males earning a higher than average weekly income, and a greater number of females earning an income in the lower income brackets.

Finally, we look at different types of taxable income earned by taxpayers by region in 2006. It shows whether incomes were earned from salaries, business returns, investments, superannuation, or other sources. Broadly speaking, much of Northern Australia had a higher dependence on wage and salary income than Australia as a whole, and a comparatively lower dependence on superannuation, annuities and investments.

In this chapter we also discuss a number of different indicators of economic activity in Northern Australia, each of which provides a different snapshot of Northern Australia's economy. Although each indicator has different caveats, it illustrates different aspects of the economic activity. For instance, BITRE's *Regional Economic Growth Database* provides long-term data on the working/taxpaying population of Northern Australia and is more suited to economic analysis. In contrast, the income data derived from the 2006 Census lends itself more to social analysis due to the inclusion of incomes derived from government benefits.

3.1 Economic growth in Northern Australia

Measures of regional economic performance

BITRE measures regional economic performance using the *Regional Economic Growth Database*. The most important measure in this database is Aggregate Real Taxable Income (ARTI), the dynamics of which can be used to assess regional economic performance. ARTI has been used for a number of years, and has been proven a good indicator of regional economic performance (BITRE 2005a).

The other measures in the *Regional Economic Growth Database* which can be used to analysis regional economic performance are the Number of Taxable Individuals (NTI) which measures the number of people in a region who submitted a tax form that were required to pay tax on their income and Real Income per Taxpayer (RIPT) which is simply the ARTI for a region divided by the NTI of the region, or the average taxable income for the region.

Aggregate Real Taxable Income (ARTI) to measure regional growth

ARTI is a measure that indicates the total level of economic activity for the region and its dynamics can be used as an indicator of regional economic growth. Changes in ARTI arise for two reasons: either the number of people earning income in the region changes as shown by changes in NTI or the income of the current workers in a region changes (changes in RIPT).

Figure 3.1.1 shows that there were three phases of economic growth in Northern Australia between 1990–91 and 2005–06. During the first phase, from 1990–91 to 1995–96, Northern Australia experienced a period of strong economic growth. The

second phase was from 1995–96 when economic growth began to slow, concluding with a significant contraction in 2000–01 (a fall of 4.5 per cent). The third phase in the economic performance of Northern Australia was a period of strong growth from 2000–01, due to the most recent mining boom.

Figure 3.1.1 Northern Australia—ARTI annual growth 1990–91 to 2005–06



Note: This figure shows growth and decline (per cent) in ARTI between 1990–91 and 2005–06, comparing Northern Australia with Australia.

Source: BITRE (2009a).

Over this period, Northern Australia had higher average annual growth in ARTI (3.4 per cent per year) than the rest of Australia (3.0 per cent per year). In the 2000s, Northern Australia's ARTI growth (5.6 per cent) has been substantially faster than that of Australia as a whole (3.7 per cent). Northern Australia appears to have a much more volatile economic pattern than Australia. The growth periods of the early 1990s and the 2000s saw Northern Australia grow considerably faster than Australia as a whole, while in the late 1990s with the aftermath of the Asian financial crisis of 1997, Northern Australia exhibited a deeper downturn than the whole of Australia.

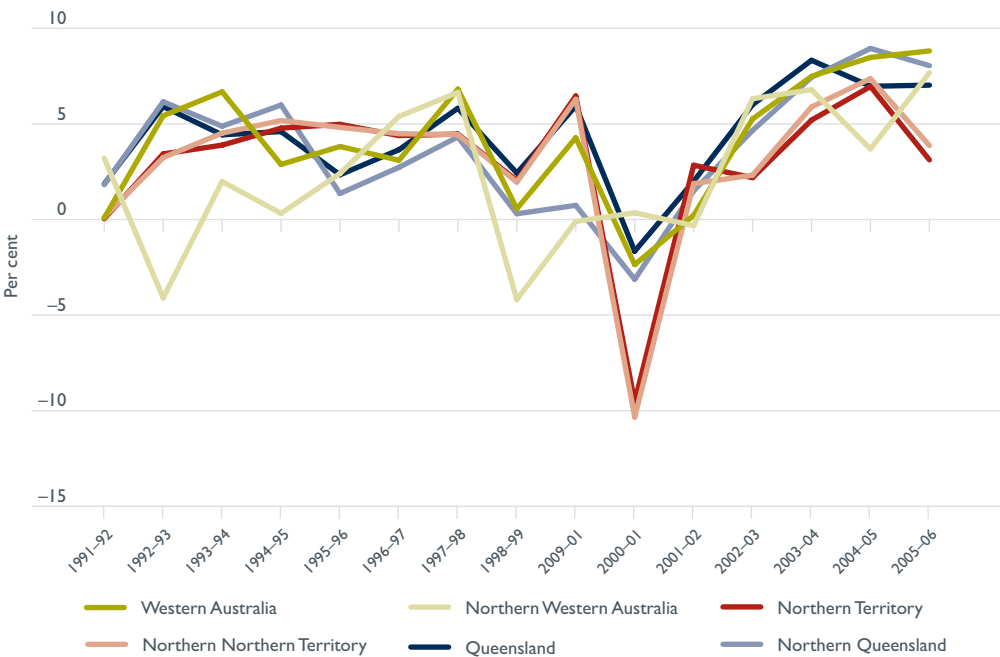
With respect to annual ARTI growth, at the state level the northern part of Queensland tracked Queensland as a whole between 1990–91 and 2005–06, but demonstrated slightly lower annual growth percentages (see Figure 3.1.2). The northern part of Western Australia did not exhibit similar growth patterns to Western Australia as a whole, and generally had lower annual growth in comparison. There was a negligible difference between the growth rates of the north of the Northern Territory and the Northern Territory as a whole.

The northern regions of Queensland contributed 20.8 per cent of Queensland's ARTI in 2005–06 and 74.9 per cent of the ARTI of Northern Australia. In the same year, the northern regions of Western Australia contributed 3.8 per cent of ARTI for Western Australia as a whole, whereas almost all (98.5 per cent) of the Northern Territory's

ARTI comes from the north of the Northern Territory. These proportions explain why the patterns of economic activity in northern regions of Queensland and the Northern Territory are a closer match to their state than northern Western Australia is to whole of Western Australia.

The Northern Territory experienced a sudden and severe drop in ARTI between 1999–00 and 2000–01 (see Figure 3.1.2). Western Australia and Queensland also experienced a sudden decline at this time, but it was not as severe as the one exhibited in the Northern Territory.

Figure 3.1.2 Northern Australia—ARTI annual growth by state, 1990–91 to 2005–06



Note: This figure shows growth and decline (per cent) in ARTI between 1990–91 and 2005–06, comparing the northern regions of Queensland, Western Australia and the Northern Territory with their respective state totals.

Source: BITRE (2009a).

The northern region which saw the lowest level of growth over this period was the North West Region (0.3 per cent per annum) in Queensland, the only region to have growth of less than 1 per cent per annum. The regions which saw the strongest growth were Mackay (4.4 per cent) and the Far North Region (5.1 per cent), both in Queensland.

Table 3.1.1 shows that from 2000–01, the Mackay Region was the fastest growing region in Northern Australia (8.7 per cent per year), whilst the Longreach Region experienced negative growth (–0.1 per cent per year). The regional breakdown is consistent with the growth in mining and construction industries (with high growth in the Pilbara in Western Australia and the Northern Region in Queensland) and the decline of the agriculture industries in regions such Longreach and Queensland’s North West (with the exception of Mt Isa and Winton SLAs in the North West Region).

Table 3.1.1 Northern Australia—average annual ARTI growth by region 2000–01 to 2005–06

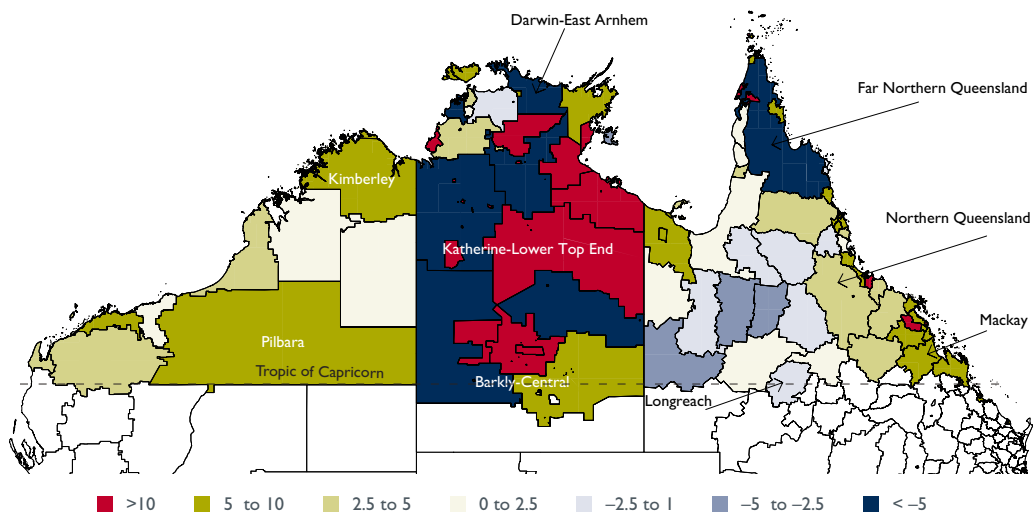
<i>Region</i>	<i>2000–01 to 2005–06</i>
Northern Australia (WA)	4.792
Pilbara Region	5.022
Kimberley Region	4.191
Western Australia state total	6.008
Northern Australia (NT)	4.243
Darwin-East Arnhem Region	4.612
Katherine-Lower Top End Region	2.846
Barkly-Central NT Region	3.025
Northern Territory total	4.048
Northern Australia (QLD)	6.085
Mackay Region	8.675
Northern Region	5.668
Far North Region	5.299
North West Region	0.864
Longreach Region	–0.093
Queensland state total	6.044
Northern Australia subtotal	5.577
Australia total	4

Notes: ARTI by region in 1000s.

Source: BITRE (2009a).

As shown in Map 3.1.1, at the SLA level, the pattern of growth closely followed regional growth patterns shown in Table 3.1.1 after 2000–01. However, growth at the SLA level was subject to greater variation (small projects or business can have a large impact on a single SLA while not greatly affecting the region which the SLA is in). Statistical Local Areas with strong mining, construction and tourism industries saw stronger growth, while SLAs based on agriculture exhibited less growth. The SLAs with the highest growth in ARTI from 2000 were the Darwin City SLAs of Gunn-Palmerston City and Bayview-Woolner, largely due to large influx of people to these growth centres of Darwin City. The SLAs which had the largest reduction in ARTI since 2000 were West Arnhem (Northern Territory), Elsey (Northern Territory) and the Indigenous communities within these SLAs, again, largely to do with a reduction in the number of taxable individuals in these SLAs.

It should be noted here that the ARTI measure is based on the place of residence of the taxpayer when they submit their tax return, and may not reflect the region where they actually work. This means that ‘fly-in, fly-out’ employees in the mining industry may be recorded at their home SLA instead of their SLA of work. ARTI figures from SLAs that are heavily reliant on the mining and resources industries could be affected by this.

Map 3.1.1 Northern Australia—ARTI growth, 2000–01 to 2005–06

Source: BITRE (2009a).

Number of Taxable Individuals (NTI)

Changes in the number of taxable individuals (NTI) can also be used as an indicator of economic performance of a region. Changes in NTI can be caused by migration to and from a region due to individuals seeking employment, changes in the participation of people in the economic activities of a region (people within a region moving in or out of the workforce) or increasing incomes so that those people earning income below the taxable level begin to earn more than the minimum tax threshold.

An analysis of the changes in NTI for the regions of Northern Australia show the same three phase growth pattern exhibited in the ARTI measure.

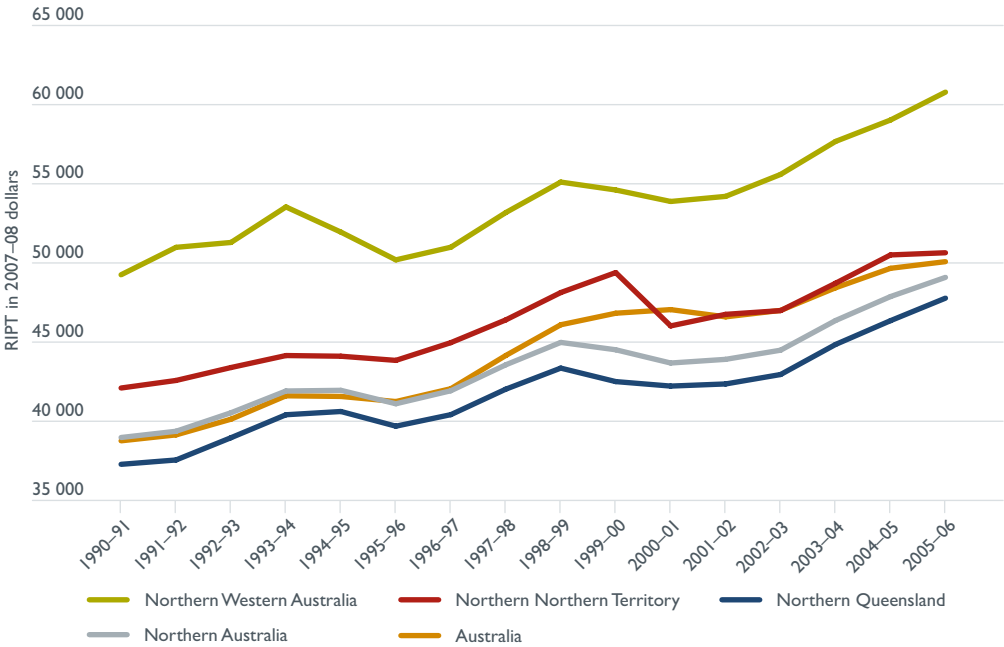
A more detailed analysis of NTI changes in Northern Australia can be found in Chapter 4.

Real Income per Taxpayer (RIPT)

Real Income per Taxpayer (RIPT) for a region is simply the ARTI for a region divided by the NTI of the region. It is therefore a measure of average income of the taxpaying population for a region, which for most regions is closely related to overall average income.

In Figure 3.1.3, it can be seen that real income per taxpayer growth trends for Northern Australia followed the Australian trend, although in the late 1990s a gap started to appear, with Northern Australia falling behind due to falling mining incomes from a slowdown in exports due to the Asian financial crisis. From 2002–03, this gap has began to close again.

Figure 3.1.3 Northern Australia—real income per taxpayer (RIPT), 1990–91 to 2005–06

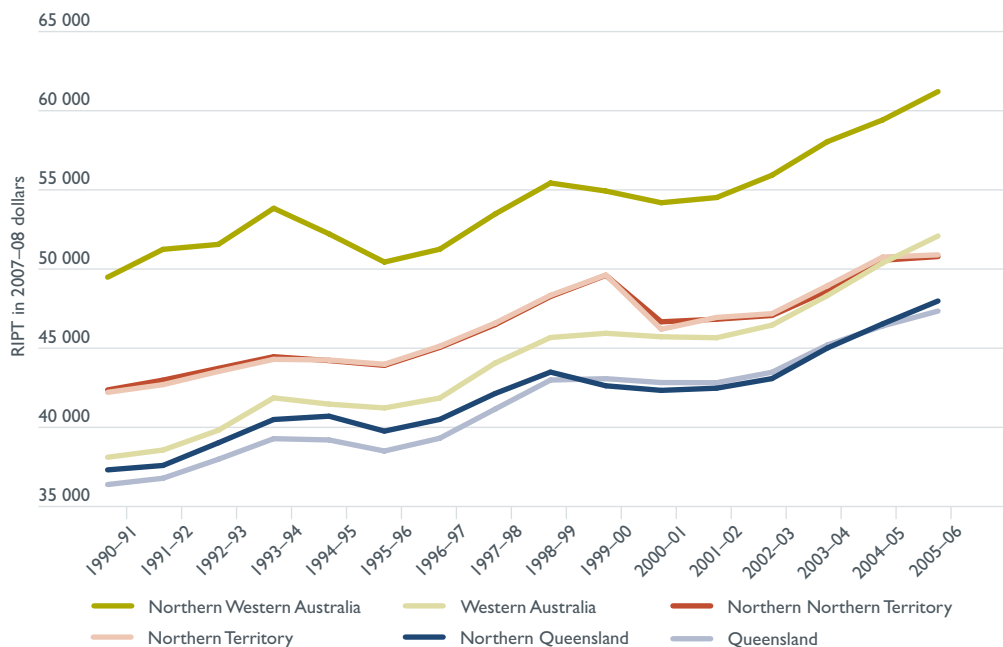


Note: This figure shows RIPT between 1990–1991 and 2005–2006, comparing the northern regions of Queensland, Western Australia and the Northern Territory with Northern Australia and Australia.

Source: BITRE (2009a).

Between 1990–91 and 2005–06, northern Western Australia’s RIPT remained considerably higher than the Australia RIPT, and the north of the Northern Territory generally had a higher RIPT than Australia. Northern Queensland’s RIPT growth pattern tracked the Australia RIPT growth pattern between 1990–91 and 2005–06, but the region’s RIPT was consistently below the national RIPT. This indicates that residents of northern Western Australia and the north of the Northern Territory have historically commanded a higher income than the rest of Australia but residents of northern Queensland earned a lower average income than the rest of Australia.

Figure 3.1.4 shows that northern Queensland RIPT closely resembled Queensland RIPT as a whole, while northern Western Australia’s RIPT was significantly higher than the RIPT of Western Australia, but tracked the state’s overall growth movements. There is almost no discernable difference between the Northern Territory as a whole and its northern parts, since more than 98 per cent of the Northern Territory’s population resides in the north. The northern parts of the states generally had higher RIPT than their respective states, though the gaps between Queensland and its north and Western Australia and its north were closing by 2005–06. For example, in 1990–91 northern Western Australia had just under \$12 500 more income per taxpayer than Western Australia, but the gap had closed to just under \$9000 by 2005–06.

Figure 3.1.4 Northern Australia—RIPT by state, 1990–91 to 2005–06

Note: This figure shows real income per taxpayer (RIPT) between 1990–1991 and 2005–2006, comparing the northern regions of Queensland, Western Australia and the Northern Territory with their respective states.

Source: BITRE (2009a).

In 1990–91, northern Queensland had a larger RIPT than the state as a whole but by 1998–99, Queensland's RIPT had become higher than Northern Queensland. This is consistent with the slowdown in the agricultural industries during the 1990s and the reduction in exports associated with the Asian financial crisis. Since then, incomes in the north of the state have been similar to Queensland as a whole.

Table 3.1.2 shows that the regions with the highest RIPT in 2005–06 were the Pilbara (Western Australia) and North West (Queensland) regions. The Pilbara RIPT has been consistently higher than every other region in Australia's north, while Longreach (Queensland) has consistently had the lowest RIPT of the regions. As can be seen in Table 3.1.2, one region, the Pilbara, exhibited absolute growth in RIPT of more than \$10 000 from 1995–96 to 2005–06. On the other hand, the Barkly-Central NT Region showed the lowest absolute increase in RIPT.

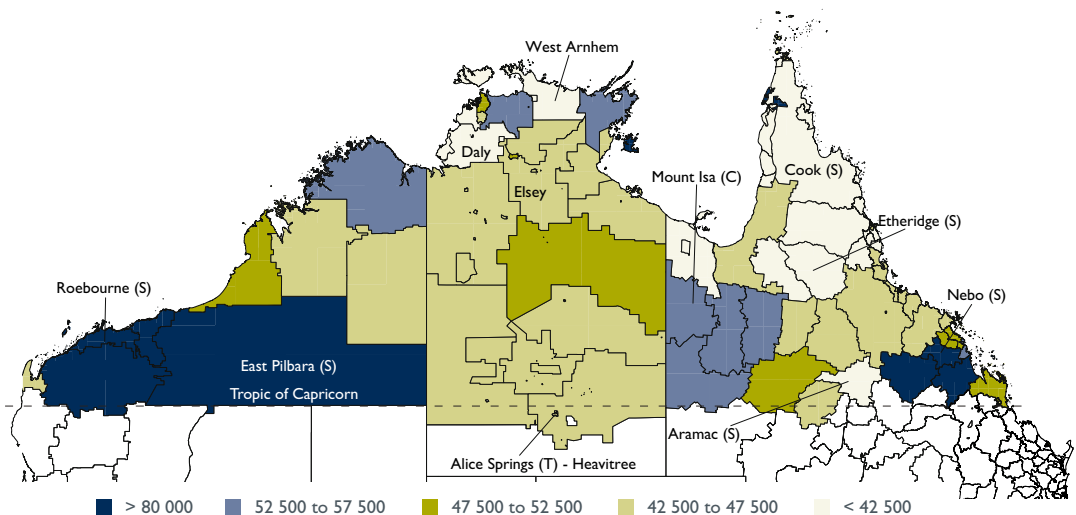
At the SLA level, the spatial distribution of RIPT can be seen in Map 3.1.2. The SLAs with the highest RIPT in 2006 were Nebo (in the Mackay Region), Ashburton (in the Pilbara Region) and Groote Eylandt (in the Darwin-East Arnhem Region). These regions all have a high percentage of mining employment and six of the top nine SLAs in RIPT levels are in the top 7 per cent of employment in mining. This is consistent with the relative prosperity of the mining and resources sector.

Table 3.1.2 Northern Australia—RIPT by region 1995–96 and 2005–06

<i>Region</i>	<i>1995–96</i>	<i>2005–06</i>	<i>Absolute change</i>	<i>Per cent change</i>
Northern Australia (WA)	50 195	60 790	10 595	21.1
Pilbara Region	54 304	66 247	11 943	22.0
Kimberley Region	41 015	49 805	8 790	21.4
Western Australia state total	41 128	51 815	10 686	26.0
Northern Australia (NT)	43 845	50 644	6 799	15.5
Darwin-East Arnhem Region	44 723	51 841	7 118	15.9
Katherine-Lower Top End Region	40 817	46 619	5 802	14.2
Barkly-Central NT Region	41 727	46 804	5 076	12.2
Northern Territory total	43 776	50 537	6 761	15.4
Northern Australia (QLD)	40 155	47 775	7 620	19.0
Mackay Region	42 887	52 563	9 676	22.6
Northern Region	40 041	47 535	7 494	18.7
Far North Region	37 396	43 504	6 108	16.3
North West Region	45 640	52 686	7 046	15.4
Longreach Region	36 150	42 756	6 606	18.3
Queensland state total	38 452	47 149	8 697	22.6
Northern Australia subtotal	41 693	49 325	7 632	18.3
Australia total	41 245	50 082	8 837	21.4

Notes: RIPT by region in 2007–08 dollar values.

Source: BITRE (2009a).

Map 3.1.2 Northern Australia—RIPT by SLA, 2006

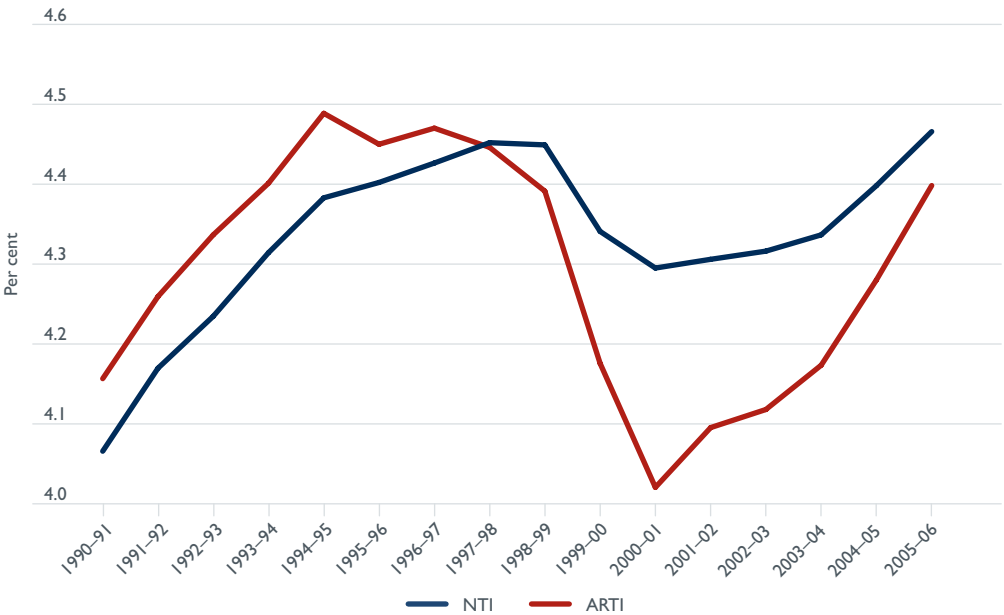
Source: BITRE (2009a).

In using RIPT it must be remembered that this is a per taxpayer measure; as such the exclusion of persons who do not have a taxable income can distort the relative economic welfare of a region, especially if a region has a small percentage of its population paying tax on their income. Also, the same caveat applied to ARTI is to be applied to RIPT. Those that travel between postcodes for work are recorded in their residential postcode, thus some SLAs may be distorted if a large percentage of their workers or residents travel for work.

Importance of Northern Australia to Australia

Figure 3.1.5 shows that in the early to mid-1990s, the proportion of Australia's economic activity generated by Northern Australia was increasing. The NTI and ARTI of Northern Australia were both growing as a proportion of the whole of Australia. Northern Australia contributed 4.1 per cent of Australia's NTI and 4.2 per cent of Australia's ARTI in 1990–91 and then grew to contribute approximately 4.4 per cent and 4.5 per cent respectively in 1994–95, as can be seen in Figure 3.1.1. The economic importance of Northern Australia stabilised in the mid-1990s and then started to decline in the late 1990s. In 2000–01, at the end of the decline, Northern Australia contributed 4.3 per cent of Australia's NTI and just over 4 per cent of Australia's taxable income.

Figure 3.1.5 Northern Australia—number of taxable individuals (NTI) and aggregate real taxable income (ARTI) as percentage of Australia, 1990–91 to 2005–06



Note: This figure shows Northern Australian NTI and ARTI between 1990–91 and 2005–06, as a percentage of Australia's number of taxable individuals and aggregate real taxable income during the same years.

Source: BITRE (2009a).

But this trend reversed from that point and by 2005–06, Northern Australia contributed just under 4.5 per cent of Australia's taxpaying population and approximately 4.4 per cent of Australia's ARTI. This reversing of the trend is consistent with the mining boom, with the relative prosperity of the mining, construction and resource industries leading to higher wages, and the increase in employment in these sectors.

3.2 Employment by industry

The industries of manufacturing, and finance, insurance, property and business services employ less people in Northern Australia as compared with the rest of Australia. On the other hand, mining and government administration and defence are larger employers within Northern Australia. This reflects the dominant contribution of regions within northern Western Australia and Queensland to Australia's mining sector.

At the state or territory level, government administration and defence (19.7 per cent) is the major source of employment within the north of the Northern Territory. This is in part due to the state's system of governance, along with the multiple military bases which are located in the area. For example, there are several Australian Defence Force bases in the Darwin-East Arnhem Region including the Robertson and Larrakeyah barracks, and Naval and RAAF bases, all of which are located in and around Darwin. Mining (19.3 per cent) is the most significant source of employment within northern Western Australia, reflecting this area's reliance on the resource sector for employment. The largest source of employment within northern Queensland (17.9 per cent) is in retail and wholesale trade. Retail and wholesale trade is likely to be related to farm produce, building supplies, and mineral, metal and chemical wholesaling which is generated by other industries in the state.

At the regional level, employment in mining is particularly dominant in the Pilbara and North West Queensland regions. This is to be expected given the dominance of these regions in the Australian resource sector. In particular, the Pilbara Region is one of Australia's best known mining regions and is responsible for the vast majority of the nation's iron ore exports. The agriculture, forestry and fishing industry is the strongest in Longreach and North West Queensland. On the other hand, in the Kimberley, Darwin-East Arnhem, Katherine-Lower Top End, and Barkly-Central NT regions, over 75 per cent of employment by industry is generated by other areas such as retail and wholesale trade, services, health and community services, and government administration and defence (see Figure 3.2.2 and Table 3.2.1).

Within Northern Australia, some SLAs are dominated by key industries such as mining, construction, manufacturing and agriculture, forestry and fishery. For example, in the Tableland (Northern Territory—79.3 per cent), Boulia (Queensland—54.0 per cent) and Aramac (Queensland—52.0 per cent) SLAs the dominant source of employment is in the agriculture, forestry and fishing. Mining is dominant in the Ashburton (Western Australia—50.6 per cent), Broadsound (Queensland—44.0 per cent) and East Pilbara (Western Australia—42.2 per cent) SLAs, while manufacturing is the largest employer in Weipa (Queensland—36.0 per cent), and Nhulunbuy (Northern Territory—29.9 per cent).

Other areas' employment is dominated by education, services, and the retail trade. Such areas are often more densely populated, and hence there is higher demand for health, retail, transport and services. There are also a number of SLAs in which employment by industry is almost solely provided by government administration and defence. Many of these areas are Indigenous communities. The high employment in government administration may be related to high levels of participation in the Community development Employment Projects (CDEP) program, which is financed by the Australian Government.⁶

6. This is discussed in further detail in the Employment, Unemployment and Labour Force Participation section (Chapter 4).

Table 3.2.1 Northern Australia—percentage of people employed by industry, by region, 2006

Region	Agriculture, forestry and fishing (per cent)	Mining (per cent)	Manufacturing (per cent)	Infrastructure (per cent)	Construction (per cent)	Retail and wholesale trade restaurants (per cent)	Accommodation and cafes (per cent)	Finance, insurance, property and business services (per cent)	Government administration and defence (per cent)	Education (per cent)	Health and community services (per cent)	Other services (per cent)	Not stated (per cent)	Total number of people
Northern Australia (WA)	2.8	19.3	4.3	6.4	9.4	12.5	5.5	7.5	7.1	7.7	9.8	5.9	1.7	32 716
Pilbara Region	1.2	28.5	4.9	6.0	11.0	12.4	4.8	8.2	4.4	6.9	6.7	3.9	1.2	20 246
Kimberley Region	5.4	4.4	3.5	7.0	6.9	12.6	6.7	6.5	11.5	9.1	14.9	9.0	2.4	12 470
Western Australia state total	3.4	4.3	10.1	6.1	9.1	18.8	4.4	13.8	5.1	7.6	10.5	5.6	1.3	922 317
Northern Australia (NT)	2.4	2.0	5.0	6.1	7.2	14.5	5.1	10.1	19.7	8.7	10.2	7.1	2.0	84 154
Darwin-East Arnhem Region	1.6	2.3	5.9	6.3	7.8	14.7	4.8	10.6	19.6	8.5	9.0	7.0	1.8	62 449
Katherine-Lower Top End Region	8.1	1.0	1.4	4.1	5.1	10.8	4.4	5.0	28.9	8.1	14.3	4.8	3.9	6 167
Barkly-Central NT Region	3.2	1.2	3.1	5.8	5.8	15.0	6.4	10.1	16.1	9.7	13.5	8.5	1.8	15 538
Northern Territory total	2.5	2.0	5.0	6.1	7.2	14.4	5.5	10.0	19.6	8.6	10.2	7.0	2.0	86 106
Northern Australia (QLD)	6.1	5.4	7.9	7.3	9.0	17.9	6.7	9.0	7.8	7.2	9.4	4.9	1.5	298 548
Mackay Region	6.6	10.9	8.5	7.1	9.9	18.6	7.0	9.0	3.4	6.5	7.5	3.8	1.3	82 045
Northern Region	4.2	3.0	9.3	7.0	9.0	17.9	4.7	9.4	9.8	8.1	11.1	5.1	1.4	93 226
Far North Region	6.1	1.3	6.7	8.0	8.9	18.0	8.5	9.3	9.3	6.9	9.6	5.8	1.7	105 843
North West Region	12.9	18.5	4.9	6.7	5.6	13.0	4.8	4.8	7.7	7.3	8.5	3.4	1.9	15 603
Longreach Region	15.8	0.3	3.7	5.4	4.6	18.1	6.0	5.7	9.4	10.9	12.0	6.0	2.1	1 831
Queensland state total	3.5	1.7	10.4	7.0	9.1	19.5	5.3	13.0	5.5	7.5	10.6	5.6	1.3	1 799 364
Northern Australia subtotal	5.1	5.8	7.0	7.0	8.7	16.7	6.3	9.1	10.1	7.5	9.6	5.4	1.6	415 418
Australia total	3.2	1.2	11.1	6.7	7.8	19.3	4.8	14.7	5.5	7.5	10.9	5.8	1.4	8 990 738

Note: This table shows the percentage of people employed by the various industries in each region. BITRE summed the data for all SLAs in order to produce state and national totals. The other services category includes cultural, recreational, and personal and other services. Infrastructure includes the electricity, gas and water supply, communication services, and transport and storage industries.

Source: ABS (2006d).

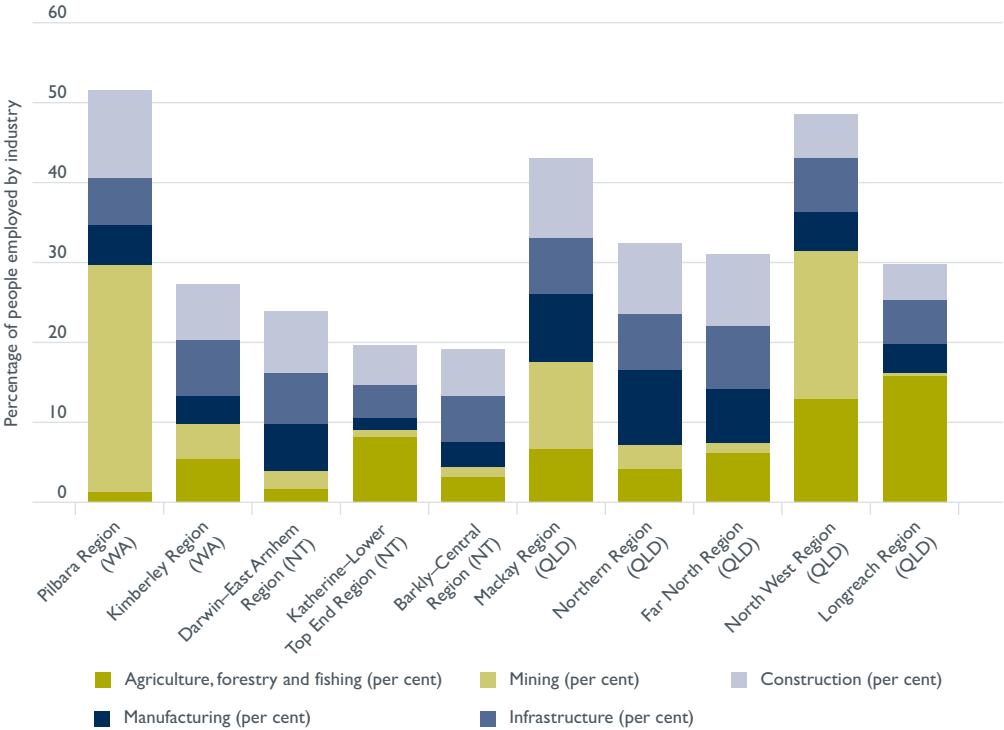
Table 3.2.2 Northern Australia—number of people employed by industry, 2006

Region	Agriculture, forestry and fishing	Mining	Manufacturing	Infrastructure	Construction	Retail and wholesale trade	Accommodation, cafes and restaurants	Finance, insurance, property and business services	Government administration and defence	Education	Health and community services	Other services	Not stated	Total number of people
Northern Australia (NA)	922	6 319	1 416	2 079	3 087	4 079	1 805	2 466	2 331	2 524	3 213	1 921	554	32 716
Pilbara Region	243	5 766	984	1 205	2 224	2 508	971	1 654	892	1 394	1 355	799	251	20 246
Kimberley Region	679	553	432	874	863	1 571	834	812	1 439	1 130	1 858	1 122	303	12 470
Western Australia state total	31 460	40 067	92 697	56 093	84 341	172 938	40 256	126 961	47 059	69 770	97 180	51 878	11 617	922 317
Northern Australia (NT)	1 984	1 671	4 246	5 103	6 080	12 166	4 272	8 515	16 556	7 332	8 620	5 961	1 648	84 154
Darwin-East Arnhem Region	991	1 432	3 681	3 954	4 867	9 168	3 004	6 636	12 264	5 330	5 644	4 346	1 132	62 449
Katherine-Lower Top End Region	500	60	87	251	315	664	274	311	1 784	502	880	296	243	6 167
Barkly-Central NT Region	493	179	478	898	898	2 334	994	1 568	2 508	1 500	2 096	1 319	273	15 538
Northern Territory total	2 112	1 691	4 288	5 295	6 185	12 371	4 763	8 584	16 854	7 408	8 794	6 062	1 699	86 106
Northern Australia (QLD)	18 118	16 032	23 498	21 941	26 874	53 310	20 002	26 788	23 176	21 498	28 152	14 641	4 518	298 548
Mackay Region	5 449	8 962	6 989	5 788	8 099	15 247	5 736	7 344	2 768	5 305	6 139	3 150	1 069	82 045
Northern Region	3 942	2 826	8 634	6 492	8 429	16 694	4 428	8 785	9 145	7 512	10 320	4 729	1 290	93 226
Far North Region	6 433	1 351	7 047	8 517	9 390	19 013	8 985	9 804	9 886	7 338	10 139	6 122	1 818	105 843
North West Region	2 005	2 887	760	1 046	871	2 025	743	751	1 205	1 143	1 334	531	302	15 603
Longreach Region	289	6	68	98	85	331	110	104	172	200	220	109	39	1 831
Queensland state total	62 693	30 657	186 816	126 029	163 622	350 315	96 152	233 690	99 672	135 045	190 218	101 166	23 289	1 799 364
Northern Australia subtotal	21 024	24 022	29 160	29 123	36 041	69 555	26 079	37 769	42 063	31 354	39 985	22 523	6 720	415 418
Australia total	285 393	106 540	998 482	606 536	705 209	1 734 868	433 687	1 323 938	493 729	678 116	976 485	524 713	123 042	8 990 738

Note: This table shows the number of people employed by the various industries in each region. BITRE summed the data for all SLAs in order to produce state and national totals. The other services category includes cultural, recreational, and personal and other services. Infrastructure includes the electricity, gas and water supply, communication services, and transport and storage industries.

Source: ABS (2006d).

Figure 3.2.1 Northern Australia—employment by key industries, by region, 2006

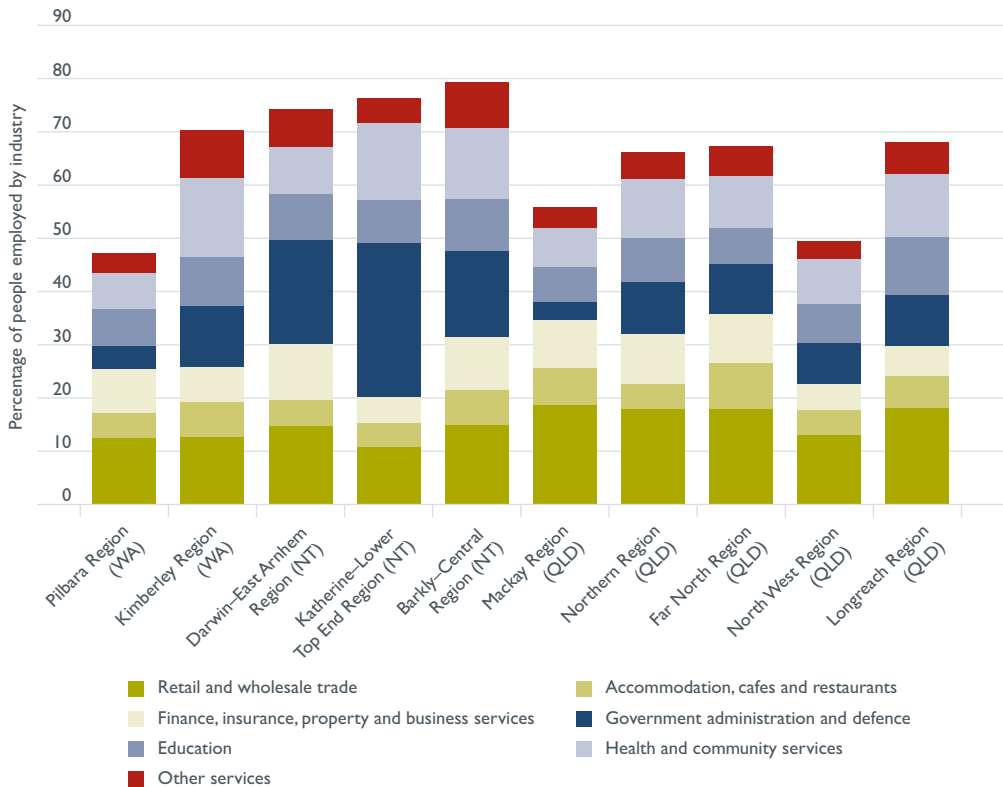


Source: ABS (2006d).

Overall, there were a greater number of people employed in Northern Australia in 2006 than there were in 2001 (Table 3.2.3). An increase is observed across all categories in Northern Australia, with the exception of a small decrease in other services, and in line with the national trend, a substantial decrease in agriculture, forestry and fishing (see Table 3.2.3). This decrease is likely to have been influenced by the drought experienced throughout Australia over this period. Within Northern Australia, the largest increase in the number of people employed by industry between 2001 and 2006 was in construction, due to a substantial increase in northern Queensland (Far North and Mackay regions), the Northern Territory (Darwin-East Arnhem) and Western Australia (Pilbara). The boom in construction is related to the increased demand in the resource sector which occurred during this period.

Within Northern Australia, the greatest increases in the percentage of people employed by industry were seen in construction and mining. These industries have benefited from the increasing demand for resources over this time period. In comparison with the rest of Australia, the increases observed in Northern Australia were larger in these areas. On the other hand, there was a decrease in the number of people being employed by agriculture, forestry and fishing in 2006 compared to 2001, and this decrease was larger than the corresponding decrease in the rest of Australia.

Figure 3.2.2 Northern Australia—employment by remaining industries, by region, 2006



Notes: Figure 3.2.1 and 3.2.2 show the percentage of people which each industry employs, by region. BITRE summed the data for all SLAs in order to produce state and national totals. The other services category includes cultural, recreational, and personal and other services. Infrastructure includes the electricity, gas and water supply, communication services, and transport and storage industries.

Source: ABS (2006d).

At the regional level, some places showed little change compared with 2001, while in others, the percentage of people employed by industry shifted between industries quite dramatically. Northern Western Australia had large increases in the percentage of people employed by mining, particularly in the Pilbara Region, reflecting the increased demand for resources over this time period, and the Pilbara's dominant contribution to Australia's iron ore exports. Within the north of the Northern Territory there was growth in the government administration and defence industry, reflecting the reliance on the government sector in this area for employment and the provision of services. In northern Queensland, there was a large decrease in the percentage of people employed by agriculture, forestry and fishing, especially in the Mackay Region. On the other hand, growth was seen in the construction industry, which was particularly strong in the Mackay Region, and in the mining industry within the North West and Mackay regions. Growth in construction is likely to be related to the need for infrastructure within the coal industry in the Mackay Region and also the smelting industry in areas immediately outside northern Queensland such as Gladstone.

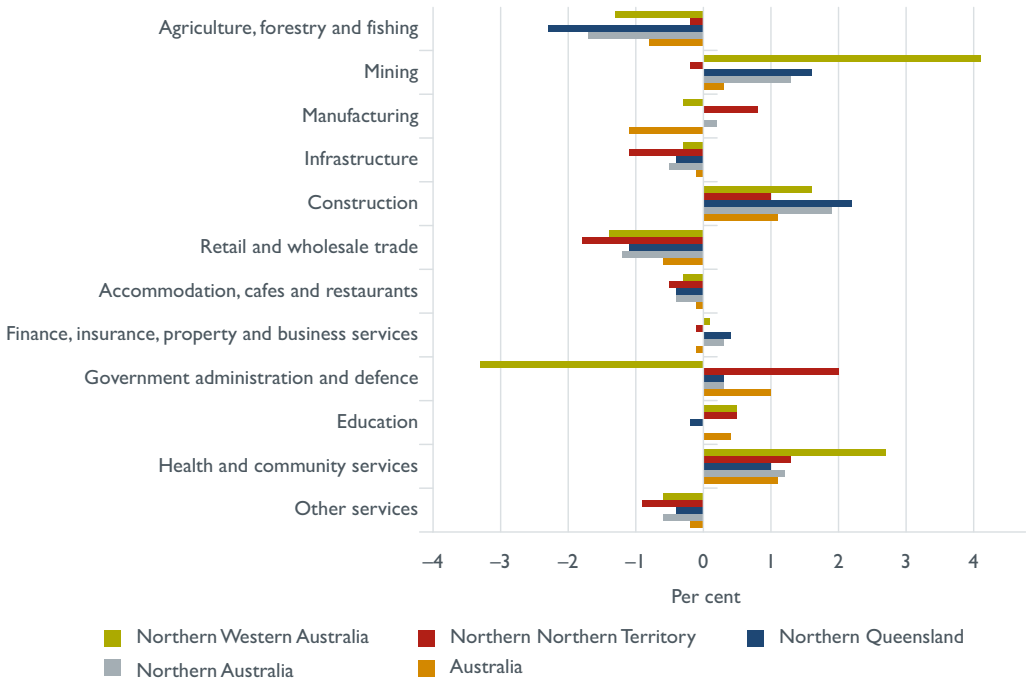
Table 3.2.3 Northern Australia — difference in the number of people employed by industry, 2001–06

Region	Agriculture, forestry and fishing	Mining	Manufacturing	Infrastructure	Construction	Retail and wholesale trade	Accommodation, cafes and restaurants	Finance, insurance, property and business services	Government administration and defence	Education	Health and community services	Other services	Total number of people
Northern Australia (WA)	-420	1 288	-104	-103	516	-506	-109	3	-1 110	135	850	-209	-264
Pilbara Region	-116	1 126	-64	-98	436	-426	-63	20	-155	83	190	-153	421
Kimberley Region	-304	162	-40	-5	80	-80	-46	-17	-955	52	660	-56	-685
Western Australia state total	-5 027	11 045	8 465	4 611	22 350	7 386	1 910	12 772	10 329	9 589	17 973	735	93 254
Northern Australia (NT)	-89	-114	778	-670	1 024	-986	-245	254	2 270	644	1 385	-495	3 197
Darwin-East Arnhem Region	-107	-38	820	-340	1 256	-540	-105	19	2 092	582	868	-36	4 097
Katherine-Lower Top End Region	25	-21	-18	-31	-11	-138	-68	-52	-234	42	272	-112	-312
Barkly-Central NT Region	-7	-55	-24	-299	-221	-309	-72	286	412	20	245	-347	-588
Northern Territory total	-155	-155	762	-769	1 016	-973	-380	197	1 993	605	1 405	-579	2 375
Northern Australia (QLD)	-4 366	5 819	2 366	1 263	8 698	2 442	924	3 889	3 270	1 739	5 645	364	30 436
Mackay Region	-1 461	4 109	1 127	390	3 302	1 726	861	1 489	846	430	1 057	285	13 635
Northern Region	-907	1 118	942	566	2 571	432	426	1 152	947	631	2 144	-90	9 483
Far North Region	-1 700	170	463	490	3 215	641	-223	1 481	1 796	663	2 236	347	9 027
North West Region	-222	419	-165	-150	-357	-358	-123	-211	-350	26	175	-176	-1 568
Longreach Region	-76	3	-1	-33	-33	1	-17	-22	31	-11	33	-2	-141
Queensland state total	-12 270	11 485	20 950	13 990	52 860	33 129	8 322	38 093	25 039	16 841	40 950	7 252	245 078
Northern Australia subtotal	-4 875	6 994	3 039	490	10 238	950	570	4 146	4 430	2 519	7 880	-339	33 369
Australia total	-43 659	31 779	-9 946	42 619	148 046	88 768	24 444	93 298	124 861	83 382	171 576	22 693	709 006

Notes: This table shows the difference between the numbers of people who were employed by industry in 2006 compared to 2001. BITRE summed the data for all SLAs in order to produce state and national totals. The other services category includes cultural, recreational, and personal and other services. Infrastructure includes the electricity, gas and water supply, communication services, and transport and storage industries.

Source: ABS (2006d).

Figure 3.2.3 Northern Australia—difference in the percentage of people employed by industry, 2001–2006



Notes: The table and graph show the difference between the percentages of people who were employed by industry in 2006 compared to 2001. BITRE summed the data for all SLAs in order to produce state and national totals. The other services category includes cultural, recreational, and personal and other services. Infrastructure includes the electricity, gas and water supply, communication services, and transport and storage industries.

Source: ABS (2006d).

3.3 Median individual income

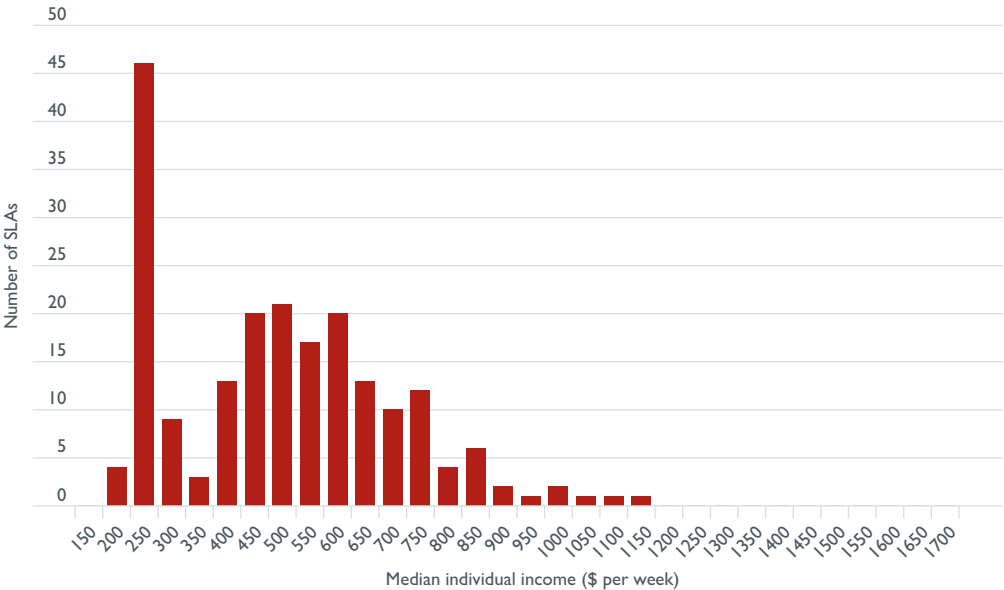
As shown in Figure 3.3.1, the median individual income for Northern Australia is bimodal. The first peak is at the \$200–250 per week bracket, and the second is at the \$450–500 per week bracket. The lower peak is likely to be related to welfare payments; the highest possible welfare payment for a single unemployed adult falls into this income bracket (Centrelink 2008). Many of the SLAs low income have significant Indigenous communities.⁷ The second peak in the data is very similar to the Australian mode (\$400–450 per week; Figure 3.3.1).

Seventy-five per cent of the SLAs in Australia with a median individual weekly income amounting to less than \$250 per week lie within Northern Australia. Many of these areas have relatively high unemployment rates, and a large number of these areas are Indigenous communities. The Australian graph has a longer ‘tail’ to the right than the Northern Australian graph, indicating a greater number of SLAs with a higher

7. The SLAs which have a median individual income of \$200–250 per week are: East Arnhem—Balance Marngarr (CGC), New Mapoon (S), Lajamanu (CGC), Jilkminggan (CGC), Mornington (S), Numbulwar Numburindi (CGC), Tiwi Islands (CGC), Angurugu (CGC), Belyuen (CGC), Kunbarlanjinja (CGC), Tennant Creek—Bal, Tanami, West Arnhem, Binjari (CGC), Hanson, Aurukun (S), Yugul Mangi (CGC), Palm Island (S), Daguragu (CGC), Injinoo (S), Umagico (S), Sandover, Anmatjere (CGC), Yarrabah (S), Saibai (IC), Lockhart River (S), Napranum (S), Hope Vale (S), Doomadgee (S), Yuendumu (CGC), Mabuigai (IC), Mapoon (S), Gulf, Halls Creek (S), Wujal Wujal (S), Mer (IC), Boigu (IC), Hammond (IC), Kubin (IC), Warraber (IC), Badu (IC), Kowanyama (S), Pormpuraaw (S), Daly Walangeri Ngumpinku (CGC).

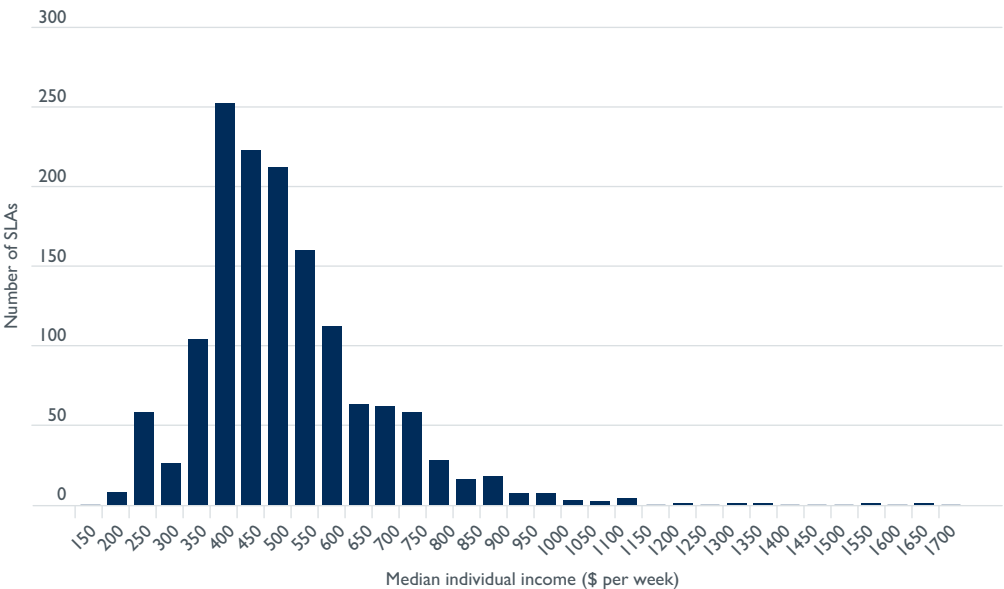
median individual income (see Figures 3.3.1 and 3.3.2). The highest median income bracket for an Australian SLA is \$1650–1700, while the highest bracket within Northern Australia is \$1100–1150. This is in Nhulunbuy, which is located in the Darwin-East Arnhem Region. The majority of people in this area are employees of, or contractors to, the bauxite mining operation (Urbis Keys Young 2006).

Figure 3.3.1 Northern Australia—median individual income by SLA, 2006



Notes: This graph shows the median individual income of each SLA in Northern Australia.
Source: ABS (2006b).

Figure 3.3.2 Australia—median individual income by SLA, 2006



Notes: This graph shows the median individual income of each SLA in Australia.
Source: ABS (2006b).

3.4 Weekly income by income bracket

Different patterns in the distribution of weekly income were observed across the Northern Australian states and territory. In northern Queensland, the distribution of weekly income resembled a bell-shaped curve, with a greater percentage of people earning in the middle income bracket (Figure 3.4.3). In contrast, the Kimberley Region followed the pattern observed in the Northern Territory, where there were a high percentage of people earning an income in the lower brackets and then a steady decrease in the percentage of people earning a high weekly income. The Pilbara Region had a steady increase in the percentage of people earning a high weekly income (Figure 3.4.1).

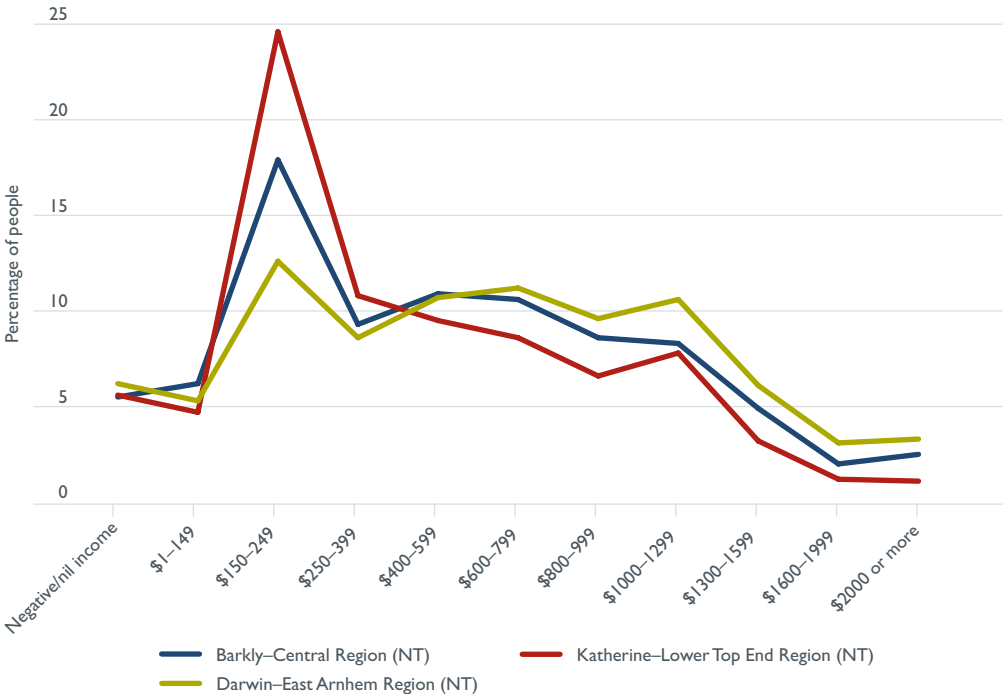
In the Pilbara (Figure 3.4.1), the percentage of people in the lower income brackets is smaller, and the percentage of people in the higher income brackets is higher, as compared with other regions. This reflects the dominance of industries such as mining, which offer high weekly incomes to workers. The Pilbara Region with a dominant resource sector, has by far the highest percentage (11.4 per cent) of people earning in the top two income brackets (\$2000 per week or more and \$1600–\$1999 per week).

Figure 3.4.1 Northern Australia (Western Australia) – weekly income by income bracket, by region, 2006



Source: ABS (2006b).

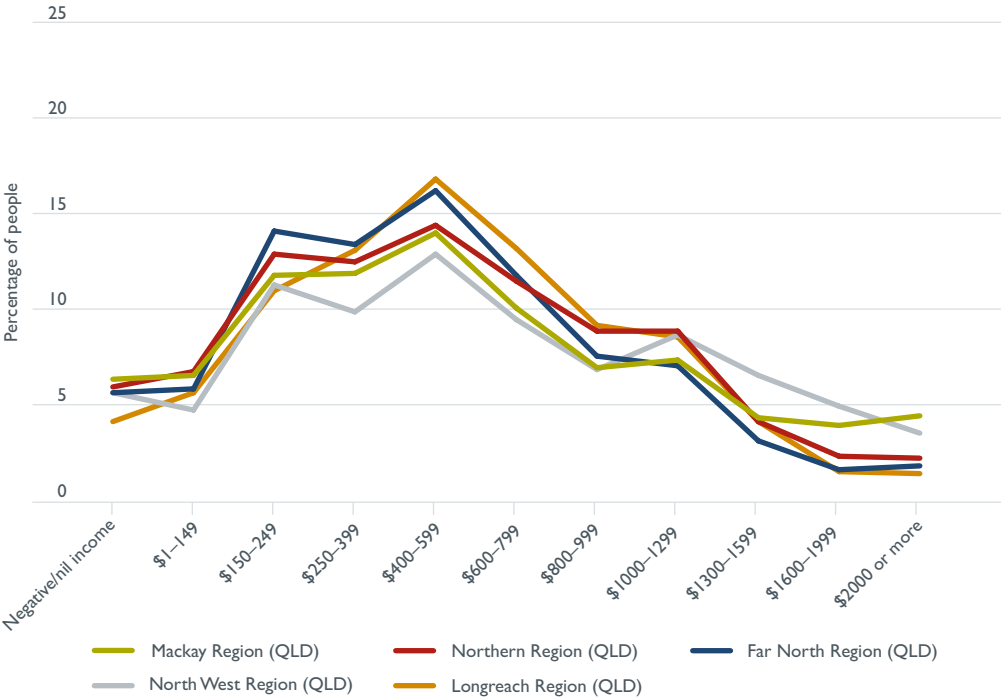
Figure 3.4.2 Northern Australia (Northern Territory)—weekly income by income bracket, by region, 2006



Source: ABS (2006b).

At the other end of the scale, northern Queensland has the highest percentage of people in the lowest income bracket (\$1–149 per week), particularly in the Mackay (6.6 per cent) and Northern (6.8 per cent) regions. It should be noted that the census data for weekly income by income bracket does not distinguish between those people who are working full-time, part-time or casually, or not working. Also worth noting is the \$150–249 per week income bracket, as this is likely to be influenced by welfare payments, given that the highest possible welfare payment for a single unemployed adult falls into this income bracket (Centrelink 2008). In the Katherine-Lower Top End Region, extremely high numbers are seen in this income bracket (24.6 per cent). High percentages of people in the negative/nil income bracket are seen in the Mackay, Darwin-East Arnhem, Northern (Queensland) and Pilbara regions. This is primarily due to the larger percentage of females who do not earn an income in these areas (Table 3.4.2).

Figure 3.4.3 Northern Australia (Queensland)—weekly income by income bracket, by region, 2006

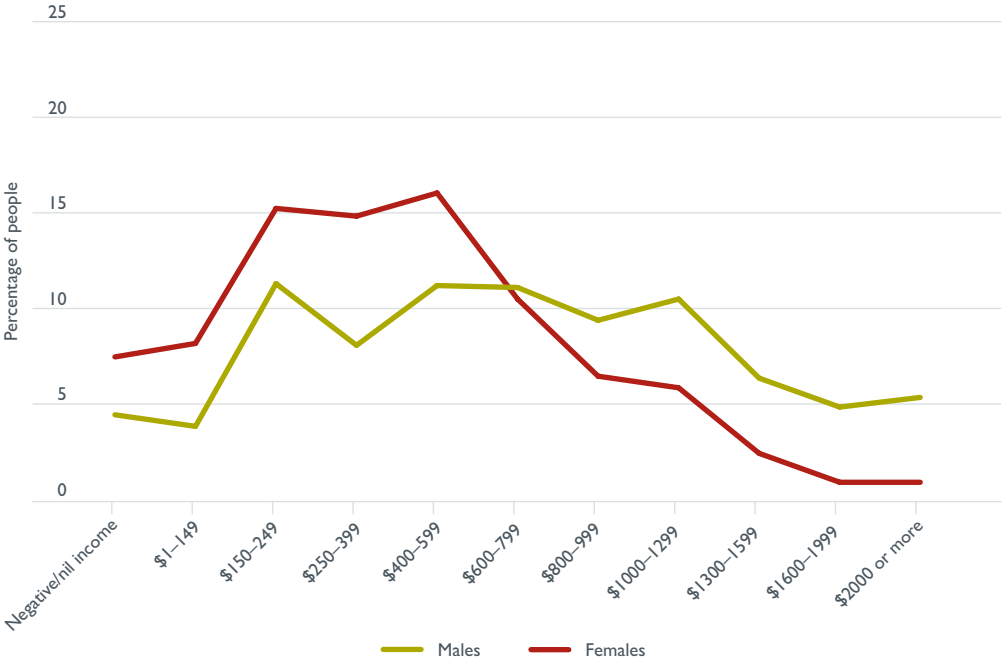


Notes: These graphs show the percentage of people within Northern Australia earning within a given weekly income bracket, by region. The data in this section is drawn from the Australian Bureau of Statistics' 2006 Census. Due to the larger of respondents who did not state their individual income, this data should be treated with caution.

Source: ABS (2006b).

In Figure 3.4.4, it can be seen that there are greater numbers of males in Northern Australia earning a weekly income in the higher income brackets, and a greater number of females earning an income in the lower income brackets. An example of this is seen in the Pilbara Region, where 50.1 per cent of females earn less than \$600 per week, compared with just 16.8 per cent of males (Table 3.4.1 and Table 3.4.2). The gender differences in part reflect the labour force participation rates within Northern Australia, which are discussed in greater detail in Chapter 4.

Figure 3.4.4 Northern Australia—weekly income by income bracket, by gender, 2006



Notes: This graph shows the percentage of females within regions in Northern Australia who are earning within certain weekly income brackets. The data in this section is drawn from the Australian Bureau of Statistics' 2006 Census. Due to the larger of respondents who did not state their individual income, this data should be treated with caution.

Source: ABS (2006b).

Table 3.4.1 Northern Australia—weekly income by income bracket, percentage of males, by region, 2006

Region	Negative/nil income	Percentage of males										Individual income not stated	Total
		\$1–149	\$150–249	\$250–399	\$400–599	\$600–799	\$800–999	\$1000–1299	\$1300–1599	\$1600–1999	\$2000 or more		
Northern Australia (WA)	3.8	2.3	10.7	4.6	5.6	6.2	6.2	8.8	8.0	10.2	12.9	20.6	29 127
Pilbara Region	3.4	1.8	4.8	3.0	3.8	4.4	5.4	8.6	9.7	14.1	18.8	22.1	17 904
Kimberley Region	4.4	3.2	20.1	7.3	8.5	9.0	7.6	9.2	5.3	3.9	3.5	18.2	11 223
Western Australia state total	5.2	4.3	9.8	8.8	10.8	11.0	9.6	11.1	7.1	5.0	7.0	10.3	772 511
Northern Australia (NT)	5.2	4.3	13.5	6.5	8.7	10.2	9.9	11.7	6.9	4.0	4.6	14.6	72 452
Darwin-East Arnhem Region	5.2	3.9	11.3	6.3	8.7	10.5	10.5	12.4	7.4	4.6	5.1	14.2	52 797
Katherine-Lower Top End Region	5.4	4.2	24.7	8.2	8.0	7.9	7.6	10.0	4.1	1.6	1.7	16.7	5 918
Barkly-Central NT Region	4.9	5.8	17.0	6.3	9.0	9.9	8.9	9.6	6.1	3.0	4.0	15.4	13 737
Northern Territory total	5.2	4.3	13.9	6.5	8.7	10.2	9.8	11.5	6.8	4.0	4.5	14.7	74 854
Northern Australia (QLD)	4.4	4.0	10.7	9.0	12.5	11.9	9.7	10.4	6.1	4.5	4.7	12.2	252 105
Mackay Region	4.0	3.4	8.9	8.2	11.0	10.6	8.8	9.9	6.9	6.8	7.8	13.6	70 931
Northern Region	4.4	4.4	10.4	8.9	12.1	12.6	11.2	11.9	6.3	4.0	3.9	9.9	76 808
Far North Region	4.7	4.2	12.6	10.1	14.3	12.8	9.4	9.2	4.6	2.7	2.9	12.5	89 790
North West Region	4.1	2.9	9.1	6.6	10.0	9.0	7.2	11.1	10.3	8.4	5.8	15.6	13 272
Longreach Region	4.1	3.9	9.6	10.5	15.8	13.3	10.0	10.8	5.4	2.8	2.0	11.7	1 304
Queensland state total	5.1	4.5	11.1	9.8	13.0	12.6	9.9	10.3	5.7	3.6	4.7	9.8	1 521 497
Northern Australia subtotal	4.5	3.9	11.3	8.1	11.2	11.1	9.4	10.5	6.4	4.9	5.4	13.4	353 684
Australia total	5.9	4.8	11.6	9.7	12.2	11.7	9.5	9.9	5.9	3.8	5.6	9.4	7 777 921

Note: This table shows the percentage of males within regions in Northern Australia who were earning within certain weekly income brackets in 2006. The data in this section is drawn from the Australian Bureau of Statistics' 2006 Census. Due to the larger of respondents who did not state their individual income, this data should be treated with caution.

Source: ABS (2006b).

Table 3.4.2 Northern Australia—weekly income by income bracket, percentage of females, by region, 2006

Region	Negative/nil income	Percentage of females											Total
		\$1– 149	\$150– 249	\$250– 399	\$400– 599	\$600– 799	\$800– 999	\$1000– 1299	\$1300– 1599	\$1600– 1999	\$2000 or more	Individual income not stated	
Northern Australia (WA)	7.7	7.1	14.0	10.8	12.5	9.6	7.0	6.7	3.7	1.8	1.7	17.3	24 651
Pilbara Region	9.5	8.7	10.2	9.6	12.1	9.4	7.1	7.1	4.1	2.3	2.0	17.9	14 244
Kimberley Region	5.4	4.9	19.3	12.4	13.0	9.9	6.9	6.3	3.1	1.1	1.3	16.4	10 407
Western Australia state total	8.7	9.6	15.2	15.8	14.9	10.0	6.6	5.7	2.4	1.1	1.3	8.8	790 143
Northern Australia (NT)	6.9	6.6	15.8	11.6	12.7	11.6	8.4	8.0	4.3	1.4	1.2	11.7	68 155
Darwin-East Arnhem Region	7.2	6.8	13.9	11.2	12.8	11.9	8.7	8.6	4.6	1.6	1.3	11.3	48 608
Katherine-Lower Top End Region	5.8	5.3	24.5	13.5	11.2	9.2	5.6	5.5	2.3	0.7	0.6	15.8	5 635
Barkly-Central NT Region	6.1	6.6	18.9	12.3	12.8	11.3	8.2	7.0	3.7	1.0	0.9	11.3	13 912
Northern Territory total	6.8	6.6	16.2	11.6	12.7	11.5	8.3	7.9	4.2	1.3	1.1	11.7	70 442
Northern Australia (QLD)	7.6	8.7	15.2	16.2	17.3	10.3	5.9	5.2	1.9	0.8	0.9	10.0	245 105
Mackay Region	9.0	10.1	14.8	15.9	17.1	9.5	5.1	4.7	1.8	0.9	1.0	10.1	66 157
Northern Region	7.6	9.1	15.4	16.2	16.7	10.3	6.7	5.8	2.0	0.8	0.8	8.5	76 906
Far North Region	6.7	7.6	15.6	16.7	18.0	10.8	5.8	5.0	1.8	0.7	0.9	10.5	89 035
North West Region	7.5	7.1	13.8	13.7	16.2	10.2	6.5	6.0	2.5	1.2	1.1	14.2	11 610
Longreach Region	4.2	7.3	12.4	15.5	17.8	13.0	8.4	6.6	3.0	0.6	1.1	10.1	1 397
Queensland state total	7.6	8.7	15.6	16.7	16.7	10.3	6.2	5.4	2.1	0.9	1.1	8.5	1 576 499
Northern Australia subtotal	7.5	8.2	15.2	14.8	16.0	10.5	6.5	5.9	2.5	1.0	1.0	10.8	337 911
Australia total	8.4	9.0	16.2	16.1	15.0	9.6	6.4	5.7	2.7	1.2	1.5	8.4	8 140 155

Note: This table shows the percentage of females within regions in Northern Australia who were earning within certain weekly income brackets in 2006. The data in this section is drawn from the Australian Bureau of Statistics' 2006 Census. Due to the larger of respondents who did not state their individual income, this data should be treated with caution.

Source: ABS (2006b).

3.5 Taxpayer income: salaries, businesses, investments, superannuation and other income

The data in this section is taken from the Australian Bureau of Statistics' (ABS) Estimates of Personal Income for Small Areas, 2001–02 to 2005–06. Unlike the previous sections on median and weekly incomes, which discussed the income of all adults as captured in the 2006 Census, this data has been collected from people required to submit tax returns to the Australian Tax Office (ATO) only.⁸ It provides a more detailed picture of the types of income which taxpayers relied upon from region-to-region, showing whether incomes were from salaries, business returns, investments, superannuation, or other sources.

As can be seen in Table 3.5.1, in 2005–06, the majority of Northern Australian regions (except Far North Queensland) had a significantly higher taxpayer dependence on wage and salary income amongst taxpayers than Australia as a whole (79.2 per cent of total taxable income). Northern Australia taxpayers also had a higher dependence on salaries and wages than those across Queensland (79.7 per cent) and Western Australia (77.9 per cent).

The Pilbara and North West Queensland regions, both with relatively high proportions of people employed in the mining industry, derive more than 90 per cent of taxpayer income from wages and salaries. Outside Darwin-East Arnhem in the north of the Northern Territory, more than 90 per cent of taxpayer income is also derived from this source. In these regions, in numerous small and remote communities and in the regional centre of Alice Springs, employment is concentrated in the provision of basic services to the local population in the retail, government and administration, and health and community sectors.

The northern regions of Queensland have the highest levels of reliance upon business income as a proportion of total taxpayer income (with the exceptions of the North West Region) in Northern Australia. These levels are well above those for the state of Queensland and Australia as a whole.

8. Like BITRE's Regional Economic Growth Database, this data does not cover some low income earners, including many pension recipients who are not required to submit tax returns. Information presented should be treated with particular caution in relation to Far North Queensland, Darwin-East Arnhem, Katherine-Lower Top End, and Barkly-Central NT. Within these regions, the Australian Taxation Office and the Australian Bureau of Statistics were unable to provide data for a number of SLAs. In Far North Queensland, no data was provided for the following SLAs, all of which are Indigenous communities: Palm Island; Badu; Hammond; Hope Vale; Iama; Injinoo; Kowanyama; Kubin; Lockhart River; Mabuiag; Mapoon; Mer; Napranum; New Mapoon; Pormpuraaw; Poruma; St Pauls; Seisia; Umagico; Warraber; Wujal Wujal; Yarrabah; Boigu; Dauan; Saibai; Yorke; Ugar; Erub; and Doomadgee.

In the Darwin-East Arnhem Region of the Northern Territory, no data is available for the Indigenous communities of Belyuen; Coomalie; Cox Peninsula; Kunbarllanjnja; Nauyu Nambiyu; Pine Creek; Thamarrurr; Angurugu; Marngarr; Numbulwar Numburindi. In the Katherine-Lower Top End Region of the Northern Territory, no data was provided for the Indigenous SLAs of Binjari; Borroloola; Daguragu; Jilkminggan; Lajamanu; Mataranka; Nyirranggulung Mardrulk Ngadberre; Timber Creek; Walangeri Ngumpinku and Yugul Mangi. In the Barkly Central NT Region of the Northern Territory, no data was provided for Alpururulam, Elliott District, Anmatjere and Yuendumu, all of which had largely Indigenous populations.

Table 3.5.1 Northern Australia—taxpayer income earned (percentage of region total) by income type by region, 2005–06

Region	Total wage and salary income (per cent of region total income)	Total own unincorporated business income (per cent of region total income)	Total investment income (per cent of region total income)	Total superannuation and annuity income (per cent of region total income)	Total other income (per cent of region total income)
Northern Australia (WA)	93.0	4.6	1.9	0.2	0.3
Pilbara Region	95.7	3.2	0.6	0.2	0.3
Kimberley Region	85.9	8.1	5.2	0.5	0.3
Western Australia state total	77.9	8.8	9.8	2.3	1.1
Northern Australia (NT)	89.8	5.0	2.9	1.9	0.3
Darwin-East Arnhem Region	89.3	5.4	2.8	2.1	0.4
Katherine-Lower Top End Region	93.1	3.0	2.9	0.9	0.1
Barkly-Central NT Region	91.5	3.4	3.4	1.5	0.3
Northern Territory total	89.9	4.9	2.9	1.9	0.3
Northern Australia (QLD)	81.9	8.8	7.0	1.8	0.6
Mackay Region	82.5	8.1	7.4	1.5	0.5
Northern Region	82.2	8.8	6.3	2.2	0.6
Far North Region	79.3	10.3	7.8	2.0	0.7
North West Region	91.0	4.7	3.4	0.6	0.3
Longreach Region	80.8	9.4	8.2	1.1	0.5
Queensland state total	79.7	7.6	9.1	2.9	0.8
Northern Australia subtotal	84.5	7.6	5.7	1.7	0.5
Australia total	79.2	6.9	9.8	3.2	0.9

Note: This table shows different income types as a percentage of the total taxpayer income (excluding government pensions and allowances) earned in each region.

Source: ABS (2008d).

Table 3.5.2 Northern Australia—average incomes (salaries, unincorporated businesses, investment, superannuation, other income) by income type by taxable income earning group by region, 2005–06

Region	Average wage and salary income (\$)	Average unincorporated business income (\$)	Average investment income (\$)	Average superannuation and annuity income	Average other income (excluding government pensions and allowances)
Northern Australia (WA)	50 084	24 417	3 124	17 351	2 849
Pilbara Region	56 364	23 814	1 113	16 403	2 925
Kimberley Region	37 686	25 083	7 290	18 285	2 656
Western Australia state total	40 209	26 620	9 231	22 027	4 716
Northern Australia (NT)	41 810	20 962	3 732	23 589	2 332
Darwin-East Arnhem Region	43 285	22 655	3 612	23 987	2 479
Katherine-Lower Top End Region	37 833	13 058	3 619	19 862	1 153
Barkly-Central NT Region	36 829	14 572	4 368	21 754	1 860
Northern Territory total	41 136	20 436	3 748	23 485	2 320
Northern Australia (QLD)	38 379	24 414	6 274	20 302	2 209
Mackay Region	42 479	24 676	6 872	20 566	1 974
Northern Region	38 346	27 305	5 695	19 317	2 126
Far North Region	34 114	23 228	6 537	21 501	2 573
North West Region	43 118	15 923	4 276	18 704	1 779
Longreach Region	33 632	14 042	5 512	18 428	1 545
Queensland state total	37 327	22 274	7 570	22 379	2 892
Northern Australia subtotal	40 028	23 903	5 704	20 922	2 256
Australia total	39 807	22 424	8 163	23 506	3 801

Notes: This table shows average incomes (amongst taxpaying earners of each income type only) by income type, by region.

Source: ABS (2008d).

All regions of Northern Australia have relatively low levels of dependence on superannuation and annuities compared with Australia as a whole, particularly in Western Australia, where fewer older people live. Within Northern Australia the highest levels of reliance on superannuation and annuities are evident in Darwin-East Arnhem and Northern Queensland, consistent with higher proportions of retirees living in larger population centres there.

Dependence on investment income was particularly low in the north of Western Australia, compared with the state of Western Australia and the nation as a whole. It was also significantly lower in the Northern Territory than across the whole of Australia. In the northern Queensland regions, investment income features more strongly; however, as a proportion of total taxpayer income, investment returns still typically play a smaller part than in Queensland and the rest of Australia.

In summary, the northern parts of Queensland, Northern Territory and Western Australia each had higher average salary incomes than the wider populations of their respective states. As a whole, Northern Australia also had a higher average salary income than Australia.

However, there was a great deal of variation between regions in Northern Australia. The highest average salaries were earned in the Pilbara and Darwin-East Arnhem regions, and were well above state and national averages. The lowest salary incomes were earned in Longreach in Queensland, and the Barkly-Central NT Region of the Northern Territory, and were significantly below state and national averages. The highest average business incomes (significantly above Queensland and Australian averages) were recorded in Northern Queensland, and the lowest in Longreach (significantly below). It should be noted that Longreach had a relatively small population and a strong dependence on agriculture, so incomes for the region may fluctuate from year-to-year.

Data relating to economic activity available in the online compendium

3.1 Economic growth in Northern Australia

- Northern Australia—ARTI, by region, 1990–91 to 2005–06
- Northern Australia—ARTI, by SLA, 1990–91 to 2005–06
- Northern Australia—ARTI growth rates, by region, 1990–91 to 2005–06
- Northern Australia—ARTI growth rates, by SLA, 1990–91 to 2005–06
- Northern Australia—ARTI average annual growth rates by SLA, 2000–01 to 2005–06
- Northern Australia—RIPT, by region, 1990–91 to 2005–06
- Northern Australia—RIPT, by SLA, 1990–91 to 2005–06
- Northern Australia—NTI, by region, 1990–91 to 2005–06

- Northern Australia—NTI, by SLA, 1990–91 to 2005–06
- Northern Australia—NTI growth rates, by region, 1990–91 to 2005–06
- Northern Australia—NTI growth rates, by SLA, 1990–91 to 2005–06.

3.2 Employment by industry

- Northern Australia—employment by industry, by SLA, 2006
- Northern Australia—difference in the percentage of people employment by industry, 2001–2006
- Northern Australia—employment by industry, number of persons, by region, 2001
- Northern Australia—employment by industry, percentage of persons, by region, 2001.

3.3 Median individual income

- Northern Australia—median individual income, by SLA, 2006
- Northern Australia—median individual income, by UCL, 2006.

3.4 Weekly income by income bracket

- Northern Australia—weekly income by income bracket, by gender, by SLA, 2006
- Northern Australia—weekly income by income bracket, by gender, by UCL, 2006
- Northern Australia—weekly income by income bracket, number of persons, by region, 2006
- Northern Australia—weekly income by income bracket, percentage of persons, by region, 2006.

3.5 Taxpayer income: salaries, businesses, investments, superannuation and other income

- Northern Australia—number of taxable earners and aggregate income earned by income type by region, 2005–06
- Northern Australia—taxpayer income earned by income type (percentage of total SLA income) by SLA, 2005–06
- Northern Australia—number of taxable earners and aggregate income earned by income type by region, 2005–06
- Northern Australia—salaries and wages as a percentage of total taxpayer income per region, 2005–06 (excluding government pensions and allowances).

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Chapter 4

Workforce



Chapter 4 Workforce

This chapter discusses the workforce of Northern Australia. It does so by considering growth and decline in the NTI by region over time; labour force participation rates; employment and unemployment in 2006; labour force size; employment and unemployment over time; and work qualifications and education levels in 2006.

With respect to the number of taxpayers per region from 1991 onward, growth rates were generally lower in the Northern Australian regions of each state than the whole of each respective state. However, from year-to-year they followed similar growth patterns to the rest of Australia.

Labour force participation rates across the north of Western Australia, Northern Territory and Queensland were all higher than their respective state participation rates in 2006, and higher than the Australia labour force participation rate. However, there is a great deal of variability at the regional, SLA and UCL levels, and between genders. Labour force numbers saw a similar pattern of growth in Northern Australia as in the whole of Australia between 1998 and 2007. However, the north of the Northern Territory and the north of Western Australia saw brief periods of decline in 1999–2000 and 2000–2001 respectively.

Employment grew more in Northern Australia between the 2001 and 2006 census than it did across Australia. ‘Fly-in, fly-out’ and ‘drive-in, drive-out’ work were significant features of employment growth in many Northern Australian mining regions.

In 2006, the majority of Northern Australian regions had unemployment rates below that of Australia. However, there is considerable variation in unemployment levels across the region at the SLA level. Much of Northern Australia saw a decline in unemployment rates between 1998 and 2007 like the rest of Australia.

In terms of education, the proportion of people who have completed Year 12 or equivalent in Northern Australia was well below the Australian figures. Furthermore, within the northern regions of Western Australia and the Northern Territory, there were a higher proportion of people who did not go to school compared to Australia.

Higher proportions of Certificate-level qualifications were seen across Northern Australia, compared to the rest of Australia. On the other hand, the Northern Australia subregions had lower numbers of Postgraduate and Bachelor degree-level qualifications, as well as lower levels of Graduate Diploma and Graduate Certificates, compared with the rest of Australia.

