

**CAPE YORK PENINSULA LAND USE STRATEGY
(CYPLUS)**

Land Use Program

**PASTORAL INDUSTRY
OF
CAPE YORK PENINSULA**

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Landcare Management Services, Toowoomba
1995

CYPLUS is a joint initiative of the Queensland and Commonwealth Governments

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Note:

Due to the timing of publication, reports on other CYPLUS projects may not be fully cited in the BIBLIOGRAPHY section. However, they should be able to be located by author, agency or subject.

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CAPE YORK PENINSULA LAND USE STRATEGY STAGE I

PREFACE TO PROJECT REPORTS

Cape York Peninsula Land Use Strategy (CYPLUS) is an initiative to provide a basis for public participation in planning for the ecologically sustainable development of Cape York Peninsula. It is jointly funded by the Queensland and Commonwealth Governments and is being carried out in three stages:

- Stage I - information gathering;
- Stage II - development of principles, policies and processes; and
- Stage III - implementation and review.

The project dealt with in this report is a part of Stage I of CYPLUS. The main components of Stage I of CYPLUS consist of two data collection programs, the development of a Geographic Information System (GIS) and the establishment of processes for public participation.

The data collection and collation work was conducted within two broad programs, the Natural Resources Analysis Program (NRAP) and the Land Use Program (LUP). The project reported on here forms part of one of these programs.

The objectives of NRAP were to collect and interpret base data on the natural resources of Cape York Peninsula to provide input to:

- evaluation of the potential of those resources for a range of activities related to the use and management of land in line with economic, environmental and social values; and
- formulation of the land use policies, principles and processes of CYPLUS.

Projects examining both physical and biological resources were included in NRAP together with Geographic Information System (GIS) projects. NRAP projects are listed in the following Table.

Physical Resource/GIS Projects	Biological Resource Projects
Bedrock geological data - digitising and integration (NR05)	Vegetation mapping (NR01)
Airborne geophysical survey (NR15)	Marine plant (seagrass/mangrove) distribution (NR06)
Coastal environment geoscience survey (NR14)	Insect fauna survey (NR17)
Mineral resource inventory (NR04)	Fish fauna survey (NR10)
Water resource investigation (groundwater) (NR16)	Terrestrial vertebrate fauna survey (NR03)
Regolith terrain mapping (NR12)	Wetland fauna survey (NR09)

Physical Resource/GIS Projects	Biological Resource Projects
Land resource inventory (NR02)	Flora data and modelling (NR18)
Environmental region analysis (NR11)	Fauna distribution modelling (NR19)
CYPLUS data into NRIC database FINDAR (NR20)	Golden-shouldered parrot conservation management (NR21)
Queensland GIS development and maintenance (NR08)*	
GIS creation/maintenance (NR07)*	

* These projects are accumulating and storing all Stage I data that is submitted in GIS compatible formats.

Research priorities for the LUP were set through the public participation process with the objectives of:

- collecting information on a wide range of social, cultural, economic and environmental issues relevant to Cape York Peninsula; and
- highlighting interactions between people, land (resource use) and nature sectors.

Projects were undertaken within these sector areas and are listed in the following Table.

People Projects	Land Projects	Nature Projects
Population	Current land use	Surface water resources
Transport services and infrastructure	Land tenure	Fire
Values, needs and aspirations	Indigenous management of land and sea	Feral and pest animals
Services and infrastructure	Pastoral industry	Weeds
Economic assessment	Primary industries (non-pastoral, non-forestry)	Land degradation and soil erosion
Secondary and tertiary industries	Forest resources	Conservation and natural heritage assessment
Traditional activities	Commercial and non commercial fisheries	Conservation and National Park management
Current administrative structures	Mineral resource potential and mining industry	
	Tourism industry	

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The compilation of the report was a team effort from all consultants involved in the project team. Significant input into the writing of the draft stages of this report were received from Brian Roberts, Jock Douglas, Peter McKeague and Peter Leis. The final compilation was completed by Bob Walker. The final report is an honest, objective assessment of the pastoral industry in Cape York Peninsula based on information reviewed and information communicated to us. Some differences of opinion exist within the project team on individual items, however, the team is supportive of most of the central themes developed in the report.

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BOB WALKER
LANDCARE MANAGEMENT SERVICES
25 May 1995

EXECUTIVE SUMMARY

Industry and Community Aspirations

Despite on-going financial hardship and difficult working conditions, there is a strong desire on the part of cattlemen and their families to persevere with the beef industry. Pastoralists wish to continue operating as independent producers, free of government support and unnecessary regulations.

Various groups within the Aboriginal community have aspirations of participating in the pastoral industry at levels from fully commercial to subsistence. Given rights over their land, Aborigines appreciate the benefits which cattle production on their land can generate. The achievement of social equity will be facilitated by appropriate access to land resources by mutual agreement.

The aspirations of conservationists for the grazing lands are variable. While agreeing that the grazing animals have caused only localised damage to Peninsula ecosystems, the threat of introduced pasture species becoming serious 'weeds' and diminishing the biodiversity and wilderness values of the region, is regarded as serious by environmentalists.

Constraints and Potential

Land tenure, conditions pertaining to leases and road conditions emerged as the most often quoted constraints to the industry. Present tenure arrangements are perceived as discouraging investment in property improvement. There is a strong case for modifying lease conditions to overcome these perceptions. This could be achieved by more regular review of leases, the introduction of property planning strategies and a change in the role of the Lands Department. There is a need to involve the Department of Primary Industries and the Department of Environment and Heritage in the formation of regional reference groups together with strong landholder representation. The provision of conditions allowing partial subdivision as a means of raising development capital is seen as highly beneficial.

Economic performance of the industry in the past has been poor but indications are that performance is progressively reversing. Signs of a slow recovery are evident with cattle numbers increasing, improving cost efficient management systems being developed and implemented, infrastructure improving and diversified marketing opportunities 'opening up' through increasing direct sales to fattening properties and potential live cattle export via Weipa.

The region's infrastructure from a pastoral industry perspective is still one of the poorest in Australia. Impassible roads in the wet, very long trucking distances, and the absence of proximate markets and services combine to restrain Peninsula development. A progressive upgrade of the main road to Bamaga and other truck roads to a two lane gravel road with high level bridges would be of great benefit to the Peninsula's

industry. For the pastoral industry, these improvements would result in significantly extending the length of time available to cattle producers for cattle movement. Bringing the long-heralded export harbour at Weipa to fruition would benefit most sectors of the Peninsula community through the multiplier effect. Funding options and priority setting for the improvement of these infrastructure requirements need to be assessed and implementation could include negotiations between government and 'user' industry organisations. Benefit-cost analysis for all 'user' industries would be a useful starting point for negotiations on capital funding and financial viability assessment of infrastructure investment.

A range of production systems of varying intensity and cost/benefit are available to Peninsula producers. Investment and risk increase with intensification but careful selection of site quality could increase the success rate and return on capital invested in higher-input systems. Overall success of beef enterprises is dependent also on animal management proficiency and access to higher quality grazing land. There is no shortage of technological solutions to production problems but economic technology transfer to a greater proportion of producers requires more attention.

Economic Performance Possibilities

The financial success of beef enterprises to date, has been limited by poor nutrition, high transport costs, inefficient animal management, low cattle prices and a shortage of developmental capital. Most of these constraints can be overcome by improved export, transport facilities and management systems. It is, however, essential that the total Peninsula herd size remains above the industry viability threshold if infrastructure and its benefits are to materialise. Continued excision of grazing land from pastoral uses will result in an industry too small to justify improved transport and export infrastructure. The future contribution of Aboriginal land and National Parks to total carrying capacity will be crucial to maintaining 'critical mass' in the industry.

The benefits of the reliable seasonal rainfall of the region can be maximised by improvements in marketing and management up to a level dictated by land capability. The expansion of fattening properties and small farms for finishing animals in the Cooktown area warrants serious consideration.

Improved animal husbandry techniques can significantly increase productivity both at low cost and in the short term. The time-lag in gaining a return on capital invested in intensive systems may require special financing.

Cultural Impacts

The future well-being of Aborigines in the Peninsula will be partially dependent on their level of participation in commercial pastoralism. That community's long experience as practical stockmen needs to be developed and expanded by the provision of management training and operational decision-making training.

The culture, traditions and heritage of four generations of Peninsula cattlemen needs to be preserved as an element of the regional social fabric. By respecting complementary

cultures with diverse origins, a united future which preserves the richness of both backgrounds may be achieved.

Environmental Impacts

Past surveys point to localised environmental effects of the pastoral industry on Peninsula landscapes. With the exception of narrow riverine environments and very limited clearing, the vegetation and soils are overall in relatively good condition. This fortunate situation probably results from the natural limitations on animal numbers on grazing leases. However, industry of the past cannot be extrapolated to a similarly sustainable intensified future industry. There is every indication that widespread adoption of higher-input systems will require significantly more environmentally-sensitive management, if the condition of much of the Peninsula is to be preserved. The preferred development option of introducing improved cattle husbandry technologies developed around a mosaic of pasture paddocks for cattle control, would be less likely to cause environmental damage.

With the exception of the effects of cattle near permanent waters, the causal links between the industry and landscape condition are not well documented. The report urges caution in the optimistic interpretation of the CYPLUS Natural Resources Analysis Program (NRAP) land suitability and potential cropping maps.

Timber clearing requires especially good information before it is deemed appropriate. Tree clearing guidelines, responsive to regional constraints, could provide this information.

The application of ESD principles is achievable, if the criteria for sound grazing management as set out in the report are adhered to, irrespective of land ownership by particular groups.

Principles and Guidelines for a Proposed Land Use Strategy

The encouragement of good land management is largely dependent on tenure and the serious implementation of lease conditions. Land management through Property Management Planning could be the key to a permanent beef industry.

The reconfiguration of land portion boundaries warrants serious consideration as a major factor in achieving equitable and efficient resource use. Boundary changes are of particular relevance to National Parks, many of which bear no resemblance to the patterns of the ecosystems they were set up to protect. The excision of quality grazing land from many parks would facilitate the management of both Parks and adjacent grazing leases. While the squared survey pattern which ignores physical boundaries is unnatural, enlightened access agreements between various land users can allow full and appropriate resource use, if approached in a spirit of cooperation and unity of purpose.

Without a planned subdivision/amalgamation program, the present serious economic problems confronting grazing leases cannot be easily overcome. While the holding of multiple leases by one lessee alleviates the situation, clearly the majority of Peninsula leases are economically unviable at their present size and at their present level of

management. Changing management strategies are progressively reversing this situation and alternative management approaches should be integrated into subdivision/amalgamation programs.

Accessibility guidelines can provide a workable framework for co-management and multiple use strategies. Serious consideration must be given to mutually beneficial access agreements. Complementary systems of sharing resources and responsibilities hold great promise as a basis for a harmonious land use strategy.

Recreation and tourism should be encouraged on grazing leases for the financial benefit of producers. Landholders can be remunerated for custodial stewardship duties in preserving conservation or cultural sites on their leases. In this context, it is considered that the present boundaries and extent of the National Parks network be reviewed as an issue for Stage 2 of the CYPLUS process. Two serious shortcomings of the present Parks estate require attention: (a) the present inclusion of vast areas in Parks which are of no particular biodiversity significance, and (b) the present absence from Parks of representative samples of a number of major plant communities and habitats. The configuration of the present Parks network, composed of inappropriate whole lease blocks, limits the achievement of conservation and pastoral objectives.

SECTION A: PROJECT OUTLINE AND METHODOLOGY

This section outlines the purpose of the report, the scope of investigations, the guiding principles and the methodology. These issues were discussed so as to establish the boundaries of the investigations. The physical borders of the project area were delineated as the CYPLUS study area, north of about 16°S. Ecologically sustainable development principles formed the basis of assessment procedures and management guideline development.

The principal purpose of the project was to collect information about economic, environmental, social and cultural issues relating to the pastoral industry. The information collected was specific to the pastoral industry of Cape York Peninsula and formed the basis of the proposed management guidelines.

The key features of the methodology adopted to investigate the required issues are:

- (i) information and documents sourced were the product of previous investigations
- (ii) the project was not required to conduct primary research but was required to review and assess earlier investigations
- (iii) consultation was an important part of the process
- (iv) the report is the outcome of these investigations.

No primary research was conducted during the project, however, extensive reviews of the many government and sectoral investigations were completed. Extensive manipulation of Natural Resources Analysis Program (NRAP) data using Geographic Information System (GIS) technology was completed. Principal NRAP data sets reviewed were land suitability, soils, vegetation and degradation data. This provided an objective set of interpretations of the physical data.

In order to establish priorities of issues and direction, our consultations involved questionnaires, sectoral meetings, landholder meeting at Musgrave, radio talkback, submissions and on-property visits. These contacts were restricted due to the designated focus of the project, however, it was felt they achieved their objectives of identifying, prioritising and informing the consultants of the issues and possible solutions.

1 INTRODUCTION

1.1 Purpose of the Project

This report presents an overview of the pastoral industry of Cape York Peninsula in terms of its economic, environmental and social conditions. Landcare Management Services was awarded the project in June 1994.

The work undertaken for the project interpreted information from CYPLUS Natural Resource Assessment Program (NRAP) projects, previous related research investigations and community consultations. Field trips undertaken were not designed to collect new information, but were intended to address community consultation obligations and to assess preliminary findings. Consequently, this project report relies heavily on previous studies and regional community opinion.

The structure of the report developed around the requirements of the brief. These requirements are listed in Section 1.2 of the report and subsequently form the basis for issue identification. Sectional strategic issues discussed in detail in the report include:

- aspirations for the pastoral industry
- tenure and land use
- economic performance and potential
- marketing arrangements
- infrastructure support
- production patterns
- management systems and technology
- land condition
- environmental impact
- socio-economic impact.

Analysis of these topics form the basis for the project findings and conclusions.

1.2 Terms of Reference

Planning for Cape York under CYPLUS is a large regional exercise. Input information and data are supplied at a regional scale (usually 1:250,000 or broader). Subsequently, planning for the pastoral industry is at a regional strategic level. Some case study investigations have been completed at a more detailed scale, however, the overall focus is at the regional level.

CYPLUS has set terms of reference that require investigation of the economic, tenure and environmental aspects of the pastoral industry in Cape York. These terms require a review to be completed at a strategic level for the whole of Cape York Peninsula. The terms of reference are divided into three sections, namely economic, tenure and environmental. Details of these terms are:

Economic

- *an investigation of present operations and management, and the implications of technology, infrastructure, and market opportunities*
- *economic analysis of present and likely future production patterns, on a current, 5-year, and 15-year basis*
- *market access and opportunities*
- *changes in cost structures including input costs*
- *comparisons of low input systems vs high input*
- *infrastructure (eg. transport, abattoir facilities, live export facilities) and technology (eg. phosphate deficiency) needs*
- *utilisation of capacity and reasons for any under-utilisation*
- *Aboriginal involvement in the pastoral industry*

Tenure

- *principles for property management plans for new or renewing tenure*
- *ground rules for reconfiguring boundaries of pastoral holdings to build up substandard blocks, improve property management, improve accessibility, provide for recreation, tourism and other public interests, and protect natural or cultural sites*
- *present and potential application of tenure system to pastoral industry*

Environmental

- *identification of issues in the management and sustainable use of land for pastoral purposes*
- *audit of environmental condition of pastoral lands on a catchment and regional basis*
- *criteria used for the setting of carrying capacities, and environmental indicators for monitoring the condition of pastoral lands*
- *suitable and unsuitable areas for current or intensified pastoral use*
- *strategies for sustainable rangeland management*
- *regeneration and rehabilitation of degraded areas. (Source: CYPLUS 1994)*

1.3 CYPLUS Planning Process

The Land Use Program (LUP) is designed to collect information about economic, environmental, social and cultural issues. This project, Pastoral Industries, is one of twenty-four (24) projects being undertaken by different organisations. These projects are utilising information from the Natural Resources Analysis Program (NRAP) and include:

- (i) resource assessments such as surface water, weeds, forestry, feral and pest animals
- (ii) industry assessments such as mining, tourism and fisheries
- (iii) regional support assessments such as land tenure, transport infrastructure and services
- (iv) resource management assessments such as conservation assessment and management, and traditional activities.

A full listing of projects undertaken for CYPLUS is included in the preface of this report.

A review of CYPLUS projects quickly highlights that this pastoral industries project is one cog in the workings of a dynamic region. Findings emanating from this project will be weighed against findings and conclusions of the many other projects. A measure of the success of this and the other projects' findings will be gauged by their compliance with ecologically sustainable development (ESD) principles and benchmarks.

The principles of ESD have gained general acceptance since 1991 as the criteria to be used in virtually all land use planning in Australia. The brief of this study also includes ESD as the framework within which proposals and options should be evaluated and compared. For application to the pastoral industry's future, it is useful to consider the 14 ESD principles as described in layman's terms at the CYPLUS Workshop in February 1993:

- 1 Inter-generational Equity - which in pastoral terms means grazing, clearing and burning the land in such a way (season, intensity and frequency) that all elements of the grazed landscapes maintain their productivity and stability. Permanence of the system is the prime aim.
- 2 Conservation of Biodiversity and Ecological Integrity - meaning that the effects of the pastoral industry on the natural resources should not reduce the number of species of fauna and flora of the region, nor should the healthy functioning of ecosystems be diminished by pastoral operations. In this way, the as yet unknown benefits of the natural gene-pool in fully-functioning biomes and integrated ecosystems, can be preserved.
- 3 Maintenance of Constant Natural Capital - which compares a grazing system with a bank account in which the operator lives on only the interest i.e. on the annually generated productivity of the system. Over-use forces operators to draw on their capital - in this case natural land productive capacity; and puts long term productivity at risk.
- 4 Living off Sustainable Income only - which relates to the constant or sustainable natural capital. In essence this means living within our ecological means.
- 5 The Precautionary Principle - the approach which requires operators to gain all available information about the possible outcomes of their initiatives. Because prevention is better (easier and cheaper) than cure, in the pastoral industry great caution is required when considering intensive systems especially where clearing is involved. Many biological processes are irreversible and once damage has occurred, the former stability of the natural system may be impossible to retrieve.
- 6 Social Equity - which is more an objective than a principle, but which has become the criterion by which 'best practice' includes 'best and fairest' in the sense of new developments not disadvantaging any community groups. Equity encourages environmentally-appropriate behaviour.
- 7 Recognition of Biophysical Limits - in pastoral terms means the need for practical realism on carrying capacity and thus on stocking rates. The common tendency to over-estimate both the number of cattle that can be carried and the areas that can be safely cleared, must be tempered by acceptance of the scientific facts available on land capability.

- 8 Encouragement of Qualitative Development - meaning that our past quest for higher production and economic growth, now needs to be at least partially replaced by an appreciation of quality of life and a move toward environmental quality. In essence this is a challenge to the basic community values of the materialistic society.
- 9 Implementation of Full Costing of Natural Resources - referring to the past approach which regarded resources as 'free goods' (soil, water, clean air) and calling now for environmental accounting which requires ecologically-realistic values and prices to be put on these resources. In a monetary society, wastage and proper use are best controlled by appropriate costing mechanisms.
- 10 Striving for Efficiency of Resource Use - an objective which is linked to the previous concept of costing. Efficiency can be encouraged by policies which reward environmental efficiency and minimal waste.
- 11 Creation of a Global Perspective - meaning that our actions should reflect our awareness of being part of a world-wide community which ultimately will stand or fall together, as population, resources and pollution affect our survival. The "Lucky Country" must shoulder special responsibilities proportional to its good fortune.
- 12 Ensuring Resilience in Land Use Systems - on a regional basis this implies having a diverse economy, not relying on only one sector. Production systems themselves are resilient when they can easily regain equilibrium after suffering stress (flood, drought, cyclone). They also have the capacity to adapt to changes in the physical and economic environment.
- 13 Maintaining External Economic Balance - which refers to our balance of payments, and implies that we should never reach national debt levels which cause us to draw on our environmental capital.
- 14 Maximising Community Participation - a fundamental principle which develops 'ownership' by the people of sound development plans to which a wide range of individuals have contributed knowledge and experience. Consultation and participation greatly enhance the acceptance of environmental policy and develop peer pressure to improve standards of planning aimed at both equity and efficiency.

1.4 Methodology

Approach to Investigation

Methodology involved the completion of the following tasks:

- (i) review documentation, practice and roles of pastoral industry in Cape York Peninsula
- (ii) preliminary analysis of strategic issue areas
 - economic performance
 - marketing and technology
 - Aboriginal involvement
 - land condition and indicators
 - land tenure
 - infrastructure

- rangeland management
 - national parks and conservation areas
- (iii) identify physical impacts of pastoral industries in Cape York Peninsula
- (iv) final analysis of strategic issue areas
- (v) propose management guidelines for the regional and catchment development of the pastoral industry in Cape York Peninsula.

At various stages throughout the project, structured consultation sessions with industry, sectoral and community representatives were conducted to validate findings and to obtain informed opinion on interim strategies. A representation of these is presented as Figure 1.1.

The methodology adopted utilised information sources from individuals or organisations that expressed an interest in planning the future direction of the pastoral industry in Cape York Peninsula. Data relating to environmental and cultural aspects of the pastoral industry were considered along with production and economic data, in accordance with the brief. Data relating to wider community issues were considered as they became available. These wider data sources were not required to be collated by this project, however, as they became available (eg. CYPLUS projects) relevant information was integrated into this project. Attached to this report is a list of appendices that are referred to at different sections of the report.

Information Sources

A comprehensive listing of main reports reviewed and NRAP data interrogated is attached as the bibliography at the back of this report. A wider review of our working bibliography was also completed. These sources were reviewed and interrogated for their relevance to the pastoral industry.

As the project developed, inputs from other LUP projects assisted in strategy development. Of particular interest, inputs from the following projects were sourced:

- values, needs and aspirations
- tenure survey
- land degradation
- current land use
- surface water resources
- land resource survey
- vegetation mapping
- land suitability mapping (DPI)
- Lands Department mapping
- groundwater resource
- salinity
- transport
- land tenure.

Many of these reports have attached GIS layers of information and where appropriate, this digital information was transferred and analysed.

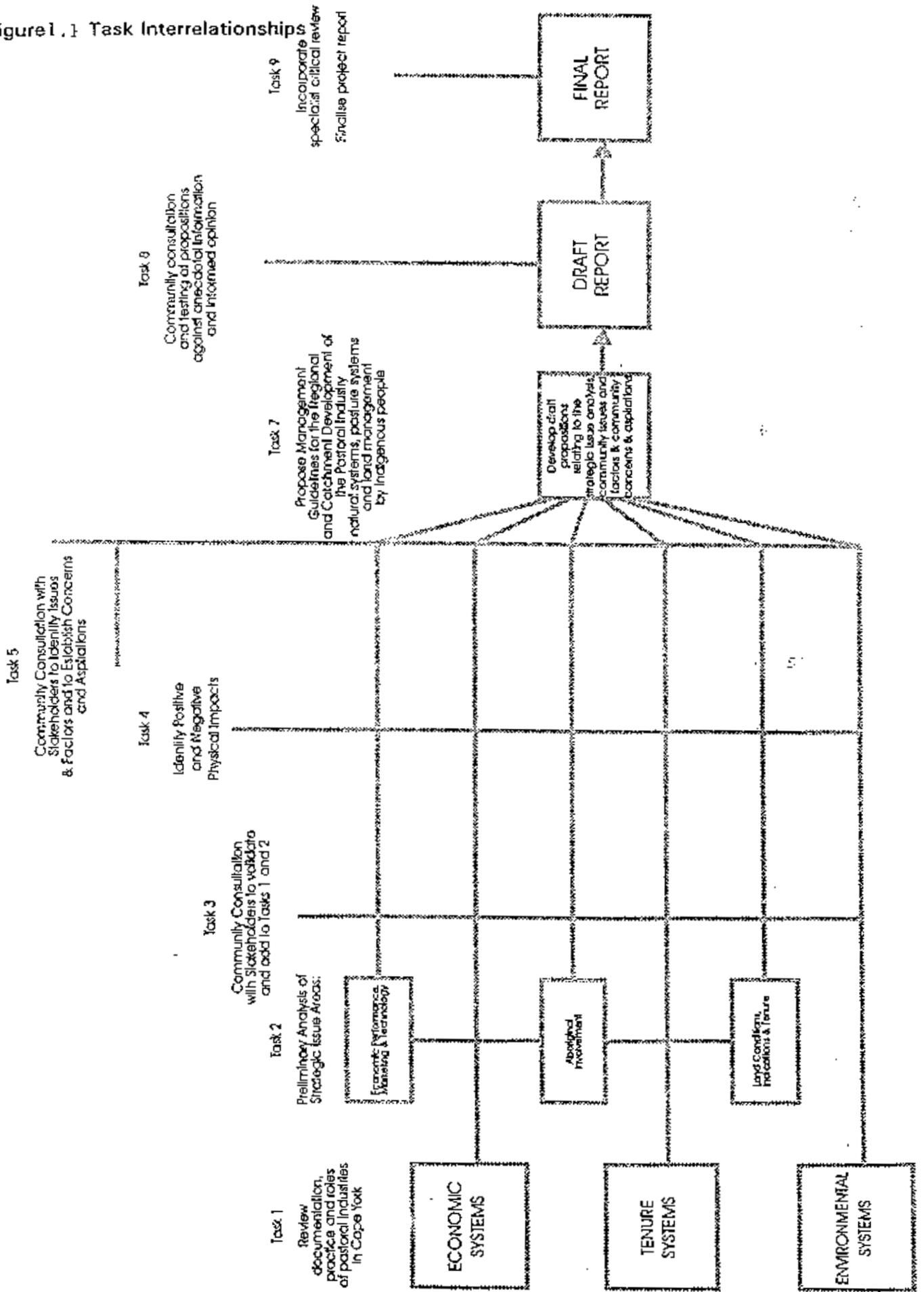
Consultation Process

The methodology adopted a multi-disciplinary approach to consultation. Contact throughout the project was made with:

- Peninsula pastoralists via Musgrave meeting, property visits, questionnaires and telephone.
- Stakeholder bodies via two meetings, one conference (CAFNEC, CYLC, Aboriginal Coordinating Council (ACC), CYPPAG, and the Cook Shire Council (CSC)).
- Government agencies - Department of Primary Industries (DPI), Department of Environment and Heritage (DEH), Australian Heritage Commission, Lands, Department of Housing Local Government and Planning (DHLG&P).
- CYPLUS land working group (two meetings).
- CYPLUS Taskforce - regular updates.
- Other LUP project team members.

These contacts were instrumental in identifying issues, improving regional awareness, validating strategies and developing wider understanding.

Figure 1.1 Task Interrelationships



SECTION B: CATTLE INDUSTRY OVERVIEW

This section outlines the characteristics of the Australian beef industry, its history and future directions. National industry data was presented in order to assess the relative importance of the Peninsula's industry to the Australian industry and provide an understanding of how the Peninsula's cattle industry contributes to the development of the national industry. This data also demonstrates that many of the features of the Peninsula's cattle industry are similar to those experienced in other sections of the Northern Australian cattle industry.

A comparison of national information with Peninsula information (Section D), would suggest that it is clear that the Peninsula's cattle industry is a contributor to the Australian cattle industry. The Peninsula's present herd size of 135,000 head contributes to the national figures and the advantages of regular rainfall and proximity to Asian markets provide market advantages. Other national benefits derived from the existence of the Peninsula's pastoral industry include its role in monitoring any potential disease outbreaks and its regular input into the regional economy. These are beneficial to the national industry and to the Australian economy as a whole.

2 OVERVIEW

The size of the Australian beef herd in 1994 was approximately 24.6 million. Annual beef cattle production to 30 June 1994, measured in terms of livestock slaughterings, was estimated at 7,289,300 adult cattle and 991,000 calves. This represents an average turnoff percentage of 33% for the Australian herd. These cattle are usually produced in mixed farming and grazing enterprises to the south and generally single commodity enterprises over large areas of land in northern Australia. This section of the report will provide an overview of the Australian cattle industry, with an emphasis on the northern Australian industry. Reference to the Cape York Peninsula industry, as part of the national industry, will be made when appropriate.

2.1 Production Systems and Cattle Breeds

Production systems adopted in the Australian beef industry depend on regional seasonal conditions. The climate of southern Australia is generally similar to Europe and subsequently these areas support European/British pastures and European/British cattle breeds and their crosses.

The development of production systems for northern Australia has been a learning exercise due to the substantial differences in climate, soils and socio-economic development rates. The animals initially introduced were British breeds. These breeds were not suited to the hot and humid climates of the north. They needed to develop the capacity to reproduce and grow under conditions where water was scarce and feed was of poor quality. Ticks created problems due to their debilitating effect on the animals but also for their ability to spread disease. In response to these constraints, *Bos indicus* breed cattle have been introduced to northern Australia. Approximately 75% of northern cattle carry at least 3/8 *Bos indicus* blood. *Bos indicus* breed cattle exhibit attributes vital to the northern Australian cattle industry, namely:

- tolerant of hot conditions permitting them to graze for longer periods of the day
- requirement for energy and protein to maintain body weight is lower than that for a European breed of similar size
- increased immunity to cattle tick
- breeding habits where the breeder normally becomes pregnant only if her body weight is reasonably high and the chances of surviving pregnancy are improved.
- ability to walk longer distances and digest higher fibre roughage.

Increased productivity resulting from hybrid vigour crosses is the focus for continued attention in the northern Australian industry. In an attempt to sustain productivity gain, current research is investigating the impacts of introducing Belmont Red, Boran and Tuli cattle from other countries to local areas to recapture hybrid vigour. Breeding strategies to improve the northern herd are relevant to the Peninsula's industry as they will improve the genetic base for the industry.

2.2 Climate and Pastures

The supply and nutritional value of pastures in northern areas differ from those in southern areas. Fundamentally, the climatic features of sunshine, temperature and rainfall determine pasture distribution and yield. Rainfall is the most important climatic influence. Light and temperature constraints are only severely restrictive in limited geographical areas where extremes exist.

A broad dissection of Australia's rainfall distribution divides the country into:

- (i) a summer rain zone supporting tropical pasture species. This extends from about 12°S to about 30°S, representing an area from close to the Queensland-New South Wales border north
- (ii) an area south of the Queensland-New South Wales border that experiences general rainfall in all seasons, supporting temperate pasture production
- (iii) an area further south supporting mediterranean patterns with rainfall in the colder months.

Pastures of southern Australia comprise some native grasses and legumes, however, much of the productive pastures rely on introduced species from the temperate and mediterranean regions of Europe. Pasture growth commences with autumn rains (March/April) following dry summers, slows in colder months and accelerates in spring until the plant matures and dies back during summer. Grazing management maintains a leafy vegetative growth for as long as possible. These vegetative stages of grasses and clovers are of high nutritional value (more than 75% digestible) and even at maturity they are 50% digestible and have a protein content of 10%.

The situation in northern areas is different where large areas of natural pasture still prevail. Australian Beef (1993) notes that:

'It was many years before the inherent limitations to animal production imposed by natural pastures on infertile northern soils were fully appreciated ... Pasture development in northern Australia has depended on species collected in the wild during the past 50 years ... The

technology required to maintain an adequate balance of legumes and grasses in a pasture under relatively uncontrolled grazing needs further development.'

Pasture development in northern Australia does not have the world historical research background of temperate pastures, however, it does have a long local research background. CSIRO's Tropical Pastures Division and DPI have researched the potential role of tropical pastures and legumes for the northern Australian cattle industry. This research has assisted with the development of the northern cattle industry and has generated considerable local benefits. Locally, an export seed industry is now established in north Queensland.

This research experience shows that tropical grasses have a capacity to mature and set seed rapidly to survive. This growth pattern, in combination with high temperatures, produces plants with a high fibre content. Digestibility of these tropical grasses reach 65% during vegetative growth, but more often 40% to 50%. Protein and mineral levels are adequate for animal production for short periods, but more typically, levels are inadequate in the quickly developing plants. Areas of inherent low fertility produce pasture unable to meet the protein needs of the animal. Cape York Peninsula, as one zone of the northern Australian beef industry, is typical of tropical pastures in its relatively low nutrient value.

2.3 Industry Structure

'The Australian beef industry is truly national in character' (Australian Beef 1993). Key industry statistics are:

- (i) 45,000 establishments involved in beef production from weaners to finished stock, in all States and the Northern Territory
- (ii) 121 major processing works throughout Australia, 63 export and 58 domestic. Domestic facilities are located mainly in major regional centres and meat is transported to wholesalers or retailers in refrigerated trucks
- (iii) 40% of total beef production is consumed on the domestic market, through the wholesale/retail sectors
- (iv) 60% of total beef production is handled by the export sector. These markets have strict production, storage, handling and transportation requirements. The world average export percentage is <10%, New Zealand being the only country that exports a higher percentage (75%)
- (v) the average annual world production of beef and veal between 1987-1990 is estimated at 48.3 million tonnes. This constituted 29% of the world's total meat production. (Pork constituted 40%, Poultry 23% and Sheep/Goats 5%). Australia accounts for around 3% of world beef and veal production (US Department of Agriculture 1992) but is second only to the EEC in terms of total export volume. Australia and the European Community combined produced 45% of the world exported beef and veal.

2.4 Livestock Transportation

Livestock are moved between farms, saleyards, abattoirs and ports. Table 2.1 summarises these movements nation-wide.

Table 2.1. Livestock movements by origin and destination

Destination	Farm (%)	Origin Saleyard (%)	Total (%)
Farm	10	20	30
Saleyard	37	-	37
Abattoir	15	15	30
Live Export	1	2	3
TOTAL	63	37	100

(Source: Australian Livestock Transporters Association 1993)

Many of these movements involve small numbers of stock and are undertaken in farmers' trucks. Livestock transporters dominate the movement of stock from local saleyards to abattoirs and ports.

The movement of livestock is an integral part of the Australian industry. Commercial transporters are constantly improving their operations so that bruising and stress to livestock are minimised and cattle are delivered efficiently and safely. Professional livestock transporters are responsible for carrying about 65% of livestock around Australia. More Queensland and New South Wales cattle are carried much longer distances than other States, constituting 24% and 26% respectively of the national total. Table 2.2 details livestock movements.

Table 2.2. Livestock movements by commercial livestock transporters and primary producers

State	Carrier		Total	% Carried by Commercial Transporters
	Livestock Transporters Million Tonnes/Kilometre	Primary Producers		
New South Wales	709	315	1,025 ¹	69
Victoria	422	165	586	72
Queensland	599	345	944	63
South Australia	152	146	298	51
Western Australia	394	161	556	71
Tasmania	25	19	44	57
Northern Territory	226	212	438	52
ACT	5	55	60	8
Australia	2,530	1,364	3,894	65

(Source: Australian Livestock Transporters Association 1993) ¹ million tonnes/kilometre

Livestock are moved by approximately 2,500 full time livestock transporting companies operating about 6,000 vehicles and constituting around 5% of the Australian road transport task.

With respect to ongoing economics of the industry, the following features expressed by the Australian Livestock Transporters Association have significant impact, namely:

'The economics of livestock transporting are very much affected by the fact that loading is generally only available one way. As a result livestock transporters are on average, loaded for 44% of the distance (allowing for empty running to reposition vehicles) compared to a load factor of 87% for typical road transport businesses.'

'The condition of rural roads also has a big impact on livestock transporters. Roads in poor condition (which are all too common in rural areas) increase operating costs through greater fuel consumption, more wear, greater tyre wear and slower speeds which in outback areas can average as low as 15 to 20 km/h on unformed roads.'

These features are of particular significance to Peninsula cattle producers. The huge one-way distances travelled over poor quality roads is a major constraint which substantially affects the economics of the Peninsula's industry.

2.5 On-Farm Marketing

Livestock selling systems vary with geographic location. In southern areas, the saleyard is the main selling centre and cattle do not have to travel far to processing works. In the north, cattle are transported long distances either for finishing on improved pasture or in feedlots or for processing. In the past, Cape York Peninsula cattle were trucked to Mareeba for sale and subsequent processing. Cattle sold in these circumstances result in the cattle producer being a price taker, with inflexible marketing options. This predicament is especially typical of the situation for remote cattle producers. Some changes to the marketing of 'remote area' cattle are alleviating this situation with increasing numbers being traded by direct sales or by electronic marketing (Computer Aided Livestock Marketing). This situation is presently developing in the Peninsula.

2.6 Trends in the Beef Industry

Figures 2.1-2.3 reflect trends in cattle numbers and production in Australia since 1970. Figures 2.4-2.6 show slaughter and consumption trends.

Major developments that influenced production levels during this period were:

- (i) Australia's exports to US soared in response to service high demand in the early 70s. Numbers peaked at 33 million in 1976
- (ii) late seventies saw a closure of key markets and rising freight rates due to the oil crisis resulting in dramatic reduction in numbers
- (iii) late seventies saw production from southern areas decline and northern areas increase

- (iv) early eighties showed steady buildup of cattle numbers due to an improving Japanese market and improving seasonal conditions
- (v) late eighties to the present saw growth in the developing Asian market and maintenance of the United States market.

Other factors impacting on the beef industry were:

- (i) increased competition from poultry and pork for protein consumption - see Figure 2.5
- (ii) stabilisation of beef and veal domestic utilisation levels - see Figure 2.6
- (iii) increasing numbers of cattle being grown on feed - see Figure 2.3
- (iv) increasing development and broadening of the export orientation of the industry.

In response to these trends and projected export opportunities, the industry is in the middle of an informed, market-driven resurgence. An overview of this position is presented by Elizabeth Moore, Senior Market Analyst with the Australian Meat and Livestock Corporation (AMLC) (Australian Beef 1993):

'The past 20 years have seen the cattle industry come of age.

This new maturity has come about as Australian beef exports have increasingly moved to the Asian market place. The United States (US) is still Australia's largest market, but increasingly markets such as Japan, Korea and Taiwan are taking a higher profile and a higher percentage of Australian exports.

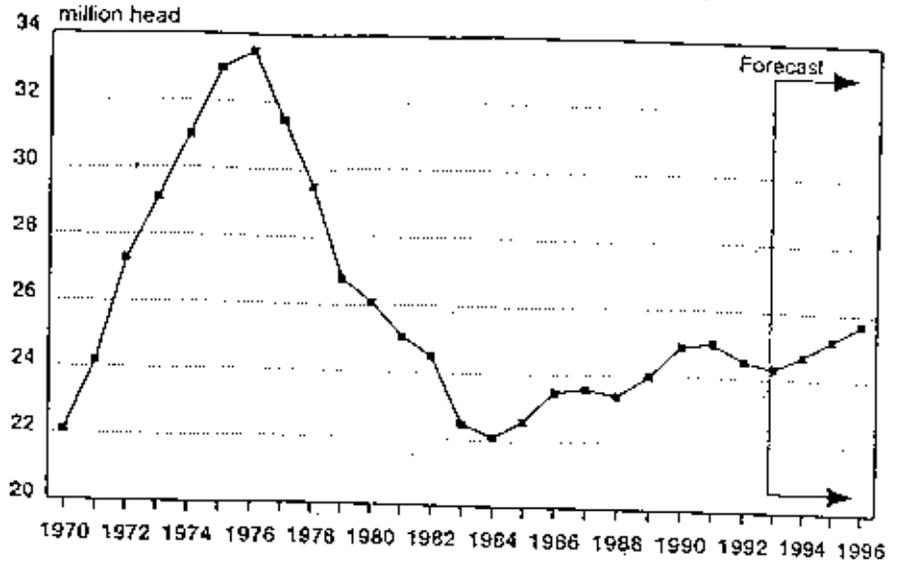
In the past decade Australian exporters have carefully wooed these markets resulting in the diversification of the beef market into specialised products.

Australia is now well established as a leading supplier to Japan and Korea, taking a leading role in the opening and liberalisation of these markets. This role continues as Australia, with the United States and New Zealand, negotiates for greater access to the Korean market and keenly monitors the liberalisation of the Japanese market place.

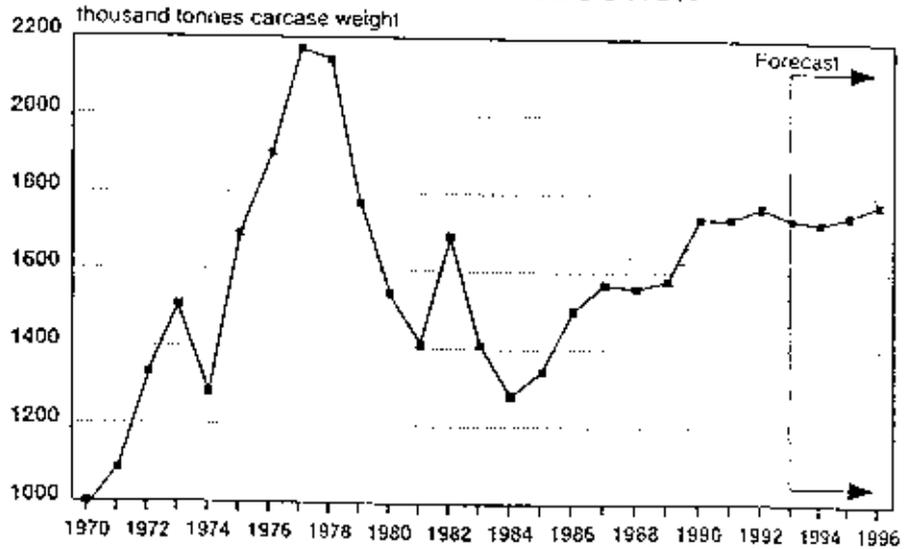
The United States still takes around 50 percent of Australia's total beef exports. However, other markets are developing rapidly to rival the US, not only in terms of tonnage shipped, but also in terms of the value of exports to the industry. This has been hastened in recent years as the Meat Import Law (MIL) has increasingly impeded exports to the US, forcing exporters to seek and develop alternative markets.

This change in direction has brought about a revolution in the industry, with the rapidly growing markets of North Asia demanding more specialised products than the manufacturing grade beef shipped to the US. As a consequence, the livestock producer who based production decisions on traditional factors such as the appearance of cattle are disappearing. The future of the industry lies clearly with the more aware, market conscious grower who turns out cattle destined for particular markets and who is able to meet exactly the specific requirements of users in these markets.'

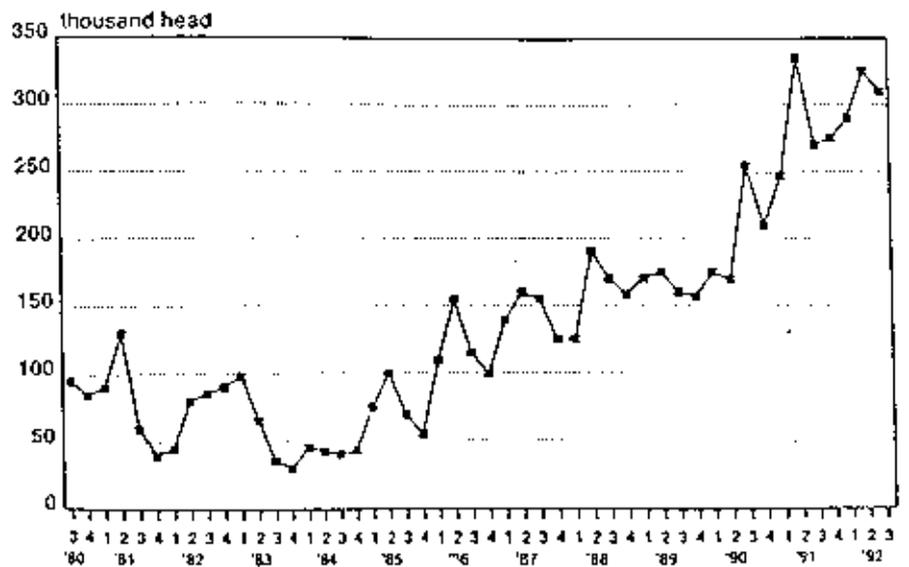
CATTLE NUMBERS IN AUSTRALIA



BEEF AND VEAL PRODUCTION

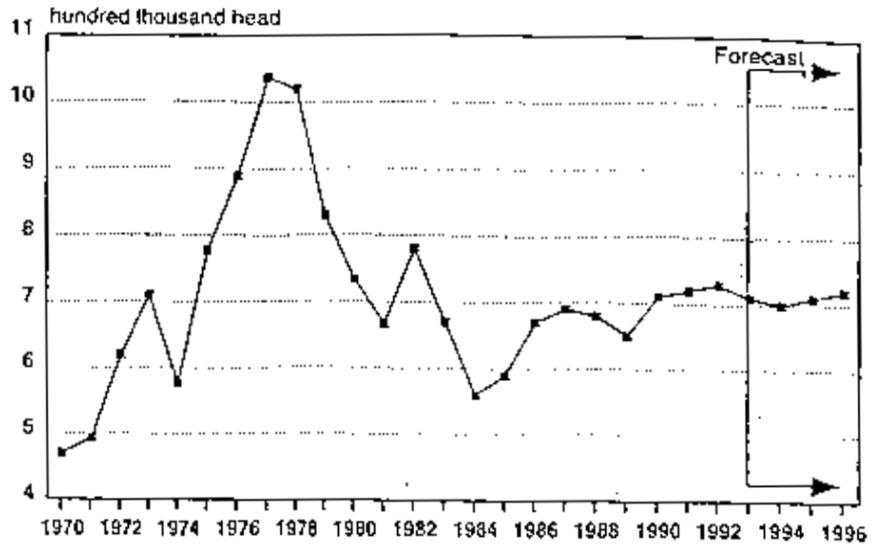


CATTLE ON FEED IN AUSTRALIA

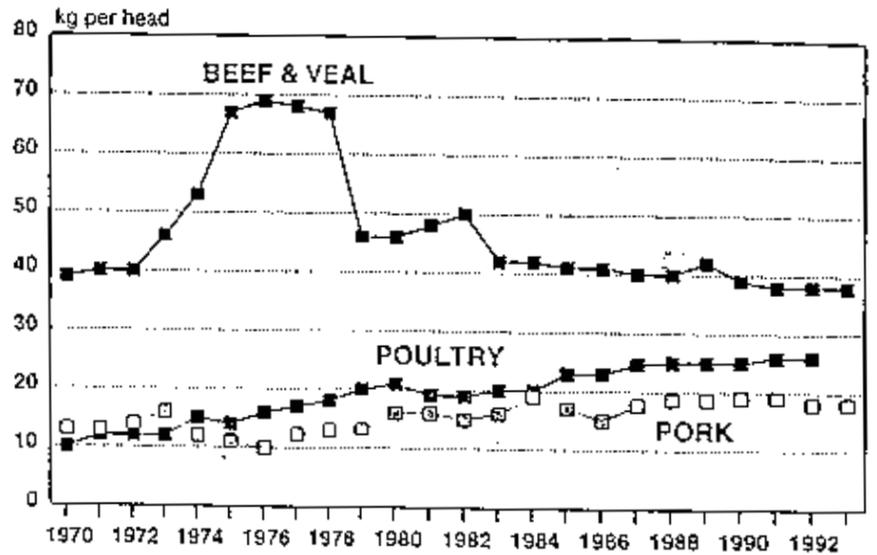


Figures 2.1, 2.2 and 2.3

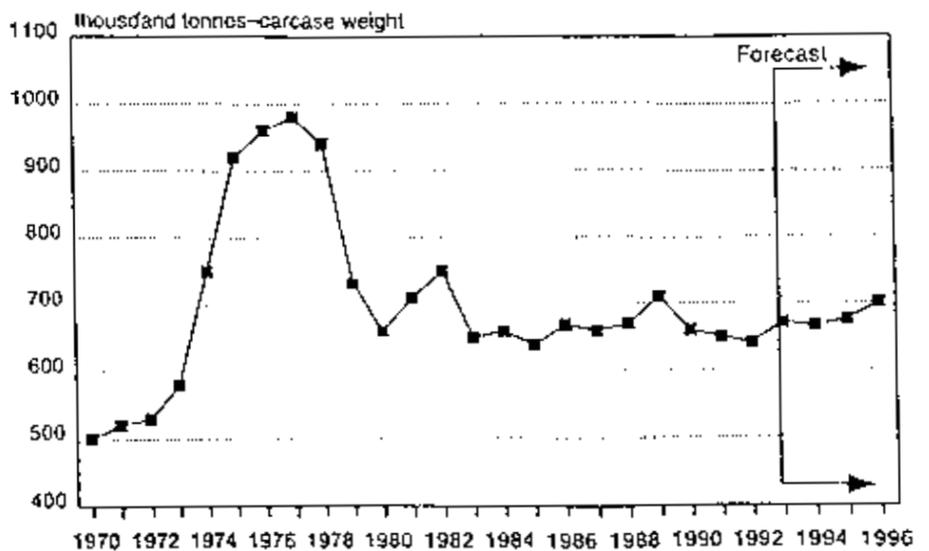
TOTAL ADULT CATTLE SLAUGHTER



PROTEIN CONSUMPTION IN AUSTRALIA



BEEF & VEAL DOMESTIC UTILISATION



Figures 2.4, 2.5 and 2.6

The Peninsula's pastoral industry is steadily responding to these market changes by producing cattle types suited to diversifying market opportunities.

2.7 Industry Strategies

In attempting to meet market changes, strategic planning is an ongoing process for the cattle industry. Attempts are continually being made to improve productivity and sustainability of the industry. Some of the future strategies currently being developed are:

Feedlotting

In feedlotting, cattle are kept in yards and fed high quality grain based diets for periods ranging from 70 to 300 days. This feed regime depends on the specifications of the market and use, and produces a consistent, tender product required by certain high priced markets. Feedlotting adds considerable value to beef production.

In northern herds, the producer must check the financial considerations of feedlots in the decision to either sell young cattle to the feedlot or to retain the beast on the property for maturing. The northern areas also operate within the constraints of limited cattle movement between October and March due to high temperatures and rainfall. This restricts feedlot operators in their desire to maintain a constant supply of cattle.

Clean Beef Production

A recent market initiative of the beef industry is to maintain its reputation of supplying clean beef, produced with minimal involvement of pharmaceutical products. Research is continually enhancing the production of chemical-free high quality meat by developing breeds that are resistant to disease, or developing breeds that achieve faster growth rates and vaccines that are free of chemicals. These animal husbandry improvements are being complemented by development of better pasture species. These efforts apply both nationally and to the Cape York industry.

Sustainability

The industry itself is now challenging the old belief that 'the land always comes back' from natural disasters. It is recognised that it doesn't and it requires careful management. In an effort to address environmental concerns, the industry is involved in environmental programs. Some of the issues under investigation include:

- the decline in the range of fodder plants
- soil degradation
- dryland salinity and scalding
- protection of native vegetation
- control of native pests eg. kangaroos
- rangeland management
- ESD policy directions.

The industry's involvement in the Landcare movement (Douglas 1988) is substantial throughout Queensland. This involvement has increased awareness of long term consequences of land degradation. Also, its involvement with Drought Policy, the Rural Adjustment Scheme, Water Quality and Biodiversity have all involved industry and property planning. This planning approach has, of recent times, broadened to encompass an overall natural resource management approach to issue resolution.

In support of this approach, environmental policies developed around ESD principles are supported. The basic tenet of environmental policy permitting continued economic and social development is supported.

Market Changes

Producers in the Peninsula will need to continually update management and technologies to be able to fulfil wider industry directions and aspirations. The export orientation of the present industry structure is driving individual sections of the industry to conform if they want to maintain market contact.

Producers in Cape York are well aware of the market driven orientation of their industry and the need to continually review their management and technical expertise.

SECTION C: TENURE AND LAND USE

This section highlights the significance of land tenure to the pastoral industry. Existing tenure designations, recent changes to tenure designations and existing tenure conditions all impact on land use in the region. The predominance of pastoral holding leases, a pioneering form of lease, typifies a lack of development in some areas of the Peninsula. This 'pioneering' tenure designation is not always reflective of development on property and reassessment of this designation and associated lease conditions are worthy of consideration if the progressive development of the industry in the Peninsula is to continue.

Substantial areas of Aboriginal and Torres Strait Islander land (15%) and National Park lands (10%) comprise other major tenure categories. Excision of land out of a pastoral designation into other tenure types reduces the productive base of the pastoral industry. The rate at which this has occurred in recent years has accelerated with pastoral properties converting to a non pastoral use. The present WIK claim is seen as threatening to some sectors of the pastoral industry.

3 LAND TENURE AND LAND USE

Security of tenure is recognised as one of the main issues of concern for the pastoral industry. This concern stems from industry uncertainty, misinformation, changing legislation and conflicting advices. Resolution of these issues is considered fundamental to any meaningful development of strategies involving the pastoral industry.

For the purpose of this study, land tenure is viewed as 'the means by which the right to use and occupy land is allocated to various industries or organisations, with varying degrees of security of ownership' (Lands Department 1994).

The present analysis of tenure assumes that security of tenure is attained if:

- (i) 'a person is secure or safe in his holding', and
- (ii) 'the person is able to transfer his rights over the land with certainty and ease'. (Wolfe, 1990).

Security of tenure is not only a question of possession, occupation or ownership but more a question of being confident that the established rights attributed to land can be kept secure. Landholders will be secure if their rights to the use of land are clearly presented and supported. Uncertainty presently is undermining the confidence of the pastoral industry and subsequent land use decisions.

3.1 Current Regional Tenure Distribution

The CYPLUS study area covers an area of approximately 136,700 square kilometres (km²). The tenures of study areas are presently in a number of forms. An outline of these tenures with areas is represented in Table 3.1 and on Map 4.

Table 3.1. Land Tenures and Areas (km²)

Type	km ²	% of Peninsula
Freehold	5,604	4.1%
Crown Reserves	4,647	3.4%
Aboriginal and Torres Strait Islander Lands (DOGIT and inalienable freehold)	20,232	14.8%
Crown Land (vacant crown land)	957	0.7%
National Parks	13,672	10.0%
State Forests and Timber Reserves	2,187	1.6%
Pastoral Leases	78,192	57.2%
Other (special purpose lease etc)	4,922	3.6%
Perpetual Mining Tenure	3,964	2.9%
Roads and Natural Features	1,093	0.8%
Other	1,230	0.9%
TOTAL	136,700	100%

(Source: Lands Department 1994)

Freehold tenure permits the owner of freehold title to occupy the land while paying off the purchase price over a period. It is the tenure of land most alienated from the Crown. Freehold land is distributed predominantly in the southeast corner of the study area.

Freeholding is the process whereby 'leasehold tenure of Crown land is converted to an estate in fee simple' (Wolfe, 1990). Little land use control is exerted on freehold land upon the completion of payments (rents) to the Crown and any exclusions are noted on the original deeds of grant. Existing tenures where freeholding conditions apply include:

- (i) **agricultural farm**
- (ii) **grazing homestead freeholding lease**
- (iii) **auction purchase freehold**
- (iv) **perpetual town leases**
- (v) perpetual lease selection
- (vi) auction perpetual lease
- (vii) special lease purchase freehold
- (viii) miners' homestead lease
- (ix) miners' homestead perpetual lease
- (x) residence areas, business areas.

Of these tenures, those highlighted are of significance to this study.

In addition to these leases with freehold conditions, the following lease categories may be converted to a grazing homestead perpetual lease, namely:

- (i) pasture development holding
- (ii) pastoral holding
- (iii) preferential pastoral holding.

These grazing homestead perpetual leases may then be converted to grazing homestead freeholding leases. Section 3.6 presents a summary of these leases while Appendix 3.1 contains a summation of lease conditions governing various tenures. It is noteworthy that the new Lands Act 1994 will have only two types of lease and does not convert existing leases to the new type.

3.2 Aboriginal and Torres Strait Islander Tenure

Aboriginal and Torres Strait Islander Lands comprise 20,232 km² or 14.8% of the study area. The categories of Aboriginal tenure that exist in the study area include:

- (i) Aboriginal Land Lease - This is a special purpose lease granted for the objects and purposes of the Local Government (Aboriginal Lands) Act 1978 to make secure, for the benefit of Aborigines who reside on the demised land, preservation of their traditional rights, use and occupancy of the demised land
 - (ii) Deed of Grant in Trust (DOGIT) - Granted in trust under the Land Act 1962 for the benefit of Aboriginal inhabitants or for the purpose of Aboriginal 'Reserve'
 - (iii) Transferable Land - Land that is granted under the Local Government (Aboriginal Lands) Act 1978 for the benefit of Aboriginal people without a claim being made under the Aboriginal Land Act for the land. This is land that CAN be transferred
 - (iv) Transferred Land - Land that is granted under the Local Government (Aboriginal Lands) Act 1978 for the benefit of Aboriginal people without a claim being made under the Aboriginal Land Act for the land. This is land that HAS been transferred
- NOTE: Both Transferable and Transferred Land must already be either an Aboriginal Reserve, Lease or DOGIT.
- (v) Aboriginal Reserve - Land set apart under the Land Act 1962 for an Aboriginal Reserve or for the benefit of Aboriginal inhabitants
 - (vi) Aboriginal Lease - The Land Tribunal recommends to the Minister that an area of land be granted to a group of Aboriginal people by way of a Lease in Perpetuity or a Lease for a specified term of years
 - (vii) Gazetted claimable Land - Land that may be claimable by, and granted under the Local Government (Aboriginal Lands) Act 1978 to Aboriginal people. (Source: Department of Lands, 1994)

The distribution of the Aboriginal tenured leases are centred on their communities. Table 3.2 provides a listing of Aboriginal communities and their census counts.

Table 3.2. Aboriginal communities and census counts

Community Name	Population
Kowanyama	1019
Edward River	481
Aurukun	784
Napranum	698
Mapoon	299
Hopevale	822
Lockhart	534
Bamaga	675)
New Mapoon	461) Torres Shire
Seisia	104)
Umagico	189)
Total communities	6066

3.3 National Park Tenure

National Parks constitute some 13,672 km² or 10% of the study area. The designation of this land to national park impacts on the regional pastoral industry as it effectively withdraws the designated areas from pastoral use. Pastoral uses on National Parks are not permitted under the provision of the new Nature Conservation legislation.

3.4 State Forests and Timber Reserves

State Forests and Timber Reserves comprise 2,187 km² or 1.6% of the study area.

3.5 Analysis

A review of the study area's tenure statistics described to this point illustrates that the amount of land used for the purposes of:

	Area (km ²)	% of Study Area
(i) National Parks	13,672	10
(ii) Roads and natural features and other	2,323	1.7
(iii) Aboriginal and Torres Strait Islander Lands	20,232	14.8
(iv) State Forests and Timber Reserves	2,187	1.6
(v) Crown Reserves	4,647	3.4

totals 43,061 km², or 31.5% of the study area. This compares with about 7% State wide (Lands Department 1994). From a pastoral industry perspective, most of these lease types are available for pastoral use, however, present pastoral use is light compared to other past lease types.

3.6 Current Pastoral Tenures and Conditions

Extensive cattle grazing on pastoral holdings is the predominant primary industry in Cape York Peninsula (Connell Wagner 1989). Pastoral lease holdings constitute over half the total area of the study area (78,192 km²), comprising 57%. This figure compares with 72% of Queensland's State land in the form of perpetual lease, term lease, licence or permit. As is the case on a State basis, grazing is the primary use on these holdings.

Cotter (1994) in his 'Study of the Pastoral Industry of Cape York Peninsula' identified the pastoral land tenure in the study area as:

- (i) pastoral holdings
- (ii) grazing homestead perpetual leases
- (iii) special leases
- (iv) occupation licences
- (v) permits to occupy.

A description of the five terms and conditions of these tenures is presented in Appendix 3.1. A summary of these leases is tabled below:

Table 3.3. Pastoral leases for Cape York

Grazing Homestead Perpetual Lease - Primary tenure for grazing and agricultural purposes which are held in perpetuity (ie. forever). Generally seen as the family unit tenure and one which takes over from the pioneer pastoral lease type. Freeholding may take place subject to public interests etc.

Occupational Licence - An interim tenure for occupational purposes only - usually over expired pastoral holdings while future land use is being sorted out.

Pastoral Holding - Pioneer tenure for grazing and agricultural purposes and for the larger mostly unsurveyed leases in the distant areas of the State. Term is up to 50 years.

Permit to Occupy - To permit the use of Crown Land, reserve or road, while at the same time preserving the underlying lawful usage. It is a low security tenure to enable occupation of land eg. will allow grazing on a road without limiting the use of the area for road purposes. Generally has no term and continues by the payment of annual rent.

Special Lease - A multi-purpose tenure which can be used for any purpose over Crown Land and reserved land. It can cover large rural properties, town lots, tourist purposes, special projects, leases over State Forests reserves etc.

(Source: Cotter 1994 and Wolfe Report 1990)

Appendix 3.2 is included for identification of leases and this information will be used in various sections of this report.

An analysis of current tenure indicates three important characteristics:

- (i) The present high percentage of land held under Pastoral Holding tenure is a deterrent to development for many pastoralists who are genuinely interested in developing the properties. Costs involved in developing Peninsula properties are substantial, and an improved security of ownership would encourage development. A change in lease designation from Pastoral Holding to Grazing Homestead Perpetual Lease on these types of properties would provide an incentive to development.

Conversely, the existing Pastoral Holding designation is reflective in some cases of properties that are presently undeveloped and whose owners have no intention to develop them in accordance with negotiated property management planning guidelines. This lease designation is reflective of the stage of development of these properties—pioneering.

- (ii) Amalgamations and subdivisions are permissible under most types of pastoral leases utilised in Cape York Peninsula. Based on the evidence assessed for this report, amalgamations of holdings cannot be supported where the properties to be amalgamated are undeveloped and no negotiated plan of management for development has been approved.

With respect to subdivisions, clarification from the Department of Lands of circumstances when subdivisions are permissible would remove some of the insecurity of tenure concerns. This report proposes guidelines for subdivision for the region's consideration.

- (iii) The distribution of the pastoral lease holdings over the Peninsula affects planning of the pastoral industry in the Peninsula. A review of the CYPLUS tenure map (Map 3) highlights a number of points:
 - (a) pastoral activity is concentrated to the west of the main range
 - (b) fragmentation of pastoral land use is progressively occurring as tenure changes eg. National Parks
 - (c) smaller properties exist in the south eastern part of the study area
 - (d) non pastoral holding tenure exist in the south eastern part of the study area.

3.7 Sizes of Pastoral Leases

Cotter (1994) has analysed the 112 pastoral leases of the region for size distribution. This study area covered approximately 93,526 km². His analysis concluded that the average size of the leases was 83,506 hectares (or 835 km²), but this average was distorted by a number of very large leases. Cotter concludes that 90,000 ha (900 km²) is the upper limit of area workable by a family unit. This conclusion is viewed as conservative by industry sources, as implementation of management strategies such as trapping and supplementation, allows for considerably larger areas to be managed by a family unit. Table 3.4 represents the size distribution of the leases. The distribution of these leases is represented on Map 3.

Table 3.4. Lease size and distribution

Size	Number	Accumulated Total
>1,000 ha	5	
1,000 - 5,000 ha	7	
5,000 - 15,000 ha	15	27
15,000 - 30,000 ha	12	
30,000 - 45,000 ha	13	
45,000 - 60,000 ha	6	
60,000 - 75,000 ha	8	
75,000 - 90,000 ha	8	74
90,000 - 110,000 ha	4	
110,000 - 130,000 ha	9	
130,000 - 150,000 ha	7	
150,000 - 180,000 ha	6	
180,000 - 250,000 ha	7	
250,000 ha -	5	112

(Source: Cotter, 1994)

An analysis shows the following characteristics:

- (i) 27 leases are 15,000 ha (150 km²) or less. This distribution is represented on Map 12. Generally, these leases are located in the southeastern corner and are lightly scattered in the central southern sections of the Peninsula. The southern leases are reasonably well positioned to function as breeding country properties for southern fattening blocks (eg. Atherton Tableland).
- (ii) 74 leases are 90,000 ha (900 km²) or less. This distribution is represented on Map 12. Generally, these leases are located either side of the development road. These leases are relatively better serviced by roads that may be able to move cattle for live export.
- (iii) 38 leases are larger than 90,000 ha (900 km²). These areas are in excess of Cotter's upper limit for a workable family unit. This distribution is represented on Map 12. Generally, these leases are located in areas west of the range.
- (iv) Cotter recognises that larger leases have 'potential to have areas excised for amalgamation with substandard blocks, or indeed subdivision to provide additional separate leases'. This investigation supports the principle of amalgamation and subdivision, however, other criteria (developed in later sections of this report) would need to be satisfied before changes could be recommended.

3.8 Ownership of Leases

The summary of the ownership of leases within the study area is represented below in Table 3.5.

Table 3.5. Lease ownership

Ownership Type	Area (km ²)	Percentage of Study Area	Percentage of Assessed Carrying Capacity
Foreign companies and individuals	5,682	6.2	7.2
Private companies	29,555	32.4	32.6
Individuals or groups of individuals	48,068	52.7	51.3
Aboriginal interests	6,520	7.3	6.6
Public company	1,300	1.4	2.3

An analysis shows the following characteristics:

- (i) foreign owned properties have a higher carrying capacity than average. Possible explanations for this result are:
- the country is inherently better (eg. better soils), or
 - the improvements on the property are above district average
 - the properties are more efficiently managed.
- A clear explanation of the reasons would need further detailed investigation. However, based on regional investigations, foreign-owned properties have been developed on some better quality land. Also, foreign-held leases have undergone the greatest amount of development. Past developmental efforts by foreign companies, although not generally successful, have been of significant benefit to the Cape York pastoral industry. In summary, foreign investment in pastoralism has accrued the following benefits:
- provision of additional employment opportunity
 - provision of 'test cases' for property development strategies
 - provision of companies of size to utilise Peninsula land as breeding country for their southern fattening blocks
- (ii) private companies manage 32.4% of the Peninsula's area which carries approximately 32.6% of the region's assessed capacity
- (iii) individuals comprise the dominant ownership type on the Peninsula, comprising over 50% of the study area and the assessed carrying capacity. The size of these individual leases range from 500 ha to 283,000 ha (2,830 km²), with an average of 66,800 ha (668 km²). The use of these holdings range from open grazing to store production to cattle fattening enterprises. Some migration of cattle to associated southern fattening enterprises originate from some of these holdings.
- (iv) Aboriginal interests are limited to four (4) leases, however limited grazing occurs on other designated Aboriginal tenured land. These four (4) leases total 652,000 ha (6,520 km²) or 6.6% of the study area.
- (v) the only lease held by a public company is Sudley Pastoral Holding near Weipa. The presence of this lease is strategic due to its location close to the port and local market of Weipa, its extensive development and its small abattoir.

The mix of ownership types is significant at this stage of the pastoral industry development in Cape York Peninsula. Maintenance of this tenure mix and subsequent capacity to integrate new technologies with market-driven initiatives will be crucial for the industry's immediate, medium and long term development.

3.9 Improvements on Leases

Cotter has estimated that the combined unimproved value of the studied leases is \$8 million, or about 86 cents per hectare. This information is not strictly current due to varying valuation assessment dates, however, it can act as a guide for discussion purposes.

The unimproved value is based on grazing usage. Some properties may have been allocated a higher valuation due to market perceptions that land has a potential for a higher usage such as tourism. However, the above unimproved figure does suggest that 'properties in the Cape are underdeveloped, particularly in relation to fencing and timber treatment' (Cotter, 1994).

With respect to the approximate value of improvements, Cotter estimates that \$16.1 million have been invested. This expenditure has been allocated to structures, yards, fencing, water and timber treatment (including pasture improvement). Table 3.6 details the proportion of the expenditure on each item.

Table 3.6. Value of improvements

Improvement	Total Expenditure (\$m)	Percentage of Total
Structures	5.8	36%
Yards	1.6	10%
Fencing	3.7	23%
Water	2.1	13%
Timber/Pasture	2.9	18%

An analysis of this table highlights a number of points:

- (i) the costs of property development, based on traditional systems of fencing, water and structures, are excessively high due to isolation and large areas
- (ii) property management systems that require minimal capital input have been practised
- (iii) any future development of the industry will be required to build from a low investment base.

4 LAND USE

4.1 Current Land Use

Current land use reflects tenure and tenure conditions. Major land uses in Cape York Peninsula and their associated tenures are represented in Table 4.1.

