

# **Annual Report to the Pastoral Lands Board of Western Australia**

**2002/2003 Financial Year**

**A report prepared for the Pastoral Lands Board of  
Western Australia by the Department of Agriculture**

**October 2003**

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**Department of Agriculture**  
Government of Western Australia



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## Preface

The Department of Agriculture has prepared this Annual Report for the Pastoral Lands Board of Western Australia for the financial year 2002 – 2003. The report details trends in a number of indicators of importance to Western Australia's rangelands.

The Department of Agriculture's activities to the Board are outlined and environmental indicators are presented at the regional and property scales. New methodologies of pastoral lease inspections incorporating a categorisation model are also introduced. The integrated assessment processes incorporating rangeland resource and condition surveys, pastoral lease inspection processes, and WARMS provides land users with a sound information base from which informed management decisions can be made to ensure the sustainability of the rangelands resource.

Seasonal conditions at the state level with more specific information at the regional level has been provided in addition to the granting of Exceptional Circumstances for 16 Shires in the southern rangelands. This declaration is significant in itself as it is the first time in history that pastoral areas anywhere in the state have received such benefits in times of seasonal adversity. The regional areas of Pilbara; Gascoyne; Murchison; and Goldfields were included in the declaration.

Social information including population and employment trends has been provided at the regional scale for the Board's information.

The land uses (often conflicting) to which the rangelands are being confronted with, growing wider public interest in the rangelands and the mechanisms by which these areas are being administered were largely the catalysts for what has become known as "The Gascoyne Muster" held in Carnarvon in May 2002.

The Department of Agriculture will continue to work closely with the Board in the provision of services it requires to administer the *Land Administration Act 1997*. No doubt the combined outcomes of the working group reports recently released at the "Gascoyne Muster II" and the subsequent consideration and direction of the government will have a significant bearing on the administration of the pastoral areas of the state.

I look forward to continuing to support the endeavours of the Board and trust the Board finds this Annual Report a useful document.

Rod Williams  
State Project Manager  
Pastoral Board Services, Carnarvon  
October 2003

## **Introduction**

The rangelands make up 87 % of Western Australia's landmass and include all but the south west of the State. Livestock grazing on pastoral leasehold is the dominant commercial land use across 42% (910,000 km<sup>2</sup>) of the WA rangelands and unallocated Crown lands comprise another 37%.

The rangelands:

- produce most of the State's mineral and energy wealth
- support important segments of the livestock industry
- are of special significance to the Aboriginal population
- offer major tourism potential
- contain essential elements of the State's biological diversity
- offer opportunities to produce horticultural and other products for niche markets

## **Pastoral leases**

The number of pastoral leases is declining. In 1996 there were 514 leases and in 2003 there are 470 leases. Part of the reduction in number has been due to the Department of Conservation and Land Management (CALM) purchasing 25 leases and converting them into conservation reserves.

There is a large variation in the size of pastoral leases which ranges between 3,000 and 500,000 hectares. The control of pastoral leases is varied:

- 57 pastoral leases are controlled by, or run on behalf of, aboriginal interests
- 47 pastoral leases are controlled by, or run on behalf of, CALM
- 45 pastoral leases and one sub-lease are controlled by, or run on behalf of, mining interests
- at least three have been purchased by private interests for conservation purposes
- the remainder are run by families and agricultural companies as pastoral businesses

The recent trends in aggregated pastoral lease areas by ownership type are:

- pastoralists interests have reduced holdings by 6.5 million hectares
- Indigenous interests have increased holdings by 2.7 million hectares
- CALM has increased holdings by 4 million hectares
- mining interests have increased holdings by 2 million hectares

## **The Diversity of the rangelands**

The rangelands region is comprised of a diverse range of climate (tropical to arid temperate), topography (coastal plains, to rocky ranges to semi arid desert country) and rainfall (1400 mm in the north Kimberley to less than 300 mm in the semi arid areas). This diversity in the physical resources impacts on many aspects of the running and performance of pastoral businesses. Both domestic and international market forces influence the types of livestock run on pastoral leases as well as the profitability of businesses operating in the region.

The Kimberley, Pilbara and northern Gascoyne are predominately cattle producing areas, focused on live export out of the northern ports of Port Hedland, Broome and Wyndham. Store cattle are also produced in the southern Pilbara and Gascoyne areas, for finishing in agricultural areas.

Wool production remains the major enterprise in the southern Gascoyne, Murchison and Goldfields areas, however there is also an increasing focus on meat production from sheep, both merino and exotic breeds, and goats in these areas.

## 1. Environmental factors

### 1.1 Western Australian Rangeland Monitoring System (WARMS)

#### *Introduction*

The Western Australian Rangeland Monitoring System (WARMS) provides an indication of change in pastoral rangelands at broad scales. It does this through a set of representative, point based sites on which attributes of soil surface condition and perennial vegetation are recorded.

There are two types of sites. Grassland sites are used in the Kimberley, Pilbara and north-west Gascoyne. Shrubland sites are used from the southern Pilbara through to the Nullarbor. Currently, WARMS is made up of 1,628 sites, comprising 632 Grassland sites and 996 Shrubland sites. Grassland sites are reassessed on a three year cycle and Shrubland sites on a five year cycle. In any given year about 410 sites are reassessed. Sampling is currently on schedule.

WARMS is designed to report at the regional or district scale rather than on individual leases as the number of sites on an individual lease is insufficient to provide a comprehensive assessment of the whole lease. WARMS data and photographs are stored in the WARMS database. This database also contains information on about 4,000 old WARMS and Pastoralist Monitoring Sites.

#### *Operational information*

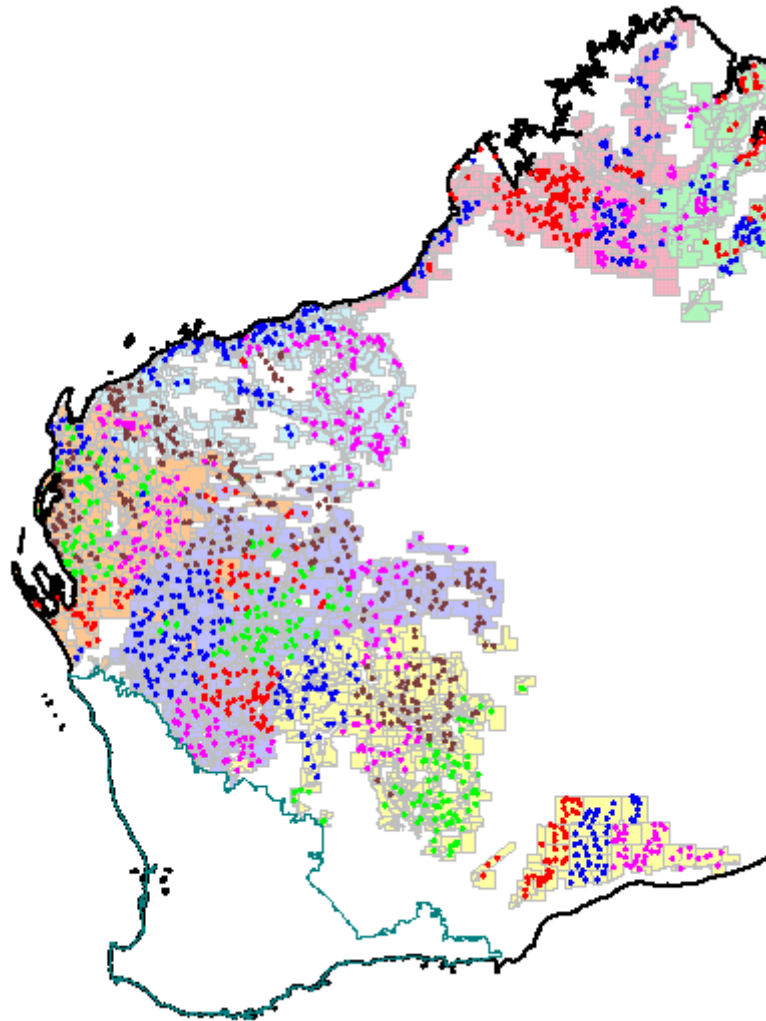
In 2002/03 reassessments of sites in the Kimberley were carried out by staff based in the Kununurra and Derby district offices. Installation and assessment of Pilbara and southern region sites was carried out by two staff based in Northam.

Storage and maintenance of the database is carried out by one staff member based in Perth and analysis is carried out by one staff member based in Northam.

The following number of WARMS sites were installed or assessed:

<b>District</b>	<b>Number of sites</b>	<b>Number of stations</b>
Carnarvon	54	15
Kalgoorlie	44	8
Meekatharra	64	26
<b><i>Southern region</i></b>	<b>162</b>	<b>49</b>
Derby	77	19
Kununurra	43	7
Karratha	35	10
<b><i>Northern region</i></b>	<b>155</b>	<b>36</b>
<b>State total</b>	<b>317</b>	<b>85</b>

These sites were reassessed in line with a defined schedule as shown in Figure 1.



**Figure 1** WARMS schedule – 5 years in shrublands and 3 years in grasslands. The sites shown in red were reassessed in 2002/2003 and the sites shown in blue will be assessed in 2003/2004.

### *Grasslands analysis*

Results from WARMS sites in the Kimberley since 1994 suggest that the rangelands used for pastoral production have maintained or increased perennial grass frequency while woody cover has remained constant. The following summarises the Kimberley WARMS results:

- **More Kimberley WARMS sites improved than declined between 1999 and 2002.** The majority of sites (88%) remained stable, while 2% declined and 10% improved, when considering perennial grass frequency as the indicator of change. The results were consistent across the two LCDs and across the five vegetation types sampled.
- **The average frequency of perennial species on Kimberley WARMS sites has generally increased since WARMS began in 1994.** Increased or stable frequency (i.e. number of quadrats containing perennial grasses out of 100 quadrats) was observed for seven of eight vegetation types between site installation and the first reassessment. The decline was minor (frequency of 97 down to 96) for the eighth group. Between the first reassessment and the second, frequency increased on seven of eight vegetation groups. Taken over the whole period from installation to second reassessment, frequency increased or remained stable on all 8 vegetation types.