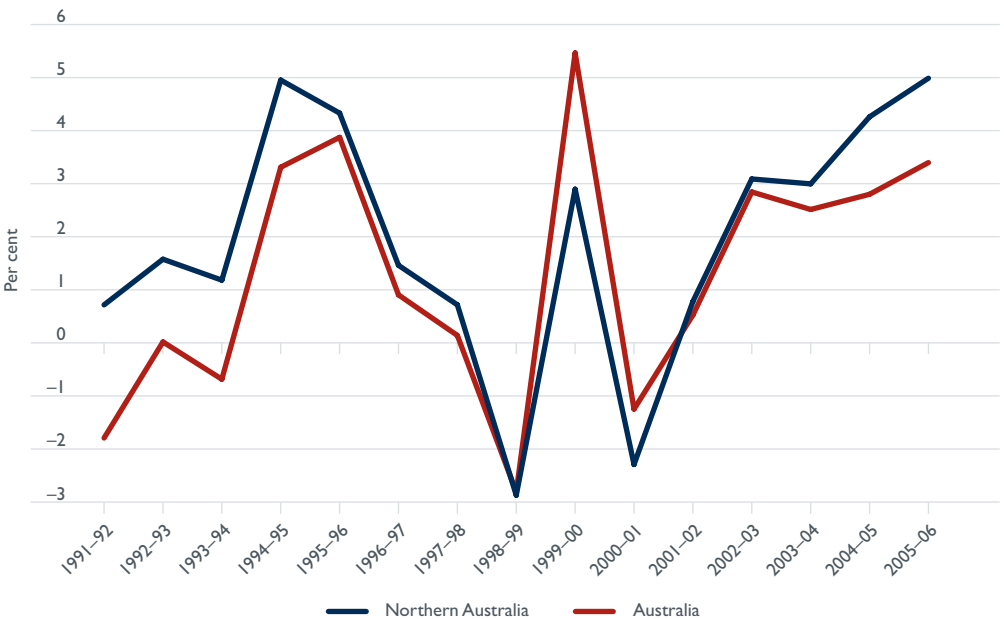
4.1 Number of Taxable Individuals (NTI)

The number of taxable individuals (NTI) represents the number of people who had a taxable income above the taxfree threshold. NTI shows us the number of people who are actively participating in an economy.

Changes in NTI for a region can occur for three reasons: people migrating to or from a region to take advantage of economic benefits; people moving in or out of the workforce in the region; or from income earners who earned income without requiring any tax payments who have an increase in income so that they must start paying tax.

Figure 4.1.1 shows that NTI growth rates for Northern Australia mimic the Australian growth patterns between 1990–91 and 2005–06. Northern Australia experienced lower growth compared to all Australia during the late 1990s but over the whole time period its average annual NTI growth was greater (1.9 per cent compared to 1.3 per cent). After 2000–01, NTI growth was higher in Northern Australia than in Australia (3.2 per cent against 2.4 per cent).

Figure 4.1.1 Northern Australia year—number of taxable individuals, growth 1990–91 to 2005–06



Note: This table shows percentage growth and decline in the number of taxable individuals between 1990–91 and 2005–06, comparing northern Australia with the whole of Australia.

Source: BITRE (2009a).

Table 4.1.1 shows that NTI growth rates between 1995–96 and 2005–06 are generally lower in the Northern Australian regions of the states, than the whole state in which they are located. Two regions had a shrinking NTI over this period: these were Barkly-Central NT in the Northern Territory (–0.4 per cent) and the North West Region (–0.4 per cent) in Queensland. The region with the largest average annual NTI growth was Mackay (Queensland) at 2.4 per cent per annum. Five of the regions (Mackay, Far North Queensland, Northern Queensland, the Kimberley and Darwin-East Arnhem) exhibited NTI growth above the Australian annual average (1.4 per cent).

Table 4.1.1 Northern Australia—NTI average annual growth by region, 1995–96 to 2005–06

<i>Region</i>	<i>Average annual growth</i>
Northern Australia (WA)	1.2
Pilbara Region	0.9
Kimberley Region	1.9
Western Australia state total	1.8
Northern Australia (NT)	1.2
Darwin-East Arnhem Region	1.7
Katherine-Lower Top End Region	0.1
Barkly-Central NT Region	–0.4
Northern Territory total	1.2
Northern Australia (QLD)	1.7
Mackay Region	2.4
Northern Region	1.7
Far North Region	1.5
North West Region	–0.4
Longreach Region	0.7
Queensland state total	2.5
Northern Australia subtotal	1.6
Australia total	1.4

Notes: This table shows annual average percentage growth or decline in the number of taxable individuals between 1995–96 and 2005–06, by region.

Source: BITRE (2009a).

In 2005–06, 4.5 per cent of Australia’s taxable population lived in Northern Australia. The northern regions of Queensland contributed 3.3 per cent of Australia’s taxable population, 17 per cent of Queensland’s taxable individuals, and 73 per cent of Northern Australia’s taxable individuals. Three per cent of Western Australia’s taxable individuals resided in northern Western Australia. Ninety-eight per cent of the Northern Territory’s taxable individuals lived in the northern regions of the Territory.⁹

Though NTI is a useful measure of employment and economic activity it does have one constraint: it is based on the address recorded on the submitted tax return. It is not based on the location of employment. Thus it will record some ‘fly-in, fly-out’ workers in their SLA of residence, not their SLA of work. This may mean that SLAs that are heavily reliant on this type of work (most likely those that have a high percentage of mining employment) may be distorted.

9. This number includes taxable individuals in Alice Springs. In 2005–06, there were 10 956 taxable individuals in Alice Springs, who represented 13.1 per cent of the total number of taxable individuals in the Northern Territory.

4.2 Census-based labour force participation rates and unemployment rates in 2006

Labour force participation

In 2006, the labour force participation rates of northern Western Australia, northern Queensland and the north of the Northern Territory were all higher than their respective states' participation rates. They were all also higher than the Australia labour force participation rate, regardless of gender. Relevant data is presented in Table 4.2.1 and Table 4.2.2. High labour force participation rates are commensurate with relatively young adult populations (compared with the rest of Australia) living in much of Northern Australia, as discussed in Chapter Two.

However, there is considerable variation between regions with respect to labour force participation rates. The Pilbara and North West Queensland, both with strong mining sector employment, have the highest adult labour force participation rates, well above state and national rates. The mining community of Weipa in Far North Queensland has the highest adult participation rates of the Northern Australian Urban Centre/Locations (UCLs) investigated in this study. On the other hand, the Barkly-Central NT and Katherine-Lower Top End regions of the Northern Territory have adult labour force participation rates below that of the Northern Territory and Australia (even though Alice Springs, within the Barkly-Central NT Region, had a very high participation rate).

Adult labour force participation rates are also highly variable between SLAs in Northern Australia. In 2006, seven SLAs had labour force participation rates of less than 30 per cent. Six of these were Indigenous communities in the Northern Territory.

Amongst those SLAs with labour force participation rates of more than 70 per cent in 2006, and well above the Australia rate of 60.4 per cent, were the mining dominated SLAs of Weipa (80.5 per cent) and Belyando (74.5 per cent) in Queensland and Ashburton (74.6 per cent) in Western Australia. Darwin SLAs also feature strongly in this group, along with parts of Townsville and Alice Springs. The inland Queensland regions of Croydon (70.5 per cent), Cloncurry (71.0 per cent), McKinlay (78.6 per cent) and Longreach (70.7 per cent) also feature in this group. A number of Indigenous communities also featured in the group of SLAs with the highest labour force participation rates in Northern Australia. It is likely that CDEP featured in these calculations, as the ABS includes participants in the 'employed' category (ABS 2008e). This matter is discussed further in the unemployment section below.

Across Northern Australia, male labour force participation rates are considerably higher than those for females, in keeping with respective participation rates for the states and the nation. Female labour force participation rates are not typically higher in mining regions (with the exception of Weipa in Far North Queensland).

Table 4.2.1 Northern Australia—employment, unemployment, unemployment rates and labour force participation by region (persons), 2006

Region	Number of people employed 2006	Number of people unemployed 2006	Number of people aged 15 and over	Unemployment rate 2006 (per cent)	Labour force participation rate 2006 (per cent)
Northern Australia (WA)	33 449	1 206	53 770	3.5	64.5
Pilbara Region	20 621	699	32 144	3.3	66.3
Exmouth	979	36	1 471	3.5	69.1
Port Hedland	4 951	209	8 733	4.1	59.1
Kimberley Region	12 828	507	21 626	3.8	61.7
Western Australia state total	936 132	36 659	1 562 653	3.8	62.3
Northern Australia (NT)	85 163	3 841	140 625	4.3	63.3
Darwin-East Arnhem Region	63 225	2 667	101 396	4.0	65.0
Darwin	35 107	1 278	52 942	3.5	68.7
Katherine-Lower Top End Region	6 231	384	11 567	5.8	57.2
Katherine	2 416	153	4 229	6.0	60.8
Barkly-Central NT Region	15 707	790	27 662	4.8	59.6
Alice Springs	11 519	282	16 529	2.4	71.4
Tennant Creek	1 096	81	2 175	6.9	54.1
Northern Territory total	87 179	4 004	145 295	4.4	62.8
Northern Australia (QLD)	302 811	13 163	497 231	4.2	63.5
Mackay Region	83 250	3 188	137 087	3.7	63.1
Mackay town	32 128	1 313	52 326	3.9	63.9
Northern Region	94 375	4 366	153 706	4.4	64.2
Townsville	63 905	2 988	101 097	4.5	66.2
Charters Towers	3 195	201	6 104	5.9	55.6
Far North Region	107 486	4 971	178 850	4.4	62.9
Weipa	1 620	19	2 037	1.2	80.5
Cairns	48 037	2 225	76 517	4.4	65.7
North West Region	15 842	586	24 887	3.6	66.0
Mount Isa	8 796	363	13 839	4.0	66.2
Longreach Region	1 858	52	2 701	2.7	70.7
Longreach	1 554	50	2 296	3.1	69.9
Queensland state total	1 824 997	90 951	3 097 998	4.7	61.8
Northern Australia subtotal	421 423	18 210	691 626	4.1	63.6
Australia total	9 104 183	503 804	15 918 076	5.2	60.4

Notes: Based on data captured by the ABS in the 2006 Census, this table shows the number of employed persons, the number of unemployed persons, the unemployment rate, the number of persons over the age of 15 (who answered the relevant question on labour force participation in the 2006 Census) and labour force participation rates by region. In preparing the table above, BITRE used ABS-published labour force participation rates and unemployment rates for SLAs, the states and Australia. BITRE has calculated participation rates for the above subregions by adding the total number of employed and unemployed persons, then dividing by the number of persons aged 15 and over, and multiplying by 100. Unemployment rates were calculated by dividing the number of unemployed persons by the sum of employed and unemployed persons, and multiplying by 100.

Source: ABS (2006b).

Table 4.2.2 Northern Australia—employment, unemployment, unemployment rates and labour force participation by region (males and females), 2006

Region	Number of males employed 2006	Number of males unemployed 2006	Males aged 15 and over	Males unemployment rate 2006 (per cent)	Males labour force participation rate 2006 (per cent)	Number of females employed 2006	Number of females unemployed 2006	Females aged 15 and over	Females unemployment rate 2006 (per cent)	Females labour force participation rate 2006 (per cent)
Northern Australia (WA)	19 498	638	29 122	3.2	69.1	13 951	568	24 648	3.9	58.9
Pilbara Region	12 449	365	17 901	2.8	71.6	8 172	334	14 243	3.9	59.7
Exmouth	541	20	787	3.6	71.4	438	16	684	3.5	66.6
Port Hedland	2 943	124	4 748	4.0	64.6	2 008	85	3 985	4.1	52.4
Kimberley Region	7 049	273	11 221	3.7	65.3	5 779	234	10 405	3.9	57.8
Western Australia state total	513 498	18 968	772 510	3.6	68.9	422 634	17 691	790 143	4.0	55.7
Northern Australia (NT)	46 259	2 067	72 446	4.3	66.7	38 904	1 774	68 179	4.4	59.7
Darwin-East Arnhem Region	34 636	1 453	52 797	4.0	68.4	28 589	1 214	48 599	4.1	61.3
Darwin	18 786	747	27 386	3.8	71.3	16 321	531	25 556	3.2	65.9
Katherine-Lower Top End Region	3 410	221	5 908	6.1	61.5	2 821	163	5 659	5.5	52.7
Katherine	1 224	98	2 076	7.4	63.8	1 192	55	2 153	4.4	57.9
Barkly-Central NT Region	8 213	393	13 741	4.6	62.6	7 494	397	13 921	5.0	56.7
Alice Springs	5 853	138	8 048	2.3	74.5	5 666	144	8 481	2.5	68.5
Tennant Creek	569	42	1 093	6.9	56.1	527	39	1 082	6.9	52.2
Northern Territory total	47 400	2 149	74 855	4.3	66.2	39 779	1 855	70 440	4.5	59.1
Northern Australia (QLD)	167 572	6 572	252 120	3.8	69.1	135 239	6 591	245 111	4.6	57.9
Mackay Region	47 607	1 535	70 934	3.1	69.3	35 643	1 653	66 153	4.4	56.4
Mackay town	17 999	599	26 208	3.2	71.0	14 129	714	26 118	4.8	56.8
Northern Region	51 814	2 092	76 810	3.9	70.2	42 561	2 274	76 896	5.1	58.3
Townsville	34 676	1 421	50 008	3.9	72.2	29 229	1 567	51 089	5.1	60.3

(continued)

Table 4.2.2 Northern Australia—employment, unemployment, unemployment rates and labour force participation by region (males and females), 2006 (continued)

Region	Number of males employed 2006	Number of males unemployed 2006	Males aged 15 and over	Males unemployment rate 2006 (per cent)	Males labour force participation rate 2006 (per cent)	Number of females employed 2006	Number of females unemployed 2006	Number of females aged 15 and over	Females unemployment rate 2006 (per cent)	Females labour force participation rate 2006 (per cent)
Northern Australia (QLD) (continued)										
Charters Towers	1 698	97	2 930	5.4	61.3	1 497	104	3 174	6.5	50.4
Far North Region	57 952	2 586	89 796	4.3	67.4	49 534	2 385	89 054	4.6	58.3
Weipa	974	15	1 156	1.5	85.6	646	4	881	0.6	74.0
Cairns	25 394	1 158	37 800	4.4	70.2	22 643	1 067	38 717	4.5	61.2
North West Region	9 260	331	13 276	3.5	72.2	6 582	255	11 611	3.7	58.9
Mount Isa	5 082	203	7 278	3.8	72.6	3 714	160	6 561	4.1	59.0
Longreach Region	939	28	1 304	2.9	74.2	919	24	1 397	2.5	67.5
Longreach	776	28	1 095	3.5	73.4	778	22	1 201	2.8	66.7
Queensland state total	984 570	45 636	1 521 497	4.4	67.7	840 427	45 315	1 576 501	5.1	56.2
Northern Australia subtotal	46 259	2 067	72 446	4.3	66.7	38 904	1 774	68 179	4.4	59.7
Australia total	4 911 133	269 686	7 777 911	5.2	66.6	4 193 050	234 118	8 140 165	5.3	54.4

Notes: Based on data captured by the ABS in the 2006 Census, this table shows the number of employed males and females, the number of unemployed males and females, the unemployment rate, the number of males and females over the age of 15 (who answered the relevant question on labour force participation in the 2006 Census) and respective labour force participation rates by region. In preparing the table above, BITRE used ABS-published labour force participation rates and unemployment rates for SLAs, the states and Australia. BITRE has calculated participation rates for the above subregions by adding the total number of employed and unemployed males/females, then dividing by the number of males/females aged 15 and over, and multiplying by 100. Unemployment rates were calculated by dividing the number of unemployed males/females by the sum of employed and unemployed males/females, and multiplying by 100.

Source: ABS (2006b).

Unemployment

In 2006, the adult unemployment rates across the aggregated total northern areas of Queensland, Northern Territory and Western Australia were all lower than the respective state unemployment rates, and the Australian unemployment rate (see Table 4.2.1). Similarly, most individual Northern Australia regions also had adult unemployment rates below that of Australia. Unemployment rates in 2006 were at their lowest (below 4 per cent) in the north of Western Australia and in the Longreach, North West and Mackay regions of Queensland.

However, there was some regional variation. The Katherine-Lower Top End Region along with the townships of Katherine, Tennant Creek and Charters Towers had unemployment rates higher than the national rate, and their respective state rates. Barkly-Central NT also had an unemployment rate higher than the Northern Territory rate.

Amongst the 207 Northern Australia SLAs, 65 had unemployment rates at or above that for Australia. Six northern Australia SLAs recorded unemployment rates at more than three times the national unemployment rate. These were Lee Point-Leanyer Swamp (16.9 per cent), Cox-Finiss (21.4 per cent) and East Arnhem Balance (18.8 per cent) of the Darwin-East Arnhem subregion; Umagico (17.2 per cent) of Far North Queensland; Palm Island (15.4 per cent) of Northern Queensland; Sandover (32.8 per cent) of Barkly-Central NT; and Jilkminggan (57.4 per cent) of the Katherine-Lower Top End Region of the Northern Territory.

In 2006, unemployment rates amongst females were higher than amongst males across most Northern Australian regions, with the exception of Katherine-Lower Top End in the Northern Territory and Longreach in Queensland (see Table 4.2.2). However, in the regional towns and cities presented at UCL level in Table 4.2.2, female employment was relatively high compared to male employment. Six of these townships had lower unemployment rates for women (Exmouth, Darwin, Katherine, Tennant Creek, Weipa and Longreach), and seven had lower unemployment rates for men.

Depending on the way in which 'unemployment' is defined, it is likely that much higher unemployment rates could be detected in a range of remote Indigenous Northern Australian SLAs. Because the ABS counts CDEP participants as 'employed', the ABS-calculated unemployment rates in communities with high CDEP participation can be very low, although all of these people were in receipt of *community participant supplement*. Some SLAs show unemployment rates of zero in the ABS census data. However, in 2005–06, there were 1942 participants in CDEP schemes covering 19 communities in the Torres Strait, including on the islands of Mabuiag, Poruma, St Pauls, Warraber and Dauan (Australian Government Torres Strait Regional Authority 2007). All of these SLAs show unemployment rates of zero in the ABS census data.

In Table 4.2.3, it can be seen that the majority of all Australian CDEP participants counted in the 2006 Census were located in Northern Australian regions, with the largest number in Far North Queensland. It also shows that unemployment rates are different depending upon whether CDEP is counted as 'employed' or 'unemployed', and what proportion of the labour force is involved in this scheme. The largest differences are in the Kimberley Region of Western Australia, and the Katherine-Lower Top End and Barkly-Central NT regions of the Northern Territory.

Table 4.2.3 Northern Australia—number of CDEP participants as a proportion of the labour force, and their potential impact on unemployment figures, by region

<i>Region</i>	<i>Number of CDEP participants</i>	<i>Percentage of total labour force participants</i>	<i>Unemployment rate—CDEP defined as employed</i>	<i>Unemployment rate—CDEP defined as unemployed</i>
Northern Australia (WA)	1 537	4.4	3.5	7.9
Pilbara Region	211	1.0	3.3	4.3
Kimberley Region	1 326	9.9	3.8	13.7
Western Australia state total	1 924	0.2	3.8	4.0
Northern Australia (NT)	3 063	3.4	4.3	7.8
Darwin-East Arnhem Region	1 656	2.5	4.0	6.6
Katherine-Lower Top End Region	766	11.6	5.8	17.4
Barkly-Central NT Region	641	3.9	4.8	8.7
Northern Territory total	3 247	3.6	4.4	8.0
Northern Australia (QLD)	2 662	1.3	4.0	5.3
Mackay Region		0.0	3.7	3.7
Northern Region	154	0.2	4.4	4.6
Far North Region	2 238	2.0	4.4	6.4
North West Region	270	1.6	3.6	5.2
Longreach Region		0.0	2.7	2.7
Queensland state total	2 662	1.3	4.0	5.3
Northern Australia subtotal	7 262	1.4	4.0	6.3
Australia total	8 767	0.1	5.2	5.3

Note: The 'number of CDEP participants' shown is a count of people were enumerated on Interviewer Household Forms (IHF) during the 2006 Census. This data is only applicable to those persons who were enumerated on IHFs and who answered 'Yes' to the question on whether they had a job last week (Question 41 in the IHF). IHFs were primarily used in remote communities across Australia. The proportion of Indigenous persons enumerated on IHFs in the states and territories where IHFs were used are: Queensland (16.6 per cent); Western Australia (19.6 per cent); and the Northern Territory (66.0 per cent). Some non-Indigenous persons were also enumerated on an IHF and a number of these were recorded as being a 'Participant worker in CDEP', making up 2.1 per cent of persons in this category (ABS 2006 Census Dictionary). It is likely that there were CDEP workers who were not enumerated using IHFs, and therefore this data is likely to be an undercount of actual CDEP participants. Therefore these numbers can be treated as a minimum only. It is likely that this is an undercount of the actual numbers of people participating in the program. BITRE has used labour force figures from the 2006 Census to calculate indicative unemployment rates provided above.

Sources: ABS (2006b); ABS (2006c).

4.3 Employment between censuses—2001 to 2006

According to census data, employment grew more in Northern Australia than it did in Australia as a whole between 2001 and 2006 (Table 4.3.1). However, employment growth in the northern regions of Western Australia and the northern regions of Queensland was not as pronounced as it was in their respective states of Western Australia and Queensland.

Table 4.3.1 Northern Australia—employment growth by region, 2001–06

Region	2001 employed persons (usually resident)	2006 employed persons (usually resident)	Growth (per cent)	Total number of people employed by industry 2001 (usually resident)	Total number of people employed by industry 2006 (usually resident)	Growth (per cent)	Employed persons 2001 (counted on Census night)	Employed persons 2006 (counted on Census night)	Growth (per cent)
Northern Australia (WA)	32 970	33 449	1.5	32 980	32 716	-0.8	39 570	43 511	10.0
Pilbara Region	19 794	20 621	4.2	19 825	20 246	2.1	22 671	26 195	15.5
Kimberley Region	13 176	12 828	-2.6	13 155	12 470	-5.2	16 899	17 316	2.5
Western Australia state total	829 051	936 132	12.9	829 063	922 317	11.2	828 781	937 884	13.2
Northern Australia (NT)	81 046	85 163	5.1	80 957	84 154	3.9	86 602	91 941	6.2
Darwin-East Arnhem Region	58 434	63 225	8.2	58 352	62 449	7.0	61 678	67 616	9.6
Katherine-Lower Top End Region	6 463	6 231	-3.6	6 479	6 167	-4.8	7 536	7 453	-1.1
Barkly-Central NT Region	16 149	15 707	-2.7	16 126	15 538	-3.6	17 388	16 872	-3.0
Northern Territory total	83 783	87 179	4.1	83 731	86 106	2.8	90 434	94 195	4.2
Northern Australia (QLD)	268 096	302 811	12.9	268 112	298 548	11.4	278 804	315 546	13.2
Mackay Region	68 417	83 250	21.7	68 410	82 045	19.9	70 836	87 122	23.0
Northern Region	83 727	94 375	12.7	83 743	93 226	11.3	84 787	94 736	11.7
Far North Region	96 820	107 486	11.0	96 816	105 843	9.3	101 641	113 357	11.5
North West Region	17 154	15 842	-7.7	17 171	15 603	-9.1	19 388	18 302	-5.6
Longreach Region	1 978	1 858	-6.1	1 972	1 831	-7.2	2 152	2 029	-5.7
Queensland state total	1 554 209	1 824 997	17.4	1 554 286	1 799 364	15.8	1 568 864	1 840 880	17.3
Northern Australia subtotal	382 112	421 423	10.3	382 049	415 418	8.7	404 976	450 998	11.4
Australia total	8 298 598	9 104 183	9.7	8 281 732	8 990 738	8.6	8 298 606	9 104 183	9.7

Notes: This table illustrates numbers of employed people by region in 2001 and 2006. The 'usually resident' counts include people who usually lived in the region (no matter where they were on census night), and who answered the census question on their employment status. The 'census night' counts include both residents and visitors who were in the region on census night and who answered the census question on their employment status. The employed persons by industry section includes usually resident people who answered the census question on which industry they were employed in.

Sources: ABS (2001); ABS (2006b); ABS (2006d); ABS (2006e).

In Northern Australia, employment growth amongst the usually resident population was highest in Mackay (21.7 per cent) and Northern Queensland (12.7 per cent). In the MacKay Region, much of the growth can be attributed to the mining industry, whilst in Northern Queensland, there was significant growth in the construction industry, along with health and community services; finance, property and business services; and mining (see Table 3.2.3 in Chapter 3).

Between 2001 and 2006, the employment phenomena referred to as 'fly-in, fly-out' work and 'drive-in, drive-out' work attained new level of prominence in Northern Australia, in association with mining industry growth. As can be seen in Table 4.3.1, employment amongst people who were present in the Pilbara on census night grew by 15.5 per cent between 2001 and 2006 but grew much less amongst the usually resident population. In other words, mining companies brought in additional personnel from outside the region to meet employment needs. In 2006, approximately 29 per cent of all people working in the Pilbara Region reported that they did not live there. Forty-two per cent of Pilbara mining workers and 21 per cent of non-mining workers (a third of whom were construction workers) usually lived elsewhere (ABS 2009). The SLA level table included in the *Northern Australia Statistical Compendium* (Internet publication) shows very high employment growth amongst people who reported that they did not live in the mining dominated SLAs of Nebo, Broadsound and Belyando (although it is likely that many still lived within the MacKay Region, in the city of Mackay).

Proportionately, the largest reductions in employment amongst usual residents were in the North West (–7.7 per cent) and Longreach regions (–6.1 per cent) of Queensland. Whilst mining employment increased in the North West, declining employment in almost all other industry categories (particularly construction, retail and government administration) meant that the region's overall employment numbers declined. In Longreach, reduced employment is largely associated with a decline in wool industry employment, linked with industry restructuring, reduced wool prices and drought at that time (Queensland Department of Primary Industries 2009).

4.4 Labour force size over time

Data in this section has been taken from the Department of Education, Employment and Workplace Relations' (DEEWR) small area labour markets estimates, and provides an illustration of growth in the size of the labour force between 1998 and 2007, year by year.¹⁰ During this period, across Northern Australia, there was a similar growth pattern in the size of the labour force as that for the whole of Australia (see Table 4.4.1 and Figures 4.4.1 and 4.4.2). However, the growth trend in Northern Australia was steady over the whole period, whereas in Australia there was more pronounced growth between 2002 and 2003 than in other years.

10. Northern Australian SLA and regional labour force numbers presented by DEEWR for 2001 and 2006 are generally larger than ABS census-based labour force numbers for the same periods. In calculating labour force size (and unemployment rates), DEEWR uses concepts based on the ABS monthly Labour Force Survey, which samples only part of the population (DEEWR 2008a p.54). DEEWR qualifies its own calculations of unemployment rates and labour force sizes by pointing out that its original larger region calculations are based on survey estimates initially, and then allocated down to a smaller area scale. In doing this, DEEWR draws on data from Centrelink (people in receipt of Newstart and Youth Allowance), from the ABS Labour Force Survey, and from the 2001 census. To calculate its official annual unemployment rates, DEEWR then averages data over four quarters per year to dampen variability in the small area numbers produced (DEEWR 2008b). By comparison, the census is collected from one point in time only during 2006 (August), and is an attempt to collect data from the entire Australian population. However, not all people answer census questions, and not all people answer them in a way that can be meaningfully counted.

Table 4.4.1 Northern Australia—labour force (number) over time by region

Region	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Northern Australia (WA)	40 481	40 471	40 918	37 743	40 017	42 544	42 597	42 974	44 250	44 895
Pilbara Region	25 572	25 565	25 848	24 710	25 631	25 558	25 590	25 817	26 582	26 970
Kimberley Region	14 909	14 905	15 070	13 033	14 386	16 986	17 007	17 158	17 667	17 925
Western Australia state total	882 181	899 224	918 236	914 021	918 599	1 025 077	1 039 687	1 091 504	1 109 264	1 143 826
Northern Australia (NT)	87 208	90 043	88 285	97 947	98 991	100 542	99 826	99 152	103 528	108 902
Darwin-East Arnhem Region	61 162	63 151	61 917	70 601	71 360	72 631	72 114	71 626	74 787	78 670
Katherine-Lower Top End Region	8 772	9 057	8 881	8 684	8 726	8 126	8 068	8 013	8 367	8 802
Barkly-Central NT Region	17 274	17 835	17 487	18 662	18 904	19 785	19 645	19 512	20 373	21 430
Northern Territory total	89 548	92 459	90 654	99 790	100 892	102 461	101 732	101 044	105 504	110 981
Northern Australia (QLD)	286 043	292 717	297 227	305 851	309 215	332 032	347 425	358 990	368 047	370 802
Mackay Region	85 282	84 258	86 893	83 702	86 149	85 261	89 670	93 067	95 147	96 277
Northern Region	77 948	80 915	78 065	80 365	85 402	102 416	107 976	114 591	117 512	114 072
Far North Region	100 244	104 343	109 588	120 472	115 588	121 385	125 572	125 746	129 165	134 803
North West Region	20 196	20 866	20 261	19 090	19 759	20 594	21 709	22 992	23 572	22 968
Longreach Region	2 372	2 334	2 421	2 223	2 316	2 376	2 499	2 593	2 651	2 683
Queensland state total	1 641 174	1 668 370	1 705 187	1 729 208	1 769 039	1 947 763	2 002 970	2 087 206	2 145 507	2 217 605
Northern Australia subtotal	413 732	423 231	426 431	441 542	448 222	475 117	489 849	501 116	515 824	524 599
Australia total	8 174 458	8 284 560	8 484 094	8 562 579	8 667 883	10 092 197	10 244 016	10 523 978	10 713 940	10 948 563

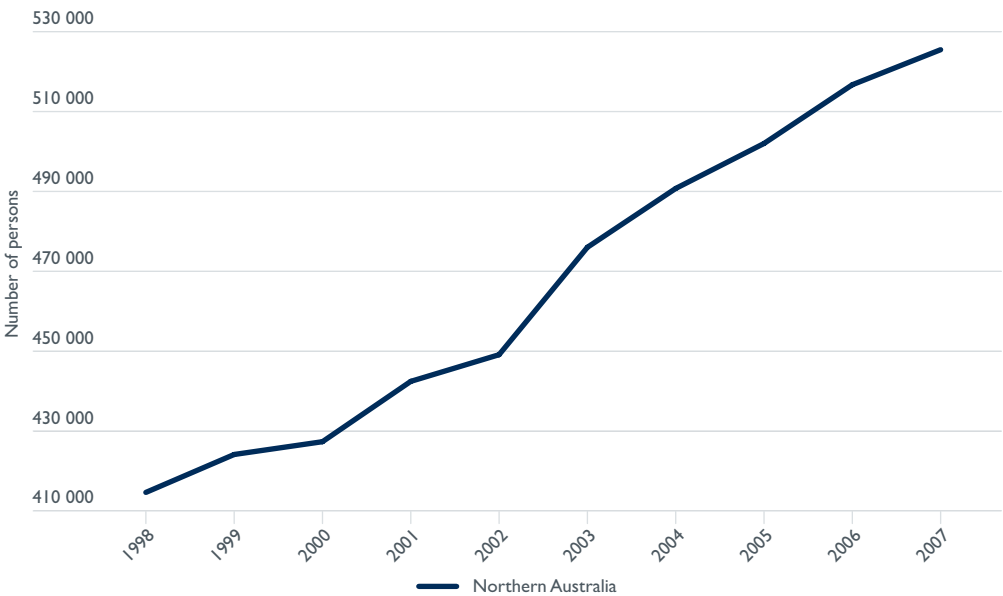
Note: This table shows growth in the size of the labour force (number of persons) by region over time.

Source: DEEWR (2008a).

At the state level, Figures 4.4.3 to 4.4.5 show that the northern regions of Western Australia, Queensland and the Northern Territory also saw sustained growth periods between 1998 and 2007. However, the northern part of the Northern Territory (in line with the whole of the Northern Territory), saw a *decline* in the size of its labour force between 1999 and 2000. In the following year, the north of Western Australia also saw shrinkage in the size of its labour force.

In Table 4.4.1, it can also be seen that there was a great deal of variation at the regional level in labour force growth and decline patterns over the period, although the size of the labour force grew between 1998 and 2007 in all regions except Katherine-Lower Top End. In this region it grew after 1998, declined, and had only just returned to roughly its original size by 2007.

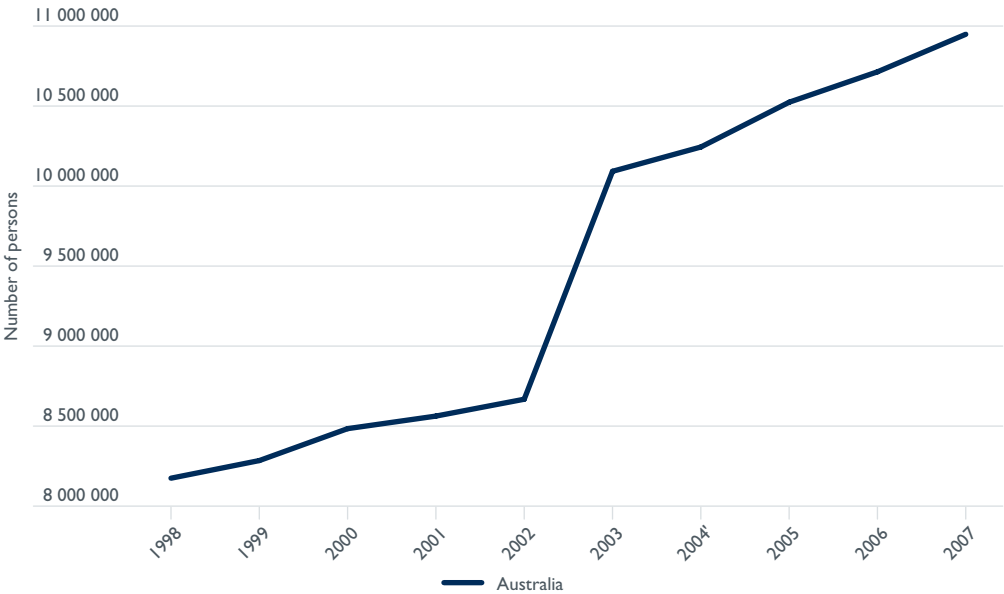
Figure 4.4.1 Northern Australia—labour force (persons) by year



Note: This figure shows growth in the size of the labour force (number of persons) across the whole of Northern Australia between 1998 and 2007.

Source: DEEWR (2008a).

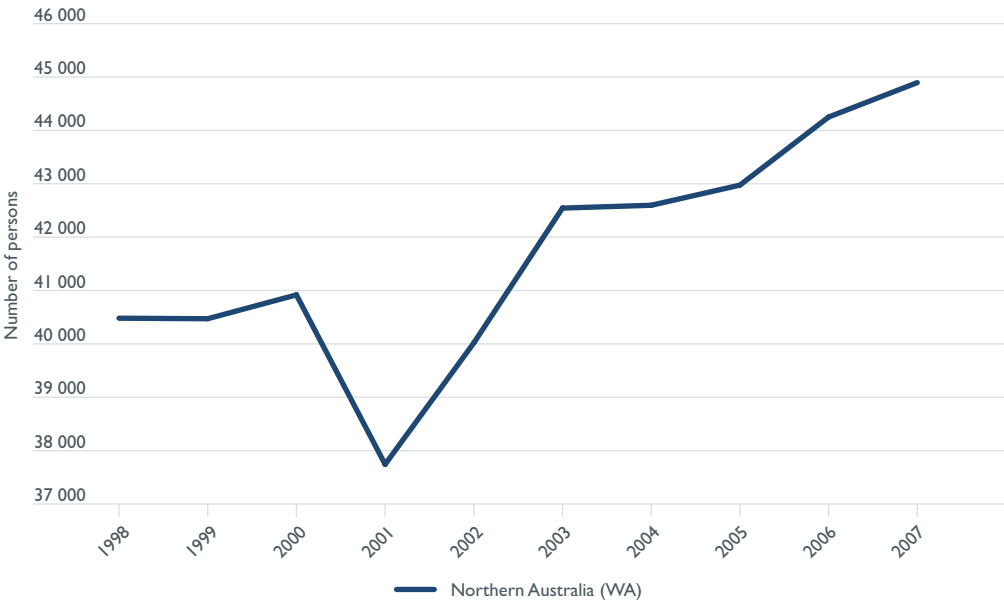
Figure 4.4.2 Australia—labour force (persons) by year



Note: This figure shows growth in the size of the labour force (number of persons) across Australia between 1998 and 2007.

Source: DEEWR (2008a).

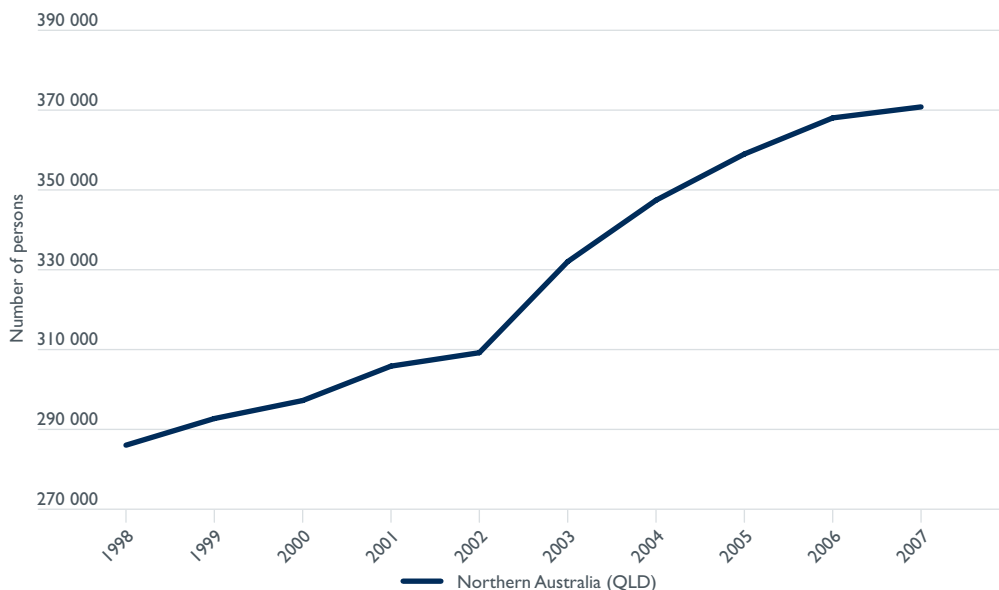
Figure 4.4.3 Northern Australia (Western Australia)—labour force (persons) by year



Note: This figure shows growth in the size of the labour force (number of persons) across the north of Western Australia between 1998 and 2007.

Source: DEEWR (2008a).

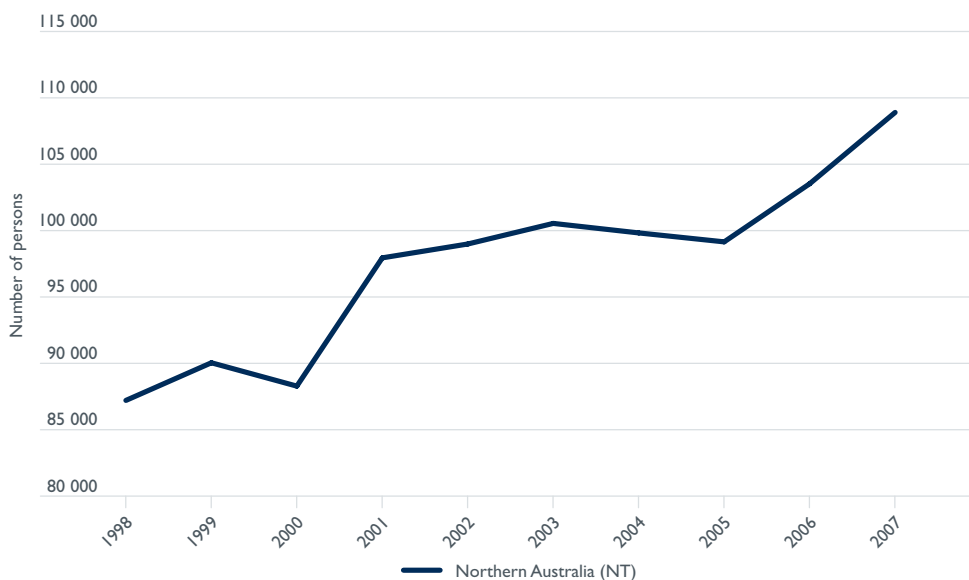
Figure 4.4.4 Northern Australia (Queensland)—labour force (persons) by year



Note: This figure shows growth in the size of the labour force (number of persons) across the northern regions of Queensland between 1998 and 2007.

Source: DEEWR (2008a).

Figure 4.4.5 Northern Australia (Northern Territory)—labour force (persons) by year



Note: This figure shows growth in the size of the labour force (number of persons) across the northern regions of the Northern Territory between 1998 and 2007.

Source: DEEWR (2008a).

4.5 Unemployment rates over time

This section shows changing unemployment rates by region over time, based on the data from DEEWR, adding to the census-related information presented earlier about unemployment rates in 2006. It should be noted that DEEWR-related unemployment rates calculated for 2006 are somewhat different to those recorded by the ABS on census night in the same year.¹¹

Like the rest of Australia, much of Northern Australia saw a decline in unemployment rates between 1998 and 2007 (see Table 4.5.1). However, this was not the case in the Katherine-Lower Top End and Barkly-Central NT regions of the Northern Territory, where unemployment levels increased over the same period.

In the north of Western Australia, unemployment rates in the Kimberley Region remained steadily higher than those of the state and the nation (see Table 4.5.1 and Figure 4.5.1). Unemployment rates in the Pilbara, on the other hand, remained consistently lower. Higher unemployment rates between 2000 and 2002 are commensurate with a drop in employment and labour force size in the region at around the same time (as discussed in Section 4.4). This corresponds to the Asian financial crisis and the subsequent reduction in mineral exportation by Australia to the countries affected (see Chapter 3 Section 3.1).

Table 4.5.1 Northern Australia—unemployment rates over time by region

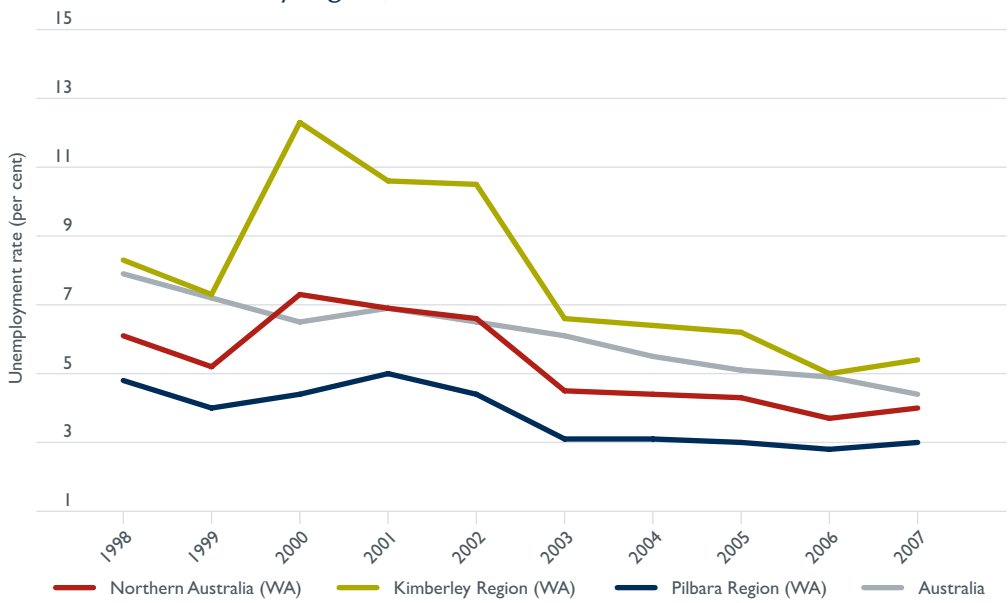
Region	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Northern Australia (WA)	6.1	5.2	7.3	6.9	6.6	4.5	4.4	4.3	3.7	4.0
Pilbara Region	4.8	4.0	4.4	5.0	4.4	3.1	3.1	3.0	2.8	3.0
Kimberley Region	8.3	7.3	12.3	10.6	10.5	6.6	6.4	6.2	5.0	5.4
Western Australia state total	7.1	6.9	6.4	7.0	6.3	6.0	5.0	4.5	3.6	3.2
Northern Australia (NT)	4.7	4.0	4.9	6.6	5.3	5.7	5.7	5.2	4.4	4.1
Darwin-East Arnhem Region	4.5	3.6	4.4	5.9	4.6	4.9	4.9	4.3	3.6	3.3
Katherine-Lower Top End Region	5.8	5.1	6.0	8.7	7.1	8.0	7.9	7.6	7.2	7.3
Barkly-Central NT Region	4.7	4.6	6.0	8.3	6.9	7.6	7.9	7.5	6.3	5.9
Northern Territory total	4.7	4.1	5.1	6.9	5.6	6.0	6.0	5.4	4.7	4.3
Northern Australia (QLD)	7.5	7.1	7.2	7.3	6.7	6.5	5.1	5.1	4.8	3.6
Mackay Region	8.7	8.8	8.5	8.7	6.9	7.3	6.3	4.8	3.4	2.8
Northern Region	9.1	7.5	8.0	8.1	7.6	7.6	5.5	4.8	5.4	3.8
Far North Region	7.2	7.2	7.1	7.3	7.2	6.0	4.5	6.4	5.8	4.2
North West Region	7.2	6.1	7.1	6.8	6.7	7.7	5.6	5.1	5.4	4.2
Longreach Region	4.2	5.2	4.1	3.7	3.6	3.4	2.5	1.8	1.9	1.6
Queensland state total	8.7	8.1	7.9	8.5	7.5	6.7	5.6	4.8	4.7	3.7
Northern Australia subtotal	6.7	6.2	6.6	7.0	6.3	6.0	5.1	5.0	4.6	3.7
Australia total	7.9	7.2	6.5	6.9	6.5	6.1	5.5	5.1	4.9	4.4

Note: This table shows estimated annual unemployment rates by region over time.

Source: DEEWR (2008a).

11. Differences in DEEWR and ABS labour force and unemployment figures have been discussed in Section 4.4.

Figure 4.5.1 Northern Australia (Western Australia)—unemployment over time by region, 1998–2007

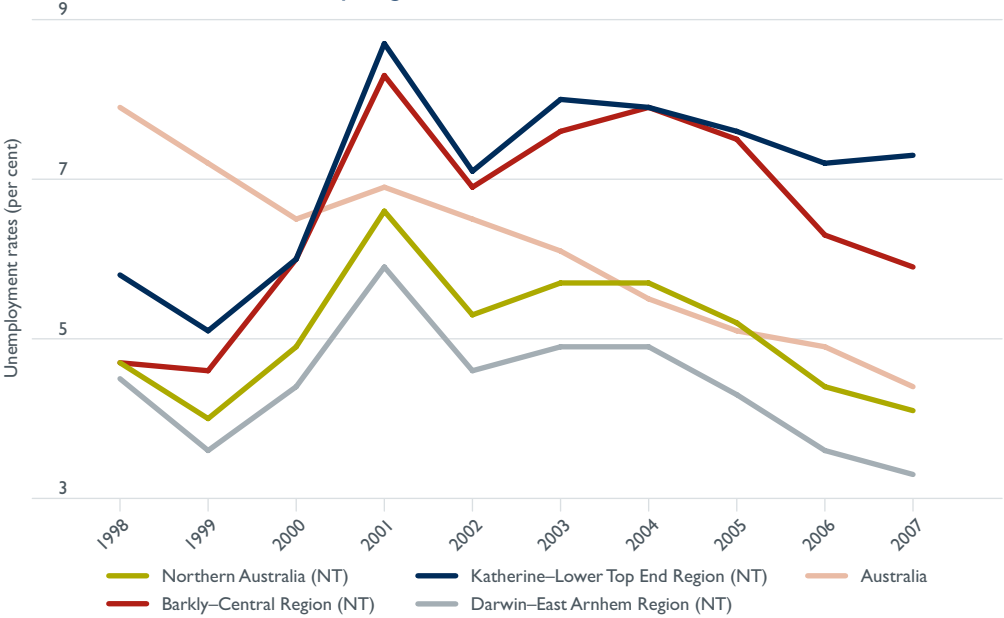


Note: This graph shows estimated annual unemployment rates by region over time. In order to calculate annual unemployment rates over time for its Northern Australian regions, BITRE has aggregated DEEWR figures at the SLA level to produce regional totals, then divided the estimated number of unemployed people for each year by the total estimated number of employed and unemployed people in each region.

Source: DEEWR (2008a).

In the Northern Territory, unemployment rates rose particularly sharply in 2001 by comparison with Australia as a whole (see Figure 4.5.2). Again, this is consistent with a decline in employment and labour force size at the same time (discussed in section 4.4). Since then, annual average unemployment rates in Darwin-East Arnhem have remained consistently lower than the national and state rates, whilst Barkly-Central NT and the Katherine-Lower Top End regions have stayed consistently higher (see Figure 4.5.2 and Table 4.5.1).

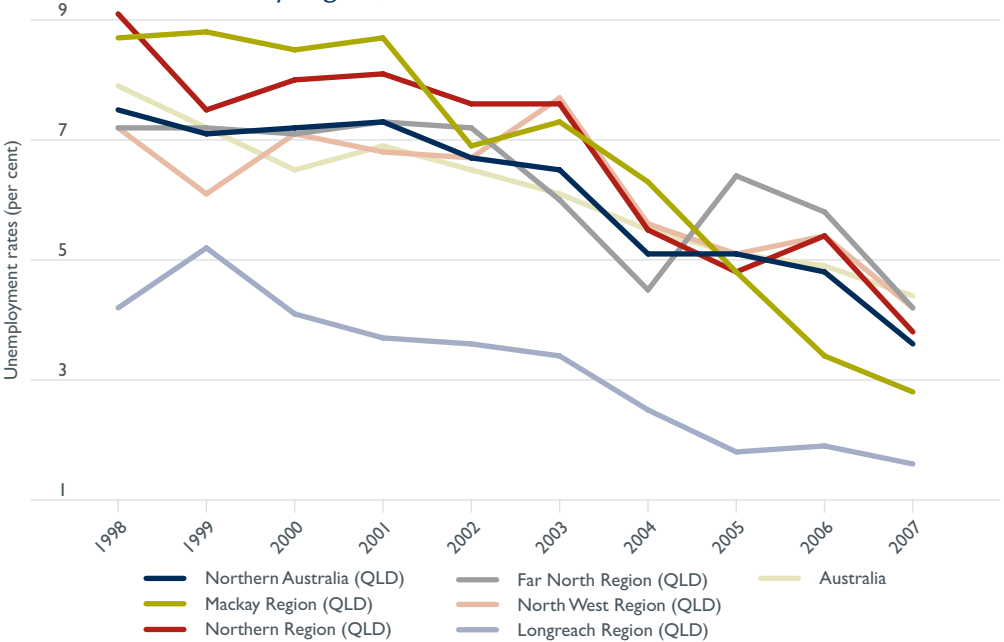
Figure 4.5.2 Northern Australia (Northern Territory) – unemployment rates over time by region, 1998–2007



Note: This graph shows estimated annual unemployment rates by region over time.

Source: DEEVR (2008a). Apart from Longreach, all regions of northern Queensland had unemployment rates higher than that of Australia for at least one year between 1998 and 2007 (see Figure 4.5.3 and Table 4.5.1). However, by 2007, all northern Queensland regions had unemployment rates lower than Australia's.

Figure 4.5.3 Northern Australia (Queensland) – unemployment rates over time by region, 1998–2007



Note: This graph shows estimated annual unemployment rates by region over time.

Source: DEEVR (2008a).

4.6 Highest year of school completed

As can be seen in Figure 4.6.1, the proportion of people to have completed Year 12 in Northern Australia is well below the national total. Within Northern Australia, regions with higher levels of school achievement are Longreach, Darwin-East Arnhem, and Northern (Queensland). The highest percentage of students finishing Year 12 was observed in Darwin (35.5 per cent). Regions with lower levels of school achievement are Katherine-Lower Top End, Barkly-Central NT and the Kimberley. The highest percentage of people who did not go to school was seen in Tennant Creek (2.5 per cent).

Compared with Australia, there are a greater percentage of people in Northern Australia whose highest year of school completed is Year 10, especially within northern Queensland (22.6 per cent). This suggests a greater number of students are leaving school at this level and are not going on to complete Year 11 or 12. These people may have chosen to leave school in order to pursue work in industries such as mining, construction or infrastructure. For example, regions in which such industries are dominant (such as Mackay, Exmouth and Northern Queensland) have high levels of students whose highest year of school completed is Year 10 or equivalent (see Figure 4.6.2). In terms of the percentage of people in Northern Australia who did not go to school, higher proportions are seen in the northern Western Australia and Northern Territory in comparison to the rest of Australia.

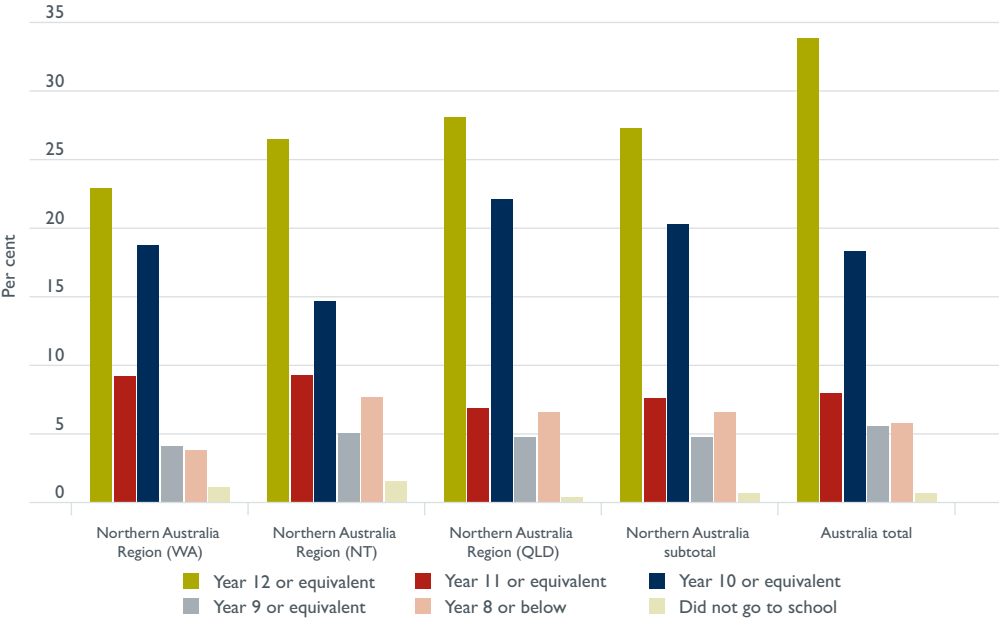
Table 4.6.1 Northern Australia—highest year of school completed, by region, 2006

Region	Year 12 or equivalent (per cent)	Year 11 or equivalent (per cent)	Year 10 or equivalent (per cent)	Year 9 or equivalent (per cent)	Year 8 or below (per cent)	Did not go to school (per cent)	Not stated (per cent)	Not applicable (per cent)	Total (number of people)
Northern Australia (WA)	22.9	9.2	18.8	4.1	3.8	1.1	14.5	25.7	72 366
Pilbara Region	23.7	9.8	19.1	3.6	2.7	0.6	15.3	25.4	43 069
Exmouth	29.1	9.9	24.3	5.0	3.1	0.3	8.0	20.3	1 845
Port Hedland	21.4	8.8	17.0	3.1	2.5	0.6	22.4	24.4	11 557
Kimberley Region	21.8	8.3	18.4	4.8	5.4	1.8	13.3	26.2	29 297
Western Australia state total	33.9	8.8	19.9	4.4	3.9	0.5	8.4	20.2	1 959 087
Northern Australia (NT)	26.5	9.3	14.7	5.1	7.7	1.6	11.2	24.0	193 026
Darwin-East Arnhem Region	29.1	9.5	15.1	4.5	6.4	1.2	11.1	23.1	139 591
Darwin	35.5	10.7	14.7	4.0	3.8	0.8	10.3	20.1	66 289
Katherine-Lower Top End Region	16.0	7.3	14.4	7.7	9.7	2.8	12.3	29.7	16 469
Katherine	21.2	8.5	15.0	6.0	4.8	0.7	16.0	27.7	5 849
Barkly-Central NT Region	14.3	7.6	14.6	8.5	12.1	2.5	14.8	25.6	2 923
Alice Springs	21.6	9.0	13.1	6.1	11.4	2.6	11.0	25.2	36 966
Tennant Creek	30.2	11.7	15.4	4.8	4.0	0.9	9.4	23.5	21 619
Northern Territory total	25.2	9.5	14.9	5.2	7.9	1.6	11.0	24.7	192 900
Northern Australia (QLD)	28.1	6.9	22.1	4.8	6.6	0.4	8.9	22.2	642 400
Mackay Region	25.1	6.9	24.4	5.2	6.9	0.2	9.6	21.7	175 144
Mackay town	26.7	6.9	23.7	4.9	6.5	0.2	9.3	21.8	66 876
Northern Region	30.8	6.9	21.7	4.6	6.5	0.4	7.5	21.7	199 222
Townsville	34.1	7.0	20.3	4.1	5.0	0.3	7.6	21.5	128 807
Charters Towers	21.9	7.3	21.9	6.9	10.7	0.5	7.2	23.5	7 978
Far North Region	28.6	7.2	20.9	4.6	6.3	0.5	9.3	22.6	231 049
Weipa	27.4	8.2	22.6	3.1	2.4	0.1	8.2	28.1	2 832
Cairns	33.3	7.4	19.2	3.9	3.9	0.4	9.9	22.0	113 840
North West Region	23.1	5.9	21.7	5.0	7.1	0.6	10.9	25.6	33 461
Mount Isa	25.0	6.1	20.6	4.1	4.9	0.5	12.1	26.6	18 857
Longreach Region	30.3	5.4	21.3	4.5	6.2	0.6	8.2	23.3	3 524
Longreach	29.7	5.5	21.2	4.5	6.8	0.6	8.8	22.9	2 977
Queensland state total	32.8	6.5	21.3	4.6	5.9	0.4	7.8	20.7	3 904 529
Northern Australia subtotal	27.3	7.6	20.3	4.8	6.6	0.7	9.8	22.9	907 792
Australia total	33.9	8.0	18.3	5.6	5.8	0.7	7.9	19.8	19 855 287

Note: This table shows the highest year of school completed for each region, as a percentage, in 2006. The data indicates the highest level of primary or secondary school a person has completed, including those people who are still at school. Due to a large number of responses in the not stated and not applicable categories, the data should be treated with caution.

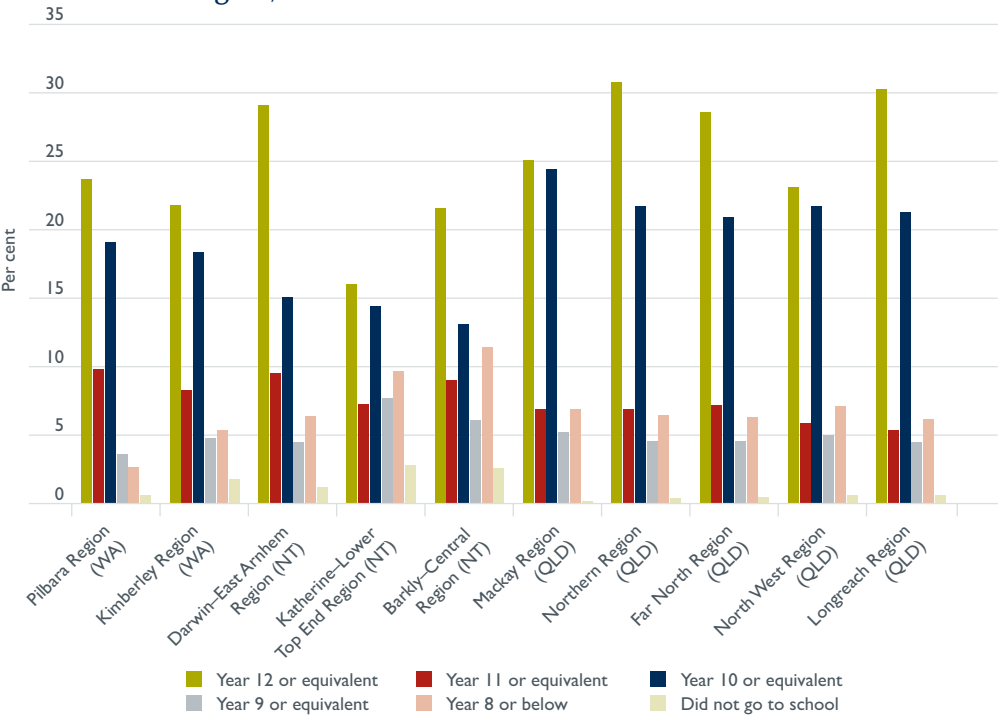
Source: ABS (2006f).

Figure 4.6.1 Northern Australia—highest year of school completed, 2006



Source: ABS (2006f).

Figure 4.6.2 Northern Australia—highest year of school completed, by region, 2006



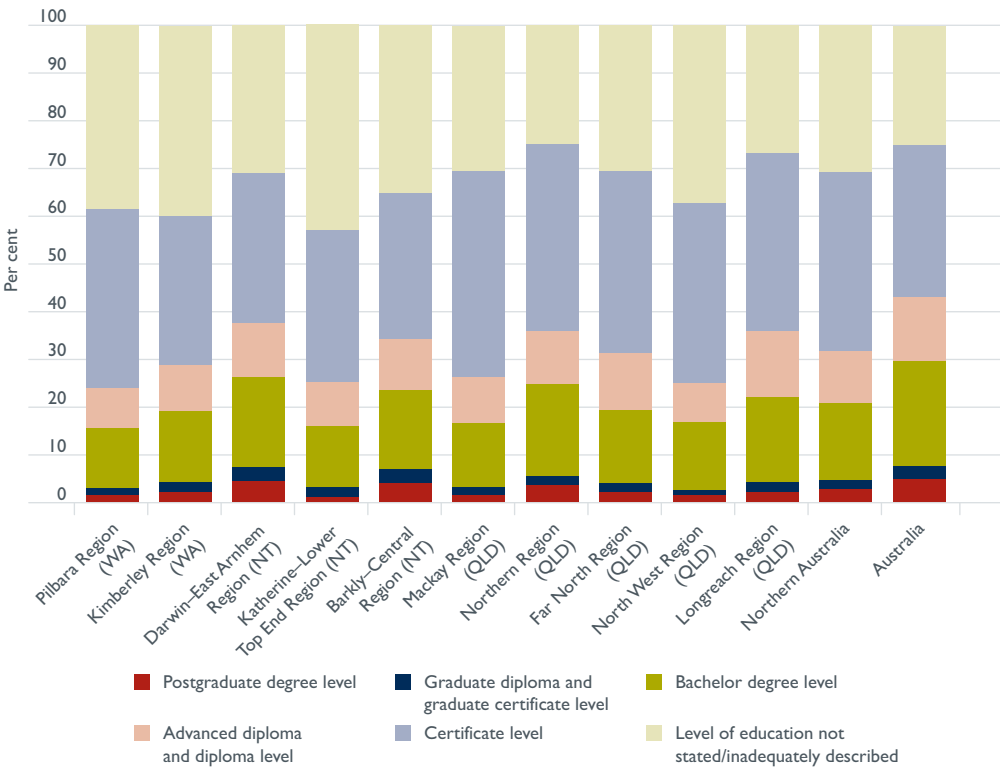
Notes: These figures show the highest year of school completed for regions within Northern Australia. The data indicates the highest level of primary or secondary school a person has completed, including those people who are still at school. Due to a large number of responses in the not stated and not applicable categories, the data should be treated with caution.

Source: ABS (2006f).

4.7 Post secondary qualifications

In all subregions across Northern Australia, the Certificate level is the most common qualification. There are proportionately more Certificate level qualifications in Northern Australia compared with Australia. This is likely to be related to strong presence of industries such as construction, manufacturing, and mining, which may require qualifications such as Certificates rather than Postgraduate or Bachelor degrees. On the other hand, the Northern Australia subregions have lower percentages of Postgraduate and Bachelor degree level qualifications, as well as lower levels of Graduate Diploma and Graduate Certificates, compared to the rest of Australia (see Figure 4.7.1). This is to be expected given that the major cities across Australia have higher percentages of people with Bachelor and Postgraduate qualifications than regional and remote areas (BITRE 2008a).

Figure 4.7.1 Northern Australia—highest level of qualification, by region, 2006



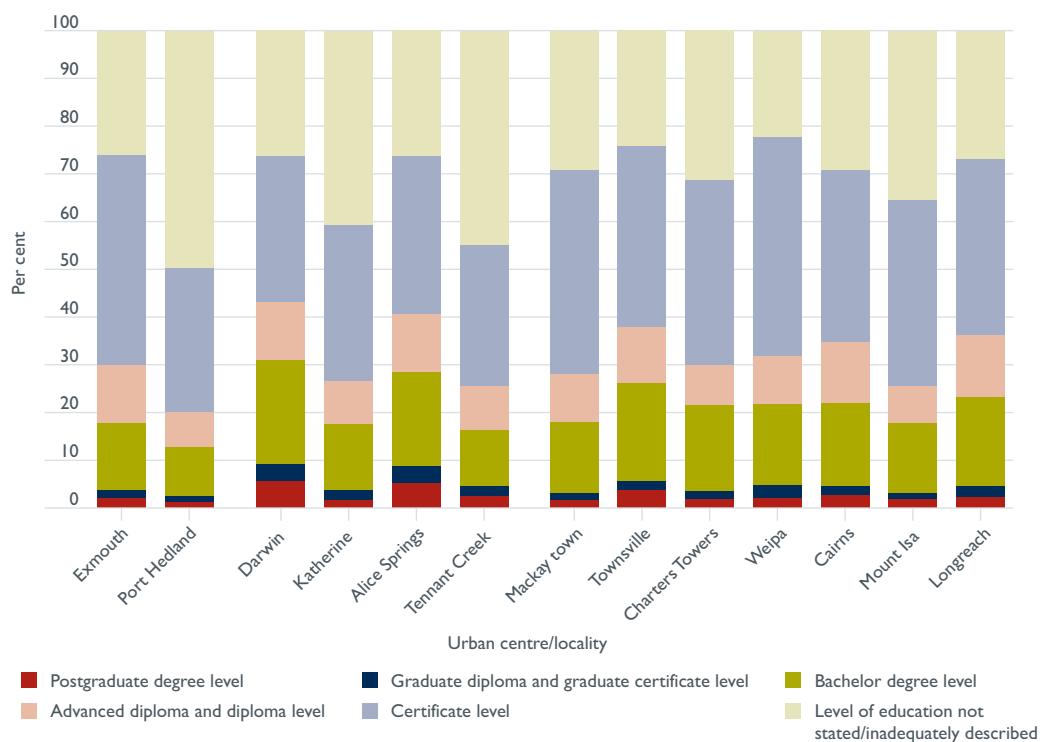
Notes: This graphs show the highest level of qualification for each region within Northern Australia. The data in this section is drawn from the Australian Bureau of Statistics' 2006 Census of Population and Housing. The data should be treated with a degree of caution, as there were a large number of people who either did not state or inadequately described their level of education.

Source: ABS (2006b).

The percentages of qualifications in each region tie in with the nature of the work which is available. For example, regions such as Darwin or Alice Springs have a high percentage of people with Postgraduate and Bachelor degrees compared to other regions, and to the total percentages across Australia (see Figure 4.7.1 and 4.7.2). This

situation in Darwin and Alice Springs is likely to be related to demand for employees in the government, education, health, and services industries (see Chapter 3 for further discussion on employment by industry). The Katherine-Lower Top End Region has the lowest number of Bachelor degree level and higher qualifications of all Northern Australia regions, indicating that this is not an area in which there are many employment opportunities for people with such qualifications.

Figure 4.7.2 Northern Australia—highest level of qualification, by urban centre/locality, 2006



Notes: This graph shows the highest level of qualification for key Urban Centres/Localities (UCL) within Northern Australia. The data in this section is drawn from the Australian Bureau of Statistics' 2006 Census of Population and Housing. The data should be treated with a degree of caution, as there were a large number of people who either did not state or inadequately described their level of education.

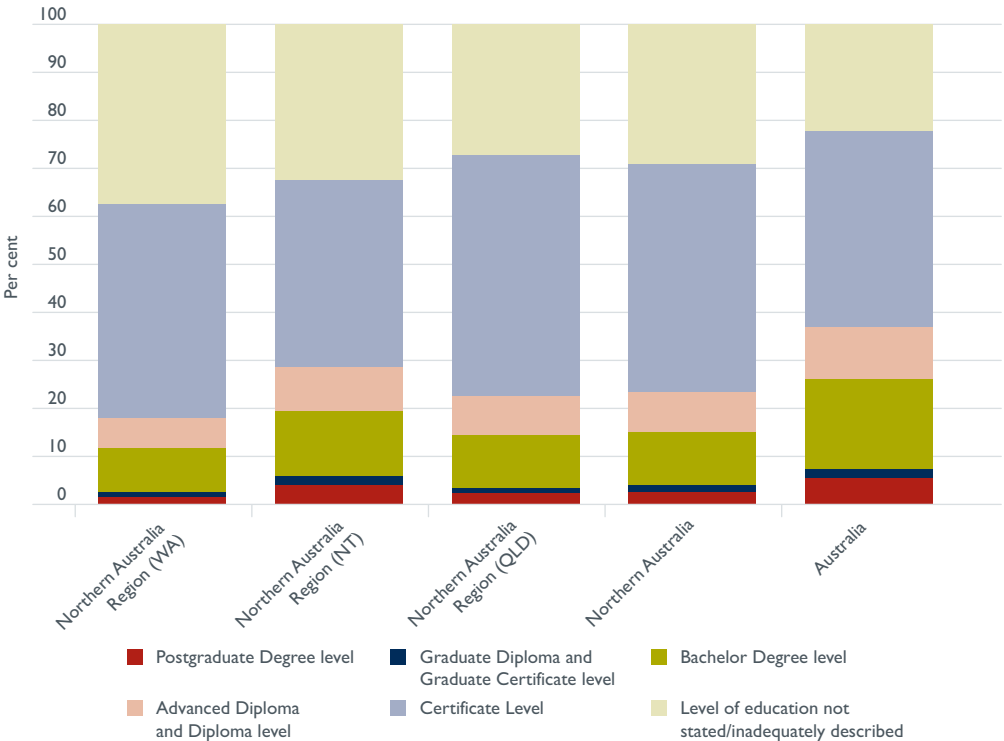
Source: ABS (2006b).

Areas such as the Pilbara Region (Western Australia) are dominated by Certificate level qualifications, particularly amongst males, which is likely to be related to the large number of people employed by the mining and construction industries in this area (see Chapter 3 for further discussion). Similarly, in the MacKay Region, Certificates are the dominant qualification, which reflects the large coal operations, manufacturing and construction industries which are present in this area.

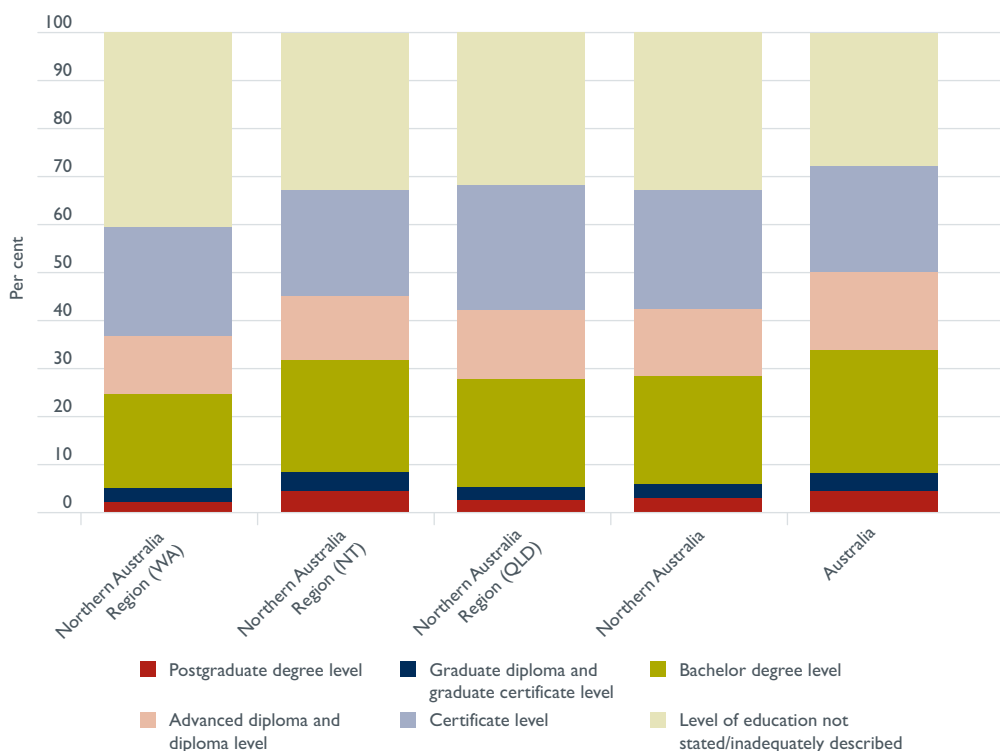
With the exception of Certificates, females within Northern Australia have lower qualifications in percentage terms, compared to Australia (see Figure 4.7.3 and 4.7.4). Females in Northern Australia are however far more likely than their male counterparts to have a Bachelor degree, Graduate Diploma and Graduate Certificate. Males in Northern Australia also have lower levels of qualifications compared to Australia,

particularly in terms of Postgraduate or Bachelor degrees. The exception however is at the Certificate level, where they have far higher proportions compared with females and the national average. As previously noted, the levels of qualifications within Northern Australia are typical of the nation-wide trends which see higher levels of Postgraduate and Bachelor degrees within major cities, and lower levels within remote and regional areas. On the other hand, higher percentages of Certificates are observed within regional and remote areas, compared to the major Australian cities (BITRE 2008a).

Figure 4.7.3 Northern Australia—highest level of qualification, males, 2006



Source: ABS (2006b).

Figure 4.7.4 Northern Australia—highest level of qualification, females, 2006

Notes: These graphs show the highest level of qualification, by gender, within Northern Australia. The data in this section is drawn from the Australian Bureau of Statistics' (ABS) 2006 Census of Population and Housing. The data should be treated with a degree of caution, as there were a large number of people who either did not state or inadequately described their level of education.

Source: ABS (2006b).

Data relating to workforce available in the online compendium

4.1 Number of taxable individuals (NTI)

- Northern Australia—NTI, by region, 1990–91 to 2005–06
- Northern Australia—NTI, by SLA, 1990–91 to 2005–06
- Northern Australia—NTI growth rates, by region, 1990–91 to 2005–06
- Northern Australia—NTI growth rates, by SLA, 1990–91 to 2005–06.

4.2 Census-based labour force participation rates and unemployment rates in 2006

- Northern Australia—employment, unemployment, unemployment rates and labour force participation by SLA (persons), 2006
- Northern Australia—employment, unemployment, unemployment rates and labour force participation by SLA (males and females), 2006

- Northern Australia—employment, unemployment, unemployment rates and labour force participation by UCL (persons), 2006
 - Northern Australia—employment, unemployment, unemployment rates and labour force participation by UCL (males and females), 2006.
- 4.3 Employment between censuses—2001 to 2006
- Northern Australia— employment growth by SLA, 2001–06.
- 4.4 Labour force size over time
- Northern Australia—labour force (number) over time by SLA.
- 4.5 Unemployment rates over time
- Northern Australia—unemployed persons (number) over time by SLA
 - Northern Australia—annual unemployment rates over time by SLA.
- 4.6 Highest year of school completed
- Northern Australia—highest year of school completed, number of people, by region, 2006
 - Northern Australia—highest year of school completed, by SLA, 2006
 - Northern Australia—highest year of school completed, by UCL, 2006.
- 4.7 Post secondary qualifications
- Northern Australia—highest level of qualification, by SLA, 2006
 - Northern Australia—highest level of qualification, by UCL, 2006
 - Northern Australia—highest level of qualification, number of people, by region, 2006
 - Northern Australia—highest level of qualification, percentage of person, by region, 2006.

Figures

- 4.4 Labour force size over time
- Labour force (persons) by year—Pilbara Region
 - Labour force (persons) by year—Kimberley Region
 - Labour force (persons) by year—Western Australia
 - Labour force (persons) by year—Darwin-East Arnhem Region
 - Labour force (persons) by year—Katherine-Lower Top End Region
 - Labour force (persons) by year—Barkly-Central NT Region
 - Labour force (persons) by year—Northern Territory

- Labour force (persons) by year—Northern Queensland region
- Labour force (persons) by year—Far North Queensland region
- Labour force (persons) by year—MacKay Region
- Labour force (persons) by year—Longreach region
- Labour force (persons) by year—North West Queensland region
- Labour force (persons) by year—Queensland.

bitre

Chapter 5

Day-to-day living



Chapter 5 Day-to-day living

This chapter discusses aspects of day-to-day living in Northern Australia, with a focus on income support; wealth (asset ownership, liabilities, and so on); the cost of living (with particular reference to groceries); schools, universities and TAFE institutions; and health services.

Between 1995–96 and 2000–01, dependence on government benefits increased in Northern Australia, more than it did across Australia as a whole. This dependence is commensurate with the economic downturn experienced in much of Northern Australia between 1999 and 2001.

In the Northern Australia region, household wealth was lower than that of Australian households generally in 2003–04. The average debt-to-asset ratio was also higher across Northern Australia (17 per cent) than across Australia generally (13 per cent).

With smaller population centres across much of Northern Australia, school sizes and enrolment numbers were often smaller than respective state averages. Few schools in remote parts of Northern Australia offered up to Year 12 tuition, meaning that students wishing to study at this level often had to study outside their home communities.

Of Australia's 9562 schools, 681 (7.1 per cent) were located in Northern Australia. Six hundred and fifteen Northern Australian schools offered up to primary school education, 137 offered up to junior secondary education (this figure includes some mixed primary/secondary schools), and 196 offered up to Year 12 education (this figure includes some mixed primary/secondary schools).

There are few university institutions located within Northern Australia which offer a broad range of course types and levels (although external studies are also available through universities located outside the region). In comparison with the rest of Australia, there are lower percentages of people aged 15 and over at university in Northern Australia, with particularly low percentages seen in northern Western Australia. At the regional level, Darwin-East Arnhem and Northern Queensland had high percentages of students, while the Pilbara and North West Queensland regions had low percentages of students relative to the population aged 15 and over.

There are more females than males at university in Northern Australia (as is the case for Australia generally); however, the gap between the sexes in Northern Australia is greater than in Australia as a whole. This difference between the sexes is particularly apparent in the northern regions of the Northern Territory.

Northern Australian student enrolments at TAFE institutions were generally higher per 1000 people in the population than across Australia as a whole. Even in the remote regions within Northern Australia, the majority of students were able to study at TAFE institutions located in their own region, rather than having to travel large distances to access education, as it is the case with university students.

The proportion of people identifying as health workers per 100 000 residents in the population is lower across Northern Australia than Australia as a whole, especially in parts of northern Western Australia and Queensland. As the remoteness of SLAs from major population centres increased, the proportion of health workers decreased. A more detailed breakdown of nine key health professions indicated that there are smaller proportions of nurses, medical workers, dentists, pharmacists, optometrists, physiotherapists, chiropractors and psychologists within Northern Australia, as compared with the rest of Australia.

Out of Australia's 795 public hospitals, 92 (approximately 11.6 per cent) were located in Northern Australia. Further, 17 of Australia's 549 private hospitals (approximately 3.1 per cent) were located across the region. Most of Northern Australia's hospitals were located in the more populous areas of northern Queensland.

With respect to the cost of living, prices of groceries varied across and within regions. The lowest grocery prices were associated with major centres where there were a number of competing grocery retailers. The highest grocery prices, nearly twice the capital city prices, are characteristic of very remote and isolated places with large proportions of Indigenous people in the population.

5.1 Income support

In 1995–96, across the whole of Northern Australia, the aggregated number of recipients of government benefits per 1000 people (242) was lower than the equivalent rate for the whole of Australia (264) (see Table 5.1.1). However, there were differences at a state level, with the northern regions of Queensland (252) having more recipients per 1000 people than the northern regions of Western Australia (194) and the Northern Territory (228). In particular, as the data above illustrates, the northern regions of Queensland had significantly higher levels of dependence on the Age Pension, amongst what were relatively older resident populations.

Table 5.1.1 Northern Australia—income support and recipients by region, 1995–96 to 2000–01

Region	Centrelink benefit recipients per 1000 persons	Percentage of total income by region	1995–96 Age Pension recipients per 1000 persons	Percentage of total income by region	2000–01 Centrelink benefit recipients per 1000 persons	Percentage of total income by region	2000–01 Age Pension recipients per 1000 persons	Percentage of total income by region
Northern Australia (WA)	194	7.0	23.8	1.2	211.8	8.6	24.1	1.2
Pilbara Region	146	4.4	13.6	0.6	150.0	4.9	16.0	0.6
Kimberley Region	274	13.7	40.7	2.7	290.8	17.0	34.5	2.6
Western Australia state total	241	9.4	76.2	3.4	255.7	10.3	81.5	3.5
Northern Australia (NT)	228	9.6	25.8	1.4	253.5	11.6	28.9	1.5
Darwin-East Arnhem Region	219	8.7	22.7	1.1	234.2	10.2	26.8	1.3
Katherine-Lower Top End Region	256	14.8	28.2	2.2	312.7	20.0	29.7	2.4
Barkly-Central NT Region	244	10.9	34.3	2.0	291.7	13.9	35.7	2.0
Northern Territory total	231	9.5	26.1	1.3	255.9	11.4	28.9	1.5
Northern Australia (QLD)	252	10.4	66.3	3.2	273.5	12.2	70.1	3.5
Mackay Region	249	9.6	65.5	3.0	279.9	11.8	72.3	3.4
Northern Region	241	10.0	74.0	3.6	261.3	11.4	73.8	3.5
Far North Region	271	11.8	64.3	3.4	289.5	14.1	68.8	3.7
North West Region	216	8.7	42.5	2.1	219.9	9.3	46.8	2.2
Longreach Region	214	10.1	85.2	4.9	199.1	7.8	85.9	3.6
Queensland state total	268	11.9	83.5	4.2	285.4	12.7	87.0	4.1
Northern Australia subtotal	242	9.9	54.2	2.7	263.9	11.8	57.2	2.9
Australia total	264	10.9	91.7	4.1	272.5	11.0	96.3	4.0

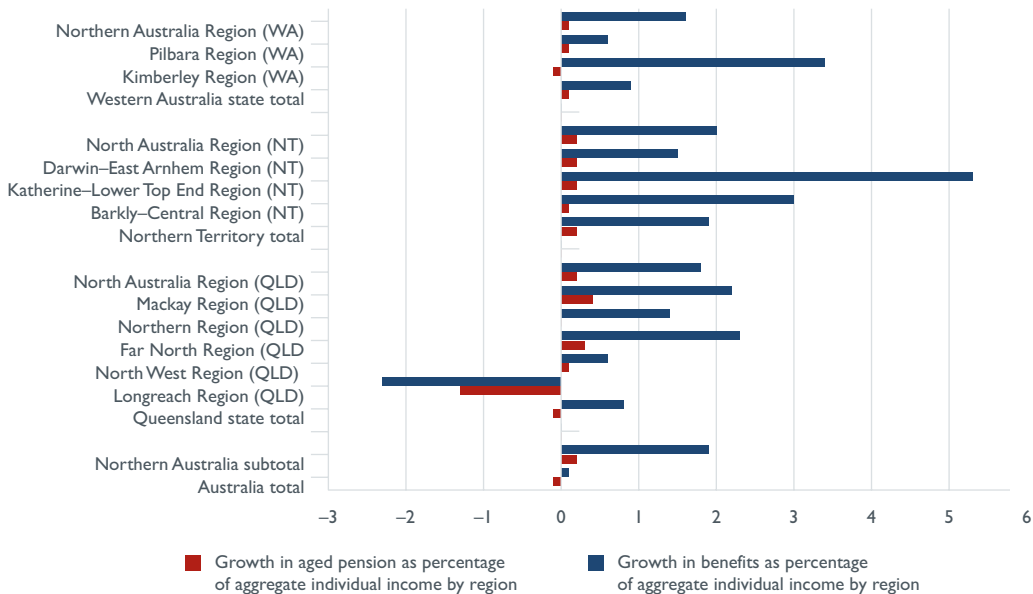
Note: The ABS has calculated total income by adding all individual taxpayer income (provided by the ATO) to all benefit recipient income (provided by FaHCSIA), by SLA. BITRE has aggregated this data to a regional level and calculated rates per 1000 persons in the population of each region.