Table 4.1. Major land uses

Tenure	Land Use	Area (km ²)	Percentage of Total Area
State Forests and Timber Reserves	Forest product	2,187	1.6%
Roads, Natural Features and Other	Roads, natural features	1,093	0.8%
Perpetual Mining	Mining	3,964	2.9%
Crown Reserve	Recreation, water supply, Aboriginal purposes, other specific purpose	4,647	3.4%
Freehold	Townships, limited grazing and agriculture	5,604	4.1%
Crown Lands and Other Lease	Specific purpose	7,109	5.2%
National Parks	Conservation/tourism	13,672	10%
Aboriginal and Torres Strait Islander Lands	Aboriginal and Torres Strait Islander Communities, Aboriginal purposes, limited grazing	20,232	14.8%
Pastoral Holding	Cattle grazing	78,192	57.2%

(Source: Lands Department 1994)

Over half the region is occupied by pastoral holdings and leases for pastoral purposes. Aboriginal land, constituting 14.8% of the region, is used for traditional and cultural purposes and supports few or no cattle. National park lands, constituting 10% of the region, supports only limited grazing and this is diminishing rapidly as the new environmental legislation prohibits grazing in National Parks. Some grazing is permitted on the other tenures mentioned. From a regional tenure perspective, 80% of the region is under either Pastoral Holding, Aboriginal or National Park related tenures. These dominant tenures effectively determine land use and are represented in Map 4.

4.2 Pastoral Land Use

History and Development of the Pastoral Industry

Recent evidence on human habitation of the Peninsula indicates that prior to the land-bridge connecting Australia to Papua New Guinea and Indonesia, there was no human presence in this portion of what was Gondwana. Aboriginal history goes back some 40,000 years and European exploration is recorded from Dutch landings in 1606. This was followed by Cook's sojourn to Cooktown in 1770 and Kennedy's expedition to the interior, that is today's Cook Shire, in 1848. Somerset was established in 1863 and in 1865 the Jardines introduced the first cattle to the Peninsula. This venture is widely regarded as the commencement of pastoralism in the northern Peninsula, followed by a local increase in the demand for meat as a result of Hann and Mulligan verifying the existence of gold on the Palmer River fields in 1872-3. This activity led to a population of over 40,000 in the Palmer area by late 1874.

The early grazing selections were:

- Butchers Hill (Lakeland Downs) 1874
- Mt Mulgrave 1876
- Frome (Fairlight) 1879
- Lakefield 1881
- Lallarookh (Silver Plains) 1882
- Rokeby 1884
- Kalkah (Glengarland) 1884
- York Downs (Sudley) 1884
- Koolburra 1884
- Pine Creek (Merluna, Wolverton) 1887
- Bertiehaugh 1888
- Lockerbie (Galloway) 1892.

In the period 1874-1883 the telegraph line was surveyed between Cooktown and the Cape and completed in 1886. The railway line planned from Cooktown to the goldfields, only reached Laura and was terminated there in 1888. (It was finally closed by the State government in 1961.) Sugar and rice industries initiated in the 1880s at Bloomfield and Cooktown respectively, both failed. When bauxite was rediscovered at Weipa in 1955, the Peninsula's biggest enterprise commenced. The beef industry gained by the introduction of Brahman (*Bos indicus*) cattle in the 1950s and the first transport of cattle by boat in 1953.

By 1959 the American hamburger market provided a market for otherwise unsaleable cattle and in 1961 the establishment of legume pastures began. By 1965 overseas owners purchased grazing leases and commenced pasture improvement. In 1967 the Mareeba-Laura road became part of the 'beef roads' scheme of inland Australia. Notably, the standard of the roads in the Peninsula is not up to the standards of much of the 'beef roads' of inland Australia. In 1969 the first major cropping scheme in the Peninsula commenced at Lakeland Downs.

Since 1969 to the present, the pastoral industry has met with mixed fortunes. Cattle numbers have been dramatically affected by the Brucellosis and Tuberculosis Eradication Campaign (BTEC), with over 225,000 head of cattle destocked in the 1980s. Many of the properties that were destocked have not yet been brought back into production. Increasing numbers of

cattle are now direct sold to southern fattening properties and live cattle export markets and infrastructure are now being developed.

Aboriginal and Torres Strait Islander Involvement in the Pastoral Industry

The Aboriginal and Torres Strait Islander communities have experience as stockmen, musterers, drovers and trackers. They have supplied much of the labour force that attended to the stock management role of property management and served a significant role in the development of the Peninsula's pastoral industry. Unfortunately, Aboriginal people lack property management experience.

As is the case with the non Aboriginal and Torres Strait Islander section of the Peninsula's pastoral industry, the overall level of enthusiasm of the Aboriginal and Torres Strait Islander communities towards the pastoral industry is diverse. Some groups are keen to develop commercial herds, others desire subsistence herds only, others again want no cattle on their land, preferring to procure their meat from wildlife and feral pigs. For those wishing to develop their pastoral property management skills, training would need to occur, possibly over the period of a generation. For those not wishing to develop into pastoral enterprises, consideration must be given to changing land tenure so as to reflect Aboriginal needs for land ownership. This will affect the critical mass of the pastoral industry in the Peninsula.

Unfortunately, many of the 'commercial' properties of the past have not been economically successful. Reasons for difficulties in transferring stock management skills to wider property management skills are varied. At the risk of generalisation camouflaging the facts, some of the constraints suggested during our consultations included:

- poor quality of land
- lack of skills training
- cultural attitudes to land development
- 'public purse' cycle diminishing initiative.

If the Aboriginal and Torres Strait Islander communities are to benefit from continued expanded participation in the Peninsula's pastoral industry, these identified constraints have to be recognised.

As is the case with all sectors of the industry in the Peninsula, proper property planning and skills training need to be continued. This process will need to be cognisant of both wider cultural and industry consideration. Any serious entry of Aboriginal landholders into commercial pastoralism would most likely be based on low-input and thus low-cost management. While output per unit area may be lower from such extensive production, it requires less resources, less technical knowledge and decision-making, and has decidedly lower financial risk. This management approach is responsive to Aboriginal and Torres Strait Islander peoples' spiritual links with land.

National Park Involvement in the Pastoral Industry

Permits to graze in National Parks have been part of the Queensland pastoral industry for decades. Such arrangements presumed that fauna and flora can be maintained under a grazing regime, given appropriate stocking rates and effective distribution of cattle. Grazing of parks

has been challenged by conservationists as detrimental to the ecological integrity and wilderness values of parks. Theoretically, the network of parks in the Peninsula has been planned so as to represent a framework of sufficiently large examples of each of the major land forms and their associated biodiversity. In practice, while several additional parcels of Crown land have been identified and recommended by DEH staff as necessary and appropriate future parks, only those leases which have become available through the political processes and pressures of the day, have become proclaimed as National Parks. Some present parks include some of the best grazing land in the Cape, eg. Lakefield, Archer Bend, Silver Plains, but the new Nature Conservation Act prevents grazing in parks.

SECTION D: DESCRIPTION OF THE CURRENT INDUSTRY

This section provides a snap shot of the present state of pastoral industry in the Peninsula. It investigates the production patterns of the industry and forecasts future production levels. It reviews the management systems practised and development for the Peninsula. The economic performance is reviewed with particular attention given to marketing arrangements and infrastructure support.

In summary, the industry is struggling out of a period of poor economic performance and low production numbers. In the recent past, BTEC resulted in 225,000 head of cattle destocked from properties and increased numbers of breeders being held for herd build-up. Also during this period, traditional management systems were inefficient, infrastructure and transportation support was very weak and marketing options were too narrow relying on Mareeba saleyards as their primary outlet. However, the outlook for the 'nuts and bolts' component of the industry has improved with the industry recovering from BTEC, improved cost efficient management systems being developed, continually improving infrastructure support being built, and the development of diversified marketing opportunities such as direct sales for fattening and live cattle exports. These evolving positive aspects emphasise the improved potential of the industry given the right circumstances.

5 PRODUCTION PATTERNS

5.1 Past Production

Total Cattle Numbers

Table 5.1 summarises total cattle numbers in the shires of Cook, Aurukun and Torres measured in five year increments.

Table 5.1. Total Meat Cattle Numbers in Cook, Aurukun and Torres Shires

Year	Cattle Numbers	Significant changes occurring
1960	99,344	
1965	99,794	
1970	101,506	
1975	132,844	Cattle industry price slump (beef depression 1974-77)
1977	150,424	Cattle numbers peaked 1977
1980	141,415	
1985	130,248	BTEC campaign 1981-89. Cattle numbers reached their
1989	119,233	lowest point 1989
1990	124,867	
1993	130,528	

(Source: Boorman Submission, 1995)

Analysis of Table 5.1 highlights a number of events in the past that have influenced cattle numbers in the Peninsula:

- cattle numbers rose in the early 1970s in response to increasing market prices
- despite a price crash in 1974, cattle numbers continued to increase as pastoralists could not afford to sell old breeders
- cattle numbers peaked in 1977 at 150,424
- the Brucellosis and Tuberculosis Eradication Campaign (BTEC) commenced in 1981
- in the late 1970s and through to 1989, cattle numbers drifted down to their lowest level since 1973 amounting to 119,233 head
- BTEC finished in 1989
- despite destocking resulting from BTEC, cattle numbers in 1989 were 20% above 1960s levels (ie. 99,344)
- post 1989, cattle numbers have increased considerably and this increase occurred in spite of some properties being still totally destocked due to BTEC and the loss of pastoral production on properties converted to National Parks
- twenty (20) properties in the Peninsula were either totally or partially destocked under BTEC.

This summation of past production events does not cover the Carpentaria Shire section of the study area. However, departmental and industry advice suggest the events and effects on cattle numbers are similar for both areas.

Herd composition

A more detailed statistical review was completed for the period 1984 to 1993.

The Australian Bureau of Statistics, Agricultural Census Data, has collated data on cattle numbers, sales and deaths for the Aurukun, Torres and Cook Shires. These data are presented as Table 5.2.

Table 5.2. Aurukun, Torres and Cook Shires, Meat Cattle Numbers, Sales and Deaths

Commodity	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Meat Cattle on Holding at 31 March	130624	130248	129293	128200	132476	119233	124867	124581	126799	130528
Sales: (Year ending 31 March)										
Steers, Bullocks and Bulls, 1 Yr and over	14002	15428	14465	13679	12571	14951	15469	12557	12221	10596
Cows and Heifers 1 Yr and over	4557	4246	3109	6454	4636	7545	5219	4628	6016	6276
Calves under 1 Yr - Number	275	466	68	1160	132	63	598	115	376	241
Deaths on Holding: (Year ending 31 March)										
Cows & Heifers 1 Yr and over	2893	3885	3371	3770	6407	13514	5790	4374	4172	5708
Calves under 1 Yr	819	1345	1036	1112	1325	1913	1817	2098	1411	1830
Other Cattle 1 Yr & over	1839	3235	2694	3879	3703	5051	3969	1597	1112	1517

These shires are not a complete representation of cattle numbers north of 16°. A section of Carpentaria Shire is also included in the south western section of the region. Statistics for this shire are presented as Table 5.3.

Table 5.3. Carpentaria Shire, Meat Cattle Numbers, Sales and Deaths

Commodity	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Meat cattle on holding at 31 March	308989	299746	281034	294888	334895	343919	344601	309625	298104	307423
Sales: (Year ending 31 March)										
Steers, Bullocks and Bulls, 1 Yr and over	30838	34591	29165	31998	37644	42000	31680	31544	16240	28233
Cows and Heifers 1 Yr and over	12053	13803	14887	14038	14567	24218	15044	31195	18149	22902
Calves under 1 Yr - Number	331	205	3357	2178	1331	4898	1780	5325	1254	6226
Deaths on Holding: (Yr ending 31 March)										
Cows & Heifers 1 Yr and over	15589	16685	14495	9547	10036	12774	10944	5366	14155	6694
Calves under 1 Yr	3080	6245	2694	2679	2073	2554	2507	2221	3430	2723
Other Cattle 1 Yr and over	5743	6000	10514	5510	3945	7911	5759	2402	3081	1762

These statistics are presented graphically in Figures 5.1 and 5.2.

Analysis of Tables 5.2 and 5.3 highlight property production responses to earlier mentioned events affecting cattle numbers:

- during the BTEC period (1984-89), cow and heifer (1 year and over) deaths increased at an increasing rate, peaking at 13,514 in 1989 in response to the eradication scheme
- the decline in cattle numbers up to 1989 was mainly due to destocks and destruction of all classes of stock during BTEC
- the sales of cows and heifers have shown an erratic pattern but with a trend for increasing sales leading up to the completion of BTEC due to the BTEC freight subsidy reducing marketing costs
- since 1989, sales of cows and heifers have decreased as graziers build up breeder numbers following BTEC.

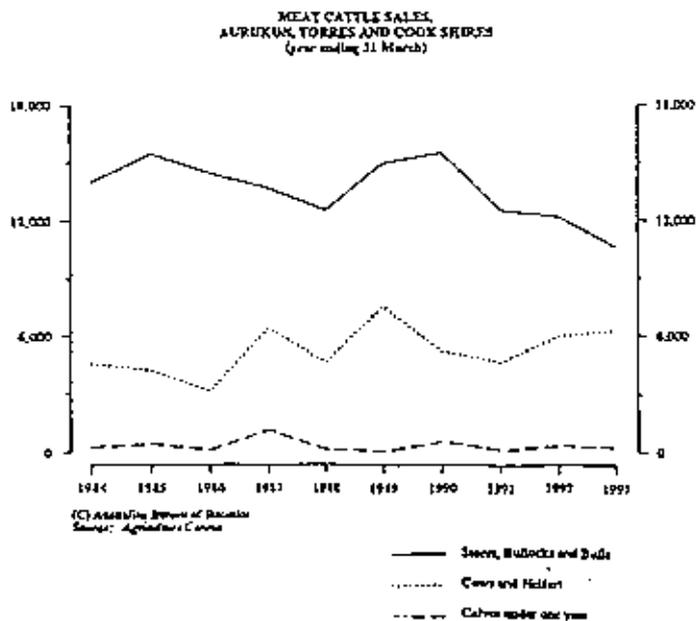
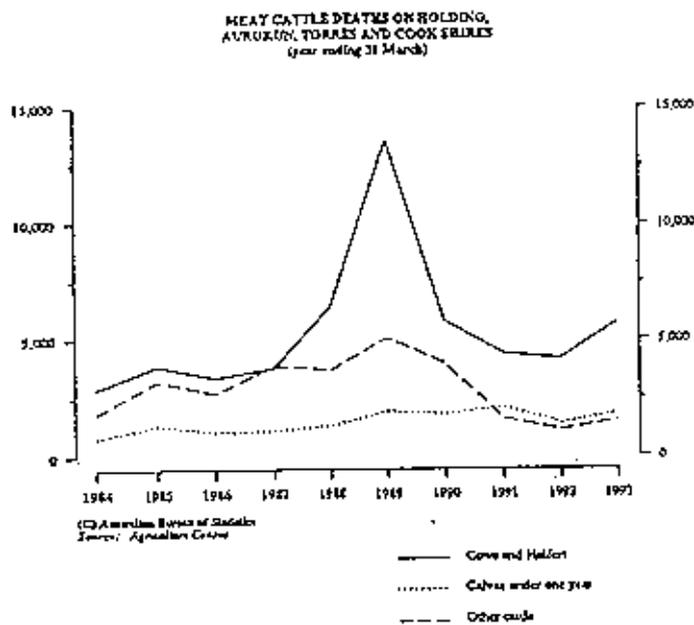
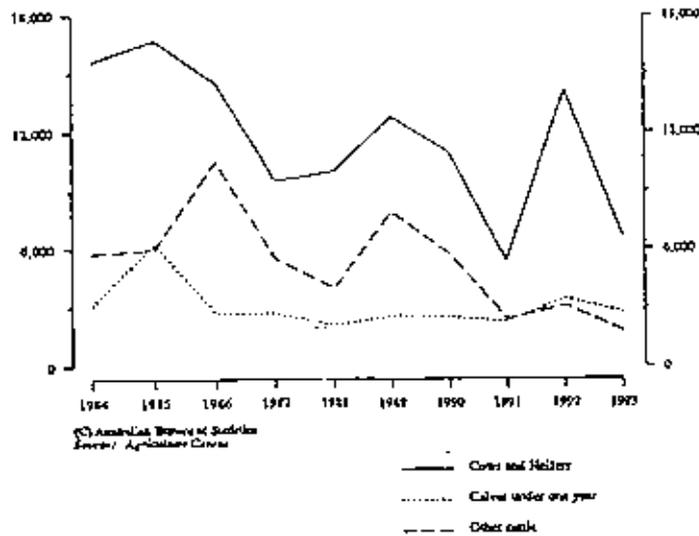


Figure S.1. Production Trends (Aurukun, Torres and Cook Shires)

MEAT CATTLE ON HOLDING,
CARPENTARIA SHIRE
(year ending 31 March)



MEAT CATTLE DEATHS ON HOLDING,
CARPENTARIA SHIRE
(year ending 31 March)



MEAT CATTLE SALES,
CARPENTARIA SHIRE
(year ending 31 March)

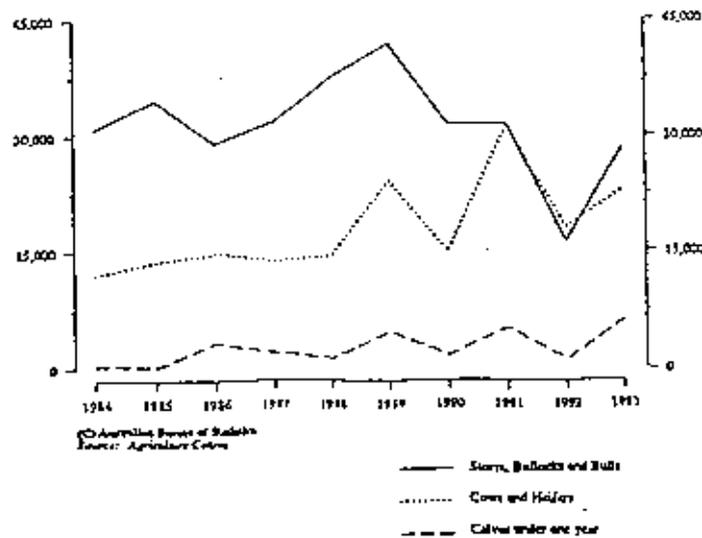


Figure 5.2. Production Trends (Carpentaria Shire)

Effects of BTEC

BTEC has influenced the Peninsula's past production of cattle. The destocking program associated with BTEC resulted in graziers recovering compensation for 99,401 head of cattle that were eradicated (DPI Stock Inspectors). In addition, cleanskin bulls were shot, but compensation was not paid on these cattle. Discussions with stock inspectors involved with BTEC in the Peninsula consider that a total of 225,000 head of cattle were destocked from 20 properties over the nine (9) year BTEC period. This averages out at a destock of 25,000 head per year from the 20 properties. In Cook, Aurukun and Torres Shires compensation was paid on 42,465 head, translating to a destock figure of about 95,000 head.

BTEC has resulted in a reduction in cattle numbers, however, the extent of this reduction is not dramatic when compared to longer term production indices. At the end of 1989, when BTEC and destocking had concluded, cattle numbers were still 20% above 1960s levels. Also it is noted that three large properties had been converted to National Parks around or soon after this period.

Despite total cattle numbers not being dramatically affected by BTEC, herd composition and management were affected. Breeder numbers declined during BTEC and graziers appear to be working on rebuilding breeder numbers since 1989. BTEC caused an adjustment of management strategies in order to re-establish some balance in the composition of their herds.

5.2 Current Production

Our statistical analysis of Australian Bureau of Statistics (ABS) data uses data current as at 31 March 1993. These data have been extracted to quantify the present 'state of the industry' in the Cook Shire and is presented as Table 5.4. Analysis of the ABS data highlights the following key features:

- (i) average herd size is 1,695 head. The significance of this figure is that it is low when compared to the Lands Department nominated 3,000-3,500 head requirement for viability. This indicates that, on average, properties are stocked with herd sizes below 'viable' levels
- (ii) average herd size increases with an increase in the size of the property. Average herd size of 5,000 head requires an average property size of 180,000 ha. If these average figures were proportioned, a herd size of say 3,500 head would require on average a property size of 126,000 ha, under present production systems
- (iii) identified herd sizes and property sizes reflect average carrying capacities. The average carrying capacity for Cook Shire is 61 ha/head. Management systems for these carrying capacities require large areas of land. The carrying capacity increased with larger herd sizes to 36 ha/head. The carrying capacity decreased with smaller herd sizes to 132 ha/head
- (iv) smaller herd size properties did not run many cattle (16,359 head)

Table 5.4. Meat cattle averages in Cook Shire at 31 March 1993

Herd size	Establishments (no.)	Area of Holdings (ha)	Holdings (%)	Total meat cattle (No.)	Total meat cattle (%)	Average establishment size (ha)	Median establishment size (ha)	Average herd size (No.)	Median herd size (No.)	Average carrying rate (ha/head)
1-999	37	2,161,830	27	16,359	12	58,428	25,900	442	450	132
1,000-2,999	26	3,226,079	40	43,979	34	124,080	122,452	1,692	1,614	73
3,000 and over	14	2,521,049	32	70,190	54	180,075	134,056	5,014	4,427	36
Total meat cattle	77	7,908,958		130,528		102,714*	71,000*	1,695*	1,004*	61*

* Overall averages

(Source: Australian Bureau of Statistics)

- (v) properties running larger herd sizes carry a proportionally high percentage of cattle (54%) compared to their area percentage (32%). The other herd size categories run substantially fewer cattle on a percentage basis than their respective percentage of area utilised.

Table 5.4 relates to the Cook Shire only. Advice from the Australian Bureau of Agricultural and Resource Economics (ABARE) is that there were 'mostly no cattle in Aurukun, Weipa and Torres - only in Cook and Carpentaria'. With respect to Carpentaria, ABARE's advice is that 'stations in the northern part of Carpentaria are very different (to the Peninsula). They are corporate owned, large and transfer considerable numbers of cattle onto and off the stations.' Logistical difficulties in statistics collection prevented an estimate of cattle numbers in this part of the study area. Total Carpentaria statistics have been included and an arbitrary percentage could be used to assess 'ball park' numbers for the Carpentaria Shire's cattle within the study area.

5.3 Production for Mareeba Saleyard Disposal

An analysis of cattle being sold through Mareeba was completed and this is represented in Figures 5.3 and 5.4. Key findings of this analysis are:

- (i) identified cattle categories are principal turnoff/sale types from Cape York Peninsula
- (ii) Cape York Peninsula cattle categories and percentages as estimated by DPI Stock Inspectors in Mareeba are bullocks 2%, medium steers 10%, export steers 45%, light cows 5%, light bulls 28% and heavy bulls 10%
- (iii) average of the categories of cattle over a 65 month period was 95.7 cents per kg live at Mareeba yards
- (iv) adjusted average price for Cape York Peninsula cattle over this period is 88.7 cents per kg at Mareeba
- (v) statistics for store cattle sold for direct sale or company transfers are not recorded through the saleyard system. It is difficult to estimate the extent of this practice, with anecdotal evidence suggesting it is significant, but this assertion was not supported by questionnaire returns received for this project. The following projection analysis considers cattle numbers moving through the Mareeba saleyards and does not include cattle sold for direct sale or company transfer.

Production Projections for Mareeba Saleyard

A further analysis was completed of cattle numbers being sold through Mareeba to establish trends in production.

The analysis methodology and model used in this Section are detailed in Appendix 5.1.

Monthly data on the numbers of cattle sold through the Mareeba Saleyard from January 1989 through November 1994 reveal various features, some of which are readily discernible by visual inspection, whereas others are uncovered only by more detailed analysis (see Figures 5.3 and 5.4).

Figure 5.4. CAPE YORK PENINSULA CATTLE CATEGORIES SOLD THROUGH THE MAREEBA SALEYARD FROM FEBRUARY 1989 TO JUNE 1994

	Bullocks	Medium Steers	Export Steers	Light Cows	Heavy Bulls	Light Bulls
Feb 1989	116.3	107.9	98.4	66.8	94.5	78.6
Mar 1989	115	105.6	99.7	73.8	93.5	81.2
Apr 1989	117.2	111.8	103.6	73.5	97.3	86
May 1989	123.4	117.8	108	75.1	100.5	90.7
Jun 1989	125.4	118.5	105.2	71.9	101.6	88.9
Jul 1989	121.5	111.2	102.9	75.2	103.2	86.9
Aug 1989	120.2	109.6	98.4	75.3	106.1	86.1
Sep 1989	110	100.4	96	54.3	99.2	83.7
Oct 1989	117	103.5	95.7	70.9	106.3	87.8
Nov 1989	120.4	110.8	104.5	79.8	113	95.9
Dec 1989	119.8	114.5	106.1	73.3	116	91.9
Jan 1990	115.6	106.1	100.1	70.8	90	84.9
Feb 1990	110.7	105.8	97.2	63.2	95.1	78.2
Mar 1990	118	107	92.7	54.1	104.3	79.8
Apr 1990	118.9	114	101.3	64.8	106.3	91.4
May 1990	121.1	113.4	100.3	73.4	105.9	91.8
Jun 1990	118.7	111.2	97.3	61.3	107.8	84.7
Jul 1990	108.4	103.2	93.1	57.3	103.3	83.4
Aug 1990	110.2	98.3	91	57	101.5	77.6
Sep 1990	109.3	101.3	93.5	57.4	105.1	78.8
Oct 1990	110	99.6	92.5	57.5	94.9	71.9
Nov 1990	111.4	104.8	96.1	55.7	104	81.4
Dec 1990	119.6	104.3	99	51.8	103.1	80.5
Jan 1991	117.2	121.9	105	64.3	95	82.5
Feb 1991	129.6	123.1	87.9	64.3	95	99.4
Mar 1991	118.4	110	99.5	65.2	111.2	86.5
Apr 1991	112	103.3	92	56.6	98.9	75.5
May 1991	108	98.8	86.1	62.3	103.1	74.6
Jun 1991	110.9	103	90.5	67	110.6	84.7
Jul 1991	110.7	103.8	88	72.8	109	84
Aug 1991	104.3	98.3	80.6	71.9	101.2	76.7
Sep 1991	100.7	94.6	78	69.4	98.9	71.9
Oct 1991	119.5	110.8	97	77.5	113.2	85.1
Nov 1991	127.7	120	107	72.5	113.8	88.8
Dec 1991	123	117	103	73.5	115.3	86
Jan 1992	127	114.7	103.5	68.9	109.8	85.5
Feb 1992	126	119.6	108.2	78.7	121.2	96.8
Mar 1992	121.8	113.1	97.4	77.6	129.8	97.5
Apr 1992	101.3	95.6	88.1	66.8	86.6	76.9
May 1992	102.8	98.8	84.2	68.3	94.6	72.9
Jun 1992	93.2	88.2	76.1	59.1	82.9	62.3
Jul 1992	103.5	97.3	80.7	59.3	87	63.5
Aug 1992	112	101.4	85.2	63.1	98.3	76.9
Sep 1992	120.2	109.5	92.4	68	108.1	82.7
Oct 1992	128.5	117.8	95.8	72.6	109.8	80
Nov 1992	130.6	121	104.3	75	121.6	90.3
Dec 1992	128.5	116.7	104.1	70.1	116.5	83.2
Jan 1993	124.6	104.6	96.7	71.3	107.8	82.3
Feb 1993	119.1	112	97	73.8	94.4	82.7
Mar 1993	102.2	86.2	86.7	62.4	74.1	63.2
Apr 1993	91.6	83.2	74.1	48.7	74.1	53.2
May 1993	95.2	84.6	69.5	49.8	49.3	47.3
Jun 1993	107.3	97.9	75.9	61.2	80.9	54
Jul 1993	117.7	106.3	83.2	65.3	90.7	62
Aug 1993	136.5	119.4	96.9	70.3	109.8	75.2
Sep 1993	143.2	125.6	105.8	70.8	121.7	79.2
Oct 1993	140.2	130.9	104.6	67.4	126.8	77.4
Nov 1993	139.7	131.3	111.1	76.8	115.4	79.4
Dec 1993	113.6	115	115.4	76.3	94.1	71.9
Jan 1994	124.6	120.9	99.6	75.8	95.6	78.1
Feb 1994	142.5	127	115.5	84.2	104.5	86.5
Mar 1994	152	136.8	119.7	86.1	120.4	93.8
Apr 1994	147.3	119.2	107.3	72.9	101.5	80.3
May 1994	109.3	104.8	91.7	69.7	87.5	78.4
Jun 1994	116.3	109.3	91	70.9	104.3	83.9

AVERAGES FOR THE PERIOD 118.2 109.1 96.1 68.0 102.2 80.6

THESE CATTLE CATEGORIES ARE PRINCIPAL TURNOFF/SALE TYPES FROM CAPE YORK PENINSULA. HOWEVER, FURTHER ADJUSTMENT IS NEEDED TO ALIGN TOTAL TURNOFF/SALE NUMBERS TO CYP STOCK CATEGORIES AND PERCENTAGES OF EACH AS ESTIMATED BY DPI STOCK INSPECTORS IN MAREEBA - BULLOCKS 2%, MEDIUM STEERS 10%, EXPORT STEERS 45%, LIGHT COWS 5%, LIGHT BULLS 28% AND HEAVY BULLS 10%.

THE CAPE YORK PENINSULA TURNOFF ADJUSTMENT IS CALCULATED AT 92.69%

AVERAGE OF THE CATEGORIES OF CATTLE OVER A 65 MONTH PERIOD WAS 95.7CENTS PER KG LIVE AT MAREEBA YARDS

ADJUSTED AVERAGE PRICE FOR CAPE YORK PENINSULA CATTLE OVER THIS PERIOD IS 88.7 CENT'S PER KG AT MAREEBA.

First, a line plot of these data is characterised by:

- extreme variability
- the possibility of non-stationarity with the variations in the fluctuation increasing over time
- little, if any, autoregressive aspect (ie. current values do not depend on previous values)
- noticeable seasonality, with low points in the December-January-February period.

Second, a simple regression of cattle numbers on time (while problematic due to the extreme variability) reveals:

- little variation in cattle numbers accounted for by the effluxion of time only
- a positive trend which is statistically significant at the 5% level
- for each month extra, an additional 17 head pass through the saleyard, from a base point of 1,643 head (on average) in January 1989
- this model is not a good fit to the data.

Third, a Box Jenkins autoregressive integrated moving average (ARIMA) model suggests the following:

- the data are non-stationary and appear to include a random component (ie. the mean fluctuates with, possibly, some trend pattern over time)
- no autoregressive aspect in the original data (ie. current values do not appear to depend on previous values)
- no moving average aspect in the original data (ie. current values do not appear to depend on error terms)
- seasonality, with a 12 period (monthly) seasonality.

The most appropriate model appears to take the Box Jenkins ARIMA form:

$$\log \text{ of } (010)(211)12$$

This model is statistically valid on all grounds. This model produces forecasts of progressively lower turnoff numbers being marketed through the Mareeba saleyards:

First year out:	20,535 head
Second year out:	18,496 head
Third year out:	16,092 head
Fourth year out:	11,936 head
Fifth year out:	8,699 head
Sixth year out:	6,228 head

and so on.

Cattle numbers being marketed through Mareeba saleyards are progressively reducing in number. It is projected that, based on current prices and trends, that this trend of lower cattle numbers moving through Mareeba saleyards is likely to continue. It should be noted that these cattle numbers do not include cattle transferred as direct sales or cattle shifted as part of company transfers. Evidence received during our consultations demonstrate that the number of cattle bypassing the Mareeba saleyards is significant. This assessment indicates the potential vulnerability of the presently so-called organised selling system through Mareeba and the opportunities for alternative marketing strategies throughout the Peninsula.

Monthly data on prices of various categories of stock have been weighted by the relevant percentage weightings of these categories passing through the saleyard. These weightings are: bullocks (2%); medium steers (10%); export steers (45%); light cows (5%); light bulls (28%) and heavy bulls (10%). The data used extend from January 1989 through November 1994.

First, a line plot of these data is characterised by:

- some periods of extreme variability
- a possible slight negative trend
- some indications of a possible autoregressive aspect (ie. current values depending on previous values).

Second, a simple regression of cattle prices on time (while problematic due to the extreme variability) reveals:

- little variation in cattle price accounted for by the effluxion of time only
- a negative, but statistically insignificant, trend
- this model is not a good fit to the data.

Third, a Box Jenkins autoregressive integrated moving average (ARIMA) model suggests the following:

- the data are characterised by non-seasonality
- there is an autoregressive aspect (ie. current values depend on values two periods previous)
- there is no moving average aspect
- there is stationarity after logarithmic transformation (ie. no noticeable increase or decline in the data, and the variance of the fluctuation remains relatively constant over time).

The most appropriate model appears to take the Box Jenkins ARIMA form:

$$(200)(000)12.$$

This model is statistically valid on all grounds.

Forecasting: For one year out, the model forecasts prices fluctuating narrowly around 91 to 92 cents, with the price settling at 92.4 cents after 12 months. It remains at this price for the projected future.

In summary, based on Mareeba saleyards data, the long term trend is for decreasing cattle numbers moving through the yard and for the long term price to remain around 92 cents. These figures do not take into account cattle movements by way of direct transfers and company transfers, and their numbers could be significant. Also, the region has endured reductions in cattle numbers emanating from the BTEC scheme and loss of properties out of pastoral use in recent times. These factors have negatively impacted on cattle numbers.

5.4 Production for Direct Sales

Table 5.5 represents the destination, numbers and cattle types of stock that are not sold through the Mareeba saleyards.

Table 5.5. Direct Sales

	Meatworks	Store Steers including live export	Heifers	Cows
Southwest area (Carpentaria shire not including Dunbar)	1,850	5,400	1,300	900
Cooktown/Lakeland area	430	800	200	-
Dry tropics peninsula	700	4,900	450	550
Totals	2,980	11,100	1,950	1,450

(Source: DPI Stock Inspectors)

This totals 17,480 going direct to meatworks, fattening on properties under the same ownership in other areas, sold direct to fattening properties, including feedlots, going to live export, or going to fatten on agistment.

Fattening of Peninsula cattle bought by property owners in the Lakeland, Cooktown and McIvor River areas make up a significant proportion of the 430 meatworks cattle in the table above. However, most of the Peninsula cattle fattened in this area go through Mareeba saleyards.

6 MANAGEMENT SYSTEMS AND TECHNOLOGY

6.1 Climatic Factors

In the context of productivity of the pastoral industry of the Peninsula, the climatic pattern provides the pastoral industry with a number of advantages. Regular monsoonal rains provide predictability and reliability of rainfall not available in many areas of Australia. This assists in planning for production.

The high rainfall zone north of Princess Charlotte Bay comprises a huge area receiving over 1,200 mm rainfall annually. South of this humid climatic zone is the moderate rainfall zone of over 13M ha receiving 800-1,200 mm annually. Both zones receive rain concentrated in the 4-5 month summer period and both zones enjoy unusually reliable rainfall by Australian standards (less than 25% variation expressed as mean deviation about the average rainfall). The length of the pasture growing season is a direct function of soil moisture availability, unlike the temperature controls operating in southern States. The most northern zone has a pasture growing season of greater than 20 weeks (5 months) while the southern zone's season varies from 16-20 weeks and is somewhat more variable than the northern zone. The major climatic zones based on rainfall and temperature are shown in Map 8.

Over 85% of the mean total rain falls in summer, although winter rain can be 30% of total annual falls in some years. Cyclonic and monsoonal rainfall intensities are characteristic of the summer downpours every year. The summer dominance and reliability of the Peninsula rainfall are important positive parameters for land use planning in this region. As such, climatic factors are less constraining to cattle production, than are nutritional factors associated with infertile soil types and a lack of high-protein native legumes.

Clearly the effects of monsoonal storms and flooding on mobility limit property operations during 'the wet', but these situations are largely predictable and can be planned for. An additional land use planning factor related to climate is the huge volume of high quality river water produced by the Peninsula catchments which is presently almost totally unused before it enters the sea on the east and west coasts.

6.2 Management Practice

Native Pasture and Natural Watering Points

Management systems based on large herd size, managed on large unimproved properties, are difficult and expensive to control. Native pastures in the Peninsula are capable of supporting only light carrying capacities. The nitrogen and phosphorus status of the pastures is below the liveweight maintenance requirements for cattle for most of the year. Cattle require large areas of land over which to graze, and in some cases, a large proportion of the property may be irregularly grazed resulting in a large proportion of the grass being uneaten. Pastures that are not burned by wildfires during the dry season or by lightning strikes at storm time, will be 'fired' by graziers at storm time to provide 'fresh feed' for cattle throughout the following year. Most graziers realise end of year fires are valuable, and, to obtain a sufficient body of material to support a "hot" fire, burning is best carried out only once in every 3 or 4 years. These regulated fires:

- control the spread of sucker regrowth
- assist in mustering as cattle graze the fresh regrowth of pastures following fire
- establish firebreaks used to control end of dry season wildfires.

The relatively high and reliable summer rainfall often leads to stream flooding, impassable roads and water-logged country. During the equally predictable dry season the streams and lagoons shrink back to the larger water holes. This increasingly congregates the cattle as the season becomes progressively drier.

Dry Season Mustering and Stock Control

Mustering is done in 'rounds'. This generally starts as the country dries out after the wet season. Following the wet season, strategic areas are burnt to facilitate mustering and to establish a pattern of firebreaks that will make it easier to control wild fires later in the year. Land that carries a 'heavy body' of grass is burnt before mustering commences. Cattle are attracted to the resulting green grass growth. It is easy to traverse the burnt country since fallen timber and ground 'break-aways' can be seen.

On many properties, sale cattle which are found during the general muster are sold direct from the yards. On such properties 'weaners' are often used as coachers to facilitate mustering. On a few properties, weaners and sale cattle are paddocked. Paddocking of sale cattle allows much more efficient marketing.

Mustering on unfenced properties that do not implement cattle control strategies is inefficient; 30-50% of the cattle are often missed. This leads to a proportion of the herd being 'clean skins' (unbranded) or feral cattle. Occasionally, producers use helicopter musters in some areas if they feel there are sufficient clean skin cattle to pay for the helicopter. Under this system, cattle are often turned off in mixed lines, in which cull cows, bullocks, clean skin bulls, etc are used to 'make up the load'.

Fencing

Strategic fencing is playing an increasingly important role in property management. 'Fences and improved stock control are now recognised as vital to efficient management. Management of improved pastures requires fencing to control grazing pressure' (CYPPAG 1995).

However, where there are light carrying capacities of the native pastures, fencing for stock segregation is uneconomic (McKeague, 1992). The number of cattle that can be run within a fenced paddock cannot pay for the cost and upkeep of the fencing. Boundary fences are seldom erected or maintained in these areas. In joint musters between lessees, the unbranded cattle are generally divided on heredity lines or according to the individual input to the muster.

Extension of fencing is dependent on the economic viability of development programs.

Strategic fencing is now part of development strategies, however economic appraisal of the complete strategy is a prerequisite before fencing is usually commenced.

Husbandry Practices

Improvement to production and financial returns can be achieved by addressing the on-property stock nutritional and management problems. Boorman (1991) demonstrated a turn-off improvement of over 100% by changing from the traditional animal management to an improved animal management system in which husbandry practices serve an important function.

Boorman (1991) nominated nine husbandry practices to improve management and herd quality. These practices are:

- botulism vaccination
- dehorning
- breeding your own bulls
- crossing British herds with Brahman bulls
- early weaning
- weaner education
- molasses based feed
- wet season phosphorus feeding
- vibriosis vaccination.

Supplementation

For optimum production in the dry monsoonal tropics, cattle require a soil phosphorus level of 8 ppm or higher (Partridge and Miller, 1991) but only very isolated areas in Cape York Peninsula have soils above this level. Also, except for a short six to eight week period during the growing season, the native pastures are low or deficient in nitrogen and thus in protein. Supplementary feeding is a viable option on some properties.

The supplementation program currently used by some properties contains phosphorus as Kynofos, nitrogen as urea and sulfur. The ratio of Kynofos to urea is increased during the wet season when the pastures are green, and decreased in the dry season when the nitrogen deficiency becomes more critical. Sulfur is needed to allow production of some proteins (skins, horns, hair) that can only be formed in the presence of adequate supplies of sulfur. Urea does not contain any sulfur, so that sulfur is added to the lick. Protein supplementation is economic only if used in conjunction with wet season phosphorus supplementation and early weaning.

The intake of supplement is regulated by adding salt to give breeders 10g of phosphorus per head per day and dry cattle 6g of phosphorus per head per day during the wet season. The benefits from adopting phosphorus supplementation will be cumulative over a three year period and the full benefits may not be realised until the third or fourth year. The cost of supplementing (for four years) is about \$15 per head per year or \$180,000 for a 3,000 head herd. To some producers this is a barrier to adoption (Appendix 6.1 Case Studies) and options such as the sale of older and additional breeders produced by the supplementation programs are considered.

6.3 Operation and Management System Alternatives

A review of the literature suggests that there is considerable potential for intensification of cattle management in some regions of the Peninsula. While this potential is physically determined primarily by soil type and rainfall, its exploitation is limited by economic constraints. A number of analysts have examined the types and levels of intensification which have been proposed and trialled at least on an experimental scale. The range of views on desirable levels of intensification are described below.

Management systems used in the Peninsula have been outlined by McKeague and Boorman (undated), Partridge and Miller (1991) and Biggs and Philip (1994). The descriptions of the management systems by these various authors overlap to some extent and only the predominant types are presented in this report. Importantly, all authors do not have a preferred system that is applicable for the whole Peninsula, and the selection of an appropriate system is determined by individual property considerations.

McKeague and Boorman Approach

McKeague and Boorman (undated) have described five management systems available to Peninsula graziers. These systems are:

- 1 *Traditional Management*
All cattle are run on native pasture. Cattle are mustered once a year when calves are branded and castrated and sale cattle are removed.
- 2 *Traditional Management with Sale Cattle or Sown Pastures*
The breeders are run under similar husbandry practices as used in system 1. Steers, from weaning, and cull cows are run on sown pastures which have been established by clearing, fertilising and seeding. Maintenance fertiliser is applied every second year. The pasture species that can be used include *Brachiaria* (Signal grass), Tully grass, Para grass, Verano, Seca, Centro and Glen Jointvetch.
- 3 *Improved Management*
All cattle are run on native pastures and mustered twice each year. Phosphorus supplementation, early weaning, botulism and vibriosis vaccinations are used.
- 4 *Improved Management with Nucleus of Sown Pastures*
Breeders are run under similar husbandry practices to those described in system 3. Weaners, cull cows, steers, spayed heifers and weak breeders are run on sown pastures similar to those described in system 2.
- 5 *Complete Herd Run on Sown Pastures*
The whole herd is run on sown pastures similar to those described in system 2. Husbandry practices are similar to those described in system 3, with the exception of phosphorus supplementation. (Source: McKeague and Boorman, undated)

The standard for comparison between these management systems is a cattle herd comprising 1,000 breeders and their progeny. Male cattle are sold at two-and-a-half years of age with females being sold as cull for age cows or spayed heifers at two-and-a-half years of age.

The results of their investigations are presented in Table 6.1.

Table 6.1. Management System Comparison

Management System	Traditional	Trad. + Sown Pasture	Improved Husbandry	Improved Husbandry + Sown Pasture	Sown Pasture
Breeder No.	1,000	1,000	1,000	1,000	1,000
Total Herd	1,737	1,718	2,216	2,296	2,457
Sale Cattle					
Aged cows	22	22	64	87	117
Steers 2-3 y.o.	151	207	272	323	359
Steers 3+ y.o.	47	3	29	3	4
Heifers 2-3 y.o.	-	-	143	154	171
Total	220	232	508	567	651
% turn-off	13	14	23	25	26
Area (ha)					
Native Pasture	36,500	26,630	35,460	18,210	-
Sown Pasture	-	340	-	790	2,180
Total	36,500	26,970	35,460	19,000	2,180

(Source: McKeague and Boorman, undated)

McKeague and Boorman's discussion of the alternative management systems highlights the reasons why alternative management systems to the traditional systems should be encouraged. From a cattle production and economic viewpoint, the poor cattle control of the traditional system results in lower turnoff percentages, higher mortality rates, lower calving rates and poor herd compositions. The aims of the alternative management systems are to reverse traditional production and economic trends. Turnoff percentages increase, cattle numbers increase, herd composition improves and the area required to support their notional 1,000 breeder herd is reduced.

McKeague and Boorman adopted the following carrying capacities for the alternative management systems:

- 1 beast to 21 ha on native pasture without supplements
- 1 beast to 15 ha on native pasture with supplements
- 1 beast to 0.75 ha on sown pasture.

Partridge and Miller Approach

Partridge and Miller (1991) examined the Cape in two zones:

- Zone A - north of Princess Charlotte Bay, 1,200 mm rainfall and over 20 weeks pasture growing season.
- Zone B - Cairns to Princess Charlotte Bay, 800-1,200 mm rainfall and 16-20 weeks pasture growing season.

These zones are represented on Map 8.

They tabulate the native pasture types in these two zones as follows:

Table 6.2. The native pasture communities found in each zone

	Native pasture community
Zone A (Monsoon tallgrass)	Pastures sparse or absent Fire grass* Native sorghum
Zone B (Monsoon tallgrass, tropical tallgrass, midgrass)	Fire grass Native sorghum Black spear grass (north) Wire/blue grasses Spinifex

**Schizachyrium fragile* and *Chrysopogon fallax*

Partridge and Miller (1991) have assessed natural carrying capacities for Zone A between 15-55 ha/beast and for Zone B between 4-20 ha/beast. They also identified three alternative management systems, namely high, medium and low inputs. A description of the inputs to each system and the strengths and weaknesses of these systems are described in Table 6.3 and their distribution is represented on Maps 9, 10 and 11.

Table 6.3. Advantages and disadvantages of high, medium and low input pastures

Inputs	Pasture type	Advantages	Disadvantages
High	Timber cleared, cultivated, fertiliser, sown species ponded paragrass	High animal production, control of regrowth High quality feed during dry season	High cost High capital cost, localised sites, intensive management
	Leucaena	High quality during dry season	Establishment difficult
	Forage crops	High carrying capacity, good animal production	Needs good soil, replanting costs, soil erosion
Medium	Sown legume, native grass, fertiliser	Lower cost than high input	Lower carrying capacity, native grasses unstable
Low	Sown legume, native grass, maybe P supplement	Low cost allows large areas to be sown	Slow legume build-up

In terms of the comparative cattle production gains of native and improved pastures, Partridge and Miller give the following generalised estimates for the northern (A) and southern (B) Peninsula:

Table 6.4. Carrying capacity and weight gains of steers for native and sown pasture in each zone

Zone	Native pasture		Inputs	Sown pasture	
	Carrying capacity (ha/beast)	Annual LWG (kg)		Carrying capacity (ha/beast)	Annual LWG (kg)
A	15-55	70-90	high	1	120-160
			medium	2	
			low	3	
B	4-20	50-150	high	1.2	120-180
			medium	2.4	
			low	4	

Biggs and Philip Approach

During their investigations for the development of 'Soil Survey and Agricultural Land Suitability of Cape York Peninsula', Biggs and Philip recognised the requirement to assess land based on its ability to support varying levels of pasture development. The categories they used were:

- 1 High input pastures implies timber clearing, cultivation, fertiliser application and sown pastures
- 2 Medium input pastures implies sown legumes, native grasses and fertiliser application
- 3 Low input pastures implies sown legumes, native grasses and possible phosphorus supplementation
- 4 Land not currently suitable for the assessed land uses (ie. cropping or improved pastures). It is considered to be unsuitable for support of viable beef production systems on a stand-alone basis, but can be an integral component of grazing systems based on improved pasture
- 5 Land unsuitable for any agricultural use because of excessive slope, rockiness, flooding or other factors.

These categories are similar to those proposed by Partridge and Miller.

6.4 Production Effects of Management Systems on Regional Production

This report has tabulated ABS statistics of cattle numbers, sales and deaths for the period 1984-1993. This is tabled in Section 5 of this report as Table 5.2. Based on these statistics and data from Appendix 6.2, Boorman (DPI Marceba) has developed a 'hard profile of a herd' in Cook, Aurukun and Torres Shires in 1993. The results are tabled in Table 6.5.

Table 6.5. Estimated Herd Structure in Cook, Aurukun and Torres Shires in 1993*

Total herd in Cook, Aurukun and Torres Shires	130,528
Estimated Adult Equivalents (AE's)	133,637
Total turnoff	17,113
Turnoff as % of total herd	13.11
Estimated % of herd mated (cows and heifers)	49
Estimated number of cows and heifers mated	63,958

* Calculations are based on:

- (a) Table 5.4 of this report
- (b) Summary herd structure and turnoff data in Appendix 9.3.

These calculations take account of the fact that some producers are presently using some improved husbandry.

Table 6.6 is the predicted profile of a Peninsula herd if 50% of the adult equivalents in the area in 1993 has been under improved husbandry and what effect that would have had on costs and returns.

Table 6.6. Estimated Herd Structure and Increased Returns*

[Assuming Adult Equivalents are held at the same level as in Table 6.5 and 50% of Total 1993 Adult Equivalents are subjected to improved husbandry.]

Adult Equivalents (AE's) subjected to traditional management	66,818
Estimated cows and heifers mated	33,857
Estimated cows and heifers sold	1,609
Estimated steers and bullocks sold	6,340
AE's subjected to improved husbandry	66,818
Estimated cows and heifers mated under improved husbandry	26,281
Estimated cows and heifers sold	5,837
Estimated steers and bullocks sold	7,714
Estimated total cattle sales	21,500
Estimated turnoff as % of total herd	16.17
Estimated % of herd (cows and heifers) mated	45
Estimated nett extra value of females sold from herds using improved husbandry	\$936,150
Estimated nett extra value of steers and bullocks sold from herds using improved husbandry	\$775,169
Estimated total nett increased returns	\$1,711,319

*Calculations are based on:

- (a) Table 5.4 of this report.
- (b) Summary herd structure and turnoff data in Appendix 6.2.

Note: This outcome would require extra expenditure by producers with service industries (licks, fodder, vaccines, transport etc) in the order of \$632,000 and would incur extra yard dues, commissions, levies and cattle transport costs (Table 8.3) in the order of \$233,000.

Table 6.7 is the predicted profile of a Peninsula herd if 50% of the breeders had been under improved husbandry and it also illustrates the effects on stocking rates, costs and returns.

Table 6.7. Estimated Herd Structure and Increased Returns*

[Assuming 50% of 1993 Estimated Breeder Numbers in Aurukun, Torres and Cook Shires (Table 6.5) are subjected to improved husbandry and Adult Equivalents are allowed to increase accordingly. *]

Estimated cows and heifers mated under traditional management	31,979
Estimated Adult Equivalents in traditional herds	63,078
Estimated cows and heifers sold	1,519
Estimated steers and bullocks sold	5,985
Estimated cows and heifers mated under improved husbandry	31,979
Estimated Adult Equivalents under improved husbandry	81,303
Estimated cows and heifers sold	7,106
Estimated steers and bullocks sold	9,386
Estimated total cattle sales	23,992
Estimated turnoff as % of total herd	16.19
Estimated % of herd (cows and heifers) mated	43
Estimated nett extra value of females sold from herds using improved husbandry	\$1,218,000
Estimated nett extra value of steers and bullocks when sold from herds using improved husbandry	\$1,388,192
Estimated total nett increased returns	\$2,606,192

* Calculations are based on

- (a) Table 5.4 of this report
- (b) Summary herd structure and turnoff data in Appendix 9.3.

Note: This outcome would require extra expenditure by producers with service industries in the order of \$877,000 and would incur extra yard dues, commissions, levies and cattle transport costs (Table 8.3) in the order of \$365,300.

Analysis of these tables highlights that the technology is available that will assist graziers to increase herd size, increase turnoff percentages and sales and to improve herd composition. Implementation of these strategies, and in this example, improved husbandry practices, will result in substantial increases in cattle numbers and substantial increases in returns.

6.5 Production Effects of Management Systems on Property Production Levels

An economic analysis of the alternative management systems is presented in Section 7 of this report. Cost factors largely influence the system selected.

From a pastoralist's perspective, the selection of the management system suitable for individual properties is determined by:

- property owner's aspirations
- capability of the land
- financial capacity
- market analysis
- location.

However, Boorman has attempted to predict what the effects of improved management practices will have on property herd composition. His predictions are presented in Table 6.8 and they demonstrate that implementation of improved management practices can assist in overcoming major Peninsula production impediments, namely low turnoff percentages, high death rates, low brandings and low calving breeding rates.

Table 6.8. A comparison of the results of traditional management and improved management in Cape York herds

	Traditional management	Improved management
Number of breeders	1,000	1,000
Breeder death rate %	16	8
Number of bulls	50	50
Brandings %	45	65
Calves branded	450	650
Annual dry cattle death rate %	5.5	3.5
Yearlings (male)	212	313
Yearlings (female breeding)	212	158
Yearlings (female culls)	-	155
2-year-old heifers mated	201	152
2 1/2-year-old store steers (sales)	201	302
2 1/2-year old cull heifers (sales)	-	150
Number of 10-year-old cows culled (sales)	50	78
Total turn-off	251	530
Turn-off as % total herd	11.5	18.6
Total effective herd*	2,175	2,856

* Total effective herd consists of: breeders to 10 years of age, calves, bulls, yearling steers, yearling breeding heifers, cull yearling heifers, 2 1/2-year-old steers, 2 1/2-year-old cull heifers and cull cows. Breeding heifers go into the breeder herd at 2 years of age.

6.6 Land Suitability and Alternative Management Systems

This report accepts departmental opinion that outlined management systems are capable of increasing production. The potential of implementing the various systems now needs consideration. Our assessment of this potential for pastoral expansion relies on the investigations completed by Biggs and Philip where they assessed the Agricultural Land Suitability of Cape York Peninsula categorising the lands of the Peninsula into suitability for peanuts, sorghum/maize, and three pasture improvement categories. Pasture improvement categories assessed were for low input, high input and medium input pastures. These pasture categories are similar to those presented by Partridge and Miller.

The principal outcomes of this investigation with respect to management strategies are that the assessment indicated the following areas were suitable for:

- peanuts and sorghum/maize (243,300 ha)
- sorghum/maize (1,812,000 ha)
- high input pastures (3,445,300 ha)
- low/medium input pastures (4,448,400 ha).

Also, Biggs and Philip have assessed that the high input pasture area contains:

- (i) 392,750 ha suitable for the assessed cropping systems of peanuts or sorghum and maize (representing 11% of the area suitable for high input pastures) and
- (ii) 3,363,050 ha suitable for low and medium input pastures (representing 98% of the area suitable for high input pastures).
- (iii) 58,800 ha is suitable for high input pasture ONLY which is due to limiting factors within the suitability framework'.

Based on this information (DPI 1995), substantial physical potential exists for the development of all of the alternative management systems proposed, although their profitability is not guaranteed.

6.7 Implementation of Alternative Management Systems

Boorman (1991) identified a number of the constraints that impede the implementation of alternative management systems. Boorman suggests to pastoralists that:

'Making changes to an existing system is always difficult. To change a property management system you must attack a three-fold problem. Firstly, steer your thinking away from the old, comfortable ways and habits. Secondly, learn as much as possible about the new practices and choose those that will work best for you in your situation. Commit yourself to making the changes and applying the practices. Thirdly, organise your finances to fund the changes.

It is possible, but expensive, to implement all of the practices in one year. Staging the program makes it affordable. The practices in each successive stage will generate enough profit to start the new one.'

Constraints to implementation are many and they are all not directly related to property management decisions. Earlier identified issues such as:

- insecurity of tenure discouraging incentive
- lack of finance
- occasional lack of aspiration
- poor quality land
- poor infrastructure and transport network

all contribute to low implementation rates. However, these constraints can be 'worked through' and the potential for pastoral development is positive. Other positive market driven opportunities such as live cattle export at Weipa, increasing direct sales for fattening, improving infrastructure and transportation networks will assist in this potential being realised.

6.8 Carrying Capacities

Lands Department has allocated carrying capacities for 26 country types. These carrying capacities have been split into natural carrying capacity and potential carrying capacities. Appendix 12.1 tables the natural and potential carrying capacity for the identified 26 country types. Natural carrying capacities provide an estimate of cattle numbers that are capable of being sustained nutritionally on native pasture. These capacities ranged between 7 and 250 hectares/beast. The cattle numbers are low due to the inherent low nutritional value of the soils. Alternative management systems that incorporate varying degrees of intensification are assessed as being capable of supporting higher stocking rates. These higher stocking rates are reflected in higher potential carrying capacities. Carrying capacities for these systems ranged from 1 to 4 hectares per beast. The natural carrying capacity of the Peninsula is shown in Map 1. Potential carrying capacity is shown in Map 2.

Also, recent discussions with the Lands Department confirm that they are reviewing their potential carrying capacity rates, and it appears likely that the present potential carrying capacity levels will be increased by up to 25%. This will substantially increase the estimated potential total herd size for the region.

The calculated herd size if over 500,000 is four times the current level of 130,000. This potential herd size may be conservative as 10% of properties in the Peninsula are currently destocked and restocking these properties alone will increase numbers significantly. The rest of the increase will result from improved management and husbandry practices.

Carrying capacity levels for intensified management systems have also been assessed by Partridge and Miller. They have allocated carrying capacity according to zones and these are described in Table 6.9.

Table 6.9. Carrying capacity for native and sown pastures

Zone	Native pastures carrying capacity (ha/beast)	Changed Management System,	
		Intensification	Carrying Capacity (ha/beast)
A	15-55	high	1
		medium	2
		low	3
B	4-20	high	1.2
		medium	2.4
		low	4

From a purely pastoral production viewpoint, an estimate of the potential herd size is possible if these potential carrying capacities are matched to the DPI suitability assessments. These details are presented in Table 6.10.

Table 6.10. Potential Cattle Numbers

DPI Land Class	Area (ha)	Carrying capacity (ha/beast)	Potential Cattle Numbers
Land suitable for high input pastures	3,445,300	1.2-1	2,871,083-3,445,300
Land suitable for medium and low input pastures	4,448,400	4-2	1,112,100-2,224,200
Land suitable for low intensity grazing of native pastures	6,148,100	55-4	111,783-1,537,025

However, a more useful assessment involves the use of the DEH vegetation database and the Lands Department's carrying capacity database. Viability of holdings has been computed and mapped. Pastoral holdings have been classed as viable (over 4,000 head c.c.), marginally viable (3,000-4,000 head), non-viable (below 3,000 head) and presently not managed for grazing (National Parks and Aboriginal land). The existing carrying capacities and potential carrying capacities have been mapped on the GIS as shown in Maps 5 and 6. These maps are of particular significance in planning the future of the Peninsula's pastoral industry. The existing and potential capacities of each lease are shown in alphabetical order in Appendix 6.3. This appendix demonstrates that the existing carrying capacities can support a herd size of 182,308 and potential carrying capacity can support a herd size of 539,813.

These calculations have not taken into account areas designated as "unavailable". This designation was allocated due to the unavailability of information and relates principally to DOGIT lands. Industry sources have estimated that upon "A quick review of Pormpuraaw, Aurukun, Lockhart River, Weipa, Old Mapoon, Kowanyama, Hopevale, the Northern Aboriginal Reserve areas will show that they total 2,436,910 hectares and have an unimproved carrying capacity of 70,495 cattle."

The addition of these figures to the other estimates and comparing these figures with actual population, suggests that a deal of underutilised capacity exists within individual properties and the regions as a whole.

Types of assessments such as those completed in this section are useful for generalised analysis. However, they oversimplify a more complex picture because of sometimes overriding factors of:

- market expectation
- tenure
- infrastructure support
- landholder aspirations
- distribution of land types.

Our analysis of the carrying capacities is that they should be assessed on an individual property basis which can take into consideration some of these determining factors. The 'ball park' estimates could vary up or down depending on the factors and these could vary with time. Carrying capacity figures exhibit a degree of variance and it appears that further research is required to confidently predict sustainable levels.

The identified potential carrying capacities are of concern to the conservation sector. They consider that expansion of the industry to this extent will 'be an environmental disaster' due to the fragility of the Peninsula's environment. However, based on investigations and observations completed by the Departments of Lands and Primary Industries, the authors of this report support these Departments' views that carrying capacities are capable of being increased. The increase will not result in accelerated degradation levels provided that the increase in herd size is well planned and occurs slowly to avoid overstocking of controlled areas in the initial stages of the process.

The issues of fragmentation of conservation and cultural areas are not directly related to the potential carrying capacities issues. This section of the report identifies the potential carrying capacity of the region. Other factors such as fragmentation may reduce the amount of land that support beef cattle production.

6.9 Constraints and Opportunities

An analysis of the production data supports the view that the basic land resource of the Peninsula is physically capable of sustaining an expanded pastoral industry. However, the structure of the pastoral industry of the future would be different to the present structure.

Based on the data reviewed, past industry structures have been characterised by:

- marketing arrangements whereby the producers are price takers (at Mareeba)
- remoteness
- a lack of control in herd management and poor musterability
- grazing of nutritionally deficit pastures that are poorly watered despite reliable rainfall
- poor infrastructure support, reflected by high input costs and poor transportation networks
- lack of finances to institute changes/improvements to management
- changing tenures of pastoral leases.

These are progressively changing. Marketing arrangements are more diversified with an increasing number of sales occurring outside the Mareeba saleyards structure, constraints associated with remoteness are being overcome by improving roads and telecommunications, and putting in place cattle management systems have been developed to improve cattle control and production levels.

These changing features have impacted on the production levels to the stage where it appears that properties adopting traditional management systems and are fully stocked, are not capable of significantly increasing production levels. Some of these properties are presently losing money under present management and are being supported by outside income. A majority of pastoralists are implementing alternative management strategies of production. Their levels of production are progressively increasing as they adapt to changing markets and improving technology.

The key to production sustainability for the industry in the Peninsula is its ability to introduce alternative management systems. Extreme bio-physical constraints of some areas make this impossible, and consequently difficult to break the poor performance cycles. Poor quality pastures and/or remoteness predominate these areas, making it difficult to change management on existing property configurations. However, technological advances in management systems have provided the management framework to develop change. Management systems of varying degrees of intensification have been investigated and trialled. These have been demonstrated to be capable of increasing production levels provided the fundamental bio-physical resource is available. Logically, the first step in the development process is the 'on property' identification of land suitable for some form of intensification. This process should take into account environmental and cultural considerations. Secondly, a financial plan describing and assessing the development proposed should be formulated. This plan will take into account the issues of the existing financial position of the pastoralist, the cost-benefit of the development and the aspirations of the pastoralist. The successful completion of this phase is not to be considered in isolation of the other constraints identified.

This report considers that a managed, incremental introduction of the proposed changes is more likely to produce sustained positive impacts. A managed intensification in areas suitable for development resulting in better cattle control, better disease control and reduced weed infestation will enable the Peninsula's environment to support a managed increase in cattle numbers. Unbridled and quick changes to cattle numbers resulting from unmanaged development strategies such as wholesale clearing and degrading stocking rates are not supported by this report. These options may be justified on economic grounds, however, the sustainability of these changes need to be assessed and monitored progressively.

7 ECONOMIC PERFORMANCE

7.1 Regional Performance

The Centre for Applied Economic Research and Analysis (CAERA) has estimated the Gross Regional Product at factor cost of major industries in the Aurukun, Cook and Torres Shires. The analysis shows the contribution of each industry sector over time in terms of its percentage contribution to total output. These data, compiled for 1985/86 and 1991/92, are presented in Table 7.1.

Table 7.1. Estimates of Gross Regional Product at factor cost of the Cape York region, which consists of the Shires of Aurukun, Cook and Torres
[1985-86 and 1991-92 in current prices \$ million]

Industry	1985-86		1991-92		% Change*
Agriculture:					
crops	0.9		2.1		133
livestock	3.9		7.2		85
fishing etc	<u>4.4</u>	= 9.2 (4.8)**	<u>6.9</u>	=16.2 (5.3)	57
Mining:					
bauxite	106.8		134.7		26
silica	3.5		11.0		214
gold	1.1		1.5		36
kaolin	0.0		9.4		
others	<u>0.2</u>	= 111.6 (57.7)	<u>0.0</u>	=156.6 (51.6)	
Manufacturing	0.8		1.0		25
Electricity, gas & water	0.4		0.4		0
Construction	10.6		13.2		25
Wholesale & retail trade	9.1		16.6		82
Transport & communication	7.9		13.0		64
Finance & business services	1.3		3.5		169
Public administration & community services	28.2		55.0		95
Recreation, personal & other services	4.0		10.0		153
Ownership of dwellings	7.4		13.6		84
General government	<u>2.8</u>	=72.5 (37.5)	<u>4.2</u>	=130.6 (43.1)	50
Total GRP at factor cost		<u>193.3</u>		<u>303.4</u>	57

* Pastoral Project Calculations

** Sector Percentage of Total GRP

(Source: CAERA 1994)

Note: GRP - is a measure of regional activity which includes expenditure on goods and services produced in the region and sold to consumers in the region, plus the value of exports produced and sold by the region, less imports purchased by the region.

A general analysis of these statistics show the following:

- (i) the statistics do not incorporate Carpentaria sections, a major cattle area of the region - departmental and statistical estimates suggest that the Carpentaria produces 30-50% of the region's cattle
- (ii) within the sectors, agriculture produces 5.3% of total GRP, with livestock producing 2.4% of the total GRP
- (iii) the mining sector produces 51.6% of total GRP
- (iv) the service sector supporting the production sectors produces 43.1% of total GRP
- (v) the fastest growing industries in the 85/86 to 91/92 period, in order of growth, were:
 - silica mining (214%)
 - finance and business services (169%)
 - recreation, personal and other services (153%)
 - crops (133%)
 - public administration and community services (95%)
 - livestock (85%)
 - ownership of dwellings (84%)
 - wholesale and retail trade (82%)
- (vi) apart from silica development, the fastest growth in production industries is taking place in agriculture. Additionally, the actual growth rate for livestock industries is probably higher than indicated due to the statistics not incorporating Carpentaria - an area suited to livestock production
- (vii) industries servicing the main wealth-generating industries grew at rates ranging from 14% to 28%.

7.2 Regional Economic Multipliers

Background

Related economic multipliers have been computed to assess the effect of changing pastoral industry income levels. The methodology adopted for this section of the economic analysis is presented in Appendix 5.1. Multipliers measure the impact of a unit increase in final demand on variables such as output, income and employment, and are usually a measure of responses to economic stimuli introduced into the system. Two types of multipliers are normally reported:

- (i) one measuring the combined direct and indirect effects for that additional sale from a particular industry across all other industry categories
- (ii) the other measuring these effects in addition to those which result from the flow-on to consumer spending at the household level.

In accounting for the induced household income effects, a fixed pattern of consumer spending is assumed. It is considered convention that these latter multipliers are maximum estimates.

The computation of multipliers requires extensive data, and as such they are usually available only for broader statistical divisions. The industry sector for which data are available is the 'animal industries', which includes the Australian Standard Industrial Classification Sectors of sheep, meat cattle, milk cattle and pigs. These four animal sectors are not equally represented in the Cape, although the multipliers discussed below refer to these in aggregate.

The Far North Statistical Division

The Australian Bureau of Statistics, Statistical Division No. 34, the Far North, includes the majority of the area under investigation, but it also extends over a similarly large section south of the 16°S. A map delineating these boundaries is attached as Appendix 7.1. Caution needs to be exercised in interpreting this divisional data, in the light of the different activities practised in the two sections of this Statistical Division, viz. north and south of the 16°S. The more intensive agricultural activities including the fruit and vegetable industries, and a concentration of tourism activities in the southern half of this Statistical Division inflates the estimated gross regional product prospects beyond that attributable to the concentration on pastoralism in the north. Nonetheless, the share of agriculture, forestry and fishing in the gross regional product for this Division is nearly twice the national share for these industries (9 percent vis-a-vis 4.7 percent on a national basis).

The Far North Division has been ranked number seven (from the 56 Divisions across Australia) in terms of projected average annual gross regional product for the period 1992/93 to 2000/01, with a projected average annual growth rate of marginally over 4%. For comparison purposes, the highest ranked is the North West (Queensland) Division (4.7 percent); the Darling Downs Division at 3.3 percent and ranked 37th; and the Central West (Queensland) Division ranked lowest at 2.7 percent. The Far North (Queensland) Division is identified in terms of primary industry intensity, as middle-range with strong growth prospects. In addition, the Far North (Queensland) Division is characterised as having a mid-range export intensity. The share of the region's output which is exported abroad occurs in the range of 10 to 15 percent.

Regional Multipliers

Four multipliers will be discussed, viz. disaggregated value-added multipliers, disaggregated output multipliers, disaggregated income multipliers, and disaggregated employment multipliers. These multipliers have been compiled by Jensen *et al.* (1994).

Table 7.2 identifies both the incremental and total effects of multipliers in the Far North Division.

