



Land Management

Fitzroy and Livingstone Shires Queensland

2004–2005

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AUSTRALIAN BUREAU OF STATISTICS

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PREFACE

These are the published results of the second Australian Bureau of Statistics (ABS) survey to use a land parcel frame for data collection. Results from the first survey undertaken in the Eurobodalla Shire, NSW were released on 4 November 2005.

The land parcel survey project was undertaken to trial an alternate survey methodology for collecting data about land based activities especially in relation to natural resource management issues.

Land parcel frames provide a new approach to the collection of land management statistics. Digital land parcel maps provide a basic framework for land ownership. By combining this framework with land owner, land area and land use details, a land cadastre, suitable for use as a survey framework, is created.

This publication highlights the flexible output that is available when conducting surveys using this type of survey methodology.

I would like to thank the various stakeholders in Queensland State and Local Government for their assistance in providing survey framework information as well as considerable input into the survey design. I would also like to thank the Fitzroy Basin Association (FBA) for their assistance in providing the opportunity to further demonstrate spatial outputs.

The ABS invites feedback in terms of relevance, usefulness, quality and range of data presented. Please send any comments to the Director, Centre of Environment and Energy Statistics, Locked Bag 10, Belconnen ACT 2616, or phone (02) 6252 7348.

Dennis Trewin
Australian Statistician

INTRODUCTION

INTRODUCTION

Traditionally the ABS has collected natural resource management (NRM) data using a business-based frame for data collection. The agriculture surveys have been the main vehicle for this data collection but recent surveys conducted using this practice also include the Salinity Survey (2001) and the Water Survey (2003). The information from these surveys has used ABS statistical geography to produce output at the State and statistical division (SD) level. However, this type of survey output is not useful for all land management applications, particularly at regional levels.

Furthermore, for NRM purposes, the agricultural collections:

- have limited capacity to include detailed NRM survey questions;
- use businesses with agriculture as their predominant income source as the survey unit, thereby excluding all land owned by non-agricultural entities; and
- are not designed to represent all land in a given NRM area of interest.

The use of a spatial, land-based area frame for NRM surveys overcomes many of these issues.

The land parcel methodology is based on a list of land parcels for a given region and contains both land owner information as well as the size and location of each land parcel. The methodology facilitates the release of spatial data, enabling the dissemination and mapping of small area statistics at a finer level than previously possible. Flexible land related outputs, for example Natural Heritage Trust (NHT) and National Action Plan (NAP) areas, are also possible.

The land parcel survey methodology differs from traditional ABS survey methodologies in that it is spatial land parcels (the holding) that form the statistical unit about which statistics are tabulated, compiled or published rather than a business unit. The methodology is therefore limited in its ability to measure the economic performance of businesses.

The publication Land Management: Eurobodalla, NSW (Cat. no. 4651.0) presented results from the first survey to utilise this methodology. This publication presents the results of the second survey to use this method.

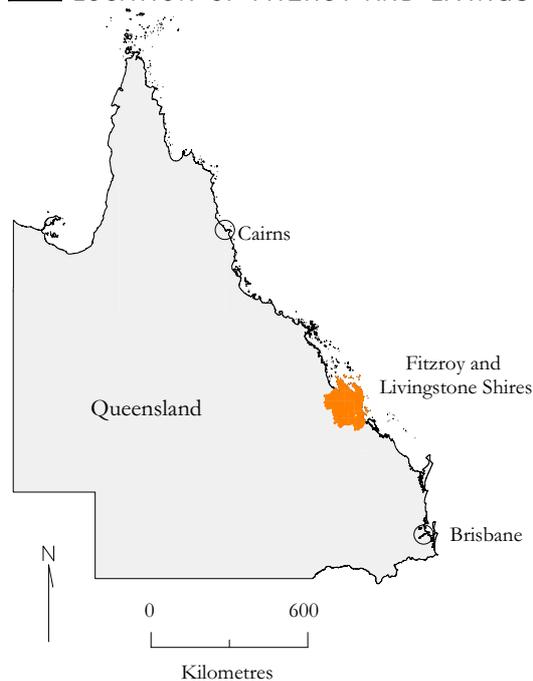
The key feature of this publication is the diversity of spatial outputs the land parcel frame approach offers. The data is presented in five different ways - by shire, for a riparian zone, for the coastal zone, for radial zones and by neighbourhood catchments. Other spatial outputs are also possible.

INTRODUCTION

The survey region is located on the Capricorn Coast of Queensland, approximately 520 kilometres north of Brisbane, and comprises the Shires of Fitzroy and Livingstone. The shires are located within the Fitzroy Basin which is the largest river basin draining to the east coast of Australia.

European explorers arrived and began pastoral settlement in the region in the mid 1800s, opening the area to grazing and mining. Today, the major land use in the region is cattle grazing, while other land uses include cropping and horticulture. The city of Rockhampton is the major urban centre in the region. Map 1.1 shows the location of the region within Queensland.

1.1 LOCATION OF FITZROY AND LIVINGSTONE SHIRES



The region has a humid, sub-tropical climate with rainfall concentrated in the warmer half of the year. Rainfall is generally highest near the coast and reduces further inland. The climate in the region is affected by the El Nino Southern Oscillation (ENSO) which causes variability in rainfall. Droughts are a significant feature of the region and many areas have been seriously affected since 1991. During the survey reference period (2004-2005) both Fitzroy and Livingstone Shires were drought declared.

INTRODUCTION
continued

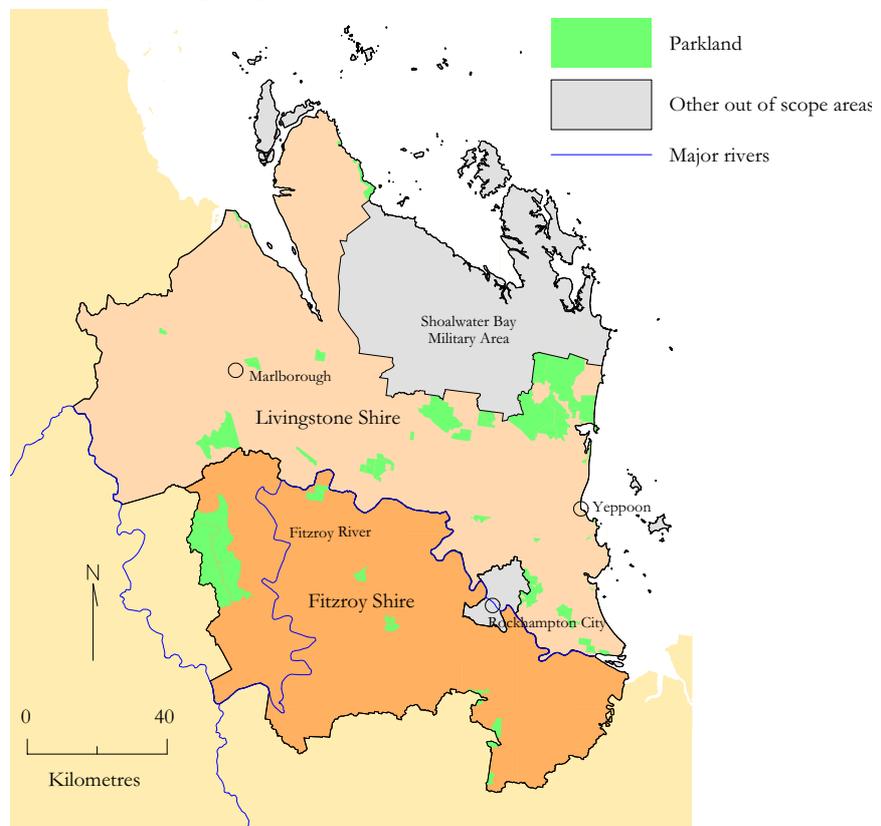
Including offshore islands, the survey region covers an area of 1,767,957 hectares. The survey region is comprised of mostly agricultural land, with National Parks, State Forests and reserves accounting for 118,103 hectares of the total area. The Shoalwater Bay Military Area covers 285,300 hectares of the region. Table 1.2 shows the total area of land in scope of the survey, in hectares, as well as the area of land which is out of scope. Map 1.3 shows the two shires, including areas of parkland, the Shoalwater Bay Military Area and the major rivers in the region.

1.2 THE SURVEY REGION

	Area ha
Urban land use(a)	37 971
Rural land use	
In scope of the survey	1 234 298
Parkland(a)	118 103
Other	377 585
Total rural land	1 729 986
Total	1 767 957

(a) Based on draft ABS Mesh Blocks.

1.3 THE SURVEY REGION



THE TWO SHIRES

The Fitzroy Shire covers an area of 590,501 hectares (based on SLA information). As at 30 June 2004 it had a population of 10,300 people distributed across small urban areas, rural towns and agricultural properties. The main urban centre is Gracemere, which is home to one of the largest sale yards in the Southern Hemisphere. The sale yards handle a significant proportion of Queensland's export beef cattle. The Tropic of Capricorn passes through the Fitzroy Shire.

The Livingstone Shire covers an area of 1,177,456 hectares (based on SLA information), and has a population of 28,300 people (as at 30 June 2004). The population is also distributed across small urban areas, rural towns and agricultural properties. Yeppoon is the major town centre and is located on the Capricorn Coast. Other towns in the shire include Emu Park, Byfield and Marlborough. A large area on the coast north of Yeppoon is listed as an internationally significant wetland site. The Shoalwater Bay Military Area is within the Livingstone Shire.

SHOALWATER BAY
MILITARY AREA

The Shoalwater Bay Military Area covers 285,300 hectares and occupies a significant proportion of the Livingstone Shire. The natural resource management conditions of the Shoalwater Bay Military Area are included in this publication for completeness. It should be noted that the information in the following two paragraphs is released with the permission of the Department of Defence, and that the data is not included in any other statistics in this publication.

The Shoalwater Bay Military Area has approximately 19,000 hectares of native grassland, 225,000 hectares of native tree or shrub cover and 30,000 hectares of wetlands and/or swamps. The area has minor problems with salinity and erosion, with approximately 100 hectares affected by each problem. The Department of Defence has undertaken earthworks, draining or water pumping, tree and shrub planting or maintenance, as well as fencing to address these problems and protect sensitive areas. As with other landholders in the shire, the Shoalwater Bay Military Area has problems with weeds, native animals and pests. The Department of Defence undertakes a variety of actions to address these problems.

During the 12 months ended 30 June 2005, the Department of Defence spent \$100,000 addressing salinity and erosion issues, \$400,000 on issues relating to feral animals, weeds and pests, \$50,000 on native vegetation related expenses and \$50,000 on water related expenses, in the Shoalwater Bay Military Area.

THE FITZROY RIVER

Five major rivers contribute to the Fitzroy River. The river itself forms most of the boundary between the Fitzroy and Livingstone Shires. A total of 300 kilometres of the Fitzroy River lies within the survey region. The river flows into the Fitzroy estuary and Keppel Bay on the Capricorn Coast. The Capricorn Coast is made up of estuaries, beaches, inshore islands, reefs and extensive wetlands.

NATURAL RESOURCE
MANAGEMENT

Historically, extensive clearing of native vegetation has occurred in the Fitzroy Basin region to make way for grazing and cropping. A number of land degradation problems have been identified in the Fitzroy Basin including soil erosion, soil compaction, salinity, water quality, fertility decline and weed invasion. Elevated loads of sediments, nutrients and pesticides are delivered to the Fitzroy estuary and Keppel Bay and also to the Great Barrier Reef Lagoon during large floods.

NATURAL RESOURCE
MANAGEMENT *continued*

The Fitzroy Basin region is an area of focus for the National Action Plan for Salinity and Water Quality which is implemented within the region by the Fitzroy Basin Association. The Fitzroy River Catchment has also been a "focus catchment" of the CRC for Catchment Hydrology since 2000.

The FBA is the key community-based group concerned with natural resource management in the region. The FBA has divided the Fitzroy region into neighbourhood catchments, relatively small areas used to assist and monitor community based natural resource management. There are 23 of these areas within the survey region.

Neighbourhood catchments provide an important 'on-ground' community-based approach to natural resource management. In developing this survey, the importance of these small areas was recognised by the ABS and included in the published results.

INTERPRETING THE DATA

Overall, 1,234,298 hectares of rural land were included in the survey. The survey covered all privately owned residential and non-residential holdings greater than 2 hectares in size. Land in the urban areas of the Fitzroy and Livingstone Shires was out of scope of the survey.

As the land parcel methodology differs significantly from other ABS methodologies, care should be taken when comparing data from this publication to similar data from other ABS products. To assist in interpreting the data included in the publication, the following key terms should be taken into account.

Key terms

LANDHOLDER

The landholder refers to any person, partnership, legal entity, organisation or body that owns one or more of the in scope land parcels.

HOLDING

A holding represents all land parcels owned by a landholder within the survey area.

RESIDENTIAL HOLDINGS

Residential holdings are holdings that are primarily for residential or lifestyle use, with no productive activities occurring.

NON-RESIDENTIAL HOLDINGS

Non-residential holdings have productive activities. The primary activity of a non-residential holding can include agricultural, industrial or commercial activities.

STOCKING RATE

Stocking rate refers to the number of hectares available per beast.

The explanatory notes at the end of this publication provide further details about the scope and coverage of the survey.

ACKNOWLEDGEMENTS

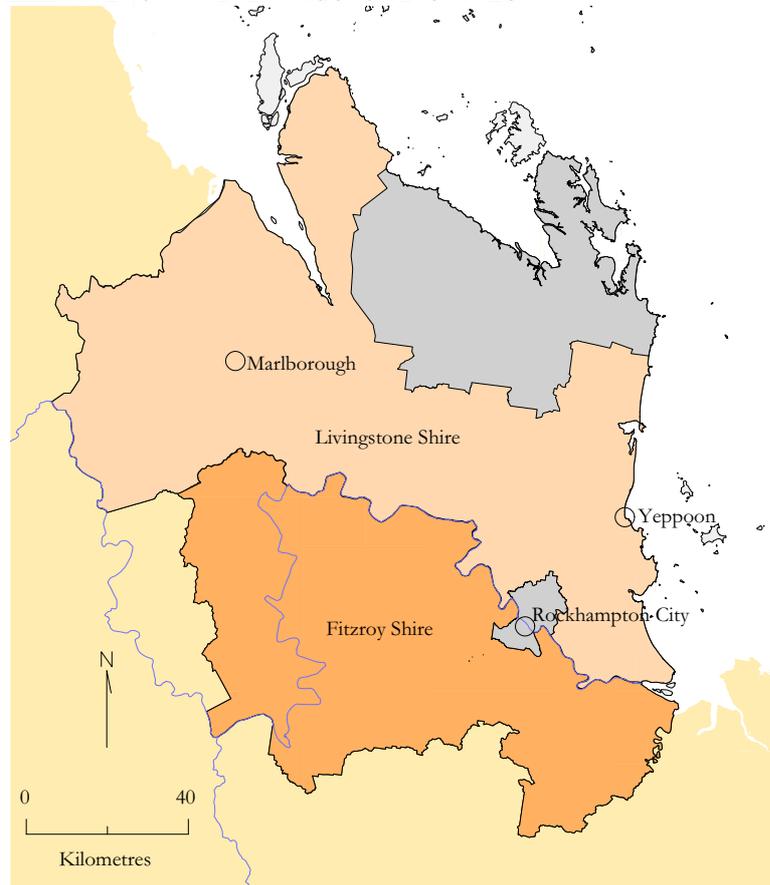
In preparing this chapter, publicly available information was sourced from the Fitzroy Basin Association and the CRC for Catchment Hydrology.

