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Annual pastoral land condition report 2006 / 2007 financial year

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Annual Pastoral Land Condition Report

2006/2007 Financial Year

A report prepared for the
Pastoral Lands Board of Western Australia by the
Department of Agriculture and Food, Western Australia

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CONTENTS

Figures

Tables

Photos

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1. SUMMARY

The Department of Agriculture and Food provides services to the Pastoral Lands Board under a Memorandum of Understanding, and is required to provide an annual report to the Board on the overall land condition on pastoral leases throughout the rangelands of Western Australia. This report presents information for the 2006/2007 financial year. The report also satisfies the Commissioner of Soil and Land Conservation's obligation to provide the Pastoral Lands Board with a report on the current condition of land under pastoral leases in the State.

The report provides background information on pastoral leases, seasonal conditions and economic conditions, and then presents pastoral land condition information from the Western Australian Rangeland Monitoring System (WARMS), rangeland resource surveys, and the pastoral lease inspection program.

This report refers to the northern rangeland region comprised of the East Kimberley (Kununurra Office), West Kimberley (Derby Office) and Pilbara (Karratha Office) pastoral districts, and the southern rangelands comprised of the Gascoyne-Murchison (Carnarvon Office) and Goldfields-Nullarbor (Kalgoorlie Office) pastoral districts. Figure 1 shows the location of the pastoral districts. This differs from previous reports due to the realignment of stations previously associated with the Meekatharra district office, which was closed in January 2007.

Pastoral leases cover nearly 90 million hectares or 36% of the State's area, spanning a range of ecosystems from the tropical grasslands in the north to the arid shrublands in the south. The number of pastoral leases has continued to decline with four leases being surrendered and two being added to the nature conservation estate.

Much of the central and northern rangelands received average to above average rainfall in 2006/07 but in contrast much of the western rangelands received below average rainfall.

The northern rangelands remain predominantly cattle focussed on the export market while the southern rangelands have seen a continuing trend over the past 20 years of an expansion of the cattle industry at the expense of the sheep industry. Poor returns for wool and high wild dog numbers have led to many pastoralists changing to cattle, meat sheep and goats.

The Western Australian Rangeland Monitoring system is designed to report at the regional or district scale. 2006/07 assessments indicate that sites in the Kimberley showed no significant change in perennial grass frequency over the last three years. There has been at least partial recovery in perennial grass frequency on sites south of the Kimberley but this will not be confirmed until after the 2007 and 2008 field sampling seasons are completed. Overall there was an average decrease in density of shrubs on shrubland sites of 3%.

A total of 102 reports were prepared for the Pastoral Lands Board. Of the 57 stations inspected for Rangeland Condition Assessments, 44 had identified land management issues. Of the 50 stations where range condition trend could be assessed, 26 stations had improved in range condition, 16 had no significant change and 8 had declined in range condition.

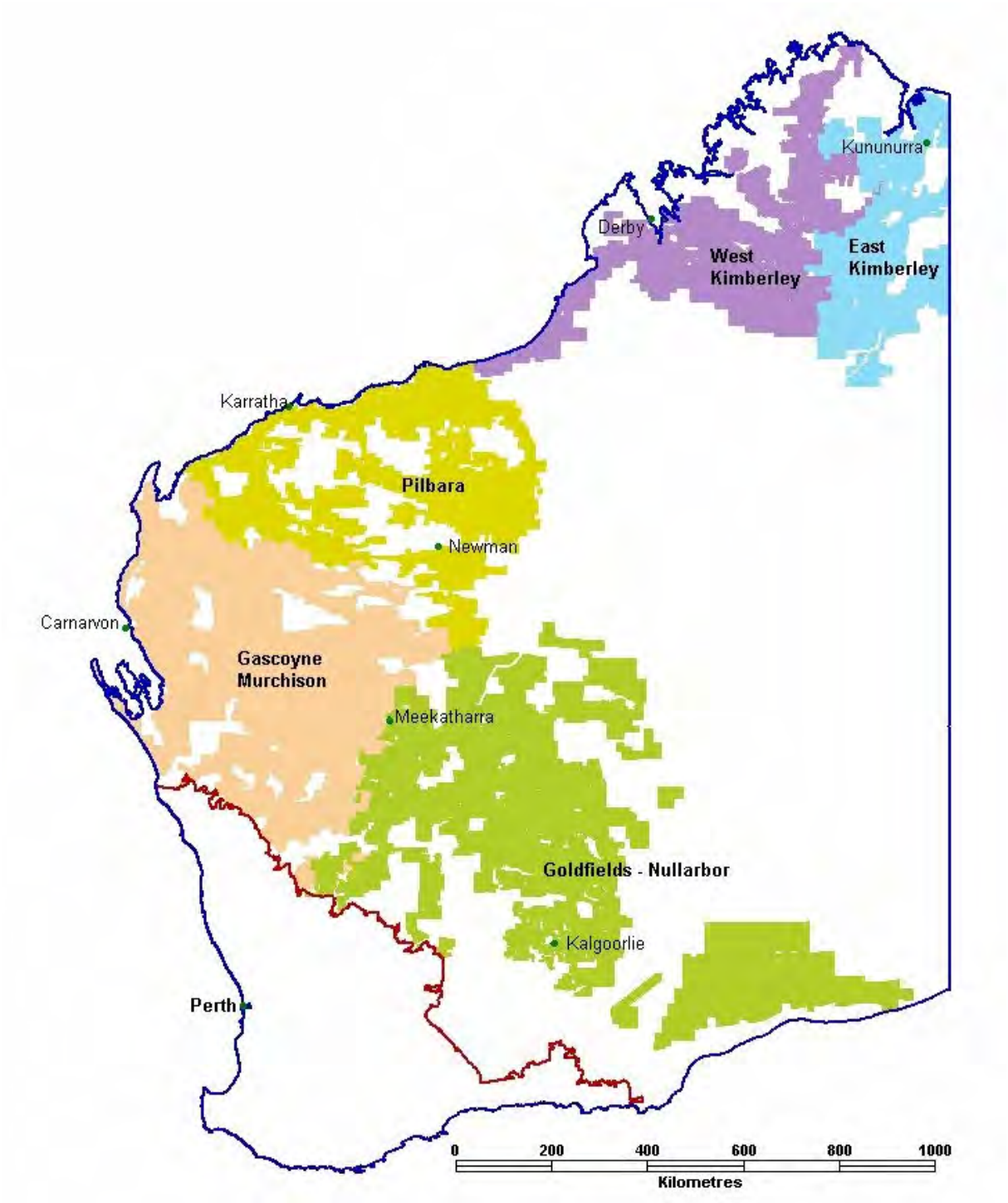


Figure 1. Pastoral districts in Western Australia

2. PASTORAL LEASES

2.1 Use of pastoral leases

Pastoral leases cover 36% (89 million hectares) of Western Australia and range from the tropical grasslands in the north through to the arid shrublands in the south, with rainfall ranging from 1,400 mm in the north Kimberley to less than 200 mm on the Nullarbor Plain in the south.

Pastoral leases are used for grazing of livestock on native vegetation. 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. Over the past 20 years there has been a gradual expansion of the cattle industry (at the expense of the sheep industry) south through the Upper Gascoyne, and Murchison areas. In addition, there has been a growing trend for cattle producers to acquire farming properties in the wheatbelt to allow for a better finished animal to enter the market.

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 sheep meat breeds, and goats in these areas.

Pastoralists and other land mangers continue to work with the relevant agencies to explore new opportunities for diversified activities in the rangelands. The past year saw an increase in the number of pastoral lessees seeking to establish irrigated fodder production areas through the use of diversification permits. Centre pivot irrigation systems are being established to help drought proof properties and to ensure consistent finishing weights.

2.2 Number of pastoral leases

There are 470 pastoral stations made up of 519 pastoral leases. While most of the pastoral leases occur in the rangelands region, eleven very small historical leases occur in the South West region of the State.

There is a large variation in the size of pastoral leases across the State, with the smallest, excluding the South West leases, being 6487 ha and the largest being 595,322 ha. The average size is 185,154 ha.

Table 1 illustrates that the number of pastoral leases across Western Australia continues to decline as it has for the past decade. The reduction in leases to 30 June 2007 is a result of four leases being surrendered: Dillon Bay (3114/479); Merolia (3114/1145); Minarup (3114/478); and Youanmi Downs (3114/1175), and two leases being transferred to the nature conservation estate: Credo (3114/1084) and Thundelarra (3114/567). Two further stations were removed as Kookynie station was amalgamated into Melita station and Mendleyarri station was amalgamated into Menangina Station.

Mt Hale station changed its name to Judal.

Table 1. Number of pastoral leases and stations in Western Australia

Year	Leases	Stations
2006-07	519	470
2005-06	525	478
2004-05	529	481
2003-04	533	483
2002-03	537	487
2001-02	542	492
2000-01	547	497
1999-00	554	504
1998-99	557	507
1997-98	563	513
1996-97	564	514

2.3 Transfer of pastoral leases

by Chris Olsen, District Valuer, Valuation Services, Landgate

The 2006/07 financial year saw a sharp decline in the transfer of pastoral leases, with a fall from 43 in 2005/06 to 24 in 2006/07 (see Table 2). This excludes non arms length transactions such as those involving share transfers between family members.

Table 2. Sales of pastoral leases in 2006/07

Area	Type	Sales
Kimberley	Cattle	2
Pilbara	Cattle	2
Southern Rangelands	Cattle	4
Southern Rangelands	Sheep	16
Total		**24**

The decrease in the number of leases transferred was indicative of a limited supply rather than the result of reduced demand. Demand for cattle leases remained very strong with a limited supply of commercial size leases available for purchase. This was evident by only four transfers occurring in the Kimberley and Pilbara regions where strong demand for cattle leases and a lack of supply have seen values rise significantly in the past few years.

Values have continued to rise for traditional sheep leases in the southern rangelands but these were limited to better quality leases.

Values remained stagnant for leases in areas of below average rainfall and where the option of converting from sheep to cattle was not available. With persistent low wool prices, the trend continued for buyers to convert from sheep to cattle where the rangeland permitted or to convert to sheep meat breeds or goats.

There is a steady market demand for smaller non viable grazing lifestyle leases, particularly where close to Perth or regional centres. These leases are quite often sold without stock and are utilized as a residence with the lessee working off station, for nearby mining companies.

Buyers of larger more commercially viable leases mainly came from the pastoral industry but also included southwest farmers looking for additional grazing land. The utilizing of pastoral leases as 'breeder' blocks then shipping weaners south for finishing is a common scenario.

The sale of Moola Bulla and Mount Amhurst and subsequent on-sale of breeding stock via a managed investment scheme was the first scheme of its kind in Western Australia. The tax deductibility status of such schemes has been a prime motivator for potential investors; however a recent Australian Tax Office ruling has since removed this option for schemes not related to forestry.

Government and mining industry transactions also affect the number of pastoral lease transfers. The Department of Environment and Conservation and the mining industry each purchased four leases.

There were 19 leases listed for sale at 30 June 2007.

3. SEASONAL CONDITIONS

Figure 2 shows the rainfall in Western Australia for 2006/07 and Figure 3 shows the rainfall deciles for 2006/07.

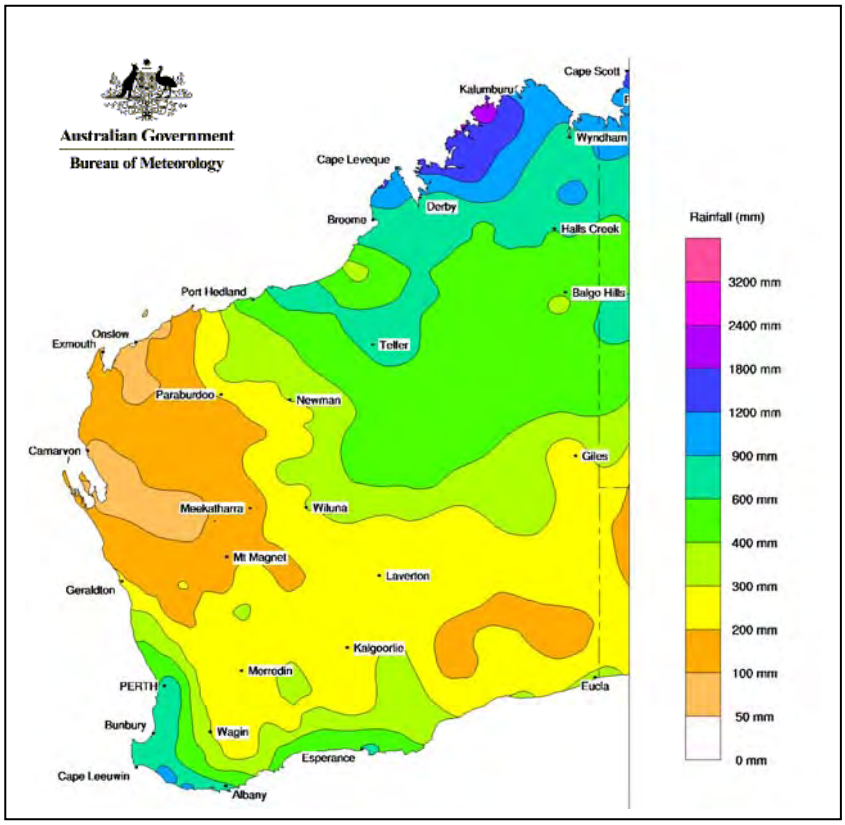


Figure 2. Rainfall (in mm) for Western Australia for 2006/07

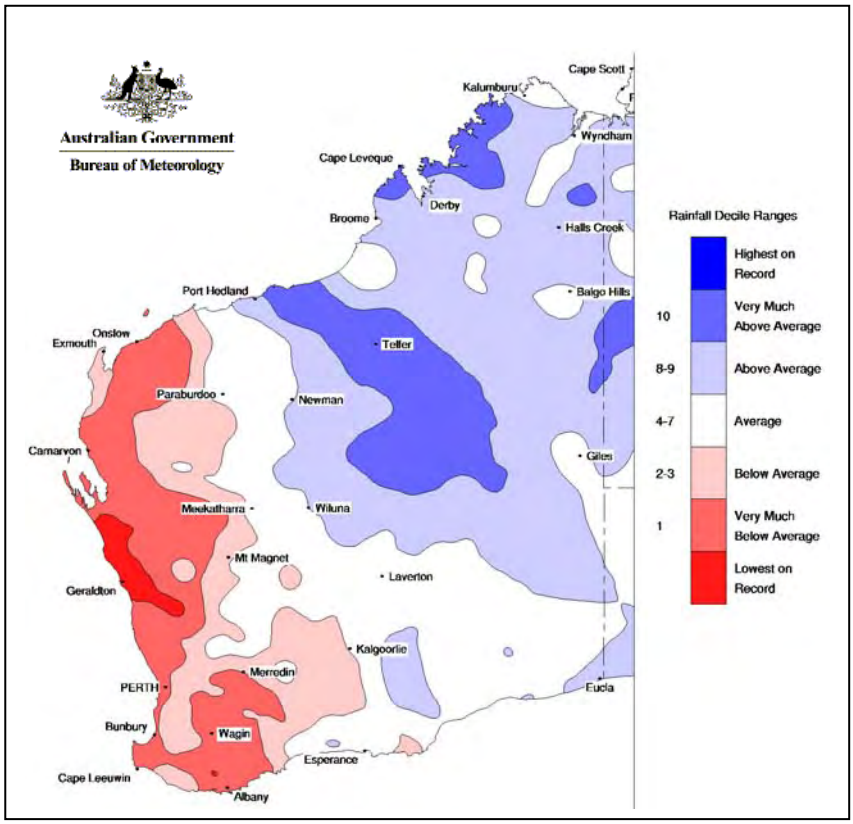


Figure 3. Rainfall deciles for Western Australia for 2006/07

As illustrated in Figure 3 the 2006/07 season saw much of the central and northern rangelands receiving average to above average rainfall with some areas receiving rainfall that was the highest on record. In contrast much of the western rangelands received below average rainfall. Table 3 shows the four cyclones that crossed the Western Australian coast in 2006/07.