Source: ABS (2005); ABS (2007a).

There was some variability between regions. The Kimberley Region of Western Australia had more than the national rate of benefit recipients per 1000 people (274), as did Far North Queensland (271). The lowest rates of benefit receipt were in the Pilbara Region of Western Australia (146 per 1000), and the Longreach region of Queensland (214 per 1000).

Table 5.1.1 shows that between 1995–96 and 2000–01, almost all of the Northern Australian regions saw growth in the numbers of income support recipients per 1000 people in the population. However, the proportion of recipients in the population declined in Longreach, from 214 to 199 per 1000 people.

Figure 5.1.1 Northern Australia—income support as a percentage of aggregate individual income by region (growth), 1995–96 to 2000–01



Note: This figure shows growth in reliance on income support as a percentage of total taxable and benefit income, by region, between 1995–96 and 2000–01.

Source: ABS (2005); ABS (2007a).

Northern Australia experienced proportionately less growth in aggregate real taxable income than Australia did between 1995–96 and 2000–01. Figure 5.1.1 shows that between 1995–96 and 2000–01, reliance on income support as a percentage of total taxable and benefit income increased across Northern Australia (1.8 per cent of total taxable and benefit income) more than it did across Australia as a whole (0.1 per cent). As discussed in Chapter 3 (section 3.1) and Chapter 4 (section 4.5), the temporary economic downturn experienced across much of Northern Australia between 1999 and 2001 was more severe in many regions than that experienced across Australia as a whole.

5.2 Wealth

Table 5.2.1 shows that across those communities where data was collected in the Northern Australia region, household wealth was relatively low compared to households across the whole of Australia in 2003–04. It should be noted that discrete Indigenous communities and very remote communities were excluded from the original data used to produce BITRE's wealth database. Had this data been available, it is likely that household wealth figures in some Northern Australian regions would have been lower than those presented here.

In Northern Australia in 2003–04, average net household worth (all household assets minus liabilities) was around \$308 700, whilst across Australia it was around \$467 600. Similarly, average assets per household were worth around \$371 100 in Northern Australia, whilst they were worth \$537 100 across Australia. This is commensurate with lower property values in many Northern Australia communities than average values across Australia as a whole. Average property assets per household were worth around \$127 900 in Northern Australia, whilst amongst Australians generally, they were worth around \$259 900.

Amongst the Northern Australian regions, net household worth was highest in Broome (Kimberley) at around \$345 600 and in Port Hedland and Roebourne (Pilbara), at around \$268 700. Net household worth was lowest in Cloncurry and Mount Isa (North West Queensland), at around \$242 500.

The average debt-to-asset ratio was also higher across Northern Australia (17 per cent) than across Australia generally (13 per cent). Amongst the Northern Australian regions, debt-to-asset ratios were highest in Darwin (Darwin-East Arnhem), at 22 per cent, Alice Springs (Barkly-Central NT), at 21 per cent, and Cloncurry and Mount Isa (North West Queensland) at 21 per cent. They were lowest in Broome (Kimberley), at 14 per cent, and Mackay, at 15 per cent.

Table 5.2.1 Northern Australia—household wealth by region, 2003–04

Region	Estimated number of households	Average net worth per household (\$ thousands)	Average equivalised net worth per household (\$ thousands)	Average assets per household (\$ thousands)	Average liabilities per household (\$ thousands)	Debt to asset ratio per household (per cent)	Average net property assets per household (\$ thousands)
Northern Australia (WA)	303 527	301.3	195.4	359.7	58.4	16.2	126.9
Pilbara Region	9 681	345.6	225.0	413.6	68.0	16.4	171.8
Kimberley Region	4 666	368.7	231.6	430.4	61.7	14.3	150.7
Western Australia state total	741 447	393.5	256.7	462.2	68.7	14.9	202.1
Northern Australia (NT)	51 902	325.1	212.5	413.1	87.9	21.3	142.3
Darwin-East Arnhem Region	39 912	325.9	213.0	415.4	89.4	21.5	145.0
Katherine-Lower Top End Region	2 905	264.3	174.1	325.0	60.7	18.7	83.9
Barkly-Central NT Region	9 085	341.0	222.6	431.1	90.1	20.9	149.0
Northern Territory total	51 902	325.1	212.5	413.1	87.9	21.3	142.3
Northern Australia (QLD)	224 836	305.3	198.7	364.7	59.3	16.3	125.0
Mackay Region	62 879	331.0	215.2	388.3	57.3	14.7	139.3
Northern Region	72 480	294.9	189.4	357.1	62.2	17.4	115.1
Far North Region	81 053	301.3	198.7	359.0	57.7	16.1	127.5
North West Region	8 424	242.5	155.3	308.5	66.0	21.4	79.6
Longreach Region	—	—	—	—	—	—	—
Queensland state total	1 461 557	383.0	247.2	446.2	63.2	14.2	200.2
Northern Australia subtotal	644 610	308.7	200.9	371.1	62.4	16.8	127.9
Australia total	7 577 838	467.6	293.9	537.1	69.4	12.9	259.9

Notes:

- The table above shows selected measures of 'wealth' by region, namely the estimated number of households, average net household worth (assets minus liabilities), average equivalised net worth (taking into account the different average number of people per household in each region), average assets per household, average liabilities per household and average debt-to-asset ratio and average net property assets per household as measures. The original data used in wealth calculations here excluded very remote and Indigenous communities, meaning that many Northern Australian SLAs are not represented at all in the data above, and that this table should be read with caution.
 - The Pilbara Region includes data from Port Hedland and Roebourne only. The Kimberley Region includes data from Broome only.
 - The Darwin-East Arnhem Region information from in and around the city of Darwin only. The Katherine-Top End region includes figures from Katherine only. The Barkly-Central NT Region includes figures from Alice Springs only.
 - The Far North Region includes information from Cairns, Weipa, Johnstone, Douglas, Cardwell, Mareeba, Herberton, Atherton and Eacham only. Many of this region's SLAs are either very remote or Indigenous communities, and were hence excluded from the original data.

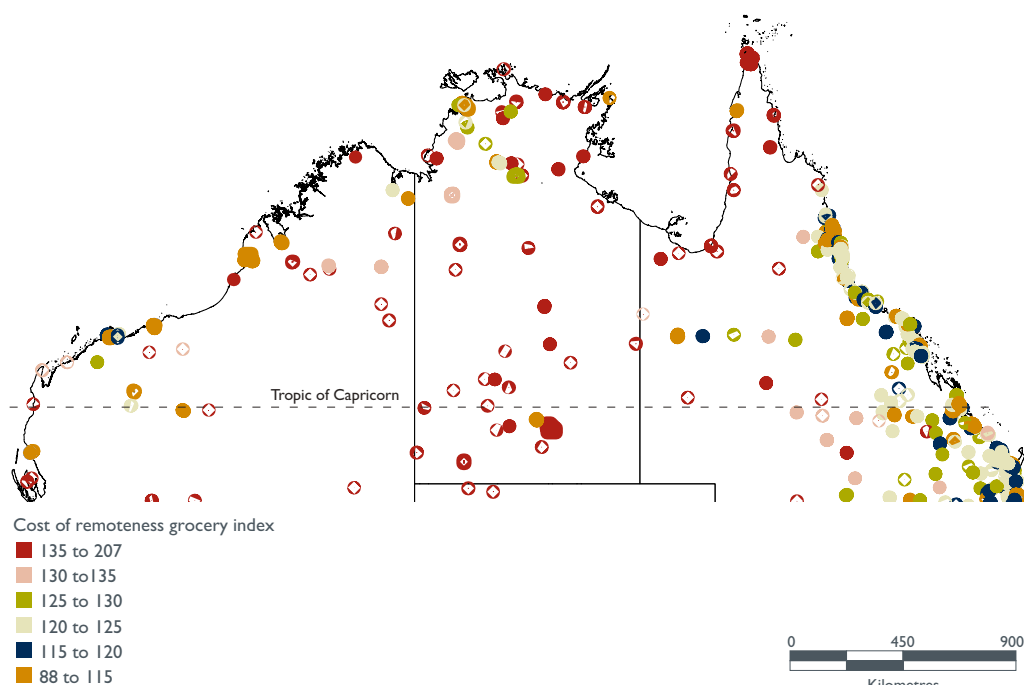
Source: BITRE (2009b).

5.3 The cost of groceries

BITRE has examined a number of social and economic characteristics of regional Australia. An important component of the cost of living in Northern Australia is the cost of groceries retailed in that region. A synthetic index of grocery prices was formulated within BITRE's Cost of Living (forthcoming) project using modelling. The modelling was based on a survey that compared price levels of a basket of groceries purchased in Australia's state capitals with those of 130 selected towns and cities in regional Australia. It is important to remember that these estimates are not the result of direct observations in the centres themselves but based on the trends and patterns across Australia.¹² BITRE expects that actual price levels in individual centres will vary considerably from the estimates.

BITRE's estimation of grocery price levels for selected localities in Northern Australia is illustrated in Map 5.3.1. The lowest levels of grocery prices are associated with major population centres, which contain major chain stores and competing grocery retailers. Higher prices are associated with smaller, more remote communities where there is reduced turnover, less competition and higher transport costs. The very highest levels of grocery prices, some of which are nearly twice the capital city levels, are characteristic of very remote Indigenous communities. However, not all such communities have high prices.

Map 5.3.1 Synthetic grocery price index by population centre, 2006



Notes: This map shows estimated grocery price index ranges by UCL across Northern Australia in 2006.

Source: BITRE (unpublished data).

12. Estimates are based on information to be published in 2009 as part of a larger BITRE project on the cost of living in regional Australia which undertook a survey of prices based on June 2006. Indices set grocery prices across the eight capital cities at 100.

5.4 Schools

Tables 5.4.1 and 5.4.2 show numbers of schools and student enrolments by region in Northern Australia. The data presented reflects a trend toward larger school facilities with higher numbers of student enrolments in dense population areas and major cities. With smaller population centres across much of Northern Australia, school sizes and enrolments are also often smaller than state averages. Tables 5.4.1 and 5.4.2 also show the percentage of the total number of schools in each state (government and private) which were located in Northern Australia.

Table 5.4.1 Northern Australia—government school enrolments by region, 2008

Region	Number of government schools 2008	Percentage of government schools in state	Number of students enrolled (government) 2008	Percentage of government school students in state	Average government school enrolment
Northern Australia (WA)	54	6.7	13 002	5.2	241
Pilbara Region	31	3.9	8 035	3.2	259
Kimberley Region	23	2.9	4 967	2.0	216
Western Australia state total	804	100.0	250 170	100.0	311
Northern Australia (NT)	141	93.4	32 247	99.0	229
Darwin-East Arnhem Region	75	49.7	23 021	70.7	307
Katherine-Lower Top End Region	25	16.6	3 773	11.6	151
Barkly-Central NT Region	41	27.2	5 453	16.7	133
Northern Territory total	151	100.0	32 582	100.0	216
Northern Australia (QLD)	319	25.1	86 208	17.9	270
Mackay Region	89	7.0	23 358	4.9	262
Northern Region	75	5.9	23 926	5.0	319
Far North Region	124	9.8	33 271	6.9	268
North West Region	27	2.1	5 003	1.0	185
Longreach Region	4	0.3	650	0.1	163
Queensland state total	1 270	100.0	480 444	100.0	378
North Australia subtotal	514	—	131 457	—	256
Australia total	6 833	—	2 264 554	—	331

Notes:

1. For comparative purposes, ABS data was used to provide Australian totals for 2008. It should be noted that the enrolment figures provided by schools are significantly higher than ABS numbers.
2. This table shows the number of government schools and student enrolments by region in Northern Australia. In the raw data tables provided by the Queensland Government, special school sections of state schools were shown separately in order to distinguish the existence of these facilities. However, because enrolment figures were not provided for special school sections of existing state schools separately from the wider school population, only whole schools were counted in calculating the number of schools and enrolments in Queensland in this table.

Sources: ABS (2008f); Independent Schools Queensland (2008); Northern Territory Government Department of Education and Training (2008a); Northern Territory Government Department of Education and Training (2008b); Queensland Catholic Education Commission (2008); Queensland Department of Education, Training and the Arts (2008a); Queensland Department of Education, Training and the Arts (2008b); Western Australia Department of Education and Training Information Services (2008a); Western Australia Department of Education and Training Information Services (2008b).

Table 5.4.2 Northern Australia—private school enrolments by region, 2008

<i>Region</i>	<i>Number of non-government schools 2008</i>	<i>Percentage of non-government schools in state</i>	<i>Number of students enrolled (non-government) 2008</i>	<i>Percentage of non-government school students in state</i>	<i>Average non-government school enrolment</i>
Northern Australia (WA)	26	8.3	3 247	2.6	125
Pilbara Region	7	2.2	1 140	0.9	163
Kimberley Region	19	6.1	2 107	1.7	111
Western Australia state total	313	100.0	127 150	100.0	406
Northern Australia (NT)	34	97.1	9 534	94.7	280
Darwin-East Arnhem Region	26	74.3	6 934	68.9	267
Katherine-Lower Top End Region	2	5.7	278	2.8	139
Barkly-Central NT Region	6	17.1	2 322	23.1	387
Northern Territory total	35	100.0	10 063	100.0	288
Northern Australia (QLD)	107	21.4	37 910	16.7	354
Mackay Region	23	4.6	9 833	4.3	428
Northern Region	35	7.0	13 239	5.8	378
Far North Region	40	8.0	13 676	6.0	342
North West Region	8	1.6	1 026	0.5	128
Longreach Region	1	0.2	136	0.1	136
Queensland state total	499	100.0	226 755	100.0	454
Northern Australia subtotal	167	–	50 691	–	304
Australia total ¹	2 729	–	1 169 737	–	429

Notes:

1. For comparative purposes, ABS data was used to provide Australian totals for 2008. It should be noted that the enrolment figures provided by schools are significantly higher than ABS numbers.
2. This table shows the number of non-government schools and student enrolments by region in Northern Australia.

Sources: ABS (2008f); Independent Schools Queensland (2008); Northern Territory Government Department of Education and Training (2008a); Northern Territory Government Department of Education and Training (2008b); Queensland Catholic Education Commission (2008); Queensland Department of Education, Training and the Arts (2008a); Queensland Department of Education, Training and the Arts (2008b); Western Australia Department of Education and Training Information Services (2008a); Western Australia Department of Education and Training Information Services (2008b).

There are higher proportions of students enrolled in government schools and lower proportions enrolled in non-government schools within Northern Australia, as compared with the rest of Australia (see Table 5.4.3). In particular, there were higher proportions of students enrolled in government schools in northern Western Australia and the north of the Northern Territory. Low proportions of students in private schools were observed in the Katherine-Lower Top End, Pilbara, North West Queensland and Longreach regions, as compared with the rest of Australia. A high proportion of the available schooling facilities in regions with very remote communities were provided by the state (such as Barkly-Central NT in the Northern Territory, the Kimberley and Pilbara regions in Western Australia, and North West Queensland).

**Table 5.4.3 Northern Australia—student enrolments by school type
(per cent of total enrolments) by region, 2008**

<i>Region</i>	<i>Total number of students enrolled 2008</i>	<i>Average enrolment (all schools)</i>	<i>Proportion of students in government schools</i>	<i>Proportion of students in non-government schools</i>
Northern Australia (VWA)	16 249	203	80.0	20.0
Pilbara Region	9 175	241	87.6	12.4
Kimberley Region	7 074	168	70.2	29.8
Western Australia state total	377 320	338	74.8	25.2
Northern Australia (NT)	41 781	239	81.4	18.6
Darwin-East Arnhem Region	29 955	297	81.2	18.8
Katherine-Lower Top End Region	4 051	150	93.6	6.4
Barkly-Central NT Region	7 775	165	77.0	23.0
Northern Territory total	42 645	229	80.9	19.1
Northern Australia (QLD)	124 118	291	76.6	23.4
Mackay Region	33 191	296	77.1	22.9
Northern Region	37 165	338	73.7	26.3
Far North Region	46 947	286	77.4	22.6
North West Region	6 029	172	85.5	14.5
Longreach Region	786	157	85.2	14.8
Queensland state total	707 199	428	75.7	24.3
Northern Australia subtotal	182 148	267	78.2	21.8
Australia total ¹	3 434 291	359	65.9	34.1

Notes:

1. For comparative purposes, ABS data was used to provide Australian totals for 2008. It should be noted that the enrolment figures provided by schools are significantly higher than ABS numbers.
2. This table shows the number and proportion of student enrolments by type of school in Northern Queensland. For the above regions, the figures presented do not necessarily reflect an availability of choice between state and private facilities within regions. In some remote regions, students may have no option but to attend private boarding facilities in order to complete senior education, for example.

Sources: ABS (2008f); Independent Schools Queensland (2008); Northern Territory Government Department of Education and Training (2008a); Northern Territory Government Department of Education and Training (2008b); Queensland Catholic Education Commission (2008); Queensland Department of Education, Training and the Arts (2008a); Queensland Department of Education, Training and the Arts (2008b); Western Australia Department of Education and Training Information Services (2008a); Western Australia Department of Education and Training Information Services (2008b).

Data in Table 5.4.4 indicates that few schools in regions characterised by very remote communities offered up to Year 12 tuition, meaning that students wishing to study at this level often had to study outside their home communities. It should also be noted that in the Northern Territory in particular, many schools counted as 'high schools' were intermediate schools which offered Years 7 to 9, as the Territory often separates high schools in this manner. Hence, even in Darwin, the proportion of high schools offering up to Year 12 education is lower than in other states. However, we can still see significant differences between Darwin-East Arnhem and the balance of the Territory in the availability of schools offering tuition up to Year 12.

Table 5.4.4 Northern Australia—school by year levels and Vocational Education and Training (VET) offered by region, 2008

Region	Number of schools offering primary years (preschools are included in this count)	Number of high schools not offering Year 12	Number of high schools offering Year 12	Proportion of high schools offering Year 12	Number of schools known to offer Vocational Education and Training (VET)
Northern Australia (WA)	34	22	23	51.1	—
Pilbara Region	19	6	12	66.7	—
Kimberley Region	15	16	11	40.7	—
Western Australia state total	748	93	276	74.8	—
Northern Australia (NT)	148	93	22	19.1	11
Darwin-East Arnhem Region	81	39	16	29.1	9
Katherine-Lower Top End Region	25	21	2	8.7	2
Barkly-Central NT Region	42	33	4	10.8	
Northern Territory total	161	104	23	18.1	12
Northern Australia (QLD)	433	22	151	87.3	86
Mackay Region	112	2	37	94.9	22
Northern Region	111	2	43	95.6	28
Far North Region	168	9	60	87.0	33
North West Region	37	8	10	55.6	2
Longreach Region	5	1	1	50	1
Queensland state total	1 426	76	450	85.6	—
Northern Australia subtotal	615	137	196	58.9	97

Note: This table shows the number of schools offering primary years, high schools not offering Year 12, high schools offering Year 12 and those high schools known to offer Vocational Education and Training (VET) in Northern Australia. VET figures here represent only those schools known by BITRE to provide VET. They are not to be used for comparative purposes. State authorities pointed out that virtually all schools offering Year 12 also offered VET to their students. Schools may also offer VET below Year 12. For example, the Northern Territory Government specifically pointed out that their VET figures did not include most remote schools and schools offering VET in Years 8 and 9. BITRE did not obtain VET figures from the Queensland Catholic Schools Association, meaning that only government and independent private schools are included in the totals above. The Queensland Government itself was unable to provide VET figures for state schools within the timeframes required, so a basic scan of the national database of Registered Training Organisations was made instead. The figure above shows all schools which offer primary school years. However, many schools in Queensland and the Northern Territory offer primary school and high school together. Hence, these schools are also included in counts of high schools. Schools offering pre-school and the prep year are included in the primary schools count above.

Sources: Independent Schools Queensland (2008); Northern Territory Government Department of Education and Training (2008a); Northern Territory Government Department of Education and Training (2008b); Queensland Catholic Education Commission (2008); Queensland Department of Education, Training and the Arts (2008a); Queensland Department of Education, Training and the Arts (2008b); Western Australia Department of Education and Training Information Services (2008a); Western Australia Department of Education and Training Information Services (2008b).

5.5 Universities

In order to attend university, Northern Australian students are often faced with the prospect of leaving the region to undertake on-campus study elsewhere in more densely populated parts of Australia. Alternatively, they may decide to study externally from home. Some find that their external study needs are also best met by southern universities. Among these people are students who travel long distances to attend short 'residential' on-campus workshops outside Northern Australia, in larger city centres.

Table 5.5.1 shows that while there are a number of university facilities in Northern Australia, few offer a broad range of courses, or qualifications up to the Postgraduate level. Many offer external studies only. This is particularly so across much of the Northern Territory and northern Western Australia, which are more sparsely populated than northern Queensland.

In 2007 in the Northern Territory, the Batchelor Institute of Indigenous Tertiary Education had almost 800 students, with 31 people studying at the Postgraduate level. Students at this university often study via small external study centres, which are spread across a number of Indigenous communities (in addition to the annexes listed in Table 5.5.1). Apart from the Batchelor Institute, Charles Darwin University is the only on-campus tertiary education option for students wishing to live and study in the Northern Territory.

Within northern Western Australia there are also relatively few study options compared to those offered in the south. All of the Western Australia universities offering education across the northern region are based in Perth. One campus in northern Western Australia offers Postgraduate qualifications.¹³

Within the more populous regions of northern Queensland there are more study options available to students, given that there are two larger universities (Central Queensland University and James Cook University) with main campuses in this area. However, the more sparsely populated regions of northern Queensland also offer a limited range of on-campus study options to students. For example, the James Cook University outlet in the North West Region provides health-related courses only.

Table 5.5.2 provides information on the number of students by broad course level at each university which has a campus in Northern Australia. These numbers are for the entire university, that is, they represent all students enrolled at the university, not just those who are within Northern Australia. In the case of Central Queensland University, a number of students would not be from within Northern Australia, as the university has also campuses in Sydney, Melbourne, Brisbane and the Gold Coast. In the case of Curtin University of Technology and the University of Notre Dame, the vast majority of these students would be located outside of northern Western Australia, in and around Perth, which is where the main campuses are situated. Universities which have students in northern Queensland, Western Australia and the Northern Territory who are studying by correspondence are not considered in this table, as no data was available.

13. The University of Notre Dame, Broome.

Table 5.5.1 Northern Australia — university campuses, by region, 2007

Region	Campus	University	Main campus located in Northern Australia	Courses offered
Northern Australia (WA)				
Pilbara Region	Karratha	Curtin University of Technology	No	Up to Bachelor and Graduate Diploma of Education
	Port Hedland	Curtin University of Technology	No	Up to Bachelor and Graduate Diploma of Education
Kimberley Region	Broome	The University of Notre Dame	No	Selected Undergraduate and Postgraduate programs
	Kununurra	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	Annex—external study centre
Northern Australia (NT)				
Darwin-East Arnhem Region	Batchelor	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	VET to Postgraduate
	Darwin	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	Annex—external study centre
	Nhulunbuy	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	Annex—external study centre
	Casuarina	Charles Darwin University	Yes (NT)	Up to Postgraduate
	Palmerston	Charles Darwin University	Yes (NT)	VET
	Jabiru	Charles Darwin University	Yes (NT)	VET
	Nhulunbuy	Charles Darwin University	Yes (NT)	VET
Katherine-Lower Top End Region	Katherine	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	Annex—external study centre
	Katherine	Charles Darwin University	Yes (NT)	VET
Barkly-Central NT Region	Tennant Creek	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	Annex—external study centre
	Tennant Creek	Charles Darwin University	Yes (NT)	VET
	Alice Springs	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	VET to Postgraduate
	Alice Springs	Charles Darwin University	Yes (NT)	VET and undergraduate degrees
Northern Australia (QLD)				
Mackay Region	Mackay	James Cook University	Yes (QLD)	External study centre
	Mackay	Central Queensland University	Yes (QLD)	Up to Postgraduate
Northern Region	Townsville	James Cook University	Yes (QLD)	Up to Postgraduate
Far North Region	Cairns	James Cook University	Yes (QLD)	Up to Postgraduate
	Thursday Island	James Cook University	Yes (QLD)	Nursing and education studies
	Yarrabah (QLD)	Batchelor Insitute of Indigenous Tertiary Education	Yes (NT)	Annex—external study centre
North West Region	Mount Isa Centre for Rural and Remote Health	James Cook University	Yes (QLD)	Undergraduate nursing and health related courses
Longreach Region	None	—	—	—

Notes: This table lists all university campuses which lie within Northern Australia, along with information related to the courses which are offered to students. The table does not consider universities which provide students within Northern Australia with the option to study by correspondence; such data was not available.

Sources: Batchelor Insitute of Indigenous Tertiary Education 2008a; Batchelor Insitute of Indigenous Tertiary Education 2008b; Central Queensland University 2008a; Central Queensland University 2008b; Charles Darwin University 2008a; Charles Darwin University 2008b; Curtin University of Technology 2008; James Cook University 2008a; James Cook University 2008b; James Cook University 2008c; James Cook University 2008d; The University of Notre Dame Australia 2008.

Table 5.5.2 Universities with a campus in Northern Australia—all students by higher education provider and broad level of course, full year 2007

Region	Main campus in Northern Australia	Doctorate by research	Doctorate by course-work	Master's by research	Master's by course-work	Other post-graduate	Subtotal post-graduate	Bachelor degree	Associate degree	Other under-graduate	Subtotal under-graduate	Enabling courses	Non-award courses	Total
Northern Australia (NT)														
Batchelor Institute of Indigenous Tertiary Education	Yes			8		23	31	172		254	426	269		726
Charles Darwin University	Yes	176	13	29	370	526	1 114	4 061	32	22	4 115	631	13	5 873
Northern Australia (QLD)														
Central Queensland University	Yes	225	37	63	5 709	1 689	7 723	11 707	71	346	12 124	1 028	177	21 052
James Cook University	Yes	592	72	107	1 949	776	3 496	11 304		98	11 402	64	613	15 575
Northern Australia (WA)														
Curtin University of Technology	No	1 431	1	312	4 644	2 645	9 033	29 531	271	221	30 023	256	1 062	40 374
The University of Notre Dame	No	40	0	9	453	251	753	4916	0	89	5005	144	322	6224

Note: As data was not available for individual campuses, these numbers are for the entire university. That is, they represent all students enrolled at the university, not just students within Northern Australia. Consequently, subtotals for each of the Northern Australia states have not been provided, as it would be misleading to suggest that all students who are enrolled at the Central Queensland University, for example, are from northern Queensland.

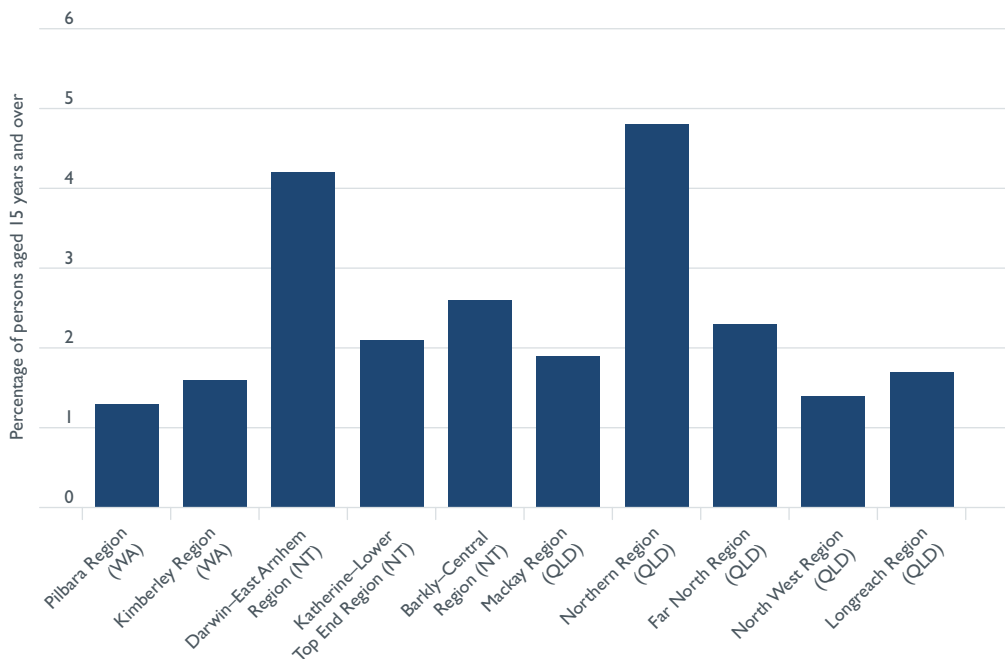
Source: DEEWR (2008c).

There are lower percentages of people at university in Northern Australia than in Australia generally (see Table 5.5.3). In particular, there are very low proportions of people within northern Western Australia who are studying at a tertiary institution (1.4 per cent compared with the national average of 4.7 per cent).

There are relatively high percentages of people at university in the Darwin-East Arnhem and Northern Queensland regions. This is probably linked to students coming in to Darwin and Townsville from outlying areas of the Northern Territory and northern Queensland, hence student numbers being particularly concentrated here.

Meanwhile there are low proportions of people at university in the Pilbara, Kimberley and North West regions. Low percentages of university students in such regions indicate that they are not places where people go to study. They also indicate that major employment industries located in this region may have little requirement for locally-based tertiary education facilities.

Figure 5.5.1 Northern Australia—percentage of persons at university or other tertiary institution, by region, 2006



Note: The above figure shows the proportion of the population aged over 15 years who are currently at university or other tertiary institutions in Northern Australia.

Source: ABS (2006b).

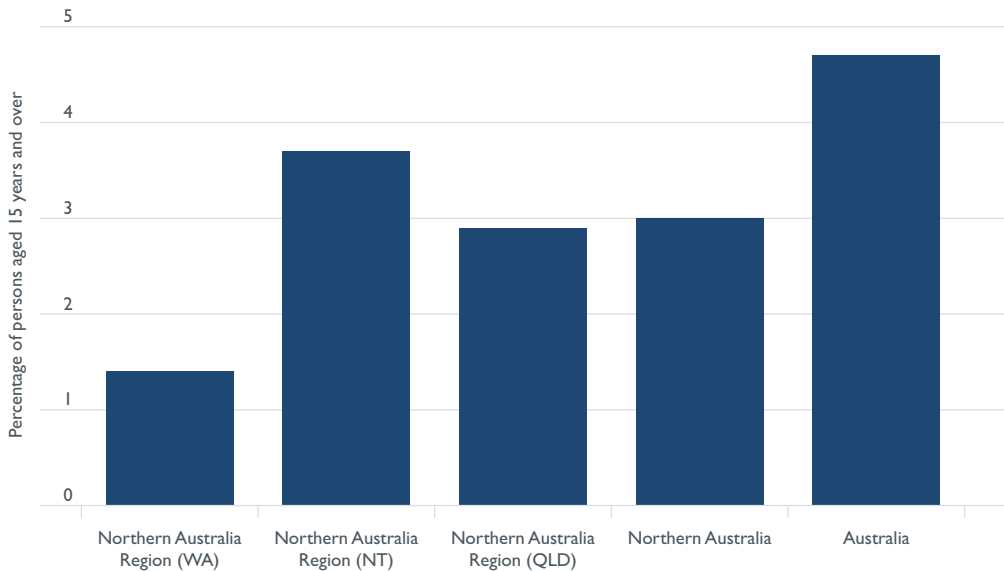
Table 5.5.3 Northern Australia—number and percentage of people at university or other tertiary institutions, by region, 2006

Region	Persons, aged 15 years and over			Males, aged 15 years and over			Females, aged 15 years and over		
	Usually resident adult population, total	University or other tertiary Institution, persons	University or other tertiary Institution (per cent)	Usually resident adult population, total	University or other tertiary Institution, males	University or other tertiary Institution (per cent)	Usually resident adult population, total	University or other tertiary Institution, females	University or other tertiary Institution (per cent)
Northern Australia (WA)	59 161	837	1.4	32 570	267	0.8	26 591	570	2.1
Pilbara Region	34 878	443	1.3	19 760	166	0.8	15 118	277	1.8
Kimberley Region	24 283	394	1.6	12 810	101	0.8	11 473	293	2.6
Western Australia state total	1 649 037	73 096	4.4	827 865	31 355	3.8	821 172	41 741	5.1
Northern Australia (NT)	155 869	5 756	3.7	81 259	2 109	2.6	74 610	3 647	4.9
Darwin-East Arnhem Region	111 535	4 684	4.2	59 070	1 738	2.9	52 465	2 946	5.6
Katherine-Lower Top End Region	13 155	275	2.1	6 706	101	1.5	6 449	174	2.7
Barkly-Central NT Region	31 179	797	2.6	15 483	270	1.7	15 696	527	3.4
Northern Territory total	159 134	5 819	3.7	82 849	2 108	2.5	76 285	3 711	4.9
Northern Australia (QLD)	532 580	15 534	2.9	272 546	5 667	2.1	260 034	9 867	3.8
Mackay Region	146 320	2 852	1.9	76 409	1 017	1.3	69 911	1 835	2.6
Northern Region	164 398	7 941	4.8	82 916	3 007	3.6	81 482	4 934	6.1
Far North Region	192 175	4 330	2.3	97 399	1 500	1.5	94 776	2 830	3.0
North West Region	26 790	362	1.4	14 406	133	0.9	12 384	229	1.8
Longreach Region	2 897	49	1.7	1 416	10	0.7	1 481	39	2.6
Queensland state total	3 256 955	137 846	4.2	1 614 410	57 129	3.5	1 642 545	80 717	4.9
Northern Australia subtotal	747 610	22 127	3.0	386 375	8 043	2.1	361 235	14 084	3.9
Australia total	15 918 076	745 457	4.7	7 777 915	324 196	4.2	8 140 161	421 261	5.2

Notes: The above table shows the proportion of the population aged over 15 years who are currently at university or other tertiary institutions. The data allows for comparisons to be made between genders, and for the Northern Australia subregions and states.

Source: ABS (2006b).

Figure 5.5.2 Northern Australia—percentage of persons at university or other tertiary institution, 2006

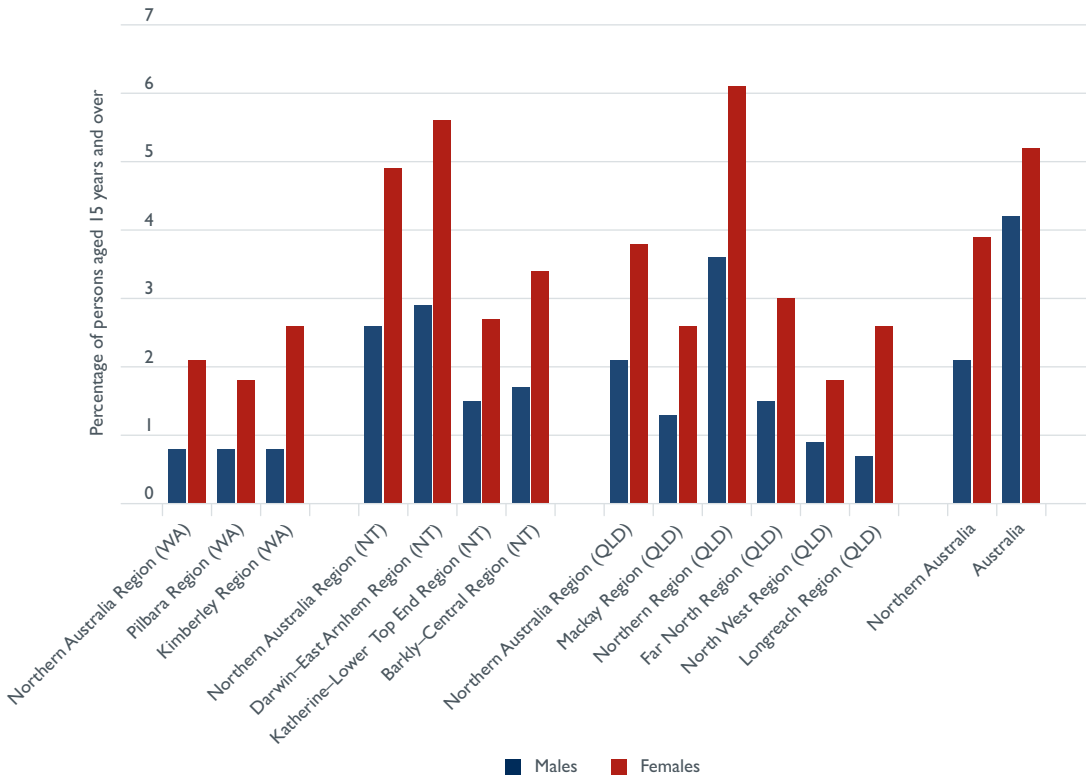


Note: The above figures show the proportion of the population aged over 15 years who are currently at university or other tertiary institutions. The data allows for comparisons to be made between the Northern Australia subregions, states and Australia.

Source: ABS (2006b).

In line with the national trend, there were more females than males at university in Northern Australia; however, the gap between the sexes is greater than is seen in the rest of Australia. This is particularly true of the northern Northern Territory, where 2.6 per cent of males were at university compared with 4.9 per cent of females. The lowest percentage of males at university was seen in the Longreach, Pilbara and Kimberley regions (see Table 5.5.1). On the other hand, high percentages were seen in the Northern Queensland (3.7 per cent) and Darwin-East Arnhem (2.9 per cent) regions, although both of these still lie below the national average (4.2 per cent). Amongst the female population in Northern Australia, there were fewer females at university in the Pilbara and North West regions. Like the male population, the highest percentages of females were in the Northern Queensland (6.1 per cent) and Darwin-East Arnhem (5.6 per cent) regions, which were higher than the national average (5.2 per cent).

Figure 5.5.3 Northern Australia—percentage of people at university or other tertiary institutions, by region, by gender, 2006



Notes: The above graph shows the proportion of the population aged over 15 years, by gender, which are currently studying at a university or other tertiary institutions. The figure allows for comparisons to be made between the Northern Australia subregions and states.

Source: ABS (2006b).

5.6 TAFE institutions

TAFE institutions play a significant role in education in Northern Australia. In Table 5.6.1, the physical distribution of TAFE institutions and training delivery outlets across the region in 2007 is shown.

Table 5.6.1 Northern Australia—location of TAFE institutions and training delivery locations, 2007

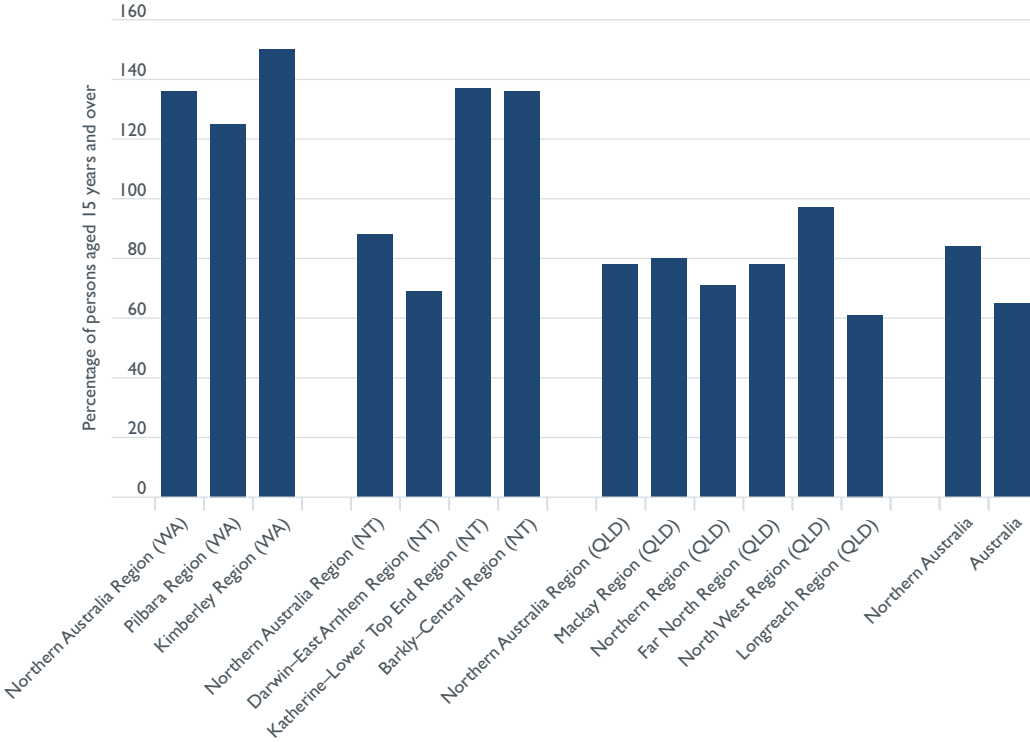
<i>Region</i>	<i>Number of TAFE college business entities located in region</i>	<i>Number of training delivery locations</i>
Northern Australia (WA)		
Pilbara Region	2	14
Kimberley Region	2	7
Northern Australia (NT)		
Darwin-East Arnhem Region	3	139
Katherine-Lower Top End Region	3	74
Barkly-Central NT Region	8	97
Northern Australia (QLD)		
Mackay Region	8	27
Northern Region	7	20
Far North Region	6	24
North West Region	8	17
Longreach Region	1	1
Australia total	71	1 502

Notes: This table shows the location of TAFE institutions (business entities), and the number of training delivery locations by region in Northern Australia. Some TAFE institutions are physically spread across more than one region. The training delivery locations listed in the second column of data do not always belong to the colleges listed in the first column of data. TAFE institutions from outside the region may also have delivery locations there.

Source: NCVER (2008).

As discussed in Chapter 4 (Section 4.6), Certificate-level qualifications were particularly dominant amongst adults in Northern Australia. In Figure 5.6.1, it can be seen that enrolments in TAFE institutions were also generally higher per 1000 people in the population than across Australia as a whole. Enrolments per 1000 people in the population were highest in the Kimberley Region (150 per 1000 people) of Western Australia, along with the Katherine-Lower Top End Region (137 per 1000 people) and the Barkly-Central NT Region (136 per 1000 people) of the Northern Territory. Student enrolment levels were at their lowest in the Longreach (61 per 1000 people) and Darwin-East Arnhem (69 per 1000 people) regions.

Figure 5.6.1 Northern Australia—usually resident enrolled TAFE students per 1000 population by region, 2007



Note: This figure shows the number of usually resident, enrolled TAFE students per 1000 people in the population, by region.

Source: NCVER (2008); ABS for DOHA (2008).

In Table 5.6.2, it can be seen that even in regions characterised by remote and Indigenous communities (such as the Kimberley, Barkly–Central NT and Katherine–Lower Top End regions), the majority of students were able to study through TAFE institutions located within their own regions in Northern Australia.

Table 5.6.2 Northern Australia—percentage of usually resident students studying at TAFE institutions within or outside their own region, by region, 2007

Region	Total students (per cent)	Studying within their own region	Studying outside home region, within Northern Australia (per cent)	Studying outside home region, outside Northern Australia (per cent)	Studying within an unknown region (per cent)
Northern Australia (WA)	100.0	81.6	–	16.0	0.1
Pilbara Region	100.0	79.6	1.4	18.9	0.1
Kimberley Region	100.0	84.0	3.4	12.4	0.2
Northern Australia (NT)	100.0	57.8	–	10.4	24.9
Darwin-East Arnhem Region	100.0	44.8	5.3	8.3	41.6
Katherine-Lower Top End Region	100.0	76.3	15.3	2.4	6.0
Barkly-Central NT Region	100.0	73.2	5.8	17.7	3.3
Northern Australia (QLD)	100.0	67.1	–	18.4	0.0
Mackay Region	100.0	55.8	23.9	20.3	0.0
Northern Region	100.0	74.5	8.6	16.8	0.1
Far North Region	100.0	72.4	10.2	17.4	0.0
North West Region	100.0	59.2	20.7	20.0	0.1
Longreach Region	100.0	0.4	33.8	65.8	0.0
Northern Australia subtotal	100.0	67.0	11.1	16.3	5.6

Note: The table above shows the proportion of students studying at TAFE colleges based in their own region, compared with the proportion of students studying at TAFE colleges located outside their home region. TAFE colleges based outside any given region may also have dedicated delivery centres physically located within that region. It should be noted that the vast majority of Australian students studying in an 'unknown region' (i.e. unknown to NCVER) reside in Northern Australia, hence the data should be treated with some caution.

Source: NCVER (2008).

5.7 Health

In Northern Australia, according to 2006 Census data, the proportion of people identifying as health workers per 100 000 people in the population is lower than the proportion of Australians generally. Table 5.7.1 shows that the number of health workers per 100 000 people is particularly low in the Mackay, Kimberley, Pilbara, Darwin-East Arnhem, North West and Far North Queensland regions. Furthermore, at the SLA level, many of the more remote areas across northern Australia have especially low proportions of health workers in comparison to the national average.

Readers interested in finding out more about the complex issues and difficulties involved in meeting existing service needs in certain parts of rural and remote areas across Australia, and about shortages of health professionals, may wish to consult DOHA's *Report on the Audit of Health Workforce in Rural and Regional Australia* (2008).

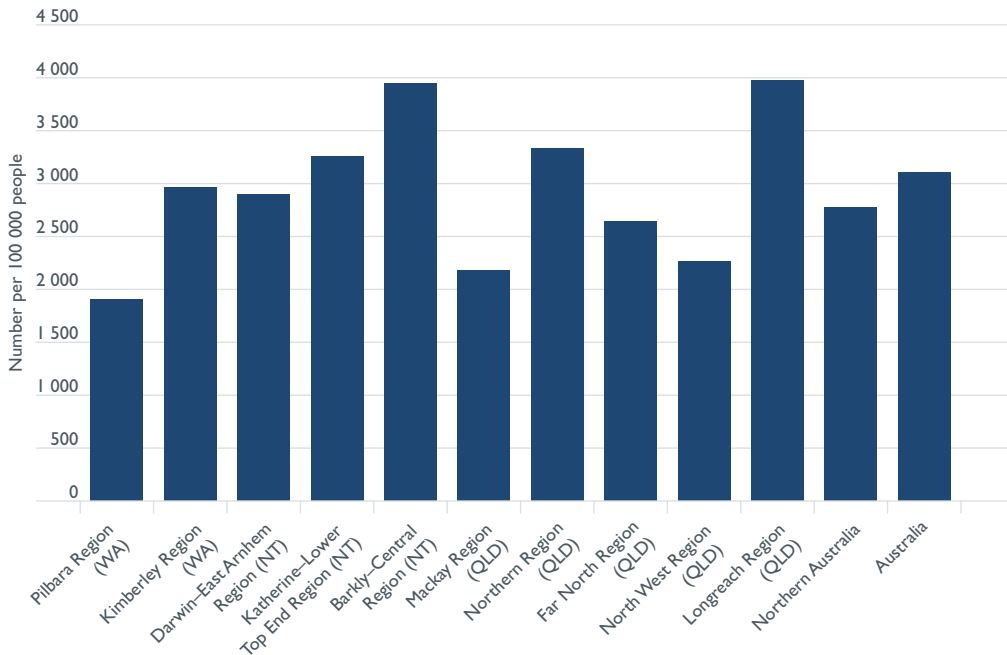
Table 5.7.1 Northern Australia — employed persons in health-related occupations, by region, 2006

Region	Population	Medical workers	Nursing	(per 100 000 population)						Pharmacists	Physio-therapists	Psychologists	Aboriginal health workers	Total health workers
				Dental	Chiropractors and osteopaths	Optometrists and orthoptists								
Northern Australia (WA)	72 363	166	938	53	10	6	25	39	55	102	2 330			
Pilbara Region	43 065	125	815	60	7	9	14	30	58	26	1 902			
Kimberley Region	29 298	225	1 120	41	14		41	51	51	215	2 959			
Western Australia state total	1 954 683	267	1 397	166	12	14	77	68	90	8	3 141			
Northern Australia (NT)	187 134	295	1 255	113	10	9	48	46	59	117	3 138			
Darwin-East Arnhem Region	133 721	295	1 223	121	11	12	51	49	64	96	2 900			
Katherine-Lower Top End Region	16 466	134	960	36			55	24	30	279	3 255			
Barkly-Central NT Region	36 947	365	1 502	119	8		35	49	54	122	3 946			
Northern Territory total	190 881	291	1 236	111	11	8	47	46	58	120	3 123			
Northern Australia (QLD)	642 414	213	1 218	130	11	12	59	35	59	22	2 719			
Mackay Region	175 133	155	1 008	108	18	14	54	26	40		2 183			
Northern Region	199 225	300	1 544	154	6	15	71	42	81	7	3 331			
Far North Region	231 057	195	1 119	138	11	10	60	35	58	44	2 644			
North West Region	33 476	143	977	48			18	30	24	75	2 267			
Longreach Region	3 523	85	1 987	85				85	85		3 974			
Queensland state total	3 891 666	267	1 349	160	13	18	76	57	62	6	2 963			
Northern Australia subtotal	901 911	227	1 203	120	10	11	54	38	59	48	2 775			
Australia total	19 813 078	287	1 413	149	17	18	77	62	69	5	3 102			

Notes: This table provides information on nine key health professions within Northern Australia, as a proportion of the population. It should be noted that the total number of health workers includes all health professions; it is not limited to the nine key professions which have been explored in greater depth. The data refers to people who described themselves as health workers only. It does not distinguish between people actively working, working part-time, or not currently working, for example. BITRE summed the SLA data in order to obtain the state and national totals.

Source: Australian Government Department of Health and Ageing (DOHA) (2008).

Figure 5.7.1 Northern Australia—health workers per 100 000 people, by region, 2006



Note: This graph provides information on the total number of health workers within Northern Australia. The data refers to people who described themselves as health workers only. It does not distinguish between people actively working, working part-time, or not currently working, for example. BITRE summed the SLA data in order to obtain the state and national totals.

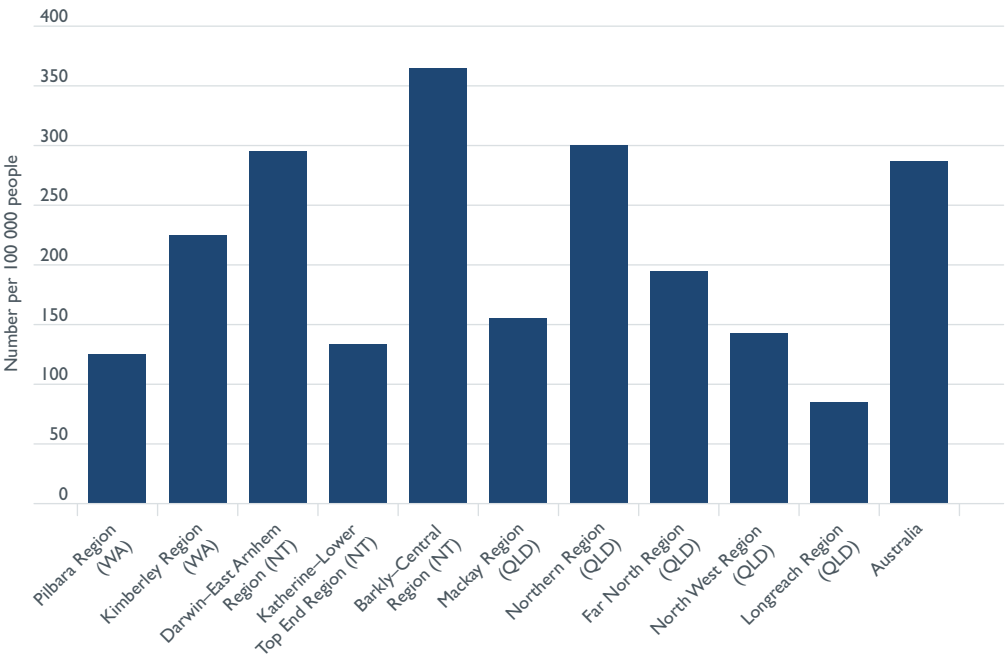
Source: DOHA (2008).

In line with national trends, the proportion of health professionals in the population decreased in Northern Australia as remoteness and distance from larger cities increases. Almost all of the key health professions had lower proportions of workers per 100 000 people in the population within Northern Australia than the rest of Australia (see Table 5.7.1). For example, the proportion of nurses, pharmacists and physiotherapists was far lower within Northern Australia than in the rest of Australia. The only exception to this was the proportion of Aboriginal health workers, which was higher within Northern Australia. The greater proportion of Aboriginal health workers in Northern Australia is to be expected given the higher proportion of Indigenous Australians living in these areas (see Chapter 2).

Figure 5.7.2 indicates that the proportion of medical workers was higher in the Darwin-East Arnhem, Barkly-Central NT and Northern Queensland regions. On the other hand, there were low proportions of medical workers per 100 000 in the Longreach (85), Pilbara (125) and Katherine-Lower Top End (134) regions in comparison with the national average (287). The proportion of dental workers per 100 000 people in the population within Northern Australia was lower than the rest of Australia. In particular the regions of North West Queensland (48), Kimberley (41) and the Katherine-Lower Top End (36) had low proportions per 100 000 people in comparison to the national ratio (149). Similarly, access to optometrists and orthoptists was much lower in parts of Northern Australia, such as the Kimberley, Katherine-Lower Top End, Barkly-

Central NT, Longreach and North West Queensland which had no medical workers in these categories. It is likely that many people living in these areas travel into larger towns in order to access such services. Alternatively, people living in more remote regions may rely on visiting services provided through the state and territory health authorities in order to access dental and optical care.

Figure 5.7.2 Northern Australia—medical workers per 100 000 people, by region, 2006



Note: This graph shows the number of medical workers per 100 000 people in the northern regions of Western Australia, the Northern Territory and Queensland, compared with their respective state totals and Australia. Medical workers include professions such as general practitioners, anaesthetists and surgeons. The data refers to people who described themselves as health workers only. It does not distinguish between people actively working, working part-time, or not currently working, for example. BITRE summed the SLA data in order to obtain the state and national totals.

Source: DOHA (2008).

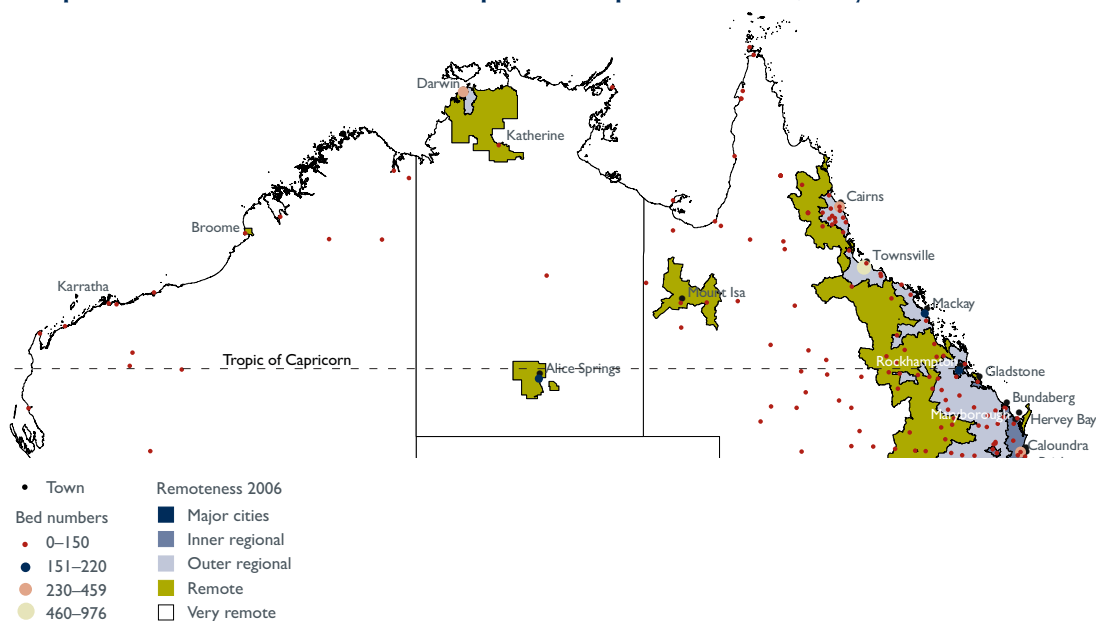
Map 5.7.1 shows the location of public hospitals across Northern Australia. In 2006, there were no private hospitals in northern Western Australia and one private hospital in the Northern Territory (located in Darwin). Within northern Queensland, there was only one private hospital across the very remote and remote areas, and five hospitals in the outer regional areas of Cairns (one hospital), Townsville (two hospitals) and Mackay (two hospitals). Thus, throughout much of Northern Australia there is a reliance on public hospitals to service the health needs of the population.

Map 5.7.2 shows the location of Aboriginal Medical Services within Northern Australia. Aboriginal Health Services are community controlled services which provide primary health care to Indigenous patients. The health centres offer a range of primary health care, substance misuse and mental health services, such as social and emotional wellbeing counselling; foster care placement for children; immunisation; disease management; health checks; education programs; and aged

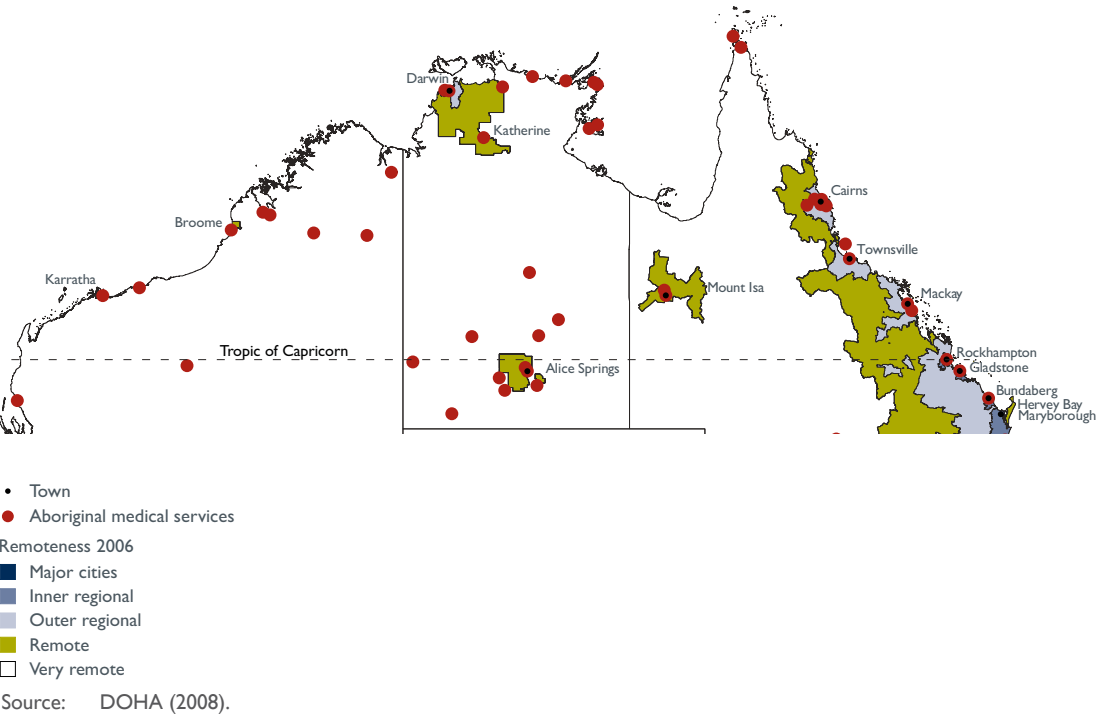
care. The Northern Australia regions of Barkly-Central NT, Katherine-Lower Top End, Darwin-East Arnhem, Kimberley and Far North Queensland all have high numbers of these medical services.

In many remote regions of Northern Australia, there is often a reliance on the Royal Flying Doctor Service (RFDS) to provide aero-medical transportation and health care (see Map 5.7.3). The RFDS provides traditional health services such as emergency aero-medical evacuations, primary and community health care clinics, remote consultations and medical chests, along with other activities such as interhospital patient transfers.

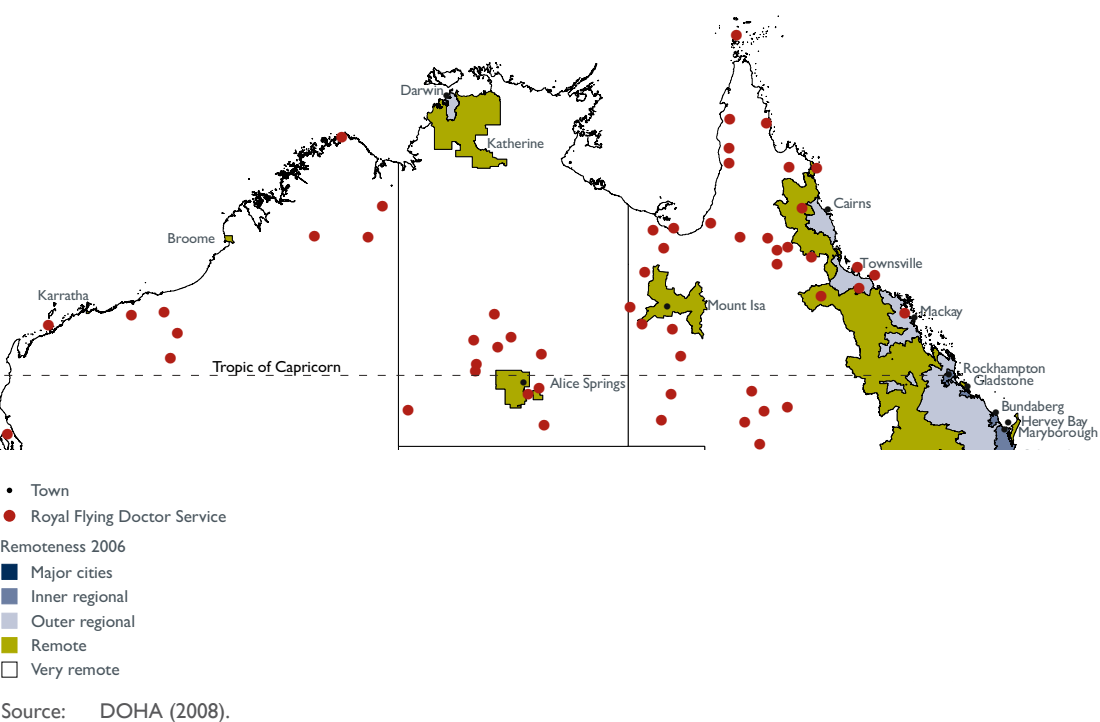
Map 5.7.1 Northern Australia—public hospital locations, May 2006



Map 5.7.2 Northern Australia—Aboriginal Medical Services, 2006



Map 5.7.3 Northern Australia—Royal Flying Doctor Service locations, February 2008



As shown in Table 5.7.2, 92 of Australia's 795 public hospitals (approximately 11.6 per cent) were located in Northern Australia. Further, 17 of Australia's 549 private hospitals (approximately 3.1 per cent) were located across the region. Most of Northern Australia's hospitals were located in the more populous areas of northern Queensland.

Table 5.7.2 Northern Australia—public and private hospitals, 2006–07

<i>Region</i>	<i>Public hospitals</i>	<i>Percentage of all Australian public hospitals</i>	<i>Private hospitals</i>	<i>Percentage of all Australian private hospitals</i>	<i>Total population (number) by region</i>	<i>Percentage of total Australian population</i>
Northern Australia (WA)	13	1.6	1	0.2	79 510	0.4
Northern Australia (NT)	5	0.6	1	0.2	206 347	1.0
Northern Australia (QLD)	74	9.3	15	2.7	683 184	3.3
Northern Australia subtotal	92	11.6	17	3.1	969 041	4.7
Western Australia state total	95	11.9	43	7.8	2 059 045	9.9
Northern Territory total	5	0.6	1	0.2	210 674	1.0
Queensland state total	177	22.3	108	19.7	4 091 546	19.8
Australia total	795	100	549	100	20 697 880	100

Sources: AIHW (2008); ABS (2008g).

Table 5.7.2 also shows the percentage of Australian hospitals in Northern Australia and the percentage of Australian people living in Northern Australia. For a range of reasons, these figures should be treated with caution. First, although it would appear that public hospitals in Northern Australia are relatively numerous compared to the populations they serve, many of these may be small clinics with limited bed capacity and basic medical services offered. Furthermore, hospital numbers alone do not illustrate the range of ways in which Northern Australians' medical needs are serviced, including through the Royal Flying Doctor Service and patient transfers to larger hospitals in southern Australia for specialist treatment.

Data relating to day-to-day living available in the online compendium

5.1 Income support

- Northern Australia—income support and recipients by region, 1995–96 to 2000–01 (Source: ABS).

5.2 Wealth

- Northern Australia—average household wealth by region, 2003–04 (Source: BITRE)
- Northern Australia—aggregate household wealth by region, 2003–04 (Source: BITRE).

5.3 Cost of living

- Northern Australia—BITRE synthetic estimates of grocery index by UCL.

5.4 Schools

- Northern Australia—schools by state, district, name, type, year levels offer, total student enrolment, town and postcode.

5.5 Universities

- Northern Australia—persons at university or other tertiary institutions, by SLA, 2006.

5.6 TAFE institutions

- Northern Australia—enrolled TAFE students by place of residence by region, 2007.

5.7 Health

- Northern Australia—number and percentage of people with a severe disability, by SLA, 2006.
- Northern Australia—number and proportion of health workers, by SLA, 2006.

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Chapter 6

Transport



Chapter 6 Transport

This chapter provides key characteristics of the transport system in Northern Australia, focusing on exports and imports via sea ports and coastal shipping, illustrating their sizes and growth rates; basic sea ports features; air passenger transport; railways and their main transport tasks; road transport; and the main technical characteristics of roads. Wherever possible, Northern Australia's transport characteristics are compared with those of Australia. Aggregations of sea transport data by subregions, ports and SLA is provided on CD and in the Internet version of the compendium.

In 2007–08, exports via Northern Australian ports grew faster than the total tonnage of Australia's exports and represented 56.3 per cent of total tonnage of Australian exports via sea ports.

The Pilbara Region in Western Australia was the largest source of tonnage exported from Northern Australia, followed by the Mackay and Gladstone regions of Queensland.

Import tonnages via Northern Australian ports are only a small fraction of those exported via these ports, with Darwin-East Arnhem in the Northern Territory and the Northern Region of Queensland being the largest importing regions in Northern Australia.

The value of exports via maritime ports of Northern Australia represented 21.1 per cent of the Australian total value in 2007–08; the Pilbara Region was the largest source of export value with iron ore exports worth nearly \$30 billion in that year.

Coastal shipping originating in Northern Australia represented 20 per cent of the Australian total tonnage loaded in 2006–07 and 14.3 per cent of the total unloaded tonnage in Australia.

Regular passenger transport, charter and other aviation services are used relatively more frequently in Northern Australia than in the rest of Australia due to large distances and specific employment practices, such as 'fly-in, fly-out' staff rotation. Residents of Northern Australia fly more frequently to other domestic destinations than Australians living outside of this region.

Domestic aviation uses more capacity per capita, as measured by aircraft movements, to service relatively sparsely populated and distant destinations in Northern Australia than in the rest of the country.

A large and important role is played by charter and owner-operated general aviation in provision of specialised aerial passenger and air freight services to that region, however, information on these services is not being collected and published in a systematic way.

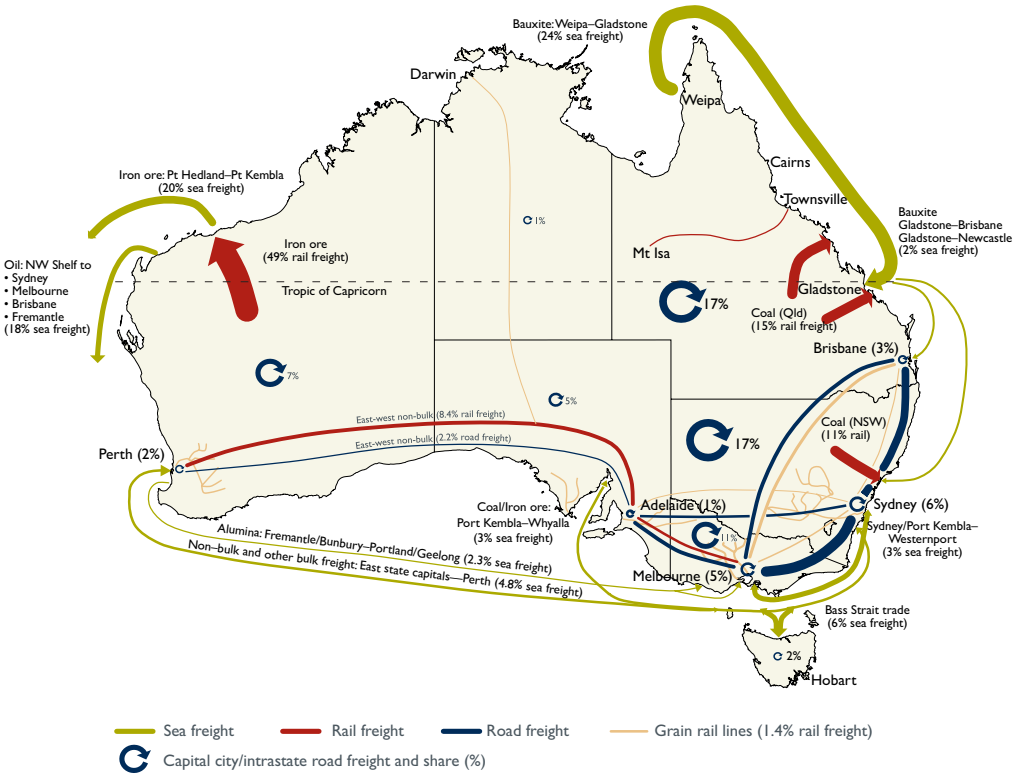
Railways in the Pilbara Region of Western Australia are not interconnected with the rest of the continent and carry very large tonnages of iron ore for exports via sea ports. Standard gauge railways of the Northern Territory and Queensland's Northern

Region are interconnected with the southern states and carry coal and other commodities for exports via ports.

The unsealed road network in Northern Australia is linked to the rest of Australia via sealed and mostly all-season roads.

Northern Australia’s maritime, rail, road and aviation transport systems are vital parts of the Australian exports of goods and domestic supply networks. A stylised Map 6.1 illustrates major flows of goods by sea transport, rail freight and road haulage. There are three major flows of commodities which dominate the transport systems in Northern Australia: rail transport of iron ore to ports for loading on ships in the Western Australian Pilbara Region (largely for exports); exports of coal transported by rail from southern regions of Queensland and loaded for exports mainly in Queensland’s Mackay Region; and bauxite shipments by coastal freight from Weipa in Queensland’s Far North Region for processing in Gladstone (see Map 6.1.1).

Map 6.1.1 Northern Australia—Australia’s major freight flow, 2006–07



Source: BITRE (2009), unpublished data.

6.1 Trade via sea ports

Exports via sea ports of Northern Australia—export tonnage

Tonnage exported via the sea ports of Northern Australia represented 56.3 per cent of the total tonnage exported from Australia via sea ports in 2007–08. Major sea ports in Northern Australia are located on the mainland but operations are also conducted from small islands and oil and gas production rigs, as illustrated on the Map 6.1.2 below. The Pilbara Region was the dominating single largest source of tonnage (iron ore) representing 34.6 per cent of the total Australian export tonnage via maritime ports. In addition to the tonnage reported, there was a volume of LNG exported to foreign markets from the North West shelf of Western Australia. For reasons of commercial confidentiality information on LNG exported is not available and therefore not listed in Table 6.1.1.

Map 6.1.2 Northern Australia—major ports, 2009

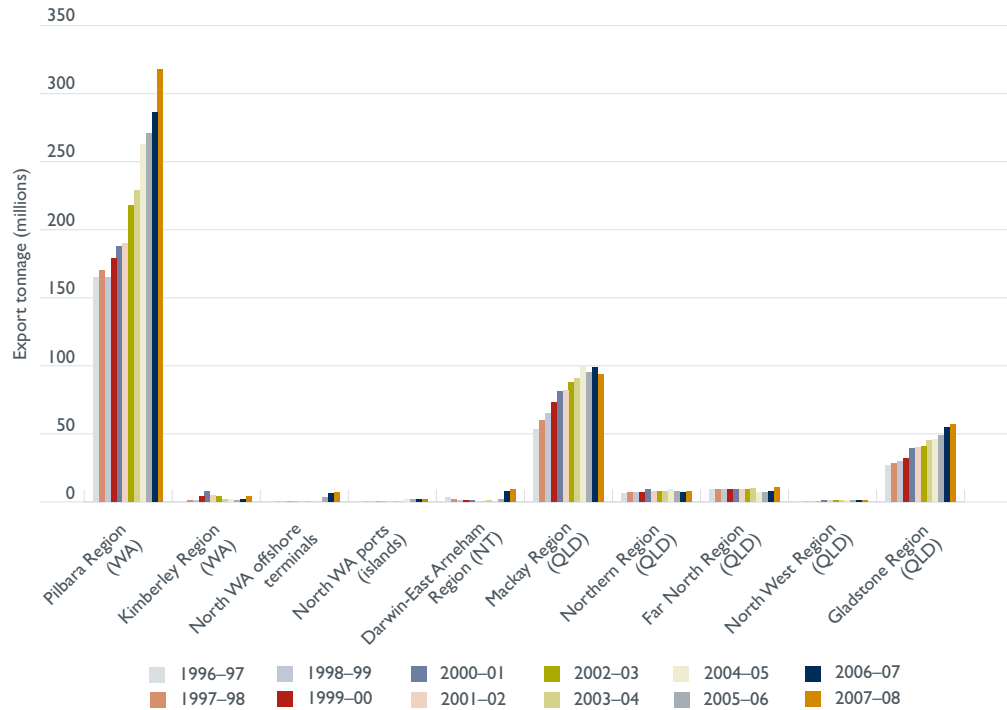


Note: Jabiru at the Timor Sea is a gas/oil venture.

Source: Geoscience Australia (2009), unpublished.

The Mackay and Gladstone regions experienced the fastest growth of export of coal, minerals and food commodities via sea ports (see Figure 6.1.1). Darwin-East Arnhem Region is the largest source of export tonnage in the Northern Territory, followed by confidential Northern Territory ports, and rigs and off shore terminals which export gas and oil from off-shore resources.

Figure 6.1.1 Northern Australia—export tonnage via sea ports, by region, 1996–97 to 2007–08 (millions of tonnes)



Note: Gladstone/Rockhampton ports are major hubs for bauxite and alumina operations sourced in Northern Australia; beginning from 2006–07, these ports are under a joint management and report activities in Gladstone and Rockhampton as one port.

Source: BITRE (2009), unpublished data.

The share of Northern Australia in shipping export commodities is illustrated in Figure 6.1.2. Tonnage exported from the Darwin-East Arnhem Region was relatively small but included energy commodities which grew strongly, especially in 2006–07 and 2007–08.

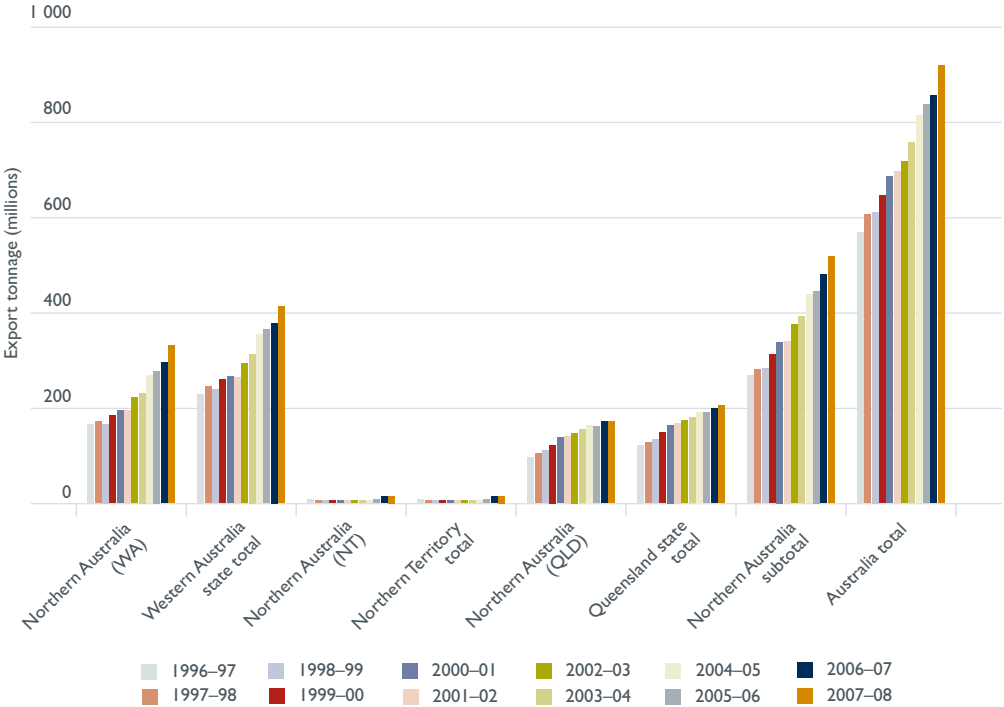
Table 6.1.1 Northern Australia—exports via sea ports, 1996–97 to 2007–08 (thousand tonnes)

Region	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	Per cent of Australia's exports via sea ports, 2007–08
Northern Australia (WA)	164 867.9	171 084.1	165 712.2	183 074.6	195 301.1	195 214.8	221 388.3	231 358.1	266 999.9	277 125.3	295 400.5	331 233.7	36.0
Pilbara Region	164 595.4	170 414.3	165 041.2	178 868.8	187 522.7	190 195.8	217 559.2	229 121.3	263 258.3	271 173.8	286 375.7	318 036.4	34.6
Kimberley Region	272.4	669.8	671.1	4 205.9	7 778.4	5 019.0	3 829.1	2 236.2	1 537.9	1 460.4	1 727.7	4 430.6	0.5
WA offshore terminals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2 563.0	5 692.7	7 013.0	0.8
WA ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2 203.7	1 928.2	1 604.4	1 753.8	0.2
Western Australia state total	228 779.4	243 689.0	238 467.1	258 533.5	266 046.8	264 417.3	293 121.6	313 075.0	353 464.5	364 963.3	378 387.1	413 497.5	45.0
Northern regions as a per cent of WA state total	72.1	70.2	69.5	70.8	73.4	73.8	75.5	73.9	75.5	75.9	78.1	80.1	
Northern Australia (NT)	7 273.9	6 498.6	6 284.8	5 808.7	5 519.2	5 012.0	5 371.7	5 934.8	6 241.9	8 112.5	13 882.4	15 150.3	1.6
Darwin–East Arnhem Region	2 520.9	1 573.3	1 246.9	705.3	574.6	454.0	448.1	593.9	456.7	2 152.3	7 640.8	8 962.8	1.0
Confidentialised NT ports	4 615.6	4 771.8	4 668.4	4 785.0	4 583.1	4 188.1	4 539.0	5 074.4	5 303.4	4 965.7	4 877.2	5 319.8	0.6
Rigs and offshore terminals NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	614.4	963.5	497.0	0.1
NT ports (island)	137.4	153.5	369.5	318.4	361.5	369.8	384.6	266.4	481.9	380.1	400.9	370.7	0.0
Northern Territory total	7 273.9	6 498.6	6 284.8	5 808.7	5 519.2	5 012.0	5 371.7	5 934.8	6 241.9	8 112.5	13 882.4	15 150.3	1.6
Northern regions as a per cent of NT total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Northern Australia (QLD)	95 467.7	103 586.7	110 985.3	122 290.2	137 191.9	139 514.5	147 400.8	153 964.3	163 508.2	160 177.8	170 774.9	171 448.8	18.7
Mackay Region	53 347.0	59 598.1	64 932.4	73 295.9	80 505.6	82 372.5	88 124.7	90 633.3	99 778.9	94 631.5	98 708.5	93 800.6	10.2
Northern Region	6 018.0	6 646.9	7 238.3	7 136.7	8 775.4	7 594.6	7 998.0	8 065.2	8 605.7	7 792.8	7 124.0	7 515.7	0.8
Far North Region	9 264.4	8 810.4	8 649.9	9 450.5	8 560.1	8 542.3	9 384.1	9 756.7	7 369.8	7 144.0	7 921.2	10 874.2	1.2
North West Region	22.5	11.2	8.3	223.2	738.9	893.0	944.6	843.2	730.3	736.3	567.4	675.9	0.1
Rockhampton region	42.4	79.0	25.5	66.6	92.7	58.8	80.0	42.8	7.9	1.0	0.0	0.0	0.0
Gladstone region	26 773.3	28 441.2	30 130.9	32 117.4	38 519.2	40 053.4	40 869.3	44 623.1	46 203.9	48 527.8	54 662.7	56 775.7	6.2
QLD ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	811.7	1 344.4	1 791.1	1 806.7	0.2
Queensland state total	120 593.9	126 879.2	134 218.4	148 251.2	164 135.2	168 428.3	174 334.9	179 333.2	191 451.5	190 480.5	198 623.7	204 388.9	22.2
Northern regions as a per cent of QLD state total	79.2	81.6	82.7	82.5	83.6	82.8	84.6	85.9	85.4	84.1	86.0	83.9	
Northern Australia subtotal	267 609.4	281 169.4	282 982.3	311 173.6	338 012.2	339 741.3	374 160.8	391 257.3	436 750.0	445 415.7	480 057.8	517 832.7	56.3
Australia total	569 196.5	606 199.4	610 846.5	645 556.4	685 240.7	695 065.8	716 507.8	756 934.2	813 277.6	837 148.6	856 456.7	919 005.5	100.0

Note: Export tonnages of LPG from the North West Region Shelf are not published by ABS for reasons of confidentiality.

Source: BITRE (2009), unpublished data.

Figure 6.1.2 Northern Australia—export tonnage via sea ports, by state, 1996–97 to 2007–08 (million tonnes)



Source: BITRE (2009), unpublished data.

The value of Northern Australia's exports via sea ports was 21.1 per cent of the corresponding total Australian exports in 2007–08. Export values from all states and regions grew during the period 1996–97 to 2007–08. The Pilbara Region was again the single largest export earner, followed by Queensland's Northern and Mackay regions (see Table 6.1.2). Annual growth of value of these exports was strong between 1996–97 and 2007–08. For example, tonnage of exports from the Pilbara Region exports doubled in that period but the corresponding export values increased nearly five times. This was due to sustainable demand for commodities which resulted in faster rises of minerals and energy prices than their respective tonnages of exports during the reported period.