INTRODUCTION

The Fitzroy and Livingstone Shires represent the two major administrative boundaries used for this survey. Their combined area is 1,767,957 hectares.

Within the Fitzroy Shire, 513,079 hectares and 1,646 holdings were included in the survey. Native vegetation covered 62% of the survey area. For the Livingstone Shire, 721,219 hectares and 2,379 holdings were included in the survey. Nearly two thirds of this area was covered by native vegetation.

2.1 FITZROY AND LIVINGSTONE SHIRES



RESIDENTIAL HOLDINGS

Residential holdings only covered a small proportion of the survey area in the Fitzroy and Livingstone Shires (4% and 6% respectively). On average, residential holdings were the same size (30 ha) in both shires. Each residential holding in the Livingstone Shire had, on average, 21 hectares of native vegetation, of which an average 15 hectares was predominantly trees and shrubs. This compares to the Fitzroy Shire where the average area of native vegetation per residential holding was 18 hectares, of which an average 9 hectares was predominantly trees and shrubs.

RESIDENTIAL HOLDINGS
continued

The majority of residential holdings in the Fitzroy and Livingstone Shires were impacted by the presence of native and feral animals, and insect pests (59% and 57% respectively). Issues with native vegetation were reported by only 18% of residential holdings in the Fitzroy Shire compared with 31% in the Livingstone Shire.

In each shire, over two thirds of residential landholders addressed at least one NRM issue on their holding, with almost 60% of residential landholders in each shire addressing native vegetation issues. Weed and pest issues were addressed by 39% of residential landholders in the Fitzroy Shire and 48% in the Livingstone Shire.

2.2 KEY DATA, residential holdings

		Fitzroy Shire	Livingstone Shire	Total
Area of land	ha	^ 21 886	^ 44 129	66 015
Area of native vegetation	ha	^ 12 536	^ 30 241	42 777
Predominantly grasslands	ha	* 6 289	^ 8 887	15 176
Predominantly trees and shrubs	ha	^ 6 173	^ 21 157	27 330
Predominantly swamps and wetlands	ha	* 74	* 196	^ 271
Number of holdings	no.	717	1 451	2 167
Holdings with NRM issues	no.	482	1 037	1 520
Weeds	no.	^ 307	^ 760	1 067
Pests	no.	^ 420	^ 831	1 252
Native vegetation	no.	^ 126	^ 454	580
Holdings that addressed NRM issues	no.	^ 482	991	1 473
Weeds and pests	no.	^ 280	^ 703	983
Native vegetation	no.	^ 427	855	1 282
Expenditure on NRM issues	\$'000	* 877	^ 2 366	3 243
Plans for the 5 years to 30 June 2010				
Plan to sell all or part of the holding	no.	52	** 22	^ 74
Plan to purchase more land	no.	^ 152	^ 245	^ 397
Barriers to improving management practices				
Lack of financial resources	no.	^ 522	1 057	1 579
Lack of time	no.	^ 515	1 012	1 527
Age or ill health	no.	^ 486	929	1 416

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

NON-RESIDENTIAL
HOLDINGS

Agricultural land accounted for 91% (1,065,727 ha) of the area of non-residential holdings, with the remaining land reported as either non-productive or unusable (8%), or as having other uses (1%). On average, the size of a non-residential holding was 629 hectares; 529 hectares in the Fitzroy Shire and 730 hectares in the Livingstone Shire.

For both shires, almost two thirds of the non-residential land area was covered by native vegetation (Fitzroy Shire 62% and Livingstone Shire 64%).

In the Fitzroy Shire, 49% of the agricultural land was classified by landholders as being of good or very good quality, compared with 39% in the Livingstone Shire.

Within the Fitzroy Shire, 15% of non-residential landholders used irrigation on their holding compared with 21% of landholders in the Livingstone Shire. Across both shires a total of 7,172 hectares were irrigated during the 12 months ended 30 June 2005.

NON-RESIDENTIAL
HOLDINGS *continued***2.3** SELECTED DATA, non-residential holdings

		Fitzroy Shire	Livingstone Shire	Total
Area of land	ha	491 193	677 090	1 168 283
Land used for agriculture	ha	455 268	610 459	1 065 727
Grazing land	ha	442 944	602 645	1 045 589
Land that is non-productive or unusable	ha	^ 34 788	^ 61 250	^ 96 038
Land used for other purposes	ha	* 1 137	* 5 381	^ 6 518
Quality of agricultural land				
Good/very good	ha	222 792	236 622	459 413
Fair	ha	188 016	274 819	462 835
Poor	ha	^ 44 460	^ 99 019	143 479
Area of native vegetation	ha	306 032	434 282	740 314
Predominantly grasslands	ha	184 517	^ 199 676	384 193
Predominantly trees and shrubs	ha	^ 114 685	206 757	321 442
Predominantly swamps and wetlands	ha	* 6 830	* 27 849	^ 34 679
Number of holdings	no.	929	928	1 858
Number of irrigators	no.	^ 138	^ 191	^ 329
Area under irrigation	ha	^ 3 937	^ 3 235	^ 7 172

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

Land Management

Appropriate land management is important for both the ecological and economic sustainability of land and water resources. As the Fitzroy and Livingstone Shires are comprised mainly of agricultural land and have a history of cattle grazing, inevitably some pressure has been placed on the land. Landholders identified various NRM issues, and during the survey period they undertook a range of activities to address these issues.

Livestock

Within the Fitzroy Shire 442,944 hectares were classified as grazing land. As at 30 June 2005, a total of 112,444 cattle were being grazed on 95% of this grazing land. This equates to a stocking rate of 3.7 hectares per beast. For the Livingstone Shire, 602,645 hectares were classified as grazing land. As at 30 June 2005, a total of 141,284 cattle were being grazed on 94% of the available grazing land, a stocking rate of 4.0 hectares per beast.

The most common form of grazing management used in both shires was stock movement which includes cell grazing, rotational grazing and stock rate adjustments. Off-stream water points for cattle were utilised by 28% of the landholders undertaking grazing management practices.

*Livestock continued***2.4** STOCK MANAGEMENT, non-residential holdings

		<i>Fitzroy Shire</i>	<i>Livingstone Shire</i>	<i>Total</i>
Land used for grazing	ha	442 944	602 645	1 045 589
Holdings with cattle at 30 June 2005	no.	765	605	1 370
Number of cattle (Beef and dairy)	no.	112 444	141 284	253 728
Holdings undertaking grazing management practices	no.	786	693	1 478
Practices undertaken				
Pasture improvement	no.	365	^ 318	683
Stock movement	no.	712	552	1 265
Use of off-stream water points	no.	^ 217	^ 198	416
Use of supplements	no.	530	443	973

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

NRM issues

The majority (95%) of non-residential landholders reported one or more NRM issues on their holding. The most frequently reported issue was the problem of native and feral animals, and insect pests. In the Fitzroy Shire, 89% of landholders reported this issue compared with 86% in the Livingstone Shire.

Water availability was an issue for 48% of non-residential landholders in each of the shires. Water condition was an issue for 26% of Fitzroy Shire non-residential landholders and for 18% of non-residential landholders in the Livingstone Shire. In the Fitzroy Shire 32% of non-residential holdings had an issue with soil compaction compared with 25% in the Livingstone Shire.

2.5 SELECTED NRM ISSUES, non-residential holdings

	<i>Fitzroy Shire</i>	<i>Livingstone Shire</i>	<i>Total</i>
	no.	no.	no.
Number of holdings	929	928	1 858
Holdings with NRM issues	888	881	1 769
Issues identified			
Insufficient native vegetation	^ 73	* 48	^ 121
Extensive or thickening native vegetation	285	^ 326	611
Declining native vegetation quality	^ 131	^ 139	^ 269
Habitat fragmentation	^ 49	* 57	^ 106
Weeds	767	640	1 406
Pests	829	797	1 625
Soil acidity, erosion and salinity	314	^ 309	622
Soil compaction	296	^ 233	530
Water availability	450	449	899
Water run-off or flooding	^ 228	^ 198	426
Water condition	245	^ 166	411

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM activities

Activities to address weeds and pests were undertaken by 88% of non-residential landholders in the Fitzroy Shire compared with 85% in Livingstone Shire. The use of herbicides to control weeds was the most common activity undertaken with 65% of landholders in the Fitzroy Shire and 52% of landholders in the Livingstone Shire reporting the use of this control method. 'Slashing, cutting, pulling, chipping or mowing' was a frequently reported method of controlling weeds in both shires.

Other commonly reported NRM activities were fencing to protect native vegetation from stock and grazing management to address soil acidity, erosion and salinity.

2.6 SELECTED MANAGEMENT ACTIVITIES, non-residential holdings

	Fitzroy Shire	Livingstone Shire	Total
	no.	no.	no.
Number of holdings	929	928	1 858
Holdings with NRM issues	888	881	1 769
Holdings that addressed native vegetation issues	507	565	1 072
Activities undertaken			
Fencing native vegetation from stock	377	326	703
Planting and/or seeding of native vegetation	^ 25	^ 29	53
Clearing of native vegetation (under permit)	* 5	^ 29	34
Holdings that addressed weeds and pests	819	793	1 612
Activities undertaken			
Herbicide application	602	479	1 081
Pesticide application	438	^ 340	778
Slashing, cutting, pulling, chipping or mowing	377	494	870
Holdings that addressed salinity, acidity or erosion	589	545	1 134
Activities undertaken			
Crop or pasture management	^ 206	^ 220	426
Grazing management	444	360	804
Tree and shrub planting or maintenance	^ 99	^ 127	^ 226
Fencing to protect sensitive areas	^ 82	^ 120	^ 202

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM expenditure

In total, non-residential landholders spent over \$13 million addressing NRM issues in the Fitzroy and Livingstone Shires during the year ended 30 June 2005. In the Fitzroy Shire, the average expenditure on NRM issues was \$12 per hectare compared with \$10 per hectare in the Livingstone Shire.

Water issues attracted the greatest NRM spending in the Fitzroy Shire with \$2.9 million spent during 2004-05. In the Livingstone Shire \$2.8 million was spent on weed and pest issues.

*NRM expenditure
continued*

2.7 NRM EXPENDITURE, non-residential holdings

	<i>Fitzroy Shire</i>	<i>Livingstone Shire</i>	<i>Total</i>
	\$'000	\$'000	\$'000
Expenditure on NRM issues	^ 6 071	^ 6 953	13 024
Salinity, erosion and soil acidity	^ 587	* 1 072	^ 1 659
Weeds and pests	^ 2 023	^ 2 829	^ 4 852
Native vegetation expenses	^ 523	^ 598	^ 1 121
Water	^ 2 938	^ 2 454	^ 5 392

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

*NRM initiatives and
barriers*

Almost 20% of non-residential landholders prepared a new property plan, in the year ended 30 June 2005, to assist with their management of natural resources.

The greatest barrier to improving land management practices in both the Fitzroy and Livingstone Shires was a lack of financial resources. Lack of time, age or health issues and doubts about success were also frequently reported barriers. The Appendix provides an overview of the demographics for both shires.

A total of 311 landholders planned to sell all or part of their holding in the next five years. This represents 17% of all non-residential landholders across both shires. By comparison, only 9% of landholders planned to purchase more land in the next five years.

2.8 SELECTED INITIATIVES AND BARRIERS, non-residential holdings

	<i>Fitzroy Shire</i>	<i>Livingstone Shire</i>	<i>Total</i>
	no.	no.	no.
Number of holdings	929	928	1 858
NRM planning undertaken during the year			
Prepared a new property plan	^ 172	^ 189	361
Used an existing property plan	^ 268	^ 148	416
Barriers to improving management practices			
Lack of financial resources	816	714	1 530
Doubts about likely success	606	525	1 131
Lack of time	721	654	1 374
Age or health issues	677	634	1 311
Plans for the five years to 30 June 2010			
Sell all or part of the holding	^ 159	^ 152	311
Purchase more land	^ 78	^ 85	163
Pass ownership to another family member	^ 63	^ 80	142
Change the activity or activity mix on the holding	^ 49	^ 72	121

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

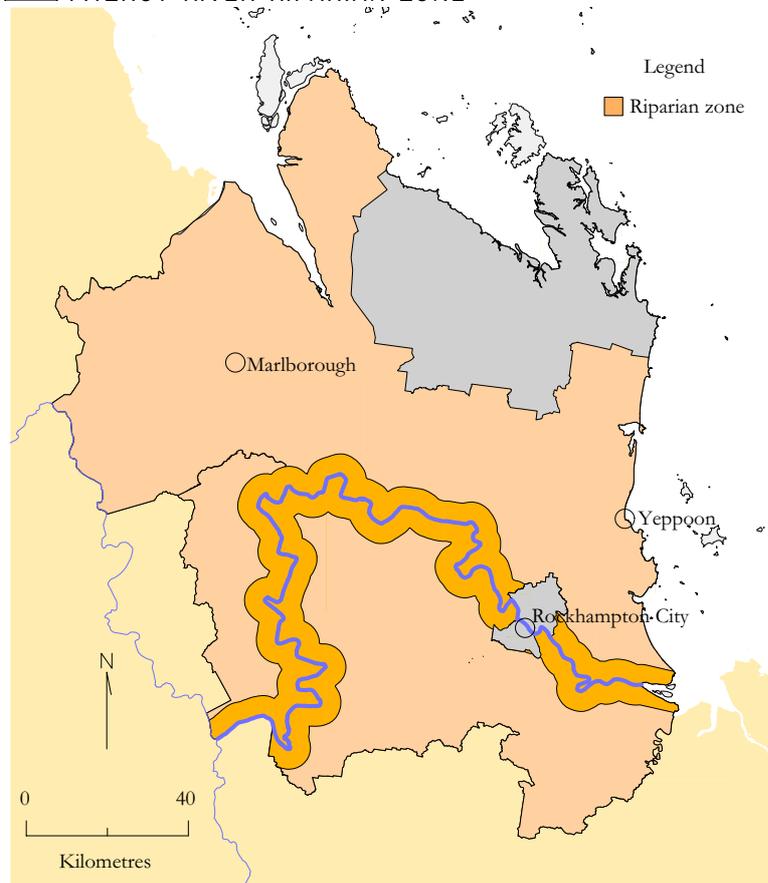
INTRODUCTION

Riparian land is land adjacent to or directly influencing a body of water. The long term sustainability of land and water resources relies on the effective management of riparian land. The importance of good land management in the Fitzroy region has been recognised, as each year sediment, nutrients and pesticides are delivered to the Fitzroy estuary and Keppel Bay. During floods these sediments and pollutants may ultimately reach the Great Barrier Reef.

