

PASTORAL LAND BOARD

ANNUAL REPORT 2003/2004



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CHAIRMAN'S FOREWORD

As Chairman of the NT Pastoral Land Board I have great pleasure in presenting the Annual Report of the Board for 2003/2004.

Achievements for the 2003/2004 year include:

- An extensive review of the Pastoral Land Clearing Guidelines to ensure consistency with clearing controls under the *Planning Act*. Revised Guidelines were published in April 2004.
- Adoption of a process to be used in the development of voluntary management plans or remedial plans to address land condition issues and/or a declining trend in land condition.
- A formal decision of the Board to abandon the proposal to require pastoral lessees to provide stock numbers in a mandatory annual stock return.
- The development and implementation of management plans to address identified land condition issues on specific properties.
- Continued implementation and monitoring reassessments under the Tier 1 and Tier 2 monitoring programs.

The Northern Territory pastoral estate is about 619,000 km² in size. The gross value of production for the NT cattle industry was estimated at \$200.47 million in 2003, which represents 46% of the total Territory rural industries and fisheries production.

The Pastoral Land Board has the important function of monitoring the condition and changes in rangeland conditions and facilitating the sustainable use of pastoral land. The Board is committed to ensuring the Territory's pastoral resources are maintained at their current level of range condition, and where possible improve in condition.

The Board received a comprehensive report from its Advisory Committees covering regional land condition issues for 2003/2004. Information in this report has assisted greatly in preparation of the Board's Annual Report. Monitoring reports will continue to be of assistance as the programs progress and as more comparative data becomes available.

The Board would like to thank its Executive Officer, Ms Judy Bartolo, members of the Pastoral Land Board Advisory Committees and all those individuals who have given the Board invaluable support, assistance and advice. With this ongoing support the Board can continue to work towards sustainable use of pastoral land in the Northern Territory.



Jim Forwood, AM
Chairman
NT Pastoral Land Board

MEMBERSHIP OF THE BOARD

CHAIRMAN

James Bower Forwood 2 year term as Chairman – expired 25 June 2004
Reappointed for a term of 3 years expiring 25 June 2007

MEMBERS

Russell William Anderson 3 year term – expiring 25 June 2005
John Reginald Childs 3 year term – expired 25 June 2004
Reappointed for a term of 3 years expiring 25 June 2007
Steven Craig 3 year term – expiring 25 June 2005
James Alexander Hayes 3 year term – expiring 25 June 2005

EXECUTIVE OFFICER

Judy Bartolo

FUNCTIONS OF THE PASTORAL LAND BOARD

Section 29 of the *Pastoral Land Act* outlines the functions of the Board:

- [a] to report regularly to, and as directed by, the Minister, but in any case not less than once a year, on the general condition of pastoral land and the operations of the Board;
- [b] to consider applications for the subdivision or consolidation of pastoral land and make recommendations to the Minister in relation to them;
- [c] to plan, establish, operate and maintain systems for monitoring the condition and use of pastoral land on a District or other basis;
- [d] to assess the suitability of proposed new pastoral leases over vacant Crown land;
- [e] to direct the preparation, and monitor the implementation of, remedial plans;
- [f] to monitor, supervise or cause to be carried out work in relation to the rectification of degradation or other damage to pastoral land;
- [g] to monitor the numbers and effect of stock and feral and other animals on pastoral land;
- [h] to monitor and administer the conditions to which pastoral leases are subject;
- [j] to make recommendations to the Minister on any matter relating to the administration of the Act;
- [k] to hear and determine all questions, and consider and make recommendations on all matters, referred to it by the Minister; and
- [m] such other functions as are imposed on it by or under the *Pastoral Land Act* or any other Act or as directed by the Minister.

Other functions outlined in the Act include:

- [I] to determine applications for clearing pastoral land [section 38(1)(h)]
- [II] to consider breaches of conditions referred by the Minister [section 41]
- [III] to consider and make recommendations to the Minister on applications for conversion of term pastoral leases to perpetual tenure [section 62]
- [IV] to administer the access provisions of the Act, including nomination of access routes under PART 6
- [V] to determine applications for non pastoral use of pastoral land [PART 7].

MEETINGS OF THE BOARD HELD DURING 2003/2004

Five meetings of the Pastoral Land Board were held during 2003/2004:

- **The 54th Meeting was held in Tennant Creek on 3 July 2003**

Prior to the meeting, the Board undertook a field trip visiting 6 properties in the Barkly Pastoral District. Matters considered at the Board meeting included a request from the Minister to review the Pastoral Land Clearing Guidelines to ensure consistency with the *Planning Act*, a discussion paper on relating land condition to grazing management and stocking rates, action to be taken in respect of land condition issues on several properties, and preliminary consideration of applications to clear pastoral land.

- **The 55th Meeting was a Teleconference held on 11 September 2003**

The Board considered an application to sub lease part of a pastoral lease.

- **The 56th Meeting was a Teleconference held on 27 October 2003**

The Board determined an application for non pastoral use of pastoral land, gave further consideration to four applications to clear on pastoral land and discussed requirements for submission of property management plans in respect of proposed land clearing development as part of the application process.

- **The 57th Meeting was held in Darwin on 3 December 2003**

Prior to the meeting, the Board undertook two property inspections as part of its investigations for clearing applications. Matters considered at the Board meeting included further consideration of four clearing applications, determination of two non pastoral use applications, a progress report on implementation of voluntary managements on three properties, a progress report on addressing land condition issues on four properties and further action required, and the review of the Pastoral Land Clearing Guidelines. The Board also held discussions with the NT Cattlemen's Association, and departmental representatives from the Natural Resource Management Division of the Department of Infrastructure, Planning and Environment. The Board also received a briefing on the current status of *Mimosa pigra* on pastoral lands of the Northern Territory.

- **The 58th Meeting was held in Alice Springs on 5 & 6 May 2004**

The Board determined four applications to clear pastoral land, and gave preliminary consideration to an application to convert a term lease to perpetual tenure. In addition, the Board considered progress reports in respect of implementation of voluntary management plans on various properties, implementation of the revised Pastoral Land Clearing Guidelines, and adopted a new approach for development of management plans to address land condition issues (refer to Policy Issues and New Initiatives on page 6). The Board also considered a preliminary draft discussion paper on the review of the *Pastoral Land Act*. A briefing was given by the Department of Business, Industry and Resource Development on grazing management studies being undertaken by that department and the Board visited Owen Springs Station with a briefing on proposed future land use for the property.

PASTORAL LAND BOARD ADVISORY COMMITTEES

The Pastoral Land Board Advisory Committee was formed in 1992 to assist the Board in the design of a rangeland monitoring system and to coordinate the activities of the separate government agencies with responsibility for the monitoring of pastoral land condition.

TERMS OF REFERENCE AND OBJECTIVES

[Reviewed and endorsed in September 1998]

1. To recommend the options for monitoring range condition and trend throughout the Territory.
2. To coordinate technical advice to the Pastoral Land Board in relation to the monitoring of the condition and trend of pastoral land.
3. To report regularly on a District and quantitative basis, on the condition and trend of pastoral land including evaluation and interpretation of available data, and where required on specific issues through the Chairman of the Advisory Committee to the Pastoral Land Board.
4. To rank areas of the Territory in terms of their priority for attention and their susceptibility to land degradation and to recommend to the Board those areas which are in need of immediate attention.
5. To provide advice to the Pastoral Land Board on other matters as and when required.

A separate Advisory Committee was formed for Central Australia in 2001, to ensure regional officers are actively involved in providing technical advice and recommendations to the Board on pastoral land management issues for central Australia (Barkly, Tennant Creek, Plenty, Northern Alice Springs and Southern Alice Springs Pastoral Districts).

In 2003, membership of the northern Advisory Committee was restructured to include relevant departmental officers from the Katherine region. This has resulted in greater participation by regional officers on the Advisory Committee.

TERMS OF REFERENCE FOR THE ADVISORY COMMITTEE FOR CENTRAL AUSTRALIA:

To provide technical advice and recommendations on pastoral land management issues for central Australian pastoral districts. This falls into 3 main categories:

1. Pastoral Land Monitoring Programs

- Make recommendations to the Pastoral Land Board on options for the further development and implementation of the Pastoral Land Monitoring Programs for central Australian pastoral districts.
- Co-ordinate technical advice to the Pastoral Land Board on the monitoring of pastoral land conditions and trend throughout central Australian pastoral districts.

2. Reporting Requirements

Provide regional input to reports to the Pastoral Land Board including the Annual Regional Land Condition Report.

3. Advice on other issues

- Provide advice to the Pastoral Land Board on other matters as required.
- Consider policy issues relevant to pastoral land management in central Australian pastoral districts including:
 - Reporting on the need for any policy reviews to the Chairman of the Advisory Committee;
 - Development of policy papers specific to central Australian pastoral districts;
 - Providing regional input on Territory – wide policy reviews.

Throughout the year, issues considered by both Advisory Committees included:

- Recommendations to the Board on applications to clear pastoral land and the appropriateness of pasture species to be planted.
- Technical advice and data in response to the Board Discussion Paper: “An approach to Relating Land Condition to Grazing Management”.
- Production of the annual pastoral land condition report.

POLICY ISSUES & NEW INITIATIVES

REVISED GUIDELINES FOR CLEARING PASTORAL LAND

Under the *Pastoral Land Act*, all pastoral leases are subject to a condition that clearing can only be undertaken with the written approval of the Pastoral Land Board, or in accordance with the Board’s guidelines. The Board first introduced clearing guidelines in 1992.

In November 2002, Territory wide native vegetation clearing controls were introduced under the *Planning Act*. Pastoral land was excluded from these new controls.

In April 2003, the then Minister for Lands and Planning requested the Pastoral Land Board review its existing “Guidelines for Clearing Pastoral Land” to include a public notification and assessment process consistent with that utilised under the native vegetation clearing controls introduced under the *Planning Act*.

An extensive review of the Pastoral Land Clearing Guidelines was undertaken to ensure consistency with the Territory wide clearing controls. Revised guidelines were published in April 2004 following endorsement by the Minister for Lands and Planning. Major changes are:

- Adoption of the NT Land Clearing Guidelines (as may be amended from time to time) as the technical guidelines to apply to all clearing on pastoral land.
- Revised application form.
- A requirement for preparation of a property management plan for land clearing development.
- Introduction of a fee of \$120 for pastoral land clearing applications.
- Public notification processes inviting public submissions on all pastoral land clearing applications (notice to be published in the NT News & regional newspapers, and details of the clearing application to be posted on the departmental web site).
- Revised agency consultation processes consistent with departmental processes for clearing applications on other land tenures.
- Copies of all agency comments and public submissions to be given to the applicant with an opportunity to address any issues of concerns.
- Hearing of the Board to invite the applicant and any person who lodged a submission to address the Board.
- Inclusion of matters to be taken into account by the Board similar to assessment criteria under the *Planning Act*.
- Documentation for pastoral land clearing approvals to include a permit, approved clearing plan and approved property management plan for land clearing development.
- Term of approvals (permit to outline periods for commencement and completion of clearing works).
- Register of Pastoral Land Clearing Determinations to be available for public viewing.

Copies of the revised Pastoral Land Clearing Guidelines were sent to all pastoral lessees and station managers in April 2004.

METHODOLOGY TO BE ADOPTED TO ADDRESS IDENTIFIED LAND CONDITION ISSUES & GRAZING MANAGEMENT STRATEGIES

In September 2000, the Pastoral Land Board proposed a policy initiative to seek lodgement of annual stock returns by all pastoral lessees as it believed that it was necessary for the Board to obtain accurate information on stock numbers to enable it to perform its statutory function of monitoring the condition of pastoral land.

The proposal was strongly opposed by the NT Cattlemen's Association (NTCA) with objections being received from the NTCA Executive as well as from individual pastoralists. Concern was expressed regarding stock returns being compulsory, the lack of consultation, and suspicion about how the information would be used.

During 2001, discussions were held with individual branches of the NTCA. Agreement was reached that the proposal for compulsory returns would be put on hold pending evaluation of whether the voluntary submission of stock numbers as part of routine Tier 1 monitoring assessments was successful.

In October 2002, Board member John R Childs prepared a draft Discussion Paper: An Approach to Relating Land Condition to Grazing Management. The purpose was to provide an alternative to requesting pastoral lessees to provide annual stock numbers as a basis of determining stocking pressure on individual leases, particularly when investigating land condition issues that may arise.

This paper was referred to the Pastoral Land Board Advisory Committees for comment and to provide the Board with information on the level of information currently available to enable the development of carrying capacities for the grazing land systems of the Territory.

In May 2004, the Board formally resolved:

- The process described in the paper "An Approach to Relating Land Condition to Grazing Management" be utilised in the development of voluntary management plans, or remedial plans required by the Board under the *Pastoral Land Act*, to address identified land condition issues and proposed management to rehabilitate the land.
- To abandon the proposal to collect stock numbers by requiring pastoral lessees to submit an Annual Stock Return to the Board.