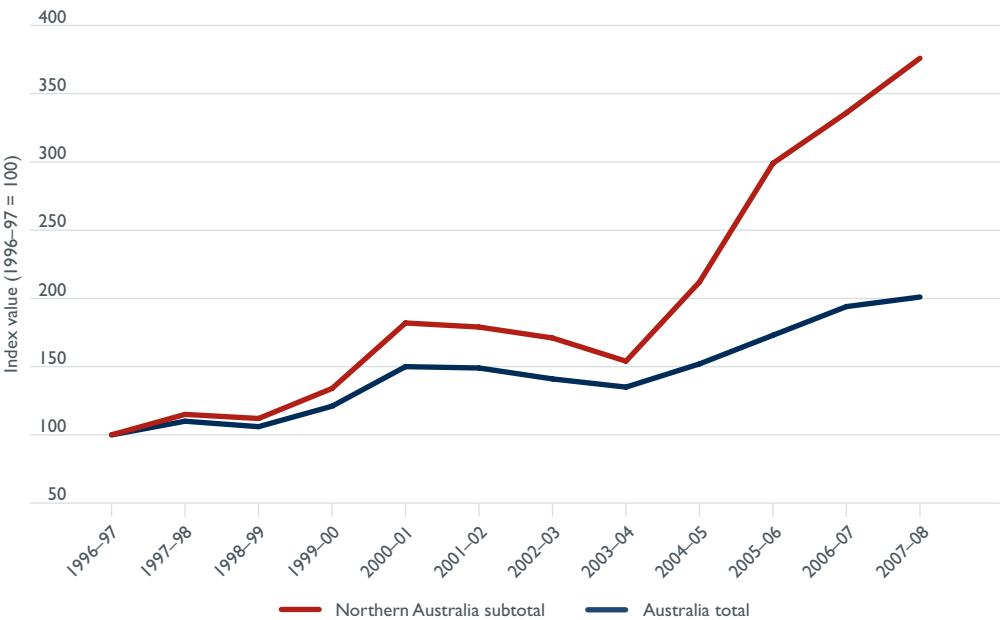
Table 6.1.2 Northern Australia—exports via sea ports by region, 1996–97 to 2007–08 (\$ millions)

Region	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	Per cent of Australia's export value via ports in 2007–08
Northern Australia (WA)	6 848.3	7 727.6	7 619.4	11 522.2	16 521.2	14 591.9	14 941.4	12 558.7	17 755.2	23 694.7	28 577.9	36 045.0	10.2
Pilbara Region	6 722.8	7 586.9	7 414.3	10 104.3	13 414.2	12 883.9	13 508.4	11 839.2	16 861.3	21 482.0	24 326.5	29 894.6	8.5
Kimberley Region	125.5	140.6	205.1	1 417.9	3 106.9	1 708.0	1 433.0	719.0	699.1	391.1	497.5	659.6	0.2
WA offshore terminals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1 686.6	3 721.7	5 453.5	1.5
WA ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	194.8	135.1	32.2	37.5	0.0
Western Australia state total	35 192.5	39 085.1	38 352.3	47 104.6	57 993.6	54 478.5	56 411.9	56 926.0	66 585.3	75 885.8	96 185.9	99 251.1	28.2
Share of NA (WA) in Northern Australia subtotal	34.7	34.1	34.4	43.7	46.1	41.4	44.2	41.2	42.5	40.2	43.1	48.6	
Northern Australia (NT)	2 214.6	2 001.9	1 813.3	1 966.3	2 263.2	2 372.6	2 209.7	2 392.1	2 840.1	3 695.1	6 502.8	6 723.6	1.9
Darwin-East Arnhem Region	1 692.8	1 459.6	1 081.9	1 218.2	1 418.4	1 555.2	1 430.5	1 592.8	1 717.2	2 105.7	4 396.8	4 324.2	1.2
Confidentialised NT ports	486.5	484.1	595.5	623.6	712.2	703.9	693.9	732.4	961.1	897.6	1 068.1	1 661.8	0.5
Rigs and offshore terminals NT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	440.2	678.0	439.7	0.1
NT ports (island)	35.3	58.2	135.9	124.5	132.6	113.5	85.3	66.9	161.8	251.6	359.9	297.9	0.1
Northern Territory total	2 214.6	2 001.9	1 813.3	1 966.3	2 263.2	2 372.6	2 209.7	2 392.1	2 840.1	3 716.6	6 502.8	6 723.6	1.9
Share of NA (NT) in Northern Australia subtotal	11.2	8.8	8.2	7.5	6.3	6.7	6.5	7.9	6.8	6.3	9.8	9.1	
Northern Australia (QLD)	10 674.2	12 915.5	12 696.1	12 897.3	17 090.5	18 282.9	16 669.7	15 505.2	21 200.4	31 595.9	31 301.6	31 367.9	8.9
Mackay Region	3 490.4	4 336.4	4 218.5	3 942.4	5 112.3	6 397.9	6 044.0	5 265.9	8 676.0	12 790.9	11 667.2	10 886.5	3.1
Northern Region	3 301.7	4 112.1	4 297.2	4 665.9	6 145.1	5 715.6	5 137.3	4 921.9	6 177.9	8 956.6	10 394.4	11 294.4	3.2
Far North Region	1 324.6	1 311.9	1 081.5	1 040.7	1 237.3	1 466.7	1 357.4	1 293.7	1 205.5	1 629.2	1 585.6	1 424.7	0.4
North West Region	35.4	15.3	9.4	135.9	388.2	365.0	362.9	364.9	369.4	710.4	877.8	696.6	0.2
Rockhampton region	30.2	87.0	11.9	73.7	133.0	112.0	82.0	68.4	14.0	0.6	0.0	0.0	0.0
Gladstone region	2 455.5	3 030.9	3 077.7	2 987.8	4 011.5	4 155.1	3 640.5	3 551.1	4 684.9	7 440.6	6 685.6	6 971.0	2.0
QLD ports (islands)	36.4	22.0	0.0	50.8	63.1	70.7	45.6	39.3	72.7	67.6	91.0	94.7	0.0
Queensland state total	24 705.7	28 217.9	28 630.0	31 005.8	39 280.9	41 712.9	38 937.5	38 350.3	47 254.2	59 369.3	62 407.3	62 056.0	17.6
Share of NA (QLD) in Northern Australia subtotal	54.1	57.0	57.4	48.9	47.6	51.9	49.3	50.9	50.7	53.6	47.2	42.3	
Northern Australia subtotal	19 737.1	22 645.0	22 128.9	26 385.8	35 874.8	35 247.4	33 820.8	30 456.0	41 795.7	58 985.7	66 382.3	74 136.6	21.1
Australia total	175 386.7	192 100.6	185 844.1	211 706.1	263 604.2	261 902.4	246 796.9	236 450.0	266 538.0	303 389.1	340 499.4	352 067.1	100.0

Source: BITRE (2009), unpublished data.

Figure 6.1.3 illustrates the fast growing exports via sea ports from Northern Australia, total of Australia. While the total value of Australia’s exports via sea ports doubled between 1996–97 and 2007–08, the respective value of Northern Australia’s export increased 3.5 times.

Figure 6.1.3 Northern Australia—value of exports via sea ports, 1996–97 to 2007–08 (index 1996–97 = 100)



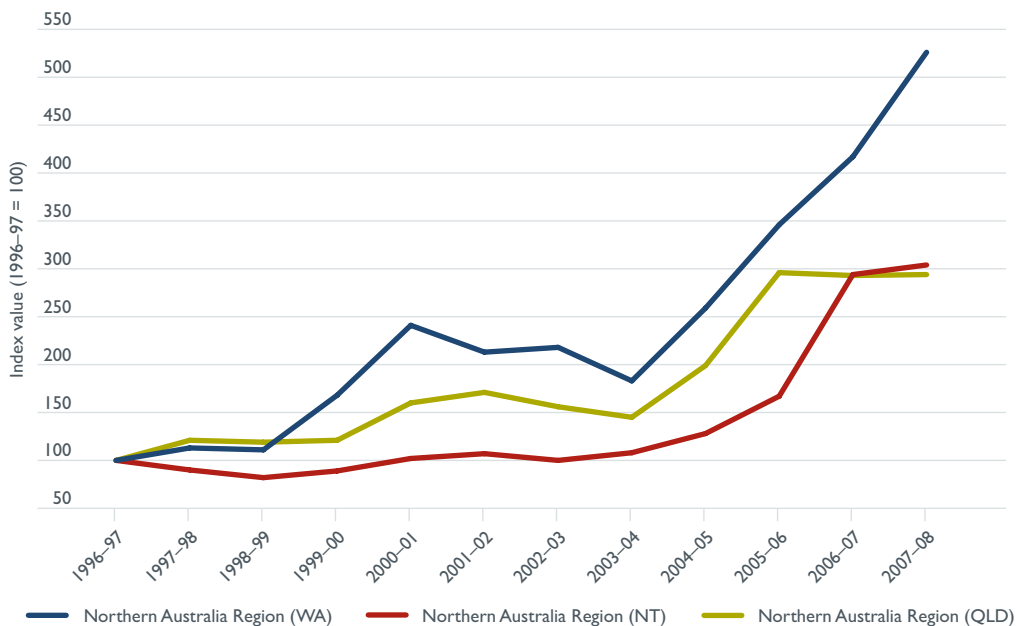
Source: BITRE (2009), unpublished data.

Western Australia’s Pilbara and Kimberley regions were the regions with strongest growth of export value, followed by Northern Territory and Queensland (see Figure 6.1.4). There was an apparent weakening of growth of exports value following the 2001–02 cyclical downturn in demand but prices and demand recovered in 2003–04.

Growth in the value of exports via sea ports by region was strong but also volatile. In Figures 6.1.5, the peaking and then decline of the value of exports from the Kimberley Region was caused by exports of mineral fuels through the sea ports of that region between 1998–99 and 2006–07. This volatility partially reflects the life cycle of minerals projects with an initial rapid growth of exploitation, followed by stabilisation and a decline of activity. It also reflects fluctuation of commodity prices over that period and variability of exported volumes.

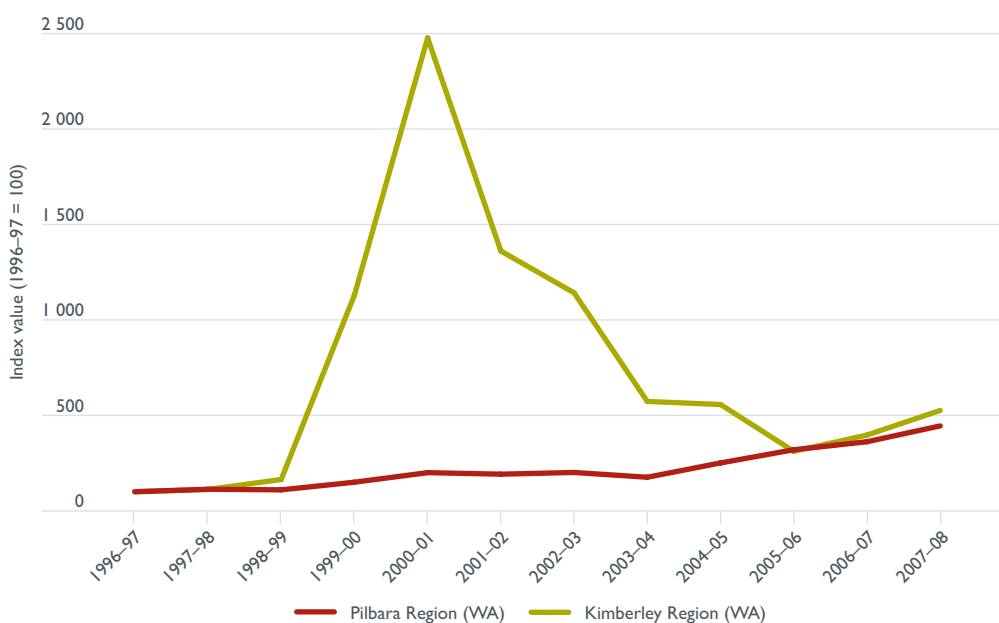
Similarly, in the Northern Territory, variability of value of exports via various sea ports is large and related to various minerals exports operations on islands, rigs and off-shore terminals. While the Darwin-East Arnhem Region’s value of exports increased by 2.5 times between 1996–97 and 2007–08, its various components increased or declined more dynamically during the same period (see Figure 6.1.6).

Figure 6.1.4 Northern Australia—value of exports via sea ports, 1996–97 to 2007–08 (index 1996–97 = 100)



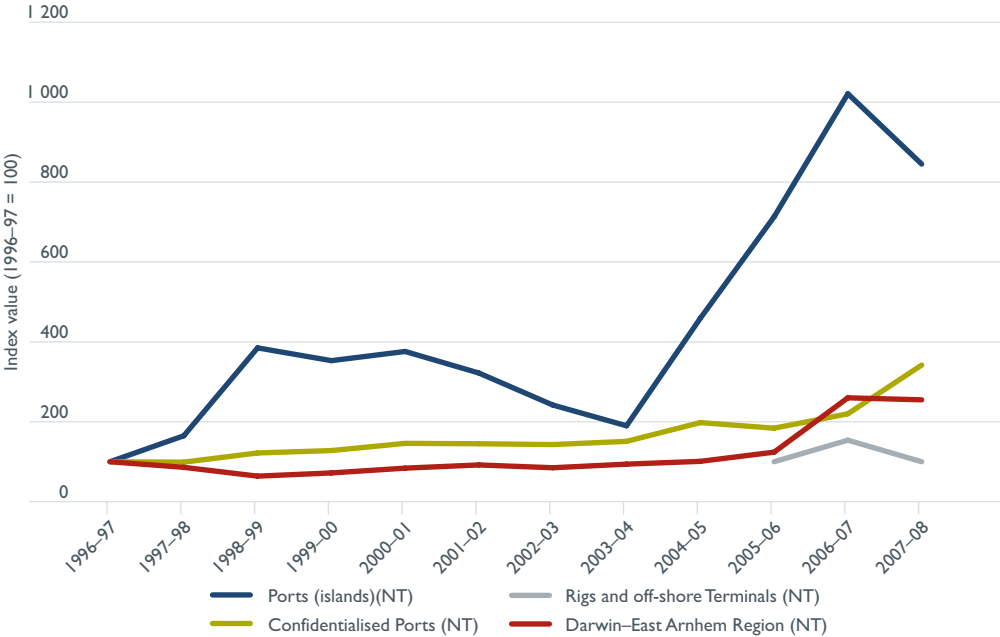
Source: BITRE (2009), unpublished data.

Figure 6.1.5 Northern Australia (Western Australia)—value of exports via sea ports, by region, 1996–97 to 2007–08 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

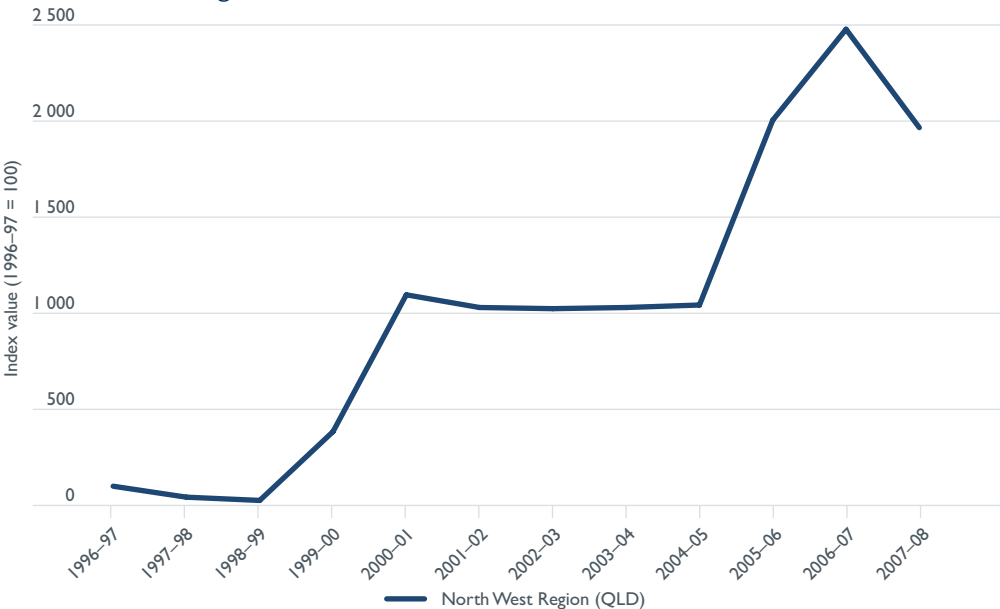
Figure 6.1.6 Northern Australia (Northern Territory)—value of exports via sea ports, by region, 1996–97 to 2007–08 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

An even more dynamic value of exports via seaports of northern Queensland regions is illustrated in Figures 6.1.7 and 6.1.8. The value of exports of bauxite from the North West Region contributed to a 25 times increase in the value of exports from that region between 1998–99 and 2006–07, and then declined in 2007–08.

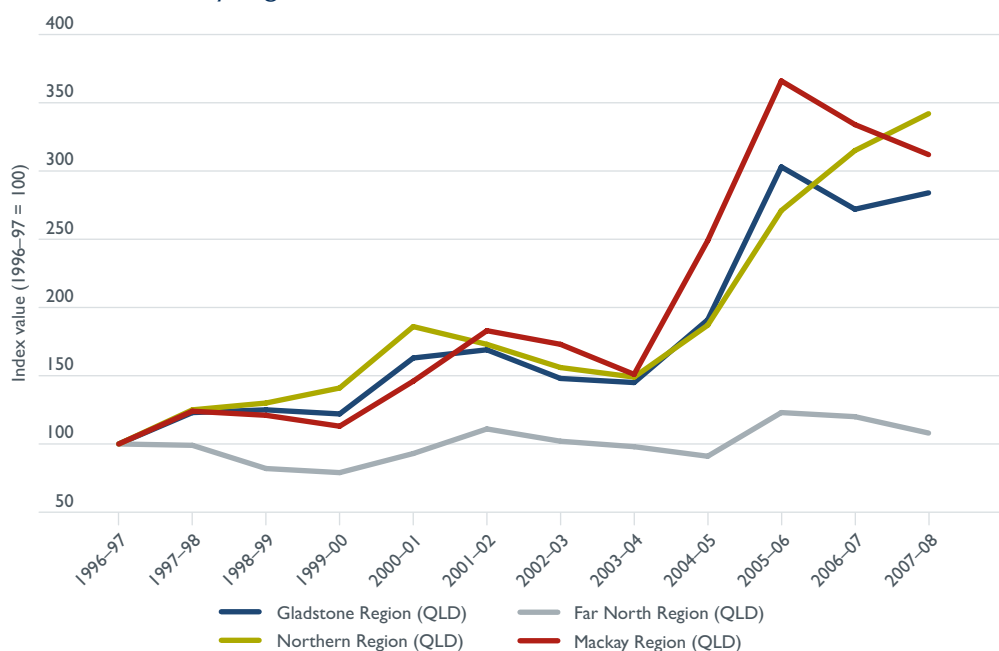
Figure 6.1.7 North West Queensland—value of exports via sea ports, by region, 1996–97 to 2007–08 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

The value of exports via other Queensland's ports of the Mackay, Northern and Gladstone regions increased by about three times between 1996–97 and 2007–08 due to a large component of coal and alumina in exports, which noted significant increases in volume of exports and export prices. Export values via sea ports from the Far North Region stayed at around their 1996–97 levels.

Figure 6.1.8 Northern Australia (Queensland)—value of exports via sea ports, by region, 1996–97 to 2007–08 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

Import via sea ports of Northern Australia—import tonnage

Import tonnages via Northern Australia's maritime ports represented only 8.5 per cent of the corresponding Australian total in 2007–08, with Darwin-East Arnhem in the Northern Territory and the Northern Region in Queensland being the largest import receivers. At the regional level, import tonnages were fairly volatile from year to year in response to operating schedules of large minerals projects. A noticeable 'trough' in import tonnages, due to a fall in economic activity in 2001–02, affected nearly all Northern Australia's regions' imports, but there was no corresponding drop in export tonnages in that year, except for a small decline in the Darwin-East Arnhem export tonnages (see Table 6.1.1 and Table 6.1.3). More detailed data on import and export tonnages can be found in the background tables listed at the back of this chapter.

Table 6.1.3 Northern Australia—imports via sea ports, 1996–97 to 2007–08 (thousand tonnes)

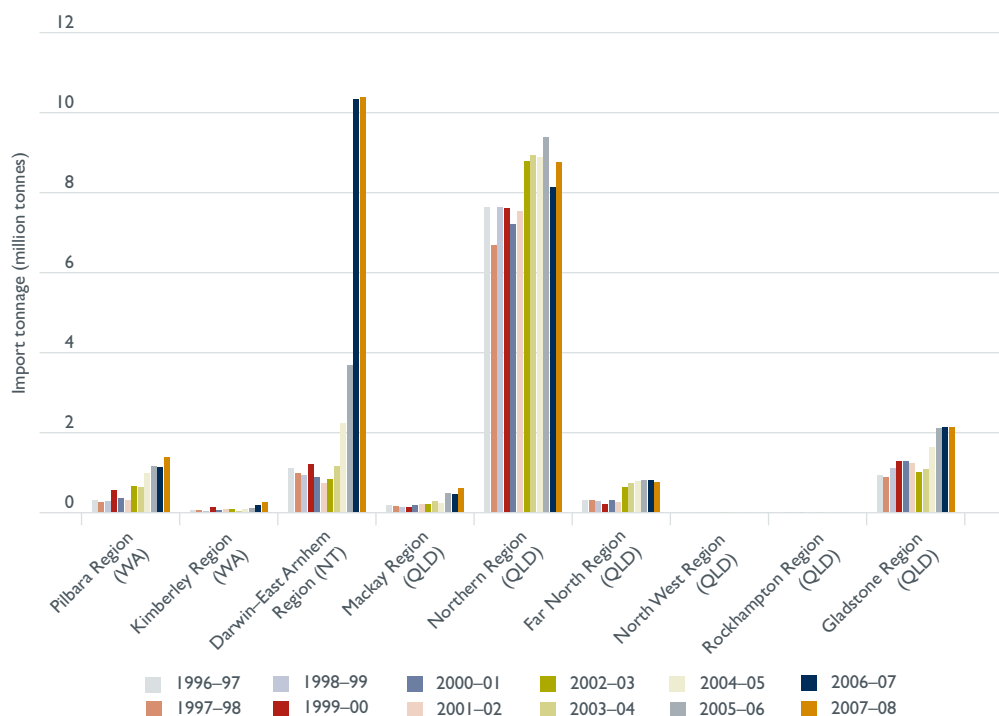
Region	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	Per cent of Australia's imports via sea ports, 2007–08
Northern Australia (WA)	383.1	313.1	341.1	713.8	419.7	381.2	740.9	686.0	1 087.1	1 289.0	1 454.5	1 697.8	0.6
Pilbara Region	312.8	256.0	297.8	566.3	358.4	305.6	662.5	641.7	997.3	1 161.3	1 148.3	1 387.2	0.5
Port Hedland	41.5	18.6	19.9	159.7	133.0	71.7	174.2	226.3	449.0	566.7	623.7	792.0	0.3
Kimberley Region	70.3	57.1	43.3	147.4	61.3	75.5	78.4	44.2	89.8	115.5	193.6	270.6	0.1
WA offshore terminals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	106.7	0.0	0.0
WA ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.2	5.9	40.0	0.0
Western Australia state total	37 294.2	35 805.6	38 958.7	36 358.5	29 271.5	36 890.9	41 830.8	44 066.3	48 740.0	44 788.1	47 735.5	53 145.0	17.7
Northern Australia (NT)	1 983.4	1 920.3	1 834.9	2 238.9	1 964.6	1 826.5	1 806.2	2 098.7	3 193.0	4 862.6	11 487.7	11 596.3	3.9
Darwin-East Arnhem Region	1 102.8	986.1	941.9	1 211.8	897.5	749.1	829.8	1 165.8	2 226.9	3 682.4	10 328.9	10 383.3	3.5
Confidentialised NT ports	880.6	934.2	893.0	1 027.1	1 067.1	1 077.4	976.4	932.9	966.0	1 168.3	1 139.9	1 168.6	0.4
NT ports (island)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.9	18.9	44.4	0.0
Northern Territory total	1 983.4	1 920.3	1 834.9	2 238.9	1 964.6	1 826.5	1 806.2	2 098.7	3 193.0	4 862.6	11 487.7	11 596.3	3.9
Northern Australia (QLD)	9 065.4	8 036.1	9 178.1	9 229.9	8 978.6	9 257.6	10 676.7	11 047.4	11 559.7	12 817.3	11 542.4	12 243.5	4.1
Mackay Region	175.2	150.1	142.0	130.9	191.2	222.7	222.8	282.1	239.2	496.6	472.0	606.4	0.2
Northern Region	7 625.7	6 688.3	7 641.5	7 599.7	7 200.6	7 528.1	8 794.7	8 937.7	8 891.9	9 397.0	8 128.8	8 755.6	2.9
Far North Region	321.6	307.7	283.2	211.4	303.3	259.1	642.0	748.7	789.4	821.2	814.8	755.1	0.3
North West Region	0.0	0.0	0.0	0.0	0.0	0.1	3.7	0.3	0.0	0.0	0.0	0.0	0.0
Rockhampton region	11.1	5.9	1.8	6.3	0.0	8.4	3.7	0.0	0.0	0.4	0.0	0.0	0.0
Gladstone region	931.8	884.2	1 109.7	1 281.7	1 283.6	1 239.2	1 009.8	1 078.6	1 639.2	2 101.5	2 126.8	2 126.3	0.7
QLD ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.1	0.0	0.0
Queensland state total	30 269.2	31 624.1	34 581.7	36 609.4	34 148.9	34 282.7	39 811.1	41 314.7	44 299.3	45 449.0	47 618.8	49 656.8	16.5
Northern Australia subtotal	11 432.0	10 269.5	11 354.1	12 182.6	11 363.0	11 465.3	13 223.8	13 832.1	15 839.8	18 969.0	24 484.6	25 537.5	8.5
Australia total	185 297.2	186 942.9	208 925.7	205 097.0	201 542.1	211 930.8	226 496.7	235 861.1	252 133.4	257 833.3	276 976.1	300 253.2	100.0

Source: BITRE (2009), unpublished data.

Tonnage imported by regions via sea ports is illustrated in Figure 6.1.9. Regions' imports are strongly related to development of large minerals projects, such as the Darwin-East Arnhem Region experienced between 2006–07 and 2007–08. Another strong importer has been the Northern Region in Queensland.

Western Australia's northern regions' imports are very small, as compared with that state's total imports via sea ports.

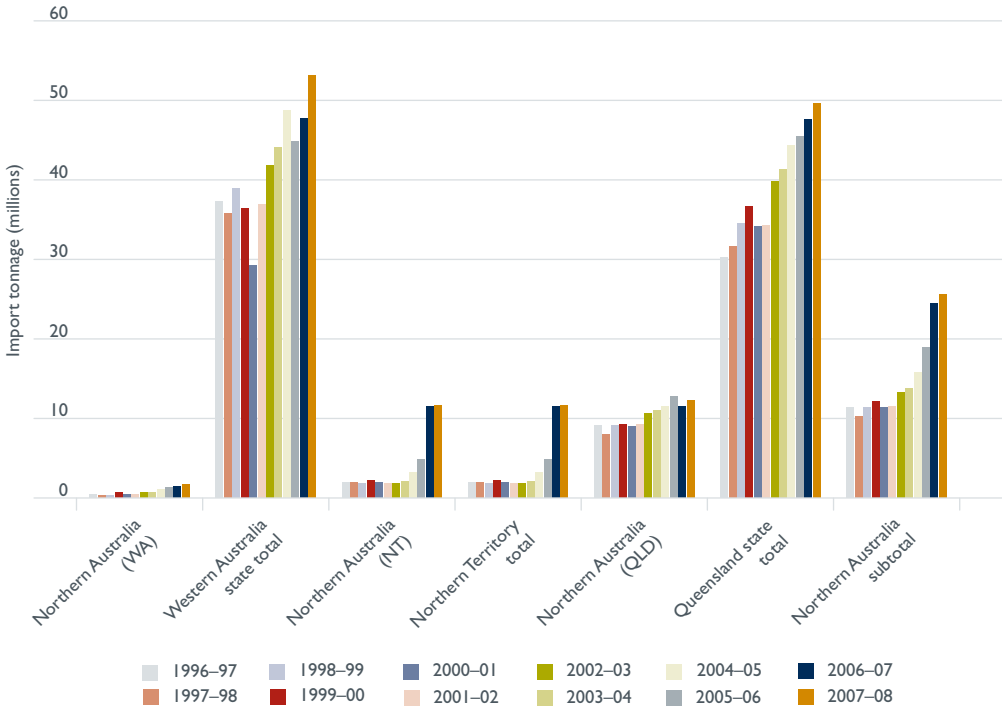
Figure 6.1.9 Northern Australia—import tonnage, via sea ports, by region, 1996–97 to 2007–08 (million tonnes)



Source: BITRE (2009), unpublished data.

Figure 6.1.10 illustrates the relative sizes of imported tonnages via sea ports in Northern Australia between 1996–97 and 2007–08. These imports are largest in proportion to the state's total imports in Queensland (25 per cent in 2007–08) and Northern Territory (all imports in all years, as all Northern Territory ports are within the Darwin-East Arnhem Region with an access to sea ports). In the case of the northern regions of Western Australia, imports via sea ports were very small and represented only 3 per cent of the respective total Western Australian imports in 2007–08. This is, partially, due to operational practices by large minerals operators, who acquire materials and supplies (including imports) via operating centres located in southern states or capitals, such as Perth, Fremantle, et cetera. These imports are frequently landed in southern regions and then distributed to operational sites in northern regions and therefore are counted as southern regions imports.

Figure 6.1.10 Northern Australia—import tonnage via sea ports, by state, 1996–97 to 2007–08 (million tonnes)



Source: BITRE (2009), unpublished data.

Import value

Northern Australia's values of 'direct' imports via sea ports was only 2 per cent of the corresponding Australian value of imports in 2007–08 (see Table 6.1.4). The discrepancy between larger tonnage of imports per capita in Northern Australia and the lower value of those imports, as compared with the value of Australian imports via sea ports, may suggest that some imports are reaching Northern Australia through southern Australia. Part of the imported production supplies and consumer goods reaches Northern Australian ports as coastal shipments or by road, for which information on value is not collected. For example, supplies of imported groceries and other consumer products to larger retail companies in Northern Australia are transported via roads or rail (mostly in northern Queensland). Data on final destination or use of these imports is not collected or not publicly available.

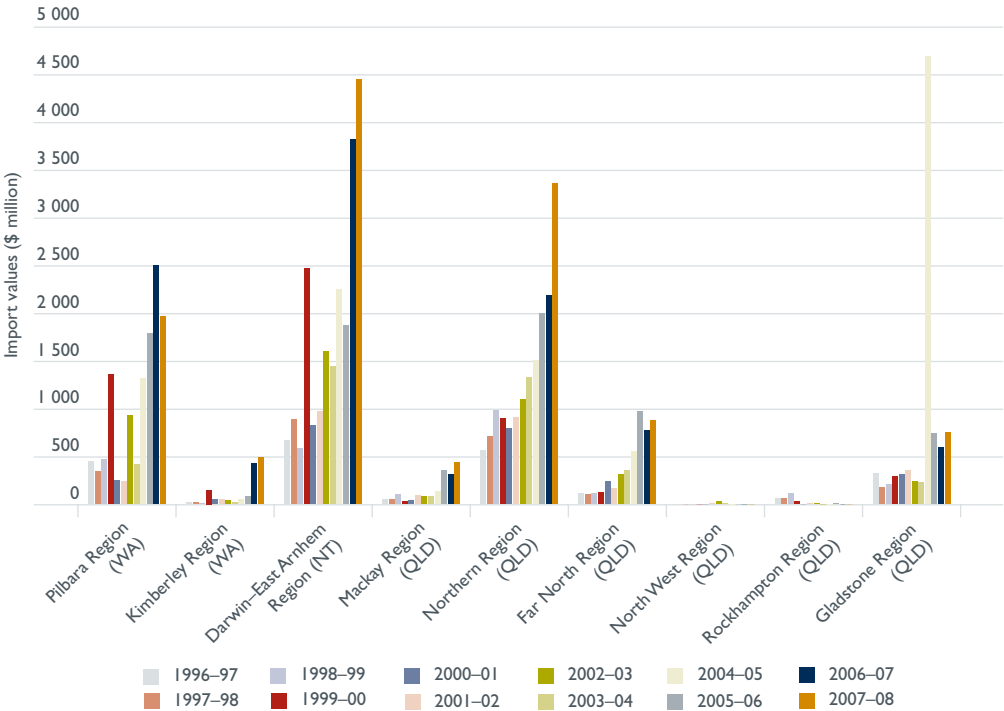
The value of Northern Australia's imports via sea ports is related to major minerals projects, between 1996–07 and 2007–08, as can be seen in Figure 6.1.11. The illustrated major peaks in import values for the Darwin-East Arnhem, Northern, Gladstone and Pilbara regions coincide with various stages of completion of gas, oil, bauxite, alumina and other minerals projects in Northern Australia. For example, peaking import values via Gladstone ports are related to completion of the alumina and aluminium projects in that region in 2004–05.

Table 6.1.4 Northern Australia—imports via sea ports by region, 1996–97 to 2007–08 (\$ millions)

Region	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	Per cent of Australia's imports via sea ports in 2007–08
Northern Australia (WA)	463.9	361.2	472.7	1 498.8	289.6	281.2	969.7	425.3	1 362.9	1 863.6	2 934.8	2 451.0	0.4
Pilbara Region	445.2	344.1	464.1	1 351.9	243.6	232.9	929.0	410.0	1 314.1	1 784.4	2 498.4	1 960.7	0.3
Kimberley Region	18.6	17.1	8.6	146.9	46.0	48.3	40.7	15.2	48.8	78.2	421.0	490.3	0.1
WA offshore terminals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	15.4	0.0	0.0
WA ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	38.4	46.4	573.9	0.1
Western Australia state total	26 922.1	29 442.0	29 505.2	30 608.0	31 083.3	32 919.5	40 895.9	39 532.1	48 865.2	56 114.8	65 820.9	76 959.4	12.0
Northern Australia (NT)	774.2	985.4	676.0	2 611.4	1 043.9	1 182.6	1 773.5	1 615.5	2 450.4	2 474.7	4 488.0	4 793.6	0.7
Darwin-East Arnhem Region	670.3	884.5	583.7	2 469.7	818.2	973.4	1 593.2	1 442.5	2 247.7	1 867.0	3 820.9	4 439.7	0.7
Confidentialised NT ports	103.9	100.9	92.3	141.7	225.7	209.2	180.3	173.0	202.7	607.7	667.0	353.8	0.1
NT ports (island)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Northern Territory total	774.2	985.4	676.0	2 611.4	1 043.9	1 182.6	1 773.5	1 615.5	2 450.4	2 484.6	4 501.3	4 839.6	0.8
Northern Australia (QLD)	1 101.0	1 085.5	1 500.3	1 361.0	1 367.1	1 516.1	1 746.3	1 990.0	6 869.9	4 069.8	3 849.5	5 417.0	0.8
Mackay Region	47.4	47.7	100.0	22.5	39.7	90.4	79.4	83.3	133.6	354.1	305.4	437.3	0.1
Northern Region	561.0	708.8	975.2	898.1	787.4	905.6	1 094.3	1 327.1	1 505.3	1 999.3	2 187.5	3 352.8	0.5
Far North Region	114.2	100.0	110.1	121.6	232.2	160.0	310.9	354.5	546.0	973.4	767.8	875.6	0.1
North West Region	0.0	0.0	0.0	0.0	0.0	0.7	27.3	2.2	0.0	0.0	0.0	0.0	0.0
Rockhampton region	59.1	54.1	106.5	28.4	0.0	3.8	1.4	0.2	0.0	1.0	0.0	0.0	0.0
Gladstone region	319.3	174.9	208.5	290.4	307.8	355.8	233.0	222.6	4 684.9	742.0	588.8	751.2	0.1
QLD ports (islands)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.3	2.2	0.0
Queensland state total	19 004.0	22 616.7	24 490.1	28 854.5	32 931.4	33 266.1	38 364.1	40 063.6	50 007.3	58 608.7	64 975.6	74 874.9	11.7
Northern Australia subtotal	2 339.1	2 432.1	2 649.0	5 471.2	2 700.6	2 979.9	4 489.6	4 030.8	10 683.2	8 408.0	11 272.2	12 661.6	2.0
Australia total	265 022.3	297 489.2	315 694.4	346 188.5	378 858.6	387 710.5	426 617.3	418 894.3	478 556.1	527 807.5	578 151.2	642 410.4	100.0

Source: BITRE (2009), unpublished data.

Figure 6.1.11 Northern Australia—import values via sea ports, by region, 1996–97 to 2007–08 (\$ millions)



Source: BITRE (2009), unpublished data.

Coastal shipping—loaded tonnage

Coastal shipping consists of goods loaded in Australian ports on Australian or foreign ships and (unloaded) delivered to other destinations within the Australian customs area. Typically, distribution of liquid fuels and fuel components from refineries located in sea ports to major agglomerations along the Australian coast is designed to use coastal shipping for the long haul and rail/road for the final part of transportation. Similarly, building materials, chemicals, construction steel, machinery and supplies are transported via coastal shipping. A special role is played by coastal shipping in supplying remote and isolated communities in Northern Australia. Vital supplies are delivered on barges to many locations along the coast, such as Nhulunbuy (Northern Territory) and Kalumburu (Western Australia). This mode of delivery is vital during seasonal non-accessibility to those places via roads.

Coastal shipping volumes originating in Northern Australia represented 20 per cent of the total loaded tonnage in Australia, in 2006–07. The largest sources of coastal tonnages was from Western Australia’s Pilbara Region, followed by Queensland’s Far North and Northern regions (see Table 6.1.5). Commodities loaded in Northern Australia were mainly minerals, fuels and food products for processing at other Australian destinations.

Table 6.1.5 Northern Australia—coastal shipping, loaded tonnage, 1996–97 to 2006–07 (thousand tonnes)

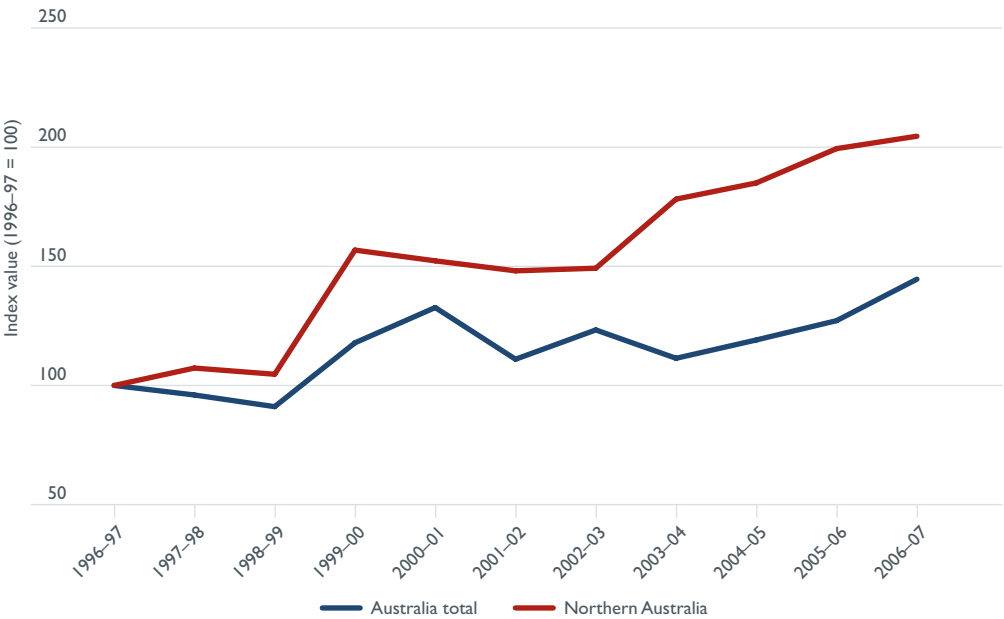
Region	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	Per cent of total loaded tonnes in Australian ports in 2006–07
Northern Australia (WA)	27 298.9	28 166.3	24 561.5	24 013.8	11 480.3	20 449.2	29 674.6	36 147.7	19 048.0	29 779.8	32 690.6	6.7
Pilbara Region	27 274.0	28 068.9	24 439.0	20 835.9	9 254.8	19 603.5	27 979.0	34 783.2	17 176.9	27 924.5	31 062.9	6.4
Port Hedland	18 175.4	13 728.2	19 593.6	14 122.4	4 071.0	8 480.2	17 324.2	17 650.8	8 583.7	12 855.2	13 708.5	2.8
Kimberley Region	25.0	97.5	122.5	1 108.7	197.0	624.3	536.9	854.3	548.7	410.8	50.4	0.0
WA offshore terminals	0.0	0.0	0.0	868.7	79.8	221.4	171.3	0.0	55.4	567.9	809.7	0.2
WA ports (islands)	0.0	0.0	0.0	1 200.5	1 398.7	0.0	987.5	510.2	1 267.1	876.6	767.6	0.2
Western Australia state total	69 263.2	57 749.7	51 008.1	48 189.6	38 247.3	55 340.2	82 670.4	76 028.8	52 198.4	58 424.1	69 193.8	14.2
Northern Australia (NT)	1 372.1	3 029.2	2 756.1	1 780.5	3 334.9	3 758.0	3 263.4	3 102.7	5 804.1	1 737.0	540.0	0.1
Darwin-East Arnhem Region	1 372.1	2 999.9	2 649.6	1 715.8	3 026.2	3 757.8	3 262.0	3 102.7	5 798.9	1 737.0	540.0	0.1
Katherine-Lower Top End	0.0	0.0	60.0	51.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Confidentialised NT Ports	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rigs and offshore terminals	0.0	0.0	46.4	13.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NT ports (island)	0.0	0.0	0.0	0.0	308.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NT communities	0.0	29.3	0.1	0.3	0.0	0.2	1.3	0.0	5.2	0.0	0.0	0.0
Northern Territory total	1 372.1	3 029.2	2 756.1	1 780.5	3 334.9	3 758.0	3 263.4	3 102.7	5 804.1	1 737.0	540.0	0.1
Northern Australia (QLD)	18 887.7	19 846.3	22 458.3	48 796.6	57 623.6	46 218.2	37 996.7	45 494.6	63 152.7	63 304.3	64 096.2	13.2
Mackay Region	1 889.2	3 143.9	2 459.6	2 514.8	2 409.7	1 247.0	798.0	1 206.6	911.7	732.5	395.7	0.1
Northern Region	96.7	258.5	613.3	2 122.4	9 110.9	13 502.2	10 435.9	14 119.0	10 654.0	18 178.4	23 617.6	4.8
Far North Region	9 044.8	9 503.7	9 451.4	30 256.9	30 958.6	11 097.0	13 079.6	11 679.3	34 694.0	27 267.3	26 277.0	5.4
North West Region	0.0	71.6	58.9	193.4	102.8	202.5	109.9	794.9	1 124.6	1 223.6	0.0	0.0
Rockhampton region	0.0	0.0	10.2	81.9	53.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gladstone region	7 856.9	6 868.6	9 859.5	13 627.3	14 988.1	20 169.5	13 573.3	17 694.8	15 768.4	15 902.6	13 805.9	2.8
QLD ports (islands)	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
QLD unknown ports	0.0	0.1	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queensland state total	86 166.1	86 845.2	108 891.6	130 357.4	140 277.0	117 419.5	129 841.2	104 900.9	141 174.0	131 850.7	143 041.5	29.4
Northern Australia subtotal	47 558.7	51 041.8	49 775.9	74 590.9	72 438.8	70 425.3	70 934.7	84 745.0	88 004.8	94 821.1	97 326.7	20.0
Australia total	336 881.7	323 379.0	307 024.3	397 156.1	447 139.7	373 846.1	415 236.4	375 419.6	401 081.8	428 538.8	487 049.2	100.0

Note: At the time of preparation data for 2007–08 was not available.

Source: BITRE (2009), unpublished data.

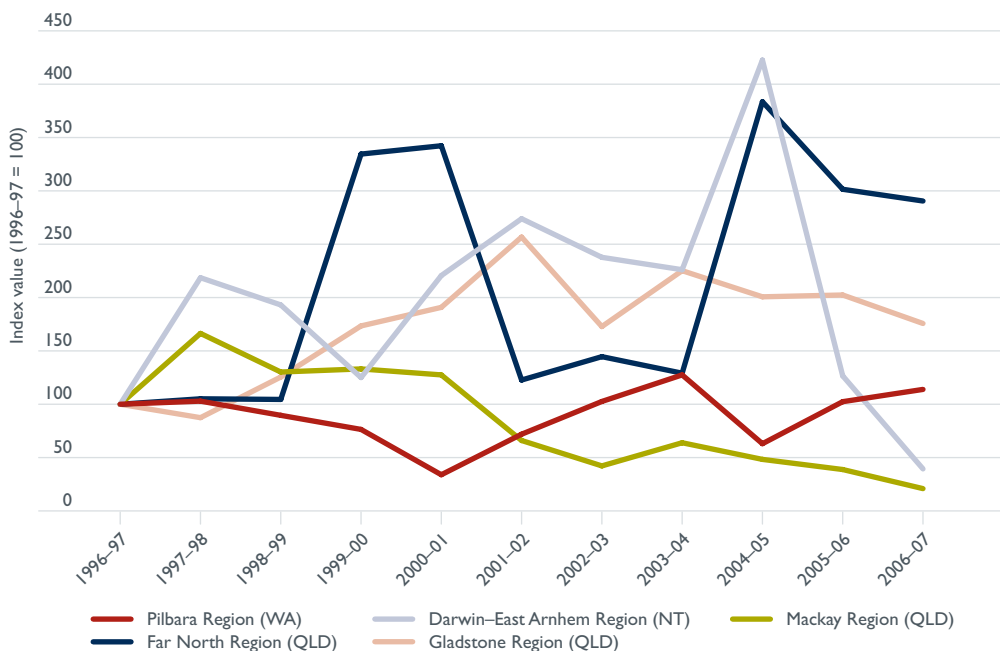
Tonnages loaded indicate volatility but also growth over time (see Figure 6.1.12). Northern Australia's loaded tonnages in coastal shipping more than doubled, while total Australian loaded tonnages increased by about 1.5 times, between 1996–97 and 2006–07. The strongest growth of loaded coastal shipping tonnages was observed in northern regions of Queensland and a sharp fall was noted in the Northern Territory, where loaded tonnages grew strongly until 2004–05, then fell in 2006–07 to about 40 per cent of their 1996–97 levels (see Figure 6.1.13). This fall in using coastal shipping coincides with the opening of the direct railway line between Darwin and Adelaide in 2004–05. Queensland's Northern Region had the strongest dynamics in loaded coastal shipping tonnages, which is related to the bauxite operations via Weipa (see Figure 6.1.14). Western Australia's Kimberley Region experienced large increase and then a decline in loaded tonnages largely due to shipments of energy commodities through this region between 1998–99 and 2006–07.

Figure 6.1.12 Northern Australia—coastal shipping, loaded tonnage, 1996–97 to 2006–07 (index 1996–97 = 100)



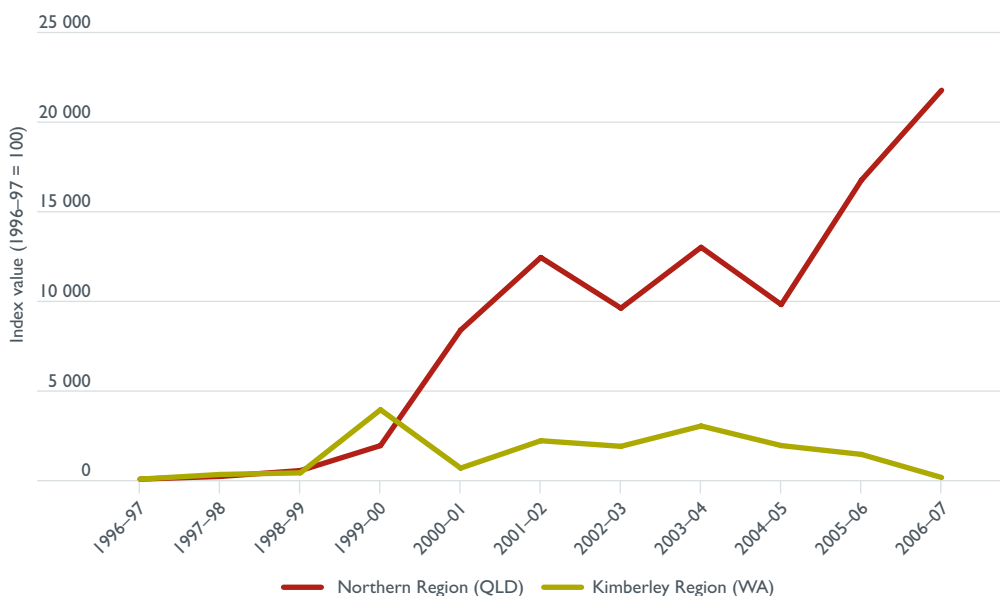
Source: BITRE (2009), unpublished data.

Figure 6.1.13 Northern Australia—coastal shipping, loaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

Figure 6.1.14 Northern Australia—coastal shipping, loaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)



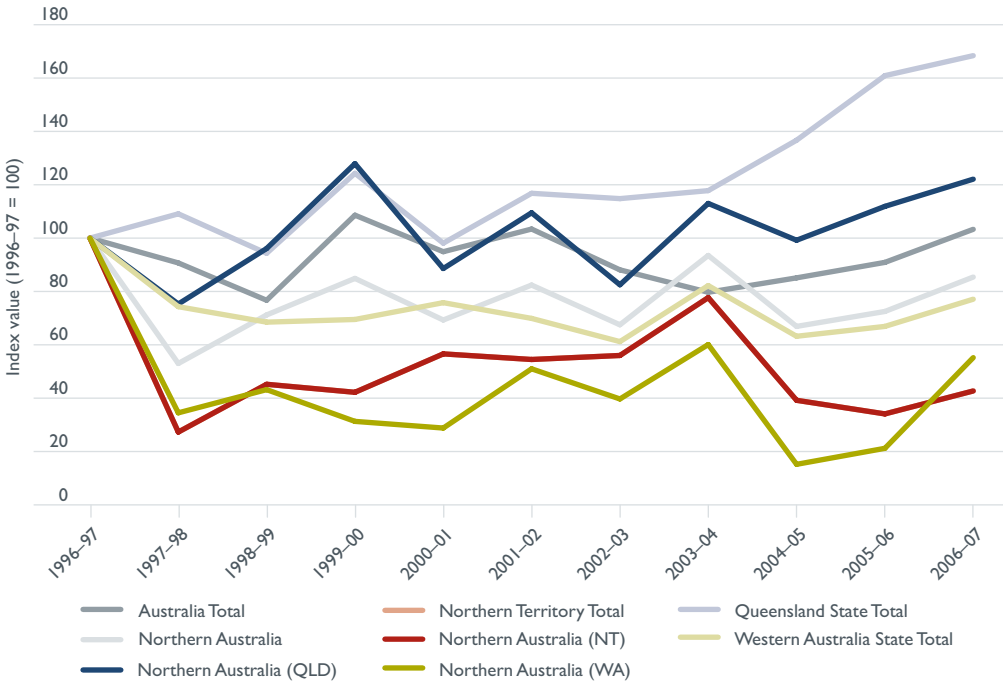
Source: BITRE (2009), unpublished data.

Coastal shipping—unloaded tonnage

Tonnages unloaded in Northern Australia coastal shipping represented 14.3 per cent of the corresponding Australian total sea port tonnages in 2006–07. A majority of the unloaded tonnages were: mineral fuels, lubricants and related materials; manufactured goods; commodities; and machinery and transport equipment. The largest tonnages unloaded were in the Northern and Gladstone regions of Queensland (see Table 6.1.6). Queensland’s northern regions represented nearly one-third of the total unloaded coastal tonnage intrastate, whilst the northern regions of Western Australia unloaded only 6 per cent of coastal sea freight of that state.

Unloaded tonnages in Northern Australia indicated strongest growth in Queensland’s northern regions, especially after 2002–03 however, the growth rate of the northern regions was weaker than that for the rest of Queensland (see Figure 6.1.15). For most other regions the growth rates of unloaded tonnages were weaker and volatile and fell below their 1996–97 levels. Following the economic slowdown, by 2000–01, most northern regions and state total tonnages unloaded fell and then slightly recovered by 2001–02 (tables with unloaded tonnages by groups of commodities and years are available in the Internet version of this publication).

Figure 6.1.15 Northern Australia—coastal shipping, unloaded tonnage, by state, 1996–97 to 2006–07 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

Table 6.1.6 Northern Australia—coastal shipping, unloaded tonnage, 1996–97 to 2006–07 (thousand tonnes)

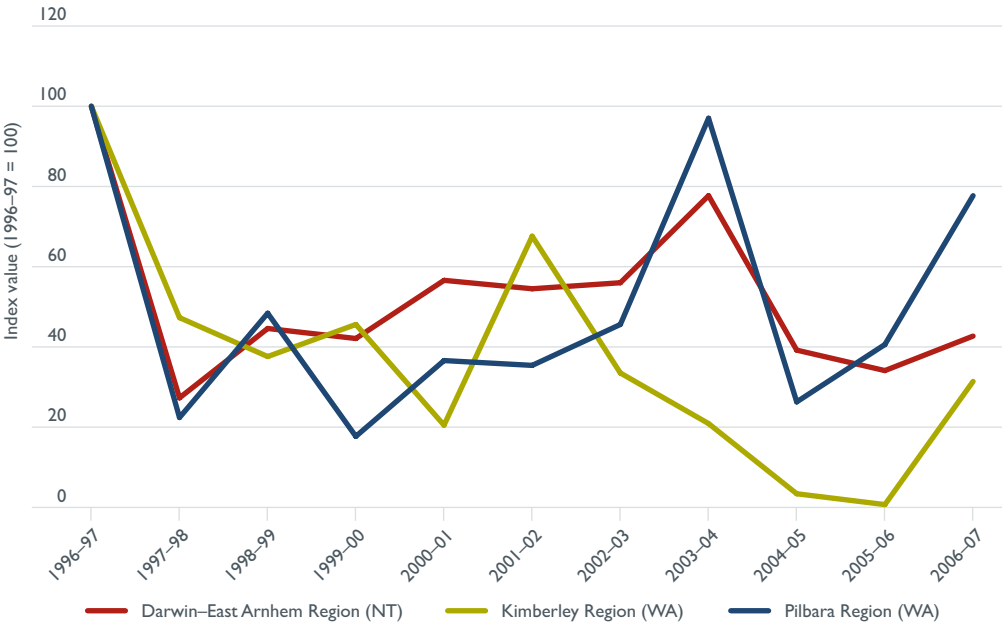
Region	1996–97	1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	Per cent of total loaded tonnes in Australian ports in 2006–07
Northern Australia (WA)	11 180.0	3 854.4	4 827.6	3 498.4	3 217.8	5 705.0	4 442.3	6 714.1	1 699.7	2 373.8	6 173.5	1.3
Pilbara Region	5 755.4	1 288.3	2 785.6	1 016.5	2 108.0	2 035.4	2 625.8	5 583.1	1 513.9	2 335.3	4 472.4	0.9
Port Hedland	2 396.7	1 288.3	1 408.7	1 016.5	1 503.4	2 035.4	933.9	4 113.8	1 513.9	2 335.3	3 462.9	0.7
Kimberley Region	5 424.6	2 566.1	2 042.0	2 476.1	1 109.8	3 669.5	1 816.5	1 131.1	185.8	38.6	1 701.2	0.3
WA offshore terminals	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Western Australia state total	39 899.9	29 649.2	27 335.6	27 715.1	30 239.3	27 900.3	24 406.4	32 797.1	25 228.6	26 681.8	30 764.2	6.3
Northern Australia (NT)	28 162.8	7 687.3	12 734.8	11 888.2	15 931.9	15 342.4	15 771.4	21 870.6	11 052.0	9 614.5	12 020.5	2.5
Darwin-East Arnhem Region	28 162.8	7 687.3	12 572.3	11 843.6	15 931.9	15 342.4	15 771.4	21 870.6	11 052.0	9 614.5	12 020.5	2.5
Rigs and offshore terminals	0.0	0.0	94.0	28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NT communities	0.0	0.0	68.5	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern Territory total	28 162.8	7 687.3	12 734.8	11 888.2	15 931.9	15 342.4	15 771.4	21 870.6	11 052.0	9 614.5	12 020.5	2.5
Northern Australia (QLD)	41 958.2	31 583.1	40 325.0	53 669.8	37 177.1	45 962.8	34 633.6	47 433.4	41 631.8	46 958.5	51 213.5	10.5
Mackay Region	4 848.9	2 643.7	2 503.5	3 126.4	3 112.5	3 543.8	3 055.9	2 379.3	2 182.3	2 788.0	2 727.2	0.6
Northern Region	8 088.9	8 784.9	14 560.4	19 748.6	13 845.7	15 310.4	11 124.7	17 088.9	16 572.0	18 411.6	21 030.2	4.3
Far North Region	13 170.3	8 818.6	8 028.9	17 719.9	7 446.7	8 328.0	5 914.7	9 761.1	6 658.6	5 573.4	3 980.4	0.8
North West Region	0.0	48.1	0.0	34.6	8.3	121.4	0.0	0.0	8.2	0.0	0.0	0.0
Rockhampton region	0.0	0.0	79.9	32.7	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gladstone region	15 850.2	11 235.3	15 087.8	12 993.1	12 713.5	18 659.1	14 538.3	18 204.2	16 210.7	20 185.5	23 475.7	4.8
QLD unknown ports	0.0	52.5	64.5	14.3	48.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queensland state total	92 050.3	100 446.8	86 820.7	114 373.6	90 277.3	107 505.2	105 653.5	108 397.3	125 819.7	148 121.6	155 000.0	31.8
Northern Australia subtotal	81 301.0	43 124.8	57 887.5	69 056.3	56 326.9	67 010.2	54 847.3	76 018.2	54 383.5	58 946.9	69 407.5	14.3
Australia total	471 290.7	427 593.7	361 506.0	511 727.9	447 336.1	487 516.3	415 236.4	375 419.6	401 081.8	428 538.8	487 049.2	100.0

Note: At the time of preparation, data for 2007–08 was not available.

Source: BITRE (2009), unpublished data.

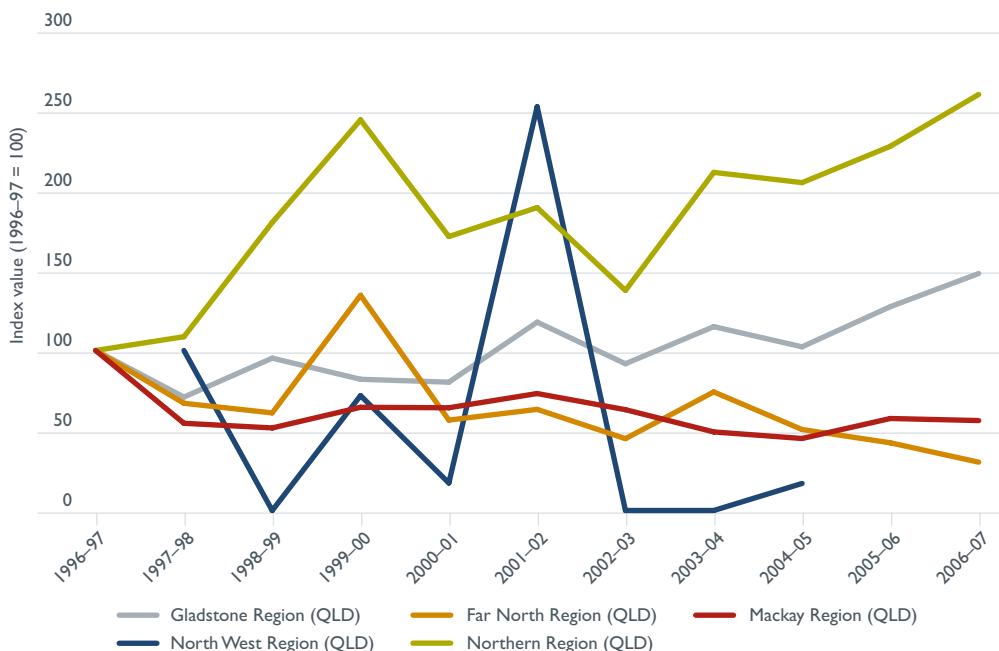
Unloaded coastal shipping tonnages by region indicated volatility and a decline in northern regions of Western Australia and Northern Territory during the period 1996–97 and 2006–07 (see Figure 6.1.16). More diversity in dynamics was observed in Queensland’s northern regions. While Queensland’s Northern Region’s unloaded tonnage increased by 2.5 times between 1996–97 and 2006–07 and Gladstone’s by 1.5 times in the corresponding period, the rest of Queensland’s regions experienced a decline in unloaded coastal shipping tonnages (see Figure 6.1.17).

Figure 6.1.16 Northern Australia (Western Australia and Northern Territory)—coastal shipping, unloaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

Figure 6.1.17 Northern Australia (Queensland)—coastal shipping, unloaded tonnage, by region, 1996–97 to 2006–07 (index 1996–97 = 100)



Source: BITRE (2009), unpublished data.

Sea ports

Maritime shipping in Northern Australia has been conducted via a number of port facilities, working platforms and small islands. Many ports are specialised in handling designated commodities, such as gas, oil or coal, but a number of ports handle general cargo and containers, as well as bulk loads of minerals and energy. Table 6.1.7 lists selected major ports in Northern Australia. Some of these listed ports support larger communities and a more diverse economy, such as Mackay, Rockhampton or Mourilyan. Others are more specialised, such as Weipa (bauxite) or Port Douglas (tourism).

Table 6.1.7 Northern Australia—selected ports, by region, 2009

Region/SLA name	Port name	Total SLA/UCL population (2006)	Main operations	Port operators	Commercial operators
Northern Australia (WA)					
Pilbara Region					
Port Hedland (T)	Port Hedland	11 558	Iron ore, salt, manganese	Port Hedland Port Authority	BHP Billiton Ltd and the Fortescue Metals Group Ltd
Ashburton (S)	Saladin Terminal	8 136	Oil and gas	Non-port authority port	Chevron Australia
Kimberley Region					
Derby-West Kimberley (S)	Derby	8 352	Lead-zinc concentrate, cattle	Shire of Derby/West Kimberley	Small scale private ventures
Northern Australia (NT)					
Darwin-East Arnhem Region					
City-Inner	Port of Darwin	66 290	Petroleum, livestock, cement, clinker	Darwin Port Corporation	A number of private operators installed specialised port facilities, such as the Yopak Darwin Acid Tank and pipeline or LNG facilities supported by commercial operators
Katherine-Lower Top End	Bing Bong	1 012	Lead-zinc concentrate	P&O Maritime on behalf of the Carpentaria Shipping Services (local community and business partnership)	McArthur River Mining Company
Northern Australia (QLD)					
Mackay Region					
Mackay (C)-Pt A	Mackay (Hay Point)	66 874	Coal	Ports Corporation of Queensland	Dalhrymple Bay Coal Terminal leased by Babcock & Brown from the Queensland Government
Bowen (S)	Bowen (Abbot Point)	7 483	Coal	Ports Corporation of Queensland	Abbot Point BulkCoal Pty Ltd
Far North Region					
Cook (S)	Cape Flattery	4 804	Silica sand	Ports Corporation of Queensland	Cape Flattery Silica Mines Pty Ltd (Mitsubishi)
Douglas (S)	Port Douglas	16 753	Tourism	Douglas Shire Council	Small scale private ventures
Johnstone (S)	Mourilyan	19 155	Raw sugar, molasses, livestock	Ports Corporation of Queensland	Mourilyan Bulk Sugar Terminal
Torres (S)	Thursday Island	3 457	General cargo	Local community	Small scale private ventures
Weipa (T)	Weipa	3 141	Bauxite, livestock (cattle), fuel	Ports Corporation of Queensland	Rio Tinto Aluminium
North West Region					
Carpentaria (S)	Karumba	3 186	Zinc, lead, livestock	Ports Corporation of Queensland	Zinifex Mine
Rockhampton Region					
Fitzroy (S)-Pt A	Rockhampton	6 102	Coal, wheat, sorghum	Central Queensland Ports Authority	BHP Billiton Mitsubishi Alliance, Waratah Coal & other coal operators

Source: BITRE (2009), unpublished data.

6.2 Aviation

Aviation provides personal transport and freight over large distances in Northern Australia. Scheduled services connect distant destinations within the region, as well as major population centres and capital cities in Australia and overseas. Tables 6.2.1 and 6.2.2 list typical domestic and international distances and travelling times for air services in Northern Australia. Distances covered by regular public transport (RPT) services are usually in excess of 500 kilometres and travelling times are similar to those between major towns in many overseas destinations, such as in the United States, Canada and Europe. Cairns and Darwin have regular connections to many regional South Pacific destinations as well as to major cities in Japan, China and Indonesia. A substantial part of the growth in international transport has been associated with outback tourism in Northern Australia, especially inbound tourism from Japan.

Table 6.2.1 Northern Australia—air travel distances and travel times on major domestic port pairs, 2007–08

<i>Port pair</i>	<i>Distance (kilometres)</i>	<i>Air travel time</i>
Northern Australia (WA)		
Karratha–Perth	1 250	1 h 55 m
Broome–Perth	1 677	2 h 30 m
Kalgoorlie–Perth	538	1 h 05 m
Perth–Port Hedland	1 312	2 h 05 m
Perth–Newman	1 019	1 h 40 m
Paraburdoo–Perth	990	1 h 40 m
Learmonth–Perth	1 094	1 h 55 m
Broome–Kununurra	731	1 h 20 m
Derby–Curtin–Perth	1 781	2 h 50 m
Broome–Melbourne	3 109	4 h 05 m
Northern Australia (NT)		
Brisbane–Darwin	2 852	4 h 00 m
Darwin–Melbourne	3 131	4 h 15 m
Darwin–Sydney	3 155	4 h 20 m
Adelaide–Darwin	2 619	3 h 35 m
Alice Springs–Darwin	1 305	2 h 00 m
Darwin–Perth	2 651	3 h 45 m
Alice Springs–Melbourne	1 860	2 h 35 m
Alice Springs–Sydney	2 022	2 h 50 m
Adelaide–Alice Springs	1 316	1 h 55 m
Darwin–Gove	647	1 h 15 m
Northern Australia (QLD)		
Brisbane–Cairns	1 391	2 h 20 m
Brisbane–Townsville	1 112	2 h 00 m
Cairns–Sydney	1 971	2 h 55 m
Brisbane–Mackay	797	1 h 35 m
Brisbane–Rockhampton	518	1 h 15 m
Cairns–Melbourne	2 311	3 h 20 m
Brisbane–Gladstone	434	1 h 05 m
Brisbane–Hamilton Island	888	1 h 45 m
Sydney–Townsville	1 690	2 h 45 m
Hamilton Island–Sydney	1 526	2 h 20 m

Source: BITRE (2009), unpublished data.

Table 6.2.2 Northern Australia—air travel distances, travel times and passenger numbers, top ten international pairs

<i>From</i>	<i>To</i>	<i>Distance (kilometres)</i>	<i>Air travel time</i>	<i>Inbound passengers</i>	<i>Outbound passengers</i>	<i>Total</i>
Cairns	Auckland	3 622	4 h 45 m	28 546	25 199	53 745
	Guam	3 376	4 h 30 m	11 541	11 439	22 980
	Hong Kong	5 545	7 h 00 m	27 107	28 903	56 010
	Nagoya	5 862	7 h 30 m	44 017	50 396	94 413
	Osaka	5 803	7 h 30 m	42 584	36 917	79 501
	Port Moresby	841	1 h 30 m	29 247	33 548	62 795
	Singapore	5 012	6 h 45 m	33 126	28 753	61 879
	Tokyo	5 878	7 h 40 m	108 710	115 878	224 588
Darwin	Bandar Seri Begawan	2 612	3 h 45 m	2 462	2 625	5 087
	Bombay	7 259	9 h 30 m	2 245		2 245
	Denpasar	1 766	2 h 45 m	20 192	19 407	39 599

Source: BITRE (2009), unpublished data.

Passenger and freight movements

The greatest number of domestic passenger movements in 2007–08 occurred in the Far North Queensland region, followed by MacKay Region and the Darwin-East Arnhem Region in the Northern Territory (see Table 6.2.3). For location of major airports (see Map 6.2.1). The large number of passengers travelling on regular air transport in Queensland is related to the size of the resident population of those regions, as well as inbound domestic and international tourism.

An important part of domestic transport in Northern Australia is related to ‘fly-in, fly-out’ staff rotation arrangements in remote mining, geological services and, increasingly, agriculture. Air transport is used to carry workers from their places of residence to remote locations in Australia’s north. While RPT services account for some of this activity, a significant proportion is carried on charter flights. Unfortunately, no detailed data is available on the charter sector.

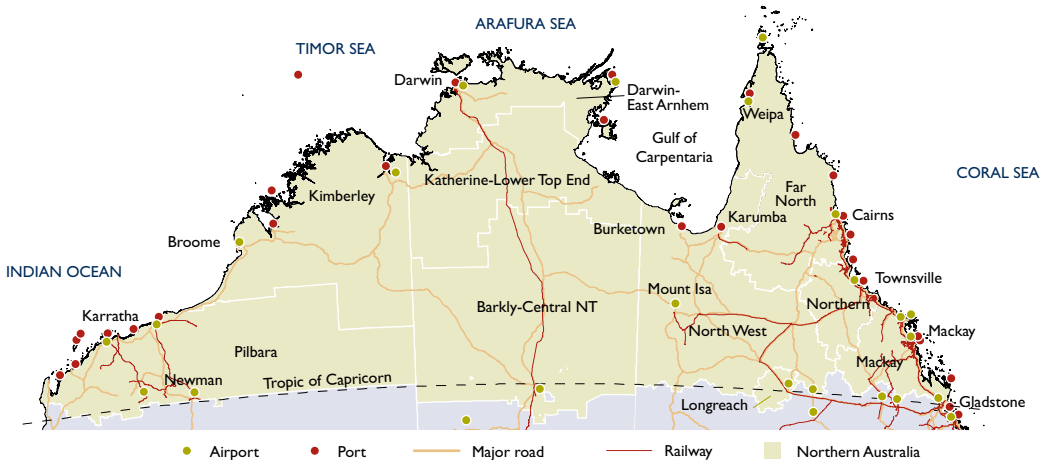
Table 6.2.3 Northern Australia—air passenger and freight movements, 2007–08

Region	Air passenger movements							Freight movements				
	Domestic inbound	Domestic outbound	Total domestic passenger movements	Total inter-national passenger movements	Total inbound	Total outbound	Total passenger movements	Inter-national inbound (tonnes)	Inter-national outbound (tonnes)	Total inter-national freight (tonnes)	Per cent of Australia's passenger movements	Per cent of Australia's freight movements
Northern Australia (WA)	686 650	691 775	1 378 425		686 650	691 775	1 378 425				1.4	0.0
Pilbara Region	440 147	441 123	881 270		440 147	441 123	881 270				0.9	0.0
Kimberley Region	246 503	250 652	497 155		246 503	250 652	497 155				0.5	0.0
Western Australia state total	4 247 570	4 273 587	8 521 157	2 477 820	5 522 779	5 476 198	10 998 977	37 257	31 462	68 719	8.7	8.8
Northern Australia (NT)	1 110 016	1 123 804	2 233 820	173 243	1 196 824	1 210 239	2 407 063	127	171	298	2.3	0.0
Darwin-East Arnhem Region	799 797	806 598	1 606 395	173 243	886 605	893 033	1 779 638	127	171	298	1.6	0.0
Barkly-Central NT Region	310 219	317 206	627 425		310 219	317 206	627 425				0.6	0.0
Northern Territory total	1 291 091	1 304 694	2 595 785	173 243	1 377 899	1 391 129	2 769 028	127	171	298	2.7	0.0
Northern Australia (QLD)	3 346 139	3 350 227	6 696 366	655 919	3 677 180	3 675 105	7 352 285	2 348	4 318	6 666	6.9	0.9
Mackay Region	824 012	827 127	1 651 139		824 012	827 127	1 651 139				1.7	0.0
Northern Region	729 114	730 359	1 459 473		729 114	730 359	1 459 473				1.5	0.0
Far North Region	1 647 087	1 645 404	3 292 491	655 919	1 978 128	1 970 282	3 948 410	2 348	4 318	6 666	3.4	0.9
North West Region	130 902	131 278	262 180		130 902	131 278	262 180				0.3	0.0
Longreach Region	15 024	16 059	31 083		15 024	16 059	31 083				0.0	0.0
Queensland state total	13 775 314	13 772 015	27 547 329	4 901 846	16 244 376	16 204 799	32 449 175	48 526	47 085	95 611	28.2	12.2
Northern Australia subtotal	5 142 805	5 165 806	10 308 611	829 162	5 560 654	5 577 119	11 137 773	2 475	4 489	6 964	10.6	0.9
Australia total	48 792 013	48 792 013	97 584 026	23 264 573	60 565 536	60 283 063	120 848 599	474 050	306 943	780 993	100.0	100.0

Note: Data on domestic airfreight is not available.

Source: BITRE (2009), unpublished data.

Map 6.2.1 Northern Australia—major airports, roads and railway, 2009

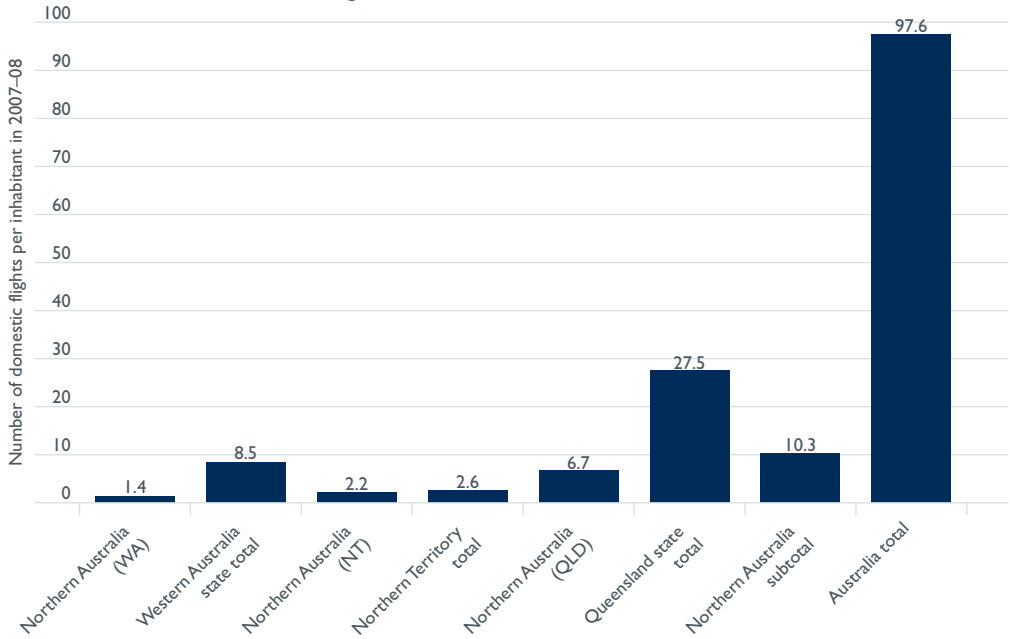


Source: Geoscience Australia (2009), unpublished.

Regular international air freight transport to Cairns and Darwin (see Table 6.2.2) allows for imports and exports of higher value goods and perishables, such as exports of fresh products from Queensland to some Asian markets. It also provides an important supply route for higher value-added products to Northern Australia. Data on the tonnage of domestic airfreight is not available.

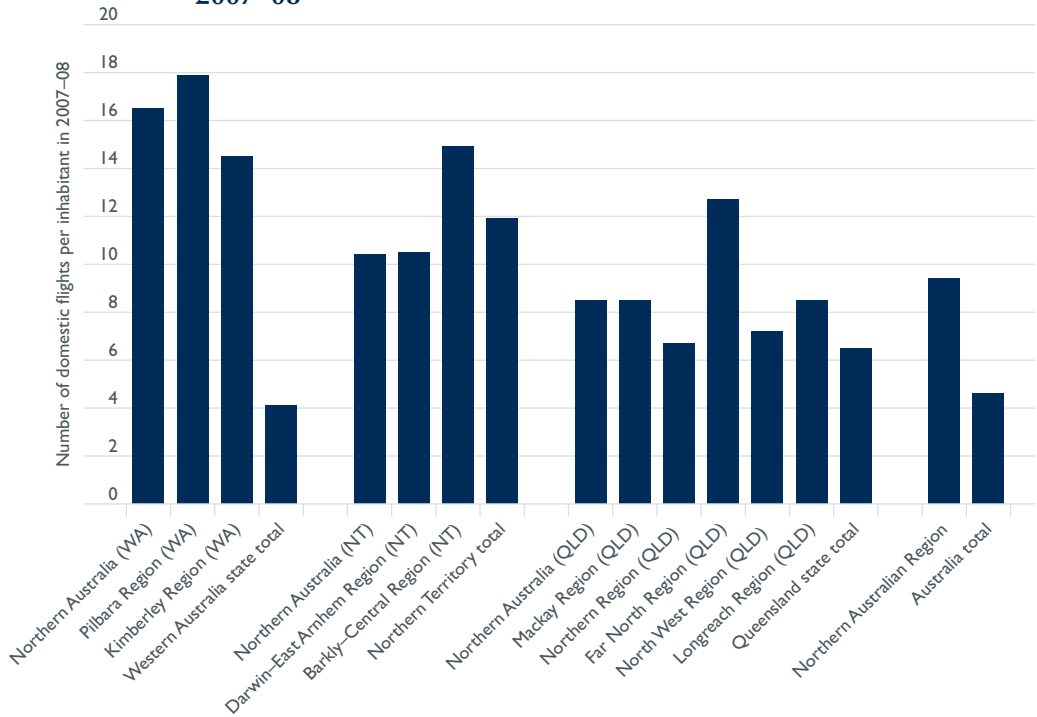
Figure 6.2.1 illustrates the total domestic RPT passenger movements in the northern regions of Queensland and Northern Territory in 2007–08. These passenger movements, when compared with the size of resident populations of these regions, indicate that domestic air transport has been used much more frequently in Northern Australia than in the rest of Australia. The average number of domestic flights per capita of residents of Northern Australia in 2007–08 was several times higher than in Australia and in their respective states. Figure 6.2.2 indicates that the number of domestic flights per resident of Pilbara and Kimberley regions was 4.5 times higher than the Australian and Western Australian averages. For Queensland’s northern regions, these averages were higher than those for Queensland and Australia but relatively lower than for northern regions of the Northern Territory and Western Australia. Northern Australia’s high level of flying frequency is largely related to long travel distances related to the remoteness of those locations and the use of regular air transport in the above mentioned periodic staff rotations in remote mining, services and other sectors.

Figure 6.2.1 Northern Australia—RPT domestic passenger movements in northern regions and state totals, 2007–08



Source: BITRE (2009), unpublished data.

Figure 6.2.2 Northern Australia—domestic flights per capita by region, 2007–08



Note: Data illustrates scheduled services only, charter flights are not included. Flying trips (domestic flights) are calculated by dividing passenger movements by the resident population.

Source: BITRE (2009), unpublished data.

Aircraft movements by regular public transport services in Northern Australia accounted for nearly 13 per cent of total Australia's RPT aircraft movements in 2007–08. These relatively large numbers of aircraft movements were required in providing regular services to about 4.7 per cent of the Australian population located in Northern Australia. Table 6.2.4 also indicates that air services are concentrated in relatively few regions, such as the Far North and Northern regions of Queensland, as well as in Darwin-East Arnhem in the Northern Territory and the Pilbara and Kimberley regions in Western Australia.

Some relatively large communities and important regional business centres did not have regular air services in 2007–08, although they had these services in 2005. Among them are Katherine and Tennant Creek in the Katherine-Lower Top End Region of the Northern Territory, Cooktown and Weipa in the Northern Region of Queensland.

Table 6.2.4 Northern Australia—aircraft movements and RPT, 2007–08

<i>Region</i>	<i>Domestic</i>	<i>International</i>	<i>Total movements</i>	<i>Per cent of state total</i>
Northern Australia (WA)	20 081		20 081	18.9
Pilbara Region	11 145		11 145	10.5
Exmouth	693	697	1 390	1.3
Port Hedland	2 588	0.0	2 588.0	2.4
Kimberley Region	8 936		8 936	8.4
Western Australia state total	93 801	12 548	106 349	100.0
Northern Australia (NT)	31 900	3 421	35 321	89.0
Darwin-East Arnhem Region	25 548	3 421	28 969	73.0
Darwin	14 959	3 421	18 380	46.3
Barkly-Central NT Region	6 352	0.0	6 352.0	16.0
Alice Springs	6 352		6 352	16.0
Northern Territory total	36 274	3 421	39 695	100.0
Northern Australia (QLD)	92 972	7 526	100 498	31.6
Mackay Region	16 907		16 907	5.3
Mackay town	10 034		10 034	3.2
Northern Region	21 103		21 103	6.6
Townsville	19 205		19 205	6.0
Far North Region	42 607	7 526	50 133	15.8
Weipa	1 782		1 782	0.6
Cairns	35 461	7 526	42 987	13.5
North West Region	11 410		11 410	3.6
Mount Isa	4 848		4 848	1.5
Longreach Region	945		945	0.3
Longreach	945		945	0.3
Queensland state total	283 918	34 253	318 171	100.0
Northern Australia subtotal	144 953	10 947	155 900	12.7
Australia total	1 092 884	138 358	1 231 242	100.0

Source: BITRE (2009), unpublished data.

Table 6.2.5 illustrates aircraft movements at selected Northern Australian airports in various fixed-wing weight categories, as well as helicopters. The data also lists regular public transport aircraft movements in these airports. The share of RPT in the total

aircraft movements varied from 26.2 to 47.9 per cent, thus indicating that a majority of aircraft movement are non-scheduled. The published data remains incomplete but it indicates that staff rotations, expert services and some categories of supplies are being carried out by charter operators. This includes: transport of passengers (largely 'fly-in, fly-out' of miners, engineering staff); transport of platform crews and light weight supplies from airports to platforms and back; provision of over-flying geological services; provision of health services; aerial surveying; transport of equipment and provisions to mines; and pipeline building and maintenance, et cetera.

Table 6.2.5 Northern Australia—aircraft movements in selected Northern Australian airports, as at November 2008

<i>Arrival port name</i>	<i>Over 136 tonnes</i>	<i>Between 7 and 136 tonnes</i>	<i>Less than 7 tonnes</i>	<i>Helicopter</i>	<i>Unknown weight</i>	<i>Total of all aircraft movements</i>	<i>Total RPT</i>	<i>Per cent of RPT in total aircraft movements</i>
Alice Springs	4	8 488	14 486	1 264		24 242	6 352	26.2
Cairns	5 122	40 096	35 814	8 674	2	89 708	42 987	47.9
Townsville	12	24 154	18 668	1 412		44 246	19 205	43.4
Rockhamptom	42	15 108	17 676	1 612		34 438	10 496	30.5
Hamilton Island		4 034	3 242	3 990		11 266	4 372	38.8

Notes: Movements are the sum of Arrivals and Circuits multiplied by 2. Arrival data is only recorded during hours of tower operation, therefore actual movements at non non-manned locations may be higher than published. The Air Services' aircraft movements data include regular air transport, chartered and owner-operator flights. Rockhamptom was included in this table as it is part of a very busy and important regional hub in an area extending into Northern Australia.

Source: Airservices Australia (2009).

The accuracy of the aircraft movement records in Northern Australia cannot be verified as some airstrips and smaller airports are not manned at all or only partially manned, therefore the undercount of the non-scheduled flying operations is likely to be substantial.

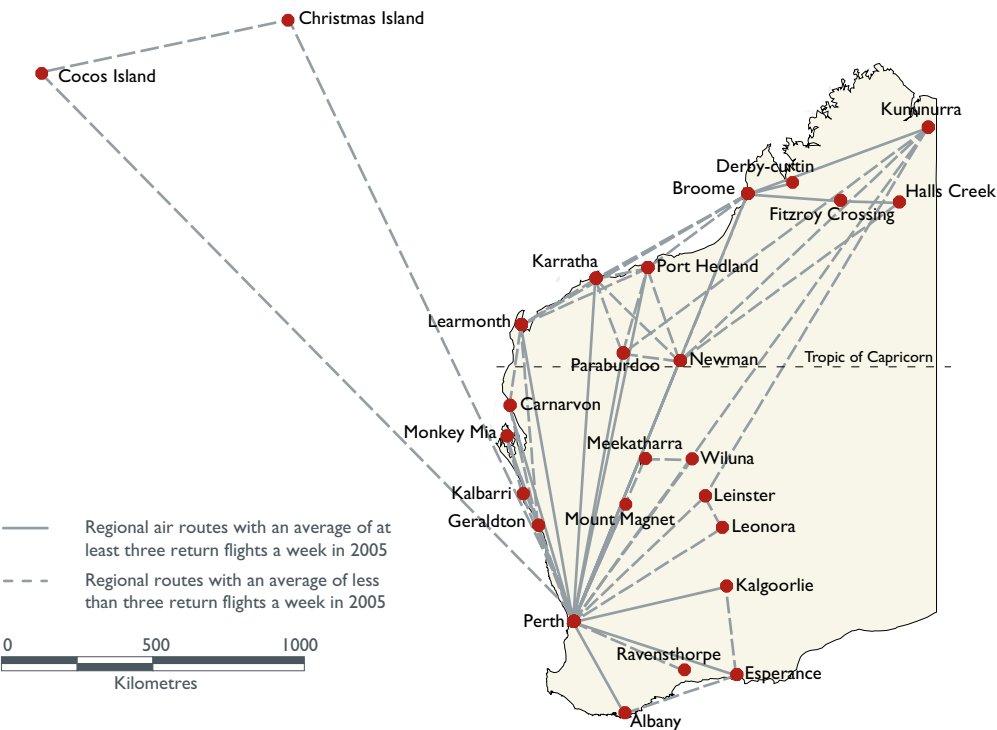
Regional aviation in Australia operates in a volatile economic and social environment which affects both the supply (air transport services) and demand side (passenger numbers). This volatility affects the stability and reliability of air services, particularly in Northern Australia, where international demand for locally-produced commodities and their price levels affect the need for air transport, as the number of affected workers may vary at various stages of business cycles. At the supply side, the general business conditions may impact upon availability and the cost of credit, thus affecting operators' ability to acquire aircraft, equipment and hiring of specialised staff.