The Fitzroy River is fed by five rivers. The river forms most of the boundary between the Fitzroy and Livingstone Shires. A total of 300 kilometres of the Fitzroy River lies within the survey area. For this survey, a riparian zone was defined as extending 5 kilometres each side of the Fitzroy River.

This chapter provides key data about land management issues and practices in this important region of the Fitzroy and Livingstone Shires. The riparian zone covers an area of 249,774 hectares, with 219,315 hectares (661 holdings) included in the survey.

3.1 FITZROY RIVER RIPARIAN ZONE



RESIDENTIAL HOLDINGS

Residential holdings covered 3% (5,977 ha) of the survey land area within the riparian zone. The average size of a residential holding within the riparian zone was 18 hectares. In total, 52% of the area of residential land within the riparian zone was covered with native vegetation, compared with 66% outside the riparian zone.

Within the riparian zone, problems with native and feral animals and insect pests were the most common NRM issue reported on residential holdings (59%). Problems with weeds were reported by 45% of residential landholders in the riparian zone. NRM issues were addressed by 68% of riparian zone landholders, with 31% specifically addressing weed and pest issues. Outside the riparian zone 48% of residential landholders addressed weed and pest issues.

On average, residential landholders spent less on addressing NRM issues within the riparian zone (\$36/ha) than outside the riparian zone (\$50/ha) during the year ended 30 June 2005.

A lack of financial resources and a lack of time were frequently identified as barriers to improving management practices by residential landholders within the riparian zone (74% and 70% of landholders respectively). Age or ill health was reported as a barrier to improving management practices by 63% of residential landholders within the riparian zone.

3.2 KEY DATA, residential holdings

		<i>Within riparian zone</i>	<i>Outside riparian zone</i>	<i>Total</i>
Area of land	ha	^ 5 977	60 038	66 015
Area of native vegetation	ha	^ 3 092	^ 39 686	42 777
Predominantly grasslands	ha	^ 1 535	*13 642	15 176
Predominantly trees and shrubs	ha	*1 484	^ 25 846	27 330
Predominantly swamps and wetlands	ha	*73	*198	^ 271
Number of holdings	no.	332	1 836	2 167
Holdings with NRM issues	no.	^ 220	1 299	1 520
Weeds	no.	^ 149	918	1 067
Pests	no.	^ 197	1 055	1 252
Native vegetation	no.	*42	538	580
Holdings that addressed NRM issues	no.	^ 225	1 247	1 473
Weeds and pests	no.	*102	881	983
Native vegetation	no.	^ 214	1 068	1 282
Expenditure on NRM issues	\$'000	*217	3 025	3 243
Plans for the 5 years to 30 June 2010				
Plan to sell all or part of the holding	no.	**8	*66	^ 74
Plan to purchase more land	no.	*60	336	^ 397
Barriers to improving management practices				
Lack of financial resources	no.	^ 247	1 331	1 579
Lack of time	no.	^ 231	1 295	1 527
Age or ill health	no.	^ 208	1 208	1 416

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

NON-RESIDENTIAL
HOLDINGS

The survey showed that 92% (195,345 ha) of non-residential land within the riparian zone was used for agriculture. Within the riparian zone, 94,878 hectares (49%) of agricultural land was considered to be of good or very good quality compared with 42% (364,535 ha) of the agricultural land outside the riparian zone.

A higher proportion of non-residential land was covered with native vegetation outside the riparian zone (68%) than within the riparian zone (45%). Of all the area of native vegetation on non-residential holdings within the riparian zone, 57% was classified as predominantly native grasslands.

The 4,886 hectares under irrigation represented 2% of the area of non-residential holdings within the riparian zone. Within the riparian zone there was a greater proportion of holdings (25%) using irrigation than outside the riparian zone (16%).

3.3 SELECTED DATA, non-residential holdings

		Within riparian zone	Outside riparian zone	Total
Area of land	ha	213 338	954 945	1 168 283
Land used for agriculture	ha	195 345	870 382	1 065 727
Grazing land	ha	189 015	856 574	1 045 589
Land that is non-productive or unusable	ha	^ 16 703	^ 79 335	^ 96 038
Land used for other purposes	ha	** 1 278	* 5 240	^ 6 518
Quality of agricultural land				
Good/very good	ha	94 878	364 535	459 413
Fair	ha	85 261	377 573	462 835
Poor	ha	^ 15 206	^ 128 273	143 479
Area of native vegetation	ha	^ 95 265	645 049	740 314
Predominantly grasslands	ha	^ 54 129	330 063	384 193
Predominantly trees and shrubs	ha	^ 38 395	283 046	321 442
Predominantly swamps and wetlands	ha	* 2 740	* 31 939	^ 34 679
Number of holdings	no.	329	1 528	1 858
Number of irrigators	no.	^ 83	^ 245	^ 329
Area under irrigation	ha	^ 4 886	^ 2 286	^ 7 172

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

Land management

The survey results show that the non-residential holdings within the riparian zone had similar holding sizes to the non-residential holdings outside the riparian zone. However, non-residential holdings within the riparian zone had higher stocking rates, more land under irrigation and a higher proportion of landholders planning to purchase more land.

Livestock

Within the riparian zone, 189,015 hectares were classified as grazing land. As at 30 June 2005, a total of 55,046 cattle were being grazed on 97% of this grazing land. This equates to a stocking rate of 3.3 hectares per beast. The equivalent stocking rate for outside the riparian zone was 4.0 hectares per beast. Landholders within the riparian zone undertook a range of grazing management practices during the year ended 30 June 2005. Movement of stock (including cell and rotational grazing and stock rate adjustments) was the most common form of grazing management in the riparian zone. Supplements were

Livestock continued

used by 74% of landholders who undertook any grazing management practice within the riparian zone.

3.4 STOCK MANAGEMENT, non-residential holdings

		Within riparian zone	Outside riparian zone	Total
Land used for grazing	ha	189 015	856 574	1 045 589
Holdings with cattle at 30 June 2005	no.	245	1 125	1 370
Number of cattle (Beef and dairy)	no.	55 046	198 682	253 728
Holdings undertaking grazing management practices	no.	265	1 214	1 478
Practices undertaken				
Pasture improvement	no.	^ 106	577	683
Stock movement	no.	^ 240	1 024	1 265
Use of off-stream water points	no.	^ 77	339	416
Use of supplements	no.	^ 195	778	973

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

NRM issues

The most common NRM issue on non-residential holdings in the riparian zone was weeds, with 83% of landholders reporting a weed problem compared to 74% of landholders outside the riparian zone. Extensive or thickening native vegetation was an issue for 38% of landholders within the riparian zone. Outside the riparian zone, pests (native and feral animals and insect pests) were a problem for 89% of non-residential landholders. Water availability was more of an issue for non-residential landholders outside the riparian zone with 52% reporting this issue compared to 33% of non-residential landholders within the riparian zone.

3.5 SELECTED NRM ISSUES, non-residential holdings

	Within riparian zone	Outside riparian zone	Total
	no.	no.	no.
Number of holdings	329	1 528	1 858
Holdings with NRM issues	309	1 460	1 769
Issues identified			
Insufficient native vegetation	*40	^ 81	^ 121
Extensive or thickening native vegetation	^ 125	486	611
Declining native vegetation quality	*50	^ 219	^ 269
Habitat fragmentation	*24	^ 82	^ 106
Weeds	273	1 133	1 406
Pests	269	1 357	1 625
Soil acidity, erosion and salinity	^ 96	527	622
Soil compaction	^ 105	425	530
Water availability	^ 110	789	899
Water run-off or flooding	^ 88	^ 338	426
Water condition	^ 84	327	411

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM activities

In the riparian zone, 88% of non-residential landholders undertook activities to address weed or pest issues. Herbicides were used by 61% of non-residential landholders and pesticides by 52% of non-residential landholders within the riparian zone. Outside the riparian zone, herbicides were used by 58% and pesticides by 40% of non-residential landholders. The most common practice undertaken to address native vegetation issues within the riparian zone was fencing native vegetation from stock (39% of non-residential landholders). Grazing management was the most frequently reported activity undertaken (36%) to address salinity, acidity or erosion issues within the riparian zone.

3.6 SELECTED MANAGEMENT ACTIVITIES, non-residential holdings

	<i>Within riparian zone</i>	<i>Outside riparian zone</i>	<i>Total</i>
	no.	no.	no.
Number of holdings	329	1 528	1 858
Holdings with NRM issues	309	1 460	1 769
Holdings that addressed native vegetation issues	^ 190	883	1 072
Activities undertaken			
Fencing native vegetation from stock	^ 128	575	703
Planting and/or seeding of native vegetation	^ 10	43	53
Clearing of native vegetation (under permit)	*6	^ 28	34
Holdings that addressed weeds and pests	290	1 322	1 612
Activities undertaken			
Herbicide application	^ 202	879	1 081
Pesticide application	^ 172	605	778
Slashing, cutting, pulling, chipping or mowing	^ 136	734	870
Holdings that addressed salinity, acidity or erosion	^ 178	955	1 134
Activities undertaken			
Crop or pasture management	^ 68	358	426
Grazing management	^ 117	686	804
Tree and shrub planting or maintenance	^ 35	191	^ 226
Fencing to protect sensitive areas	*36	^ 166	^ 202

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM expenditure

On average, non-residential landholders within the riparian zone spent more on NRM activities than landholders outside the riparian zone (\$16/ha and \$10/ha respectively). The highest expenditure in the riparian zone was on water related expenses (\$10/ha). An average of \$3 per hectare was spent on addressing land management issues relating to weeds and pests within the riparian zone.

*NRM expenditure
continued*

3.7 NRM EXPENDITURE, non-residential holdings

	<i>Within riparian zone</i>	<i>Outside riparian zone</i>	<i>Total</i>
	\$'000	\$'000	\$'000
Expenditure on NRM issues	^ 3 502	^ 9 522	13 024
Salinity, erosion and soil acidity	* 489	^ 1 171	^ 1 659
Weeds and pests	^ 626	^ 4 226	^ 4 852
Native vegetation expenses	* 272	^ 849	^ 1 121
Water	* 2 115	^ 3 276	^ 5 392

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM initiatives

During the year ended 30 June 2005, 18% of landholders in the riparian zone prepared a new property plan to meet their own NRM requirements, while 34% of landholders used an existing property plan to assist in their management of natural resources.

A higher proportion of non-residential landholders reported barriers to improving management practices within the riparian zone than outside the riparian zone. Lack of financial resources was the most common barrier, reported by 90% of non-residential landholders within the riparian zone and 81% outside the riparian zone. Lack of time was reported by 85% of non-residential landholders within the riparian zone compared with 72% outside the riparian zone. In total, 74% of non-residential landholders within the riparian zone reported age or health issues as a barrier. The survey showed that 14% of non-residential landholders within the riparian zone plan to sell all or part of their holding in the next five years, while 13% reported that they planned to purchase more land.

3.8 SELECTED INITIATIVES AND BARRIERS, non-residential holdings

	<i>Within riparian zone</i>	<i>Outside riparian zone</i>	<i>Total</i>
	no.	no.	no.
Number of holdings	329	1 528	1 858
NRM planning undertaken during the year			
Prepared a new property plan	* 60	* 301	361
Used an existing property plan	* 113	303	416
Barriers to improving management practices			
Lack of financial resources	297	1 233	1 530
Doubts about likely success	* 236	895	1 131
Lack of time	280	1 094	1 374
Age or health issues	245	1 067	1 311
Plans for the five years to 30 June 2010			
Sell all or part of the holding	47	264	311
Purchase more land	44	119	163
Pass ownership to another family member	* 31	112	142
Change the activity or activity mix on the holding	* 23	98	121

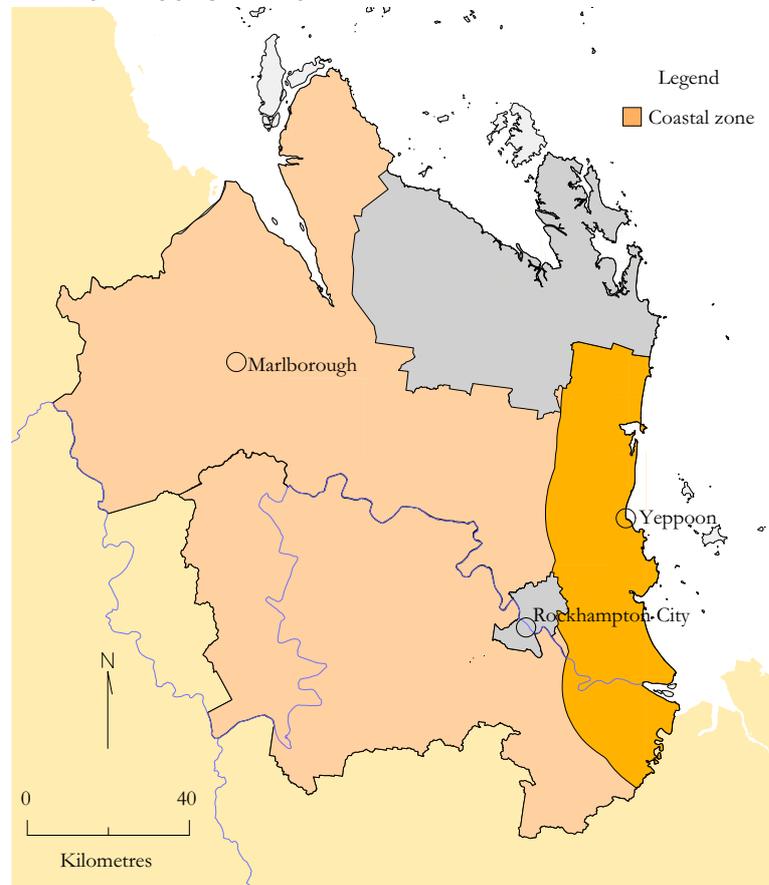
* estimate has a relative standard error of 25% to 50% and should be used with caution

INTRODUCTION

Coastal regions and estuaries form a strip between terrestrial and marine environments. They are both ecologically and economically important regions and typically have high biodiversity value. Coastal regions and estuaries help protect marine environments by accumulating and buffering sediments and nutrients that are washed down from upper catchment areas. Coastal zones typically contain a higher concentration of urban and industrial development, ports, harbours and tourism infrastructure. These landscapes are therefore vulnerable to pressures which may lead to degradation of land and also affect the ecological integrity of marine ecosystems. In Queensland, protecting the Great Barrier Reef Marine Park from pollutants and sediments is a key concern.