In adopting this methodology, the Board recognised:

- The approach is only to be used where property inspections, Tier 1 or Tier 2 monitoring identify degradation or a declining trend in land condition.
- Carrying capacities are already being determined on a property basis for pastoral leases in the Northern Territory.
- This approach refines the determination of carrying capacities to include year-to-year variation and property condition scores. That is, it separates seasonal effect from grazing management effect.
- The purpose of using this approach is to improve the preparation of management plans to address identified land condition issues.

In June 2004, the Board requested implementation of the revised approach by officers of the Pastoral Land Management Branch, Department of Infrastructure, Planning and Environment in all cases where action is required to address land degradation or declining trends in land condition. The Board also wrote to the Minister, NT Cattlemen's Association, and relevant government agencies advising the adoption of this new initiative and the decision to abandon the previous proposal to require compulsory submission of an annual stock return.

MORATORIUM ON LAND CLEARING IN THE DALY REGION

In November 2003 the Hon Clare Martin MLA, Chief Minister of the Northern Territory, announced the establishment of a Community Reference Group to develop a draft Integrated Regional Land Use Plan for the 'Daly Region'.

The Chief Minister also advised that there would be no new land clearing approved in the 'Daly region' until the draft Integrated Regional Land Use Plan was completed. There have been no applications lodged to clear pastoral land within the 'Daly Region' since the announcement of the moratorium on 9 November 2003.

REVIEW OF THE PASTORAL LAND ACT

In May 2004, a preliminary draft of a discussion paper to review the *Pastoral Land Act* was referred to the Board for comment and input prior to its public release. It is envisaged the Pastoral Land Board will play a key role in the review of the *Pastoral Land Act*.

REPORT ON PASTORAL LAND MONITORING PROGRAMS

MONITORING PROGRAMS

The Pastoral Land Board, the pastoral industry and the Northern Territory government are working together to maintain or improve the condition of the Territory's pastoral land. This land, held as pastoral leases, comprises around 46% of the Territory. Maintenance of this natural resource in good condition is essential for a profitable and sustainable pastoral industry.

Monitoring and reporting on the condition of pastoral land is a key function of the Pastoral Land Board under the *Pastoral Land Act*. The Board is also responsible for instigating remedial action to restore pastoral land condition. In support of the Board, the Department of Infrastructure, Planning and Environment operates a two-tiered pastoral land monitoring system. Both tiers of the monitoring program aim to assist pastoralists in making better management decisions.

The Tier 1 program uses photos and visual assessment of photo-point sites to assess pastoral land condition and changes in condition over time. Pastoralists are being encouraged to use the photo-point sites to become more aware of pasture plants and the level of pasture use by stock. This in turn will help them better manage their livestock and land.

Tier 2 programs are designed to provide an objective assessment of pastoral land condition using remote sensing and ground-based assessment methods.

ESTABLISHMENT AND REASSESSMENT OF TIER 1 PHOTO-POINT MONITORING SITES

The Tier 1 monitoring program commenced in 1993. By 30 June 2004, a total of 2186 Tier 1 photo-point monitoring sites had been established on 221 properties¹, which includes 70 monitoring sites on 11 properties held under other tenure such as Crown leases and Aboriginal land. Generally, at least one site is located in each paddock on a preferred grazing land system. These sites will provide a bench mark for pastoralists to assess pasture changes over time.

During 2003/2004, a total of 674 monitoring sites were reassessed on 67 properties and 5 new monitoring sites were established.

Table 1 below, summarises the establishment and reassessment of Tier 1 photo-point monitoring sites. The map at Figure 1 on page 9 outlines the property locations of these sites and the history of the establishment of Tier 1 monitoring sites and re-assessment.

¹ A total of 2192 Tier 1 monitoring sites on 222 properties were reported in the 2002/2003 Annual Report. During 2003/2004 tenure changed for one property previously held under pastoral lease tenure and as the property is no longer used for pastoral activities, monitoring data (11 sites) has been removed from the Tier 1 statistics.

Pastoral District	Total No of Sites	No of Properties <i>[with Tier 1 sites]</i>	Average Sites/Property	New Sites Established 2003/2004	Reassessed 2003/2004	
					Sites	Properties
DARWIN 20 Pastoral Leases in District	141	20	7	0	46	6
KATHERINE 7 Pastoral Leases in District	49	7	7	0	31	4
ROPER 10 Pastoral Leases in District	49	10	5	0	3	1
VRD 25 Pastoral Leases in District	320	25	13	1	51	5
STURT PLATEAU 26 Pastoral Leases in District	173	25	7	1	44	7
GULF 19 Pastoral Leases in District	120	18	7	0	6	1
BARKLY 30 Pastoral Leases in District	433	30	14	3	318	23
TENNANT CREEK 8 Pastoral Leases in District	76	8	9	0	26	3
PLENTY 14 Pastoral Leases in District	157	14	11	0	33	4
NORTHERN ALICE SPRINGS 30 Pastoral Leases in District	327	29	11	0	32	3
SOUTHERN ALICE SPRINGS 26 Pastoral Leases in District	271	24	11	0	83	9
OTHER TENURE <i>[All Districts] Aboriginal Land and Crown Leases</i>	70	11	6	0	1	1
TOTALS	2186	221	10	5	674	67

Table 1: Tier 1 Photo-point Monitoring Sites established and reassessed 2003/2004

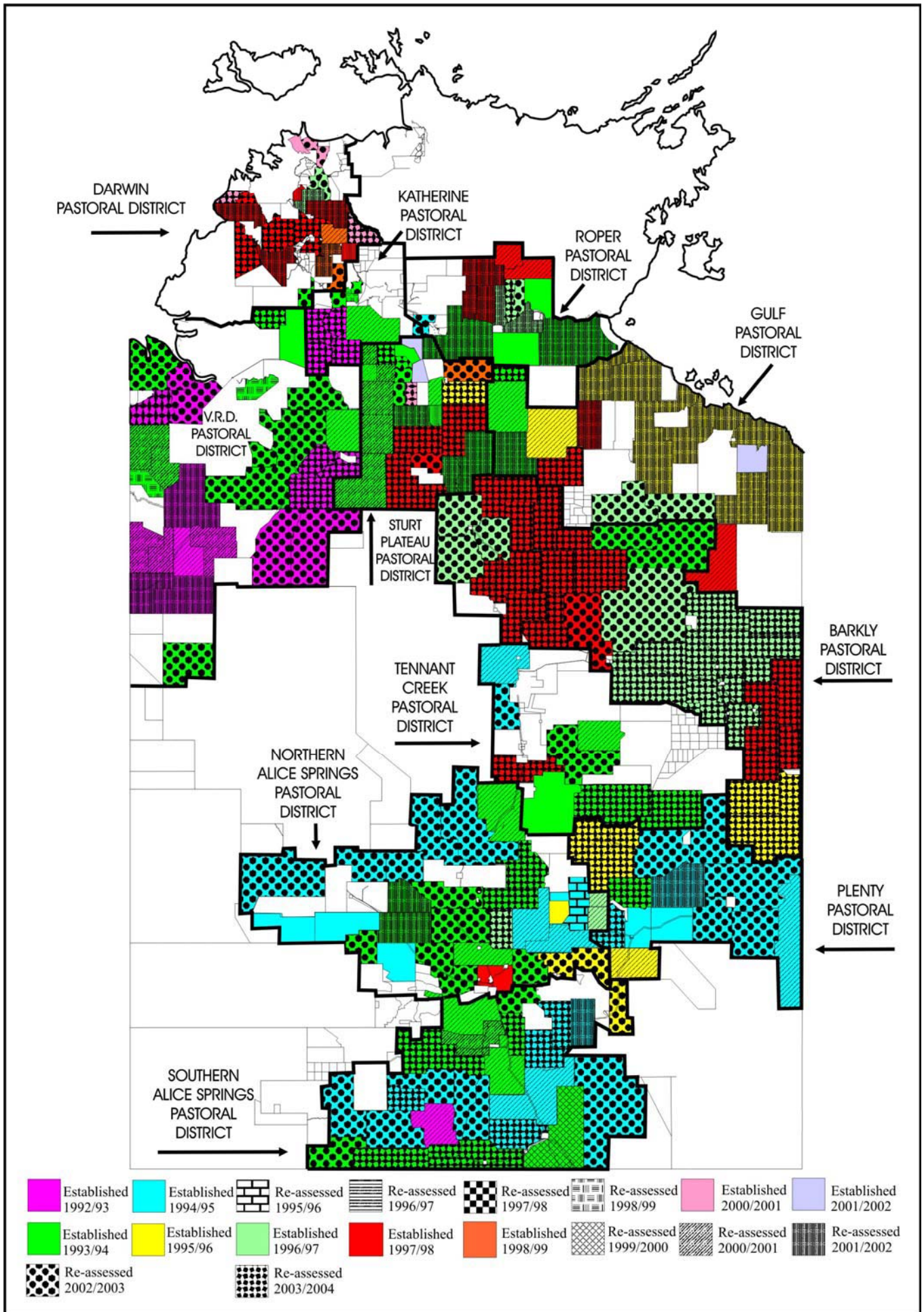


Figure 1: Properties monitored under the Tier 1 Monitoring Program at 30 June 2004

TIER 2 MONITORING PROGRAM

Tier 2 Monitoring in the Darwin Pastoral District

There are no Tier 2 monitoring programs, specifically targeted at pastoral properties, in the Darwin Pastoral District. An integrated catchment project for the Mary River Catchment, involving some satellite monitoring, was completed during 2002. The prime focus for this project was to monitor salt water intrusion and the assessment of land clearing and weed infestation, and the study area included several pastoral properties.

Tier 2 Monitoring in the Katherine Pastoral District

There are no Tier 2 monitoring programs in the Katherine Pastoral District.

Tier 2 Monitoring in the Roper Pastoral Pastoral District

There are no Tier 2 monitoring programs in the Roper Pastoral District.

Tier 2 Monitoring in the VRD Pastoral District

The acquisition of Landsat satellite data and updating of time-series imagery continued as part of the LCCA (Land Cover Change Analysis) monitoring program in the VRD in 2003/2004. The VRD core scene data set, covering 28,000 km², spans 21 continuous years from 1983 to 2003. The regional Ord/Victoria nine-scene mosaic data set, covering approximately 265,000km², now includes 11 dates between 1987 and 2003. In 2004 both these data sets have been subject to fire-scar identification. This has allowed the analysis of cover histories without biases caused by the low cover values associated with fire scars.

A preliminary analysis has been performed to illustrate the capacity of these satellite data-sets to compare pasture condition between individual paddocks and against a regional mean. The results from this analysis are summarised below.

Ground monitoring of Tier 2 sites also took place in the late dry season of 2003 and data has been collated to show changes in vegetation cover, landscape function and plant frequencies over time since ground monitoring began in 1994. Tier 1 data over the VRD has also been used to assess land condition. Results are discussed below.

Land Cover Change Analysis

This section examines time-traces using the Landsat red band (MSS2; TM3) as an index of vegetation cover. Fire scars have been masked from both the Ord-Victoria Mosaic and VRD Core Scene data sets, and cloud has been masked from the Ord-Victoria mosaic. The masking process eliminates cover index values caused by dark (fire scar) and bright (cloud) pixels.

Long-term cover change, VRD Core Scene 1983-2003

A comparison of three land types occurring within the VRD core scene is shown in Figure 2. Basalt Plains occupy one third of the VRD core scene, and Undulating Basalt Hills and Laterite Plains comprise 7% and 3% respectively.

For the two basaltic land types the following can be observed:

- Increasing cover trend and historical high cover index values since 1993 characterise these time-traces.
- Stability in the cover indices is evident from 1993 to 2003 compared with the previous 10 years from 1983 to 1992.
- The lowest cover index values occurred in 1989, the highest values in 2002. Dips in the basalt traces over the last decade in 1998 and 2003 are thought to be due to: below-average rainfall in 1998 and loss of cover due to widespread fire in 2001 and 2002 effectively reducing the amount of cover in 2003.
- From 1993 to 2003, all cover index values have been greater than, or equal to, the highest cover values recorded for the Basalt Plains in the previous decade 1983 to 1992.

Little on-ground detail is available for interpreting the Laterite Plains CLT (combined land types) time-trace. However, cover index values are generally higher and increasing trend evident from 1993 to 2003. Stability in the trace is a feature from 1983 to 1992, and greater variability a feature from 1993 to 2003. It is suspected that higher occurrence of fire has increased variance in the cover index values for the latter period.