As Northern Australia's air transport market is relatively small, adverse economic factors may impact upon the provision of air services more severely than for interstate services, where demand for air transport under difficult economic conditions may become smaller but would still allow for continued operations. Maps 6.2.2 to 6.2.7 illustrate the variability of connections by regular air services in Western Australia, the Northern Territory and Queensland, between 2000 and 2005. A number of regular connections disappeared over this period and new ones were created joining other localities, reflecting the changed demand. Occasionally, these adjustments are associated with insolvency of operators, such as that of MacAir Airlines, Queensland's

largest privately own regional airline servicing outback Queensland. MacAir was placed into voluntary administration in February 2009.¹⁴

The maps also illustrate the polygon-shaped air transport connections with and among more remote distant communities. These connections, which usually attract less passenger traffic than direct connections with capital cities, may in some instances require government support for sustainability and reliability. Generally, regular air transport connections among regional communities have become less numerous over the last decade, with fewer community centres enjoying regular air transport. At the same time, the aircraft serving the regional centres have become larger, flying longer distances between regional centres. This implies that the average distances to the nearest centre with regular air transport has been increasing over time in Northern Australia.

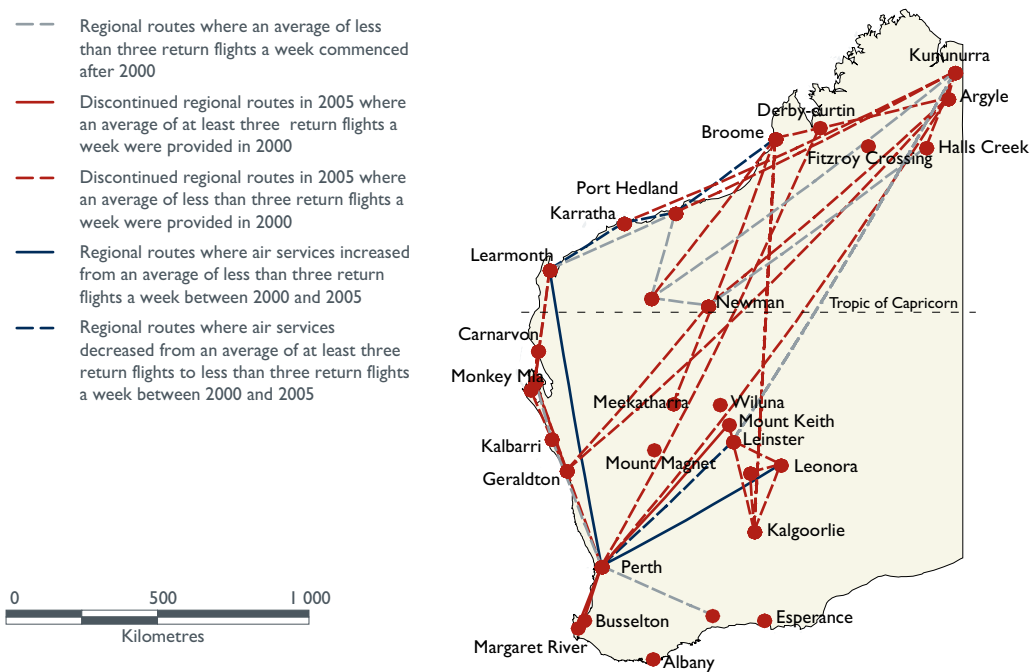
Map 6.2.2 Intrastate air services on regional routes in Western Australia, 2005



Source: Reproduced from BITRE (2008b).

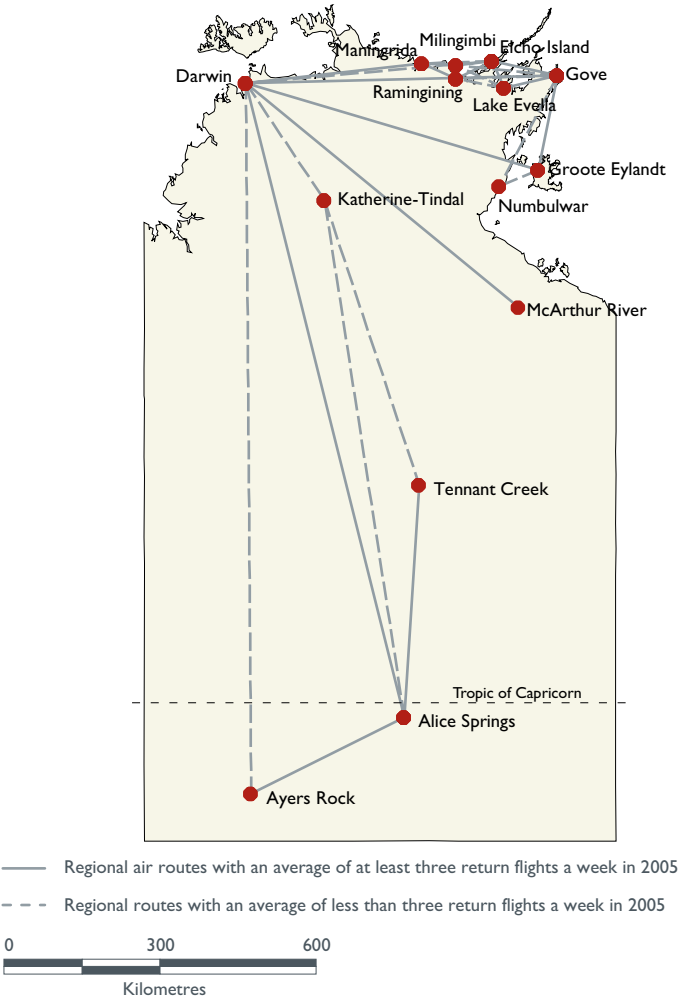
14. MacAir serviced about 30 destinations in its network, with the link between Townsville and Mt Isa being the busiest. This route was important to the mining support infrastructure and was recently included in Qantas regional services.

Map 6.2.3 **Changes in intrastate air services between 2000 and 2005 on regional routes in Western Australia**



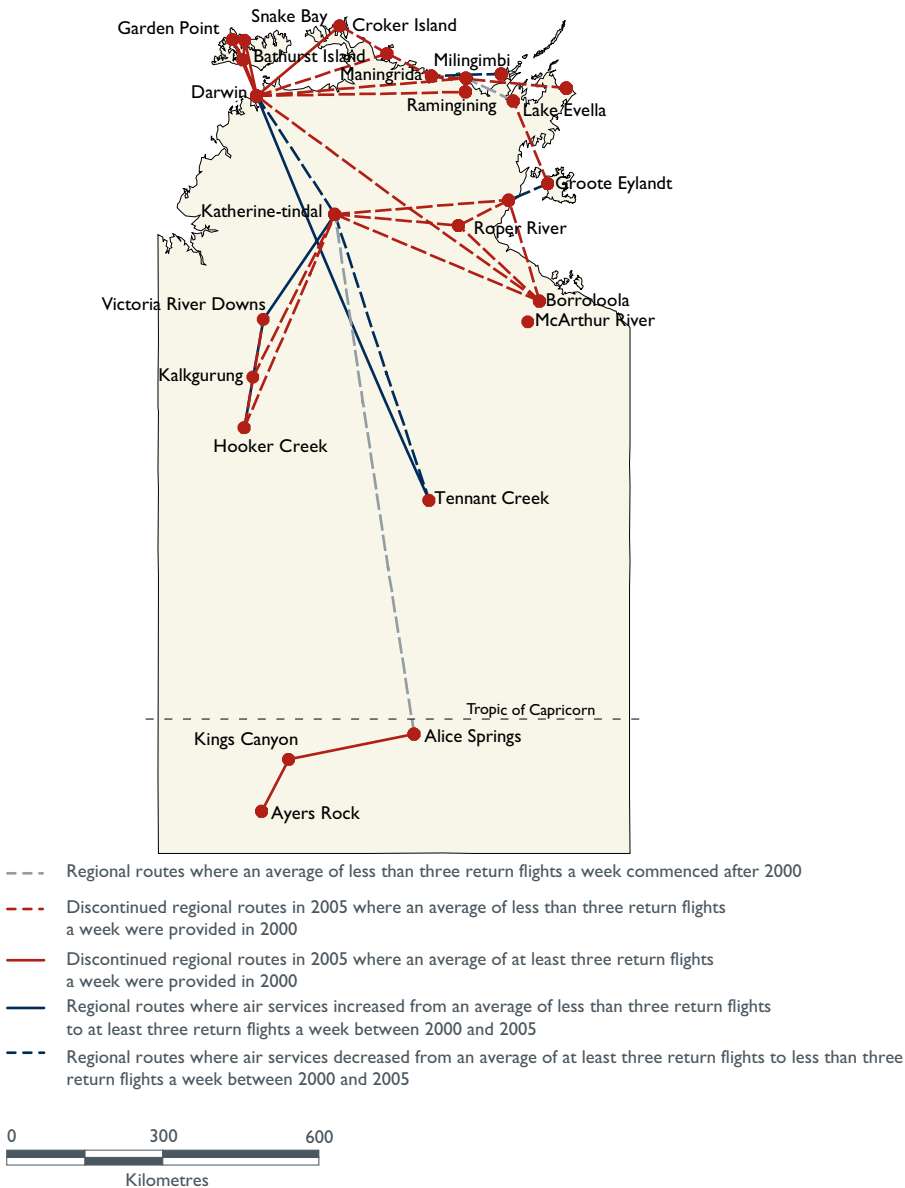
Source: Reproduced from BITRE (2008b).

Map 6.2.4 Intrastate air services on regional routes in Northern Territory, 2005



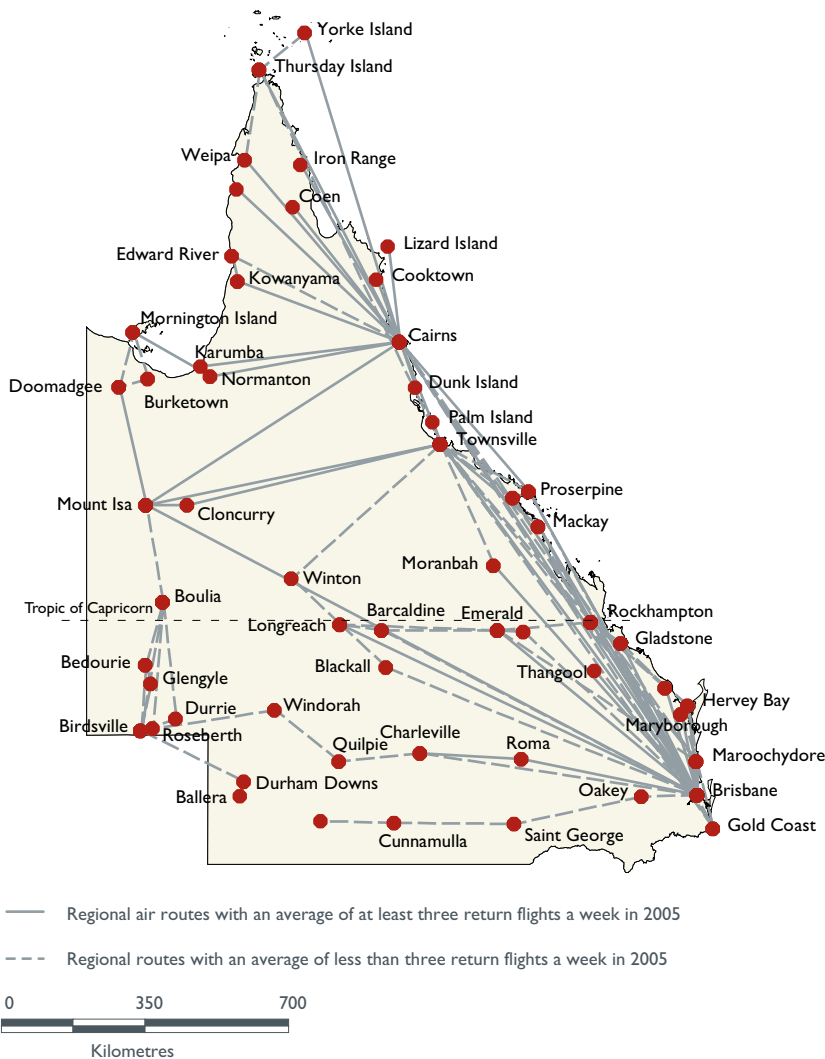
Source: Reproduced from BITRE (2008b).

Map 6.2.5 **Changes in intrastate air services between 2000 and 2005 on regional routes in the Northern Territory**



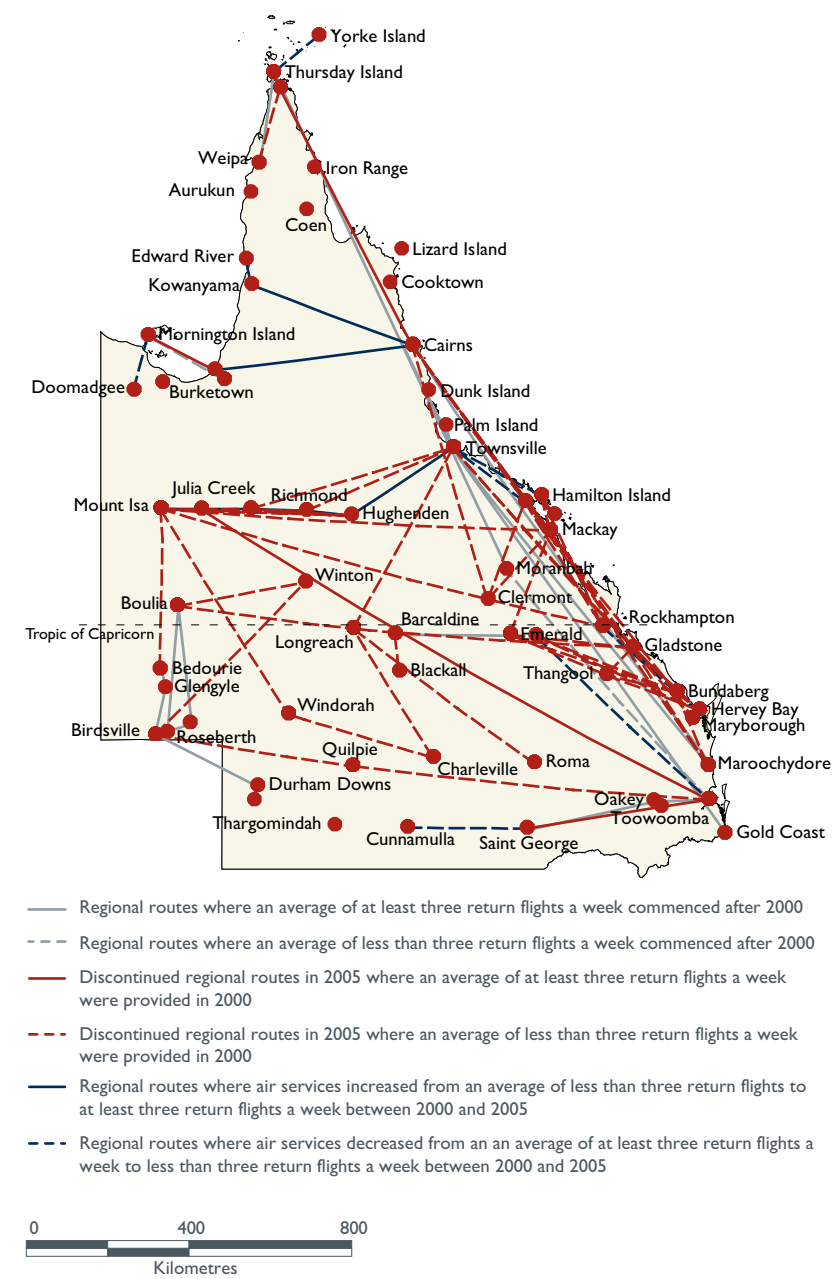
Source: Reproduced from BITRE (2008b).

Map 6.2.6 Intrastate air services on regional routes in Queensland, 2005



Source: Reproduced from BITRE (2008b).

Map 6.2.7 Changes in intrastate air services between 2000 and 2005 on regional routes in Queensland



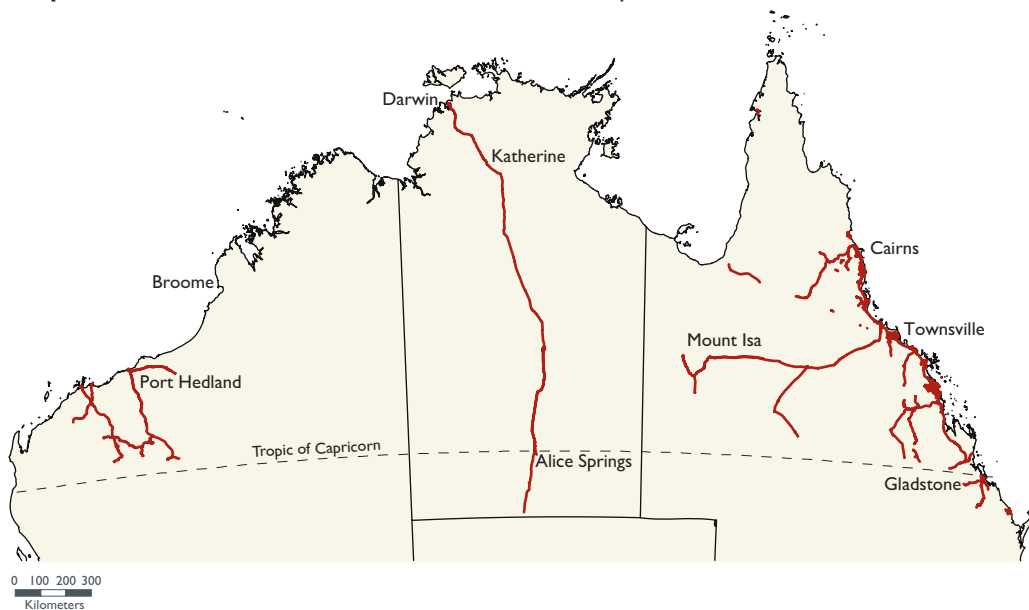
Source: Reproduced from BITRE (2008b).

6.3 Railways

The Northern Territory has the longest section of the standard gauge line, joining Darwin with Adelaide. The second longest standard gauge railway line is in the Pilbara Region but it does not join this region with the southern regions of Western Australia. In Queensland's north-eastern coastal regions, narrow gauge of 1067 mm railways join the northern regions with southern Queensland. Most other railways are of local significance and join *hinterland* resource locations with local port or processing plants, such as sugar mills, et cetera. Most of these railway lines are of narrow gauge, referred here as *light* and *other*. Generally, the Northern Australia's railway system provide specialised transport services to the mining and resource industries, while other typical railway services, such as passenger transport, general cargo or container services are only a limited part of their work, especially on the specialised 'pendulum' lines.

However, this dedicated railway system carries about 65 per cent of Australia's total rail freight (tonne kilometres), which is discussed below. Map 6.3.1 illustrates the location of main railway lines across Northern Australia.

Map 6.3.1 Northern Australia—main railway lines



Source: BITRE (2009), unpublished data.

Northern Queensland

On the Mount Isa–Townsville rail corridor, the transport operations include shipments of bulk minerals, general freight services and livestock services. This corridor allows also for important regional passenger services.

With demand for Queensland coal predicted to continue to increase, Queensland Railways has implemented an infrastructure program to increase capacity of the coal supply chains in Queensland from mine by rail to ship. As about 85 per cent of the

state's coal is produced from mines in the Bowen Basin, and the remainder from mines in the Moreton and Surat Basins, two railway systems are being developed and upgraded:

- Surat/Gladstone System includes the new Wiggins Island Coal Terminal (WICT) to be completed around 2011–12, based on export demand forecasts and the intention to move coal traffic from Barney Point Coal Terminal to WICT. The majority of the demand for WICT appears to be from the Moura System, more specifically from the Surat Basin.
- The Goonyella System is based on forecast to see coal demand increase by approximately 50 per cent from the 88 million tonnes per annum (Mtpa) hauled in the 2006–07 financial year to 130 mtpa and beyond.

Northern Territory

The railway link between Darwin and Adelaide was completed in 2004 and resulted in a deviation of traffic from coastal shipping and road transport to railway, especially for the Northern Territory's Darwin-East Arnhem Region, but with only between 1 per cent and 2 per cent of Australia's railway tonnage it remains a niche market for the railway operators, despite expectations the service would be a gateway to Asia. Private company *FreightLink* operates six high-speed intermodal freight trains per week between Adelaide and Darwin with connecting rail services to other interstate locations. The freight trains can operate to a maximum length of 1.8 kilometres, axle load up to 23 tonnes and a maximum loading height of 6.5 metres above rail allowing double-stacking of containers on purpose-built well wagons. *FreightLink* provides track access to Great Southern Railway for use of the railway for the operation of the *Ghan* passenger train. The operator *Freightlink* says it transported more than 1.1 million tonnes in the 2006–07 financial year, up from almost 670 000 tonnes the year before.

The railway appears to have acted as a catalyst for mining developments along the corridor and has commenced the haulage of manganese ore between Bootu Creek mine and the Port of Darwin, the haulage of iron ore between Frances Creek and the Port of Darwin and is contracted to commence haulage of copper-gold concentrate from OZ Minerals Prominent Hill mine to the Port of Darwin. There are many other mines along the corridor that intend to commence operations because the railway provides a viable transport solution for their products. The development of new mines and expanded rail operations provide significant employment prospects for local residents and will drive growth in the regional economy.

The more significant mining opportunities along the corridor include the *BHP Billiton Olympic Dam Project*, *Western Plains Resources Peculiar Knob Project*, *Minemakers Wonarah Phosphate Project*, *Arafura Resources Nolan's Bore Project* and *Altona Resources Arckaringa Coal to Liquids Project*.

Western Australia

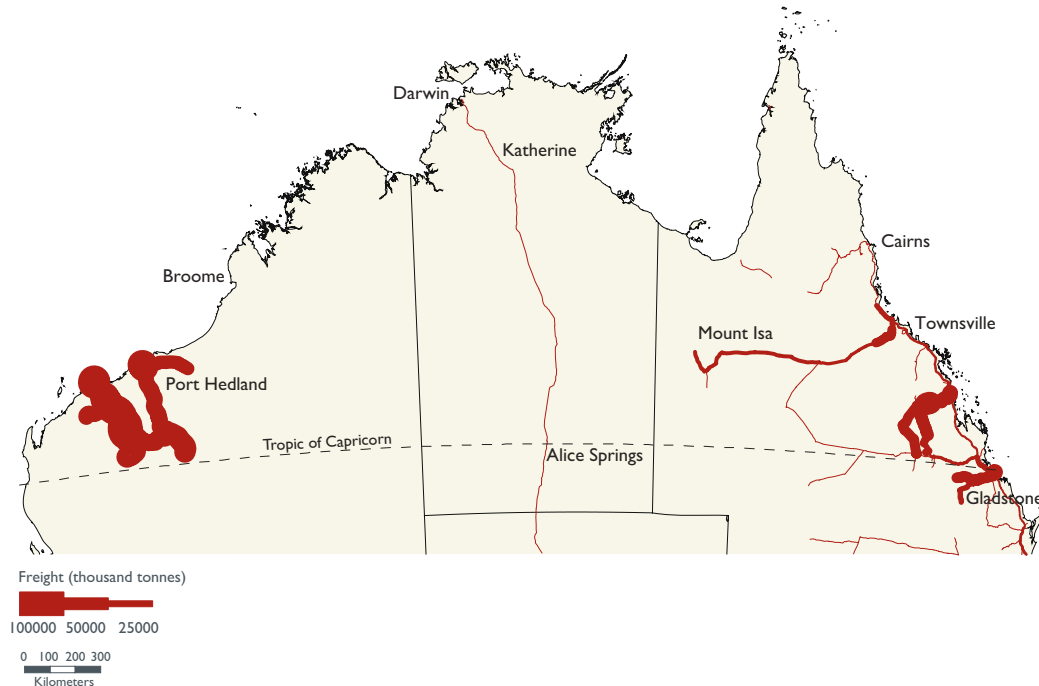
The Pilbara's rail network is used to transport iron ore from the inland operation to coastal ports of Port Hedland, Dampier and Camp Lambert/Port Walcott, which

handle bulk loads, especially iron ore, salt and liquid fuels, such as LNG, LPG and condensate. The railway network is owned and operated by *BHP Billiton Iron Ore* and the *Pilbara Rail Company*, a joint venture between *Hamersley Iron Pty Ltd* and *Robe River Iron Associates*. The State Agreements Act, which governs the Pilbara railway, obligates the railway owners to carry the freight of third parties upon reasonable terms and at reasonable charges, providing that this can be done without unduly prejudicing or interfering with their existing operations. Recently, access to the privately-owned railways was granted to a competitor *Fortescue* and other potential users. The major Pilbara train lines include:

- Mount Newman to Port Hedland, owned by BHP Iron Ore, distance 426 kilometres, tonnage: 63.5 Mtpa in 1999
- Paraburdoo to Dampier, owned by Hamersley Iron, distance 638 kilometres, tonnage: 61.5 Mtpa in 1999
- Yarrie to Port Hedland, owned by BHP Iron Ore
- Panawonica to Camp Lambert, owned by River Iron Associates, distance 200 kilometres, tonnage: 32 Mtpa in 1999
- West Angles to Camp Lambert, owned by Robe River, in development.

The freight density on the Northern Australia's railways is illustrated on Map 6.3.2.

Map 6.3.2 Northern Australia—assigned rail freight (kilotonnes), 2005



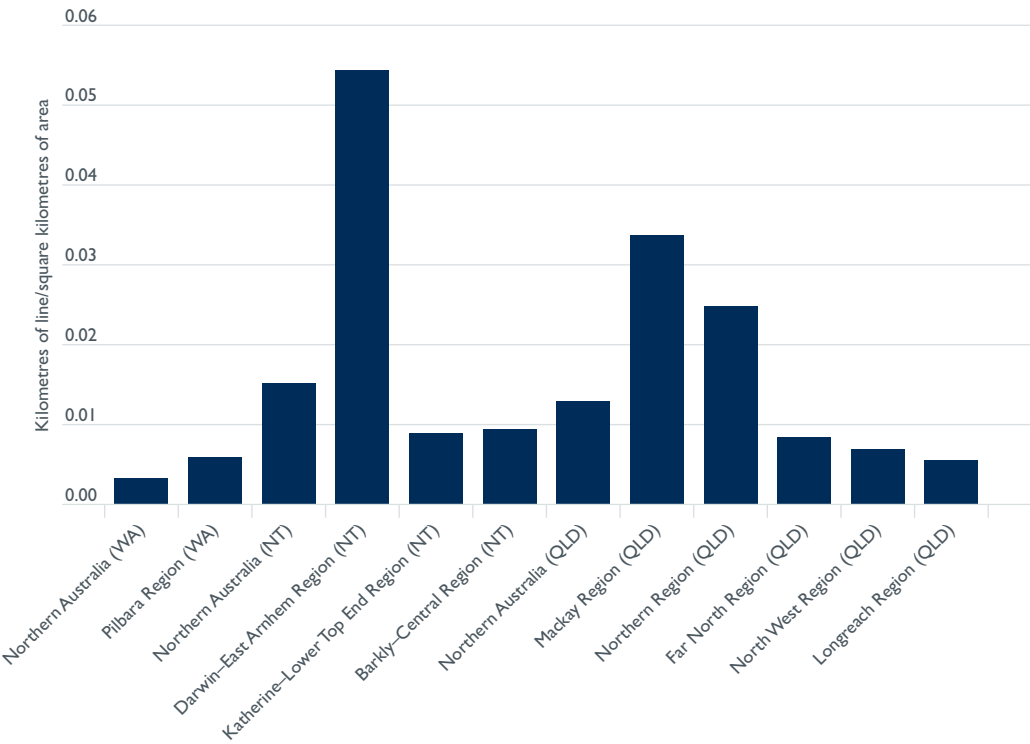
Source: BITRE (2009c).

Characteristics of railway infrastructure

In Northern Australia, railways are not well developed in the spatial sense, with the railway density per square kilometre of less than 10 metres (see Figure 6.3.1 and Map 6.3.1). Rail density per square kilometre measures how intensive is the connection of selected areas with railways. This measurement has been frequently used in assessing the accessibility of particular areas in Europe, the United States and other countries.

Figures 6.3.1 and 6.3.2 illustrate the railway density (kilometres/square kilometres) in Northern Australia by region in 2006. In spite of reasonably well interconnected railway systems, such as that in the Northern Territory, the vast spaces of Northern Australia cannot be considered well served by railway transport. However, the railways are probably appropriate given the sparse population in many areas. The Kimberley Region in Western Australia does not have any railway lines

Figure 6.3.1 Northern Australia—railway density, by region, 2006



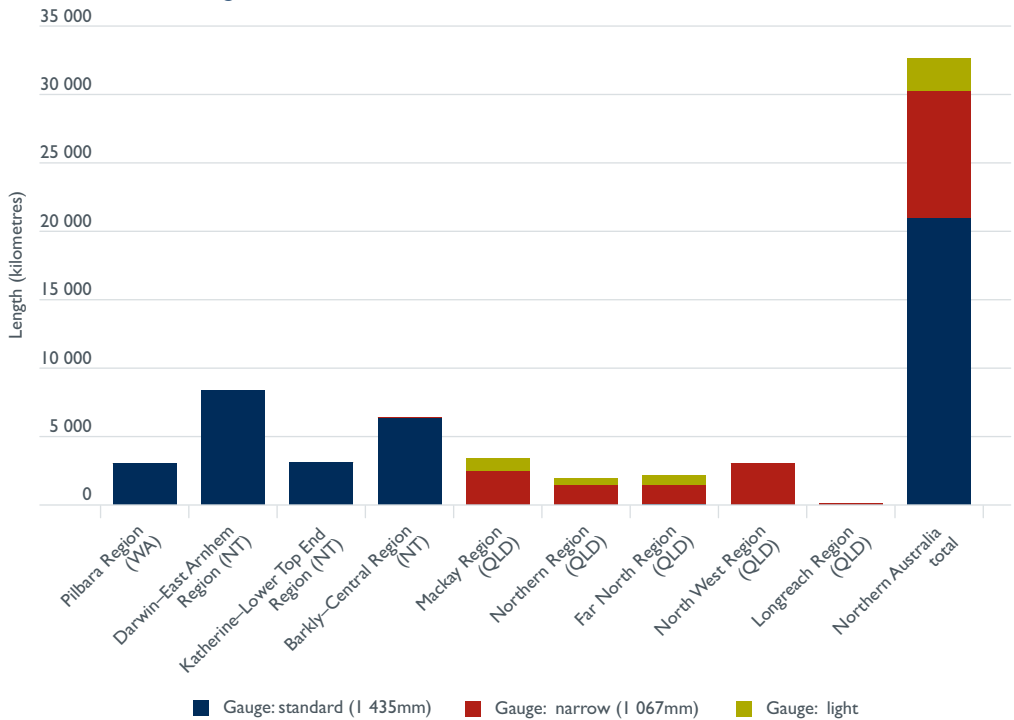
Source: BITRE (2009), unpublished data.

Table 6.3.1 Northern Australia—type and length of railways, by region, 2006

Region	Area (sq km)	Gauge: standard (1 435 mm)		Gauge: narrow (1 067 mm)		Gauge: light		Gauge: other		Total number of railways	Total Length of railways (kilometres)
		Operational	Abandoned	Operational	Abandoned	Operational	Abandoned	Operational	Abandoned		
Northern Australia (WA)	933 879	3 050								4	3 049.8
Pilbara Region	513 079	3 050								4	3 049.8
Northern Australia (NT)	1 175 211	17 820.6	43.5	48.9	0.0	0.0	0.0	0.0	0.0	25	17 913.0
Darwin-East Arnhem Region	153 619	8 357.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10	8 357.6
Katherine-Lower Top End Region	346 143	3 122.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3	3 122.3
Barkly-Central NT Region	675 449	6 340.7	43.5	48.9	0.0	0.0	0.0	0.0	0.0	12	6 433.2
Northern Australia (QLD)	926 560	43.0	0.0	9 280.3	179.2	2 373.8	0.0	31.2	7.1	84	11 914.6
Mackay Region	101 998	0.0	0.0	2 441.1	0.0	989.2	0.0	0.0	7.1	17	3 437.4
Northern Region	80 039	0.0	0.0	1 408.1	31.8	546.4	0.0	0.0	0.0	20	1 986.3
Far North Region	273 162	43.0	0.0	1 389.4	140.8	730.8	0.0	0.0	0.0	27	2 304.0
North West Region	446 494	0.0	0.0	3 047.8	2.1	0.0	0.0	31.2	0.0	10	3 081.1
Longreach Region	23 561	0.0	0.0	132.0	0.0	0.0	0.0	0.0	0.0	0	0.0
Northern Australia total	3 035 651	20 913	44	9 329	179	2 374	0.0	31	7	113	32 877.4

Source: BITRE (2009), unpublished data.

Figure 6.3.2 Northern Australia—type and length of operational railways, by region, 2006



Source: BITRE (2009), unpublished data.

6.4 Roads

Due to large distances between major centres of settlement and economic activities in Northern Australia, the road network consists of largely unsealed roads and smaller lengths of sealed principal and secondary roads (see Table 6.4.1, and Map 6.4.2). The length of the only dual carriage road (around Darwin) is 29 kilometres. The majority of roads in Northern Australia are unsealed minor roads and tracks, many of which are seasonal and may not be accessible for parts of the wet season.

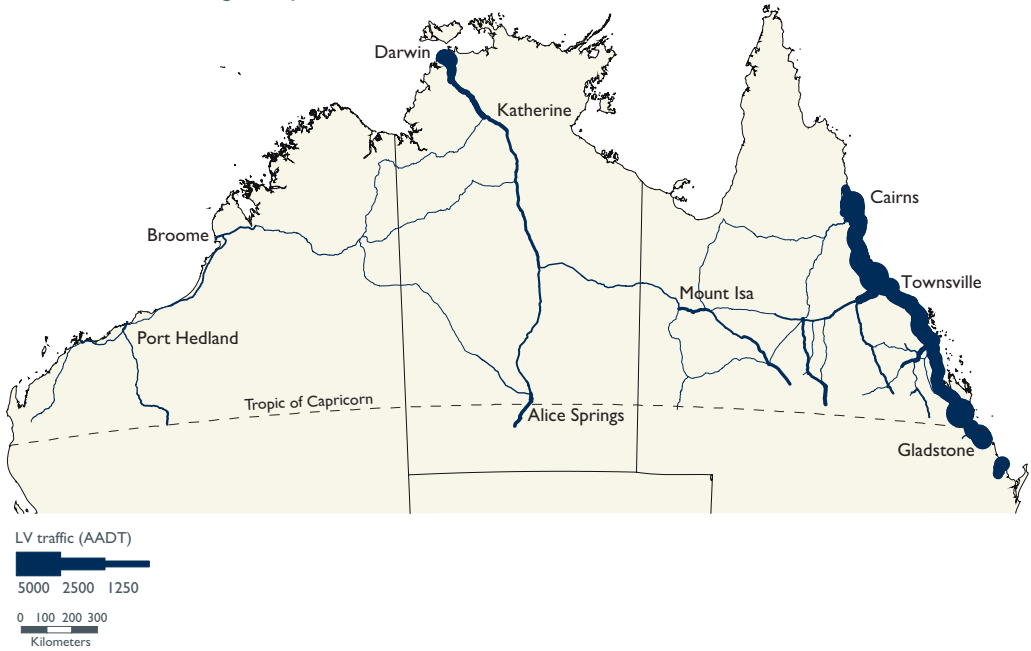
Road transport is typically used in Northern Australia for provision of groceries and other living supplies and other production supplies, such as machinery, equipment, et cetera.

Table 6.4.1 Northern Australia—type and length of roads, by region, 2006

Region	Area (sq km)	Dual carriage ways, length (km)	Principal roads, length (km)		Secondary roads, length (km)		Minor roads, length (km)		Tracks, length (km)		Total length of sealed roads (km)		Total length of unsealed roads and tracks (km)		Road density sealed and unsealed
			Sealed	Unsealed	Sealed	Unsealed	Sealed	Unsealed	Sealed	Unsealed	Sealed	Unsealed	Sealed	Unsealed	
Northern Australia (WA)	933 879		3 351	485	579	1 697	633	10 849		64 193	4 563	77 224	81 787		0.1
Pilbara Region	513 079		1 668	176	579	767	395	6 476		33 885	2 642	41 304	43 946		0.1
Kimberley Region	420 799		1 683	309		930	238	4 373		30 308	1 921	35 920	37 841		0.1
Northern Australia (NT)	1 175 211	29	3 307	582	1 452	1 523	1 931	15 755		98 621	6 719	116 481	123 200		0.1
Darwin-East Arnhem Region	153 619	29	439		207		1 209	5 491		12 585	1 884	18 076	19 960		0.1
Katherine-Lower Top End Region	346 143		1 308	1	503	790	425	4 186		26 216	2 236	31 193	33 429		0.1
Barkly-Central NT Region	675 449		1 560	581	742	733	297	6 078		59 820	2 599	67 212	69 811		0.1
Northern Australia (QLD)	926 560		7 923	815	3 076	4 461	4 431	31 141	39	2 128 950	15 430	165 367	180 838		0.2
Mackay Region	101 998		1 349	9	1 155	415	1 683	6 919		16 830	4 187	24 173	28 360		0.3
Northern Region	80 039		1 075		451	231	908	4 275		11 518	2 434	16 024	18 458		0.2
Far North Region	273 162		1 213	90	939	1 156	1 139	8 370	39	26 877	3 291	36 493	39 823		0.1
North West Region	446 494		3 297	660	340	2 452	373	10 133		2 69 918	4 010	83 163	87 175		0.2
Longreach Region	23 561		188	56	102	201	29	1 177		3 435	319	4 869	5 188		0.2
Northern Australia total	3 035 651	29	14 581	1 882	5 107	7 681	6 995	57 745	39	2 291 764	26 712	359 072	385 825		0.1

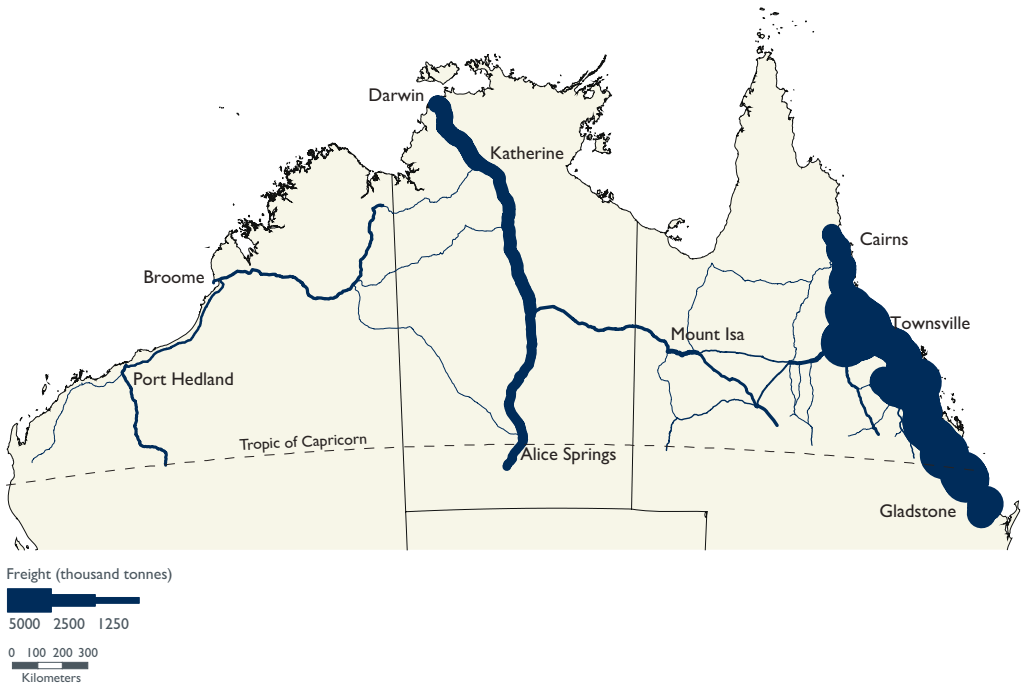
Source: BITRE (2009), unpublished data. The network of primary and secondary roads provides access to communities and businesses around Northern Australia. Map 6.4.1 illustrates the assigned light average annual daily vehicle traffic (AADT) on major highways in Northern Australia, in 2005. Light vehicle and road freight density illustrated on Maps 6.4.1 and 6.4.2 indicate that road transport is being used heavily in north-eastern Queensland, and from South Australia to Darwin, via Alice Springs. These north-south links are more heavily used than east-west links. The most important road transport link east-west joins port of Townsville with the interior via Mount Isa to the Darwin to Adelaide highway and further west, via Broome to Port Hedland and then to southern Western Australia. This link provides relatively speedy transport of production supplies for mining but is also important for transporting cattle and other agricultural products to major markets in Australia and overseas.

Map 6.4.1 Northern Australia—assigned light vehicle traffic on major highways, 2005



Source: BITRE (2009c).

Map 6.4.2 Northern Australia—road freight density (kilotonnes), 2005

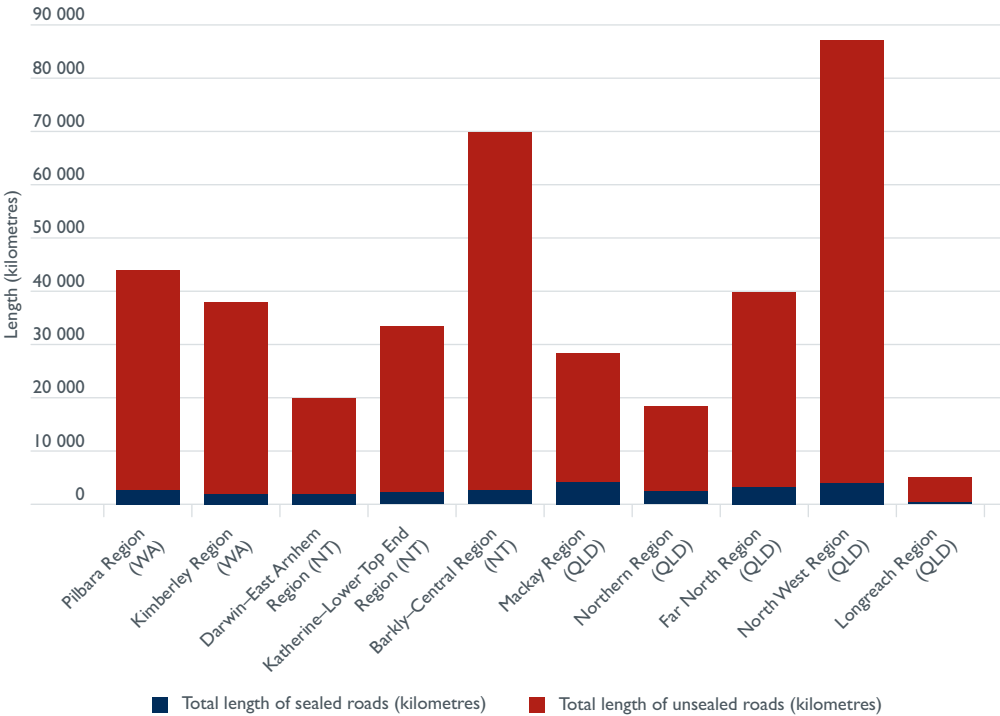


Source: BITRE (2009c).

Roads—technical characteristics

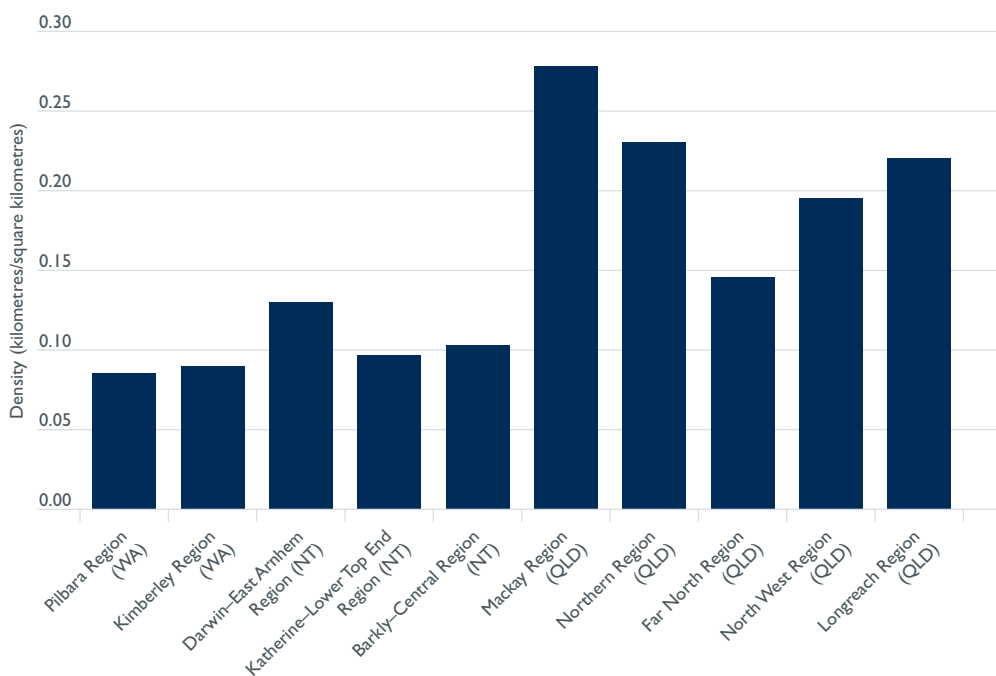
Figure 6.4.1 illustrates the predominant role of unsealed roads in Northern Australia. With the exception of smaller northern regions of Queensland, such as Rockhampton, Bundaberg and Gladstone (not illustrated here), which are relatively close to larger agglomerations, accessibility to distant and remote locations is by unsealed roads. Largely sealed principal roads provide connection with the rest of Australia via the major transcontinental road network.

Figure 6.4.1 Northern Australia—road length (kilometres), by region, 2006



Sources: BITRE (2009), unpublished data.

Road density (measured as kilometres of road per square kilometre) is very low in large regions of Northern Australia but reasonably high for smaller regions (see Figure 6.4.2) and the roads system is not used for haulage of large tonnages across Northern Australia. These large loads are delivered or exported predominantly via sea ports, as discussed earlier in this chapter.

Figure 6.4.2 Northern Australia—road density, by region, 2006

Sources: BITRE (2009), unpublished data.

Data relating to transport available in the online compendium

Trade via maritime ports

- Table Northern Australia—sum of export tonnes by ports, 1996–97 to 2007–08
- Table Northern Australia—sum of import tonnes by ports, 1996–97 to 2007–08
- Table Northern Australia—sum of discharged (unloaded) tonnes (coastal shipping) by ports, 1996–97 to 2006–07
- Table Northern Australia—sum of loaded tonnes (coastal shipping) by ports, 1996–97 to 2006–07
- Table Northern Australia—sum of export values by ports, 1996–97 to 2007–08
- Table Northern Australia—sum of import values by ports, 1996–97 to 2007–08
- Table Northern Australia—sum of export tonnes by ports, by group of commodities, 1996–97 to 2007–08

- Table Northern Australia—sum of import tonnes by ports, by group of commodities, 1996–97 to 2007–08
- Table Northern Australia—sum of discharged (unloaded) tonnes (coastal shipping) by ports, by group of commodities, 1996–97 to 2006–07
- Table Northern Australia—sum of loaded tonnes (coastal shipping) by ports, by group of commodities, 1996–97 to 2006–07
- Table Northern Australia—sum of export values by ports, by group of commodities, 1996–97 to 2007–08
- Table Northern Australia—sum of import values by ports, by group of commodities, 1996–97 to 2007–08
- Table Northern Australia—imports by value (\$) via Northern Australia's ports, 1996–97 to 2007–08
- Table Northern Australia—exports by value (\$) via Northern Australia's ports, 1996–97 to 2007–08
- Figure 6.1.24 Northern Australia—value of goods imported via Western Australia's ports, 1996–97 to 2007–08
- Figure 6.1.25 Northern Australia—value of goods imported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.26 Northern Australia—value of goods imported via Queensland's ports, 1996–97 to 2007–08
- Figure 6.1.27 Northern Australia—share of northern regions in the value of goods imported via Western Australia's ports, 1996–97 to 2007–08
- Figure 6.1.28 Northern Australia—share of northern regions in the value of goods imported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.29 Northern Australia—share of northern regions in the value of goods imported via Queensland's ports, 1996–97 to 2007–08
- Figure 6.1.18 Northern Australia—value of goods exported via Western Australia's ports, 1996–97 to 2007–08
- Figure 6.1.19 Northern Australia—value of goods exported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.20 Northern Australia—value of goods exported via Queensland's ports, 1996–97 to 2007–08
- Figure 6.1.21 Northern Australia—share of northern regions in the value of goods exported via Western Australia's ports, 1996–97 to 2007–08
- Figure 6.1.22 Northern Australia—share of northern regions in the value of goods exported via Northern Territory's ports, 1996–97 to 2007–08
- Figure 6.1.23 Northern Australia—share of northern regions in the value of goods exported via Queensland's ports, 1996–97 to 2007–08

- Table: Northern Australia—export tonnage by region and by commodity group, 1996–97 to 2007–08
- Table: export tonnage—animal & vegetable oils, fats & waxes
- Table: export tonnage—beverages & tobacco
- Table: export tonnage—chemical & related products nes
- Table: export tonnage—commodities & transactions nes
- Table: export tonnage—crude materials, inedible, except fuels
- Table: export tonnage—food & live animals
- Table: export tonnage—machinery & transport equipment
- Table: export tonnage—manufactured goods classified chiefly by material
- Table: export tonnage—mineral fuels, lubricants & related materials
- Table: export tonnage—miscellaneous manufactured articles
- Table: Northern Australia—import tonnage by region and by commodity group, 1996–97–2007–08
- Table: import tonnage—animal & vegetable oils, fats & waxes
- Table: import tonnage—beverages & tobacco
- Table: import tonnage—chemical & related products nes
- Table: import tonnage—commodities & transactions nes
- Table: import tonnage—crude materials, inedible, except fuels
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- Table: import tonnage—machinery & transport equipment
- Table: import tonnage—manufactured goods classified chiefly by material
- Table: import tonnage—mineral fuels, lubricants & related materials
- Table: import tonnage—miscellaneous manufactured articles
- Table: Northern Australia—loaded tonnage—coastal shipping, by commodity group and region, 1996–97–2006–07
- Table: loaded tonnage—animal & vegetable oils, fats & waxes
- Table: loaded tonnage—beverages & tobacco
- Table: loaded tonnage—chemical & related products nes
- Table: loaded tonnage—commodities & transactions nes
- Table: loaded tonnage—crude materials, inedible, except fuels
- Table: loaded tonnage—food & live animals

- Table: loaded tonnage—machinery & transport equipment
- Table: loaded tonnage—manufactured goods classified chiefly by material
- Table: loaded tonnage—mineral fuels, lubricants & related materials
- Table: loaded tonnage—miscellaneous manufactured articles
- Table: Northern Australia—discharged tonnage—coastal shipping, by commodity group and region, 1996–97—2006–07
- Table: discharged tonnage—animal & vegetable oils, fats & waxes
- Table: discharged tonnage—beverages & tobacco
- Table: discharged tonnage—chemical & related products nes
- Table: discharged tonnage—commodities & transactions nes
- Table: discharged tonnage—crude materials, inedible, except fuels
- Table: discharged tonnage—food & live animals
- Table: discharged tonnage—machinery & transport equipment
- Table: discharged tonnage—manufactured goods classified chiefly by material
- Table: discharged tonnage—mineral fuels, lubricants & related materials
- Table: discharged tonnage—miscellaneous manufactured articles
- Table: Northern Australia—export values by region and by commodity group, 1996–97—2007–08
- Table: export values by region—animal & vegetable oils, fats & waxes
- Table: export values by region—beverages & tobacco
- Table: export values by region—chemical & related products nes
- Table: export values by region—commodities & transactions nes
- Table: export values by region—crude mats, inedible, except fuels
- Table: export values by region—food & live animals
- Table: export values by region—machinery & transport equipment
- Table: export values by region—manufactured goods classified chiefly by materials
- Table: export values by region—mineral fuels, lubricants & related materials
- Table: export values by region—miscellaneous manufactured articles
- Table: Northern Australia—import values by region and by commodity group, 1996–97 to 2007–08
- Table: import values by region—animal & vegetable oils, fats & waxes

- Table: import values by region—beverages & tobacco
- Table: import values by region—chemical & related products nes
- Table: import values by region—commodities & transactions nes
- Table: import values by region—crude mats, inedible, except fuels
- Table: import values by region—food & live animals
- Table: import values by region—machinery & transport equipment
- Table: table import values by region—manufactured goods classified chiefly by materials
- Table: import values by region—mineral fuels, lubricants & related materials
- Table: import values by region—miscellaneous manufactured articles

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Chapter 7

Infrastructure



Chapter 7 Infrastructure

This chapter discusses the infrastructure of Northern Australia. It does so by considering electricity generation and supply; major water storage and usage; gas supply; and telecommunications in 2006. In addition, the infrastructure of ports, major airports, roads and railway are discussed.

Within Northern Australia, an electricity grid interconnected with the rest of the state system is available only in northern Queensland regions. Overall, electricity supply in Northern Australia is based largely on local generators. Most generators are of relatively small capacity and use locally available gas and liquid fuels.

Water resources and storage in Northern Australia are strongly concentrated around the coastline with major water reserves in the north-eastern regions of Queensland and the Kimberley Region. The largest water reserves in Northern Australia are stored in the Argyle Dam on the Ord River.

The major water user is agriculture and, as there are no major population agglomerations in Northern Australia, supply systems for urban areas are on a relatively small scale. Artesian water is an important source for irrigation and other agricultural use.

Gas production and transmission is a large and growing industry in Northern Australia, providing vital sources of heat and electricity for commodity production and processing in the region, as well as for consumption by the local population. Northern Australia is the largest gas producer in Australia for exports and the domestic market.

In 2006, there were a greater proportion of people with no Internet connection within Northern Australia, compared to the rest of Australia. Within Northern Australia, there were lower proportions of people with broadband access, and higher proportions of people with dial-up access.

7.1 Electricity generation and supply

Electricity supply in Northern Australia is based largely on local generators. Most generators are of relatively small capacity and use locally available gas and liquid fuels. An electricity grid interconnected with the state system is available only in northern Queensland regions.

Electricity-generating capacity in Northern Australia represents 13.4 per cent of the Australian total in 2008 (Table 7.1.1). Generating capacity based on renewable fuels is only 186.2 megawatts, with the largest installed generators producing 156 megawatts in the Far North Region of Queensland, representing 2.2 per cent of the total Australian renewable generating capacities. No data on electricity generation and end use is available at disaggregated levels.

The highest fossil fuel electricity generation capacity is in the Gladstone and Rockhampton regions of Queensland, where predominantly coal-based power stations are interconnected with the East Coast Australian electricity grid. The third largest generating region is the Pilbara (most gas-fired), which is interconnected regionally but not connected to the state's grid (see Table 7.1.2 and Map 7.1.1). In the Darwin-East Arnhem Region, the generating capacity is gas/distillate-fired and connected south to Katherine.

Table 7.1.1 Northern Australia—capacity of fossil fuel and renewable electricity power stations (megawatts) by region, 2008

<i>Region</i>	<i>Total capacity (megawatts) of fossil fuel electricity power stations</i>	<i>Per cent of state total fossil fueled</i>	<i>Total capacity (megawatts) of renewable energy electricity power stations</i>	<i>Per cent of state total renewable</i>
Northern Australia (VWA)	962	13.2	30	13.5
Pilbara Region	902	12.4	—	—
Kimberley Region	60	0.8	30	13.5
Western Australia state total	7 279	100.0	222	100.0
Northern Australia (NT)	833	100.0	0.2	100.0
Darwin-east Arnhem Region	725	87.1	—	—
Katherine-Lower Top End Region	49	5.9	—	—
Barkly-Central NT Region	59	7.0	0.2	100.0
Northern Territory total	833	100.0	0.2	100.0
Northern Australia (QLD)	1 375	11.0	156	23.8
Mackay Region	291	2.3	—	—
Northern Region	546	4.4	—	—
Far North Region	26	0.2	156	23.8
North West Region	512	4.1	—	—
Longreach Region	0.0	0.0	—	—
Queensland state total	12 502	100.0	656	100.0
Northern Australia subtotal	3 170	6.5	156	1.8
Australia total	48 487		8 540	

Source: Geoscience Australia (2008a).

Apart from the very large coal-fired units installed in Gladstone and Stanwell, the majority of the generators are relatively small. These coal-fired power stations provide about a quarter of Queensland's total electricity to the state grid. This power, generated from locally extracted coal, is essential for aluminium smelting using bauxite shipped from Weipa in the Far North Region of Queensland.

The relative proportions of installed generator capacity in Northern Australia (13.4 per cent) and total population of that region (4.7 per cent) reflects the reality of electricity being used for industrial applications, particularly to produce and process commodities, to a much larger degree than in the rest of Australia.

Availability of local gas piped to many locations in Northern Australia allows for this fuel to be used in the vast majority of installed electricity generators. A small proportion of generators use distillate and other oil-based products of local industries.

Table 7.1.2 Northern Australia—fossil fuel power stations by fuel type, technology, and capacity (megawatts), by SLA and region, 2008

<i>Region/SLA name</i>	<i>Power station name</i>	<i>Fuel type</i>	<i>Technology</i>	<i>Total capacity (megawatts)</i>
Northern Australia (WA)				
Pilbara Region				
East Pilbara (S)	Newman	Gas	Gas turbine	108
East Pilbara (S)	Telfer	Gas	Gas turbine	141
East Pilbara (S)	Nifty	Gas	Gas turbine	23
Port Hedland (T)	Port Hedland	Gas	Gas turbine	180
Ashburton (S)	Paraburdoo	Distillate	Reciprocating engine	20
Ashburton (S)	Cloud Break	Gas	Gas turbine	45
Roebourne (S)	Dampier C	Gas	Steam turbine	120
Roebourne (S)	Cape Lambert	Gas	Gas turbine combined cycle	105
Roebourne (S)	Burrup Peninsula	Gas	Steam turbine	40
Roebourne (S)	Dampier	Gas	Steam turbine	120
Kimberley Region				
Wyndham-East Kimberley (S)	Argyle	Other	Reciprocating engine	20
Broome (S)	Broome	Gas	Gas turbine	40
Northern Australia (NT)				
Darwin-East Arnhem Region				
City-Remainder	Berrimah	Gas	Gas turbine	30
Litchfield (S)-Pt B	Weddell	Gas	Gas turbine	78
Litchfield (S)-Pt B	Channel Island	Gas/other	Gas turbine combined cycle	255
Litchfield (S)-Pt B	Wickham Point	Gas	Gas turbine	180
Jabiru (T)	Jabiru	Distillate	Reciprocating engine and steam turbine	28
Pine Creek (Cgc)	Pine Creek	Gas	Gas turbine combined cycle/gas turbine	49
Nhulunbuy	Gove	Other	Steam turbine	105
Katherine-Lower Top End Region				
Borroloola (CGC)	McArthur River	Gas/other	Gas turbine/reciprocating engine	21
Katherine (T)	Katherine	Gas/other	Gas turbine/reciprocating engine	28
Barkly-Central Nt Region				
Alice Springs (T)-Stuart	Alice Springs	Gas/other	Gas turbine/reciprocating engine	59
Northern Australia (QLD)				
Mackay Region				
Mackay (C)-Pt A	Mackay	Distillate	Gas turbine	34
Bowen (S)	Collinsville	Black coal	Steam turbine	180
Broadsound (S)	German Creek	Gas	Reciprocating engine	32
Nebo (S)	Moranbah North	Gas	Gas turbine	45
Northern Region				
Stuart-Roseneath	Mt Stuart	Other	Gas turbine	288
Thuringowa (C)-Pt B	Yabulu	Black coal	Steam (cogeneration)	38
Thuringowa (C)-Pt B	Yabulu	Gas	Gas turbine combined cycle	220
Far North Region				
Weipa (T)	Weipa	Other	Reciprocating engine	26
North West Region				
Boulia (S)	Phosphate Hill	Gas	Gas turbine	42
Boulia (S)	Cannington	Gas	Cogeneration	38
Cloncurry (S)	Ernest Henry	Other	Reciprocating engine	32
Mount Isa (C)	Mica Creek A, B and C	Gas	Steam turbine	325
Mount Isa (C)	Mt Isa	Gas	Gas turbine	30
Mount Isa (C)	Mines Station-Mt Isa	Gas	Gas turbine	45

Notes: This table shows the fossil fuel power stations located in Northern Australia, by fuel type, technology and capacity (megawatts) and by SLA.

Source: Geoscience Australia (2008a).

The renewable electricity generating capacity of Northern Australia is predominantly comprised of hydro schemes, based on local dams and rivers in the northern regions of Queensland and the Kimberley in Western Australia (see Table 7.1.3). Generating capacities based on hydro schemes are relatively small but serve local population needs well, given the remoteness of most of these locations or long distances to the nearest state electricity grid. Wind and photovoltaic generation amount to only 12.2 megawatts but are important to local domestic use.

Table 7.1.3 Northern Australia—renewable electricity power stations by fuel type, technology, and capacity (megawatts), by SLA and region, 2006–07

<i>Region/SLA Name</i>	<i>Power station name</i>	<i>Fuel type</i>	<i>Technology</i>	<i>Total capacity (megawatts)</i>
Northern Australia (WA)				
Kimberley Region				
Wyndham-East Kimberley (S)	Ord Dam	Hydro	Water	30
Northern Australia (NT)				
Barkly-Central NT Region				
Tanami	Kings Canyon	Photovoltaic	Solar	0
Northern Australia (QLD)				
Far North Region				
Cairns (C)-Barron	Barron Gorge	Hydro	Water	60
Cardwell (S)	Kareeya	Hydro	Water	84
Herberton (S)	Windy Hill	Wind	Wind	12

Source: Energy Supply Association of Australia (ESAA) (2008a).

7.2 Major water storage and use

Water resources and storage in Northern Australia are strongly concentrated around the coastline with major water reserves in the Kimberley Region and north eastern regions of Queensland. The major water user is agriculture, as there are few major population agglomerations in Northern Australia. Artesian water is an important source for irrigation and other agricultural use.

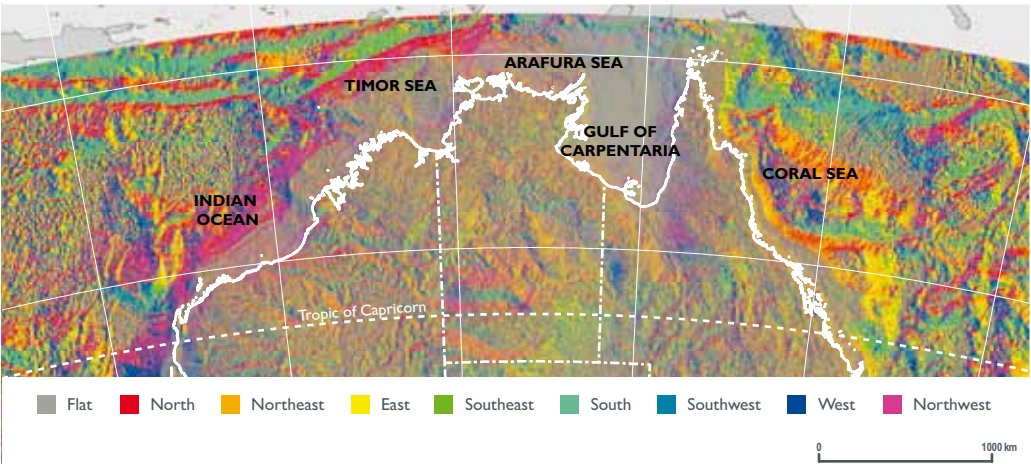
Map 7.2.1 illustrates Australia’s landmass topography. In the northern regions of Western Australia, slopes direct runoff water toward the Indian Ocean, especially in the Pilbara Region.

In the Kimberley Region, the land slopes towards the Timor Sea. The largest water reserves in Northern Australia are stored in the Argyle Dam on the Ord River, which is heading north at that point. The total water storage capacity of Argyle is 10.7 billion megalitres (see Table 7.2.1).

The northern regions of the Northern Territory do not have substantial water storage capacities apart from two small dams near Darwin.

Australia’s main rivers and water reservoirs are illustrated on Map 7.2.2.

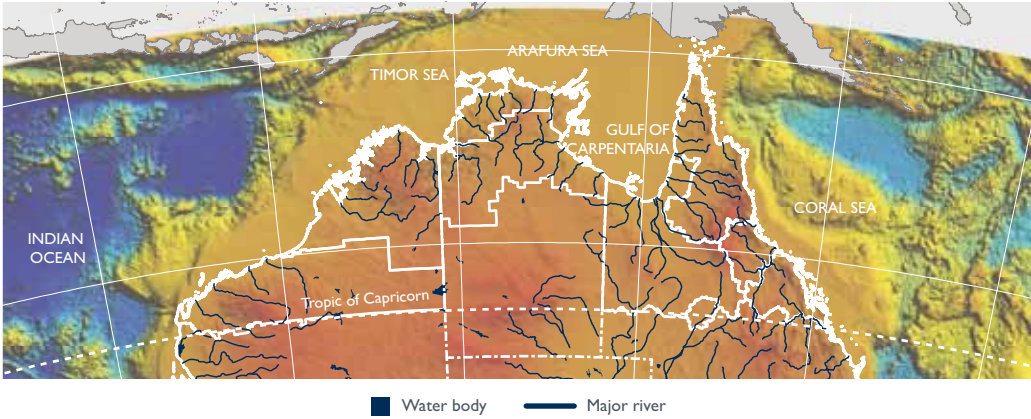
Map 7.2.1 Northern Australia’s landmass topography



Source: Geoscience Australia (unpublished).

North Queensland’s sloping terrain and rivers flow on both sides of the Great Divide and provide an ample reserve of run-off water in a number of regions. Part of the run-off waters head south west towards the centre of Australia and southwards, filling the seasonal rivers, lakes and storage ponds. Typically, flood headwaters from Queensland go south along the Diamantina and Georgina seasonal rivers, filling the Goyders Lagoon on their way through the desert to Lake Eyre, some 700 kilometres north of Adelaide.¹⁵

Map 7.2.2 Northern Australia—main rivers and reservoirs



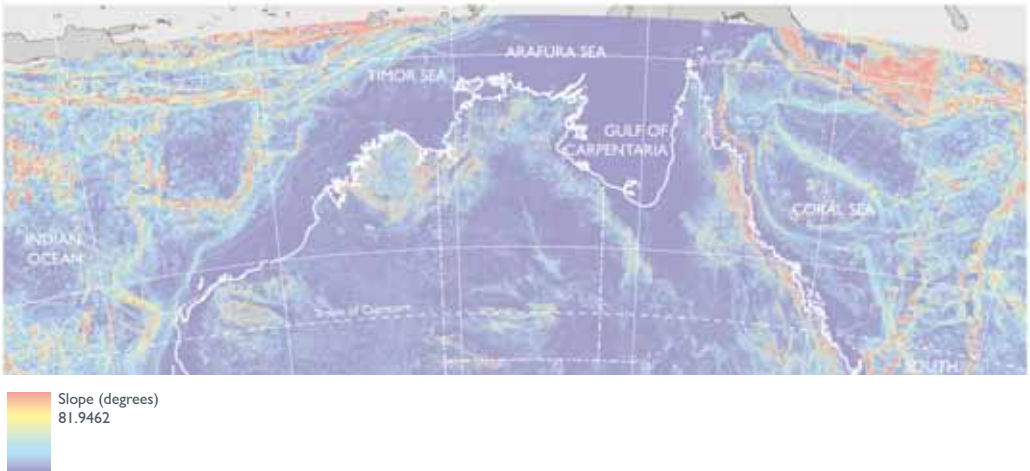
Source: Geoscience Australia (unpublished).

Dams and weirs built across rivers, sometimes multistage, provide a relatively stable source of water for agriculture, mining and other uses. For example, Cairns and its surrounds are supplied by dams at Copperlode Falls, Tinaroo and Behana Creek.

15. Lake Eyre is a 9690 square kilometre basin situated 15 metres below sea level, and is the lowest point in Australia. The lake has filled substantially only three times since it was first discovered about 160 years ago.

Although water resources of Northern Australia are large, as compared with southern states, the land is predominantly flat and low, as illustrated on Map 7.2.3. These characteristics significantly limit the potential of electricity generation, as discussed in Section 1 above.

Map 7.2.3 Northern Australia—land slope



Source: Geoscience Australia (unpublished).

The complexity of the system of barring rivers and piping water to various regions of northern Queensland does not allow for allocation of these water resources to particular regions, therefore the information in Table 7.2.1 is presented as a summary of information for northern Queensland regions. The total water storage capacity of northern Queensland regions represented about one-third of that of the Kimberley Region (Lake Argyle) in Western Australia. However, the volume of irrigation water used in northern Queensland regions was about 10 times larger than that of Kimberley's due to the larger (about 20 times the size of the Kimberley's) area of irrigation in these regions (see Table 7.2.2).

The area of agricultural land in Northern Australia was 154.3 million hectares in 2005–06, with only a small fraction of this irrigated. In the northern regions of Western Australia and Northern Territory about half of agricultural establishments irrigated their farms. In Queensland's northern regions about one-third of farms are irrigated, but the total area and volume of water used is much larger than in the other state and territory. The largest volumes of water per hectare irrigated were applied in the Kimberley (Western Australia) and Northern Queensland regions.

Table 7.2.1 Northern Australia—dams by location, storage capacity (megalitres), construction type, surface area and year of construction completion, by state

<i>Region/ dam name</i>	<i>Nearest town</i>	<i>Total storage capacity (megalitres)</i>	<i>Construction type</i>	<i>Surface area at full level (hectares)</i>	<i>Year completed</i>
Northern Australia (WA)	Total	10 826 800		84 400	
Argyle Dam (Ord River)	Kununurra	10 763 000	Rockfill	70 300	1971
Harding Dam	Roebourne	63 800	Rockfill	14 100	—
Northern Australia (NT)	Total	280 900		4 445	
Darwin River Dam	Darwin	265 000	Earth and Rockfill	4 000	1972
Manton Dam	Darwin	15 900	Concrete Arch Construction	445	1942
Northern Australia (QLD)	Total	3 355 512		37 385	
Bowen River Weir (Collinsville Weir)	Collinsville	943	Mass Conc.	50	1983
Eungella Dam	Eungella	1 12 400	Earth and Rockfill	848	1969
Gattonvale Offstream Storage	Collinsville	5 234	Earthfill	65	2005
Ben Anderson Barrage	Bundaberg	30 300	Earth and Rockfill Conc. Crest (Shutters)	775	1976/83
Bucca Weir	North Kolan	1 1 600	R.C.C.	250	1987
Kolan Barrage	Bundaberg	4 020	Earth and Rockfill	210	1973
Burdekin Falls Dam	Ravenswood	1 860 000	Mass Conc.	22 000	1987
Clare Weir	Claredale	15 900	Mass Conc. (Shutters)	520	1978/86
Giru Weir	Giru	1 020	S.S. Piling Cas.	68	1977
Val Bird Weir	Giru	615	S.S. Piling Cas. (R.D.)	110	1983
Kinchant Dam	North Eton	62 800	Earth and Rockfill	920	1977/86
Julius Dam	Mount Isa	107 500	Multiple Arch Conc. Buttress	1 255	1976
Eden Bann Weir	Yaamba	35 900	Mass Conc.	670	1995
Tinaroo Falls Dam	Atherton	438 900	Mass Conc.	3 500	1958
Tartrus Weir	Marlborough	12 000	Mass Conc.	280	1986
Dumbleton Weir	Mackay	8 840	Mass Conc.	151	1982/93/98
Marian Weir	Marian	3 980	Mass Conc.	130	1952
Mirani Weir	Mirani	4 660	Mass Conc. (R.D.)	151	1987
Teemburra Dam	Mirani	147 500	Conc. Faced Rockfill	1 107	1996
Peter Faust Dam	Proserpine	491 400	Earth and Rockfill	4 325	1990
Northern Australia	Total	14 463 212		126 230	

Note: This table shows all of the dams in Northern Australia, by location, storage capacity, construction type, surface area and year of completion of construction.

Source: Sunwater (2008a); SunWater (2008b); Power and Water Corporation (2009); Water Corporation (2008).

Table 7.2.2 Northern Australia—water usage by agricultural businesses, 2005–06

Region	Agricultural businesses (number)	Agricultural businesses irrigating (number)	Area of agricultural land (thousand hectares)	Area irrigated (thousand hectares)	Irrigation volume applied (megalitres)	Application rate megalitres per hectare
Northern Australia (VWA)	271	114	35 331	10	104 773	10.5
Pilbara Region	66	—	15 309	—	—	—
Kimberley Region	205	114	20 022	10	104 773	10.5
Northern Australia (NT)	614	342	43 378	5	2 754	0.6
Darwin-East Arnhem Region	381	266	2 757	4	1 034	0.3
Katherine-Lower Top End Region	138	60	9 233	1	1 195	1.2
Barkly-Central NT Region	95	16	31 388	n.p.	525	—
Northern Australia (QLD)	8 899	3 281	75 615	212	1 020 852	4.8
Mackay Region	2 830	1 177	9 600	86	166 674	1.9
Northern Region	1 898	857	6 908	89	710 965	8.0
Far North Region	3 187	1 210	16 051	34	137 088	4.0
North West Region	873	35	40 677	3	6 125	2.0
Longreach Region	111	2	2 379	—	0	—
Northern Australia subtotal	9 784	3 737	154 324	227	1 128 379	5.0

Notes: This table shows water usage by type of agricultural business by region in Northern Australia. Many of the estimates for the SLAs within each subregion had a relative standard error of 10 per cent to 50 per cent, and thus should be used with caution. For more detail on these errors, see SLA table. n.p. denotes regions where data was not available for publication—denotes regions where the values were nil or rounded to zero (including null cells).

Source: ABS (2008h).

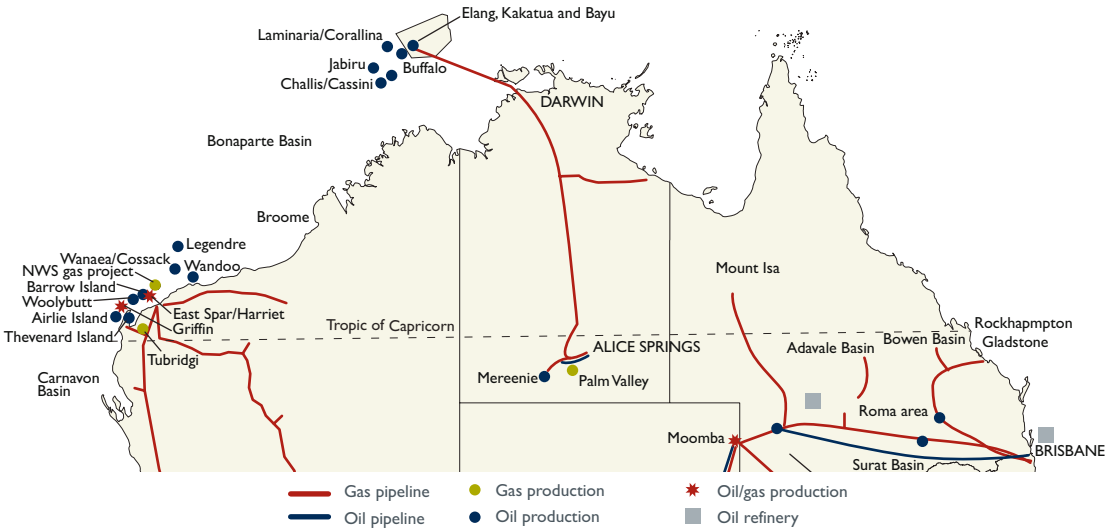
7.3 Gas supply

Gas production and transmission is a large and growing industry in Northern Australia providing vital sources of heat and electricity for commodity production and processing in the region, as well as for consumption by the local population. Northern Australia is the largest gas producer in Australia for exports and the domestic market. Map 7.3.1 illustrates the major gas pipelines in this region.

The largest pipelines join gas and oil fields offshore with processing facilities on shore and, further south, with major users such as mines, processors, power plants and communities (see Table 7.3.1). The Darwin-East Arnhem Region receives gas from the Timor Sea rigs via a pipeline joining these fields, with consumers located as far south as Alice Springs in the Barkly-Central NT Region. Another large pipeline system joins the North West shelf gas rigs with on-shore users south of Perth and, via a parallel pipeline, with Kalgoorlie and mines around that region as well as Esperance on the Southern Ocean. In addition to providing heat for mineral processing, these gas pipelines are a source of power for numerous power stations along their way, thus partially ‘substituting’ for an electricity grid in remote localities.

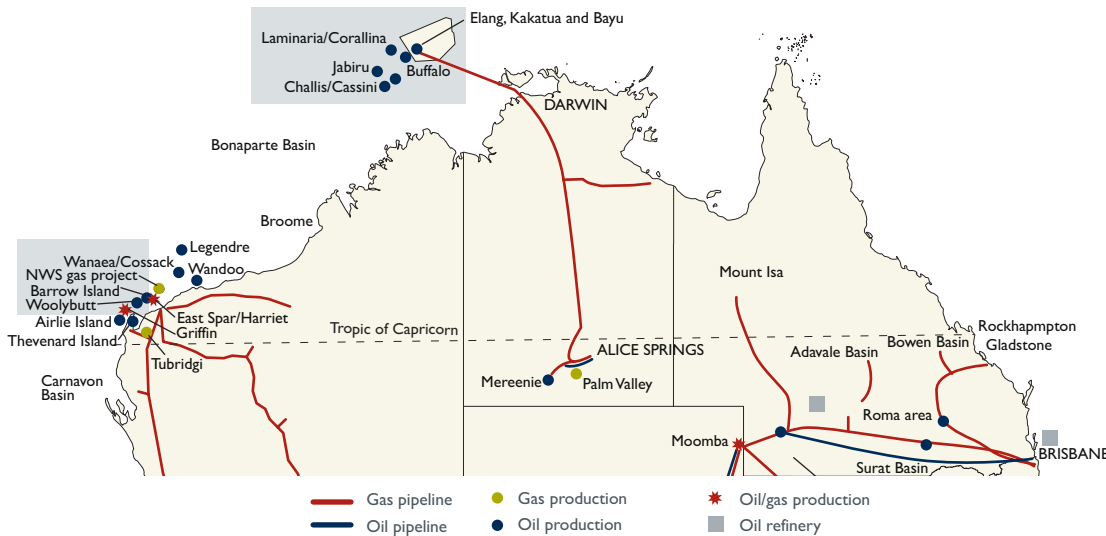
In Queensland’s North West Region, a gas pipeline from Ballera to the Mt Isa area is heading north and south-east from Ballera providing power to the mining industry and local communities on its way.

Map 7.3.1 Northern Australia—gas pipelines, 2009



Source: Geoscience Australia (2008b).

Map 7.3.2 Northern Western Australia and the Northern Territory—gas pipelines, 2009



Source: Geoscience Australia (2008b).

Table 7.3.2 lists proposed natural gas pipelines, which are new projects or additions to the existing capacity, as at June 2007. A new large development (currently on hold) would connect gas deposits developed jointly with Papua New Guinea, and connect the Northern Region of Queensland with markets along the eastern coast of Australia. Another large development (also on hold) would join the Timor Sea gasfields with Moomba in South Australia, and from there, the Queensland and New South Wales gas supply systems.¹⁶

16. Information on gas consumption is available at the state level only. No sales or consumption of gas could be attributed to a particular region or SLA.

Table 7.3.1 Main natural gas pipelines in Northern Australia, June 2007

Route	Year commissioned	Length (kilometres)	External diameter (millimetres)	Pipeline operator
Northern Australia (WA)				
North Rankin to Withnell Bay	1984	134	1 016	Woodside Energy
Dampier to Bunbury (including laterals)	1984	1 789	660	Alinta Asset Management
Karratha to Cape Lambert	1984	57	273	Alinta Asset Management/ Robe River Iron Ore
Tubridgi Pipeline (Tubridgi to Dampier/ Bunbury)	1991	88	168	BHP Billiton
Griffin Pipeline (Tubridgi to Dampier/Bunbury)	1991	88	273	BHP Billiton
Varanus Island to Dampier/Bunbury	1993	100	324	Apache Energy
Thevenard Island to Tubridgi	1993	44	168	WAPET
Griffin to Tubridgi	1993	70	200	BHP Billiton
Karratha to Port Hedland	1995	219	457	Epic Energy
East Spar to Varanus Island	1996	22	356	Apache Energy
GGT Pipeline to Newman lateral	1996	47	219	Goldfields Gas Transmission
Goldfields Gas Pipeline (Yarraloola to Newman/Kalgoorlie)	1996	1 378	400/350	Goldfields Gas Transmission
Pilbara Pipeline System to Wodgina lateral	1996	80	457	Epic Energy
Port Hedland main to Burrup Peninsula	1998	24	610	Epic Energy
Varanus Island to Dampier/Bunbury	1999	100	400	Apache Energy
Midwest pipeline (Dampier/Bunbury main to Windimurra)	1999	353	203/178	Australian Pipeline Trust
Port Hedland to Telfer gold mine	2004	443	—	Australian Pipeline Trust
Telfer to Birla Nifty	2006	47	156	Australian Pipeline Trust
Dampier Bunbury Stage 4 expansion	2006	400	750	Alinta Asset Management
Northern Australia (NT)				
Palm Valley to Alice Springs	1983	146	219	OEAM
Mereenie to Tylers Pass	1987	116	273	NT Gas
Palm Valley to Mataranka/Darwin	1987	1 512	356/324	NT Gas
Daly Waters to McArthur River Mine	1995	333	168	NT Gas
Bayu-Undan field (Timor Gap) to Darwin	2006	92	660	ConocoPhillips
Timor Sea to Darwin Pipeline (LNG processing)	2006	483	660	ConocoPhillips
Northern Australia (QLD)				
Gilmore to Blackall/Barcaldine	1995	240	168	Australian Gasfields
Carpentaria Pipeline (Ballera to Mt Isa)	1997	841	324	Australian Pipeline Trust
Ballera/Mt Isa main to Cannington	1998	100	150	Australian Pipeline Trust
Bunya Vernon Fields (Cooper Basin) to Ballera/ Mt Isa Main	1999	130	150/100	Santos
North Queensland gas pipeline (Moranbah to Townsville)	2005	393	273	Enertrade

Note: Northern Australia is based on regions which fall above the Tropic of Capricorn. Where the data did not precisely meet this definition, approximations were used. All pipelines which passed through an area with latitude of less than 24 degrees were included.