A 20 kilometre wide coastal zone was defined on the eastern side of the survey area. The coastal region in the north west of the survey area was sparsely populated and was not included as part of the coastal zone. The coastal zone covered an area of 224,605 hectares, with 139,768 hectares (1764 holdings) included in the surveyed area.

4.1 20KM COASTAL ZONE



RESIDENTIAL HOLDINGS

Residential holdings covered 21% (29,278 ha) of the land within the coastal zone compared with 3% (36,737 ha) outside the coastal zone. The average size of a residential holding within the coastal zone was 25 hectares. Native vegetation covered 68% of the area of residential land within the coastal zone. Of this native vegetation, 77% was predominantly native tree or shrub cover.

A higher proportion of residential landholders reported that they had NRM issues within the coastal zone (74%) than outside the coastal zone (65%).

The survey showed that 822 residential landholders (70%) in the coastal zone addressed one or more NRM issues. During the year ended 30 June 2005, residential landholders spent more, on average, addressing NRM issues within the coastal zone (\$76/ha) than outside the coastal zone (\$28/ha).

Lack of financial resources was reported as a barrier to improving management practices by 865 residential landholders (73%) within the coastal zone. Lack of time and age or ill health were barriers for 72% and 64% of residential landholders respectively within the coastal zone.

4.2 KEY DATA, residential holdings

		<i>Within the coastal zone</i>	<i>Outside the coastal zone</i>	<i>Total</i>
Area of land	ha	29 278	^ 36 737	66 015
Area of native vegetation	ha	19 984	^ 22 793	42 777
Predominantly grasslands	ha	^ 4 415	*10 762	^ 15 176
Predominantly trees and shrubs	ha	^ 15 383	^ 11 948	^ 27 330
Predominantly swamps and wetlands	ha	*186	*84	^ 271
Number of holdings	no.	1 182	985	2 167
Holdings with NRM issues	no.	878	642	1 520
Weeds	no.	635	432	1 067
Pests	no.	716	536	1 252
Native vegetation	no.	^ 402	^ 178	580
Holdings that addressed NRM issues	no.	822	651	1 473
Weeds and pests	no.	589	394	983
Native vegetation	no.	689	593	1 282
Expenditure on NRM issues	\$'000	^ 2 220	^ 1 023	3 243
Plans for the 5 years to 30 June 2010				
Plan to sell all or part of the holding	no.	**16	*58	^ 74
Plan to purchase more land	no.	^ 230	^ 167	^ 397
Barriers to improving management practices				
Lack of financial resources	no.	865	714	1 579
Lack of time	no.	847	679	1 527
Age or ill health	no.	761	655	1 416

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** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

NON-RESIDENTIAL HOLDINGS

Within the coastal zone 91,826 hectares of non-residential land (83%) were used for agriculture. The survey showed that 37% of agricultural land in the coastal zone was considered to be of good or very good quality compared with 44% of agricultural land outside the coastal zone. Within the coastal zone, 50% of agricultural land was classified

NON-RESIDENTIAL
HOLDINGS *continued*

as being of fair quality. A higher proportion of non-residential land was covered with native vegetation outside the coastal zone than within the coastal zone.

Within the coastal zone there were 1200 hectares under irrigation, which represented 1% of the area of non-residential holdings. There was a greater proportion of holdings using irrigation within the coastal zone than outside the coastal zone.

4.3 SELECTED DATA, non-residential holdings

		<i>Within the coastal zone</i>	<i>Outside the coastal zone</i>	<i>Total</i>
Area of land	ha	110 490	1 057 793	1 168 283
Land used for agriculture	ha	91 826	973 901	1 065 727
Grazing land	ha	88 075	957 514	1 045 589
Land that is non-productive or unusable	ha	^ 15 744	^ 80 294	^ 96 038
Land used for other purposes	ha	* 2 936	* 3 582	^ 6 518
Quality of agricultural land				
Good/very good	ha	^ 33 886	425 527	459 413
Fair	ha	^ 46 129	416 706	462 835
Poor	ha	^ 11 811	131 668	143 479
Area of native vegetation	ha	^ 49 085	691 229	740 314
Predominantly grasslands	ha	* 21 500	362 693	384 193
Predominantly trees and shrubs	ha	* 22 319	299 123	321 442
Predominantly swamps and wetlands	ha	* 5 266	* 29 413	^ 34 679
Number of holdings	no.	582	1 276	1 858
Number of irrigators	no.	^ 136	^ 192	^ 329
Area under irrigation	ha	^ 1 200	^ 5 972	^ 7 172

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

Land Management

Compared to outside the coastal zone, the survey results show that the coastal zone had, on average, smaller non-residential blocks, higher stocking rates, and a lower proportion of land covered by native vegetation. Fewer NRM issues were reported by the non-residential landholders within the coastal zone.

Livestock

Within the coastal zone 88,075 hectares were classified as grazing land. As at 30 June 2005, a total of 28,182 cattle were being grazed on 94% of this grazing land. This results in a stocking rate of 2.9 hectares per beast. In comparison, the stocking rate outside the coastal zone was 4.0 hectares per beast.

During 2004-05, 65% of all non-residential holdings within the coastal zone used some form of grazing management practice. Outside the coastal zone 86% of non-residential holdings used some form of grazing management practice.

Livestock *continued***4.4** STOCK MANAGEMENT, non-residential holdings

		Within the coastal zone	Outside the coastal zone	Total
Land used for grazing	ha	88 075	957 514	1 045 589
Holdings with cattle at 30 June 2005	no.	323	^ 1 046	1 370
Number of cattle (Beef and dairy)	no.	28 182	^ 225 546	253 728
Holdings undertaking grazing management practices	no.	378	^ 1 100	1 478
Practices undertaken				
Pasture improvement	no.	215	^ 468	683
Stock movement	no.	295	^ 970	1 265
Use of off-stream water points	no.	136	^ 279	416
Use of supplements	no.	241	^ 732	973

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

NRM Issues

Problems with pests were the most frequently reported NRM issue (84%) for non-residential holdings within the coastal zone. Weed problems were reported by 70% of landholders. Half the non-residential landholders within the coastal zone had an issue with water availability.

A higher proportion of non-residential landholders outside the coastal zone reported problems with soil acidity, erosion or salinity than within the coastal zone.

4.5 SELECTED NRM ISSUES, non-residential holdings

	Within the coastal zone	Outside the coastal zone	Total
	no.	no.	no.
Number of holdings	582	1 276	1 858
Holdings with NRM issues	545	1 225	1 769
Issues identified			
Insufficient native vegetation	*31	^ 91	^ 121
Extensive or thickening native vegetation	^ 192	419	611
Declining native vegetation quality	*63	^ 206	^ 269
Habitat fragmentation	*43	^ 63	^ 106
Weeds	410	996	1 406
Pests	488	1 138	1 625
Soil acidity, erosion and salinity	^ 171	452	622
Soil compaction	^ 119	410	530
Water availability	^ 291	608	899
Water run-off or flooding	^ 156	^ 269	426
Water condition	^ 96	315	411

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM Activities

Within the coastal zone 90% of non-residential landholders undertook activities to address weed or pest issues. The most common method used to address weed issues was 'slashing, cutting, pulling, chipping, or mowing' (64%).

Herbicides were used by 52% and pesticides by 35% of non-residential landholders within the coastal zone.

NRM Activities continued

The most common practice undertaken to address native vegetation issues within the coastal zone was fencing of native vegetation from stock (34% of non-residential landholders).

4.6 SELECTED MANAGEMENT ACTIVITIES, non-residential holdings

	Within the coastal zone	Outside the coastal zone	Total
	no.	no.	no.
Number of holdings	582	1 276	1 858
Holdings with NRM issues	545	1 225	1 769
Holdings that addressed native vegetation issues	^ 311	761	1 072
Activities undertaken			
Fencing native vegetation from stock	^ 197	506	703
Planting and/or seeding of native vegetation	^ 17	37	53
Clearing of native vegetation (under permit)	^ 14	^ 20	34
Holdings that addressed weeds and pests	524	1 088	1 612
Activities undertaken			
Herbicide application	^ 304	777	1 081
Pesticide application	^ 203	575	778
Slashing, cutting, pulling, chipping or mowing	^ 375	495	870
Holdings that addressed salinity, acidity or erosion	^ 324	809	1 134
Activities undertaken			
Crop or pasture management	^ 139	287	426
Grazing management	^ 171	633	804
Tree and shrub planting or maintenance	^ 102	^ 124	^ 226
Fencing to protect sensitive areas	^ 64	^ 138	^ 202

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

NRM Expenditure

On average, non-residential landholders spent more on NRM activities within the coastal zone (\$30/ha) than outside the coastal zone (\$9/ha). Within the coastal zone non-residential landholders spent an average \$13 per hectare on water related expenses. On average, \$10 per hectare was spent within the coastal zone addressing land management issues relating to native and feral animals, weeds and insect pests, while \$3 per hectare was spent outside the coastal zone.

*NRM Expenditure
continued*

4.7 NRM EXPENDITURE, non-residential holdings

	<i>Within the coastal zone</i>	<i>Outside the coastal zone</i>	<i>Total</i>
	\$'000	\$'000	\$'000
Expenditure on NRM issues	^ 3 319	^ 9 705	13 024
Salinity, erosion and soil acidity	* 466	^ 1 193	^ 1 659
Weeds and pests	^ 1 157	^ 3 694	^ 4 852
Native vegetation expenses	* 264	^ 857	^ 1 121
Water	* 1 431	^ 3 960	^ 5 392

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM Initiatives

During the year ended 30 June 2005, 112 non-residential landholders (19%) within the coastal zone prepared a new property plan to meet their own NRM requirements, while 80 (14%) used an existing property plan to assist in their decision making.

Lack of financial resources was identified as a barrier to improving management practices by 85% of non-residential landholders outside the coastal zone, compared with 76% within the coastal zone. Age or health issues were a barrier for 415 non-residential landholders (71%) within the coastal zone. Lack of time and doubts about likely success were reported by 69% and 53% of non-residential landholders respectively within the coastal zone. A total of 98 non-residential landholders (17%) within the coastal zone reported that they planned to sell all or part of their holding in the next five years.

4.8 SELECTED INITIATIVES AND BARRIERS, non-residential holdings

	<i>Within the coastal zone</i>	<i>Outside the coastal zone</i>	<i>Total</i>
	no.	no.	no.
Number of holdings	582	1 276	1 858
NRM planning undertaken during the year			
Prepared a new property plan	^ 112	249	361
Used an existing property plan	^ 80	336	416
Barriers to improving management practices			
Lack of financial resources	440	1 090	1 530
Doubts about likely success	^ 311	820	1 131
Lack of time	^ 399	975	1 374
Age or health issues	^ 415	896	1 311
Plans for the five years to 30 June 2010			
Sell all or part of the holding	^ 98	^ 213	311
Purchase more land	* 37	^ 126	163
Pass ownership to another family member	* 32	^ 110	142
Change the activity or activity mix on the holding	* 32	^ 89	121

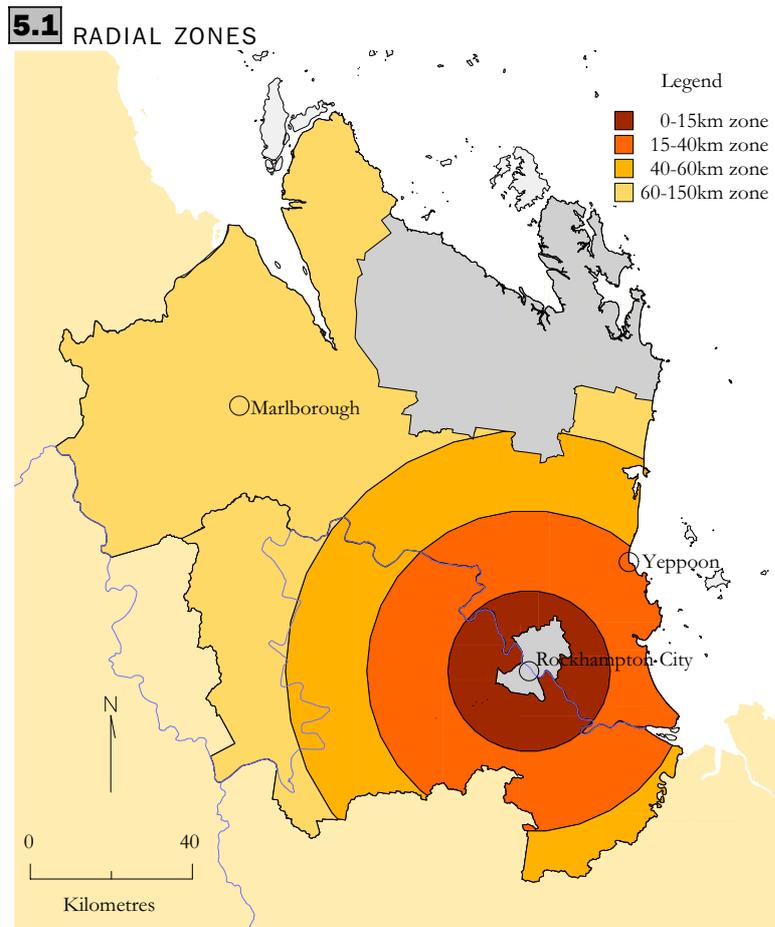
^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

INTRODUCTION

Rockhampton is the major urban centre in the Fitzroy and Livingstone region. As the centre of residential and business activity for the region, Rockhampton has an impact upon the land uses of the surrounding area. Land uses change with distance from Rockhampton as do natural resource management issues. As is common with most urban centres, the average holding size increases with distance from the centre while population density decreases.

For this survey, radial zones around Rockhampton have been defined to show how land use and land management issues change with increasing distance from this urban centre. The zones are 0-15km, 15-40km, 40-60km and 60-150km from the Rockhampton City Centre. Properties classified as urban residential were not in scope and therefore Rockhampton, which is predominantly urban, was not included in the survey estimates.



RESIDENTIAL HOLDINGS

The proportion of non-urban residential land decreased with distance from Rockhampton. The percentage of land covered by residential holdings in each radial zone decreased with distance from Rockhampton (15%, 12%, 5% and 2% respectively.) The average residential holding size in each radial zone increased with distance from Rockhampton (18 ha, 25 ha, 48 ha and 103 ha respectively).