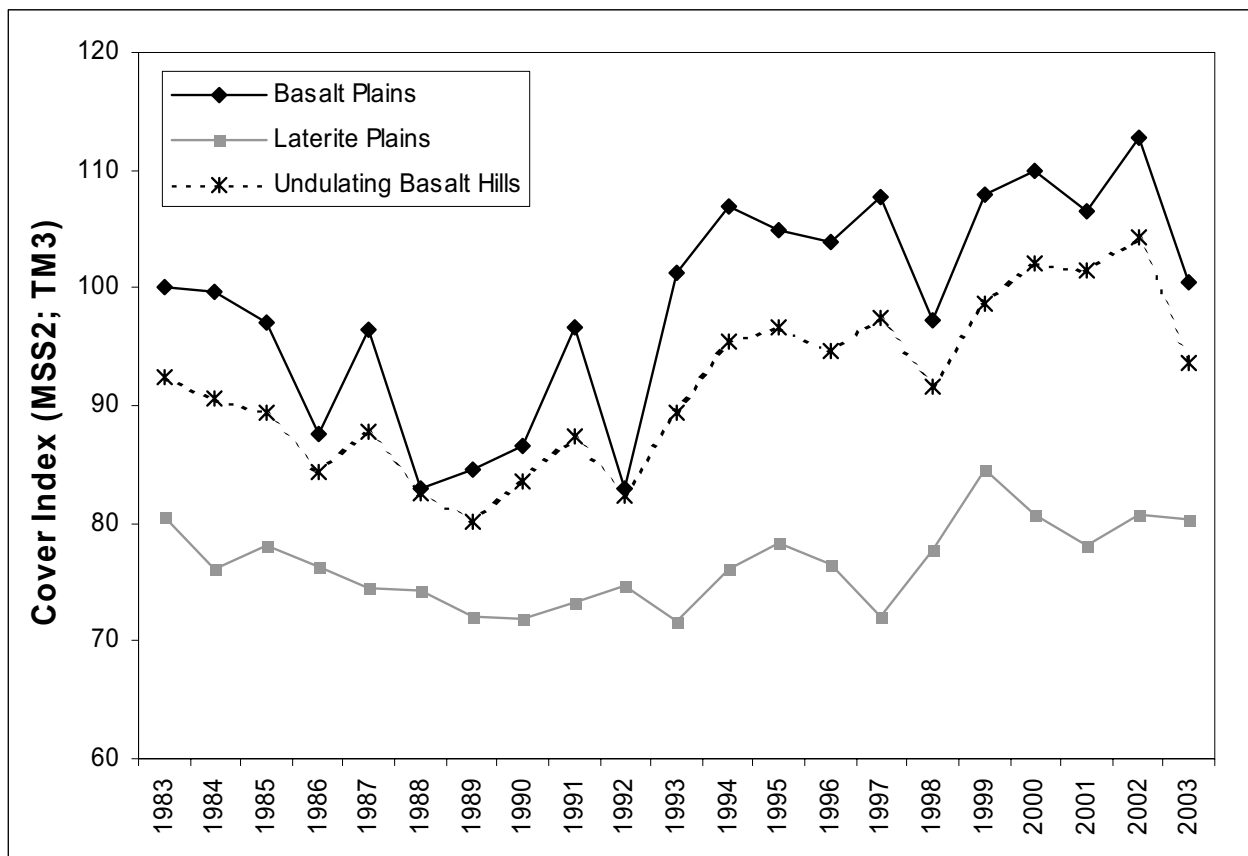


Figure 2: Time-traces spanning the period from 1983 to 2003 for 3 land types occurring in the VRD Core Scene

Long-term cover change – Ord-Victoria Mosaic 1987-2003

Time-step cover index values were analysed for major pastoral land types that comprise 46% (61,500 km²) of the VRD Pastoral District (Figure 3).

The Basalt Plains and Undulating Basalt Hills have similar increasing trend for the period 1987-2003 and high historical cover index values since 1993. For these basaltic land types the lowest cover index values occurred in 1988, the highest in 2001. This is consistent with results observed in the VRD core scene time-traces.

Again, the Laterite Plains have comparatively lower cover index values than the basaltic land types. Since 1993 a progressive increasing trend in cover is evident. For laterite soils, a higher cover index was expected to indicate more bare ground exposed due to relatively bright red coloured soil. However, field observations and limited ground data suggest a build up of senescent grasses, corresponding to the 1990s wet period, has persisted on otherwise bare soil or gravel, providing a relatively bright response. Analysis of other TM bands combined with ground truthing need to be undertaken to test this hypothesis.

In the more northerly Alluvial Plains and Northern Rugged Sandstone Hills the negative trend in the traces from 1987 to 2000 indicates increasing vegetation cover if these land types are dominated by light coloured soils, as some evidence suggests. The sharp rise in the cover index value for 2001 possibly reflects widespread fire in 2000 and 2001 that has reduced the amount of cover in 2003.

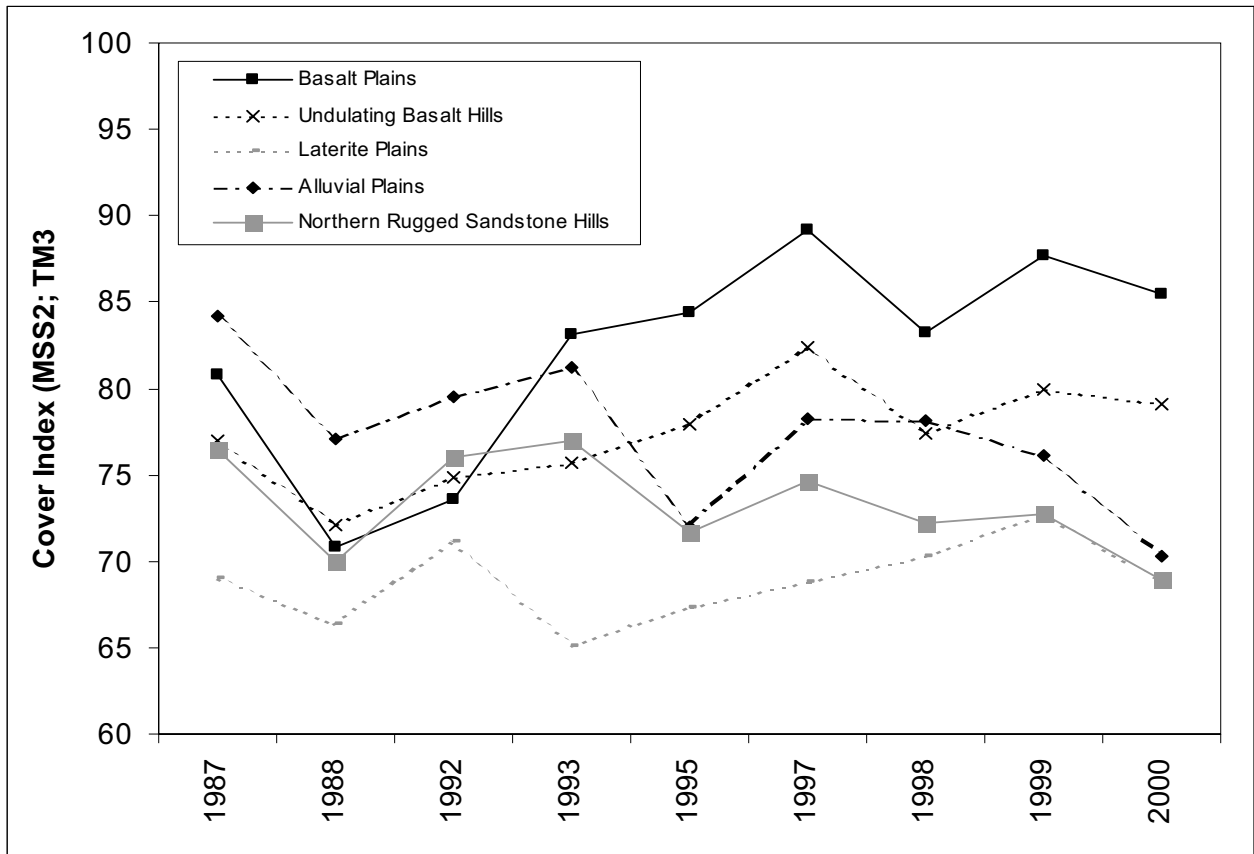


Figure 3: Time-traces for a number of land types in the VRD spanning the period from 1987 to 2000. All time-traces show a positive trend in cover of the period

Ground Monitoring

Nearly two-thirds of the 33 Tier 2 monitoring sites are located in the Basalt Plains (21 sites) hence results focus on this land type. The change over time of three important landscape function analysis (LFA) indicators, number of patches, patch width and patch length is shown in Figure 4. Values for each of the 21 sites were calculated, then averaged for each year with standard error shown on the graph.

- A progressive increase in the landscape function indicators is evident over the period 1995 to 1999.
- After four years of no data collection, a decrease in values occurred in 2003. The average patch width and length, increased from 4.4m and 3.4m respectively in 1995, to peak values of 25m and 8.6m respectively in 1999. In 2003, patch width and length decreased sharply back to 1996/97 levels of 8.3m and 3.7m respectively.

- The average number of patches in 1995 was 12.6, increasing to a peak value of 24.6 in 1998, then decreasing marginally to 20.5 in 1999 and slightly further to 17.3 in 2003.
- Patch length had the lowest population standard deviation over the five dates at 2.4, patch width the highest at 8.4, and number of patches at 3.8. Interestingly, in 1998 the average patch width nearly trebled from the previous year and the other indicators also had distinct increases, all after a below average wet-season.

This trend in the LFA indicators, patch width and length, increasing from 1995 to 1999 then decreasing substantially in 2003, is not clearly expressed in the floristic measures of perennial plants estimated from quadrats at the Tier 2 sites.

- Average perennial plant frequency percentages, increased slightly from 60% to 62% during three years 1995 to 1997, followed by a sharp dip to 54 % in 1998, recovering in 1999 to 59%, and reaching a peak value of 64% in 2003.
- Perennial cover increased from 1995 (17%) to 1999 (20.8%), followed by a substantial drop in 2003 (12.6%). However, unlike the LFA trend, perennial cover declined in 1998 (16%). A drop in perennial cover for 1998 is consistent with the sharp decline in perennial frequency for that year.

The changes in the LFA and quadrat site data over the sampling period are interpreted as a response to:

- favourable seasonal conditions, then
- fire impact.

It is known that the region experienced well-above average rainfall from 1993 to 2003, with the exception of 1998 and 2002 being below-average rainfall years. It is also known that the occurrence of fire in the VRD Pastoral District increased during the 1990s and 2000s.

The increase in the indicator values from 1995 to 1998/99 are related to successive good seasons, combined with occasional fire disturbance and generally low utilisation by cattle. For the most part, it was observed that individual patches expanded or colonised bare ground during this time, often coalescing into composite patches. This explains the relatively high values for 'cover extent' indicators, especially patch width since this measurement can be 10s of metres on a single site when patches become aggregated.

The sharp decreases of indicator values in 2003 are attributed to the high occurrence of fire at the sites. Specifically, 10 of the 21 Basalt Plains sites were known to have been burnt between 2000 and 2002. This disturbance has effectively reduced the connectivity in patches as well as overall cover of perennial plants.

An increase in perennial frequency and modest decrease in number of patches in 2003 are evidence that perennial plants were not destroyed by fire, but rather, their size decreased.

In 1998, below average rainfall probably explains the dip in perennial cover and frequency. But interestingly, LFA indicators do not show the effects of the poor season, rather a marked increase in the LFA indicators occurred, up an average of 30% on the previous year.

It has been shown how the functional state of 'robust' landscapes drift under favourable seasonal conditions, and how sensitive the landscape function indicator values are following disturbance from fire. It would be expected that indicator values measured in the wet 1990s would be higher overall than in the drier 1980s simply due to climatic differences, not management. Currently, the intrinsic properties of landscape function at the sites are intact, having returned to the levels measured in 1996/1997.

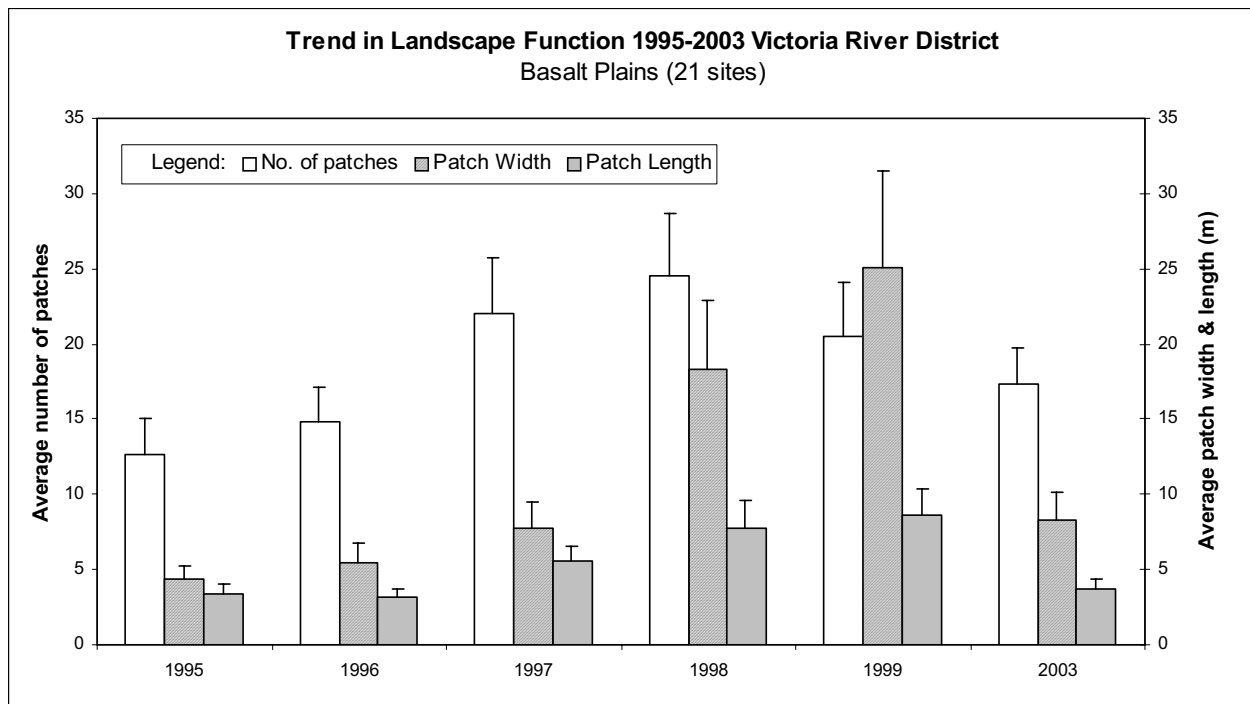


Figure 4: Trend in landscape function for three key indicators, over six dates, using mean values for 21 Basalt Plains sites in the VRD. Standard error shown as bars.