Table 7.2. Disaggregated value added multipliers^(a) far north: animal sector

Sector	Initial Impact	First Round Effect	Total Industry Effects	Total Effects (including household consumption)
Animal	0.544	0.002	0.546	0.547
Machinery				
Manufacture	0.000	0.044	0.044	0.045
Elec. Goods	0.000	0.006	0.007	0.011
Trade	0.000	0.016	0.019	0.053
Transport	0.000	0.013	0.015	0.023
Finance	0.000	0.007	0.010	0.035
Public Admin	0.000	0.005	0.006	0.012
Community Services	0.000	0.004	0.005	0.031
Entertainment	0.000	0.001	0.001	0.014
Multiplier	1.000		1.224	1.460

Notes: (a) Based on 1990 data. (Source: Jensen *et al.* 1994)

Analysis

The industry multiplier of 1.224 indicates that an additional output of \$1.22 has been created across the industrial economy of this division, i.e. an additional effect of 22 cents attributable to the initial one extra dollar of animal sales. The machinery, manufacturing, trade (wholesale, retail and repairs) and transport sectors provide services to the animal sector in its production of additional output. The other-mentioned sectors, eg. electrical goods, finance, public administration, community services and entertainment contribute to a lesser extent. The industries benefiting most from the additional household consumption are the trade industries, finance and community services, with the entertainment industries capturing some flow-on.

Table 7.3 lists selected data on disaggregated output multipliers for this statistical division.

Table 7.3. Disaggregated output multipliers^(a) far north: animal sector

Sector	Total Industry Effects	Total Effects (including household consumption)
Other Agriculture	0.012	0.021
Food Manufacture	0.001	0.015
Machinery Manufacture	0.091	0.093
Electrical Goods	0.018	0.028
Trade	0.037	0.105
Transport	0.024	0.038
Finance	0.018	0.062
Public Administration	0.010	0.018
Community Services	0.006	0.039
Entertainment	0.001	0.027
Multiplier	1.242	1.478

Notes: (a) Based on 1990 data. (Source: Jensen *et al.* 1994)

Analysis

The multiplier 1.242 points to a 24 cent increase in output across all other industry sectors needed to accommodate a one dollar increase in sales from the animals sector. The major industry sectors contributing are listed, with the trade sector and transport expanding by some four and two cents respectively to provide for the additional one dollar of output from the animal sector. When the household consumption sector is included, an additional 24 cents of consumption is drawn upon in bringing forth the initial one dollar of sales to final demand. This additional consumption is expended in the food manufacturing, trade, finance, community services and entertainment sectors, and results from the increased output providing further household income.

Disaggregated income multipliers for selected sectors are listed in Table 7.4.

Table 7.4. Disaggregated income multipliers^(a) far north: animal sector

Sector	Total Industry Effects	Total Effects (including household consumption)
Animal	0.311	0.312
Machinery Manufacture	0.028	0.028
Trade	0.012	0.034
Transport	0.010	0.015
Finance	0.004	0.013
Public Administration	0.006	0.011
Community Services	0.004	0.028
Entertainment	0.000	0.008
Multiplier	1.242	1.503

Notes: (a) Based on 1990 data. (Source: Jensen *et al.* 1994)

Analysis

For an increase in sales to final demand by the animal sector of one dollar, household income to the animal sector increases by \$0.31. The machinery manufacturing sector benefits by about three cents, and the trade and transport sectors by about one cent each. The trade, finance and community services sectors benefit most from the flow-on, with transport, public administration and entertainment deriving some benefit. In all, the multiplier of 1.503 is quite low; the additional one dollar of sales to final demand, while producing \$0.31 of additional household income to the animal sector, produces only \$0.16 of additional income elsewhere.

Selected disaggregated employment multipliers are presented in Table 7.5.

Table 7.5. Disaggregated employment multipliers^(a) far north: animal sector

Sector	Total Industry Effects	Total Effects (including household consumption)
Animal	0.018	0.018
Machinery Manufacture	0.001	0.001
Trade	0.001	0.002
Transport	0.000	0.001
Finance	0.000	0.001
Community Services	0.000	0.001
Multiplier	1.198	1.428

Notes: (a) Based on 1990 data. (Source: Jensen *et al.* 1994)

Analysis

The type II multiplier, 1.428, points to an additional four+ employees being taken up elsewhere in the local economy for each additional ten persons employed in the animal sector. \$1 million of additional sales in the animal sector requires one extra person employed in the machinery manufacturing sector and one in the trade sector. This additional employment in these sectors induces additional employment in sectors supplying into household consumption.

7.3 Regional Economic Multiplier Effects

Changes to management systems result in changes to input cost structures and these changes affect the wider community through multiplier effects. Changing input costs will result in:

- (i) changing investment expenditures by farmers which will affect demand for some non-farm goods and services, with subsequent multiplier effects
- (ii) changes to intermediate inputs used in the farm sector which will affect demand for goods and services in the non-farm sector, with subsequent multiplier effects
- (iii) changes to some non-farm household income will be affected by changes in the value of farm production, with subsequent multiplier effects.

In the Peninsula, the continuation of existing production systems that develop on low or reducing input costs and low or reducing turnover, restrict wealth-generating enterprises resulting in a constriction for the industry and subsequently a constriction in allied industries and the wider regional economy. With industry multipliers in the order of 1.2 to 1.4, a reduction in money spent within and outside the industry will have a flow-on effect. A reduction to the present \$16.2M earned by agricultural industries, compounded by any future income loss incurring opportunity costs for the industry, will result in a multiplied loss to the wider community.

Alternatively, a managed expansion of the industry will generate wealth within the industry, but also it will generate multiplied wealth in allied industries and the wider regional economy. Any expansion of the industry is likely to result in an expansion of the associated industries of trade, transport, communication and machinery. The extra income generated by these industries will generate multiplied wealth-generation in the wider community.

7.4 Economic Analysis of Existing Management Systems

An assessment of the economic health of the current industry is difficult to accurately complete on a regional basis. Detailed individual property appraisal would be required as a wide diversity of management systems are implemented throughout the Peninsula, biophysical attributes vary significantly and access to market varies. A more useful approach is the assessment of the main management systems implemented throughout the Peninsula. Management systems assessed include the traditional husbandry, improved husbandry and the various input pasture systems. This assessment relies on data emanating from the DPI's economic models BREEDCOW and DYNAMA, run on actual data from many properties in the Peninsula. These data have been generalised to assess the actual costs and additional revenues for low- input systems. Appendix 6.2, BREEDCOW and DYNAMA Calculations and Findings, are summaries of typical property situations. Analysis of these summaries are developed on a management system proposed by Boorman and Miller. These summaries compare the present traditional system with a number of other systems in terms of:

- gross margin analysis
- variable costs comparison
- expected changes in production indices (eg. mortality rates, breeder sales and so on) ;
- development debt levels
- nett cash flow.

The actual costs and returns from the present traditional system of uncontrolled stocking are compared to the expected costs and expected returns with the more controlled and highly managed systems of Boorman (1994). Their proposed system relies principally on improved animal husbandry practices for improved cattle control. A summary of their findings is detailed in Table 7.6 and property case studies are presented in Appendix 6.1.

Table 7.6. Comparative economics of three production systems

Management System (1,000 breeders)	Production Indices			Variable Costs ⁽¹⁾⁽²⁾					Fixed Costs ⁽¹⁾⁽³⁾					Family Expenses				
	Female Death (Annual %)	Male Death (Annual %)	Branding Rates (%)	1993 ⁺	1994	1996	2000	2003	1993	1994	1996	2000	2003	1993	1994	1996	2000	2003
Present traditional	5-15	5-7	45	16,000	16,000	16,000	16,000	16,000	55,000	55,000	55,000	55,000	55,000	15,000	15,000	15,000	15,000	15,000
Improved husbandry (limited breeder sales)	3.5-8	3.5	65	16,000	46,144	37,077	37,192	37,270	55,000	55,000	55,000	55,000	55,000	15,000	15,000	15,000	15,000	15,000
Improved husbandry (increased breeder sales)	3.5-8	3.5	65	16,000	43,464	32,761	36,277	37,256	55,000	55,000	55,000	55,000	55,000	15,000	15,000	15,000	15,000	15,000
	Turnoff %			Cash Flow (from cattle trading)					Net Cash Flow (for debt service)					Total Debt				
Present traditional				85,233	85,233	85,233	85,233	85,233	(767)	(767)	(767)	(767)	(767)	0	853	853+	853+	853+
				(indicative only)					(indicative only)					(indicative only)				
Improved husbandry (limited breeder sales)	higher % turnoff			85,233	85,099	159,539	159,797	166,564	(767)	(31,046)	52,462	52,606	59,294	0	853	(15,616)	(152,303)	(289,344)
Improved husbandry (increased breeder sales)	higher % turnoff			85,233	121,134	150,351	137,356	167,332	(767)	7,669	47,590	31,078	60,077	0	853	60,839	(140,595)	(324,733)

(1) All costs measured at 1993 dollar values

(2) Additional variable costs for change comprise of: botulism vaccination, dehorning, early weaning, molasses, phosphorus feeding, vibriosis vaccination.

(3) Fixed costs of horse feed etc, fuel/lubricants, gas/avgas, wages, cartage, mustering contracts, insurance, irrigation, Queensland transport, protective clothing, repairs/maintenance, royalties, saddlery, poison, accountant fees, donations, papers, rates/rent, subscriptions, telephone, workers compensation, bank charges, dog maintenance, sundries.

7.5 Traditional Husbandry Management System

Traditional husbandry is generally characterised by:

- use of native pastures and natural watering points
- no stock segregation
- high breeder mortality (16%)
- high weaner mortality (5-40%)
- low calving (45%)
- low mustering efficiency
- low turnoff percentages.

McKeague (DPI 1992) explains the cost structures associated with the traditional system:

'A consideration of the property case operating costs including the costs of transport and selling stock demonstrates the financial bind associated with the low productivity in Cape York Peninsula. For example, a family owned property in the Archer to Wenlock River area (646 km to Mareeba saleyards), the average sale liveweight of the cattle is 420 kg, the average sale price is 85c/kg and the cattle are transported in a hired semi-trailer. The cash operating costs of this property are tabulated in Table 7.7.

Table 7.7. Selling costs and farm gate return/head

Gross return	Transport cost	Saleyard cost	Total selling cost	Farm gate return	Selling cost % of gross
\$357.00	\$67.29	\$26.10	\$93.39	\$263.61	26%

The cash living and operating cost for a family in this situation is about \$40,000/year. Some 152 head are required to be sold to meet these costs. At 15% turnoff, a herd of 1,000 head is required to produce these cattle.

When paid labour has to be used and mustering costs are \$15 to \$30/head, the farm gate return from 1,000 head will finance two musters per year. This leaves little or no income to cover other costs.

The off-property work which has to be done to survive in this region leads to less work being done on the property and makes property development slow if not impossible.'

McKeague's findings are supported by modelling exercises completed for this project. DPI modelling highlighted that traditional systems are running at a small profit, with little surplus to service loans and property development. Gross margin analysis confirms this conclusion. Gross margins for the traditional husbandry system are tabled below:

Table 7.8. Gross margins - traditional husbandry

	\$/herd	\$/beast	\$/A.E.
Net cattle sales	\$94,219	\$42.29	\$41.36
Direct costs excluding bulls	\$15,669	\$ 7.03	\$ 6.88
Bull replacement and husbandry	\$ 9,317	\$ 4.18	\$ 4.09
Cattle Gross Margin	\$69,233	\$31.07	\$30.39

Table 7.8 suggests a gross margin of \$69,223 before interest. With fixed costs in the order of \$55,000, properties of 1,000 breeders using traditional management systems are making about \$14,000 per year. Additional outside income is needed to support the property should the owner be servicing a loan or wishes to fund property development.

7.6 Improved Husbandry Management System

The proposed change in management improves the production indices. However, in order to introduce these changes, input costs are higher. A comparison of some input costs increases are presented in Table 7.9.

Table 7.9. Cattle enterprise costs

Cattle enterprise costs	Present traditional system (\$/animal)	Improved husbandry system (\$/animal)
Dip, drench, vaccine	\$1.35 - \$2.15	\$ 1.35 - \$ 2.40
Fodder, licks, supplements	\$5.27 - \$7.25	\$10.92 - \$17.92
Total	\$6.62 - \$9.40	\$12.27 - \$20.32

The improved husbandry management system results in between 1 and 3 years of negative cash flow, depending on the attitude of the pastoralist to selling breeders. Negative cash flow can be avoided by selling surplus breeders in the first 3 years. The present reluctance to sell breeder cattle results in higher debt levels for longer. This is a major decision for the pastoralists and it is influenced by assessments of seasonal forecasts, price fluctuations, personal aspirations and stage of breeder number buildup following BTEC. By years 5 to 7, positive cash flows can be achieved without reducing turnoff through fewer deaths and high branding rates due to improved herd management and herd quality.

The magnitude of the debt incurred to improve management of a 1,000 breeder herd property is up to \$50,000. Levels slightly higher than this could be expected due to time lags in cattle sales and monies recovered.

The overall financial position of the property 'turns around' significantly after year 1 or year 3, depending on breeder sale attitude and seasonal conditions. The magnitude of the improvement is significant with debts being converted into profits after the transitional stage. These profits are in excess of \$100,000 after year 7. The gross margin for the improved husbandry system is \$96,481, producing a positive cash flow (see Table 7.10) after interest.

Table 7.10. Improved husbandry systems

	\$/Herd	\$/Beast	\$/A.E.*
Net cattle sales	\$173,141	\$74.65	\$76.01
Direct costs excluding bulls	\$ 36,489	\$15.73	\$16.02
Bull replacement and husbandry	\$ 8,171	\$ 3.52	\$ 3.59
Cattle Gross Margin	\$128,481	\$55.40	\$56.40
Cattle Gross Margin after interest	\$ 96,481	\$41.60	\$42.35

* Animal equivalent

Introduction of these management changes is not without risk and the figures presented reflect cash flow predictions before interest. Should the interest on the loan be high, the level of debt would have to be re-assessed. Gross margin of the improved husbandry system is \$128,481, producing a positive cash flow.

7.7 Pasture Systems

Partridge and Miller have identified a number of pasture management systems and these are described in Table 7.11.

Table 7.11. Management systems and operations

System	Operations
High input	Timber clearing, cultivation, fertiliser application and sown pastures
Medium input	Sown legumes, native grasses and fertiliser application
Low input	Sown legumes, native grasses and possible phosphorus supplementation

(Source: Partridge and Miller 1991)

A review of the economics of implementing the various management systems is difficult to complete on a regional basis and is better performed on a property by property basis. The economics of the development process will vary with the quality of soil, vegetation type, biodiversity assessment, and access to market. However, in an attempt to illustrate the scale of the costs involved for the different systems, the following regionalised development costs are included. Moreover, more specific property case studies have been analysed; property case studies are presented as Appendix 6.1.

Regional Pasture Development Costs

Costs involved in establishing pastures are significant. The decision to develop pastures needs to be considered in light of this cost factor. Partridge and Miller (1991) give the following view of funding of improved pastures, using the high lending rates of 1990/91:

Cash on hand and cash-flow are obvious major factors in investment planning. A project may appear profitable but cash reserves and the existing cash flow must be able to fund the development until the benefits begin to roll in.

Funds for development can be from own cash reserves, borrowings or from equity partners, or combinations of each. The cost of funds will be interest charges where funds are borrowed, lost income from alternative investments where own reserves are used, and a loss of equity where outside investors are introduced as partners.

In addition to their establishment costs, improved pastures often need funds for livestock capital because they affect herd composition and herd size. For example, where turnoff cattle are congregated on small areas and are sold younger, country previously used for them can be used for breeders. This increased capacity can be met by buying breeders or by keeping heifers.

Whether funds are borrowed or are from own reserves, their cost is high. Lending rates for the agricultural sector from normal commercial sources range from 20 to 24% (1980's rates). Bank interest on deposits can be as high as 18.5%. At these rates, the cost of funds becomes a major consideration when evaluating pasture development although taxation levels may have to be considered.

At 22%, a pasture development which costs \$200 per beast area and is funded from borrowing will need an annual profit of \$44 to cover interest costs from development alone. On top of this, interest on working capital, interest on livestock capital, and a return on labour, starting capital and management have to be earned.

It is rarely economical to borrow funds for pasture development. This has traditionally been done with profits from the existing operation.

Partridge and Miller (1991) sum up their comparison of pasture establishment options by listing the relative costs, time to earn a return on investment (lead time) and predicted carrying capacity as follows:

Table 7.12. Comparison of systems of pasture establishment

Method of establishment	Cost* (\$/ha)	Lead time (years)	Carrying capacity (ha/steer)
Fire, seed	50	4	2.5
Fire, partial cultivation, seed	50	3	2.5
Tree pulling, fire, seed	100	2	1.5
Tree clearing, fire, stick raking, fire, plough, seed	250	1	1.0

*excludes cost of fertiliser, fencing, water and extra cattle.

Pasture improvement changes annual production costs. The effect of congregating cattle allows for easier mustering and cattle control. Mustering costs on native pastures range from \$6 to \$25 per beast, thus impacting on profitability. Mustering costs on improved pasture varies from \$1 to \$4.25 per beast. Balancing the reduced mustering costs, the maintenance costs of fertilising pastures are high, costing about \$11.25 per hectare annually. Phosphorus supplements, costing \$8-10 per beast per year are cheaper and can be used where phosphorus is the only major nutrient in short supply.

Partridge and Miller also assessed typical annual production costs for the different systems, and these are represented in Table 7.13.

Table 7.13. Typical annual production costs (\$/head)

	Native pasture	Native pasture + P supplement	Sown pasture
Mustering	6-25	4-10	1-4
Pasture maintenance			27
Supplements		8-10	

Partridge and Miller have compared costs for the different systems and this is presented as Table 7.14.

Table 7.14. Comparisons between sown pasture systems

System and area developed	Estimated cost (\$)	Years to production	Stocking rate (ha/head)
Intensive (195 ha)		2	1
pull	40		
rake	80		
plough x 2	100		
fertiliser - 40 kg P	160		
seed (including 2 kg grass)	<u>40</u>		
Total	420		
Medium input (1,045 ha)		4	2
pull	40		
fertiliser - 10 kg P	40		
seed (including 2 kg grass)	<u>30</u>		
Total	110		
Minimum input (645 ha)		4	2
fertiliser - 10 kg P	40		
seed	<u>30</u>		
	70		

Shaw and Kernot (DPI 1992) have also compared costs for different systems. Management associated with each of these systems varies from Partridge and Miller's systems in that their medium input system involves chain pulling of trees and the exclusion of cattle for 12 to 18 months to build-up fuel for a hot clean-up fire.

Shaw and Kernot's costs are estimated as dollars per beast area and at dollars per hectare. Comparative costs are tabled as Table 7.15.

Table 7.15. Comparisons between sown pasture systems

System	Cost (\$/beast area)	Cost (\$/hectare)
Low input	200	70
Medium input	200	133
High input	300	200

(Source: Shaw, K and Kernot, J., DPI, Mareeba, 'Sown Pastures in the Dry Tropics of North Queensland: 1. Northern High Rainfall Area (>1200 mm)').

Further to these development costs, ABARE have assessed prices paid for production input costs. This assessment based on ABARE data over the decade ending 1993, highlights a number of points:

- (i) average total prices paid increased by an indexed factor of 5.44
- (ii) relative indexes of input prices paid on:
 - fodder and feedstuff 4.13
 - store and breeding stock 3.38
 - fertiliser 5.77
 - fuel and lubricants 5.79
 - labour 5.42
 - freight outwards 5.07
 - selling expenses 5.08
 - total marketing 5.06.

These indices indicate that fuel, lubricants and fertiliser inputs are increasing at a faster rate than other inputs. This variable rate of price increase of selected inputs could impact on the selection of pasture system chosen by pastoralists, especially those with minimal capital backing.

High and Medium-Input Pasture Systems

In order to evaluate the biophysical potential of high-input pastures on a geographical (and thus total area) basis, it is necessary to extract areas of high agricultural potential from the GIS system developed by CYPLUS. Map 11 shows the areas of the Peninsula suitable for high-input pastures.

An assessment of the high and high-to-medium-input pasture systems relies on the detailed investigations completed by P. McKeague, as presented in the DPI publication 'The Cattle Industry of Cape York Peninsula', for the Batavia Downs property. The full economic analyses of this section of this report are presented below to avoid any misrepresentation:

'Batavia Downs was a Department of Primary Industries pastoral grazing lease in the Weipa hinterland. In 1989 it was completely destocked under BTEC and most of the structural improvements were in a poor state of repair. In this state, it presented an opportunity to assess the viability and cost of establishing a cattle property using this production technology.

Management objectives

The property development was designed to meet the following management objectives:

- maintain a branding rate of 75% or better
- limit death rates: weaners 5%; steers and heifers 2%; breeders 4%
- maintain annual live weight gain of steers: 140 kg/ha and heifers 120 kg/ha
- maintain segregation between stock classes
- educate weaners
- contain labour costs
- maximise marketability
- preserve and respect the environmental integrity of the area.

The following structures, pastures and husbandry practices are designed to meet these objectives:

To maintain branding rate at 75% or better

- heifers run on sown pastures from weaning until they wean their first calf
- after weaning the first calf, all breeders run on native pasture with phosphorus supplements
- heifers without a calf at first calf weaning culled
- supplement sheds provided at 1 shed/125 head
- twice/year weaning
- heifers run on low input sown pastures with phosphorus supplements
- heifers mated to calve in November (predicted break in dry season)
- heifers and bulls vaccinated against vibriosis.

Control death rates

- early weaning
- high input pastures for weaners
- all stock fed phosphorus supplements
- meal and non protein nitrogen supplements fed to weaners
- high input pasture for hospital paddock
- heifers run on low input sown pastures until first calf is weaned
- inoculation for botulism.

Maintain live weight gain of steers and heifers

- steers and heifers run on low input sown pastures with phosphorus supplementation.

Stock segregation

- 4 breeder paddocks (4,000-8,000 ha)
- 10 steer and heifer paddocks (500-800 ha)
- 5 weaner, horse and hospital paddocks (25-75 ha).

Weaner education

- weaners fed in yards for 10 days
- weaners given further handling while run on intensive pasture for 6 weeks.

Contain labour costs

- use of dams with trap yards in the breeder paddocks
- Wenlock River not used for watering cattle
- property boundary fenced. This would not be necessary if the neighbouring land were being used for similar types of grazing
- 2 sets of cattle yards
- cattle requiring regular handling eg. weaner, first calf heifer, sale cattle run at higher stocking rates
- sown pasture, higher stocking rate areas adjacent to yards
- areas unsuitable for grazing fenced out.

Maximise marketability

- dehorn
- educate weaners
- phosphorus supplementation
- wean twice/year.

Preserve and respect environmental integrity

- fire remains the main vegetation control measure in 80% of area
- heavily grazed areas stabilised with sown pastures
- identified environmentally important areas eg. Embley Range, deciduous and riverine forests not developed.

Property development decisions

In order to contain costs and maximise production during the development process a number of management practices are observed:

- dams are built in the dry season before fencing or paddock construction
- the number of cattle that can be handled in one group is used to determine paddock size ie. 200 to 300 head in sown pasture paddocks
- low input sown pastures require relatively heavy grazing in the early years of establishment. The rate of development is dependent on the availability of stock to supply this grazing
- high input pastures do not require stocking during the establishment phase and therefore they can be planted in advance of stocking requirement
- nitrogen (urea) as well as phosphorus is fed as supplement in the low input sown pastures while the legumes are becoming established
- to take advantage of natural spread, low input pastures are planted as early as possible in the development sequence
- unequipped dams are the cheapest way to supply stock water; reliable rainfall reduces the size of dams required.

Economic assessment

The effects of development on cash flow are shown in Table 7.16.

The development program, which is designed to reach full production as quickly as is practical, takes 9 years. The cattle numbers and turnoff are stabilised by year 11. The ratio of different age breeders in the herd profile takes longer to stabilise.

Table 7.16. Summary of development costs and cash flow

Year	Land and subdivision	Development costs	Accommodation and plant	Fixed and variable	Cash flow cattle trading	Net cash flow
1	\$150,000	\$139,500	\$186,000	\$ 74,500	0	-\$550,000
2	\$ 50,000	\$101,300	\$ 7,000	\$115,655	-\$170,170	-\$444,125
3	\$ 50,000	\$179,700	\$ 9,500	\$128,194	-\$144,571	-\$511,965
4	\$ 50,000	\$194,200	\$ 16,000	\$166,173	-\$ 91,211	-\$517,584
5	\$ 50,000	\$ 73,600	\$ 5,000	\$149,722	\$ 33,256	-\$245,066
6	0	\$ 73,800	\$ 6,000	\$158,873	-\$ 2,479	-\$241,152
7	0	\$ 65,600	\$100,000	\$165,103	-\$262,246	-\$592,949
8	0	\$ 1,200	0	\$159,579	\$276,616	\$115,837
9	0	\$ 8,700	0	\$159,916	\$289,730	\$121,114

An operating cash surplus is reached in year 8, but by then the cumulative combined costs are \$3,100,000.

Therefore, the total cost of reaching a positive cash flow situation is about \$3 million and expenditure of these levels is rarely affordable.

Partridge and Miller have also concluded that it is rarely economical to borrow funds for pasture development. Pasture development has traditionally been done with profits from the existing operation.

Development of medium to high input pastures in the past has met with limited success. McKeague (1991) gives the following overview of past trends:

'The Cape York Peninsula beef industry has never had a financially buoyant or boom period, but individual properties have been through boom and bust sequences.

The availability of large areas of land at seemingly cheap prices has attracted entrepreneurial investors. In general, these investors have tried to apply current or fashionable technology from other grazing areas in Australia or in some cases from other parts of the world. For a few years this has seen a flurry of activity on individual properties. New watering points (dams and bores), paddock fencing, fresh blood lines, timber clearing, sown pastures and improved accommodation have been tried on properties such as Batavia Downs, Merluna, Silver Plains, Lakefield, Holroyd River and Bertiehaugh.

After an initial flurry of activity the source of investment capital dried up as properties did not show a return on the investment. Management and labour inputs were reduced. A large percentage of the herds became feral. The properties were often stripped of the readily musterable cattle and then sold.

This process of selling all the musterable cattle and then selling the lease is continuing in recent times eg. Meripah, Bonny Glenn, Holroyd River.'

From an economic perspective, it is clear that wholesale development of high input pastures is a risky and expensive exercise. Large scale development of these pastures could only be supported if detailed investigations were conducted into risk assessment, cost-benefit analysis and environmental impact assessment.

7.8 Economic Survivors of the Industry

This report concludes assessments of risk, financial cost-benefit and wider regional, environmental and cultural considerations are required *before* any change in management system should be considered. The economic survivors in the Peninsula, and for that matter anywhere in Australia, are going to be businessmen who assess these issues.

History of economic survival in the Peninsula is summarised by McKeague (1991) under the headings of 'The Survivors':

'In Cape York Peninsula there are a group of graziers who have lived there for up to four generations. These people are descendants of the earlier pioneers eg. the Shepherds, Raymonds, Gordons, Gostelows. In most, if not all cases, cattle production has not been their only form of income. Contract fencing, mustering, sleeper cutting, yard building, road works, trucking, bull dozing, water drilling and more recently supplying tourist facilities and amenities, have augmented and supported their pastoral activities.'

However, the Peninsula will always attract risk takers, albeit in the form of companies or overseas investors, interested in high intensity development of properties. Provided these risk takers can demonstrate, by way of appropriate investigations, that their plans are sustainable and non-degrading, managed development of suitable areas of the region should be encouraged.

It is clear that the future of high-input systems need to overcome both the biological and economic risks of failure if they are to be perceived as a sound investment by landholders in the Peninsula. The first step in confidently recommending such investments is the accurate mapping of the portions of each lease which satisfy the soil and moisture requirements for improved pastures. The second step is to satisfy the needs of Aboriginal cultural values, biodiversity preservation and erosion control before change is decided on. The third step, if incorporating pasture development, is to select only the hardiest and most persistent pasture species, preferably with only moderate fertiliser requirements. The fourth step is to ensure that fire protection of sensitive pasture legumes has been planned. The fifth step is to plan for the fencing and stock waters associated with pasture, in such a way as to allow an effective grazing system which will promote maximum persistence of the perennial pasture species.

From a beef economics point of view there is presently a strong case for encouraging the cattle husbandry approach (cf. Boorman, 1991) with a de-emphasis of the agronomic (improved pasture) approach. This conclusion is supported by the latest (October 1994) qualifications to the Agricultural Land Suitability map (Briggs and Philip, 1994) which classes virtually the whole of the eastern Peninsula as 'low intensity grazing of native pastures ... unsuitable for support of viable beef production systems on a stand-alone basis, but can be an integral part of grazing systems based on improved pasture.'

8 **MARKETING**

8.1 **Present Marketing Arrangements and Prospects**

Marketing of cattle from the Cape York Peninsula region presently offers few options, being almost largely confined to selling at the Mareeba saleyards' weekly cattle sales. A significant number of cattle are sold direct to store cattle buyers for further fattening; some Peninsula cattle are bought by property owners in the Lakeland, Cooktown, McIvor River areas for fattening and some are moved to fattening properties outside the region. Also, there is little direct consignment to meatworks or 'on hook' sales. Sale cattle are usually turned off Cape York Peninsula properties in small, mixed lots not conducive to direct consignment sales. There is some Aboriginal production and processing for community use but this is outside normal market arrangements and is a very small part of Cape York Peninsula production.

Although the marketing of Peninsula cattle is diversifying away from saleyard disposal and moving toward direct selling and increasing live cattle exports, the poor standard of the development road and long haulage distances restrict a majority of pastoralists to being 'price takers' instead of 'price makers'. The relatively low level of pasture nutrients in this scenario is the main negative influence, but distance from markets and poor infrastructure are strong supplementary features. These combine to provide a constrained economic and agronomic cycle where it is difficult to produce high quality animals. So, although there is a high and reliable rainfall in the region, there are few instances where landholders have broken out of this low economic cycle to develop pastures and management for improved quality of cattle.

Cattle from Cape York Peninsula are well suited to the U.S. hamburger or MX (grinding meat) trade. This U.S. MX market is Australia's largest export market and the most reliable. It underpins the whole Australian beef cattle industry. While the U.S. market is a most consistent one, it generally is in a lower price range than other markets. High value beef markets have evolved in Japan and Korea over the past decade to become very significant end users of Australian beef. Specifications for these markets are strict and production is specialised. Specifications include a dentition evaluation to describe the age of each animal. Older or 'full mouthed' animals are not acceptable. Slow growth rates on the low nutrient native pastures of Cape York Peninsula have mitigated against cattle production for these markets in the past, however there is a growing awareness for the need to change management to accommodate marketing opportunities.

Cape York Peninsula cattle production studies have identified the low nutrient/low value market constraints but these have been restricted to consideration of Cape York Peninsula cattle being processed in Australia close to the region. The recent development of live cattle export markets in the Phillipines and Indonesia present distinct opportunities to Cape York Peninsula cattle producers. The expansion of Asian economies and Cape York Peninsula's proximity to the region could reverse the logistical constraints of present cattle marketing.

The live cattle export market has radically improved the economic outlook for cattle producers in the Northern Territory. The Northern Territory government has provided considerable infrastructure at Darwin to help develop the market opportunities. It is possible that parallel live export markets will place the Cape York Peninsula pastoral industry on an economic plane to provide profitability for on-property re-investment and development.

The development of live cattle export infrastructure near Weipa is an aspiration of the cattle industry. The Weipa Hinterland is suggested as the first focal area. This area could develop a live export market through Weipa which would benefit most of Cape York Peninsula' (Cattlemen's Union 1990).

Logistically, a live cattle export infrastructure (assembly, weight gain, quarantine) near Weipa offers considerable advantages:

- Price at port for cattle is currently 135-145 cents per kilogram liveweight. This can be compared with a Mareeba saleyard average of 88.7 cents.
- Transport distances and costs would be much less. Also trucks would be able to backload older cattle to Mareeba saleyards (cows, bulls, ox) after carrying export steers to Weipa.

In summary, the constraints of cattle marketing from Cape York Peninsula are dictated by inherent conditions and logistics, but opportunities are now evident because of developing markets in the Asian region. Cape York Peninsula could become a reliable breeding area for live export steers destined for nearby markets.

8.2 Market Description

The market outlets/turnoff destinations for Cape York Peninsula cattle are described in seven categories:

- (a) The Mareeba Saleyard
- (b) Fattening on properties under the same ownership in other areas
- (c) Sold direct to fattening properties (including feedlots)
- (d) Live cattle exports
- (e) Direct consignment to meatwork.
- (f) Cattle slaughtered within Cape York Peninsula for local consumption
- (g) Agistment for fattening purposes.

Average cattle turnoff over the last five years is estimated to range between 30,000 to 45,000 head per annum from the region. It has been estimated that 33,500 head were turned off last year (1993).

These cattle are sold at the Mareeba saleyards and by direct sales outlets. An estimated turnoff by numbers description is given for the past year. It should be understood that market price opportunity and seasonal factors always influence cattle movements and marketing destination. The cattle industry operates on an open market with unsubsidised production. The market price for cattle fluctuates with supply and demand.

The following table illustrates the turnoff marketing pattern.

**Table 8.1. Turnoff/marketing of Cape York Peninsula cattle for past year (1993)
(estimation made in conjunction with DPI Stock Inspectors, Mareeba)**

	Meatworks	Store Steers including live export	Heifers	Cows	Mareeba Saleyard
SouthWest area (Carpentaria shire not including Dunbar)	1,850	5,400	1,300	900	
Cooktown/Lakeland area	430	800	200	-	
Dry tropics peninsula	700	4,900	450	550	
Totals	2,980	11,100	1,950	1,450	16,000

(Source: DPI Stock Inspectors)

Mareeba Saleyards

These saleyards are a major outlet for Cape York Peninsula cattle. Situated at the southern end of the Peninsula Developmental Road and in reasonable proximity to export meatworks, Mareeba is an important service centre for the far north Queensland cattle industry.

Weekly sales are held, which are attended by buyers from export processing works and local butcheries plus cattle fatteners and traders.

The market itself is an auction with cattle from the various vendors drafted into similar type and sold mainly on a cents per kilogram live basis. Some are sold on an 'open auction' or price per animal basis.

The market price is determined by the suitability of the animals offered to the end use of the purchaser and is influenced by supply and demand.

Dissemination of the Mareeba saleyards average price index over a 65 month period, February 1989 to June 1994, indicates a fluctuating average market price between 70c and 114c per kilogram liveweight, with an overall average price of 90.45c through that period (see Appendix 8.1). This average price is adjusted to reconcile with the principal types of cattle sourced from Cape York Peninsula to give an average price over that period of 88.7 cents per kilogram liveweight (see Appendix 8.2).

Mareeba prices are generally low when compared with the rest of the State. The 90.45c average for Mareeba compares with an overall average price over the same period for Queensland (Queensland cattle market index - QLMA) of 125.9 cents. This reflects the lack of suitability and low average weight of cattle and it could also reflect restricted competition because of limited processing facilities. Note: The latter situation bears comment in that supply of cattle and market outlets for meat dictate the number of abattoirs which service a given region. Abattoir location and cattle sourcing are quite regionalised within Queensland because of the high cost to transport livestock. There is no restriction to further export abattoir facilities being developed in the region, other than being constructed and operated to

the high standard required. However, there is no indication of new or expanded export processing capacity being developed to service Cape York Peninsula.

Selling costs strongly influence marketing of cattle. The overall gross return and cost of marketing cattle at Mareeba is given for a 350 kg liveweight animal at the average price (transport costs are not included):

350 kg @ 88.7c per kg		<u>Gross:</u> \$310.45
Saleyards charges @ 1%	3.10	
Scale fees to weigh	2.00	
Agents commission @ 4%	12.40	
Industry levy (AMLC, MRC etc)	3.60	
	<u>21.10</u>	
		<u>Nett:</u> \$289.35

Store Cattle Turnoff Outside Mareeba

Store cattle sales and turnoff outside the Mareeba saleyards fluctuate and are more difficult to quantify.

The main movement of cattle in this category are those which are sold to be fattened in other more favoured areas with higher nutritional grazing. There are some enterprises which own breeding properties within Cape York Peninsula and breeding/fattening properties in southern and western regions of Queensland. Cattle are bred on the Cape York Peninsula property and transported direct to the outside property to be further prepared for market.

Agistment of stock is a developing feature of the cattle industry in Queensland. Cattle are moved to agistment because of poor seasonal conditions. Cattle are taken on agistment because of favourable seasonal conditions and low stock numbers on a particular property. Many landholders take cattle on agistment regularly as a means of augmenting cash flow. This development in the industry allows cattle from the Cape York Peninsula area to be moved to better nutritional grazing conditions to meet the age and weight specifications of high value Japanese and Korean beef markets. Currently, the Kowanyama Aboriginal community has approximately 1,000 head of cattle agisted. These could be sold direct from the agistment property. Kulata is an example of cattle from a Cape York Peninsula property moving to another in the same ownership outside the region; some 2,500 head were involved in this turnoff. There is also some direct sale of store cattle to fatteners outside Cape York Peninsula, mainly on the Atherton Tableland.

Live Cattle Exports

Some direct live cattle exports of Cape York Peninsula cattle have been made through the newly developed Karumba port. Drumduff has sold 350 head in this manner and other properties are also diversifying into these markets.

Buyers who source cattle for the live export markets attend Mareeba sales and purchase cattle which are suitable.

The market is strong for these cattle. 125c/kg liveweight at Mareeba is the indicated price or 135-145c at wharf or export port.

Karumba is difficult to reach by road from Cape York Peninsula which restricts access.

Direct Consignment to Meatworks

As previously described, a combination of the poor condition of transport roads causing bruising and dehydration and a low economic cycle mitigate against production of lines of suitable cattle favoured by abattoirs in their direct consignment purchases. However, the industry is responding to market forces and increasing numbers are being consigned to meatworks.

It is estimated that 2,980 cattle were sold on direct consignment to meat works. These went to the meatworks at Innisfail, Townsville and Tolga and were produced on properties which had undertaken pasture improvement with higher nutritional grazing conditions and/or improved animal husbandry techniques. Most of the cattle from the Lakeland, Cooktown and McIvor River area go to the local trade through Tolga meatworks.

Consumption within Cape York Peninsula

Approximately 500 head are processed and consumed within Cape York Peninsula at accredited Cape York Peninsula slaughter houses.

Sudley supplied about 400 head to Weipa. These are processed on the property and are produced under improved pasture conditions.

Three accredited slaughter houses are situated at Aboriginal communities. These are at Pormpuraaw, Kowanyama and Wujal Wujal. These are used for provision of meat for consumption by the communities, using cattle owned by the communities. However, this is more akin to self provisioning as practised by pastoralists throughout Cape York Peninsula.

8.3 Marketing Constraints

Grazing Conditions/Product Quality

The main marketing constraint is the low suitability level for high value markets of cattle produced from the low nutrient native pastures of Cape York Peninsula. Animals produced under these conditions are generally smaller and lighter in weight at a given age, than cattle produced under optimal conditions.

Animal Husbandry/Herd Management

General profitability is limited because of the low nutritional grazing conditions of native pastures. This, in turn, limits re-investment in property improvements and genetic improvement of cattle. Herd management, mustering and marketing is often basic, with opportunity turnoff of small consignments of mixed cattle being common. The inability to present larger, even 'lines' of cattle for sale has a negative effect on price.

Controlled mating using genetically superior bulls has brought significant production gains to the Australian cattle industry. The Cape York Peninsula conditions under which cattle are run make it difficult to control mating. (Unselected male progeny or 'mickey bulls' must be castrated before reaching sexual maturity.)

Lack of Infrastructure/Transport Costs

The tyranny of distance and poor roads throughout Cape York Peninsula present a number of marketing problems with distance to markets up to 700 kilometres.

Cape York Peninsula is serviced by the Peninsula Developmental Road. This road is largely unsealed and prone to seasonal flooding, making it impassable for up to three months in the northern section during the wet season.

Mustering and cattle turnoff are normally confined to the dry season. This gives a shorter marketing season. While this does not necessarily affect the sale price of U.S. market stock (because meatworks are also seasonal), store cattle prices can rise through the wet season. This can result in a missed marketing opportunity.

Rough and dusty road conditions, particularly on feeder roads, cause increased bruising of cattle and unattractive presentation at sale. The Queensland Department of Transport study of the Peninsula Developmental Road (1986) stated that carriers consistently reported an operating cost on gravel surfaces three to four times that on bitumen, and that bruising of cattle is reported due to corrugation and swaying caused by gullies and sharp corners. Death of cattle suffocated in dusty road conditions has also been reported.

Freight cost penalties in Cape York Peninsula result from lack of a sealed road system. Transport costs when marketing cattle are a major inhibiting factor on industry profitability.

Cape York Peninsula has largely been neglected in the provision of a reasonable road system on a comparative State and national basis. As described in the Regional Opportunities Identification Study for Major Projects Cape York: 'Most other parts of Australia not only have all weather road access, but are served by railways'.

The report goes on to describe freight cost penalties in the following table:

Table 8.2. Cattle freight costs per truck/km (figures in brackets on bitumen)

Type of Truck	Cost per km
Body truck (8t)	\$1.50
Single deck semi-trailer	\$2.20; \$2.40; \$3.80
Double deck semi-trailer	\$3.60; \$3.72; \$3.80 (\$2.60)
4 deck semi-trailer	\$6.00; \$5.60 (\$4.40)
Average per deck/km	\$2.11 for gravel \$1.20 for bitumen Differential 91c/deck/km

Additional costs due to bruising and death from poor road conditions have been identified and outlined in the report which goes on to say 'It is estimated that lack of a spine bitumen road costs other Cape York communities and stations from Weipa southwards, something over \$1 million a year. Thus the annual freight costs penalty of not having a bitumen road up to Weipa is estimated to be in the order of \$10 million per annum.'

Current costs of transporting cattle are described in the following table. These are given for an animal of 350 kg liveweight transported in various trucking configurations from Sudley, Musgrave and Laura to Mareeba.

Table 8.3. Cattle transport costs

Type of Truck	No. of Cattle per deck	Cost per Head per km (and per deck load)	Origin of Cattle/ Distance to Mareeba	Overall Cost per head	Overall Cost in cents/kg per head
Body Truck (24 feet)	17	9.4c (\$1.60 per km)	Sudley 700	\$65.80	18.8c
			Musgrave 381	\$35.80	10.2c
			Laura 241	\$22.65	6.5c
Single Deck 40' Semi-trailer	28	10.7c (\$3 per km)	Sudley	\$71.00	20.3c
			Musgrave	\$40.75	11.6c
			Laura	\$25.80	7.4c
Double Deck Semi-trailer	28	7.1c (\$2 per km)	Sudley	\$49.70	14.2c
			Musgrave	\$27.05	7.7c
			Laura	\$17.10	4.8c
Double deck road train	28	6.4c (\$1.80 per km)	Sudley	\$44.80	12.8c
			Musgrave	\$24.40	7.0c
			Laura	\$15.40	4.4c

(Prices per deck as quoted December 1994 from transport operator in Mareeba.)

Taking Musgrave as an example, being situated approximately halfway from Mareeba to Weipa, the average cost for Cape York Peninsula cattle is \$32.00 per head for transport (without deaths in transit and bruising).

This is a very large marketing cost imposition. It is estimated that this cost would be reduced by 43% (using DOT costings) if the Peninsula Developmental Road was sealed.

The overall marketing costs for a national average Cape York Peninsula animal weighing 350 kg liveweight at Mareeba and transported a distance of 381 km (Musgrave to Mareeba) is set out as follows:

Gross sale price 350 kg @ 88.7c per kg		\$310.45
Low selling costs		
Saleyard charges @ 1%	\$ 3.10	
Scale fees	\$ 2.00	
Agents commission @ 4%	\$12.40	
Industry levy	\$ 3.60	
	<hr/>	\$21.10
Transport to market		
Average transport cost	\$32.00	
TOTAL Marketing Cost		<u>\$53.10</u>
	Nett return after marketing costs	<u>\$257.35</u>

Technology Uptake

Sufficient information has been developed to overcome the nutritional deficiencies and allow adoption of husbandry/management practices to produce animals with much improved market suitability. The adoption of this technology has largely been constrained by the low economic cycle including production and marketing costs.

8.4 Marketing Potential and Industry Background

The Cape York Peninsula cattle industry could be described as a regional cattle industry which is caught in a low socio-economic cycle, but whose people have a strong culture of survival and self-reliance and who are largely unsupported by public funding or infrastructure.

The high and reliable rainfall of the region is counterbalanced by generally low fertility soils and low protein native pastures. On-property technology advances of: improved pasture species; phosphate supplementation of stock and/or pastures and improved cattle management and husbandry techniques are gradually being adopted. This is because a relatively low quality product, high transport and production costs give low market returns and profitability. Although not yet a widely accepted practice, management system development costs can be financed through the sale of breeders.

Low market returns and high input costs have not provided sufficient capital for on property re-investment. The slow rate of property investment is partially due to the high cost of implementing modern technologies. However, it should be noted that the procedure recommended by the DPI involves the financing of many of these costs by the sale of breeders. This approach requires a change in thinking by most landholders and probably the security of

back-up capital would hasten implementation rates. Failure to apply improved technologies will lock owner/operators into the low economic cycle. Introduction of capital can break the cycle but for the regional cattle industry to be viable, investment capital should be self-generating.

Currently people in the cattle industry supplement their income from a variety of outside sources, but generally are prepared to live in conditions well below the accepted standard (or poverty line) and with minimal government assistance.

There are four developments which have potential to provide conditions for a breakout from the low economic cycle and benefit the Cape York Peninsula cattle industry:

- (a) *The development of the Asian economies and markets and their proximity to the region.* This has already led to a rapid expansion of the live cattle export market. The trend is strongly towards increased numbers of cattle required. This market gives returns almost 50% above the current average price for Cape York Peninsula cattle at Mareeba saleyard, the major market place. An additional benefit is that the average Cape York Peninsula transport cost to market cattle would be substantially reduced if a live export facility was available at Weipa.
- (b) *Tourism development.* Large numbers of Australian and international tourists are visiting Cairns. Opportunities for tourism for Cape York Peninsula landholders are expanding giving strength to diversification for cattle industry people.
- (c) *The development of conservation and biodiversity values in Australia.* Community values have shifted quickly to place a greater value on nature conservation, biodiversity and sustainable development. There is a growing acceptance of the need to enlist resident landholders as managers of nature conservation and to compensate or reward them for doing so. In Cape York Peninsula a huge extent of unmodified land has tourism and biodiversity value which could be of benefit to resident landholders. Given the right policy settings this would allow sound on property diversification and regional development. The extent and potential of unmodified land also allows for a planned incremental development of part of cattle properties, with only a minor, acceptable impact on the conservation and biodiversity values. There is strong evidence that native fauna species thrive in the conditions where pasture nutrient levels are raised and permanent water is provided for cattle.
- (d) *Technology development.* Cattle management and pasture technology have developed to the stage where it is possible to introduce higher protein pastures, supplementary feeding of phosphates and herd management techniques to produce stock suited to the high value live export market and for southern fatteners. The widespread uptake of that technology awaits an economic catalyst. The live cattle export market has the potential to provide that catalyst.

The cattle industry of the Northern Territory and the Kimberleys have recently developed substantially and these areas owe their good fortune in part to the expansion of live cattle export markets and the establishment of a network of bitumen roads for distribution. This support has not been provided to the same extent in Cape York Peninsula. In order to achieve the region's market potential, development of these areas will be required.

Live Export Market

The livestock export market is expanding particularly to Indonesia and the Philippines where the imports are linked to government programs to place the expansion on a sound basis.

Specifications for the animals required for Indonesia and the Philippines suit north Queensland production where the cattle have a high *Bos indicus* content. (Requirement is for at least 50% *Bos indicus* content.)

The price offered is currently around 145c/kg live at port or 125c/kg live at Mareeba saleyard. This is significantly higher than the average price of cattle marketed at Mareeba and is very similar to the average indexed price for Queensland over a three year period.

Description:

The tremendous growth of Australia's livestock trade to the Asia Pacific region continued throughout the 1993 calendar year. The live cattle trade constituted 98.6% of Australia's global cattle exports and reached 207,277 head, an increase of 40% compared to the volume in 1992. This prodigious growth is from a strong base as live cattle exports in 1992 had increased 27% from 1991.

The total livestock trade to the region was worth A\$90.1 million ... (Asia Livestock Marketing, John Maher, AMLC). This report goes on to describe the two major markets: The Philippines and Indonesia.

Philippines

In 1993 Philippine importers purchased a total of 94,465 head consisting of 8,512 breeding cattle and 85,953 feeder steers. The total trade was valued at \$34.4 million.

In February 1994 a Philippines Department of Agriculture Administrative order was signed by the Secretary of Agriculture with the following features:

- the necessary accreditation of bona fide feedlot operators (or cattle consortiums) to import cattle
- the requirement, effective 1 March 1994, that for every nine feeder steers imported, one pregnant breeding heifer must be imported
- the imposition of heavy penalties for both suppliers and importers violating the new regulations.

From 1 July 1994, a 3% tariff will apply to all feeder and breeding cattle imported.

Indonesia

The AMLC reported 'phenomenal' growth of the feeder steer trade from Australia to Indonesia rising 136% from 1992 to 1993 with a total of 58,534 head worth \$24.5 million.

Malaysia

Cattle exports to Malaysia declined by 17% during 1993 to 22,959 head worth \$9.5 million.

Live Cattle Exports - Infrastructure Requirements:

Lower Peninsula data indicate that live cattle exports could increase gross margins by 50% to 100%. However, in order to encourage live exports, facilities (roads and terminals) need establishing in Cape York Peninsula. The poor quality of the developmental road is the main factor inhibiting development of the area.

Assembly of cattle prior to export is required to undertake the health/husbandry protocols of importing countries. Animals are required to be isolated from others to enable health testing. This is normally undertaken by exporting companies in their facilities. Loading facilities at the wharf are required. Normally the trucks drive onto the wharves and load direct to ships using temporary ramps.

Cape York Peninsula producers currently have limited access to a live export port. The closest are at Karumba and Townsville. Roads from Cape York Peninsula to Karumba are such that only the southwest area of Cape York Peninsula can economically access that port. Townsville is at a disadvantage to Darwin and Karumba for the Indonesian market with considerably extra sailing days to the destination.

Weipa is now an open port and offers significant advantages as a live export port. It is a deep water port and can handle large ships. It is well situated for both the Philippines and Indonesian markets. However, Weipa has the disadvantages of poor quality road access, a limited supply base of cattle and lack of assembly facilities for export cattle.

Weipa is one of the ports administered by the Ports Corporation. The Ports Corporation is responsible for the trading ports of Weipa and Cape Flattery, the community port of Thursday Island, and the non-trading port of Cooktown. Being an owner and developer of these port facilities, the role of the Corporation is to identify port needs and to work with both existing and potential port users to ensure these needs are met efficiently and effectively.

The Ports Corporation has advised that the appropriate facility to use at Weipa is Humbug Wharf which is used for general cargo and is currently being upgraded for the export of bagged kaolin. The Ports Corporation has structured its leasing arrangements to provide multi-user access to such facilities and access can be provided to the facility. There are currently no facilities such as holding yards to support live cattle exports at Weipa.

Karumba is another port to consider. Live cattle exports are established in the port and relevant facilities (such as holding yards) are under the control of Integrated Resource Industries. Their leasing arrangements require them to allow access to others to export cattle at reasonable rates. The lack of direct access road between the Peninsula and Karumba mitigates against movement of large numbers of stock.

It should be noted that the Northern Territory Government has strongly supported live cattle export expansion and has invested in infrastructure at Darwin.

The marketing advantage of a live cattle export capacity is illustrated in the following table:

Table 8.4. Live cattle costs and returns

Marketing Costs	CYP average animal at Mareeba	Live export steer at Weipa
Saleyards charges @ 1%	\$ 3.10	-
Scales (weighing) fees	\$ 2.00	-
Agents commission 4% and 2.5%*	\$ 12.40	\$ 8.00
Industry levy	\$ 3.60	\$ 3.60
Transport cost (same distances)	\$ 32.00	\$ 28.00
Total marketing cost	\$ 53.10	\$ 39.60
Gross sale price	\$310.45	\$432.00
Nett per head return (farm gate)	\$257.35	\$392.40

*Paddock sale commission rate charged by agents. Direct sales without agents are possible.

Note: Gross sale price at Mareeba is calculated for a 350 kg animal at 88.7c/kg liveweight. Gross sale price for live export steers is calculated for a 320 kg animal at 135c/kg liveweight Weipa.

In summary, the live cattle export market offers considerable potential for the Cape York Peninsula cattle industry with major benefits to those close to Weipa if assembly facilities are established there.

Other Potential Markets

The expansion of tourism in north Queensland and growth in population provide an expanded table meat market. Two scenarios are likely:

- (a) Aboriginal communities have significant land holdings. It is possible these will move towards greater self-sufficiency and (i) increasingly produce cattle for their own consumption and (ii) gradually move to commercial cattle production as part of the cattle industry.
- (b) An improved demand for table meats with increased urban populations in far north Queensland could see an increased cattle fattening capability in favoured areas such as the Atherton Tableland and Lakelands. This could trigger a younger turnoff age of stock and a market for breeding enterprises to service younger animals. Fatteners in the more favoured areas could look to Cape York Peninsula to invest as a means of servicing these cattle. This would follow the normal trend of response to supply and demand within the industry.

9 INFRASTRUCTURE

Infrastructure underpins the cattle industry of Cape York Peninsula. The large area of Cape York Peninsula, with small population and low production output, together with constraining natural features, present difficulties for the development of infrastructure.

The infrastructure which supports the pastoral industry of Cape York Peninsula is much less well developed than for the same industry in other parts of Queensland and Australia.

Infrastructure features for the pastoral industry are listed under the following headings:

- 1 Roads and road transport
- 2 Meatworks and cattle processing facilities
- 3 Saleyards and selling facilities
- 4 Air services
- 5 Ports
- 6 Technical service provision
- 7 Telecommunications
- 8 TV and radio
- 9 Electricity.

9.1 Roads and Transport

Within Cape York Peninsula the single most important infrastructure feature is the Peninsula Developmental Road. This is a central access road running from Mareeba to Weipa, a distance of 702 kilometres. Feeder roads into the Peninsula Developmental Road occur along its length to service pastoral properties and Aboriginal settlements.

The following companies and instrumentalities have funding, road building and maintenance responsibilities: Department of Transport, Cook Shire Council, Carpentaria Shire Council, Torres Shire Council, Aurukun Shire Council, Aboriginal Communities, Comalco, other companies, beef producers and the Australian Army (Connell Wagner 1989).

The natural constraints to provision of roads for the region include annual wet season flooding which cuts roads for many months, and the scarcity of suitable road building material along most of the length of the Peninsula Developmental Road.

Connell Wagner reported as follows on the general condition of roads: 'The roads in Cape York Peninsula are predominantly unsealed and may offer only six to eight months accessibility each year ... Travel speeds on these roads are much lower than in more developed areas of Australia, with speeds of not more than 60 to 80 kilometres per hour being typically attainable under favourable conditions' and 'Funding has not been available to provide roads in Cape York Peninsula with a flood immunity'.

The Peninsula Developmental Road is unsealed for the major part of its length. Bitumen sealing of the roads extends north from Mareeba, with a Department of Transport projection of completing sealing from Mareeba to Lakeland by 1996. Transport costs over the rough, dusty unsealed section of the Peninsula Developmental Road and feeder roads add considerably to cattle selling costs.

The projections for sealing of the Peninsula Developmental Road are long term - to Musgrave by 2016 and Archer River by 2021. The GH & D report to CYPLUS on Transport Services and Infrastructure in Cape York Peninsula estimates that the costs of upgrading the Peninsula Developmental Road to bitumen standard is \$217M, access roads to Aboriginal communities at \$365M and the Cooktown Developmental Road at \$30M. Alternative improvements such as the improvement of the roads to a two lane gravel road standard with high level bridges involves costs of \$78M for the Peninsula Developmental Road and \$77M for access to Aboriginal communities.

At these levels of funding 'major arterial and arterial roads cannot be upgraded to a two (2) lane gravel standard before 2020...'. Of the 1,476 kms to be upgraded, only 670 kms are State controlled roads and the remainder are the responsibility of Shire and Aboriginal Councils. Local roads (200 kms) under Council control have not been included in these figures.

The cost of maintaining existing roads is \$1,000/km. Presently, pastoralists grade the road from their property to the major road network to keep the road trafficable for stock movement.

A shortfall in road funding is evident on the Peninsula and the funding options to overcome this shortfall are presented in the GH & D report.

Cook Shire operates under a low rate base from leasehold and freehold land in its area and has sought assistance for maintenance because of road use from outside the shire (tourism, Comalco) and a lowered rate base with leasehold land being acquired for National Parks by the State Government (National Parks and other public lands are not rateable).

Cornell Wagner reports that the Cook Shire concentrates on areas of higher rate contribution and responds on a needs basis at landowners' request, that access (feeder) roads sometimes do not exist 'in a practical or dedicated sense' and that permanent works were limited to an upgrading of trouble spots.

Ports

Major port facilities are established at Weipa and Cape Flattery with minor facilities at Thursday Island. Also there are barge unloading facilities or basic port facilities at most other coastal towns or settlements.

The pastoral industry very largely relies on road transport to Mareeba for the sale of cattle produced. However, the recent large growth of live cattle export markets in the nearby Asian region and future projections, point to Cape York Peninsula having live export potential. Weipa is the obvious port to service this new market. Weipa is a publicly owned port giving access to live cattle exporters. Infrastructure to support live cattle exports (assembly areas) would need to be developed in reasonable proximity to Weipa.

Karumba, in the southern Gulf of Carpentaria, is currently developing as a potential live-cattle port, having already been used in 1994. However, the logistics of Cape York Peninsula cattle accessing Karumba are difficult and expensive. Some pastoral properties and Aboriginal communities north and east of Karumba could benefit from the development but the great bulk of Cape York Peninsula would not, as Weipa would be their preferred port.

Air Services

Air services are well developed in Cape York Peninsula and form a vital part of the transport system because of the seasonal nature of the roads. The Queensland Government regulates and subsidises aviation services within Cape York Peninsula while the Commonwealth Government regulates operational and safety matters.

There are two categories of air service licence:

- (a) regular public transport
- (b) charter.

Most towns, communities and some cattle properties are serviced by regular public air transport. Mail and freight to cattle properties is provided by charter contractors - 28 charter companies service Cape York Peninsula. Cape York Air Services is the major operator with mail/freight flown to 65 properties. It is important to note that these services are based in Cairns and charter services are regularly used when public transport cannot be coordinated.

Licensed aerodromes are situated at Cooktown, Horn Island, Lockhart River, Coen, Bamaga, Aurukun, Edward River and Kowanyama.

The air service-infrastructure is important for the provision of health/accident response services throughout Cape York Peninsula. It is also vital to maintain freight and mail services through the wet season. The mail service is Government funded, whereas passenger and freight services are not subsidised.

Technical Services

The Cape York Peninsula pastoral industry is serviced by an extensive technical information service provided by the Queensland Department of Primary Industries (DPI) and by private consultants.

The DPI service is mainly based at Mareeba so the service suffers from the disadvantages of distance and isolation. However, DPI officers attempt to overcome this by regularly travelling through the region and by attending cattle industry meetings.

A DPI Research Station at Batavia Downs which was producing agronomic information for the area, was recently closed.

The DPI has accumulated significant production and land use information relevant to the region, much of it generated by DPI officers who are recognised by cattle producers as an important information source.

Private consultants for the cattle industry in Cape York Peninsula are not widely used, however, there is some consultancy use, particularly on properties under development using capital from outside the area.

Telecommunications

A major upgrading of services by Telecom was completed in 1989. Telephone, fax and computer communications infrastructure is mostly in place, but access is still limited. This infrastructure provides the potential for improvement to communication throughout the region with consequent benefit in the areas of health, lifestyle and access to production information.

TV and Radio

Generally the radio reception is poor, particularly during the wet season when atmospherics and lightning-induced static interferes with reception. The ABC regional radio based at Cairns provides useful industry information through its early morning and 'country hour' programs. Unfortunately, reception from Cairns is not good, and Peninsula listeners receive better reception from Longreach, Mt Isa and Emerald. These western services are not targetted to Peninsula issues.

The knowledge and experience of ABC rural journalists based in Cairns is highly regarded by the Cape York Peninsula cattle industry as expressed at industry meetings. The issues covered, range from topical relevant social issues, to production, animal health and marketing information. 'Notice board' information on meetings and coming events is also provided by ABC radio for the region. Improvement of reception from Cairns would be of benefit to the Peninsula community.

TV reception is limited to within close range of larger centres (except where satellite dish antennae are used). The Department of Community Services is funding re-broadcast equipment for the Aboriginal communities of Hopevale, Lockhart River, Aurukun, Edward River, Kowanyama, Bamaga and Thursday Island.

Electricity

The Queensland grid extends only as far north as Laura and Cooktown with no plans to extend further.

These towns experience 'end of line' supply problems of voltage surge and lightning-strike failures. Electrical installations require expensive protection equipment.

Power supply on cattle properties is mainly supplied with private diesel or petrol generators.

9.2 Licenced Abattoirs and Accredited Slaughter Houses and Saleyards

A decreasing percentage of Cape York Peninsula turnoff cattle are marketed at the Mareeba saleyards. Last year (1993), approximately 50% of these turnoff cattle were marketed through Mareeba saleyards. The cattle are sold on a live weight basis at open auction. Cape York Peninsula cattle are generally suited to the U.S. MX or hamburger meat market. There are three major licenced export abattoirs which regularly purchase cattle at Mareeba sales for processing and exporting to a variety of destinations with some cuts being sold on the Australian domestic market.

These are:

AMH, Townsville
 QME, Townsville
 Innisfail Butchering Co., Innisfail.

Occasionally, abattoirs located near Bowen purchase cattle at Mareeba.

Ten accredited slaughter houses are situated within reasonable proximity to Cape York Peninsula and the Mareeba saleyards. These service slaughter and store cattle buyers from the south and local butchers. A substantial number of cattle are directly sold to Tableland properties and on selling of fattened cattle for the local market. Poorer quality meat bits service local butcher shops for sausage or mince production.

Within Cape York Peninsula itself the major accredited slaughter house is situated at Sudley. This processes animals for sale in Weipa.

Three accredited slaughter houses are operated at Aboriginal communities within Cape York Peninsula to service the communities of Pormpuraaw (Edward River), Kowanyama and Wujal Wujal.

Mareeba Saleyards

The Mareeba saleyards is unusual in that it is owned and operated by a cooperative of local graziers. (Most Queensland saleyards are owned by local authorities.)

Two methods of selling are used: 'open auction' and 'liveweight auction'. The former method is used for store cattle, while cattle judged to be destined to meatworks are sold through the latter method on a cents per kilogram liveweight basis. This method is deemed to be fairer by producers as it takes the guesswork out of judging the weights of animals purchased by the meatworks and butchery buyers.

Cattle are drafted into pens on an owner/animal type basis before auction. Soon after auction they are weighed then assembled into buyer lots.

The Mareeba Saleyards Board charges yard dues of 1% commission on all sales plus a weighing scales fee of \$2 per head for multiple weighing or \$3 per head for a single weighing.

Stock agents currently charge vendors 4% commission. There is an industry transaction levy charge of \$3.60 per head for adult animals and 90c per head for calves.

A typical Cape York Peninsula animal is around 350 kg live, which would bring \$310 if applying the Cape York Peninsula adjusted average price (see marketing section).

Total charges/selling fees would be \$21.10 per head for this notional average animal.

The saleyards has loading and unloading facilities, weighing and drafting capacity. It is well shaded, provided with stock watering troughs and is adequate in design and state of repair.



SECTION E: ISSUES AND ASPIRATIONS

This section highlights the pastoral issues and aspirations important to the pastoral industry and the non pastoral sector. This study does not align itself with any preferred grouping, presenting the findings from an independent position as required by the terms of reference.

Issues presently important to the pastoral industry include security of tenure, lease conditions, lack of finance to fund property development, efficiency of management systems, market opportunities and the state of roads and supporting infrastructure. In response to the complexity of these issues, pastoral industry aspirations range from pessimistic to uncertain. It is considered that clarification of the social issues is required before further long term development options for the industry can proceed.

Similarly, non pastoral industry issues ranged from social/cultural concerns to natural resource degradation and conservation management. Again these issues were complex, however during our consultations, most parties were of the view that the pastoral industry should continue to play a role in the Peninsula's development.

10 PASTORAL INDUSTRY ISSUES AND ASPIRATIONS

10.1 Consultation Process and Response

An assessment of the current attitudes and aspirations of pastoralists was conducted by consultation with industry representatives, individual pastoralists, and CYPLUS Land Working Group. Also a questionnaire was circulated to property owners and managers involved in the pastoral industry. Industry representatives included CYPPAG, Cattlemen's Union and Bob Wincen. A meeting convened at Musgrave (8 October 1994) gave individual pastoralists an opportunity to convey their opinions, attitudes and aspirations. These opinions were re-affirmed during property visits conducted during the project. For those pastoralists unable to be visited or unable to attend meetings, the questionnaire was forwarded for completion.

The response to this questionnaire was a 30% return. Analysis from this return highlights the following points:

- (i) surveys were completed predominately by owners of larger leasehold cattle properties who have worked the properties for longer than 10 years
- (ii) cattle turnoff percentages were higher than expected. Some anomalies exist here
- (iii) a majority propose some development of their property in the future
- (iv) property development techniques proposed to be adopted include pasture improvement, selective land clearing, strategic fencing, phosphate improvement, increased use of licks, improved watering

- (v) factors identified as limiting to the industry's development included low nutrition pastures, poor soils, poor transportation networks, poor cattle control and poor marketing opportunities
- (vi) factors that were thought to restrict the implementation of development techniques were lack of finance, restrictive lease conditions, poor access
- (vii) a majority of producers considered that the condition of their land was stable or improving
- (viii) a majority of producers considered that they could not subdivide their land under present tenure arrangements
- (ix) a minority of producers would consider subdivision of their lease
- (x) reasons given for subdivision were to generate more capital for property development and for easier property management.

A summary of results from the questionnaire have been collated and presented as Appendix 10.1.

10.2 Current Industry Issues

Current issues that influence industry attitude include:

- the Native Title claim by the Wik people
- the likelihood of other claims
- probable establishment of the Aboriginal land acquisition fund to purchase Peninsula properties
- rapid conversion of significant areas of pastoral properties to National Park tenure, eg. Starke, Lakefield, Silver Plains
- EARC's review of local authority boundaries
- CYPLUS planning process
- the Wolf Report on Tenures
- changing legislations.

The complexities of these issues make it difficult for the industry to appreciate the implications of proposed changes and then determine a position. Decision-making is founded on 'shifting sands' and continuation of these circumstances will act as an impediment to effective long term planning.

The key feature of each of these issues for the beef industry is not always the content or objective of the issue, but rather the uncertainty it generates for future planning. Each of these issues could result in some structural change for the industry. The likelihood of structural change is not feared by the industry, however, there is a perception that structural change will occur without meaningful input from the industry. A feeling of 'not knowing' pervades the industry and should structural change occur, it is feared that this change might prejudice industry interests.

However, despite these difficulties, other more specific industry issues offer the Peninsula industry encouragement. These issues include:

- the ongoing improvement to the Peninsula Developmental Road, especially the northern sections in the Archer and Weipa area
- the continued interest in developing Weipa Port as a possible live cattle export facility
- the gradual restocking of properties following the BTEC rundown
- the gradual acceptance of improved cattle husbandry techniques
- the gradual improvement in services supporting the Peninsula.

It is important to recognise that gradual structural change is occurring within the industry and these incremental structural changes are addressing the existing constraints to industry growth. In particular, the infrastructure cannot be rapidly addressed. Poor transportation networks and communications have been long term impediments to industry development. Improvement to infrastructure will support potential improved marketing prospects emanating from live cattle export, ex Weipa.

10.3 Current Industry Attitudes

Attitudes in the Peninsula are a product of the region's remoteness, development history, relatively poor service infrastructure support and evolving government policies. Current industry attitudes have subsequently developed in response to the region's history and present day issues. The underlying attitudes of producers in the Peninsula is one developed on a culture of survival and self reliance. This culture results in an industry structured to support producers with varying aspirations. These aspirations range from highly commercial orientated business to producers who view pastoralism as a way of life with involvement in the industry not only on financial grounds. The pastoral industry is currently caught in a low socio-economic cycle and has long suffered from poor infrastructure support, extremes in wet season conditions, poor communications and remoteness from markets. However, it has survived. The people working in the pastoral industry have worked together to develop the industry. The history of pastoralism in Cape York is peppered with some conflict, however, all parties involved have shown a strength for survival. This attitude of survival is still present and can contribute to future planning.

With respect to the industry's attitude to the current Peninsula issues, the following summaries are presented.

Uncertainty in Decision-Making

The industry is presently confused by past conflicting advice and policy administration decisions made by governments. These inconsistencies have led to uncertainty caused by the lack of clear decisions. Uncertainty created by past actions is made no clearer by the present period of structural change. The complexity of the present issues bring with them uncertainty. This feeling of uncertainty develops tentative attitudes towards:

- security of tenure
- investment decisions
- property improvement decisions
- infrastructure support decisions
- stocking numbers
- breeding programs.