Across all radial zones, the proportion of residential landholders reporting a NRM issue was greater than 60%. The inner radial zone had the lowest proportion of residential holdings with NRM issues. The 40-60km radial zone had the highest proportion of residential holdings reporting weed issues (60%). In the outer radial zone (60-150km) only 31% of residential holdings reported an issue with weeds. The same radial zone had the highest proportion of pest issues reported.

A greater proportion of residential landholders addressed NRM issues in the outer radial zone. In particular, a higher proportion of residential landholders addressed weed and pest issues in this zone compared with other radial zones.

The survey showed that 24% of residential landholders in the 40-60km radial zone planned to purchase more land in the next five years. The second and third radial zones (15-40km and 40-60km) had a higher proportion of holdings reporting age or ill health as a barrier to improving management practices when compared to the inner and the outer radial zones.

5.2 KEY DATA, residential holdings

		RADIAL ZONES				Total
		0-15km	15-40km	40-60km	60-150km	
Area of land	ha	^ 5 696	37 613	^ 11 442	^ 11 263	66 015
Area of native vegetation	ha	^ 2 623	24 710	^ 7 077	^ 8 368	42 777
Predominantly grasslands	ha	^ 1 257	^ 7 393	** 2 997	** 3 530	15 176
Predominantly trees and shrubs	ha	^ 1 300	^ 17 170	^ 4 061	* 4 799	27 330
Predominantly swamps and wetlands	ha	^ 66	* 146	* 19	* 39	^ 271
Number of holdings	no.	323	1 498	237	^ 109	2 167
Holdings with NRM issues	no.	^ 196	1 058	^ 186	^ 80	1 520
Weeds	no.	^ 123	767	^ 143	* 34	1 067
Pests	no.	^ 169	862	^ 148	^ 73	1 252
Native vegetation	no.	* 37	471	^ 60	* 12	580
Holdings addressing NRM issues	no.	^ 214	991	^ 180	^ 88	1 473
Weeds and pests	no.	^ 99	712	^ 99	^ 74	983
Native vegetation	no.	^ 185	904	^ 147	* 46	1 282
Expenditure on NRM issues	\$'000	* 260	^ 2 637	* 205	^ 141	3 243
Plans for the 5 years to 30 June 2010						
Plan to sell all or part of the holding	no.	* 20	* 41	—	* 13	^ 74
Plan to purchase more land	no.	* 40	^ 278	* 57	* 21	^ 397
Barriers to improving management practices						
Lack of financial resources	no.	^ 223	1 121	^ 153	^ 82	1 579
Lack of time	no.	^ 207	1 083	^ 171	^ 65	1 527
Age or ill health	no.	^ 171	1 022	^ 163	^ 60	1 416

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

— nil or rounded to zero (including null cells)

NON-RESIDENTIAL
HOLDINGS

The majority of land was used for agriculture in all four radial zones. The inner radial zone (0-15km) had the highest proportion of good or very good quality agricultural land (52%), while the 40-60 km radial zone had the lowest proportion (36%).

The outer radial zone had the highest proportion of non-residential land covered by native vegetation (72%). In the 15-40km radial zone, 48% of non-residential land was covered by native vegetation. This was the lowest proportion of the four radial zones. Trees and shrubs covered a greater proportion of the area of native vegetation in the outer radial zone (46%) compared to the inner radial zone (23%).

The proportion of holdings using irrigation in the inner radial zone was 24%. In the same radial zone, 3% of the area of non-residential holdings was under irrigation.

5.3 SELECTED DATA, non-residential holdings

		RADIAL ZONES				Total
		0-15km	15-40km	40-60km	60-150km	
Area of land	ha	33 557	287 250	241 009	606 467	1 168 283
Land used for agriculture	ha	31 244	257 777	219 987	556 719	1 065 727
Grazing land	ha	29 288	243 697	217 865	554 740	1 045 589
Land that is non-productive or unusable	ha	*1 466	^ 26 926	np	np	^ 96 038
Land used for other purposes	ha	*805	*2 542	np	np	^ 6 518
Quality of agricultural land						
Good/very good	ha	^ 16 360	126 094	79 449	237 510	459 413
Fair	ha	^ 9 057	93 838	110 523	249 416	462 835
Poor	ha	*5 826	^ 37 845	^ 30 015	^ 69 792	143 479
Area of native vegetation	ha	21 219	137 675	^ 147 403	434 017	740 314
Predominantly grasslands	ha	^ 13 965	^ 82 321	^ 77 212	210 695	384 193
Predominantly trees and shrubs	ha	^ 4 815	^ 52 128	^ 64 225	200 274	321 442
Predominantly swamps and wetlands	ha	*2 439	*3 227	*5 966	*23 047	^ 34 679
Number of holdings	no.	^ 235	1 130	299	192	1 858
Number of irrigators	no.	*57	^ 203	*43	^ 26	^ 329
Area under irrigation	ha	*1 134	^ 3 930	*1 059	*1 049	^ 7 172

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

np not available for publication but included in totals where applicable, unless otherwise indicated

Livestock

In the two outer radial zones (40-150km from Rockhampton) virtually all of the agricultural land was used for grazing. The stocking rate decreased with distance from Rockhampton. In the inner radial zone there were 2.3 hectares per beast and in the outer most radial zone there were 4.6 hectares per beast. The proportion of holdings running stock also increased with distance from Rockhampton.

Grazing management practices were common in all the radial zones, with stock movement and the use of supplements the most common practices. Proportionally, these two practices were more frequently used in the outer radial zone.

5.4 STOCK MANAGEMENT, non-residential holdings

		RADIAL ZONES				Total
		0-15km	15-40km	40-60km	60-150km	
Land used for grazing	ha	29 288	243 697	217 865	554 740	1 045 589
Holdings with cattle at 30 June 2005	no.	^ 157	807	242	164	1 370
Number of cattle (Beef and dairy)	no.	^ 11 167	73 986	52 082	116 493	253 728
Holdings undertaking grazing management practices	no.	^ 178	869	268	163	1 478
Practices undertaken						
Pasture improvement	no.	^ 78	422	^ 119	64	683
Stock movement	no.	^ 149	766	198	151	1 265
Use of off-stream water points	no.	*50	^ 257	^ 58	^ 51	416
Use of supplements	no.	^ 130	576	^ 136	130	973

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM issues

In the outer radial zone, 7% of non-residential landholders were concerned about insufficient native vegetation, while a higher proportion (55%) reported extensive or thickening native vegetation as a NRM issue. Soil compaction was reported by a high proportion of non-residential landholders in the inner zone and a low proportion in the outer radial zone. This compares closely with the stocking rate for these two radial zones.

Water availability was a common concern in the 15-40km radial zone with 56% of non-residential landholders reporting this issue. Water run-off or flooding was an issue for 28% of non-residential landholders in this zone. Weed issues and issues relating to animal and insect pests were reported by a large proportion of non-residential landholders in all radial zones.

5.5 SELECTED NRM ISSUES, non-residential holdings

	RADIAL ZONES				Total
	0-15km	15-40km	40-60km	60-150km	
	no.	no.	no.	no.	no.
Number of holdings	^ 235	1 130	299	192	1 858
Holdings with NRM issues	^ 218	1 085	290	176	1 769
Issues identified					
Insufficient native vegetation	*36	*63	*9	^ 13	^ 121
Extensive or thickening native vegetation	*62	^ 341	^ 102	106	611
Declining native vegetation quality	*58	^ 137	*41	^ 34	^ 269
Habitat fragmentation	*17	*55	*18	^ 16	^ 106
Weeds	^ 185	863	218	140	1 406
Pests	^ 187	1 000	278	161	1 625
Soil acidity, erosion and salinity	^ 79	407	^ 88	^ 49	622
Soil compaction	^ 97	^ 304	^ 86	^ 43	530
Water availability	^ 86	636	^ 107	70	899
Water run-off or flooding	*45	^ 318	*40	^ 23	426
Water condition	^ 62	^ 234	^ 77	^ 37	411

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

NRM activities

The proportion of non-residential landholders that addressed native vegetation issues increased with distance from Rockhampton. Fencing native vegetation from stock was the activity most commonly undertaken to address native vegetation issues in all radial zones.

Weed and pest issues were addressed by a high proportion of non-residential landholders in each of the four radial zones. The use of herbicides to control weeds was most prevalent in the inner radial zone. In all radial zones, herbicide weed control was more common than 'slashing, cutting, pulling, chipping or mowing'. The use of pesticides for pest management was least common in the outer radial zone.

5.6 SELECTED MANAGEMENT ACTIVITIES, non-residential holdings

	RADIAL ZONES					Total
	0-15km	15-40km	40-60km	60-150km		
	no.	no.	no.	no.	no.	
Number of holdings	^ 235	1 130	299	192	1 858	
Holdings with NRM issues	^ 218	1 085	290	176	1 769	
Holdings that addressed native vegetation issues	^ 127	618	^ 184	143	1 072	
Activities undertaken						
Fencing native vegetation from stock	^ 85	423	111	84	703	
Planting and/or seeding of native vegetation	^ 11	^ 28	^ 12	^ 3	53	
Clearing of native vegetation (under permit)	np	^ 22	np	7	34	
Holdings that addressed weeds and pests	208	982	258	164	1 612	
Activities undertaken						
Herbicide application	^ 150	654	^ 165	112	1 081	
Pesticide application	^ 97	489	^ 123	^ 70	778	
Slashing, cutting, pulling, chipping or mowing	^ 114	559	^ 144	^ 53	870	
Holdings that addressed salinity, acidity or erosion	^ 148	723	^ 159	104	1 134	
Activities undertaken						
Crop or pasture management	*69	^ 276	^ 41	^ 39	426	
Grazing management	^ 105	488	^ 124	87	804	
Tree and shrub planting or maintenance	*52	^ 151	*12	*11	^ 226	
Fencing to protect sensitive areas	*10	^ 150	^ 18	^ 24	^ 202	

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

np not available for publication but included in totals where applicable, unless otherwise indicated

NRM expenditure

In the inner radial zone an average \$35 per hectare was spent on NRM issues. The average expenditure in the two outer zones (40-60km and 60-150km) was \$7 per hectare and \$5 per hectare respectively.

Management of feral animals, weeds and pests attracted significant expenditure with a large proportion of the money spent by non-residential landholders in the 15-40km radial zone. In this radial zone, \$2,358,000 was spent on feral animal, weed and pest management, an average of \$8 per hectare. In addition, \$12 per hectare was spent on water related expenses in this zone.

*NRM expenditure
continued*

5.7 NRM EXPENDITURE, non-residential holdings

	RADIAL ZONES				Total
	0-15km	15-40km	40-60km	60-150km	
	\$'000	\$'000	\$'000	\$'000	\$'000
Expenditure on NRM issues	*1 163	^ 7 129	^ 1 633	^ 3 098	13 024
Soil acidity, salinity and erosion	np	*967	np	*406	^ 1 659
Weeds and pests	*353	^ 2 358	^ 703	*1 438	^ 4 852
Native vegetation	np	^ 273	np	^ 465	^ 1 121
Water	*602	^ 3 528	^ 469	^ 793	^ 5 392

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

np not available for publication but included in totals where applicable, unless otherwise indicated

*NRM plans, barriers and
initiatives*

Nearly one third of non-residential landholders in the outer radial zone prepared a new property plan during the year ended 30 June 2005. The highest proportion of non-residential landholders who used an existing property plan during the year was in the inner radial zone.

Lack of financial resources was reported as a barrier to improving NRM practices by the highest proportion of non-residential landholders in the inner radial zone. Doubts about likely success, lack of time, and age or health issues were barriers most common in the 40-60km radial zone.

In the 40-60km radial zone, 20% of non-residential landholders considered selling all or part of their holding in the next five years. In the outer radial zone, 16% of non-residential landholders planned to pass ownership of the holding to another family member.

5.8 SELECTED PLANS, BARRIERS AND INITIATIVES, non-residential holdings

	RADIAL ZONES				Total
	0-15km	15-40km	40-60km	60-150km	
	no.	no.	no.	no.	no.
Number of holdings	^ 235	1 130	299	192	1 858
NRM planning undertaken during the year					
Prepared a new property plan	*32	^ 205	^ 65	^ 59	361
Used an existing property plan	^ 78	^ 243	^ 43	^ 52	416
Barriers to improving management practices					
Lack of financial resources	^ 206	923	250	151	1 530
Doubts about likely success	^ 142	675	219	95	1 131
Lack of time	^ 171	831	245	128	1 374
Age or health issues	^ 169	790	239	112	1 311
Plans for the five years to 30 June 2010					
Sell all or part of the holding	*27	^ 206	*59	^ 19	311
Purchase more land	*21	^ 109	*19	*13	163
Pass ownership to another family member	**17	^ 64	^ 31	^ 30	142
Change the activity or activity mix of the holding	*18	^ 67	**19	16	121

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

INTRODUCTION

One of the main aims of this survey was to demonstrate the various geographic outputs that are made possible by the use of a land parcel frame for data collection. In this chapter, the data presented is for neighbourhood catchments.

The Fitzroy Basin Association coordinates a Neighbourhood Catchments program. This involves landholders in a given catchment area working together to improve the management of natural resources within that catchment. A neighbourhood catchment is a sub-catchment of a larger catchment area and is of sufficiently small size that local landholders can work together to address local NRM issues.

Map 6.1 shows the neighbourhood catchments within the surveyed area.

The Fitzroy Basin Association has identified two priority neighbourhood catchments within the Fitzroy and Livingstone Shires for addressing NRM issues; the Alligator Creek Neighbourhood Catchment in the Livingstone Shire and the Upper Fitzroy River Neighbourhood Catchment in the Fitzroy Shire.