The change in mean vegetation cover (grass, forb, litter, shrub and tree) from Tier 2 monitoring sites was plotted in Figure 5. These cover values do not consider rock, gravel or cryptogam, as these values are characterised within the LFA component of site assessment. Mean cover values were attained from amalgamating annual data at 33 sites from six dates, spanning a nine-year period 1995 to 2003. Delays were experienced in site establishment in 1995 so floristic data in this year represents only 19 of the 33 sites.

Mean vegetation cover ranges from a low of 33% in 1996 to a high of 53% in 1999, about a 60% increase, before falling off to 44% in 2003. The variations in mean values over the period are believed to be caused by fire occurring at the sites, as vegetation cover, including litter, is significantly reduced the year following a fire. All sites experienced varying degrees of grazing intensity over the sampling period, but for the most part, grazing observed on the sites was considered light to moderate.

Overall, a slight increasing trend is evident in the data values over the six dates. This positive response in mean cover values for the sites is consistent with the satellite cover response over the same period in the Basalt Plains land type, where the majority of sites occur.

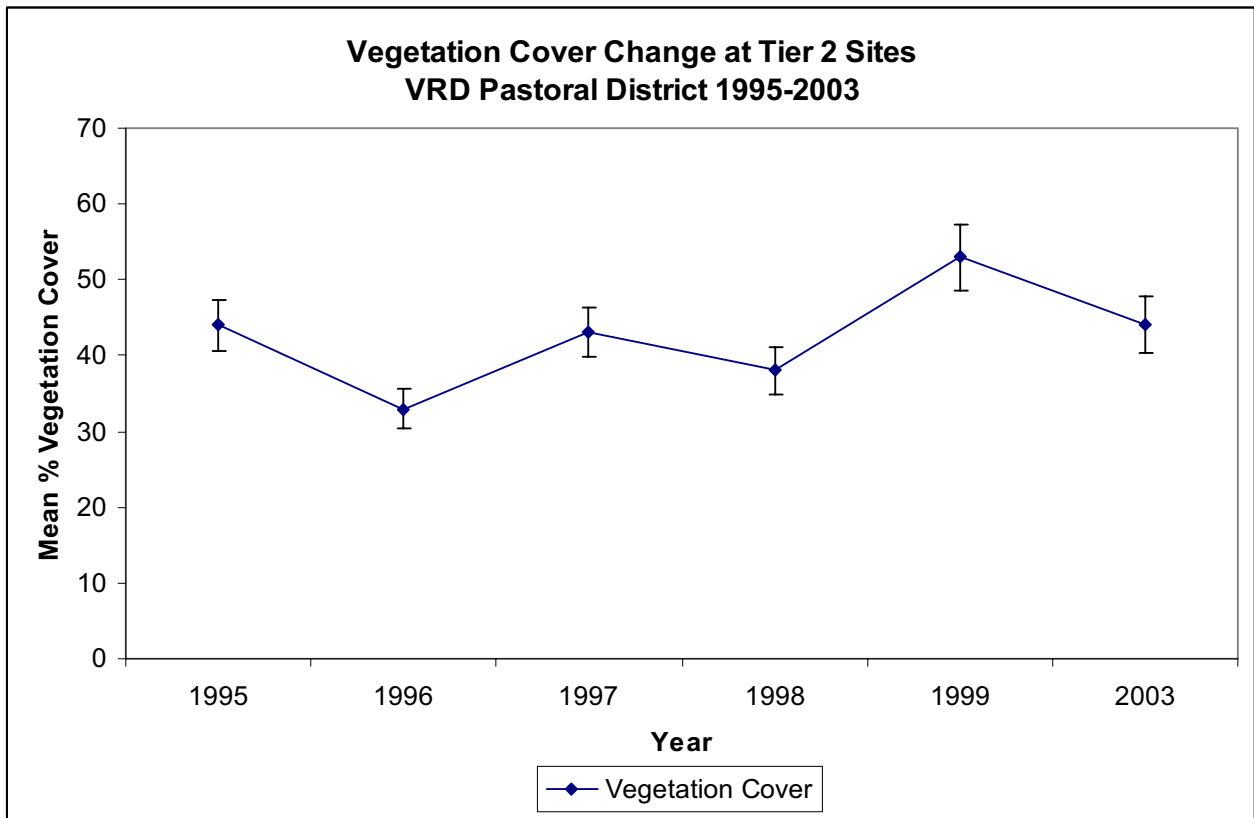


Figure 5: Mean percentage vegetation cover for 33 Tier 2 monitoring sites in the VRD over six dates. Error bars represent standard error.

Tier 2 Monitoring in the Sturt Plateau Pastoral District

There were no Tier 2 monitoring programs undertaken in the Sturt Plateau Pastoral District during 2003/2004.

Tier 2 monitoring in the Gulf Pastoral District

There are no Tier 2 monitoring programs in the Gulf Pastoral District.

Tier 2 monitoring in the Barkly Pastoral District

During 2004, the Land Monitoring Branch, Natural Resource Management Division, Department of Infrastructure, Planning and Environment undertook a Tier 2 monitoring project to assess current land condition in the Barkly Pastoral District. This project was in response to a request from the Pastoral Land Board following concerns in previous annual reports (2001/2002 and 2002/2003) suggesting land condition was declining in the Barkly Pastoral District. The purpose of this work was to:

- deliver a report to the Pastoral Land Board in response to its request for a satellite land condition assessment of the Barkly Pastoral District;
- update digital sets from a previous satellite-base rangeland assessment conducted for the district during the 1990s; and
- re-establish departmental capacity to undertake Grazing Gradient assessment techniques developed by CSIRO.

In total, 17 of the 30 Pastoral Leases in the district were assessed, in various levels of detail, covering approximately 60% of the Barkly Pastoral District.

Grazing Gradient Analysis and field assessments indicate that the majority of the Barkly Pastoral District is in an improving condition or in good condition. These findings are consistent with interpretations from the Tier 1 monitoring program. The effects of fire and ephemeral waters in the remote sensing analysis are still not well understood and require further work. Greater understanding is also needed of seasonal conditions, cover indices with respect to land type and management histories. This work should be undertaken as part of the on-going NT pastoral monitoring program.

There are, however, a number of areas identified that show persistent grazing effects. These areas will be incorporated into the Tier 1 monitoring program to ascertain the nature of the problem. This may include comparative analysis with Tier 1 data, paddock-scale or watering point-scale Grazing Gradient Analysis, and importantly, field verification.

Tier 2 Monitoring in the Tennant Creek Pastoral District

There are no Tier 2 monitoring programs in the Tennant Creek Pastoral District.

Tier 2 Monitoring in the Plenty Pastoral District

There are no Tier 2 monitoring programs in the Plenty Pastoral District.

Tier 2 Monitoring in the Northern Alice Springs Pastoral District

There are no Tier 2 monitoring programs in the Northern Alice Springs Pastoral District.

Tier 2 Monitoring in the Southern Alice Springs Pastoral District

There were no Tier 2 monitoring programs undertaken in the Southern Alice Springs Pastoral District during 2003/2004.

REPORT ON PASTORAL LAND CONDITION

GENERAL DEFINITION OF LAND CONDITION

A general definition of landscape condition is provided by the Commonwealth Land and Water Audit (2001) “as a value judgement related to the worth of a landscape for a particular use”. In the Northern Territory, where maintaining natural pastures is a primary goal of sustainable pastoral management, landscape condition is most usefully defined in terms of the ability of the land to maintain productivity for future generations. Land condition in the Northern Territory pastoral estate, can best be described by three main indicators:

- The distribution of water and nutrients in a landscape often scarce in these essential components, which in turn affects,
- The productivity and composition of pasture plant species, and,
- The presence of feral animals and noxious weeds

For a program of land condition monitoring to be successful in determining trends in land condition, it must be implemented through the use of agreed criteria and indicators. The indicators described above are widely accepted as being useful measures of land condition by pastoralists and governments in many of the rangelands throughout the world.

The Tier 1 monitoring system of ground-based photo points has proved to be invaluable as a means of recording physical changes in the grazing environment. It is an excellent extension and educational tool and has provided the means by which objective data on pasture changes can be acquired from permanently located sites.

The Tier 2 program has yielded encouraging results. The work completed so far indicates that the analysis of satellite data complemented with ground sites can record trends in condition and will assist materially in lease scale decision making. The Board encourages increased use of Tier 2 monitoring programs as a monitoring tool to report on regional land condition.

An assessment of pastoral land condition in pastoral districts throughout the Territory has been given below using Tier 1 monitoring data.

LAND CONDITION IN THE DARWIN PASTORAL DISTRICT

The data derived from the Tier 1 re-assessments made during the 2003/2004 field season indicates that land condition in the Darwin Region is predominantly good with 74% of sites considered to be in good condition, 21% in fair condition, and 5% in poor condition (refer Figure 6).

The 2003/2004 reassessments indicated that there is negligible change in site status with a slight decrease in the number of sites assessed as fair (decrease of 1%), to the gain of sites considered as good (increase of 1%). Sites assessed as poor remain unchanged from the previous assessment.

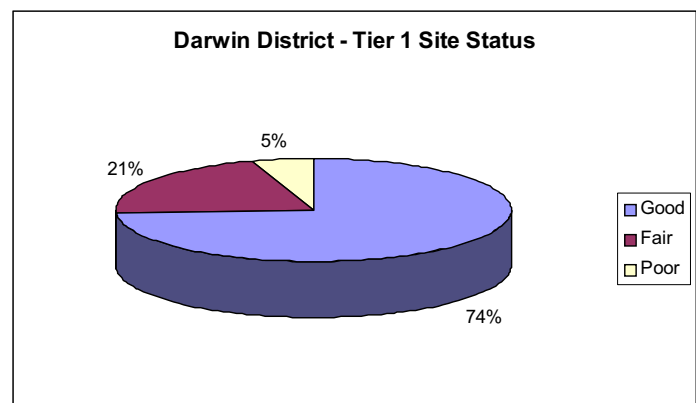


Figure 6: Darwin Pastoral District Tier 1 monitoring site condition status for 2003/2004 reassessments

The slight increase in favourable land condition trend between the years of 2002/2003 and 2003/2004 is negligible and not contributory to any single action or event. The number of sites in poor condition remains unchanged from the previous year, and continues to be the result of *Mimosa pigra* infestation on floodplain properties.

The overall range condition for the Darwin Pastoral District is similar to the previous year and is considered to remain in good condition with the exception of areas affected by Mimosa.

LAND CONDITION IN THE KATHERINE PASTORAL DISTRICT

To date 49 Tier 1 monitoring sites have been established on 7 pastoral leases in the Katherine Pastoral District since the program commenced in 1993. During 2003/2004, reassessments were carried out on 4 leases in the District, which was the fourth round of condition assessment for these properties. As illustrated in Figures 7 and 8, land condition at these sites has remained stable or has improved. The data in the graphs represents 63% of sites in the Katherine Pastoral District.