Table 3. Cyclones that crossed the coast in 2006/07

Date	Cyclone	Crossed the coast at
3 January 2007	Isobel	Port Hedland
8 March 2007	George	Port Hedland
12 March 2007	Jacob	Port Hedland
27 March 2007	Kara	Wallal

Tropical Cyclone George was a category 4 cyclone and although it delivered heavy rain, no flooding was experienced. Wider flooding resulted from Tropical Cyclone Jacob, which crossed the coast four days later. The cumulative rainfall from TC George and TC Jacob can be seen in Figure 4.

Photo 1 TC George with TC Jacob offshore, March 2007

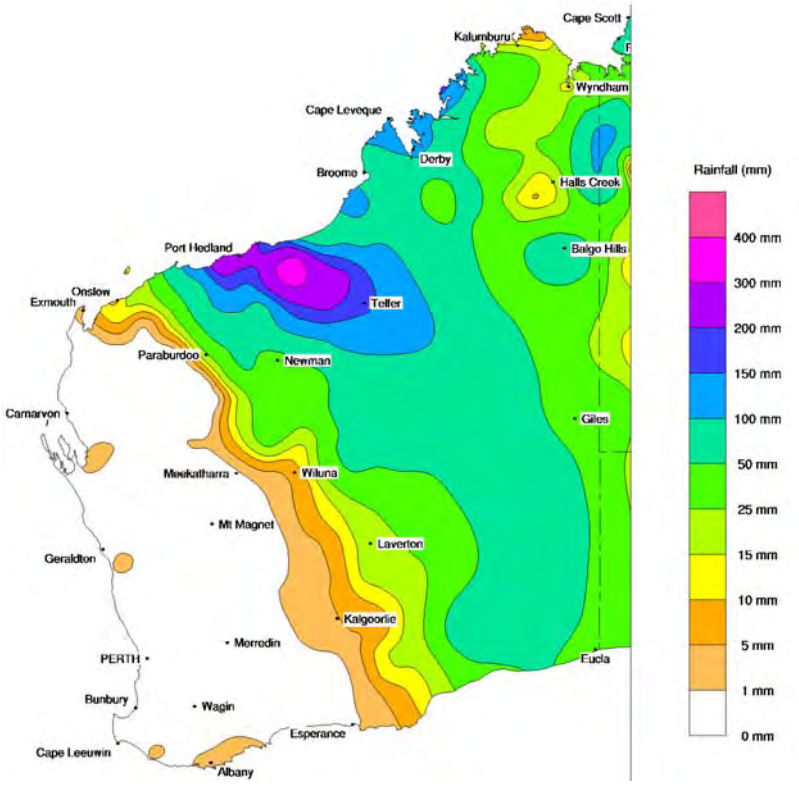


Figure 4. Weekly rainfall for the week ending 15 March 2007

3.1 District summaries

The following provides a summary of seasonal conditions for each pastoral region.

East Kimberley

Seasonal conditions during the 2006 dry season were generally above average, with high levels of pasture growth during the preceding wet season except in the far north-west, where some areas were below average. Many properties were affected by extensive wildfires over August – November 2006. The area affected by wildfires during the 2007 dry season was much less than in 2006.

Total rainfall over the 2006/07 wet season was average or above in most areas, but rainfall was not well distributed, with November, February and April being relatively dry. Cyclonic activity was fairly subdued. During March the district was affected by the passage of Tropical Cyclone George and a monsoonal low which later became Tropical Cyclone Kara. Pasture growth relative to historical records was predicted to be above average in eastern areas south of Warmun but was well below average in parts of the far north Kimberley (www.LongPaddock.qld.gov.au).

West Kimberley

Seasonal conditions during the 2006 dry season were generally above average, with high levels of pasture growth during the preceding wet season. A negative aspect was that pasture quality in northern areas was depressed, with reports of many cattle losing condition even when on green feed. Wildfires were a major issue, affecting most of the properties between Fitzroy Crossing and Broome. Wildfires during the 2007 dry season affected many areas that had escaped in 2006, including much of the Dampier Peninsula and country north of the Gibb River Rd.

Total rainfall over the 2006/07 wet season was above average in most areas. There were very good opening rains in November but both February and April were below average. The district was affected by the passage of Tropical Cyclones George and Kara in March 2007. Across much of the area, including the Broome coast, pasture growth relative to historical records was predicted to be around average (falling within middle 40% of years). Above-average pasture growth was expected in some northern areas (www.LongPaddock.qld.gov.au).

Pilbara

Seasonal conditions were variable through the year. Following on from a good wet season in 2005/2006 an unusual rainfall event was recorded in the East Pilbara during September 2006 with rainfall readings of 50 mm recorded at Marble Bar to 5 mm along the coast.

For the wet, cyclones were not experienced until late in the season. Three cyclones impacted on the Pilbara in March in George, Jacob and Kara. Exceptional rains were recorded in the De Grey River catchment with some properties recording 630 mm for March. Most of the high rainfall was recorded in the De Grey catchment while significant rain was experienced through the Fortescue catchment area. Limited rainfall was recorded in the Ashburton catchment. (0 - 75 mm).

Cyclone George was the most severe cyclone for the season, crossing the coast at Category 4 and maintaining its strength well inland. Two lives were lost, and four

stations had major impacts with damage to watering points (32 mills on one station and over 20 on another), buildings, fences and stock.

Pastures in the northern, central and eastern Pilbara bulked up well especially given the excellent season in the previous year. The West Pilbara area missed out on general rains and feed was limited to creeks and rivers. Some pastoralists undertook early mustering to reduce stock pressure and enhance feed reserves.

Gascoyne/Murchison

For the 2006/07 year seasonal conditions in the Gascoyne and Murchison regions were generally below average. Conditions in the Northhampton, Shark Bay, Yalgoo, and Murchison Shires were particularly poor. In the Carnarvon and Upper Gascoyne the situation was more varied, with conditions more satisfactory in coastal districts and some useful patchy rainfall at times and in patches elsewhere.

Pastoralists entered the financial year influenced by earlier dry conditions and deteriorating stock returns. With the exception of the Gascoyne Coast and north eastern 'upland' parts of the Carnarvon Shire, most have continued to face a poor and deteriorating pasture reserve situation.

The livestock market situation through the financial year was adversely influenced by the prevailing weak overall seasonal situation in the remainder of Australia and particularly, by the poor West Australian 2006 agricultural season. At times markets have been oversupplied, restricting industry's disposal of surplus and cull stock.

Goldfields/Nullarbor

The Goldfields/Nullarbor region generally received below average rainfall in 2006/07 resulting in further pressure on forage production and available food on offer. Rainfall was higher than average over the 2006/07 summer but the 2006 and 2007 winters were very poor. These are strongly winter dominant rainfall areas and the low winter rainfall led to poor winter pasture growth. In addition, heavy summer rainfall events bring a risk of erosion.

Sheep numbers in the district are well below the long-term average as a result of the poor ongoing seasonal conditions (that have resulted in poor reproductive performance and higher mortality rates) and wild dog predation on most leases. Cattle numbers have remained relatively stable as producers with new cattle enterprises have counteracted those that have reduced numbers because of poor forage availability.

3.2 Exceptional Circumstances Declaration – Southern Rangelands

The Exceptional Circumstances (EC) Program is funded jointly by the Australian and State governments to assist owner operator farmers and pastoralists overcome the effects of extended drought, rare and severe enough to only occur once every 20 to 25 years. For an area to obtain EC declaration there must be at least two consecutive years of drought contributing to a significant reduction in stock numbers across the defined area.

The southern rangelands area was originally declared on 2 July 2003 and covered areas from the Roebourne and Ashburton Shires to the Southern Goldfields. The EC declaration was extended to 1 July 2006. On 24 October 2006 the Australian

Government re-declared parts of the southern rangelands pastoral region for EC purposes until 31 March 2008 as a direct result of continuing drought conditions. Despite being a new declaration it did include some areas previously declared EC on 2 July 2003. Additional areas were declared for EC purposes on 19 February 2007 as the drought continued with this declaration also ending on 31 March 2008. A further six month extension was given on 17 September 2007 and as a consequence assistance is now available for the existing declared areas of the southern rangelands and the north eastern wheatbelt until 30 September 2008.

EC Relief Payments are available direct from Centrelink to provide farming families with benefits equivalent to the Newstart Allowance to assist with living expenses and also provided a Health Care Card. An off station asset test is applied by Centrelink when determining EC relief payments.

EC Interest Rate Subsidy (IRS) is available through DAFWA. The declaration dated 24 October 2006 provides for up to 80% of the interest and charges for all business debt directly associated with the pastoral/farming enterprise raised during the period from 24 October 2006 until 30 June 2007 (249 days) while the declaration dated 19 February 2007 provides for up to 80% of the interest and charges raised during the period from 19 February 2007 until 30 June 2007 (131 days). The Australian Government is now applying an off station assets test of $750,000 (for one year only expiring on the 30 September 2008). Off station assets with a net value above $750,000 need to be disposed of, or at least, budgeted to be disposed of in the current budget year. If they are not disposed of, no subsidy is paid.

Up to 12 December 2007 there have been 25 IRS applications with 15 approved, 8 declined and 2 withdrawn. The average payment for a 24 October 2006 application was $48,398 and for a 19 February 2007 application was $10,322.

4. ECONOMIC CONDITIONS

4.1 Livestock industry statistics

Cattle

- Since 2002/2003 cattle numbers in the Kimberley and Pilbara have increased annually by around 10% in response to strong export demand for live cattle. The Gascoyne has increased by approximately 50% as stations move from sheep to cattle.
- Poor returns for wool in the 1990s and high wild dog numbers have forced many pastoralists to diversify into cattle.
- Demand for Australian beef has been buoyant since early 2004, due to a combination of the lack of competition from the US in key markets, high US beef prices, and the revival of Australian and US consumer interest in beef.
- The Australia - US free trade agreement entered into force in January 2005 immediately eliminating the in quota tariff on Australian beef (4.4 US cents/kg). The agreement also increases Australia's quota for beef by 70,000 tones over 18 years.
- Sales in the Kimberley in 2006/07 dropped off because of the lack of market for many of the shorthorn type animals and much lower values than in 2005/06.

Table 4. Cattle numbers in the rangelands ('000 head)

Region	02/03	03/04	04/05	05/06	06/07
Kimberley	543	549	590	615	621
Pilbara	226	243	231	265	259
Gascoyne	51	62	76	80	84
Murchison	67	75	70	72	83
Goldfields/Nullarbor	24	27	26	23	29
TOTAL	**911**	**955**	**993**	**1,055**	**1,076**

Source: Annual Return of Livestock and Improvements. Where stations failed to report correctly in the Annual Returns it has been assumed that the same numbers were present as was reported in the previous year.

Table 5. Number of cattle sales in the rangelands (000 head)

Region	02/03	03/04	04/05	05/06	06/07
Kimberley	168	179	240	237	202
Pilbara	113	85	105	80	88
Gascoyne	30	17	28	27	29
Murchison	32	28	28	24	22
Goldfields/Nullarbor	7	6	6	8	6
TOTAL	**350**	**315**	**397**	**376**	**347**

Source: Annual Return of Livestock and Improvements. Where Annual Returns were inadequately completed values were estimated based on historical figures.

Sheep

- There has been a gradual decline since the mid 1990s in the number of merino sheep in the rangelands due to pastoralists reacting to downward movements of wool price and diversifying into cattle, meat sheep or goats.
- Sheep numbers in the Pilbara and Goldfields/Nullarbor have decreased significantly. Only three stations in the Pilbara run sheep flocks with numbers totalling only 1000 head. Sheep numbers in the Goldfields/Nullarbor have declined by 50% since 2002/03 because of poor ongoing seasonal conditions and increased wild dog predation.
- The estimated value of wool production from WA's rangelands declined from $20.8 million in 2000/2001 to $8.7 million in 2005/2006.
- Low availability of sheep and lambs continues throughout Australia and sale yard prices for both in Western Australia remain high.
- The number of meat sheep (primarily damaras and dorpers) continues the steady growth of recent years. Both damaras and dorpers are well adapted to the southern rangeland environment of Western Australia. In country previously only used to run merino wethers these breeds are able to successfully reproduce.
- DAFWA estimates between 80,000 - 100,000 meat sheep are run in the southern rangelands on around 30 pastoral stations, providing an estimated 30,000 - 40,000 of the 150,000 males and 20,000 female meat sheep that were exported in 2006/07. The average price of contracts is currently approximately $55 per head.

Table 6. Sheep numbers in the rangelands ('000 head)

Region	02/03	03/04	04/05	05/06	06/07
Pilbara	32	16	16	1	1
Gascoyne	190	208	205	232	200
Murchison	221	211	200	228	235
Goldfields/Nullarbor	259	279	200	153	140
TOTAL	**702**	**715**	**631**	**614**	**576**

Source: Annual Return of Livestock and Improvements

Table 7. Number of sheep sales in the rangelands ('000 head)

Region	02/03	03/04	04/05	05/06	06/07
Pilbara	5	20	5	-	-
Gascoyne	60	38	45	82	71
Murchison	75	44	44	50	59
Goldfields/Nullarbor	52	55	45	40	29
TOTAL	**192**	**157**	**139**	**172**	**159**

Source: Annual Return of Livestock and Improvements. Where Annual Returns were inadequately completed values were estimated based on historical figures.