- **There has little change in woody cover across the Kimberleys since WARMS began.** While there have been some minor changes (up and down) on some vegetation types in some areas, the consistent message is that woody cover hasn't altered across the set of WARMS sites in the Kimberley since 1994.

### *Shrublands analysis*

A substantial report analysing WARMS data from the Gascoyne-Murchison area was completed in late 2002. The report used data from all 223 sites within this area that had been reassessed. These were predominantly from across the northern part of the region from Exmouth to Wiluna.

The report showed that the rangelands represented by WARMS sites improved between site installation (1993-1997) and reassessment (1999-2001). On 88% of sites, shrub density increased. Shrub cover increased on 95% of sites. Recruitment of new shrubs was found on all sites and for almost all species. There was little or no difference in results between those shrub species known to increase under grazing and those species known to decrease. The WARMS results suggest widespread and impressive improvement across at least the northern part of the Gascoyne-Murchison. A copy of the full report has been provided to the Pastoral Lands Board Executive.

## **1.2 Pastoral lease inspections**

### *New format of reports*

The format of lease reports was changed in July 2001 to Rangeland Condition Assessments. These reports integrate information from the lessee, monitoring sites, traverse data and past reports. Inspection cycles are now determined by a method of categorising pastoral leases, classified by resource condition and infrastructure condition information held by the Department. The approach has the advantage of focusing on leases with environmental and/or infrastructure issues whilst rewarding those leases with no such concerns. In addition the categorisation model provides an effective tool in recognising both issues on a state and regional basis, and assists in determining schedules accordingly.

The lease categories are:

#### *Category 1 – Low concern*

Lease has no known land resource and/or infrastructure issues.

Inspection cycle baseline inspection of whole property undertaken on a six yearly cycle

Sale if a sale occurs more than three years after the baseline inspection a new baseline inspection occurs, this then becomes the anniversary of the six year cycle

a follow-up inspection is carried out after three years of sale date to verify the lease remains in this category or moves to alternate category

#### *Category 2 – Minor concern*

Lease experiences minor land resource and/or infrastructure issues that have been subject to a periodic follow-up program.

Inspection cycle issues of concern inspected on a three yearly cycle, baseline inspection of whole property undertaken every six years

Sale existing information forwarded to incoming lessee without further inspections

### Category 3 – Moderate concern

Lease experiences moderate land resource and/or infrastructure issues that are subject to an ongoing follow-up program.

Inspection cycle issues of concern inspected on a two yearly cycle, baseline inspection of whole property undertaken every six years

Sale existing information forwarded to incoming lessee without further inspections

### Category 4 – High concern

Lease experiences land resource and/or infrastructure issues of a major nature and have been subject to an ongoing follow-up program. Criticisms of the condition of the property may have also been brought to the attention of the Board (ie. property is 'well known' in the district).

Inspection cycle issues of concern inspected on an annual cycle, baseline inspection of whole property undertaken every six years

Sale existing information forwarded to incoming lessee without further inspections

### District summary

The following table provides a summary of all reports prepared for the Board in 2002/03:

Office	RCAs	Follow-up Report	Management Plans	Subdivision	Other
Derby	7	2	-	-	6
Kununurra	2	-	-	-	2
Pilbara	9	1	1	-	4
Carnarvon	19	10	5	-	7
Meekatharra	19	6	4	-	6
Geraldton	10	2	2	1	2
Kalgoorlie	8	2	2	-	6
<b>Total</b>	<b>74</b>	<b>23</b>	<b>14</b>	<b>1</b>	<b>33</b>

The following table provides a summary of Rangeland Condition Assessments undertaken in 2002/03:

Office	No. of leases	Category				average RCAs/year	RCAs done in 2002/03
		1	2	3	4		
Derby	53	25	19	9	0	9	7
Kununurra	39	27	12	0	0	6.5	2
Pilbara	57	41	9	7	0	9.5	9
Carnarvon	109	25	47	34	3	18	19
Meekatharra	67	27	28	12	0	11	19
Geraldton	72	41	23	3	5	12	10
Kalgoorlie	73	35	20	13	5	12	8
<b>Total</b>	<b>470</b>	<b>221</b> <b>47%</b>	<b>158</b> <b>34%</b>	<b>78</b> <b>16%</b>	<b>13</b> <b>3%</b>	<b>78</b>	<b>74</b>



### *Summary of issues identified in Rangeland Condition Assessments*

The following table shows the number of stations with land management and/or infrastructure issues identified in Rangeland Condition Assessments:

<b>Region</b>	<b>Number of stations inspected</b>	<b>Number of stations with no issues</b>	<b>Number of stations with issues identified</b>
Carnarvon	17	2	15
Kalgoorlie	15	1	14
Meekatharra	20	1	19
<b><i>Southern region</i></b>	<b>52</b>	<b>4</b>	<b>48</b>
Derby	7	5	2
Kununurra	2	1	1
Karratha	13	9	4
<b><i>Northern region</i></b>	<b>22</b>	<b>15</b>	<b>7</b>
<b>State total</b>	<b>74</b>	<b>19</b>	<b>55</b>

The following table shows the types of land management and/or infrastructure issues identified in Rangeland Condition Assessments:

<b>Issue</b>	<b>Southern</b>	<b>Northern</b>
Animal management	1	-
Feral donkeys	1	-
Feral goats	6	-
Feral pigs	1	-
High numbers of kangaroos	6	-
Poor management practices	1	-
Rangeland degradation	28	3
Historical rangeland degradation	2	3
Areas of severe degradation and erosion	17	1
Soil erosion	2	1
Soil erosion due to infrastructure	2	-
Excessive stocking rate	4	-
Vegetation decline due to overstocking	5	-
Vegetation decline near water point	8	1
Infrastructure	7	-

### *Trends in range condition*

Baseline assessments of range condition on a pastoral lease are undertaken during the Rangeland Condition Assessment. The assessments are compared to the previous assessments made during rangeland resource surveys or on previous lease inspections. Some leases have not previously been covered by rangeland surveys, and in some cases a direct comparison can not be made because methodology has changed (some surveys date back to 1969/1970) or the traverse route was significantly different. With the new pastoral lease inspection process methodology and traverse routes have been standardised and direct comparisons will be able to be made more readily in the future.

The following table provides a summary of trends in range condition presented in the 2002/03 Rangeland Condition Assessments:

Office	Improved	No significant change	Declined	Unable to assess	RCAs done
Derby	6	1	-	-	7
Kununurra	1	-	-	1	2
Pilbara	2	6	-	1	9
Carnarvon	8	4	5	2	19
Meekatharra	11	2	4	2	19
Geraldton	3	3	4	-	10
Kalgoorlie	2	2	1	3	8
<b>Total</b>	<b>33</b>	<b>18</b>	<b>14</b>	<b>9</b>	<b>74</b>

### 1.3 Rangeland resource surveys

Regional resource inventory and condition surveys in Western Australia's rangelands are conducted by a combined team from the Department of Agriculture and the Department of Land Information. The surveys provide comprehensive description and mapping of the landforms, soils and vegetation resources of the region, together with an evaluation of the condition of the soils and vegetation at the pastoral lease scale. Field sampling is conducted at land unit scale. Resource condition statements are derived from visual traverse assessment ratings and have three components, the extent and type of soil erosion, and the condition of the perennial vegetation.

Twelve regional inventory and condition surveys have been completed in Western Australia's rangelands with two regional surveys, the Western Nullarbor and the Southern Goldfields, left to complete. This represents almost 87% (843, 576 km<sup>2</sup>) of the pastoral rangelands (see Figure 2). The report and accompanying maps are primarily intended as a reference for land managers, land management advisers and land administrators. The survey inventory enables location of land types of particular land use or conservation value. The reports contain information which can be used to plan sustainable land management at the sub-catchment, lease or paddock scale. The resource information is used by many stakeholders including the pastoral industry, mining industry, government, and research and conservation groups.

In 2002/03 the survey team undertook field work in the Lower Murchison area. This field work will fill in a gap between regional surveys. The team also completed and published a re-assessment of carrying capacities in the Ashburton survey area. There has been widespread establishment of buffel grass in parts of the survey area since the time of the survey in 1976-1978. This has significantly increased the carrying capacity of parts of the landscape, particularly in frontage country.



**Figure 2 Rangeland resource surveys in Western Australia.**

## 1.4 Seasonal conditions

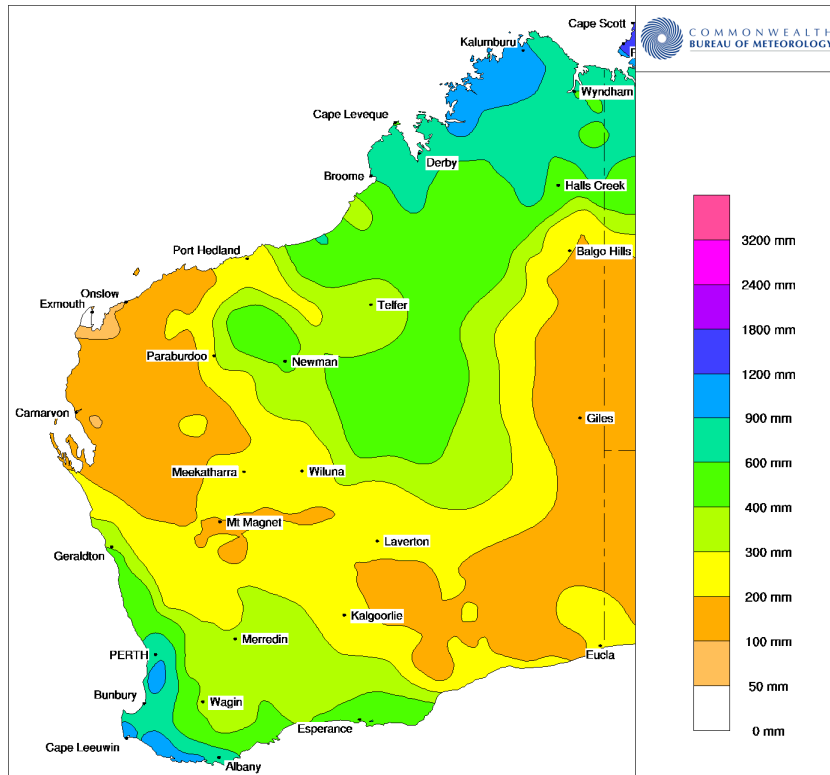


Figure 3 Rainfall (in mm) for Western Australia for the period 1 July 2002 to 30 June 2003.