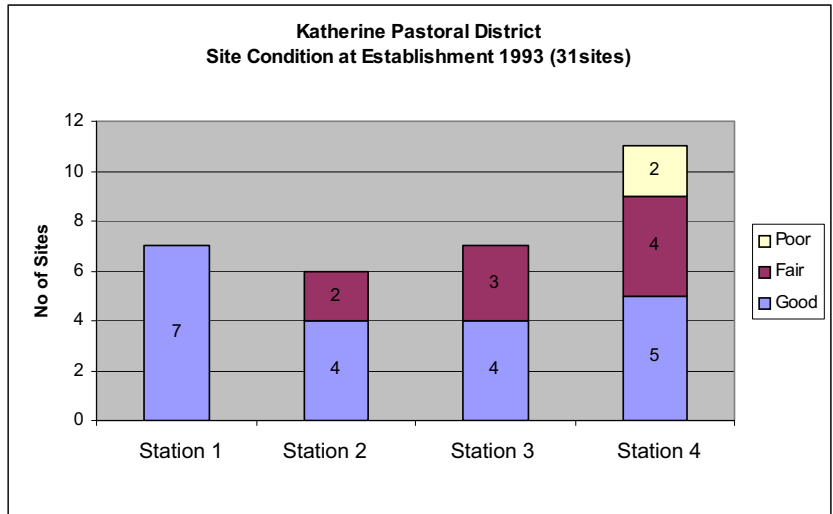


Figure 7: Katherine Pastoral District Tier 1 monitoring site condition status at establishment in 1993, for 31 sites on 4 Pastoral Leases

One site assessed during 2003/2004 was classed as in poor condition. When established in May 1993 the site was rated as in Fair condition and dominated by Black Spear grass (*Heteropogon contortus*). The site was not reassessed during inspections in 1998 and 2000 due to wet conditions and missing star pickets. The site was re-established in May 2003. Ground cover is low (65%) and Black Spear Grass abundance has declined significantly with the site now dominated by Sun Flower Daisy (*Wedelia spumante*).

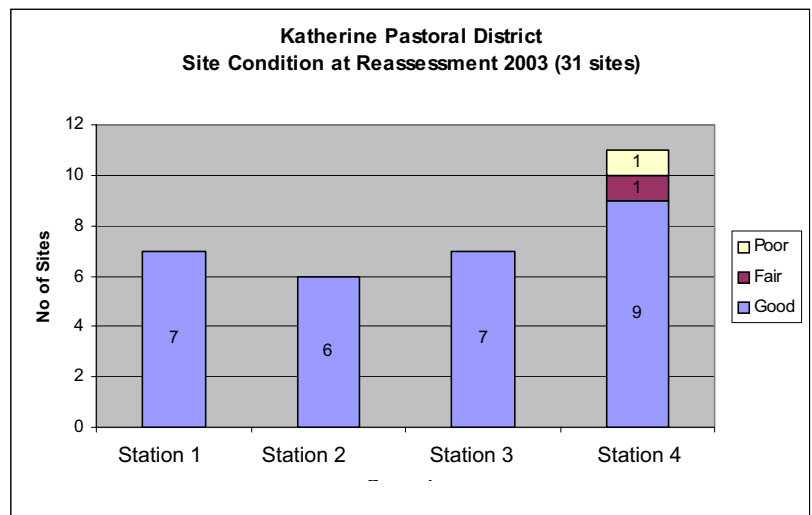


Figure 8: Katherine Pastoral District Tier 1 monitoring site condition status at reassessment in 2003 for 31 sites on 4 Pastoral Leases

Sun Flower Daisy is an upright, branching, rough-stemmed annual forb, which is often associated with Mitchell/ Blue grass country which is deteriorating in condition. The plant is poisonous to livestock.

LAND CONDITION IN THE ROPER PASTORAL DISTRICT

Tier 1 monitoring sites reassessments were only carried out on 1 Pastoral Lease in the Roper Pastoral District during 2003/2004. Tier 1 assessments in recent years indicate the rangelands of the Roper Pastoral District are stable or improving in condition. It is believed this improvement is the result of above average rainfall and increased management of pastures following subdivision and subsequent development of smaller properties in the district.

Track erosion identified on one property during 2002/2003 has been addressed with all necessary works being completed satisfactorily. Possible land conditions issues have been identified on 3 properties in the district, with issues of concern being weeds and track and fence line erosion. Inspections have been programmed for these properties in 2004/2005.

LAND CONDITION IN THE VRD PASTORAL DISTRICT

The Tier 1 monitoring program commenced in the VRD Pastoral District during March 1993, with 293 sites established on 24 leases across the district. There are now a total of 320 sites established in the district covering 25 properties. A total of 1049 Tier monitoring site reassessments have been carried out since 1993.

To provide an analysis of land condition in the VRD Pastoral District, Tier 1 monitoring data has been analysed to detect changes in pasture species present at 254 sites established in 1993 and reassessed between 1998-2003. All sites have been aggregated into condition classes of good, fair and poor. The sites were then broken down into land classes to identify any trends where change has occurred.

Figure 9 shows there are approximately 10% more sites considered to be in good condition at reassessment as opposed to establishment.

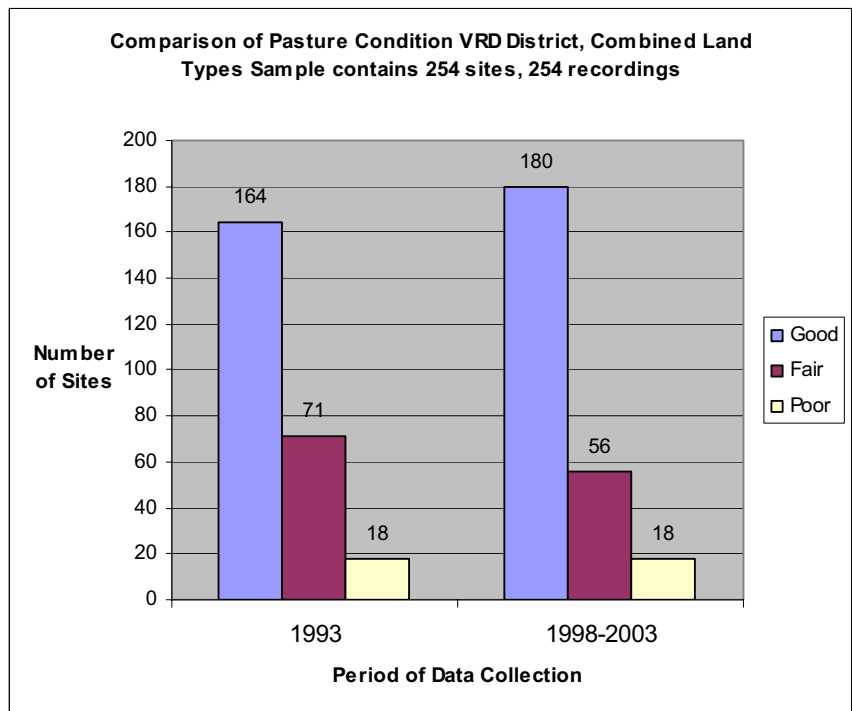


Figure 9: VRD Pastoral District comparison of Tier 1 monitoring site condition status at establishment in 1993 and at reassessment 1998 – 2003 for 254 sites

A proportional decrease is noted in sites assessed as fair, while poor site numbers remain the same primarily due to historic land condition issues. Some of these sites were established specifically to monitor the recovery of historic land degradation.

The majority of Tier 1 monitoring sites in the VRD Pastoral District are located on 3 significant land types for pastoral production: Alluvial, Basaltic and Relic Clay Plain. Figures 10 and 11 below illustrate changes that have taken place over the ten year period between establishment and reassessment.

A substantial number of sites in the Alluvial and Basalt Plain land types assessed as fair or poor condition upon establishment were upgraded to good or fair condition at reassessment. A slight change in condition of 4 sites occurred on the Relic Clay Plain land type (+ 1 fair site, + 1 poor site and - 2 good condition sites). Subtle changes in condition class populations were observed in land types with 10 or less sites.

Analysis of Tier 1 monitoring data over 2 time periods (site establishment and reassessment) did not show a substantial change towards poor condition sites in any land type. Rather, a modest increase overall in the number of good condition sites occurred. This indicates stable to improving land condition in the VRD Pastoral District between 1993 and 1998 - 2003.

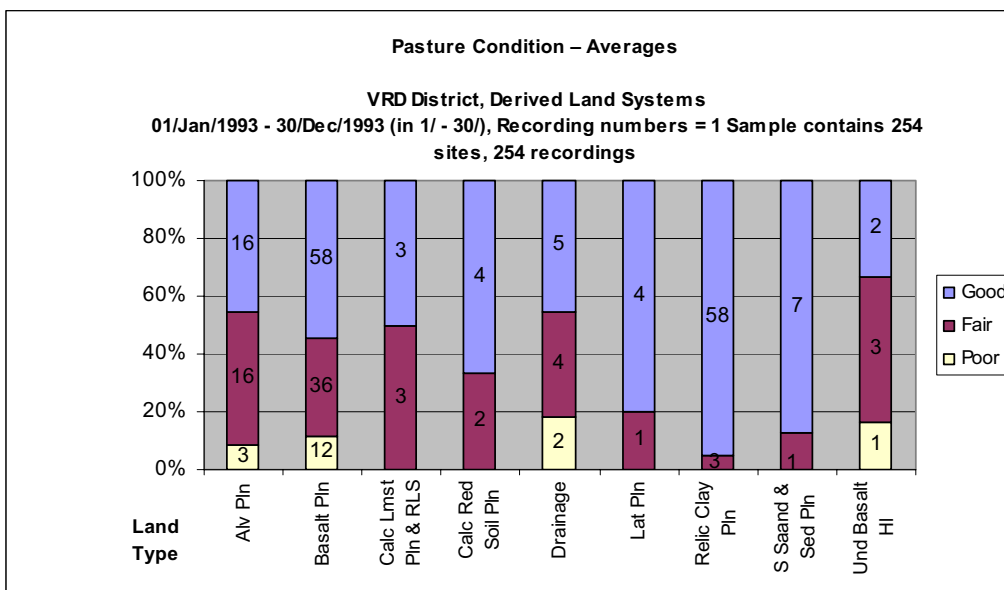


Figure 10: VRD Pastoral District Tier 1 monitoring site condition status by land systems at establishment in 1993 for 254 sites

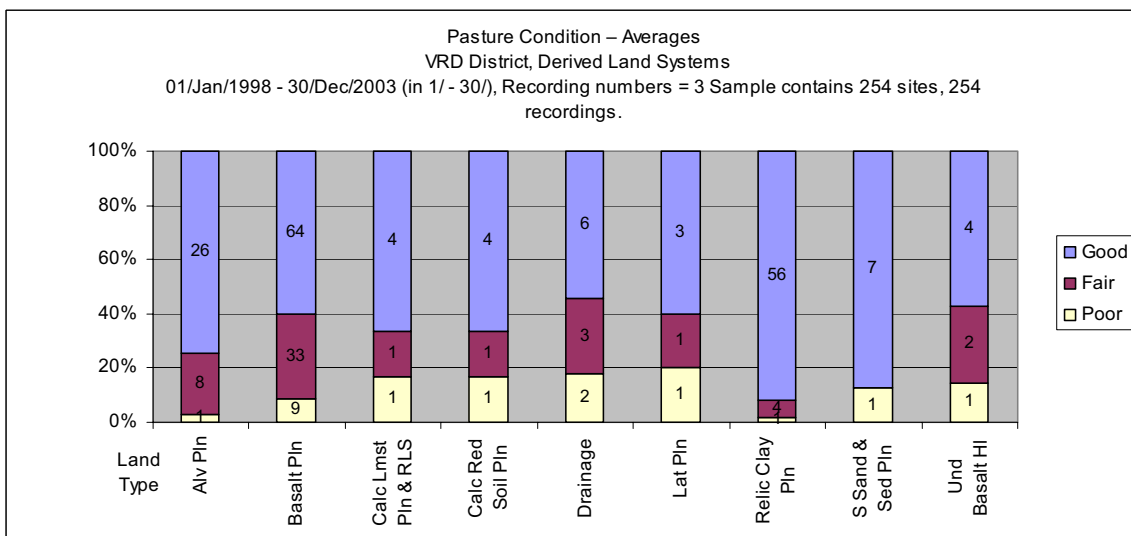


Figure 11: VRD Pastoral District Tier 1 monitoring site condition status by land systems at reassessment 1998 – 2003 for 254 sites

LAND CONDITION IN THE STURT PLATEAU PASTORAL DISTRICT

The Sturt Plateau has continued to develop at a steady rate. Pastoralists on the Plateau have utilised the Pastoral Water Enhancement Scheme (PWES) to develop their properties through support for establishing new waters to expand grazing area by pumping out to new tanks and watering points located in the middle of paddocks and previously unwatered areas. Good seasons combined with strategic development are keeping the rangelands of the Plateau in good and stable condition.

The Tier 1 monitoring program has been carried out on a 3 year reassessment cycle since sites were first established and properties in the Sturt Plateau District are subject to regular routine inspections in conjunction with PWES compliance, clearing and term lease inspections. No land condition issues have been identified during these inspections.

During 2003/2004, 7 properties were reassessed under the Tier 1 monitoring program. Eighty five percent ((85%) of sites were assessed as being in good condition, 4% in fair condition, 9% of sites had been burnt and 2% were not located for assessment (refer Figure 12).