Table 8. Wool production in the rangelands (tonnes greasy)

Region	02/03	03/04	04/05	05/06	06/07
Pilbara	124	86	100	4	4
Gascoyne	700	651	663	706	552
Murchison	912	748	699	570	615
Goldfields/Nullarbor	1,214	1,135	1,098	638	498
TOTAL	**2,950**	**2,544**	**2,533**	**1,918**	**1,669**

Source: Annual Return of Livestock and Improvements

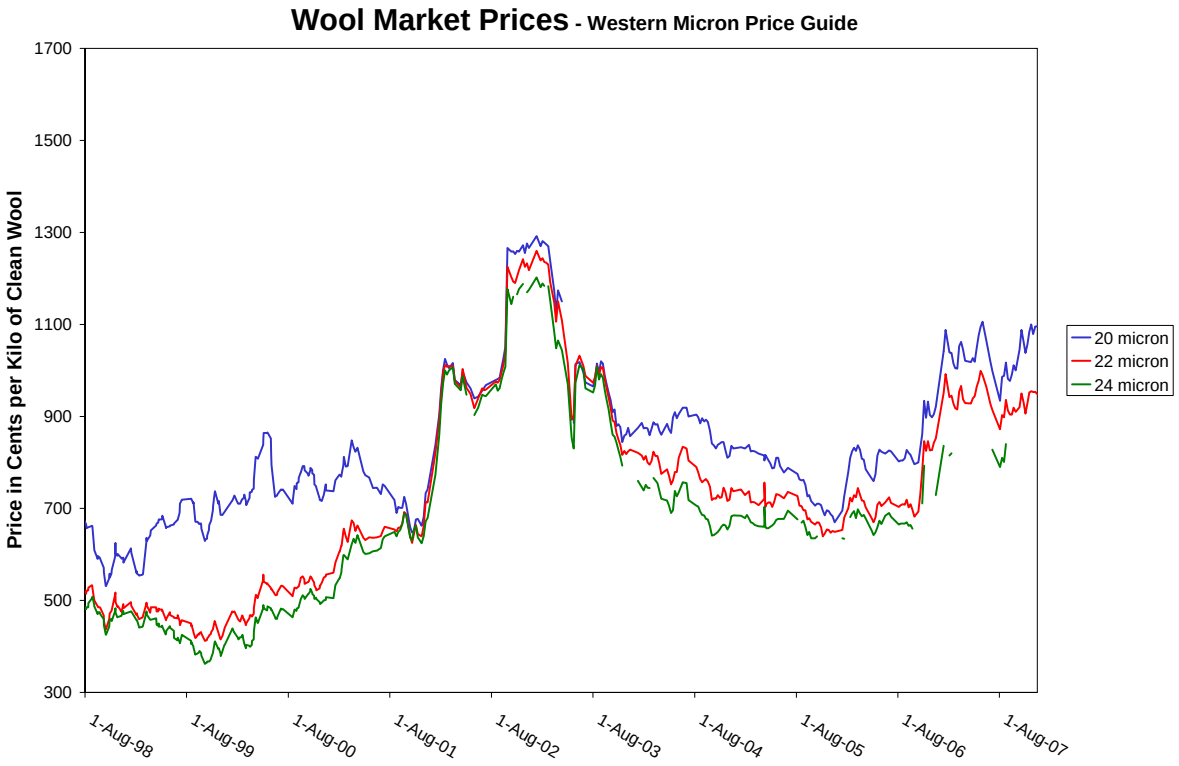


Figure 5. Wool market prices

Goats

- In 2006, Western Australian abattoirs processed a total of 233,674 goats, of these 230,474 were for export and 3,200 for domestic markets. In 2007, a total of 200,690 goats were processed, of these 196,941 were for export and 3,739 for domestic market (Source: Western Australian Meat Industry Authority).
- An estimated 90% of the state's goat population is located in the southern rangelands.
- The number of goats exported live from the rangelands continues to decline. Throughout Australia the constraints of inconsistent supply and variable quality have hampered the development of the goat industry.
- Historical data shows that prices for rangeland goats are lowest in March - April and rise steadily from August until December.

Table 9. Current state of the goat industry

	01/02	02/03	03/04	04/05	05/06	06/07
No. of rangeland goats processed (records no longer maintained).	286,743	282,435	210,770	230,612	N/A	N/A
Goat meat exports from WA in tonnes (WAQIS records)	4,536	4,287	3,318	3,774	4,303	3,658
No. of goats exported live (Agrifood Infonet)	63,960	41,499	27,119	26,100	17,422	16,580

Table 10. 2006 goat meat schedule prices for Western Australia

Carcass weight				
<5 kg	**5-12kg**	**12-16kg**	**16-24kg**	**>25kg**
NCV	$20	$28	$29	$32

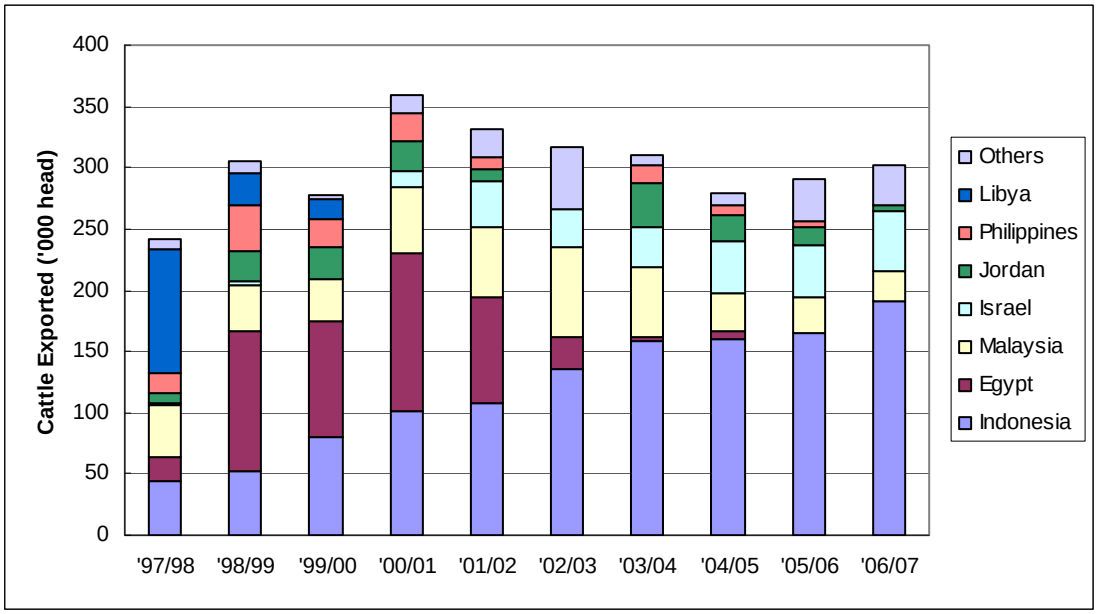
4.2 Live export markets

Since the late 1990's Western Australia has been the largest exporter of any Australian state for goats, cattle and sheep and a high proportion of these livestock are sourced from the rangelands. Livestock from the rangelands are exported from the ports of Fremantle, Geraldton, Port Hedland, Broome and Wyndham.

Export markets are important for both the northern and southern rangelands. There is strong demand for feeder cattle for lot feeding operations in Asia and the Middle East from the northern rangelands. Export of live sheep to Middle East markets and live goats to Asian markets is important for pastoral businesses in the southern rangelands. The high Australian Dollar and competition from other suppliers is limiting returns to Australian exporters.

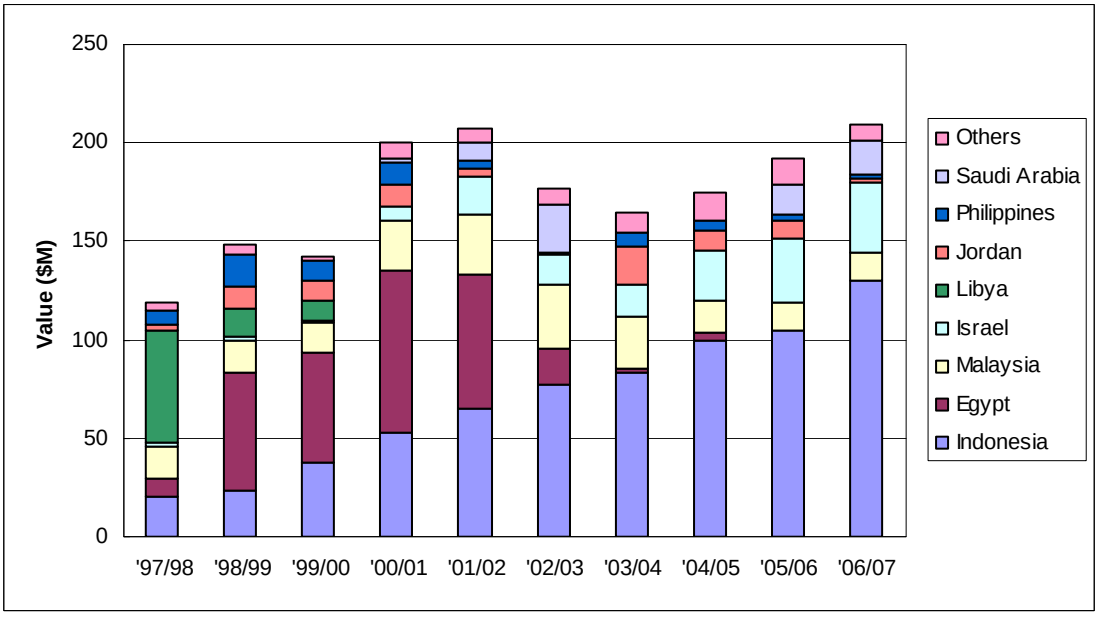
Cattle

The dominant export markets for cattle from Western Australia are shown in figures 6 and 7. The main export destination for cattle sourced from pastoral regions has traditionally been Indonesia, Malaysia, and Egypt. Over the past few years the relative importance of these markets has changed and the principal export destination for Western Australian live cattle in 2006/07 was Indonesia at 63%, followed by Israel at 17% and Malaysia at 8%, with no exports to Egypt since 2004/05.



Source: Agrifood Infonet

Figure 6. Quantity of live cattle exports from Western Australia ('000 head)

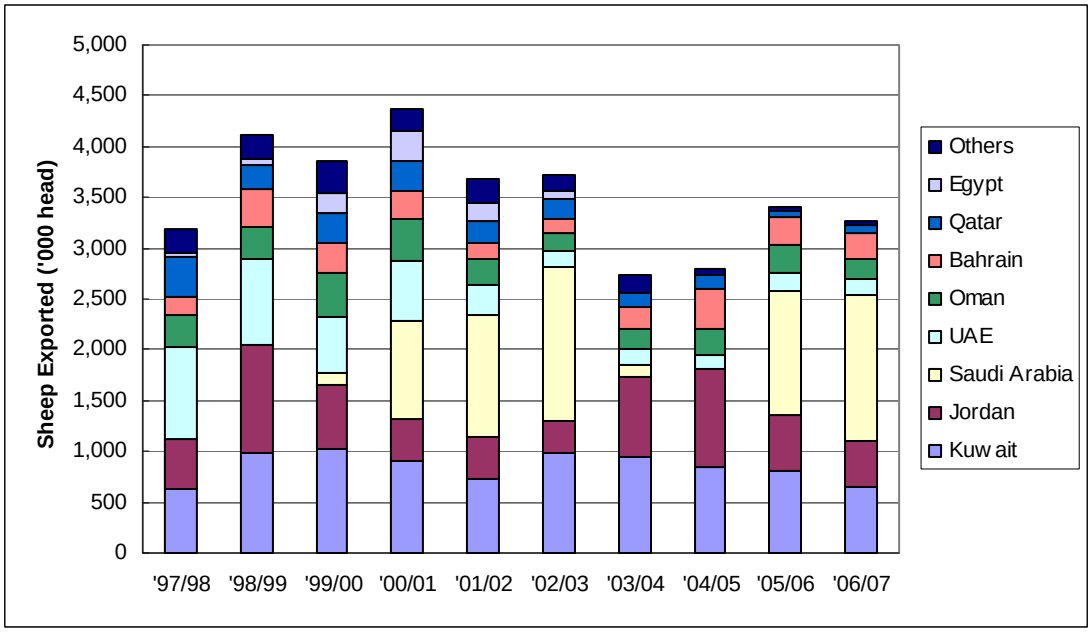


Source: Agrifood Infonet

Figure 7. Value of live cattle exports from Western Australia ($ Millions)

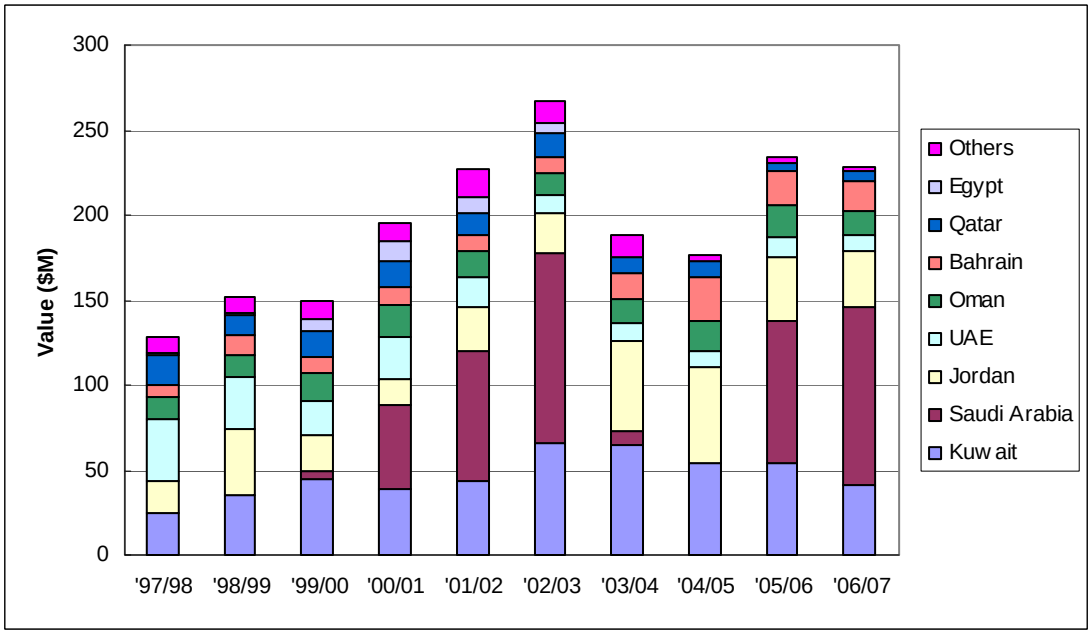
Sheep

The dominant export markets for sheep from Western Australia are shown in figures 8 and 9. Saudi Arabia was Australia's biggest Middle Eastern market for live sheep in 2003, importing 1.5 million head valued at more than $100 million. The trade was suspended in August 2003 after sheep on board the MV Cormo Express were denied entry. In May 2005 Australia and Saudi Arabia signed a Memorandum of Understanding which has allowed the resumption of live trade from Australia to Saudi Arabia and in 2006/07 1.4 million sheep were exported to Saudi Arabia from Western Australia valued at $105 million.



Source: Agrifood Infonet

Figure 8. Quantity of live sheep exports from Western Australia ('000 head)



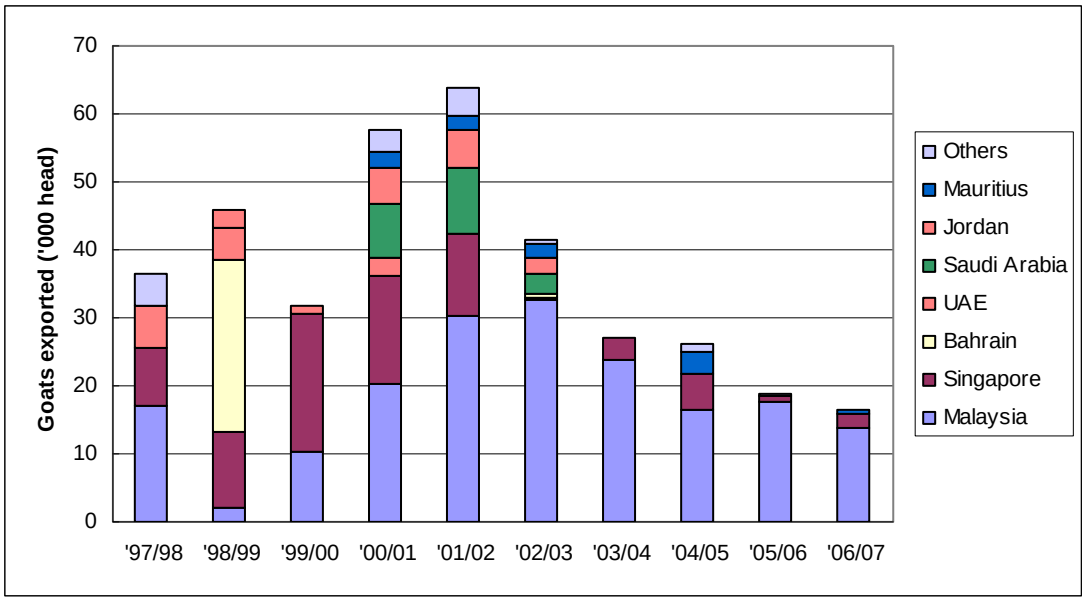
Source: Agrifood Infonet

Figure 9. Value of live sheep exports from Western Australia ($ Millions)

It is interesting to note the difference in the quantity and value for live export sheep from Western Australia. Price per animal increased by 38% in 2001/02 and, coupled with a slight increase in export numbers led to significant gains in total value of live exports. Prices have remained high and compared to the late 1990s the value of exports are greater despite the number of sheep exported reducing.