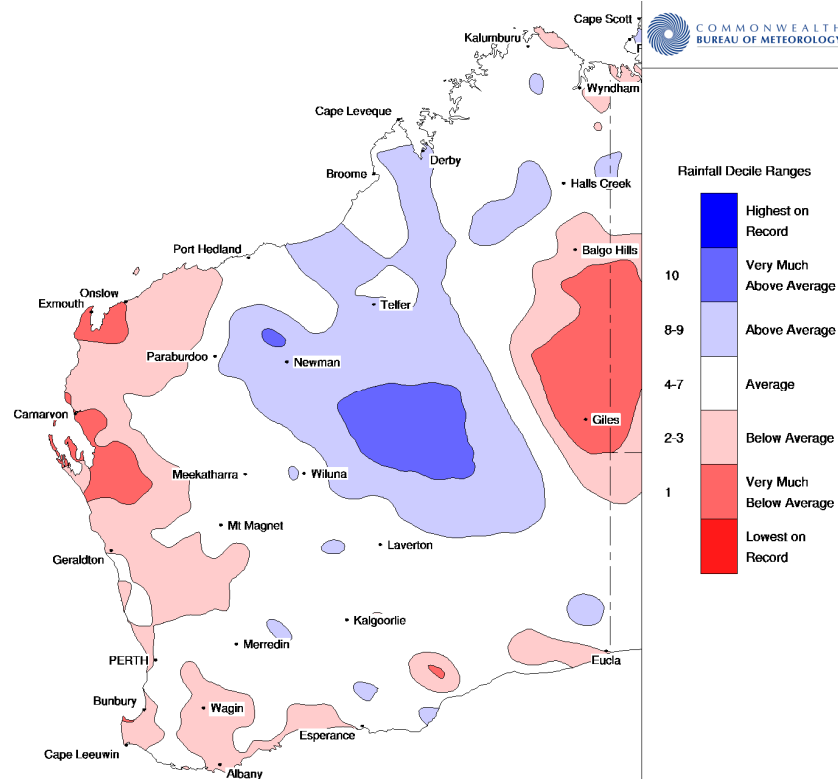


Figure 4 Rainfall deciles for Western Australia for the period 1 July 2002 to 30 June 2003.

## Exceptional Circumstances Declaration – Southern Rangelands

Exceptional Circumstances covering 16 shires in the Pilbara; Gascoyne; Murchison; and Goldfields regions was declared on 2 July 2003 following extensive and lengthy representation to both the State and Federal Governments. The declaration is the first of its kind in the history of the pastoral areas of the state. In addition, due to the size of properties in the area a 50-kilometre buffer zone has been applied to the EC-declared area.

An independent assessment by the National Rural Advisory Council (NRAC) found that graziers in the southern rangelands were suffering from a severe and prolonged decline in income due to the effects of historically low and ineffective rainfall during 2001 and 2002. Many properties had been forced to de-stock and have continued to do so throughout the year.

NRAC had also advised that the drought had also had a significant impact on regional communities in the Southern Rangelands. Declining employment opportunities on the region's properties have resulted in flow on effects such as declining school enrolments and local business downturns in addition to the quality of a range of social activities.

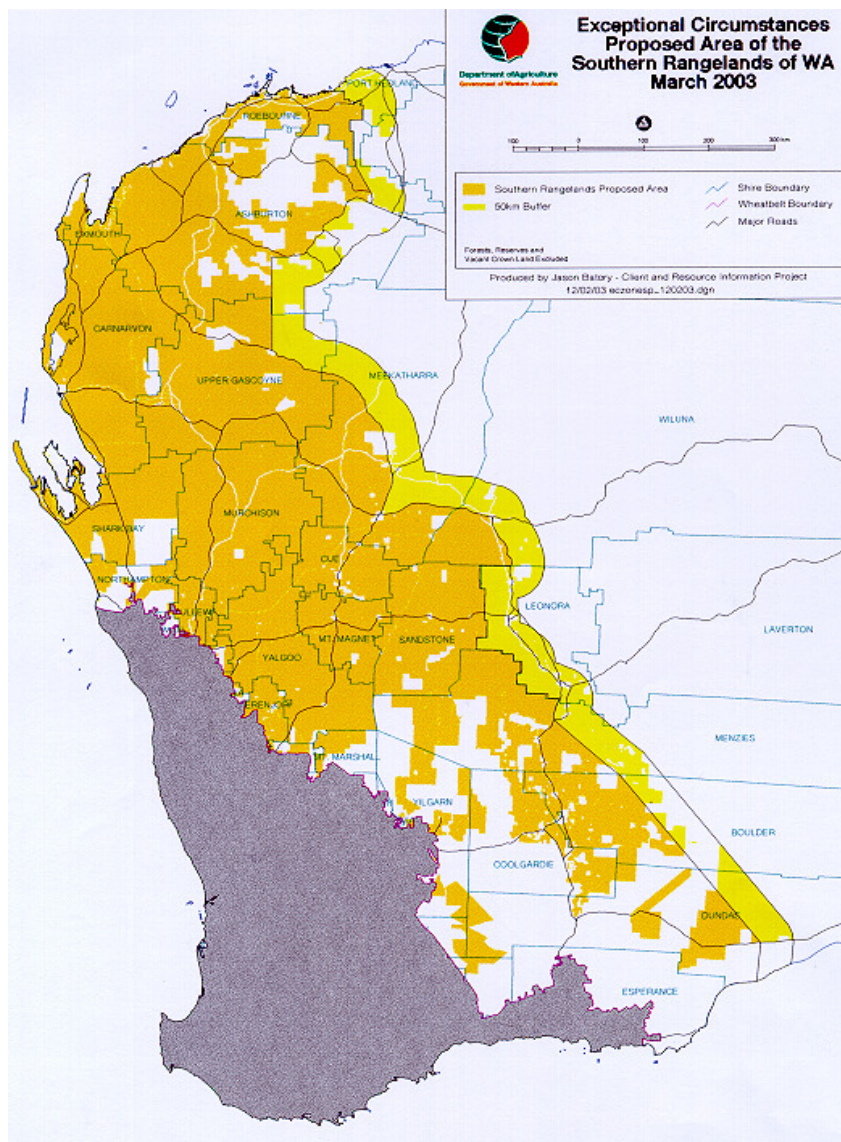


Figure 5 Exceptional Circumstances Declared Area and Buffer Zone.

## 2. Economic issues

### 2.1 Economic data

The rangelands are an area of low agricultural productivity in comparison to the rest of the State. The potential however, for productivity improvements is high. Agricultural operations are extensive and typically based on minimising the cost of production. The sheer scale of operations means that even a small change in productivity can lead to a significant impact on the business' bottom line and the aggregated impact on the regional economies could be significant.

#### *Livestock industry statistics*

#### **Beef Cattle and Sheep**

The two main livestock activities in the rangelands are wool production in temperate areas and live cattle exports in tropical areas. There are an increasing number of cattle in the temperate sub-regions and the Pilbara in response to strong export demand for live cattle.

The table below indicates the cattle numbers in the rangelands (000 head):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02 estimate
<b>Kimberley</b>	520	488	548	507	585	530	550
<b>Pilbara</b>	163	184	206	209	228	250	250
<b>Gascoyne</b>	38	51	54	40	48	70	55
<b>Murchison</b>	56	64	81	73	86	104	85
<b>Goldfields</b>	17	12	15	15	21	24	20
<b>TOTAL</b>	<b>794</b>	<b>799</b>	<b>904</b>	<b>844</b>	<b>969</b>	<b>978</b>	<b>960</b>

Source ABS

Key issues:

- The Kimberley herd is relatively constant.
- The Pilbara, Murchison and Gascoyne herds are increasing due to strong export demand for live cattle.
- Poor returns for wool in the 1990s forced many pastoralists to diversify into cattle.
- The Goldfields herd is constant but relatively low.

The table below indicates the number of cattle sales in the rangelands (000 head):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02 estimate
<b>Kimberley</b>	91	100	117	111	134	135	140
<b>Pilbara</b>	34	34	41	47	52	70	72
<b>Gascoyne</b>	9	10	13	11	11	24	35
<b>Murchison</b>	12	12	20	25	23	39	45
<b>Goldfields</b>	2	1	2	3	13	5	7
<b>TOTAL</b>	<b>148</b>	<b>158</b>	<b>194</b>	<b>196</b>	<b>233</b>	<b>273</b>	<b>299</b>

Key issues:

Significant increases in the Kimberley and Pilbara due to buoyant market prices and strong export demand.

- Relatively constant levels of turnoff in other areas.
- A recent run of dry seasons in the Gascoyne and Murchison have forced many businesses to destock.