Source: ESAA (2008b),

Table 7.3.2 Northern Australia—natural gas pipelines, June 2007

Route	Proposed year commissioned	Length (kilometres)	Proponent	Capacity (terajoules per day)	Status
Northern Australia (WA)					
Dampier Bunbury Stage 5 expansion	2008	1 150	DBNGP	110	Under construction
Dampier Bunbury Stage 5A expansion—additional looping	2008	570	DBNGP	80	Under construction
Dampier Bunbury Stage 5A(2) expansion—additional looping	2008	100	DBNGP	—	Proposed
Great Northern Pipeline	2010	630	ARC Energy	150/300	Proposed
Scarborough Gas Field LNG Development	—	280	BHP Billiton	—	Proposed
Dampier-Bunbury Natural Gas Pipeline extension to Albany	—	320	—	—	Proposed
Gorgon Gas Field Development	—	—	Gorgon Gas Venture	—	Proposed
Pluto Gas Pipeline (Gorgon to Dampier)	—	200	Woodside Energy	—	Proposed
Angel Gas Pipeline	—	49	Woodside Energy	—	Proposed
Northern Australia (NT)					
Bonaparte Gas Pipeline (Wadeye to Amadeus-Darwin)	2009	275	Australian Pipeline Trust	82	Advanced planning
Darwin to Moomba (linking Bayu-Undan)	—	3 500	Australian Pipeline Trust / Epic	100	On hold
PNG-Queensland to Gove Lateral	—	3 200	Cape York Pipeline Company	—	On hold
Blacktip-Wadeye Gas Pipeline	—	108	Eni Australia	—	Proposed
Northern Australia (QLD)					
Papua New Guinea to Queensland (Brisbane)	—	3 200	Cape York Pipeline Company	800	On hold
Townsville to Ballera	—	—	Cape York Pipeline Company	1 200	On hold

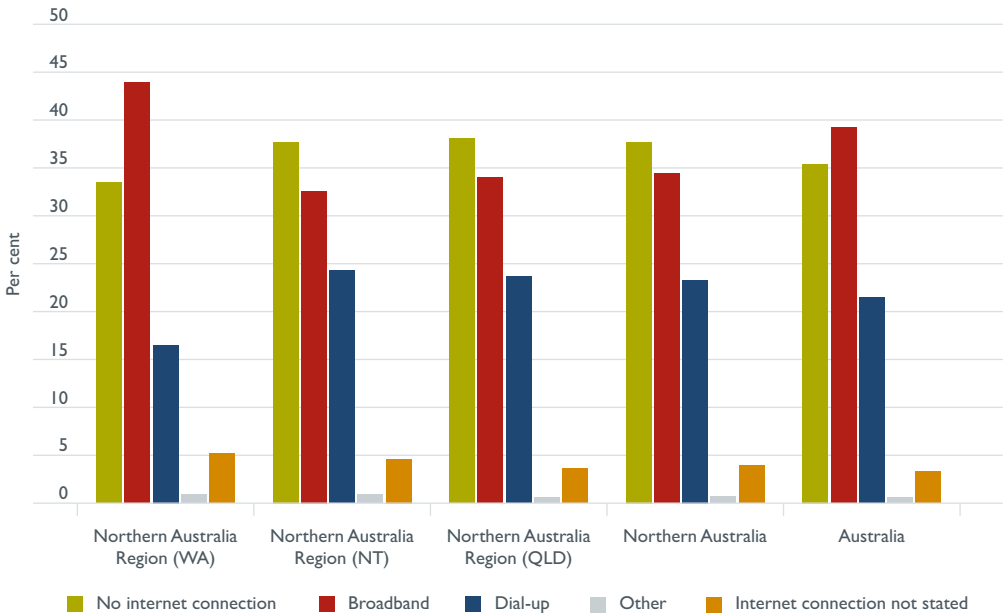
Note: Northern Australia is based on regions which fall above the Tropic of Capricorn. Where the data did not precisely meet this definition, approximations were given. All pipelines which passed through an area with a latitude of less than –24 degrees were included.

Source: ESAA (2008b).

7.4 Telecommunications

The availability of the Internet is generally lower in Northern Australia than in the rest of Australia. There was a greater proportion of households with no Internet connection within Northern Australia than in Australia as a whole. In 2006 (see Table 7.4.1), there were also lower numbers of households with broadband¹⁷ within Northern Australia, and slightly higher numbers of households with a dial-up Internet connection (see Figure 7.4.1).

Figure 7.4.1 Northern Australia—household Internet connection by type, by state (per cent), 2006



Note: This figure shows the proportion of households which have an Internet connection (by type), by state.
Source: ABS (2006b).

At the state level, there were higher proportions of households without an Internet connection within northern Queensland and the Northern Territory. In contrast, there was a lower proportion of people within northern Western Australia without the Internet, as compared with Northern Australia and the rest of Australia. The highest proportion of households with broadband is in Western Australia (43.9 per cent), which is well above the national average (39.2 per cent), while the Northern Territory had the highest proportion of households with a slower dial-up connection (24.3 per cent).

17. The ABS defines 'broadband' as ADSL, cable, wireless and satellite connections. 'Dial-up' includes analog modems and ISDN connections. 'Other' includes Internet access through mobile phones, set-top boxes, games, machines or connections other than dial-up or broadband.

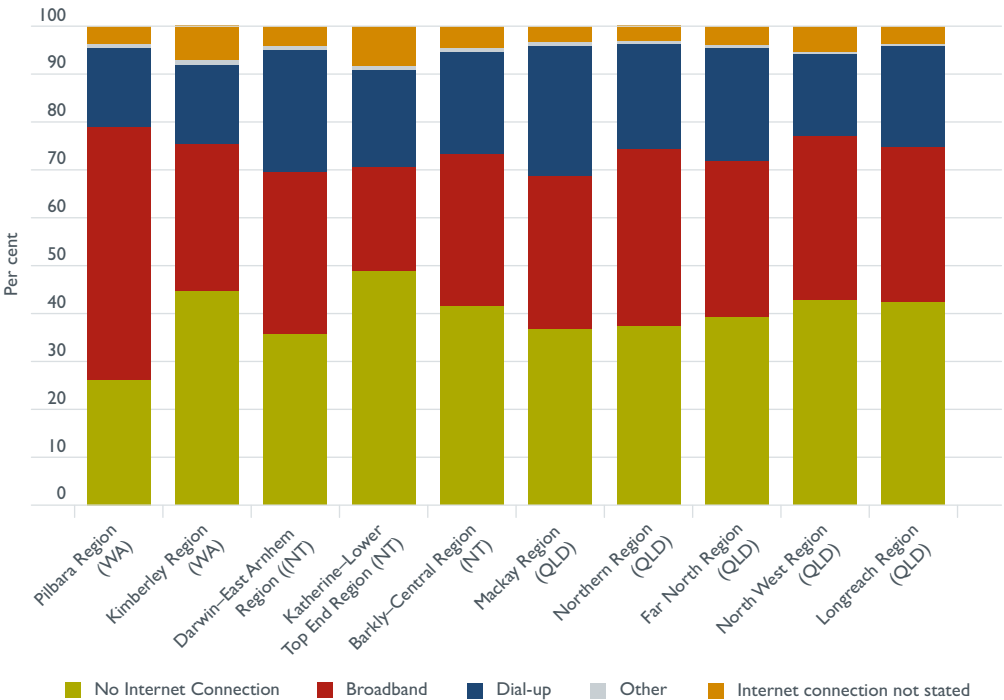
Table 7.4.1 Northern Australia—type of internet connection by household, by region, 2006

Region	No Internet connection	Broadband	Dial-up	Other	Internet connection not stated	No internet connection (per cent)	Broadband (per cent)	Dial-up (per cent)	Other (per cent)	Internet connection not stated (per cent)	Total
Northern Australia (WA)	6 629	8 687	3 266	174	1 020	33.5	43.9	16.5	0.9	5.2	19 776
Pilbara Region	3 095	6 240	1 969	97	448	26.1	52.7	16.6	0.8	3.8	11 849
Exmouth	242	298	141	10	28	33.7	41.4	19.6	1.4	3.9	719
Port Hedland	890	1 485	471	22	149	29.5	49.2	15.6	0.7	4.9	3 017
Kimberley Region	3 534	2 447	1 297	77	572	44.6	30.9	16.4	1.0	7.2	7 927
Western Australia state total	236 997	284 425	155 460	4 424	21 862	33.7	40.4	22.1	0.6	3.1	703 168
Northern Australia (NT)	20 749	17 906	13 338	474	2 523	37.7	32.6	24.3	0.9	4.6	54 990
Darwin-East Arnhem Region	14 472	13 722	10 304	372	1 700	35.7	33.8	25.4	0.9	4.2	40 570
Darwin	7 665	8 935	5 220	252	1 076	33.1	38.6	22.6	1.1	4.6	23 148
Katherine-Lower Top End Region	1 933	860	810	28	333	48.8	21.7	20.4	0.7	8.4	3 964
Katherine	661	584	313	13	234	36.6	32.4	17.3	0.7	13.0	1 805
Barkly-Central NT Region	4 344	3 324	2 224	74	490	41.5	31.8	21.3	0.7	4.7	10 456
Alice Springs	2 336	2 916	1 713	61	320	31.8	39.7	23.3	0.8	4.4	7 346
Tennant Creek	408	164	148	6	67	51.5	20.7	18.7	0.8	8.4	793
Northern Territory total	21 267	18 144	13 468	492	2 554	38.0	32.4	24.1	0.9	4.6	55 925
Northern Australia (QLD)	83 594	74 517	51 965	1 376	7 985	38.1	34.0	23.7	0.6	3.6	219 437
Mackay Region	21 596	18 838	16 118	395	1 988	36.6	32.0	27.3	0.7	3.4	58 935
Mackay Town	8 236	8 383	5 207	144	707	36.3	37.0	23.0	0.6	3.1	22 677
Northern Region	25 587	25 447	15 053	379	2 202	37.3	37.1	21.9	0.6	3.2	68 668
Townsville	15 379	18 444	9 362	252	1 385	34.3	41.1	20.9	0.6	3.1	44 822
Charters Towers	1 377	767	471	13	118	50.1	27.9	17.2	0.5	4.3	2 746
Far North Region	31 486	26 283	18 781	529	3 206	39.2	32.7	23.4	0.7	4.0	80 285
Weipa	239	456	142	10	24	27.4	52.4	16.3	1.1	2.8	871
Cairns	13 559	16 722	8 660	271	1 628	33.2	40.9	21.2	0.7	4.0	40 840
North West Region	4 405	3 550	1 756	66	544	42.7	34.4	17.0	0.6	5.3	10 321
Mount Isa	2 199	2 116	1 176	45	310	37.6	36.2	20.1	0.8	5.3	5 846
Longreach Region	520	399	257	7	45	42.3	32.5	20.9	0.6	3.7	1 228
Longreach	483	310	213	7	43	45.7	29.4	20.2	0.7	4.1	1 056
Queensland state total	475 307	557 972	307 723	7 797	42 834	34.2	40.1	22.1	0.6	3.1	1 391 633
Northern Australia subtotal	110 972	101 110	68 569	2 024	11 528	37.7	34.4	23.3	0.7	3.9	294 203
Australia total	2 531 018	2 802 177	1 535 028	42 727	233 146	35.4	39.2	21.5	0.6	3.3	7 144 096

Note: This table shows the number of households and the percentage of households which have internet connections (by type), by region. For regions SLAs data was aggregated and for major towns in those regions UCL data was used, wherever available.

Source: ABS (2006b).

Figure 7.4.2 Northern Australia—household Internet connection by type, by region (per cent), 2006



Note: Note: This figure shows the proportion of households which have an Internet connection (by type), by region.
Source: ABS (2006b).

At the regional level there was a large variability in terms of the household access to the Internet (see Figure 7.4.2). The Pilbara Region had the lowest proportion of households with no Internet connection (26.1 per cent), while the Katherine-Lower Top End Region had the highest (48.8 per cent). At the town level, Tennant Creek and Charters Towers also had very high proportions of households without the Internet. The highest proportion of households with a dial-up Internet connection was reported in the Mackay Region (27.3 per cent), while the lowest proportion was in the Kimberley Region (16.4 per cent). The region with the highest proportion of households with broadband was the Pilbara (52.7 per cent), while the region with the lowest proportion was the Katherine-Lower Top End Region (21.7 per cent).

Data relating to infrastructure available in the online compendium

Tables

7.1 Electricity generation and supply

- Northern Australia—capacity of fossil fuel and renewable electricity power stations (megawatts), by SLA, 2008
- Northern Australia—fossil fuel power stations by fuel type, technology, and capacity (megawatts), by SLA, 2008.

7.2 Major water storage and use

- Northern Western Australia—dam name, nearest town, current storage and data, storage capacity, type of construction, year built, catchment area, surface area at full, wall height, crest length, spillway type, spillway capacity, highest storage reading, lowest storage reading
- Northern Northern Territory—dam name, nearest town, total storage capacity, construction type, surface area at full level, year completed, height of wall, crest length, catchment area, spillway capacity, and pipeline length
- Northern Queensland—dam details including name, total storage capacity, construction type, nearest town, full supply level, storage level above original bed, area at full level, year completed, full capacity, current storage and date, current storage per cent full, blue green algae level, 2008
- Northern Australia—water usage, by SLA, 2005–06.

7.4 Telecommunication

- Northern Australia—type of Internet connection, by SLA, 2006.

bitre

Chapter 8

Natural resources



Chapter 8 Natural resources

This chapter discusses natural resources within Northern Australia. It does so by considering land types and usage; rainfall and temperature trends and long-term outlooks; cyclone activity; minerals and energy resources; soil characteristics; groundwater; and fisheries.

In terms of land use, the largest area under dry cropping was in northern Queensland's Mackay Region. Conservation and natural environments occupy large proportions of land in the Darwin-East Arnhem and Pilbara regions. Lakes, reservoirs and rivers (many are seasonal) are the largest proportions of land in the Kimberley and Pilbara regions. Mines occupy relatively sizable areas in the Pilbara, Darwin-East Arnhem, Mackay, Northern Queensland, Far North Queensland and Gladstone regions.

During the period 1961–1990, 50 per cent of Australia's rainfall occurred within Northern Australia. The far northern parts of Western Australia, the Northern Territory, and north-east Queensland all experience particularly high levels of average rainfall. Northern Australia's subregions receive the majority of their rainfall during the wet season, from approximately November through April. Little rainfall occurs during the dry season, from May through October.

Higher temperatures are observed across Northern Australia in comparison to the rest of Australia. Temperatures are warm throughout the year in Northern Australia, with particularly high maximums observed during the wet season and slightly lower, but still comparatively high, temperatures observed during the dry seasons.

According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO), based on modelling associated with current emission trends, by the year 2030 annual rainfall within Northern Australia is predicted to increase in parts of the Kimberley and Mackay regions, and in the Darwin-East Arnhem and Far North regions. It is predicted that most other parts of Northern Australia will experience a decrease in annual rainfall.

The CSIRO predicts that there will be an increase in the average winter and summer temperatures across Northern Australia by 2030, particularly in inland areas.

On average there are about thirteen cyclones which form in the Australia region each cyclone season, although many do not make landfall. The majority of cyclone activity across Australia occurs within regions in Northern Australia, particularly in the regions around north-east Queensland and north-west Western Australia.

Mineral and energy resources of Northern Australia are abundant and new discoveries and improvements in technology result in continuous upgrading of many minerals' *economic documented reserves*.

Northern regions of Western Australia and the Northern Territory types of soil support pastoral uses and some irrigated cropping while Queensland's northern regions are suitable for sugar cane cropping and other uses facilitated by higher water availability in most regions.

Groundwater capacity varies considerably over the Northern Australian region. Across much of the Northern Territory's interior and the northern Kimberley in Western Australia, groundwater basins have a sustainable yield of less than 500 gigalitres per year. Meanwhile, much of the Arnhem and Gulf coastal area of the Northern Territory have underground reserves which can produce a sustainable yield of between 2000 and 2500 gigalitres per year.

The Great Artesian Basin stretches across much of Queensland (particularly the North West and Far North regions within Northern Australia), with a sustainable yield of between 200 000 and 500 000 megalitres of water per year.

Availability of groundwater in many rural and urban communities leads to an increasing reliance on supplies from this source for irrigated agriculture, urban consumption, mining, and aquaculture demands.

Fisheries in Northern Australia are subject to the same management rules as the rest of Australia. The Australian Fisheries Management Authority manages more than twenty fisheries, nine of which include waters off Northern Australia. Of these nine, four fisheries are exclusively associated with Northern Australia.

8.1 Land use

Land use information provided in Table 8.1.1 illustrates the types of land resource availability in each subregion of Northern Australia and their main utilisation. The largest share of land use in Northern Australia was grazing natural vegetation (57.4 per cent), followed by conservation and natural environments (40.2 per cent). Grazing natural vegetation was particularly high within Northern Queensland (82.1 per cent). Much of this land use can be attributed to the beef industry. Rangelands grazing across much of this terrain is seasonally variable and opportunistic, requiring relatively large tracts of country per animal. For the most part, average stocking rates do not exceed 10 steers per square kilometre (Western Australia Department for Planning and Infrastructure 2005 p.2, Rural Management Partners 2005 p.6).

The highest share of land use in northern Western Australia was in conservation and natural environments (57.3 per cent). The largest area under dry cropping was in Queensland's Mackay Region (see Map 8.1.6), whilst only a very small area was used for dry cropping in the Darwin-East Arnhem Region (see Map 8.1.3).

Mine land use is high in the Pilbara (see Map 8.1.1), Darwin-East Arnhem, Mackay, Northern (see Map 8.1.7) and Far North region (see Map 8.1.8), relative to the rest of Australia. Although the total area of mines in Northern Australia represent only a very small share of total land area (0.01 per cent), they occupied 35.5 thousand hectares.

Lakes, reservoirs and rivers (many seasonal) have higher proportions of land surface in the Kimberley (see Map 8.1.2) and Pilbara regions, as compared with other regions. Relative to other regions, lakes are a more significant proportion of land area in the Barkly-Central NT Region (see Map 8.1.5) of the Northern Territory, Northern and North West regions in Queensland.

Details on land tenure, including Indigenous ownership, may be found in Chapter 1. More land use data can be found in the background tables.

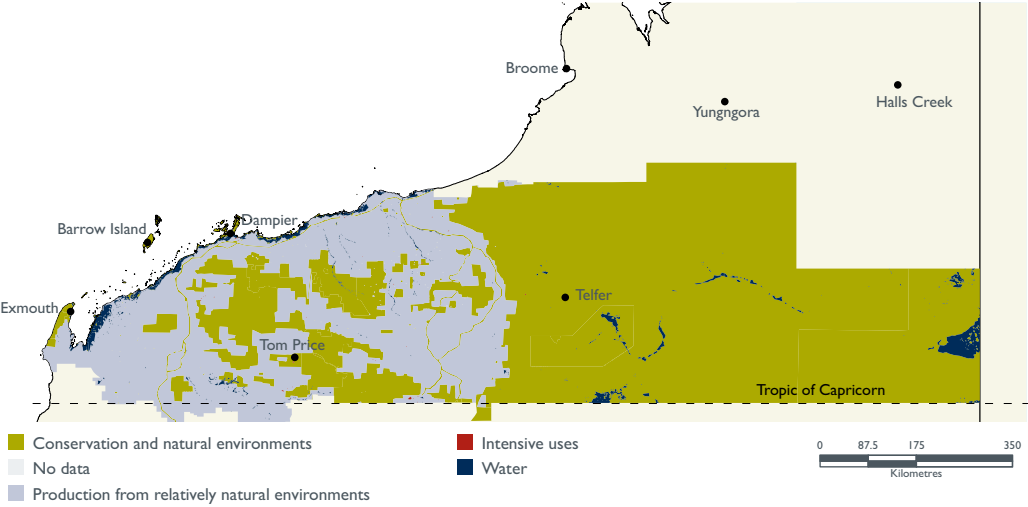
Table 8.1.1 Northern Australia—selected land use (per cent), by region, 2001

Region	Land use (percentage)										
	Grazing natural vegetation	Cropping	Irrigated cropping	Irrigated perennial horticulture	Irrigated seasonal horticulture	Mining	Lake	Reservoir	River	Conservation and natural environments	Other Uses
Northern Australia (WA)	40.8	0.00	0.00	0.00	0.00	0.01	0.64	0.09	0.08	57.3	1.07
Pilbara Region	31.6	0.00	0.00	0.00	0.00	0.01	0.97	0.00	0.08	66.6	0.70
Kimberley Region	52.7	0.00	0.00	0.00	0.00	0.00	0.21	0.21	0.07	45.3	1.55
Northern Australia (NT)	53.3	0.00	0.00	0.01	0.00	0.00	0.30	0.00	0.07	45.2	1.11
Darwin-East Arnhem Region	19.1	0.01	0.00	0.04	0.00	0.02	0.02	0.03	0.22	74.7	5.83
Katherine-Lower Top End Region	66.0	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.10	32.9	0.98
Barkly-Central NT Region	54.6	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.01	44.8	0.10
Northern Australia (QLD)	82.1	0.30	0.18	0.02	0.00	0.03	0.05	0.04	0.09	13.5	3.70
Mackay Region	76.0	1.45	0.32	0.03	0.02	0.21	0.00	0.11	0.16	12.7	9.01
Northern Region	81.9	0.40	1.35	0.03	0.01	0.01	0.18	0.21	0.05	8.5	7.30
Far North Region	62.5	0.37	0.11	0.04	0.00	0.01	0.01	0.02	0.17	31.5	5.23
North West Region	94.9	0.00	0.00	0.00	0.00	0.00	0.08	0.01	0.03	3.9	1.13
Longreach Region	91.6	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	8.4	0.01
Northern Australia total	57.4	0.09	0.05	0.01	0.00	0.01	0.34	0.04	0.08	40.2	1.84

Notes: This table shows the land use as a percentage of the total land use for the region. Due to rounding, zeros may indicate very small land area used for a particular land use. Conservation and natural environments includes nature conservation, managed resource protection and other minimal use.

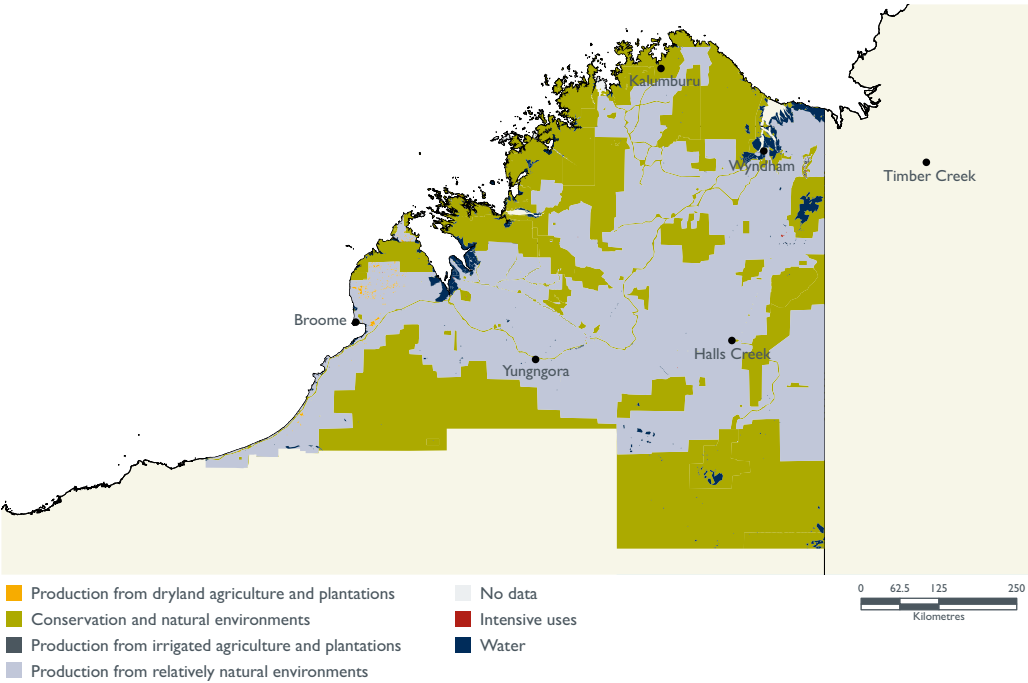
Source: Bureau of Rural Sciences (BRS) (2008).

Map 8.1.1 Land use in the Pilbara Region (Western Australia), 2001



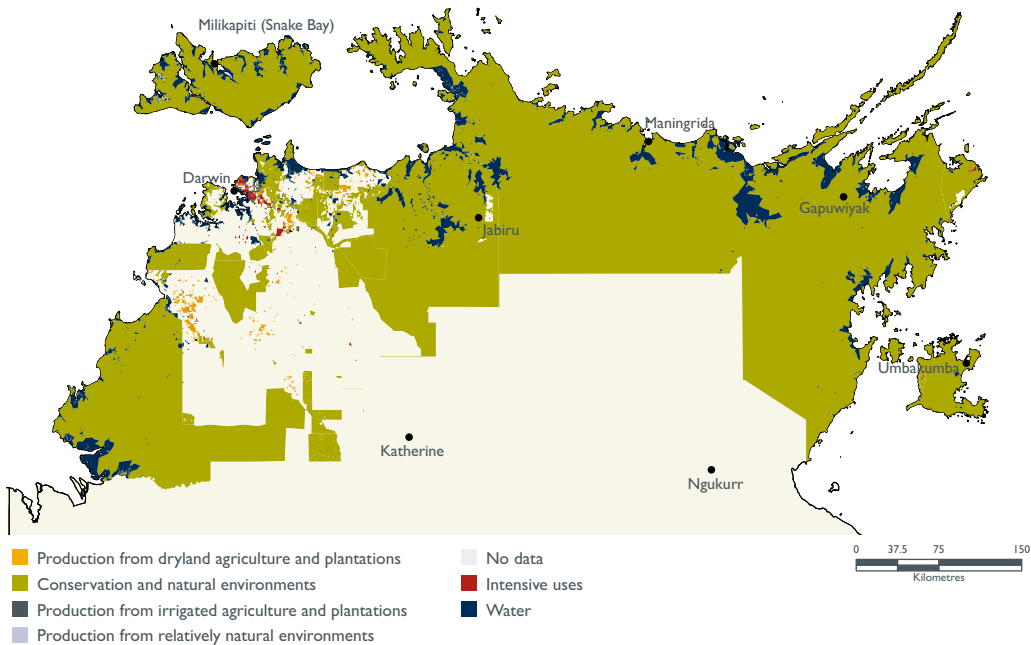
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.2 Land use in the Kimberley Region (Western Australia), 2001



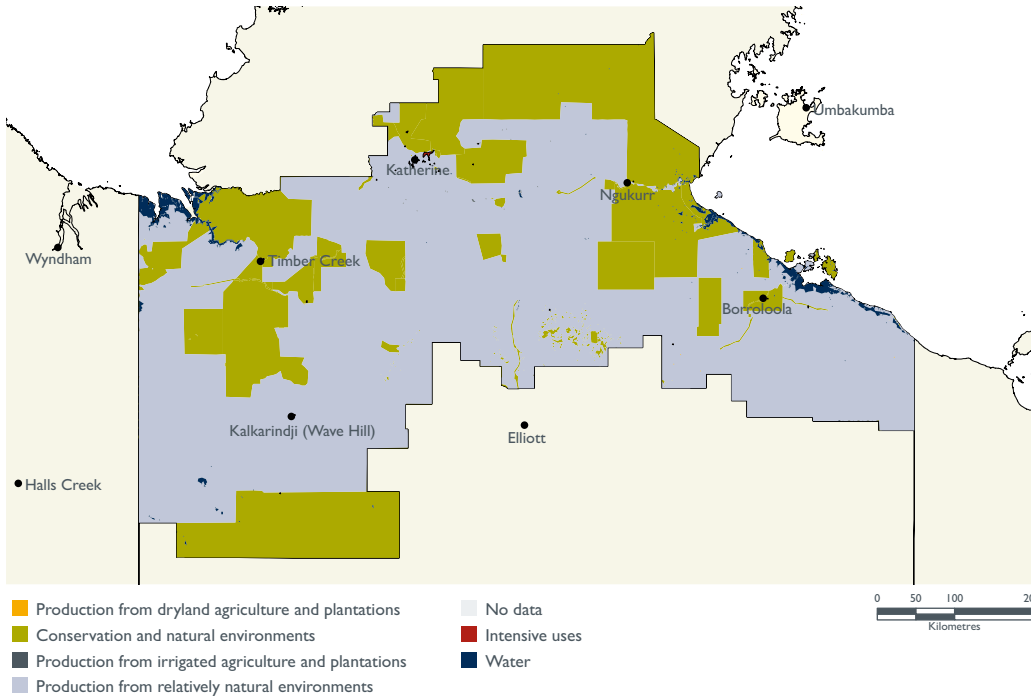
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.3 Land use in the Darwin-East Arnhem Region (Northern Territory), 2001



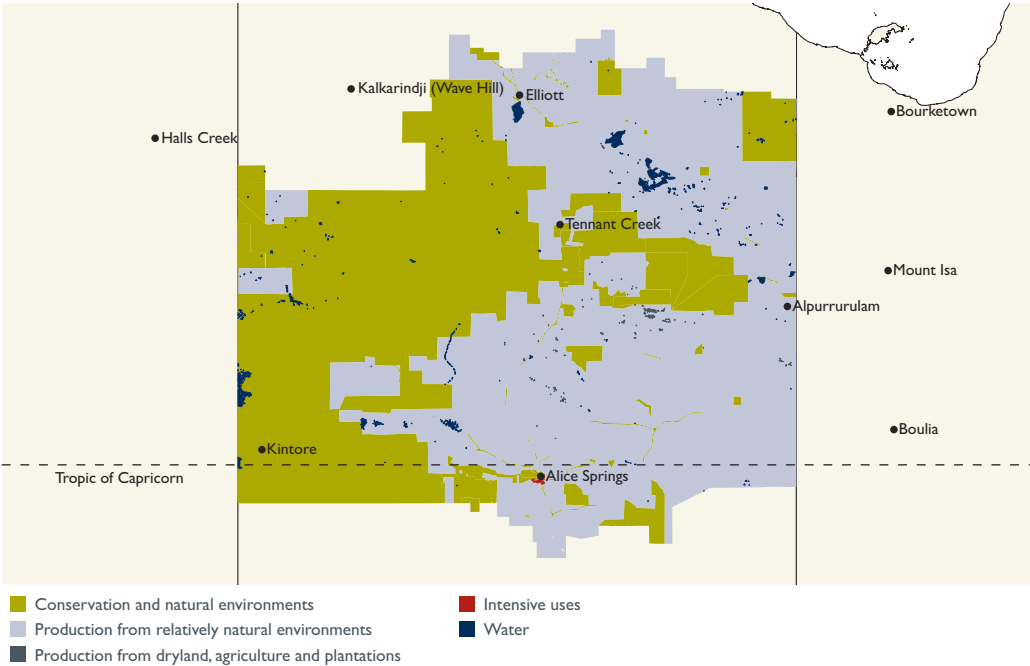
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.4 Land use in the Katherine-Lower Top End Region (Northern Territory), 2001



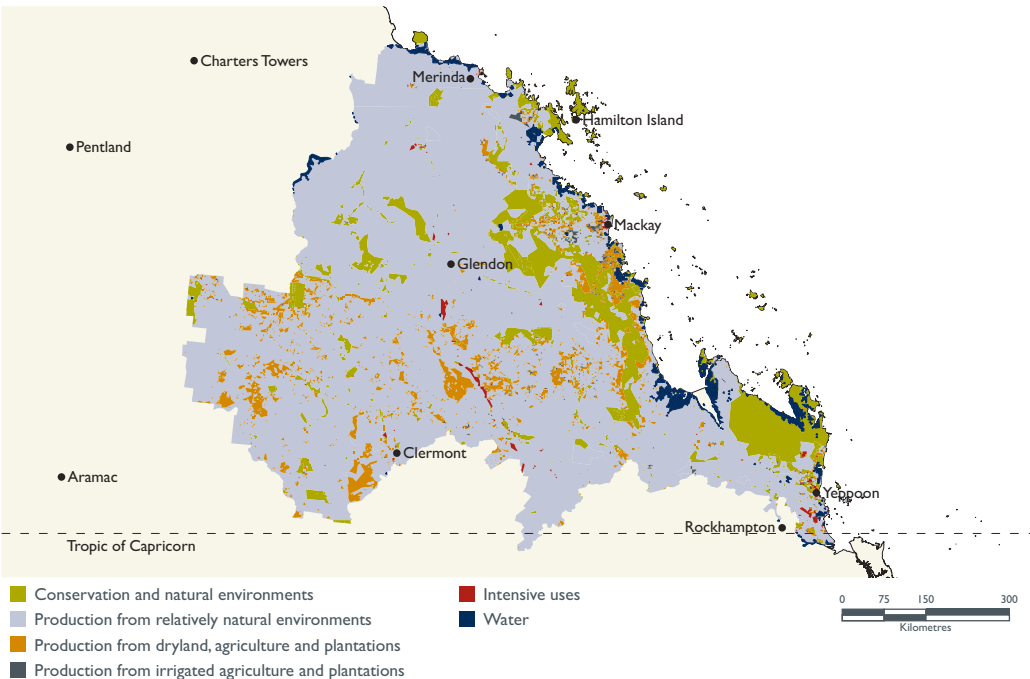
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

**Map 8.1.5 Land use in the Barkly-Central NT Region
(Northern Territory), 2001**



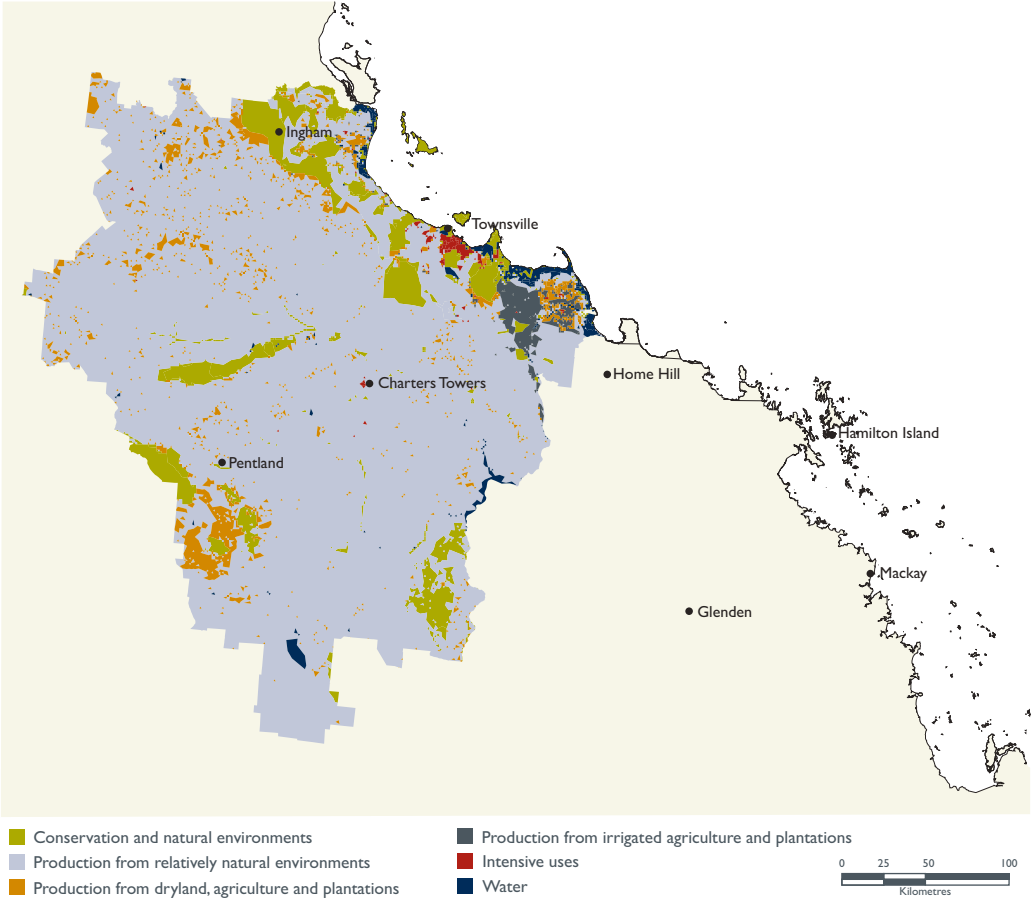
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.6 Land use in the MacKay Region (Queensland), 2001



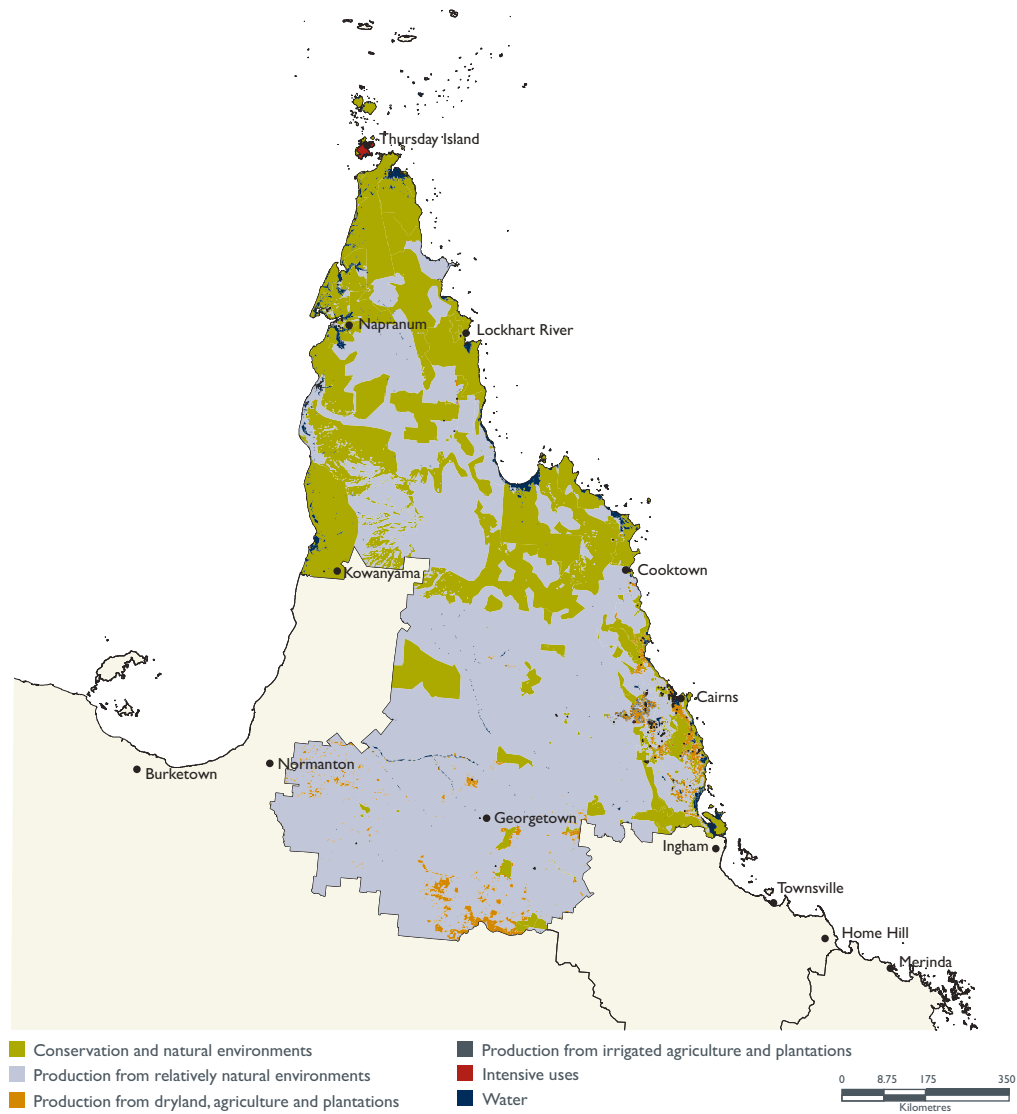
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.7 Land use in the Northern Region (Queensland), 2001



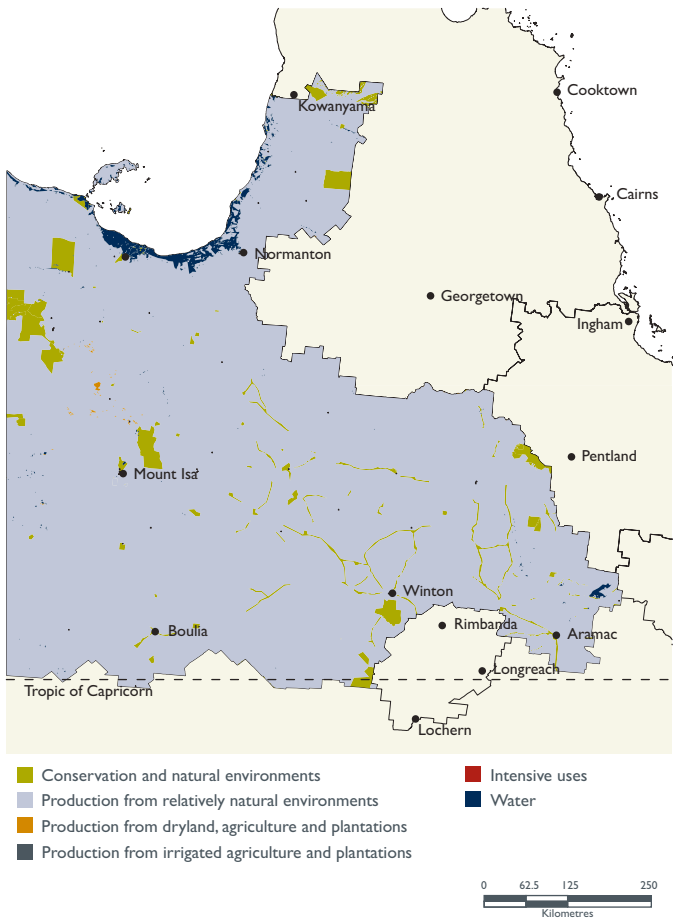
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.8 Land use in the Far North Region (Queensland), 2001



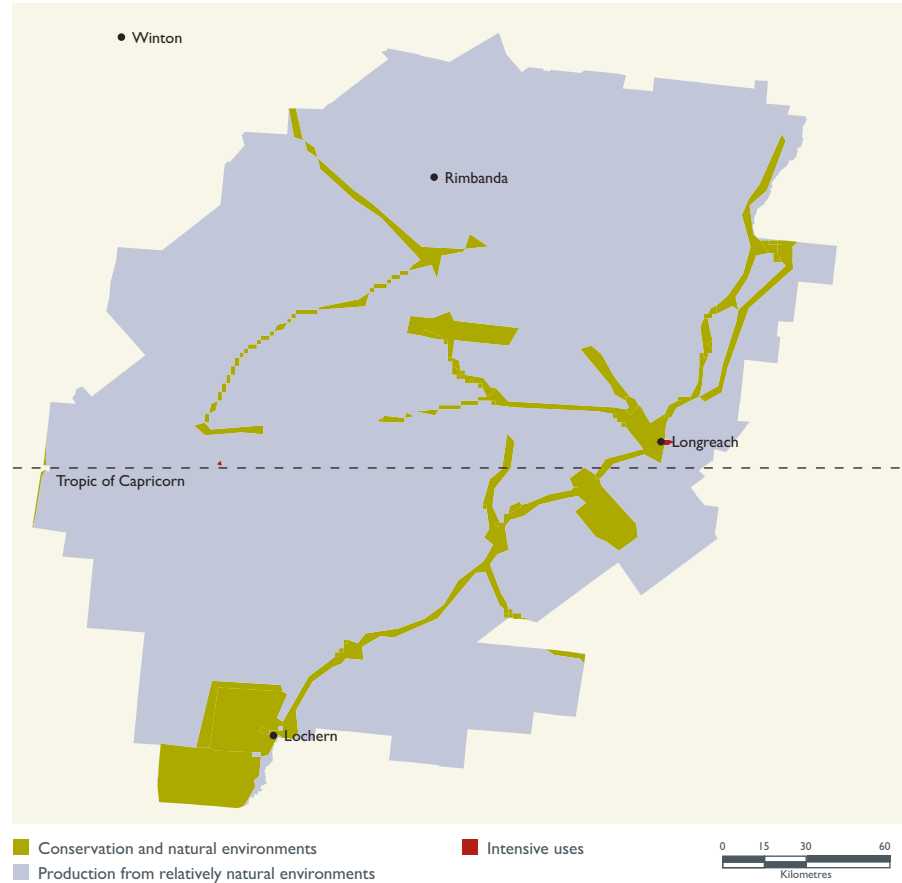
Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.9 Land use in the North West Region (Queensland), 2001



Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

Map 8.1.10 Land use in the Longreach Region (Queensland), 2001

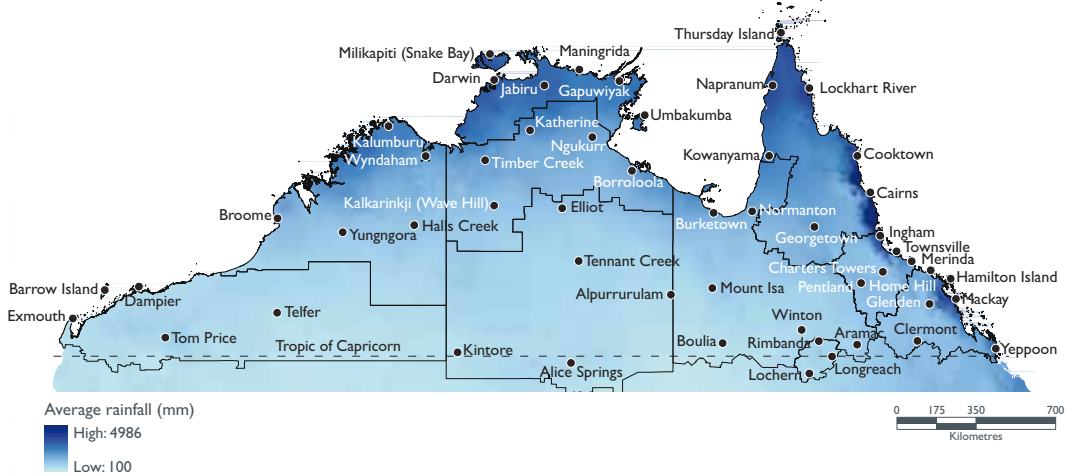


Source: BITRE map drawn from BRS data (2009) available from www.brs.gov.au.

8.2 Rainfall and temperature

The tables and maps show the mean rainfall, maximum and minimum temperatures over a thirty year period in Northern Australia. Overall, 50 per cent of Australia's rain fell within Northern Australia during this thirty year period. As can be seen in Map 8.2.1, the far northern parts of Western Australia, the Northern Territory, and north-east Queensland experienced high levels of average rainfall. On the other hand, much of northern Western Australia, the southern parts of the Northern Territory, and the western parts of Northern Queensland all experienced low levels of rainfall.

At the regional level, the lowest levels of annual rainfall were experienced in the Pilbara Region, where Roebourne experienced 277 mm of annual rainfall, while on average there were 301 mm of rainfall in Alice Springs—Stuart (Barkly-Central NT Region). The Darwin-East Arnhem, Far North, and Mackay regions all experienced high levels of rainfall annually, with around 2000 mm of rain experienced in many parts of the Far North Region. These levels of rainfall are among the highest seen across Australia.

Map 8.2.1 Northern Australia—annual average rainfall (mm), 1961–1990

Source: BITRE map drawn from Bureau of Meteorology (BOM) data (2009).

The rainfall patterns across Northern Australia during the year reflect the wet and dry seasons. The wet season lasts for about four months between December and March. As seen in Maps 8.2.2 and 8.2.5, this is a period which is characterised by high levels of rain. For example, on average the majority of rainfall in the Darwin-East Arnhem Region falls between February and November. High levels of rainfall are observed as proximity to the coast increased within regions in northern Queensland. However, rainfall does not increase with proximity to the coastline in many areas at similar latitude in Western Australia.

Maps 8.2.3 and 8.2.4 illustrate that many of the regions experienced little rainfall during the dry season (between May and October). In contrast to parts of southern Australia, extensive areas across Northern Australia are very dry during the winter months. For example, in the Katherine-Lower Top End and Kimberley regions, the highest average rainfall experienced during August was just 2 mm.

Table 8.2.1 Northern Australia — mean rainfall, maximum and minimum temperature, 1961—90

Region/SIA name	Name	February			May			August			November			Annual rain (mm)
		Max temp (°C)	Min temp	Average rain (mm)	Max temp (°C)	Min temp	Average rain (mm)	Max temp (°C)	Min temp	Average rain (mm)	Max temp (°C)	Min temp	Average rain (mm)	
Northern Australia (WA)														
Pilbara Region														
East Pilbara (S)	Telfer	39	24	72	28	15	25	28	12	8	39	22	16	295
Ashburton (S)	Barrow Island	36	26	76	30	20	56	28	17	11	34	21	1	372
Exmouth (S)	Exmouth	37	24	31	28	16	52	26	12	17	34	19	3	292
Ashburton (S)	Tom Price	37	23	77	25	14	32	24	11	12	36	21	9	378
Roebourne (S)	Dampier	37	26	60	31	18	35	29	14	6	37	22	0	277
Kimberley Region														
Wyndham-East Kimberley (S)	Wyndham	36	26	191	34	21	13	34	19	0	39	27	54	820
Halls Creek (S)	Halls Creek	36	24	129	30	17	14	30	15	2	38	25	34	550
Derby-West Kimberley (S)	Yunggora	37	25	132	33	16	13	32	13	0	40	24	10	469
Broome (S)	Broome	33	26	158	32	18	24	30	15	2	34	25	8	604
Wyndham-East Kimberley (S)	Kalumburu	34	24	310	33	18	19	34	16	0	37	25	81	1 206
Northern Australia (NT)														
Darwin-Kakadu Region														
City-Inner	Darwin	32	24	318	32	22	25	32	20	9	34	25	126	1 686
Jabiru (T)	Jabiru	33	24	358	33	21	14	33	18	0	37	24	116	1 463
East Arnhem-Bal	Gapuwiyak	31	24	289	31	22	44	30	18	4	33	24	75	1 389
Groote Eylandt	Umbakumba	32	24	276	30	19	45	30	16	4	34	23	76	1 365
Tiwi Islands (CGC)	Milikapiti (Snake Bay)	31	25	325	31	22	43	30	20	1	32	25	123	1 565
West Arnhem	Maningrida	32	24	260	32	21	27	31	18	0	33	25	57	1 277
Katherine-Lower Top End Region														
Daguragu (CGC)	Kalkarindji (Wave Hill)	36	24	135	31	16	9	31	13	0	39	24	44	517
Borroloola (CGC)	Borroloola	34	25	187	31	17	16	30	14	2	37	24	56	826
Timber Creek (CGC)	Timber Creek	35	24	192	33	18	9	33	16	0	39	25	72	839
Yugul Mangi (CGC)	Ngukurr	35	25	180	32	18	14	32	15	0	39	25	49	793
Katherine (T)	Katherine	34	24	230	32	18	5	33	16	1	38	25	93	991
Barkly-Central NT Region														
Alice Springs (T)—Stuart	Alice Springs	35	20	38	23	8	18	22	5	11	33	17	29	301
Alpururulam (CGC)	Alpururulam	37	24	67	28	13	17	27	10	6	38	21	19	338
Tennant Creek (T)	Tennant Creek	36	24	89	28	16	13	27	14	2	36	23	29	421
Tanami	Kintore	36	22	59	25	11	23	24	8	11	35	20	30	334
Elliott District (CGC)	Elliott	36	24	142	30	16	7	31	14	1	39	24	40	525

(continued)

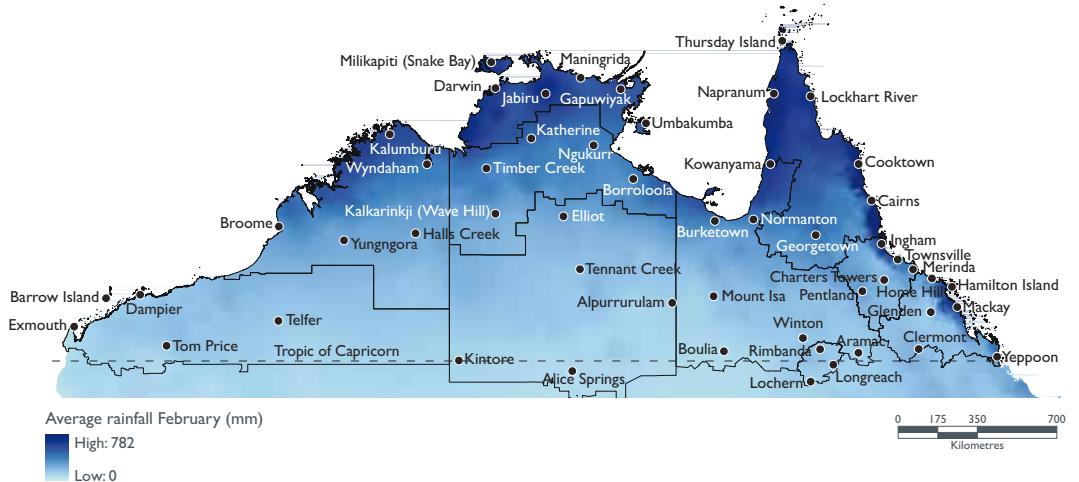
Table 8.2.1 Northern Australia—mean rainfall, maximum and minimum temperature, 1961—90 (continued)

Region/SLA name	Name	February			May			August			November			Annual rain (mm)
		Max temp (°C)	Min temp	Average rain (mm)	Max temp (°C)	Min temp	Average rain (mm)	Max temp (°C)	Min temp	Average rain (mm)	Max temp (°C)	Min temp	Average rain (mm)	
Northern Australia (Qld)														
Mackay Region														
Mackay (C)–Pt A	Mackay	30	23	327	25	17	97	23	14	25	29	22	104	1 662
Belyando (S)	Clermont	33	21	101	26	12	47	25	9	19	33	19	62	629
Whitsunday (S)	Hamilton Island	30	24	319	25	18	145	23	15	32	29	22	67	1 731
Livingstone (S)–Pt B	Yeppoon	30	23	188	25	16	104	23	12	35	29	21	86	1 204
	Bowen (S)	31	24	176	27	18	48	26	15	17	31	22	46	874
Nebo (S)	Glenden	30	21	88	24	13	42	23	9	15	31	19	69	652
Northern Region														
Burdekin (S)	Home Hill	32	23	190	27	16	44	26	13	15	32	21	53	926
West End	Townsville	31	24	231	27	18	41	26	15	14	31	23	53	1 042
Charters Towers (C)	Charters Towers	32	22	113	27	15	34	26	12	12	34	20	53	711
	Hinchinbrook (S)	32	24	412	28	18	115	27	15	33	31	22	102	1 987
Dalrymple (S)	Pentland	33	22	112	27	14	34	26	11	12	35	20	41	658
Far Northern Region														
Kowanyama (S)	Kowanyama	33	24	347	32	19	10	32	16	1	36	24	75	1 206
Cook (S)	Cooktown	31	24	439	27	22	94	26	20	19	31	24	68	1 881
Etheridge (S)	Georgetown	34	23	209	30	17	11	30	13	3	37	22	62	834
Cairns (C)–City	Cairns	31	24	443	27	20	115	27	17	23	31	22	103	2 153
	Lockhart River (S)	31	24	368	29	22	114	28	20	27	32	23	64	1 996
Napranum (S)	Napranum	31	24	433	32	21	16	32	19	2	35	23	114	1 819
Torres (S)	Thursday Island	30	24	373	29	24	48	28	22	8	31	25	42	1 790
North West Region														
Burke (S)	Burketown	34	25	204	31	18	9	30	15	1	36	24	46	781
Winton (S)	Winton	36	23	79	27	13	20	27	9	6	37	21	23	390
Carpentaria (S)	Normanton	34	25	203	32	20	6	31	17	0	37	25	39	799
	Boulia (S)	38	24	41	27	13	14	26	10	7	37	21	16	238
Mount Isa (C)	Mount Isa	35	23	74	27	14	14	27	11	3	36	21	24	384
	Aramac (S)	35	23	66	27	13	24	26	10	16	36	20	32	453
Longreach Region														
Longreach (S)	Longreach	36	23	69	27	12	29	26	8	11	36	20	24	392
Longreach (S)	Rimbada	36	23	80	27	12	24	26	9	8	36	20	24	443
Longreach (S)	Lochnern	37	23	60	26	12	28	25	8	5	36	20	16	319

Note: The period of measurement for both rainfall and temperature was taken for four months throughout the year.

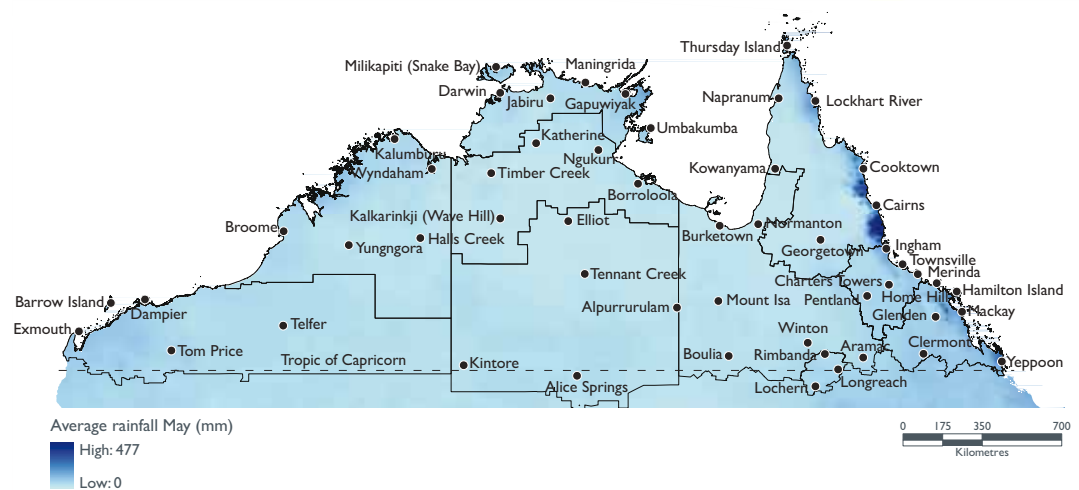
Source: Bureau of Meteorology (2007a).

Map 8.2.2 Northern Australia—February average rainfall (mm), 1961–90



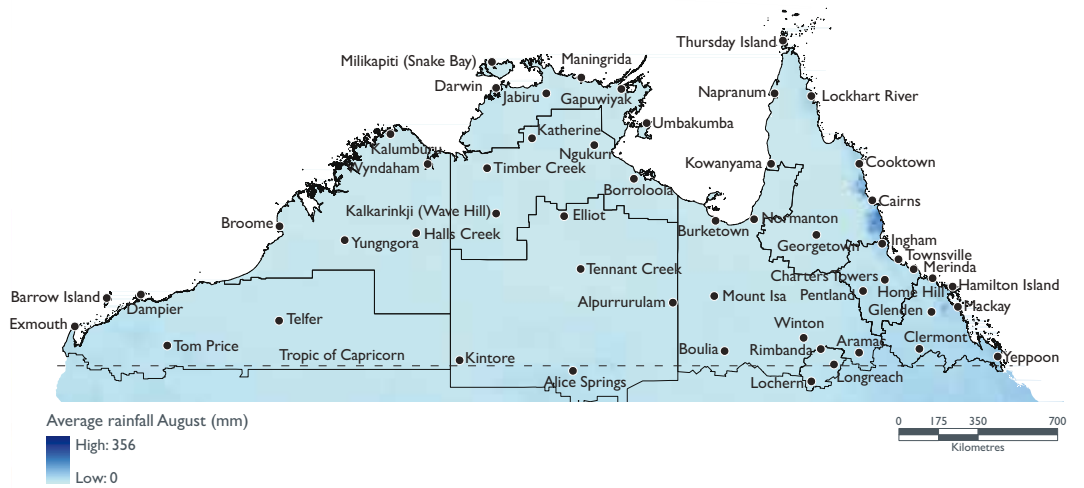
Source: BITRE map drawn from BOM data (2009).

Map 8.2.3 Northern Australia—May average rainfall (mm), 1961–90



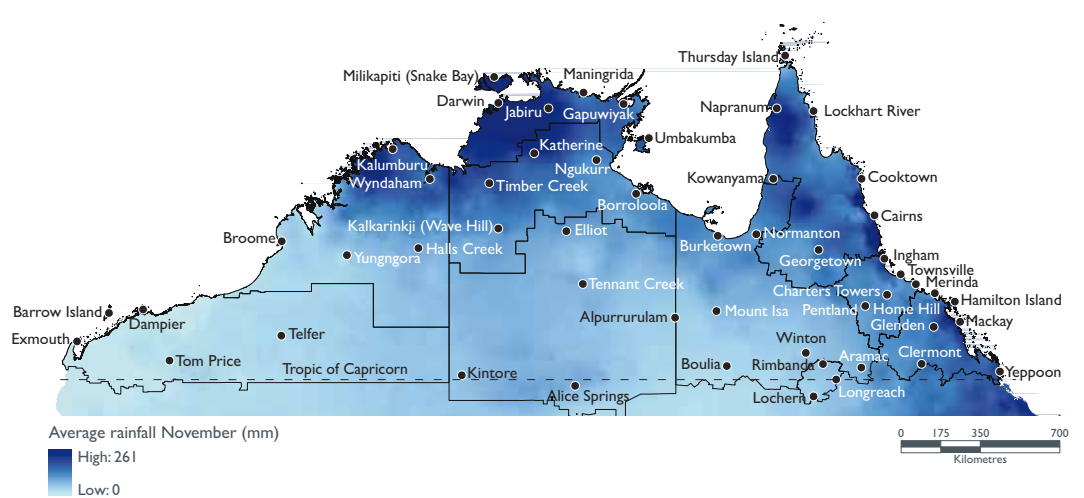
Source: BITRE map drawn from BOM data (2009).

Map 8.2.4 Northern Australia—August average rainfall (mm), 1961–90



Source: BITRE map drawn from BOM data (2009).

Map 8.2.5 Northern Australia—November average rainfall (mm), 1961–90

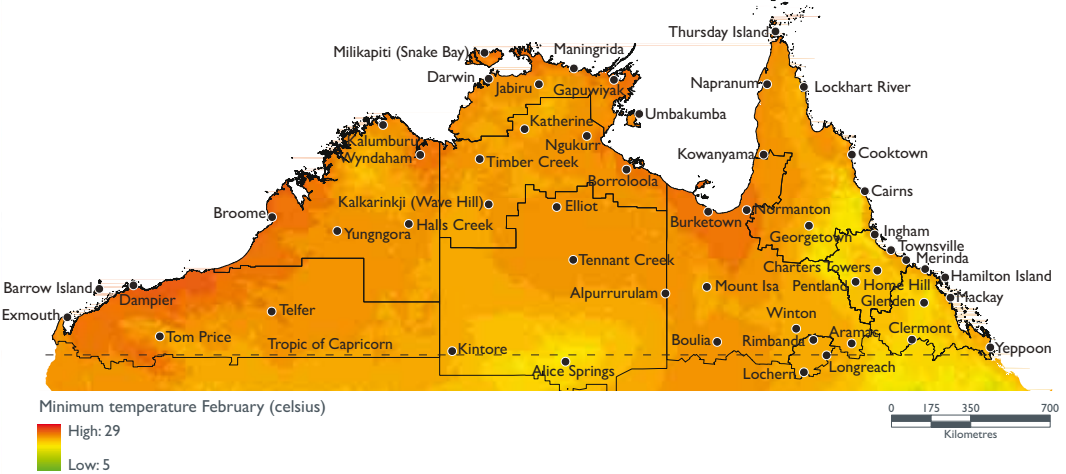


Source: BITRE map drawn from BOM data (2009).

Similar to the rainfall patterns, the average minimum and maximum temperatures throughout Northern Australia reflect the wet and dry seasons. Higher temperatures were observed during the wet season across many regions, while in contrast lower temperatures were experienced during the dry season.

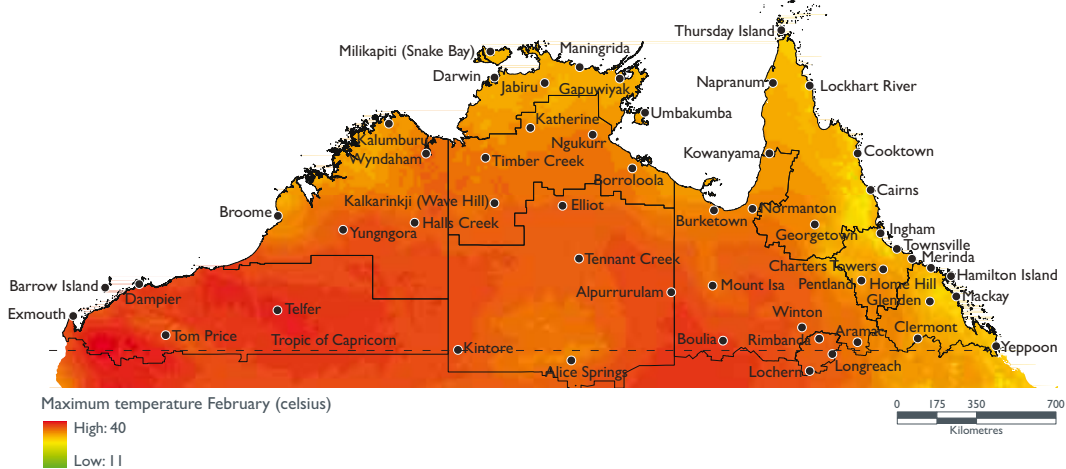
The average minimum temperature for February is higher across Northern Australia than it is across the rest of Australia. As can be seen in Map 8.2.6, particularly high averages are observed in many areas within northern Western Australia, as well as in much of the northern Northern Territory. High values are also observed for February’s maximum temperature throughout Northern Australia. This is particularly the case in the Pilbara, Barkly-Central NT and North West regions, where the average temperatures approaches 40 degrees celsius.

Map 8.2.6 Northern Australia—February minimum temperature (celsius), 1961–90



Source: BITRE map drawn from BOM data (2009).

Map 8.2.7 Northern Australia—February maximum temperature (celsius), 1961–90

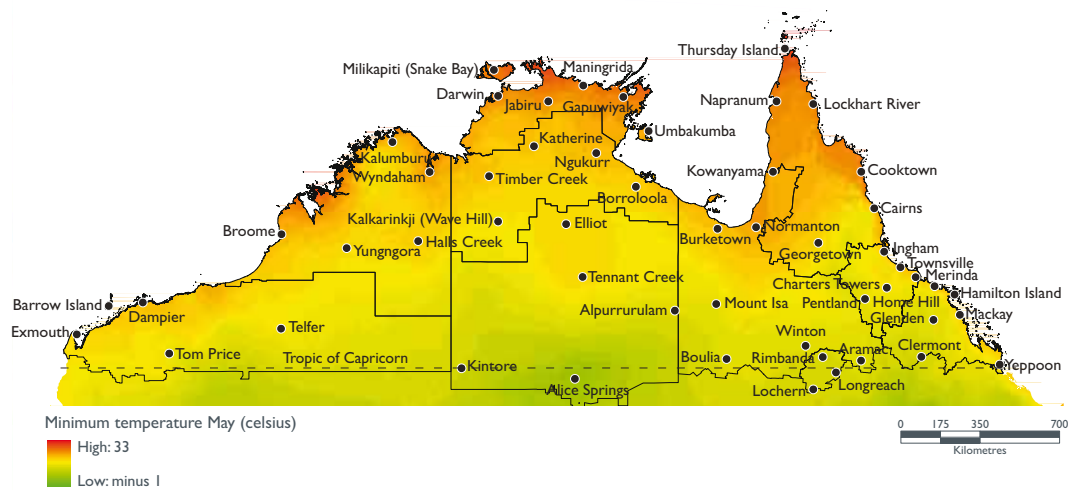


Source: BITRE map drawn from BOM data (2009).

The trend of higher temperatures within Northern Australia in comparison to the rest of Australia continues to be seen throughout May and August, although the temperatures are lower than in the wet season. As can be seen in Maps 8.2.9 and 8.2.11, there are particularly high maximum temperatures within northern Western Australia, north-western Queensland and the northern Northern Territory, where the temperatures are around 30 degrees celsius or higher. At the regional level there are particularly high maximum temperatures in the Kimberley, North West, Darwin-East Arnhem and Katherine-Lower Top End regions during May and August.

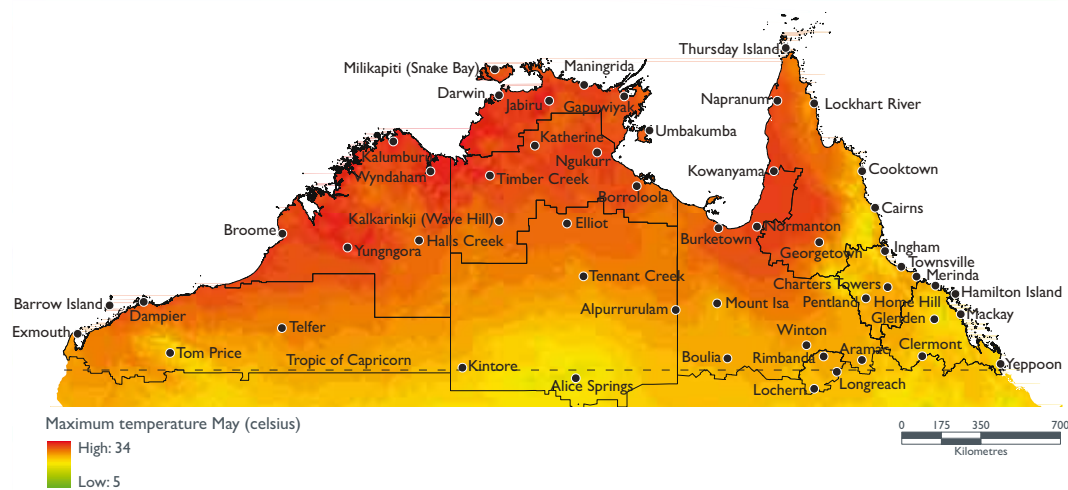
The minimum temperatures for May and August are higher in the more northern parts of Western Australia, Queensland and the Northern Territory, where temperatures approach an average of 24 degrees celsius (see Maps 8.2.8 and 8.2.10). However, far lower temperatures are observed in areas closer to the Tropic of Capricorn, particularly in some parts of the Pilbara, Longreach and Barkly-Central NT regions, where the minimum temperature range from 8 to 16 degrees celsius. Many of these areas contain deserts where temperatures can drop dramatically during the night.

Map 8.2.8 Northern Australia—May minimum temperature (celsius), 1961–90



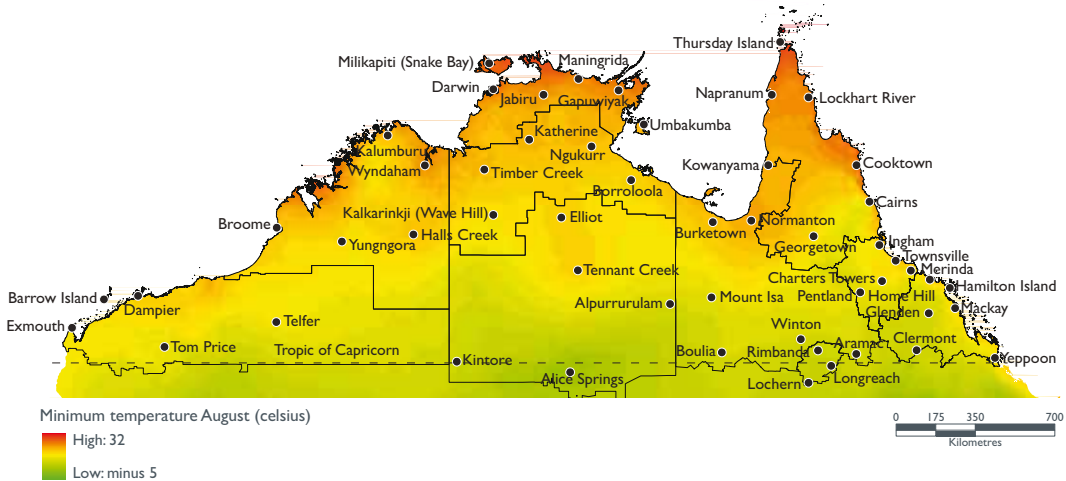
Source: BITRE map drawn from BOM data (2009).

Map 8.2.9 Northern Australia—May maximum temperature (celsius), 1961–90



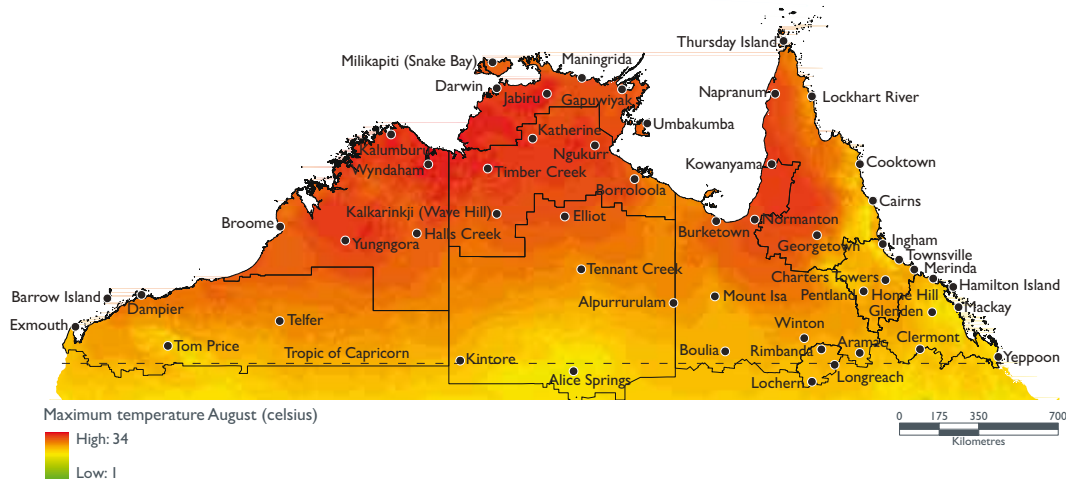
Source: BITRE map drawn from BOM data (2009).

Map 8.2.10 Northern Australia—August minimum temperature (celsius), 1961–90



Source: BITRE map drawn from BOM data (2009).

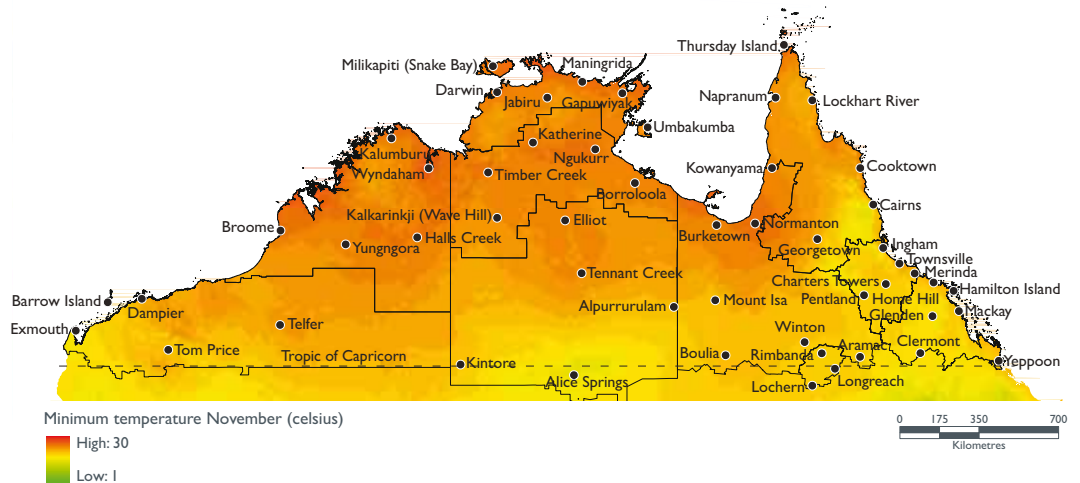
Map 8.2.11 Northern Australia—August maximum temperature (celsius), 1961–90



Source: BITRE map drawn from BOM data (2009).

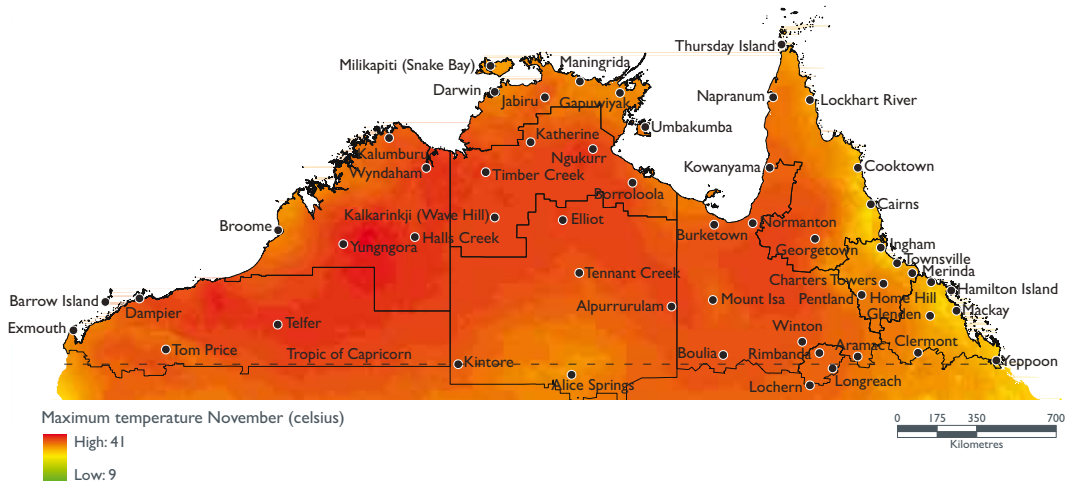
Similar to February, in many parts of Northern Australia the average temperatures during November are very high, reflecting the wet season. As can be seen in Maps 8.2.12 and 8.2.13, the minimum and maximum temperatures during this month are higher than the rest of Australia. Of particular note are the average maximum temperatures, which are close to 41 degrees celsius in most of northern Western Australia, the more northern parts of the Northern Territory, and the inland parts of Queensland such as the North West Region.

Map 8.2.12 Northern Australia—November minimum temperature (celsius), 1961–90



Source: BITRE map drawn from BOM data (2009).

Map 8.2.13 Northern Australia—November maximum temperature (celsius), 1961–90



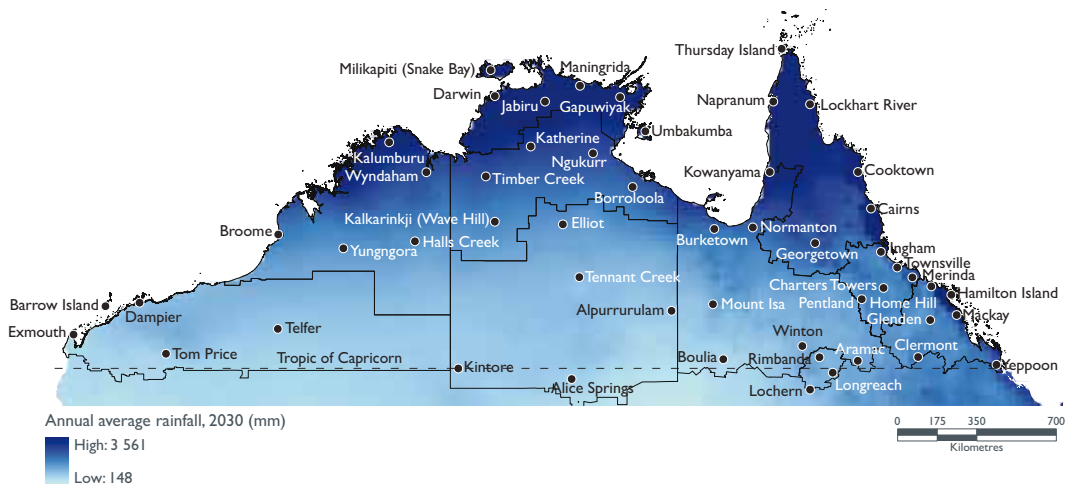
Source: BITRE map drawn from BOM data (2009).

8.3 Predicted future rainfall and temperature

The maps below illustrate the predicted mean rainfall, maximum and minimum temperature for the year 2030, based on moderate global warming. These predictions were calculated by the CSIRO, using different data than section 8.2. Consequently, the predictions should only be compared in a general way with data in the previous section.

As can be seen in Map 8.3.1, the annual rainfall within Northern Australia in the year 2030 is predicted to be highest in the far northern areas of Queensland, Western Australia and the Northern Territory. In particular, an increase in rainfall is predicted in parts of the Kimberley and Mackay regions, and in the Darwin-East Arnhem and Far North regions. Aside from these regions, the predictions suggest that most other parts of Northern Australia will experience a decrease in annual rainfall (see Table 8.3.1). The lowest levels of rainfall in the year 2030 are predicted to be within the Pilbara, Barkly-Central NT, North West and Longreach regions.

Map 8.3.1 Northern Australia—predicted average annual rainfall (millimetres), 2030



Notes: Map 8.3.1 illustrates the predicted average annual rainfall for the year 2030, based on moderate global warming and moderate rainfall.

Source: BITRE map based on CSIRO and BOM data available at www.climatechangeinaustralia.gov.au.

It should be noted that Maps 8.2.1 and 8.3.1 use different keys to show average rainfall; the map of annual rainfall (Map 8.2.1) has values ranging from 100–4986, while the map of predicted annual rainfall (Map 8.3.1) has values ranging from 148–3561. Thus, care should be taken when comparing the two maps.