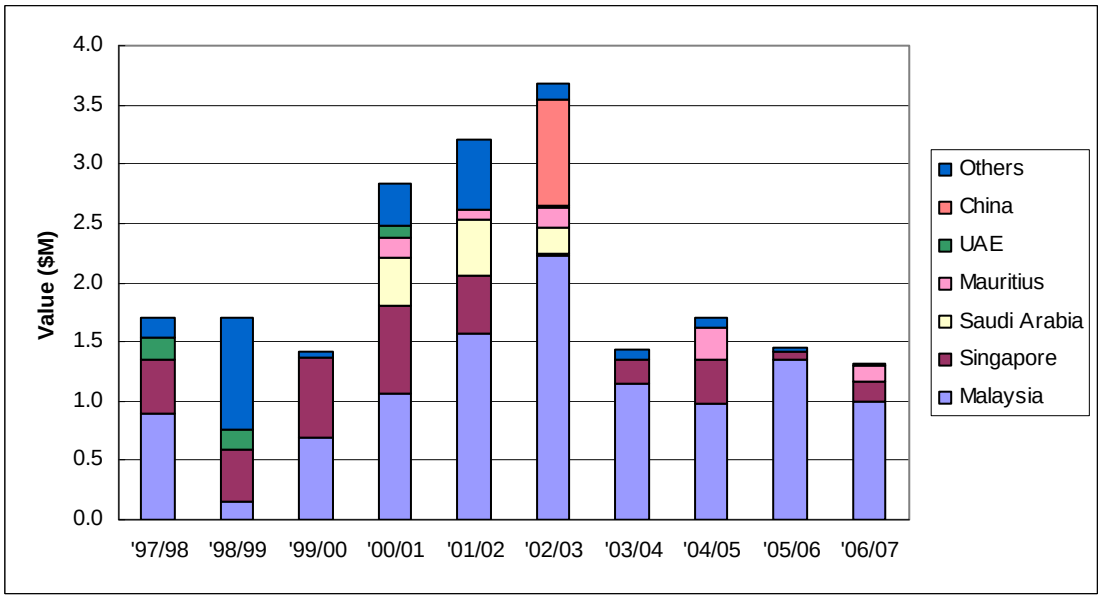
Goats

The dominant export markets for goats from Western Australia are shown in figures 10 and 11, with Malaysia accounting for 83% of the live exports. The primary market for 'skin on' carcasses is Taiwan (62% of exports) with the highest demand during the October to January period. Next is USA followed by Trinidad and Tobago. The live export market accounts for 84% of goat exports.



Source: Agrifood Infonet

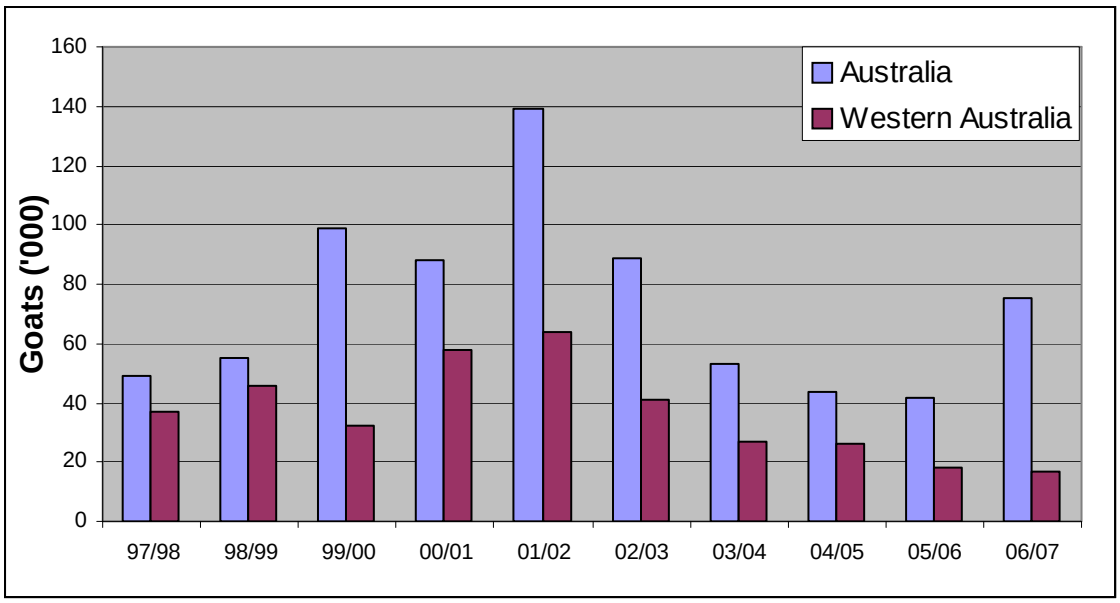
Figure 10. Quantity of live goat exports from Western Australia ('000 head)



Source: Agrifood Infonet

Figure 11. Value of live goat exports from Western Australia ($ Millions)

Western Australia's contribution to total live exports has declined over recent years (see Figure 12). For a long period (early 1990's until 2004) WA contributed an average of 60% of Australian goat exports, but declined to 40% in 2005/06 and 25% in 2006/07. Of the national total, South Australia is an increasing supplier of slaughter goats (about 30%) while New South Wales and Queensland are supplying the increasing demand from Malaysia for Boer cross breeding goats.

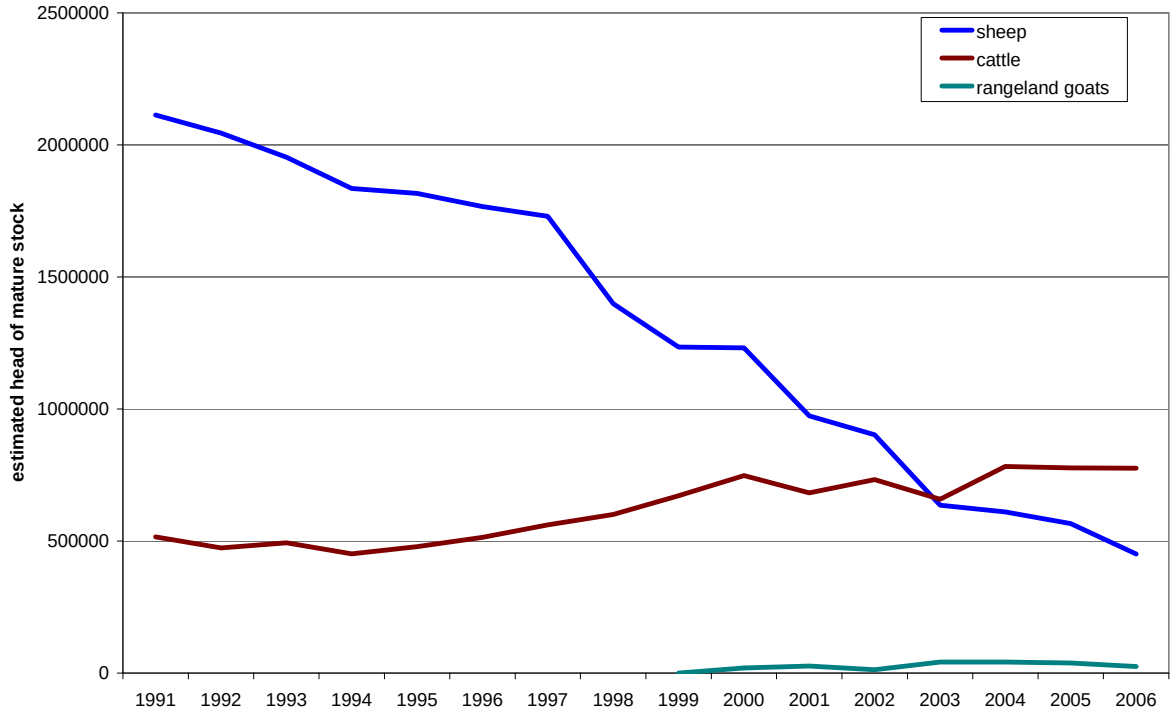


Source: Agrifood Infonet

Figure 12. Live exports of goats from Australia and Western Australia

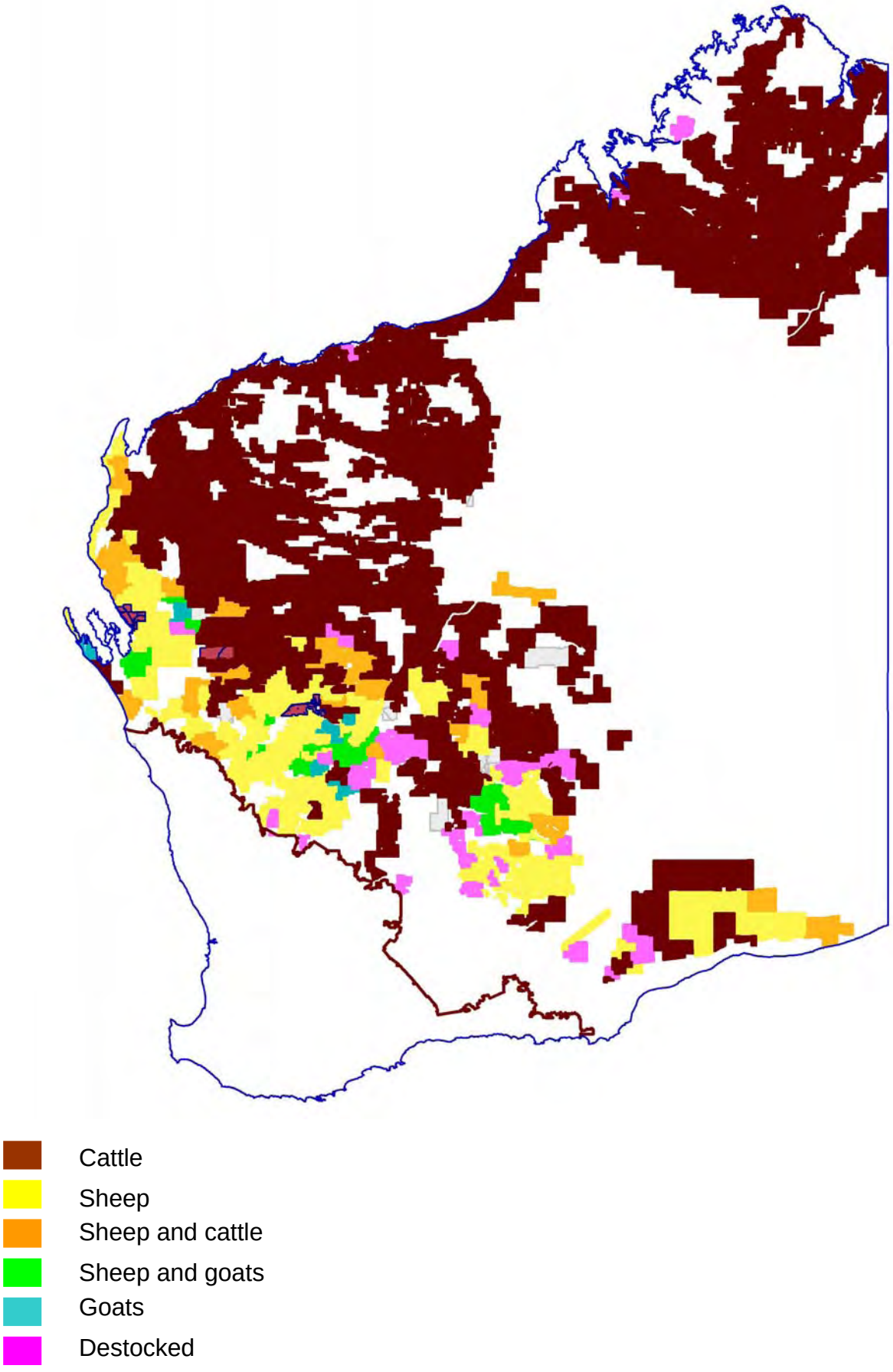
4.3 Trends in livestock type

Over the last decade there has been a steep decline in sheep numbers and a gradual increase in cattle numbers as producers through the Upper Gascoyne and Murchison areas change from cattle to sheep (see Figure 13). In addition, there is an increasing focus away from wool production to meat production from sheep (both merino and meat sheep breeds) and goats in the southern Gascoyne, Murchison, Goldfields and Nullarbor regions. Figure 14 shows livestock types run in the Western Australian rangelands.



Source: Annual Return of Livestock and Improvements

Figure 13. Trends in livestock type in the rangelands of Western Australia



Source: 2006 Annual Return of Livestock and Improvement Declarations. The type referred to is the dominant income stream.

Figure 14. Livestock type in the rangelands of Western Australia

5. PASTORAL LAND CONDITION

5.1 Western Australian Rangeland Monitoring System (WARMS)

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

There are two types of sites: grassland sites which are used in the Kimberley, Pilbara and north-west Gascoyne and shrubland sites which are used from the southern Pilbara through to the Nullarbor. Currently, WARMS is made up of 1,620 sites, comprising 632 grassland sites and 988 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.

WARMS is designed to report at the regional or district scale rather than on individual pastoral leases. The number of sites on an individual pastoral 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, which are used in the pastoral lease inspection process, and 80 benchmark sites.

In 2006/07 reassessments of sites in the Kimberley were carried out by staff based in the Kununurra and Derby district offices. A member of staff based in Northam and a private contractor carried out the reassessment of Pilbara and southern region sites.

Table 11. Number of WARMS sites reassessed in 2006/07

District	*Shrubland sites*	*Grassland sites*	Total number of sites	Number of stations
Carnarvon	*115*	*2*	*117*	*44*
Kalgoorlie	*90*	*-*	*90*	*29*
Meekatharra	*54*	*-*	*54*	*20*
Southern region	**259**	**2**	**261**	**93**
Derby	*-*	*86*	*86*	*26*
Karratha	*10*	*37*	*47*	*12*
Kununurra	*-*	*44*	*44*	*6*
Northern region	**10**	**167**	**177**	**44**
State total	***269***	***169***	***438***	***137***

The fifth assessment of the Kimberley grassland sites is about 40% complete. One full cycle (i.e. two assessments) has been completed for shrubland sites, with about 35% of sites assessed three times.