The table below indicates the value of cattle disposals in the rangelands (\$000):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02 estimate
<b>Kimberley</b>	26,920	29,304	49,187	53,867	59,152	69,002	72,000
<b>Pilbara</b>	14,366	14,516	17,495	22,996	22,861	36,000	37,000
<b>Gascoyne</b>	3,902	4,456	5,543	5,231	5,063	12,505	18,200
<b>Murchison</b>	5,120	3,885	8,540	11,928	10,342	20,070	23,200
<b>Goldfields</b>	671	556	946	1,187	5,926	2,432	3,200
<b>TOTAL</b>	<b>50,979</b>	<b>52,717</b>	<b>81,712</b>	<b>95,209</b>	<b>103,345</b>	<b>140,009</b>	<b>153,600</b>

Key issues:

- 100% plus increase in value of disposals across the rangelands.

The table below indicates the sheep and lamb numbers in the rangelands (000 head):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02 estimate
<b>Kimberley</b>	-	-	8	-	-	-	-
<b>Pilbara</b>	217	176	174	161	72	48	45
<b>Gascoyne</b>	700	789	716	589	421	479	450
<b>Murchison</b>	832	797	655	429	490	551	515
<b>Goldfields</b>	654	620	447	400	570	537	515
<b>TOTAL</b>	<b>2,402</b>	<b>2,381</b>	<b>2,000</b>	<b>1,580</b>	<b>1,553</b>	<b>1615</b>	<b>1525</b>

Key issues:

- Few sheep in the Kimberley.
- A significant decrease in numbers in the Pilbara.
- Total numbers of sheep declining.

The table below indicates the number of sheep and lamb sales in the rangelands (000 head):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02 estimate
<b>Kimberley</b>	-	-	4	-	-	-	-
<b>Pilbara</b>	30	50	28	56	77	15	25
<b>Gascoyne</b>	108	118	73	116	122	102	100
<b>Murchison</b>	116	143	109	145	89	217	140
<b>Goldfields</b>	64	118	125	136	115	63	75
<b>TOTAL</b>	<b>318</b>	<b>429</b>	<b>339</b>	<b>454</b>	<b>402</b>	<b>453</b>	<b>340</b>

Key issues:

- Low sale numbers in the Pilbara.
- Relatively constant sales in the Gascoyne.
- Increasing sales in the Murchison and the Goldfields.
- A recent run of dry seasons in the Gascoyne and Murchison have forced many businesses to destock. However, the slight increase in numbers of recent times is most likely attributable to increases in heavier meat breeds of sheep such as the Damara.

The table below indicates wool production in the rangelands (tonnes):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02 estimate
<b>Kimberley</b>	-	-	61	-	-	-	-
<b>Pilbara</b>	1,290	921	783	778	353	249	260
<b>Gascoyne</b>	4,170	3,658	3,938	3,175	2,849	2,271	2,300
<b>Murchison</b>	4,880	3,887	3,885	3,091	3,374	3,087	3,200
<b>Goldfields</b>	3,696	2,861	3,135	3,405	3,324	1,540	2,000
<b>TOTAL</b>	<b>14,037</b>	<b>11,327</b>	<b>11,803</b>	<b>10,449</b>	<b>9,900</b>	<b>7,147</b>	<b>7,760</b>

Key issues:

- There has been a gradual decline since the mid 1990s of the national sheep flock due to pastoralists reacting to downward movements of wool price and diversifying into cattle.

The table below indicates the value of wool production in the rangelands (\$000):

	95/96	96/97	97/98	98/99	99/00	00/01	01/02 estimate
<b>Kimberley</b>	-	-	245	-	-	-	
<b>Pilbara</b>	4,476	3,757	5,216	3,720	1,709	1,077	1,000
<b>Gascoyne</b>	14,469	14,930	21,518	13,659	10,063	10,177	9,500
<b>Murchison</b>	16,931	15,863	19,707	9,971	11,717	11,431	10,800
<b>Goldfields</b>	12,824	11,677	13,464	9,316	13,574	6,631	6,800
<b>TOTAL</b>	<b>48,699</b>	<b>46,227</b>	<b>60,150</b>	<b>36,665</b>	<b>37,062</b>	<b>29,316</b>	<b>28,100</b>



Key issues:

- Although there has been a decline in production in recent times, the volatility of wool prices, has led to the value of wool increasing.

NOTE: A graphical representation of these statistical tables is found in the Appendix.

## Goats

Goat meat exports earn about \$12 million revenue for Western Australia, with record volumes achieved in the past 2 years (DAWA internal report). Historical data shows that prices for rangeland goats are lowest in March - April and rise steadily from August until December. In 2001, prices around \$ 30 to \$34 per head were paid upon delivery to Geraldton and Carnarvon abattoirs. This price cycle is linked to the Taiwan meat market, which imported 76% of WA total goat meat exports in 2001/02.

The table below indicates the current state of the goat industry:

	<b>99/00</b>	<b>2000/01</b>	<b>2001/02</b>	<b>2002/03</b>
No. of rangeland goats processed	210,181	173,906	286,743	282,435
Goat meat exports from WA (Tonnes)	3,155	4,253	4,536	4,287
No. of goats exported live	31,772	57,356	63,690	39,478

Source DAWA data

### *Live export markets*

Export markets are important for both temperate and tropical rangeland pastoral businesses. In tropical areas there is a strong demand for feeder cattle for lot feeding operations in Asia and the Middle East. In temperate areas, the export of live sheep to Middle East markets is an important revenue earner for pastoral businesses. There are also live exports of goats.

The main export destination for cattle sourced from pastoral regions are Indonesia, Malaysia, Egypt and the Philippines. Over the past few years the relative importance of these markets has changed – the principal live cattle export destination is Egypt 29.8% and then next in importance is Indonesia is 29%, and then Malaysia 17.9%.

During the years of 2001 and 2002, Western Australia was the largest exporter of any Australian state for goats, cattle and sheep. A high proportion of these livestock are sourced from rangelands pastoral businesses. The main ports for exporting livestock from Western Australia's rangelands are Fremantle, Geraldton, Port Hedland, Broome and Wyndham.

The following table indicates the livestock numbers exported by port and livestock category for WA:

<b>Port</b>	<b>Livestock category</b>	<b>2001</b>	<b>2002</b>
<b>Fremantle</b>	Goats	24,245	22,677
	Cattle	139,154	145,473
	Sheep	4,336,228	3,359,744
<b>Geraldton</b>	Goats	10,485	12,850
	Cattle	15,610	26,069
	Sheep	6,285	8,400
<b>Port Hedland</b>	Goats	5,914	5,900
	Cattle	47,120	22,481
	Sheep	4,077	1,350
<b>Broome</b>	Goats	9,850	n/a
	Cattle	80,306	77,962
	Sheep	6,574	n/a
<b>Wyndham</b>	Goats	n/a	93
	Cattle	56,892	56,708
	Sheep	n/a	n/a

Source DAWA

### *Financial performance of pastoral businesses*

It has been established that the productivity of the rangelands is relatively low compared with land located in the agricultural regions of WA. Even though there may be low productivity, this is offset by the large size of pastoral businesses and the relatively large livestock herds and flocks on each pastoral lease. As the tenure of the rangelands is pastoral leasehold, the capital invested in landholdings is relatively low per hectare of land, compared with other forms of land tenure, mainly freehold, in the agricultural regions.

The major types of infrastructure found in rangelands pastoral businesses are water points, access roads, accommodation and stock handling facilities. The rangelands are quite unlike the agricultural regions in that, according to some current DAWA work on stock water points in the Kimberley, there might be one water point (dam, bore/trough) per 10 thousand hectares. The amount of internal fencing might be quite limited and so mobs of sheep and cattle tend to graze in the areas surrounding water.

The work being done in the Kimberley on water points has also found that the cost of monitoring stock watering points on a typical pastoral lease may cost a manager anywhere from \$60,000-\$150,000 each year. This estimate is based on the cost of labour, distance travelled, fuel carried and the frequency of visiting each water point. An average bore run may be anywhere from 150-350 km on station roads –some of which may be in very poor condition.

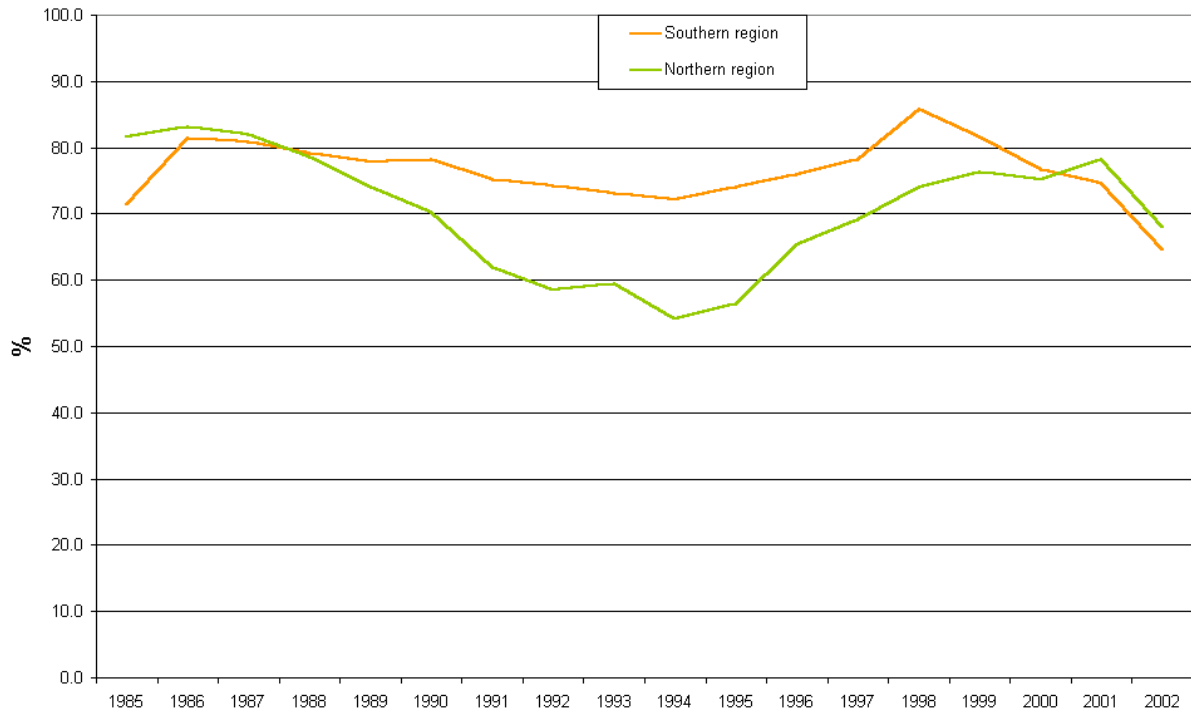
The financial performance of pastoral businesses is comparable to the financial performance of grazing enterprises in the agricultural regions but the cost structure, due to the scale of the operation is quite different. The low productivity of the rangelands and scale of operation means that it is not cost effective to run intensive management systems of pastures or livestock. In parts of the tropical north, some cattle ventures may have extremely low managerial inputs but still earn a good rate of return on capital invested.