It is a fundamental business principle that the amount and rate of business activity is a function of expectation. If expectation is fuelled by uncertainty, as it is in Cape York Peninsula, the overall impact on the industry will be negative.

In order to rectify this position, the industry considers that better decision-making based on effective consultation and factual information inputs is required. However, the industry considers that 'at present, the future of the Peninsula is being governed by political decisions, or in many cases, lack of decisions, with little regard for the interests of resident stakeholders' (CYPPAG, 1995).

Sustainable Development

Many in the industry consider that the Peninsula is lightly stocked. Low cattle numbers are a product of existing management technologies involving limited cattle control, minimal fencing and extensive grazing strategies. The result of this management approach is an environment that is generally stable in condition.

A perception of the industry is that the Peninsula is capable of supporting higher cattle numbers. The resultant increase in cattle numbers, it is thought, relies on development strategies resulting in better cattle control. These strategies generally result in more intensive management.

Specific practices of the more intensive management regime that have proved successful in the Peninsula include improved husbandry practices such as botulism vaccination, dehorning, early weaning, supplementation and vibriosis vaccination and strategic pasture improved areas. The implementation rate of these practices has been slow and piecemeal. Reasons suggested for the low and piecemeal adoption of these practices are:

- poor access and transport networks
- pastoralist's resistance to change
- lack of finance (for development)
- lack of infrastructure support (eg. ports, saleyards)
- restrictive lease conditions
- size of the property
- tenure insecurity.

The industry considers that overcoming these barriers is the logical first step to change and subsequent industry revitalisation.

Pastoral Lease Use

In the Cattlemen's Union Working Paper on 'An Assessment of the Future Directions of the Pastoral Industry in Cape York Peninsula', the industry estimates '30% of the total area could be considered unsuitable for grazing at present because of its soil properties or vegetation type'. Of the remaining 70%, many properties are running well below potential carrying capacities.

Reasons why properties are carrying stock numbers less than capacity are complex and often are property specific. However, some of the factors that have contributed to low stock numbers of recent times include:

- (i) destocking as a result of the Brucellosis and Tuberculosis Eradication Scheme
- (ii) high costs of restocking destocked properties
- (iii) lack of confidence in the long term security of the pastoral industry on the Peninsula, discouraging investment
- (iv) low breeding rates due to existing stock management practices
- (v) land speculation.

A disturbing issue that is associated with the low stock numbers is a trend for leasehold land with a pastoral designation not to be used for pastoral purposes. These areas of land are not running cattle or just a few head and result in a non-productive use of this land. The exclusion of these areas from pastoral use erodes the industry's development.

The attitude of the industry is that if the designation of the lease is pastoral, a genuine effort should be made to run cattle on that lease. Non-pastoral dominant use of pastoral leases is considered to be inefficient from an industry perspective.

Conversely, provision presently is not made for smaller hobby properties near population centres (eg. Weipa) or near fattening areas (eg. Tablelands). The industry's attitude is that the provision of 'smaller hobby farm' leases would be consistent with its overall attitude to pastoral use for pastoral leases and it would satisfy a demand for these blocks.

Multiple-Use Planning

The industry appears to be supportive of the concept of multiple use planning. This support has been gauged from responses emanating from the Musgrave meeting (8 October 1994), circulated questionnaire replies and CYPLUS working group discussions.

Multiple use planning is not a foreign concept to the industry and it has been informally practised throughout the history of pastoralism in the Peninsula. Aboriginal access to culturally significant sites has been a regular occurrence throughout the industry's history. Environmentally sensitive areas of properties have either been only lightly grazed or not grazed at all with a view of maintaining the integrity of these areas.

It is the industry's attitude that 'Cape York needs to accommodate the widest possible range of business activity and land use'. There is room for a vastly expanded pastoral industry alongside mining, tourism, national parks, wilderness areas, strategic defence use, and Aboriginal land.

The principles of multiple use planning were supported by the industry at the Musgrave meeting and subsequent consultations. The logistics of further developing these principles of multi-use beyond existing informal arrangements are the subject of conflict within the industry. The CYPPAG position on this issue is that 'pastoral leases have been granted and are legally binding agreements between the Crown and leasees. The degree that outside parties are allowed to participate in drawing up these agreements (for multiple use, access) is, and should remain, negligible.

These informal arrangements could change to more formalised legally binding agreements on properties subject to Native Title claim. This action is conjecture until mediations involved with the claims are finalised. However, individual properties have the right to negotiate individual agreements with respect to multiple use and access, regardless of ownership. These agreements are likely to be responsive to market forces and government policy. Interestingly, historians suggest that early lease conditions provided for access onto leasehold land.

Government Policy Making

The industry's current attitude to the government has developed from past inaction on the part of land authorities. Governments, in their roles as custodians of Crown or leasehold land, are perceived to have failed to supply supporting social and economic infrastructure required for industry development. Basic infrastructure support such as services, decent roads, communications, and social support are all deficient in the Cape. This contrasts with other areas throughout the State and, of more recent times, in the Northern Territory where the government sponsored infrastructure support has facilitated the expansion of live cattle exports from Darwin.

With respect to production related problems, the industry perceives the government's attitude to pastoral lease conditions as limiting. The past practice of requiring traditional fencing and watering points, structures and improvements on leases are considered to be ineffective in Cape York. More flexibility, more security of tenure and more production incentive related conditions are considered relevant to the present industry.

Also, the industry considers that the policy of destocking for BTEC has had the effect of 'stripping' properties and subsequently many of these properties cannot afford to restock. In contrast, DPI has given positive support in investigating and working on production systems for the Cape, although the recent closure of the Batavia Downs research station has reduced this commitment.

In response to these concerns about government policy making, the industry has coordinated its efforts and formed the Cape York Peninsula Pastoral Advisory Group (CYPPAG), a local industry representative committee. CYPPAG coordinates comments on policy and develops and evaluates land use initiatives.

10.4 Future Industry Aspirations

A review of the industry's future aspirations suggest that there is a view that the region is positioned to benefit from a number of 'windows of opportunity'. This optimism is tempered by individual and industry constraints.

National Perspective

From a national perspective, the local industry considers its location offers comparative advantages and serves a number of functions.

The basis for the comparative advantage assertion relate to the region's reliability of seasonal rainfall and closeness to Asian markets for live cattle exports. The high reliability of rainfall provides a security for planning needed for further development of the industry. Secondly, the Asian market is an expanding market for live cattle exports and Cape York Peninsula is physically well positioned to serve this market. The live cattle export market to Asia is expanding at around 20% per annum, with around 130,000 head exported out of Darwin in 1994.

Other national changes that will impact on the Peninsula's pastoral industry is the trend for northern Australian cattle to be marketed at a younger age and to 'changes in the pasture available, the increased mobility of cattle through the use of motor transport and the more rapid growth in cattle fattened in feedlots, are seeing northern cattle also marketed at a younger age' (Australian Beef 1993). Similar trends are expected in the Peninsula provided transportation networks are progressively improved and cattle control strategies are implemented.

Marketing Perspective

The Australian Meat and Livestock Corporation have identified that the future of the industry 'lies clearly with the more aware, market-conscious grower who turns off cattle destined for particular markets and who is able to meet exactly the specific requirements of users in these markets'. Australia's entry in the 'fastidious markets of North Asia' with its tight specifications is 'encouraging the Australian industry to re-evaluate their production systems' (Australian Beef 1993).

The region is well positioned to supply live beef cattle to Asian markets via Gulf port facilities. The locational advantages warrant further attention to live cattle exports from Weipa and Karumba. The development of these markets beyond the 'pipe dream' stage will require changes to production systems and infrastructure support. Some sectors of the Cape York Peninsula cattle industry have aspirations of meeting this market-driven demand. Market related changes such as improved cattle control improving continuity of supply, improved infrastructure on and off property and the use of strategic 'finishing off' paddocks will develop the existing store cattle production systems to maximise market potential.

Production Systems

Changes to production systems and infrastructure underpin the aspirations of those sections of the industry that see the industry developing in the future. The current management style is viewed as being 'not financially self supporting' (Cattlemen's Union Working Paper 1990).

When considering future production systems, the full spectrum is covered with some sectors promoting clearing of large tracts of land, other sectors promoting clearing of strategically located small areas to assist with cattle control, and other sectors relying on improved animal husbandry techniques. The decision on appropriate technology is determined by individual circumstance and also by specific regional constraints. Constraints to be considered include security of tenure, financial position, stage of life of pastoralist, existing property resources and infrastructure.

Cultural Considerations

Aspirations of participation in pastoralism within Aboriginal and Torres Strait Islander (ATSI) communities are as diverse as in non-ATSI. Land that is suitable for pastoralism under Aboriginal and Torres Strait Islander control or management is frequently under-utilised for cattle production. Aspirations for the future range from non-use of land for cattle production, to managed use for the supply of cattle for their own consumption to an expanded use initiated by improved marketing opportunities.

Initiatives involving cooperative marketing strategies, slaughter houses and associated infrastructure have been proposed by ATSI communities as opportunities for communities to move into the cattle industry. These developing production, management and marketing systems, supported by managed training schemes are essential to their involvement with the industry.

Competing Land Use Demands

Attitudes towards managed development of the Peninsula's cattle industry are predictably parochial. The industry is aware of competing land users' demands and objectives. However, the industry considers that the beef industry can develop in harmony with other land use requirements. The CYPLUS planning process provides a forum for a better exchange of views based on objective data. Resolution of land use disputes is best achieved at a grassroots level, within agreed procedures and protocols and based on sound information sources reflecting national goals.

Sustainable Development and Stewardship

The Australian cattle industry has recognised the increasing community awareness of the need for integrated natural resource management and appropriate environment policies. Land degradation issues such as soil erosion, salination, acidification, declining water quality, reduced ground cover of native species and habitat decline resulting in reduced biodiversity and endangered species are concerns of the wider industry. More specifically, two predominant concerns to policy makers are:

- the effects of vegetation clearance and decline in the number and range of native plants and animals
- the impacts of agricultural activity on water quality and availability.

In Cape York Peninsula, many cattle producers aspire to protect their land for the purpose of handing on the property to the next generation in a sound condition. Management systems reflecting this aspiration will have to consider environment condition. Some of the wider industry issues and approaches mentioned earlier are present on the Peninsula, however the underlying commitment to sound stewardship of the land is part of the Peninsula's approach to land management. The role of the pastoralist as a steward of the land is on-going and inter-generational.

10.5 Opportunities and Constraints

Table 10.1 is an assessment of the pastoral industry's perceptions of the opportunities and constraints emanating from continued pastoral development in the region.

Table 10.1. Opportunities and Constraints - Pastoral Industry Perceptions

Issue	Opportunity	Constraint	Present Situation Manageable
Tenure			
1 Native Title claims		✓	
2 Lease conditions		✓	
3 Government policy (living area concept, land clearing)		✓	
4 Tenure classification (pastoral holding)		✓	✓
Infrastructure			
5 Existing condition of roads		✓	✓
6 Proposed improvement of roads (within 50 years)		✓	✓
7 Services		✓	✓
8 Port facility at Weipa	✓		
Production			
9 Cattle management systems & technology	✓		✓
10 Soil types, pasture condition			✓
11 Climate/Rainfall pattern	✓		
Marketing			
12 Alternative marketing outlets to Mareeba saleyards	✓		
13 Weipa export facility	✓		
Economic			
14 Levels of capital for development		✓	
15 Foreign Ownership	✓		✓
16 Changing land use to non pastoral		✓	
Environmental			
17 Biodiversity		✓	✓
18 National Parks (present policy)		✓	
19 Pest and disease control	✓		
Cultural			
20 Present access arrangements			✓
21 Aboriginal Land Fund	✓		
22 Aboriginal involvement	✓		✓

With respect to the pastoral industry's current attitudes and aspirations, this report considers an opportunity exists for the industry to develop in cooperation with competing land uses. It is considered that 'multiple-use strategies' for the pastoral industry can facilitate the achievement of objectives of other sectoral groups, as well as foster pastoral industry ambitions. This can be achieved by making decisions based on the objective data, by recognising existing legislative frameworks and by developing acceptable performance standards to monitor progress. Effective consultation at grassroots, regional and government levels underpins the success of the process.

In order for the industry to realise its potential, industry, government and the community need to focus on resolving the identified constraints to managed development. The tenure constraints restrict the industry's development by not providing a security of tenure to encourage development. Infrastructure constraints are a significant problem to all sectors on the Peninsula and a progressive improvement will facilitate improved marketing opportunities and the continued introduction of sustainable production systems. The continued implementation of sustainable production systems is the key to the progressive resolution of the economic constraints. These investigations suggest that the industry is capable of a progressive improvement in economic performance and the rate of improvement will be affected by the rate of resolution of the identified constraints.

Sustained development with improved infrastructure, improved employment prospects for the region's youth, increased wealth-generation emanating from industry diversification, preservation of environmental values and maintenance of cultural values are potential outcomes, provided the pastoral industry of the future can be developed on sustainable and multiple-use principles.

11 NON PASTORAL INDUSTRY ISSUES AND ASPIRATIONS

11.1 Consultation Process

A preliminary assessment of the current attitudes and aspirations of the non pastoral community was conducted by consultation with government agencies, representative sectoral groups and the CYPLUS consultation processes. Government agencies contacted included Lands Department, Department of Primary Industries and Department of Environment and Heritage. Sectoral groups contacted include ACC, CYLC and CAFNEC. The CYPLUS process included two meetings with the Land Working Group and discussions with other CYPLUS LUP consultants. No specific non-pastoral community analysis was completed as other LUP projects, in particular the Value, Needs and Aspirations report, addressed these issues. With respect to community aspirations for the pastoral industry in the Peninsula, data from Professor John Holmes' investigations have been used. Holmes' (1995) report has been used in the absence of any other documented survey data being found at the time of writing. Assessing the validity of Professor Holmes' findings was not seen as the province of this Pastoral Industry Report and Holmes' findings are represented as objectively as possible.

11.2 Current Non Pastoral Industry Issues

Based on the findings of our limited research and other reports earlier mentioned in this section, Table 11.1 represents a summary of key issues we perceive are both important to the non pastoral industry sectors of the Peninsula and also may have impact on the future development of the industry.

Table 11.1. Current Non Pastoral Industry Issues

Sector	Issue
Aboriginal and Torres Strait Islander sector	<ul style="list-style-type: none"> . Recognition of their race. . Land ownership as a right, as stipulated in the provisions of the Native Title Act. . Resolution of existing Native Title claims. . Land Management strategies observing management protocols linked to their cultural heritage. . Access to sites of cultural significance. . Access to funds for land acquisition. . Protection of areas of high cultural value. . Assistance to improve pastoral and industry management skills.
Environmental sector	<ul style="list-style-type: none"> . Need for representative reserve system eg. National Parks, protected areas . Off reserve conservation management. . Alternative land use to pastoralism in areas that are ecologically unsustainable or economically unviable. . Development based on ESD. . Resourcing of Aboriginal and Torres Strait Islander people for ecological land management. . Protection of areas of high conservation value.
Other non pastoral industry sectors	<ul style="list-style-type: none"> . Managed economic growth. . Increased employment. . Increased regional wealth. . Protection of areas of high conservation, mining, pastoral, cultural value. . Sustainable development. . Diversity of industry.

With respect to the generic categories of economic, social, environmental and tenure, the issues relating to them are presented in Table 11.2. These issues are not presented in any order of priority.

Table 11.2. Community attitudes and issues

Category	Attitude and/or Issue
Tenure	Aboriginal control of land. Insecurity of tenure. Multi use tenures - for and against. Cooperation and co-existence in management. Lease control/land subdivision. Difficulties in managing National Parks due to low budgets. Fallacy of acquiring National Parks based on old property boundaries.
Environmental	Protection of sensitive conservation area. Sustainable development of rangelands. Impacts of intensification of pastoralism. Weed invasion from introduced species. Wilderness and heritage value. Weed control (eg. rubber vine) and degradation. High sediment loads in rivers. Maintenance of 'wild and natural lands in their present condition'.
Social	Preservation of sites that are culturally significant. Aboriginal decision-making based on families. Non specific identification of cultural sites. Tree clearing constraints due to cultural reasons. Maintenance of generational non-Aboriginal culture.
Economic	Economic efficiency vs social equity. Poor economic performance of existing systems. Cooperative advantage for industry. Wealth generation attributes. Live cattle export potential. Support services.

With respect to sectional opinion on specific issues, Professor Holmes surveyed the major Peninsula stakeholders:

- Cape York Development Association (CYDA)
- Cape York Peninsula Pastoral Advisory Group (CYPPAG)
- Cairns and Far North Environment Centre (CAFNEC)
- Cape York Land Council (CYLC)
- Aboriginal Coordinating Council (ACC)

- Queensland Mining Council and Comalco (QMC)
- Cook Shire Council (CSC).

In summary, Professor Holmes identified the following issues as in need of attention:

- lease subdivision
- Aboriginal access on pastoral leases (more urgent)
- measures to preserve valued habitats and species (longer term)
- procedures for approving alternative, third party use
- land management planning - voluntary vs compulsory
- clearing controls on leases
- tenure options for pastoral leases purchased for Aboriginal peoples.

The detail of addressing these issues draw divergent views among the project's participants. The divergence of views persisted mainly between CAFNEC/CYLC and CYPDA/CYPPAG.

Other important issues that did not have such divergent views included:

- riparian access and management
- land management planning - concept
- zoning near population centres
- private uses in National Parks
- a new public tenure to accommodate private uses.

All the issues raised in this section are related to the pastoral industry. They are significant and will impact on the future development. These issues have been taken into account in this pastoral industry project.

This section simplifies the findings of the Tenure report, however we consider it addresses the key elements of the report presented by Professor Holmes. The represented findings as those of Professor Holmes as determined by his investigations.

11.3 Current Non Pastoral Attitudes and Aspirations

Australia is presently evolving through a phase of re-assessment of attitudes. Traditional values on most social issues are being questioned and society as a whole is re-evaluating attitudes. In general terms, social attitudes towards our environment, our heritage, our past history, roles of women in society, ownership of land, our approach to land management, and our general government approach are all being questioned. Many of these issues have a strong focus on Cape York Peninsula.

Changing legislations and government policies are evolving community sectoral responses to these issues that are generating misunderstanding and insecurity. The seeds of misunderstanding and insecurity usually grow into forms of social division. This circumstance has the potential to occur in Cape York Peninsula due to the complexities and number of social change issues that need to be resolved.

With respect to the pastoral industry issues, sectoral grassroots responses are presently balanced, with a central attitude of working together to resolve the issues as they arise. It would be naive to suggest that no antagonism exists, however the seeds of misunderstanding and security have not matured yet.

Sectoral responses to our contact have ranged from the extreme single sector control, use and management of land to the middle ground whereby cooperative use and management strategies are preferred to those sectors satisfied with the *status quo*. Interestingly, all sectors contained extremist, middle ground and *status quo* elements. This study does not align itself with any preferred grouping and its aim is to present its findings on the pastoral industry from an independent position determined by the brief. The existing laws of the land are accepted and any proposed changes are geared towards sustainable development for Cape York Peninsula.

It would be trite for this report to attempt to express stakeholders' viewpoints on the many issues raised, suffice to mention the list of issues is not exhaustive, but it is representative of consulted stakeholder opinion. From the project's viewpoint, the complexity of issues will make it difficult to propose 'one right' solution. The region's land use strategy process should be reflective of these issues.

11.4 Opportunities and Constraints

Table 11.3 is an assessment of the non pastoral industry's perceptions of the opportunities and constraints emanating from continued pastoral development in the region.

Table 11.3. Opportunities and Constraints - Non Pastoral Industry Perceptions

Issue	Opportunity	Constraints	Present Situation Manageable
Aboriginal and Torres Strait Islander Sector			
1 Recognition of their race		✓	
2 Land ownership as a right		✓	✓
3 Native Title claim		✓	✓
4 Cultural land management strategies	✓	✓	✓
5 Sites of cultural significance - protection and access		✓	✓
6 Land acquisition fund	✓		
Aboriginal			
7 Involvement in industry	✓		
Environmental sector			
8 Representative reserve system		✓	
9 Off reserve conservation management	✓	✓	
10 Non pastoral use of 'unviable' and 'unsustainable' properties		✓	✓
11 ESD principles		✓	✓
12 Aboriginal involvement in the industry	✓		✓
13 Protection of high conservation value areas		✓	
Other non pastoral interests			
14 Managed economic growth	✓		
15 Employment	✓		
16 Regional wealth	✓		
17 Protection of high value areas for conservation and cultural purposes		✓	✓
18 Sustainable development			✓
19 Diversity of industry	✓		

SECTION F: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT ANALYSIS

This section describes the environmental and socio-economic impacts of the pastoral industry in the Peninsula. Assessments involved reviewing previous government and university investigations.

In summary, the environmental impacts resulting from present industry operations appear to be limited to narrow riverine environments. This outcome is a product of the present low level of development. The causal links between industry and landscape condition is not well documented and subsequently further development should proceed cautiously.

Economically, the industry is recognised as a regular contributor to the region's economy, albeit small relative to the mining sector. The multiplier effects of an expanded pastoral industry has positive economic effects for the region.

Socially, the industry is recognised as an employer of people either directly or indirectly. Social comment was made on social justice issues and conservation issues.

12 ENVIRONMENTAL ANALYSIS

12.1 Land Condition Analysis

Previous Studies

Environmental impacts are taken as including landscape, vegetation, soil, water and air. Monitoring of air pollution is non-existent in the study area, with the exception of the Weipa bauxite and kaolin mine sites where Comalco practise dust suppression techniques and monitor dust levels. Apart from sediment and nutrient estimates (Moss *et al.* 1993), water pollution has not been intensively studied in Cape York Peninsula although Comalco monitor the effects of mining and loading operations at Weipa. Vegetation changes as a result of the pastoral industry have been referred to in a number of studies but estimates of the location and area of cleared land are not easily available from the Lands Department office in Cairns. Data from the QDPI database gives a 'disturbance map' as shown in Map 7.

The impacts of the pastoral industry on the native pastures (ground cover) and soils of the study area have been estimated by various researchers (Weston *et al.* 1981). The first estimate of soil erosion was made in 1975 for the shires of Cook, Carpentaria, Croydon and Etheridge, including sections of the shires of Burke, Mareeba and Herberton (QDPI 1975). At that time there was only 0.03% of the area under cultivation, so the erosion survey was essentially a grazingland condition survey, covering a total area managed by 390 landholders.

Approximately 85% of the 1975 survey area consisted of native pastures used for beef cattle breeding and fattening on properties which averaged 100,000 ha. That survey estimated the eroded area from the length of the Peninsula rivers based on the observation that virtually all

the erosion occurred on the river frontages, levees and floodplains near permanent water. Based on a 10 km wide strip of frontage country being affected along a total of 1,981 km of rivers an area of 314,000 ha was estimated to be eroded and in need of treatment. A total cost of \$2,080,000 was calculated as the value of fencing and water trough provision as a means of overcoming the degradation problem. The original field notes from the 1975 survey warrant documentation here:

'Friable earths and clays fairly stable. Duplex and massive earths highly erodible when disturbed. Main soils very permeable with poor moisture holding capacity. Inherent fertility very low. Grazing land erosion is mainly on frontage country of all the rivers and permanent waters. Necessity for stock to walk down river banks for water and concentration on grazing frontage country. Definitely not economic for property owners to provide pumped water supplies and necessary fencing. Natural drainage system [shows] very severe streambank erosion due to high runoff from ranges and incised cattle pads down river banks. Flooding of lower floodplains [occurs] annually with frequent substantial stock losses and damage to fences and waterpoints. Most properties in the zone have not been financially rewarding except for peak years when the market suited the type of stock produced. Management practices are generally of a low standard. There is much burning of pasture in selected areas to assist in mustering large areas. This accentuates the erosion risk. High risk of damage by fire and flood does not encourage management aids such as subdivision [fences] and pumped water supplies.' (Field Notes for Inter-departmental Report 1978)

In a more recent survey by Tothill and Gillies, the 1978-80 estimates of pasture condition are compared with the 1991 estimates for the three major types of grazingland in the Peninsula:

		1978-80(%)			1991(%)		
		Good	Fair	Poor	Good	Fair	Poor
1	Native Sorghum	90	5	5	90	5	5
2*	Plains and low hills	80	10	10	20	70	10
3*	Northern flooded alluvial plains	45	35	20	30	50	20

* *Schizachyrium* grassland

The areas of these three types have a capacity of 31,000, 139,000 and 56,000 cattle equivalents respectively (Tothill and Gillies 1994).

Other studies such as CSIRO's general 'degradation severity index' based on the ARIS survey dated 12 January 1988, maps the whole of the present study areas as being 'moderately' degraded, ie. the second most severely degraded in four classes (severe, moderate, mild and not degraded) (Ive and Cocks 1989).

In reviewing recent changes in Cape York ecosystems, Stanton (1992) reports that the most threatened habitats in the Peninsula are the grasslands. The threat, in Stanton's view, comes from the absence of earlier Aboriginal burning, and the invasion of exotic pasture grasses which may be beneficial from a pastoral viewpoint but detrimental in terms of native fauna habitat (Winter and Allison 1980). The removal of cattle from Lakefield N.P. has led to localised spreading of *Digitaria decumbens* (Pangola grass) in low lying areas. We are

advised by CYPAG that the areas of pangola grass on Lakefield National Park total only several hectares out of a total area of over 500,000 ha. These areas are being monitored by DEH staff. The other extensive grasslands are around Princess Charlotte Bay, on the west coast south of Aurukun, along the east coast between Silver Plains and Lockhart River in the valleys of rivers such as the Nesbit. A similar threat is held by Para grass (*Brachiaria mutica*) for the wetlands of places like Aurukun, in the same way as it has ruined the Townsville Common Bird Sanctuary, according to Stanton.

In some regions of the Peninsula, the most significant change in the vegetation is the result of the replacement of cool mosaic burns (as practised by the Aborigines) by widespread late season hot fires (Crowley 1994). Stanton records that these fires are often started by lightning and that their effect is to scorch and kill the margins of the rainforest and replace those areas with grassland. There is no doubt that rainforest does not presently occupy all the soils which it can occupy. On the moist east coast, rainforest is expanding primarily due to less burning.

Early burns in the dry season are often limited to small areas in an effort to concentrate cattle grazing. This causes severe loss of cover until the rains come and leads to unfettered invasion of tree saplings in the absence of grass which means no competition and no hot shrub-killing fire the next season.

Another vegetation change indirectly associated with cattle is the effect of feral pigs. Feral pigs have a massive effect in churning up the riverine wetlands. The wetlands are further threatened, in Stanton's view, by the introduced tall wetland grasses (ponded pastures) *Hymenachne amplexicaulis* and *Echinochloa polystacha*. The floating masses of vegetation formed by these grasses could conceivably smother the Peninsula's lagoons.

The relationship between the pastoral industry and the worst weed in this region, namely the exotic Rubber Vine (*Cryptostegia grandiflora*), is complex and not well understood. It has choked much riverine vegetation in the southern Peninsula, killing trees and forming impenetrable thickets. Rubber Vine establishes best in silt and is sensitive to fire. Where heavy grazing along streams has removed grass competition and fire, this weed flourishes. Stanton has shown at Lakefield N.P. that if caught early in its establishment, the vine can be controlled by hot fires from sufficient grass.

A very different form of degradation in the study area is the water erosion emanating from roads and tracks. While this form is by no means limited to the pastoral industry, much of this damage occurs on cattle properties where multiple tracks are formed, concentrating surface water flows and directing runoff water out of the natural drainage. This issue is of particular significance in areas of highly erodible topsoils in landscapes with long (not necessarily steep) slopes, as occur in the vast grazing areas underlain by 'massive earths (Bb4)' (Northcote 1980).

12.2 Catchment Condition Analysis

The normal connotation of catchment condition, as used in southern Australia, has not been appropriate to the Peninsula under its past and current land use. The reason for this is, that in its virtually natural state, the surface hydrology of the region has been so little changed by land use, that landholders downstream in the Peninsula river systems probably cannot identify any significant changes in the volume and quality of river flow which can be positively associated

with land use. There may be limited exceptions to this where localised clearing has occurred, such as on Lakeland Downs, Heathlands and Lockhart River holdings, and in the much-publicised case of the Mitchell River (only part in study area).

This report makes mention in several sections, of the concentration of cattle near permanent waters, resulting in some streambank erosion and increased turbidity of the water. However, the undeveloped nature of lower reaches of most of the Peninsula rivers, together with the vast volumes of runoff during the monsoon season, have tended to mask the significance of any deterioration in catchment condition which may have occurred to date. This situation is markedly different from that in southern Australia where off-site effects of clearing, salinity, nutrient enrichment and sedimentation have had serious economic consequences for water users downstream.

The studies of Pain *et al.* (1994) and Moss *et al.* (1993) have recently studied the potential soil loss and surface water quality respectively, in the Peninsula. The former authors have attempted to apply the Universal Soil Loss Equation to the area and conclude that the erosion hazard for most of the CYPLUS study area is 'in the range of very low to low mainly because of the high permeability of the sandy soils ...'. They recommend conservative stocking rates, location of stock watering points away from areas of high erosion risk, fencing off of eroded or erosion-prone areas, and planning roads with erosion minimisation in mind. QDPI have identified significant areas of erodible massive earths and duplex soils in the Peninsula. These areas would need to be carefully managed and strategies proposed by them should be considered on these areas.

The results of Moss *et al.*'s (1993) assessments of sediment and nutrients in Peninsula rivers indicate relatively high levels of nitrogen and phosphorus, recorded from the natural (undeveloped) catchments of north-east Cape York Peninsula. In addition, relatively high silt loads were recorded for these rivers despite low cattle numbers in the catchment. These authors state that 'more than 61% of the north-east Cape York Peninsula catchment is used for grazing and could not be rated as pristine'. The Fitzroy, Burdekin and north-east Cape York Peninsula were recorded as the State's highest sediment-yielding coastal catchments. The extent to which there is a causal relationship with grazing requires clarification before it is assumed in the present report.

12.3 Pastoral Use Impacts on Natural Resources

Under-Use of Pastoral Land

Of all the grazinglands in Australia, those of Cape York Peninsula have been shown by several studies to be in better general condition than any other pastoral regions. As referred to elsewhere, approximately 90% of the major native pasture type of the Peninsula is in good condition. For the State overall, this figure is nearer 30% (Weston *et al.* 1981).

It must be concluded that the unusually good condition of most of the Peninsula's native pastures, is due primarily to under-use, ie. an unusually low overall stocking rate for the total area. This is due to the lack of property infrastructure which in turn is the result of a general lack of finance. The outcome of this situation is an unusually uneven distribution of cattle over the property as a whole, leading to high concentrations near the waterways and very low use or even non use of the outlying areas of the property. Techniques such as patch burning

and wide distribution of supplements do assist in attracting animals away from the water to some extent, but by and large the under-use of the 'outside country' is a very widespread phenomena.

The questions must thus be asked when attempting to predict the future impacts of pastoralism, 'Where and how can sustainable cattle production be practised in the Peninsula?', and 'Is cattle production in the Peninsula in the best national interest?'

Over-use of Pastoral Land

As reported earlier, the land of Cape York Peninsula used for pastoralism has been over- and under-used on a mosaic pattern determined by the location of permanent water and to a lesser extent the position of roads and access tracks. The under-use is evident in country which is distant from reliable waterholes, or inaccessible or vegetated by plant communities which provide little or no grazing (heathlands, rainforest, mangroves). The 26 major vegetation types have recently been mapped (NRAP 1994) and their areas calculated as a basis for potential carrying capacity computation.

Those areas which are under-used by cattle are, however, not necessarily in pristine condition since feral animals such as pigs, and encroaching weeds such as Rubber Vine are causing major changes to such ungrazed areas. The over-used areas, though much smaller in total size, are of special significance in this overview of the pastoral industry. Several forms of degradation have already been described under Environmental Impacts and it is appropriate to exemplify these by way of the Kowanyama case study:

The Kowanyama Deed of Grant in Trust Lands are showing signs of several forms of over-use according to Clark (1992), namely:

- soil loss from water erosion in heavily stocked localities
- soil structure decline from trampling
- weed invasion from species associated with stock and stock feed
- invasion by feral animals such as pigs which feed partially on dead stock
- excessive harvesting of fauna by personnel associated with the pastoral industry
- decline of wetlands due to trampling and grazing by cattle
- ecological changes in vegetation due to a changed fire regime suited to the pastoral industry
- erosion due to vehicle tracks and road-making.

To overcome these degradation problems it was agreed by participants at the Kowanyama Land Degradation Conference (KALNRMO 1992) 'that cooperative land management strategies (can) be developed in the future, and within which, the Kowanyama Aboriginal Community will continue to play an active role.'

Beef production impacts from over-use of the resources is at the heart of several of the basic problems. It was awareness of these problems which led the Kowanyama community to be instrumental in the formation of the Mitchell River Watershed Group (ARRI 1994). In 1992 the community had called for a consultant to assist with their Kowanyama Cattle Company management plan.

12.4 Pastoral Use Impacts on Biodiversity

In an era of environmental awareness there will inevitably be a critical evaluation of the effect of a land use such as pastoralism on the conservation values as measured in terms of biodiversity. The study of Winter and Allison (1985) suggests that there was no evidence a decade ago, that any species of endemic (locally unique) fauna had become extinct anywhere in the Peninsula, at least not during the past 30 years. Apart from marine mammals, there are 81 mammal species in the study area. The unique Australian monotremes (platypus and echidna) are two of these, marsupials number 33, rodents 14, bats 31 and carnivores 1. A total of 76 of these had been recorded by 1948, and a further five between 1949 and 1980.

Other CYPLUS projects will report on the value of the biodiversity of the region but for this study of the future of the pastoral industry, it is sufficient to note that the fauna and flora of the Peninsula are richer in species diversity than virtually any region in Australia. Bats are a case in point, where 31 of Australia's 59 species occur in Cape York Peninsula. The bird population of the region, with 108 species of water birds and 258 species of land birds (Kikkawa 1976), is amongst the richest in the world. In terms of the number of plant species, the area is also noted as the most diverse in Australia, ie. 2,533 plant species (Cocks 1992). The richness of the ecology of the Peninsula stems from its geological origin as a 'meeting place' of the great faunas (and their habitats) of wet tropical Papua New Guinea and dry inland Australia.

The pastoral leases share the Peninsula with principally National Parks and Aboriginal land use. Some of the areas, while not presently proclaimed as parks, have special environmental significance. For several historic reasons the coastal areas presently designated for special uses are concentrated on the east coast at least in the northern section of the Peninsula. This is despite the abundance of archeological evidence of concentrations of Aboriginal population at a number of west coast sites indicating a strong case for Aboriginal association in these areas.

The distribution of the cattle industry is presently concentrated in the centre of the Peninsula, with the majority of the west coast allocated to Aboriginal land use, some of which includes cattle raising. Except for a section of reserves across the centre (Archer, Coen and Wenlock river areas) all the present National Parks and Aboriginal lands bound the coastline.

The present NRAP studies should identify all areas of special environmental interest including habitats which warrant protection from cattle grazing and trampling. The wetlands will probably be shown to be of special significance.

Considering the Peninsula as a whole, the McIlwraith Range (NE of Coen) is considered to have the highest diversity of birds and mammals and as such warrants special attention from biodiversity analysts. Similarly the upper and lower Jardine river and Lockerbie rainforests are of special significance.

12.5 Potential Impacts of Pastoralism

High versus Low Input Systems

Potential impacts on the economic sectors of Cape York Peninsula are more clearcut than impacts on the landscape which may be measured using either social or environmental criteria.

As referred to earlier, present grazing leases total 75 and constitute 9,352,676 ha or an average size of 83,506 ha. About 46% of leases are under 45,000 ha and five leases exceed 250,000 ha. No big public companies such as Stanbroke Pastoral or Australian Agricultural hold leases in the study area. The Sudley holding held by Comalco is the only public company lease.

It is difficult to confirm a single figure for the natural or potential capacity of the Peninsula. The Lands Department (1994) estimates the total (natural) carrying capacity of Cape York Peninsula leases at 207,680 cattle based on one beast per 45 ha. As pasture technology expands so the potential carrying capacity will increase. The unimproved value of the leases totals \$8,095,700 or 86c/ha based on 'grazing value' not 'higher value' and it is in this context that development for pastoral purposes must be evaluated.

Intensification of pastoral systems ranges from historical use of native pastures through a series of increasing inputs of improved husbandry practices to improved grass and legumes together with associated fertiliser increases, in a physical framework of more fences, smaller paddocks, reticulated watering points and supplement feeding structures.

It appears that a general lack of funds resulting from poor turnoff rates and high transport costs, has prevented the more rapid adoption of these 'improved' technologies. Uncertainty on issues such as permanent tenure has no doubt also been a major reason for lessees not to invest more heavily in property improvements and infrastructure. Delays in gaining government commitment to an abattoir near Cooktown and full export loading facilities at Weipa have been additional factors which reduced producers' will to invest in intensification. The construction and maintenance costs of fencing on relatively low carrying capacity country (1:30-80) is another long-standing deterrent.

Provision of water is usually in the form of simple gully dams, with very few well-equipped earth banks or bores. Artesian bores are rare and limited to a few leases on the western side of the Peninsula where mining operations sunk bores in the past (WRC 1988). However, pastoralists advise that "presently artesian bores are (now more) common through most of the Peninsula" (CYPPAG, 1995).

Much has been written about the trials and potential of improved pastures, as detailed in Sections 6 and 7. As a cost-effective alternative to protein supplements, properly fertilised legume pastures have been reasonably successful in selected areas of good soil. Phosphorus licks for cattle are also recommended. Presently legumes such as Wynn cassia and others including Seca and Verano can be well established but may not persist especially when burned. It is common to find however, that the heavier grazing pressure associated with legume pastures tends to eliminate the upright tufted native grasses and can lead to bare areas and resultant sheet erosion.

Legumes plus 50-80 kg/ha of fertiliser can increase carrying capacity from 1:30 ha to about 1:3.5 ha a few years after establishment. In its most intensive form such improvement would require initial clearing of all timber before establishment and fertiliser application at least every three years. Clearing is expensive and control of regrowth causes on-going maintenance costs. In addition, the ecological effects of clearing trees which act as 'mineral pumps' on infertile soils are not well understood, nor has the effect of timber removal on ecosystem biodiversity been fully studied although the reduction in total species is well documented.

In high intensity management systems, the best of the improved pastures may reach a carrying capacity of 1:2 ha which for a viable herd of 3,000 cattle may require 5,000 ha to be cleared. Unless on-going inputs of fertiliser and management are maintained, the pasture and its productivity will dissipate and the return on the investment in clearing, fencing and establishment will be lost. The application of this practice is recognised by the industry as being limited to a small number of larger pastoral operators. It is presently beyond the financial capacity of most individuals.

The historic low intensity beef production system by contrast is low cost, simple and requires minimal management. Cattle are run year round on native pasture and mustered only once per annum when all operations and drafting are done. Mortality is high, calving rates are low and weight gains are slow in this system. Advantages of the system are low costs, low management requirements and simple infrastructure (often no more than three fenced paddocks). The inefficiency of mustering in vast unfenced areas has led to a build-up of feral cattle in some less accessible and lighter carrying capacity country. These areas may be mustered only once in two or three years. The cattle that are found there are mainly bred in these areas, however, occasional additions from better accessible country stray into the area. Because of the low costs of this system, many lessees with little capital have been able to establish themselves in the Peninsula cattle industry. Because of unusually low production per unit area, economies of scale do not result in larger areas necessarily becoming viable economic units in the absence of intensification and development.

In addition, the transport distances in the northern region of the Peninsula are such that trucking costs are beyond the level which can be absorbed by this system while still yielding a good profit margin. See Anning's (1980) overview for a general description of the problems and possibilities of pasture intensification in the Peninsula, as seen by the QDPI at that time.

As discussed, a number of management options are available and used by the pastoralists of the Peninsula. These options range from high intensity complex improved pastures to low intensity open grazing situations. These high and low management intensity extremes are not recognised as appropriate to properties on the Peninsula, however, they are presented to demonstrate the level of potential impact if significant areas (not properties) were developed under either system. The predominant management involves a combination of improved husbandry practices and strategic pasture improved areas.

The administering authority of the grazing leases, ie. the Lands Department, has no preferred production system, provided the land is maintained in good condition and the revenue raised through rentals meets the State's expectations. Somewhere between the basic traditional

system and the highly developed intensive system of beef production in the study area, is an improved management system which is a compromise between the high and low cost systems. This improved management system is based on early weaning, phosphate supplementation and disease control, notably botulism (which is associated with phosphorus deficiency) and vibriosis, as detailed in Section 6.

Whatever the system used, special attention must be given to resource maintenance and Landcare in all its facets - weed control, gully reclamation, creek bank restoration, scald rehabilitation, salinity control, contamination control (arsenic dips) and pasture degradation and its associated erosion.

Size of Holdings

There are presently significant problems in interpreting the Lands Department's carrying capacity estimates since they vary by 300 to 400% for many types of country. However, this information is presented as it was being applied by the Department of Lands at the time this report was prepared. Additional data will become available from the CYPLUS planning process and this will provide the Department of Lands with recent objective data in the future to establish better researched carrying capacities and holding size requirements.

Of the current leases, about 90 may be deemed to be too small, ie. less than the so-called 'living area' (3,500 head) as designated by the Department of Lands. Only about 15 leases are above the desired size for a living area. These estimates assume a carrying capacity based on unimproved native pasture, so if large scale development of properties was to allow significant intensification and thus an increase in carrying capacity, very few leases would be deemed too small. The chances of this happening are analysed in Sections 6 and 7. It should be noted that Aborigines presently hold four leases (3.5%) averaging 162,000 ha or a carrying capacity equivalent of 3,513 head. (Bonny Glen, Helmsley, Ancilia and Coen river pastoral leases.) Nine leases (8%) totalling 568,270 ha (15,379 herd equivalent) are held in the study area by foreign owners, and only one lease (130,000 ha; 5,200 head) is held by a public Australian company (0.9%). The 72 leases (not all 'grazing leases') held by private individuals (60%) average about 63,000 ha with a capacity of about 1,530 head each on average (including approximately 15 leases with a carrying capacity of less than 100 head).

The environmental influence of property size is difficult to estimate because of three major factors:

- the type of country and its carrying capacity
- the extent of development and pasture improvement
- the uneven environmental effects caused by very localised distribution of stock in the vicinity of permanent water.

Of the 26 major types of pastoral country (Appendix 12.1), the heaviest stocking pressure would usually be concentrated on no more than six of these types (Lands Department 1b, 4a and b, 5b, 6a and 8d), all of which are located in low lying areas where storm runoff concentrates in the wet season. It is also within these areas that permanent water and thus stock concentration occur.

Roughly half of the types of country available (12 of 26) are regarded by the Lands Department (1994) as having no potential for improvement (increase in carrying capacity) and are thus disregarded as areas for increasing viability through development.

An examination of the 112 leases indicates that 26 are regarded as capable of improvement in terms of carrying capacity. This represents 23% of the Peninsula's leases. Based on the Lands Department's (1994) figure of 3,500 head as an economically viable herd, about 160,000 ha constitutes a living area in the current cost/price structure. While some individuals hold more than one lease, a number of the family properties will require amalgamation or intensification if they are to achieve commercial viability.

However, a more useful assessment involves the use of the DEH vegetation database and the Lands Department's carrying capacity database. Viability of holdings has been computed and mapped. Pastoral holdings have been classed as viable (over 4,000 head c.c.), marginally viable (3,000-4,000 head), non-viable (below 3,000 head) and presently not managed for grazing (National Parks and Aboriginal land). The viability of pastoral holdings based on existing carrying capacities and potential carrying capacities have been mapped on the GIS as shown in Maps 5 and 6. These maps are of particular significance in planning the future of the Peninsula's pastoral industry. The existing and potential capacities of each lease are shown in alphabetical order in Appendix 6.3. This appendix demonstrates that the existing carrying capacities can support a herd size of 182,308 and potential carrying capacity can support a herd size of 539,813.

The appropriate size of properties cannot, however, be finalised without reference to the way of life and thus the economic expectations of the landholders. Thus Aboriginal communities wishing to run cattle primarily for consumption by themselves, could satisfy their needs and the requirements for environmental stability with relatively small numbers of cattle. This could translate into either smaller properties or lower stocking rates or both. The environmental effects of cattle are, however, primarily the result of distribution of animals on the frontages, rather than the result of overall stocking rates or overgrazing in general. It should also be noted that many graziers responding to this study's questionnaire, indicated no intention of high intensification.

12.6 Mapping of Production and Conservation Land Units

The tropical tall grass pastures of the Peninsula make up 10.4M ha or 6.0% of the State's native pastures. Their estimated total carrying capacity may be 190,000 head of cattle or 1.5% of the total Queensland herd. By comparison, Black speargrass pastures carry 2.6% of the State's cattle, Brigalow country carries 17%, Mitchell grass 15.5% and Mulga 4% of the beef herd (Weston *et al.* 1981).

Against this background, the grazing country of the Peninsula should now be mapped to identify its production and conservation areas in detail to allow for the application of categories of land use as proposed by Morton *et al.* (1994) for Central Australia. These workers propose four categories of land management units (see Appendix 12.2):

- (a) National Parks (including Aboriginal traditional use).
- (b) Excised Management Units (EMUs) - small conservation areas.
- (c) Restricted Use Units (RUUs) - pastoralism and tourism.

- (d) Sustainable Use and Living Areas (SULAs) - multiple use areas for grazing, mining, tourism, Aboriginal settlements.

This division of land was proposed for arid Australia and requires modification and adaptation for Cape York Peninsula, but the basic concept holds promise as a framework for coexistence of a range of community interests in the Peninsula. Appendix 12.3 shows the scale and criteria proposed for the arid zone and indicates how cost-sharing may be achieved, including salaries for land stewards as referred to elsewhere. This approach should be given priority by the CYPLUS Taskforce as a basis for planning of Peninsula land allocation.

In a recent paper by Friedel (1994), in answering the question 'Is it possible to maintain livestock grazing industries and conserve biodiversity at the same time?', Friedel says 'The simple answer is that there is no real alternative. The biodiversity of the rangelands is too great to be represented in existing park systems, and the community cannot afford to acquire and manage large traditional tracts of land. Instead, we must accept that biodiversity conservation and productive use of land can and do coexist in many areas.' Friedel infers that especially where pastoral production is not economically viable, serious consideration must be given to reviewing land use in the context of balanced community objectives on a regional scale.

12.7 The Precautionary Principle and the NRAP Maps

The CYPLUS program has provided for the most comprehensive mapping of land resources undertaken anywhere in modern Australia on such a vast scale. Despite this multi-disciplinary use of the GIS technology, many questions will still remain unanswered at local level, notably on the distribution and status of rare fauna and flora, including insects and lower plants. The same uncertainty surrounds the 'degradation' surveys which, at their present scales, may overlook not only the more subtle changes in species (as in grass species composition), but even the more obvious symptoms such as erosion associated with roads and tracks and the botanical effects of changes in fire regimes.

One of the subjective judgements which will be required in developing CYPLUS policy, is the extent to which susceptibility to degradation (eg. as shown on erosion and salinity maps) should influence land allocation decisions. Soils mapped as potentially erodible or saline, may cause planners to be cautious about future uses - thus the need to heed 'precautionary principle' which states that until a particular land use or development can be proven not to degrade the environment, approval of such use should be withheld.

There are real problems in applying this principle at Cape York Peninsula, firstly because much of the land has already been used for a particular purpose for the past century, and secondly because even when a particular land use appears to meet theoretical environmental requirements, the level of day-to-day management becomes the determining factor in its effects on resources. The size of properties, isolation, wet season constraints, and poor transportation networks will affect day-to-day decision making in Cape York Peninsula.

The interpretation of NRAP maps such as those for erosion and salinity potential will no doubt be different for optimists and pessimists (or idealists and realists). Thus in attempting to sketch the future of the Peninsula beef industry within environmentally safe limits, not only the spatial distribution of future cattle grazing, but the level of intensification (development),

stocking rates and infrastructure will need to be agreed on, preferably in the form of a comprehensive Property Management Plan (PMP).

13 SOCIO-ECONOMIC ANALYSIS

13.1 Socio-Economic Impacts

Positive Impacts

Several estimates of the economic benefits of the Cape York beef industry have been published. These estimates range from the Connell Wagner gross market value of \$20M to CAERA Gross Regional Product (GRP) figure of \$7.2M in 1991-92. Analysis of the CAERA data demonstrates that pastoral industries have contributed to the economy of the Peninsula on a regular basis. This contribution may be relatively small, especially when compared to mining, however, the impact is positive. Economic benefits have been derived in the associated regional industries of transport, trade and finance. Connell Wagner also identified income generated by the road transport industry amounts to approximately \$1.5M from trucking cattle and \$300,000 from other freight. The value of vehicles and associated transport equipment is \$10.4M (Connell Wagner 1989; ABARE 1988). The rates and taxes paid by the rural sector (primarily pastoral and mining) varies from \$258,000 to \$662,000 depending on the year. Total property debt in the region varied from \$7.5M to \$13.8M from 1985 to 1988. The average rate of return on capital (excluding capital appreciation) varied from -1.3% to 12.1% between 1985 and 1988 and averaged approximately 6% during the decade before. Multiplier values in the order of 1.5 for the pastoral industry will generate further wealth for the Peninsula economy.

Social studies related to the beef industry are sketchy and incomplete and are best dealt with in the social program of CYPLUS.

A number of current sources of economic information have been canvassed. The Peninsula cattle stations employ about 400 workers in total. The lessees and their families, together with these workers, form the bulk of the non-indigenous Peninsula rural community. They are augmented by a small population of service personnel and government officers stationed in the small towns of the Peninsula.

The distribution of wealth and the spread of benefits among the various community groups of the Peninsula indicates major discontinuities in economic status. The most striking example of this is in the mining sector where vast investment in plant and labour has led to relatively small economic gain to the region's community. In the pastoral industry vast tracts of land have produced a meager disposable income for most graziers and their families, and little benefit to Aborigines other than stockmen's wages. However, the industry has been a regular contributor to regional wealth levels, albeit at modest amounts.

Contact with representatives of the pastoral industry indicates a clear and unambiguous perception by the pastoral families as seeing themselves as the backbone of the Peninsula social fabric. This image of the grazier community is probably not supported by the Aborigines or tourism operators who recognise other values, more associated with the absence of producers and their cattle. There is clearly no single social value attached to the presence of one particular group.

It is clear that the beef industry has had a major influence on the economy of Cape York Peninsula and has been the major source of income and source of social fabric for the non-indigenous Peninsula community. The present study recognises that in the absence of the grazier community, under present land use allocation, the area would be largely unpopulated, with the exception of concentrations of inhabitants at settlements such as Kowanyama, Weipa, Laura and Bamaga. The report makes no value judgement on this situation.

The social impacts of the pastoral industry are most noticeable at cattle centres such as Mareeba and Coen and in the basic infrastructure of roads, telephone lines and fuel stations which serve this widespread community. The purchasing power of grazier families has expanded the social impacts of this community to those small service towns in the region on which the pastoralists depend.

The positive economic impacts of the pastoral industry are derived from approximately 130,000 cattle run on about 75 properties on Cape York Peninsula. The northern section is sparsely populated and the industry there employs only about 60 workers while the most productive properties are in the south-eastern zone of the Peninsula. The south-western zone includes the Gulf Plains with its large stations and 'relatively fertile' alluvial plains and coastal deltas which suffer localised erosion on the waterways (QDPI 1975).

As referred to earlier, the pastoral leases account for 57.2% of the Peninsula's land area; National Parks about 10% and Aboriginal land about 14.8%. The 78,192 km² under grazing is the most recently 'settled' region of Queensland and for several reasons is in better overall ecological condition than any other part of the State. In essence the nutrient deficiencies, unusually low calving percentages and the high cost of restocking, all contributed to a low overall stocking rate. Thus despite localised degradation associated with permanent watering sites, it is important to appreciate that pastoralism in the past has largely kept intact 90% or more of the Peninsula grazinglands, at least as estimated by condition surveys (Weston *et al.* 1981).

Negative Impacts

In view of the positive contribution of the grazier community to the non-indigenous social structure of the Peninsula, it is difficult to substantiate any significant negative social influence which has resulted specifically from the pastoral industry *per se*. Again the effects of this industry on the social situation of Aborigines are in some cases the exception to the otherwise positive influence on the social structure of Cape York Peninsula. The effect of pastoralism on the Aboriginal community (Wynter and Hill 1991) can be interpreted as having both positive and negative influences, the positive elements including the provision of employment eg. stockmen, assistance and support by grazier families in the fields of education, health and access to services generally.

In a somewhat different interpretation of the economy, it has been argued that the Aboriginal economy has been disadvantaged by the large proportion of previously Aboriginal (Tindale 1974) land which has been allocated to pastoral leases since the late 1800s. In a cash economy such as that which operates in white Australia, there are fundamental difficulties in quantifying and thus valuing the 'economic' losses incurred by Aborigines as a result of being denied ownership or access to certain leases (Jones 1994). In evaluating social influences on Aborigines, a distinction must be made between the effects of historical official policy and the

effects of the pastoral industry *per se*. The means of righting of historical wrongs and the achievement of an equitable tolerant multi-racial community are beyond the scope of this study.

13.2 Social Justice and Equity of Resource Access

Many areas of the Peninsula are clearly suited to more than one land use. The selection of single land use options or multi-purpose land use (Stanton 1976) is both an ecological and a political decision. Much of the present grazing land is equally suited to pastoralism, tourism, Aboriginal cultural use and national parks.

The present study focuses on the future of the pastoral industry but by any social equity and justice criteria, competing claims on grazingland require democratic consideration. Consider first the equity issues relating to the grazing community. The graziers of Cape York have developed homes and a social structure under difficult isolated conditions over the past century (Holmes 1987). The claim that several generations of pioneer grazing families have a right to continued use of their leases is a logical legitimate claim. This claim is strengthened by the fact that the grazing leases are generally in good condition (of the order of 80% classed as good).

However, Aborigines also consider they have legitimate claims for land in Cape York Peninsula. The issues of Aboriginal recognition, Native Title, Aboriginal ownership, Aboriginal access and the protection of areas of cultural significance are all of great importance to Aboriginal society. Our meetings with the Aboriginal stakeholder groups working within the CYPLUS framework did not result in the identification of sites of importance to the Aboriginal community, however, issues relating to the outstanding Native Title Wik claim did demonstrate the issues of Native Title and land ownership will impact on the development of the pastoral industry in Cape York Peninsula.

Other stakeholder groups also consider they have legitimate claims for land in Cape York Peninsula. Conservation groups view the issues of maintenance of biodiversity, establishment of a representative reserve system and retention of habitat as important. The present network of National Parks and reserves have been defined based on historic cadastral boundaries and conservation sectors have differing views on the representativeness of the existing system. Complete alienation of this land to satisfy the interests of conservation stakeholders, resulting in the exclusion of pastoral interests will impact on the development of the pastoral industry in Cape York Peninsula.

Similar agreements of resource use, management and access could be forcibly put for other interest groups, for example the tourist industry, mining, defence and transport sectors.

The determination of how land is allocated is a matter of social policy and political judgement. Social policy should take into account historic events, good and bad, and propose future directions that strengthen the social fabric of society. With respect to how social policy impacts on the pastoral industry of Cape York Peninsula, this report is of the view that the issues of land ownership, resource use, management and access need resolution before any future planning for the industry can proceed.

Resource Use

A social policy that operates on the acceptance of a non-commercial land use position will have severe negative socio-economic impacts on the pastoral industry. Exclusion of land from pastoral activities will diminish the potential for managed expansion of the pastoral industry. The potential to reach critical stock numbers to support export facilities and improvements to existing transportation network would be reduced. Also, unmanaged land increases the risk for the spread of animal diseases and this would place the region's, the state's and the nation's cattle industry at risk.

Some social justice commentators emphasise acceptance of non-commercial land use as a legitimate alternative to commercial beef production (Roberts 1994a). Many observers of the Cape York Peninsula situation would recognise the need for no particular group (pastoralist, Aborigine, conservationist) to be seen as 'more than equal' despite the case made for 'catch-up' policies to compensate for perceived past inequities. The natural land use option may appear attractive, however, there is overwhelming evidence that education, employment and income are necessary elements of any group seeking survival and prosperity in the world of the future. If all Peninsula stakeholders can maximise the opportunities offered to them to participate in a market economy without losing the richness of their environment and culture, they can have the best of both worlds. The concept of multi-use has wide application on the land users of the Peninsula.

Resource Management

The present condition of the Peninsula's pastoral lands is considered to be good. A number of reasons account for this present situation. The region has been managed extensively for centuries, both by Aborigines and pastoralists. Brian Roberts (1991) has argued that the reasons for the relatively minor effect which Aborigines had on their traditional lands should not be confused with simply a lack of the non-Aboriginal technology associated with land degradation (steel axes, crosscut saws, rifles, motor vehicles, bulldozers, in that order). In an era when conscious informed land stewardship by Aborigines is quoted as one reason to grant Native Title, this ideal may be no more than a deficiency in the means of exploitation. The Kowanyama Landcare Group has, for instance, recognised that their own Aboriginal Cattle Company should take all precautions against further damage to their grazingland, notably at the billabongs and other watering places (KALNRMO 1992).

Similarly, the pastoralists have not adopted many of the land management technologies that resulted in land degradation in other areas of Australia. The Peninsula has been lightly grazed resulting in minimal damage, so in this sense of isolation has been beneficial to the Peninsula during Australia's development phase since European settlement. Any change in management technology needs to take into account environmental considerations.

The relatively recent land use phenomenon of allocating land for a conservation purpose by way of National Parks and other reserves has generated a new set of concerns relating to the management of land in the Peninsula. The management of conservation areas in the Peninsula has varied from intensive management in high traffic areas to a complete lack of management inputs. Recognising the fact that some of these areas serve an important role in preserving biodiversity and habitat retention, other issues such as weed infestation, difficulties in cattle

control along unfenced boundaries and disease control negatively impact on the pastoral industry.

The Green report, which reviewed the adequacy of resourcing national parks in the Peninsula, concluded that 'National Parks in Cape York are seriously under resourced in respect of staff levels and operating and capital works budgets'. A continuation of the process to purchase land for National Parks and then remain unmanaged presents management difficulties to the pastoral industry of Cape York Peninsula. A cooperative arrangement between neighbouring pastoralists and National Park owners aimed at improving the management of these areas is required. Pastoral use of these areas has a role to play in some cases.

Access

The notion of totally free and open access to all lands on the Peninsula in order for sectoral groups to satisfy their production, cultural or conservation requirements is desirable, but neither practical nor achievable. All sectors have an interest in the land, however the control of access remains with the landholders or their representatives. Land ownership is determined by the nation's legislation and forms the basis for access arrangements.

A majority of the Peninsula's land is owned by the Crown and governments can exercise controls over access by way of proprietary controls or regulatory controls. The Crown maintains ownership of the land until it is licenced, leased or freeholded. Access arrangements re-incorporated into appropriate title conditions may be negotiated at this stage. Alternatively, the government may exercise regulatory control by restricting the way the land is used and managed. In this case, the title holder would negotiate access based on conditions.

Presently, the Peninsula's leaseholders negotiate with other sectoral groups on access. These negotiations establish the conditions upon which access is granted and are dependent on the predominant use allocation. The present arrangement places constraints on the authorities in changing the existing conditions of use or restricting the range of uses currently permitted through either the regulating or proprietary methods. Any such change would require compensation payments.

Access agreements are vital to multiple-resource use. The recognised owners, be they pastoralist lessee, Aboriginal community or government, establish the conditions for entry and possible use. The government in the long term can influence the direction of access agreements by enforcing proprietary or regulatory controls.

13.3 Animal Health Implications

Owing to its proximity to northern land masses, Cape York Peninsula is an important area in terms of its potential exposure to exotic disease.

Protection of Australia's animal industries from the threat of exotic disease depends heavily upon:

- (i) early and accurate diagnosis of disease
- (ii) rapid and effective response to the outbreak.

Livestock control is an essential element of these reactions. Whatever form the pastoral industry on Cape York Peninsula may take, control of livestock needs to be a fundamental consideration.

All sectors of the industry should operate within a legislative harmony which would accommodate a rapid response to a disease threat.

Education of all livestock owners in disease recognition and reporting obligations is another important facet of disease control.

SECTION G: PROPOSED MANAGEMENT GUIDELINES FOR THE PASTORAL INDUSTRY

This section outlines proposed management guidelines for the Peninsula's community. Consider. Guidelines proposed included:

- property management planning
- government roles
- land allocation criteria
- boundary reconfigurations
- multiple use concepts
- carrying capacity standards
- environmental indicators.

14 PRINCIPLES, POLICY AND STRATEGIES

Proposed management guidelines presented in this section of the report are developed on ecological sustainable development (ESD) principles and integrated catchment management (ICM) principles.

With respect to ESD principles, three core objectives were considered with reference to Cape York's pastoral industry:

- to enhance individual and community well being by following a path of economic development that safeguards the welfare of future generations
- to provide for equity within and between generations
- to protect biological diversity and maintain ecological processes and systems. (ESD Draft National Strategy).

Integrated Catchment Management principles of importance are:

- (i) Land and water resources are basic and interactive components of natural systems.
- (ii) Management of land and water resources should be based on geographic units which account for the interactions between these resources.
- (iii) River catchments are continuously changing in response to natural processes.
- (iv) Management of land and water resources must be coordinated.
- (v) Land and water resource management decisions must be based on the best available information.
- (vi) In a democratic society sound land and water management is best achieved through the informed action of the individual users and managers of these resources.
- (vii) A balance between economic development and conservation of land and water resources must be maintained. (DPI, ICM Strategy)

Principles on which conclusions and proposed guidelines are developed are:

- effective integration of economic, environmental and social considerations
- paying due regard to the precautionary principle
- recognition of the global dimension
- development of a strong, growing and diversified economy
- adoption of cost effective and flexible policy instruments
- acknowledgment of the value and necessity of consulting and involving the broad community.

The proposed strategies for sustainable pastoralism, as outlined in Appendix 14.1, Sustainable Pastoralism in Northern Australia, provides a useful framework for the managed development of the pastoral industry in Cape York Peninsula.

15 PROPERTY MANAGEMENT PLANNING

Property Management Planning (PMP) is a voluntary process that allows producers to plan the development and management of their properties. This process can be expanded to incorporate financial decisions, improvement planning and husbandry strategies if desired. This report believes PMP is critical to the ongoing planning process for the Peninsula. Appendix 7.2 outlines the objectives, strategies and processes involved with PMP.

15.1 Government Role

The DPI is the lead government agency for Property Management Planning in Queensland and Property Management Planning is seen as an important extension approach. The importance of Property Management Planning in improving the ability of primary producers to make decisions based on the principles of sustainable agriculture and in providing them with ownership of the decision making process has been recognised by the Ecologically Sustainable Development Agriculture Working Group, the Commonwealth and Queensland Decade of Landcare Plans, the Queensland State Economic Development Policy, the National Drought Policy and the Queensland Drought Policy.

The Queensland Landcare Council (QLC) has taken a leading role in developing mechanisms to encourage and assist landholders to become involved in PMP.

The Queensland government aims to facilitate/promote a PMP service that:

- encourages voluntary participation by rural producers
- uses adult education and action learning principles consistent with the DPI Extension Strategy to assist landholders to use and develop their existing knowledge and skills to plan the management of their properties
- where possible, uses a workshop format to encourage a pooling and sharing of knowledge
- actively encourages a coordinated, whole of government approach to service delivery by utilising existing government extension services that have an adult education/action learning format in the delivery of modules to suit the training and information needs of clients
- provides equal opportunity for non-government providers including consultants, training bodies and industry groups to provide or participate in delivering a PMP service

15.2 Property Management Planning Process

Property Management Planning is a flexible approach to farm/property management. It uses a business planning process which recognises:

- the importance of long term goal setting in management
- that the land is the basic resource of any farming/grazing enterprise
- the importance of the human component in agricultural enterprises
- that financial viability is essential to sustainable land management.

From a landholder's perspective, the following extract from an article written by Jock Douglas (QLC) for a landholder group, describes the practical applications of the planning process.

Property management planning is an ongoing management process which only begins with a map of the physical resource features inside the boundary fence. PMP includes the planned use of resources so that land, stock and financial management is combined and continuing. The process involves:

- (i) having a good think and talk about personal aims and objectives for the property*
- (ii) attend a DPI organised PMP workshop for the mapping of soils, timber, fences, creeks etc on aerial photograph overlays*
- (iii) compare ideas with district families at the workshop*
- (iv) complete the mapping by driving and riding through all the paddocks. This involves having a really good look with an eye to the future, pinpointing the hot spots such as eroded gullies, badly placed roads and fences, fertility rundown and overgrazed paddocks*
- (v) compare completed map overlays with other landholders.*

PMP is an ongoing process. Every three months the plan is used as a basis to monitor the condition of land, stock and finances.

For land, notes are made on the state of pastures and/or crops in each paddock after an inspection. Progress on attention to 'hotspots' is recorded.

With stock, notes are made on condition/weights, health, sales, purchases and expectations.

Financial management involves book-keeping for each quarter to run a reconciliation of cheques drawn, look at the actual income and expenditure for the previous quarter and compare that with the predicted. Then a prediction for the next quarter is made to see if finances and seasons allow progress with improvements and development.

Property management planning can improve property situations in a number of ways:

- the group workshop allows for better information about and understanding of properties*
- the quarterly assessment of land, stock and finances tightens management considerably, particularly land and financial management*
- the condition of land improves from closer attention being given to it*
- workshop groups grow closer together and this makes for better districts*
- lifestyle is improved through better control of the future.'*

Topics that can be addressed at PMP workshops include:

Personal/family

- Goal setting, problem solving and strategic planning*
- Handing the farm down and estate planning*
- Choosing an enterprise type*

Farm Business Management

- Markets and marketing*
- Financial management*
- Testing costs and benefits of options*
- Risk management (including drought)*

Livestock Production

- Market suitability of product
- Nutrition
- Breeding
- Handling/mustering
- Health, disease and pest control
- Water requirements
- Risk management (eg. conservative stocking)
- Pasture monitoring

Natural Resource

- Land suitability/capability
- Soil/water conservation
- Nature conservation
- Rehabilitation/revegetation
- Risk management (eg. conservation tillage)

15.3 Property Enterprise Agreements

Property Enterprise Agreements form part of the Regional Adjustment Program for South-West Queensland to accompany interest rate assistance for property build up.

Agreements will be between the landholder, the government and the lending institution. It is proposed that they include:

- property lease conditions
- property plans (Resource Inventory Map)
- financial plans.

Initiatives such as Property Enterprise Agreements are worthy of consideration in any ongoing review of Cape York Peninsula's pastoral industry.

Subregional planning groups should consider formation along boundaries nominated as 'Landscapes' in the DPI's Suitability Report. These subregions are Heathlands, Batavia, Lockhart River, Edward River, Ebagoola, Mitchell and Hodgkinson. These landscape divisions are differentiated on the basis of physiography, geology, vegetation and current land use.

15.4 Application to the Peninsula

This report supports the process of property management planning as a vehicle for assessing *at the property level*, the Peninsula's resource use, management and access issues. The property management plan is capable of developing the regional NRAP data to a level that will facilitate sound land use decision making. It is at the grassroots level that the 'nuts and bolts' decision making is made. It is at this level where effective pastoral development will occur, effective conservation planning will occur, effective cultural planning will occur and effective community interaction will occur. The Property Management Planning process is seen as integral to the ongoing development of the CYPLUS process as it structures all the biophysical data collected, the economic data and the aspirations of stakeholders.

16 GOVERNMENT ROLE

Controls by government over the allocation of resources such as land and natural resources are generally accepted. However, according to industry sources, indecision, lack of policy direction and poor policy initiatives in the past have handicapped development in the Peninsula. Continued government involvement should result in a reduction of overlap between departments, clear policies with accountability and more local industry and community input. Consideration should be given to changes in the reallocation of proprietorial, regulatory and land planning controls and responsibility.

In a democracy, the stakeholders have a right to have input into the decision making process that allocates resources. Allocation of resources can no longer be determined in isolation. Possible structures and their various roles are suggested in this section for consideration by the Cape York Peninsula community.

Cape York Peninsula Government Agency Group

A joint Cape York Peninsula Government Agency Group (CYPGAG) should be considered to provide a multi-disciplinary approach to land allocation.