INTERPRETING THE DATA

There are 23 neighbourhood catchments which are located either partly or fully within the Fitzroy and Livingstone Shires. For reasons of confidentiality and data integrity it is not possible to report fully for all 23 of these sub regions. To provide meaningful spatial output, the 23 neighbourhood catchments have been combined as follows:

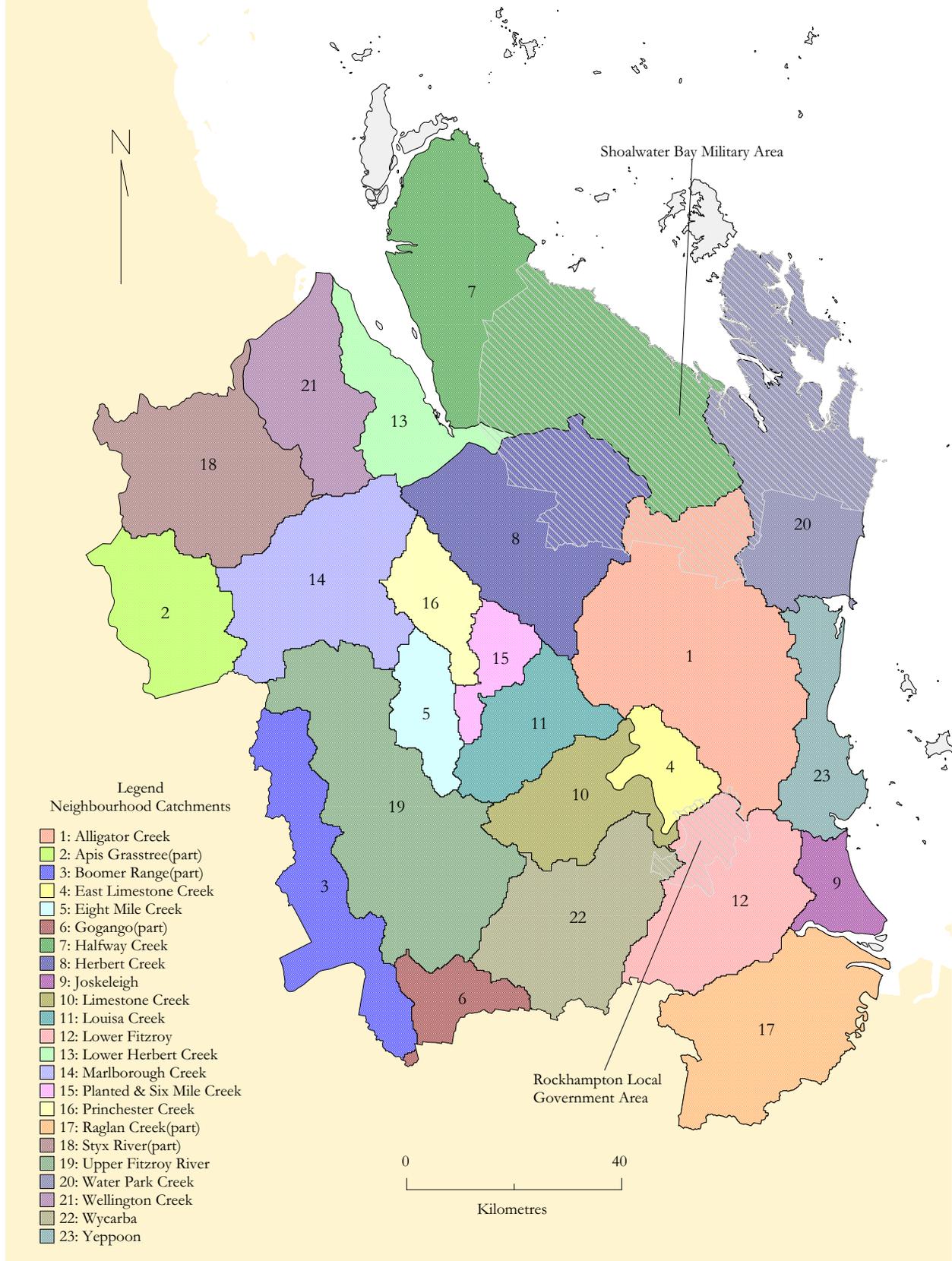
For residential holdings, all neighbourhood catchments with an estimate of less than 35 residential holdings have been combined to form the category 'Remaining neighbourhood catchments'. This comprises Apis Grasstree (part), Boomer Range (part), Eight Mile Creek, Halfway Creek, Herbert Creek, Joskeleigh, Lower Herbert Creek, Marlborough Creek, Planted and Six Mile Creek, Princhester Creek, Styx River (part), Upper Fitzroy River and Wellington Creek.

For non-residential holdings, small neighbourhood catchments have been combined with an adjoining larger neighbourhood catchment. Five small neighbourhood catchments have been combined with others to form:

- Lower Fitzroy & Joskeleigh;
- Boomer Range (part) & Gogango (part);
- Lower Herbert, Herbert & Halfway Creeks; and
- Yeppoon and Water Park Creek.

For non-residential holdings 'Remaining neighbourhood catchments' comprises Apis Grasstree (part), Eight Mile Creek, Marlborough Creek, Planted and Six Mile Creek, Princhester Creek, Styx River (part) and Wellington Creek.

6.1 NEIGHBOURHOOD CATCHMENTS



RESIDENTIAL HOLDINGS

The average size of residential holdings in the East Limestone Creek, Limestone Creek and Water Park Creek Neighbourhood Catchments was smaller compared with the other neighbourhood catchments. The Water Park Creek Neighbourhood Catchment had the highest proportion of native vegetation cover and the lowest proportion of holdings with native vegetation issues. In the Alligator Creek Neighbourhood Catchment, 45% of holdings had an issue with native vegetation.

6.2 LAND MANAGEMENT, residential holdings

Catchment	Number of holdings	Area of holdings	Average size of holdings	Area of native vegetation	HOLDINGS WITH NRM ISSUES				Holdings that addressed NRM issues
					Weeds	Pests	Native vegetation	Total	
					%	%	%	%	
	no.	ha	ha	%	%	%	%	%	%
Alligator Creek	444	^ 12 772	29	70	55	64	45	72	69
Lower Fitzroy	297	^ 6 869	23	54	49	64	22	72	71
Raglan Creek (Pt)	^ 76	*3 805	50	57	27	59	32	70	49
East Limestone Creek	168	^ 2 872	17	71	55	48	19	60	70
Wycarba	233	^ 6 646	29	72	44	47	11	61	71
Limestone Creek	^ 199	^ 3 191	16	46	49	67	12	68	65
Louisa Creek	^ 35	*1 424	41	67	56	56	11	79	67
Water Park Creek	112	^ 2 167	19	83	38	78	7	79	92
Yeppoon	550	^ 12 574	23	63	53	50	34	74	64
Remaining Neighbourhood Catchments	54	13 696	253	66	29	47	18	60	54
Total/Average	2 167	66 015	31	65	49	58	27	70	68

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

* estimate has a relative standard error of 25% to 50% and should be used with caution

The Water Park Creek Neighbourhood Catchment had the highest proportion (92%) of residential holdings addressing NRM issues. The proportion of holdings addressing NRM issues was lowest in the Raglan Creek Neighbourhood Catchment.

NON-RESIDENTIAL
HOLDINGS

Key Data

ALLIGATOR CREEK NEIGHBOURHOOD CATCHMENT

The average size of a non-residential holding in the Alligator Creek Neighbourhood Catchment was 269 hectares. Just over half the area of non-residential holdings was covered by native vegetation and nearly all of the land was used for agriculture. The stocking rate was 3.2 hectares per beast.

UPPER FITZROY NEIGHBOURHOOD CATCHMENT

In the Upper Fitzroy Neighbourhood Catchment the average holding size (2,916 ha) was eleven times greater than in the Alligator Creek Neighbourhood Catchment. Two thirds of the land had native vegetation cover. Nearly all the land was used for agriculture with half of it being of good or very good quality. An extra hectare of land per beast (4.2 ha) was used for grazing in this neighbourhood catchment compared with the Alligator Creek Neighbourhood Catchment.

6.3 SELECTED DATA, non-residential holdings

Catchment	Number of holdings	Area of holdings	Average size of holdings	Area of native vegetation	Land used for agriculture	Good or very good quality agricultural land	Stocking rate
	no.	ha	ha	%	%	%	ha/beast
Alligator Creek	377	101 341	269	53	94	45	3.2
Lower Fitzroy & Joskeleigh	^ 182	64 234	352	56	86	32	2.3
Raglan Creek (Pt)	159	73 831	466	53	90	46	3.1
East Limestone Creek	^ 82	16 880	205	46	90	54	2.2
Wycarba	241	71 241	296	72	91	48	3.8
Limestone Creek	255	44 265	174	45	95	65	2.8
Louisa Creek	61	44 253	723	28	93	45	3.1
Upper Fitzroy	47	136 613	2 916	66	93	50	4.2
Boomer Range (Pt) & Gogango (Pt)	^ 59	^ 65 712	1 123	67	97	50	4.4
Lower Herbert, Herbert & Halfway Creeks	62	173 192	2 794	66	97	41	4.5
Yeppoon & Water Park Creek	^ 222	20 242	91	40	71	20	3.4
Remaining Neighbourhood Catchments	112	356 481	3 189	74	87	37	5.0
Total/Average	1 858	1 168 283	629	63	91	43	3.9

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

OTHER NEIGHBOURHOOD CATCHMENTS

The Wycarba Neighbourhood Catchment had the highest proportion of native vegetation cover, and the Louisa Creek Neighbourhood Catchment had the lowest. The Limestone Creek Neighbourhood Catchment had the highest proportion of land rated as good or very good. The heaviest stocking rate was reported in the East Limestone Creek Neighbourhood Catchment where 2.2 hectares per beast was the average.

Land management

ALLIGATOR CREEK NEIGHBOURHOOD CATCHMENT

Water availability was an issue for just over half the holdings that had NRM related issues in the Alligator Creek Neighbourhood Catchment. Pests were the biggest issue with 90% of landholders reporting they had a problem with animal and insect pests. Nearly all (98%) the non-residential landholders in this neighbourhood catchment addressed NRM issues.

UPPER FITZROY RIVER NEIGHBOURHOOD CATCHMENT

Water availability was an issue for 68% of holdings in the Upper Fitzroy River Neighbourhood Catchment. Pests were the biggest issue in this neighbourhood catchment. The survey showed that 91% of non-residential landholders addressed NRM issues on their holdings.

6.4 LAND MANAGEMENT, non-residential holdings

Catchment	Number of holdings	Holdings with NRM issues no.	KEY NRM ISSUES IDENTIFIED					Holdings that addressed NRM issues %
			Weeds	Pests (animal and insect)	Native vegetation	Soil acidity, erosion and salinity	Water availability	
			%	%	%	%	%	
Alligator Creek	377	96	66	90	45	39	52	98
Lower Fitzroy & Joskeleigh	^ 182	100	88	93	52	29	54	96
Raglan Creek (Pt)	159	94	85	93	36	40	26	92
East Limestone Creek	^ 82	96	83	89	31	29	50	93
Wycarba	241	95	81	83	35	38	50	94
Limestone Creek	255	94	77	87	36	35	46	92
Louisa Creek	61	97	74	84	44	7	55	97
Upper Fitzroy	47	90	75	90	49	31	68	91
Boomer Range (Pt) & Gogango (Pt)	^ 59	100	95	95	58	15	41	100
Lower Herbert, Herbert & Halfway Creeks	62	99	42	94	55	47	29	92
Yeppoon & Water Park Creek	^ 222	93	69	79	35	26	61	93
Remaining Neighbourhood Catchments	112	90	79	82	57	34	40	91
Total/Average	1 858	95	76	88	42	34	48	94

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

OTHER NEIGHBOURHOOD CATCHMENTS

In the Louisa Creek and the Boomer Range and Gogango Neighbourhood Catchments the incidence of soil acidity, erosion and salinity was comparatively low. Weed and pest issues were most frequently reported in the Boomer Range and Gogango Neighbourhood Catchments.

Initiatives, barriers and plans

ALLIGATOR CREEK NEIGHBOURHOOD CATCHMENT

A new property plan had been prepared during the year ended 30 June 2005 by 15% of non-residential landholders. Nearly three quarters of the landholders in the Alligator Creek Neighbourhood Catchment reported that their age or health was a barrier to improving NRM practices. Selling all or part of their property by 30 June 2010 was a consideration for 12% of landholders. However, 11% of landholders in this neighbourhood catchment reported that they planned to purchase more land over the coming five year period.

UPPER FITZROY RIVER NEIGHBOURHOOD CATCHMENT

One quarter of all non-residential landholders prepared a new property plan during the survey reference period. Just over half the landholders in the Upper Fitzroy River Neighbourhood Catchment reported that their age or health was a barrier to improving NRM practices. Selling all or part of their property by 30 June 2010 was a consideration for 7% of landholders. Coincidentally, 7% of landholders in this neighbourhood catchment reported that they planned to purchase more land over the coming five year period.

6.5 MANAGEMENT INITIATIVES, non-residential holdings

Catchment	Number of holdings	PROPERTY PLANNING		KEY BARRIERS TO IMPROVING NRM PRACTICES				PLANS FOR THE FIVE YEARS TO 30 JUNE 2010	
		Prepared a new property plan	Used an existing property plan	Lack of financial resources	Doubts about likely success	Lack of time	Age or health issues	Sell all or part of the holding	Purchase more land
	no.	%	%	%	%	%	%	%	%
Alligator Creek	377	15	14	77	54	70	73	12	11
Lower Fitzroy & Joskeleigh	^ 182	22	32	81	62	85	78	35	6
Raglan Creek (Pt)	159	27	27	94	77	82	78	16	6
East Limestone Creek	^ 82	35	19	69	50	60	41	13	22
Wycarba	241	11	30	79	54	67	65	9	11
Limestone Creek	255	15	26	98	84	90	85	21	8
Louisa Creek	61	12	10	77	53	66	60	17	9
Upper Fitzroy	47	25	25	74	51	59	51	7	7
Boomer Range (Pt) & Gogango (Pt)	^ 59	34	28	87	48	74	70	19	4
Lower Herbert, Herbert & Halfway Creeks	62	30	12	80	74	81	73	27	3
Yeppoon & Water Park Creek	^ 222	22	18	77	54	65	65	18	2
Remaining Neighbourhood Catchments	112	19	26	83	53	71	68	8	18
Total/Average	1 858	19	22	82	61	74	71	17	9

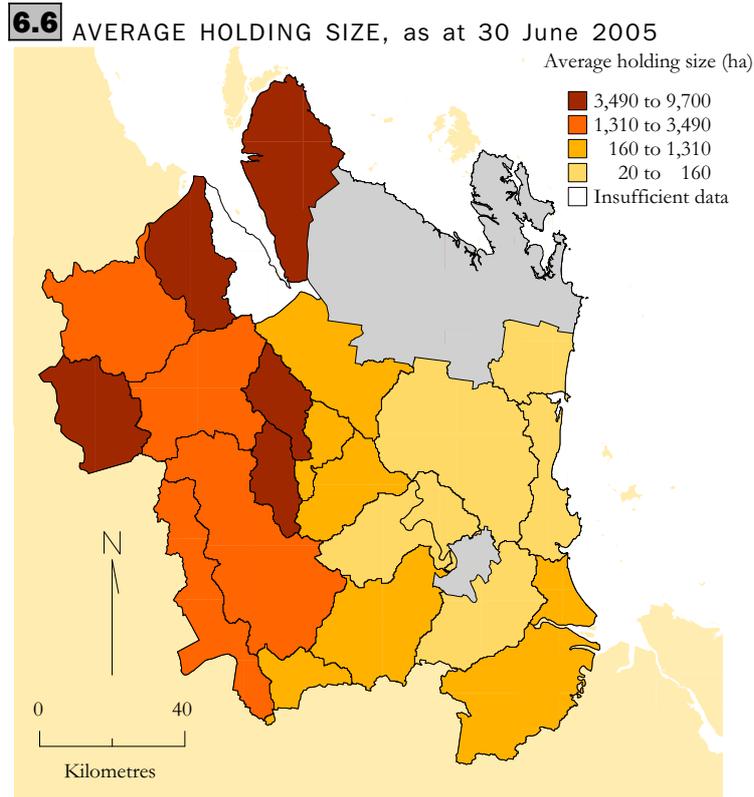
^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

OTHER NEIGHBOURHOOD CATCHMENTS

In the East Limestone Creek and the Boomer Range and Gogango Neighbourhood Catchments over one third of holdings prepared a new property plan during the year ended 30 June 2005. East Limestone Creek was the only neighbourhood catchment with fewer than half the holdings reporting age or health issues as a barrier to improving NRM practices.