<b>Tropical</b>						
		<b>1998-99</b>	<b>1999-00</b>	<b>2000-2001</b>	<b>2001-02</b>	<b>2002-03</b> estimate
Total Cash Receipts	\$	806 386	667 773	997 039	785 902	800 000
Total Cash Costs	\$	592 367	480 382	526 123	310 687	500 000
Farm Cash Income	\$	214 018	187 392	470 916	475 215	300 000
Farm Business Profit	\$	97 774	429 642	552 245	400 083	150 000
Profit at full equity (excl capit apprec)	\$	117 115	449 385	563 040	409 923	185 000
Farm capital at 30 June	\$	4 407 700	5 608 500	7 626 757	n/a	n/a
Equity ratio	%	94.5	97.0	98.7	97.0	97.0
Rate of return (excl capit apprec)	%	2.6	8.8	8.7	11.1	6.5
<b>Temperate</b>						
		<b>1998-99</b>	<b>1999-00</b>	<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>
Total Cash Receipts	\$	255 440	390 695	592 751	677 323	650 000
Total Cash Costs	\$	219 825	312 967	426 988	409 103	475 000
Farm Cash Income	\$	35 615	77 728	165 763	268 220	175 000
Farm Business Profit	\$	- 62 330	12 221	94 864	107 677	35 000
Profit at full equity (excl capit apprec)	\$	- 48 232	40 097	142 636	136 855	45 000
Farm capital at 30 June	\$	1 182 332	1 916 226	2 976 686	n/a	n/a
Equity ratio	%	80.6	71.4	75.0	74.0	72.0
Rate of return (excl capit apprec)	%	-4.1	2.2	5.3	5.0	3.0

Source: ABARE Farm Survey

From the above information it can be seen that the location of the pastoral business influences many of the financial performance indicators. In general, the tropical pastoral business are higher in most indicators than temperate pastoral businesses and perhaps the underlying reasons for this is the predominance of sheep operations in the south that are subject to fluctuations in wool prices, and the impacts of drought. In the tropical north, operations are based around the supply of live cattle into a buoyant export market and the climate is dependent on the tropical monsoon systems and cyclones. It is rare to have the monsoon fail completely.

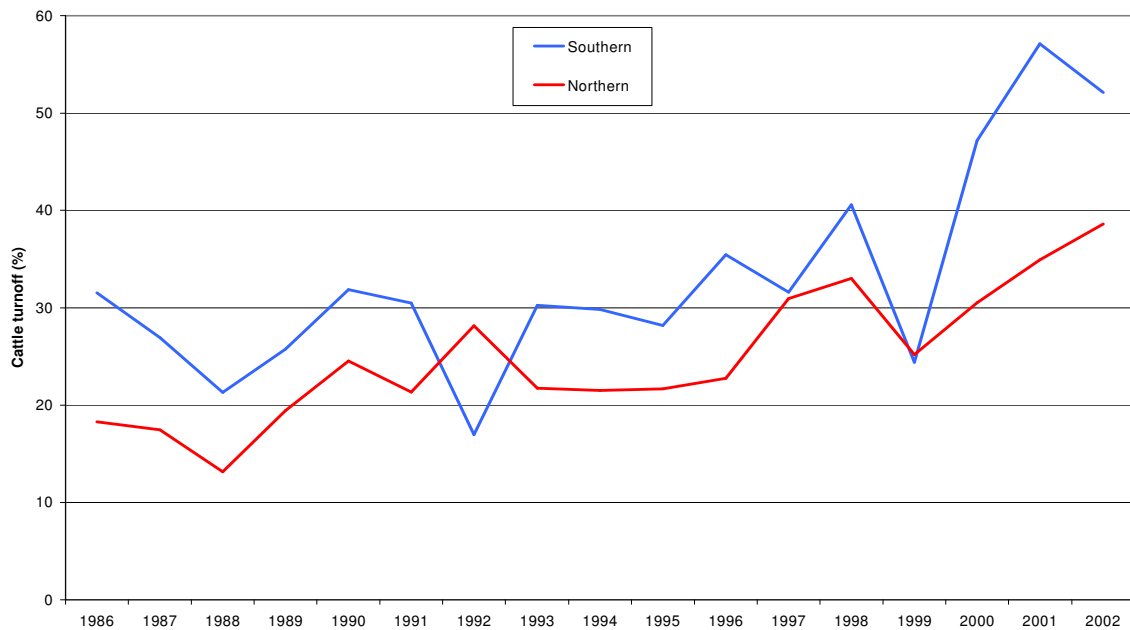
## 2.2 Trends in stock numbers compared to potential carrying capacities



**Figure 6 The percentage of actual to potential stock units from annual Stock and Improvements Declarations aggregated by region.**

Note – the reassessed Potential Carrying Capacities (Novelly and Baird 2003) have been used for the Kimberley pastoral leases.

## 2.3 Trends in cattle turnoff and wool cuts per head



**Figure 7 Cattle turnoff in the rangelands.**

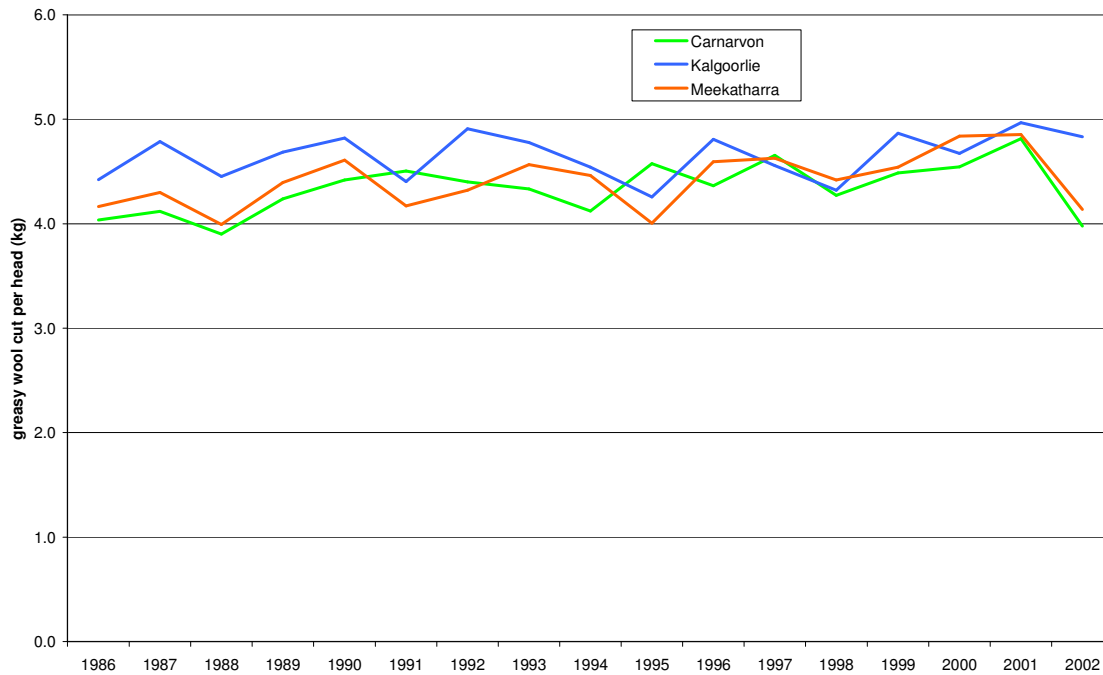


Figure 8 Wool cuts per head in the southern rangelands

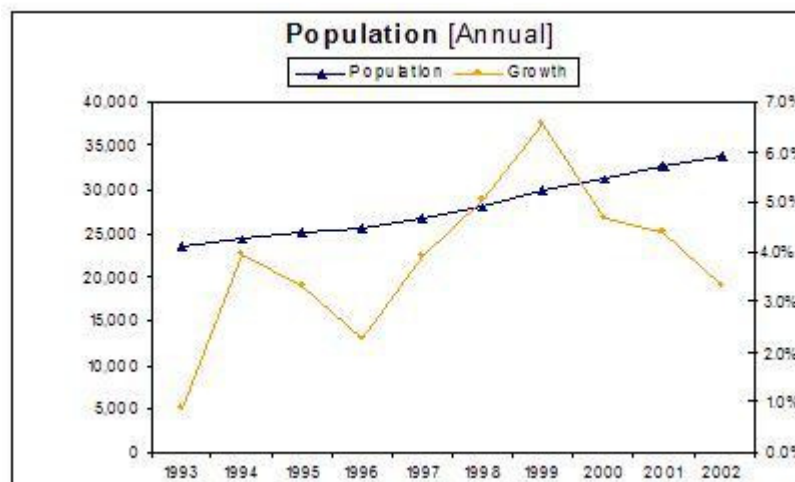
### 3. Social indicators

#### 3.1 Kimberley

- Population

The population of the Kimberley Region was 33,705 as at 30 June 2002. This represented an increase of 3.3% over the previous year. Over the same period, the population of regional Western Australia grew by 1.1% and the State population grew by 1.4%.