This CYPGAG would consist of representatives from Department of Lands, Primary Industries, DHLG&P, Environment and Heritage and local authority representatives. Their main functions would be to advise the Department of Lands, as the lead agency, in the areas of:

- land allocation in accordance with a regional strategy that is regularly updated
- lease conditions
- liaise with CYPRPAG (see below) in the development of regional planning policies (that are consistent with State planning policies). These policies should be integrated into regional and/or local planning schemes.

Cape York Peninsula Regional Planning Advisory Group

A Cape York Peninsula Regional Planning Advisory Group (CYPRPAG) should be considered to provide local input into the regulatory and land planning function of government.

The advisory group (CYPRPAG) would consist of representatives from the Government Agency Group (CYPGAG), local authorities, sectoral groups and local community groups. Their main function would be to:

- develop regional planning policies in consultation with CYPGAG and local authorities that are reflective of regional attitudes and aspirations
- develop a regional land use strategic plan based on regional policies for State government approval
- recommend lease conditions appropriate to designated use allocation of the regional land use strategy for consideration by CYPGAG

- coordinate regional responses to development proposals (eg. live cattle export ex. Weipa, road improvements).

CYPPAG representation is recommended on this Group. Ideally, CYPRPAG, through its Chairman, should have direct access to State Ministers.

Local authorities need to take a lead function in land planning in consultation with the Department of Housing, Local Government and Planning (DHLG&P) and CYPRPAG. Local authorities should take into account the pastoral industry in their strategic planning by considering industry constraints and opportunities.

Regional Open Space System

State and local government agencies should facilitate the development of multiple-use planning by initiating the formation of a Regional Open Space System (ROSS) for the Peninsula.

This ROSS would constitute a network of corridors linked throughout the Peninsula that would achieve the multiple-use functions of:

- controlled grazing land
- wildlife corridors and fauna reserves
- buffers between competing land uses
- protection of wetland sites
- recreation and tourist value
- water supply.

It is suggested that the land that constitutes ROSS be managed jointly by the Department of Lands. Management agreements relating to cattle use, tourist, access and so on, would be determined by the Department in consultation with CYPRPAG.

Suggested criteria for the designation of a ROSS area are:

- interconnectivity for corridor establishment
- representativeness of region
- ability to provide infrastructure support
- ability to provide cultural benefit.

From a Peninsula pastoral industry perspective, the ROSS would provide an extended stock route corridor network suitable for the temporary agistment of cattle awaiting marketing. In order to fulfil this function, some infrastructure by way of watering points, holding paddocks and yards should be progressively developed in these areas. This would assist, when located near the road network, with the movement of cattle to market outlets. Also, it would assist with long term property management in times of property development, drought management and fire management. The management of these areas so that the productive capacity and environmental integrity of the area is maintained is crucial to the long term use of these areas.

17 TENURE

Insecurity of tenure has been identified as a major constraint to the future development of the industry. Tenure security issues should be clarified following a judgement on the WIK people's Native Title claim in terms of a decision and/or conditions of use, management and access.

The following approaches are proposed for consideration:

Lease conditions should provide incentives to lessees to introduce sustainable cattle control strategies.

Lease conditions should be improved to encourage investment in property development.

Lease valuations and rentals should provide financial incentives to lessees to introduce sustainable cattle control strategies.

Lease conditions should be reviewed on a regular basis to progressively convert the lease into more secure lease categories as approved cattle control strategies are implemented. Under the new Act, this will involve a staged upgrade from term to perpetual lease, depending on the extent of improvement. Conditions of the upgraded lease will require the lessee to provide evidence that the strategies are being maintained and are effective.

Lease conditions should provide disincentives to the under utilisation of land leased for pastoral purposes. Lease conditions should be reviewed on a regular basis and related pastoral use applications be assessed on their merits.

A review of existing tenures to take into account NRAP data. This review should consider, in consultation with lessees, industry and community groups, a reconfiguration of existing boundaries, development requirements and valuations. This review should ideally be conducted in association with strategic planning requirements of local authorities. Security of planning is a benefit of improved security of tenure.

Lease conditions should be flexible so as to encourage multiple use of leases. The additional uses should be developed as part of an overall strategy for particular leases and should be developed in accordance with the local authority's strategic plan objectives. Data supplied from NRAP will contribute to the data requirements of the planning process.

18 LAND ALLOCATION CRITERIA

The base resource of the industry is primarily an open woodland with a ground cover of tall summer-growing grasses. In evaluating the opportunities for sustainable pastoral production, four factors require consideration and in the following sequence:

- (a) Which country is inherently suited to cattle grazing as assessed by its carrying capacity and tolerance of grazing and trampling on a year-long basis?
- (b) What management techniques are most likely to meet the needs of production and sustainability?
- (c) What changes will future technology, improved marketing opportunities and improved economic performance have on potential production and sustainability?
- (d) What will changes to land use patterns along coastal Queensland resulting from urbanisation have on existing land use allocations in the Peninsula?

18.1 Land Suitability

The Lands Department's (1994) tabulated summary of the carrying capacity of each of the 26 recognised types of country in the Peninsula reflects the significantly higher natural productivity of a small number of these types eg. 2, 8 and 11. When the vegetation map is overlaid on the property boundary map it can be seen that many leases consist largely of less productive country with small sections of better country interspaced between the poorer types. These assertions will need individual property confirmation by detailed suitability assessment developed around the property planning process and will need to be updated with objective data developed from the CYPLUS process.

Interpretation of the regional NRAP data on land suitability and country types highlights the inappropriateness of the original squared survey blocks in this era of integrated multi-use land planning. Since very few boundary fences have been constructed, one might argue that the shape of properties is somewhat academic - at least as a determinant of effective land use. However, since there is increasing pressure on government to make at least a portion of the present grazing leases available for other purposes (Aboriginal land, National Parks, Tourism), a series of decision strata should be recognised. The NRAP vegetation and soil maps can now offer, for the first time, a more accurate and detailed database for identification of the most productive and stable grazinglands.

One approach to designating the future grazing lands would be a two step approach in which possible resumption of less suitable grazing land could be delineated on the combined vegetation and property map for consideration when present leases expire. The property plan is an important document in this procedure as the property planning process will identify, in consultation with the lessee and lessor, areas that have the potential for development through the introduction of modern management technologies. From the pastoralists' perspective, it is only those areas of low potential carrying capacity or areas that cannot easily be managed, that would be considered for reallocation. Possible outcomes of this process are:

- amalgamation of some areas with adjoining lands, be they land used for pastoral, conservation or cultural use
- designation of these areas for non pastoral use with appropriate management in practice
- subdivision of existing pastoral leases, based on the productivity capacity.

Following the satisfactory completion of the property plan either prior to lease renewal or earlier, the second stage decision on resumption and compensation could be made. In the interim it may be established that a proportion of lessees may welcome the opportunity to terminate their leases early, given reasonable financial conditions. The desire to leave will be partially dependent on government commitment to new marketing facilities in the northern portion of the Peninsula, notably deep-water loading facilities at places like Weipa and the ability for the remainder of the property to be developed using modern technologies. This process could fund property development.

18.2 Production and Sustainability

The productivity maintenance and sustainability questions must be considered in the light of fuller use of country distant from the major watercourses. There are real fears at least by ecologists, that development of fences and watering points across all the lighter carrying country (often the more fragile ecosystems) could easily and quickly lead to widespread devastation including weed invasion and soil erosion, especially on highly erodible soils; thus the importance of research which establishes the stability of various types of country under increasing grazing pressure. Portions of the Palmer River catchment may offer historic pointers in this regard.

The stability of various Cape York ecosystems under grazing does not assume a constant or static ecological situation, but rather the ability of a particular type of country to recover from periods of stress eg. heavy grazing, drought, fire, flood, cyclone, insects or pathogens (Gardner and McIvor 1987). Slow continuous or discontinuous change in the vegetation and its associated fauna is an inherent natural phenomenon. Plant migrations along coastlines and rivers are part of the evolutionary process, so some changes must be recognised as natural and not indicative of disturbance or malpractice. The same applies to the sediment loads of the eastern Peninsula as recorded by Moss *et al.* (1993).

Downey (1994) refers to the survey of Tothill and Gillies (1992) in attempting to answer the question 'What has been the impact of grazing over the past 100 years or so on the Peninsula?'. This survey indicated that the largest grazingland type (native sorghum) is in unusually good condition overall. The 1980 and 1991 condition assessments and the upward or downward trend in each of the 13 pasture types in Northern Australia are shown in Table 18.1 for comparative purposes:

Table 18.1. Condition Trends in Native Pastures

Pasture type	Classed good 1978-80 (%)	Classed 'A' 1991 (%)	Direction
1 Native sorghum, Cape York	90	90	Stable
2 Alluvial floodplains, W. Cape York	45	30	Down
3 Heathland	na	na	-
4 Blady grass	70	10	Down
5 Black speargrass	60	30	Down
6 Golden speargrass	80	95	Up
7 <i>Aristida-Chrysopogon</i> Einasleigh	50	75	Up
8 <i>Aristida-Chrysopogon</i> Southern Gulf	70	75	Up
9 <i>Aristida-Triodia</i>	75	na	-
10 Bluegrass-browntop	80	20	Down
11 Mitchell grass	80	70	Down
12 Soft spinifex	80	75	Down
13 Littoral	70	90	Up

(Source: Tothill and Gillies, 1994)

These data are difficult to interpret in the context of the Peninsula alone, however, they do indicate that the major grazingland types which occur in this study area (Types 1, 7 and 8) have not deteriorated under grazing although Type 2 may require closer examination. It will be noted that these Alluvial Floodplains of the western Cape York Peninsula had apparently deteriorated to the extent that 55% of their area was in less than good condition a decade before the 1991 re-survey when 70% of these plains were estimated as having been degraded. As referred to elsewhere, the NRAP salinity map warrants interpretation in terms of future land management of these plains.

The specific effects of cattle on biodiversity cannot be gauged on the broad scale of the above condition surveys and must be examined at a local level, especially near permanent waters. Similar processes would evaluate the opportunities for areas of conservation value. Objective baseline data should be a product of the CYPLUS planning process and this data should be used as a basis for monitoring environmental performance of production and ecological systems.

18.3 Future Technologies and Marketing Opportunities

These issues are for the future, however, they are worthy of consideration for the CYPLUS process. Technology will improve, marketing opportunities will improve and the economics will subsequently change as a result of technology. These potential improvements will further develop the pastoral industry, however, the extent of the improvement is difficult to predict. Importantly, the strategy proposed should be flexible enough to incorporate further change as it occurs and not be so rigid to develop strategies based just on present day factors.

The preferred pattern of development for pastoralism in the Peninsula is that determined by pastoral suitability assessment. These assessments suggest that the potential for growth of pastoralism in the Peninsula is substantial. The realisation of this potential depends on the

resolution of issues earlier identified and the introduction of sustainable management options. This report is of the view that the expansion of the industry is capable of developing in a number of complementary forms.

Firstly, individual pastoralists without substantial capital backing are capable of developing their properties progressively, implementing the less intensive improved cattle husbandry technology as a vehicle for improving economic performance. Funding of these changes should be considered from a number of sources, depending on the individual's position, namely:

- borrowings
- sale of breeders
- subdivision (dependent on government policy).

This approach to development is likely to be acceptable to the Aboriginal and Torres Strait Islander communities involved in pastoralism as it involves minimal disturbance of the land.

Secondly, in areas suited for low and medium input pasture development, pastoralists are capable of developing their properties so that they integrate small areas of improved pastures and other pasture development strategies into property management. This form of development involves the establishment of a mosaic of pasture paddocks aimed at further improving cattle control. Benefits accruing from this approach are the ability to provide a more reliable supply of cattle, provide a better product and to improve economic efficiency.

Another form of development is that of intensive pasture development. Any large⁵ scale expansion of this practice would be subject to appraisals of land suitability, economic benefit, cost, environmental performance and risk analysis.

The complementary forms of development would provide a range of cattle descriptions capable of satisfying most market requirements. A market-driven resurgence of the pastoral industry based on technological advances improving economic efficiencies is possible in the Peninsula provided environmental standards are set and the land allocation process is practical.

In order to be satisfied that the technology predictions are correct, it is appropriate that checks be put in place to monitor environmental performance. Assessment and monitoring of environmental performance is critical to 'knowing' whether the development strategies are sustainable. Performance standards such as water quality measurement, sediment load, pasture cover at critical times of the year (measured by satellite imagery) and biodiversity assessments should be considered as possible measures of sustainability. The establishment of appropriate standards, consistent with ESD and ICM principles, would be a negotiated arrangement between the owner and the user of the land.

18.4 Changing Land Use Patterns

Similarly, changing land use patterns along coastal Queensland may place pressure on some areas in the Peninsula for intensification of land use beyond pastoral use. These changes would be subject to scrutiny and investigation, however, they could eventuate. Flexibility of planning process is required to accommodate potential future changes.

19 ECONOMIC EFFICIENCY OF ALTERNATIVE LAND USES AND POSSIBLE BOUNDARY CHANGES

It is usual for modern western societies to compare the merits of alternative land uses or development projects on the basis of their economic efficiency, i.e. the wealth that can be generated per unit of monetary investment. On this basis the Peninsula cattle industry competes favourably with tourism only on certain land types. Both these industries can be made more efficient by changes in infrastructure; for example, Weipa beef export facility and extension of all weather tourist roads.

In addition to the merits of economic efficiency, another method of comparing alternative land uses is the multi-cultural concept of 'social efficiency'. Social efficiency necessarily includes the full social value of Aboriginal land-based beliefs and this warrants consideration on the list of criteria for Peninsula land allocation. This concept is in many ways similar to the values inherent in national park allocation. Social efficiency includes elements, not only of equity and justice, but also of links to 'mother earth' - an idea written about by western societies but not fully appreciated in the full context of its cultural significance (Williams and Baines 1993). The non-Aboriginal community might not appreciate the value of 'sitting on' the land without using the land resources. Equally the Aborigines may not appreciate that there is no future for the children of a non-productive society in the modern world. Such a statement may appear insensitive, but all the evidence points to an appropriate Aboriginal land use which generates income without losing the traditional links to the land of this most ancient of cultures (Heritage Unit 1989).

The identification of present leasehold land *which may be equitably converted from pastoral holdings* to alternative land uses, requires a multipurpose approach. Issues such as, but not restricted to:

- location of sites
- scenic value
- coastline access
- cultural value
- conservation value
- tourism value
- lifestyle and remoteness value
- economic performance

will be determining factors. Depending on the circumstance and the aspirations of particular tenants, any one of these factors could be overriding in the decision making process.

From an economic efficiency perspective, it makes economic sense to use carrying capacity (current and potential) and improvements (facilities) as selection criteria. As an example, the following leases are recorded as having a carrying capacity of 1 on 75 ha or less and have no recorded value of improvements carried out by the lessees (Lands Department 1994) at the time of assessment:

Lease No	Station	Carrying Capacity	Improvements
2	Punsand Bay	1:85	0
48	Kalpowar (portion)	1:125	0
58	Harkness	1:75	0
59	Crosbie		
91	Elderslie (portion)	1:100	0
106	Karma Waters	1:100	0
111	(unnamed)	1:85	0
112	Diggers Creek	1:85	0

These leases are examples of large tracks of low carrying country which the lessees had not attempted to develop up to the date of the last assessment. The reasons for this lack of investment are several:

- the lessee had no intention of entering the pastoral industry but saw potential in the land for other purposes
- the economics of developing the property for pastoral purposes may not be favourable
- lessees may be unaware of modern cattle management technologies or unwilling to implement these technologies
- lessees may be happy with their present lifestyles.

A second group of stations contains those which do have infrastructure investment but which remain very low carrying country with no substantial opportunity to increase their stocking rates through pasture development. Examples of these are:

Lease No	Station	Carrying Capacity	Improvement
3	Shelburne	1:70	\$ 43,300
11	Bromley	1:65	\$ 30,900
13	Wattle Hills	1:125	\$ 47,300
17	Kendall River	1:60	\$134,000
20	Blue Mountains	1:65	\$ 11,500
26	Southwell	1:60	\$ 13,400
27	Denman	1:65	\$151,200
33	Astrea	1:75	\$ 49,800
61	Dixie (portion)	1:65	\$ 22,900

It can be seen that investment in these stations has been minimal in most cases. The reason for this may be a serious lack of development capital, given the poor gross margins of beef production in this region. Closer examination of the distribution of the more productive land on these stations is expected to indicate that the cattle are largely supported on a small proportion of the total lease, notably on the river frontages and flood plains. The 'outside' country in these cases may be deemed as more valuable for purposes other than cattle grazing.

Boundary reconfiguration cannot rely on existing Department of Lands' information on carrying capacity. Detailed assessments of the suitability of land for pastoral production is required before boundary reconfigurations are implemented. These suitability assessments and

access to biophysical data have only recently become available. An examination of these more detailed NRAP maps will identify land of low value for pastoral uses.

Alternative management strategies for land of low value for pastoral uses need consideration in consultation with the present lessees of these lands. Past experience has shown that due to the large areas involved and the severe budgetary constraints on government, management of these lands for a conservation purpose by the Department of Environment and Heritage would be minimal. Past experience also has shown that management of large areas by ATSI communities would be minimal. Therefore, from a land management (weed control, noxious disease control) and sustainability consideration, an alternative would be to negotiate terms and conditions for the grazier to manage those areas incorporating high grade biological reserves within the boundary of properties and for the ATSI communities to receive training so that they can manage areas of conservation value within their boundaries. Preferably, the owner/manager would be trained and paid to do it. Provided standards are satisfied and monitored, this would provide a cheaper and satisfactory outcome for all the main stakeholders. Secondly, implementation of improved cattle husbandry techniques may allow for increased areas of this low value land to be better incorporated into property management.

The following criteria are suggested as a mechanism for 'first cut' property reconfiguration:

- (i) properties of low potential carrying capacity (say 1:75) and low improvement values be considered for non pastoral land uses. These alternative land uses must be managed (eg. appropriate fire strategies, weed control) to limit degradation, weed invasion and habitat value decline
- (ii) properties comprising a mix of land types comprising varying carrying capacities and/or property improvements should be managed by the present stakeholders, the pastoralists. These pastoralists would require some training, with the view that the low potential carrying capacity areas would be managed for a much reduced cattle use and an enhanced conservation use. The aim is to protect smaller areas of high conservation through an off reserve network on the property
- (iii) some boundary changes of existing pastoral leases and national parks areas may need to be considered. The aim is to protect areas of high conservation value, through a reserve system, and reallocate existing national park land of low conservation value, but high pastoral use value to pastoral lease
- (iv) similar principles would apply to all pastoral lands, regardless of ownership. In areas of non Aboriginal ownership, negotiations between the present stakeholders (pastoralist, national park) and Aboriginal groups for access and use would be a negotiated arrangement.

Reconfiguration arrangements such as these proposals could have several benefits for both the graziers and the alternative users of what is presently pastoral lease country:

- (a) Graziers' rentals relative to their stock numbers could be significantly reduced.
- (b) Country which is low-grade grazing but high-grade ecological reserve could be protected and managed appropriately (Stanton 1992).

- (c) Aboriginals could have access to important cultural sites or bush tucker locations (river frontages) (Stewart, undated) at no serious economic disadvantage to cattle producers.
- (d) Cattle producers could apply much better management to smaller more productive units, reducing their costs and improving their efficiency.

Referring back to Map 1, which shows natural carrying capacities of each section of the Peninsula, the total areas of high, medium and low capacity have been calculated as shown below:

MAP 1: Existing Carrying Capacity

Class	Capacity	Area ('000 ha)
1	1 Beast/10-30 Ha	958.19
2	1 Beast/30-100 Ha	8881.68
3	1 Beast/100-250 Ha	3467.63
4	Excluded	11.22
Total		13318.71

If the potential for intensification is developed as shown in Map 2 (Potential Carrying Capacity), the following total areas can be computed:

MAP 2: Potential Carrying Capacity

Class	Capacity	Area ('000 Ha)
1	1 Beast/3-5 Ha	958.19
2	1 Beast/5 Ha	6758.80
3	1 Beast/5-10 Ha	798.00
4	1 Beast/7-30 Ha	843.94
5	1 Beast/20-80 Ha	3299.08
6	1 Beast/100-250 Ha	649.48
7	Excluded	11.22
Total		13318.71

This analysis suggests that even with high-input systems applied to the most favourable pockets of country, huge areas of very low carrying capacity country will need to be utilised appropriately.

20 PROPERTY BOUNDARY RECONFIGURATION CRITERIA

Ground rules to consider for reconfiguring boundaries of pastoral holdings are:

- take into account overall regional land use strategy and local authority strategic plans
- most new properties should be capable of supporting herd sizes that are sustainable utilising available management practices and technologies, should the landholder desire
- carrying capacities used to determine potential herd size should adopt the more conservative potential carrying capacity estimates developed by government departments, unless landholders can demonstrate that alternative rates will not result in increased degradation levels
- boundary lines should relate to prominent natural features that influence stock management eg. ridges and rivers
- amalgamation of properties should not proceed unless it can be demonstrated that the amalgamated property is capable of supporting a stocking rate that is higher than the original property and that this stocking rate is higher than 75 hectares per head
- subdivision of properties should be encouraged where it can be demonstrated that the subdivided portions of the property will be:
 - better managed using available technologies
 - transferred to a use compatible with its biophysical and cultural attributes
 - providing regional infrastructure required for industry development (eg. holding paddocks for live cattle network)
- country types that have low natural and potential carrying capacities should be managed. Very light carrying country (eg. 75 hectares per head or less) is difficult to manage economically. The management of these areas, be it for pastoral use or conservation use is critical if disease outbreaks such as rabies and screw worm are to be controlled. (Note: the distribution of these country types is equally important. If small areas of these country types exist, they could be integrated into property operations. Large areas of poor country present the most difficulty for pastoral management)
- reconfiguration strategies should encourage better cattle control strategies instead of increasing the size of substandard blocks
- multiple land use options should be encouraged.

Adherence to these ground rules will result in some properties or sections thereof:

- amalgamating with adjoining properties to form viable units
- amalgamating with adjoining public land to serve a particular function
- subdividing to form a viable property with surplus land used for other purposes

- smaller blocks being developed to provide breeding blocks for fattening properties south and south-west of the Peninsula, in accordance with strategic planning objectives of the government and local authority
- smaller blocks to service Aboriginal outstation family-run pastoral enterprises
- smaller blocks to service 'hobby farm' demand near major centres
- flexible reconfigurations to accommodate multiple use options eg. extension to creek areas near major access routes.

Consistent with improved stock control is improved access. Accessibility constraints can be reduced by planning improved stock control so that accessibility is available. This may involve re-aligning boundaries so that properties have direct access to the proposed improved road network and the proposed expanded stock route system (eg. ROSS).

These accessibility considerations are also important to recreation and tourism users. The ability of properties to perform multiple-use functions will be influenced by accessibility to transport corridors and open space systems. Existing boundaries may require change to perform these functions.

Part of the multiple use function of properties is the protection of natural or cultural sites. Boundary reconfigurations may be required to maintain the integrity of these sites in one entity. Management agreements or property transfer will need to be developed on an as needs basis to accommodate these requirements.

These arrangements can be facilitated by PMP and should be integrated into the proposed Regional Open Space System where appropriate.

21 MULTIPLE USE, MANAGEMENT AND ACCESS

The principles associated with multiple use, management and access to land are worthy of consideration in the future planning for the pastoral industry in the Peninsula. Examples of joint responsibility include:

- (a) Lessees of pastoral holdings acting as paid custodians of sites of special conservation value.
- (b) Aborigines having access to lease sites of special cultural significance.
- (c) Tourists having access to roads and camping sites on leases.
- (d) Pastoral lessees having access to grazing on Aboriginal land and National Parks.
- (e) Aborigines having access to National Parks.
- (f) Excision of land to encourage investment in industry infrastructure.

Obviously there will be a need for negotiated conditions of access to each of the three types of tenure (Pastoral, National Parks, Aboriginal land). It would seem reasonable to request each of the three groups of landholders to help develop 'Access Guidelines' (AG) for those wishing to access other land resources. In many cases there is little prospect of single use tenure using all the resources on a property sized block of land to their full potential (economic, cultural, aesthetic, scientific and recreational).

The proposition put forward by Curry and Hacker (1990) was the first formal analysis of how graziers could meet ESD criteria in the pastoral zone of Australia. It is well known that many leaseholders had long accepted their role of environmental custodians of special habitats on their leases (notably waterholes and forest patches) - thus the repeated claim from producers that 'we're all conservationists at heart' (a sentiment challenged by conservation groups). There is no reason why present Peninsula lessees should not be remunerated for formally entering into a custodial agreement relating to specific areas of their lease. Such agreements could be initiated by the lessees in response to sites in need of particular management (which may include prescribed fire and/or exclusion of stock) as identified by the Department of Environment and Heritage, National Parks and Aboriginal authorities. In this way, the holders of pastoral leases could not only be seen to be contributing to complementary land use, but could justifiably receive economic benefit from such cooperation. The Access Guideline document could also stipulate how the cost of fencing, roadmaking, litter collection and other management costs could be carried by those using the sites concerned.

In the case of Aboriginal access to their cultural sites on grazing leases, it is assumed that these sites would be of significance primarily to the historical tribal people of the land concerned. As shown in Appendix 21.1, Aboriginal values pertaining to land sometimes concern whole landscapes and where the land and its fauna and flora are deemed to be 'hurt' by cattle grazing operations and their required infrastructure, special arrangements for meeting the needs of Aborigines and pastoral lessees may be complex and difficult to implement. Access by Aborigines to present leases may include food gathering in various seasons as shown in Appendix 21.1. Provided those collecting 'bush tucker' do not disturb grazing animals or interfere with station infrastructure, Access Guidelines should be workable.

Tourist access to grazing leases already occurs to a large extent but it is difficult to cater for self-sufficient individual travellers who often prefer to extend their adventure by 'going bush', making their own tracks and selecting their own camp sites. No doubt suitable access

agreements can be reached with tour bus and aeroplane operators to incorporate the lessees and their families as meaningful economic beneficiaries of the tourist industry.

The historic differences between graziers and Aborigines could be replaced with a mutually beneficial 'symbiosis' if Access Guidelines could provide either for graziers' cattle to utilise suitable Aboriginal land at an agreed rental, or for graziers to be remunerated for managing Aboriginal cattle on their own land. Such complementary effort could generate much-needed income for Aborigines, allow fuller use of the resources desired by graziers, and promote harmonious co-management to replace the inefficiencies associated with exclusive use.

In the case of grazing in National Parks, if co-use of conservation reserves is again to be allowed in the future, the development of guidelines for grazing in National Parks will need to take the local conditions of each park into consideration. On the negative side, grazing has been shown to have several disadvantages which in the view of some specialists make it incompatible with the long-term objectives of National Parks. Negative effects include:

- disturbance of vegetation leading to weed invasion
- overuse of frontage country and damage to the natural condition of waterholes
- development of vehicle tracks, leading to erosion and the spread of weed seeds from vehicles and cattle
- complication and sometimes elimination of ecologically-planned burning programs aimed at enhancing biodiversity.

Positive effects emanating from managed grazing of National Parks include:

- managed control of undergrowth
- managed control of feral animals
- graded buffering zone between areas of high conservation value and high pastoral value
- fire management control.

Co-use will require an assessment of both the positive and negative impacts and these assessments will form part of the management planning process.

Each National Park is planned to run on the basis of a management plan. Such plans include a fire strategy, weed control, feral animal control, an access road plan including roadside erosion control, and the control of tourist activities in natural and man-made settings. Generally the park authorities do not recommend the construction of perimeter firebreaks because they tend to serve as invasion routes for weeds, lead to soil erosion on the bared surface and are used as unauthorised access tracks by visitors and neighbours. In addition, unless breaks are very wide, they do not prevent the spread of wildfires in windy weather. Despite the problems associated with firebreaks, park management makes provision for the use of fire in virtually any month of the year when the grass will burn. Co-use strategies would assist in this area.

Also, the issue of future grazing in parks must be considered in conjunction with plans to conserve current and potential rare and threatened species. The more visionary staff in DEH recognise that concentrating only on the protection of species known to be presently threatened may be seriously short-sighted. By identifying those areas most likely to come under pressure in the future, early precautions can be taken to preserve sufficient (number and

size) good examples before their biodiversity is degraded, eg. grassy plains on heavy clay soils. Co-use procedures provide a mechanism for achieving this objective.

One of the problems of grazing in parks has been the spread and dominance of certain aggressive exotic grasses and legumes. The species used in ponded pastures are particularly prone to take over the finely-balanced natural wetland habitats, which are some of the most important sites in National Parks.

Despite the above negative conservation influences of grazing, the National Parks staff can become meaningfully involved in the pastoral industry, by providing guidance and monitoring of conservation sites on grazing leases - notably on Pastoral Holdings where the appointment of graziers as rangers or custodial stewards of environmentally-significant sites could be a major element in the Cape York conservation strategy. The use of graziers as rangers utilises the acquired knowledge of the grazier and helps alleviate the problem of under resourcing in DEH for the management of National Parks. In the same way, several former Peninsula graziers are already making a major contribution to conservation in the Peninsula, by performing as the best rangers in the employ of DEH, using their practical experience and knowledge of the land for the benefit of park management. This arrangement could have considerable security benefits as well.

Aboriginal access to National Parks has been considered for some years. The non-destructive use of former tribal lands in parks is an obvious case for complementary land use. However, the conservation constraints relating to rare and threatened species require evaluation within the laws governing protected fauna and flora. Harvesting of such species should be subject to the same assessment and monitoring as that which is supposed to apply to Aboriginal harvesting of 'traditional' food species such as turtles and dugongs in marine ecosystems.

The new Land Act 1994 incorporates the following five general principles of land administration.

- to use land in the best calculated way to serve the whole of the people
- to prevent monopolies in land
- to make land available in areas suitable for the requirements of applicants
- to ensure the steady flow of land back to the Crown (Government) to meet the progressive needs of land settlement, and
- to manage land for sustainable resource use and development to ensure existing needs are met and the resources are conserved for the benefit of future generations. (Hardy 1995)

It would seem that co-management and multiple-use access arrangements could greatly contribute toward all these objectives given the political will to facilitate such arrangements, and peer pressure in all user groups to approach Access Guidelines in a cooperative and positive spirit.

22 CRITERIA USED FOR SETTING OF CARRYING CAPACITIES

In terms of the criteria used for setting carrying capacities, the relationships between soil type, rainfall and dry matter production per unit area remain the most reliable scientific basis. For instance, the Monsoon Tall Grass region in the 750-1,100 mm rainfall zone produces 112-270 g/m² per annum. This generalised range of productivity can be converted to stocking rates by using a daily dry matter intake requirement of the order of 9 kg. In this way realistic average stocking rates can be calculated, making provision for using not more than 50% of total herbage to meet ecological and erosion control requirements.

23 ENVIRONMENTAL INDICATORS FOR MONITORING THE CONDITION OF PASTORAL LANDS

Environmental indicators used to monitor the condition of pastoral land on the Peninsula are percentage ground cover and botanical composition of that pasture. In Cape York, the highly reliable rainfall produces regular growth of pasture. However, this growth is not maintained following the wet season due, at least in part, to the poor quality of the soils. Nutrient deficiencies of these soils will also result in the density of dry season pastures being generally low. Composition of the pasture varies with grazing pressure and grazing pressure is a function of seasonal conditions. Recognition of the good indicator plants (key species) will be an important element of condition assessment.

With respect to changing production systems, monitoring of these environmental indices will provide localised assessment of the condition of the pasture land. From a wider regional perspective, assessments of sediment loads in drainage systems will provide a generalised assessment of the condition of the catchment. The establishment of baseline data on sediment loads is essential before monitoring of alternative production systems can be undertaken.

The establishment of a monitoring program to assess ground cover, botanical composition and sediment load is considered to be an important phase of any large scale development process.

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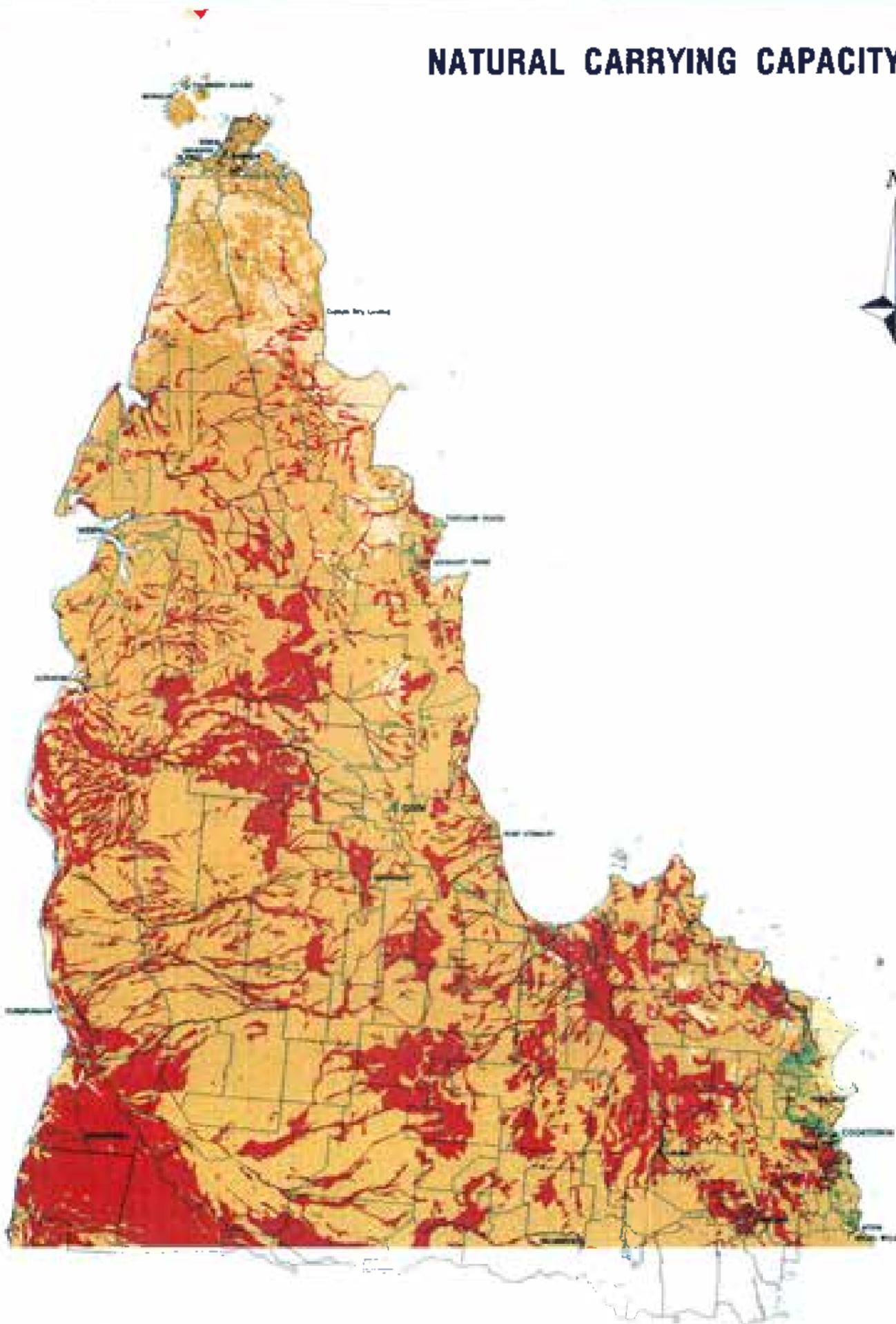
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ATTACHMENT 1 - MAPS 1 - 12

NATURAL CARRYING CAPACITY



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This information is subject to change and its currency should be checked through the appropriate department.

LEGEND

- 1 Beast/10-30 Ha
- 1 Beast/30-100 Ha
- 1 Beast/100-250 Ha
- Excluded

- Pastoral Holdings
- Non-Pastoral Holdings

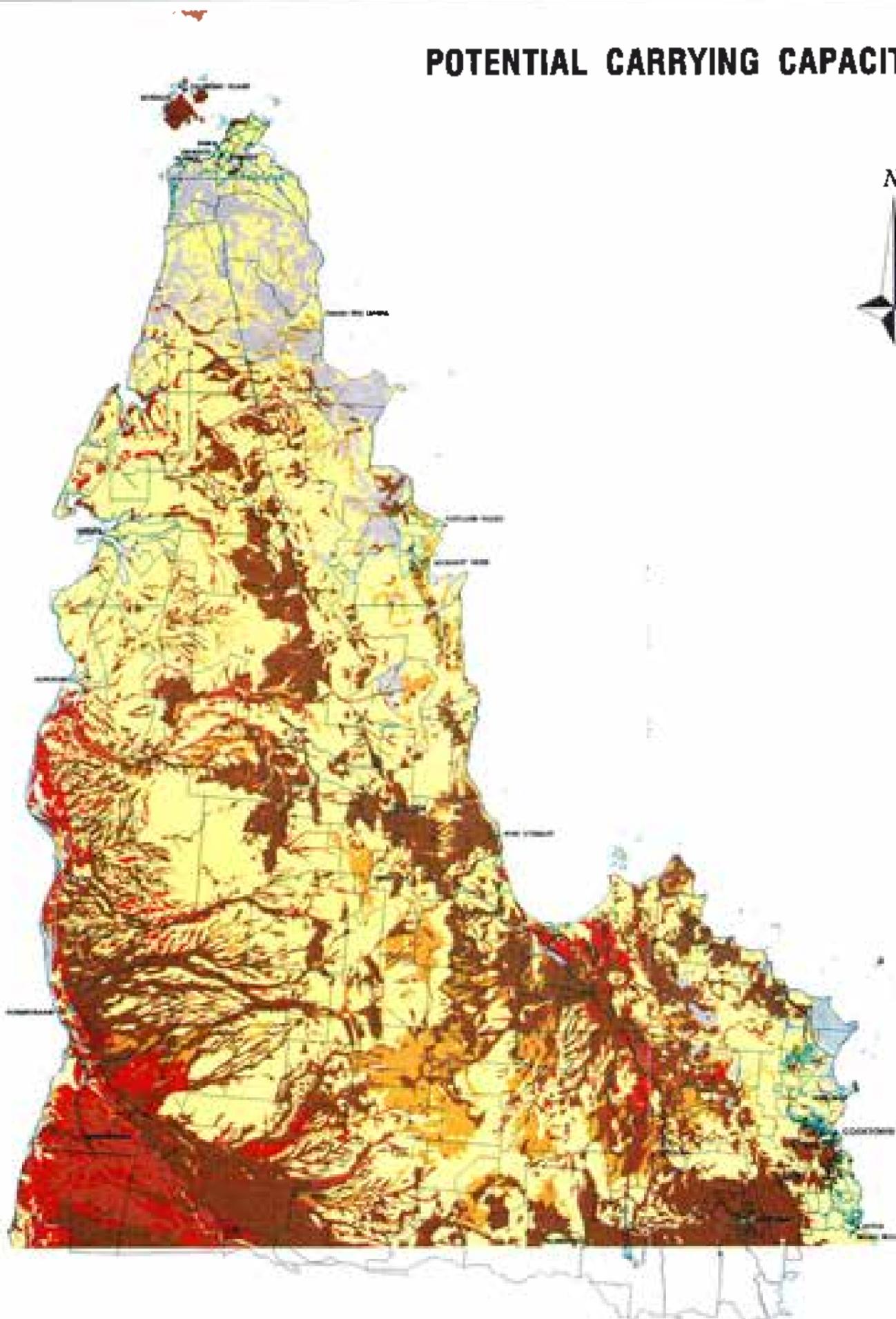


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POTENTIAL CARRYING CAPACITY



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LEGEND

-  1 Beast/3-5 Ha
-  1 Beast/5 Ha
-  1 Beast/5-10 Ha
-  1 Beast/7-30 Ha
-  1 Beast/20-80 Ha
-  1 Beast/100-250 Ha
-  Unavailable

 Pastoral Holdings

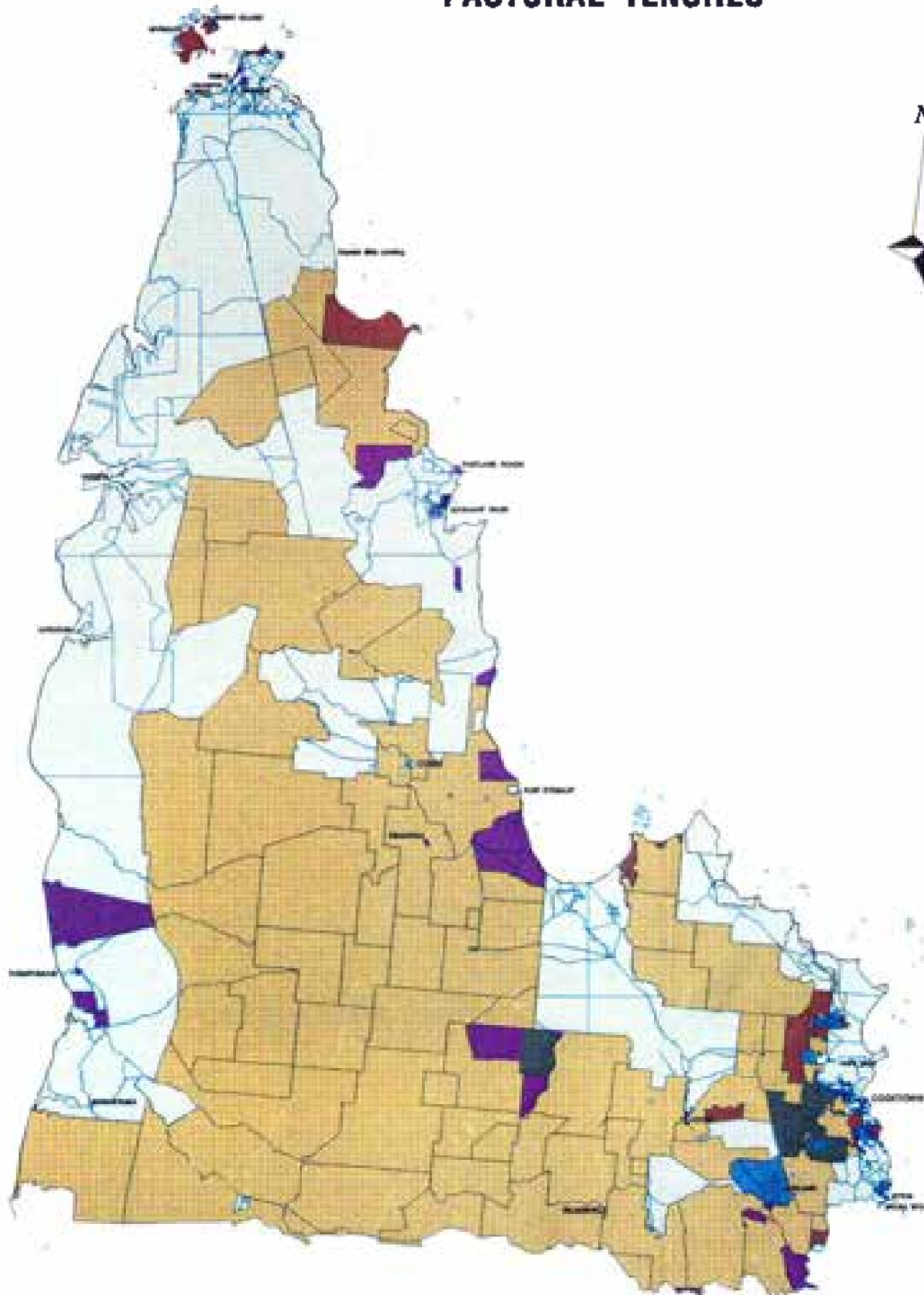


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PASTORAL TENURES



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LEGEND

-  Pastoral Holdings
-  Grazing Homestead Perpetual Lease
-  Licence To Occupy
-  Freehold
-  Special Lease
-  Freeholding Lease
-  Perpetual Lease
-  Non-Pastoral Tenure

-  Pastoral Holdings
-  Non-Pastoral Holdings

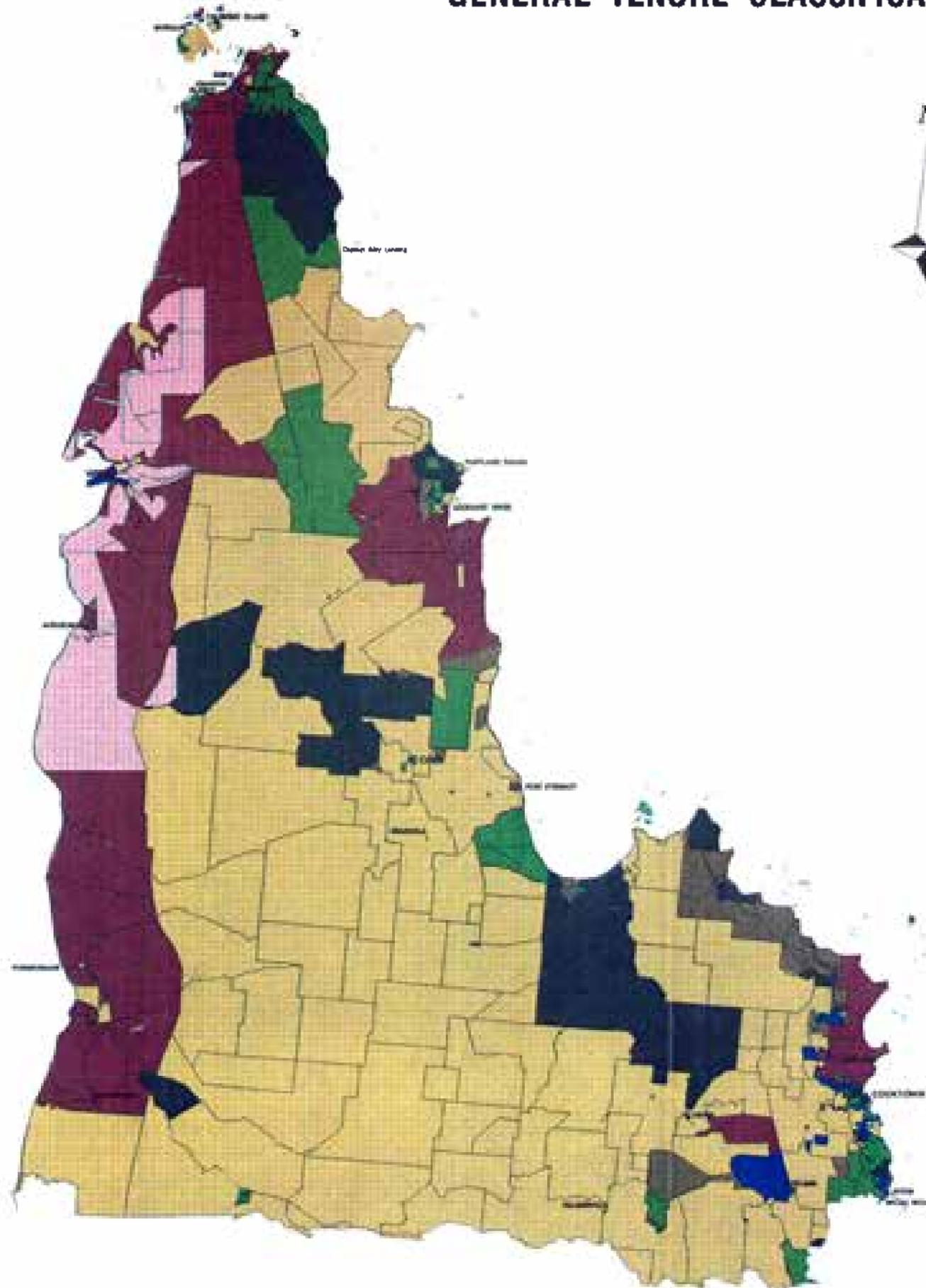


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GENERAL TENURE CLASSIFICATIONS



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LEGEND

- Pastoral Associated Tenure
- Freehold
- Crown Land - Reserves
- Crown Land - Public Purposes
- National Parks
- Mining Tenure
- Harbours and Marine
- Aboriginal Lands

- Pastoral Holdings
- Non-Pastoral Holdings

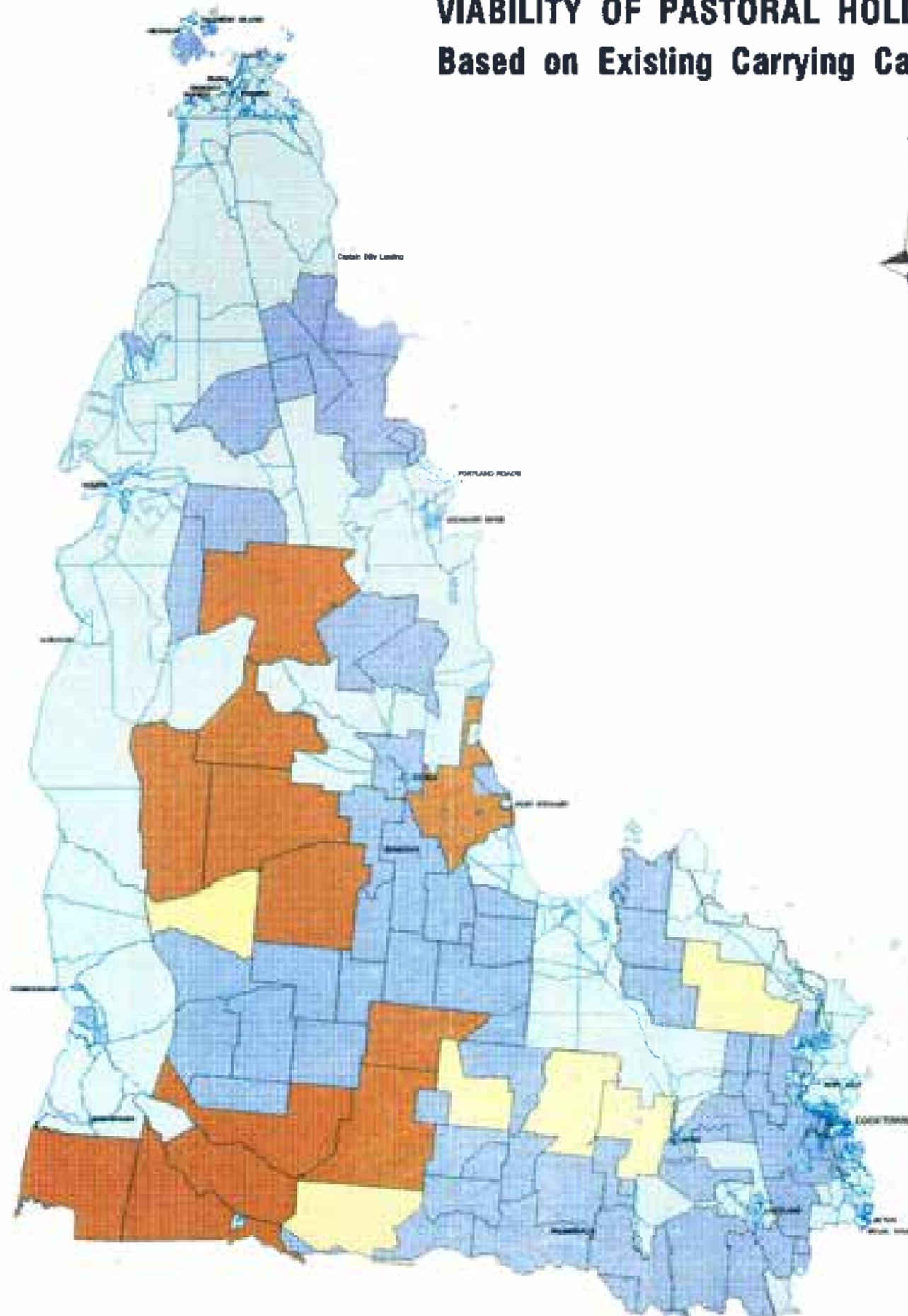


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VIABILITY OF PASTORAL HOLDINGS Based on Existing Carrying Capacity



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LEGEND

-  Viable Holding
-  Marginally Viable
-  Non Viable
-  Unavailable

-  Pastoral Holdings
-  Non-Pastoral Holdings

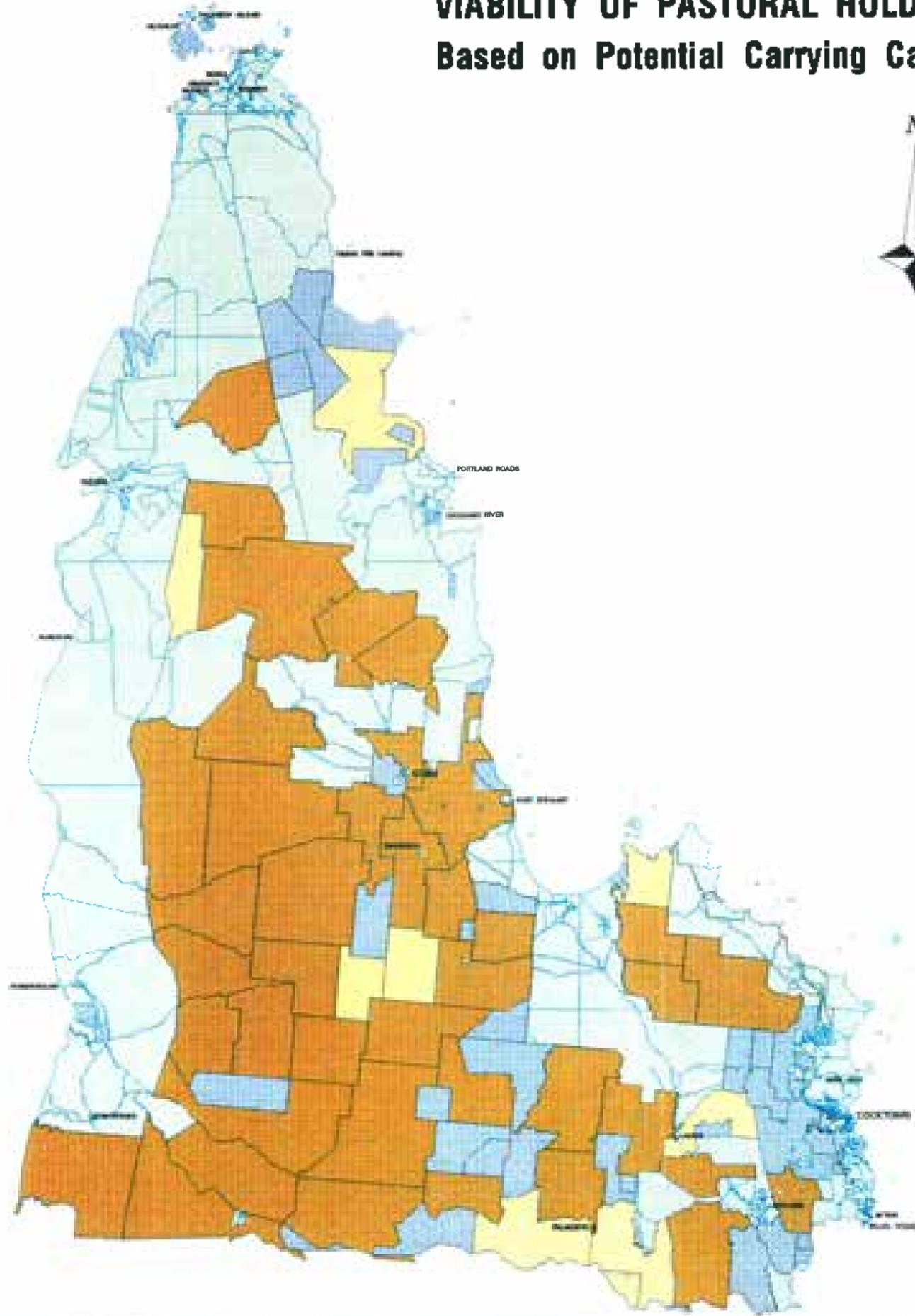
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VIABILITY OF PASTORAL HOLDINGS Based on Potential Carrying Capacity



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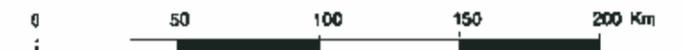
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LEGEND

- Viable Holding
- Marginally Viable
- Non Viable
- Unavailable

- Pastoral Holdings
- Non-Pastoral Holdings



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LAND USE/DISTURBANCE



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LEGEND

-  No Disturbance
-  Grazed
-  Clearing
-  Cultivation
-  Highly Disturbed

-  Pastoral Holdings
-  Non-Pastoral Holdings

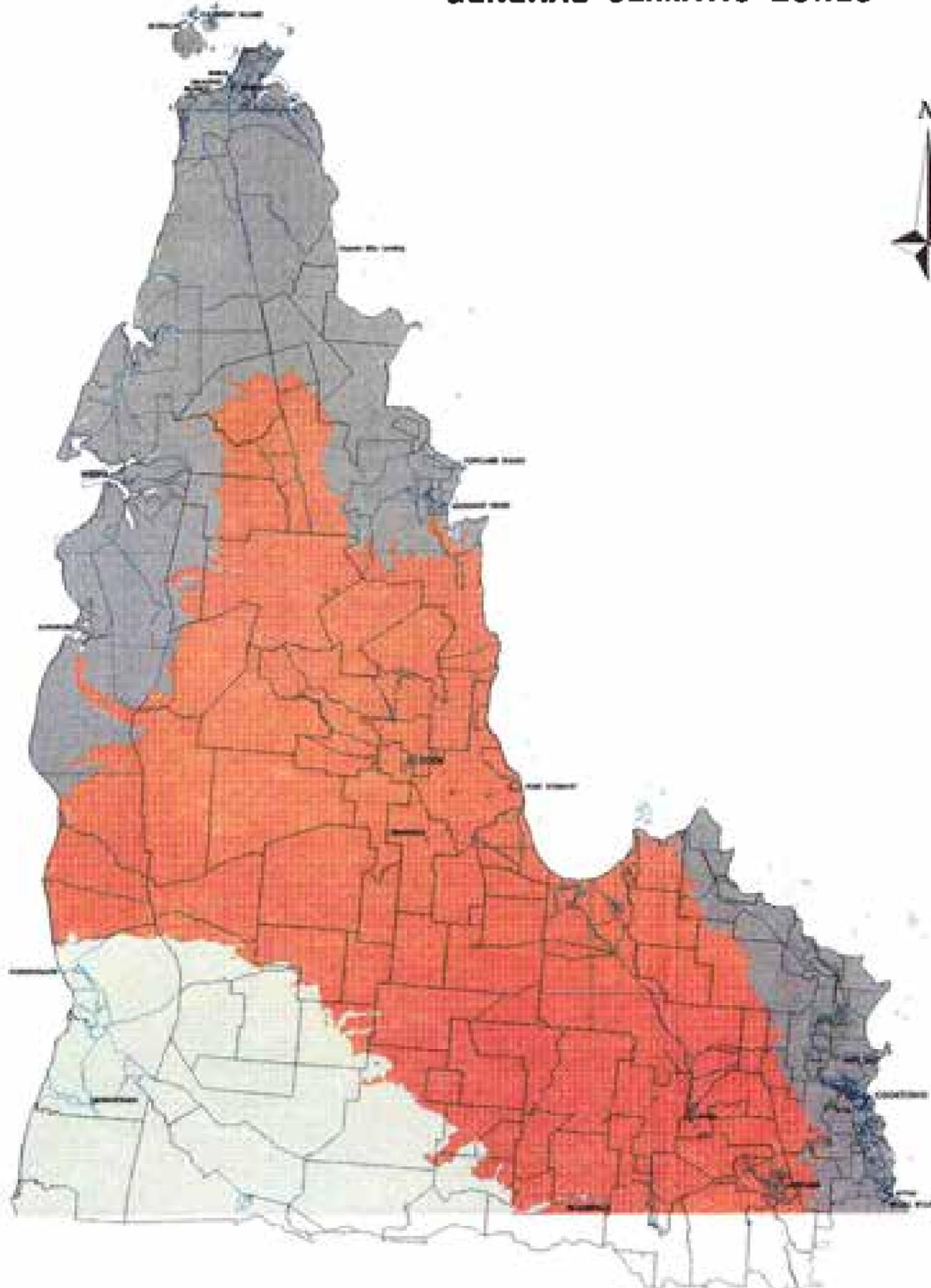


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GENERAL CLIMATIC ZONES



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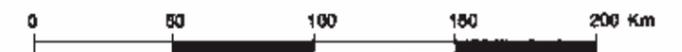
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LEGEND

-  > 1500mm and < 35 Degrees Monthly Max Temp
-  < 1500mm and < 35 Degrees Monthly Max Temp
-  < 1500mm and > 35 Degrees Monthly Max Temp

-  Pastoral Holdings
-  Non-Pastoral Holdings

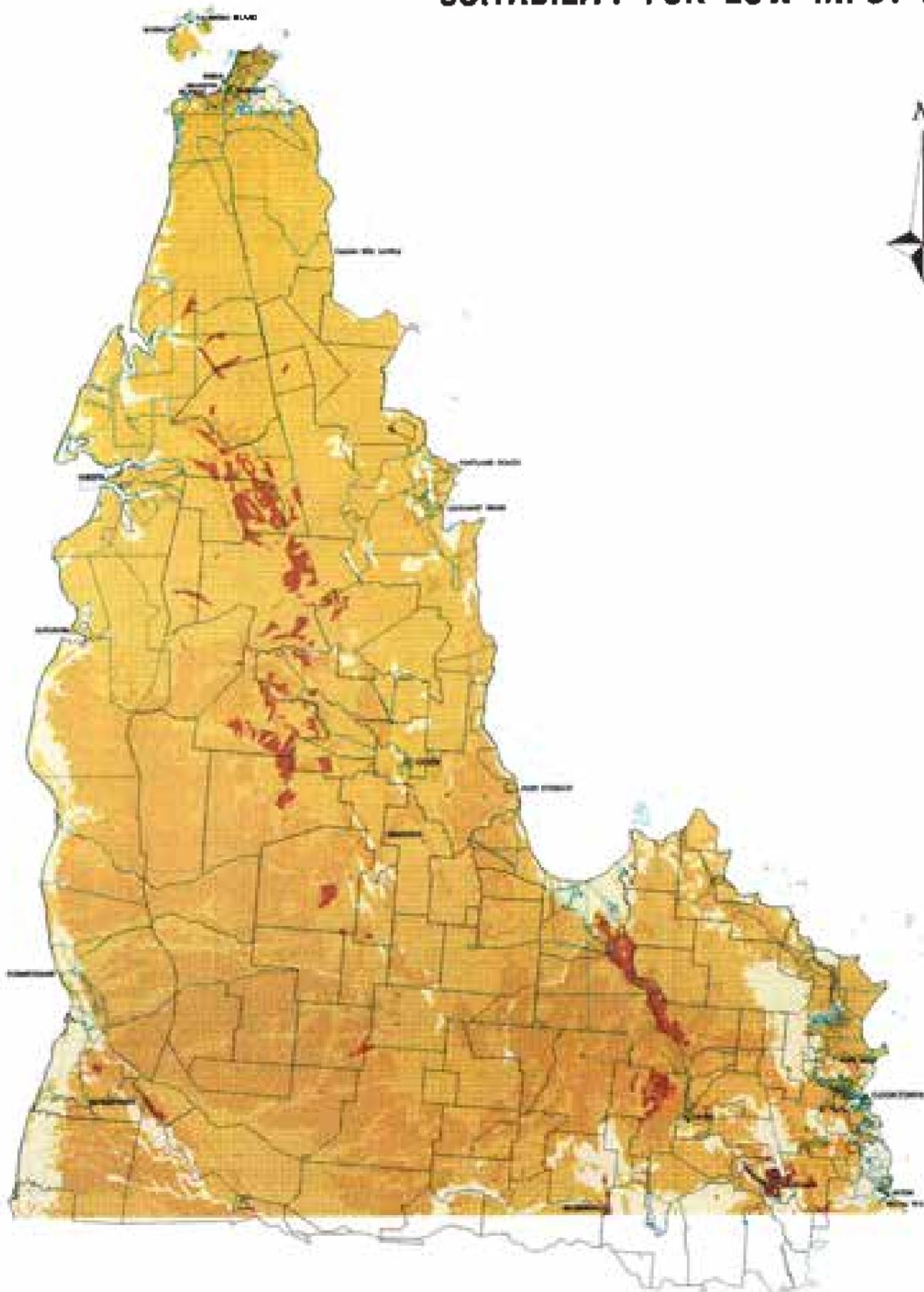


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SUITABILITY FOR LOW INPUT PASTURES



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PASTORAL INDUSTRY STUDY

The information shown on the map have been supplied by Departments of Primary Industries and Lands.

Initial enquiries regarding the information should be directed to the appropriate Department.

This information is subject to change and its currency should be checked through the appropriate department.

LEGEND

-  Suitable
-  Suitable with Minor Limitations
-  Suitable with Moderate Limitations
-  Marginal
-  Unsuitable with Excessive Limitations

-  Pastoral Holdings
-  Non-Pastoral Holdings

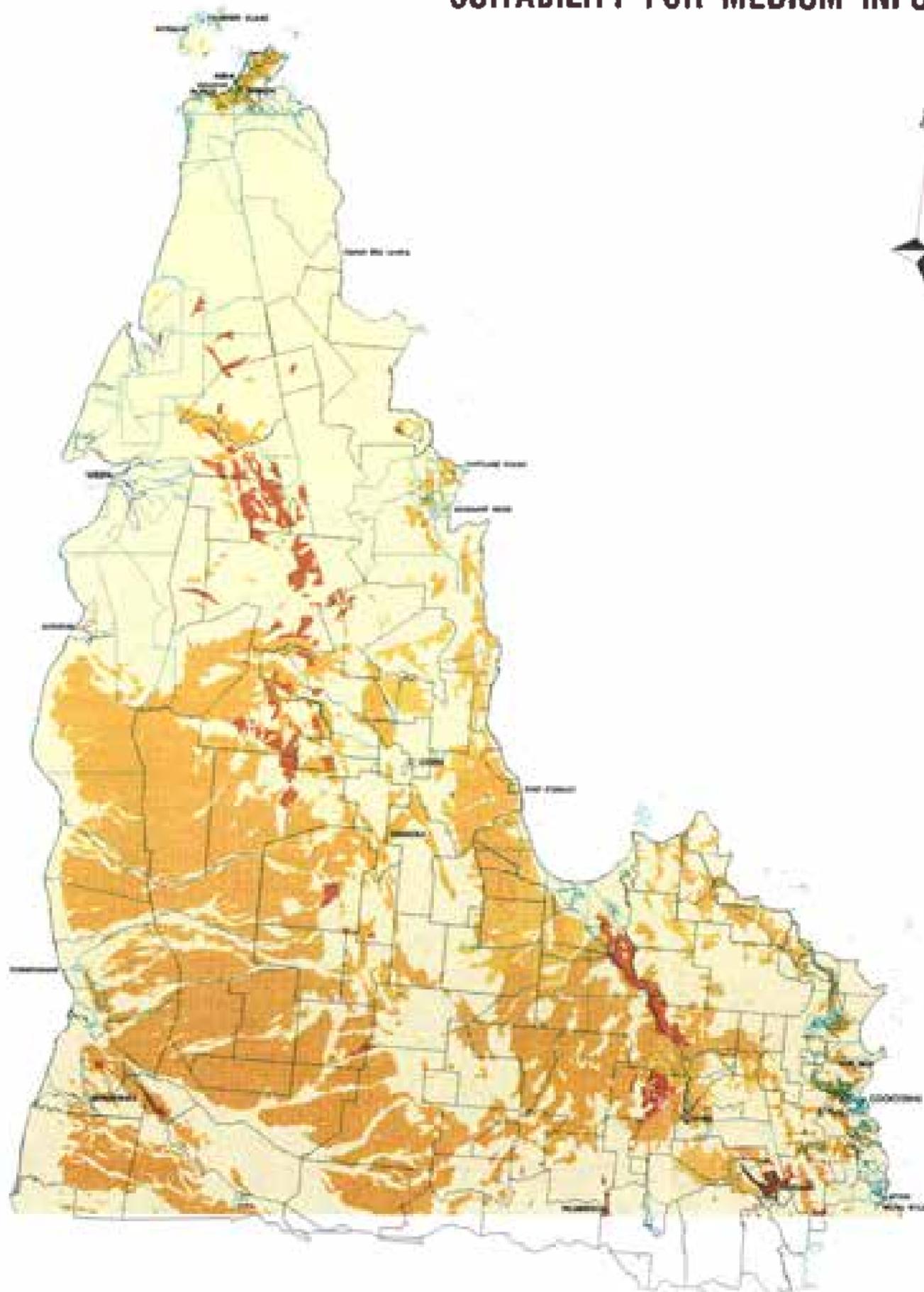


Transverse Mercator Projection Zone 54 : Australian Map Grid

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SUITABILITY FOR MEDIUM INPUT PASTURES



CYPLUS
CAPE YORK PENINSULA
LAND USE STRATEGY

CYPLUS is a joint initiative between the Queensland and Commonwealth Governments.