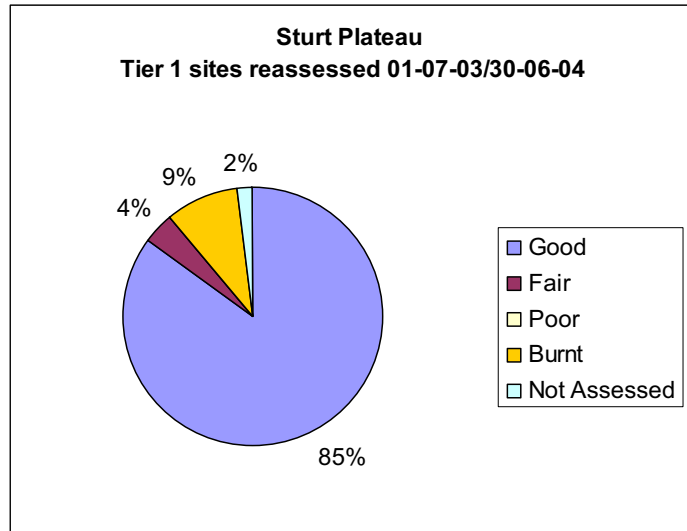


Figure 12: Sturt Plateau Pastoral District Tier 1 monitoring site condition status for 2003/2004 reassessments.

LAND CONDITION IN THE GULF PASTORAL DISTRICT

Tier 1 monitoring sites reassessments were only carried out on 1 Pastoral Lease in the Gulf Pastoral District during 2003/2004 (6 sites). The majority of the Gulf Tier 1 sites will be reassessed in the second half of 2004, maintaining the 3 year reassessment cycle.

Since the initial establishment stage in 1993-96 and subsequent reassessment during the period 1996-2001, Tier 1 monitoring data indicates that the rangeland of the Gulf is improving. There has been a significant increase in the number of sites in good condition. When established 19 sites were classed as being in good condition and 40 sites considered to be in fair condition. At reassessment the number of sites in good condition had risen to 69 and sites considered in fair condition had fallen to 19. The data in Figures 13 and 14 below is a comparison of the same sites at establishment and again at reassessment.

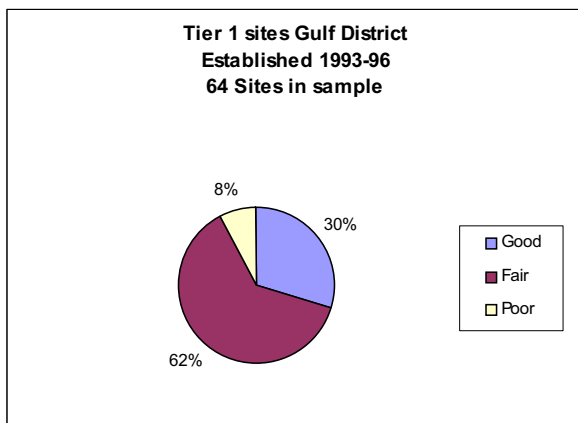


Figure 13: Gulf Pastoral District Tier 1 monitoring site condition status at establishment 1993 – 1996 for 64 sites

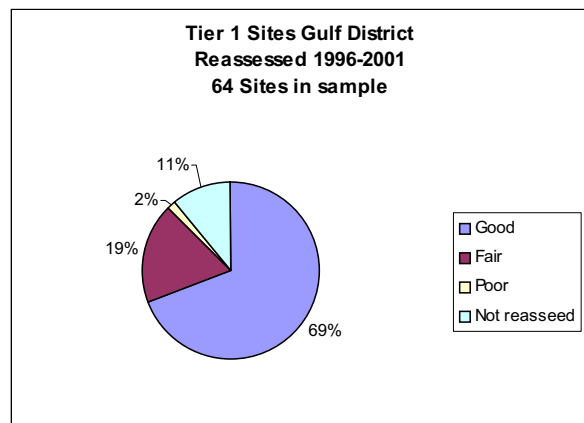


Figure 14: Gulf Pastoral District Tier 1 monitoring site condition status at reassessment 1996 – 2001 for 64 sites

LAND CONDITION IN THE BARKLY PASTORAL DISTRICT

As reported in the 2001/2002 and 2002/2003 Pastoral Land Board Annual reports, land condition in the Barkly Pastoral District was considered to be declining. These statements were based on limited field visits and viewing satellite images depicting anomalies such as fenceline effects. In response to these statements and a request from the Pastoral Land Board, the Pastoral Land Management Branch, Department of Infrastructure, Planning and Environment, ensured that the Barkly Pastoral District was made a priority for Tier 1 monitoring reassessments in 2003/2004. A review of Tier 1 site locations in relation to distance from water was also carried out. In addition, the Land Monitoring Branch, Natural Resource Management Division, Department of Infrastructure Planning and Environment, undertook a Tier 2 monitoring project to assess current land condition in the Barkly Pastoral District (refer to the report on the Tier 2 monitoring program for the Barkly Pastoral District on page 15).

Since the Tier 1 monitoring program commenced in the Barkly District, 433 sites have been established on thirty properties. The majority of sites have been 4 kilometres or less from watering points (387 sites or 89%) the remaining 46 sites are located between 4 and 6 kilometres from water, 1 site established as a benchmark is 9 kilometres from water. The recommended distance from water for site establishment under the Tier 1 monitoring program guidelines is 4 kilometres.

Limited reassessments were carried out prior to 2000, with the majority of second and third round assessments undertaken since 2000. To provide comparative data over time, 307 sites that were established in or between 1994 and 1997 and were reassessed for the first time in or between 1999 and June 2004 have been selected.

The Barkly land systems were classified into land use groups based on the groupings established by C.S Christian and G.A. Stewart (*1947-48 Survey of the Barkly Region, Northern Territory and Queensland, Land Research Series No.3 CSIRO Melbourne 1954*). These broad categories were used to relate site condition to the main land types used for grazing.

Since establishment, Tier 1 data indicates that land condition on the Barkly Tableland is stable or improving (refer Figure 15). There has been an increase in the number of sites in good condition and a corresponding reduction in fair condition sites. The number of poor sites has decreased marginally as many of the sites were originally established in areas of known poor condition to monitor the effect of changes in management practices and land use.

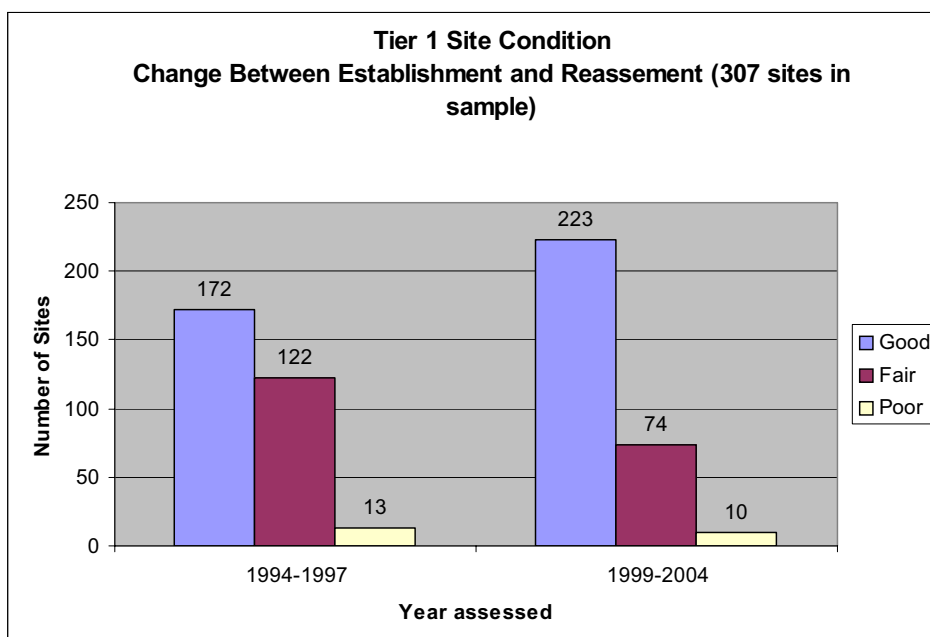


Figure 15: Barkly Pastoral District Tier 1 monitoring site condition status at establishment 1994 – 1997 and at reassessment 1999 – 2004 for 307 sites

Although Tier 1 monitoring data indicates stable or improving land condition, areas of concern were noted by Pastoral Officers travelling around the District, including extended grazing radii around some bores and areas of dead Mitchell grass.

Early developed bores located along the stock routes exhibit evidence of historical grazing pressure with grazing radii extending out to 3 kilometres in some instances. Grazing radii were recorded by C.S. Christian and G.A. Stewart during their survey of the Barkly in 1947-48. These form a small percentage of the total number of watering points on the Barkly and need to be viewed in this context.

During Tier 1 monitoring reassessments on a property in the Camooweal locality, areas of dead Mitchell grass were observed (refer Photo 1). Management advised that the area received very little rain during the 2002/2003 wet season and that the previous wet was also very light. This appears similar to the situation in Western Queensland where large areas of Mitchell grass have died. Future Tier 1 monitoring reassessments will specifically target these areas to monitor the situation.



Photo 1: Barkly Pastoral District, dead Mitchell grass tussocks. Site assessed as fair with a poor seasonal response.

LAND CONDITION IN THE TENNANT CREEK PASTORAL DISTRICT

During 2003/2004, 26 Tier 1 monitoring sites were reassessed on three properties. There were no consistent trends in land condition detected, with only 9 of the twenty six sites changing to a new condition state. Of these 9 changes, 5 sites had an upward trend, while 4 sites showed a downward trend. Overall, land condition has changed little on the properties assessed (refer Figure 16).

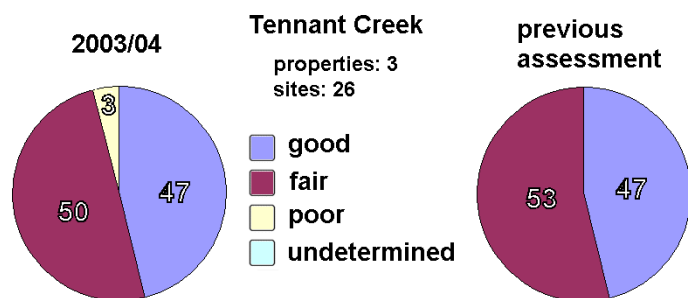


Figure 16: Tennant Creek Pastoral District comparison of Tier 1 monitoring site condition status at reassessment 2003/2004 and previous assessment

LAND CONDITION IN THE PLENTY PASTORAL DISTRICT

During 2003/2004, 33 Tier 1 monitoring sites were reassessed on four properties in the Plenty Pastoral District (4 sites were not determined/reassessed). There was a slight increase in the number of sites assessed as good since the previous assessment. However, overall there was a lack of significant change across the 4 properties assessed in this district.

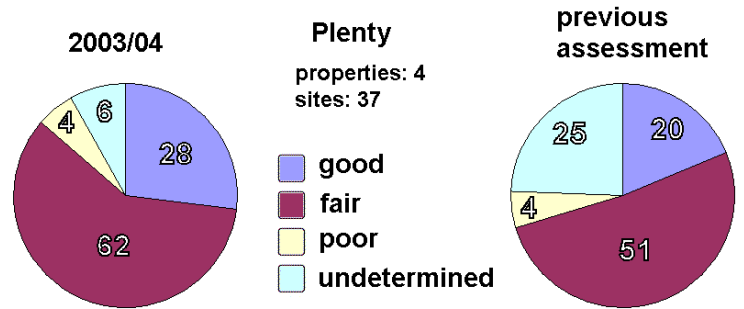


Figure 17: Plenty Pastoral District comparison of Tier 1 monitoring site condition status at reassessment 2003/2004 and previous assessment

LAND CONDITION IN THE NORTHERN ALICE SPRINGS PASTORAL DISTRICT

During 2003/2004, 32 Tier 1 monitoring sites were reassessed on 3 properties in the Northern Alice Springs Pastoral District (5 sites were not determined/reassessed). Overall, there was an improvement in the number of sites in good land condition. However, there were marked differences in trend between the properties visited. One property continues to show an upward trend in land condition, as historically damaged areas continue to slowly improve.

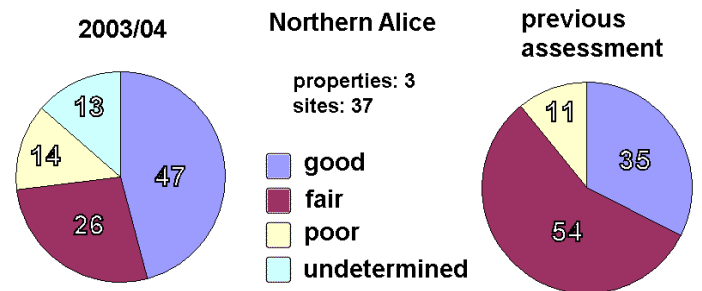


Figure 18: Northern Alice Springs Pastoral District comparison of Tier 1 monitoring site condition status at reassessment 2003/2004 and previous assessment

Another property showed a dramatic improvement in land condition since last being assessed, moving from having one good site in 1995, to having 7 assessed as good in 2004. The other property reassessed showed a downward trend in land condition particularly in the more productive areas, moving from having 8 good condition sites in 1997, to having just 2 in 2004. It is not possible to make an informed judgement on this downward trend, due to the limited data available. Reassessment of monitoring sites on this property has been made a priority following future effective rainfall.