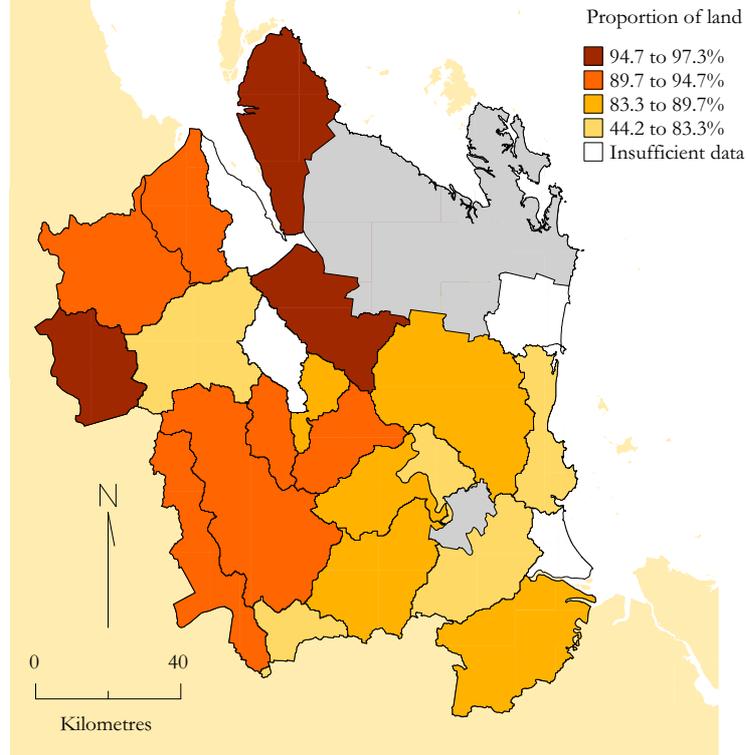
SELECTED MAPS

The following maps present selected data for neighbourhood catchments. Due to the broad nature of the data, it was possible to present estimates for most neighbourhood catchments, including the majority of those collectively called 'Remaining neighbourhood catchments' in the preceding tables. The data used for the maps was a combination of data from residential and non-residential holdings. The few neighbourhood catchments for which there was insufficient data have been left blank (white) on the maps.