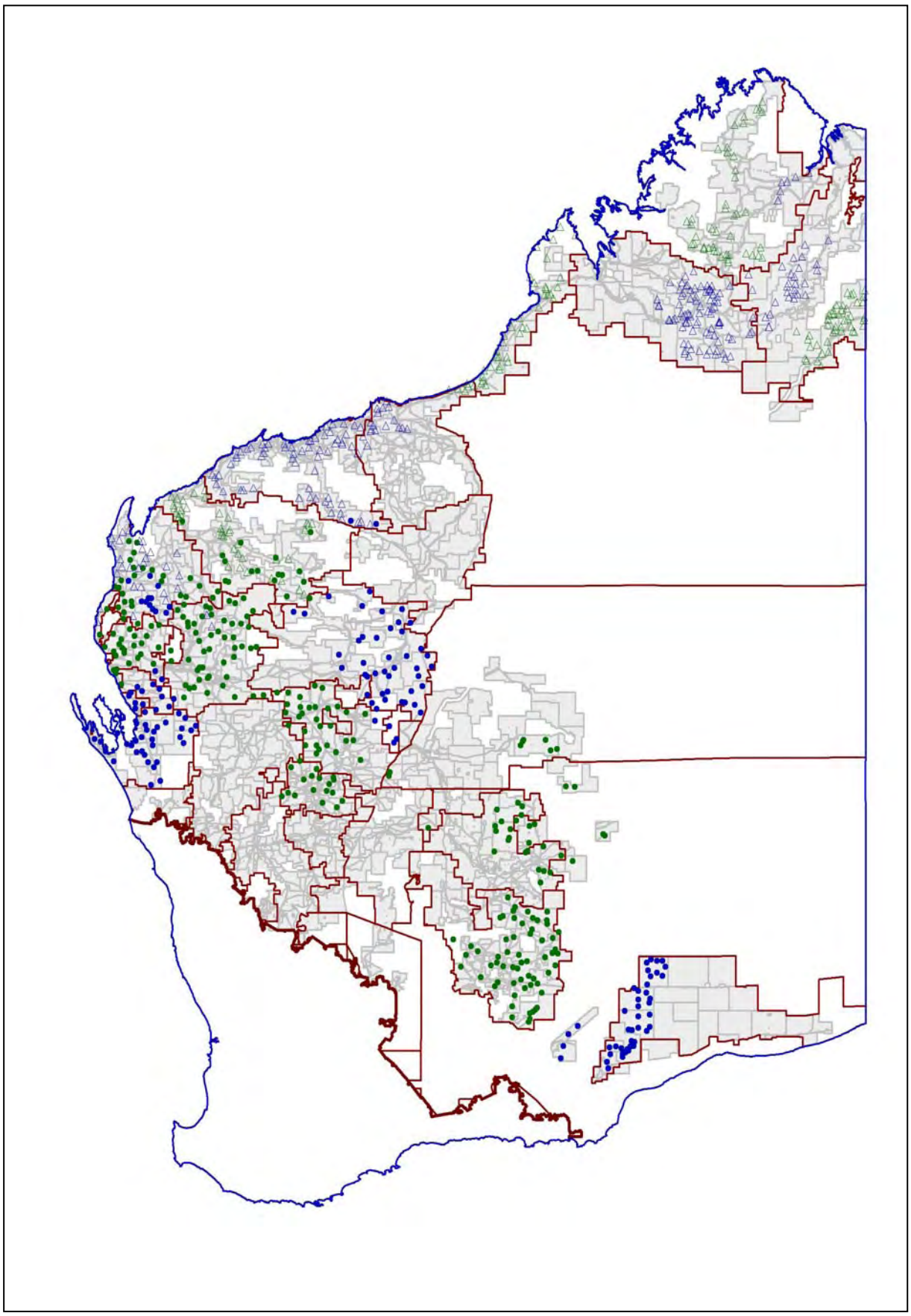


Figure 15. WARMS reassessments carried out in 2006/07 (sites shown in green) and proposed for 2007/08 (sites shown in blue). Grassland sites are represented by a triangle and shrubland sites by a solid circle.

Grassland sites

For the Derby-West Kimberley, Halls Creek-East Kimberley and North Kimberley Land Conservation Districts, the average frequency of perennial grasses increased over the first three assessments and then flattened out by the fourth assessment (Figure 16). Based on 2006 results it appears that perennial grass frequency has not decreased since. In the Broome LCD, flood inundation in 2000 caused deaths of perennial grasses but the 2006 data suggest that there has been good recovery in many areas.

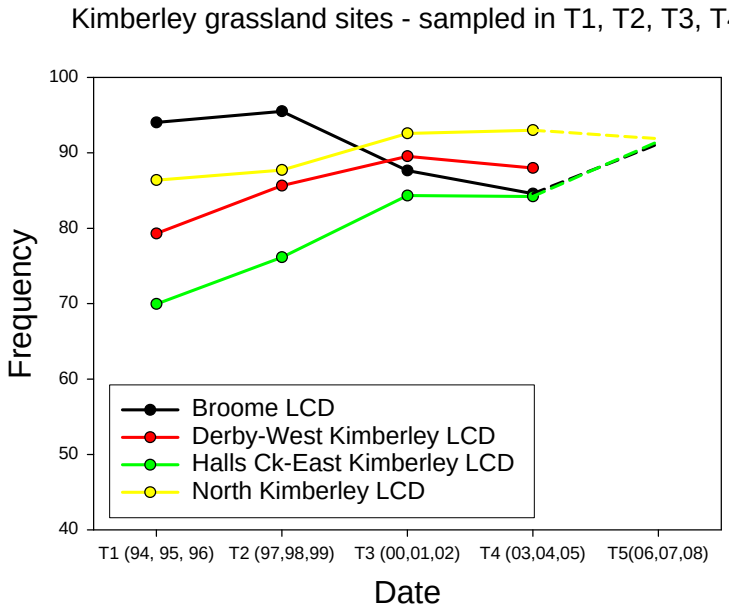


Figure 16. Average grass frequency of Kimberley grassland sites assessed over all cycles. For Time 5 (06,07,08) only sites assessed in 2006 are shown.

Perennial grass frequency south of the Kimberley generally decreased from the second and third assessment to the fourth (Figure 17). The 2006 data suggest that there has been at least partial recovery but this will not be confirmed until after the 2007 and 2008 field sampling seasons are completed.

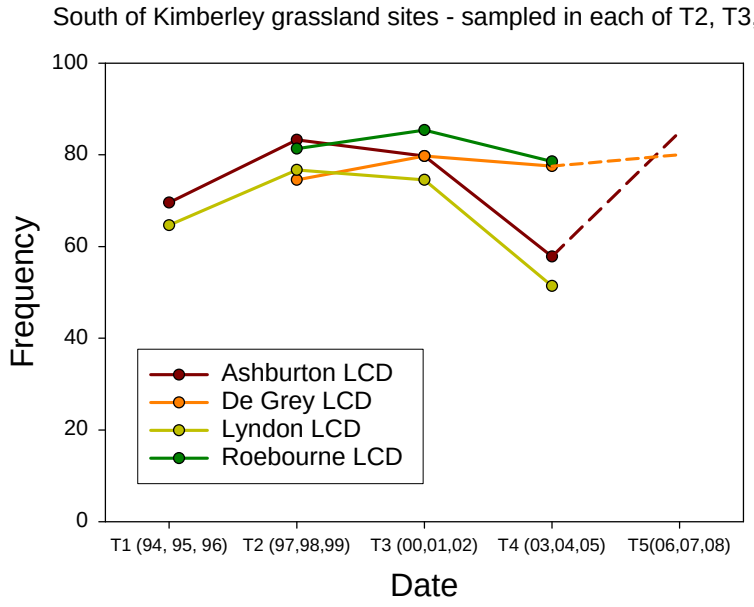


Figure 17. Average grass frequency on grassland sites located south of the Kimberley assessed over all cycles. For Time 5 (06,07,08) only sites assessed in 2006 are shown.

Shrubland sites

A total of 309 sites have been assessed three times. For these sites; the density of shrubs increased on 33% of sites (Figure 18). Overall, there was an average decrease in density of 3%. The density declined substantially (i.e. to less than 50% of density) on 6.5% of sites.

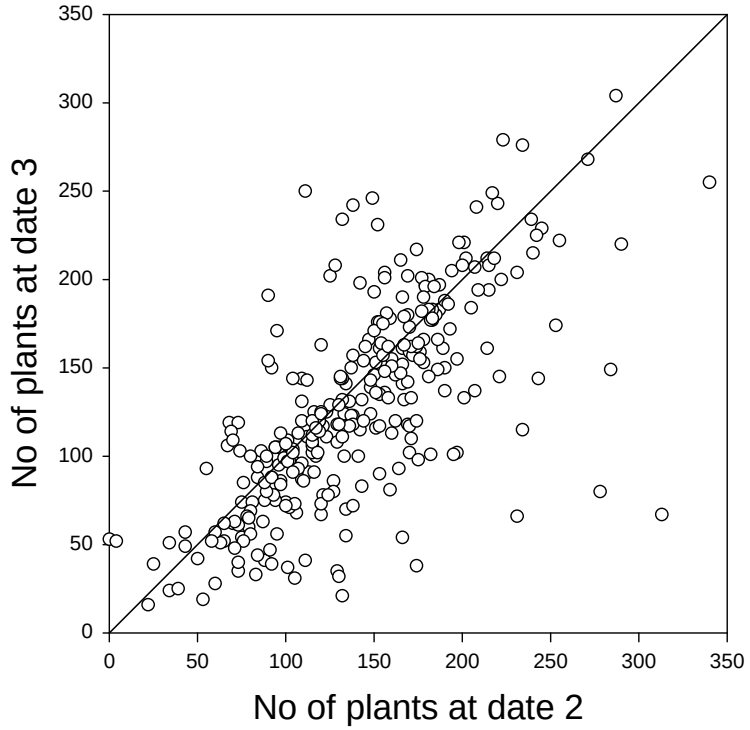


Figure 18. Shrub density on shrubland sites that have been assessed three times

5.2 Australian Collaborative Rangeland Information System (ACRIS)

The Australian Collaborative Rangeland Information System (ACRIS) was established as a partnership between Australian government organisations and state agencies to report on changes in the following themes; landscape function, sustainable management, biodiversity, socio economic, climate variability, total grazing pressure, water use and management, and fire regimes. DAFWA was the lead agency in Western Australia, with additional input from the Department of Environment and Conservation, Landgate Valuation Services, and the Pastoral Lands Board of Western Australia.

The National Resources Policies and Programs Committee (NRPPC) are currently reviewing the final national report, which will be posted on the website, along with the various state reports (www.environment.gov.au/land/management/rangelands/acris/publications-products). Table 12 summarises four of the ACRIS themes.

Table 12. Summary of four ACRIS themes

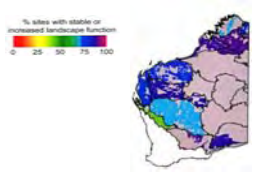
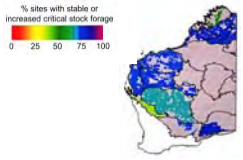
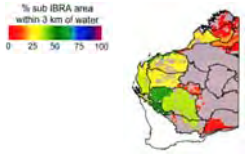
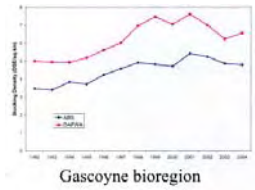
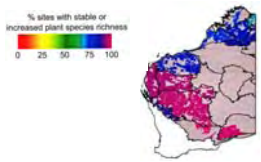
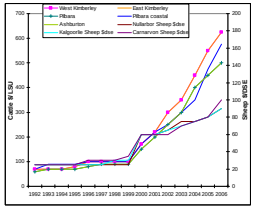
Theme	Dataset	Indicator	Example figure	WA comment	Key national finding
Landscape function	WARMS	Landscape function as assessed on WARMS sites		Most bioregions had a high proportion (>60%) of sites that had stable or increased landscape function. Some of the Yalgoo reduction is due to below average seasonal conditions.	Trends in landscape function recorded on ground based sites remained stable, given seasonal conditions. However there are disturbing trends in livestock numbers in some regions, suggesting difficulty in maintaining landscape function in these areas.
Sustainable management	WARMS	Critical stock forage Woody cover		Most bioregions had a high proportion (>70%) of sites that had stable or increased critical stock forage, based on fixed sites. Greater than 40% of sites in Yalgoo and North Kimberley 1 had reduced levels.	Vegetation species used to indicate critical stock forage have remained stable or improved in 15 regions.
	Station plans	Distance from water		The sub IBRA's of Roebourne (59%), Tallering (51%) and Western Murchison (49%) have the highest percentage of areas within 3km of water.	Distance from stock watering points also has influence on biota and areas of refugia for biodiversity, in Biodiversity theme.
	PLB annual returns ABS	Stock density		Carnarvon, Murchison and Yalgoo have reduced density. Other regions have increased or remained steady. Comparisons of ABS data and Annual return data from the PLB, indicated that ABS data consistently understated the stocking density.	The long run of good seasons in many regions has encouraged landholders to increase stock numbers, especially in the northern beef industry. This has increased the environmental risks associated with higher grazing pressures and land management agencies need to be alert to this, particularly if drier conditions are experienced.

Table 12. continued…

Theme	Dataset	Indicator	Example figure	WA comment	Key national finding
Biodiversity	WARMS	Plant species richness		Native species richness was maintained or increased at >75% of sites, apart from Victoria Bonaparte 1, where it was only 70%.	Of the data available for ACRIS, many indicators suggest continued declines in biodiversity. For example the Birds Australia Atlas project has shown declines in detection rates of bird species.
	Conservation estate			The percentage of bioregions currently conserved, ranges from 16.1% in the Nullarbor IBRA to 1% in Dampierland.	Whilst the number and extent of areas set aside for long term protection has increased in the period 2000 to 2005, there are still gaps in representativeness and adequacy.
Socio economic	Land values	Lease and improvement values		The average turnover rate of pastoral leases is about 5%, with the majority in the southern rangelands. There has been significant appreciation in Kimberley properties and to a lesser extent Pilbara and Ashburton.	Irrespective of their productivity, land values in parts of the grazed rangelands have climbed in recent years. If capital value outstrips the production value, this could threaten longer term industry viability and the ability to withstand poorer seasons, lower commodity prices and increases in interest rates.

5.3 Rangeland resource surveys

Regional resource inventory and condition surveys in Western Australia's rangelands are conducted by a combined team from DAFWA and Landgate. The surveys provide a comprehensive description and mapping of 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. Almost 85% (790, 436 km^2) of the rangelands held under pastoral lease have been surveyed. The resource information is used by many stakeholders including the pastoral industry, mining industry, government, research and conservation groups.

In 2006/07 the rangeland survey team continued to carry out fieldwork and report preparation for the Western Nullarbor survey. This survey continues on from the 1974 survey of the eastern part of the Western Australian portion of the Nullarbor Plain, and includes the Roe Plain and southern areas outside the pastoral leases. The Western Australian portion of the Nullarbor Plain was largely undeveloped for pastoralism prior to 1955, with considerable pastoral development taking place during the 1960's. There are 19 pastoral leases operating in the Western Nullarbor. Survey team members are also preparing a publication on the Lower Murchison region survey.

Photo 2. Survey team describing soil and vegetation at a site on the Nullarbor

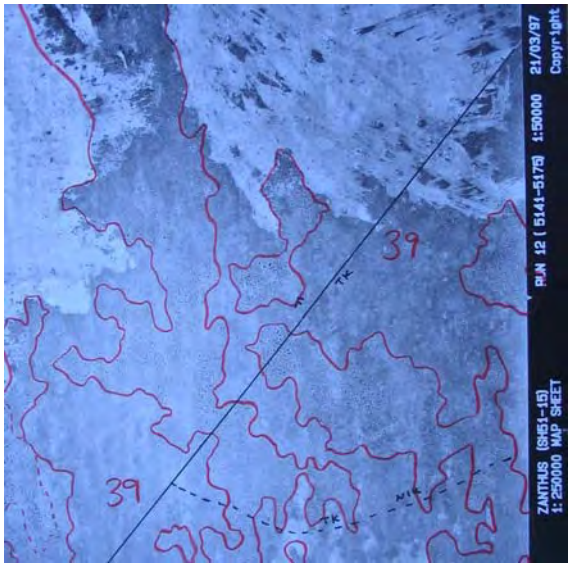


Photo 3. Aerial photo showing land system boundaries and fire scars

5.4 Pastoral lease inspection program

Pastoral lease reports

The Department of Agriculture and Food, Western Australia (DAFWA) provides advice on the State's pastoral leases to the Pastoral Lands Board under a Memorandum of Understanding. A total of 102 reports were prepared for the Board in 2006/07. Table 13 provides a summary of these reports on a district basis. Of the total number of reports, 57 constituted scheduled or sale Rangeland Condition Assessments (RCAs) and an additional four desk top assessments were conducted to allow lease transfers.