As at 30 June 2002 the population of the Kimberley Region made up 6.4% of the people living in regional Western Australia and 1.7% of the State's population.



Source: Australian Bureau of Statistics

- **Employment**

Total employment in the Kimberley Region in the March 2003 quarter was 15,413 people. This represented a decrease of 2.6% from the previous quarter when there were 15,822 people employed in the region. When the March 2003 quarter is compared with the same quarter of the previous year, employment within the Kimberley Region grew by 38.1%, compared to 4.1% growth for regional Western Australia and 3.0% growth for the State. A total of 7.5% of the Kimberley workforce is employed in the Agriculture, Forestry and Fishing industries, under which pastoralism falls.

Source: Department of Employment and Workplace Relations

**Kimberley Employment Multipliers** indicate how much employment will increase in the Kimberley economy if employment in the industry increases by one person:

Industry	Employment multiplier
Grains	1.1297
Beef cattle	1.2364
Other agriculture	1.2611

Source : Johnson P, An input-output table for the Kimberley region of W.A. Economic Research Centre, Department of Economics, The University of Western Australia, March 2001

- **Unemployment**

In the March 2003 quarter there were 1,493 unemployed people in the Kimberley Region, compared to 1,380 unemployed people in the December 2002 quarter and 1,384 people for March 2002. The unemployment rate for the Kimberley Region in the March 2003 quarter was 8.8% compared to 6.0% for regional Western Australia and 6.3% for the State.



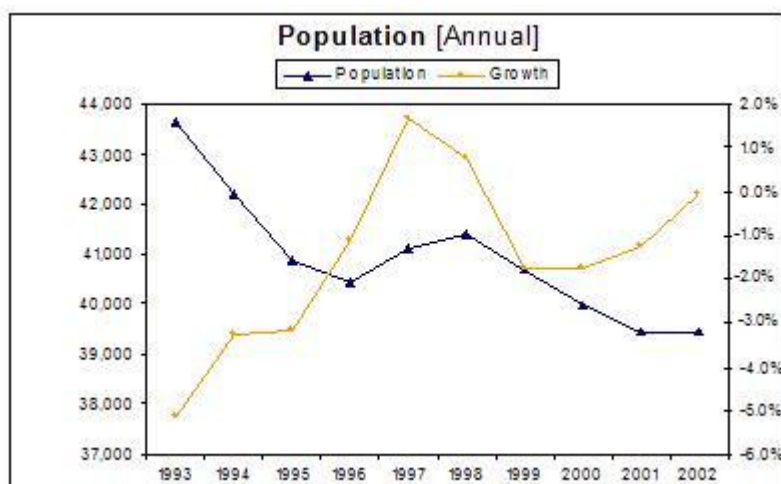
Source: Department of Employment and Workplace Relations

### 3.2 Pilbara

- **Population**

The population of the Pilbara Region was 39,441 as at 30 June 2002. This represented a decrease of 0.1% from the previous year. Over the same period, the population of regional Western Australia grew by 1.1% and the State population grew by 1.4%.

As at 30 June 2002 the population of the Pilbara Region made up 7.5% of the people living in regional Western Australia and 2.0% of the State's population.



Source: Australian Bureau of Statistics

- **Employment**

Total employment in the Pilbara Region in the March 2003 quarter was 23,128 people. This represented a decrease of 2.4% from the previous quarter when there were 23,698 people employed in the region. Only 1.6% of the workforce is employed in the Agriculture, Forestry and Fishing industries, under which pastoralism falls.

When the March 2003 quarter is compared with the same quarter of the previous year, employment within the Pilbara Region grew by 7.8%, compared to 4.1% growth for regional Western Australia and 3.0% growth for the State.

Source: Department of Employment and Workplace Relations

A set of employment multipliers do not currently exist for the Pilbara region however the State multipliers give the next best indication:

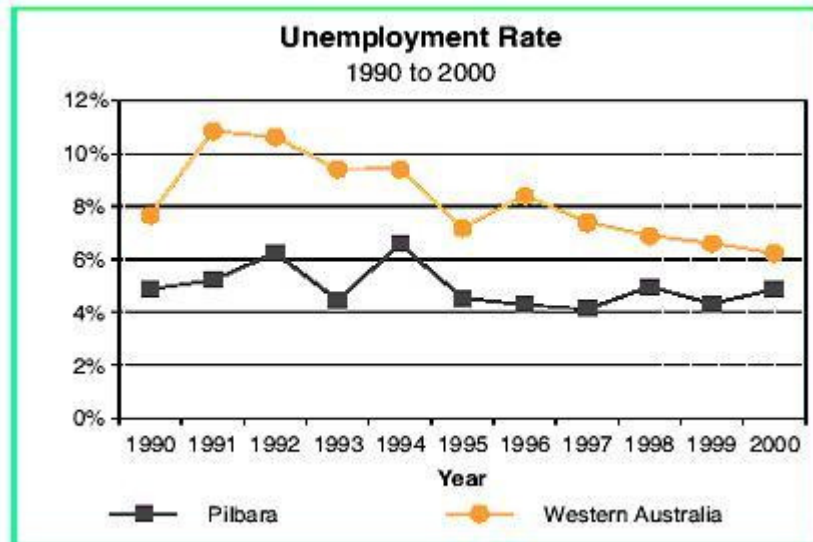
Industry	Employment multiplier
Sheep meat	1.2939
Sheep wool	1.4728
Beef cattle	1.4579
Horticulture	1.7431

Source: Islam N and Johnson P, Australia and the Western Australian Economy - An input-output analysis Volume 1, Agriculture Western Australia, October 1997

- **Unemployment**

In the March 2003 quarter there were 871 unemployed people in the Pilbara Region, compared to 721 unemployed people in the December 2002 quarter and 1,171 people for March 2002.

The unemployment rate for the Pilbara Region in the March 2003 quarter was 3.6% compared to 6.0% for regional Western Australia and 6.3% for the State.



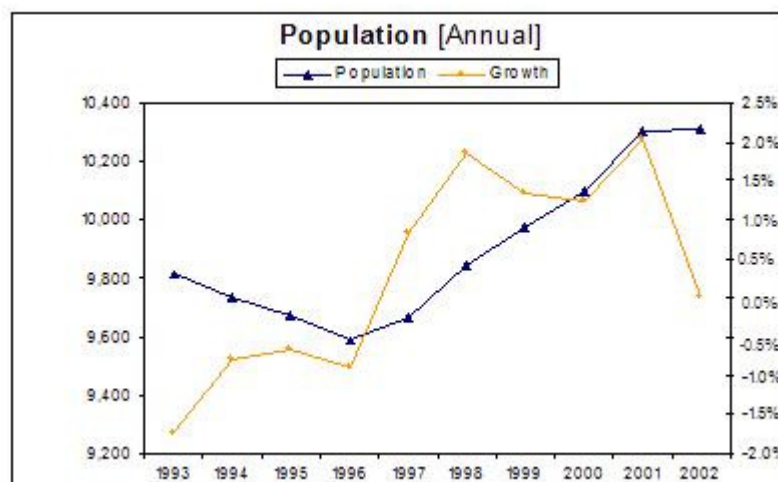
Source: Department of Employment and Workplace Relations

### 3.3 Gascoyne

- **Population**

The population of the Gascoyne Region was 10,308 as at 30 June 2002. This represented an increase of 0.0% over the previous year. Over the same period, the population of regional Western Australia grew by 1.1% and the State population grew by 1.4%.

As at 30 June 2002 the population of the Gascoyne Region made up 2.0% of the people living in regional Western Australia and 0.53% of the State's population.



Source: Australian Bureau of Statistics



- **Employment**

Total employment in the Gascoyne Region in the March 2003 quarter was 5,457 people. This represented a decrease of 3.6% from the previous quarter when there were 5,660 people employed in the region. 16.7% of the workforce is employed in the Agriculture, Forestry and Fishing industries, which pastoralism falls under.

When the March 2003 quarter is compared with the same quarter of the previous year, employment within the Gascoyne Region grew by 22.9%, compared to 4.1% growth for regional Western Australia and 3.0% growth for the State.

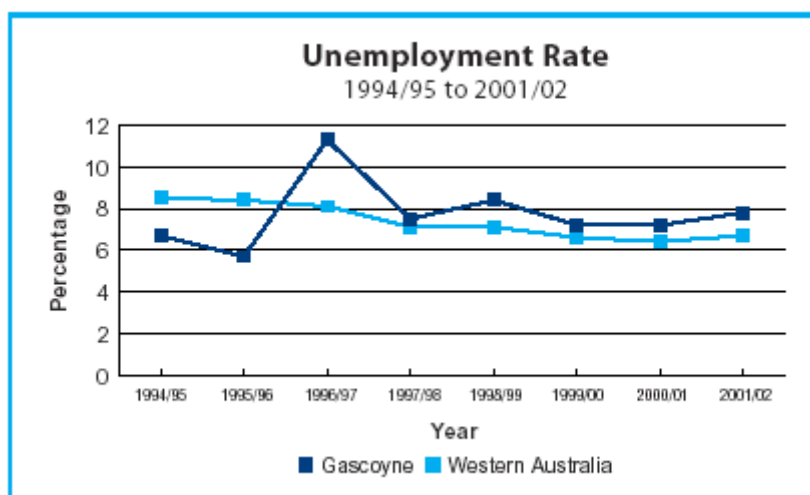
An input – output analysis is currently being developed for the Carnarvon Shire which is the economic centre of the Gascoyne region. Employment multipliers will be generated from this analysis. As indicated in section 3.2, State multipliers give the next best indication of the impact on employment in the region if employment in the industry increases by one person.