Landcare
Management
Services

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**Appendix 3.1
PASTORAL LAND TENURES**

TENURE:	GRAZING HOMESTEAD FREEHOLDING LEASE (Section 144 and Others)
TYPE:	Freeholding tenure
PURPOSE:	Provides tenure mechanism of obtaining freehold title cover over a grazing homestead perpetual lease.
HOW AVAILABLE:	From conversion of grazing homestead perpetual lease.
TERM:	40 years.
AREA LIMITATIONS:	Shall not substantially exceed a living area.
SURVEY REQUIREMENTS:	Survey required.
DISQUALIFICATIONS and RESTRICTIONS:	Person must be 18 years. Corporation, trustee agent or servant cannot hold. Except personal representatives, beneficiaries of estate etc.
RESIDENCY:	Personal residency for balance of period as applicable to the former GHPL then subject to occupation.
PURCHASE PRICE:	Determined by the Minister or the Land Court. Paid off over 40 years interest free or may be purchased outright at a discount of about 50%.
TIMBER:	Commercial timber is valued as at date of conversion and determined by the Minister or the Land Court. Paid off over 10 years interest free.
CONDITIONS:	The converted lease continues to be subject to the same development and improvement conditions as the underlying lease.
REVERTS TO CROWN:	May be forfeited for non payment of rent and/or breach of any condition.
GENERAL COMMENTS:	A needed tenure for freeholding. When the deed is issued after the commencement of the 'Land Act Amendment Act of 1984' any subsequent transfer to a company or trustee requires consent of Governor in Council if title area exceeds 2,500 hectares (Section 147A).

The Committee would see that restrictions should be placed on the issue of this tenure until such time as the appropriate controls are placed on all lands of the State to control misuse and wanton destruction of trees along water courses, steep slopes, wildlife habitat, etc and until the matter of reservation in title of extractive industries is considered.

The terms of the purchase price have been addressed elsewhere.

TENURE:	GRAZING HOMESTEAD PERPETUAL LEASE (Section 61 and others)
TYPE:	Primary tenure for grazing and agricultural purposes.
HOW AVAILABLE:	By ballot, renewal of lease, or conversion from pastoral lease types in certain instances.
TERM:	Perpetuity (ie. forever).
AREA LIMITATIONS:	Shall not substantially exceed a living area.
SURVEY REQUIREMENTS:	Survey usually insisted upon.
DISQUALIFICATIONS and RESTRICTIONS:	<p>Person must be 18 years. A person cannot apply for or hold two or more GHPL's in excess of two living areas.</p> <p>Corporation, trustee agent or servant cannot hold. Except personal representatives, beneficiaries of estates, etc.</p>
RESIDENCY:	Ballot block - personal resident maybe imposed for the first seven years, thereafter occupation.
RENT:	Determined by Minister or Land Court in accord with the same principles as for a pastoral holding.
CONDITIONS:	As required on the opening lease which the Minister may impose. No trees may be destroyed without first obtaining a permit from the Land Commissioner.
REVERTS TO CROWN:	May be forfeited for non payment of rent and/or breach of any condition.
GENERAL COMMENTS:	<p>Generally seen as the family unit tenure and one which takes over from the pioneer pastoral lease type. Freeholding may take place subject to public interests, etc.</p> <p>This is a relevant tenure and is still required and necessary.</p>

TENURE:	PASTORAL HOLDING (Section 49 to 61)
TYPE:	Leaschold.
PURPOSE:	Pioneer tenure for grazing and agricultural purposes and for the larger mostly unsurveyed leases in the distant areas of the State.
HOW AVAILABLE:	Ballot, renewal of lease, or as an additional area.
TERM:	Up to 50 years. (Extended from the previous 30 years term by the 1966 Amending Act No 31.)
AREA LIMITATIONS:	No limitations on area or numbers of holdings held in the one ownership.
SURVEY REQUIREMENTS:	Survey not required.
DISQUALIFICATIONS and RESTRICTIONS:	Person must be 18 years of age. Registered and company and incorporated organisations can hold. Must be used for pastoral or agricultural purposes unless with the Minister's prior approval in writing for alternative use, eg. tourism. No restrictions on ownership but Minister's consent is required for transfer, as is the case for all leases and licences (Section 286).
RESIDENCY:	None prescribed.
RENT:	Determined by Minister; can be referred to the Land Court if rent is over \$100.00 per annum. Rental is based on a nett rate per head of estimated long term average carrying capacity; reassessed every 10 years. If land is classed as arable then rental is struck at 2.5% of the unimproved capital value of such land as at the date of assessment.
CONDITIONS:	Development and improvement conditions as considered relevant by Minister. No trees may be destroyed without first obtaining a permit from the Land Commissioner.
FREEHOLDING:	Direct freeholding of this tenure is not available. Conversion to grazing homestead perpetual lease may be allowed in specific instances with Ministerial approval.
REVERTS TO CROWN:	May be forfeited for non payment of rent and/or breach of conditions. Resumption provisions do not now apply to this tenure although in the past there was provision to resume up to one third of a lease after the first 15 years of its term.

GENERAL COMMENTS: Generally used as the 'first up' tenure, and is now predominantly associated with the larger cattle and sheep properties in the outer areas of the State.

This tenure needs to be retained. Some of these leases could provide land for closer settlement if such could be made available.

TENURE:	OCCUPATION LICENCE (Section 75-79)
TYPE:	Occupation purposes only - usually over expired pastoral holdings while future land use is being sorted out.
PURPOSE:	Interim tenure to allow continued occupation of land pending the issue of a new lease; sometimes used over areas such as mining fields where other tenures are inappropriate.
HOW AVAILABLE:	Can be auctioned, but generally priority is given to current occupier of land who would be the lessee of the previous expired lease.
TERM:	Renewed yearly by payment of annual rental.
AREA LIMITATIONS:	No limitations.
SURVEY REQUIREMENTS:	Survey not required.
DISQUALIFICATIONS and RESTRICTIONS:	Person must be 18 years. Companies are incorporated and organisations can hold. Minister's permission needed for transfer.
RESIDENCY:	None prescribed.
RENT:	Determined by Minister generally in line with pastoral lease rents when in the grazing areas or amount bid by successful applicant if auctioned.
CONDITIONS:	Improvement conditions may be imposed by the Minister. No improvements are to be effected without the prior consent of the Minister. No trees may be destroyed without first obtaining a permit from the Land Commissioner.
REVERTS TO CROWN:	By giving three months notice by Minister.
FREEHOLDING:	Not permitted.
GENERAL COMMENTS:	This tenure is seldom used. When the passing of the Mineral Resources Act this type of licence will not be needed for lands situated in the mining fields because better tenures can then be used.

Section 159A of the Land Act makes provisions for the Governor in Council to extend an expired holding lease for up to nine (9) months where an application has been made for a new lease before expiry.

TENURE:	SPECIAL LEASE (Section 198-207)
TYPE:	Leasehold (freehold conditions can be built in under Section 205 in certain instances).
PURPOSE:	Can be used for any purpose over Crown land and reserved land - can cover large rural properties, towns lots, tourist purposes, special projects, leases over State forests, reserves, etc. A multi purpose tenure which has outgrown its original intent.
HOW AVAILABLE:	By auction and in priority.
TERM:	Up to 30 years by action where the auction determines the first period rental. Up to 75 years where conditions require substantial improvements or where conversion to freehold is not allowed.
AREA LIMITATIONS:	No specific area limitations but usually in accord with areas available as GHPL where rural lands are concerned.
SURVEY REQUIREMENTS:	Survey not required unless freeholding is taking place.
DISQUALIFICATIONS and RESTRICTIONS:	Person must be 18 years. Registered company and incorporated organisations can hold. Minister's permission requested for transfer.
RESIDENCY:	None prescribed.
RENT:	Rents are fixed or determined by the Minister and shall be an amount an experienced person would pay for the lease. Reassessment is not specific but is usually every five years. Auction - rent determined by the successful bidder (amount stated as upset rent). Reassessment - determined by the Minister and may be referred to the Land Court if above \$200.00 per annum.
CONDITIONS:	Development conditions as considered relevant; also there is a specified purpose for which lease is to be used. No trees may be destroyed without first obtaining a permit from the Land Commissioner.
REVERTS TO CROWN:	May be forfeited by non payment of rent and/or breach of any condition.

GENERAL COMMENTS: The lessee has the right to apply for freehold tenure if not expressly prevented in the lease. Where Crown land is costly to develop a lease can issue as a prelude to freehold with a pre-determined purchase price and would include specific development conditions, eg. tourist leases.

If the lease expires the land reverts to the Crown for further dealing. This tenure has evolved over time and has become a general use tenure for many varied circumstances.

TENURE.	PERMIT TO OCCUPY (Section 371A)
TYPE:	Occupation.
PURPOSE	To permit use of Crown land, reserve or road, while at the same time preserving the underlying lawful usage.
HOW AVAILABLE:	Can be granted over Crown land, reserve or road without the need for cancelling the reserve or closing the road.
TERM:	Generally has no term and continues by payment of annual rent.
AREA LIMITATIONS:	None prescribed.
SURVEY REQUIREMENTS:	None required.
DISQUALIFICATIONS and RESTRICTIONS:	None.
RESIDENCY:	None prescribed.
RENT:	Determined by Minister.
CONDITIONS:	Conditions such as fencing and others as considered relevant. No timber destruction allowed unless with the consent of the Conservator of Forests.
REVERTS TO CROWN:	Terminable at will by the Minister.
GENERAL COMMENTS:	<p>Low security tenure to enable occupation of land without interfering with the underlying usage eg. will allow grazing on a road but without limiting the use of the area for road purposes.</p> <p>Permits have occasionally been issued liberally in the past for long time arrangements when a lease would have been more relevant.</p> <p>There is also problem that the underlying land authority always remains intact and consequently available for its legal use. Any improvements technically interfere with this underlying use, eg. beach huts on explanade which is a contradiction in terms.</p> <p>A very useful tenure but in need of some refinements.</p>

NO	SECURE	RUN NO	PR NAME AREA	STATION NAME	RFD LOT OR PLAT	LESSEE	CARRYING CHARGE			CAPACITY		LIVING AREA THIS PROPERTY	PERCENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX. VALUE OF IMPROVEMENTS	VAL. NO. & VAL. OF VAL. 3/1/75
							RATE	TOTAL	PAY	POTENTIAL	SUPPL					
							RATE	TOTAL	PAY	POTENTIAL	SUPPL					
1	P.O.	4345145 File Ref 7831	13300 ha	Part of w/425 13-2nd	1 on PER. 5145	Roadcroft	1-50	306	1-50	306	Nil		1963	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	701 446	
2	O.L.	43478		Entrance Road	14 on O.L. 74	RP Fell-Tyvel	1-50	70	1-50	10	Nil		1969	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	701 451	
3	P.H.	434693 File Ref 5082	1425 ha	Portland Bay	4539 on PH 2361	Hallina P/L Sawmough Liner	1-85	17	1-85	17	5000 head	0.2%	1980	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	701 491	
3	P.H.	4345117 File Ref 7499	49987 ha	Sherburne	5117 on PH 376	ER Nixon	1-70	714	1-70	714	5000 head	14%	1980	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	705 2152	
4	O.L.	73 File Ref O.L. 71	46563 ha	Part of Sherburne	33 on O.L. 343	DO & ER Nixon	1-85	1024	1-85	1024	5000 head	30%	1985	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	705 2167	
5	P.H.	434475 File Ref 5610	98800 ha	Part of Bramwell	2 on SH 15	T Harcourt	1-81	1465	1-82	1465	4500-5000 head	31%	1988	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	705 2111	
6	P.H.	434693 File Ref 5136	Bramwell	Bramwell	3691 on PH 3167	T Harcourt	1-40	912	1-40	912	4500-5000 head	21%	1989	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	705 2111	
7	P.H.	434198 File Ref 7612	Bramwell	Bramwell	4 on D.L.H + Bruce	Monte P/L & LT Bruce	1-50	2700	1-50	2700	4500-5000 head	80%	1986	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	705 2107	

NO	TENURE	RUN NO	PR NAME AREA	STATION NAME	RPD LOT OF PLAN	LESSEE	CARRYING				CAPACITY		LIVING AREA THIS PROPERTY	PRESENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL. NO & LIV. VAL. 31/3/92	
							CARRYING		POTENTIAL									
							RATE	TOTAL	RATE	TOTAL	RATE	TOTAL						
16	P.R.	34/4819 File Ref 8204	Cuen River 116174 ha	Metapala	3819 on PH 2262	AT&TIC	1-35	5828	1-35	5324	1-35	5128	3500-4000 head	152%	1976	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$127,000 \$ 36,000 \$128,000 \$ 34,000 \$ 6,000 \$331,000	705 2116 \$147,500
17	P.H.	34/4653 File Ref 7302	Kendall River 174000 ha	Kendall River	4652 on PH 1502	J Boch	1-60	4567	1-60	4567	1-30	3480	3500-4000 head	100%	1992	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$ 50,000 \$ 20,000 \$ 48,000 \$ 1,000 \$ 15,000 \$124,000	705 2130 \$110,000
18	P.R.	34/4652 File Ref 5821	Holroyd River 283000 ha	Holroyd River	4652 on PH 931	K Shepherdson	1-45	6289	1-45	6289	1-30	9660	3500-4000 head	100%	1992	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$ 22,000 \$ 9,000 \$ 55,500 \$ 32,300 \$ 20,500 \$139,300	705 2124 \$225,000
19	P.H.	43/4633 File Ref 6234	Woburnon 117000 ha	Woburnon	1 on WMT 70	W Jackson	1-50	2740	1-50	2740	1-50	2740	3500-4000 head	78%	1992	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$111,000 \$ 40,500 \$ 73,300 \$140,000 \$ 18,400 \$383,200	705 2164 \$80,000
20	P.H.	43/4509 File Ref 5565	Geikie 112665 ha	Blue Mountains	4509 on PH 159	Creighton P/L	1-65	1233	1-65	1233	1-65	1502	3500-4000 head	43%	1987	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$ \$ 11,200 \$ 300 \$ \$ \$ \$ 11,500	705 2121 \$41,000
21	P.H.	43/4813 File Ref 7699	Lavel 48400 ha	Mt Knoll	4 on SO 800314	Evmy Enterprises	1-45	1076	1-45	1076	1-30	1076	3000-3500 head	32%	1988	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$ \$ 6,100 \$ 18,300 \$ 12,200 \$ \$ 37,600	705 2158 \$40,000
22	S.L.	39284 File Ref 7134	 987.9 ha	Part of Lochinvar	4 on CO 4	N Shepherd	1-12	\$2	1-12	\$2	1-12	\$2	3000-3500 HEAD	3%	1978	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$ \$ \$ 4,000 \$ \$ \$ 4,000	705 1878 \$4,000
23	P.H.	43/4341 File Ref 6446	Lochinvar 25800 ha	Lochinvar	9 on CO 15	N ShepSard	1-35	726	1-30	847	1-30	847	3000-3500 HEAD	24%	1981	Structures Yards Fencing Water Timber Treat. (improved past) TOTAL	\$ 19,400 \$ 18,500 \$ 18,300 \$ 19,100 \$ 9,800 \$ 45,600	705 2137 \$27,500

NO	TENURE	PSN NO	PR NAME AREA	STARTUP NAME	LOT OR BLK	LESSEE	EMBRITING			CAPACITY		LIVING AREA THIS PROPERTY	PRESENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL NO. 4 CV DALL 31/7/92	
							LEASE CHARGE	TREES	TOTAL	POTENTIAL	TOTAL						
							RATE	TOTAL	RATE	TOTAL							
24	P.H.	14/5130 File Ref 528	Silver Plains 175000 ha	Silver Plains	15 on SD 23	R Rand & Partners Charlton Psaloni Co P/L	1-50	3500	1-50	3500	1-50	3500	100%	1991	Structures \$ Yards \$ Fencing \$ 14,000 Water \$ Timber Treat. \$ Improved past \$ TOTAL \$ 14,000	705 2155	
25	S.L.	14/5026 File Ref 6513	13070 ha	Part of Silver Plains	12 & 14 on SD 22	R Rand & Partners Charlton Psaloni Co P/L	1-50	479	1-20	479	1-12	2000	40%	1991	Structures \$318,300 Yards \$29,000 Fencing \$10,000 Water \$35,000 Timber Treat. \$419,000 Improved past \$ TOTAL \$1,341,300	705 2155	
26	P.H.	14/5485 File Ref 5987	Southwell 171000 ha	Southwell	2 on LK4	MEP Price	1-60	2017	1-60	2017	1-60	2017	58%	1985	Structures \$ 6,200 Yards \$ Fencing \$ 7,200 Water \$ Timber Treat. \$ Improved past \$ TOTAL \$ 13,400	705 2154	
27	P.H.	14/5484 File Ref 8131	Dwynn 146000 ha		4 on LK 4	RJ & JR Price	1-65	2246	1-65	2246	1-53	2733	64%	1985	Structures \$ 55,400 Yards \$25,000 Fencing \$44,400 Water \$ 2,400 Timber Treat. \$ 24,000 Improved past \$ TOTAL \$151,200	705 2117	
28	P.H.	14/6072	Llewellyn 89100 ha	Dwynn	1 on CO 17	AI Gennick	1-50	1781	1-50	1781	1-50	1782	42%	1984	Structures \$ Yards \$ 6,200 Fencing \$ Water \$ Timber Treat. \$ Improved past \$ 6,200 TOTAL \$ 6,200	705 2132E	
29	P.H.	14/2386 File Ref 7920	Aurora 123000 ha	Yarrulca	10 on SD 17	BJ & DJ Shephard	1-40	3025	1-40	3025	1-40	3025	86%	1983 & 1987	Structures \$117,000 Yards \$39,000 Fencing \$28,000 Water \$15,000 Timber Treat. \$ 10,000 Improved past \$ TOTAL \$209,000	705 2103	
30	S.L.	14/4142	874 ha	Part of Yarrulca	4 on SD 11	DJ & DJ Shephard	1-30	29	1-20	29	1-30	29	1%	1990	Structures \$ Yards \$ 2,500 Fencing \$ 6,700 Water \$ Timber Treat. \$ Improved past \$ 9,200 TOTAL \$ 9,200	705 2105	
31	S.L.	14/2881	40960 ha	Running Creek	1 on SD 18 being part of 84 on PS 115	D 3011	1-41	911	1-41	911	1-43	910	26%	1988	Structures \$ 4,400 Yards \$ 4,000 Fencing \$ 7,700 Water \$ 2,600 Timber Treat. \$ Improved past \$ 9,200 TOTAL \$ 28,900	705 2171	
																\$ 28,900	\$ 21,000

NO	TENURE	RUN NO	RM NAME AREA	STATION NAME	REV LOT ON PLAN	LESSEE	CARRYING				CAPACITY		LIVING AREA THIS PROPERTY	PRESENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL NO & UV VAL 31/3/97
							LEASE COWS		YIELDING		POTENTIAL						
							RATE	TOTAL	RATE	TOTAL	RATE	TOTAL					
32	P.H.	34/814V File Ref 4698	Suezona 246049 ha	Suezona	4049 on PH 11	G Guest & RJ Flower	1-55	4434	1-46	5349	1-46	5349	3500-4000 head	15%	1945	Structures \$ 30,000 Yards \$ 12,700 Fencing \$ 50,000 Water \$ 21,000 Timber Treat. \$ 3,400 (improved past) TOTAL \$117,100	705 2158 \$136,000
33	P.H.	34/3434 File Ref 4243	Astrea 62419 ha	Astrea	3874 on PH 2173	JAI Gordon	1-75	832	1-75	832	1-75	832	3500-4000 head	24%	1986	Structures \$ 31,000 Yards \$ 2,700 Fencing \$ 16,100 Water \$ Timber Treat. \$ (improved past) TOTAL \$ 49,800	705 2102 \$20,000
34	P.H.	34/4243 File Ref 3223	Minka 120425 ha	Seathway	4113 on PH 363	A.E Schwabe	1-50	1409	1-50	2409	1-50	2409	3500-4000 head	69%	1984	Structures \$ 35,000 Yards \$ 21,700 Fencing \$ 19,900 Water \$ 3,300 Timber Treat. \$ 10,000 (improved past) TOTAL \$ 89,900	705 2140 \$80,000
35	P.H.	34/4506 File Ref 5693	Jogleby 64700 ha	Suezona	3 on KA 63479	J Robinson	1-55	1176	1-55	1176	1-55	1176	3500-4000 head	34%	1985	Structures \$ 15,300 Yards \$ 2,800 Fencing \$ 9,800 Water \$ 3,400 Timber Treat. \$ 6,000 (improved past) TOTAL \$ 36,300	705 2127 \$26,000
36	P.H.	34/3875	Ancilia 90132 ha	Glen Garland	3875 on PH 3152	Edmulp Aboriginal Corporation	1-55	1639	1-55	1639	1-55	1639	3500-4000 head	47%	1987	Structures \$ 65,000 Yards \$ 12,900 Fencing \$ 23,400 Water \$ 9,500 Timber Treat. \$ 13,500 (improved past) TOTAL \$123,300	705 2100 \$51,000
37	P.H.	34/3385 File Ref 7921	Alecata 80000 ha	Banhuu	3385 on PH 1755	VMG Evans	1-45	1778	1-45	1778	1-45	1778	3500-4000 head	51%	1945	Structures \$ 6,400 Yards \$ Fencing \$ 2,900 Water \$ 27,600 Timber Treat. \$ (improved past) TOTAL \$ 36,900	705 2099 \$64,000
38	S.L.	34/4389 File Ref 5608	 31209 ha	Part of Lily Vale	Lease 1 on 34N EE being part RL on FTY 3124	FW Shepherd	1-45	782	1-45	782	1-45	782	3500-4000 head	21%	1989	Structures \$ Yards \$ 1,500 Fencing \$ Water \$ 16,700 Timber Treat. \$ (improved past) TOTAL \$ 18,150	705 2136 \$23,000
39	P.H.	34/3384 File Ref 7899	Aglois 6179 ha	Banhuu	3384 on PH 1682	VM Evans	1-45	137	1-45	137	1-45	137	3500-4000 head	4%	1986	Structures \$ 20,000 Yards \$ 12,300 Fencing \$ 5,500 Water \$ 10,900 Timber Treat. \$ (improved past) TOTAL \$ 49,200	705 2099 \$8,000

NO	TENSURE	BEN NO	BR HOME AREA	STATION NAME	RSD LOT OR PLAN	ECCSIDE	CARRIVING				CAPACITY		LIVING AREA THIS PROPERTY	PERCENT 1 OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL NO. 4 OR VAL. 51/3/92
							USE	TOTAL	BASE	IMPROV	POTENTIAL	TOTAL					
40	P.H.	145361 File Ref 6052	Lily Vale 16500 ha	Lily Vale	5162 on PH 1824	EW Shephard	1-36	1014	1-36	6217	1-36	1317	35%	1986	Structures \$ 91,400 Yards \$ 23,200 Fencing \$ 20,000 Water \$ 34,800 Timber Treat. (improved past) \$ 4,100 TOTAL \$173,500	705 211A \$44,000	
41	P.H.	145361 File Ref 5213	Violet Vale 70000 ha	Violet Vale	5162 on CP 8593H	H.A. AK Chapple	1-40	1778	1-35	2000	1-36	2360	58%	1991	Structures \$ 80,600 Yards \$ 22,800 Fencing \$ 185,500 Water \$ 44,800 Timber Treat. (improved past) \$ 197,000 TOTAL \$540,600	705 2101 \$71,000	
42	P.H.	145365 File Ref 7889	Artemis 415100ha	Artemis	4161 on PH 1824	TD Shephard	1-55	2235	1-50	2502	1-50	2502	71%	1984	Structures \$ 78,400 Yards \$ 15,400 Fencing \$ 56,000 Water \$ 27,000 Timber Treat. (improved past) \$ 1,200 TOTAL \$178,000	705 2101 \$76,000	
43	S.L.	145365 File Ref 7248	Part of Sweet Plains 3100 ha	Part of Sweet Plains	Genie C on HN 14 being part of RD on FRY 1254	R. Bond & Pinciro Chudoko Pastoral co	1-50	66	1-50	66	1-50	66	2%	1986	Structures \$418 Yards \$ Fencing \$ Water \$ Timber Treat. (improved past) \$ TOTAL \$	705 2153 \$9,000	
44	O.L.	574 File Ref 7792	Part Kalljower 10610 ha	Part Kalljower	574 on OL 141	Walton P/L	1-40	265	1-40	265	1-40	255	4%	1981	Structures \$418 Yards \$ Fencing \$ Water \$ Timber Treat. (improved past) \$ TOTAL \$	705 2106 \$9,000 coefficient	
45	P.H.	145371 File Ref 5187	Birdsby Plains 63200 ha	Part Kalljower	2 on NE 800313	Walton P/L	1-40	3580	1-40	3540	1-32	1975	45%	1988	Structures \$775,000 Yards \$ 23,000 Fencing \$ 21,900 Water \$115,600 Timber Treat. (improved past) \$ TOTAL \$937,500	705 2108 \$54,000	
46	P.H.	145383 File Ref 5829	Kalljower 82011 ha	Part of Kalljower	2708 on PH 840	Walton P/L	1-35	2187	1-33	2287	1-28	2858	65%	1988	Structures \$ 500 Yards \$ 15,800 Fencing \$ 43,500 Water \$ 21,500 Timber Treat. (improved past) \$ TOTAL \$111,300	705 2108 \$96,000	
47	P.H.	145462 File Ref 5787	JACK LAKER 63846 ha	Part of Kalljower	4642 on PH 701	Walton P/L	1-30	2254	1-30	2754	1-23	3592	79%	1988	Structures \$102,400 Yards \$ 20,200 Fencing \$ 71,500 Water \$ 61,400 Timber Treat. (improved past) \$ 15,000 TOTAL \$313,500	705 2108 \$99,000	

NO	TENURE	RUM NO	PIE NAME AUGA	SECTION NAME	R/D LOT OR PLAN	LESSEE	CARPENTRY				CAPACITY		LIVING AREA THIS PROPERTY	PRESENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL. NO. C OR VAL. 31/3/92	
							LEASE CHARGE		FENCING		POTENTIAL							
							RATE	TOTAL	RATE	TOTAL	RATE	TOTAL						
48	P.H.	14/4780	Ljha 172752 ha	Part of Kajowar	4760 on P11 2247	Wataw P/L	1-125	1382	1-125	1382	1-125	1382	3500-4000 head	39%	1984	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$Nil \$ \$ \$ \$ \$ \$	705 2108 \$61,000
49	P.H.	14/2453 File Ref 5105	Starcke 137000 ha	Starcke	2498 on P11 1402	George Quaid Holdings P/L	1-40	4425	1-40	4425	1-34	5206	3500-4000 head	176%	1993	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$ 1,000 \$ \$ 5,800 \$ 16,200 \$ 34,400 \$ \$ 57,400	705 2156 \$212,500
50	S.L.	26670 expired File Ref 3687	 439 ha	Part of Starcke	3 on B5 31	George Quaid Holdings P/L	1-40	12	1-40	12	1-40	12	3500-4000 head	0.3%	1984	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$Nil \$ \$ \$ \$ \$ \$	705 2156 \$40,000
51	P.H.	34/4695	Balurga 116000 ha	Balurga	4695 on P11 1554	DA Price	1-70	1657	1-70	1657	1-70	1657	4000-4500 head	41%	1984	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$ \$ 1,350 \$ \$ \$ \$ \$ 1,350	705 2104 \$40,000
53	P.H.	34/4429 File Ref 5368	Sellen 78995 ha	Sellen	4829 on P11 436	NH Finch	1-70	1129	1-70	1129	1-70	1129	4000-4500 head	28%	1980	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$ 3,200 \$ 4,400 \$ \$ \$ \$ \$ 13,600	705 2151 \$27,000
54	P.H.	34/5545 File Ref 5369	Halmsey 231000 ha	Onices	12 on CTh 3	Kowanyama Community Council	1-55	4236	1-55	4236	1-55	4236	3500-4000 head	121%	1988	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$ 15,600 \$ 34,000 \$ 7,300 \$ \$ 3,000 \$ \$ 60,100	705 2113 \$124,000
55	P.H.	34/5546	Kulera 170000 ha	Koolalah	13 on CTh 3	GL, CB, BMC Hughes	1-35	4857	1-35	4857	1-35	4857	3500-4000 head	139%	1988	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$150,000 \$ 77,500 \$236,000 \$ 40,000 \$ 5,000 \$ \$508,500	915 982 \$102,000
56	P.D.H.	34/1796	Ruiland Plains 236000 ha	Ruiland Plains	1796 on P11 1322	MDH P/L	1-22	4927	1-22	4927	1-19	4241	3500-4000 head	355%	1993	Structures Yards Fencing Water Timber Treat. (Improved past) TOTAL	\$152,000 \$ 48,800 \$135,700 \$130,000 \$ \$ \$467,300	915 999 \$230,000

NO	TERMRE	RUN NO	PIL NAME AREA	STATION NAME	RPO LOT OR PLAN	LESSEE	CARRYING				CAPACITY		LIVING AREA THIS PROPERTY	PRESENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL NO & UV VAL 31/3/92
							LEASE CURRENT		PRESENT		POTENTIAL						
							RATE	TOTAL	RATE	TOTAL	RATE	TOTAL					
17	P.H.	54/1862	Dunbar 68300 ha	Dunbar	3 on MM2	ADIR PIL	1-20	1705	1-40	1705	1-32	21344	3500-4000 head	444%	1984	Structures \$ 55,200 Yards \$ 149,600 Fencing \$ 151,600 Water \$ 56,000 Timber Treat. \$ (Improved past) TOTAL \$ 412,400	915 974 712 6757 \$483,000
58	P.H.	14/4712	Harkness 126751 ha	Harkness	4732 on PH 2209	JH Falcon	1-75	1823	1-75	1823	1-75	1823	3500-4000 head	52%	1984	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. \$ (Improved past) TOTAL \$	705 2123 \$44,000
59	P.H.	14/4862 File Ref 5541	Ingleby South 112000 ha	Cowbie	4682 on PH 1137	Gavin PH	1-70	1614	1-70	1614	1-70	1614	3500-4000 head	46%	1992	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. \$ (Improved past) TOTAL \$	705 2126 \$40,000
60	P.H.	14/2147 5480 File Ref 5961	Peringa 140000 ha	Part of Dixie	1 on WR 4	Dixie Holdings Pty Ltd	1-65	2154	1-65	2154	1-65	2154	3500-4000 head	62%	1984	Structures \$112,800 Yards \$ 33,000 Fencing \$ 40,000 Water \$ 59,000 Timber Treat. \$ 7,000 (Improved past) TOTAL \$ 251,800	705 2148 \$77,000
61	P.H.	34/5481 File Ref 8887	Wulpa 262000 ha	Part of Dixie	1 on WR 3	Dixie Holdings Pty Ltd	1-65	4021	1-65	4021	1-65	4021	3500-4000 head	115%	1984	Structures \$ Yards \$ 6,400 Fencing \$ 14,500 Water \$ 2,000 Timber Treat. \$ (Improved past) TOTAL \$ 22,900	705 2149 \$108,000
62	P.H.	34/2007 File Ref 5211	Drumduff 204000 ha	Drumduff	1 on SN 848571	GLCB, HM Hughes	1-30	6800	1-30	6800	1-30	6800	3500-4000 head	194%	1982	Structures \$ 46,500 Yards \$ 44,700 Fencing \$ 33,500 Water \$ 4,800 Timber Treat. \$ (Improved past) TOTAL \$ 129,500	705 2119 712 6758 \$285,000
63	P.H.	14/4379 File Ref 6259	Morchad 37800 ha	Mary Valley	4929 on PH 1783	MR & CF Shepherd	1-40	945	1-40	945	1-40	945	3500-4000 head	27%	1974 & part 1987	Structures \$ 12,000 Yards \$ 3,600 Fencing \$ 38,200 Water \$ 4,300 Timber Treat. \$ 3,000 (Improved past) TOTAL \$ 63,100	705 2141 \$41,000
64	S.L.	14/52624 File Ref 8168	 43181 ha	Part of Kalings	35 on CP R50114	RP, L, MO Brady	1-55	784	1-55	784	1-55	784	3500-4000 head	22%	1990	Structures \$ Yards \$ Fencing \$ Water \$ 6,300 Timber Treat. \$ (Improved past) TOTAL \$ 6,300	705 1872 \$35,000

NO	TOWNSHIP	BLK NO	PT NAME AREA	STATION NAME	RVD LOT OR DRAIN	LESSEE	CARRYING			CAPACITY		LIVING AREA THIS PROPERTY	PRESENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL OR UV VAL 31/3/82
							LEASE C. MORE	PERCENT	POTENTIAL	BASE	TOTAL					
							DATE	REMARKS	REMARKS	REMARKS						
73	P.H.	140593 File Ref 7573	Knoxhara 100000 ha	Knoxhara	2 on A15 LJ	KJ & MJD Lohsefer	1-40	4000	1-40	4000	3500-4000 head	31.4%	1985	Structures \$ 51,000 Yards \$ 6,400 Fencing \$110,500 Water \$ 6,000 Timber Treat. \$ Improved past TOTAL \$180,000	705 2134	
74	S.L.	44051 File Ref 7511	100000 ha	Jongde Creek	1 on WR J	G. & D. Halbert	1-50	366	1-50	366	3500-4000 head	10%	1987	Structures \$ 16,500 Yards \$ 1,000 Fencing \$ 6,000 Water \$ 3,600 Timber Treat. \$ 500 Improved past TOTAL \$ 30,200	705 1986	
75	P.H.	140583	King River	King Vale	1 on RG J	PA & AB Cunningham	1-50	1110	1-50	1110	3500-4000 head	31.6%	1980	Structures \$ 35,000 Yards \$ 25,500 Fencing \$ 23,500 Water \$ 11,200 Timber Treat. \$ 1,000 Improved past TOTAL \$ 76,600	705 2133	
76	P.H.	140516 File Ref 7498	Yambo	Faught	3218 on PH 1103	KJ & MJD Callaghan	1-50	2348	1-42	2548	3500-4000 head	71.2%	1986	Structures \$ 40,000 Yards \$ 17,100 Fencing \$ 35,900 Water \$ 42,500 Timber Treat. \$ 48,500 Improved past TOTAL \$180,000	705 2165	
77	P.H.	140512 File Ref 5786	Olive Vale	Olive Vale	5112 on PH 1863	Douglas Ave P/L	1-30	3933	1-30	3933	3000-3500 head	131.6%	1990	Structures \$ 65,200 Yards \$ 44,200 Fencing \$135,200 Water \$ 78,200 Timber Treat. \$ Improved past TOTAL \$302,800	705 2146	
78	P.H.	140525 File Ref 5566	Turple	Recess	5268 on PE 1436	Douglas Ave P/L	1-50	830	1-50	830	3500-4000 head	34.8%	1986	Structures \$ 8,400 Yards \$ 11,600 Fencing \$ 15,100 Water \$ 900 Timber Treat. \$ 3,500 Improved past TOTAL \$ 39,700	705 2160	
79	P.H.	140589 File Ref 7770	Sturston	Amber	4580 on PH 1079	W.S. O'Grady PJ Turtlow	1-55	118	1-55	118	3500-4000 head	9%	1985	Structures \$ 31,500 Yards \$ 400 Fencing \$ 4,200 Water \$ Timber Treat. \$ Improved past TOTAL \$ 36,600	705 2157	
80	P.H.	140558 File Ref 3787	Mt Jack	Mt Jack	4634 on P/L 1237	PA & EA Kuhn	L-80	395	1-80	395	3500-4000 head	11.8%	1986	Structures \$ 1,500 Yards \$ 4,000 Fencing \$ 13,700 Water \$ Timber Treat. \$ 15,500 Improved past TOTAL \$ 44,200	705 2140	

NO	TERMINE	RUP NO	PIE NAME AREA	STATION NO/CE	MNO LOT OR PLAT	LESSEE	CATEGORIC				CAPACITY		LEAVING AREA THIS PROPERTY	PERCENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL. NO & OF VAL. 1/17/79
							LEASE CHIMP		LEASE P		POTENTIAL	TOTAL					
							DATE	RATE	DATE	RATE							
88	O. L.	361	12,108 sq	Part of Eldershe	563 on DL 116	A. Sargent	1-30	404	1-30	404	1-30	404	17%	1986	Structures \$ 33,000 Yards \$ Fencing \$ 3,100 Water \$ 10,000 Timber Treat. \$ 4,500 (improved past) TOTAL \$ 57,100	705 2173	
89	O. L.	485	1072 sq	Part of Sureka	485 on DL 127	George David Holdings P/L	1-30	69	1-30	69	1-30	69	2%	1990	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. \$ Improved past \$ TOTAL \$	705 2156	
91	O. L.	504	35300 sq	Part of Eldershe	564 on DL 412	A. Sargent	1-100	353	1-100	353	1-100	353	12%	1990	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. \$ Improved past \$ TOTAL \$	705 2173	
91	O. L.	471 File Ref 7774	1748 ha	Part of Sureka	215 on BK 15755 & 208 on BK 15758	George David Holdings P/L	1-50	35	1-50	35	1-50	35	1%	1990	Structures \$ Yards \$ Fencing \$ 10,100 Water \$ Timber Treat. \$ Improved past \$ TOTAL \$ 10,100	705 2156	
93	O. L.	487 File Ref 7771	5783 ha	Part of Sureka	487 on DL 418	George David Holdings P/L	1-40	96	1-40	96	1-40	96	3%	1990	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. \$ Improved past \$ TOTAL \$	705 2155	
94	P. H.	164880	6784 ha	Part of Louisiana	1 on BS 145	M/M Redfish	1-40	79	1-40	79	1-40	79	3%	1985	Structures \$ Yards \$ 1,500 Fencing \$ 1,600 Water \$ Timber Treat. \$ Improved past \$ TOTAL \$ 3,100	705 2112	
95	P. H.	144830	6000 ha	Part of Louisiana	439 on P/L 2044	M/M Redfish	1-30	200	1-30	200	1-30	200	7%	1985	Structures \$ 700 Yards \$ 2,200 Fencing \$ 8,000 Water \$ Timber Treat. \$ 8,000 Improved past \$ 13,500 TOTAL \$ 23,400	705 2112	
96	CHPL	240 File Ref 5540	7170 ha	South Evangeline	104 on BS 204	C. G.D. Alford	1-25	222	1-25	211	1-25	211	7%	1989	Structures \$ 500 Yards \$ 500 Fencing \$ 3,300 Water \$ 500 Timber Treat. \$ 4,000 Improved past \$ 10,900 TOTAL \$ 19,900	705 1055	

NO	TENURE	RUN NO	PH NAME AREA	STATION NAME	RFD LOT OR PLAN	LESSEE	CARRYING				CAPACITY		LIVING AREA THIS PROPERTY	PERCENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL NO & UV VAL 31/3/92
							LEASE CURRENT		RESERVE		POTENTIAL						
							RATE	TOTAL	RATE	TOTAL	RATE	TOTAL					
97	GHPL	231 File Ref 6509		Alkoonic	4613 on BS 285	RS Hardy AB Holmes	1-85	291	1-85	291	1-85	291	3000-3500 head	10%	1987	Structures \$ 12,800 Yards \$ 5,300 Fencing \$ 8,000 Water \$ 3,000 Timber Treat. (improved past) \$ TOTAL \$ 30,600	705 1470 \$47,000
98	P.H.	14/1317 File Ref 7898	Damun	Part of Oaky	3317 on PH 2113	CJ Martin	1-25	166	1-25	166	1-25	166	3000-3500	6%	1988	Structures \$ Yards \$ Fencing \$ 3,900 Water \$ 2,600 Timber Treat. (improved past) \$ TOTAL \$ 6,500	705 2115 \$16,800
99	P.H.	14/1434 File Ref 5372	Coobee	Part of Oaky	634 on BS 236	CJ Martin	1-25	724	1-25	724	1-25	724	3000-3500 head	24%	1987	Structures \$ 2,000 Yards \$ 11,300 Fencing \$ 26,900 Water \$ 14,200 Timber Treat. (improved past) \$ TOTAL \$ 54,400	705 2115 \$73,000
100	P.H.	14/2715 File Ref 7574	Beebika	Beebika	2715 on PH 1003	G & V Meeson	1-25	98	1-25	98	1-25	98	3000-3500 head	3%	1993	Structures \$ Yards \$ Fencing \$ 16,400 Water \$ 6,000 Timber Treat. (improved past) \$ TOTAL \$ 22,400	705 2106 \$44,000
101	GHPL	234 File Ref 6319		Part of Kings Plains	2009 on BS 297	DR & SV Brennan	1-25	649	1-25	748	1-25	748	3000-3500 head	25%	1986	Structures \$ Yards \$ 16,200 Fencing \$ 47,300 Water \$ 16,400 Timber Treat. (improved past) \$ 6,000 TOTAL \$ 86,000	705 2145/1 \$48,500
102	GHPL	233 File Ref 6147		Part of Kings Plains	1980 on BS 296	DR & SV Brennan	1-40	1140	1-40	1140	1-40	1140	3000-3500 head	18%	1986	Structures \$ Yards \$ 24,700 Fencing \$ 27,800 Water \$ 6,600 Timber Treat. (improved past) \$ TOTAL \$ 54,100	705 2145/1 \$56,000
103	P.H.	14/242 File Ref 5662	Springdale	Springdale	242 on PH 1265	D Bower & Ore	1-30	1667	1-28	2000	1-28	2000	3000-3500 head	67%	1986	Structures \$ 44,300 Yards \$ 18,400 Fencing \$ 43,800 Water \$ 18,700 Timber Treat. (improved past) \$ 33,500 TOTAL \$ 178,700	705 2155 \$102,000
104	P.H.	14/233 File Ref 5554	Ni Mulgevoe	Ni Mulgevoe	233 on PH 1796	LW Westaway & Ore	1-30	1067	1-30	1067	1-30	1067	3000-3500 head	116%	1985 Part 1989	Structures \$144,500 Yards \$168,000 Fencing \$129,000 Water \$134,500 Timber Treat. (improved past) \$ TOTAL \$576,000	705 2144 712 6774 \$560,000

NO	TENURE	RUN NO	PH NAME AREA	STATION NAME	RPD LOT OR PLAT	LESSEE	CARRYING				CAPACITY		LIVING AREA TICS PROPERTY	PERCENT % OF LIVING AREA	LAST ASSESSMENT DATE	APPROX VALUE OF IMPROVEMENTS	VAL NO & DV VAL 31/3/99		
							LEASE CURRENT		POTENTIAL		RATE	TOTAL						RATE	TOTAL
							RATE	TOTAL	RATE	TOTAL									
104	P.H.	14/5422 File Ref 5817	Palmerville 13600 ha	Palmerville	1 on CF 10	AG Wilson	1-55	2473	1-55	2473	1-55	2473	3500-4000 head	70%	1984	Structures \$ 9,000 Yards \$ 10,000 Fencing \$ 47,000 Water \$ 20,600 Timber Treat. (improved past) \$ 23,500 TOTAL \$108,100	705 2147 \$96,000		
106	S.L.	14/1183 File Ref 7468	 19700 ha	Kanai Waters	1 on CF 14	A & J Pedersen	1-100	197	1-100	197	1-100	197	3000-3500 head	7%	1988	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. (improved past) \$ TOTAL \$	705 1834/5 712 6723 \$4,900		
107	S.L.	15/51679 File Ref 5845	 100 ha arable	Port Maitland Downs	3 on CF 16	G & J Ahlers	1-55	91	1-55	91	1-55	91	3000-3500 head	3%	1985	Structures \$ Yards \$ Fencing \$ Water \$ 7,300 Timber Treat. (improved past) \$ TOTAL \$ 7,300	705 2139 \$6,000		
108	P.H.	14/3113	Maitland Downs 70900 ha	Maitland Downs	113 on CF 16	G & J Ahlers	1-55	1278	1-50	1406	1-50	1406	3000-3500 head	47%	1985	Structures \$108,000 Yards \$ 24,000 Fencing \$ 39,500 Water \$ 62,300 Timber Treat. (improved past) \$ 70,000 TOTAL \$303,800	705 2139 712 6772 \$58,000		
109	P.H.	14/4646 File Ref 7771	Mount Gibson 3500 ha		4546 on PH 1514	K & B Robson	1-85	412	1-85	412	1-85	412	3000-3500 head	14%	1978	Structures \$ 2,900 Yards \$ Fencing \$ Water \$ 6,000 Timber Treat. (improved past) \$ TOTAL \$ 8,900	705 2142 \$21,000		
110	S.L.	14/46344 File Ref 6004	 19100 ha		1 on CF 9	Nairobi Holdings P/L	1-80	238	1-80	238	1-80	238	3000-3500 head	8%	1991	Structures \$ 37,400 Yards \$ Fencing \$ Water \$ 10,000 Timber Treat. (improved past) \$ TOTAL \$ 67,400	705 2094 712 6724 \$22,600		
111	D.L.	570 File Ref 7712	 9842 ha		570 on DL 059	N Simms	1-85	116	1-85	116	1-85	116	3000-3500 head	4%	Pre 1982	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. (improved past) \$ TOTAL \$	705 2174 712 4000 \$18,400		
112	P.H.	09/4355 File Ref 7691	Diggers Creek 6475 ha		4555 on PH 2083	TM Fiske	1-85	76	1-85	76	1-85	76	3000-3500 head	3%	1981	Structures \$Nil Yards \$ Fencing \$ Water \$ Timber Treat. (improved past) \$ TOTAL \$	705 2118 707 4002 \$18,200		

Appendix 5.1

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

Equation Number : Dependent Variable.. CATNOS

Block Number: 1. Method: Enter TIME

Variable(s) Entered on Step Number

1.. TIME

Multiple R .25135
 R Square .06317
 Adjusted R Square .04960
 Standard Error 1375.72703

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	8806406.85124	8806406.85124
Residual	69	130591116.13467	1892624.87152

F = 4.68301 Sig. F = .0345

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
TIME	17.154842	7.966700	.251346	2.157	.0345
(Constant)	1643.331590	330.017594		4.980	.0000

End Block Number 1 All requested variables entered.

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable PRICE

Block Number 1 Method: Enter TIME

Variable(s) Entered on Step Number

1. TIME

Multiple R .16113
 R Square .02596
 Adjusted R Square .01185
 Standard Error 9.14780

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	153.91255	153.91255
Residual	69	5774.07894	83.68230

F = 1.83925 Sig. F = .1795

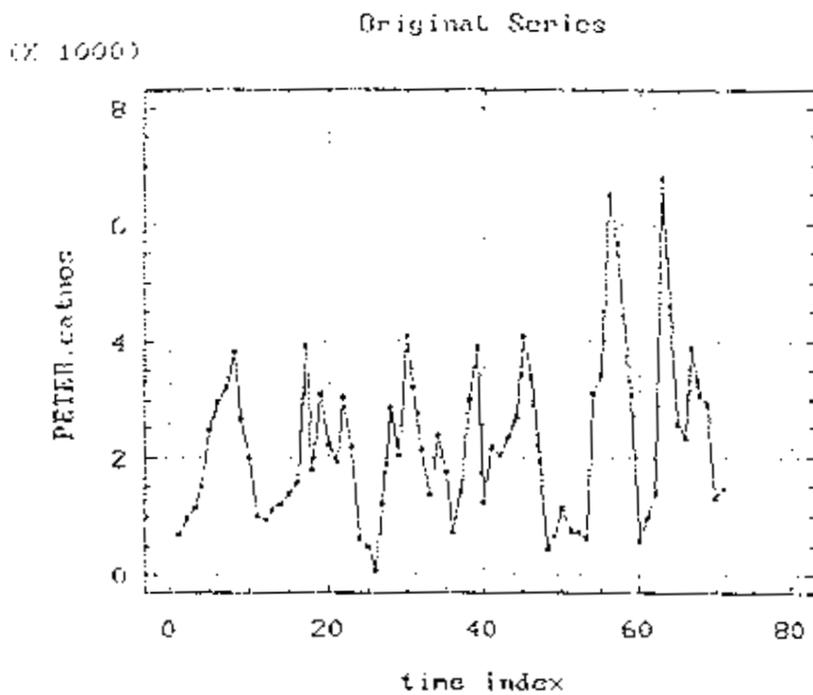
----- -- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
TIME	.071843	.052974	-.161133	-1.356	.1795
(Constant)	95.103425	2.194430		43.339	.0000

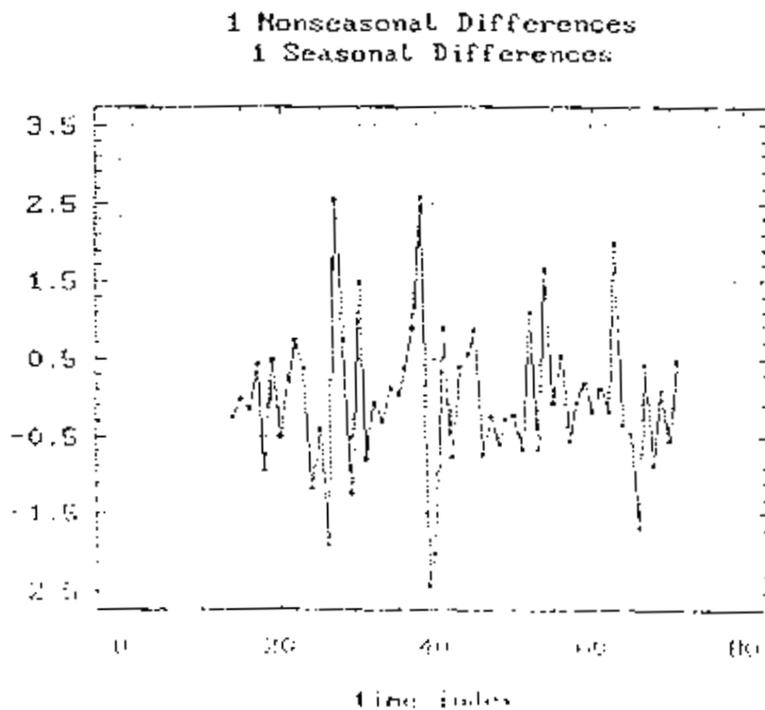
End Block Number 1 All requested variables entered.

FORECASTING MODEL FOR CATNOS

A plot of the data is shown below:



Due to noticeable trend, seasonality and increasing variance, a log function was undertaken with both non seasonal differencing and seasonal differencing. The resulting plot becomes:

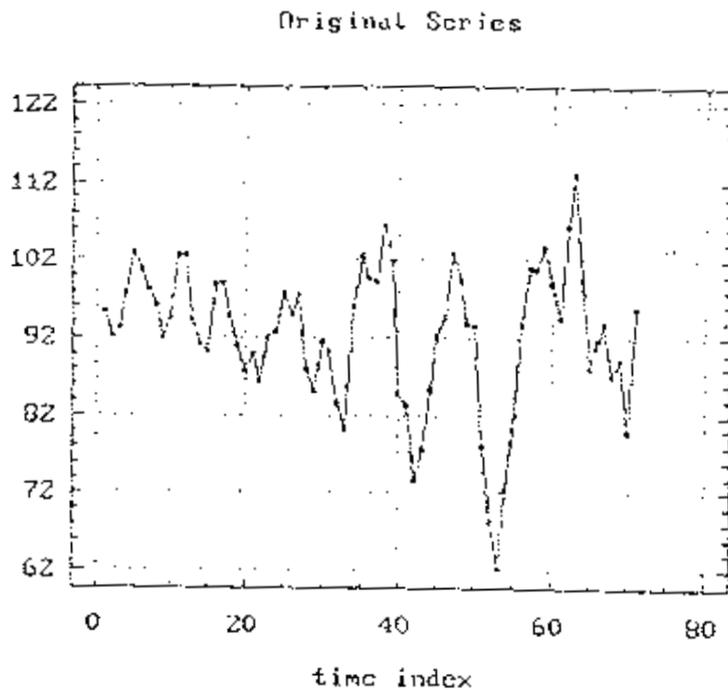




(20,1)	2241.88	(69,1)	775.56	(118,1)	94.405
(21,1)	2636.79	(70,1)	707.395	(119,1)	81.1345
(22,1)	2411.59	(71,1)	600.818	(120,1)	54.0485
(23,1)	2453.88	(72,1)	413.942		
(24,1)	1519.24	(73,1)	130.955		
(25,1)	418.864	(74,1)	183.283		
(26,1)	613.824	(75,1)	190.545		
(27,1)	726.787	(76,1)	399.172		
(28,1)	1678.93	(77,1)	321.621		
(29,1)	1332.15	(78,1)	346.816		
(30,1)	1216.22	(79,1)	445.088		
(31,1)	1643.98	(80,1)	507.437		
(32,1)	2052.08	(81,1)	494.179		
(33,1)	2044.6	(82,1)	450.47		
(34,1)	1887.89	(83,1)	390.698		
(35,1)	1399.67	(84,1)	264.814		
(36,1)	1075.73	(85,1)	84.8283		
(37,1)	360.669	(86,1)	117.673		
(38,1)	508.927	(87,1)	120.991		
(39,1)	512.051	(88,1)	241.354		
(40,1)	1155.5	(89,1)	195.435		
(41,1)	939.373	(90,1)	215.083		
(42,1)	1070.49	(91,1)	282.777		
(43,1)	1277	(92,1)	316.422		
(44,1)	1465.87	(93,1)	311.77		
(45,1)	1388.55	(94,1)	282.539		
(46,1)	1290.09	(95,1)	250.361		
(47,1)	1173.31	(96,1)	165.838		
(48,1)	793.546	(97,1)	51.9046		
(49,1)	265.137	(98,1)	71.9239		
(50,1)	369.825	(99,1)	74.7041		
(51,1)	380.361	(100,1)	149.093		
(52,1)	717.235	(101,1)	119.82		
(53,1)	597.238	(102,1)	128.473		
(54,1)	694.267	(103,1)	169.634		
(55,1)	964.724	(104,1)	190.517		
(56,1)	1068.42	(105,1)	187.453		
(57,1)	1092.55	(106,1)	169		
(58,1)	1090.98	(107,1)	146.113		
(59,1)	938.203	(108,1)	97.5491		
(60,1)	610.578	(109,1)	30.4369		
(61,1)	188.647	(110,1)	-42.0102		
(62,1)	215.313	(111,1)	-43.2994		
(63,1)	185.029	(112,1)	87.3529		
(64,1)	880.313	(113,1)	69.7383		
(65,1)	470.366	(114,1)	74.4638		
(66,1)	494.287	(115,1)	96.4109		
(67,1)	671.229	(116,1)	108.648		
(68,1)	773.521	(117,1)	105.074		

FORECASTS OF PRICE MODEL

A plot of the data is shown below:



There would appear to be seasonal influences, slight trend and increasing variance. However, analysis of the trend component shows that the trend is insignificant (supported by regression analysis) and that the seasonal influence is not strong enough to model. This was confirmed by running a sequence of alternative models where trend and seasonal models all performed worse than simple exponential smoothing models (which assume no trend or seasonality).

Hence, we undertook only logs of the data to remove the increasing variance.

Analysing a non seasonal ARIMA model, we derived the following model:

 Summary of Fitted Model for: LOG PETER price

Parameter	Estimate	Std.error	T-value	P-value
AR (1)	.99929	.11538	8.66190	.00000
AR (2)	-.37564	.11727	-3.20316	.00207
MEAN	4.52565	.02142	211.24845	.00000
CONSTANT	1.70321			

 Estimated white noise variance = 4.66728E-3 with 68 degrees of freedom.

Estimated white noise standard deviation (std err) = 0.0683175

Chi-square test statistic on first 20 residual autocorrelations = 13.235

with probability of a larger value given white noise = 0.720317

Backforecasting: yes

Number of iterations performed: 2

Final model is simply (2 0 0) (0 0 0)¹²

It is interesting to note that forecasts, using this model, remain constant after period 24 i.e. after 2 years. Forecasts for next 24 periods are :

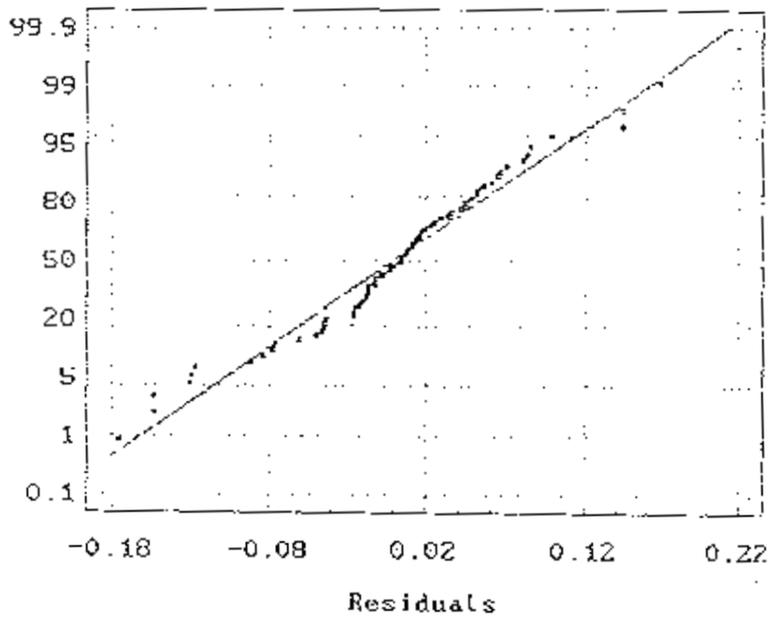
(1,1) 101.27
 (2,1) 99.8417
 (3,1) 96.4398
 (4,1) 93.6547
 (5,1) 92.144
 (6,1) 91.6622
 (7,1) 91.742
 (8,1) 92.0027
 (9,1) 92.2339
 (10,1) 92.367
 (11,1) 92.413
 (12,1) 92.4089
 (13,1) 92.3876
 (14,1) 92.3678
 (15,1) 92.356
 (16,1) 92.3517
 (17,1) 92.3518
 (18,1) 92.3535
 (19,1) 92.3552
 (20,1) 92.3563
 (21,1) 92.3567
 (22,1) 92.3567
 (23,1) 92.3565
 (24,1) 92.3564
 (25,1) 92.3563
 (26,1) 92.3563
 (27,1) 92.3563

(28,1) 92.3563
(29,1) 92.3563
(30,1) 92.3563
(31,1) 92.3563
(32,1) 92.3563
(33,1) 92.3563
(34,1) 92.3563
(35,1) 92.3563
(36,1) 92.3563

All forecasts following period 24 remain at 92.3563

A normal probability plot of our residuals, shown below, shows that this model has performed well on the randomness of residuals criteria.

Normal Probability Plot



Appendix 6.1

CATTLE PROPERTY CASE STUDIES

In an attempt to portray an understanding of the managerial, financial, physical and attitudinal aspects of cattle production on Cape York Peninsula cattle properties, three properties are selected for detailed study. These properties are private, family owned and operated properties. Their cooperation is appreciated and anonymity must be respected.

Case Study A

Family property - children past school age.

Neighbouring National Park and other unused land.

Area: 126,609

Rainfall: 1050 mm annually.

Distance to Mareeba Sale Yards: 364 km

Estimated Herd Profile:

Class	Number	Loss/Death %	Number Lost	Branding Rate
Calves/Weaners	668	4	28	
Heifers 1 yr	320	7	22	
Heifers 2 yrs	298	16	48	45%
Cows 3-10 yrs	1,250	15	85	45%
Steers 1 yr	320	7	22	
Steers 2 yrs	298	10	30	
Bullocks 3 yrs	80	10	8	
Bullocks 4 yrs	20	10	2	
Bullocks 5 yrs	9	10	1	
Herd Bulls	64	10	6	
Total	3,326		352	

Annual loss/death as percentage of herd

Current stocking rate 38 ha/beast.

Sales (Annual):

Class	Number	Price (Nett after selling costs)	Gross
Cows	63	\$162/head	\$10,206
Steers 2 yrs	207	\$204/head	\$42,228
Bullocks 3 yrs	58	\$310/head	\$17,980
Bullocks 4 yrs	10	\$417/head	\$ 4,170
Bullocks 5 yrs	9	\$524/head	\$ 4,716
Herd Bulls	2	\$400/head	\$ 400
Total	349		\$80,100
Purchases - 10 bulls, \$600/head			\$ 6,000
Sales less purchases			<u>\$74,100</u>

Operating Costs:

(a) Variable Costs per beast

This includes supplements, inoculations, growth promotants etc.

Weaners	\$2.60	
Other cattle	\$1.40	
Total herd variable costs		\$ <u>4,983</u>

(b) Fixed Costs

Horse feed etc	\$5,400	Fuel & Lubes	\$ 9,880
Gas/Avgas	\$2,500	Wages	\$ 3,200
Mustering Contracts	\$9,650	Insurance	\$ 1,360
Water	\$ 477	Qld. Transport	\$ 1,443
Protective Clothing	\$ 650	Repairs & Maintenance	\$ 5,120
Royalties	\$1,910	Saddlery	\$ 935
Poisons	\$ 110	Accountancy	\$ 825
Donations	\$ 120	Rates & Rents	\$ 4,800
Subscriptions	\$ 96	Telephone	\$ 1,164
Workers Compensation\$	572	Bank Charges	\$ 250
		Sundries	<u>\$11,729</u>
		Total	\$62,306
		Total Annual Operating Costs	<u>\$67,289</u>

Funds available for living, debt service, property development etc \$11,794

Marketing costs at Mareeba sale yard per steer (300 kg)

Contract cartage	\$25/hd
Yard fees, commission etc	\$25/hd
Total	<u>\$50/hd</u>

Discussion:

The scenario outlined in this management system has attributes which, to varying degrees, are representative of most of the older surviving family properties in Cape York Peninsula.

This is survival rather than production management. In most years the operating costs are kept equal to the income by, if necessary, reducing the operating costs.

Off-property income, eg. contract fencing, cattle cartage, sleeper cutting etc, is used to maintain a basic living standard.

Cattle are often missed during muster. This leads to a few aged male cattle and 'clean skills' being turned off.

Property development, housing improvement, new vehicles etc are only undertaken when cattle prices and gross returns are favourable.

In years of low cattle prices, cattle are withheld from market.

Cattle husbandry costs are reduced by neighbouring families working together.

Stocking rates are low, 1 head/38 ha.

Efficiency of turn-off is low at 10.6% of total herd.

The system is financially secure provided there is little regular financial commitment such as loan repayment.

Environmentally, this is a very sensitive system. The low stocking rate and land management through burning is responsible for the lack of land degradation in Cape York Peninsula.

This management system provides a self-sufficient lifestyle which contributes to the wider community through cattle turn-off, operating costs and free land management.

The system cannot be maintained. There is insufficient funds to provide for the retirement of older family members or to allow one sibling to purchase another's share in the property.

Case Study B

Family owned and run property. School aged children.

Property - neighbours, National Parks and other unused land.

Property is in early stages of complementing a phosphorus supplementation program.

Area of lease: 26,842 ha

Rainfall: 1,100 mm per annum.

Distance to Mareeba sale yards 502 km.

Distance to Weipa: 255 km.

Estimated Herd Profile:

Class	Number	Death/Loss Rate	Number Lost	Branding Rate
Weaners	550	10%	5	
Heifers 1 yr	248	5%	12	
Heifers 2 yrs	214	12%	26	25%
Cows 3-6 yrs	624	10%	82	60%
Cows 7-8 yrs	220	12%	26	50%
Cows 9+ yrs	222	20%	44	40%
Spayed Cows	31	2%	1	
Steers 1 yr	242	3%	7	
Steers 2 yrs	235	3%	7	
Bullocks 3 yrs	228	3%	7	
Bullocks 4 yrs	216	3%	6	
Bullocks 5 yrs	205	3%	6	
Bulls	43			
Total	<u>3,279</u>		<u>259</u>	

Annual death/loss as percentage of herd 7.9%

Current stocking rate 8.18 ha/beast

Sales (Annual)

Class	Number	Price	Gross
Cows 10 yrs	73	\$180.00/hd	13,140
Cows 11+ yrs	58	\$100.00/hd	5,800
Spayed Cows	11	\$215.00/hd	2,365
Bullocks 3 yrs	5	\$220.00/hd	1,100
Bullocks 4 yrs	5	\$275.00/hd	1,375
Bullocks 5 yrs	205	\$350.00/hd	71,750
Herd Bulls	6	\$400.00/hd	2,400
	363		\$97,925

Purchases: 5 bulls @ \$2,000/hd \$10,000

Sales less purchases \$87,925

Operating Costs

(a) Variable costs per head

Herd average \$8.92

Total variable costs \$26,055

(b) Fixed Costs

Fuel	\$ 7,000	Rates/Rent	\$ 5,000
Wages	\$15,000	Compensation	\$ 500
Insurance	\$ 2,000	Accounting	\$ 1,200
Repairs & Maintenance	\$ 2,000	Education	\$20,000
Total fixed costs	<u>\$56,280</u>		
Total operating costs	<u>\$82,335</u>		

Funds available for living, debt services etc\$5,000

Discussion:

Compared to Case Study A, the selling prices for stock are much lower. This is a reflection of the increased distance from markets, price fluctuations at Mareeba sale yards, and the unreliable road access restricting the selling periods.

The production benefits from the supplementation program are not yet apparent in the herd. The turn-off, 11% of herd, is very low.

The ability of this property to continue its phosphorus supplementation program is dependent upon an improved cash flow.

The straying of cattle onto unmustered neighbouring land and lease insecurity through the lack of agreement of the impending lease renewal, place extra pressures on this property.

The carrying rate at 8 ha/beat is too high for this class of country. Part of the herd must be grazing on unfenced neighbouring lands.

This situation is not regarded as exceptional on Cape York Peninsula. Historically, the grazing community has placed more importance on a producer's ability and commitment to manage his cattle rather than containing them inside unfenced boundaries. This attitude or custom has been necessary for individual independence and the survival of the industry.

The acquisition of land for non-grazing interests is in conflict with this custom. The producing properties which are disadvantaged by this changed attitude to land use or land ownership sequence compensation through boundary changes which include additional land in the grazing lease.

Sensitivity to Potential Market Options

The market options for the property used in Case Study B would change with an improvement of the access road to southern abattoirs or the development of a live cattle export market through Weipa.

The sale prices from Case Study A are used to represent an improvement in road access.

The live export market is represented by the sale of 2 yr steers for \$335/head.

Using BCOWSPAY - Steady State Herd Model (W. Holmes), the gross margins and return per beast (adult equivalent) are compared.

Sale Price Comparisons:

	Case Study B		Case Study A		Export (Weipa)
	2 yrs	5 yrs	2 yrs	5 yrs	2 yrs
Age (male)					
Sale Price	\$ 150	\$ 345	\$ 204	\$ 510	\$ 335
Gross Margin	\$21,584	\$49,864	\$37,802	\$85,464	\$69,000
\$/beast (AE)	\$ 7.01	\$ 12.27	\$ 11.23	\$ 27.75	\$ 22.40

Discussion:

With the current situation the development of an export market at Weipa gives this property a considerably increased income.

If the road to the southern markets were upgraded to the stage where market options were improved, the financial advantage could be in favour of marketing older cattle to southern markets.

The advantage to marketing older cattle is relatively common to breeding properties in north Australia with low branding rates and high mortality rates.

Potential for Improved Carrying Capacity

The agricultural land suitability mapping and classification undertaken for CYPLUS by the Queensland Department of Primary Industries provides a base for estimating a potential carrying capacity for Cape York Peninsula. Because of the scale of mapping there are limitations in accuracy when this is applied to individual properties.

In this estimation the pasture suitability classes are included at their most productive pasture class. The stocking rates from each class are taken from the Queensland Department of Primary Industries publication 'Sown Pastures for the Seasonally Dry Tropics'.

Case Study A

Carrying Capacity Potential Land Suitability	Area (ha)	Stocking Rate (ha/hd)	Stock Number
Low Input Sown Pasture	used in higher class		
Medium Input Sown Pasture	4,500	3	1,500
High Input Sown Pasture	23,791	2	11,895
Native Pasture	98,217	38	2,584
Total	126,508		15,979

Discussion:

This property is currently carrying about 3,000 head. Therefore there is a potential for a five fold increase in stocking rate.

Because of the low soil phosphorus level, large areas of this property are down graded to native pasture only class. In a different economic climate this classification could change.

This data clearly demonstrates that a relatively small amount of improved pasture can have a vast impact on production.

SRE21003A - Steady State Herd Model - Version 1.00

Name: Bankers, Accountants, Agents workshop 2

Date:

Compiled by K.E. Holmes, D.P.I., Townsville, Qld.