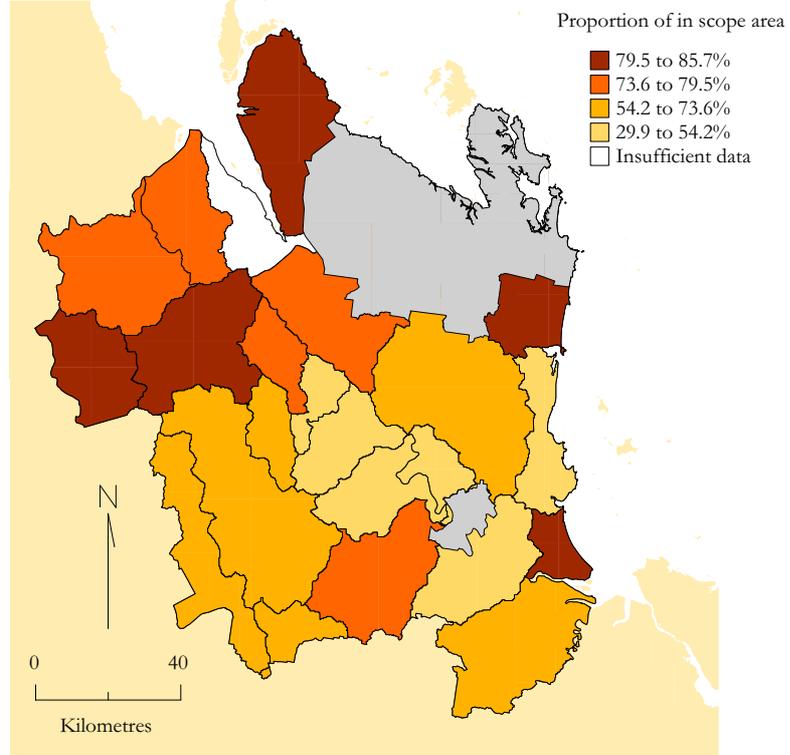


SELECTED MAPS
continued

6.7 PROPORTION OF IN SCOPE LAND USED FOR AGRICULTURAL PURPOSES, as at 30 June 2005

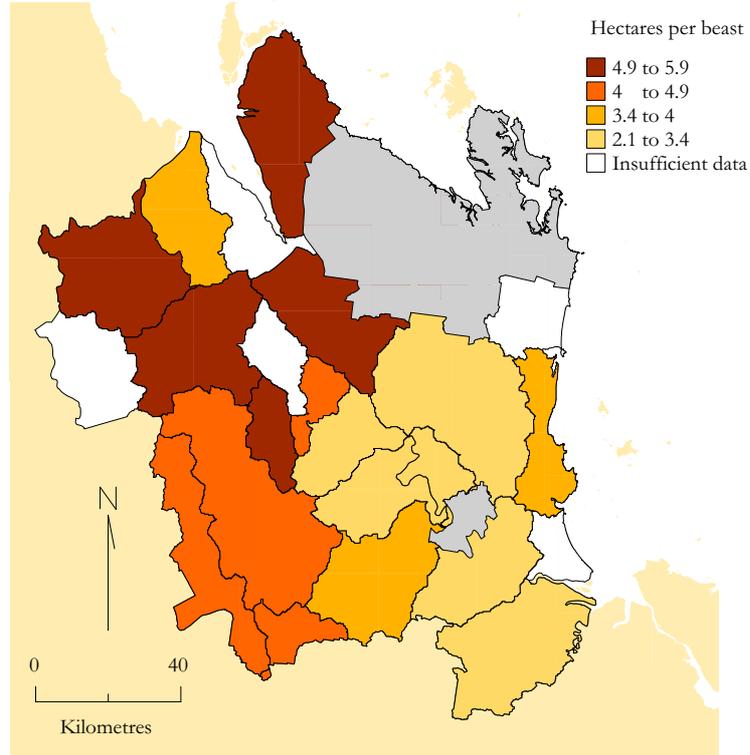


6.8 PROPORTION OF IN SCOPE LAND WITH NATIVE VEGETATION COVER, as at 30 June 2005

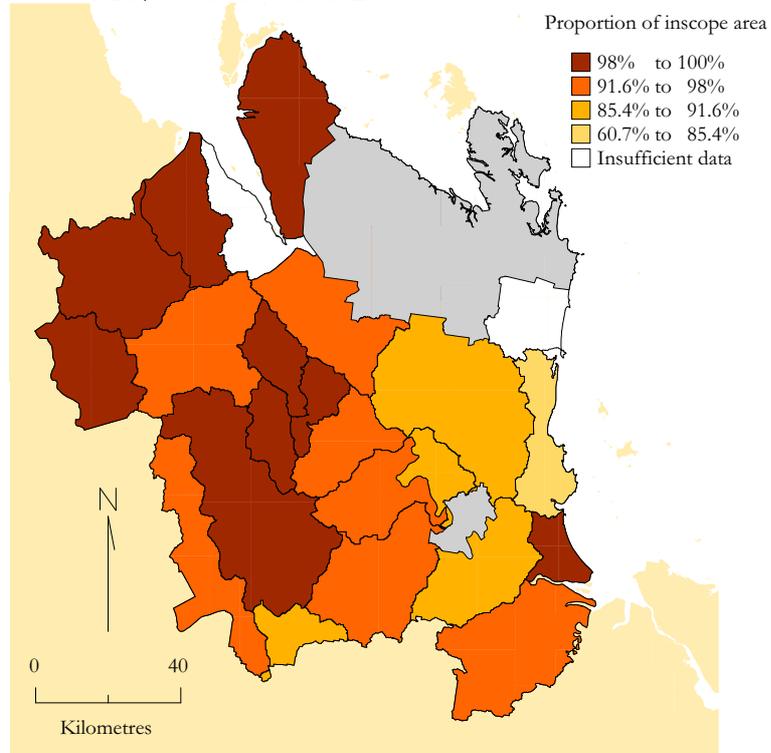


SELECTED MAPS
continued

6.9 STOCKING RATE, as at 30 June 2005

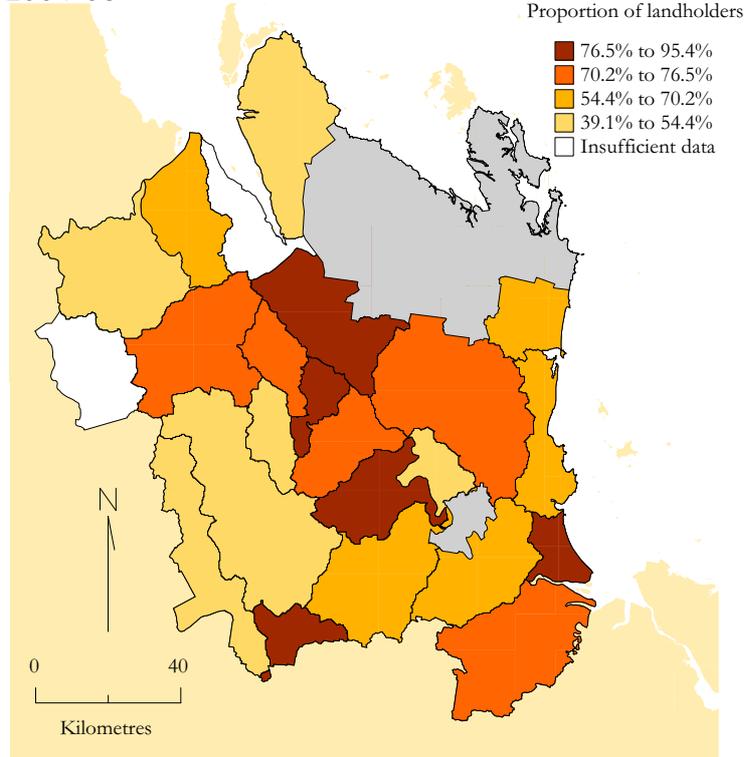


6.10 PROPORTION OF LAND USED FOR NON-RESIDENTIAL PURPOSES, as at 30 June 2005

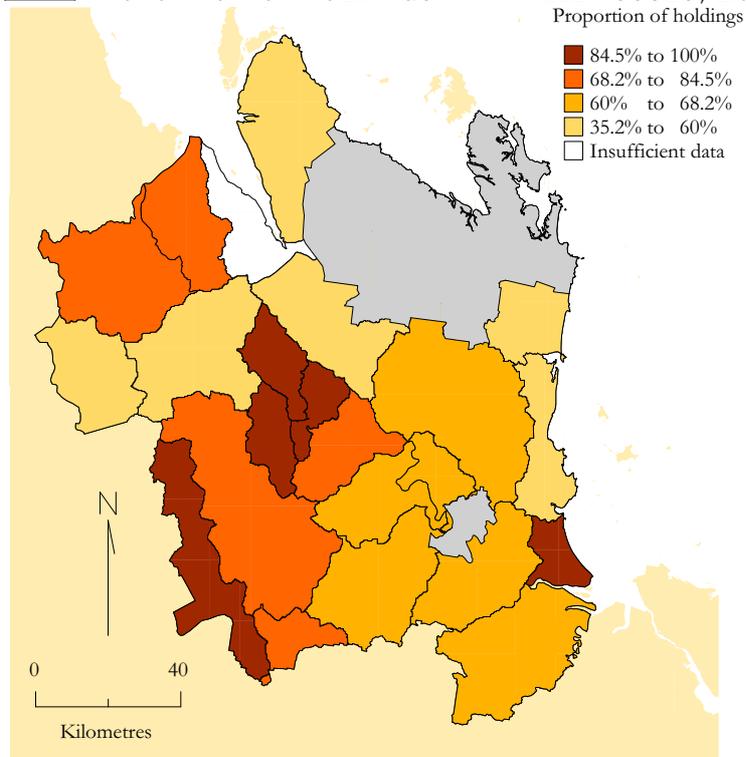


SELECTED MAPS
continued

6.11 PROPORTION OF LANDHOLDERS WITH AGE OR HEALTH ISSUES, 2004-05

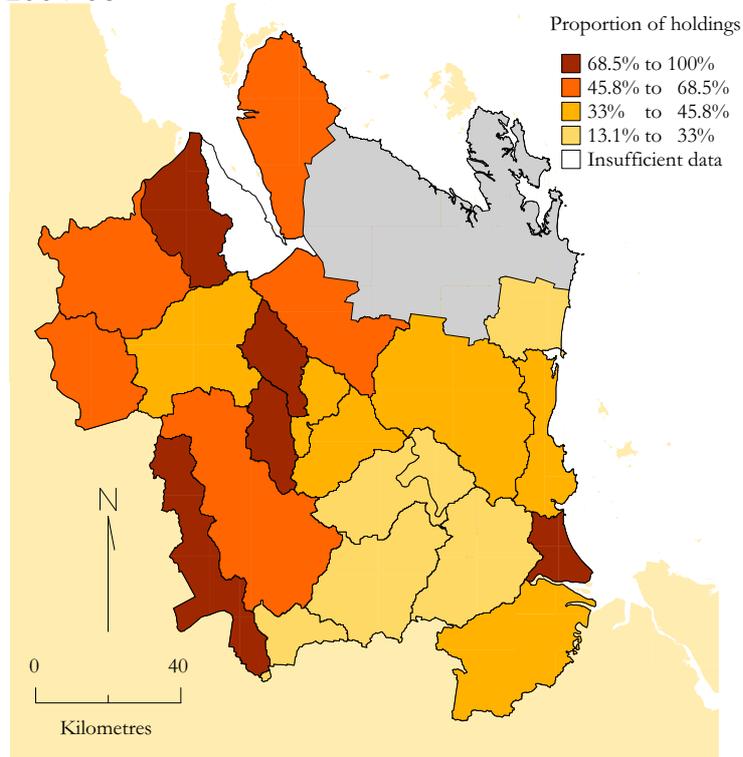


6.12 PROPORTION OF HOLDINGS WITH WEED ISSUES, 2004-05

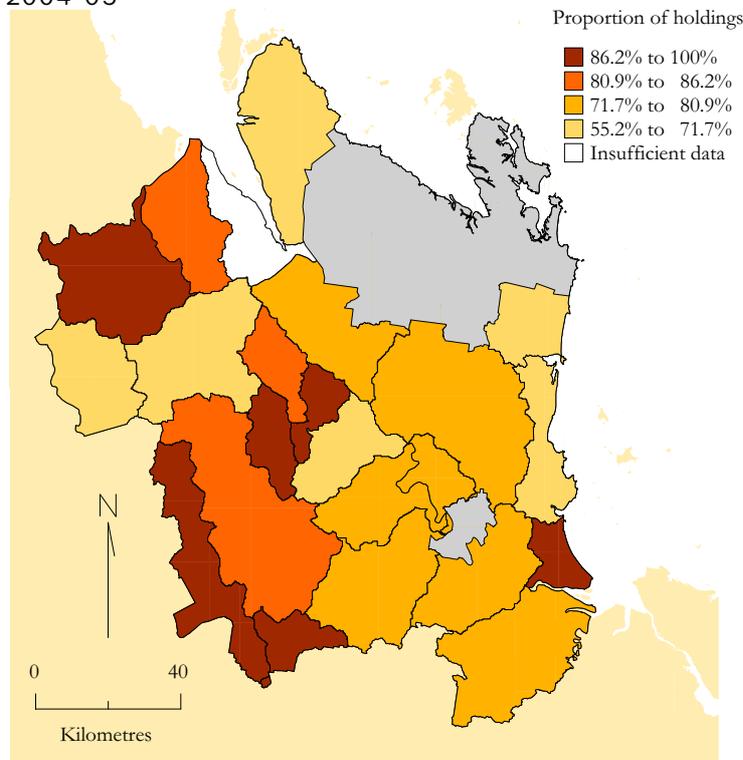


SELECTED MAPS
continued

6.13 PROPORTION OF HOLDINGS WITH NATIVE VEGETATION ISSUES, 2004-05

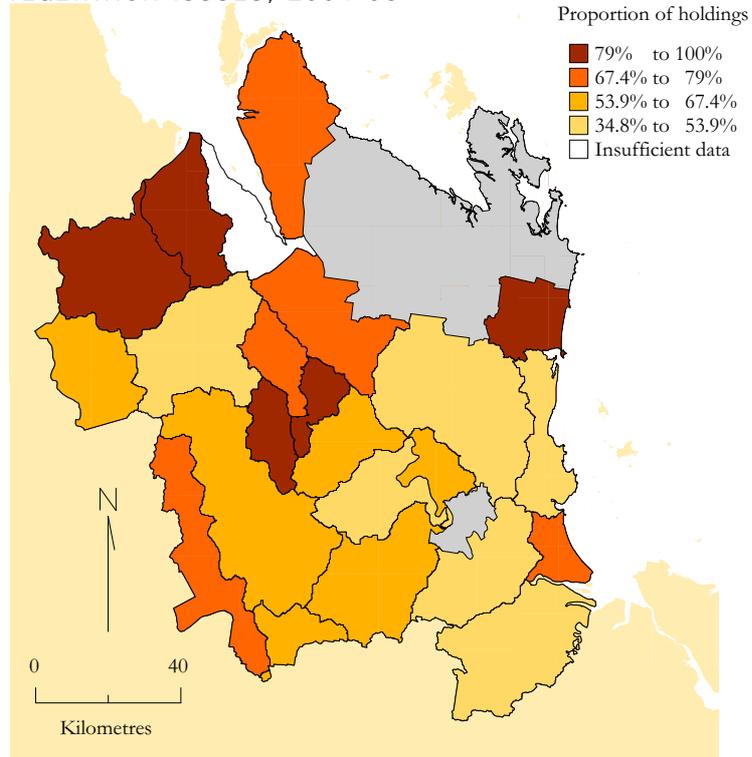


6.14 PROPORTION OF HOLDINGS THAT ADDRESSED WEED ISSUES, 2004-05



SELECTED MAPS
continued

6.15 PROPORTION OF HOLDINGS THAT ADDRESSED NATIVE VEGETATION ISSUES, 2004-05



SAMPLING ERRORS *continued*

symbol '*', indicating that the estimate should be used with caution as it is subject to sampling variability too high for most practical purposes. Where the RSE of an estimate exceeds 50%, it has been annotated with the symbol '**', indicating that the sampling variability causes the estimate to be considered too unreliable for general use. RSEs of all estimates in this publication are available on request.

12 The following table contains estimates of RSEs for a selection of the statistics presented in this publication.

RELATIVE STANDARD ERRORS OF SELECTED ESTIMATES

		FITZROY RIVER			
		FITZROY SHIRE	LIVINGSTONE SHIRE	RIPARIAN ZONE	COASTAL ZONE
		%	%	%	%
Residential holdings					
Number of holdings	no.	7	5	8	4
Area of holdings	ha.	16	11	13	9
Area of native vegetation	ha.	19	12	19	10
Holdings with NRM issues	no.	10	8	12	6
Holdings addressing NRM issues	no.	11	9	12	6
Non residential holdings					
Number of holdings	no.	4	5	8	8
Area of holdings	ha.	1	1	—	2
Area of native vegetation	ha.	7	8	12	17
Land used for agriculture	ha.	1	2	2	4
Quality of agricultural land					
Good/very good	ha.	5	9	9	19
Fair	ha.	7	8	9	17
Poor	ha.	16	12	18	22
Holdings with cattle at 30 June 2005					
Number of cattle (Beef and dairy)	no.	3	6	6	11
Holdings undertaking grazing management practices	no.	5	7	9	10
Holdings with NRM issues					
Holdings that addressed native vegetation issues	no.	6	8	11	12
Holdings that addressed weeds and pests	no.	4	6	9	9
Holdings that addressed salinity, acidity or erosion	no.	6	8	12	11

— nil or rounded to zero (including null cells)

NON-SAMPLING ERRORS

13 Errors other than those due to sampling may occur because of deficiencies in the list of units from which the sample was selected, non-response, and errors in reporting by providers. Inaccuracies of this kind are referred to as non-sampling error, which may occur in any collection, whether it be a census or a sample. Every effort has been made to reduce non-sampling error to a minimum by careful design and testing of questionnaires, operating procedures and systems used to compile statistics.

ABS DATA AVAILABLE ON REQUEST

14 As well as the statistics included in this publication, the ABS may have other relevant data available on request. Inquiries should be made to either the National Information and Referral Service on 1300 135 070 or John Purcell on 02 6252 5651.

RELATED PUBLICATIONS

15 A range of NRM and agricultural publications are produced by the ABS, including:

- Land Management: Eurobodalla Shire NSW 2003-2004 (Cat. no. 4651.0)
- Water Account, Australia (Cat. no. 4610.0)
- Agricultural Commodities, Australia (Cat. no. 7121.0)
- Environment Expenditure Local Government (Cat. no. 4611.0)
- Water Use on Australian Farms (Cat. no. 4618.0)
- Salinity on Australian Farms (Cat. no. 4615.0)

RELATED PUBLICATIONS

continued

16 Current publications and other products released by the ABS are listed in the Catalogue of Publications and Products (Cat. no. 1101.0). The Catalogue is available from any ABS office or the ABS web site <<http://www.abs.gov.au>>. The ABS also issues a daily Release Advice on the web site which details products to be released in the week ahead.

ACKNOWLEDGEMENT

17 ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated; without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence, as required by the Census and Statistics Act 1905.

ABBREVIATIONS

\$'000	thousand dollars
ABS	Australian Bureau of Statistics
CRC	Cooperative Research Centre
DISR	Department of Industry, Science and Resources
FBA	Fitzroy Basin Association
ha	hectare
no.	number
NRM	natural resource management
Pt	Part
Qld	Queensland
RSE	relative standard error
SD	statistical division
SE	standard error
SLA	statistical local area
yrs	years

DEMOGRAPHIC DATA FOR FITZROY AND LIVINGSTONE SHIRES

DEMOGRAPHIC DATA

As at 30 June 2004 (one year before the Land Management Survey reference period) there were 6,600 persons aged 60 years or older living in the Fitzroy and Livingstone Shires. The total population of both Shires was 38,600 persons.

According to the 2001 Census of Population and Housing (unpublished data), 1,200 persons reported that they worked in the Agriculture, Forestry and Fishing industry. Nearly a quarter of these people (270) were aged 60 years and over. Given that agriculture plays such a big part in the Fitzroy and Livingstone Shires it could be assumed that most of these people worked in agriculture related activities rather than in forestry and fishing. Population projections are that by 2006, 540 persons will be 60 years and over and by 2011, 710 persons will be 60 years and over working in agriculture related activities (based on 8% of the working population in the shires being employed by the Agriculture, Forestry and Fishing industries).

The Land Management Survey found that 71% (1,311) of the non-residential landholders cited age or health issues as a barrier to improving NRM practices. Of those landholders who cited age or health issues, 17% (219) also reported that they either planned to sell all or part of their holding or pass ownership to another family member before 30 June 2010.

Age distribution by gender

As at 30 June 2004, the population of the Livingstone Shire was slightly older than that of the Fitzroy Shire with 18% of the population aged 60 years and over compared with 14% in the Fitzroy Shire.

A1.1 AGE DISTRIBUTION BY SEX, 30 June 2004

	<i>Fitzroy Shire</i>	<i>Livingstone Shire</i>	<i>Total</i>
	no.	no.	no.
Male			
0-29yrs	2 253	5 952	8 205
30-44yrs	1 079	3 049	4 128
45-59yrs	1 015	3 105	4 120
60+yrs	769	2 560	3 329
Total	5 116	14 666	19 782
Female			
0-29yrs	2 222	5 027	7 249
30-44yrs	1 253	3 017	4 270
45-59yrs	995	3 004	3 999
60+yrs	710	2 552	3 262
Total	5 180	13 600	18 780
Total			
0-29yrs	4 475	10 979	15 454
30-44yrs	2 332	6 066	8 398
45-59yrs	2 010	6 109	8 119
60+yrs	1 479	5 112	6 591
Total	10 296	28 266	38 562

Source: generated from ABS revised 2004 SLA age/sex Estimated Resident Population data (unpublished).

Population projections

The 2002 ABS resident population projections (unpublished) for the Fitzroy Shire predict a marginal rise from 10,000 people in 2002, to 10,400 in 2012 and to 10,500 in 2022. The population of the Fitzroy Shire at 30 June 2004 was 10,300 people.

For Livingstone Shire, the resident population projections predict a rise from 26,900 people in 2002, to 33,200 in 2012 and to 39,100 in 2022. The population of Livingstone Shire at 30 June 2004 was 28,300 people.

Level of Education

According to the 2001 Census of Population and Housing, a higher proportion of people aged 15 years and over had a qualification in the Livingstone Shire (30%), compared with the Fitzroy Shire (23%). The most common qualification for people aged 15 years or over in both Fitzroy and Livingstone Shires was a Certificate (15% and 16% respectively).

A1.2 NON-SCHOOL LEVEL OF EDUCATION (a), 2001

	<i>Fitzroy Shire</i>	<i>Livingstone Shire</i>	<i>Total</i>
	no.	no.	no.
Level of education			
Postgraduate Degree	20	229	249
Graduate Diploma/Graduate Certificate	47	252	299
Bachelor Degree	282	1 339	1 621
Advanced Diploma and Diploma	251	972	1 223
Certificate	1 024	3 411	4 435
Total persons 15 years and over (b)	6 945	20 859	27 804

(a) Applicable to persons aged 15 years and over

(b) Includes 'Level of education inadequately described', 'Level of education not stated' and persons who have a qualification that is out of the scope of the Australian Standard Classification for Education and persons with no qualifications

Source: 'Census of Population and Housing: Selected Education and Labour Force Characteristics for Statistical Local Areas, Queensland'. (Cat. No.2017.3)

Industry of Employment

According to the 2001 Census of Population and Housing, the Retail industry employed the highest proportion of people working in both Fitzroy and Livingstone Shires (17% and 14% respectively). In the Fitzroy Shire, 12% of employed people worked in Health and Community Services and 11% in the Agriculture, Forestry and Fishing industries.

In the Livingstone Shire, 12% of the employed population worked in the Education Industry while 9% worked in accommodation, cafes and restaurants. The Agriculture, Forestry and Fishing industries employed 7% of the working population.

Industry of Employment
continued

A1.3 INDUSTRY OF EMPLOYMENT, 2001

	Fitzroy Shire	Livingstone Shire	Total
	no.	no.	no.
Industry of employment			
Agriculture, Forestry and Fishing	437	714	1 151
Mining	48	195	243
Manufacturing	395	830	1 225
Electricity, Gas and Water Supply	82	138	220
Construction	266	806	1 072
Wholesale Trade	260	416	676
Retail Trade	634	1 407	2 041
Accommodation, Cafes and Restaurants	149	869	1 018
Transport and Storage	341	453	794
Communication Services	38	96	134
Finance and Insurance	56	195	251
Property and Business Services	206	735	941
Government Administration and Defence	113	430	543
Education	150	1 159	1 309
Health and Community Services	468	953	1 421
Other(a)	198	560	758
Total	3 841	9 956	13 797

(a) Includes 'Cultural and Recreational Services', 'Personal and Other Services', 'Non-Classifiable Economic Units' and 'Not stated'.

Source: 'Census of Population and Housing: Selected Education and Labour Force Characteristics for Statistical Local Areas, Queensland'. (Cat. No. 2017.3)

Wage and Salary Earners

The average income of wage and salary earners in 2000-2001 was similar for the Fitzroy and Livingstone Shires (\$32,075 and \$32,520 respectively).

A1.4 WAGE AND SALARY EARNERS AGED 15 AND OVER, 2001

	Fitzroy Shire	Livingstone Shire	Total
Wage and Salary Earners no.	2 600	8 471	11 071
Total Income \$	83 394 648	276 636 527	360 031 175
Average Total Income \$	32 075	32 657	32 520

Source: 'Regional Wage and Salary Earner Statistics, Australia'. (Cat. No. 5673.0)

FOR MORE INFORMATION . . .

INTERNET

www.abs.gov.au the ABS web site is the best place for data from our publications and information about the ABS.

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