Table 13. Summary of reports to the Pastoral Lands Board in 2006/07

District Office	RCAs	Sale RCAs	Sale letters	Follow-up reports	Manage-ment plan comment	Permit comment	Other
Derby	10	1	1	-	2	1	2
Kununurra	3	-	1	1	3	-	2
Karratha	7	-	1	-	-	2	1
Carnarvon	13	7	-	4	6	8	4
Kalgoorlie	16	-	1	-	1	1	3
Total	**49**	**8**	**4**	**5**	**12**	**12**	**12**

It should be noted that this report refers to five district offices. Previously reports referred to six district offices, however the Meekatharra District Office was closed down in January 2007 and leases previously serviced by this office have been assigned to the Karratha, Carnarvon and Kalgoorlie district offices.

Land management issues

Table 14 provides the number of stations with land management and/or infrastructure issues on a district basis as identified while undertaking Rangeland Condition Assessments during 2006/07. Of the 57 stations inspected, land management issue were identified on 44 stations. In 2004/05, 62% (47 out of 76) of stations inspected had identified land management issues. This number increased in 2005/06 to 79% (56 out of 71) stations with a similar percentage (77%) in 2006/07.

Table 14. Issues identified in Rangeland Condition Assessments in 2006/07

District office	Number of stations inspected	Number of stations with issues identified	Number of stations with no issues
Derby	11	5	6
Kununurra	3	3	-
Karratha	7	6	1
Northern region	**21**	**14**	**7**
Carnarvon	20	19	1
Kalgoorlie	16	11	5
Southern region	**36**	**30**	**6**
State total	**57**	**44**	**13**

Table 15 outlines the various types of land management issues that were identified. It should be noted that more than one issue may have been identified on a station.

Table 15. Types of issues identified in Rangeland Condition Assessments in 2006/07

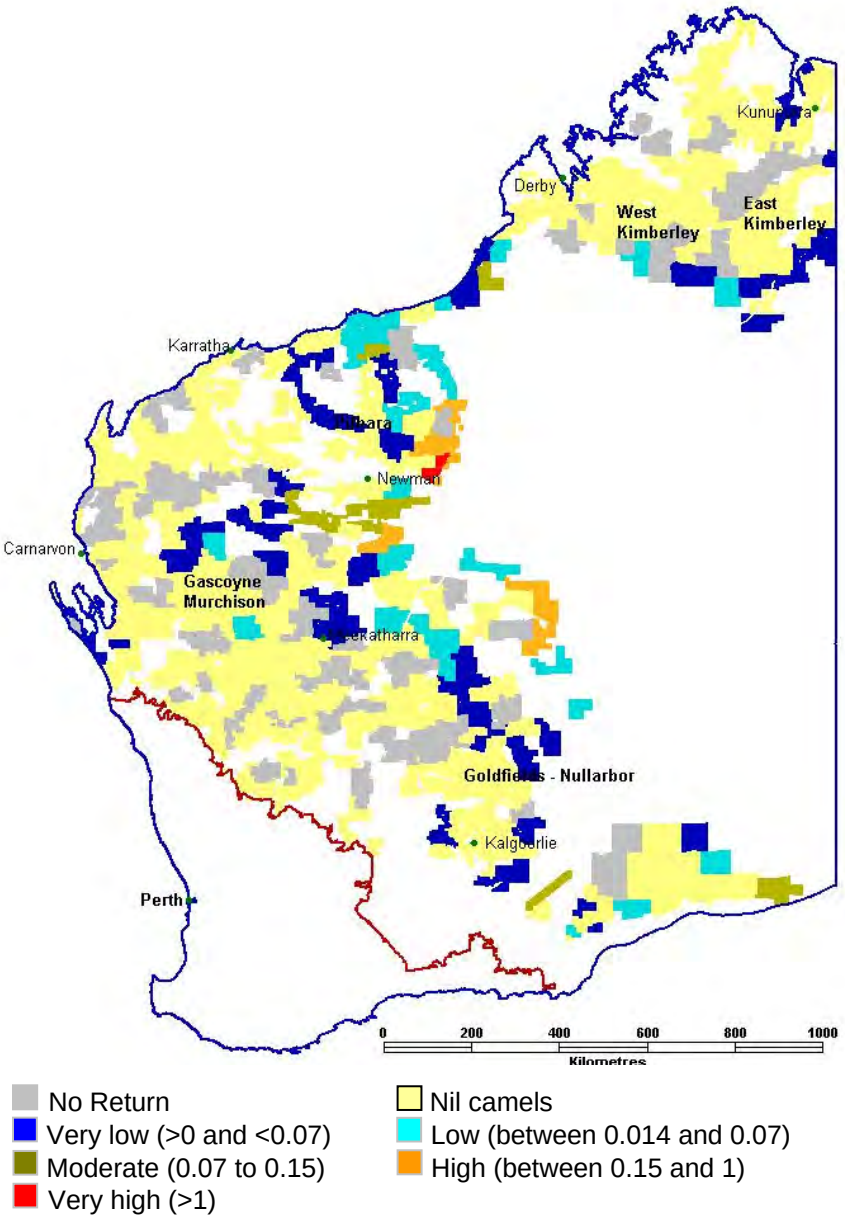
Issue	Northern Region	Southern Region
Animal management	1	-
Areas of severe degradation and erosion	1	9
Destock an area	-	1
Destock paddocks	-	1
Declared weeds	4	-
Excessive stocking rate	3	7
Fire management	-	1
Historical degradation	2	1
Infrastructure	4	3
Natural disturbances	1	-
Photo monitoring sites recommended	2	2
Rangeland degradation	8	16
Soil erosion	4	6
Unmanaged goats	-	2
Update infrastructure mapping	-	1
Vegetation decline due to overstocking	1	1
Vegetation decline near water point	1	4
Water point distribution	-	1
Woody weeds	-	1
TOTAL	**32**	**57**

Declared plants and animals are noted during Rangeland Condition Assessment inspections. Table 16 outlines the declared plants and animals that were reported in Rangeland Condition Assessments in 2006/07. Wild dogs cause significant stock losses through predation. Feral grazing animals, including donkeys, camels, horses and goats, compete with livestock for available feed, water and habitat, and can cause rangeland degradation through uncontrolled grazing. Kangaroos also cause degradation where populations have increased significantly through the provision of artificial water supplies. Invasive weeds potentially reduce land productivity and biodiversity. The most commonly reported weeds were parkinsonia, mesquite, saffron thistle, Bathurst burr and horehound. The responsibility for control of declared animals and plants rests with land managers. DAFWA provides services to assist pastoralists in co-ordinating control operations.

Table 16. Number of stations with declared plants and animals reported in Rangeland Condition Assessments in 2006/07

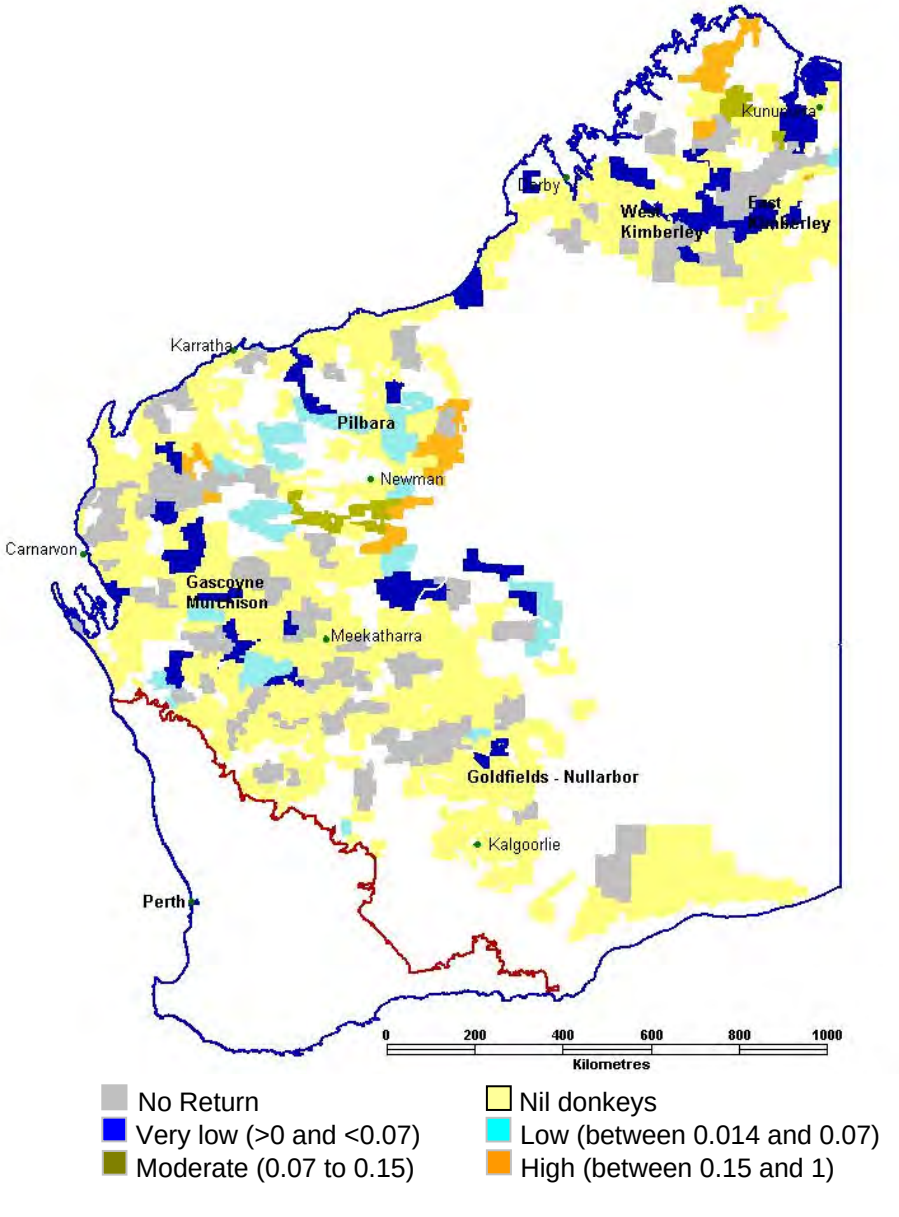
Species	West Kimberley	East Kimberley	Pilbara	Gascoyne/ Murchison	Goldfields/ Nullarbor
	Declared animals				
Wild dogs	11	2	7	8	16
Donkeys	7	-	2	-	1
Camels	1	-	4	1	3
Horses	-	-	1	-	1
Goats	-	-	-	2	7
Pigs	3	-	-	-	-
Stations with no declared animals	0	1	0	12	0
	Declared plants				
Parkinsonia	5	-	4	-	-
Mesquite	-	-	2	2	-
Saffron thistle	-	-	-	-	3
Bathurst burr	-	-	-	-	3
Horehound	-	-	-	-	3
Thornapple	-	-	-	-	2
Caloptrope	-	-	1	-	-
Chinese apple	-	-	1	-	-
Prickly cactus	-	-	-	1	-
Stations with no declared plants	6	3	1	18	12
No of stations inspected	11	3	7	20	16

Pastoral lessees report on feral herbivores and wild dogs in Annual Returns of Livestock and Improvements. Figures 19, 20 and 21 provide estimates of the densities of camels, donkeys and goats on pastoral stations based on the 2007 Annual Returns. Figure 22 shows the pastoral stations that indicated on the 2007 Annual Returns that wild dogs had impacted on their production during the past twelve months, and Figure 23 shows whether pastoral stations reported that wild dog numbers on their station had increased, decreased or remained the same within the last twelve months.



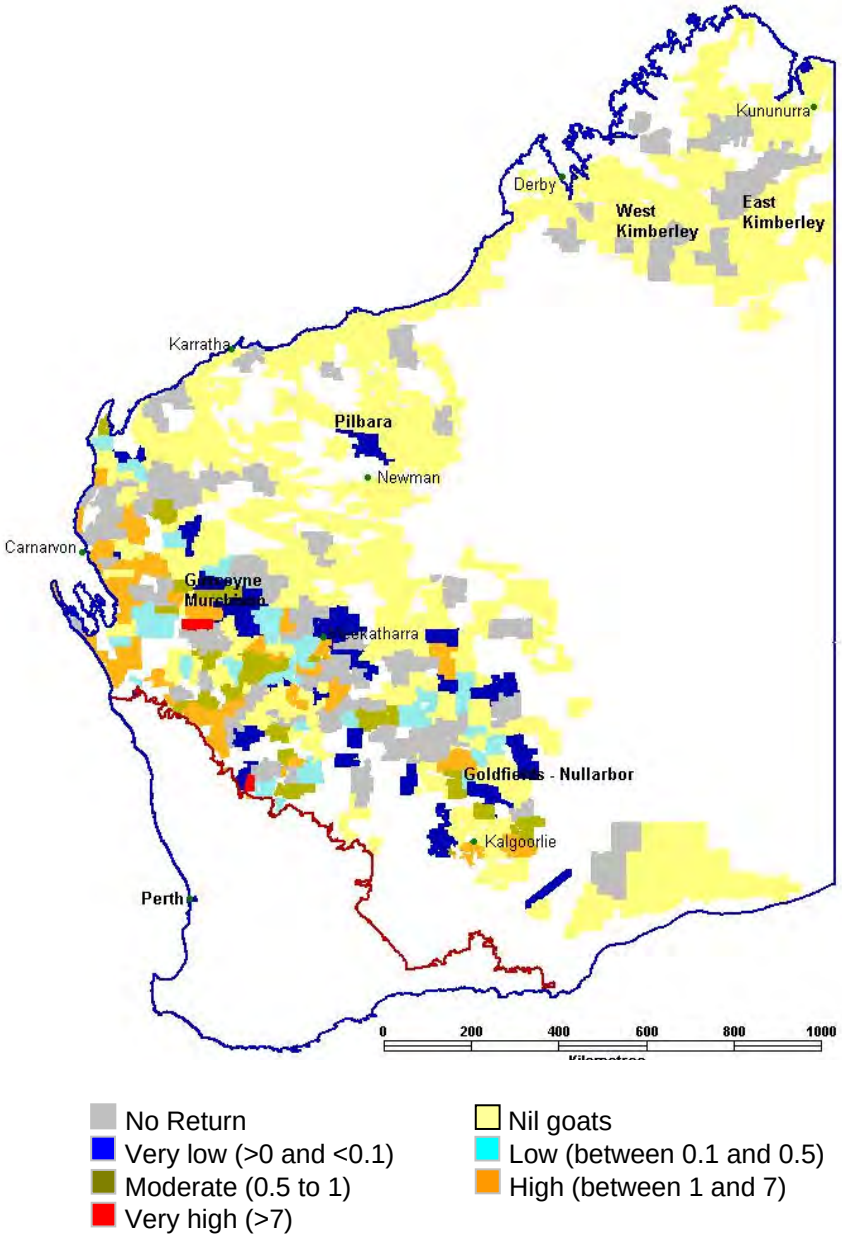
Source: 2007 Annual Return of Livestock and Improvements