Source: Department of Employment and Workplace Relations

- **Unemployment**

In the March 2003 quarter there were 425 unemployed people in the Gascoyne Region, compared to 326 unemployed people in the December 2002 quarter and 524 people for March 2002.

The unemployment rate for the Gascoyne Region in the March 2003 quarter was 7.2% compared to 6.0% for regional Western Australia and 6.3% for the State.



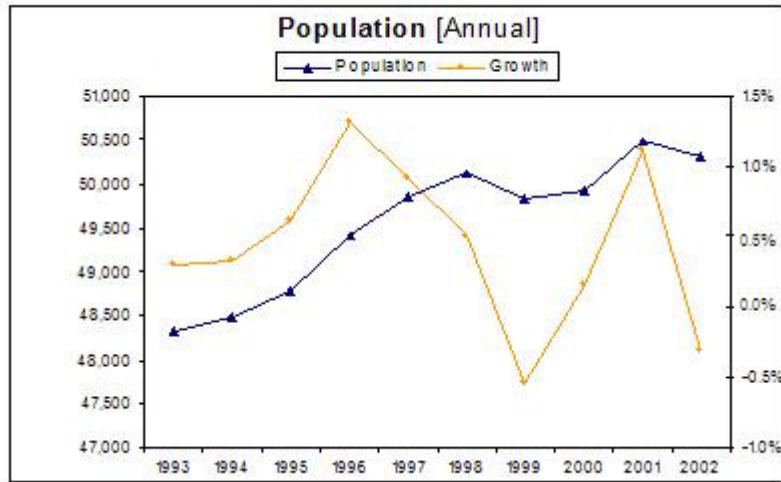
Source: Department of Employment and Workplace Relations

### 3.4 Mid-West

- **Population**

The population of the Mid West Region was 50,318 as at 30 June 2002. This represented a decrease of 0.3% from the previous year. Over the same period, the population of regional Western Australia grew by 1.1% and the State population grew by 1.4%.

As at 30 June 2002 the population of the Mid West Region made up 9.6% of the people living in regional Western Australia and 2.6% of the State's population.



Source: Australian Bureau of Statistics

- **Employment**

Total employment in the Mid West Region in the March 2003 quarter was 25,694 people. This represented a decrease of 3.2% from the previous quarter when there were 26,550 people employed in the region. 16.3% of the workforce is employed in the Agriculture, Forestry and Fishing industries, which pastoralism falls under.

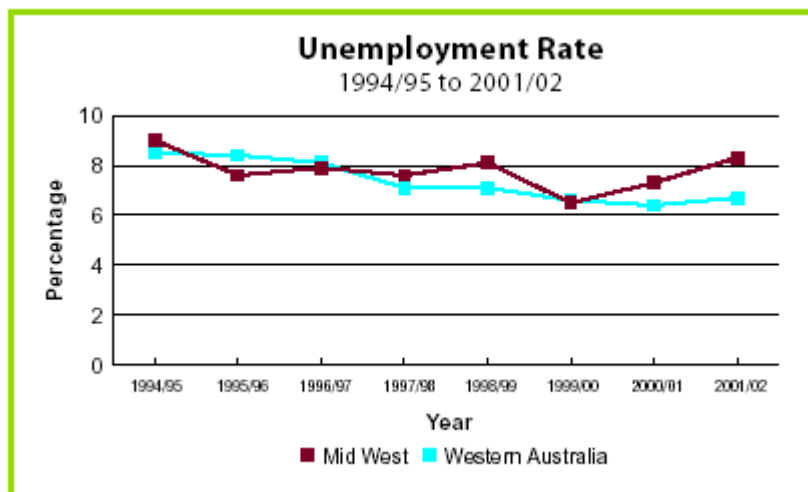
When the March 2003 quarter is compared with the same quarter of the previous year, employment within the Mid West Region grew by 11.2%, compared to 4.1% growth for regional Western Australia and 3.0% growth for the State.

As indicated in section 3.2, State multipliers give the next best indication of the impact on employment in the region if employment in the industry increases by one person.

Source: Department of Employment and Workplace Relations

- **Unemployment**

In the June 2002 quarter there were 2,028 unemployed people in the Mid West Region, compared to 2,173 unemployed people in the March 2002 quarter and 2,047 people for June 2001. The unemployment rate for the Mid West Region in the June 2002 quarter was 7.8% compared to 5.8% for regional Western Australia and 6.1% for the State.



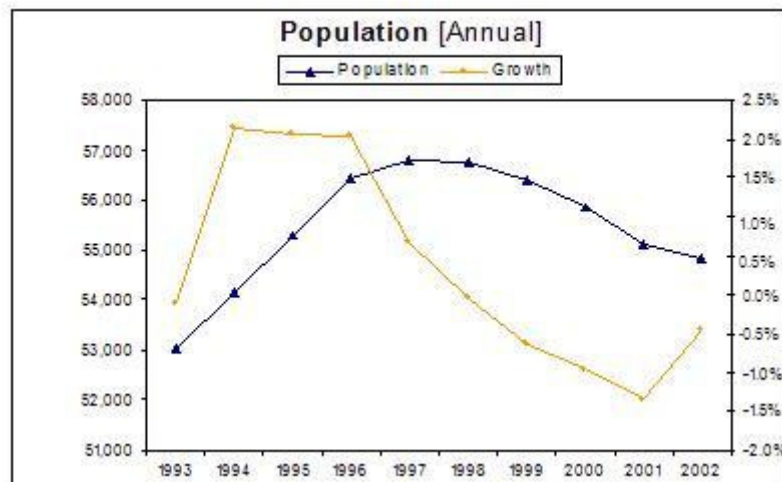
Source: Department of Employment and Workplace Relations

### 3.5 Goldfields-Esperance (Nullarbor)

- **Population**

The population of the Goldfields-Esperance Region was 54,855 as at 30 June 2002. This represented a decrease of 0.4% from the previous year. Over the same period, the population of regional Western Australia grew by 1.1% and the State population grew by 1.4%.

As at 30 June 2002 the population of the Goldfields-Esperance Region made up 10.4% of the people living in regional Western Australia and 2.8% of the State's population.



Source: Australian Bureau of Statistics

- **Employment**

Total employment in the Goldfields-Esperance Region in the March 2003 quarter was 31,067 people. This represented a decrease of 2.8% from the previous quarter when there were 31,961 people employed in the region. 7.1% of the workforce is employed in the Agriculture, Forestry and Fishing industries, which pastoralism falls under.

When the March 2003 quarter is compared with the same quarter of the previous year, employment within the Goldfields-Esperance Region grew by 2.4%, compared to 4.1% growth for regional Western Australia and 3.0% growth for the State.

As indicated in section 3.2, State multipliers give the next best indication of the impact on employment in the region if employment in the industry increases by one person.

Source: Department of Employment and Workplace Relations

- **Unemployment**

In the June 2002 quarter there were 1,546 unemployed people in the Goldfields-Esperance Region, compared to 1,754 unemployed people in the March 2002 quarter and 1,652 people for June 2001.

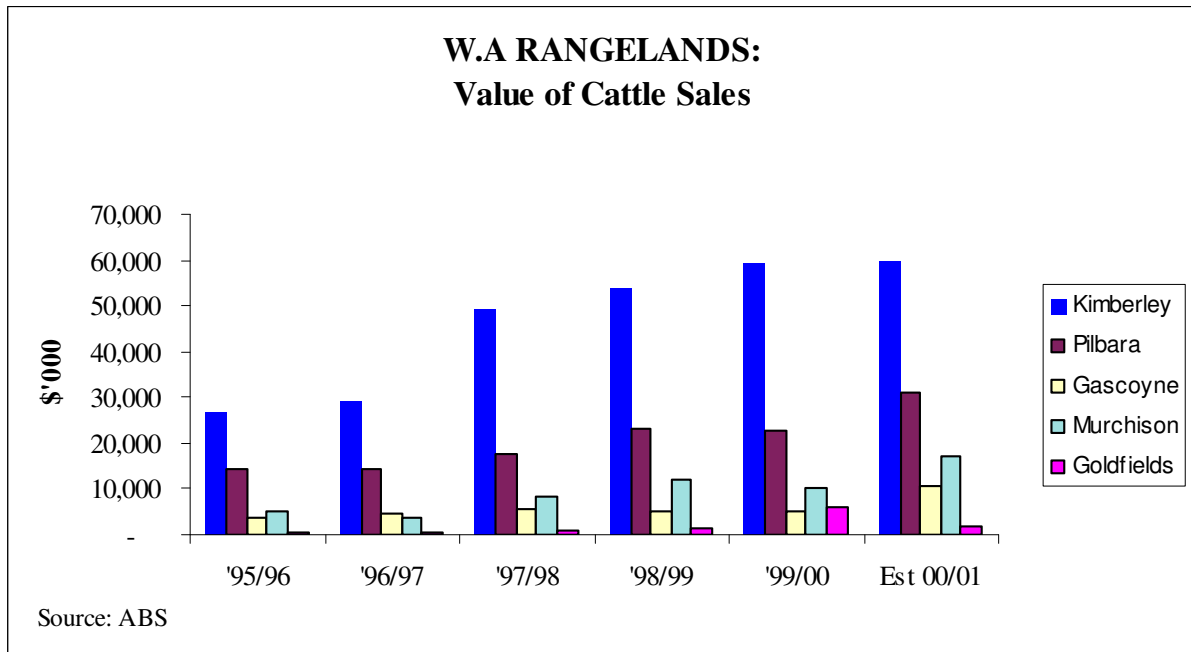
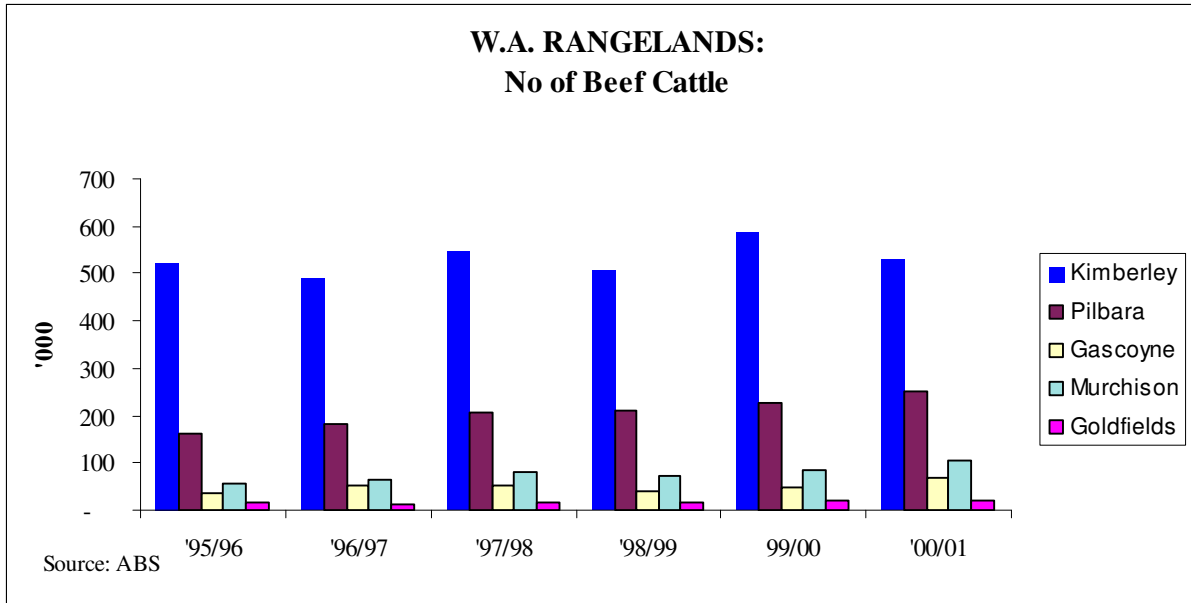
The unemployment rate for the Goldfields-Esperance Region in the June 2002 quarter was 4.7% compared to 5.8% for regional Western Australia and 6.1% for the State.