Table 8.3.1 Northern Australia—predicted mean rainfall, summer and winter surface temperature, 2030

Region/SLA Name	Name	Prediction, 2030		
		Average summer surface temp (°C)	Average winter surface temp (°C)	Annual rain (mm)
Northern Australia (WA)				
Pilbara Region				
East Pilbara (S)	Telfer	33	19	337
Ashburton (S)	Barrow Island	31	21	314
Exmouth (S)	Exmouth	30	19	261
Ashburton (S)	Tom Price	31	21	314
Roebourne (S)	Dampier	32	21	365
Kimberley Region				
Wyndham-East Kimberley (S)	Wyndham	31	24	883
Halls Creek (S)	Halls Creek	31	22	566
Derby-West Kimberley (S)	Yungngora	32	22	558
Broome (S)	Broome	30	22	663
Wyndham-East Kimberley (S)	Kalumburu	31	24	883
Northern Australia (NT)				
Darwin-Kakadu Region				
City-Inner	Darwin	29	25	1 696
Jabiru (T)	Jabiru	29	24	1 364
East Arnhem-Bal	Gapuwiyak	29	24	1 242
Groote Eylandt	Umbakumba	30	23	1 062
Tiwi Islands (CGC)	Milikapiti (Snake Bay)	29	25	1 799
West Arnhem	Maningrida	29	24	1 306
Katherine-Lower Top End Region				
Daguragu (CGC)	Kalkarindji (Wave Hill)	31	21	614
Borroloola (CGC)	Borroloola	31	22	786
Timber Creek (CGC)	Timber Creek	30	22	838
Yugul Mangi (CGC)	Ngukurr	31	23	871
Katherine (T)	Katherine	30	23	956
Barkly-Central NT Region				
Alice Springs (T)–Stuart	Alice Springs	29	14	295
Alpururulam (CGC)	Alpururulam	32	18	342
Tennant Creek (T)	Tennant Creek	31	19	378
Tanami	Kintore	31	16	315
Elliott District (CGC)	Elliott	32	21	549
Northern Australia (Qld)				
Mackay Region				
Mackay (C)–Pt A	Mackay	27	18	1 401
Belyando (S)	Clermont	28	16	611
Whitsunday (S)	Hamilton Island	27	19	1 654
Livingstone (S)–Pt B	Yeppoon	27	17	838
Bowen (S)	Merinda	26	17	1 360
Nebo (S)	Glenden	27	18	548
Northern Region				
Burdekin (S)	Home Hill	28	19	778
West End	Townsville	28	20	841
Charters Towers (C)	Charters Towers	29	19	587
Hinchinbrook (S)	Ingham	27	19	1 084
Dalrymple (S)	Pentland	29	18	611

(continued)

Table 8.3.1 Northern Australia—predicted mean rainfall, summer and winter surface temperature, 2030 (continued)

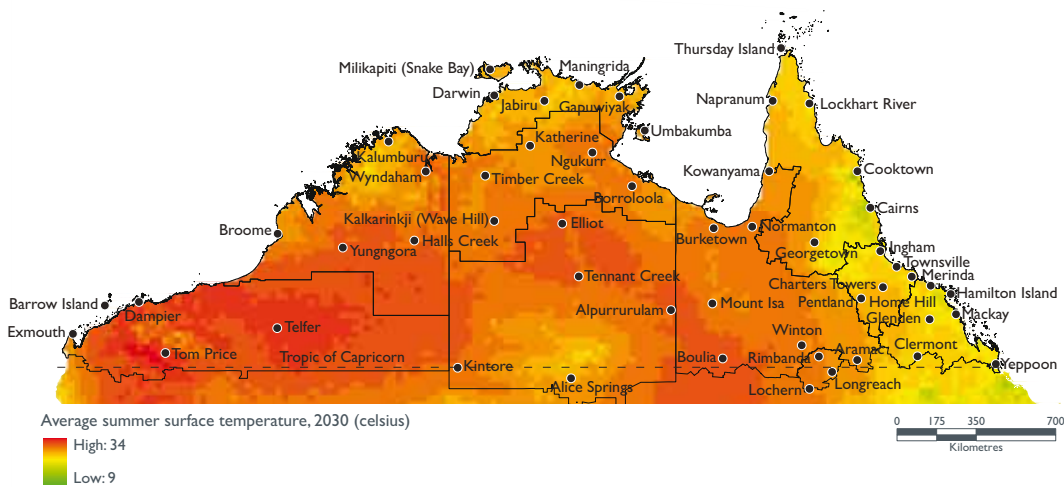
Region/SLA Name	Name	Prediction, 2030		
		Average summer surface temp (°C)	Average winter surface temp (°C)	Annual rain (mm)
Far Northern Region				
Kowanyama (S)	Kowanyama	30	24	1 242
Cook (S)	Cooktown	27	22	2 588
Etheridge (S)	Georgetown	29	20	795
Cairns (C)—City	Cairns	26	20	3 381
Lockhart River (S)	Lockhart River	27	23	1 749
Napranum (S)	Napranum	29	25	1 852
Torres (S)	Thursday Island	28	26	1 952
North West Region				
Burke (S)	Burketown	31	22	766
Winton (S)	Winton	31	17	431
Carpentaria (S)	Normanton	31	23	752
Boulia (S)	Boulia	32	17	248
Mount Isa (C)	Mount Isa	30	18	489
Aramac (S)	Aramac	30	17	490
Longreach Region				
Longreach (S)	Longreach	30	16	444
Longreach (S)	Rimbanda	30	16	444
Longreach (S)	Lochern	30	16	444

Notes: The predictions for the year 2030 are based on average rainfall with moderate warming. The predictions for average surface temperature are given for winter and summer, and are based on moderate global warming.

Source: CSIRO and BOM data available at www.climatechangeinaustralia.gov.au.

The predicted temperatures for 2030 indicate that there will be an increase in the average winter and summer temperatures across Northern Australia, particularly in the more inland areas. The Pilbara, Kimberley, Barkly-Central NT, North West and Longreach regions are predicted to have the highest average temperatures during summer (with average temperatures above 30 degrees celsius). On the other hand, lower temperatures within Northern Australia over the summer period are predicted to be in the eastern parts of Northern Queensland, especially in the Gladstone region, and sections of Mackay and Far North regions.

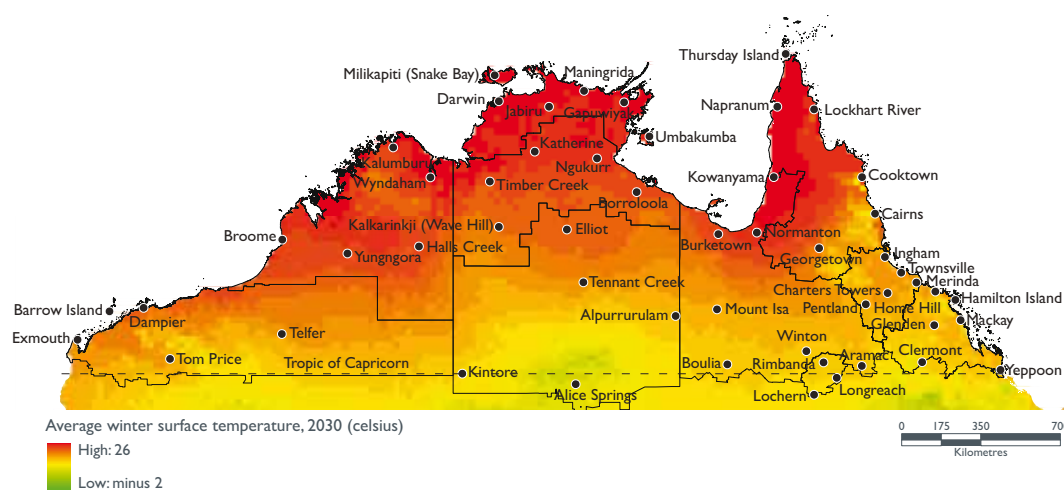
Map 8.3.2 Northern Australia—predicted average summer temperature (celsius), 2030



Source: BITRE map based on CSIRO and BOM data available at www.climatechangeinaustralia.gov.au.

As can be seen in Map 8.3.3, the highest temperatures in Northern Australia during the winter period are predicted to be in the Kimberley, Katherine-Lower Top End, Darwin-East Arnhem and Far North regions. The lowest temperatures are predicted to be in parts of the Barkly-Central NT and Gladstone regions (with average temperatures of approximately 14 degrees celsius).

Map 8.3.3 Northern Australia—predicted average winter temperature (celsius), 2030



Source: BITRE map based on CSIRO and BOM data available at www.climatechangeinaustralia.gov.au.

8.4 Cyclone activity

Table 8.4.1 and Map 8.4.1 show the cyclone occurrences within Northern Australia, over a thirty year period. On average there are about thirteen cyclones which form in the Australia region each cyclone season, although many do not make landfall (BOM 2009a). The majority of cyclone activity across Australia occurs within regions in Northern Australia.

In an average season, cyclones are most likely to occur in regions around north-east Queensland and also in regions around the north-west in Western Australia. At the regional level, areas within northern Western Australia were hit the most times by cyclones between 1970 and 2007. For example, in the Pilbara Region there were 67 cyclones, which resulted in 109 different SLAs being hit. In Far North Queensland, 95 SLAs were hit by cyclones between 1970 and 2007.

Tropical cyclones bring with them severe winds and rainfall, often with devastating effect. During the observed thirty year period, Cyclone Tracy (1974) and Cyclone Larry (2006) were among the most destructive cyclones. Cyclone Tracy hit Darwin causing 250 mm of rain in twelve hours and estimated winds of 240 kilometres per hour (BOM 2009b). This resulted in the highest level of property damage ever experienced in Australia as a result of a cyclone; with at least 90 per cent of Darwin homes badly damaged or destroyed (BOM 2009b). The cyclone also resulted in 71 deaths, and thousands of injuries (Australian Government 2008).

In 2006, Cyclone Larry hit the Far North Region in Queensland, with winds reaching 290 kilometres per hour (BOM 2007). This resulted in major damage to agricultural crops, homes, and other buildings in the area. Access to the region via road and rail was disrupted for several days due to the flooding which occurred in the area, meaning that food drops were required to several townships (BOM 2007). The affected area was declared a national disaster zone and the estimated cost of the damage to the region was \$A1.5 billion (Australian Government 2008).

As can be seen in Map 8.4.1, there was a substantial cyclonic activity within the Northern Territory. This was particularly the case in the more northern regions (Darwin-East Arnhem and Katherine-Lower Top End). High cyclone density was also observed in northern Queensland, particularly around the Far North and North West regions (see Map 8.4.1). On the other hand, some parts of northern Queensland, such as the Longreach Region, which is located inland and further south, was less likely to be hit by cyclones.

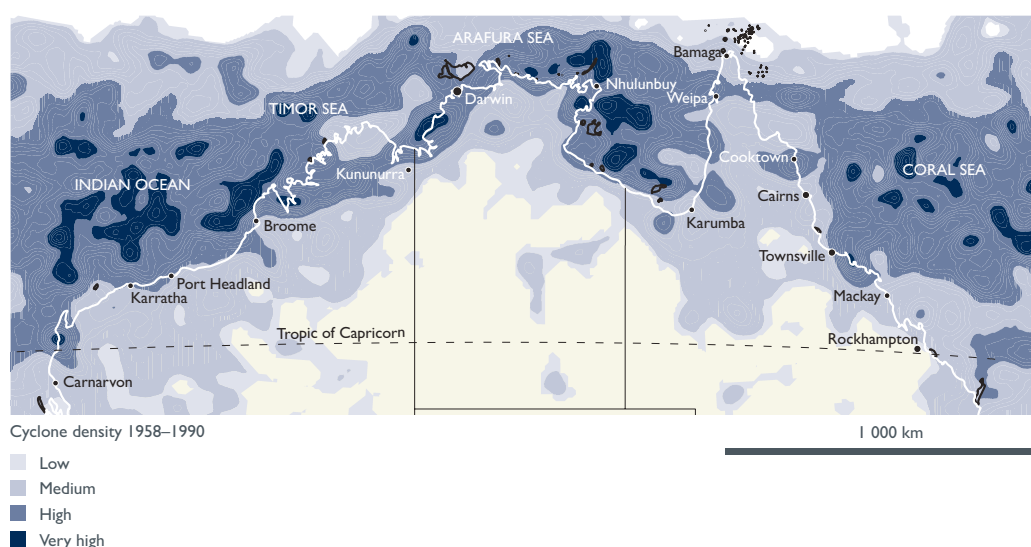
Table 8.4.1 Northern Australia—cyclone occurrences between January 1970 and 30 June 2007

<i>Region¹</i>	<i>Number of cyclones²</i>	<i>Number of SLAs in which those cyclones occurred in³</i>	<i>Total number of cyclone occurrences⁴</i>
Northern Australia (WA)	123	198	667
Pilbara Region	67	109	347
Kimberley Region	56	89	320
Northern Australia (NT)	75	136	304
Darwin-East Arnhem Region	32	62	120
Katherine-Lower Top End Region	30	55	122
Barkly-Central NT Region	13	19	62
Northern Australia (QLD)	93	170	349
Mackay Region	12	21	34
Northern Region	9	10	15
Far North Region	47	95	194
North West Region	24	43	104
Longreach Region	1	1	2
Northern Australia subtotal	291	504	1 320

1. Northern Australia is based on regions which fall above the Tropic of Capricorn. Areas with latitude greater than -24 degrees were excluded. Where the data did not precisely meet this definition, approximations are given.
2. The number of different cyclones which affected each subregion.
3. Total number of SLAs which a cyclone was observed in. Each cyclone is assigned one name, meaning one cyclone occurrence may hit multiple SLAs with cyclonic strength.
4. The total number of times the SLAs were hit by cyclones. Each cyclone is assigned one name, meaning a cyclone may last for a longer time period and may hit an individual area multiple times with cyclonic strength.

Source: Bureau of Meteorology (2008).

Map 8.4.1 Northern Australia—cyclone density, 1958–90



Source: Department of the Environment, Water, Heritage and the Arts (2003).

8.5 Minerals and energy resources

Mineral and energy resources of Northern Australia are abundant and new discoveries and improvements in technology result in continuous upgrading of many minerals' *economic documented reserves*.

Information on mineral and energy resources of Northern Australia can be accessed directly through the online *Atlas of Australia's Mineral Resources, Mines and Processing Centres*.¹⁸ The atlas has a web-based geographic information system format and shows the spatial location of resources, mines and respective production/processing centres across Australia. Information contained in this section was largely sources from the *Australia's identified mineral resources, 2008*, by Geoscience Australia, which is also available online.¹⁹

In addition to the deposits of iron ore, coal, oil and gas, which are subject to exports in large tonnage via sea ports, Northern Australia has a number of metal ore deposits, such as copper, bauxite, lead, zinc, manganese and nickel. Apart from these 'high tonnage' minerals, there are numerous deposits of other minerals and energy products mined in Northern Australia, such as uranium, gold, silver, tin, et cetera. Some of the minerals are mined jointly in various quantities from the same ore body, for example, copper, gold and uranium in the Darwin-East Arnhem Region of the Northern Territory, while others are found in a geographic proximity to others, such as iron ore and manganese in the Pilbara Region of Western Australia.

Western Australia's Pilbara Region dominates the Australian iron ore mining industry, accounting for 97 per cent of total production. The Pilbara Region produces about 85 per cent of Australia's total identified resources and 92 per cent of its extraction.

The following maps illustrate the geographic location of selected minerals which can be found in the previously mentioned *Atlas of Australia's Mineral Resources, Mines and Processing Centre*.

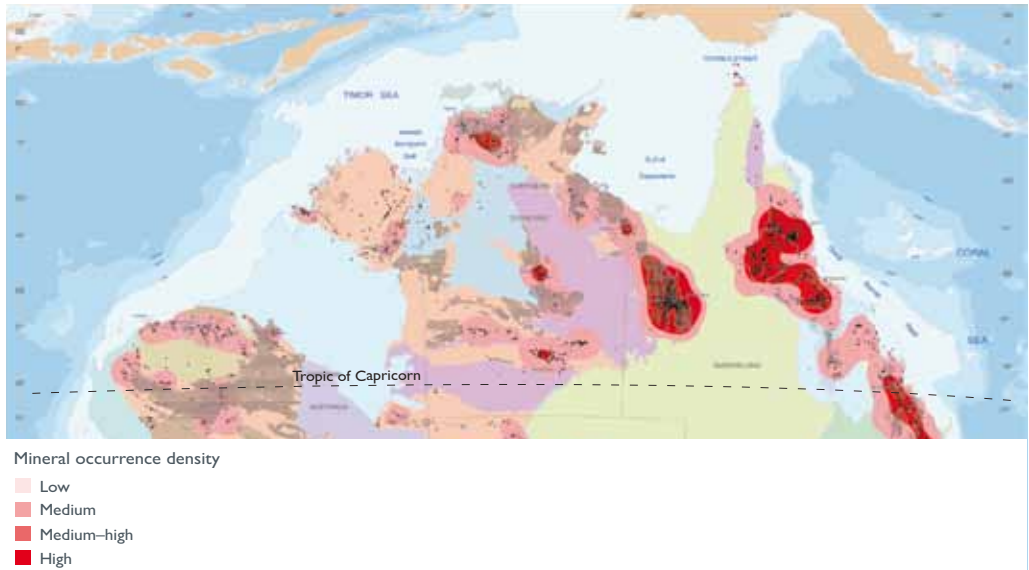
Copper

Copper ore deposits are being mined in a number of regions of northern Queensland, around Mt Isa and in eastern northern Queensland, and in the Darwin-East Arnhem Region (Ranger project). Queensland has the second largest *economic documented reserves* (EDR) with 12 per cent of the national total. Copper is also mined in other mining operations across Northern Australia either as a dedicated operation or as part of wider mining projects in the Katherine-Lower Top End and Barkly-Central NT in the Northern Territory (see Map 8.5.1). The map also illustrates the potential copper reserves which are present in nearly all regions of Northern Australia.

18. The Atlas can be accessed from this website: www.australianminesatlas.gov.au.

19. Publication available http://www.ga.gov.au/image_cache/GA12717.pdf.

Map 8.5.1 Northern Australia—copper deposits, occurrence and potential



Source: Geoscience Australia.

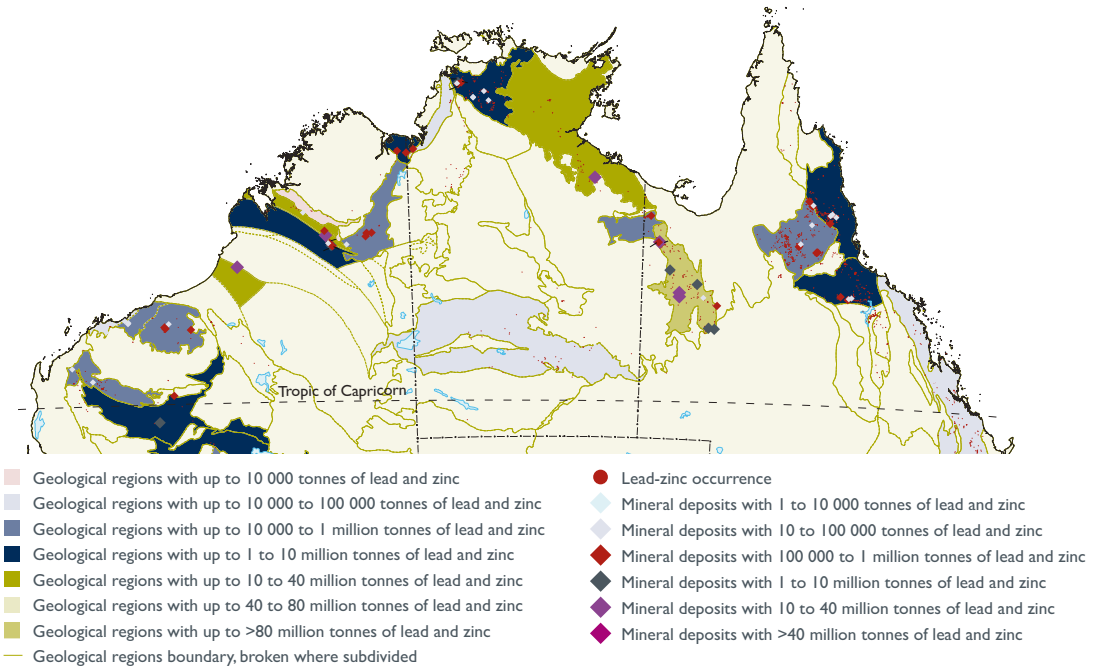
Lead and zinc

Lead and zinc are being mined in the Mt Isa area of Queensland but prospective reserves in Northern Australia are numerous across north-eastern Queensland, the Darwin-East Arnhem Region in Northern Territory, the Pilbara and Kimberley regions of Western Australia (see Map 8.5.2).

Manganese

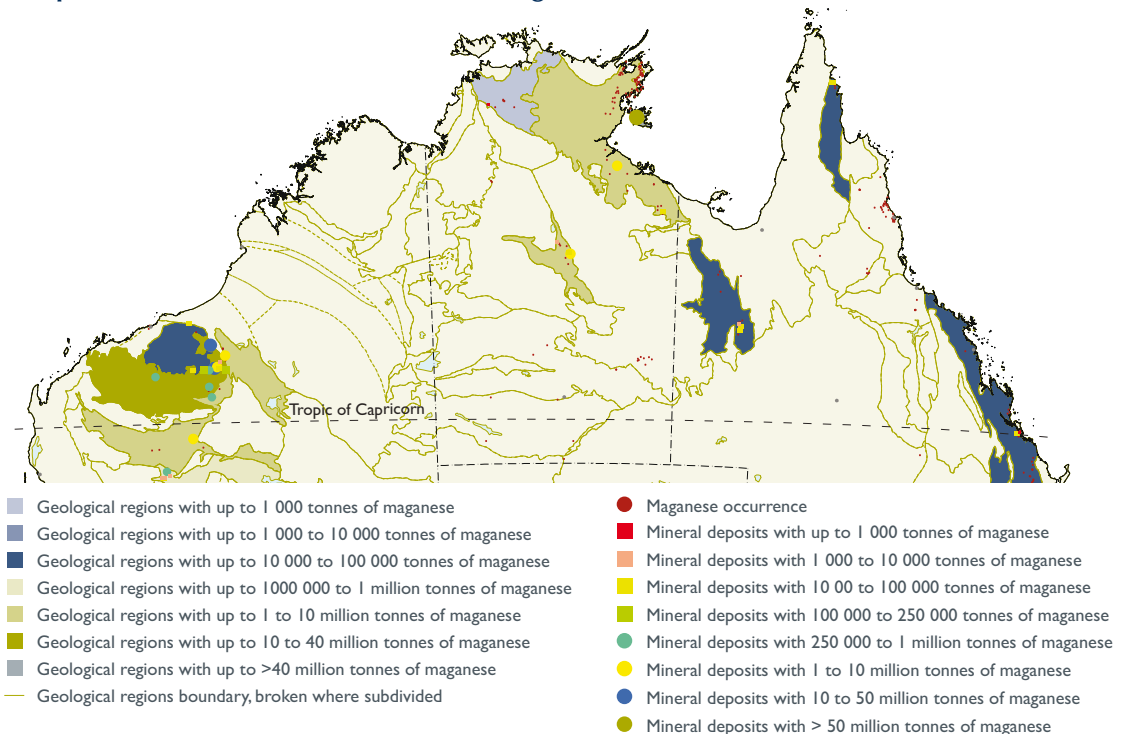
Manganese ores are mined in the Kimberley Region of Western Australia and are also documented to occur in smaller quantities in the Darwin-East Arnhem and Katherine-Lower Top End regions of Northern Territory, as well as in the North West and Far North regions of Queensland (see Map 8.5.3).

Map 8.5.2 Northern Australia—lead and zinc resources



Source: Geoscience Australia.

Map 8.5.3 Northern Australia—manganese resources

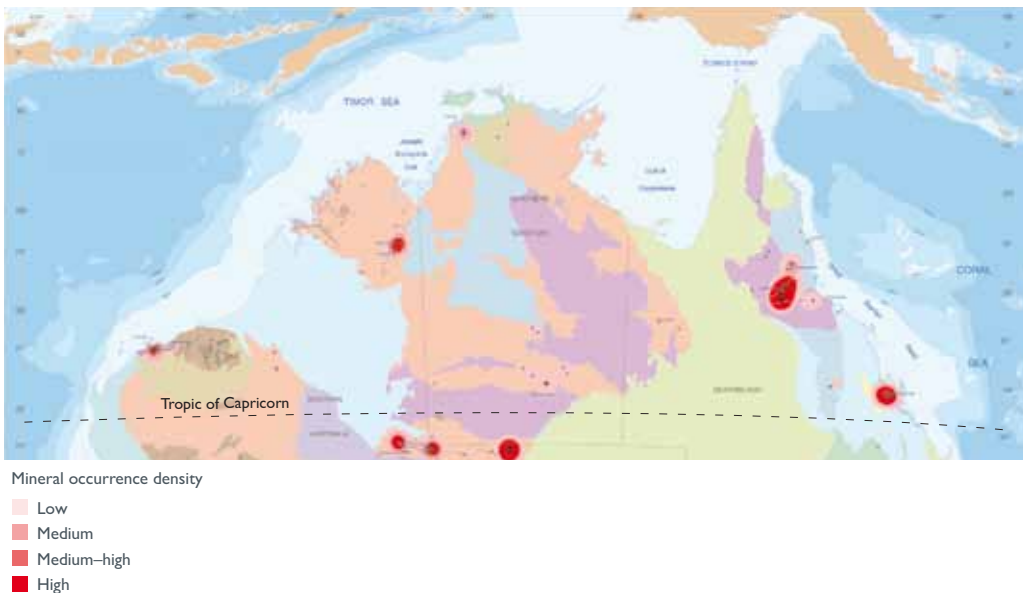


Source: Geoscience Australia

Nickel

Nickel deposits are documented in a number of regions of Northern Australia, such as the Pilbara and Kimberly regions in Western Australia, the Darwin-East Arnhem and Barkly-Central NT in the Northern Territory (see Map 8.5.4). Substantial nickel deposits are located in the Northern Region of Queensland.

Map 8.5.4 Northern Australia—nickel deposits, occurrences and potential



Source: Geoscience Australia.

Gold

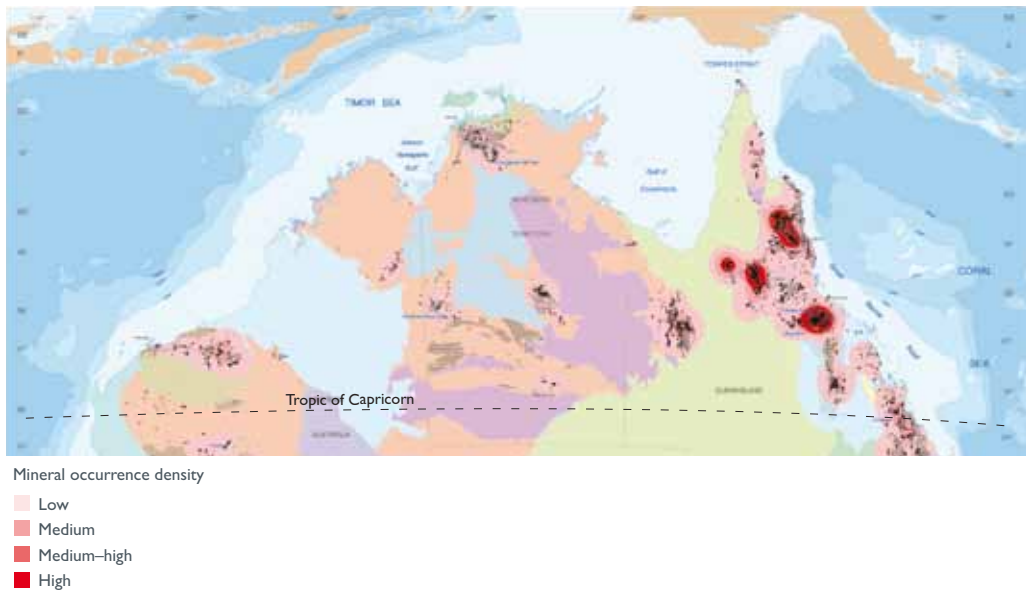
Australia's gold resources occur and are mined in all states and the Northern Territory. The largest documented deposits of gold are in the northern part of the Great Dividing Range of Queensland. Smaller sites occur in many regions of Northern Australia, as illustrated on Map 8.5.5. Gold's *economic demonstrated resources* have increased steadily since 1975 with much of the increase attributed to the improvement in ore processing by introduction of the carbon-based technology which allowed for processing of low-grade ore deposits.

Diamonds

Australia ranks as the world's fourth largest producer of diamond by weight after Russia, Botswana and Congo. As a producer of gem/near gem diamond, Australia is the fourth largest after Russia, Botswana and Canada, and is the third largest producer of industrial grade diamonds after Congo and Russia.

Australia's diamond production is almost entirely from Rio Tinto Ltd's Argyle mine in the Kimberley Region of Western Australia. Other diamond resources are being developed and mined in the Ellendale mine in the western part of the Kimberley region (see Map 8.5.6). North Australian Diamonds Ltd is evaluating a potential mining project which could produce 400 000 carats per year and is located in Merlin, (eastern part of the Darwin-East Arnhem Region).

Map 8.5.5 Northern Australia—gold deposits, occurrences and potential



Source: Geoscience Australia.

Map 8.5.6 Northern Australia—diamond deposits, kimberlites, and related rocks



Note: nT—nanotesla.

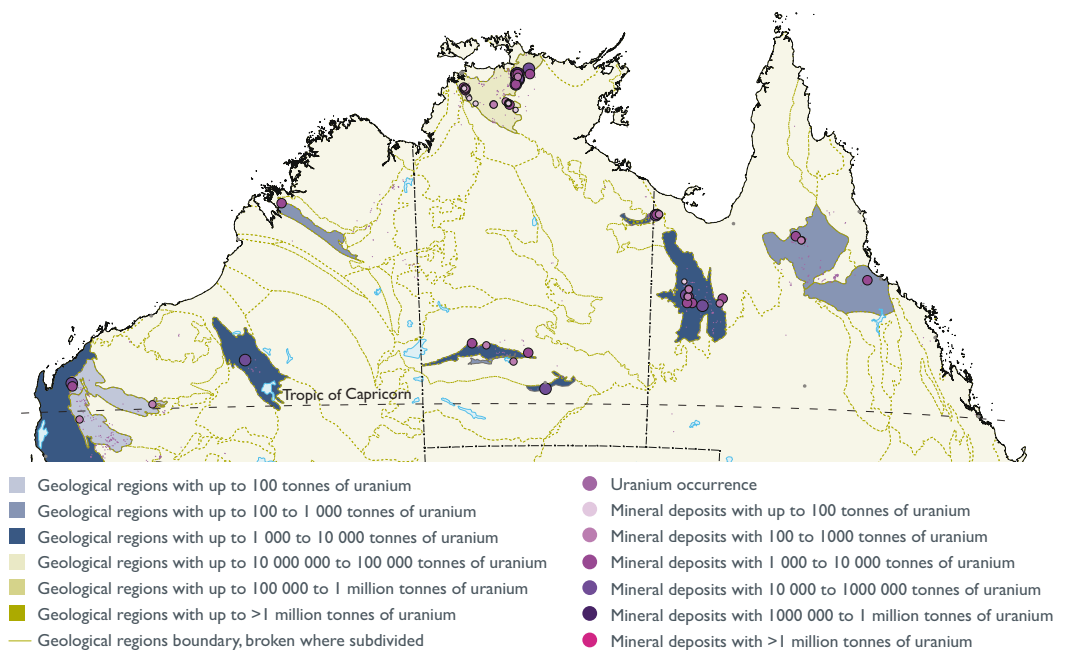
Source: Geoscience Australia.

Uranium

Australia's *economic demonstrated resources* at December 2007 were estimated to be 983 000 tonnes of U_3O_8 , which represented an increase of 38 per cent over the estimates for December 2006. This was due mainly to a large increase in resource estimates for the Olympic Dam deposit (South Australia) but resources also increased at *Ranger 3* deposit in the Darwin-East Arnhem Region in the Northern Territory. This fast deposit development took place mostly in Northern Australia. Among the main exploration areas (in terms of expenditure) in developing uranium resources during 2007 were the Northern Territory—the Alligator Rivers region and Western Arnhem Land, Rum Jungle area and Ngalia Basin and in Queensland—the Mt Isa area.

Northern Territory's uranium resources represented 13 per cent of Australia's total resources. Approximately 95 per cent of Australia's total uranium resources in *economic demonstrated reserves* are within the following six deposits: Olympic Dam, which is the world's largest uranium deposit in South Australia; Ranger, Jabiluka, Koongarra in the Alligator Rivers region in the Northern Territory; and Kintyre and Yeelirrie, which are located in southern Western Australia.

Map 8.5.7 Northern Australia—uranium resources



Source: Geoscience Australia.

Coal

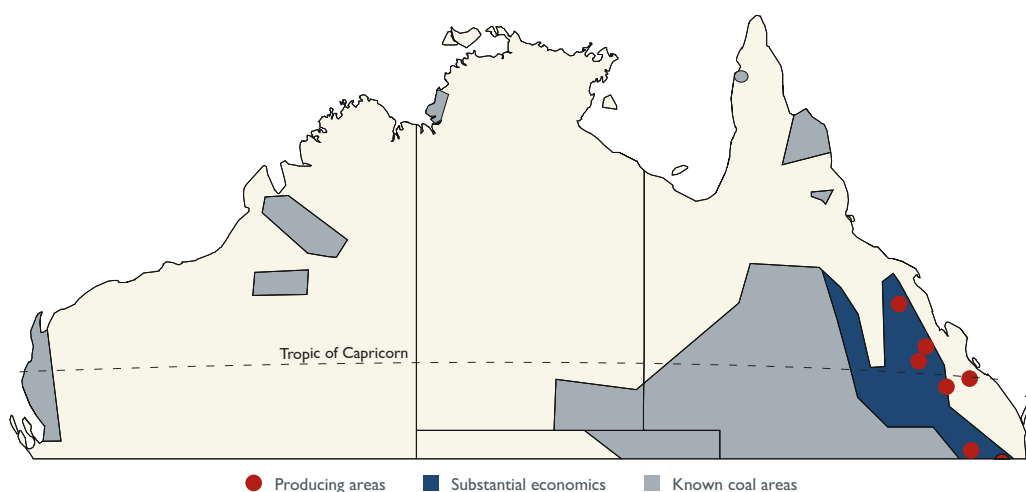
Coal is a widespread resource available across Australia. In Northern Australia, coal is abundant in the Mackay and Far North regions of Queensland. The Bowen Galilee Basins in particular are being further developed to provide thermal and coking coal for exports and local industries. The map below illustrates the *known coal areas*, *substantial economic* and *producing area* (see Map 8.5.8). Currently, the *economic*

resources, which are closer to port facilities or local markets are being exploited and further developed, although new coal fields are being added to coal resources.

For example, Waratah Coal was granted two coal exploration leases in the Laura Basin, in the Far North Region of Queensland, in December, 2007. The Laura Basin is situated on the eastern side of Cape York Peninsula. Within the Laura Basin, known coking coal resources have been identified at Bathurst Range in the Bathurst Seam. Resource tonnage is in excess of 50 million tonnes and the seam thickness greater than 1.5 metres (Waratah Coal, 2007).

Similar potential for future coal resource expansion exists in a number of regions, as the *known coal areas* exist in the Pilbara and Kimberley regions of Western Australia, the Darwin-East Arnhem Region of the Northern Territory and the North Western region of Queensland.

Map 8.5.8 Northern Australia—black coal resources



Source: Australian Coal Association (2009).

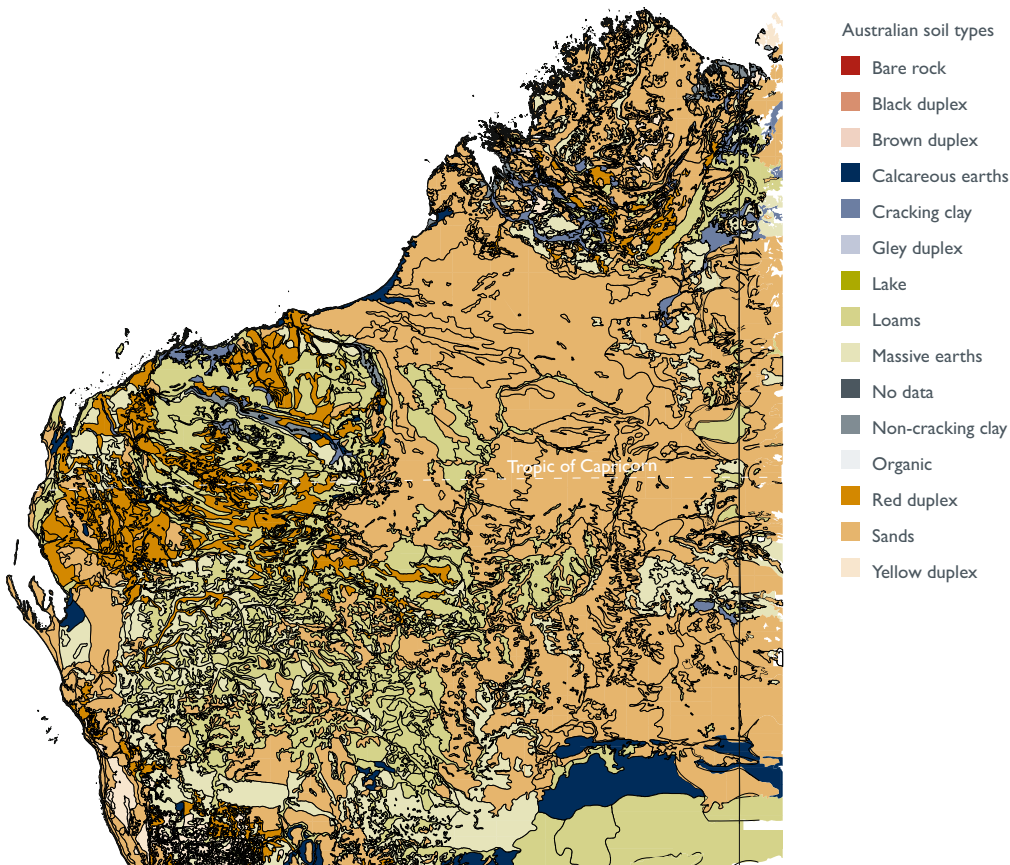
8.6 Soil characteristics

This section discusses soil characteristics across Northern Australia, with reference to soil types, organic carbon levels, soil pH levels and plant available water capacity. These are some of the indicators which can be used by land users and policymakers in assessing the productive capacity of different tracts of land.

Maps 8.6.1 to 8.6.3 provide a basic overview of soil types across Northern Australia. With reference to the North of Western Australia, Pindan red loam makes up the basis of most soils throughout the western Pilbara. The loams of Karratha, Dampier, Roebourne, Wickham and Point Samson have a gravelly texture, with stone making up a significant component of the soil (Water Corporation, no date available). Sand, sandy loam and rocky stony soils are more common inland (Water Corporation, no data available). In semi-tropical to arid climates across the region, agricultural use of land (where possible) is based largely on rangeland pastoralism across large tracts of grazing country.

In about one-third of the Kimberley Region, shallow soils and rock outcrops dominate, making these areas generally unsuitable for agriculture. Deep red or brown sandy soils occupy approximately one-quarter of the region, and support some pastoral rangelands grazing, as well as some irrigated cropping. Cracking clays are more limited, but are important for grazing and irrigated agriculture (Kimberley Development Commission, no date available).

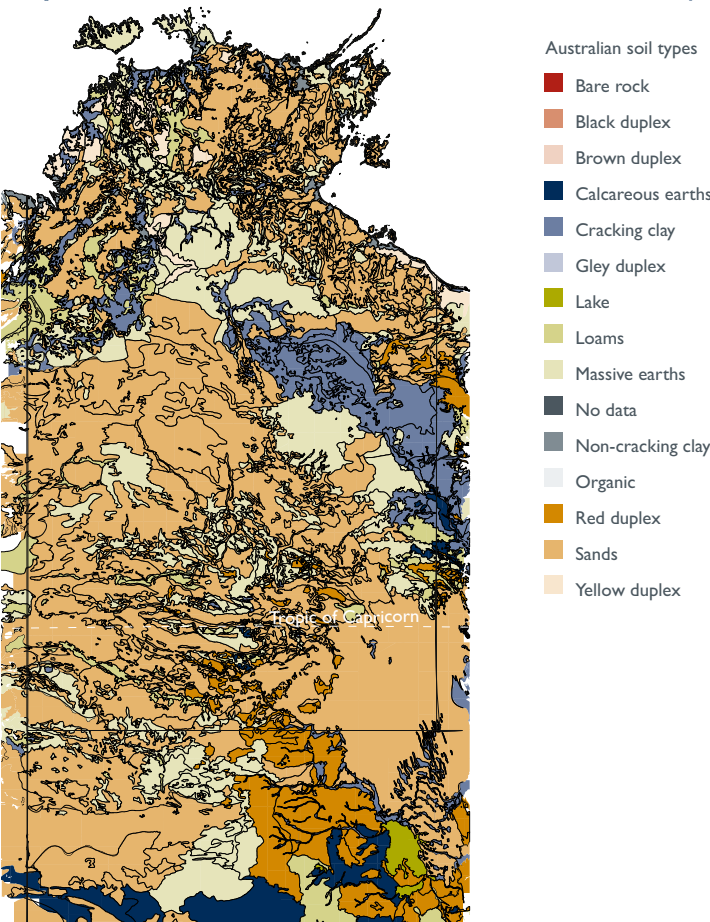
Map 8.6.1 **Northern Australia—northern Western Australia soil types**



Source: BRS (2009).

With respect to the Northern Territory, the soil pattern is complex without large areas of uniform soil types. According to O’Gara (2007 p.13), ‘Most soils are highly erodible, difficult to manage under conventional cultivation and have relatively poor natural fertility and low water holding capabilities. Soil types range from massive red, yellow and grey earths to shallow ironstone gravels ... shallow stony and sandy soils [are] interspersed with massive red and yellow earths throughout the Top End ... Surface textures range from sands to clay loams ... Black and brown cracking clay soils ... are common on the seasonally flooded coastal areas ...’

Map 8.6.2 Northern Australia—Northern Territory soil types



Source: BRS (2009).

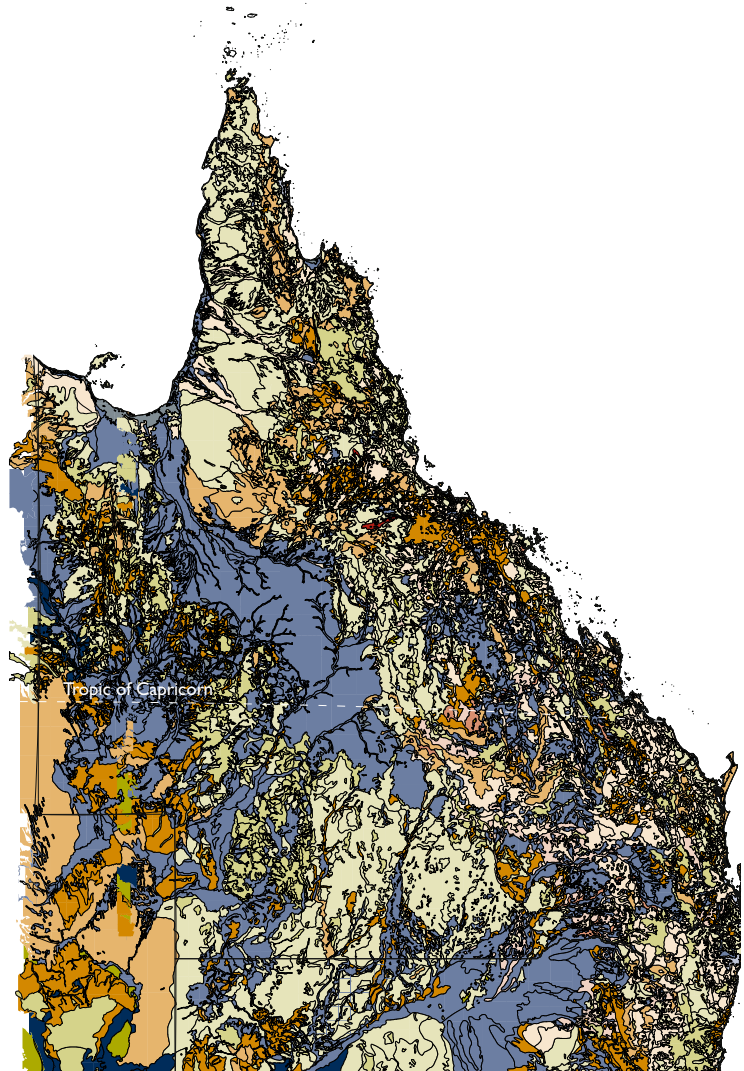
In the semi-arid and tropical regions of northern Queensland, red, yellow and grey Kandosols feature strongly²⁰ (McKenzie, Jacquier et al 2004 p.68). These soil types (particularly red and yellow) have relatively high plant water availability and are well-drained. Red Kandosols are suitable for uses such as sugar cane cropping and beef grazing, for example. The other Kandosols are associated more typically with rangelands grazing (Department of the Environment, Water, Heritage and the Arts 2007).

20. Kandosols include soils with weak or massive subsoil structure. For further information see (Department of the Environment, Water, Heritage and the Arts 2007). They are displayed on the map in this publication under the catch all category ‘massive earths’.

Map 8.6.3 Northern Australia—northern Queensland soil types

Australian soil types

- Bare rock
- Black duplex
- Brown duplex
- Calcareous earths
- Cracking clay
- Gley duplex
- Lake
- Loams
- Massive earths
- No data
- Non-cracking clay
- Organic
- Red duplex
- Sands
- Yellow duplex



Source: BRS (2009).

The Australian Soil Resource Information System (ASRIS) database²¹ includes descriptions of soils and landscapes across the whole of Australia, as well as more detailed soil profile information on soil thickness, water storage, permeability, salinity, fertility and erodibility for selected sites across the country. Readers seeking more detailed soil information may also contact the National Committee on Soil and Terrain. This committee is made up of a range of Federal, state and territory agencies which provide information to a central data collection point through the Australian Collaborative Land Evaluation Program. Relevant contact details and information about the agencies involved can be found online at <http://www.clw.csiro.au/aclep/Collaborators.htm>.

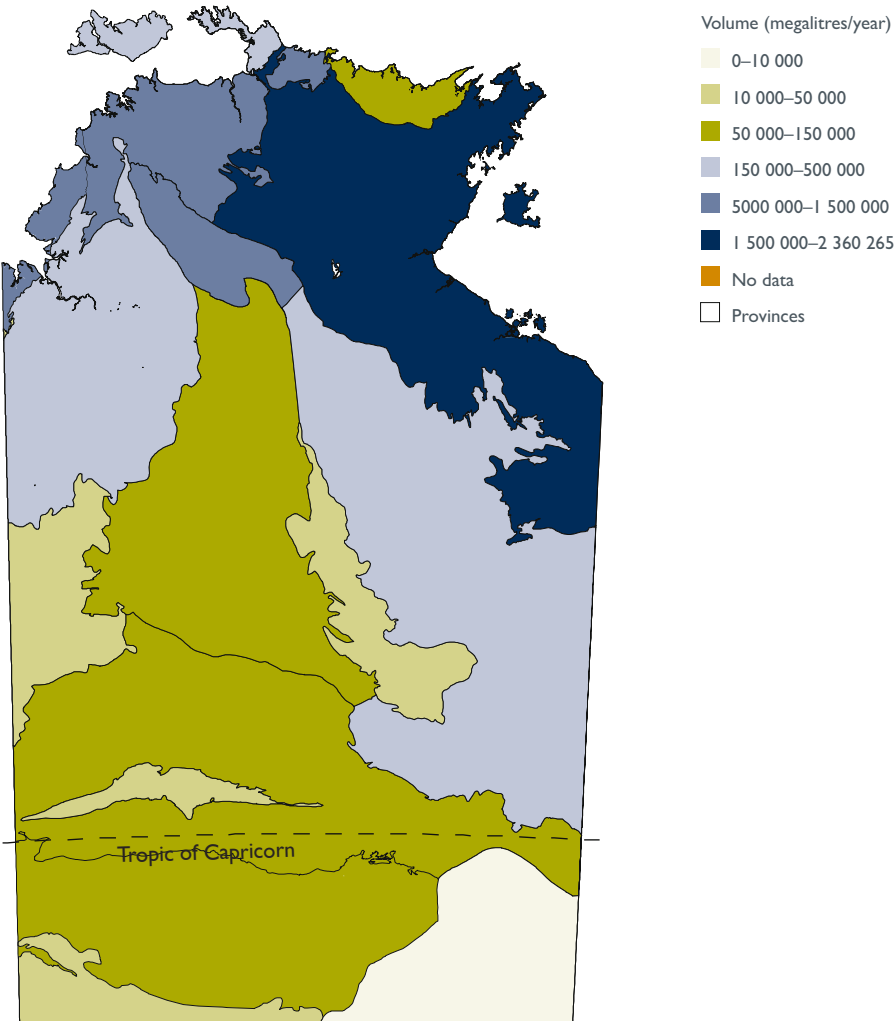
21. For more detailed information about soils and landscapes across Australia, readers may consult online at <http://www.asris.csiro.au/about.html>.

Groundwater

Groundwater refers to water which is stored underground in rock fractures or pores. Maps 8.7.1 to 8.7.3 show that groundwater capacity varies considerably over the Northern Australian region.

For example, Map 8.7.1 and 8.7.3 show that across much of the Northern Territory's interior and the northern Kimberley in Western Australia, groundwater basins have a sustainable yield of less than 500 gigalitres per year. Meanwhile, in Map 8.7.1 it can be seen that much of the Arnhem and Gulf coastal area of the Northern Territory (part of the Darwin-East Arnhem Region) have underground reserves which can produce a sustainable yield of between 2000 and 2500 gigalitres per year, the highest in Northern Australia.

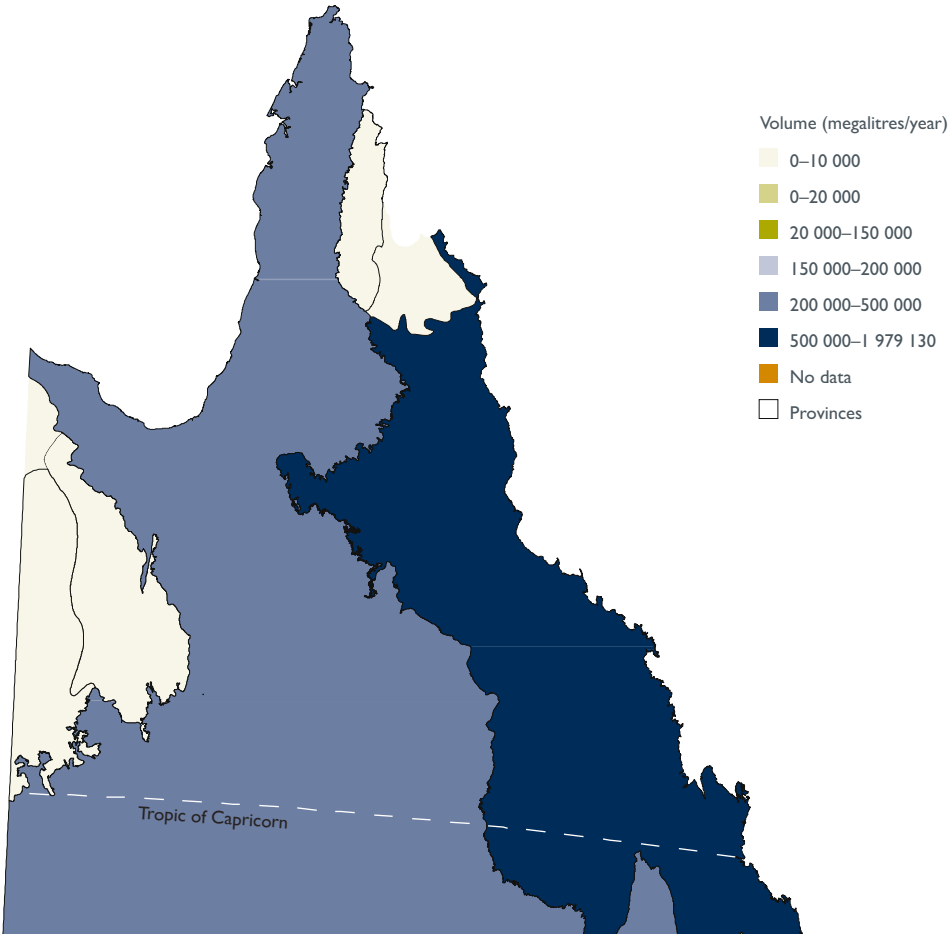
Map 8.7.1 Sustainable yield of groundwater provinces, Northern Territory



Source: Land and Water Australia (2001).

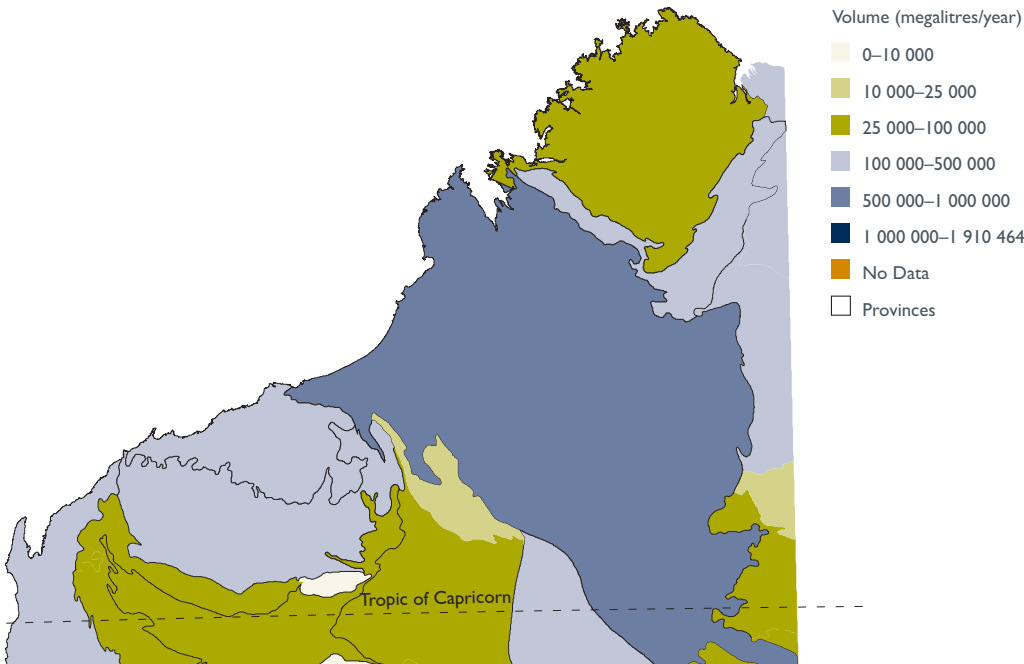
In Map 8.7.2, it can be seen that the Great Artesian Basin stretches across much of Queensland (particularly the North West and Far North regions within Northern Australia), with a sustainable yield of between 200 000 and 500 000 megalitres of water per year. This is one of the largest artesian groundwater basins in the world. It underlies approximately one-fifth of Australia, covers a total area of over 1 711 000 square kilometres and it has an estimated total water storage of 64 900 million megalitres.

Map 8.7.2 Sustainable yield of groundwater provinces, Queensland



Source: Land and Water Australia (2001).

Map 8.7.3 Sustainable yield of groundwater provinces, Western Australia



Source: Land and Water Australia (2001).

Water supplies from groundwater resources have been developed to meet urban, rural domestic, pastoral, irrigated agriculture, mining, construction and aquaculture demands (Australian State of the Environment Committee 2006). Many rural and urban areas within Northern Australia rely heavily on groundwater to meet their water supply needs.

Across Australia, there has been a large increase in the levels of groundwater usage between 1983–84 and 1996–97. This is particularly the case in Western Australia and the Northern Territory (see Table 8.7.1).

As information on ground water within the Northern Australia subregions considered by this compendium was not available, data tables and maps have been provided which show the ground water levels and allocated usage for the three states/territories within Northern Australia: Western Australia, Queensland and the Northern Territory.

Table 8.7.1 Groundwater usage, 1983–84 to 1996–96

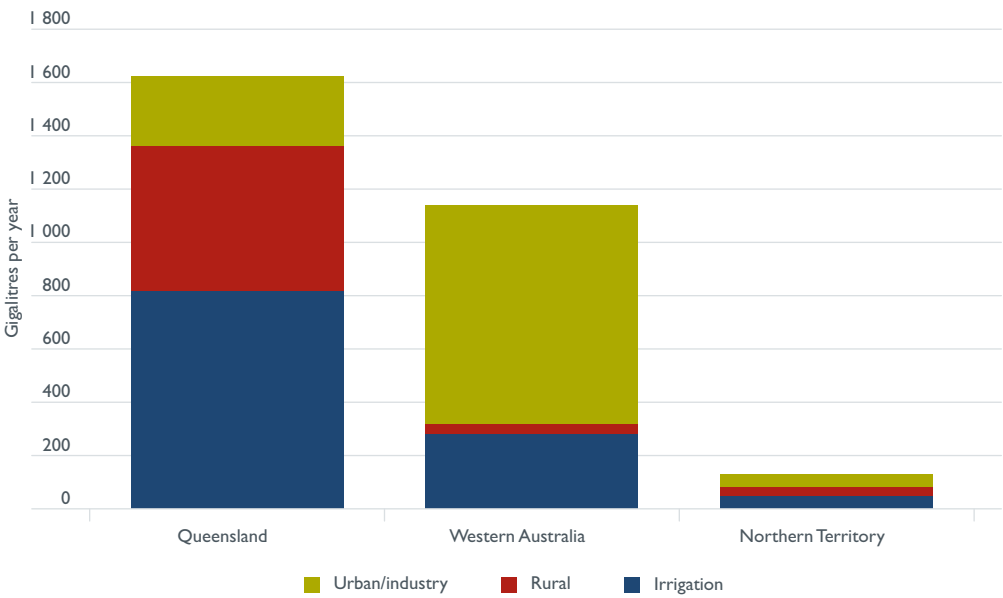
Province	Use in 1983–84 (gigalitres per year)	Use in 1996–97 (gigalitres per year)	Per cent change
Queensland	1 121	1 622	45
Western Australia	373	1 138	205
Northern Territory	65	128	97
Australia	2 634	4 962	88

Source: Australia State of the Environment Committee (2006).

As discussed in Chapter 9, irrigated agriculture, mining, and forestry and fishing are large industries within Northern Australia. Due to the reliance of these industries on water, and the increased levels of usage which have been observed over the past decades, there is growing pressure to exploit additional groundwater and river systems within Northern Australia (Australian State of the Environment Committee 2006).

Figure 8.7.1 shows that the highest user of groundwater in Queensland during 1996–97 was irrigated agriculture, while industries (such as mining and manufacturing) used a substantial proportion of Western Australia’s groundwater during the same period. Groundwater use within the Northern Territory was balanced between irrigation, rural, and urban/industry during 1996–97.

Figure 8.7.1 Groundwater usage, by state, 1996–97



Source: Australian Government (2007).

Additional maps which show the volume of groundwater allocated for use, either within or external to a surface water management area, is available in the background information.

Within the north of the northern Northern Territory, the highest levels of groundwater usage are within the Darwin-East Arnhem Region. The more southern parts of the Barkly-Central NT Region, in and around Alice Springs, also have higher levels of groundwater usage. The Darwin and Katherine population centres use both groundwater and surface water supplies. In contrast, Tennant Creek and Alice Springs are entirely reliant on groundwater supplies, as are the majority of smaller communities within the Northern Territory.

At the regional level, most of the groundwater is used by the pastoral industry (23.5 gigalitres per year), with mines across the region such as the Nabalco bauxite mine also using on groundwater (17 gigalitres per year).²² Irrigated agriculture and

22. http://www.anra.gov.au/topics/water/allocation/nt/index.html#gw_alloc.

horticulture, which mainly feature in the Darwin and Katherine regions, also use a large amount of groundwater (47 gigalitres per year).²³

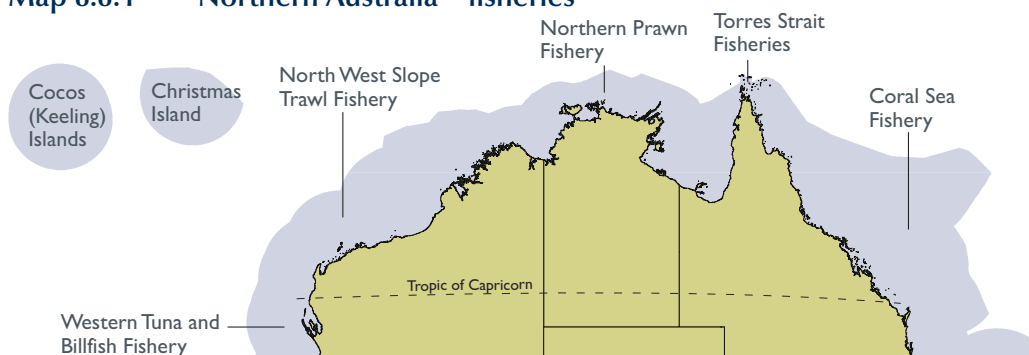
8.8 Fisheries

Due to the importance of the fishing industry and the pressures currently being placed on the natural marine environment, the fisheries of Australia have been placed under strict management, both at the state and national level. Each fishery incorporates measures such as catch limits, size limits, target catches and seasonality to ensure the sustainable harvest of the fisheries.

Fisheries are open to two classes of fishing: commercial and recreational. Commercial fishing is important as a source of food for both domestic and foreign consumption, while recreational fishing is important as a source of tourism revenue for the regions where this is allowed.

At the national level, the Australian Fisheries Management Authority (AFMA) is responsible for the efficient and sustainable management of the Commonwealth fish resources. Generally, they manage fisheries from three nautical miles to 200 nautical miles (or national economic boundaries) of ocean, but on negotiation with the states can manage up to the shore line. State authorities control the fisheries situated within three nautical miles of the coast.²⁴

Map 8.8.1 Northern Australia—fisheries



■ Extend of the Australian fishing zone

Source: AFMA (2008).

AFMA manages more than twenty fisheries, nine of which include waters off Northern Australia. Of these nine, only four fisheries are exclusively associated with Northern Australia.

The fisheries which are situated off the coast of Northern Australia are:

- Torres Strait Fisheries
- Coral Sea Fishery

23. http://www.anra.gov.au/topics/water/allocation/nt/index.html#gw_alloc.

24. All data on the fisheries administered by the AFMA comes from their website <http://www.afma.gov.au/fisheries/default.htm>.

- Western Deepwater Fishery (a small area of its most northern part)
- Northern Prawn Fishery
- North West Slope Fishery
- Eastern and Western Tuna, Skipjack and Billfish fisheries (which cover the whole of the Australian coast).

Coral Sea Fishery

The Coral Sea Fishery is a relatively small fishery which lies off the coast of Queensland, encompassing approximately 17 000 square kilometres. A diverse set of marine life are allowed to be fished, including sea cucumber, shark and large varieties of finfish. In 2006–07, the approximate landed weight from the Coral Sea Fishery was 192.2 tonnes (plus aquarium fish) with an estimated value of \$1.34 million.

Northern Prawn Fishery

Situated off the northern coast of Australia, the Northern Prawn Fishery stretches from Cape York in Queensland to Cape Londonderry in Western Australia. The Northern Prawn Fishery produces nine commercial species of prawns as well as squid, scallops, scampi and bugs.

To manage this fishery, the AFMA operates a number of controls so that the fishery is not over fished. These controls include and are not limited to seasonal closure, localised permanent closures and limited entry.

In 2006–07, production from this fishery was estimated at \$64 million, which is down from the 2000–01 peak estimate of \$164 million. In 2006–07, 2647 tonnes of banana prawns and 1834 tonnes of tiger prawns were produced.

North West Slope Trawl Fishery

The North West Slope Trawl Fishery is situated off the northern Western Australia coast, extending from 114°E to approximately 125°E. The fishery mostly targets crustaceans such as deepwater prawns and scampi. Many operators fish both the Northern Prawn Fishery and the North West Slope Trawl Fishery, though the fishery is somewhat seasonal, based on the seasonal operation of the Northern Prawn Fishery.

In 2003–04 (latest year available), the fishery produced an estimated 61.6 tonnes with an estimated value of \$A1.149 million, mostly for domestic consumption.

Western Deepwater Trawl Fishery

The majority of the Western Deepwater Trawl Fishery is not situated off the coast of 'northern Australia', though its most northern part can be considered part of Northern Australia. This fishery produces numerous different types of fish, primarily finfish. In the northern section the fish tend to be more tropical in nature, such as tropical snapper.

The Western Deepwater Trawl Fishery is not heavily fished with a total haul of 109.5 tonnes valued at approximately \$979 600 in 2003–04. The market for the produce of the fishery is mainly domestic.

The above figures are for the whole of the Australian fishery and not for Northern Australia parts alone, as the data was not able to be divided into our northern Australia classifications.

Eastern and Western Tuna, Skipjack and Billfish fisheries

These fisheries cover the whole of the Australian Fishing Zone, with the only difference in coverage being in the Torres Strait area. Fishing of these fish also occurs on the high seas, outside of the Australian Fishing Zone. These fisheries have an east/west divide for the ease of management. The main markets for the production of the Tuna and Billfish Fisheries are Japan, America and domestically, while the majority of the production of the Skipjack Fisheries are supplied to the Port Lincoln cannery.

The Eastern Tuna and Billfish Fishery's main port in Northern Australia is Cairns. A total of 5217 tonnes was produced from this fishery at a value of \$A26.8 million in 2006–07.

The Western Tuna and Billfish Fishery produced 925 tonnes (including 446 tonnes of skipjack tuna) in 2005–06 at a value of \$A3.2 million. Due to the depressed price of skipjack, Australian production values have in the ten years to June 2007 ranged from \$A0 to \$A8.1 million.

These figures are for the whole of these fisheries and not for Northern Australia alone, as the data was not able to be divided into our Northern Australia classifications.

Torres Strait Fisheries

The Protected Zone Joint Authority (PZJA)²⁵ (a joint operation of the Australian Government, the Queensland Government and the Torres Strait Regional Authority) manages and is responsible for the 10 separate fisheries located in the Torres Strait Protected Zone (TSPZ). The purpose of these fisheries is to acknowledge and protect the traditional culture and livelihoods of the inhabitants of the Torres Strait. Within these fisheries, the traditional inhabitants have the right of free movement and can fish for their traditional catch, in a traditional manner. For instance, in the Pearl Shell Fishery, licences are limited to the Indigenous population, and the only method of harvest allowed is diving and hand collection.

The largest (in geographical size) fishery is the Turtle and Dugong Fishery, where Torres Strait Islanders are allowed to fish for turtles and dugong using their traditional methods. All of the other fisheries are geographical subsets of the Turtle and Dugong fishery. Detailed maps of the other Torres Strait fisheries can be found at <http://www.pzja.gov.au/resources/maps.htm>. Some of the other fisheries of the Torres Strait are for rock lobster, barramundi, beche-de-mer (sea cucumber) and crab.

The total catch for the Torres Strait Fisheries was 1835 tonnes at an approximate value of \$23.5 million in 2006–07. The majority of this (1171 tonnes and \$11.3 million) came from harvesting prawns. In 2000–01, 619 (± 134) dugongs and 1619 (± 574) turtles were reported as caught.

25. <http://www.pzja.gov.au/>.

Western Australia State Fisheries

The Western Australian Department of Fisheries oversees the fisheries along the Western Australian coast which are within three nautical miles of the shore. The Department breaks up its coast into four offshore and two inland bioregions. Each region contains numerous fisheries based on geographical location and target catch. Of interest to Northern Australia are the North Coast Bioregion and the most northern part of the Gascoyne Coast Bioregion.

The North Coast Bioregion contains twelve individual fisheries, four dedicated to prawns, five dedicated to fish (and shark) of different species, and one each for oysters, crabs and beche-de-mer.

The estimated total catch for these fisheries was 4007 tonnes and 600 654 oysters for the 2007 reporting period (Western Australian Department of Fisheries 2008). The approximate value for this catch has not been made available yet.

The Gascoyne Bioregion contains six bioregions, only one of which is applicable to Northern Australia. The Exmouth Gulf Prawn Fishery, as its name suggests, is situated in the water east of Exmouth and targets four species of prawns. The fishery approximated production was 790 tonnes in the 2007 reporting period.

In terms of value of production, the Pearl Oysters Fishery is the most important of the Western Australia state fisheries. In the 2006 reporting period, the oyster production contributed over 80 per cent of the total production value for the year. This fishery is the last remaining wild stock pearl fishery in the world.

The second largest (by tonnage) fishery is the Pilbara Fish Trawl Fishery, which produces various species of snapper, emperor and cod. The Pilbara Fish Trawl Fishery produced an estimated 1704 tonnes in 2007. In 2006, this fishery produced 2222 tonnes at an estimated value of \$A10.5 million.

Recreational fishing is low in the North West Bioregion, with most of the recreational fishing occurring in the Blue Swimmer Crab (25 per cent of the commercial catch) and Mackerel Fisheries (around 45 per cent of the commercial catch with a small catch in the Pilbara Fish Trawl Fishery (between 2 and 10 percent) and the Kimberley Gillnet and Barramundi Managed Fishery (under 2 per cent).

Also situated in the Gascoyne Bioregion is the Ningaloo reef, an important natural attraction for the tourism industry, acting as a main attraction for tourists.

Northern Territory Fisheries

The Northern Territory Department of Regional Development, Primary Industry, Fisheries and Resources is responsible for the fisheries of the Northern Territory. The Northern Territory has 11 operating wild catch fisheries.

The value of the wild catch of the Northern Territory fisheries was estimated at \$A28.2 million in 2006, with the highest values coming from barramundi (\$A5.3 million), mud crab (\$A4.7 million) and shark (\$A4.3 million) (Department of Primary Industry, Fisheries and Mines 2007).

Due to the diverse nature of the marine life off the Northern Territory coast from the tropical nature of the waters, the Territory has a dedicated aquarium fishery for the sole purpose of harvesting marine life for the purpose of display. This fishery produced over 37 500 individual fish in 2006.

Indigenous fishing is also an important part of the Northern Territory fisheries. In 2000–01, 91 per cent of the Indigenous population of communities along the northern coast went fishing, with an average of 12 days fishing each in that year. The most important species for the Indigenous population (in number of organisms) were mussels, mud crabs and mullet.

Recreational fishing in the Northern Territory is estimated at the value of \$A35 million, which is from the value of equipment such as rods, reel and boats, spent by the people of the Northern Territory each year, with approximately 25 per cent coming from tourists from outside of the Northern Territory.

Queensland State Fisheries

The Queensland Department of Primary Industry and Fisheries is the authority which manages the states fisheries. Twenty-one fisheries were in operation in 2006, eighteen of which have an influence on Northern Australia. Most of the Queensland fisheries cover the whole of the Queensland coastline; only four fisheries are located solely in the waters off Northern Queensland.²⁶ These four fisheries are:

- East Coast Tropical Rock Lobster Fishery
- Gulf of Carpentaria Developmental Finfish Trawl
- Gulf of Carpentaria Inshore Finfish Fishery
- Gulf of Carpentaria Line Fishery.

Together these four fisheries produced 3037 tonnes with a combined estimated value of \$A25.7 million. The largest fishery is the Gulf of Carpentaria Inshore Finfish Fishery with 1929 tonnes of fish harvest, with an approximate value of \$A12.8 million in 2006.

These fisheries are also important as a source of indigenous fishing. There was an indigenous harvest of 13 000 individual lobsters from the East Coast Tropical Rock Lobster Fishery and a combined 262 000 individual fish were harvested from the Development Finfish Trawl and the Line Fishery.

As well as these fisheries, the fisheries of the Torres Strait are important to the coastal fishing of Queensland—but the majority of these are reserved for Torres Strait Islanders to fish in their traditional ways.

Recreational fishing is not large in these fisheries, with only 101 tonnes harvested in the Inshore Finfish Fishery and 44 tonnes in the Line Fishery.

The natural marine resources off the Queensland coast, includes the Great Barrier Reef. Considered one of the natural wonders of the world, it serves as a major tourist attraction for Queensland, bringing numerous tourists to the region each year, as indicated by the high aviation travel to and from Cairns and Townsville (see Chapter 6).

26. Each fishery has its own report and there is no amalgamated report to reference.

The following table (Table 8.8.1) summarises the total catch at the fishery level (only for those fisheries which are solely located in Northern Australia), the whole of Western Australia, Queensland and the Northern Territory, and for Australia as a whole. However, the numbers contained in this table provide an illustration of magnitude of tonnages caught and their respective location.

Table 8.8.1 Northern Australia—fisheries catch in tonnes and value, 2006–07

<i>Fishery</i>	<i>Catch (tonnes)</i>	<i>Commercial GVP (thousands of dollars)</i>	<i>Year</i>
Onslow Prawn	4	na ²	2007
Nickol Bay Prawn	44	na ²	2007
Broome Prawn	72	na ²	2007
Kimberley Prawn	271	na ²	2007
Kimberly Gillnet and Barramundi	26	na ²	2007
Northern Demersal Scalefish	908	na ²	2007
Pilbara fish trawl	1 704	na ²	2007
Pilbara demersal trap and line	460 (trap) 102 (line)	na ²	2007
Mackerel	324	na ²	2007
Northern Shark	na ¹	na ¹	2007
Pearl Oyster	600 658 individual	na ²	2007
beche-de-mer	92.2	na ²	2007
Exmouth Gulf Prawn	790	na ²	2007
Western Australia state total	26 826	351 500	2006/07
GOC Developmental Finfish	613	2 500	2006
GOC Inshore FinFish	1 929	12 800	2006
GOC Line	307	1 600	2006
Tropical Rock Lobster	188	7 800	2006
Queensland state total	24 003	201 100	2006/07
Aquarium	1 778 kg rock, 66 413 individuals rock, coral crustaceans and fish	na ³	2006
Barramundi	1 019	5 200	2006
Coastal Line	236	670	2006
Coastal Net	47.7	190	2006
Demersal	223	1 320	2006
Development	na ⁴	na ⁴	2006
Finfish Trawl	866.2	na ⁴	2006
Mud Crab	266	4 730	2006
Offshore Net and Line	1 292	4 340	2006
Spanish Mackerel	409	2 490	2006
Timor Reef	726	4 080	2006
Trepang	169.8	na ⁴	2006
Northern Territory total	5 717	28 900	2006/07
Torres Strait Fisheries	1 311	23 449	2006/07
Coral Sea Fishery	192.2	13 800	2006/07
Northern Trawl Prawn Fishery	5 131	63 700	2006/07
North West Region Slope Fishery	61.6	1 150	2003/04
Australia Wildcatch total	185 925	1 429 000	2006/07

Note: State and national totals and Commonwealth fisheries data sourced from ABARE, state fisheries data sources from relevant states.

1. Closed to fishing in 2007.
2. Not disclosed in report.
3. Not reported in 2006.
4. Deemed confidential due to small number of operators.

Sources: ABARE (2008); Northern Territory Department of Primary Industry, Fisheries and Mines (2007); Western Australia Department of Fisheries (2008); Queensland Primary Industries and Fisheries (2007).

Data relating to natural resources available in the online compendium

Tables

8.1 Land use

- Northern Australia—selected land use, by region, 2001
- Pilbara Region—land use, by region, 2001
- Kimberley Region—land use, by region, 2001
- Darwin-East Arnhem Region—land use, by region, 2001
- Katherine-Lower Top End Region—land use, by region, 2001
- Barkly-Central NT Region—land use, by region, 2001
- Mackay Region—land use, by region, 2001
- Northern Region—land use, by region, 2001
- Far North Region—land use, by region, 2001
- North West Region—land use, by region, 2001
- Longreach Region—land use, by region, 2001.

8.4 Cyclone activity

- Northern Australia—cyclones, by SLA, January 1970 and 30 June 2007.

Maps

8.7 Groundwater usage

- Western Australia—allocated groundwater, 1996–97
- Queensland—allocated groundwater, 1996–97
- Northern Territory—allocated groundwater, 1996–97.

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Chapter 9

Main industries



Chapter 9 Main industries

This chapter discusses industries in Northern Australia, considering agriculture; general business activity over time; mining; tourism; and service industries.

In terms of agriculture, farming in Northern Australia is diversified in response to natural conditions and proximity to markets. Northern Australia has relatively few forests and forestry plantations.

Australia's two largest scale mining operations are located in Northern Australia: mining of iron ore in the Pilbara and mining of black coal in eastern Queensland's MacKay Region. Within Northern Australia, the value-adding operations are small compared with the large scale of mining minerals, which export as predominantly unprocessed products.

With respect to business activity, this chapter shows that between 2004 and 2006, the total number of businesses grew across much of Northern Australia, as it did in Australia as a whole. This is commensurate with economic and employment growth in the region over the same period. Whilst numbers of non-employing businesses declined, numbers of employing businesses generally grew sufficiently to compensate for the fall in employment.

Northern Australia has a relatively strong dependence on tourism, as compared with Australia as a whole. In 2005, Northern Australia had a very high share of tourist overnight stays (16.9 per cent of international overnight stays and 7.5 per cent of domestic overnight stays), compared with its usually resident population, which was 4.7 per cent of the Australian total in 2006. Most Northern Australian tourist visits occurred in the northern regions of Queensland, followed by the Northern Territory.

Relative to Australia, service industries such as finance, insurance, property and business services employ less people in Northern Australia. On the other hand, government administration and defence are larger employers within that region.

9.1 Agriculture

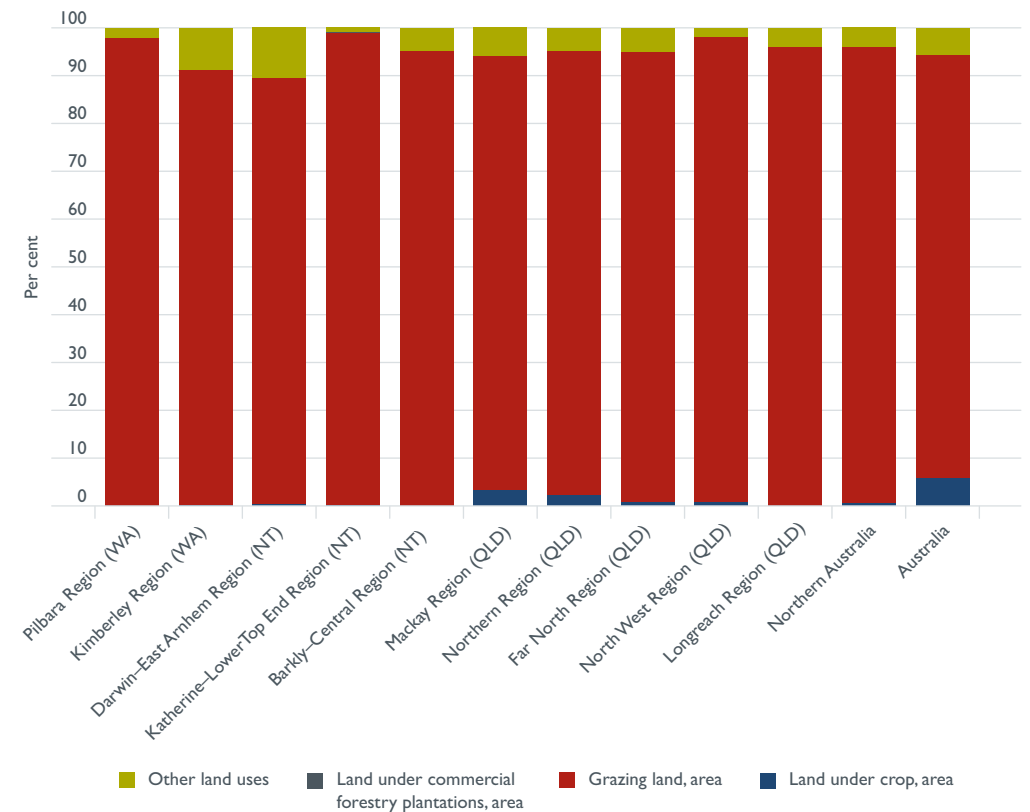
Agriculture in the northern regions of Western Australia and the Northern Territory is based on grazing natural dry land pastures with a small amount of cropping areas in the Darwin-East Arnhem and Katherine-Lower Top End regions and in the Kimberley Region (see Figure 9.1.1). The number of agricultural establishments in the Pilbara and Kimberley regions was only 1.8 per cent of Western Australia's total number of agricultural businesses, but this industry held about 36 per cent of that state's total agricultural land (see Table 9.1.1). Pilbara's agriculture is almost entirely rangeland grazing. The Kimberley has similar enterprises but is augmented by the large irrigation areas around Kununurra supplied by Lake Argyle.

A different and more diversified agriculture has developed in the northern regions of Queensland, where farms are smaller than in the rest of Northern Australia. A relative abundance of water, especially in the Mackay and Northern regions, allows for more cropping. Cropping and horticulture industries include sugar cane and a wide variety of fruits, vegetables and nuts.

Another feature of Northern Australian agriculture is that there are few forests and forestry plantations, most of which are in the Mackay and Katherine-Lower Top End regions.

More information about agricultural land uses, production values, and water use in Northern Australia can be found in the electronic background data (on CD or Internet).

Figure 9.1.1 Northern Australia—land use by region, 2005–06



Source: ABS (2008i).

Table 9.1.1 Northern Australia—agricultural land use, by region, 2005–06

Region	Land use					Land use (per cent)			Percentage of the state			
	Total area (ha)	Number of establishments	Land under crop (ha)	Grazing land, area (ha)	Land under commercial forestry plantations, area (ha)	Other land uses (ha)	Land under crop, area (ha)	Grazing land, area (ha)	Land under commercial forestry plantations, area	Other land uses (ha)	Percentage of the state's total area	Percentage of the state's farming establishments
Northern Australia (WA)	35 086 687	257	15 170	32 940 562	383	2 130 572	0.0	93.9	0.0	6.1	35.6	1.8
Pilbara Region	15 064 585	60	0	14 725 746	0	338 839	0.0	97.8	0.0	2.2	15.3	0.4
Kimberley Region	20 022 102	197	15 170	18 214 816	383	1 791 733	0.1	91.0	0.0	8.9	20.3	1.4
Western Australia state total	98 654 515	14 238	7 292 868	84 764 112	158 631	6 438 904	7.4	85.9	0.2	6.5	100.0	100.0
Northern Australia (NT)	51 628 526	630	31 039	49 557 796	10 122	2 029 569	0.1	96.0	0.0	3.9	87.3	97.7
Darwin-East Arnhem Region	2 757 166	371	10 133	2 450 513	32	296 488	0.4	88.9	0.0	10.8	4.7	57.5
Katherine-Lower Top End Region	17 483 681	166	20 519	17 289 066	10 090	1 64 006	0.1	98.9	0.1	0.9	29.6	25.7
Barkly-Central NT Region	31 387 679	93	387	29 818 217	0	1 569 075	0.0	95.0	0.0	5.0	53.1	14.4
Northern Territory total	59 127 149	645	31 040	56 811 592	10 122	2 274 395	0.1	96.1	0.0	3.8	100.0	100.0
Northern Australia (QLD)	75 617 644	8 725	901 327	72 034 817	9 591	2 671 909	1.2	95.3	0.0	3.5	52.0	27.5
Mackay Region	9 601 118	2 782	311 566	8 719 879	5 358	564 315	3.2	90.8	0.1	5.9	6.6	8.8
Northern Region	6 908 161	1 849	143 859	6 427 718	161	336 423	2.1	93.0	0.0	4.9	4.7	5.8
Far North Region	16 051 521	3 127	120 702	15 087 668	3 712	839 439	0.8	94.0	0.0	5.2	11.0	9.9
North West Region	40 677 533	859	325 158	39 519 029	0	833 346	0.8	97.2	0.0	2.0	28.0	2.7
Longreach Region	2 379 311	108	42	2 280 523	360	98 386	0.0	95.8	0.0	4.1	1.6	0.3
Queensland state total	145 523 352	31 693	2 540 565	135 563 342	224 576	7 194 869	1.7	93.2	0.2	4.9	100.0	100.0
Northern Australia subtotal	162 332 857	9 612	947 536	154 533 175	20 096	6 832 050	0.6	95.2	0.0	4.2	37.3	6.3
Australia total	434 942 511	152 514	24 816 060	384 736 970	988 911	24 400 570	5.7	88.5	0.2	5.6	per cent of Australia's total	per cent of Australia's total

Notes: Land under crop includes vegetables, fruits, nuts, broadacre crops, grapes and nurseries. Grazing land includes pastures and rangelands. Percentages for the regions and for the Northern Australia state subtotals are calculated out of the state total. Percentages for each state's total are calculated out of Australian total. The scope of the data includes businesses undertaking agricultural activity with an estimated value of agricultural operations of \$5000 or more. State percentages provided in the table for Western Australia, the Northern Territory and Queensland are proportions of the Australian total for each land use category.

Source: ABS (2008i).

9.2 Business activity—entries, exits and dynamics

In 2004 and 2006, the total number of businesses grew across much of northern Australia, as it did in Australia as a whole (see Table 9.2.1). This is commensurate with economic and employment growth in the region over the same period. Whilst numbers of non-employing²⁷ businesses declined, numbers of employing businesses generally grew to an extent which more than compensated for this.

Proportionately, growth in the number of businesses was highest in the Longreach (8.4 per cent) and Mackay (8.2 per cent) regions of Northern Australia. The number of businesses declined in the Kimberley (1.5 per cent), Katherine-Lower Top End (1.1 per cent) and Darwin-East Arnhem (0.6 per cent) regions. However, this did not equate with a reduction in employment in the Darwin-East Arnhem or Kimberley regions (see Chapter 4, section 4.4), because most of the business exits were non-employing businesses, and many of the new business entries employed staff.

Across most of the Northern Australian regions, as in Australia generally, the number of non-employing businesses declined between 2004 and 2006 (see Figure 9.2.1). The largest declines were in the Katherine-Lower Top End Region of the Northern Territory (declining by 12.9 per cent from 534 to 465 businesses), and the Kimberley Region of Western Australia (declining by 10.2 per cent from 1299 to 1167 businesses). However, the number of businesses without employees increased in Mackay (increasing by 0.9 per cent from 9237 to 9318 businesses), Northern Queensland (increasing by 1.5 per cent from 8727 to 8856 businesses) and Longreach (increasing by 1.9 per cent from 324 to 330 businesses).