Figure 19. Camel density on pastoral stations (per sq km averaged over total station area)



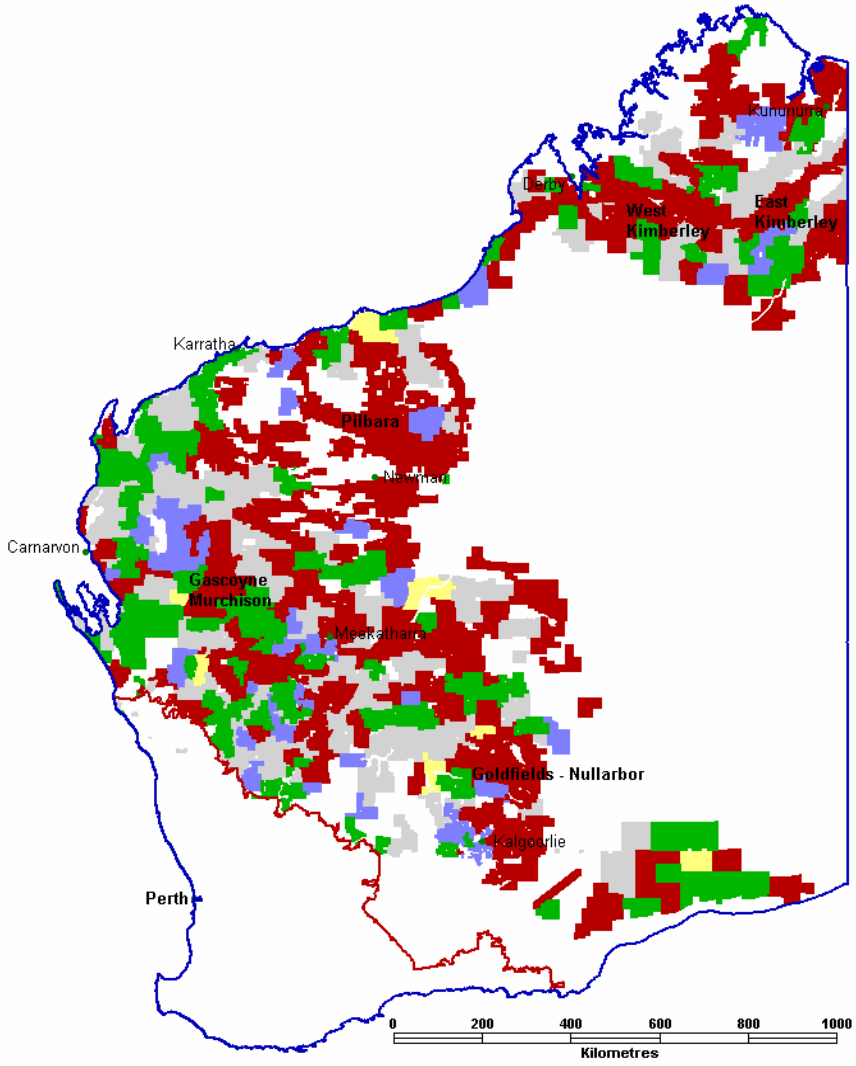
Source: 2007 Annual Return of Livestock and Improvements

Figure 20. Donkey density on pastoral stations (per sq km averaged over total station area)



Source: 2007 Annual Return of Livestock and Improvements

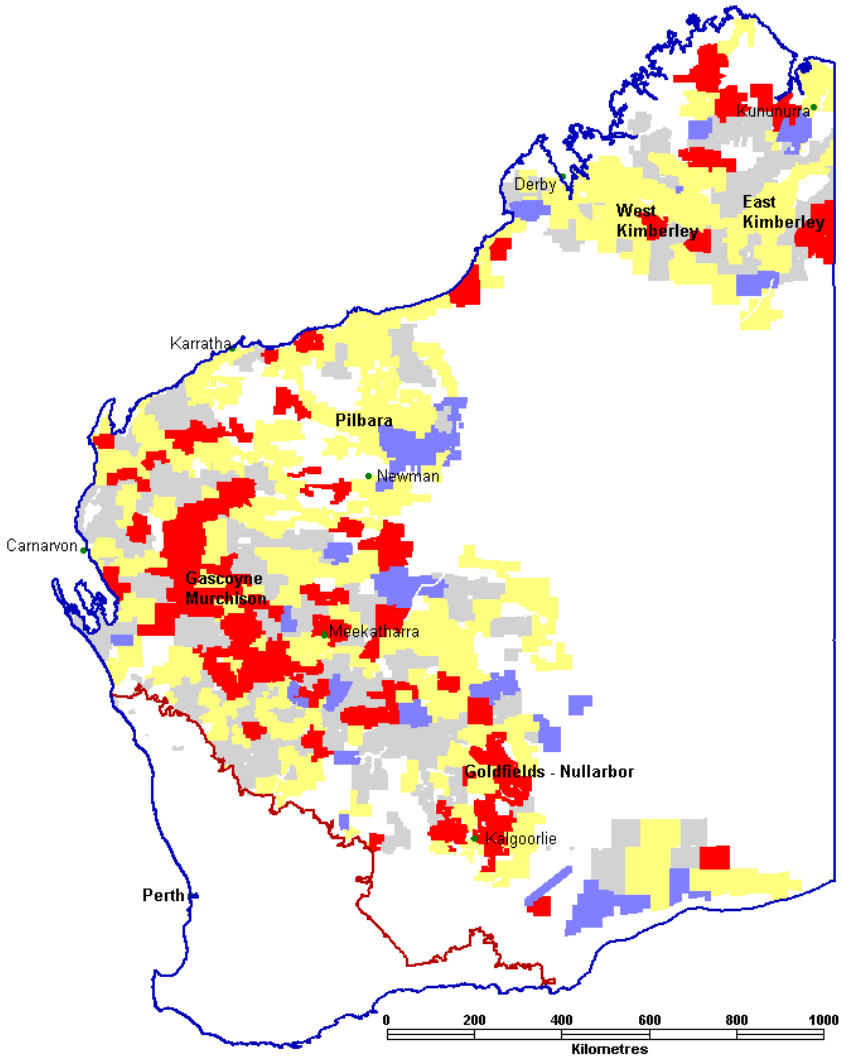
Figure 21. Goat density on pastoral stations (per sq km averaged over total station area)



No Return
No details supplied
Wild dogs did not impact production
Wild dogs did impact production
Don't know if wild dogs impacted production

Source: 2007 Annual Return of Livestock and Improvements

Figure 22. Impact of wild dogs on production in 2006/07 on pastoral stations



No Return or not completed
Numbers remained the same
Numbers decreased more than 10%
Numbers increased more than 10%

Source: 2007 Annual Return of Livestock and Improvements

Figure 23. Trend in wild dog numbers over 2006/07 on pastoral stations

Lease category

DAFWA categorises pastoral stations as a tool to assist in prioritising the inspection schedule to ensure resources are used most effectively and to introduce an appropriate follow up regime where land management issues have previously been identified.

The station categories are:

1 *Low concern* – The station has no known land management issues. A baseline inspection of the whole property will be undertaken on a six yearly cycle.

2 *Minor concern* – The station has minor land management issues. In addition to the whole property baseline inspection every six year, areas of concern will be inspected on a three yearly cycle.

3 *Moderate concern* – The station has moderate land management issues. In addition to the whole property baseline inspection every six year, areas of concern will be inspected on a two yearly cycle.

4 *High concern* – The station has significant land management issues. In addition to the whole property baseline inspection every six year, areas of concern will be inspected on an annual cycle.

Table 17 provides the number of pastoral stations in each category on a district basis for 2006/07, and identifies if there has been an increase or decrease in the number of stations in that category since the previous year.

Table 17. Number of stations within each category and change in 2006/07

District Office	No. of stations	Category 1		Category 2		Category 3		Category 4	
		No.	Change	No.	Change	No.	Change	No.	Change
Derby	56	28	- 2	22	+ 4	6	- 2	0	-
Kununurra	39	23	-	11	- 2	5	+ 2	0	-
Karratha	64	36	- 3	22	+ 3	6	-	0	-
Carnarvon	162	42	- 3	75	+ 7	43	- 4	2	-
Kalgoorlie	143	59	- 3	52	+ 2	25	+ 1	7	-
State	**464**	**188 41%**	**- 11**	**182 39%**	**+ 14**	**85 18%**	**- 3**	**9 2%**	**0**

Range condition trend

Traverse assessments of range condition are undertaken during the Rangeland Condition Assessment inspection. A Range Condition Index (RCI) is derived from the traverse assessments. RCI values range from 1 (good) to 3 (poor). The average RCI of stations inspected in 2006/07 was 1.79.

Figure 24 shows the Range Condition Index for pastoral stations at the most recent assessment. 98 stations indicate on average good condition, 153 stations indicate on average good to fair range condition, 108 stations indicate on average fair to poor range condition and 16 stations indicate on average poor range condition.

Assessments of range condition during inspections are compared to the previous assessments made during rangeland resource surveys or on previous lease inspections to provide an indication of range condition trend. Some stations have not previously been covered by rangeland surveys, and in some cases a direct comparison can not be made because the assessment route was significantly different or the methodology used for assessments has changed (some surveys date back to 1969/1970) and results can't be directly compared. Figure 25 shows changes in the Range Condition Index between rangeland surveys and inspections. 124 stations had a positive change in overall range condition with 20 stations indicating a large positive change, 44 stations indicating a moderate positive change and 60 stations indicating a small positive change. 66 stations had a negative change in overall range condition with 2 stations indicating a large negative change, 24 stations indicating a moderate negative change and 40 stations indicating a small negative change. 98 stations indicated no significant change in overall range condition. Comparison of RCI values at survey (1972 to 1998) and subsequent inspection for all pastoral stations indicates a marginal improvement from 1.84 to 1.76.

Of the 50 stations inspected in 2006/07 where range condition trend could be assessed, 26 stations improved in range condition, 16 had no significant change and 8 declined in range condition (Table 18). In 2004/05, of the stations that could be assessed, 37% showed an improvement in range condition, 38% had no significant change and 25% declined. The 2005/06 assessments showed a significant overall improvement in range condition with 54% of stations having improved, 31% with no significant change and 15% declined. The 2006/07 assessments indicate a similar result with 52% of stations improved, 32% with no significant change and 16% declined.

Table 18. Trends in range condition from Rangeland Condition Assessments in 2006/07

Office	Improved	No significant change	Declined	Unable to assess	Total RCAs
Derby	8	1	1	1	11
Kununurra	-	2	1	-	3
Karratha	3	3	1	-	7
Carnarvon	9	7	4	-	20
Kalgoorlie	6	3	1	6	16
Total	**26**	**16**	**8**	**7**	**57**

When split between the northern and southern rangelands the 2006/07 figures indicate that, of the stations that could be assessed, in the northern rangelands 55% improved in range condition, 30% indicated no significant change and 15% declined in range condition. In the southern rangelands, 50% improved in range condition, 33% indicated no significant change and 17% declined in range condition.

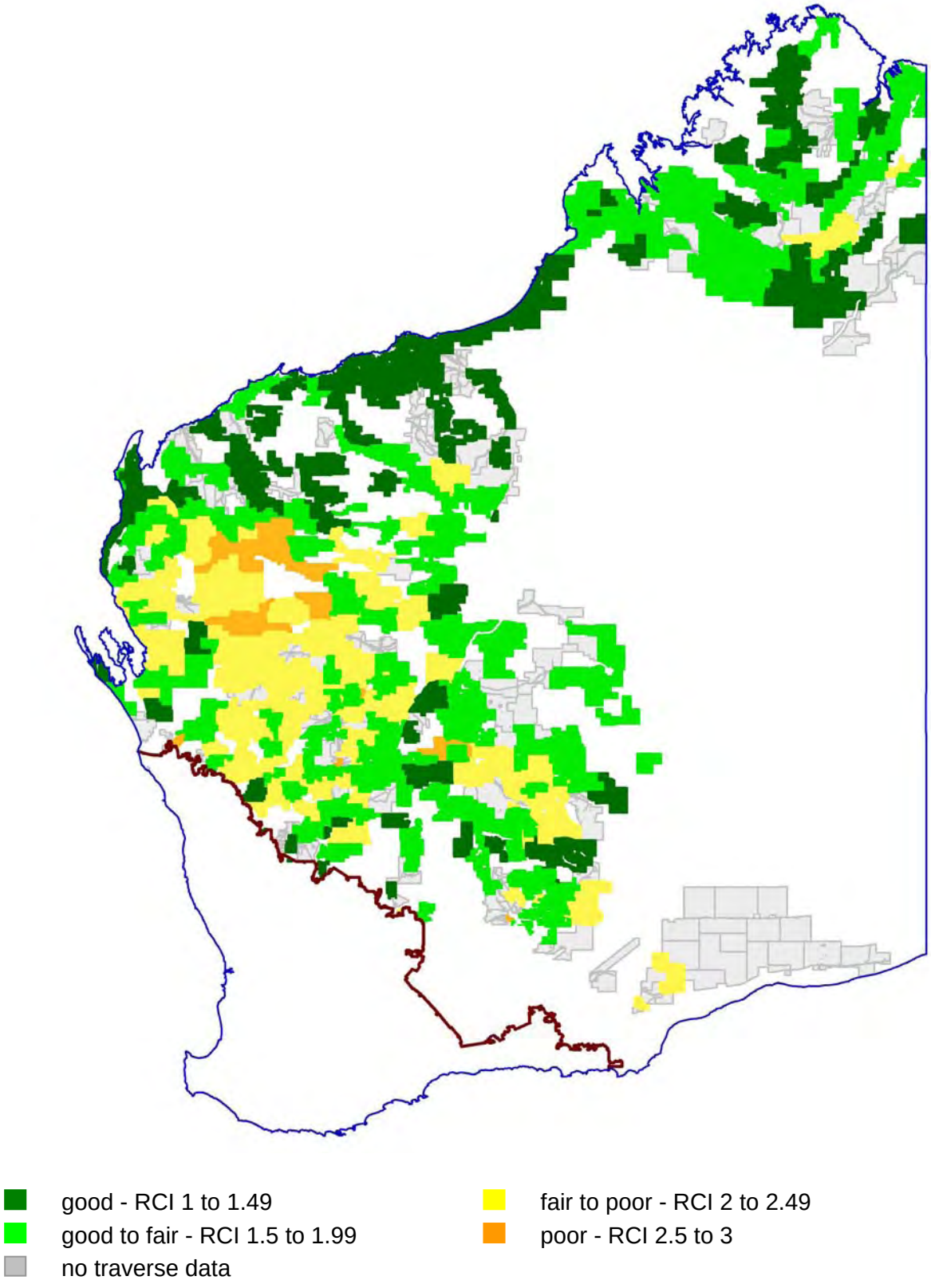
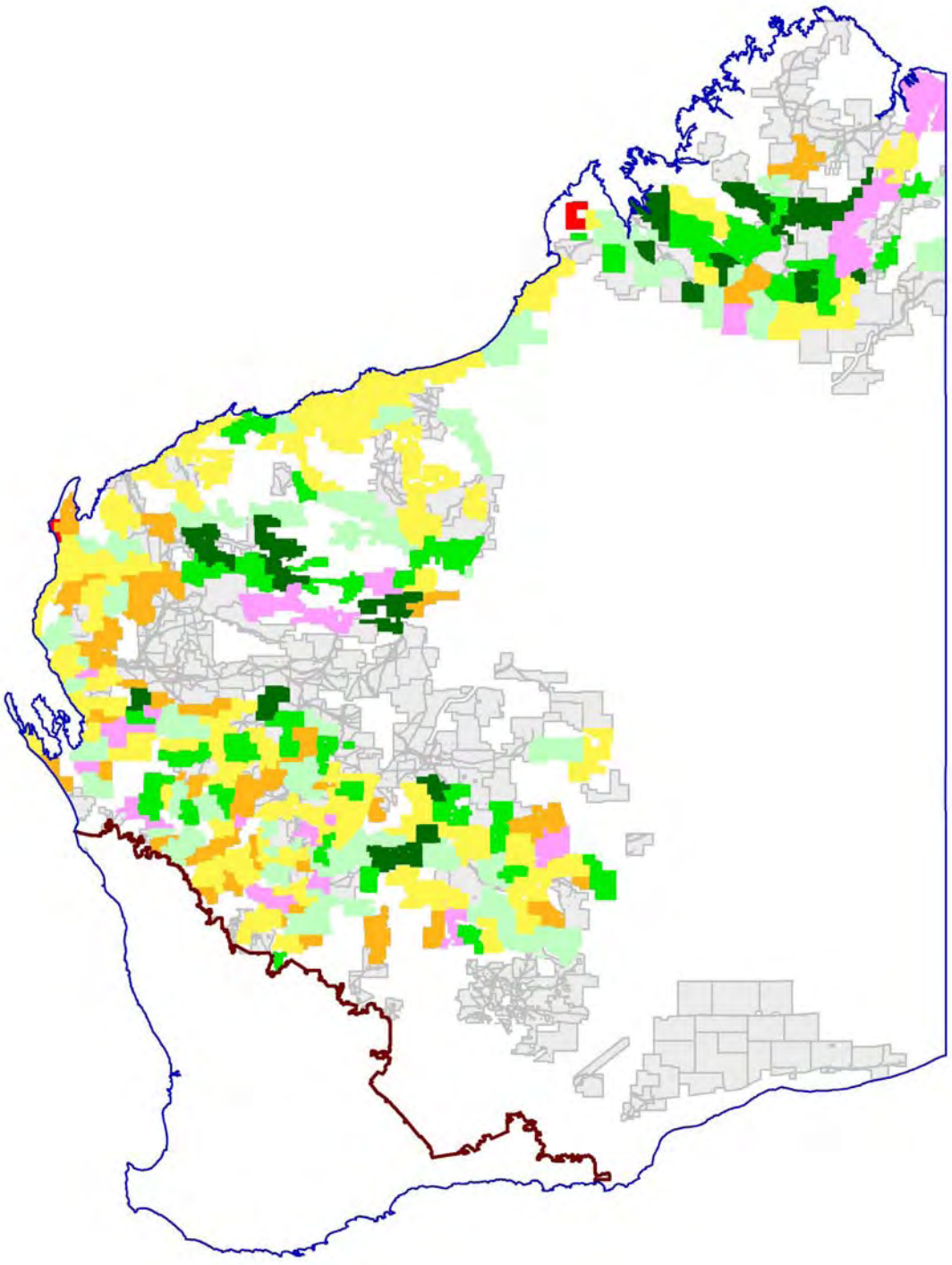