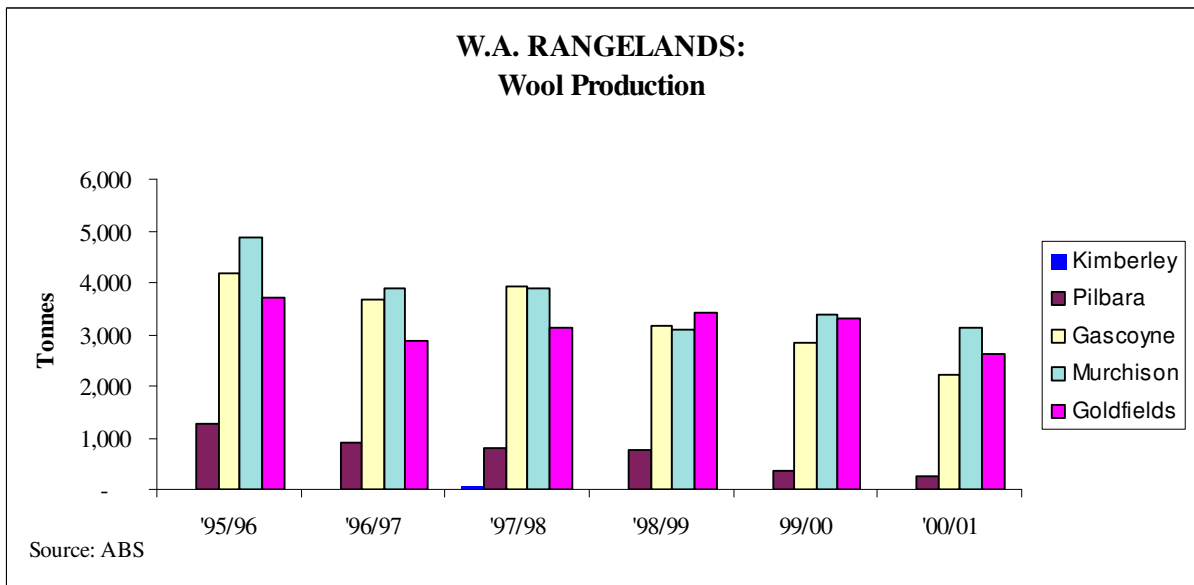
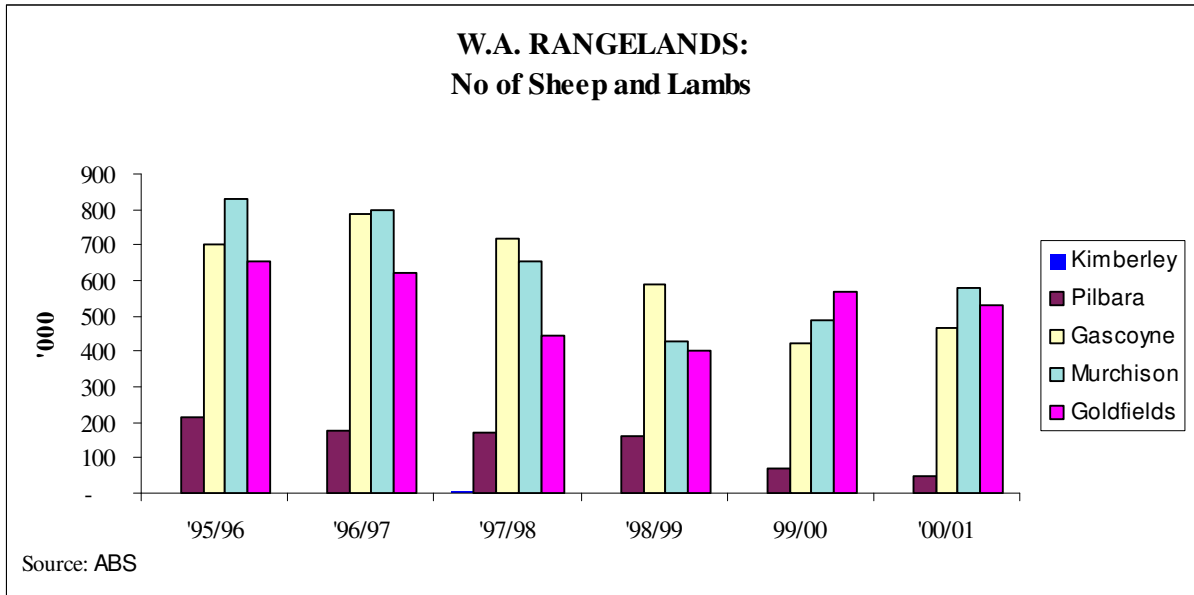


Source: Department of Employment and Workplace Relations

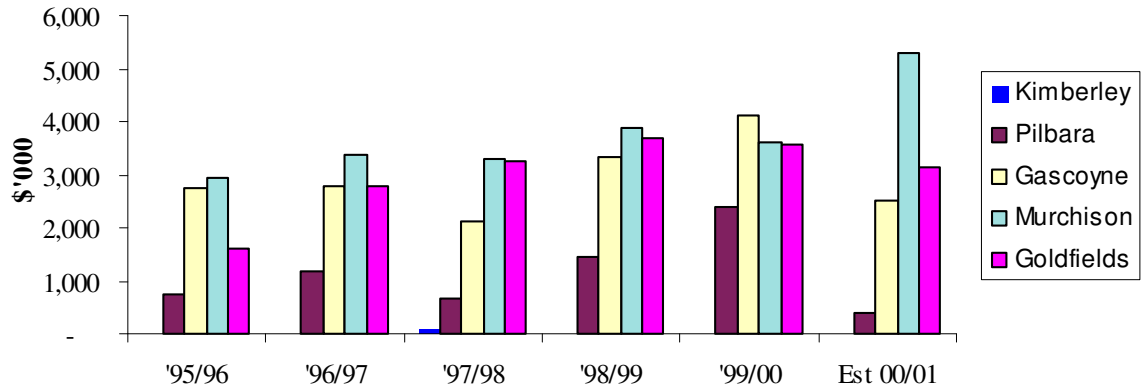
# APPENDIX

## Graphical representation of rangeland statistics



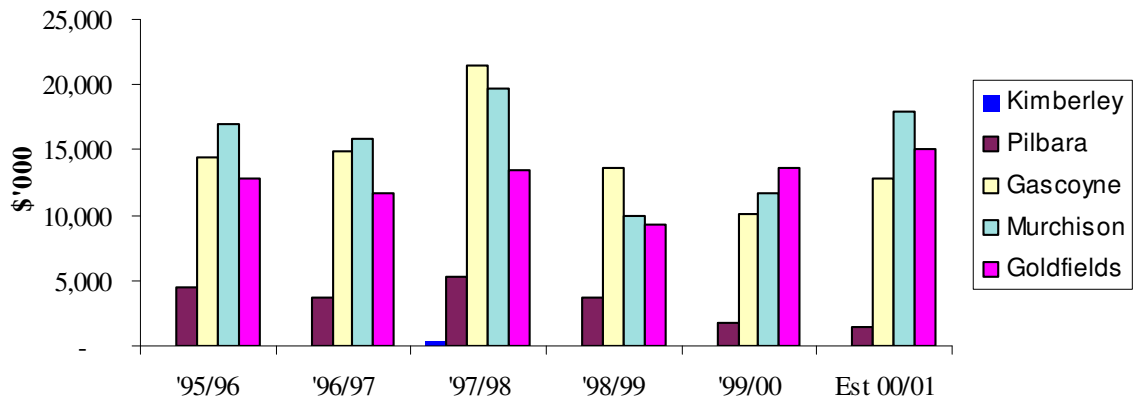


**W.A. RANGELANDS:  
Value of Sheep Sales**



Source: ABS

**W.A. RANGELANDS:  
Value of Wool Production**



Source: ABS