LAND CONDITION IN THE SOUTHERN ALICE SPRINGS PASTORAL DISTRICT

During 2003/2004, 83 Tier 1 monitoring sites were reassessed on 9 properties in the Southern Alice Springs Pastoral District (8 sites were not determined/reassessed). There was an overall improvement in the number of sites recorded in good condition, compared with previous assessment of the same sites. However, there were also a greater number of sites in poor condition, reflecting mixed results from the various properties visited, and the trend in poor condition sites will require further investigation, with further reassessments to be carried out as a high priority following effective rainfall.



Figure 19: Southern Alice Springs Pastoral District comparison of Tier 1 monitoring site condition status at reassessment 2003/2004 and previous assessment

SPECIFIC LAND CONDITION ISSUES

Implementation of Management Plans to address Land Condition Issues

In cases where specific land condition issues are identified on a pastoral property, the Pastoral Land Board may request the lessee to prepare a management plan detailing the action to be taken to address the land management issues which have been identified. It is a basic tenet of the *Pastoral Land Act* that pastoral lessees acknowledge their duty to adopt sound management practices and their responsibility to address any land condition issues that may arise. In line with this philosophy, the Pastoral Land Board seeks voluntary collaboration with pastoral lessees to address land condition issues and implementation of rehabilitation programs.

During 2003/2004 action continued in respect of implementation of management plans on five properties. New action commenced to redress identified land condition issues on four properties.

Buffel Grass

Buffel grass (*Cenchrus ciliaris*) is a deep rooted perennial grass introduced into central Australia for pasture, and to control the significant wind erosion (dust storms) the town experienced in the 1950s and 1960s. It is not listed as a weed however continues to be the cause of much debate and criticism from environmental groups, particularly in Central Australia.

Buffel grass tolerates grazing once established, and shoots after small falls of rain, which native grasses do not do. Native perennial grasses tend to be restricted to river systems and fertile pockets that receive extra water run-off. Buffel grass also likes these environments, but it will grow on any reasonably fertile, well-drained soil, thus greatly increasing pasture production in some areas. As pastoral properties move from open range grazing to more controlled paddock grazing, Buffel grass may be more intensively managed, taking pressure off native pastures.

Along with better livestock control and an increase in tree and shrub cover, Buffel grass played a major role in reducing airborne dust in Alice Springs, greatly improving the quality of life for residents. In response to the effects of the drought large areas of Central Australia were planted to Buffel grass in the 1970s and early 1980s to mitigate the dust problem (refer Photo 2).



Photo 2: Dust storm in central Australia

Buffel grass is regarded by ecologists and environmentalists as a major environmental weed. The negative impacts on biodiversity from Buffel have been described in a number of studies from Queensland and to a lesser degree in the Northern Territory. Problems with the spread of Buffel are most obvious in the vicinity of Alice Springs, where it dominates the ground layer over large areas. It has spread from the flats up into areas in the ranges, where it has largely replaced spinifex vegetation. A study has commenced as part of the Desert Knowledge CRC to examine the effects of Buffel on biodiversity and its pattern of spread into areas of unintended use.



Photo 3: Successful Buffel grass planting in Alice Springs

Buffel grass is regarded as an important introduced pasture grass by the pastoral industry, which can maintain and enhance pastoral productivity and enterprise viability. In central Australia buffel grass can sustain higher stocking rates than native grasses and can increase pastoral productivity. Its ability to respond after rainfall events is a positive attribute for pastoral activities (refer Photo 3).

The Pastoral Land Board has concerns regarding the campaign by environmental groups for certain improved pasture species, such as Buffel grass, to be declared weeds. It is the view of the Board that a productive improved pasture on a pastoral lease, which is grazed and managed in a sustainable manner, is not a weed, and is a legitimate improved pasture which can benefit natural resource condition. The management issue is to manage buffel so that the risk of spread off-station is minimised.

Drought

Much of Central Australia received low effective rainfall until late 2003/2004. Pastoralists responded to the dry conditions by reducing stock numbers. Cattle were sold to interstate markets for finishing and or slaughter and prices were mostly attractive. However drought in the eastern States limited the market for females for restocking. Widespread useful rain in late May 2004 produced a response of fattening herbage although grass growth was limited by low temperatures.

As a consequence of the general reduction in stock numbers most pastoral enterprises in central Australia are conservatively stocked relative to fodder reserves. Bushfires would alter this outlook rapidly. A buoyant cattle market in mid 2004 is providing good prices for further reduction in herd numbers if conditions remain dry.

The NT Drought Policy was reviewed by a committee of government and pastoral industry representatives. The review covered Commonwealth programs including Farm Management Deposits and Exceptional Circumstances, NT programs including NT Drought Assistance Arrangements and the Pastoral Water Enhancement Scheme and joint Commonwealth / NT programs particularly FarmBis. Enhancements to each of the programs were considered. Draft recommendations of the review are being used as the NT position in the ongoing national review of Exceptional Circumstances.

Erosion on Roads, Fences and other Infrastructure

Erosion on roads, tracks and fencelines continues to be a significant soil management issue on pastoral leases throughout the Northern Territory (refer Photo 4). Officers of the Pastoral Land Management Branch, Department of Infrastructure, Planning and Environment, adopt a co-operative approach to assist station managers with appropriate soil conservation earthwork design and construction. Voluntary management plans have been prepared by Pastoral Lessees and successfully implemented on a number of properties to address issues arising from the poor siting of infrastructure, and/or inappropriate maintenance techniques.



Photo 4: Fenceline and track erosion in the Darwin Pastoral District

Feral Animal Control Program – VRD Pastoral District

Donkeys (*Equus asinus*) were first imported in substantial numbers into Australia in 1866 by Sir Thomas Elder. Up to the 1930s they were used as pack and draught animals throughout rural Australia until their use declined due to modern transport (Agriculture 2000).

Donkeys, like camels, can reduce their evaporative water loss when they become dehydrated. They are able to reduce the water content of their faeces, and can continue to eat when deprived of water. They can tolerate extreme loss of body water. These abilities have led to their success as a feral animal in Australia (Agriculture 2000).

Feral donkeys compete for food with domestic stock, particularly where food is scarce. Excessive numbers of feral donkeys and horses in the Victoria River District were revealed following an aerial survey conducted in 1996 by Parks and Wildlife Commission.

In August 1999 notices were first issued to landholders in the VRD to control feral horses and donkeys on their land. The Parks and Wildlife Commission under the *Territory Parks and Wildlife Conservation Act* and the Pastoral Land Board under the *Pastoral Land Act* issued the notices, following which, landholders were expected to participate in the control program either through their own arrangements or in a cost share arrangement with the NT government.

The VRD Feral Animal Control Program completed its fifth year in June 2004. In recent years the program has gained momentum with a total of 132,347 donkeys and horses being removed from Aboriginal Land Trust, pastoral leases and National Park Estate. A significant off take has been achieved primarily through aerial operations but include ground shooting and some pet meat operations.

In May 2004, representatives of the Department of Infrastructure, Planning and Environment undertook a field trip to the VRD to visit representative landholders to discuss the future of the VRD Feral Animal Control Program. Feedback received indicates support for the continuation of the pest control declarations, to ensure numbers are maintained at controllable levels.

Feral Camels in Central Australia

The Department of Infrastructure, Planning and Environment conducted a broad scale aerial survey in 2001 to ascertain the distribution and abundance of feral camels in the southern part of the Northern Territory. At that time it was considered that there was a minimum of 80,533 feral camels in the Northern Territory. The population of feral camels in the Northern Territory increased annually at around 10% per year between 1993 and 2001 and it was believed this trend was likely to continue for the foreseeable future.

Camel numbers appear to be increasing as predicted. Lessees neighbouring the Tanami Desert approached officers of the Department of Infrastructure, Planning and Environment during 2003/2004, seeking help to manage camel problems. Camels are knocking down fences and encroaching more onto pastoral properties. A group of pastoralists to the south of Alice Springs have formed a cartel to address the camel issue in that area. They are pooling their resources and propose a broad scale culling operation. The Department has applied to the Bureau of Resource Sciences to obtain funds to engage all of the relevant stakeholders in a camel management workshop. If funding is granted, a workshop will be held in 2005.

Weeds

Weeds threaten the sustainability of rural primary industries in the Northern Territory through increased costs, reduced efficiency and limitations on marketing. They also threaten water resources, freshwater fishing, and conservation of the natural environment, recreation, tourism and traditional hunting.



Photo 5: Rubber Bush monoculture on an access road in the Barkly Pastoral District

The Fire and Weed Management Branch, Department of Infrastructure, Planning and Environment, assists landholders to manage weeds by providing technical advice, assisting with weed management plans, carrying out surveys and controlling key infestations.

Major weed issues for each pastoral district during 2003/2004 are summarised in Table 2 on page 29.



Photo 6: Aerial mapping of weeds in the Gulf Pastoral District



Photo 7: Mechanical removal of Athel Pine in the Finke River, Southern Alice Springs Pastoral District

PASTORAL DISTRICT	Major weed issues & control programs
DARWIN	<ul style="list-style-type: none"> • Mimosa (<i>Mimosa pigra</i>) Mimosa continues to be the major weed impacting on the pastoral industry in the Darwin Pastoral District, with approximately \$1.2 million being spent annually in control programs. • Bellyache bush (<i>Jatropha gossypifolia</i>) Management program commenced during 2003/2004 on the only major infestation of Bellyache bush in the Darwin Pastoral District.
KATHERINE	<ul style="list-style-type: none"> • Bellyache bush (<i>Jatropha gossypifolia</i>) • Parkinsonia (<i>Parkinsonia aculeata</i>) • Mesquite (<i>Prosopis spp.</i>)
ROPER	<ul style="list-style-type: none"> • Parkinsonia (<i>Parkinsonia aculeata</i>)
VRD	<ul style="list-style-type: none"> • Mimosa (<i>Mimosa pigra</i>) • Parkinsonia (<i>Parkinsonia aculeata</i>) • Prickly Acacia (<i>Acacia nilotica</i>)
STURT PLATEAU	<p>Pastoralists in the Sturt Plateau Pastoral District have raised concerns regarding weed management along the rail corridor. A Weed Management Plan for the railway line is currently being developed.</p>
GULF	<ul style="list-style-type: none"> • Rubber vine (<i>Cryptostegia grandiflora</i>) • Parkinsonia (<i>Parkinsonia aculeata</i>) • Prickly Acacia (<i>Acacia nilotica</i>)
BARKLY	<ul style="list-style-type: none"> • Prickly Acacia (<i>Acacia nilotica</i>) • Mesquite (<i>Prosopis spp.</i>) • Parkinsonia (<i>Parkinsonia aculeata</i>) • Rubber Bush (<i>Calotropis procera</i>) • Longspine Thornapple (<i>Datura ferox</i>) Isolated infestation.
TENNANT CREEK	<ul style="list-style-type: none"> • Parkinsonia (<i>Parkinsonia aculeata</i>)
PLENTY	<ul style="list-style-type: none"> • Parkinsonia (<i>Parkinsonia aculeata</i>) • Rubber Bush (<i>Calotropis procera</i>)
NORTHERN ALICE SPRINGS	<ul style="list-style-type: none"> • Parkinsonia (<i>Parkinsonia aculeata</i>) • Rubber Bush (<i>Calotropis procera</i>)
SOUTHERN ALICE SPRINGS	<ul style="list-style-type: none"> • Athel Pine (<i>Tamarix aphylla</i>) • <i>Neurada procumbens</i>

Table 2: Weed Issues in NT Pastoral Districts 2003/2004

REPORT ON SEASONAL CONDITIONS FOR 2003/2004

The 2003/2004 wet season saw extremely high rainfall for much of the Northern Territory. Rainfall was in the top 10% of historical records for more than half the Territory and above average or average across the rest of the Territory (Figure 20).

DARWIN PASTORAL DISTRICT

Upland Pastures

The 2003/2004 wet season was an unusual one for the Darwin Pastoral District due to significant late rains.

While the first significant rainfall event for the season was on 11 September in the Darwin and Rural areas, only 2 such falls were recorded for the month, and 10 significant rainfall events at 7 sites during October. In the Darwin – Daly area, September and October were dry, with the first significant fall occurring on 4 November.

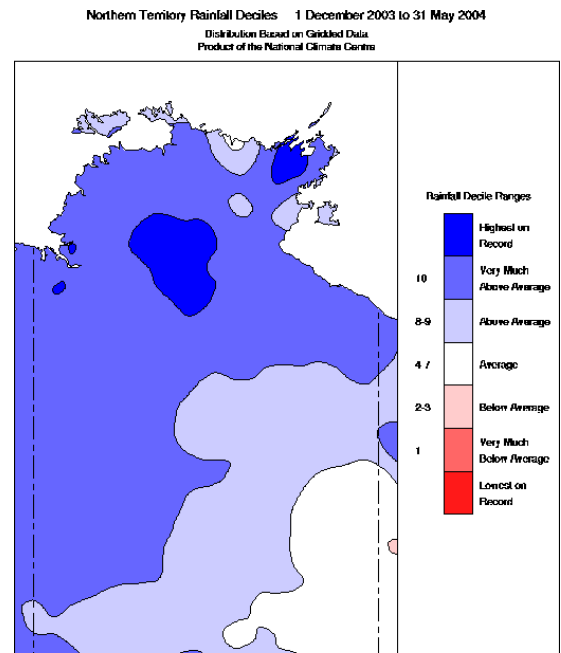


Figure 20: NT Rainfall Deciles 1 December 2003 to 31 May 2004 (Source: Australian Bureau of Meteorology)

All sites received at least one significant fall in November. The wet season followed a “normal” pattern of isolated storms up until 20 December when there were widespread falls over the entire District. From that date, it was continuously wet through until 3 March, with significant rainfall events at most sites every few days.