ACMI:

SECTION A: CALVING AND DEATH RATE ASSUMPTIONS

Cattle age start year	Calves	1	2	3	4	5	6	7	8	9	10
Cattle age end year	1	2	3	4	5	6	7	8	9	10	11
Branding rate	na	0.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%	45.0%
Female death rate	7.0%	5.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
Male death rate	7.0%	5.5%	5.5%	5.5%	5.5%	5.5%	No entries allowed for bullocks over 6 yrs				

Note 1: Deaths calves to 1 yr are deaths from branding to age 1 year

Branding 2 to 3 yrs is branding from 2 yr old mating etc.

SECTION B: SALE PRICES

Cattle age at sale	Calves	1	2	3	4	5	6	7	8	9	10	11
Heifers/cows	\$75	\$175	\$250	\$285	\$305	\$305	\$305	\$305	\$305	\$290	\$275	\$260
Stags/bullocks ..	\$75	\$250	\$310	\$450	\$490	\$510	\$550	No entries allowed for bullocks over 6 yrs				

Note 2: All prices are to be net of selling and freight costs.

SECTION C: FEMALE HERD STRUCTURE

One year old heifers to be retained	207	(Enter 207.01									
Age at first joining (1 or 2 yrs)	2	to give required									
Cow culling age (integer only, max 11 years)	11	number of AEs)									
Required herd size (Adult Equivalents)	2278										
Cow age start year	1	2	3	4	5	6	7	8	9	10	
Cow age end year	2	3	4	5	6	7	8	9	10	11	
Cows/heifers available start year ..	209	197	167	140	119	101	86	73	62	53	
Optional sales % start year cows ...	na	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Cows sold start year	2	0	0	0	0	0	0	0	0	0	
Cows joined in each age group	0	197	167	140	119	101	86	73	62	53	
Calves branded from each group	0	88	75	63	54	46	39	33	28	24	
Cows and heifers sold	47	Cow sales/total sales		20.73%	Average female price		\$256.33				
Surplus heifers culled 1 yr	2	Heifer culling %		1.05%							
Cows and heifers mated	1000	Calves/cows mated %		45.00%							
Calves branded	450	Calves/cows surviving		53.05%							
Breeder deaths	152	Breeder deaths %		15.17%							

Note 4: If heifer culling rate is negative, optional sales must be reduced, or cow culling age increased.

METHOD OF CALCULATION OF GROSS MARGINS

	\$/Herd	\$/Beast	\$/E		Capital Value of Herd (ex sales)	\$/Herd
Net cattle sales	\$94219	\$42.29	54.5%		Value of females and calves	\$358236
Direct costs excl. bulls ..	\$15669	\$7.03	15.2%		Value of steers and bullocks	\$171627
Bull replac. & husbandry ..	\$9317	\$4.18	14.0%		Value of bulls 2 years and older ...	\$47114
Cattle Gross Margin	\$69233	\$31.07	73.3%		Total	\$577177
Cattle GM after interest ..	\$39320	\$17.60	\$17.22		Interest on herd capital @ 5.20%	\$30010
	Run	Run	Run	Run	Run	Run
	Turnoff	Turnoff	Turnoff	Turnoff	Turnoff	Turnoff
Total adult equivalents	2278	2278	2278	2278	2278	2278
Total cattle carried	2213	2220	2225	2226	2227	2228
One year old heifers retained	268	240	220	214	210	220
Total cows and heifers mated	1296	1159	1064	1033	1013	1000
Total calves branded	593	521	479	465	456	473
Calves/cows mated %	45.00%	45.00%	45.00%	45.00%	45.00%	45.00%
Calves/cows surviving %	53.05%	53.05%	53.05%	53.05%	53.05%	53.05%
Overall breeder deaths %	15.17%	15.17%	15.17%	15.17%	15.17%	15.17%
Female sales/total sales %	18.41%	19.28%	20.06%	20.38%	20.59%	20.73%
Total cows and heifers sold	61	55	50	49	48	50
Maximum cow culling age	11	11	11	11	11	11
Heifer joining age	2	2	2	2	2	2
One yr old heifer sales and spay % ..	1.05%	1.05%	1.05%	1.05%	1.05%	1.05%
Two yr old heifer sales and spay % ..	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total steers and bullocks sold	271	229	200	191	184	197
Maximum bullock turnoff age	1	2	3	4	5	6
Average female price	\$256.03	\$256.03	\$256.03	\$256.03	\$256.03	\$267.39
Average steer/bullock price	\$250.00	\$210.00	\$432.25	\$445.47	\$449.40	\$454.90
Capital value of herd	\$525624	\$520293	\$544593	\$558920	\$569699	\$577179
Net cattle sales	\$83499	\$85025	\$99456	\$97379	\$95140	\$94219
Direct costs excluding bulls	\$15644	\$15763	\$15707	\$15689	\$15677	\$15669
Bull replacement and husbandry	\$12001	\$10796	\$9918	\$9622	\$9436	\$9317
Gross margin for herd	\$55574	\$58467	\$73832	\$72068	\$70038	\$69233
Gross margin per adult equivalent ..	\$24.40	\$25.67	\$32.41	\$31.64	\$30.74	\$30.39
Imputed interest on herd capital % ..	5.20%	5.20%	5.20%	5.20%	5.20%	5.20%
GM/AE after imputed interest	\$12.40	\$13.56	\$19.99	\$18.80	\$17.74	\$17.22

Compiled by N.E. Holmes, D.P.L., Townsville, Qld.

SECTION A: CALVING AND DEATH RATE ASSUMPTIONS

Cattle age start year	Calves	1	2	3	4	5	6	7	8	9	10
Cattle age end year	1	2	3	4	5	6	7	8	9	10	11
Branding rate	na	0.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Female death rate	3.5%	3.5%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	6.0%	8.0%
Male death rate	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	No entries allowed for bullocks over 6 yrs				

Note 2: Deaths calves to 1 yr are deaths from branding to age 1 year
 Branding 2 to 3 yrs is branding from 2 yr old mating etc.

SECTION B: SALE PRICES

Cattle age at sale	Calves	1	2	3	4	5	6	7	8	9	10	11
Heifers/cows	\$75	\$165	\$265	\$305	\$320	\$320	\$320	\$320	\$320	\$320	\$295	\$295
Breeders/bullocks	\$75	\$270	\$250	\$500	\$530	\$560	\$590	No entries allowed for bullocks over 6 yrs				

Note 3: All prices are to be net of selling and freight costs.

SECTION C: FEMALE HERD STRUCTURE

One year old heifers to be retained 258 (Enter 258.45
 Age at first joining (1 or 2 yrs) 2 to give required
 Cow culling age (integer only, max 11 years) 11 number of AEs
 Required herd size (Adult Equivalents) 2278

Cow age start year	1	2	3	4	5	6	7	8	9	10	11
Cow age end year	2	3	4	5	6	7	8	9	10	11	12
Cows/heifers available start year	259	249	229	87	80	74	68	62	57	53	
Optional sales % start year cows	na	0.00%	58.86%	0.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cows sold start year	0	0	135	0	0	0	0	0	0	0	0
Cows joined in each age group	0	249	95	87	80	74	68	62	57	53	
Calves branded from each group	0	162	61	57	52	48	44	40	37	34	

Cows and heifers sold	184	Cow sales/total sales	43.80%	Average female price	\$299.28
Surplus heifers culled 1 yr	0	Heifer culling %	0.07%		
Cows and heifers mated	825	Calves/cows mated %	65.00%		
Calves branded	596	Calves/cows surviving	70.65%		
Breeder deaths	66	Breeder deaths %	0.00%		

Note 4: If heifer culling rate is negative, optional sales must be reduced, or cow culling age increased.

SECTION B: CALCULATION OF GROSS MARGINS

	\$/Herd	<i>1000 head</i> \$/Beast	\$/A.E.	Capital Value of Herd (ex sales)	\$ Total
Net cattle sales	\$173141	\$74.65	\$76.61	Value of females and calves	\$335433
Direct costs excl. bulls ..	\$36489	\$15.73	\$16.02	Value of steers and bullocks	\$241891
Bull replect. & husbandry ..	\$8171	\$3.52	\$3.59	Value of bulls 2 years and older ...	\$38857
Cattle Gross Margin	\$128481	\$55.40	\$56.40	Total	\$615381
Cattle GM after Interest ..	\$96481	\$41.60	\$42.35	Interest on herd capital @ 5.20%	\$32800

	Run Turnoff	Run Turnoff	Run Turnoff	Run Turnoff	Run Turnoff	Run Turnoff	Run MaxGM
Total adult equivalents	2278	2278	2278	2278	2278	2278	2278
Total cattle carried	2326	2328	2323	2321	2328	2319	2322
One year old heifers retained	364	314	381	270	263	258	277
Total cows and heifers mated	1160	1000	896	861	839	825	883
Total calves branded	754	650	582	564	545	536	574
Calves/cows mated %	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%
Calves/cows surviving %	70.65%	70.65%	70.65%	70.65%	70.65%	70.65%	70.65%
Overall breeder deaths %	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Female sales/total sales %	41.52%	42.39%	43.15%	43.45%	43.66%	43.80%	43.26%
Total cows and heifers sold	258	223	199	192	187	184	197
Maximum cow culling age	11	11	11	11	11	11	6
Heifer joining age	2	2	2	2	2	2	2
One yr old heifer sales and spay % ..	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.00%
Two yr old heifer sales and spay % ..	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total steers and bullocks sold	364	303	263	249	241	236	258
Maximum bullock turnoff age	1	2	3	4	5	6	7
Average female price	\$298.28	\$298.28	\$298.28	\$298.28	\$298.28	\$298.28	\$329.00
Average steer/bullock price	\$270.00	\$350.00	\$481.43	\$491.47	\$498.14	\$502.54	\$508.00
Capital value of herd	\$526626	\$528807	\$565875	\$588141	\$603975	\$615381	\$568354
Net cattle sales	\$175201	\$172413	\$185866	\$179754	\$175764	\$173141	\$191850
Direct costs excluding bulls	\$39964	\$38318	\$37225	\$36885	\$36637	\$36489	\$37893
Bull replacement and husbandry	\$11496	\$9913	\$8875	\$8330	\$8312	\$8171	\$8749
Gross margin for herd	\$128481	\$124191	\$139866	\$134369	\$129815	\$128481	\$146008
Gross margin per adult equivalent ..	\$54.36	\$54.52	\$61.43	\$58.98	\$57.43	\$56.40	\$64.69
Imputed interest on herd capital % ..	5.20%	5.20%	5.20%	5.20%	5.20%	5.20%	5.20%
GM/AE after imputed interest	\$42.34	\$42.22	\$48.48	\$45.56	\$43.64	\$42.35	\$51.12

April 15, 1996

DECISION TABLE 7 - HERD DEVELOPMENT AND TURNOFF FROM START

Start of Year Description	1995	1995	1995	1995	1995	1996	1996	1996	1996	1996
	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	537	na	na	na	na	536
Heifer calves/weaners	225	0	na	0	217	269	0	na	0	259
Heifers 1 yr	213	0	0	0	205	217	0	0	0	209
Heifers 2 yrs	200	0	0	0	180	205	0	0	0	189
Cows 3 yrs	173	0	0	0	156	190	0	0	55	167
Cows 4 yrs	147	0	0	0	132	156	0	0	0	143
Cows 5 yrs	124	0	0	0	111	132	0	0	0	122
Cows 6 yrs	105	0	0	0	95	111	0	0	30	74
Cows 7 yrs	89	0	0	0	88	95	0	0	27	62
Cows 8 yrs	76	0	0	0	68	89	0	0	19	57
Cows 9 yrs	65	0	0	0	58	68	0	0	11	55
Cows 10 yrs	55	0	0	0	49	58	0	0	5	49
Cows 11 yrs and over	47	0	0	47	0	49	0	0	49	0
Grayed cows	0	na	na	0	0	0	na	na	0	0
Male calves/weaners	225	0	na	0	217	269	0	na	0	259
Steers 1 yr old	213	0	na	0	205	217	0	na	0	209
Steers 2 yrs	200	0	na	24	170	205	0	na	25	174
Bullocks 3 yrs	166	0	na	100	64	170	0	na	102	65
Bullocks 4 yrs	63	0	na	19	42	64	0	na	19	43
Bullocks 5 yrs	42	na	na	12	28	42	na	na	13	29
Bullocks 6 yrs +	27	na	na	27	0	28	na	na	28	0
Heid bulls	49	13	na	10	51	51	5	na	11	45
BYO bulls retained @ 2	0	na	na	na	na	0	na	na	na	na
Total Cattle	2502	13	0	239	2666	2666	5	0	423	2665
Cows mated	1833					Cows mated	908			
Branding rate	52.00%					Branding rate	59.00%			
Bulls required	52					Bulls required	45			
Bull/cow ratio	5.90%					Bull/cow ratio	5.90%			
Bull purchase % bulls required	22.50%					Bull purchase % bulls required	22.50%			
BYO retention % bulls required	0.38%					BYO retention % bulls required	0.00%			
Bull death rate	2.00%					Bull death rate	2.00%			
Minimum sales of opening bulls	20.92%					Minimum sales of opening bulls	20.92%			

Heid Summary

DECISION TABLE 7 - HERD DEVELOPMENT AND TURNOFF FROM START

Start of Year Description	1997					1998				
	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	536	na	na	na	na	536
Heifer calves/weaners	268	0	na	0	259	268	0	na	0	259
Heifers 1 yr	259	0	0	0	250	259	0	0	0	249
Heifers 2 yrs	209	0	0	0	193	250	0	0	0	250
Cows 2 yrs	169	0	0	94	87	193	0	0	98	187
Cows 4 yrs	87	0	0	0	80	87	0	0	0	80
Cows 5 yrs	143	0	0	23	110	80	0	0	0	74
Cows 6 yrs	122	0	0	46	66	110	0	0	37	66
Cows 7 yrs	74	0	0	7	62	66	0	0	0	62
Cows 8 yrs	62	0	0	0	57	62	0	0	0	57
Cows 9 yrs	57	0	0	0	53	57	0	0	0	53
Cows 10 yrs	53	0	0	0	49	53	0	0	0	49
Cows 11 yrs and over	49	0	0	49	0	49	0	0	49	0
Spayed cows	0	na	na	0	0	0	na	na	0	0
Maia calves/weaners	268	0	na	0	259	268	0	na	0	259
Steers 1 yr old	259	0	na	0	250	259	0	na	0	250
Steers 2 yrs	209	0	na	25	178	250	0	na	30	212
Bullocks 3 yrs	174	0	na	105	67	178	0	na	107	69
Bullocks 4 yrs	65	0	na	20	44	67	0	na	20	45
Bullocks 5 yrs	43	na	na	13	29	44	na	na	13	30
Bullocks 6 yrs +	29	na	na	29	0	29	na	na	29	0
rand bulls	45	0	na	9	40	40	9	na	0	40
BYO bulls retained @ 2	0	na	na	na	na	0	na	na	na	na
Total Cattle	2665	0	0	421	2671	2671	9	0	392	2708

Cows mated	825	Cows mated	825
Branding rate	65.00%	Branding rate	65.00%
Bulls required	41	Bulls required	41
Bull/cow ratio	5.00%	Bull/cow ratio	5.00%
Bull purchase % bulls required	22.50%	Bull purchase % bulls required	22.50%
BYO retention % bulls required	0.00%	BYO retention % bulls required	0.00%
Bull death rate	2.00%	Bull death rate	2.00%
Minimum sales of opening bulls	20.92%	Minimum sales of opening bulls	20.92%

Herd Summary



EXHIBIT TABLE 7 - HERD DEVELOPMENT AND TURNOFF FROM START

April 15, 199

Start of Year Description	1999					2000				
	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	536	na	na	na	na	536
Heifer calves/weaners	268	0	na	0	259	268	0	na	0	259
Heifers 1 yr	259	0	0	0	249	259	0	0	0	250
Heifers 2 yrs	249	0	0	0	229	249	0	0	0	229
Cows 3 yrs	229	0	0	135	87	229	0	0	135	127
Cows 4 yrs	87	0	0	0	80	87	0	0	0	80
Cows 5 yrs	80	0	0	0	74	80	0	0	0	74
Cows 6 yrs	74	0	0	0	68	74	0	0	0	68
Cows 7 yrs	68	0	0	0	62	68	0	0	0	62
Cows 8 yrs	62	0	0	0	57	62	0	0	0	57
Cows 9 yrs	57	0	0	0	53	57	0	0	0	53
Cows 10 yrs	53	0	0	0	49	53	0	0	0	49
Cows 11 yrs and over	49	0	0	49	0	49	0	0	49	0
Spayed cows	0	na	na	0	0	0	na	na	0	0
Male calves/weaners	268	0	na	0	259	268	0	na	0	259
Stearns 1 yr old	259	0	na	0	250	259	0	na	0	250
Stearns 2 yrs	250	0	na	30	212	250	0	na	30	212
Bullocks 3 yrs	212	0	na	127	82	212	0	na	127	82
Bullocks 4 yrs	82	0	na	21	46	82	0	na	25	55
Bullocks 5 yrs	46	na	na	14	31	46	na	na	14	31
Bullocks 6 yrs +	30	na	na	30	0	31	na	na	31	0
Herb bulls	40	9	na	8	40	40	9	na	8	40
BYO bulls retained @ 2	0	na	na	na	na	0	na	na	na	na
Total Cattle	2708	9	0	414	2723	2723	9	0	418	2730
		Cows mated		825		Cows mated		825		
		Branding rate		65.00%		Branding rate		65.00%		
		Bulls required		41		Bulls required		41		
		Bull/cow ratio		5.00%		Bull/cow ratio		5.00%		
		Bull purchase % bulls required		22.50%		Bull purchase % bulls required		22.50%		
		BYO retention % bulls required		0.00%		BYO retention % bulls required		0.00%		
		Bull death rate		2.00%		Bull death rate		2.00%		
		Minimum sales of opening bulls		20.92%		Minimum sales of opening bulls		20.92%		

and Summary

April 15, 19

DESIGN TABLE 7 - HERD DEVELOPMENT AND TURNOFF FROM START

Start of Year Description	2003 Opening Numbers	2003 Purch (Enter)	2003 Spay (Enter)	2003 Sell (Enter)	2003 Closing Numbers
New calves	na	na	na	na	536
Heifer calves/weaners	268	0	na	0	259
Heifers 1 yr	259	0	0	0	250
Heifers 2 yrs	250	0	0	0	230
Cows 3 yrs	230	0	0	135	87
Cows 4 yrs	87	0	0	0	80
Cows 5 yrs	80	0	0	0	74
Cows 6 yrs	74	0	0	0	68
Cows 7 yrs	68	0	0	0	63
Cows 8 yrs	62	0	0	0	57
Cows 9 yrs	57	0	0	0	53
Cows 10 yrs	53	0	0	0	49
Cows 11 yrs and over	49	0	0	49	0
Spayed cows	0	na	na	0	0
Male calves/weaners	268	0	na	0	259
Heifers 1 yr old	259	0	na	0	250
Heifers 2 yrs	250	0	na	30	212
Bullocks 3 yrs	212	0	na	127	82
Bullocks 4 yrs	82	0	na	25	55
Bullocks 5 yrs	55	na	na	17	37
Bullocks 6 yrs +	37	na	na	37	0
Herd bulls	49	9	na	8	49
BYO bulls retained @ 2	0	na	na	na	na
Total Cattle	2739	9	0	428	2739

Cows mated	825
Branding rate	65.00%
Bulls required	41
Bull/cow ratio	5.00%
Bull purchase % bulls required	22.50%
BYO retention % bulls required	0.00%
Bull death rate	2.00%
Minimex sales of opening bulls	28.92%

Herd Summary

INCOME TABLE 9 - CASH FLOW BEFORE INTEREST

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	1993	1994	1995	1996	1997	1998	1999	2000
Cash flow from cattle trading	\$85233	\$85099	\$88327	\$159539	\$159061	\$146745	\$157133	\$159797
Capital disposals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sundry income	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Variable and fixed costs	\$71000	\$101144	\$92525	\$92077	\$91537	\$91075	\$92869	\$92192
Capital additions	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Family living expenses	\$15000	\$15000	\$15000	\$15000	\$15000	\$15000	\$15000	\$15000
Taxation paid on previous year's income ..	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Net cash flow available for debt service ..	(\$767)	(\$31046)	(\$19199)	\$52462	\$53324	\$29670	\$50064	\$52606
Land, plant & improvements value start yr.	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Depreciation estimate	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Land, plant and improvements value end yr.	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total debt at start of year	\$0	\$853	\$35488	\$60839	\$9319	(\$45106)	(\$87100)	(\$140594)
Total debt at end of year	\$853	\$35488	\$60839	\$9319	(\$45106)	(\$87100)	(\$140594)	(\$195629)
Net worth at start year	\$651229	\$655894	\$655862	\$678396	\$727559	\$783150	\$843155	\$904700
Net worth at end of year	\$655894	\$655862	\$678396	\$727559	\$783150	\$843155	\$904706	\$967621

	2001	2002	2003
Cash flow from cattle trading	\$161677	\$165336	\$166564
Capital disposals	\$0	\$0	\$0
Sundry income	\$0	\$0	\$0
Variable and fixed costs	\$92270	\$92270	\$92270
Capital additions	\$0	\$0	\$0
Family living expenses	\$15000	\$15000	\$15000
Taxation paid on previous year's income ..	\$0	\$0	\$0
Net cash flow available for debt service ..	\$54406	\$58066	\$59294
Land, plant & improvements value start yr.	\$0	\$0	\$0
Depreciation estimate	\$0	\$0	\$0
Land, plant and improvements value end yr.	\$0	\$0	\$0
Total debt at start of year	(\$198029)	(\$258747)	(\$324733)
Total debt at end of year	(\$258747)	(\$324733)	(\$393628)
Net worth at start year	\$967621	\$1031953	\$1100030
Net worth at end of year	\$1031953	\$1100030	\$1168938

no trailers

*

± 1993 TABLE 10

	1993				1994			
	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount
Term Loans								
Term loan 1	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 2	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 3	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Total term loans	\$0	\$0		\$0	\$0	\$0		\$0
		(Increase)				(Increase)		
Overdraft/stock fin. .	\$0	\$767	11.25%	\$0	\$853	\$21046	11.25%	\$3569
Cash surpluses	\$0	\$0	2.50%	\$0	\$0	\$0	2.50%	\$0
Net balances all loans	\$0	na	na	\$0	\$853	na	na	\$3569

LOANS TABLE 10

Term Loans	1995	1995	1995	1995	1996	1996	1996	1996
	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount
Term loan 1	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 2	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 3	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Total term loans	\$0	\$0		\$0	\$0	\$0		\$0
		(increase)				(increase)		
Overdraft/stock term	\$35488	\$19199	11.25%	\$6152	\$60839	\$0	11.25%	\$942
Cash surpluses	\$0	\$0	2.50%	\$0	\$0	\$52462	2.50%	\$0
Net balances all loans	\$35488	na	na	\$6152	\$60839	na	na	\$942

LOANS TABLE IV

	1997				1998			
	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount
Term Loans								
Term loan 1	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 2	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 3	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Total term loans	\$0	\$0		\$0	\$0	\$0		\$0
		(Increase)				(Increase)		
Overdraft/stock firm	\$9319	\$0	11.25%	\$0	\$0	\$0	11.25%	\$0
Cash surpluses	\$0	\$53324	2.50%	(\$100)	\$45105	\$39870	2.50%	(\$2124)
Net balances all loans	\$9319	na	na	(\$100)	(\$45105)	na	na	(\$2124)

LOANS TABLE 10

	1999				2000			
	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount
Term Loans								
Term loan 1	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 2	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 3	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Total term loans	\$0	\$0		\$0	\$0	\$0		\$0
		(Increase)				(Increase)		
Overdraft/stock firm	\$0	\$0	11.25%	\$0	\$0	\$0	11.25%	\$0
Cash surpluses	\$87108	\$50064	2.50%	\$3429	\$140594	\$52606	2.50%	\$4830
Net balances all loans	(\$87100)	na	na	(\$3429)	(\$140594)	na	na	(\$4830)

LOANS TABLE 10

Term Loans	2001	2001	2001	2001	2002	2002	2002	2002
	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount
Term loan 1	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 2	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Term loan 3	\$0	\$0	0.00%	\$0	\$0	\$0	0.00%	\$0
Total term loans	\$0	\$0		\$0	\$0	\$0		\$0
		(Increase)				(Increase)		
Overdraft/stock firm ..	\$0	\$0	11.25%	\$0	\$0	\$0	11.25%	\$0
Cash surpluses	\$198629	\$54486	2.50%	\$6311	\$258747	\$58066	2.50%	\$7929
Net balances all loans	(\$198629)	na	na	(\$6311)	(\$258747)	na	na	(\$7929)

EXAM. TABLE 15

	2002	2003	2003	2003
Term Loans	Opening Balance	Repayment Incl. Int.	Interest Rate	Interest Amount
Term loan 1	\$0	\$0	0.00%	\$0
Term loan 2	\$0	\$0	0.00%	\$0
Term loan 3	\$0	\$0	0.00%	\$0
Total term loans	\$0	\$0		\$0
		(Increase)		
Overdraft/stock fund	\$0	\$0	11.25%	\$0
Cash surpluses	\$324733	\$59294	2.50%	\$9661
Net balances all loans	(\$324733)	na	na	(\$9661)

EXHIBIT TABLE 1. HERD DEVELOPMENT AND TURNOFF FROM SCARS

April 15, 1996

Start of Year Description	1995					1996				
	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	457	na	na	na	na	471
Heifer calves/vealers	202	0	na	0	195	229	0	na	0	221
Heifers 1 yr	213	0	0	0	205	195	0	0	0	185
Heifers 2 yrs	200	0	0	0	190	205	0	0	0	185
Cows 3 yrs	173	0	0	55	106	180	0	0	54	115
Cows 4 yrs	101	0	0	0	93	106	0	0	0	96
Cows 5 yrs	124	0	0	0	111	93	0	0	0	85
Cows 6 yrs	105	0	0	0	95	111	0	0	30	74
Cows 7 yrs	89	0	0	0	80	95	0	0	27	62
Cows 8 yrs	76	0	0	0	66	80	0	0	18	57
Cows 9 yrs	65	0	0	0	58	66	0	0	11	50
Cows 10 yrs	55	0	0	55	0	58	0	0	58	0
Cows 11 yrs and over	0	0	0	0	0	0	0	0	0	0
Spayed cows	0	na	na	0	0	0	na	na	0	0
Male calves/vealers	202	0	na	0	195	229	0	na	0	221
Steers 1 yr old	213	0	na	0	205	195	0	na	0	189
Steers 2 yrs	200	0	na	24	174	205	0	na	25	174
Bullocks 3 yrs	166	0	na	100	64	170	0	na	102	65
Bullocks 4 yrs	83	0	na	19	42	64	0	na	19	43
Bullocks 5 yrs	42	na	na	12	28	42	na	na	13	29
Bullocks 6 yrs +	27	na	na	27	0	28	na	na	28	0
Heif bull	44	9	na	9	43	43	6	na	9	39
BYO bulls retained @ 2	0	na	na	na	na	0	na	na	na	na
Total Cattle	2359	9	0	302	2395	2395	6	0	294	2372
Cows mated						879				
Branding rate						52.00%				
Bulls required						44				
Bull/cow ratio						5.00%				
Bull purchase % bulls required						22.50%				
BYO retention % bulls required						0.00%				
Bull death rate						2.00%				
Minimum sales of opening bulls						20.92%				
Cows mated						798				
Branding rate						59.00%				
Bulls required						40				
Bull/cow ratio						5.00%				
Bull purchase % bulls required						22.50%				
BYO retention % bulls required						0.00%				
Bull death rate						2.00%				
Minimum sales of opening bulls						20.92%				

herd Summary

ANNUAL TABLE OF BYO DEVELOPEMENT AND TURNOFF FROM START

Start of Year Description	1997					1998				
	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	501	na	na	na	na	519
Heifer calves/vealers	235	0	na	0	227	250	0	na	0	242
Heifers 1 yr	221	0	0	0	213	227	0	0	0	219
Heifers 2 yrs	189	0	0	0	179	213	0	0	0	196
Cows 3 yrs	189	0	0	57	121	173	0	0	76	95
Cows 4 yrs	116	0	0	0	106	121	0	0	0	111
Cows 5 yrs	98	0	0	23	69	106	0	0	0	98
Cows 6 yrs	85	0	0	12	69	69	0	0	0	63
Cows 7 yrs	74	0	0	7	62	62	0	0	0	62
Cows 8 yrs	60	0	0	0	57	62	0	0	0	57
Cows 9 yrs	57	0	0	0	53	57	0	0	0	52
Cows 10 yrs	53	0	0	53	0	53	0	0	53	0
Cows 11 yrs and over	0	0	0	0	0	0	0	0	0	0
Spayed cows	0	na	na	0	0	0	na	na	0	0
Male calves/vealers	235	0	na	0	227	250	0	na	0	242
Sheers 1 yr old	221	0	na	0	213	227	0	na	0	219
Sheers 2 yrs	188	0	na	23	160	213	0	na	26	181
Bullocks 3 yrs	174	0	na	105	67	160	0	na	96	62
Bullocks 4 yrs	65	0	na	20	44	67	0	na	20	45
Bullocks 5 yrs	43	na	na	13	29	44	na	na	13	30
Bullocks 6 yrs +	29	na	na	29	0	29	na	na	29	0
Herd bulls	39	0	na	8	39	39	16	na	0	39
BYO bulls retained @ 2	0	na	na	na	na	0	na	na	na	na
Total Cattle	2372	0	0	348	2427	2427	16	0	315	2532

Cows mated	770	Cows mated	759
Branding rate	65.00%	Branding rate	65.00%
Bulls required	39	Bulls required	40
Bull/cow ratio	5.00%	Bull/cow ratio	5.00%
Bull purchase % bulls required	22.50%	Bull purchase % bulls required	22.50%
BYO retention % bulls required	0.00%	BYO retention % bulls required	0.00%
Bull death rate	2.00%	Bull death rate	2.00%
Minimum sales of opening bulls	20.92%	Minimum sales of opening bulls	20.92%

Herd Summary

EXHIBIT TABLE 7 - HERD DEVELOPEMENT AND TURNOFF FROM START

April 15, 11

Start of Year Description	1999	1999	1999	1999	1999	2000	2000	2000	2000	2000
	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	522	na	na	na	na	536
Weaner calves/weaners	258	0	na	0	258	261	0	na	0	252
Heifers 1 yr	242	0	0	0	233	250	0	0	0	241
Heifers 2 yrs	219	0	0	0	202	233	0	0	0	214
Cows 3 yrs	198	0	0	98	90	202	0	0	95	98
Cows 4 yrs	95	0	0	0	87	90	0	0	0	83
Cows 5 yrs	111	0	0	0	102	87	0	0	0	80
Cows 6 yrs	98	0	0	0	90	102	0	0	0	94
Cows 7 yrs	83	0	0	0	58	90	0	0	0	83
Cows 8 yrs	62	0	0	0	57	58	0	0	0	53
Cows 9 yrs	57	0	0	0	53	57	0	0	0	53
Cows 10 yrs	53	0	0	53	0	53	0	0	53	0
Cows 11 yrs and over	0	0	0	0	0	0	0	0	0	0
Spayed cows	0	na	na	0	0	0	na	na	0	0
Male calves/weaners	261	0	na	0	258	261	0	na	0	252
Steers 1 yr old	242	0	na	0	233	250	0	na	0	242
Steers 2 yrs	219	0	na	26	186	233	0	na	28	198
Bullocks 3 yrs	181	0	na	198	70	186	0	na	112	72
Bullocks 4 yrs	62	0	na	18	42	70	0	na	21	47
Bullocks 5 yrs	45	na	na	14	31	42	na	na	12	28
Bullocks 6 yrs +	38	na	na	38	0	31	na	na	31	0
Hard bulls	39	9	na	8	39	39	10	na	8	40
BYO bulls retained @ 2	0	na	na	na	na	0	na	na	na	na
Total Cattle	2532	9	0	356	2595	2595	10	0	364	2666
Cows mated					803					824
Branding rate					65.00%					65.00%
Bulls required					40					41
Bull/cow ratio					5.00%					5.00%
Bull purchase % bulls required					22.50%					22.50%
BYO retention % bulls required					0.00%					0.00%
Bull death rate					2.00%					2.00%
Minimum sales of opening bulls					20.92%					20.92%

Herd Summary

April 15, 19...

TABLE 1. CATTLE DEPARTMENT AND TURNOFF FROM START

Start of Year Description	2001	2001	2001	2001	2001	2002	2002	2002	2002	2002
	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers	Opening Numbers	Purch (Enter)	Spay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	554	na	na	na	na	549
Weaner calves/weaners	268	0	na	0	258	277	0	na	0	257
Heifers 1 yr	251	0	0	0	243	258	0	0	0	249
Heifers 2 yrs	241	0	0	0	232	242	0	0	0	233
Cows 2 yrs	214	0	0	95	119	222	0	0	147	79
Cows 4 yrs	98	0	0	0	90	110	0	0	0	101
Cows 5 yrs	83	0	0	0	76	90	0	0	0	85
Cows 6 yrs	69	0	0	0	74	76	0	0	0	78
Cows 7 yrs	54	0	0	0	87	74	0	0	0	68
Cows 8 yrs	82	0	0	0	76	87	0	0	0	69
Cows 9 yrs	55	0	0	0	49	76	0	0	0	79
Cows 10 yrs	51	0	0	57	0	49	0	0	49	0
Cows 11 yrs and over	0	0	0	0	0	0	0	0	0	0
Scayed cows	0	na	na	0	0	0	na	na	0	0
Male calves/weaners	268	0	na	0	258	277	0	na	0	257
Steers 1 yr old	251	0	na	0	243	258	0	na	0	249
Steers 2 yrs	241	0	na	29	205	242	0	na	29	206
Bullocks 3 yrs	198	0	na	119	76	205	0	na	123	79
Bullocks 4 yrs	72	0	na	22	49	76	0	na	23	52
Bullocks 5 yrs	47	na	na	14	32	49	na	na	15	33
Bullocks 6 yrs +	28	na	na	20	0	32	na	na	32	0
Hand bulls	40	11	na	8	42	42	9	na	9	41
BYO bulls retained @ 2	0	na	na	na	na	0	na	na	na	na
Total Cattle	2965	11	0	368	2743	2743	9	0	425	2747
Cows mated					852					831
Branding rate					65.00%					65.00%
Bulls required					43					42
Bull/cow ratio					5.00%					5.00%
Bull purchase % bulls required					22.50%					22.50%
BYO retention % bulls required					0.00%					0.00%
Bull death rate					2.00%					2.00%
Minimum sales of opening bulls					20.92%					20.92%

Herd Summary

April 15, 199

EXHIBIT TABLE 2 - HERD DEVELOPMENT AND TURNOFF FROM START

Start of Year Description	2002	2003	2004	2005	2006
	Opening Numbers	Purch (Enter)	Seay (Enter)	Sell (Enter)	Closing Numbers
New calves	na	na	na	na	529
Heifer calves/weaners	270	0	na	0	261
Heifers 1 yr	267	0	1	0	256
heifers 2 yrs	249	0	0	0	239
Cows 3 yrs	220	0	0	129	87
Cows 4 yrs	69	0	0	0	64
Cows 5 yrs	101	0	0	0	93
Cows 6 yrs	69	0	0	0	75
Cows 7 yrs	79	0	0	0	64
Cows 8 yrs	68	0	0	0	62
Cows 9 yrs	30	0	0	0	73
Cows 10 yrs	79	0	0	70	0
Cows 11 yrs and over	0	0	0	0	0
Spayed cows	0	na	na	0	0
Male calves/weaners	270	0	na	0	261
Steers 1 yr old	267	0	na	0	258
steers 2 yrs	249	0	na	30	212
Bullocks 3 yrs	206	0	na	124	80
Bullocks 4 yrs	79	0	na	24	54
Bullocks 5 yrs	52	na	na	15	35
Bullocks 6 yrs +	33	na	na	33	0
Herd bulls	41	9	na	9	40
BYB bulls retained @ 2	0	na	na	na	na
Total Cattle	2747	9	0	433	2755
	Cows mated				814
	Branding rate				65.06%
	Bulls required				41
	Bull/cow ratio				5.00%
	Bull purchase % bulls required				22.50%
	BYB retention % bulls required				0.00%
	Bull death rate				2.00%
	Minimum sales of opening bulls				20.92%

Herd Summary

INCOME STATEMENT CASH FLOW BEFORE INTEREST

	1993	1994	1995	1996	1997	1998	1999	2000
Cash flow from cattle trading	\$65233	\$121134	\$111853	\$150351	\$135341	\$120079	\$136064	\$137356
Capital disposals	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sundry income	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Variable and fixed costs	\$71000	\$98464	\$88665	\$87761	\$88852	\$89504	\$90430	\$91277
Capital additions	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Family living expenses	\$15000	\$15000	\$15000	\$15000	\$15000	\$15000	\$15000	\$15000
Taxation paid on previous year's income ..	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Net cash flow available for debt service ..	(\$767)	\$7669	\$8248	\$47590	\$32869	X\$15574	\$20635	\$21878
Land, plant & improvements value start yr.	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Depreciation estimate	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Land, plant and improvements value end yr.	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total debt at start of year	\$0	\$653	(\$6986)	(\$15616)	(\$64786)	(\$99502)	(\$117953)	(\$152303)
Total debt at end of year	\$653	(\$6986)	(\$15616)	(\$64786)	(\$99502)	(\$117953)	(\$152303)	(\$187965)
Net worth at start year	\$651229	\$655894	\$665618	\$692382	\$732096	\$773338	\$820803	\$874655
Net worth at end of year	\$655694	\$665618	\$692382	\$732096	\$773338	\$820803	\$874655	\$932357

	2001	2002	2003
Cash flow from cattle trading	\$149326	\$163317	\$167332
Capital disposals	\$0	\$0	\$0
Sundry income	\$0	\$0	\$0
Variable and fixed costs	\$92313	\$92532	\$92256
Capital additions	\$0	\$0	\$0
Family living expenses	\$15000	\$15000	\$15000
Taxation paid on previous year's income ..	\$0	\$0	\$0
Net cash flow available for debt service ..	\$33013	X\$55785	X\$60077
Land, plant & improvements value start yr.	\$0	\$0	\$0
Depreciation estimate	\$0	\$0	\$0
Land, plant and improvements value end yr.	\$0	\$0	\$0
Total debt at start of year	(\$187965)	(\$226502)	(\$289344)
Total debt at end of year	(\$226502)	(\$289344)	(\$359156)
Net worth at start year	\$932357	\$994059	\$1062832
Net worth at end of year	\$994059	\$1062832	\$1132834

*Sold extra
breeders*

Appendix 6.3

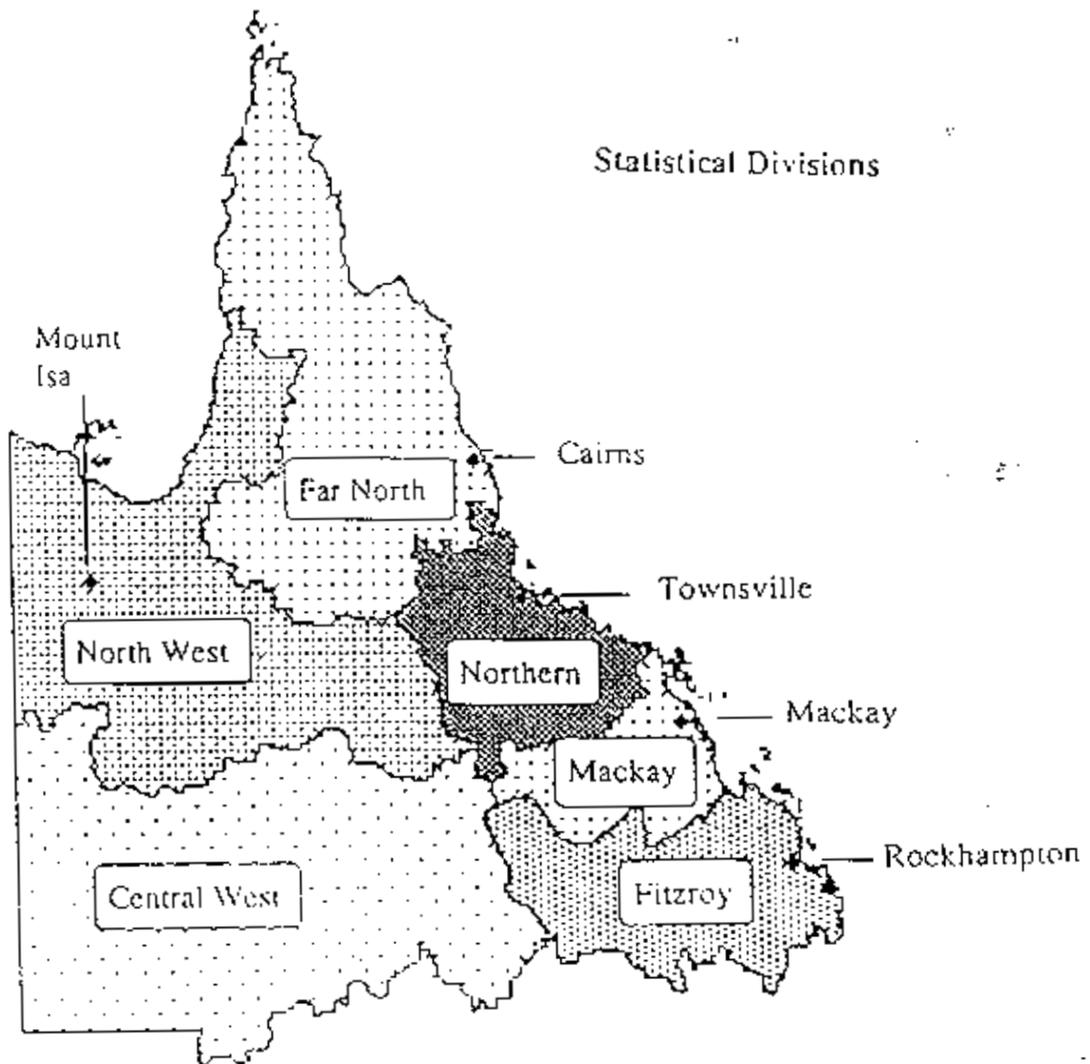
<i>MAP 5: Existing Carrying Capacity By Property</i>	
<i>(Sorted by Property)</i>	
Property Name	Existing Carrying Capacity
AGLAIA	151
ALCESTIS	2284
ANCILIA	1818
ARTEMIS	2738
ASTREA	1019
AURORA	2466
BALURGA	2717
BATTLE CAMP	395
BEESEBIKE	82
BERTIEHAUGH	2489
BIRTHDAY PLAINS	1400
BONNY GLEN	797
BOYNTON	147
BRAMWELL	714
BRANNIGHAN	129
BRIDGE CREEK	316
BROMLEY	2282
CALOOLA	550
COEN RIVER	6653
DARNUM	155
DENMAN	3099
DIGGERS CREEK	15
DRUMDUFF	3975
DUNBAR	8715
ESCORT CREEK	1830
GEIKIE	2480
GRESLEY	1381
HARKNESS	2188
HELMSLEY	5156
HIGHBURY	65
HOLROYD RIVER	6313
IMOoya	971
INGLEBY	1281
INGLELEY SOUTH	2088
JACK LAKES	1976
KALPOWAR	2465
KENDALL RIVER	5401
KIMBA	1407
KING JUNCTION	2027
KING RIVER	1187
KOOLBURRA	3919
KULATA	5014
LECONSFIELD	2340
LILY VALE	639
LOCHINVAR	410
LOVEL	1010
LYTHE	3398
MAITLAND DOWNS	93

MINKA	2628
MOREHEAD	895
MOUNT GIBSON	171
MOUNT JACK	637
MOUNT MULGRAVE	1080
OLIVE VALE	3878
PALMERVILLE	504
PEAK HILL	28
PERINGA	5138
PICKERSGILL	692
PINNACLES	705
PORMPURA AW	6987
PRYDE	97
RICHARDSON	1612
RUTLAND PLAINS	10170
SEFTON	1213
SHELBURNE	668
SILVER PLAINS	4115
SOUTHWELL	2465
SPRINGVALE	1855
STAUNTON	108
STRATHBURN	5286
STRATHLEVEN	977
SUDLEY	2833
TUNGIN	811
VIOLETVALE	1607
WATSON RIVER	1909
WIPELLA	3205
WOLVERTON	2571
WULPAN	5741
YAMBO	2127
YORK DOWNS	9450
TOTAL	182308

<i>MAP 6: Potential Carrying Capacity By Property</i>	
<i>(Sorted by Property)</i>	
Property Name	Potential Carrying Capacity
AGLAIA	664
ALCESTIS	4815
ANCILJA	3164
ARTEMIS	9174
ASTREA	2221
AURORA	5826
BALURGA	10005
BATTLE CAMP	1101
BEESEBIKE	196
BERTIEHAUGH	8720
BIRTHDAY PLAINS	3687
BONNY GLEN	5603
BOYNTON	707
BRAMWELL	2307
BRANNIGHAN	211
BRIDGE CREEK	362
BROMLEY	3380
CALOOOLA	1573
COEN RIVER	14984
DARNUM	370
DENMAN	8534
DIGGERS CREEK	85
DRUMDUFF	12604
DUNBAR	36173
ESCORT CREEK	3771
GEIKIE	4986
GRESLEY	6580
HARKNESS	4909
HELMSLEY	23031
HIGHBURY	272
HOLROYD RIVER	11717
IMOQYA	1205
INGLEBY	3532
INGLELEY SOUTH	6816
JACK LAKES	5658
KALPOWAR	8761
KENDALL RIVER	10247
KIMBA	1690
KING JUNCTION	4699
KING RIVER	2758
KOOLBURRA	8566
KULATA	23805
LECONSFIELD	4057
LILY VALE	2454
LOCHINVAR	2702
LOVEL	4284
LYTHE	7741
MAITLAND DOWNS	606
MINKA	6926

MOREHEAD	2529
MOUNT GIBSON	1212
MOUNT JACK	1854
MOUNT MULGRAVE	3547
OLIVE VALE	11560
PALMERVILLE	3548
PEAK HILL	134
PERINGA	8847
PICKERSGILL	1623
PINNACLES	1170
PORMPURAAW	33462
PRYDE	110
RICHARDSON	2891
RUTLAND PLAINS	44590
SEFTON	1982
SHELBURNE	834
SILVER PLAINS	16808
SOUTHWELL	9086
SPRINGVALE	7377
STAUNTON	279
STRATHBURN	10598
STRATHLEVEN	2774
SUDLEY	7605
TUNGIN	1982
VIOLETVALE	6986
WATSON RIVER	3393
WIPELLA	4858
WOLVERTON	6069
WULPAN	14347
YAMBO	6724
YORK DOWNS	22795
TOTAL	539813

Appendix 7.1



Appendix 7.2 PROPERTY MANAGEMENT PLANNING

Objectives

To develop a PMP program that:

- (a) actively encourages the voluntary adoption of PMP by Queensland landholders as an ongoing management practice
- (b) provides a coordinated government service that is both relevant to local needs and focuses on improving landholders management skills
- (c) involves the wider community including industry groups, agribusiness and the landcare movement in its development, marketing and delivery.

Strategies

Achieving the objectives of the PMP program requires four key actions:

- (a) Continuing development of a PMP process that utilises up-to-date, effective methods of adult education and skills development.
- (b) Coordinating the efforts of PMP service providers.
- (c) Increasing adherences and acceptance of the program within the agricultural sector and government agencies.
- (d) Evaluating how priority actions contribute to improved management skills and a sustainable agricultural sector.

1 Process development

The PMP implementation strategy outlines the process being used to progress PMP in Queensland. The Queensland government supports the use of the workshop approach utilising a relaxed learning environment where technical content is tailored to participants' needs. It is recognised however that the workshop approach is not appropriate for all producers, particularly in the more northern and western parts of the State. In these situations the Queensland government accepts that greater use will need to be made of specific home study materials and in some cases one on one PMP will be accepted as the only effective approach.

The workshop approach focuses on building on the managerial skills producers already possess, provides the forum to expose participants to new methods of gathering knowledge and skills and facilities and the sharing of information and knowledge between participants.

The Queensland government favours the use of a module approach delivered through workshops (Appendix ... provides a listing of possible modules which could be delivered through the PMP process) and supports producers entering the planning process utilising any topic area although an assessment of physical resources is seen as an important starting point

Module development and training

Central to the success of PMP is the availability of structured modules based on the provision of learning outcomes for workshop and individual participants.

Both written and audio-visual materials are required to assist workshop facilitators develop an effective service. Written materials can, however be prepared and presented in any format, however to foster the process the Queensland government:

- supports the DPI preparing guidelines to assist module development and the preparation of a range of draft PMP modules covering industry area specific issues that can be easily adapted for local use
- will continue to provide staff skilled in various aspects of property management to participants in the delivery of PMP
- will, through the use of the DPI's Rural Extension centre, Regional extension specialists and Regional PMP coordinators, together with other Departments and private training institutes ensure that relevant training is provided to deliverers of PMP services
- supports the maintenance of an adequately funded Rural Adjustment Scheme to allow landholder access to training grants and professional advice as part of an overall strategy for achieving self reliance.

Participation in PMP only provides the introduction to the learning process in most instances. Experience in adult learning indicates that people become motivated to undertake further skilling once they have been introduced to learning in adult life. It is expected that participation in PMP will encourage individual producers to undertake further skills development through other formal training and education avenues, many of which will be providing training on a commercial or cost recovery basis.

Many existing government services are compatible with the government's requirements for PMP modules. Appendix ... outlines other forms of business planning and development assistance offered by the government. The challenge is to ensure PMP participants are made aware of other forms of business planning assistance and provided with access to them.

A list of courses and consultants is being developed for each PMP Centre to help landholders plan their own learning activities.

2 Coordinating of services

The Department of Primary Industries is the lead government agency for PMP in Queensland. However, while the delivery of PMP involves other government agencies, educational institutes, landcare group and other community groups it would be enhanced by greater involvement of private consultants. The DPI has established 12 PMP Centres around the State. These centres are located in Mareeba, Charters Towers, Bowen, Cloncurry, Mackay, Rockhampton, Emerald, Longreach, Bundaberg, Charleville, Roma and Toowoomba. The centres provide a focal point for producer contact to access PMP services and for State

government staff and consultants to liaise with to ensure a coordinated PMP service is provided.

The Queensland government actively encourages the use of the adult learning processes being adopted as part of the delivery of PMP to facilitate greater involvement and provision of PMP services by non-government individuals and organisations with an interest in PMP.

Community input, ownership and commitment to the PMP program is essential for its success. In order for this to occur community input to PMP program management and policy making will be necessary. The Queensland government endorses this input and the following mechanisms for their involvement at the district/PMP Centre, Regional and State level:

- Establishment of District/PMP Centre/industry working groups to work together on workshop delivery, module development and PMP promotion at the local level.
- Establishment of Regional coordination/advisory committees to provide input to Regional policy and program management.
- Appointment of Regional PMP coordinators to work across regions and business groups to provide support and leadership to extension staff and undertake Regional management duties such as collection of monitoring information and staff training.
- The QLC establishing a PMP subcommittee to provide ongoing input to State Policies and Program Management for PMP.

Resourcing of PMP services

PMP as it is currently delivered in Queensland is primarily supported by a combination of State revenue, Special Treasury allocations and Commonwealth (National Landcare Program [NLP]) funds. Individuals and landcare group members participating in PMP workshops contribute significant personal resources to the process and in some instances other PMP providers from the private sector and educational institutions provide input at minimal or subsidised costs.

Resourcing of the PMP program as currently delivered by Government has been significantly enhanced by the NLP funded PMP Campaign and special treasury allocations currently projected until June 1996. While it is expected that PMP will eventually become part of the core business of a large percentage of rural sector service providers, the Queensland government will in the short to medium term:

- ensure that adequate resources are available for continued delivery of an effective PMP service
- monitor the provision of PMP services by both government and private sector providers
- maintain an ongoing evaluation of the need for State and Commonwealth funding for PMP delivery and if appropriate seek continued support from Commonwealth programs in the provision of PMP services
- transfer delivery of all or specific elements of the PMP service to private sector or other providers of services as demands for service and appropriate providers emerge.

User Charging

At present government operates on a beneficiary pays basis for a range of products and services including some elements of PMP. Different locations and providers vary in the products and services attracting a charge and the manner in which these charges are determined. It is recognised that there needs to be a standard set of principles adopted for any situations where the beneficiary pays principle operates or may be considered for the future.

The general philosophy of user charging or beneficiary pays as held by the Queensland government is that users of government products or services should directly contribute to the costs of providing these services at levels which are economically efficient and/or acceptable to government.

The Queensland government supports the DPI developing a user charging/beneficiary pays policy for PMP that will:

- encourage efficiency in development and delivery of products and services by Government Departments
- discourage wasteful use of these products and services
- ensure that rural producers continue to access the PMP process, value the services provided and utilise the services in moving toward self-reliance
- result in the equitable sharing of the cost of providing these products and services among specific uses and, where appropriate, the community
- provide opportunity for private sector or other providers to deliver PMP services as demands and opportunities arise.

3 Awareness

Current understanding and awareness of the PMP process within government, industry and the community is generally not good.

PMP should be recognised as an approach to management and should not be confused with plans or maps such as Tree Management Plans or Soil Conservation Runoff Coordination Plans. These plans may be derivatives of the PMP process, or they may be prepared in isolation from the PMP process to serve particular needs. They present information on one element of the property such as tree clearing or runoff control. They differ from the complex, dynamic, PMP process which remains voluntary.

However, landholders who participate in PMP should be well placed to satisfy any leasehold land administrative requirements for Tree or Land Management Plans. Some examples of these other planning requirements are included in Appendix ...

If the Decade of Landcare goal of 50% of producers involved in PMP is to be met by the end of the decade, producers will need to be aware of the benefits of participating in PMP. They will also need to show where and how to access more information and assistance. Word of mouth provides an important communication network in rural areas. A quality PMP product will sell itself. Conversely, if producers do not receive a tangible benefit from attending a workshop, PMP will struggle for acceptance.

The Property Management Planning Implementation Strategy released by the Queensland government in early 1994 clearly sets out the actions necessary to achieve the successful development and an option of PMP as a planning process by landholders.

The Queensland government affirms support for this implementation strategy and will:

- continue to work with industry bodies, landcare groups and the Queensland Landcare Council to promote a greater awareness and adoption of PMP
- ensure that PMP is directed towards learning outcomes so that producers recognise tangible benefits through participation
- continue to encourage the use of the implementation strategy with the accompanying brochure, poster and video at all available opportunities to promote PMP
- publicise the role of DPI PMP centres located throughout the State.

4 Evaluation

The delivery of PMP involves considerable expenditure by government agencies, and participation in it requires considerable time commitment and expenditure by landholders. Continuing monitoring and evaluation is therefore warranted to ensure the program is achieving the desired goals.

The Queensland government aims for a PMP process resulting in landholders acquiring better planning and management skills, and making improved decisions about the management of their properties. The success of the PMP program must therefore be evaluated on these criteria rather than the inputs such as the number of PMP centres established or landholders who have attended PMP workshops. Ultimately government wishes to be able to demonstrate that the adoption of PMP will result in producers being more viable and self-reliant in the long run. In order to be able to do this the Queensland government will develop an effective monitoring and evaluation system that focuses on outcomes.

**CAPE YORK PENINSULA CATTLE CATEGORIES SOLD THROUGH THE MAREEBA SALEYARD
FROM FEBRUARY 1989 TO JUNE 1994**

	Bullocks	Medium Steers	Export Steers	Light Cows	Heavy Bulls	Light Bulls
Feb 1989	116.3	107.3	98.4	66.8	94.5	78.6
Mar 1989	115	105.6	99.2	73.8	93.5	81.2
Apr 1989	117.2	111.8	103.6	73.5	97.3	86
May 1989	121.4	117.8	108	75.1	101.5	90.7
Jun 1989	125.4	118.5	106.2	71.5	101.6	98.9
Jul 1989	121.5	111.2	102.9	75.2	107.2	90.9
Aug 1989	120.2	109.6	99.4	75.3	106.1	86.1
Sep 1989	110	100.4	96	54.3	99.2	83.7
Oct 1989	117	103.5	95.7	70.9	106.3	87.8
Nov 1989	120.4	110.8	104.5	79.6	113	95.9
Dec 1989	119.8	114.5	106.1	73.3	116	91.9
Jan 1990	116.6	106.1	100.7	70.8	90	84.9
Feb 1990	110.7	105.8	97.2	63.2	95.1	78.2
Mar 1990	118	107	92.7	54.1	104.3	79.8
Apr 1990	118.9	114	101.3	64.8	106.3	91.4
May 1990	121.1	113.4	100.3	73.4	105.9	91.3
Jun 1990	118.7	111.2	97.3	61.3	107.8	84.7
Jul 1990	108.4	103.2	93.1	57.3	103.3	83.4
Aug 1990	110.2	98.3	91	57	101.5	77.6
Sep 1990	109.3	101.3	93.5	57.4	105.1	78.8
Oct 1990	110	99.6	92.5	57.5	94.9	71.9
Nov 1990	111.4	104.8	96.1	55.7	104	81.4
Dec 1990	119.6	104.3	99	51.8	103.1	80.5
Jan 1991	117.2	121.9	105	64.3	95	82.5
Feb 1991	129.6	123.1	87.9	64.3	95	99.4
Mar 1991	118.4	110	99.5	65.2	111.2	88.5
Apr 1991	112	103.3	92	56.6	98.9	75.5
May 1991	108	96.8	86.1	62.3	101.1	74.6
Jun 1991	110.9	103	90.5	67	110.6	84.7
Jul 1991	110.7	103.8	88	72.8	109	84
Aug 1991	104.3	98.3	80.6	71.9	101.2	76.7
Sep 1991	100.7	94.5	78	69.4	98.9	71.9
Oct 1991	119.5	110.8	97	77.5	113.2	85.1
Nov 1991	127.7	120	107	72.5	113.8	88.9
Dec 1991	123	117	103	73.5	115.3	86
Jan 1992	127	114.7	103.5	68.9	109.8	86.5
Feb 1992	128	119.6	108.2	78.7	121.2	96.8
Mar 1992	121.8	113.1	97.4	77.6	129.8	97.5
Apr 1992	101.3	95.6	89.1	66.8	86.6	76.9
May 1992	102.8	98.8	84.2	68.3	94.6	72.9
Jun 1992	93.2	89.2	76.1	59.1	82.9	62.3
Jul 1992	103.5	97.3	80.7	59.3	87	63.5
Aug 1992	112	101.4	85.2	63.1	98.3	78.9
Sep 1992	120.2	109.5	92.4	68	108.1	82.7
Oct 1992	128.5	117.8	95.8	72.6	109.8	80
Nov 1992	130.6	121	104.3	75	121.6	90.3
Dec 1992	128.5	116.7	104.1	70.1	116.5	83.2
Jan 1993	124.6	104.6	96.7	71.3	107.8	82.3
Feb 1993	119.1	112	97	73.8	94.4	82.7
Mar 1993	102.2	86.2	86.7	62.4	74.1	63.2
Apr 1993	91.6	83.2	74.1	48.7	74.1	53.2
May 1993	96.2	84.8	69.5	49.8	49.3	47.3
Jun 1993	107.3	97.9	75.9	61.2	80.9	54
Jul 1993	117.7	106.3	83.2	65.3	90.7	62
Aug 1993	136.5	119.4	96.9	70.3	109.8	75.2
Sep 1993	143.2	125.6	105.8	70.8	121.7	79.2
Oct 1993	140.2	130.9	104.6	67.4	126.8	77.4
Nov 1993	139.7	131.3	111.1	76.8	115.4	79.4
Dec 1993	113.6	115	115.4	76.3	94.1	71.9
Jan 1994	124.6	120.9	99.6	75.8	95.6	78.1
Feb 1994	142.5	127	115.5	84.2	104.5	86.5
Mar 1994	152	136.8	119.7	86.1	120.4	93.8
Apr 1994	147.3	119.2	107.3	72.9	101.5	80.3
May 1994	109.3	104.6	91.7	69.7	97.5	78.4
Jun 1994	116.3	109.3	91	70.8	104.3	83.9

AVERAGES FOR THE PERIOD: 118.2, 109.1, 96.1, 68.0, 102.2, 80.6

THESE CATTLE CATEGORIES ARE PRINCIPAL TURNOFF/SALE TYPES FROM CAPE YORK PENINSULA. HOWEVER, FURTHER ADJUSTMENT IS NEEDED TO ALIGN TOTAL TURNOFF/SALE NUMBERS TO CYP STOCK CATEGORIES AND PERCENTAGES OF EACH AS ESTIMATED BY OPT STOCK INSPECTORS IN MAREEBA: BULLOCKS 2%, MEDIUM STEERS 10%, EXPORT STEERS 45%, LIGHT COWS 5%, LIGHT BULLS 28% AND HEAVY BULLS 10%.

THE CAPE YORK PENINSULA TURNOFF ADJUSTMENT IS CALCULATED AT 92.69%.

AVERAGE OF THE CATEGORIES OF CATTLE OVER A 65 MONTH PERIOD WAS 95.7 CENTS PER KG LIVE AT MAREEBA YARDS. ADJUSTED AVERAGE PRICE FOR CAPE YORK PENINSULA CATTLE OVER THIS PERIOD IS 88.7 CENTS PER KG AT MAREEBA.

Appendix 10.1

QUESTION 2

OWNER	MANAGER	HOME ONLY	PLACE OF WORK	OTHER
23	2	None recorded	None recorded	None recorded

QUESTION 3

< 1 year	1 - 2 years	3 - 5 years	6 - 10 years	11 - 20 years	> 20 years
1	none recorded	5	4	7	8

QUESTION 4

0-50	50-500	500-5,000	5,000-20,000	20,000-50,000	>50,000	No: answered
none recorded	3	2	2	4	1	1

QUESTION 5

Grazing only	Cropping only	Mixed farming (Crops and Grazing)	Residence only	Other
21	none recorded	1	none recorded	3

Other Included:

Vacant/unused (1), Grazing and Mining and Grazing (1) and of dual park service station (1).

QUESTION 7 & 8 Cattle numbers are only approximates and have been obtained from 22 completed questionnaires.

Cattle numbers of properties	Type of							Total
	Cows	Steers	Holsteins	Bulls	Wethers	Goats	Pigs	
52 850	1 899	3 958	909	294	3 254	70	10 384	10 384

QUESTION 10

Yes	No	Not answered/ incorrect
8	14	14

QUESTION 11

More intensive grazing	less intensive grazing	More dryland cropping	Expansion of property	Introduction of supplementary activities	Other	Not answered/ incorrect
12	none recorded	3	none recorded	3	2	11

QUESTION 12

Yes	No	Not answered/ incorrect
21	2	2

QUESTION 13

Pasture Improvement	Selective land clearing	Strategic fencing	Phosphate improvement	increased use of licks	Other	Not answered/ incorrect
21	13	16	13	14	10	2

Other Included:

Increased water	Tourism and agriculture	feed supplements	Fertilizer	reforestation
8	1	2	2	1

QUESTION 15

Lack of finance	Restrictive lease conditions	Size of property	Access to saleyards/ ports (distance & road condition)	Other	Not answered/ incorrect
10	6	2	9	3	

Other Included:

Time, Native title land claims (2)

QUESTION 16

Stable	Improving	Getting worse	Not answered/incorrect
15	8	1	1

QUESTION 20

Leasehold	Freehold	Other
18	7	0

QUESTION 22

Yes	No	Not answered/incorrect
9	13	3

QUESTION 22a

Yes	No	Not answered/incorrect
5	9	2

QUESTION 22b

Generate capital for more property development	Easier management of property	lifestyle	Amalgamation of adjoining property boundaries	Other	Not answered/incorrect
9	6	1	0		2

7. If grazing, what is the size of your cattle herd?

Please specify:

8. How many cattle do you presently turn off a year on average?

Please specify the numbers, age and destination as indicated below:

	Number	Age	Destination
Cows			
Steers			
Heifers			
Bulls			
Weaners			

9. What are the approximate major costs involved in running your property?

Per Head Estimate

Mustering

Transportation

Supplements

Others (please specify):

.....

10. Do you expect to change the land use of this property in the future?

1. YES

2. NO

11. If yes, what is the proposed change?

- 1. More intensive grazing
- 2. Less intensive grazing
- 3. More dryland cropping
- 4. Expansion of property size
- 5. Introduction of supplementary business activities
- 6. Other (please specify)

12. Do you expect to further develop the property by the Year 2000?

- 1. YES
- 2. NO

13. If yes, what development options are you considering?

- 1. Pasture improvement
- 2. Selective land clearing
- 3. Strategic fencing
- 4. Phosphate improvement
- 5. Increased use of licks
- 6. Other (please specify)

14. How many cattle do you think the property is capable of turning off if it were further developed as intended by the Year 2000? Please specify projected numbers and ages as indicated below:

	Number	Age
Cows		
Steers		
Heifers		
Bulls		
Weaners		

Others (please specify):

.....

.....

.....

.....

15. What factors are restricting the property from being further developed?

- 1. Lack of finance
- 2. Restrictive lease conditions
- 3. Size of property
- 4. Access to saleyards/ ports
- 5. Other (please specify)

.....

.....

.....

.....

16. How would you describe the present condition of the land on the property?

- 1. Stable
- 2. Improving
- 3. Getting worse

17. Is the property affected by any of the following degradation problems? Please specify approximate per cent.

- Weeds%
- Pasture decline%
- Erosion%

Others (please specify):

.....

.....

.....

18a. What percentage of the property has paddocks that are fenced? %

18b. What percentage of the property has paddocks which are not fenced? %

19a. What percentage of the property is cleared and used for grazing? %

19b. What percentage of the property is treed and used for grazing? %

19c. What percentage of the property is not used for grazing? %



20. What is the tenure of the property?

1. Leasehold

2. Freehold

3. Other (please specify)

.....

21. If leasehold, please specify type of lease, and lease number:

.....

.....

.....

.....

.....

.....

22. Can you subdivide the property under its present tenure?

1. YES

2. NO

22a. If no, would you subdivide the property if allowed?

1. YES

2. NO

22b. If yes, what would be the reasons for subdivision?

1. Generate capital for more property development.

2. Easier management of the property.

3. Lifestyle,

4. Amalgamation of adjoining property boundaries.

5. Other (please specify):

.....

.....



23. What changes to property management would you like to introduce? Please specify below:

.....
.....
.....
.....
.....
.....

24. What are your views on the future of the pastoral industry on Cape York? Please specify below:

.....
.....
.....
.....
.....
.....

25. What improvements to the Cape's existing infrastructure and communications would assist the operation of the property? Please list in order of priority (highest to lowest):

1.
2.
3.
4.
5.