Figure 24. Range Condition Index (RCI) at last inspection (inspection can be between 1999 and June 2007)



large positive change (>0.5)
moderate positive change (0.25 to 0.5)
small positive change (0.1 to 0.25)
no significant change (0.1 to -0.1)
large negative change (<-0.5)
moderate negative change (-0.25 to -0.5)
small negative change (-0.1 to -0.25)

Note: Traverse data from the Gascoyne survey is not comparable with current traverse technique and the Wiluna-Meekatharra survey did not incorporate a traverse technique.

Figure 25. Changes in Range Condition Index between survey (1972 to 1998) and inspection (1999 to 2007)

5.5 Trends in stock numbers compared to Potential Carrying Capacity

Sustainable use of pastoral land is largely determined by stocking levels. The distribution of stock, and the intensity and length of grazing must be controlled to prevent land degradation and allow vegetation to regenerate. Comparison of actual stocking levels to potential carrying capacity can be used as an indicator of sustainable use.

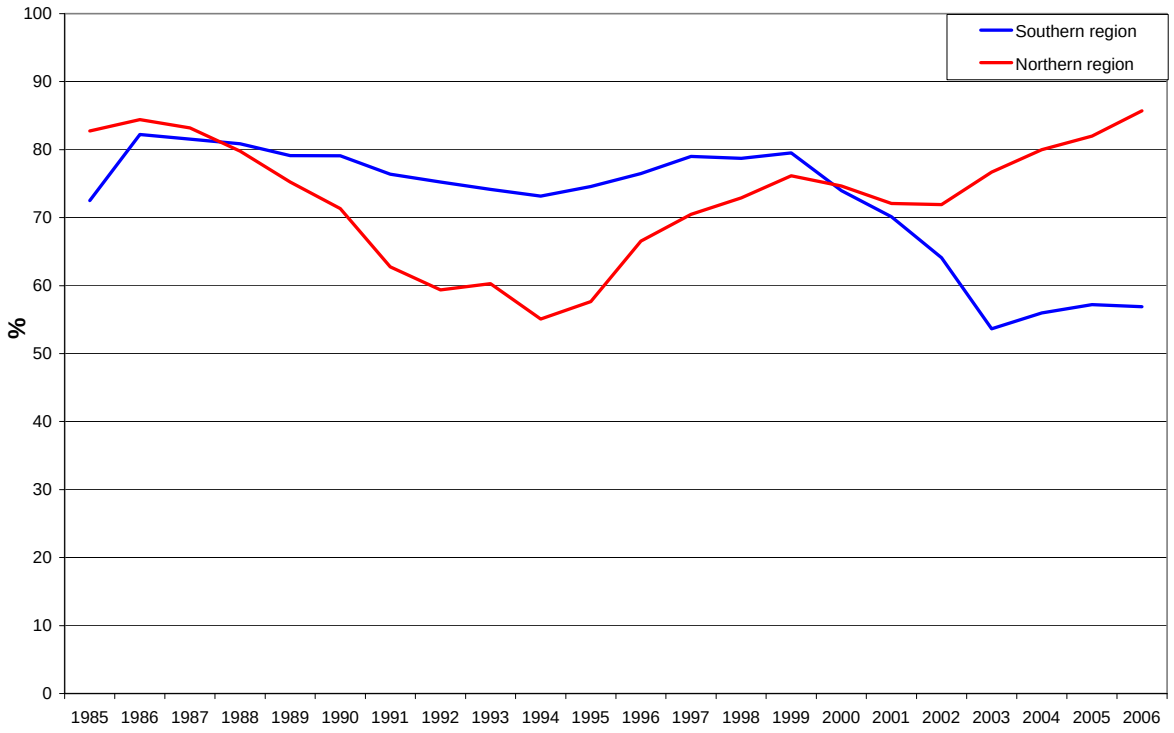
Potential Carrying Capacity is derived from estimates of stocking rates which each rangeland type, in its original condition, can support on a long term basis without damage to the rangeland resource. The area of these rangeland types on each pastoral station is derived from rangeland survey information, and together with the estimated stocking rate is used to calculate Potential Carrying Capacity of the station. The Potential Carrying Capacity assumes the capacity of the land to produce forage has not been reduced and that water point distribution is sufficient to ensure that all pastures on the station are able to be grazed all year round.

Figure 26 shows the trend in stock numbers carried on pastoral stations compared to Potential Carrying Capacities of the stations for the southern and northern rangeland regions, and Figure 27 shows the trend by pastoral district. There has been an increasing trend towards potential carrying capacities in the Kimberley and Pilbara districts since the mid 1990s. Since 2001-2002 there has been a decreasing tend in the Gascoyne, Murchison and Goldfields-Nullarbor.

Figure 28 shows the percentage of actual stock numbers to Potential Carrying Capacity for all pastoral stations across the rangelands. Table 19 provides a summary of the number of stations in each percentage stocking class by district office.

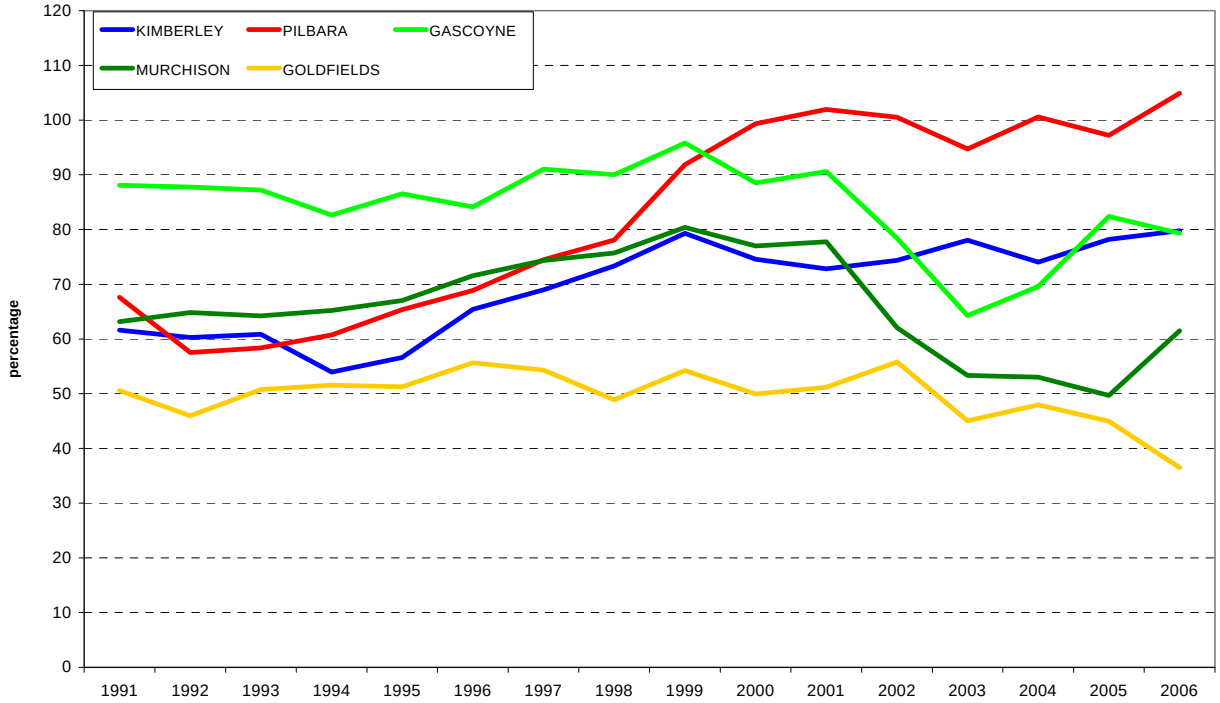
Table 19. Number of stations in each actual to potential stocking class in 2005/06

District Office	Destocked	1-25%	26-50%	51-75%	76-100%	100-125%	126-150%	over 150%
Derby	3	5	8	11	12	8	3	4
Kununurra	1	7	7	5	7	8	1	2
Karratha	1	1	8	13	13	9	4	10
Carnarvon	5	23	38	40	25	11	7	6
Kalgoorlie	21	46	29	25	7	4	1	2
Total	**31**	**82**	**90**	**94**	**64**	**40**	**16**	**24**



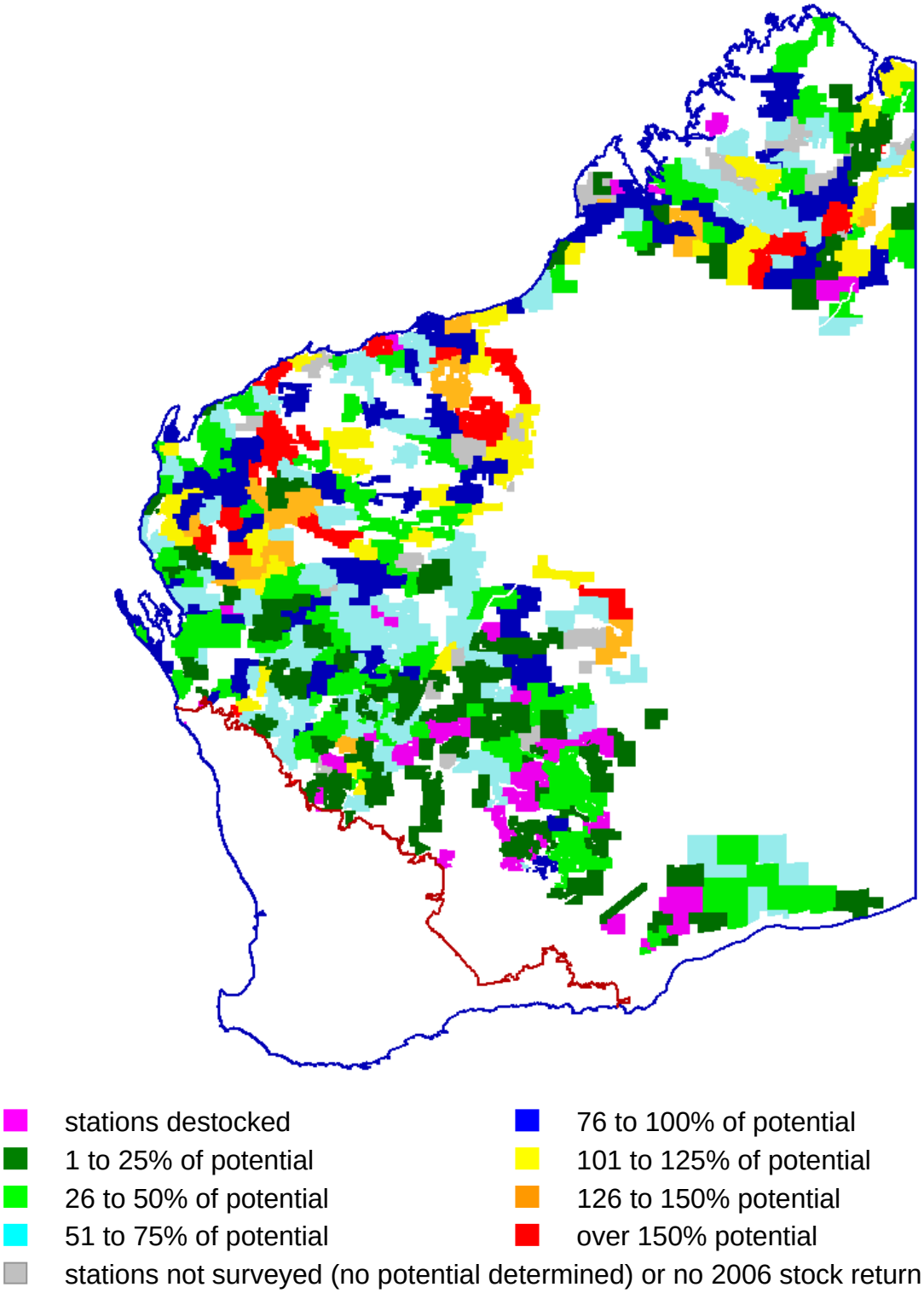
Source: Annual Return of Livestock and Improvements

Figure 26. Percentage of actual to potential stock units aggregated by region



Source: Annual Return of Livestock and Improvements

Figure 27. Percentage of actual to potential stock units aggregated by district



Source: 2006 Annual Return of Livestock and Improvements

Figure 28. Distribution of stations by percentage of actual to potential stock units