At the same time, the number of businesses with numbers of employees increased, again following similar patterns of growth experienced across the whole of Australia. Proportionately, the largest increases in the number of businesses employing five or more people occurred in Longreach (increasing 20 per cent from 90 to 108 businesses), and the Katherine-Lower Top End Region (increasing 11.8 per cent from 153 to 171 businesses). Only one Northern Australian region, the Kimberley, saw a decline in businesses employing five or more people, falling 1.4 per cent from 513 to 504 businesses.

27. Non-employing businesses include those operated solely by their owners (for example, consultants and contractor) and those operated by people working for commission only.

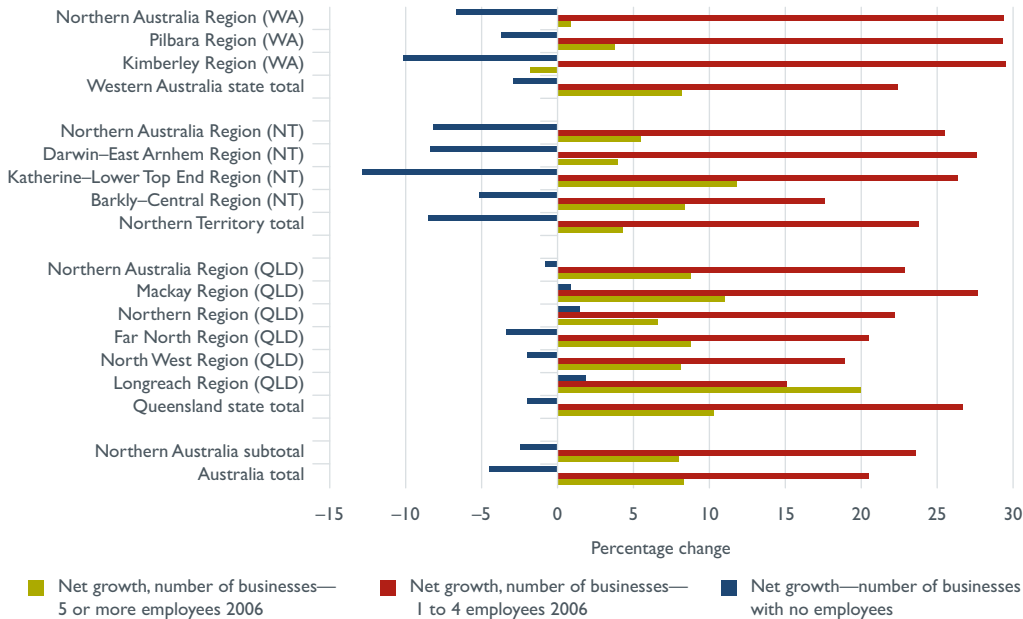
Table 9.2.1 Northern Australia—net growth of the number of business establishments by type, 2004–06

Region	Number of businesses—no employees 2004	Number of businesses—no employees 2006	Net growth—number of businesses with no employees (per cent)	Number of businesses—1 to 4 employees 2004	Number of businesses—1 to 4 employees 2006	Net growth, number of businesses—1 to 4 employees 2006 (per cent)	Number of businesses—5 or more employees 2004	Number of businesses—5 or more employees 2006	Net growth, number of businesses—5 or more employees 2006 (per cent)	Number of Businesses (all business types) 2004	Number of Businesses (all business types) 2006	Net growth in business numbers, all businesses types (per cent)
Northern Australia (WA)	2 826	2 637	-6.7	765	990	29.4	993	1 002	0.9	4 584	4 629	1.0
Pilbara Region	1 527	1 470	-3.7	399	516	29.3	480	498	3.8	2 406	2 484	3.2
Kimberley Region	1 299	1 167	-10.2	366	474	29.5	513	504	-1.8	2 178	2 145	-1.5
Western Australia state total	1 21 386	117 861	-2.9	37 233	45 573	22.4	29 604	32 046	8.2	188 223	195 480	3.9
Northern Australia (NT)	7 734	7 101	-8.2	1 926	2 418	25.5	1 926	2 031	5.5	11 586	11 550	-0.3
Darwin-East Arnhem Region	5 877	5 382	-8.4	1 392	1 776	27.6	1 416	1 473	4.0	8 685	8 631	-0.6
Katherine-Lower Top End Region	534	465	-12.9	159	201	26.4	153	171	11.8	846	837	-1.1
Barkly-Central NT Region	1 323	1 254	-5.2	375	441	17.6	357	387	8.4	2 055	2 082	1.3
Northern Territory total	8 802	8 055	-8.5	2 205	2 730	23.8	2 361	2 463	4.3	13 368	13 248	-0.9
Northern Australia (QLD)	33 513	33 231	-0.8	10 884	13 371	22.9	9 981	10 863	8.8	54 378	57 465	5.7
Mackay Region	9 237	9 318	0.9	3 087	3 942	27.7	2 682	2 976	11.0	15 006	16 236	8.2
Northern Region	8 727	8 856	1.5	3 123	3 816	22.2	2 754	2 937	6.6	14 604	15 609	6.9
Far North Region	13 605	13 140	-3.4	3 975	4 788	20.5	3 939	4 284	8.8	21 519	22 212	3.2
North West Region	1 620	1 587	-2.0	540	642	18.9	516	558	8.1	2 676	2 787	4.1
Longreach Region	324	330	1.9	159	183	15.1	90	108	20.0	573	621	8.4
Queensland state total	237 522	232 797	-2.0	74 223	94 011	26.7	57 978	63 966	10.3	369 723	390 774	5.7
Northern Australia subtotal	44 073	42 969	-2.5	13 575	16 779	23.6	15 174	16 395	8.0	81 825	85 467	4.5
Australia total	1 211 466	1 156 497	-4.5	411 192	495 462	20.5	288 888	312 984	8.3	1 911 546	1 964 943	2.8

Note: This table shows the net increase or decrease in the number of businesses by business size by region. For the purpose of the business statistics provided above, the ABS definition of 'employment' excludes non-salaried directors; volunteers; persons paid by commission only; and self employed persons such as consultants and contractors.

Source: ABS (2008).

Figure 9.2.1 Northern Australia—net growth in the number of businesses by business type



Note: The figure above shows net growth (or decline) in the number of businesses by business type by region, expressed as percentages.

Source: ABS (2008j).

Table 9.2.2 shows that the distribution of business types (employing or non-employing) changed slightly between 2001 and 2006. Overall, there was a small decline in the proportion of businesses which were owner-operated, accompanied by a rise in the proportions with employees, again in line with trends followed across the country as a whole. This was also the case in Australia and the states of Queensland, Northern Territory and Western Australia as a whole.

Table 9.2.2 Northern Australia—proportion of businesses by business type, and change over time, 2004–06.

Region	Number of businesses 2004	Non-employing businesses (per cent of all businesses per region) 2004	Employing businesses: 1 to 4 employees (per cent of all businesses per region) 2004	Employing businesses: 5 or more employees (per cent of all businesses per region) 2004	Number of businesses 2006	Non-employing businesses (per cent of all businesses per region) 2006	Employing businesses: to 4 employees (per cent of all businesses per region) 2006	Employing businesses: 5 or more employees (per cent of all businesses per region) 2006
Northern Australia (WA)	4 584	61.6	16.7	21.7	4 629	57.0	21.4	21.6
Pilbara Region	2 406	63.5	16.6	20.0	2 484	59.2	20.8	20.0
Kimberley Region	2 178	59.6	16.8	23.6	2 145	54.4	22.1	23.5
Western Australia state total	188 223	64.5	19.8	15.7	195 480	60.3	23.3	16.4
Northern Australia (NT)	11 586	66.8	16.6	16.6	11 550	61.5	20.9	17.6
Darwin-East Arnhem Region	8 685	67.7	16.0	16.3	8 631	62.4	20.6	17.1
Katherine-Lower Top End Region	846	63.1	18.8	18.1	837	55.6	24.0	20.4
Barkly-Central NT Region	2 055	64.4	18.2	17.4	2 082	60.2	21.2	18.6
Northern Territory total	13 368	65.8	16.5	17.7	13 248	60.8	20.6	18.6
Northern Australia (QLD)	65 655	51.0	16.6	15.2	69 288	48.0	19.3	15.7
Mackay Region	15 006	61.6	20.6	17.9	16 236	57.4	24.3	18.3
Northern Region	14 604	59.8	21.4	18.9	15 609	56.7	24.4	18.8
Far North Region	21 519	63.2	18.5	18.3	22 212	59.2	21.6	19.3
North West Region	2 676	60.5	20.2	19.3	2 787	56.9	23.0	20.0
Longreach Region	573	56.5	27.7	15.7	621	53.1	29.5	17.4
Queensland state total	369 723	64.2	20.1	15.7	390 774	59.6	24.1	16.4
Northern Australia subtotal	81 825	53.9	16.6	15.8	85 467	50.3	19.6	16.3
Australia total	1 911 546	63.4	21.5	15.1	1 964 943	58.9	25.2	15.9

Note: This table illustrates the total number of businesses by region in 2004 and 2006, and the proportions of those businesses which were non-employing, employing (1 to 4 employees), and employing (5 or more employees).

Source: ABS (2008j).

9.3 Mining and minerals processing

There are diverse mineral deposits located across many regions of Northern Australia (see Map 9.3.1) but in terms of tonnage mined, two mining operations dominate: mining of iron ore for export in the Pilbara Region and mining of black coal for export and domestic use in eastern Queensland's MacKay Region (see Table 9.3.1).

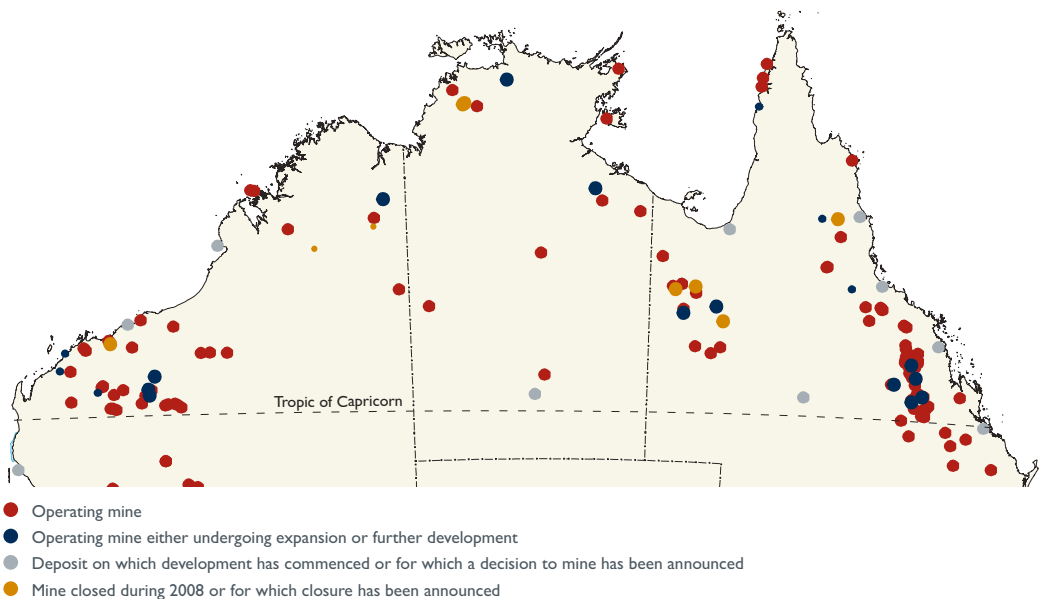
Table 9.3.1 lists all on-shore operating mines in Northern Australia by region, in 2008. As illustrated, in Northern Australia operating and/or projected mines are located in all regions.

A number of gas and oil producing rigs are located off-shore in the Timor Sea and North-West Shelf, which are shown on Map 9.3.1.

Within Northern Australia, the value-adding operations are small compared with the large scale of mining minerals, which are exported as predominantly unprocessed products, such as ores, concentrates or ingots.

Gold and silver are mined in the Northern Region of Queensland and in other regions of Northern Australia a number of metals and minerals are being extracted where they occur in specific geological deposits. For example, in the Far North Region, zinc, copper, lead and silver ores are being mined in the Etheridge area. Similarly, in the Darwin-East Arnhem Region, zinc, lead, silver, uranium, cadmium and copper are mined. Bauxite and antimony are being mined in the Gulf area.

Map 9.3.1 Northern Australia—existing mines, 2008



Source: Geoscience Australia.

Table 9.3.1 Northern Australia—operating mines, 2008

<i>Region/SLA name</i>	<i>Name</i>	<i>Commodity</i>
Northern Australia (QLD)		
Mackay Region		
Belyando (S)	Blair Athol	Coal—black
Belyando (S)	Carborough Downs	Coal—black
Belyando (S)	Goonyella	Coal—black
Belyando (S)	Isaac Plains	Coal—black
Belyando (S)	Moranbah North	Coal—black
Belyando (S)	North Goonyella	Coal—black
Belyando (S)	Peak Downs	Coal—black
Bowen (S)	Collinsville	Coal—black
Bowen (S)	Eastern Creek	Coal—black
Bowen (S)	Newlands	Coal—black
Broadsound (S)	Foxleigh	Coal—black
Broadsound (S)	German Creek	Coal—black
Broadsound (S)	German Creek East	Coal—black
Broadsound (S)	Lake Lindsay	Coal—black
Broadsound (S)	Norwich Park	Coal—black
Broadsound (S)	Saraji	Coal—black
Nebo (S)	Burton	Coal—black
Nebo (S)	Coppabella	Coal—black
Nebo (S)	Hail Creek	Coal—black
Nebo (S)	Millenium	Coal—black
Nebo (S)	Moorvale	Coal—black
Nebo (S)	Poitrel	Coal—black
Nebo (S)	South Walker Creek	Coal—black
Nebo (S)	Suttor Creek	Coal—black
Northern Region		
Dalrymple (S)	Nolans	Gold
Dalrymple (S)	Ravenswood	Gold, Silver
Dalrymple (S)	Rishton	Gold
Dalrymple (S)	Sarsfield	Gold
Dalrymple (S)	Vera-Nancy	Gold, Silver
Far North Region		
Cook (S)	Collingwood	Tin
Cook (S)	Norton	Gold
Cook (S)	Skardon River	Kaolin
Cook (S)	Weipa	Bauxite
Etheridge (S)	Balcooma	Zinc, Copper, Lead, (Silver, Gold, Alunite)
Etheridge (S)	Dry River South	Zinc, Copper, Lead, Silver, (Gold)
Herberton (S)	Mt Garnet	Zinc, Copper, (Silver)
Hope Vale (S)	Cape Flattery	Silica sand
North West Region		
Burke (S)	Century	Zinc, (Lead, Silver, Cadmium)
Cloncurry (S)	Duchess	Phosphate
Cloncurry (S)	Ernest Henry	Copper, Gold
Cloncurry (S)	Mt Cuthbert	Copper, Gold, Silver
Cloncurry (S)	Mt Watson	Copper, Gold
Cloncurry (S)	Osborne	Copper, Gold

(continued)

Table 9.3.1 Northern Australia—operating mines, 2008 (continued)

<i>Region/SLA name</i>	<i>Name</i>	<i>Commodity</i>
North West Region (continued)		
McKinlay (S)	Cannington	Silver, Zinc, Lead, (Bismuth, Antimony)
McKinlay (S)	Eloise	Copper, Gold, (Silver)
Mount Isa (C)	George Fisher	Zinc, Lead, Silver, Copper
Mount Isa (C)	Lady Annie	Copper, Gold
Mount Isa (C)	Mount Kelly	Copper, Gold
Mount Isa (C)	Mt Gordon	Copper
Mount Isa (C)	Mt Isa	Copper, Zinc, (Lead, Silver)
Northern Australia (NT)		
Darwin-East Arnhem Region		
Daly	Brocks Creek	Gold, (Silver)
Daly	Fountain Head	Gold
Daly	Rising Tide	Gold
East Arnhem—Bal	Gove	Bauxite
Groote Eylandt	Groote Eylandt	Manganese ore, (Manganese)
South Alligator	Ranger	Uranium
South Alligator	Toms Gully	Gold
Katherine-Lower Top End Region		
Gulf	McArthur River	Zinc, Lead, (Silver, Cadmium, Copper, Antimony)
Gulf	Merlin	Diamond—gem and cheap gem, Diamond—undifferentiated
Gulf	Redbank	Copper
Barkly-Central NT Region		
Sandover	Mud Tank	Vermiculite
Sandover	Test Case 2	Copper
Sandover	White Range	Gold
Tableland	Bootu Creek	Manganese ore, (Manganese)
Tanami	Callie	Gold
Northern Australia (WA)		
Pilbara Region		
Ashburton (S)	Brockman No2	Iron ore, Iron
Ashburton (S)	Channar	Iron, Iron ore
Ashburton (S)	Deepdale J	Iron, Iron ore
Ashburton (S)	Eastern Range	Iron, Iron ore
Ashburton (S)	Marandoo	Iron, Iron ore
Ashburton (S)	Mt Tom Price	Iron ore, Iron
Ashburton (S)	Nammuldi	Iron ore, Iron
Ashburton (S)	Paraburdoo	Iron ore, Iron
East Pilbara (S)	BHPBYandi	Iron ore, (Iron)
East Pilbara (S)	HIYandi	Iron
East Pilbara (S)	Jimblebar	Iron ore, (Iron)
East Pilbara (S)	Mining Area C	Iron ore, (Iron)
East Pilbara (S)	Mt Whaleback	Iron ore, Iron
East Pilbara (S)	Nifty	Copper
East Pilbara (S)	Orebody 18	Iron
East Pilbara (S)	Orebody 25	Iron
East Pilbara (S)	Orebody 29	Iron
East Pilbara (S)	Orebody 30	Iron
East Pilbara (S)	Telfer	Gold, Copper
East Pilbara (S)	West Angelas	Iron ore, Iron

(continued)

Table 9.3.1 Northern Australia—operating mines, 2008 (continued)

<i>Region/SLA name</i>	<i>Name</i>	<i>Commodity</i>
Pilbara Region (continued)		
East Pilbara (S)	Woodie Woodie	Manganese ore, (Manganese)
East Pilbara (S)	Yarrie	Iron ore, (Iron)
Port Hedland (T)	Wodgina	Tantalum pentoxide, Tin, Gemstones, Tantalum
Roebourne (S)	Radio Hill	Nickel, Copper, Cobalt, Palladium, Platinum group elements
Roebourne (S)	Whim Creek	Copper, Zinc
Roebourne (S)	Whundo	Copper, Zinc, (Silver)
Kimberley Region		
Derby-West Kimberley (S)	Cockatoo Island	Iron ore, Iron
Derby-West Kimberley (S)	Ellendale	Diamond—undifferentiated
Derby-West Kimberley (S)	Koolan Island	Iron ore, (Iron)
Derby-West Kimberley (S)	Pillara	Zinc, (Lead, Silver, Cadmium)
Halls Creek (S)	Coyote	Gold
Halls Creek (S)	Sally Malay	Nickel, Copper, Cobalt, Platinum group elements
Wyndham-East Kimberley (S)	Argyle	Diamond—undifferentiated
Wyndham-East Kimberley (S)	Argyle Alluvials	Diamond—undifferentiated

Note: Northern Australia is based on regions which fall above the Tropic of Capricorn. The subregions are made up of Statistical Local Area (SLA) boundaries. Where the data did not precisely meet this definition, approximations were given. Areas with a latitude greater than –24 degrees were excluded.

Source: Geoscience Australia (2008b).

Projected mining investments listed in Table 9.3.2 are all located in Northern Australia and include expansion of existing mining operations, adding new mining projects, as well as new or expanding processing plants. The projects listed are in various stages of projection, planning, approval or construction. Most of the coal mining investments are made in the known deposits in the MacKay Region. Similarly, investments in the Pilbara's iron ore deposits reflect the development of the resource and expansion of the most directly related infrastructure, such as raising the capacity of railway in the Dampier iron ore project in Roebourne (see Table 9.3.2).

Table 9.3.2 Northern Australia — projected mining investments, 2008

Region/SIA name	Name	Commodity	Capacity	Status	Capital expenditure	Technology	Commencement
Northern Australia (QLD)							
Mackay Region							
N/A	Hay Point—expansion	Black Coal	32 to 40 Mtpa	Under Construction	US\$100 million		2006
Belyando (S)	Clermont	Black Coal	12.2 Mtpa	Under Construction	US\$750 million	Open-pit	2010
Belyando (S)	Eagle Downs	Coal	4 Mtpa coking coal	Proposed	\$620 million	Longwall	Unknown
Belyando (S)	Goonella—Expansion	Black Coal—Coking	Stage 1: 52 Mtpa to 57 Mtpa; Stage 2: 57 to 59 Mtpa	Operating	Stage 1: US\$94 million; Stage 2: \$US57 million	Open-cut	Stage 1: mid-2005; Stage 2: mid-2006
Belyando (S)	Grosvenor	Black Coal—Coking	5 Mtpa	Proposed	\$500 million	Underground longwall	Unknown
Belyando (S)	New Saraji	Coal	5 Mtpa coking coal	Proposed	Unknown	Longwall	1012
Bowen (S)	Sonoma	Black Coal—Coking and Thermal	2.0 Mtpa	Operating	Unknown	Open-cut	2007
Broadsound (S)	Middlemount	Coal	1.8 Mtpa	Bulk sampling	Unknown	Open-cut	2009
Broadsound (S)	Olive Downs	Coal—Coke/PCI	1.0 Mtpa Coke/PCI	Proposed	\$50 million	Open-cut	2007
Broadsound (S)	Vermont	Black Coal—Coking/PCI	4 Mtpa	Operating	\$176 million	Open-cut	2008
Livingstone (S)—Pt B	Marlborough	Nickel Cobalt	3.7 Mtpa ore for 25 kt Ni; 2 kt Co	New project, feasibility completed. On hold	\$688 million	Open-pit and high pressure acid leach	2010
Nebo (S)	Broughton	Black Coal—Coking	Unknown	Proposed	Unknown	Open-cut	2007
Nebo (S)	Ellensfield	Coal	5.5 Mtpa ROM	Proposed	Unknown	Longwall	2009
Northern Region							
N/A	Abbot Point—expansion	Black Coal	21 to 50 Mtpa	Proposed	\$770 million		Unknown
N/A	Dalrymple Bay—expansion	Black Coal	Stage 1: 55 to 60 Mtpa; Stage 2: 60 to 68 Mtpa; Further Stages: to 85 Mtpa	Under Construction	Stage 1: \$30 million; Stage 2: \$350 million; further Stages: \$640 million		Stage 1: early 2006; Stage 2: 2008; further Stages 2009
City	Townsville—Zn	Zinc	Zinc ferrite processing plant	Operating	\$50 million		2007
City	Yabulu—Expansion	Nickel	35 ktpa Ni 1.3 ktpa Co (linked to Ravensthorpe mining project, WA)	Under Construction	\$400 million	Refinery	2007

(continued)

Table 9.3.2 Northern Australia—projected mining investments, 2008 (continued)

Region/SLA name	Name	Commodity	Capacity	Status	Capital expenditure	Technology	Commencement
Mackay Region (continued)							
Dalrymple (S)	Lucky Break	Nickel, Cobalt	Stage 1: 0.25 Mtpa for 1600tpa of Nickel in concentrate; Stage 2: 1.5Mtpa for 10 000tpa Nickel in concentrate	Under construction	\$20 million	Open-pit then Heap and Vat Leach	Stage 1: 2008; Stage 2: 2009
Dalrymple (S)	Normico	Nickel, Cobalt	10 ktpa Ni; 0.435 ktpa Co	Proposed	\$278 million	Open-pit and Heap Leach	Unknown
Far North Region							
Aurukun (S)	Aurukun	Bauxite, Alumina	7.5 Mtpa of Bauxite; 2.1 Mtpa of Alumina	Proposed	\$3.0 billion	Open-pit and Refinery	2011
Cook (S)	Ely	Bauxite	2.0 Mtpa bauxite	Operating	Unknown	Open-cut	2007
Etheridge (S)	Agate Creek	Gold	1.5 Mtpa for 60 000oz per ann Au	Proposed	Unknown	Open-pit and Carbon-In-Pulp	Unknown
Etheridge (S)	Einassleigh	Copper, Gold, Silver	1.0 Mtpa	Proposed	Unknown	Open-pit and underground	2009
Mareeba (S)	Baal Gammon	Copper Tin Silver Indium	750,000 tpa	Proposed	Unknown	Open-pit	Unknown
Mareeba (S)	Mungana	Zinc, Copper, Lead Gold, Silver	400 ktpa ore for 60 000 tpa concentrates	Under construction	\$60 million	Underground mine and surface treatment plant	2009
Mareeba (S)	Watershed	Tungsten	2.0 Mtpa for 4,000 tpa concentrate of contained WO ₃	Proposed	Unknown	Open-pit	2009
Mareeba (S)	Wolfram Camp	Tungsten, Molybdenum	150 000 tpa ore	Under construction	\$30 million	Open-pit	2008
North West Region							
Burke (S)	Westmoreland	Uranium	1 400 tpa of U ₃ O ₈	Proposed	\$275 million	Open-pit & Acid Leach	Unknown
Cloncurry (S)	Cloncurry	Copper	0.6 Mtpa for 36 ktpa of concentrates for 10 to 12ktpa of Cu in concentrates	Proposed	Unknown	Open-pit	2009

(continued)

Table 9.3.2 Northern Australia — projected mining investments, 2008 (continued)

Region/SIA name	Name	Commodity	Capacity	Status	Capital expenditure	Technology	Commencement
North West Region (continued)							
Cloncurry (S)	Dugald River	Lead, zinc, silver	1.8 Mtpa ore	Proposed	\$500 million	Underground operation	2011
Cloncurry (S)	Ernest Henry—underground	Copper	75 ktpa Cu concentrate	Proposed	\$26 million	Underground mining	2011
Cloncurry (S)	Lady Annie	Copper	19 ktpa LME grade copper cathode	Operating	\$86 million	Open-pit, heap leaching, solvent extraction and electrowinning	2007
Cloncurry (S)	Leichardt—Mt Watson	Copper	Stage 1: 5.5 ktpa Copper Metal	Operating	\$10M	Open-pit, Heap Leach and Solvent Extraction/ Electrowinning	2007
Cloncurry (S)	Rocklands	Copper	3 Mtpa expandable to 5 Mtpa	Proposed	Unknown	Flotation	2010
Cloncurry (S)	Roseby	Copper	Initially 5Mtpa Sulphides then 8Mtpa Oxides for 34 ktpa Cu	Proposed	\$338million	Open-pit	2008
Cloncurry (S)	White Range	Copper	15ktpa Copper Cathode	Proposed	\$39 million	Open-pit	2007
Mount Isa (C)	Lady Loretta	Lead, Zinc, Silver	1.0 Mtpa for 125 ktpa Zn; 50 ktpa Pb; 850,000 oz Ag	Proposed	\$200 million	Underground mine	2009
Mount Isa (C)	Mt Isa—expansion	Silver, Lead, Zinc	Expansion from 5.5 to 8 Mtpa	Under construction	\$160 million	Open-pit operation	2008
Mount Isa (C)	Valhalla	Uranium	2,700 tpa U3O8	Proposed	\$400 million	Open-pit	2012
Gladstone Region							
N/A	Wiggins Island	Black coal	Phase 1: 20Mtpa; Ultimate 70Mtpa	Proposed	Phase 1: \$400 million		2009
Calliope (S)—Pt A	Boyne Island – Expansion	Aluminium	170 kt	Expansion, pre-feasibility study underway	\$1 billion	Smelter	Unknown

(continued)

Table 9.3.2 Northern Australia—projected mining investments, 2008 (continued)

Region/SLA name	Name	Commodity	Capacity	Status	Capital expenditure	Technology	Commencement
Gladstone Region (continued)							
Gladstone (C)	Gladstone—expansion	Black Coal	Stage 1: 40 to 54 Mtpa; Stage 2: 54 to 62 Mtpa	Operating	Stage 1: \$167 million; Stage 2: \$46.5 million		2007
Gladstone (C)	Gladstone—Ferrochrome	Ferrochrome	120 ktpa Stage 1	Proposed	\$200 million Stage 1, \$100 million Stage 2	Unknown	Unknown
Gladstone (C)	Stuar—Stage 2	Oil Shale—Petroleum	14.8 kbd	New project, under review	\$450 million		Unknown
N/A	Gladstone—Nickel	Nickel, cobalt	30 ktpa Nickel and 1.4 ktpa Cobalt	Proposed	\$1.3 billion	Refinery	2009
N/A	Gladstone—Steel	Steel	Unknown	Proposed	\$2.8 billion	Unknown	Unknown
Northern Australia (NT)							
Darwin-East Arnhem Region							
Coomalie (CGC)	Batchelor—Mg	Magnesium	12.5 kt magnesium metal (stage 1)	New project, feasibility study	\$127 million		Unknown
Coomalie (CGC)	Browns	Cobalt Copper Nickel	1.3 Mtpa ore for 10 ktpa Cu, 1 ktpa Co, 750 tpa Ni	Operating	\$100 million	Open-Pit, Heap Leach, Solvent Extraction, Electrowinning	2008
Daly	Frances Creek	Iron Ore	1.0 Mtpa 2007; 1.5 Mtpa from 2008	Operating	\$10 million	Open-pit	2007
East Arnhem—Bal	Gove—Expansion	Aluminium	Increasing capacity from 2.1 to 3.8 Mtpa	Under construction	\$1.5 billion	Alumina refining	2007
South Alligator	Jabiluka	Uranium	1 kt U3O8	New project, on hold	\$70 million		Unknown
South Alligator	Ranger	Uranium	0.4 ktpa U3O8	Under construction	\$27.6 million	Processing plant	2008
Katherine-Lower Top End Region							
Gulf	McArthur River—Open Pit	Lead and Zinc	1.8 Mtpa	Operating	\$66 million	Open Pit	2007
Katherine (T)	Maud Creek	Gold	100,000 oz per ann	Proposed	\$25 million	Underground and GEOCOAT	2009

(continued)

Table 9.3.2 Northern Australia —projected mining investments, 2008 (continued)

Region/SLA name	Name	Commodity	Capacity	Status	Capital expenditure	Technology	Commencement
Barkly-Central NT Region							
Hanson	Nolans Bore	Rare Earths Uranium Phosphate	750 ktpa for 20 ktpa REO, 150tpa U3O8	Proposed	\$75 million	Open-pit and processing plant	2011
Sandover	Harts Range	Garnet	Stage 1 80 ktpa of abrasives	Proposed	\$4 million	Open-pit	2008
Sandover	Molyhil	Molybdenum, Tungsten	400,000 tpa	Proposed	\$60 million	Open-pit	2009
Tennant Creek-Bal	Wonarah	Phosphate	3 Mtpa	Proposed	\$50 million	Open pit	2010
Northern Australia (WA)							
Pilbara Region							
N/A	Cape Lambert -Iron	Iron	3.6 Mtpa	Proposed	\$1.9 billion	Direct Reduction Iron (DRI)	Unknown
Ashburton (S)	Brockman 4	Iron Ore	22 Mtpa	Under construction	US\$1,521 million	Open-pit	2010
Ashburton (S)	Cloud Break	Iron Ore	45 Mtpa	Operating	\$3.7 billion	Open-pit	2008
Ashburton (S)	Manyingee	Uranium	Unknown	Proposed	\$30 million	In-Situ Leaching	Unknown
Ashburton (S)	Mesa A-Warrambo	Iron Ore	25 Mtpa pisolites	Under construction	US\$901 million	Open-cut	2009
Ashburton (S)	West Pilbara	Iron Ore	25 Mtpa	Proposed	\$2 billion	Open-pit	2011
Ashburton (S)	Yannarie Solar	Salt	3 Mtpa	Proposed	Unknown	Open-pit	2008
East Pilbara (S)	Golden Gate	Gold	1.0 Mtpa for 70,000oz/ann	Proposed	\$42 million	Open-cut and Carbon-In-Pulp	2007
East Pilbara (S)	Hope Downs	Iron ore	Stage 1: 22 Mtpa; Stage 2: 30 Mtpa	Operating	US\$1.0 billion	Open-pit	Stage 1: 2008
East Pilbara (S)	Kintyre	Uranium	1.2ktpa Uranium Oxide	Proposed	\$120 million	Open-pit	Unknown
East Pilbara (S)	Marillana	Iron Ore	Stage 1: 2.0Mtpa; Stage 2: 10 Mtpa	Proposed	\$300 million	Open-pit	Stage 1: 2009; Stage 2: 2011
East Pilbara (S)	Maroochydore	Copper	60 kt Cu cathode	Feasibility study underway	\$200 million	Open-pit	Unknown
East Pilbara (S)	Mindy Mindy	Iron Ore	5.0 Mtpa	Proposed	\$50 million	Open-pit	Unknown
East Pilbara (S)	Panorama-Sulphur Springs	Zinc Copper	1.5 Mtpa for 80,000tpa Cu and 90,000tpa Zn	Under construction	\$213 million	Open-pit and Concentrator	2009
East Pilbara (S)	Phils Creek	Iron Ore	1.5 Mtpa DSO	Proposed	Unknown	Open-pit	2010

(continued)

Table 9.3.2 Northern Australia—projected mining investments, 2008 (continued)

Region/SLA name	Name	Commodity	Capacity	Status	Capital expenditure	Technology	Commencement
Pilbara Region (continued)							
East Pilbara (S)	Spinifex Ridge	Molybdenum, Copper	20 Mtpa for 11 ktpa of Mo and 12 ktpa of Cu in Concentrates	Proposed	\$1 071 million	Open-pit	2009
Exmouth (S)	Exmouth—Limestone	Limestone—Quicklime	1 Mtpa limestone; 200 ktpa quicklime	New project, on hold	\$45 million		Unknown
Port Hedland (T)	Abydos	Iron Ore	3 Mtpa DSO	Proposed	\$38.5 million	Open-pit	2010
Port Hedland (T)	Nelson Point—RGP 1, 2, 3, 4 and 5	Iron Ore	RGPI: 100 to 110 Mtpa; RGP2: 110 to 118 Mtpa; RGP3: 129 Mtpa; RGP4: 155 Mtpa; RGP5: 200 Mtpa	RGPI: Operating; RGP2: Operating; RGP3: Operating; RGP4: Under construction; RGP5: Under construction	RGPI: US\$111 million; RGP2: US\$575 million; RGP3: US\$1.3 billion; RGP4: US\$1.4 billion; RGP5: US\$1.094 billion	Open-pit	RGPI: end 2004; RGP2: late 2006; RGP3: late 2007; RGP4: 2010; RGP5: 2011
Port Hedland (T)	Pardoo	Iron Ore	2008: 1.0 Mtpa; 2010: 3.0 Mtpa Direct Shipping Ore	Proposed	2008: \$9.9 million; 2010: \$13 million	Open-pit	2008
Roebourne (S)	Balla Balla	Vanadium Titanomagnetite	3.0 Mtpa vanadium rich titanomagnetite concentrate	Proposed	\$240 million		2009
Roebourne (S)	Balmoral Central—magnetite	Iron Ore	70 Mtpa ore	Proposed	5.2 billion	Open-pit and magnetite concentrator	2009
Roebourne (S)	Balmoral Southern—magnetite	Iron Ore	42 Mtpa ore	Proposed	US\$2.6 billion	Open-pit, concentrator and DRI	2010
Roebourne (S)	Cape Lambert—magnetite	Iron Ore	15 Mtpa concentrate	Proposed	\$600 million	Open-pit and Concentrator	2009
Roebourne (S)	Dampier	Iron Ore	Stage 1: Port capacity raised from 74 to 116 Mtpa; Stage 2: Port & Rail capacity raised to 140 Mtpa	Under construction	Stage 1: \$A945 million Port and \$A35 million Rail; Stage 2: US\$1.35 billion (including US\$690 million for Port)	Open-pit	Stage 1: 2005; Stage 2: 2008

(continued)

Table 9.3.2 Northern Australia—projected mining investments, 2008 (continued)

Region/SLA name	Name	Commodity	Capacity	Status	Capital expenditure	Technology	Commencement
Pilbara Region (continued)							
Roebourne (S)	Munni Munni PGM	PGM	100 000 ozpa PGM's and gold 5 ktpa Cu and Ni	New project, feasibility study underway	\$71 million		Unknown
Roebourne (S)	Sherlock Bay	Nickel	2 Mtpa for 8.85 ktpa of contained Ni	Proposed	\$35 million	Open-pit	Unknown
Kimberley Region							
Derby-West Kimberley (S)	Koolan Island	Iron Ore	4 Mtpa Direct Shipping Ore	Operating	\$147 million	Open-pit	2007
Derby-West Kimberley (S)	Lennard Shelf-Pillara	Zinc	80ktpa of Zn concentrates over 4 years	Operating	\$31 million	Underground	2007
Wyndham-East Kimberley (S)	Argyle	Iron Ore	1.5 to 2.0 Mtpa direct shipping ore	Proposed	\$50 million	Open-pit	2009
Wyndham-East Kimberley (S)	Argyle-underground	Diamonds	20 million carats per annum	Under construction	A\$101.3 million plus \$200 million on open-pit 'cut-back' operation	Underground block caving operation	2007
Wyndham-East Kimberley (S)	Speewah	Fluorspar	100ktpa	Proposed	\$20 million	Open-pit	Unknown

Note: This table shows proposed mining projects in the Northern Australia region as at 2008. Northern Australia is based on regions which fall above the Tropic of Capricorn. The subregions are made up of Statistical Local Area (SLA) boundaries. Where the data did not precisely meet this definition, approximations were given. Areas with latitude greater than -24 degrees were excluded.

Source: Geoscience Australia (2008b).

Out of the 63 major minerals processing plants in Australia, only seven were located in Northern Australia in 2008, with another five in the Rockhampton and Gladstone regions (see Table 9.3.3). One of these plants, the Port Hedland pig iron processing plant, is currently being decommissioned. The role of other processing plants is largely pre-processing the mined metal ores in order to reduce the tonnage of material transported that would otherwise be required if the processing took place in smelters located in southern Australia or overseas. For example, zinc and copper refineries in Townsville (Northern Region) produce metal are close to the mine mouth, thus reducing the need for costly transport of low-value ores (per tonne) to a distant processor.

Nearly all of the value-adding operations in Northern Australia are restricted to production of relatively low-processed commodities, such as metals, uranium, gas and oil.

Table 9.3.3 Northern Australia — mineral processing plants, 2008

Region/name	Location	Qualifier	Commodity	Company	Capacity (per annum)	Processor type	Comments
Northern Australia (WA)							
Pilbara Region							
Port Hedland	Port Hedland	Direct Reduced Iron	Pig Iron	BHP Billiton	Plant closed	Direct Reduced Iron	The Boodarie HBI plant is to be demolished commencing in 2006 with completion due in 2008
Northern Australia (NT)							
Darwin-East Arnhem Region							
Gove	Gove	Bauxite Refinery	Aluminium	Alcan Aluminium Ltd (owned by Rio Tinto)	3.8 million tonnes (by the end of 2008)	Bauxite Refinery producing Alumina	Operating
Northern Australia (QLD)							
Mackay Region							
Moranbah	170km West of Mackay	Coal Bed Methane	Coal Bed Methane	CH4 Gas Ltd	13PJ of gas		A 400 km pipeline provides gas to Townsville and the Yabulu power station
Northern Region							
Townsville	Townsville	Zinc Refinery	Zinc	Sun Metals Corporation	170 000 tonnes of zinc	Refinery	Operating
Townsville	Townsville	Copper Refinery	Copper	Xstrata	300 000 tonnes of copper cathode	Refinery	Operating
Yabulu	25km North of Townsville	Nickel Refinery	Nickel	QNI (BHP Billiton)	76 000 tonnes of Nickel; 3 200 tonnes of Cobalt	Refinery	Operating
North West Region							
Mt Isa	Mt Isa	Copper and Lead Smelters	Copper and Lead	Xstrata Queensland Ltd	190 000 tonnes of copper in concentrate, 240 000 tonnes of copper in anode	Smelter	Xstrata is to expand the capacity of the smelter at a cost of \$41 m to increase capacity from 240 to 280 ktpa within the next 18 months

(continued)

Table 9.3.3 Northern Australia—mineral processing plants, 2008 (continued)

Region/name	Location	Qualifier	Commodity	Company	Capacity (per annum)	Processor type	Comments
Northern Australia (QLD) (continued)							
Rockhampton Region							
Rockhampton	Parkhurst, Rockhampton	Cement Plant	Cement	Cement Australia Pty Ltd	Not available		Fuel used—Coal
Gladstone Region							
Boyne Island	Gladstone	Aluminium Smelter	Aluminium	Comalco	545 000 tonnes	Smelter	Operating
Gladstone—Cement	Fishermans Landing, Gladstone	Cement Plant	Cement	Cement Australia Pty Ltd	1.6 million tonnes		Fuel used—Coal
Gladstone—QAL	Gladstone	Bauxite Refinery	Aluminium	Queensland Alumina Ltd (QAL)	3.95 million tonnes	Bauxite Refinery producing Alumina	Operating
Yarwun	Yarwun, 10 km NW of Gladstone	Bauxite Refinery	Alumina	Rio Tinto	1.4 million tonnes	Bauxite Refinery producing Alumina	The \$1.5 billion refinery commenced in 2006. A US\$1.8 billion expansion to 3.4 Mtpa to be completed by 2011

Note: Only the major processing centres were included in this table, not the minesite pre-processing plants.

Source: Geoscience Australia (2008b).

9.4 Tourism

According to Tourism Research Australia's survey data, most tourist overnight stays across Northern Australia and Australia were made by international visitors. By comparison with the usually resident population of the region, Northern Australia received proportionately more overnight visits from tourists than Australia as a whole. In 2005, approximately 16.9 per cent of all international overnight stays, and 7.5 per cent of all domestic overnight stays, occurred in Northern Australia (see Table 9.4.1), although Northern Australia accounted for only 4.7 per cent of Australia's usually resident population in 2006. In other words, the demand for services and infrastructure is significantly higher in Northern Australia than it would be if only the usually resident population were present.

Table 9.4.1 Northern Australia—number of overnight stays by visitor type, by region; proportion of all Australian overnight stays by visitor type, by region, 2005

<i>Region</i>	<i>International overnight stays 2005</i>	<i>Domestic overnight stays 2004–05</i>	<i>International overnight stays (proportion of all Australian international overnight stays) 2005</i>	<i>Domestic overnight stays (proportion of all Australian domestic overnight stays) 2004–05</i>
Northern Australia (WA)	1 13 145	1 168	1.1	1.3
Pilbara Region	47 150	565	0.5	0.6
Kimberley Region	65 995	603	0.7	0.6
Western Australia state total	948 472	8 738	9.5	9.4
Northern Australia (NT)	343 436	1 575	3.4	1.7
Darwin-East Arnhem Region	171 176	915	1.7	1.0
Katherine-Lower Top End Region	1 602	237	0.0	0.3
Barkly-Central NT Region	170 658	423	1.7	0.5
Northern Territory total	576 114	1 962	5.7	2.1
Northern Australia (QLD)	1 239 641	4 270	12.4	4.6
Mackay Region	256 039	1 212	2.6	1.3
Northern Region	133 541	989	1.3	1.1
Far North Region	819 767	1 631	8.2	1.8
North West Region	28 629	370	0.3	0.4
Longreach Region	1 666	69	0.0	0.1
Queensland state total	3 323 171	21 787	33.1	23.4
Northern Australia subtotal	1 696 223	7 013	16.9	7.5
Australia total	10 030 210	93 150	100.0	100.0

Note: This table shows the number of overnight stays by visitor type (international and domestic visitors), and the proportion of all overnight stays in Australia by visitor type, by region.

International data was collected based on calendar years while domestic was collected based on financial years. The TRA data was collated at 2001 ASGC. It appears that TRA was not able to allocate some of the visitor stays to specific 2001 SLAs. As a result, BITRE was unable to allocate approximately 5 per cent of international overnight stays, and 8 per cent of domestic overnight stays, to an appropriate SLA or region when concurring the data to 2006 ASGC. For comparative purposes, original TRA 2001 ASGC-based overnight stay totals have been used for Australia and the states in the tables above, to minimise the possibility of further data loss.

Sources: Tourism Research Australia (2005a) and (2005b).

Within Northern Australia, the majority of international tourist overnight stays (approximately 73.1 per cent of overnight stays in Northern Australia) and domestic tourist overnight stays (approximately 60.9 per cent of overnight stays in Northern Australia) occurred in the northern regions of Queensland. The northern regions of Western Australia had the smallest share of tourism overnight stays in Northern Australia.

Table 9.4.2 Northern Australia—proportion of all Northern Australian overnight stays by visitor type by region.

<i>Region</i>	<i>Percentage of all international overnight stays in Northern Australia 2005</i>	<i>Percentage of all domestic overnight stays in Northern Australia 2004–05</i>
Northern Australia (WA)	6.7	16.7
Pilbara Region	2.8	8.1
Kimberley Region	3.9	8.6
Northern Australia (NT)	20.2	22.5
Darwin-East Arnhem Region	10.1	13.0
Katherine-Lower Top End Region	0.1	3.4
Barkly-Central NT Region	10.1	6.0
Northern Australia (QLD)	73.1	60.9
Mackay Region	15.1	17.3
Northern Region	7.9	14.1
Far North Region	48.3	23.3
North West Region	1.7	5.3
Longreach Region	0.1	1.0
Northern Australia subtotal	100.0	100.0

Note: This table shows overnight stays in each region as a proportion of total overnight stays in Northern Australia (domestic and international visitors).

International data was collected based on calendar years whilst domestic was collected based on financial years. The TRA data was collated at 2001 ASGC. It appears that TRA was not able to allocate some of the visitor stays to specific 2001 SLAs. As a result, BITRE was unable to allocate approximately 5 per cent of international overnight stays, and 8 per cent of domestic overnight stays, to an appropriate SLA or region when concurring the data to 2006 ASGC. For comparative purposes, original TRA 2001 ASGC-based overnight stay totals have been used for Australia and the states in the tables above, to minimise the possibility of further data loss.

Source: Tourism Research Australia (2005a) and (2005b).

At the regional level, some areas within Northern Australia are particularly popular destinations for international overnight trips. In 2007, Tropical North Queensland was the third most visited area (behind Sydney and Melbourne), with 793 000 visitors, who on average stayed for seven nights in the region (Tourism Research Australia 2007a). The Whitsundays were also a popular tourist destination for international overnight visitors: 221 000 in 2007, staying an average five nights. Uluru (210 000 International visitors) and Alice Springs (165 000 International visitors) were also among the top 10 most visited regional areas in Australia, in 2007 (Tourism Research Australia 2007a).

Table 9.4.3 illustrates the number of day, overnight and international visitors in the tourism regions in Northern Australia. Although the tourism regions, as listed in the table, are not geographically identical with Northern Australia's regions, as defined in this compendium, the data illustrates the basic tourist movement in the regions. The data also illustrates the size of inbound tourism, length of stay and expenditure that tourism generates in Northern Australia.

Table 9.4.3(a) Northern Australia—domestic and international visitors by tourism regions, 2005

<i>Tourism region</i>	<i>Domestic day visitors</i>			
	<i>Expenditure (\$ millions)</i>	<i>Number of visitors (thousands)</i>	<i>Expenditure per visitor (\$)</i>	<i>Expenditure excluding airfares (\$ millions)</i>
WA—North West Region	51	313	164	435
NT—Darwin	62	514	121	496
NT—Kakadu				
NT—Alice Springs				155
QLD—Tropical North	138	1 457	95	1 104
QLD—Outback				207
QLD—Northern	84	866	97	313
QLD—Whitsunday				646
QLD—Mackay				216

Note: Western Australia's—North West Region is approximately equivalent to the Pilbara and Kimberley regions combined; other tourist regions are selected to provide the 'best' approximation to the regions of Northern Australia; missing data replaces unreliable estimates.

Source: Tourism Research Australia (2005c).

Table 9.4.3(b) Northern Australia—domestic and international visitors by tourism regions, 2005

<i>Tourism region</i>	<i>Domestic overnight visitors</i>						
	<i>Expenditure (\$ millions)</i>	<i>Number of visitors (thousands)</i>	<i>Visitor nights (thousands)</i>	<i>Exp. per visitor (\$)</i>	<i>Exp. per night (\$)</i>	<i>Av. length of stay (nights)</i>	<i>Expenditure excl. package (\$ millions)</i>
WA—North West Region	51	513	3 842	849	113	7	48
NT—Darwin	62	562	3 085	883	161	5	70
NT—Kakadu							11
NT—Alice Springs		258	1 080	601	144	4	66
QLD—Tropical North	138	1 252	7 132	882	155	6	852
QLD—Outback		622	2 722	333	76	4	
QLD—Northern	84	826	2 912	379	107	4	71
QLD—Whitsunday		551	3 391	1 173	190	6	107
QLD—Mackay		592	2 068	365	105	3	14

Note: WA—North West Region is approximately equivalent to the Pilbara and Kimberley regions combined; other tourist regions are selected to provide the 'best' approximation to the regions of Northern Australia; missing data replaces unreliable estimates.

Source: Tourism Research Australia, Travel Expenditure by Domestic and International Visitors in Australia's Regions, 2005.

Table 9.4.3(c) Northern Australia—domestic and international visitors by tourism regions, 2005

Tourism region	International visitors					
	Expenditure (\$ millions)	Number of visitors (thousands)	Visitor nights (thousands)	Expenditure per visitor (\$)	Expenditure per night (\$)	Average length of stay nights
WA—North West Region	51	54	828	896	58	15
NT—Darwin	62	144	1 086	488	65	8
NT—Kakadu		54	142	195	74	3
NT—Alice Springs		180	627	368	106	3
QLD—Tropical North	138	857	6 439	993	132	8
QLD—Outback						
QLD—Northern	84	141	1 142	501	62	8
QLD—Whitsunday		208	1 113	512	96	5
QLD—Mackay		51	182	268	74	4

Note: WA—North West Region is approximately equivalent to the Pilbara and Kimberley regions combined; other tourist regions are selected to provide the 'best' approximation to the regions of Northern Australia; missing data replaces unreliable estimates.

Source: Tourism Research Australia, Travel Expenditure by Domestic and International Visitors in Australia's Regions, 2005.

9.5 Service industries

Relative to Australia, service industries such as finance, insurance, property and business services employ less people in Northern Australia. In the states of Queensland and Western Australia particularly, this is commensurate with major urban service hubs being located outside northern regions. On the other hand, government administration and defence are larger employers within Northern Australia, compared with the whole of Australia (see Table 9.5.1).

As discussed in Chapter 3, at the territory level, government administration and defence (19.7 per cent) is the major source of employment within the northern regions of the Northern Territory. This is in part due to the Northern Territory's main centre of government (Darwin) being part of Northern Australia, as well as the presence of multiple military bases in the area. There are also a number of SLAs in northern regions of Queensland where employment is almost solely provided by government administration and defence (e.g. Mabiug, Kowanyama, and Badu). Many of these areas are Indigenous communities. The high employment in government administration may be related to high levels of participation in the Community Development Employment Projects (CDEP) program, which is financed by the Australian Government.²⁸

The largest provider of employment within northern Queensland (17.9 per cent) is retail and wholesale trade. This is related to local distribution of farm produce, builder supplies, and mineral, metal and chemical wholesaling which is generated in response to demand of local industries and population.

In the Kimberley, Darwin-East Arnhem, Katherine-Lower Top End, and Barkly-Central NT regions, over 75 per cent of employment by industry is generated in areas such as retail and wholesale trade, services, health and community services, and government administration and defence.

28. This is discussed in further detail in the Employment, Unemployment and Labour Force Participation section (Chapter 4).

Table 9.5.1 Northern Australia — percentage of people employed in service industries, by region, 2006

Region	Retail and wholesale trade (per cent)	Accommodation, cafes and restaurants (per cent)	Finance, insurance, property and business services (per cent)	Government administration and defence (per cent)	Education (per cent)	Health and community services (per cent)	Other services (per cent)	Other industries	Not stated (per cent)
Northern Australia (WA)	12.5	5.5	7.5	7.1	7.7	9.8	5.9	42.3	1.7
Pilbara Region	12.4	4.8	8.2	4.4	6.9	6.7	3.9	51.5	1.2
Kimberley Region	12.6	6.7	6.5	11.5	9.1	14.9	9.0	27.3	2.4
Western Australia state total	18.8	4.4	13.8	5.1	7.6	10.5	5.6	33.0	1.3
Northern Australia (NT)	14.5	5.1	10.1	19.7	8.7	10.2	7.1	22.7	2.0
Darwin-East Arnhem Region	14.7	4.8	10.6	19.6	8.5	9.0	7.0	23.9	1.8
Katherine-Lower Top End Region	10.8	4.4	5.0	28.9	8.1	14.3	4.8	19.7	3.9
Barkly-Central NT Region	15.0	6.4	10.1	16.1	9.7	13.5	8.5	19.0	1.8
Northern Territory total	14.4	5.5	10.0	19.6	8.6	10.2	7.0	22.7	2.0
Northern Australia (QLD)	17.9	6.7	9.0	7.8	7.2	9.4	4.9	35.7	1.5
Mackay Region	18.6	7.0	9.0	3.4	6.5	7.5	3.8	43.0	1.3
Northern Region	17.9	4.7	9.4	9.8	8.1	11.1	5.1	32.5	1.4
Far North Region	18.0	8.5	9.3	9.3	6.9	9.6	5.8	30.9	1.7
North West Region	13.0	4.8	4.8	7.7	7.3	8.5	3.4	48.5	1.9
Longreach Region	18.1	6.0	5.7	9.4	10.9	12.0	6.0	29.8	2.1
Queensland state total	19.5	5.3	13.0	5.5	7.5	10.6	5.6	31.7	1.3
Northern Australia subtotal	16.7	6.3	9.1	10.1	7.5	9.6	5.4	33.5	1.6
Australia total	19.3	4.8	14.7	5.5	7.5	10.9	5.8	30.1	1.4

Note: This table shows the percentage of people employed by the various industries in each region. BITRE summed the data for all SLAs in order to produce state and national totals. The Other Services category includes cultural, recreational, and personal and other services. Infrastructure includes the electricity, gas and water supply, communication services, and transport and storage industries.

Source: ABS (2006d).

Data relating to population available in the online compendium

Tables

9.1 Agriculture

- Northern Australia—agricultural land use, by region, 2005–06
- Northern Australia—agricultural land use, by SLA, 2005–06
- Northern Australia—production value of agriculture, by region, 2005–06
- Northern Australia—production value of agriculture, by SLA, 2005–06
- Northern Australia—water usage, 2005–06
- Northern Australia—water usage, by SLA, 2005–06.

9.2 Business activity—entries, exits, and dynamics

- Northern Australia—net growth of the number of business establishments by type, by SLA, 2004–06
- Northern Australia—proportion of business establishments by type, and change over time, by SLA, 2004–06.

9.4 Tourism

- Northern Australia—number of overnight stays by visitor type, by SLA, 2004–05.

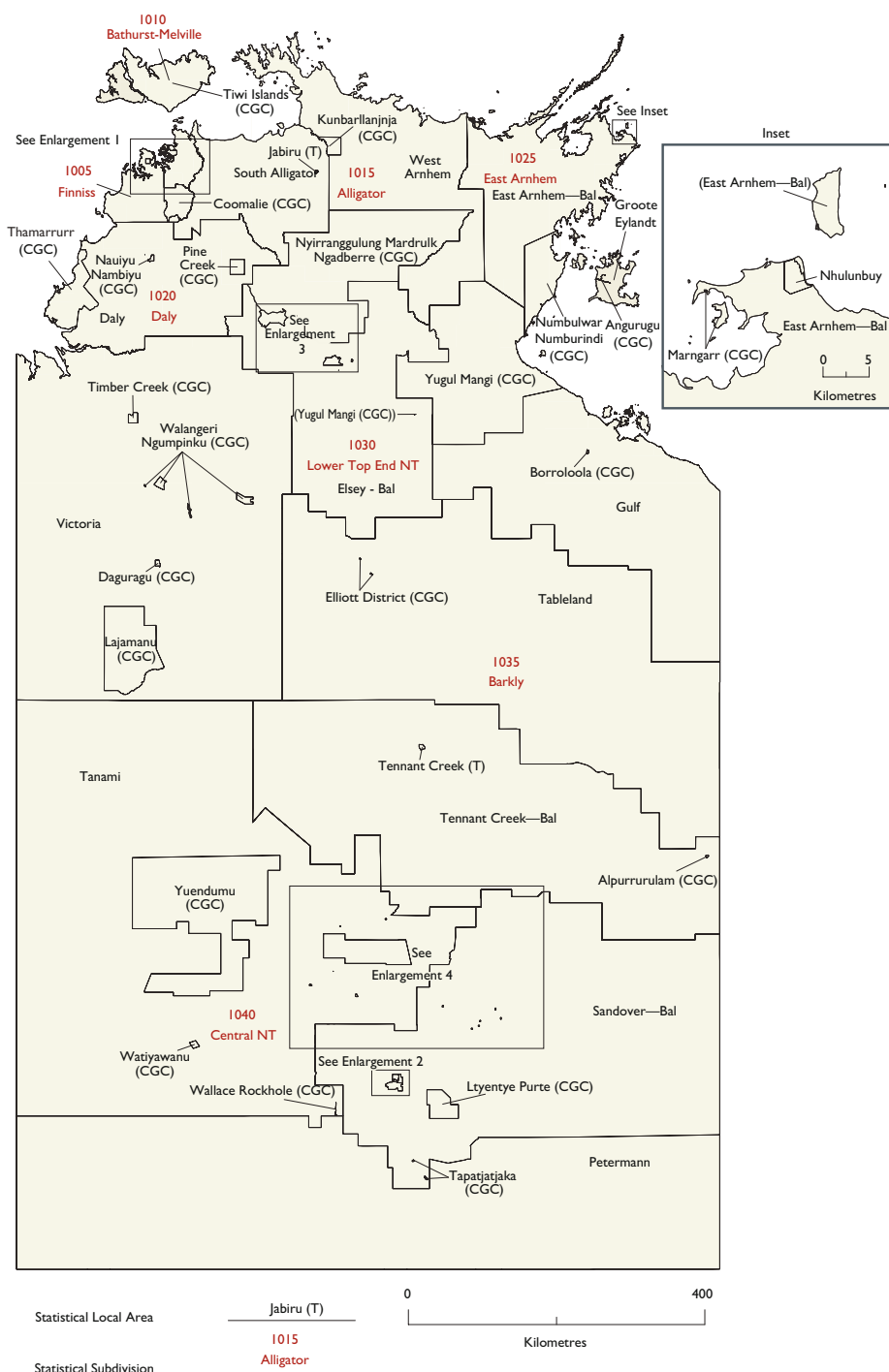
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Appendix



Appendix

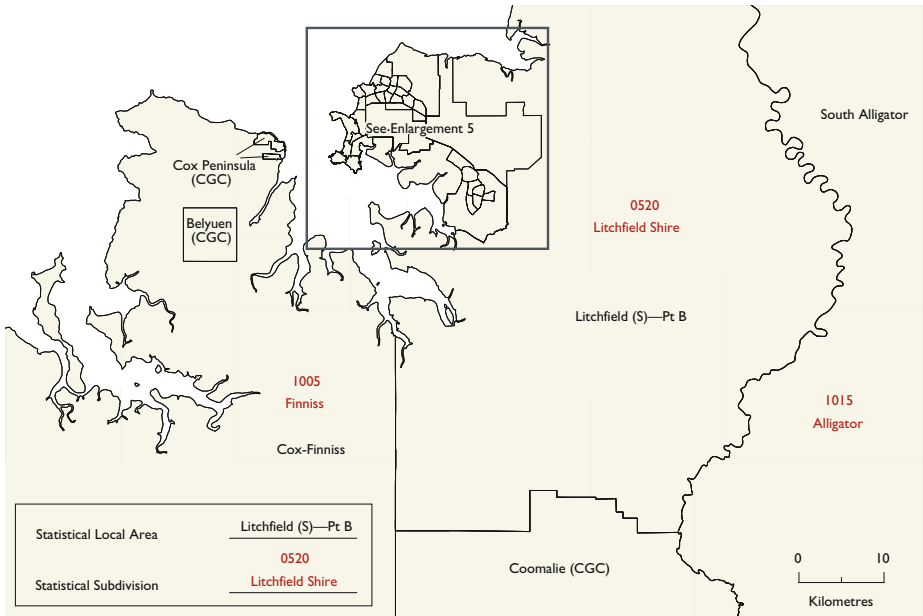
Map A1 Northern Territory—Statistical Subdivisions and Statistical Local Areas



Source: Australian Bureau of Statistics (2005a).

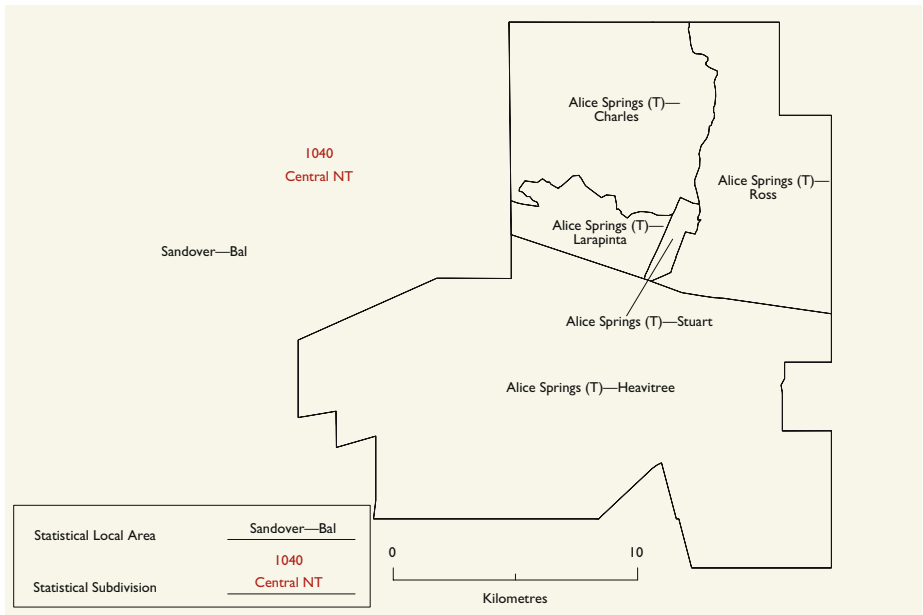
Map A2 Northern Territory—Statistical Subdivisions and Statistical Local Areas

(a) Enlargement 1



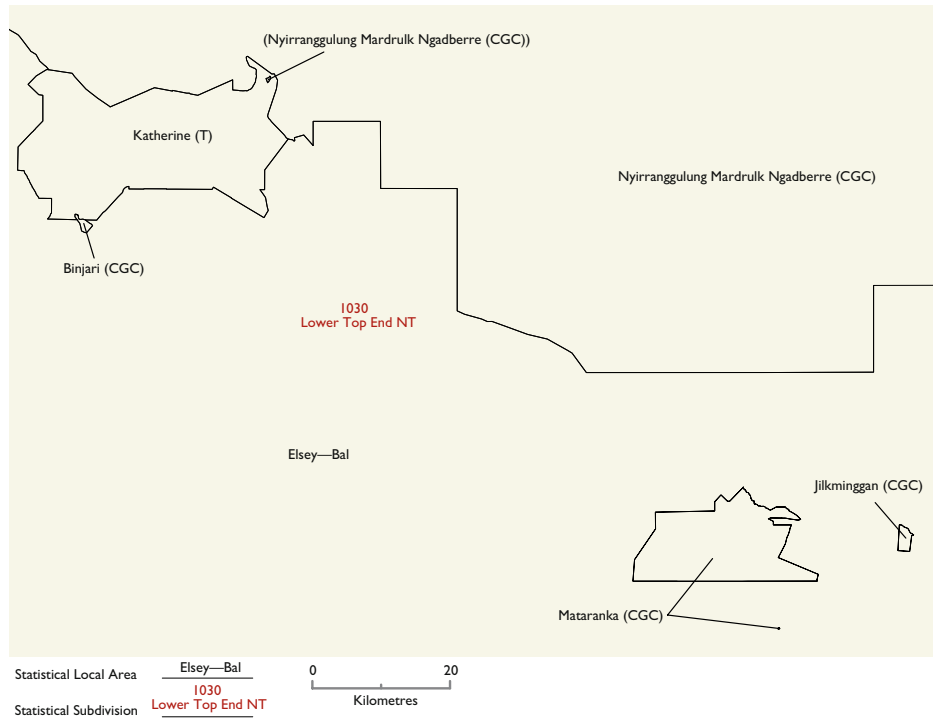
Source: Australian Bureau of Statistics (2005a).

(b) Enlargement 2



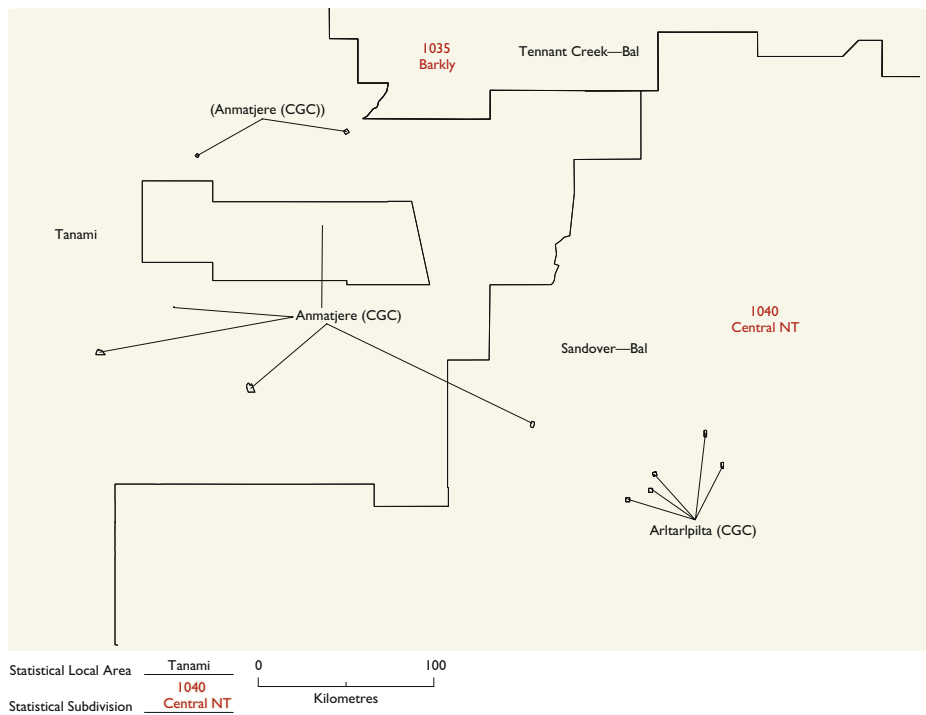
Source: Australian Bureau of Statistics (2005a).

(c) Enlargement 3



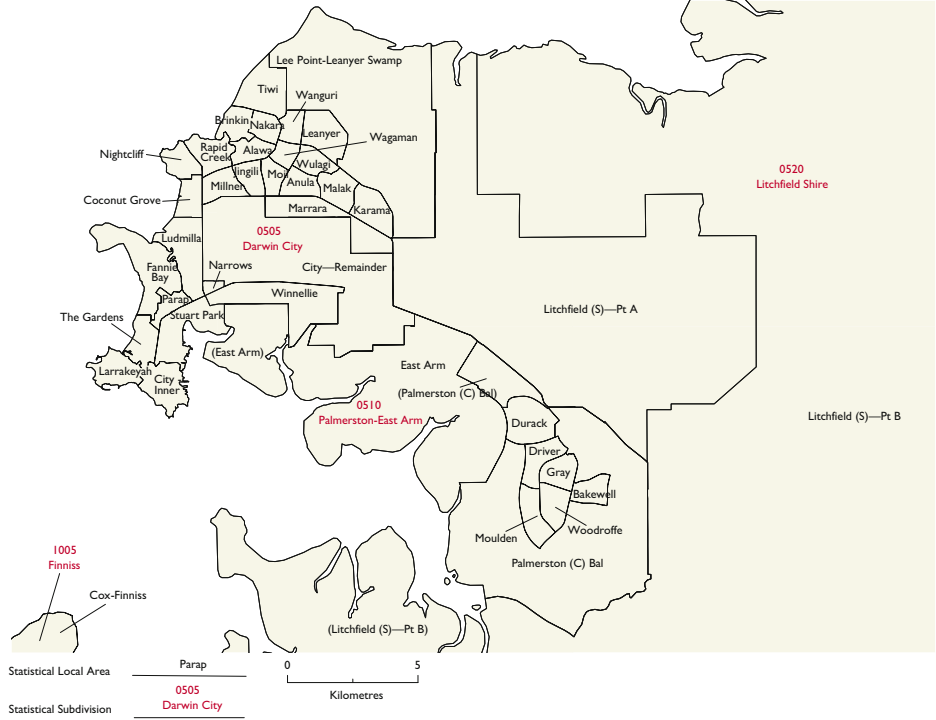
Source: Australian Bureau of Statistics (2005a).

(d) Enlargement 4



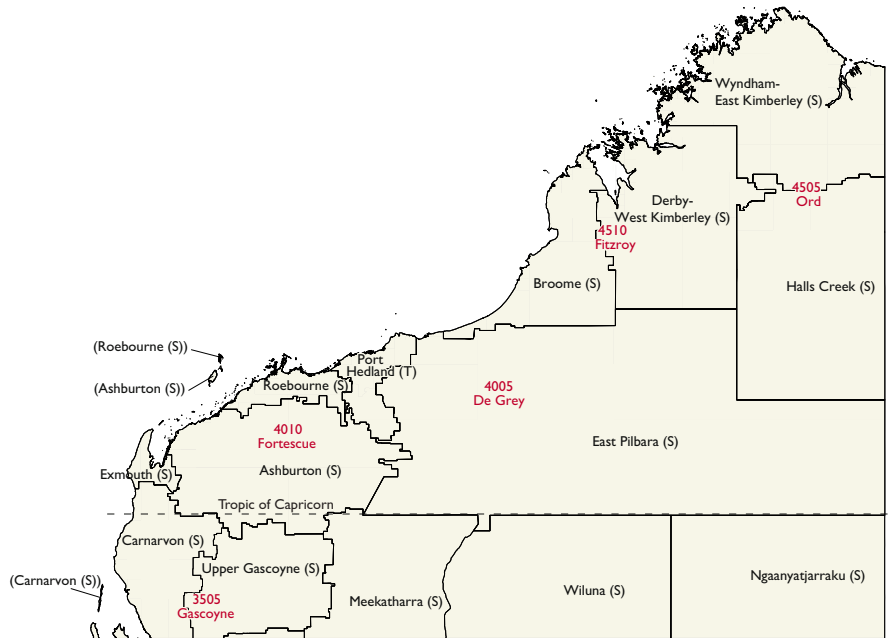
Source: Australian Bureau of Statistics (2005a).

(e) Enlargement 5



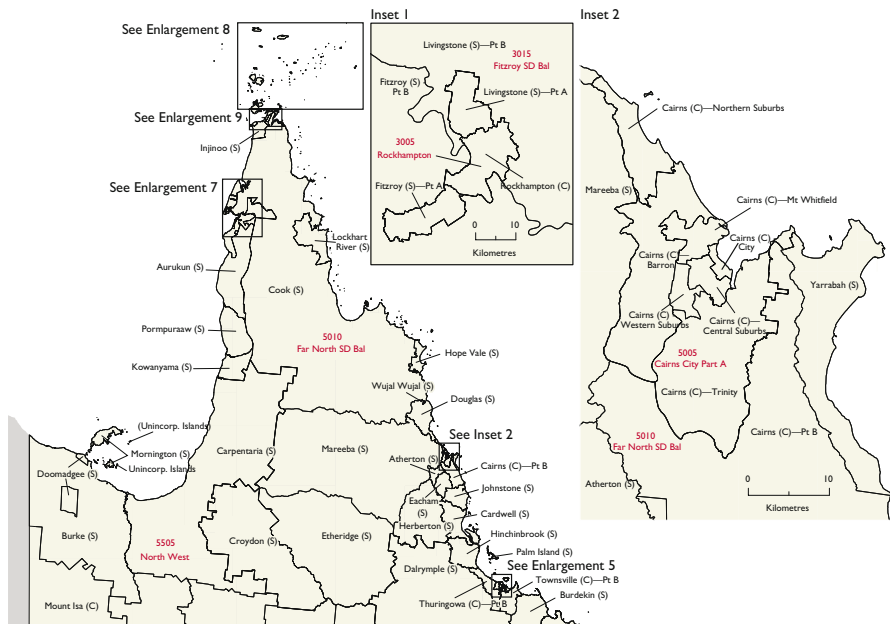
Source: Australian Bureau of Statistics (2005a).

Map A3 Western Australia—Statistical Subdivisions and Statistical Local Areas



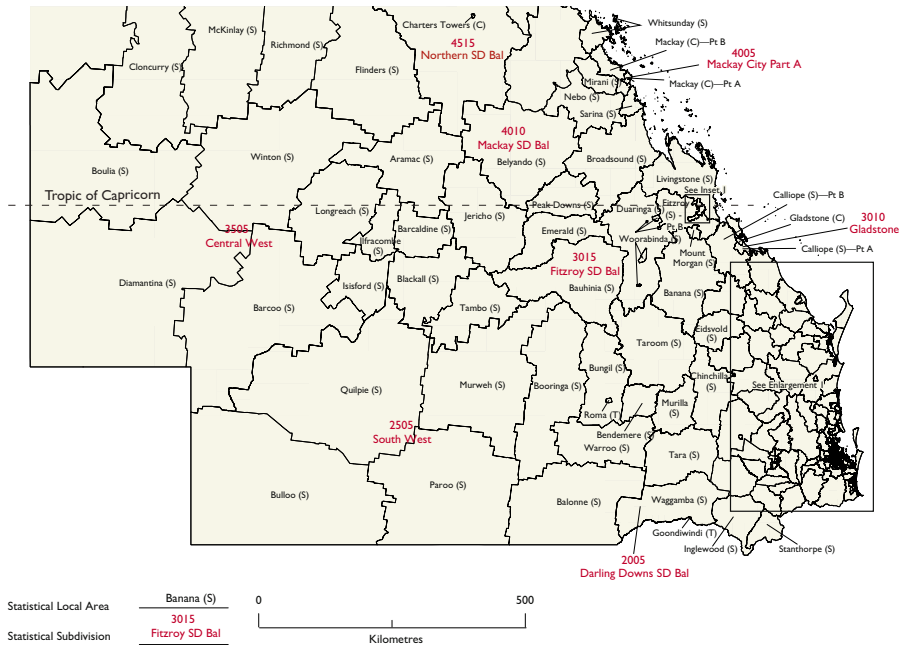
Source: Australian Bureau of Statistics (2005a).

Map A4 Queensland—Statistical Subdivisions and Statistical Local Areas



Source: Australian Bureau of Statistics (2005a).

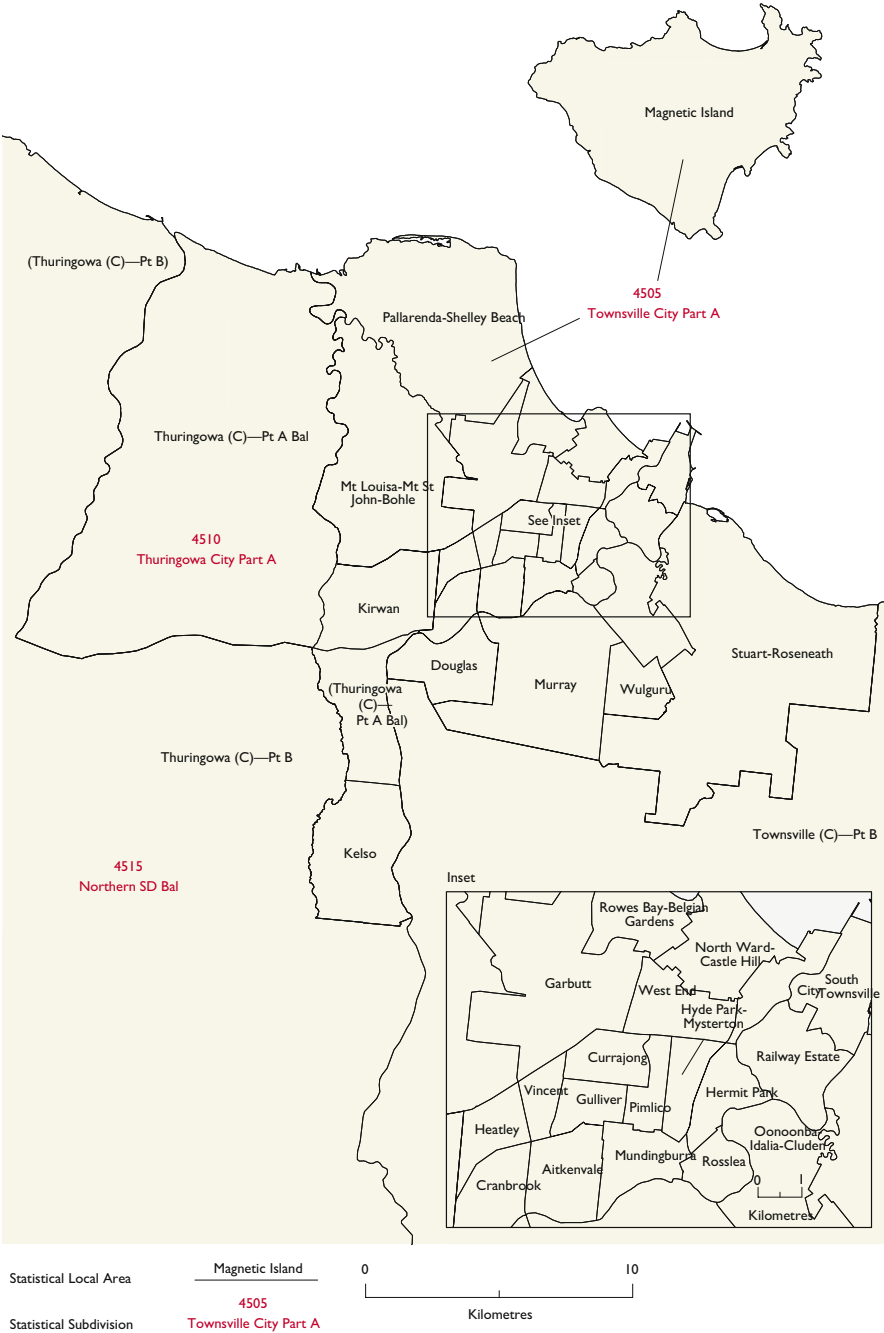
Map A4 Queensland—Statistical Subdivisions and Statistical Local Areas
(continued)



Source: Australian Bureau of Statistics (2005a).

Map A5 Queensland—Statistical Subdivisions and Statistical Local Areas

(a) Enlargement 1



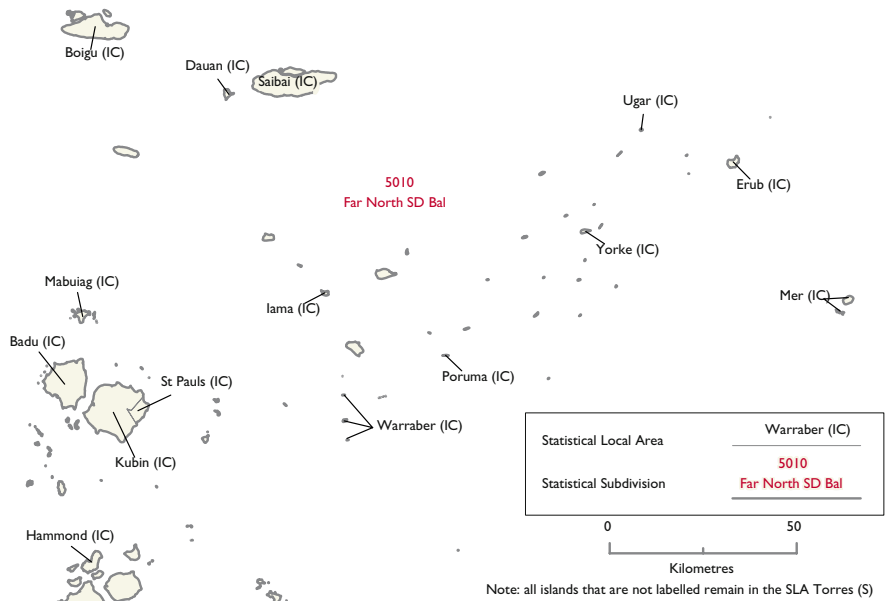
Source: Australian Bureau of Statistics (2005a).

(b) Enlargement 2

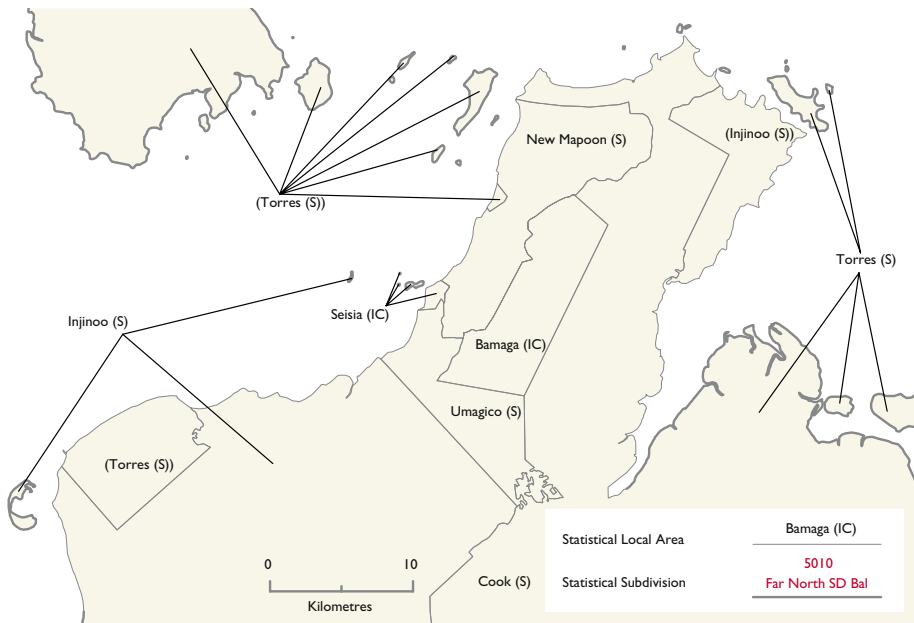


Source: Australian Bureau of Statistics (2005a).

(c) Enlargement 3



(d) Enlargement 4



Source: Australian Bureau of Statistics (2005a).

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Abbreviations and acronyms



Abbreviations and acronyms

AADT	Average Annual Daily Traffic
ABS	Australian Bureau of Statistics
ARTI	Aggregate Real Taxable Income
ATO	Australian Taxation Office
ASGC	Australian Standard Geographical Classification
BITRE	Bureau of Infrastructure, Transport and Regional Economics
BOM	Bureau of Meteorology
CDEP	Community Development Employment Projects
EDR	Economic demonstrated reserves
ESAA	Energy Supply Association of Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEEWR	Australian Government Department of Education, Employment and Workplace Relations
DOHA	Australian Government Department of Health and Ageing
ERP	Estimated Resident Population
FaHCSIA	Australian Government Department of Families and Housing, Community Services and Indigenous Affairs
LGA	Local Government Area
LNG	Liquified Nitrogen Gas
LPG	Liquified Petroleum Gas
NCVER	National Centre for Vocational Education Research
NTI	Number of Taxable Individuals
RFDS	Royal Flying Doctor Service
RIPT	Real Income Per Taxpayer
RPT	Regular Passenger Transport
SLA	Statistical Local Area
TAFE	Technical and Further Education
TRA	Tourism Research Australia
UCL	Urban Centre/Locality
VET	Vocational Education and Training
WICT	Wiggins Island Coal Terminal

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