A dry spell from 3 to 11 March was followed by another widespread spell of wet weather until 22 March. After that date, there were infrequent isolated storms until 13 April, when it appeared that the dry season had arrived.

After being completely dry for 3 weeks, there was widespread rain across the District on 6 May. This was repeated on May 20, preceded and followed by infrequent isolated storms through until 1 and 2 June, when 6 sites received significant falls of rain. This late rain was extremely effective for pasture growth as it coincided with a period of cooler temperatures which reduced evaporation.

The good rainfall produced normal than expected pasture yields across the District. With the late rain, pastures continued to grow and remained green through until early July. This was a bonus for cattle producers as animals continued to gain weight on the green feed well into the dry season. The late rain led to some losses of yield and quality curing hay crops and windrowed seed crops. The late rain also delayed the main burning season this year.

Floodplain pastures

The floodplains were flooded for an extended period during this wet season, following topping up by the late rain. This delayed grazing of the floodplains by 4 to 6 weeks. The deeper parts of the floodplains may not dry out at all this year because of the late rain and lower temperatures.

KATHERINE PASTORAL DISTRICT

In the Katherine Pastoral District, the wet season began slowly, however, by the end of the wet the township of Katherine and the Tindal Airbase had received record rains of over 2000mm, most of which fell in the Tindal Creek catchment. This caused localised flooding of several Katherine businesses, offices and homes that were located in low lying areas on the Tindal flood plain and put Katherine township on flood alert.

In Katherine, above average rainfall was recorded for December through to March. In December 574mm was recorded. Willeroo about 120 kilometres west of Katherine recorded good falls for December through to March with February being the wettest month when 493mm fell.

ROPER PASTORAL DISTRICT

The Roper Pastoral District received a similar wet season to the other northern Pastoral Districts with very little rain falling between September and November and then building from December to March. The highest recordings were generally in February. Overall the Roper District received an average wet season.

The Upper Waterhouse automated recording station recorded substantial falls for December through to March, after a poor start to the Wet. In March 389mm was recorded at Waterhouse. Mataranka Council recorded good rainfall from December through to February with 588mm recorded in February. Mataranka College had a substantial wet season with 611mm of rain recorded for February. In December/January a combined recording of more than 1000mm was recorded. Flying Fox Station recorded good falls with 399 mm falling in February. Numul Numul Station had similar conditions, with very good falls for January/February when a total of 783mm was recorded.

VRD PASTORAL DISTRICT

The VRD Pastoral District received an average to above average wet season. The northern part of the District around Keep River received above average falls that produced good pasture. The northern section of Rosewood Station received better rainfall than the southern section, which is quite noticeable when traversing the property. Properties in the south eastern portion of the District received only average to slightly above average falls. The more consistent rainfall aided in pasture production.

Good falls were recorded at Camfield from December through to February with a maximum of 293mm received. Very little rain was received at the start of the wet. Although the Montejinni rainfall records for 2003/2004 wet are incomplete, above average rainfall for December and January was recorded. Auvergne Station received good rainfall in November/December with very good falls recorded for January through to March. February was the wettest month with 421mm received.

VRD Station had very sporadic rain for the 2003/2004 wet season with average rain being received in most months with the exception being February when 580mm of rain fell. Inverway received average rainfall with no exceptional rainfall recordings. Wave Hill received above average rainfall with no exceptional recordings. Timber Creek received good falls for the months between December and March. Keep River Rangers Station experienced a similar rainfall situation to Timber Creek with good falls throughout the wet. Nelson Springs in the south western part of the District received average rainfall.

STURT PLATEAU PASTORAL DISTRICT

The Sturt Plateau, like the other northern Pastoral Districts, didn't receive significant falls of rain until December. From then on above average rains were recorded for the remainder of the wet season. Larrimah received good falls for December through to March with February being the wettest month with a total of 482mm of rain recorded. Maryfield received consistent rain for December to March with February again being the wettest month with a total of 462mm being recorded. Daly Waters received similar rainfall to Maryfield with constant rains from December. Gorrie station experienced similar conditions to Daly Waters with the highest recording in February.

GULF PASTORAL DISTRICT

Average to slightly above average rainfall was recorded for the 2003/2004 wet season in the Gulf Pastoral District. Mallapunyah Springs received 511mm in February, which was the wettest month of the 2003/2004 wet season.

BARKLY PASTORAL DISTRICT

The Barkly Pastoral District received an average to above average wet. The northern section of the Barkly received an above average wet season. The central section of the Barkly received above average rain and to the south of the District an average to below average wet season was received. Consistent rains were received due to the monsoon in the northern section of the Barkly over December but did not move south to the central section of the Barkly until January/February.

Helen Springs received average falls for the 2003/2004 wet with the wettest month being December. Eva Downs received average rainfall for this wet season. Anthony Lagoon also received average rainfall for this wet with the highest recording in February of 301mm. Renner Springs roadhouse received average rainfall as well, with the wettest month again being February when 262mm fell. Brunette Downs received above average rainfall with December being the wettest month when 214mm fell. Newcastle Waters received an above average wet season in the northern part of the lease, whilst the southern part received below average rainfall.

TENNANT CREEK PASTORAL DISTRICT

The Tennant Creek Pastoral District had a very useful summer rainfall period between December 2003 and March 2004. Total average rainfall for these 4 months was 437mm, ensuring a good pasture response.

PLENTY PASTORAL DISTRICT

The Plenty Pastoral District had poor to average seasonal conditions in 2003/2004. Rainfall was characterised by extreme patchiness and generally decreased towards the QLD border. Some pasture growth occurred after rains in February 2004, and again after rain in May 2004.

NORTHERN ALICE SPRINGS PASTORAL DISTRICT

The Northern Alice Springs Pastoral District was characterised by extreme patchiness of rainfall in the summer months, often over very short distances, followed by a general cool season rainy period in May 2004. Most properties had areas with both good and poor seasonal conditions prevailing. Totals for the 12 months ranged from 276mm at Mt. Riddock to 403mm at Woodgreen.

SOUTHERN ALICE SPRINGS PASTORAL DISTRICT

The Southern Alice Springs Pastoral District had a varying summer season, characterised by patchiness of rainfall. Totals ranged from just below average (eg. Santa Teresa 212mm) to well above (Kulgera 395 mm). While the southern border areas experienced generally good seasonal conditions, the north eastern properties in the District have had well below average seasonal conditions for the third consecutive year. Useful rain in May 2004 was a temporary reprieve for these properties.

VALUE OF THE CATTLE INDUSTRY TO THE NORTHERN TERRITORY

The pastoral estate of the Northern Territory covers around 619,000 km² comprising nearly 46% of the area of the Northern Territory under 216 pastoral leases. Pastoral holdings vary from small stations of 198 km² to the Territory's largest station, which runs cattle over 12,212 km². The area of land devoted to pastoral production has decreased over time due to other demands for the land. However, the trend in pastoral production, measured by the number of cattle turned off annually, is, in general, increasing, an indication of sustainability of pastoral land in the Northern Territory.

The estimated gross value of production from the NT cattle industry in 2003 was \$200.47 million, a increase of 9% on the 2002 value. In 2003 the cattle industry contributed 46% to the total value of production of the rural and fisheries industries in the Territory. In addition, the pastoral activity provided significant flow-on benefits to other industries, particularly transport and meat processing.

An estimated 511,720 head of cattle were turned off from Territory pastoral properties to abattoirs, interstate and overseas markets in 2003, an increase of 37% on 2002, due mainly to an increase in the interstate movement of cattle (improvement drought conditions in eastern and south states). Of the total NT cattle turned off, 54% were exported overseas live, 45% went interstate while only 1% were slaughtered at Territory abattoirs.

The total live NT cattle exports in 2003 were 229,988 head, a decline of 8% on 2002. Indonesia was again the largest market for NT cattle taking 158,677 in 2003, an increase of 6% on 2002. Philippines took 46,371 head, a decline of 12% on 2002 largely affected by exchange rates and competition from imports from other countries. Exports to Malaysia and Egypt also declined.

Some 92% of all overseas exports of Territory cattle went through the Port of Darwin. The total value of NT cattle exported live in 2003 was \$112.5 million, 19% lower than the 2002 value.

In 2003, Northern Territory cattle provided almost 26% of Australian live cattle exports to all overseas markets and 35% of total Australian live cattle exports to Asia.

The number of interstate cattle exported through the Port of Darwin in 2002 was high due to drought conditions in Queensland. In 2003, interstate cattle exported from Darwin Port declined to 46,665 head, reflecting improvement in drought conditions in Queensland.

The number of Northern Territory cattle exported through the Port of Darwin in 2003 declined by 7.5% to 212,625. In addition, Northern Territory cattle are exported through the Western Australian ports of Wyndham and Broome.

Prices at Darwin for live export cattle fell to \$1.30/kg live weight for steers in June 2003 but as supplies diminished in the second half of the year prices for steers rose to \$1.70/kg live weight.

APPLICATIONS CONSIDERED BY THE BOARD DURING 2003/2004

APPLICATIONS TO CLEAR PASTORAL LAND 2003/2004

(i) **Clearing Applications approved 2003/2004 – Purpose and Areas**

Purpose of clearing	Number of proposals	Area approved ¹
Improved pastures/hay production	4	8,010 ha
TOTALS:	4	8,010 ha

¹Approval of the Board is limited to a designated area. Proposals may involve selective clearing within that area, for example, removal of a particular species only, strip clearing and retention of buffer zones.

Table 3: Purpose and areas of pastoral land clearing approved 2003/2004

(ii) **Applications to clear Pastoral Land 2003/2004**

Applications carried over from 2002/2003	4
Total number of clearing applications lodged 2003/2004	2
Applications lapsed/withdrawn	1
Applications approved	4
Applications carried over	1

Table 4: Clearing applications determined 2003/2004

APPLICATIONS FOR NON PASTORAL USE 2003/2004

Applications carried over from 2002/2003	0
Applications lodged during 2003/2004	3
Applications approved	3
Applications carried over	0

Table 5: Applications for non pastoral use determined 2003/2004

APPLICATIONS TO SUBDIVIDE A PASTORAL LEASE INTO TWO OR MORE PASTORAL LEASES 2003/2004

Applications carried over from 2002/2003	1 ¹
Applications referred 2003/2004	0
Applications considered by the Board with recommendation to the Minister	0
Applications carried over	1¹

¹ This application has been deferred indefinitely at the applicant's request.

Table 6: Subdivision applications considered 2003/2004

APPLICATIONS TO SURRENDER TERM PASTORAL LEASES IN EXCHANGE FOR PERPETUAL PASTORAL LEASES 2003/2004

Applications carried over from 2002/2003	2
Applications referred 2003/2004	1
Applications lapsed/withdrawn	1
Applications considered by the Board with recommendation to the Minister	0
Applications carried over	2

Table 7: Applications to convert to perpetual tenure considered 2003/2004

APPLICATIONS TO SUB LEASE PASTORAL LEASES 2003/2004

Applications carried over from 2002/2003	0
Applications referred 2003/2004	1
Applications considered by the Board with recommendation to the Minister	1
Applications carried over	0

Table 8: Applications to sub lease Pastoral Leases considered 2003/2004

REPORT ON LAND CLEARING PREVIOUSLY APPROVED

It is a requirement of the *Pastoral Land Act* that a lessee shall not undertake clearing on pastoral land without the written consent of the Pastoral Land Board. The Pastoral Land Board has included details of the number of clearing applications and purpose of land clearing approvals in each of its Annual Reports to the Minister since 1992/93. Since 1999/2000, the Board has also reported on progress with previous land clearing approvals. Table 9 below outlines whether clearing has proceeded and current status for determinations of the Board since the last report.

YEAR	CLEARING PURPOSE	AREA	COMMENTS
2001/2002	Pasture Improvement & hay production	500 ha	Clearing not yet commenced. Discussions to be held with lessee regarding status of approval.
2001/2002	Pasture Improvement	40 ha	Clearing completed.
2001/2002	Removal of non preferred species – thinning of woody weeds and thickening scrub	Total clearing not to exceed 854 ha	Clearing completed.
2001/2002	Removal of non preferred species.	1440 ha	Clearing progressing – majority has been completed.
2002/2003	Improved pastures for hay production	50 ha	50 ha chained. Site preparation progressing for planting to proceed in 2005/2006 wet season.
2002/2003	Improved pastures for hay production & grazing	1000 ha	Clearing commenced.

Table 9: Report on land clearing previously approved