Appendix 12.1
CARRYING CAPACITY AND POTENTIAL OF PENINSULA LANDS

Country Type	Carrying Capacity Beast to Hectares	
	Natural	Potential
1 Tetrodonta (Stringybark, Messmate) Associations		
(a) Stringybark, bloodwood, ironwood on a range of soils including sand, bauxite and ironstone.	1-40/100	Nil
(b) Stringybark, carbeen, swamp mahogany moist lowland areas and creek edges.	1-15/30	Nil
(c) Stringybark, bloodwood sandstone ranges.	1-40/250	Nil
2 Chlorophylla (Box) Associations		
(a) Undulating box country, sometimes with ghost and cabbage gum on a range of soils, often with undergrowth.	1-15/30	1-4/7
(b) Open melonholey dark soil box, yellow-wood	1-10/15	1-5
3 E. Cullenii (Ironbark Associations		
Ironbark, bloodwood and sometimes generally mixed eucalypt on shallow skeletal soils, hill slopes and plateau edges.	1-20/50	1-5/8
4 E. Leptophleba (Molloy Box) Associations		
(a) Rolling downs and drainage lines of molloy box, poplar gum and broad leaved carbeen.	1-10/20	1-5/8
(b) Dark soiled open molloy box, poplar gum, ghost gum, ti tree river frontages.	1-10/20	1-5
5 E. Clarksonia (Bloodwood) Associations		
(a) Open bloodwood, molloy box, ironwood, stringybark, undulating hills and lower slopes.	1-30/60	Nil
(b) Bloodwood dominated river flood plains.	1-15/30	1-5/8
6 Ti Tree Association		
(a) Ti tree soaks and depressions, swamps and lagoons.	1-10/30	1-5
(b) Low open ti tree and bloodwood, range of soils - usually silt clay and sandy clam loams.	1-20/40	1-7/10
(c) Poor sandy soiled undulating ti tree, ironwood, stringybark, grass tree.	1-40/80	Nil

Country Type	Carrying Capacity Beast to Hectares	
	Natural	Potential
7 Rainforest Associations		
(a) Rainforest and closed scrubs including beach dune scrubs.	1-30/50	Nil
(b) River gallery forest and more open riverine forest.	1-15/25	Nil
(c) Deciduous vine thickets.	1-20/40	Nil
8 Grasslands		
(a) Marine couch coastal plains.	1-10/20	Nil
(b) Generally level coastal plains.	1-7/12	1-3/5
(c) Undulating black soil plains, odd terminalia.	1-7/12	1-3/5
(d) Alluvial creek flats.	1-7/15	1-5/10
9 Heath Communities		
Includes windswept headlands, Cape Flattery type dunes and mixed scrublands.	1-100/250	Nil
10 Mangroves	1-100/250	Nil
11 Wet Eucalypt and Wattle Communities		
(a) Level to undulating carbeen, bloodwood forest often with a dense shrubby understorey in the wetter coastal areas.	1-15/25	1-5
(b) Level to steep very mixed eucalypt and wattle forest communities found mostly between the Annan and Bloomfield Rivers.	1-15/25	1/3-5
12 Basalt Country		
Red basaltic soils, generally undulating with considerable stone, timbered with box and gum.	1-15/25	1-3/5
13 Unavailable		
Country unavailable to cattle including steep broken mountains, rock outcrops, bare sand areas, urban centres.	1-250	Nil

Appendix 12.2
PROPOSED LAND MANAGEMENT UNITS
(Morton et al., 1994)

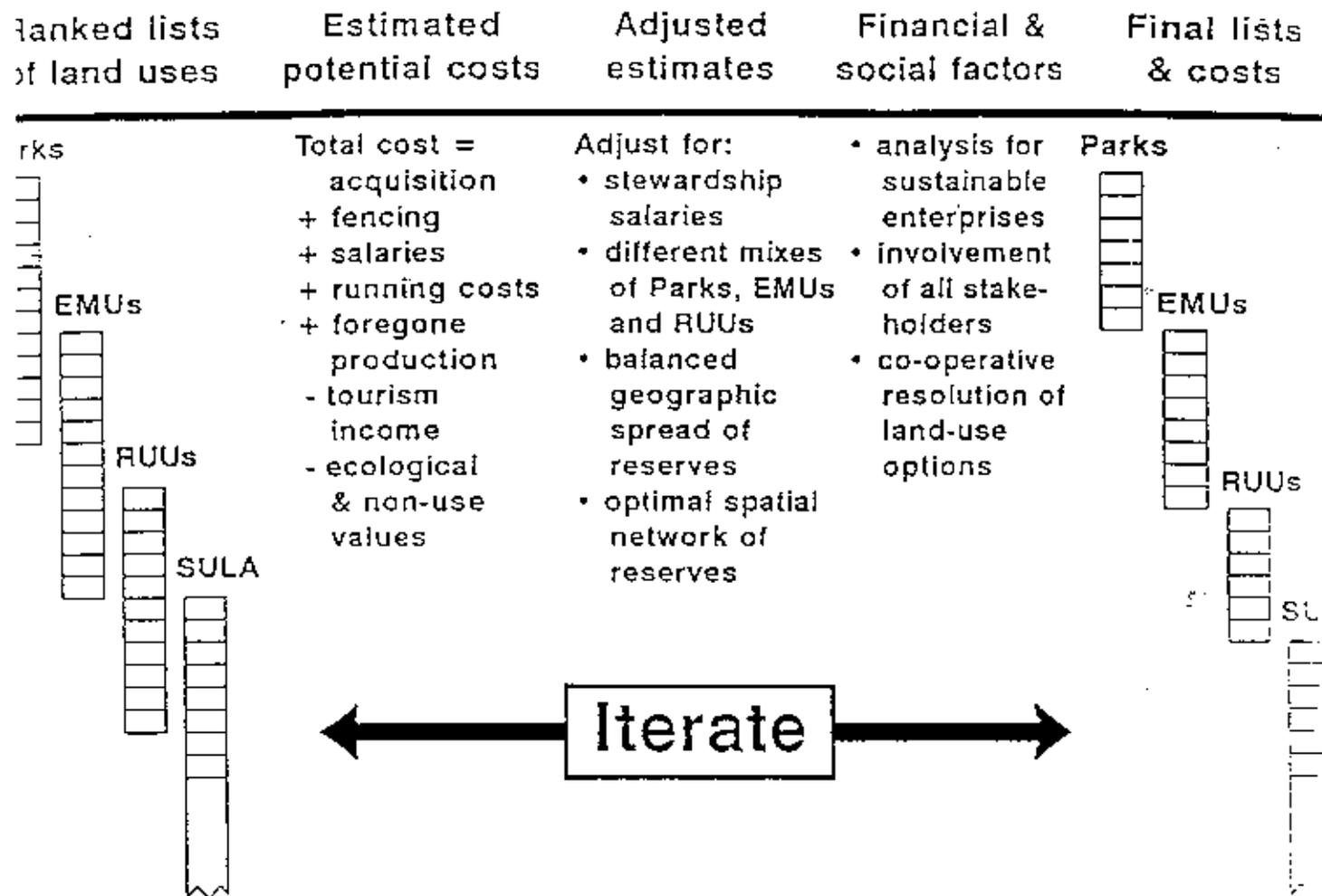
Table 1:

A summary of the suggested criteria by which land in arid Australia would be allocated to national parks, excised management units (EMUs), restricted use units (RUUs), and sustainable use and living areas (SULAs).

Primary spatial scales of land allocation and management	Units of Land	Criteria for allocation
National and regional	National parks	<ul style="list-style-type: none"> . representation of biodiversity in reserve network . large size and efficiency of management by park staff . major aggregations of resource-rich patches
Regional	EMUs	<ul style="list-style-type: none"> . representation of biodiversity through complementarity with parks . emphasis upon resource-rich patches that cannot efficiently be incorporated into the park network . moderate size . connectivity
Regional and local	RUUs	<ul style="list-style-type: none"> . representation in the reserve network of areas of land that are temporarily significant for persistence of biodiversity . emphasis upon resource-rich patches . either small size or intermittent significance . connectivity
Local	SULAs	<ul style="list-style-type: none"> . remainder of the land

Appendix 12.3

COSTING OF PROPOSED LAND MANAGEMENT UNITS
(Morton et al. 1994)



Appendix 14.1 SUSTAINABLE PASTORALISM IN NORTHERN AUSTRALIA

Strategies for Sustainability

There are several strategies for ensuring long-term use and sustainability; many of these are interacting.

1 Establishing guidelines for safe stocking strategies

With a sufficient understanding of pasture responses to season, grazing pressure and fire, indicators could be developed to guide tactical management of grazing. These indicators would provide for timely adjustments to stocking rate and so avoid damage to grazing resources.

Information to support both tactical and strategic stocking rate decisions is required, such as:

- improved pasture husbandry practices relating to the maintenance of desirable or improved composition, production capability, utilisation and the management of natural or enhanced floristic diversity
- paddock design and the management of watering points
- a better understanding of livestock husbandry and nutritional requirements in relation to feed quality and quantity
- feral animal control and wildlife management.

Producers must have sufficient knowledge to be able to compare alternative strategies, rather than just being told what to do. This requires developing close or interactive links between producer and researcher; field station research should be linked with on-property research so that it can relate research to property management information.

2 Establishing a better understanding of the management of resource diversity

Understanding management of a diverse resource is particularly important for large properties where the pasture units are highly variable and the climate is unpredictable during the year; these conditions are found in Central Australia and in the smaller scale diversity of the highly dissected parts of the Top End of the Northern Territory and the Kimberley region.

Another case is large scale diversity within a region, rather than within a property, as found in the Maranoa and central regions of Queensland. In these regions, lands of high and low pastoral and agricultural potential are interspersed - Queensland bluegrass, brigalow, eastern gidgee and eastern mitchell grass are intermixed with *Aristida-Bothriochloa* pasture communities. Here the management of resource diversity must be more at the interproperty, or catchment level, rather than within properties.

Over the whole of northern Australia, there is a problem in the management of frontage country; this has resulted from overuse of land which has higher soil fertility and is adjacent to water.

This strategy (2) overlaps substantially with Strategies 1, 3, 4, 6 and 8, but it is listed separately because, like Strategy 1, it addresses a complex problem. The individual issues need to be understood as well as the complex interactions.

3 Establishing guidelines and techniques for monitoring the pasture resources

The pasture resource must be monitored to determine whether its condition is stable, improving or declining. This will involve:

- monitoring of all aspects of the production system to develop the necessary understanding of the resilience, sustainability, degradation and recuperative process of the system. Land managers must be involved in all phases of the monitoring process to encourage participation, awareness and education (see Strategy 2)
- regular periodic monitoring of the production resources of leaseholds. In all three States making up the northern Australia region, new Land Acts are in various stages of adoption. All will embrace new concepts of leaseholding designed to provide better incentives for responsible, long-term land management, and for regular monitoring (see Strategy 11)
- primary producers are increasingly interested in how they can monitor their own properties. With increasing availability of computerised decision support systems, property managers are likely to start using such information. Appropriate monitored statistics will need to be considered within the scope of property management (see Strategy 8)
- monitoring is an important element of managing drought and understanding drought processes (see Strategy 6).

4 Reconsideration of fire as a strategic management tool

Fire can play a strategic role in grazing management, by helping to maintain pasture composition, and particularly in controlling woody weeds. It has particular relevance to Strategies 1, 7 and 9. In recent years, fire has been down-played as being environmentally unfriendly, however reduced use of fire (Roberts, 1991) has more likely come about because of the shortage of fuel due to dry years, increased stocking rates, and more efficient utilisation of pasture biomass through the use of feed and mineral supplements (see Strategies 2, 7 and 9).

5 Greater use of on-farm research and acquisition of farm-related data

The wealth of farm information has to be tapped as a means of verifying and making the large amount of available research information relevant to the farm. This process requires a close liaison between researcher and client, ie. the farm manager, particularly for the development of decision support systems as an aid to management (McKeon et al., 1986; Gillard and

Money Penny, 1990). This is already taking place in the form of the QDPI decision support packages - GRASSMAN and STOCKMAN (see Strategies 1, 2, 8 and 12).

6 Strategies for handling drought

Given that droughts are likely to recur and that some degradation in the pasture and soil resources is likely to follow, the recuperative processes after drought must be understood to develop property management options.

The knowledge base required to support Strategy 1 is also relevant to drought management. However, the contingency planning for drought and the actions taken during drought can have a substantial effect on what those options are after drought. At present drought is invariably dealt with as it occurs, without forward planning. There is, therefore, a need for better predictive capability and interpretation of past events so that drought preparedness and management strategies are in place and degradation effects on the production resources are minimised (CSIRO, 1990).

Although still in their early development, such prediction systems as RAINMAN (Clarkson and Owens, 1991) are paving the way to better understanding and reliability. They require more feedback from the producer level to improve their local usefulness (see Strategies 3, 5 and 8).

7 Addressing the serious weed problems and threats of weed invasion

Serious incursions of exotic woody and herbaceous weeds have developed in north Queensland over the last 10 years and are outlined in Appendix 3. In many situations, land has been made almost totally unproductive by invasion of weeds, while, in other areas, a formidable threat exists in the form of reservoirs of infection. In addition to these exotic species, and also some native ones, there is a widespread and endemic problem of woody regrowth from eucalypt and acacia species, particularly in southern Queensland (see Strategy 9). This is specifically important in such systems as the mulga and other acacia species in south-west Queensland and Central Australia, where finding the right balance between top-feed and ground-feed is not always easy.

Other areas of northern Australia may not have serious problems now, except for mimosa in the north-west of the Northern Territory, but there is always the threat of the exotic weeds colonising from north Queensland. Understanding fire ecology could be essential to the development of management strategies to address this problem (see Strategy 4).

8 Enhanced educational programs for producers

Such educational programs should be participatory and of a 'grass-roots' nature, with a strong emphasis on producer-derived information. This could come through a broadening of Landcare activities or such producer-based organisations as the Victorian River District or Centralia Land Management Associations.

Producers are requiring greater access to technology, and there is need for better channels of feed-back to researchers about their changing situations and requirements. However, there is need for support and channels to facilitate and empower producer groups so that 'user-pays-

user-says' messages are representative of the producers and receive an effective hearing. Agricultural advisers need to play a responsive role rather than a command one. Landholders need to be able to access the new technologies, particularly in the use of computerised decision support systems, as this will be one of the most potent ways of advancing both management expertise and the technical base on which tailored systems will operate (see Strategies 1, 2, 3 and 5).

9 Tree management

Tree management issues arise largely in southern Queensland and in Central Australia. As mentioned under Strategy 7, woody species regrowth is an endemic problem and is likely to remain so where pasture lands exist on cleared or partially cleared eucalypt woodlands.

Fire is an important factor in control of regrowth. In the acacia woodlands, suckering from old rootstocks can be a serious problem, especially in the brigalow lands, but now only on lands that cannot be cultivated for crop production. In other areas, acacia regeneration by seedlings can be a problem, particularly after fire. This may be the case in the mulga and other top-feed acacia systems of south-west Queensland and Central Australia where a balance is needed between the tree density desirable for top-feed and that for pasture growth.

Another aspect of tree management that is of increasing concern is the effect of clearing on salinisation. Where sodic or texture contrast soils are widespread - as in the *Aristida-Bothriochloa* pasture community, considerable parts of the black speargrass, and some brigalow communities - salinisation could occur between 20 and 100 years after clearing. The Murray Darling Basin Ministerial Council is addressing this issue over a large part of eastern Australia, but little activity is being undertaken in Queensland except by the Queensland Department of Primary Industries (see Strategies 4 and 7).

In many areas where there has been excessive or unnecessary clearing, guidelines should show how to re-establish trees for shade, windbreaks, soil and water conservation, wildlife habitat and landscape aesthetics. For other areas where there is a case for tree reduction, guidelines must show how this should be done, ie. the degree and pattern of the removal (see Burrows et al., 1988).

10 Feral animals and wildlife

Uncontrolled populations of feral buffalo, pigs, donkeys, camels, horses and rabbits, and of native herbivores such as kangaroos and wallabies, all contribute to difficulties of management, particularly in the implementation of Strategy 1. For feral animals, there is a need to broaden the approach to their control. There are few examples anywhere of the successful eradication of feral animals, and most programs have eventually opted for control rather than elimination.

In terms of wildlife, while much work has been done in feed resource competition and dietary complementarity, there is a need for better monitoring of numbers, and for setting levels of population control which will balance competition with survival (see Strategies 1 and 2).

11 Improved conditions of leasehold

There are several cases where uneconomic sized leases are leading to over-use of the land resource to provide a livelihood for the landholder. Such situations exist in the Northern Territory Gulf region (Holmes, 1990), and in the mulga lands in south-west Queensland, especially in the Maranoa district (Clark et al., 1992). While this is not a problem for research, it must be viewed as an environmental constraint to good land management.

There should be interaction between landholders, researchers, agricultural advisers and land administrators in setting and reviewing adequate living areas, and in helping to establish acceptable methodologies for monitoring the land resource and its management. At present, all three States comprising the region are developing a new generation of Land Acts (see Strategies 3 and 5), which should address these problems.

12 Better definitions of markets and formulation of production objectives

Where there are ill-defined market objectives, management options are decreased and resource-use planning is difficult. If the industry is to be made more efficient by emphasising sustainable improved production on a per-head basis rather than on a per-hectare basis, market objectives for the necessary investments need to be defined.

A recent example of this is the beef meat and live animal market in Indonesia, which has given producers in the Northern Territory new market objectives, just at the time (following the BTEC program) when they were most needed. Now there is a strong demand for decision support services to help with property planning (see Strategy 5)

Pasture communities at risk**At risk -****from overgrazing:**

- with the use of feed supplements, pasture legumes, hardier breeds of livestock; and by feral animals:
 - black speargrass
 - ribbongrass
- on calcareous soils carrying sweet feed:
 - shortgrass annual pastures (Central Australia and Victoria River District)
- on systems carrying top-feed of edible acacias:
 - mulga pastures

from weed invasion and regrowth:

- exotic woody weeds:
 - parkinsonia, mesquite, prickly acacia: mitchell grass (mostly Queensland)
 - rubbervine, chinee apple: frontage country (Queensland Gulf and Peninsula)
 - mimosa: ricegrass-*Hymenachne* (Darwin, north-west coastal)
- native woody weeds:
 - eucalypt regrowth: southern black speargrass (central and southern Queensland)
 - eucalypt regrowth, shrubs and cypress pine regeneration: *Aristida-Bothriochloa* (central and southern Queensland)
 - acacia regeneration with other shrubs: mulga, other acacia (Queensland, Central Australia and Pilbara)
 - acacia sucker regrowth: brigalow (Queensland)
 - acacia regeneration: gidgee (Queensland, Central Australia)
- exotic herbaceous weeds:
 - parthenium: central Queensland bluegrass (Queensland), northern brigalow (Queensland), central eastern mitchell grass (Queensland)
- native herbaceous weeds
 - pimelea: southern alluvials (Queensland), southern brigalow (Queensland)
- exotic grass weeds:
 - giant rat's tail grass (coastal south and central Queensland)

from soil deterioration:

- soil fertility decline:
 - nutrient depletion: derived rainforest pastures (Queensland), blady grass pastures (Queensland), heathland pastures (Queensland), other sown pastures.
 - nutrient tie-up: brigalow pastures (Queensland), Queensland bluegrass
- soil structural degradation:
 - surface scalding on red earth soils: mulga (Queensland, Central Australia, Western Australia)
 - surface scalding on fine-textured duplex soils: some black speargrass (Queensland), some *Aristida-Bothriochloa* (Queensland)
- soil profile degradation:
 - salinisation due to tree clearing on duplex soils with saline sub-soil: some *Aristida-Bothriochloa* (Queensland), some black speargrass (Queensland), some brigalow pastures (Queensland)

Problems and priorities

In ranking the problems in Table 4, we have chosen to group them into three levels of priority. When we asked people to allocate priorities to this list of 12, we found much diversity in view from individuals between regions as well as within regions. However, there was reasonable consensus when we grouped the responses into three levels. A further difficulty in this exercise is that not all problems are equally important over the four regions.

The listing is an approximate overall order of importance for all of northern Australia. In this ranking, Western Australia places low priority on further research into monitoring, not because it is not considered important but because that State has satisfactory monitoring systems in place. The main problem is in processing the information acquired.

Western Australia places a high priority on fire research as they see fire as an invaluable tool in pasture management. This is apparent in the condition scores and land capability estimates in Table 3, because a much higher use is made of the poor quality pasture land than elsewhere.

Queensland places a high priority on on-farm research and data collection. This probably reflects the higher level of importance that decision support technology is given. It might also reflect more intensive land use in Queensland and more exposure of producers to extension personnel. The State is also strengthening its research on the problems of drought, and on property management strategies for drought.

Table 4. Overall ranking of problems and ratings for each region¹
(rating of 1 indicates highest priority)

Priority	Item	Qld	NNT	CA	WA
1	Stocking strategy	1	1	1	1
2	Managing resource diversity	1	1	1	1
3	Resource monitoring	1	1	1	3
4	Fire research	2	2	1	1
5	On-farm research/data	1	2	2	2
6	Drought	2	2	1	2
7	Weeds	1	2	2	2
8	Education	2	2	2	2
9	Tree Management	2	3	2	3
10	Feral animals/wildlife	3	2	2	3
11	Leasehold sizes/covenants	2	3	3	3
12	Market research	3	3	3	3

¹Qld = Queensland, NNT = northern Northern Territory, CA = Central Australia;
WA = Western Australia

Appendix 21.1
AN OVERVIEW OF ABORIGINAL LAND RESOURCE USE IN CAPE YORK

(Extract from: A Dale (1991), *Aboriginal Access to Land Management Funding and Services*.
Griffith University: 143 pp)

With a total population of around 61,000 Aborigines and Torres Strait Islanders, Queensland has the highest indigenous population of any Australian State or Territory. Aborigines and Islanders represent 2.3% of the Queensland population and the land controlled by these groups represents an equivalent percentage of the total area of the State.

While most of the land originally held by Islanders remains under Islander control, most Aborigines now have little or no access to their traditional or ancestral lands. Most of the State's 48,980 Aborigines reside in major urban centres and rural towns. However, some 18,870 Aborigines also reside in discrete Aboriginal communities established during the long period of colonial dispossession, concentration and re-location (ie. from the 1830s to the late 1960s). Many Aborigines in these communities have been removed far from their traditional country.

It is not commonly recognised that most Aborigines live within the mainstream Queensland community. Many of these people have their own private freehold and leasehold lands, though these lands are not officially recognised as being 'Aboriginal land'.

Land Access

The Aboriginal Land Bill was enacted on the 31st of May 1991 amid strong Aboriginal concerns about the inappropriate consultation processes leading to its formulation. It will enable Aboriginal people to lodge claims on the basis of their traditional, cultural or economic interests in land.

Under the Act, there may also be an additional 2 million hectares of vacant crown land (1.16% of the State) available for traditional or historical claim. This land will not be claimable until it has been gazetted by an Executive Council Minute. Once granted, this claimable land will not carry timber or quarry rights, but the grantee will obtain an estate in fee simple. Claims granted on the basis of need will only be awarded in leasehold and subject to conditions. National Parks can also be gazetted as being available for historical and traditional claim, potentially making a further 3.84 million hectares (or 2.2% of the State) claimable.

In the case of claims over National Parks, the DAIA Land Branch will first identify those parks in which Aborigines have an interest. Once the Tribunal makes its recommendations, both agencies (the DAIA and the Department of Environment and Heritage) will form a working party which will also include representatives of the agencies, a conservation group and a consultant working on behalf of the claimant group. The working group will determine a broad management plan for the National Park under claim. The emphasis of these plans is likely to be on broad management strategies rather than specific day-to-day management issues. The relevant clauses of the leaseback arrangement will also be determined. No grant will be made unless the grantees have already agreed to lease the National Park back to the Government in perpetuity and on to conditions set out within the management plan. At the

end of the implementation process, granted Aboriginal land cannot be sold. Mineral and petroleum rights will remain the property of the crown, and there is no right of Aboriginal veto.

While there is no absolute veto over the granting of Exploration Permits for mining on Aboriginal land, Aborigines can withhold consent for access. This denial of access can only be overturned by the Governor in Council. If exploration identifies exploitable mineral resources on Aboriginal land, then the Mining Warden's Hearing will now always call for an Environmental Impact Statement (which will include a strong social impact assessment component). This information will help to determine the terms of approval for mining on Aboriginal land. Where mining is approved by the Minister of Resource Industries on Aboriginal land, the percentage of the royalty that grantees and the chief executive are each entitled to receive will be based on a sliding scale.

The actual distribution of Aboriginal lands in Queensland is largely a function of the natural resources they contain. Those traditional Aboriginal lands with commercially exploitable natural resources were occupied by Europeans throughout the initial colonisation period. Much of the remaining land which proved difficult to exploit was left as Aboriginal reserve or it was later designated as National Park. As a result of the poor natural resources on most Aboriginal lands, low intensity pastoralism remains the most common resource development. In most cases, pastoralism provides the 'lowest rent' land use option. In Queensland, pastoralism conducted on Aboriginal land has been largely marginal from an economic viewpoint.

In recent years, with increased mineral exploitation and the transformation of the Australian tourist industry into a major revenue earner, commercial developers have become increasingly interested in mining and tourism developments on Queensland Aboriginal lands. Substantial mineral deposits have been identified on existing Aboriginal lands and other non-Aboriginal areas where traditional associations to land remain strong. Mining companies, for example, have expressed interests in further bauxite and oil exploration at Aurukun and Napranum, gold at Lockhart River and Coen, ongoing silica mining at Cape Flattery and the development of fresh silica deposits on the west coast of Cape York Peninsula and Shelburne Bay. A number of tourism developments have also been proposed on or adjacent to Aboriginal lands. Prime tourism opportunities exist on both the east and west coasts of Cape York Peninsula, including the cultural experience associated with Aboriginal communities, scenic settings, wilderness qualities, and the potential for low impact and safari type adventure recreation. The common European perception of Cape York Peninsula as a 'wilderness' area of immense international significance is dependent on the non-development of Aboriginal lands for commercial purposes. Thus, from the rural viewpoint, the value of Aboriginal land is generally limited, but from the viewpoint of the tourism and mineral industries, many lands hold considerable natural resources. However, these lands also provide an important subsistence resource base for Aboriginal communities. Nearly all Cape York Peninsula communities have substantial land and maritime subsistence resources.

While traditional affiliations to land have been diminished in much of the southern and eastern parts of the State, Aborigines in northern and western Queensland retain direct and clear traditional links to country, despite many having been removed within the lifespan of the older living generations. Cape York Peninsula is increasingly being recognised as an Aboriginal domain, with most land areas still being of real significance to existing traditional owners. The

use of land and marine resources for economic subsistence is closely linked to Aboriginal spiritual affiliations to land.

Aboriginal control and input into the management of maritime and land subsistence resources is an issue of utmost importance to many communities.

Little public recognition has been awarded to the notion of Aboriginal maritime resource use rights. Queensland Aborigines do not have sole ownership and management rights over maritime resources adjacent to their lands or in other parts of the State that are of traditional significance. Limited rights to the use of certain protected species (turtle and dugong) do exist under the Community Service Act, though these will be transferred to the new Nature Conservation Act being devised by the State Department of Environment and Heritage.

Aborigines have similar concerns in regard to their access to subsistence resources on non-Aboriginal land and in National Parks. Queensland's Legislative Review Committee (1991:46) recently called for traditional hunting and gathering rights of all Aborigines in Queensland to be guaranteed on Aboriginal and non-Aboriginal land by legislation arising from its review of the Community Services Legislation. Aboriginal access to subsistence resources in National Parks, for example, is currently prohibited. However, in some areas, unofficial agreements between local Queensland National Parks and Wildlife Service (QNPWS) rangers and Aboriginal groups have been in operation. The management plans developed under the Aboriginal Land Act for National Parks claimed by Aboriginal groups will have to seriously address this issue.

Most Queensland communities have also engaged in some form of commercial economic development of their land resources, though to date, the commercial viability of most development projects has been limited. On most DOGIT lands, pastoral enterprises have, until recently, remained under the control of the State government. Market garden projects have been largely funded by the Federal Community Employment Development Programme (CDEP) though they have rarely achieved any degree of commercial viability. Some communities are currently venturing into large scale tourism development projects (eg. the Injinoo Aboriginal Community has recently purchased the Cape York Wilderness Lodge). Within commercial development projects, communities often place greater emphasis on the achievement of employment, training, educational and other social objectives. Where the government funds projects to be commercially profitable, this conflict in objectives often limits commercial viability. However, government funding agencies are becoming increasingly aware of the legitimacy of the use of land and resource projects for social and vocational purposes.

Conservation groups see many Aboriginal lands as being of high conservation value as most remain relatively unexploited. When viewed in the context of Aboriginal control of these lands and the continuation of Aboriginal resource management practices, nature conservation is compatible with the aspirations of many Aborigines. However, viewed in the context of declining Aboriginal control, increasing external intervention and the imposition of restricted Aboriginal access, the use of Aboriginal lands for nature conservation purposes seriously threatens Aboriginal aspirations.

It must be also remembered that Aboriginal people hold aspirations for traditional land and resources beyond the boundaries imposed by European land tenure systems. Of particular

significance to Aborigines is their desire to gain greater access to traditional sites and subsistence resources in National Parks and in other conservation areas.

Land and Resource Degradation

Until recently, government and public concern about land and resource degradation in Queensland centred on those forms of degradation that affected the short-term profitability of primary resource development. Through the recent evolution of greater public environmental awareness and the growing dependence of the State economy on tourism, land and resource degradation is now being viewed as an issue that affects the basic quality of life in Queensland. Queensland Aboriginal lands have suffered from degradation to a lesser degree than most lands because of a number of factors. First, the majority of Aboriginal lands in the State are in those areas that were left behind by European colonial expansion. Second, Aboriginal lands have not been used extensively by Aboriginal people to conduct intensive forms of commercial resource development. In Cape York Peninsula, pastoral operations have always been conducted on an extensive scale. Low stocking rates and the low probability of serious drought have helped to avoid extensive degradation problems. Equally, continued Aboriginal access to land has ensured the continuation of appropriate indigenous burning practices, preventing the development of potentially devastating wildfire conditions. There are, however, a number of degradation issues of concern to Queensland Aboriginal communities:

(i) Soil erosion. The majority of Aboriginal lands retain their original vegetative cover. The amount of Aboriginal land developed for cropping purposes is very small and most communities only have small market garden ventures. Soil erosion in these ventures is minimal as most are out of production during the wet season. In general, scalding, salinity, acidity and structural soil problems are not extensive in Queensland Aboriginal lands because of the extensive land use patterns. Nonetheless, the potential for salinity problems certainly exists.

The vast majority of Aboriginal land is used for pastoral purposes. Native pasture resources have rarely been improved, and by and large, these pastures have not been significantly degraded. However, the infrastructure of these pastoral operations has been rapidly deteriorating in recent years. This is a general characteristic of Cape York Peninsula properties, though managerial neglect prior to the handover of DOGIT on some ex-Aboriginal reserves has exacerbated the situation.

(ii) Coastal, marine and water resource degradation. Aboriginal lands in Queensland face no major beach erosion problems due to the general absence of structural development in the vicinity of coastlines. In recent years though, increasing pressure from external tourism development has threatened Aboriginal access to coastlines adjacent to existing communities. Also of great concern is the depletion of a variety of maritime resources, generally by legal and illegal forms of non-Aboriginal over-use. Fish stocks in most river systems in the Gulf of Carpentaria have decreased in recent years, leading Aboriginal people to demand greater control over fisheries resources.

Aboriginal communities realise that the quality and quantity of their estuarine resources depend on land use in other parts of the catchment. Both the Aurukun and Kowanyama Councils have taken initiatives to protect upper catchments beyond their administrative boundaries.

(iii) *Introduced animals and plants**. The explosion of feral animal populations on Aboriginal land has been met with mixed responses in Aboriginal communities. Feral pigs have become a serious environmental risk in Cape York Peninsula, particularly with the decline of feral cattle numbers following the implementation of the Brucellosis and Tuberculosis Eradication Campaign (BTEC). Feral pigs are particularly destructive in wetland environments, including the expansive floodplains on the west coast of the Peninsula. They have seriously reduced once staple vegetable subsistence resources (yams and lilies) and they have possibly led to reductions in the number of waterfowl, crocodiles and green turtles. However, pigs themselves have replaced lost subsistence staples as a major source of protein, and many Aboriginal people fear that their eradication may result in the declining availability of 'bush tucker'. At Aurukun, this concern is paramount following the BTEC removal of feral cattle 'killers' (cattle used for domestic consumption) as a major source of protein.

Feral horses are seen as important social resources for Aboriginals who continue to relate strongly to their historical involvement in the cattle industry in Queensland. On some communities, residents own horses that roam uncontrolled. These horses use pastoral resources, cause problems for stock management and contribute to soil erosion problems. In most Cape York Peninsula communities, feral horse numbers are not particularly high and many clan or other kinship-based groups claim ownership of 'Yarraman' stocks through their past involvement in mission-based cattle operations.

A number of Aboriginal properties now face woody shrub invasion. The Moor Moor holding has faced serious problems with rubber vine and the Daintree property (Waudimbi) has been forced to use the ADC's Maintenance of Properties program to maintain weed control within government regulations. The majority of Cape York Peninsula properties potentially face other serious weed infestation threats.

(iv) *Other Aboriginal views on land degradation*. Traditional Aboriginal notions of 'healthy' land are intricately connected with the responsibility that traditional owners have for land management. From a traditional perspective, effective land management includes the protection and maintenance of sacred sites and the maintenance of traditional subsistence resources. At Aurukun, for example, land is considered to be degraded or to have 'gone wild' if traditional burning regimes are neglected. Aboriginal pathways may also become degraded if they are not regularly maintained. Thus, with the removal of most Aboriginals from their traditional lands, in the view of those with traditional knowledge of country, much Aboriginal land in Queensland has become 'degraded' [in this context].

* Blainey, in his *Triumph of the Nomads* (1982) refers to the fundamental importance of Aboriginal food production as follows: 'There is a touch of drama about the way in which the world wide advances of herds and gardens halted within sight of the northern Australian coast. Two different ways of making a living stood side by side [gardening flourished throughout Asia and the islands of Torres Strait] ... they co-existed for perhaps as long as several thousand years. Why the domestication of plants and animals did not affect Australia is one of the baffling questions in prehistory ...'

ATTACHMENT

The following attachment incorporates responses from community and other groups associated with the CYPLUS process in regards to this project. These comments were circulated to the author (where possible) to assist in the revision of the draft report.

From these responses, issues of fact were amended within the final report. Sections of the following comments also portray the views of the respondent and their 'constituency' (if available) in regards to the information presented by the report.

The Cape York Peninsula Land Use Strategy recognises that various and contrasting opinions exist within the wider community. The inclusion of all responses made in relation towards the information within this report, indicates that the CYPLUS process has been, and continues to be, inclusive of all points of view presented by the community.

PASTORAL INDUSTRY REVIEW

by Landcare Management Services

C.Y.P.P.A.G. REVIEW OF SECOND DRAFT

1. Compliance with Terms of Reference

The extensive section on the National Industry appears to be included as padding to add bulk.

The Flow Chart of activities to be undertaken, notably Task 8, Community Consultation and testing of proposals and propositions against anecdotal and informed opinion, has not occurred.

Many of the comments and corrections of fact of the First Draft of the report have been ignored and have re-appeared. The writer is not prepared to correct his mistakes. Community consultation, Pastoral Community at least, has only occurred by these written submissions.

A great deal of time was spent reviewing the material at no cost to the consultant. Of necessity the reviews were completed within a short time span to speed the production of the report. All to no avail. It has taken four months to produce this amended copy.

The time frame for completion has been exceeded by six months. Is it completed yet? How many more times are we going to be asked to review the material? Does it really matter? Are our views going to be considered.

2. Standard of Writing

The report is largely extracts from previous reports. Summarizing of the information has not, in many cases been attempted, in other cases it has not been successful.

3. Standard of Maps, Diagrams & Tables

The black and white copies of colour maps are impossible to decipher. Some of the Tables are inaccurate and misleading.

4. Adequacy of Research Methodology

Research appears to be comprehensive, however on closer inspection it is a rehash of other reports of various ages and reliability.

5. Depth of Research

Reliance has been placed on previous reports that have not been subjected to peer review.

6. Accuracy of Reliability of the Data and Information

The transcript of some data is often downright inaccurate and is therefore unreliable. Much of the information is not relative to Cape York.

7. Summary

While these comments are of a negative nature, the document contains a great deal of useful information. In our view it will require substantial rewriting to produce the required product.

In its present form it includes much contradictory and demonstrably incorrect information. It fails to interpret data in the context of local needs and conditions.

It is unnecessarily repetitive, which makes it extremely difficult to assimilate. Review of the paper has been difficult due to the many issues touched on in passing, then returned to in other sections of the report.

We would like to suggest that further pastoral industry consultation will be necessary before the draft of this document is finalized. A detailed list of our comments is attached.

EXECUTIVE SUMMARY

Generally reads OK. Needs to be rewritten after correction of the entire report.

SECTION A: PROJECT OUTLINE AND METHODOLOGY

Page 1. The consultation with landholders produced a one page report. This, plus the survey paper is the total consultation with land holders. No consultation other than written comments has occurred since the production of the Draft Copy of the report. See Fig. 11 Task Interrelationships.

Seven pages of repeated information that should be condensed..

SECTION B: CATTLE INDUSTRY OVERVIEW

Page 9 to 18.

Unduly lengthy descriptions, have marked irrelevant sections. The three pages of irrelevant graphs are not necessary. Feedlots operations are not relevant to the Peninsula. Industry strategies - unduly lengthy with a lot of patronising and gratuitous advice.

SECTION C : TENURE AND LAND USE

Page 19 to 28 is a direct copy of the DoL Tenure Report which is written from a DoL perspective. While it acknowledges that security of tenure is fundamental to confidence in investment in property development it does not question the DoL policy which has restricted Cape York Peninsula to Pastoral Holdings classified as Pioneer Tenure, instead of allowing conversion to Grazing Homestead Perpetual Lease which is the basis of the "family farm" policy, the objective of which is to establish stability in rural communities. Their words (DoL).

The DoL requirement to invest millions in Pastoral Holdings before up grading the lease to Perpetual Lease is unique to the Cape York Peninsula region.

The so called analysis of the leases also comes from the DoL report. Our comment of that report pointed out that less than 10% of the leases in the Peninsula fell within the DoL specification of the

"family operated property". Hardly an effective attempt at achieving their stated objectives.

Page 29. Amazing that the History of the Pastoral Industry ends in 1969 and does not include reference to the compulsory destocking of over 225,000 head of cattle by B.T.E.C. in the 1980's. This had a devastating effect on the industry. Many of these properties have not yet been brought back in production. The comment on legume pastures and fodder cropping is pointless. What does it mean?

SECTION D: DESCRIPTION OF THE CURRENT INDUSTRY

Mention of BTEC in the Current state of the Industry is hardly appropriate. Surely it is history.

8.3 National Park Involvement in the Pastoral Industry

This section is good except for a few incorrect conclusions made by the writer.

Page 34. The writer is definitely confused about the BTEC effects. Analysis of these figures without knowledge of the BTEC process is impossible.

- Dot point 1. OK. Cow and heifer deaths were BTEC destroyed.
- Dot point 2. The decline in numbers was mainly due to destocks and destruction of all classes of stock.
- Dot point 3. The comment re market forces is utter nonsense! BTEC was compulsory destock, regardless of market values.
- Dot point 4. Increased sales of females instead of destruction on property was due to the BTEC freight subsidy.
- Dot point 5. OK.

The two pages of graphs covering the BTEC period are pointless as market forces were hopelessly distorted.

Page 37. Current Production (iii)

The statement re carrying capacity is out of context and is actually referring to carrying rate (actual stock no's) in Table 5.4.

Page 39. Stock categories. The descriptions used are not those used by industry. Export steers could mean anything. The term usually used is store steers. All store steers are not export.

5.3 Production for Mareeba Saleyard Disposal

Discussion on Mareeba Saleyards trends does little more than reinforce what is already known. i.e. Saleyards are losing market share to direct sales and paddock sales. Detailed investigation would have revealed the extent of cattle by-passing the Mareeba Saleyards.

The writer acknowledges that the numbers are significant and includes numbers.

The numbers provided simply do not add up. Why the pages of graphs and projections made with erroneous figures. Analysis of the figures provided in this report show an average of 25,188 cattle p.a. through the Saleyard for the five year period. Direct Sales (by passing the Saleyards) are shown as 17,480 p.a.

A total turn off of 42,668 cattle p.a. (10,000 more than quoted elsewhere).

Clearly the percentage of Peninsula cattle through the Saleyards is mis represented.

6 MANAGEMENT SYSTEMS AND TECHNOLOGY

Page 45 to Page 59 is a copy of DPI publications which are accepted. Page 50. Partridge and Miller (1991) figures quoted are wrong. Check the Partridge and Miller Table 6.2, Page 51.

7 ECONOMIC PERFORMANCE

A review of CAERA information.

The DPI modelling exercises presented are accepted by most Cape York graziers as representing achievable outcomes.

8 MARKETING

Much of this has been said elsewhere, particularly Mareeba Saleyards and Live Export. Turn off quoted as 33,500 here.

Page 83. Confused understanding for lack of direct to works sales. It is not market forces - it is the shocking road conditions, and long time spent on transport which cause dehydration and bruising which mitigate against direct sales.

9 INFRASTRUCTURE

Again, mostly a lengthy repeat of information presented elsewhere.

Page 92. Cost of maintaining existing roads \$1,000km/hr?

Page 95. More misinformation on Mareeba Saleyards. It has all been said elsewhere.

SECTION E: ISSUES AND ASPIRATIONS

Good although often priorities are confused due to the writers lack of familiarity with the subject and the lack of consultation.

e.g. Page 100. * lack of infrastructure - poor access, lack of roads or railways not mentioned as barriers to development.

Opportunities and Constraints

Page 105. Table 10.1

We suggested a summary of these comparisons in Table Form in our comment on the Draft Report. It should be noted that most of the constraints are imposed by government policies. The identification of constraints and opportunities should be decided by Pastoralists, not the writer. Pastoralists have not had the opportunity to comment on this table.

Constraints outnumber opportunities. Proposed improvement to the roads are 50 years away and is hardly an opportunity.

Aboriginal Land Fund is probably more of an opportunity than a constraint.

Apart from these the Table looks OK.

11 NON PASTORAL INDUSTRY ISSUES AND ASPIRATIONS

As noted this section is extracted from Professor Holmes 1995 report.

The findings are not sufficiently detailed to form any conclusions. The second stage of the report which was to ask some contentious questions relating to land use has not been completed.

SECTION F: ENVIRONMENTAL AND SOCIO-ECONOMIC ANALYSIS

12 ENVIRONMENTAL ANALYSIS

Close investigation of the survey material reveals that much of it does not relate specifically to the Peninsula. Outdated reports of a much larger area cannot be expected to produce reliable information.

The calculation of area by estimating riverine frontages as being 10 kilometres wide should alert the reader to the fact that the Peninsula is not being discussed.

Page 113. Attention was drawn by us to the alleged statement attributed to Peter Stanton in the Draft Report. It is still here and our comment still applies. "The removal of cattle from Lakefield N.P. has led to a total dominance of *Digitaria decumbens* (Pangola grass)."

We have no doubt that this statement was never made, at least not in this context. The area of Lakefield is over 500,000 ha. The areas of Pangola would perhaps total several ha. The Pangola is being monitored by N.P. staff to assess its potential rate of increase.

Statements, and out of context misquotes such as this, serve to demonstrate the authors lack of local knowledge.

Page 114. The comment on feral pigs and a ready supply of food in bogged cattle at the end of winter is nonsense. What do they live on for the rest of the year?

Rubber vine will not be burnt out of actual river systems by a build up of grass debris as it is washed away each season.

12.5 Potential Impacts of Pastoralism

Page 118. Why is it necessary to rehash information presented in the Tenure Section.

Artesian Bores are common through most of the Peninsula. Again old information is used.

The next paragraph. While much has been written on pastures, it has not been understood by the writer of this report. Comment re fertilised pastures is not what is recommended by D.P.I. advisers.

All of this from here to Page 123, rightly belongs in the Current Industry or a Production section. It has mostly been said elsewhere within the report.

Page 119. A lengthy discussion on management options which are not likely to be used. This is acknowledged, why include it?

This is a repeat interpretation of the conflicting statements in the DoL report on The Cape York Pastoral Industry. The DoL estimates on carrying capacities vary widely. Attempting to assess viable property sizes by this method of categorizing 26 major land types into natural carrying capacities is complex and impractical.

This method does not apply in other regions, DoL acknowledge that the system is under review as it is considered unrealistic.

We have commented on this. Appendix 14.3. i.e. The notion that Tetrodonta country has nil potential for pasture development is nonsense and contrary to D.P.I. advice. Who provides pasture advice to the DoL?

The difficulty of interpreting DoL carrying capacities is also experienced by the DoL. At this time it has not been fully explained to pastoralists. It is not clear how it fits with the CYPLUS NRAP soil mapping project.

13 SOCIO-ECONOMIC ANALYSIS

Another rehash of the basic details of the Industry.

Page 124. Negative Impacts. Would be more appropriately headed "perceived negative impacts".

Most of this section OK. Needs to be summarised.

SECTION G: PROPOSED MANAGEMENT GUIDELINES FOR THE PASTORAL INDUSTRY

14 PRINCIPLES, POLICY AND STRATEGIES

Page 131. 15.1 Government Role

Lists a multitude of Government Agencies with a say in land management in the Peninsula. None of the mentioned bodies have set foot in the Peninsula to ask for local input.

Page 134. 16 GOVERNMENT ROLE

The suggestion to establish even more government agencies to administer Cape York Peninsula is ridiculous.

Buck passing, indecision, and lack of policy direction between Government Departments is one of the chief handicaps to development.

Suggestions on changes which result in a reduction of overlap between departments and clear policies with accountability for achieving results/milestones in providing services would be more welcome.

The establishment of CYPGAG, CYPRPAG, and ROSS is hardly likely to achieve more than another several layers of bureaucratic handicaps.

Page 136. TENURE

OK. Except that improved leases should be available before investment is made in property development as applies elsewhere.

18 LAND ALLOCATION CRITERIA

Page 137. More on the DoL classification of carrying capacities. Enough said. DoL admit they are not currently workable. Appears to have some fairytale expectation of lease resumptions funding property development.

Page 139. Inclusion of data which is acknowledged as being "difficult to interpret in the context of the Peninsula alone" is pointless as it only further confuses the issues. If relative information is not available why use unrelated data.

Relative baseline data will need to be established before on-going assessment of environmental change can be monitored. Note this Table uses 13 Pasture types not compatible with the 26 used by DoL.

Today 28/06 the Premier announced the Cape York Wilderness Zone. This report would now appear to be immaterial. My comments from here on will be very brief.

19 ECONOMIC EFFICIENCY OF ALTERNATIVE LAND USES AND POSSIBLE BOUNDARY CHANGES

This section which considers "other uses of land which may be equitably converted from pastoral holdings" is nothing more than fantasy. Uses for land other than Pastoral cannot be decided on by carrying capacity.

Location of sites, scenic values, coastline access etc, will be the chief deciding factors. Aboriginal, conservation, tourism, cultural, hobby farms, remote area rural lifestyle and particular industry requirements coupled with the aspirations of particular tenants will be deciding factors.

These purposes have an endless range. The examples shown are nonsense.

Page 142 Boundary reconfiguration. An impractical academic approach.

Page 145 to 150 . Seems OK. It would now appear that all of these considerations will be overridden by political decisions.

APPENDIX

A great deal of paper, often unrelated to the Peninsula. Close inspection of them will often reveal their genesis and their age. Many are out dated and simply poorly researched rehashes of previous reports.

Page 87. Professor Holmes Report - Written from a Conservation Perspective for the Conservation Movement. Professor Holmes spent about a week in the Peninsula and arrived with pre-conceived ideas. It is pro conservation.

This Report should be balanced by a pro grazing report, or a least a commentary by Peninsula based Grazing representatives. John Boormans discussion on the potential is dismissed as "unlikely".

The report is supposed to deal with the Peninsula as a whole. Aboriginal Lands and their use is often remarked upon.

Page 116. The vast majority of Aboriginal Land is used for Pastoral purposes.

In the tables and discussion on carrying capacity and potential carrying capacities DOGIT land is not included.

A quick review of Pormpuraaw, Aurukun, Lockhart River, Weipa. Old Mapoon, Kowanyama, Hopevale, the Northern Aboriginal Reserve areas will show that they TOTAL 2,436,910 hectares and have an unimproved carrying capacity of 70,495 cattle.

One would think that a resource of this size would deserve more mention.

R. Wincen.

R. Wincen
Liaison Officer
30/06/1995

DEPARTMENT OF PRIMARY INDUSTRIES
OFFICE MEMO

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DATE: 22 June 1995

FROM: David Crowther, Technical Support Officer (Agricultural Production)

TO: Stewart Wood, Regional Director, North Region
Chris O'Brien, Regional Manager, Agricultural Production

SUBJECT: CYPLUS FINAL REPORT - PASTORAL INDUSTRY PROJECT

I discussed the draft final report of the CYPLUS Pastoral Industry Project with John Boorman while in Mareeba recently. John was unable to find the time to prepare a written reply, and provided the following comments for me to write up. He has read this memorandum and approved it.

John expressed general satisfaction with the final version of the Report on the Pastoral Industry. He was pleased to see many of his suggestions on the draft report included in the final report. He feels that minor errors in the Final Report do not justify any re-write. He also commented on the strengths of the report, such as the proposals relating to land tenure, which suggest that CYPLUS has got the right feel of the situation, e.g.:

- consider National Park boundary changes to remove sections not of high conservation value,
- return this valuable grazing land to the grazing industry, and
- exchange land of high environmental value for land of low environmental value.

John provided the following additional comments:

1. **Page 24, Section 3.7, Sizes of Pastoral Lease:** 90 000 ha is the upper limit of area workable by a traditional family unit. The PDS site at "Pinnacle" showed trapping can cut mustering time and increase capture rates considerably, allowing a considerably larger area to be managed by a family unit. This should be taken on board by CYPLUS to indicate that 90 000 ha is conservative.
2. **Page 30, Section 4.2, Aboriginal and Torres Strait Islander Involvement in the Pastoral Industry:** Aboriginal people lack property management experience. It could take one generation to change the culture and teach aboriginal people to manage

grazing properties and efficiently by "western" standards. The question is whether "western" values are appropriate to aboriginal people. If not, then land tenure must be changed to reflect Aboriginal needs for land ownership. This will affect the critical mass of the pastoral industry in the Peninsula.

3. **Page 45, Section 6.1, Climatic Factors:** The reliable rainfall of the Peninsula is one of its greatest assets.
4. **Page 45, Section 6.2, Management practice:** Pasture burning is more selective than the report would imply in relation to end of year fires. Most graziers realise end of year fires are valuable for sucker control and that to obtain a sufficient body of material to support a hot fire, burning is best carried out only once in every 3 or 4 years.
5. **Page 47, Section 6.2, Supplementation:** When the term "supplementary feeding" is used, does it apply to supplementation *per se* or protein supplementation only? If the latter, then protein supplementation is economic only if used in conjunction with wet season phosphorus supplementation and early weaning.
6. **Page 55, Section 6.8, Carrying Capacities:** The Department of Lands (DoL) suggests the potential total herd of the Peninsula is in the order of 500 000 head. This is four times the current level of 120 000 and may still be conservative. Therefore it is credible. As 10% of the properties in the Peninsula are currently destocked, restocking them alone will increase the herd significantly. The rest of the increase will come from improved management and husbandry using existing technology, for example trapping, culling, early weaning, supplementation, improved watering and fencing.
7. **Page 58, Section 6.8, Carrying Capacities:** Conservationists' concern (paragraph 2) over carrying capacity is not supported by DPI and DoL. There is a caveat, however. Any increase in herd size must be done carefully, be well planned and occur slowly to avoid overstocking of controlled areas in the initial stages of the process.
8. **Page 58, Section 6.9, Constraints and Opportunities:** Production levels of traditionally managed properties are not capable of significant increase *only* if they are currently fully stocked. Due to BTEC, many are not.
9. **Page 59, Section 6.9, Constraints and Opportunities:** John fully endorses the sentiments expressed in the last paragraph on this page.
10. **Page 69, Section 7.6, Improved husbandry management:** Negative cash flow can be avoided by selling surplus breeders in the first 3 years. By years 5 to 7, cash flow will be positive. This can be achieved without reducing turnover through fewer deaths and higher branding rates due to improved herd management and herd quality.
11. **Page 71, Section 7.7, Pasture Systems:** Bank lending rates of 20% to 24% seem overestimated.
12. **Page 72, Table 7.14:** Check for calculation errors in the Intensive and Medium input totals.

13. **Page 84, Lack of Infrastructure / transport Costs:** Deaths of cattle due to dusty road conditions are more likely on feeder roads than on the Peninsula Developmental Road.
14. **Page 86, Section 8.4, Marketing Potential and Industry Background:** Industry in the Northern Territory and Kimberley owes its recent good fortune in part only to the live cattle export trade. A major factor in their favour has been the network of excellent bitumen roads supplied by public funds. These have not been provided to near the same extent in Cape York Peninsula and at current rates, will not eventuate for many years yet.
15. **Page 89, Live cattle export support from the Northern Territory government:** This is an important point for Queensland's policy makers to take on board. Lower Peninsula data indicate that live exports could increase gross margins by 50% to 100%. However, the government must foster Live Cattle Exports by putting facilities in Cape York Peninsula - roads and terminals - and recoup its investment through the flow-on effects of taxes, fuel excise, etc. CYPLUS must support the point that the Peninsula Developmental Road is the *main* factor inhibiting the development of the area. Live cattle exports through Karumba are not practical because there is no direct road access between the Peninsula and Karumba, except via Mareeba.
16. **Page 94, Technical Services:** DPI services to Cape York Peninsula have been affected by the retirements of Peter McKeague and Rob Webber and the need for new officers, especially Jim Turnour (Landcare) and Rod O'Connor (Financial Adviser), to gain experience.
17. **Page 94, TV and Radio:** Listeners in the Peninsula are better able to receive the ABC stations in Longreach, Mt Isa and Emerald than Cairns. However, news and Country Breakfast Session items broadcast from Longreach, Mt Isa and Emerald are not targeted towards Peninsula listeners, and are less relevant. This could get worse as AM stations are progressively replaced by FM stations with smaller broadcast radii, leaving Peninsula listeners outside the immediate area of Weipa and Coen more isolated than ever.
18. **Page 101, Pastoral Lease Use:** Pastoral leases not being used for pastoral purposes, for example Bertiehaugh, Bromley, Blue Mountain and Aboriginal holdings are a big problem for the Peninsula as they affect the critical mass of the grazing industry and lower the economic activity required to foster improved services and infrastructure.

John also points out that there are 150 000 ha on Holroyd River, Meripah and Kendall River on which peanuts, maize and sorghum could be grown under irrigation from the artesian aquifer. The main unknown at this point in time is the suitability of the artesian water of the area for irrigation of crops. There is also a substantial area east of Weipa which is suitable for cropping. Reliable rainfall and artesian water should be a factor encouraging the assessment of these areas for cropping, to follow on from the pioneering beef industry, and looking to Asia for export of produce. The Atherfon Tableland is only 170 000 ha in total, of which only 40% (approx. 70 000 ha) is suitable for cropping peanuts, maize, etc.

19. **Page 118, Section 12.5, Potential Impacts of Pastoralism:** The estimate of the potential carrying capacity in the last paragraph is conservative (1 beast to 5 ha is conservative). Given the fact of higher, more reliable rainfall, a stocking rate of 1 to 3.5 ha should not put excessive pressure on the environment and should be considered practical.
20. **Appendices:** Due to pressure of time, John did not go through the Appendices in detail. As they are regularly cited throughout the report and no errors were picked up there, John feels confident that they are accurate.

**D E Crowther
TECHNICAL SUPPORT OFFICER
(AGRICULTURAL PRODUCTION)
NORTH REGION**

Mr. Lane
Land Use Program Manager
CYPLUS
P.O. Box 7440
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18 January 1995

Dear John,

Comments on Pastoral Project

Introduction

We have received a copy of the draft report on the pastoral industry and have set out below our comments. In general, this paper joins a long list of publications which effectively attempt to translate industry aspirations into broadly appealing policy positions that mask the real issues associated with suggested courses of action. The paper does nothing to recognise the aspirations of any sector of society other than the pastoral industry and its supporters.

The paper suffers badly from an over emphasis on "uncertainty" as the major factor that has hampered the development of the pastoral industry on Cape York. The industry is subject to many factors which have retarded its development many of which explain why the intensification of the Cape York pastoral industry offers no comparative regional advantage, not the least amongst these is unfavourable environmental conditions e.g. pastures and soils.

Any attempt to either downgrade the status of national parks or reconfigure boundaries to provide more land for grazing will be strenuously resisted by conservation groups.

The paper also gives a very optimistic view of the land condition and the impacts from pastoralism to date.

It fails to properly consider the nature of Cape York Peninsula's biophysical attributes and in particular its fragile soils and outstanding natural and cultural values.

CAFNEC is a member of the Arid Lands Coalition, a consortium of conservation groups around Australia working on rangeland issues, including Cape York Peninsula. The coalition has produced a number of position papers and these have been provided to the consultants who completed the CYPLUS pastoral industry project. Unfortunately very little of this material has been incorporated into the draft report and therefore by necessity we need to restate some of it.

The paper fails to create an appropriate nexus between the conservation values on CYP and the potential damage to these values from inappropriate land use allocation. The concept of multiple land use simply does not result in adequate protection. It is a concept that is ecologically dubious and politically difficult in ensuring that it results in this adequate protection in the real world. It is precisely the justification that the mining industry uses to promote mineral exploration and extraction in national parks and other conservation reserves.

The paper proceeds from the starting point that the cattle industry on CYP has a viable future and then suggests changes that need to be made to ensure this future. These changes are :

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- * modification to lease conditions
- * tenure changes
- * partial subdivision
- * improved cattle control systems
- * live cattle export
- * upgrades to the road system
- * higher input systems
- * development of domestic and export marketing strategies
- * grazing on Aboriginal and national park lands including the excision of grazing land from many parks

The links between these changes and the principles of ESD, which the paper spends some time talking about, are very nebulous.

The paper fails to recognise the reality and impact that such measures will have on CYP's ecology. Australia's past is littered with examples that provide evidence of these substantial impacts and while the paper attempts to suggest and justify a system of co-operative environmental management to ameliorate these impacts, the reader is left with a sense that the path suggested is unworkable, damaging and not properly appreciative of the impacts that such a path will produce.

It short it will represent a disaster for the rangelands of CYP.

The Arid Lands Coalition has a fourfold approach in sequential order that is applicable to CYP:

Firstly, the establishment of a representative reserve system throughout CYP supported by off reserve conservation management;
 secondly, where pastoralism is either ecologically unsustainable or economically unviable alternative ecologically sustainable land uses must be developed and implemented;
 thirdly, where any pastoral land use can be ecologically sustainable, ensure that all activities are within the principles of ESD and
 fourthly, appropriate resourcing and support provided to facilitate the realisation of the aspirations of traditional Aboriginal owners for ecologically sustainable land management.

Managing land for conservation is not the same as managing land for intensified cattle production and the paper implies that these two are in fact very compatible. With the changes suggested in the paper and listed above, this intensification is significant and it is not enough to say that they are designed to protect the values of CYP. They are in fact designed to intensify the cattle industry in an area of outstanding natural value.

The paper places a lot of emphasis on the claim that CYP's natural condition is still good and that this condition has been maintained after 100 years of pastoralism. Unfortunately nowhere near enough emphasis is placed on the environmental effects of the paper's suggested changes listed above. Extensive rather than intensive use has given us what we have today, a change to intensive will not give future generations what we have today and there is ample evidence to support this proposition.

In our view this glowing report on the Cape's condition is over stated and optimistic.

It is no longer good enough to say that we cannot prove this riverine degradation, weed invasion, erosion or loss of biodiversity is because of "this cow" or "these cattle." As has been stated by a member of the Arid Lands Coalition: "It is a bit like the tobacco industry continuing to claim that smoking does not cause cancer."

Unfortunately in this country we have a long list of agricultural consultants and Government officers who are reluctant to offend the farming lobby by telling it like it really is. The environmental problems over vast areas of Australia that have been the result of the very path suggested by this paper are now so serious that it is time to say that the users must be able to prove they can manage land in a sustainable manner rather than the community having to prove that they cannot.

Changes in land use allocation is the fundamental first step in such a process. This paper's version of changes in land use allocation place an emphasis on "....the excision of quality grazingland from many (national) parks...." This is absurd and has no basis given the ecological and wilderness values of CYP.

The paper provides inadequate discussion on the value of CYP's rangelands other than for cattle raising and subsequent intensification of this use. Sections on conservation and biodiversity values are very weak and do not do justice to these values. There is a very weak recognition of the proven impacts from pastoralism.

The comments below refer to specific sections in the report.

Section A : Project Outline and Methodology

This section provides detail of the methodology adopted and this includes a number of references to " community consultation with stakeholders. " In the case of the environment sector this consisted of representations made through two working group meetings and attendance by one of the consultants at a meeting of conservation groups in Cairns. It is our view that while the consultation took place, we find it disappointing that very little of the views put forward at these forums have been incorporated into the report, particularly the four point position of the Arid Lands Coalition set out above.

Section C : Aspirations and Attitudes

4.1 Questionnaire analysis

* the property development techniques are the very activities which have wrecked much of Australia's grazinglands,

* a major impediment to property development for cattle production on CYP is the environment i.e. low nutrition pastures and poor soils. This factor is not recognised by landholders in the responses given. It needs to be accepted that CYP is not naturally suited to high cattle production and any attempts to carry it out will therefore be continuing the modus operandi in other areas of the country i.e. pound the land into submission.

Section 4.2

* There is no mention of a recognition by industry of the ecological and natural importance of CYP. Conversion to national park tenure is presented as merely taking away " significant areas of pastoral properties" without one iota of acceptance that national parks have a vital ecological function in a largely destructive society.

* the reference to Lakeland Downs on page 19 is incorrect and presumably should be Lakefield.

Section 4.2.2

The discussion on uncertainty states that : " the industry considers that better decision making based on effective consultation and factual information inputs is required." The environment sector agrees with this, it is a shame that the pastoral industry representatives involved in CYPLUS have chosen not to put these words in practice.

Section 4.2.3

The last statement fails to recognise that an overwhelming reason that CYP is in its present condition is because the pastoral industry has been contained for a variety of reasons. It is not in its present condition through any deliberate decision of the industry. The result has come about because of factors outside their control and in fact contrary to their aspirations as evidenced by the questionnaire.

Section 4.2.5 In reading the industry view that : " Cape York needs to accomodate the widest

possible range of business activity and land use - one automatically has to ask : Why ? This statement is made in a vacuum divorced from the reality of the importance of CYP's environment. This attitude has resulted in vast areas of Australia being degraded ir-reversibly.

Section 4.3 Future Industry Aspirations-

4.3.1 The view that Cape York offers comparative advantages for the pastoral industry from a national perspective is utter nonsense. On any criteria amongst many, Cape York falls short in its national comparative advantage.

The view that somehow intensifying production on Cape York will assist in the rehabilitation of areas of western Queensland is laughable. Where do we intensify next after we have wrecked Cape York in order to give it a chance to recover ? That is the reality of the situation.

Section 4.3.6 The industry ".....considers that the beef industry can develop in harmony with other land use requirements..." When this claim is combined with the changes that the industry seeks, the statement must be challenged when it comes to : the protection of wilderness, biodiversity and the ecological systems of CYP.

Section 4.4 Page 25. The sentence at the job of the page sounds very noble indeed. The only problem is that all outcomes sought within the guidelines suggested later by the consultants and the aspirations of the industry, are impossible to achieve together and the paper suffers greatly from a failure to recognise this fact.

At the end of the day, decisions about the direction we want to go in and the outcomes we are seeking must be made and acted upon. It is a fallacy that " attempting to be all things to all people " will result in proper recognition and protection of the significant natural values of CYP.

Section 5 Community Aspirations

5.1 Present Community Attitudes

It must be stated that this section does not reflect the views of the wider community outside CYP, who increasingly have shown that they place great store on maintaining our wild and natural lands in their present condition. The list under 5.1 reflects this and does not include any recognition of the natural and cultural value of CYP.

5.2 Community aspirations for the Pastoral Industry

This discussion is a serious oversimplification of the results of this land tenure project results. Particularly the second and third last paragraphs. We suggest that the full land tenure project report be included in the appendix to this pastoral report.

Section D : Tenure and Land Use Analysis

Section 6 : Once again the " uncertainty " factor is emphasised - refer to comments above.

Section 6.3 There is an underlying tone to the statement in this section. One has to ask what criteria has been applied to present the view that : " National Parks constitute a substantial component of the study area..." ?

On the basis of the percentage of land in conservation tenure compared to the percentage of land not in conservation tenure but worthy of such, the statement made in the report is unjustifiable.

Page 32 : the last table and sentence continues the trend of attempting to build a picture in the readers minds that is a picture the industry wants to hear. There are a number of issues raised by this comment, that are probably best not stated here.

Section 7 Pastoral Tenure

Section 7.1 The first sentence must surely be changed to "Grazing is the most extensive use of land on Cape York Peninsula." It cannot be the most important on any criteria...economic return or environmental protection. If this sentence remains as stated in the final report, it will seriously erode the claim to independence by the consultants.

Section 8 Pastoral Land Use

Section 8.3 National park Involvement in the Pastoral Industry

The predominant reason that Queensland has a long history of grazing in national Parks has nothing whatsoever to do with a recognition of the benefits of doing so or the outcomes which it produces; it has everything to do with a State whose successive Governments have pandered to an industry and been reluctant to do anything which might mildly concern them.

Section 8.4 Constraints and Opportunities

The comments on page 42: "The total land area available to the industry must be considered a prime constraint to the future of pastoralism.....However, the opportunities which are offered by a new approach to the sharing of resources are wide-ranging....." seeks to justify the concept of multiple use which is effectively a front for making more land available for pastoralism.

Section E : Economic Analysis

This section from page 44 to 68 is cumbersome and would benefit from a table of conclusions and a summary.

Major conclusions are :

- * that the industry is not viable in its present form
- * that to change it requires the implementation of environmentally damaging practices and technologies and
- * there is no clear indication of where investment finance will come from.

9.5 Carrying Capacities

The potential carrying capacity and resultant herd size will be an environmental disaster for Cape York Peninsula.

Page 70 : The DPI suitability assessments must be challenged and even a cursory glance at the accompanying map will reveal that the criteria applied are drastically flawed.

9.6 Constraints and Opportunities for Economic Growth

Page 71 The discussion centres around intensification and says : " This process should take into account environmental and cultural considerations." but does not provide any guidance or recognition that the very measures being proposed cannot properly incorporate the environmental and cultural considerations that the writers aspire to.

Section F : Environmental and Social Impact Analysis

A reading of this section shows clearly that pastoralism has had a negative impact on the environment of Cape York Peninsula mainly through erosion, the introduction of weed species and changes in fire regimes.

Section 13.2 The statement at the bottom of this page in the last paragraph regarding the precautionary principle is very confusing to say the least and cannot be justified.

Section 13.3 This section is very weak and does not support local anecdotal information. In addition, the results of Moss et al. are inadequately explained away.

Section 14.2 We agree with Friedel's inference in the first sentence of the fifth paragraph.

Section 14.4 Page 112 a major reason for the claim in the first sentence can be put down to the nature of the grazing industry on the Cape in the past. Because it hasn't reached the levels of intensification elsewhere the country has been spared the enormous degradation that has ravaged so much of our rangelands.

To recommend intensification is to recommend the degradation of the Cape's fragile soils, vegetation and ecosystems.

Section 14.5 : Potential Impact of Pastoralism - High versus Low Input Systems

This section does not do justice to its title. It is a description of the different methods and a general discussion where it is difficult to sequentially follow on from other sections.

Section 15.1 References should be provided for the statement on page 118 in the third paragraph, last sentence. It is not clear what these condition surveys are.

Section 17 Page 122 : This section demonstrates a poor understanding of native title. It is not just a right, it is also ownership, that may or may not have been taken away in white society's view by the granting of pastoral leases. In Aboriginal society the land is still owned.

Section 18 page 124 to 126. This provides a good analysis and conclusion.

Section 19 page 127 to 128. Criteria assessment must include consideration of the conservation value of land and the loss of those values elsewhere both on a national and international basis.

Section 20 The second and third paragraph are based on the premise that use and development of country are good. We believe there must be places left in the World where this does not apply.

We agree with the discussion on financial incentives etc in the large second last paragraph.

Page 130 the third paragraph commencing "In the case of grazing of" we find this paragraph contains underlying value judgements, ideologies, poor understanding of national park philosophy and need and is consequently blinkered in its view. It contains ridiculous justifications.

Page 131 the discussion here fails to suggest that where conservation values are protected in the national interest and where this results in a loss of rates for the local authority, in this case Cook Shire, then it follows that under funding and grant allocations that Shire must be compensated by Federal and State Governments because of this national interest.

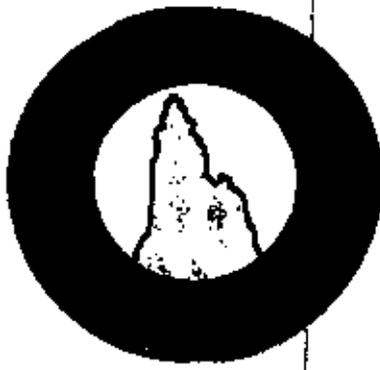
We trust these comments are useful and state clearly our position on a number of issues raised by the pastoral paper.

Yours faithfully,



Jim Downey

CYPLUS Co-ordinator



CAPE YORK LAND COUNCIL

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RESPONSE TO PASTORAL INDUSTRY PROJECT

We have considerable reservations about many aspects of this report.

However, due to the lateness of our response we will concentrate on the main section that is of great concern to the Land Council.

Section 17 (p 122-123) **SOCIAL JUSTICE AND EQUITY OF RESOURCE ACCESS** we would like to see totally removed from the report.

It shows a complete lack of understanding of the principle of Native Title ('free land', 'being allocated land', 'one reason to grant Native Title').

It is full of inferences that are not accepted by Aboriginal people and it shows an ignorance of the fact that many Aboriginal people wish to establish a secure economic base.

The last paragraph on p. 122 and first on p 123 are paternalistic and patronising and show an ignorance of current Aboriginal culture and thinking.

The section needs so heavily rewriting that it would be simpler to drop this whole section.

Joan Staples
8 February 1995

